Multi-Services Bracketry and Frame Solutions

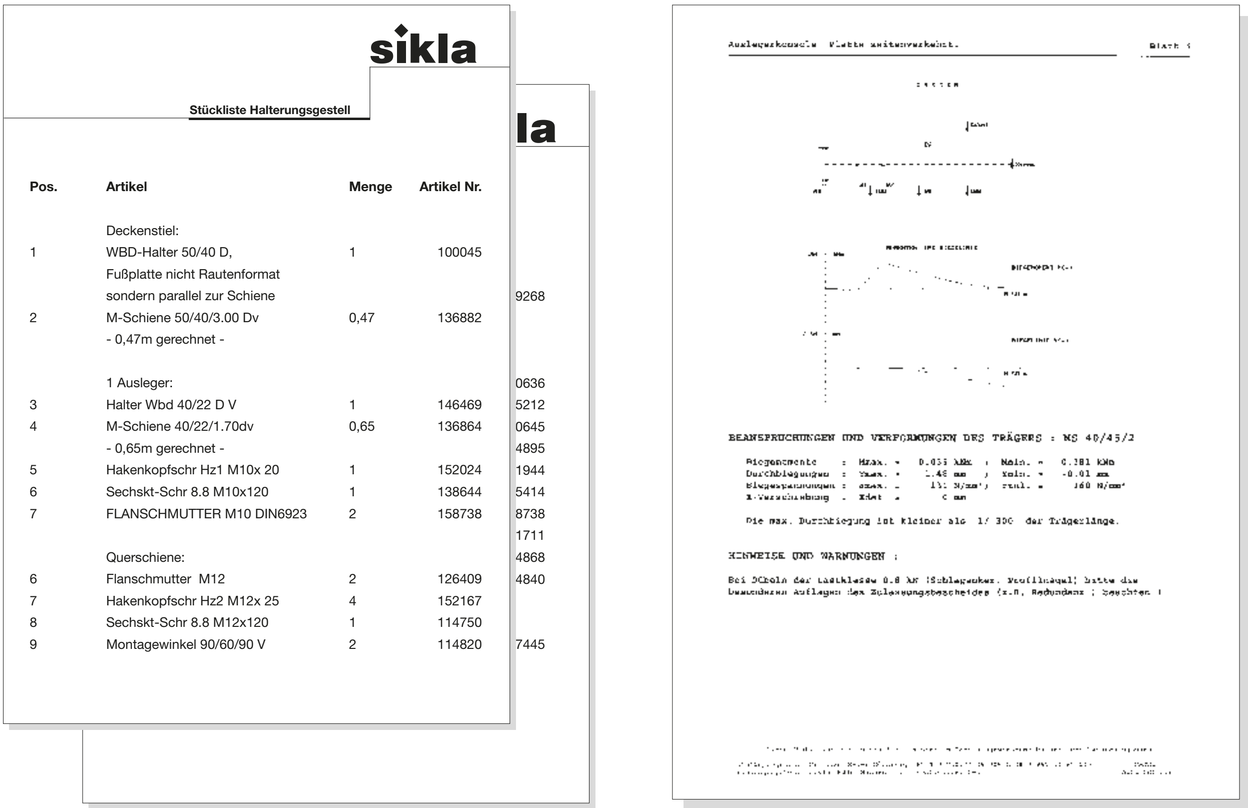
Off-Site Assemblies – The professional planning and pre-assembly service for frames and bracketry

In cooperation with representatives from each of the different trade contractors, the Sikla Technicians can develop support solutions that integrate all services to a common bracket or frame pre-assembly. The final bracket or frame is calculated according to the specific static load requirements of the combined services loading. The bracket or frame is then pre-assembled and delivered to site according to the required works installation programme. Pipework and electrical containment can then be installed to the pre-assembled bracket quicker on-site, leading to a more productive workforce, easier commissioning and less rework of the complete installation.

Certainty of programme and quality; through simplification of site operations, reduced dependence on weather and the reduction of defects, based on controlled factory-based assembly processes.

Safety and working conditions; Transferring such installation work off-site into a controlled environment improves safety due to large reduction in the number of manual installation operations subsequently required on-site.

Documentation (Part list, Static Calculation, AutoCad)



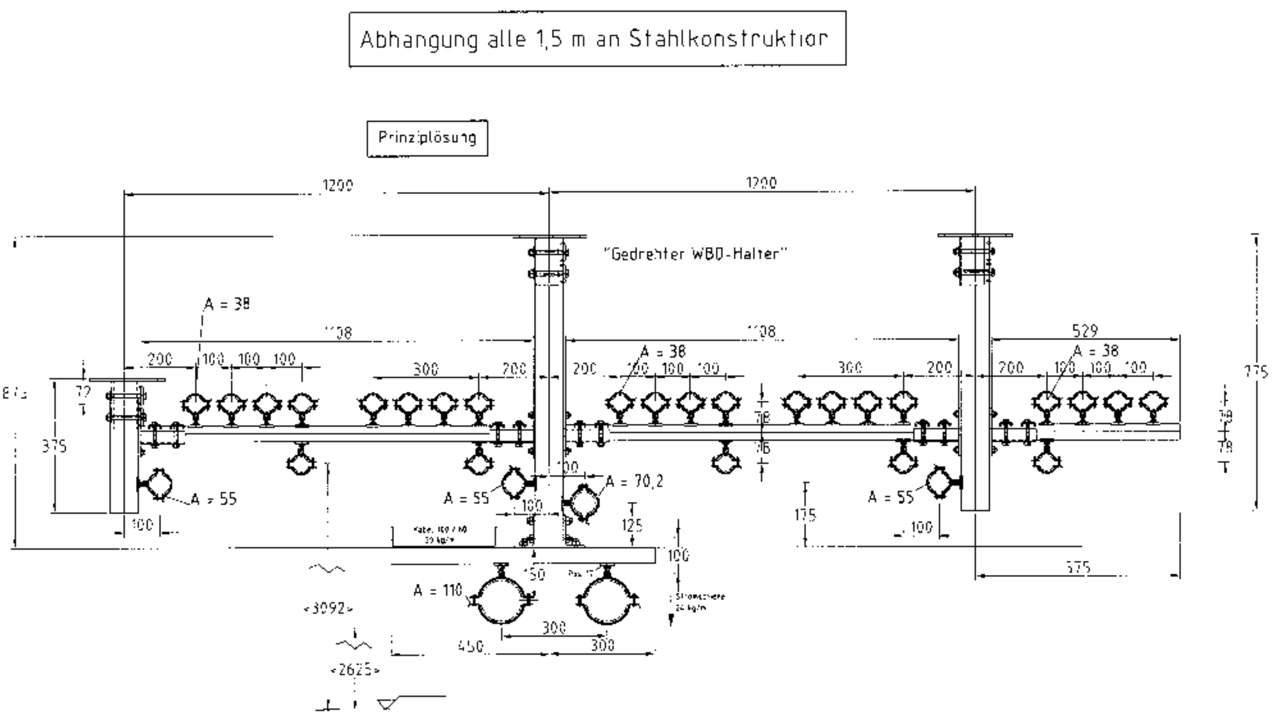
Stückliste Halterungsgestell

Pos.	Artikel	Menge	Artikel Nr.
	Deckenstiel:		
1	WBD-Halter 50/40 D,	1	100045
	Fußplatte nicht Rautenformat		
	sondern parallel zur Schiene		
2	M-Schiene 50/40/3.00 Dv	0,47	136882
	- 0,47m gerechnet -		
	1 Ausleger:		
3	Halter Wbd 40/22 D V	1	146469
4	M-Schiene 40/22/1.70dv	0,65	136864
	- 0,65m gerechnet -		
5	Hakenkopfschr Hz1 M10x 20	1	152024
6	Sechskt-Schr 8.8 M10x120	1	138644
7	FLANSCHMUTTER M10 DIN6923	2	158738
	Querschiene:		
6	Flanschmutter M12	2	126409
7	Hakenkopfschr Hz2 M12x 25	4	152167
8	Sechskt-Schr 8.8 M12x120	1	114750
9	Montagewinkel 90/60/90 V	2	114820

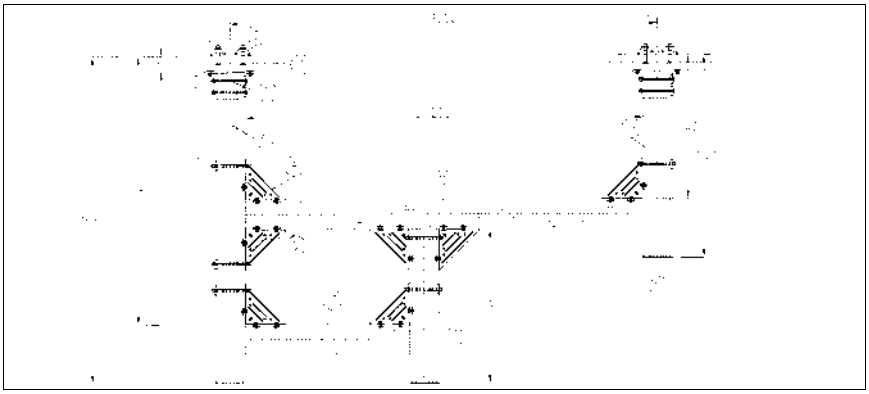
BEANSPRUCHUNGEN UND VERFORMUNGEN DES TRÄGERS : MS 40/45/2

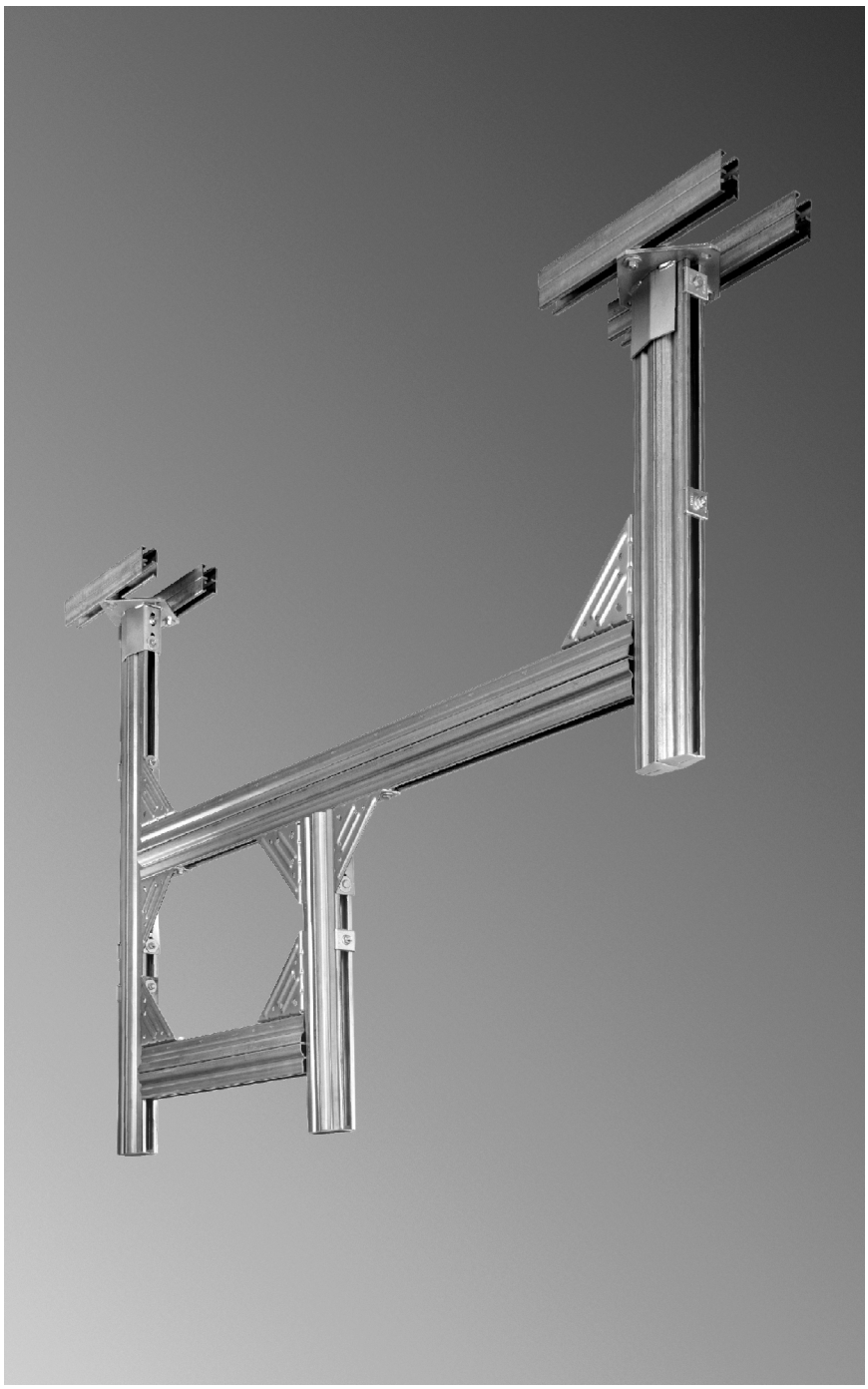
Die max. Durchbiegung ist kleiner als 1/ 300 der Trägerlänge.

HINWEISE UND WARNUNGEN :



Modular Frame Construction





M&E services supports built out of bracketry assembly systems, is an ever more frequently used option in fastening technology. Universal practicability, material selection to a reasonable price and calculable loading capacities are only a few reasons for this positive result.

More complex construction assemblies consisting of several individual parts are normally planned on site. These operations are often carried out under more onerous conditions like low temperature, or lack of space. Loss of productivity can be the result.

Our tailored pre-assembly solutions help to solve these problems. Sikla offer an economic service for the installation contractor : we carry out the design, dimensioning, static load checks and deliver the pre-assembled construction for the final on-site installation according to the works programme requirement. The logistics and loss of productivity for countless individual parts is unnecessary.

Cost-effective construction is possible from only a few parts - test us!

The Sikla range of services for off-site assembly of brackets and frames:
Sikla construct according to your specific fixing requirements for building services and industrial installation work -
You save time and money, from design through to final installation.

Your advantage

- Sikla supports you through the design and layout process.
- Sikla constructs according to customer requirements from as little as one assembly.
- Sikla manages all pre-assembly logistics and handling.
- Sikla guarantees and maintains cost predictability throughout the process

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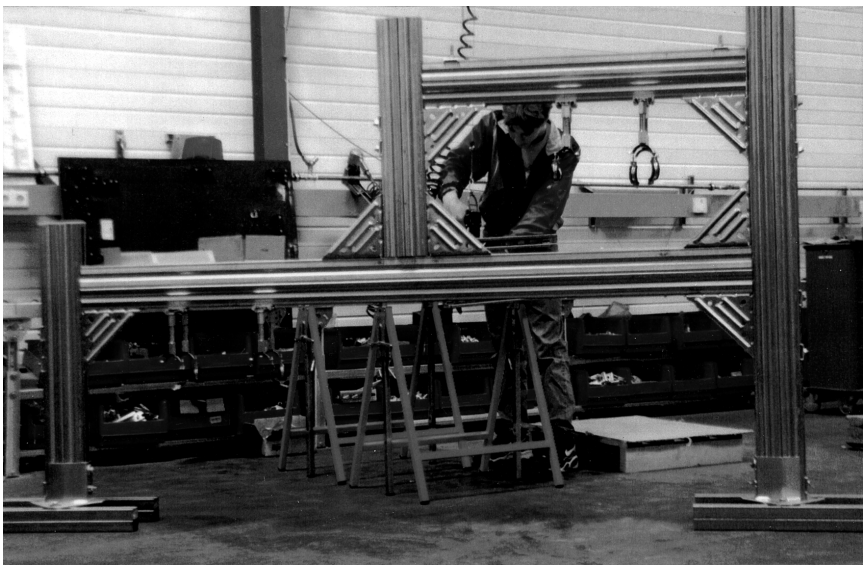
From pre-assembly to site



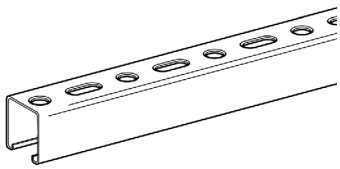
Larger frame constructions, special solutions, and modules can be delivered by carrier directly to site : Just in time!

Test our service; our customer consultants will be pleased to advise you.

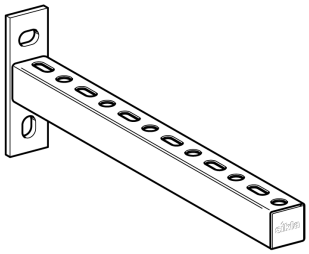
By the way...
We know our products.
This means we can construct the pre-assemblies very efficiently, and with our factory assembly processes we can work more efficiently than on site.

Products

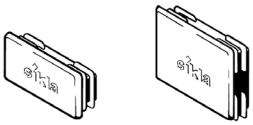
Channel MS 27-1.25



Cantilever Bracket AK 27-1.25

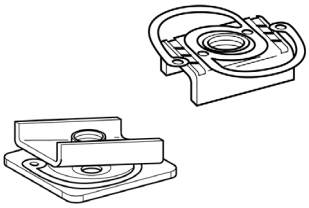


End Cap ADK 27

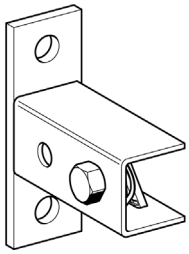


Blockset PBS CC 27

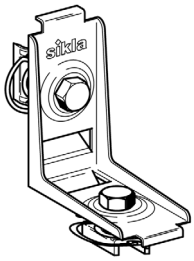
Speed Nut NT CC 27
Block PB 27



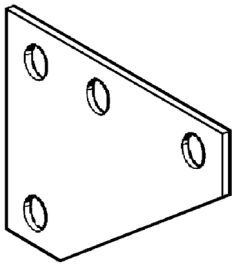
Channel Holder MOF 27



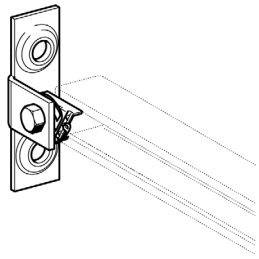
90° Angle Connector CN CC 27



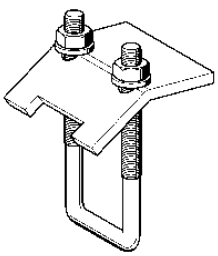
Web Plate KNO



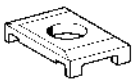
T Bracket MOS 27



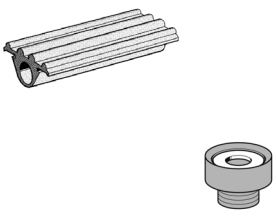
Beam Clamp SB 27



Holding Bracket HK 27



Channel Lining SAL 27
Sound Absorption Unit SDE 27



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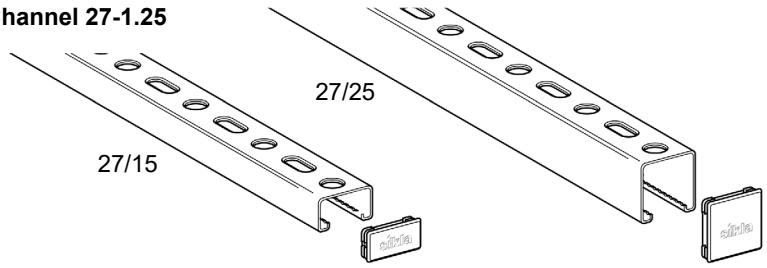
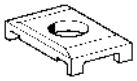
Connection to the building structure

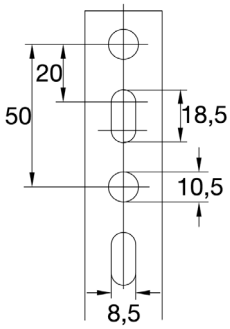
Channel 27-1.25



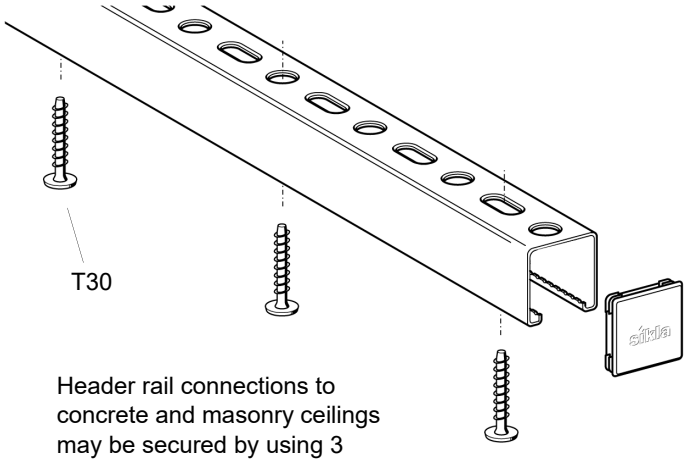


The Holding Bracket HK 27 secures over the open channel edges to prevent deformation of the channel under maximum load conditions imposed by the connecting part.

Slot pattern Channel 27

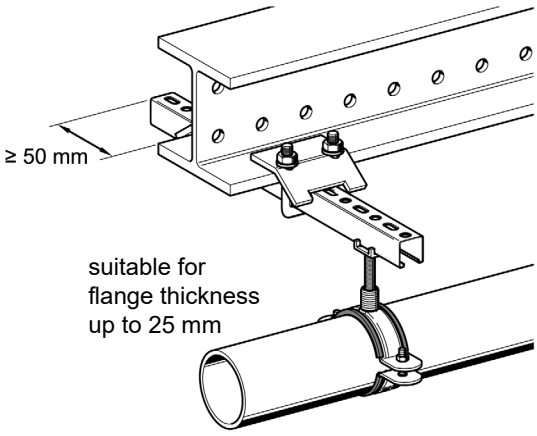


Suspension to walls, ceilings and beams



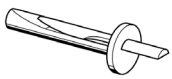
Header rail connections to concrete and masonry ceilings may be secured by using 3 self-cutting screw anchors TSM LPS.

U-Holder SB 27 for fixing crossbars on both sides to beams - to be used in pairs only.



suitable for flange thickness up to 25 mm

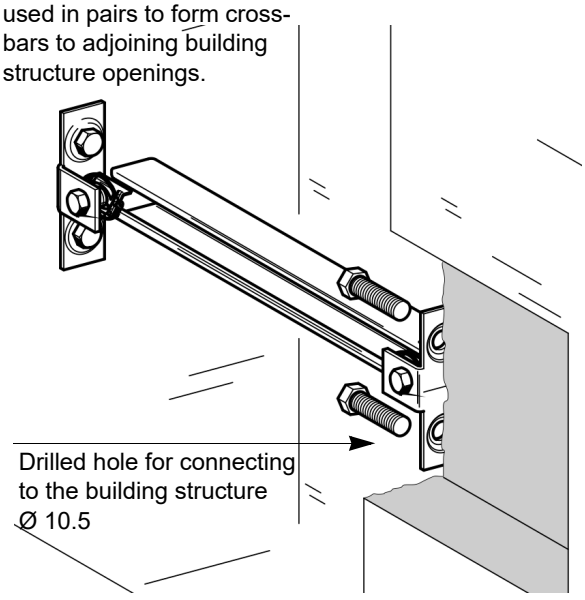
Alternative suspension for concrete



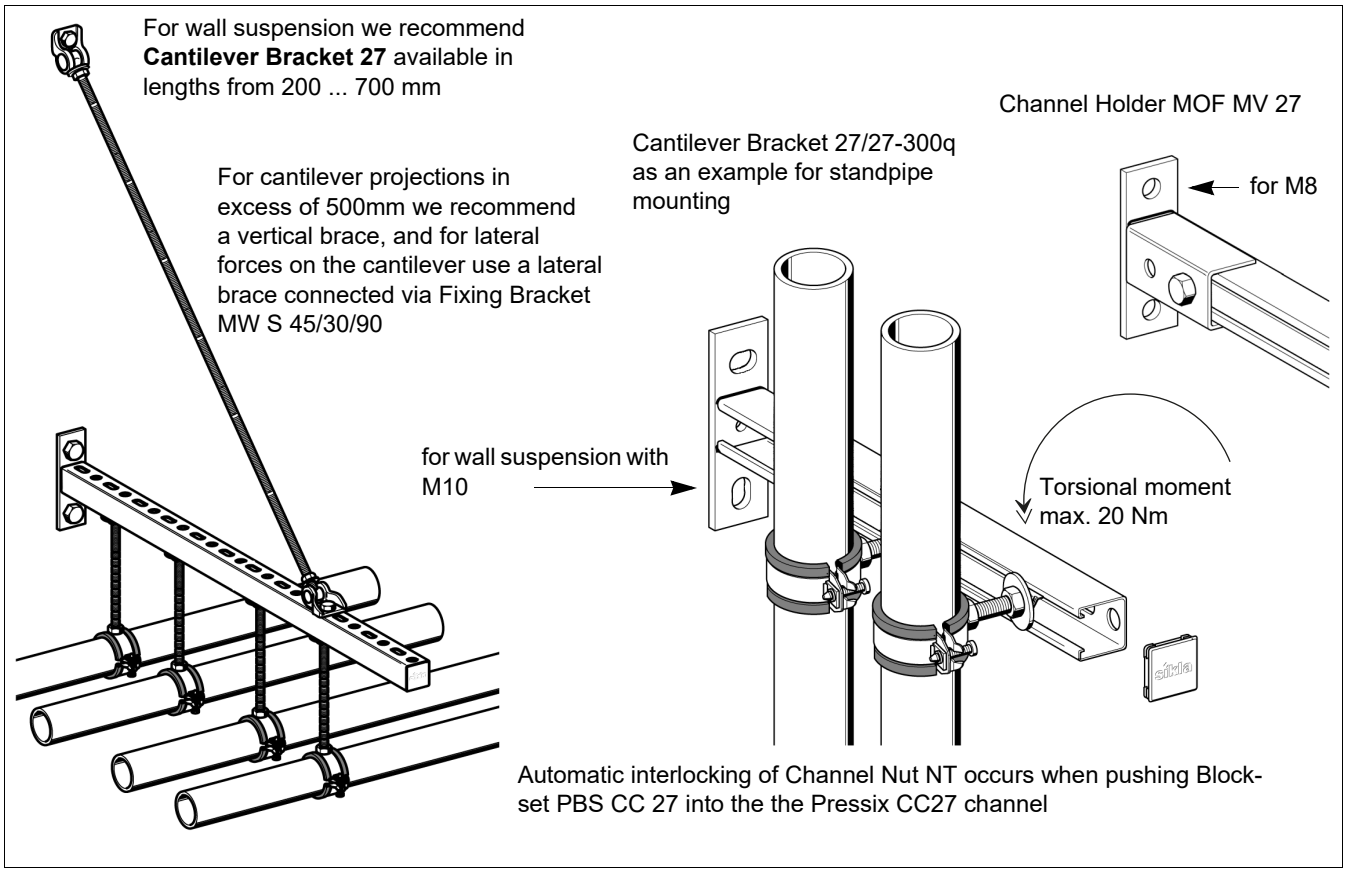
Nail Anchor PN 27

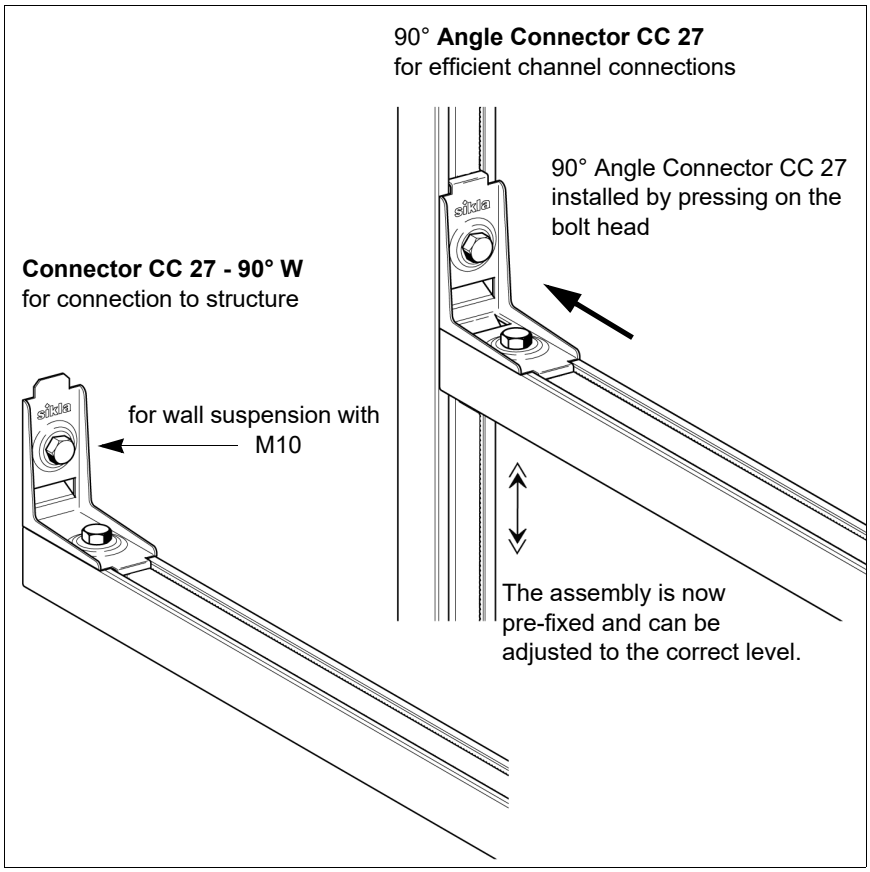
For the concrete Screw Anchor and Nail Anchor PN 27 a pilot hole of Ø 6mm is required.

T-bracket MOS 27 can be used in pairs to form cross-bars to adjoining building structure openings.



Fixing Brackets and Frames





Your benefits using Pressix CC 27:

- Simple brackets and frame structures for small and medium loads guarantee an efficient installation of building services.
- From already 3 pipelines, costs can be reduced by using Pressix.
- An innovative fixing concept based on pre-assembled components reduces installation costs by up to 50%.

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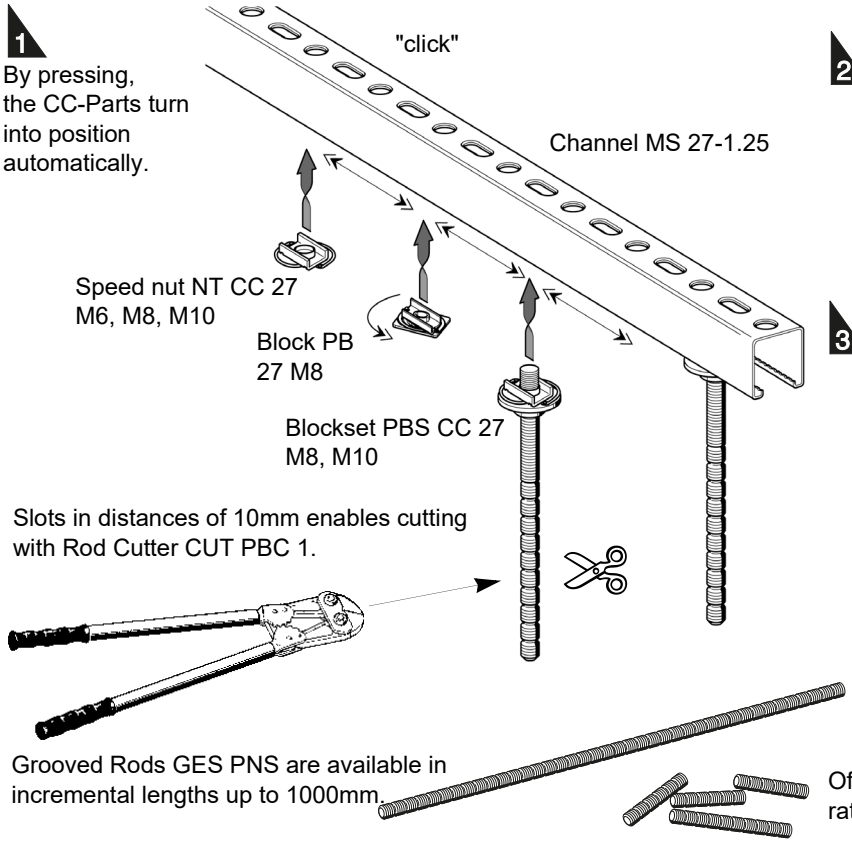
Connecting to Channels

1 By pressing, the CC-Parts turn into position automatically.



2 When positioned into the Channel, a 'click' sound can be heard. At this stage the assembly can still be adjusted. Before securing the assembly to the channel, the height of the Grooved Rod GES PNS can be adjusted by winding in and out of the channel profile.

3 The Grooved Rod can be cut to length before or after fixing. The cutting grooves ensure the thread won't be damaged. The pipe clamps can be installed without additional deburring of the rod.

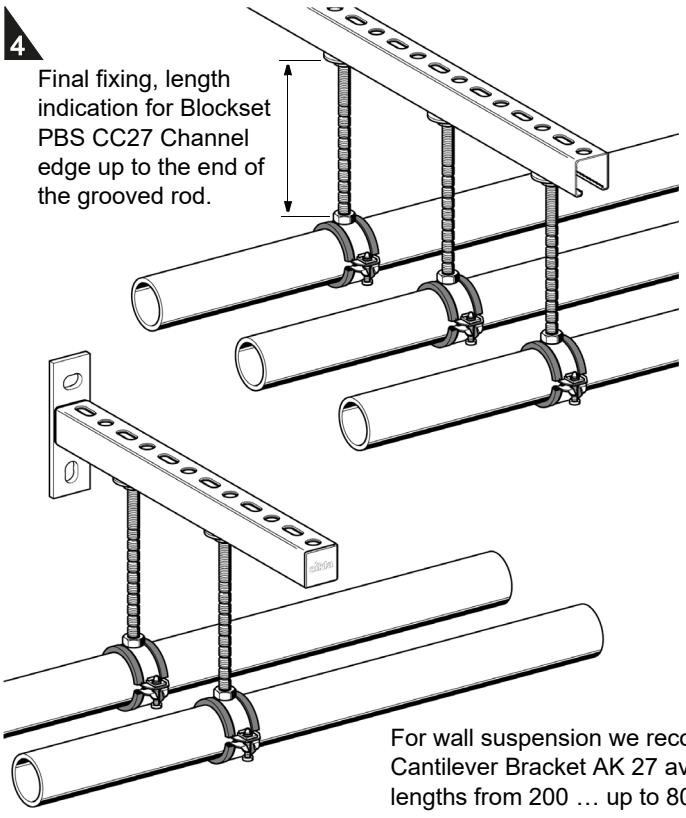
Caution!

- *Rod Cutter CUT PBC 1 has been developed especially for cutting Grooved Rod GES PNS M8 and M10. It shouldn't be used for anything else.*

Grooved Rods GES PNS are available in incremental lengths up to 1000mm.

Off-cuts can be used as further threaded studs rather than discarded.

4 Final fixing, length indication for Blockset PBS CC27 Channel edge up to the end of the grooved rod.



For wall suspension we recommend Cantilever Bracket AK 27 available in lengths from 200 … up to 800 mm.

Advantages by using Pressix:

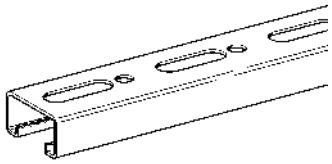
- less parts
  = less orders
  = less searching
  = less confusion.
- Neither electricity nor special tools are needed for assembly.
- Pipe supports are generated in just a few easy steps.
  Apart from the fact that it saves you time and the bother with small parts, it also is amusing!

Note:

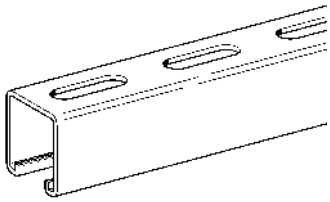
- *Compatibility within the system only when using Sikla connection elements 27.*

Products

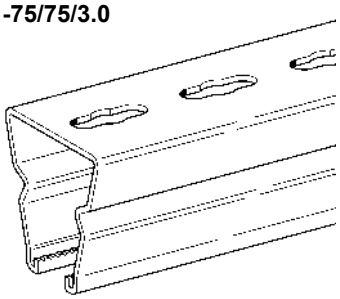
Channel MS 41/21/1.5



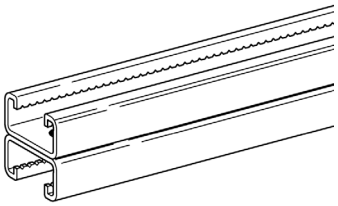
Channel MS 41/41/2.5



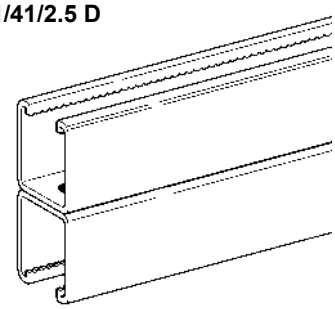
Channel MS 41-75/75/3.0



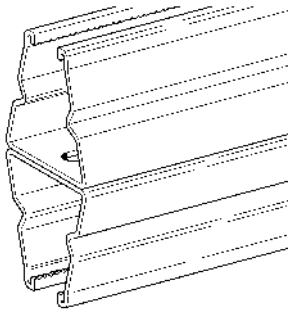
Channel MS 41/21/2.0 D



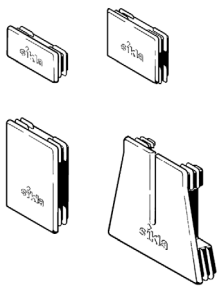
Channel MS 41/41/2.5 D



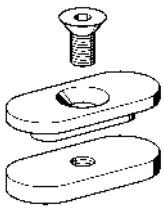
Channel MS 41-75/75/3.0 D



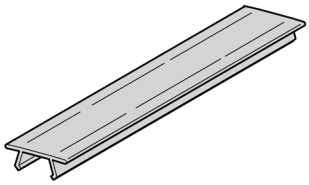
End Cap ADK 41



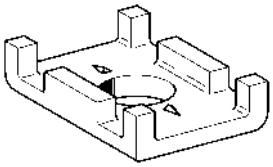
Clamping Unit KL



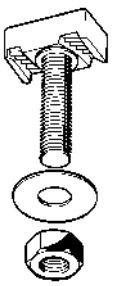
Channel Cover MSA 41



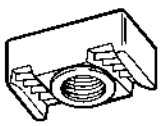
Holding Bracket HK 41



T-Head Bolt TBO HZ 41

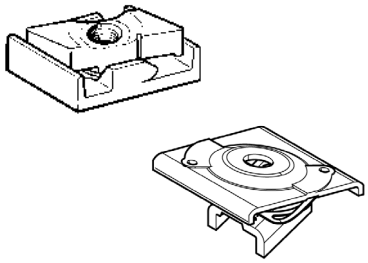


Channel Nut HZ 41

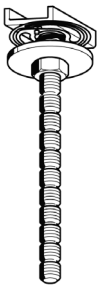


Products

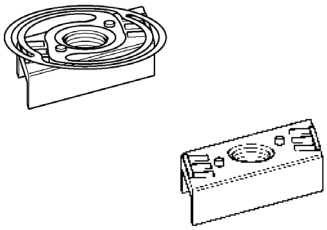
Block PB 41
Block PBH 41



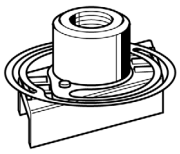
Blockset PBS CC 41



Speed Nut CC 41
Channel Nut NT 41

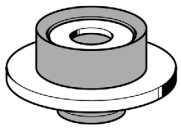


Adapter NT CC 41
DIN 3015



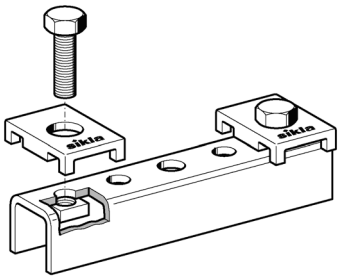
Rod Cutter PBC

Sound Absorption Element
SDE 41

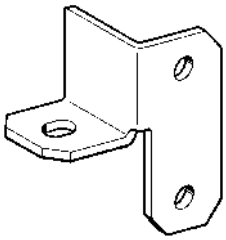


see Sound Absorption Products SDE

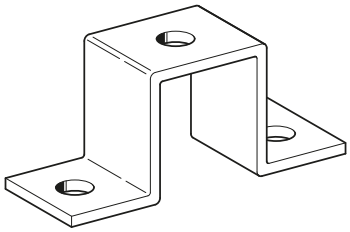
Channel Connector SK



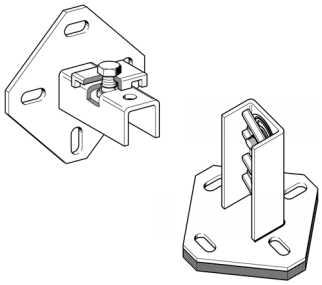
Corner Bracket EW



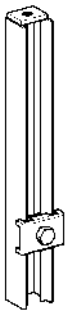
Channel Bracket SH



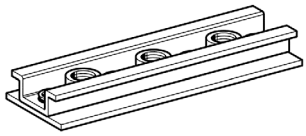
End Support WBD
Insulated Foot Plate SHB HCP



Channel Extension ST 41



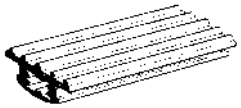
Slide Element GS 41



see Slide Supports

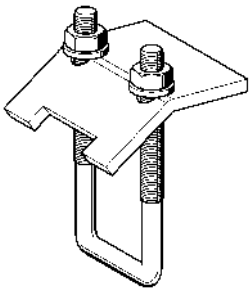
Products

Channel Lining SAL 41



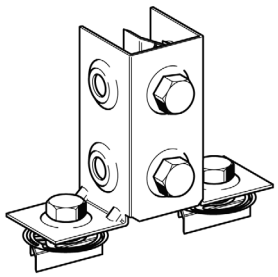
see Sound Absorption Products SDE

U-Holder SB 41

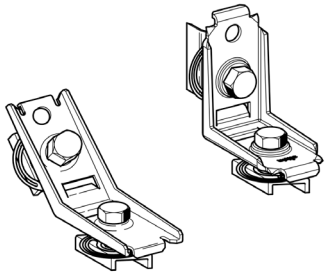


see Sound Absorption Products

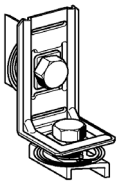
Angle Connector CN CC 41-2



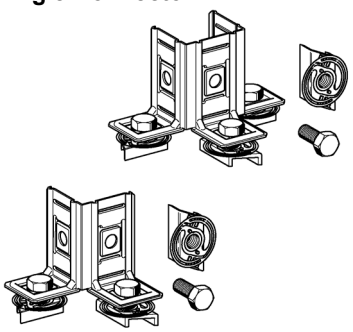
Angle Connector CN CC 41 Stabil



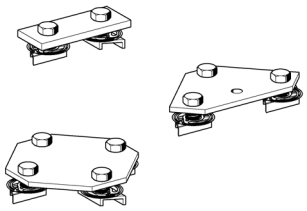
Angle Connector CN CC 41 - 90°



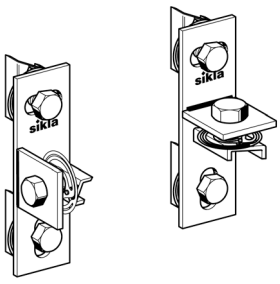
Angle Connector CN CC 41



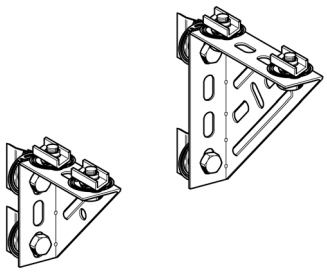
Flat Fitting ECO CC



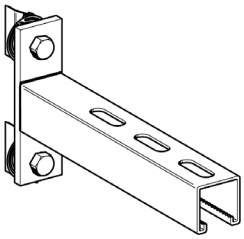
T-Bracket MOS CC



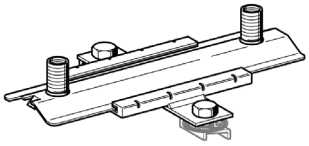
Support Bracket WK CC



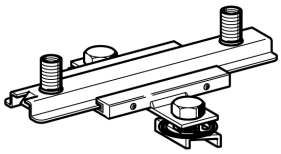
Cantilever Bracket CC



Slide Set GS CC - H3G/1



Slide Set GS CC - 2G/1



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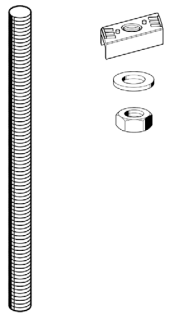
Switch over from conventional assembly solution to Pressix CC

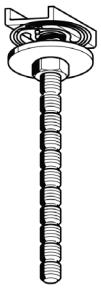
Threaded Rod Assembly



4 components

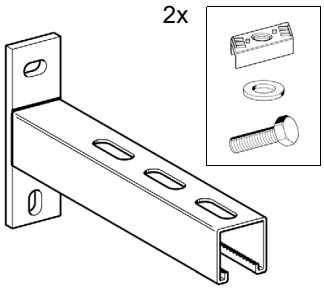
1 product

Blockset CC 41



Cantilever Bracket

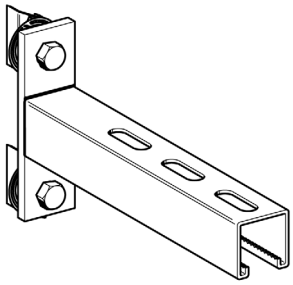
2x



7 components

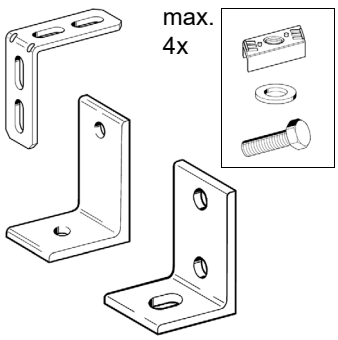
1 product

Cantilever Bracket CC



Fixing Bracket MW; S

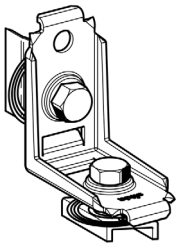
max. 4x



13 components
3 versions

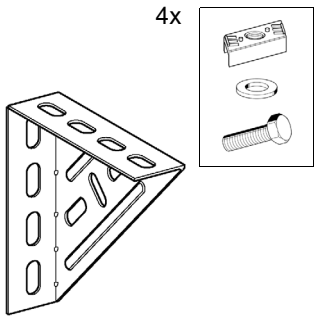
1 product

Angle Connector CN CC 41 Stabil



Support Bracket

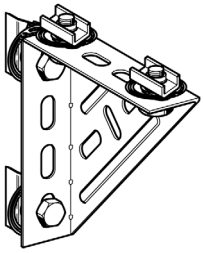
4x



13 components

1 product

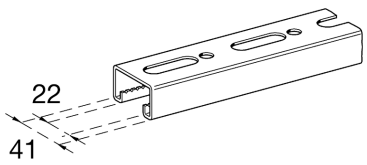
Support Bracket CC

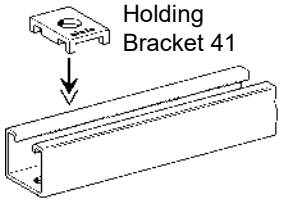


Single channels, end caps and slot patterns

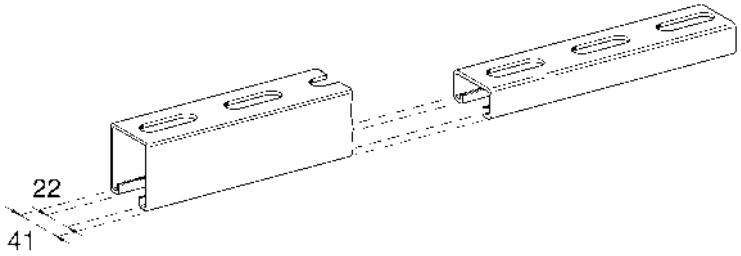
System 41

41/21/1.5

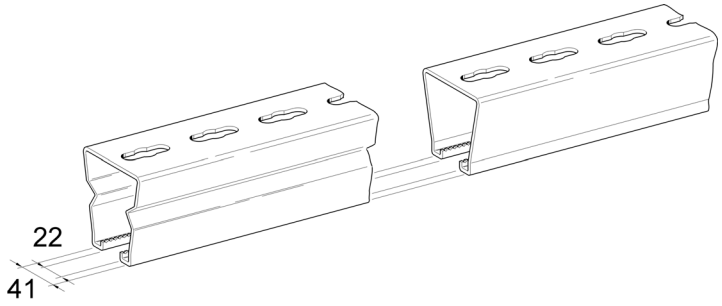




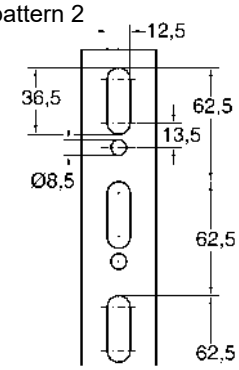
41/62/2.5 41/21/2.0



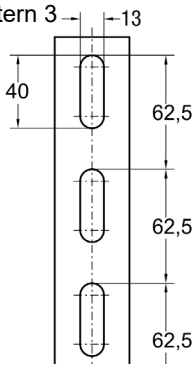
41-75/75/3.0 41-75/65/3.0



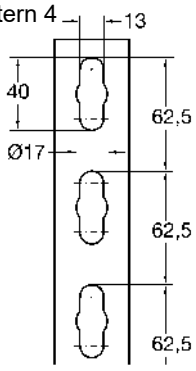
Slot pattern 2



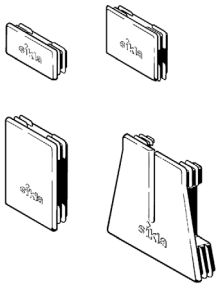
Slot pattern 3



Slot pattern 4

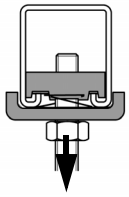


End Caps ADK 41



End caps are available for all Channel sizes and neatly protect any cut ends of the Channels.

For back to back channels use 2 of the same end caps at each end.



Holding Bracket HK 41 used with Channel Nut NT or T-Head Bolt TBO ensure optimum load distribution to the supporting channel, without opening or bending the edges of the channel under load.

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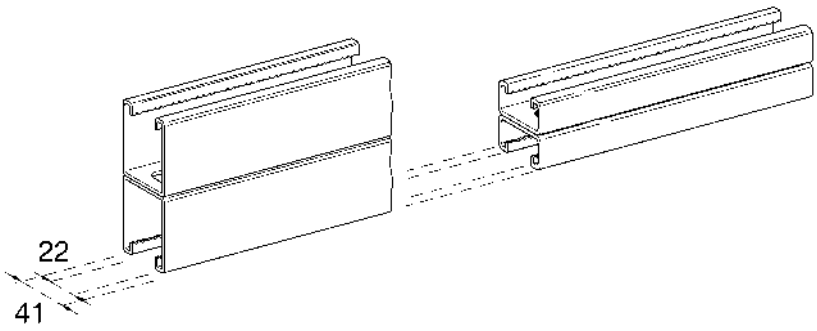
Double Channels and Channel Covers

System 41

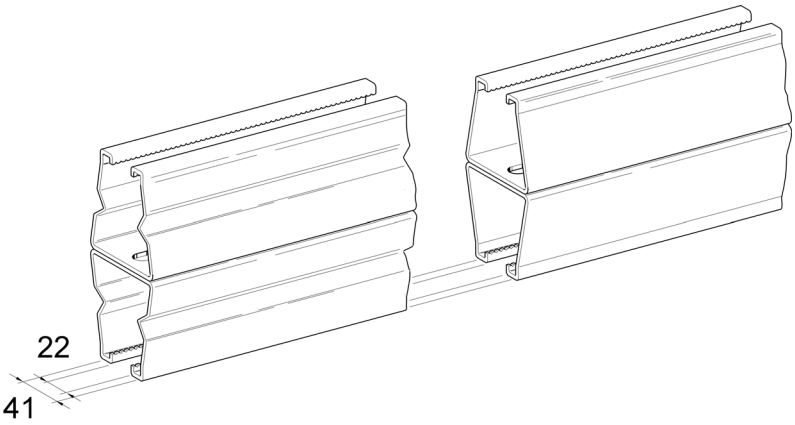
41/62/2.5 D

41/21/2.0 D



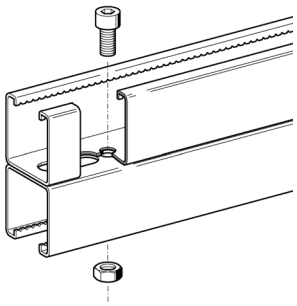
41-75/75/3.0 D

41-75/65/3.0 D



Channels ready-made delivered connected back to back, slipfree.

Self-assembly double channels (slot pattern 2) for 41/21/1.5 D



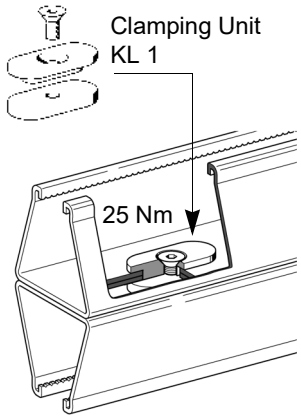
Channels can be connected back to back with M18 x 16 Hexagon Bolts spaced at 250 mm and at each channel end.

▲

Two channels with the same slot pattern can be connected to create a double channel.

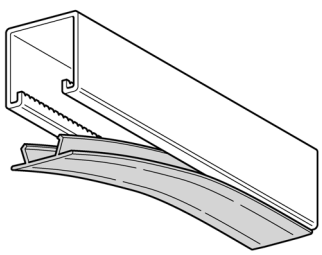
▼

Self-assembly double channels (slot patterns 3 and 4) for all channel sizes from 41/41/2.0



Channels can be connected back to back with Clamping Units KL 1 spaced at 500mm and at each channel end.

Channel Cover 41



Channel Cover 41 for covering the opening of channels from dirt ingress e.g. clean rooms, food industry

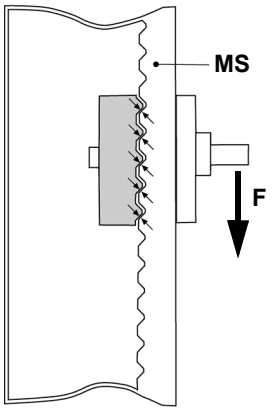
Note:

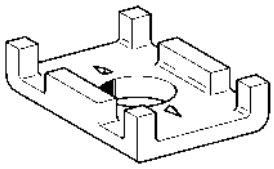
- *Offcuts with a length up to 500 mm also have to be connected at each end.*

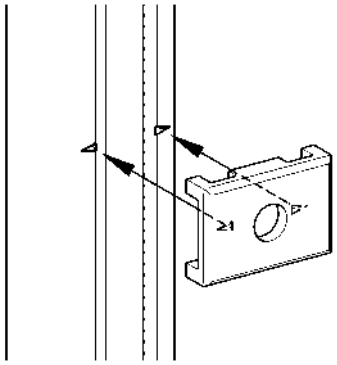
Safe connections to the Channel System 41 range

Safe connecting elements

For vertically fixed channels or where lateral forces occur, safer connections are achieved by the specially developed interlocking geometry





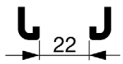


Interlocking connecting parts provide optimum safety and higher vertical carrying capacities

- The inner edges of the Sikla Channels in the 41 series are serrated, ideal for mounting Sikla serrated connecting elements.
  - Blockset CC 41
  - Block PB 41/PBH 41
  - T-Head Bolt TBO HZ 41
  - Speed Nut CC 41
  - Speed Nut 41
  - Speed Nut HZ 41
  - Adapter NT CC 41
    DIN 3015.

- Holding Bracket HK 41:
  Positive locking to the channel edges prevent the channel from opening or bending under load.

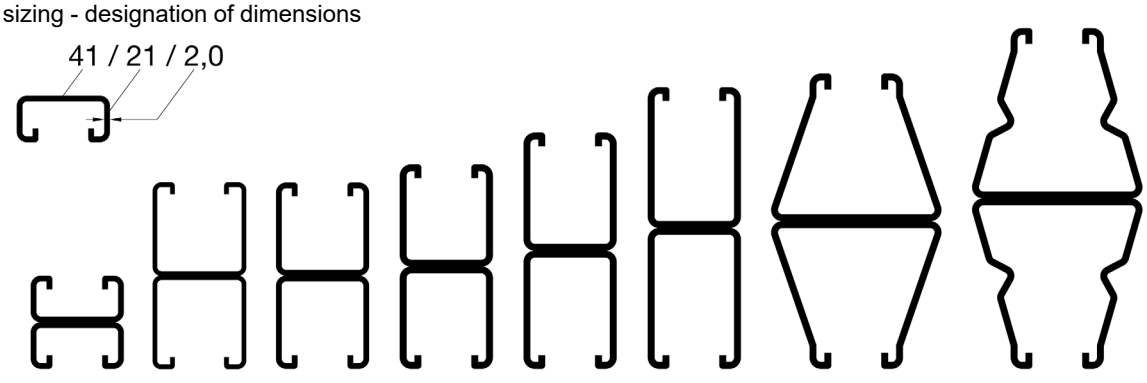
System 41



The Channel opening on all channels has a width of 22 mm, the same connecting elements can be used.

41/21/1,5
41/21/2,0 | 41/31/2,0 | 41/41/2,0 | 41/41/2,5 | 41/45/2,5 | 41/52/2,5 | 41/62/2,5 | 41-75/65/3,0 | 41-75/75/3,0

Channel sizing - designation of dimensions



41/21/2,0 D | 41/41/2,0 D | 41/41/2,5 D | 41/45/2,5 D | 41/52/2,5 D | 41/62/2,5 D | 41-75/65/3,0 D | 41-75/75/3,0 D

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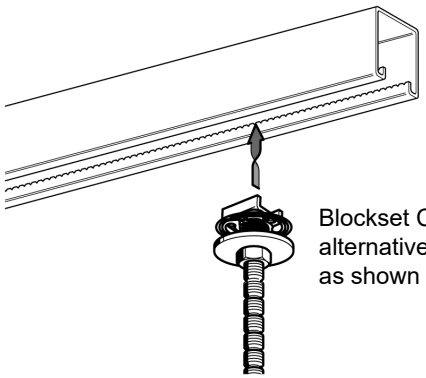
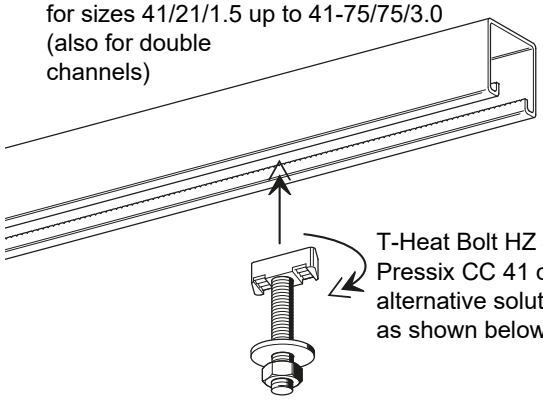
Connecting options, Channel 41

Options and Solutions



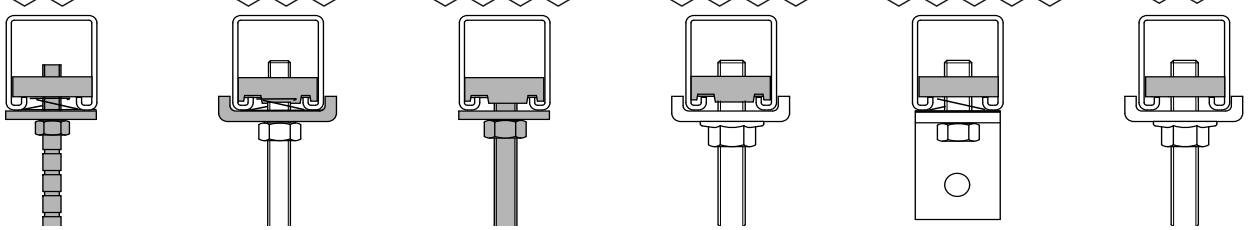
Blockset CC 41 or alternative solution as shown below

for sizes 41/21/1.5 up to 41-75/75/3.0 (also for double channels)

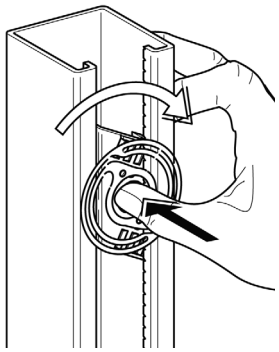


T-Heat Bolt HZ 41, Pressix CC 41 or alternative solution as shown below

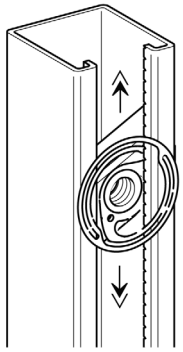
Pressix Blockset CC 41 (grooved rod incl.)	Pressix Block PB 41/PBH 41	T-Head Bolt HZ 41	Speed Nut HZ 41	Pressix CC Speed Nut CC 41	Speed Nut 41
8 10	8 10 12	8 10 12 16	8 10 12 16	6 8 10 12 16	8 10



Speed Nut CC 41



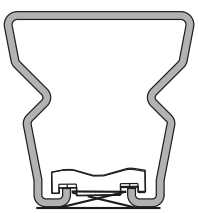
Once inserted into a vertical channel, the Speed Nut keeps itself in position without slipping inside the channel, and may be adjusted easily along the face of the channel.



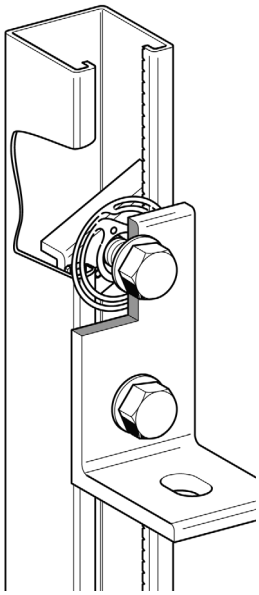
1

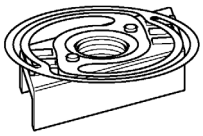
Centre pressure to the Speed Nut CC 41 produces an automatic turn and lock into the Channel.

2



3





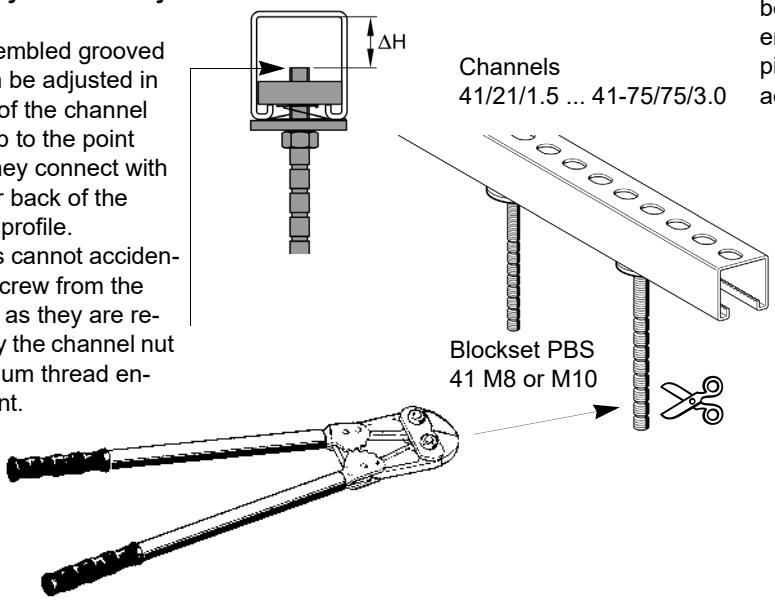
Advantages

- suitable for all Channels of the 41 series
- one-handed installation by pressing and automatic turn into the channel
- no special installation tools required
- can be combined with other system products
- adjusts freely within the channel without 'sticking' when sliding

Flexibility and security using Blockset CC 41

Flexibility and security

Pre-assembled grooved rods can be adjusted in and out of the channel profile up to the point where they connect with the inner back of the channel profile.
The rods cannot accidentally unscrew from the blockset as they are retained by the channel nut at minimum thread engagement.

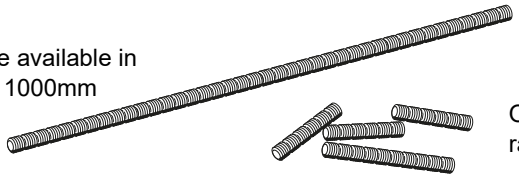


The Grooved Rod can be cut to length before or after fixing. The cutting grooves ensure the thread won't be damaged. The pipe clamps can be installed without additional deburring of the rod.

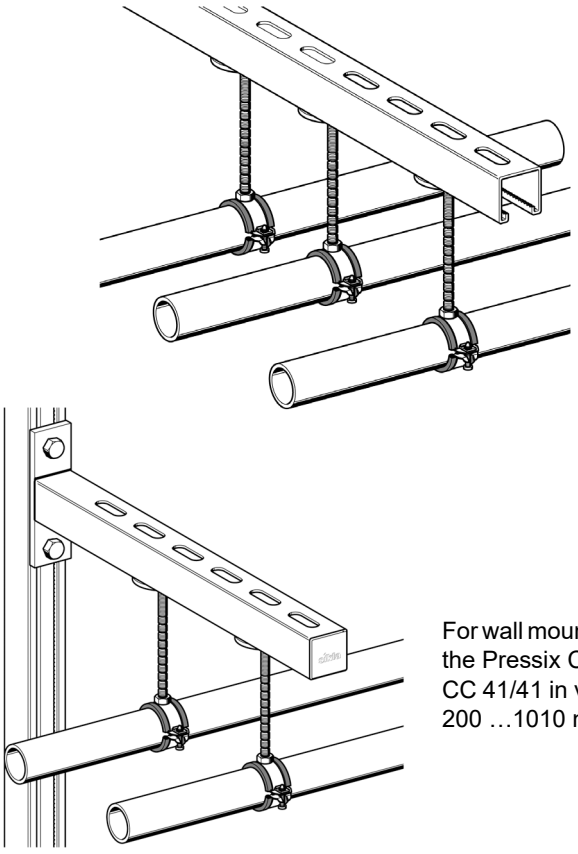
Attention!

- *Rod Cutter CUT PBC 1 has been developed especially for cutting Grooved Rod GES PNS M8 and M10. It shouldn't be used for anything else.*

Pressix Grooved Rods are available in incremental lengths up to 1000mm



Off-cuts can be used as further threaded studs rather than discarded.



For wall mounting we recommend the Pressix Cantilever Bracket CC 41/41 in various lengths from 200 …1010 mm.

Advantages using of Pressix:

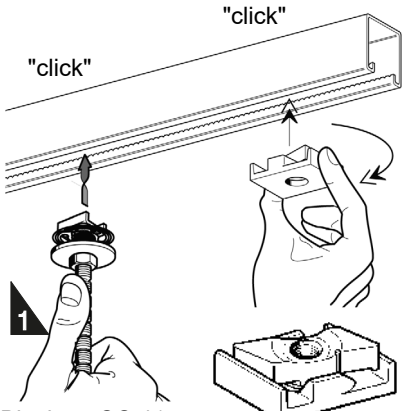
- less parts
  = less orders
  = less searching
  = less confusion.
- Installation without electricity and without special tools.
- Pipe supports are generated in just a few easy steps.
  Apart from the fact that it saves you time and the bother with small parts, it also is amusing!

2019-10

Blockset PBS 41 and Block PB 41/PBH 41

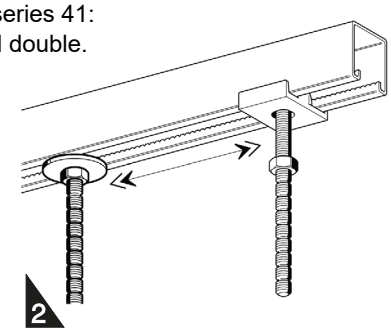
Installation

Blockset PBS CC 41 and Block PB 41
(alternatively Block PBH 41)
can generally be used in all Channels series 41:
41/21/1.5 up to 41-75/75/3.0 single and double.

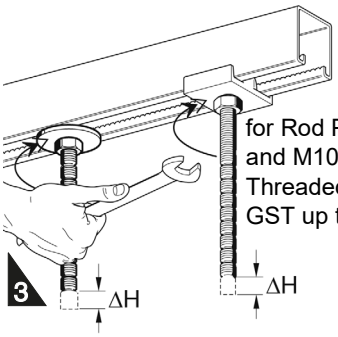


Blockset CC 41
(M8, M10)

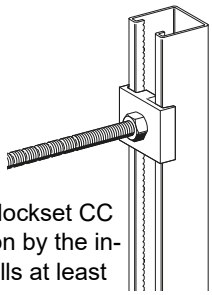
Block PB 41
(M8, M10, M12)



The Blockset CC 41 fixes itself automatically into the channel. Rotating by 90°, the integrated Channel Nut slids into the channel. Both block and channel nut are still adjustable in the channel.

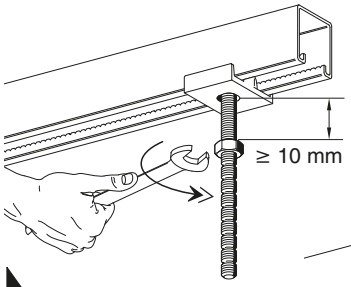


After finally positioning the Block/ Blockset by
- sliding it sidewise inside the Channel and
- height adjustment
the Nut can be fixed.

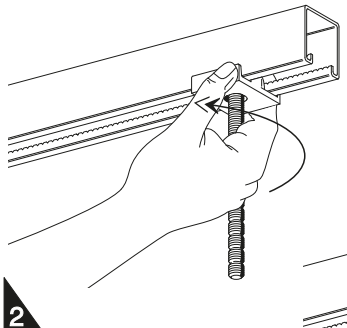


Advantage when mounting to walls: Blockset CC 41 and Block PB 41 are held in position by the integrated spring. For suspending to walls at least M10 is to be used.

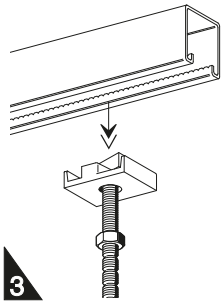
Removal of Block PB 41



Unscrew the nut up untill at least 10 mm distance between nut and Holding Bracket.



Hold the Holding Bracket at the sides and rotate anti-clockwise by 90° - **Do not pull!**



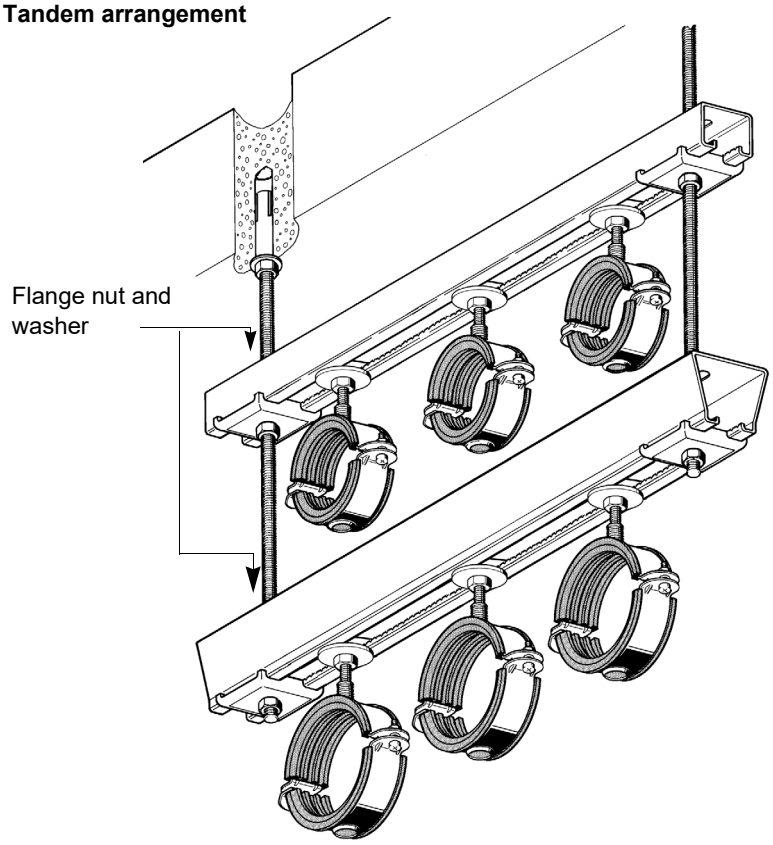
The Block PB 41 releases automatically.

Advantages:

- Easy installation and removal without the need for special tools
- When installed to vertical channels, block is self-supporting but remains adjustable
- Combine with Pressix rods, bolts or other threaded parts to complete the assembly
- The use of Blockset CC 41 reduces the installation time even further, so use CC41 instead of PB41 where possible

Application examples for single and double channels

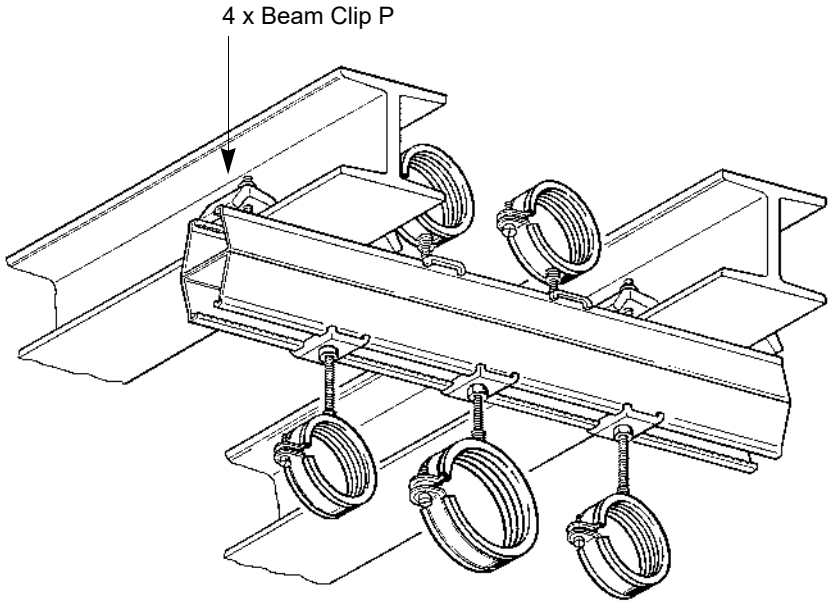
Tandem arrangement



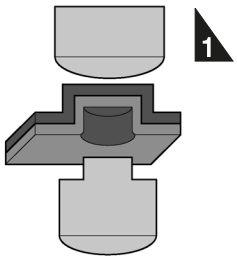
Note:

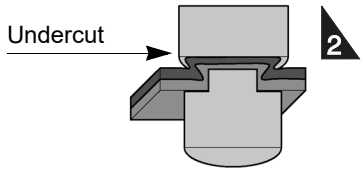
- *This arrangement requires careful selection of anchors and appropriate threaded rods!*

Cross support attached to IPB beams



Clinching





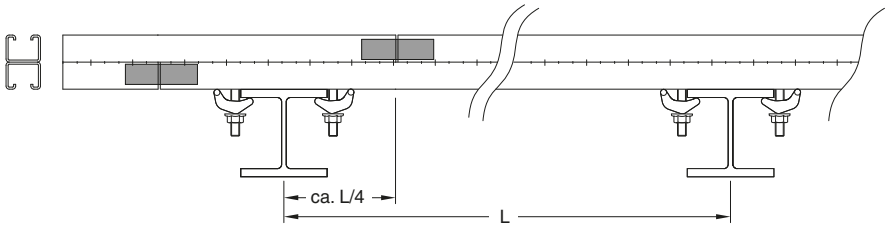
Standard configuration for electro-galvanised double channels:

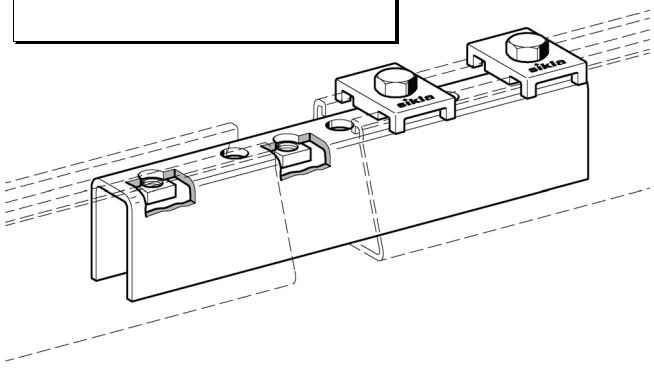
From size 41/21/2.0 D, these profiles are connected by form-fit undercutting.

Channel Connector SK

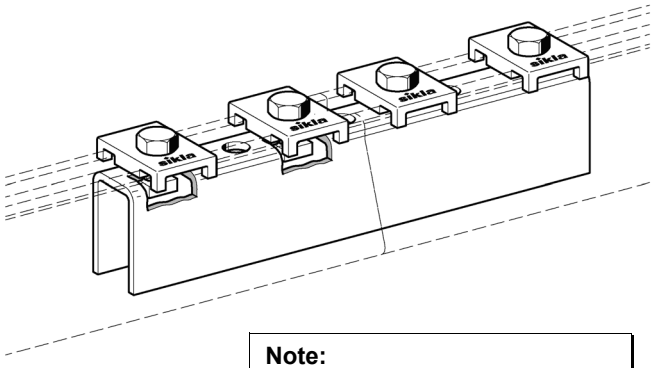
Note:

- *The joining of double channels together requires 2 channel connectors.*
  When used over longer channel lengths, the connector positions should be staggered as shown in the diagram.





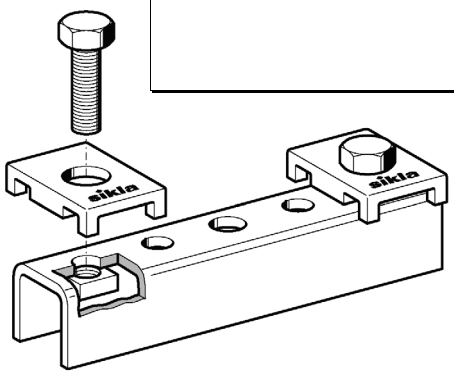
1



2

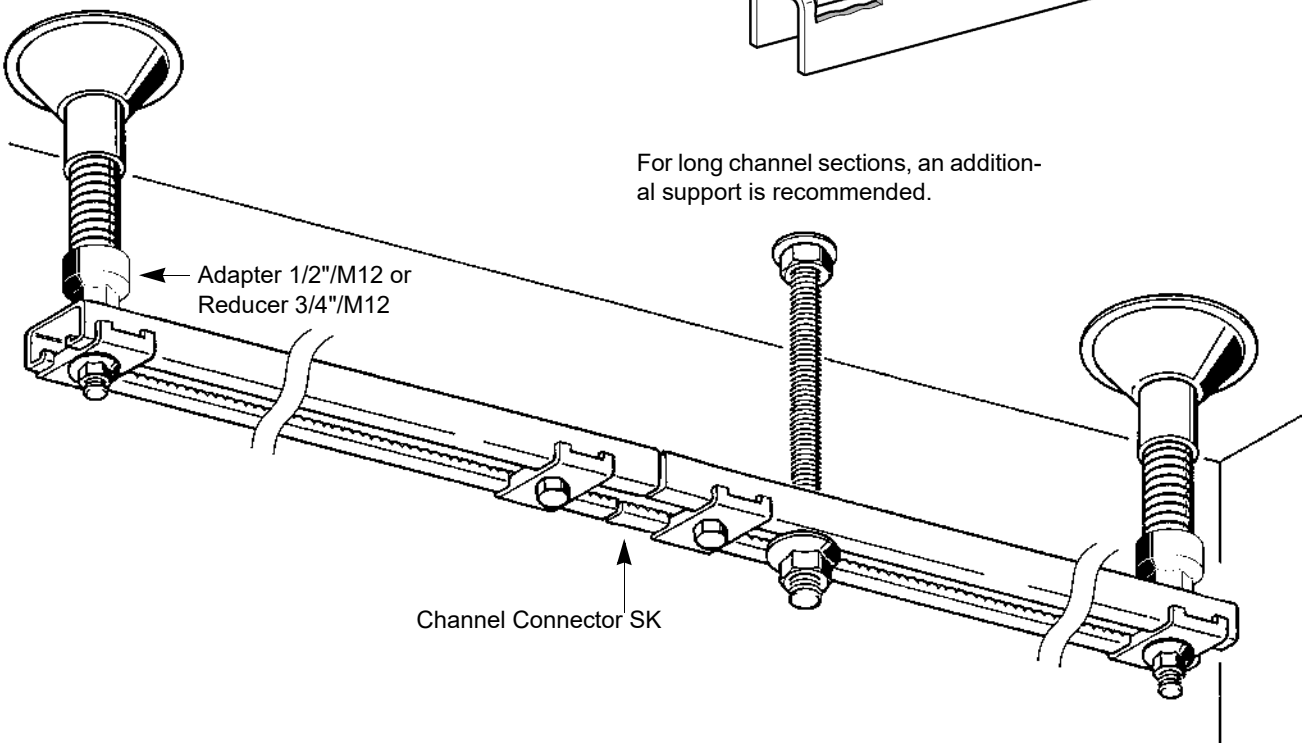
Note:

- *Delivered with Holding Brackets and Hexagon Bolts.*



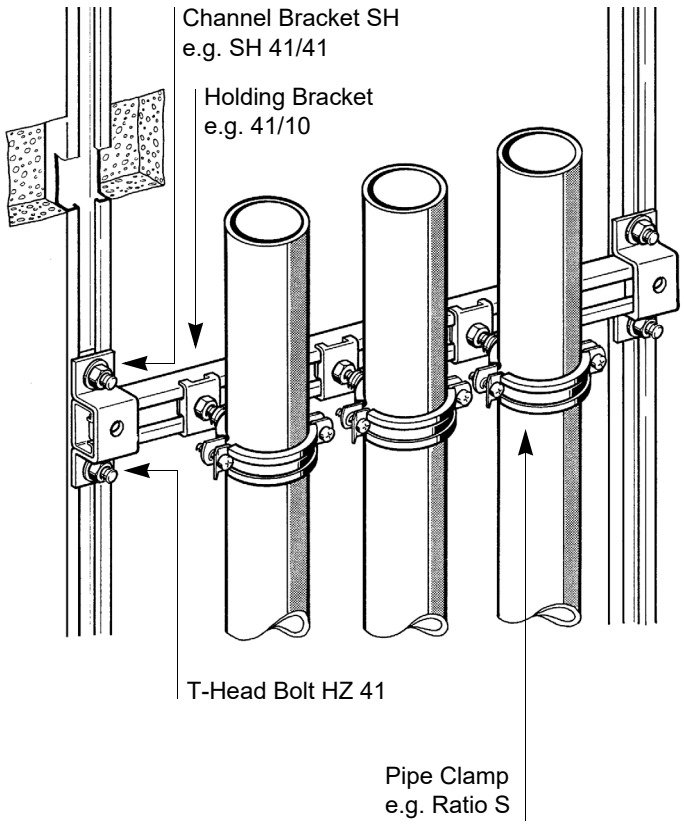
It is recommended to use rigid supports.
e.g. Support Cone SMD 1 - 1/2" or SMD 1 - 3/4"

For long channel sections, an additional support is recommended.

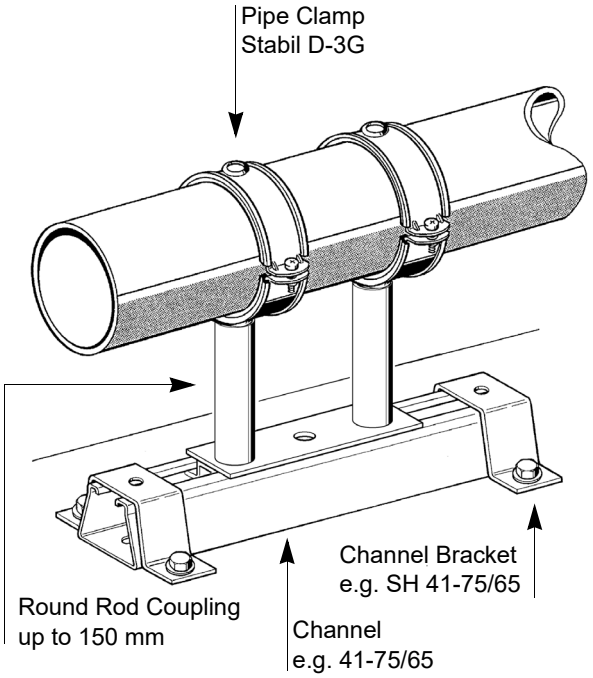


Channel Bracket SH

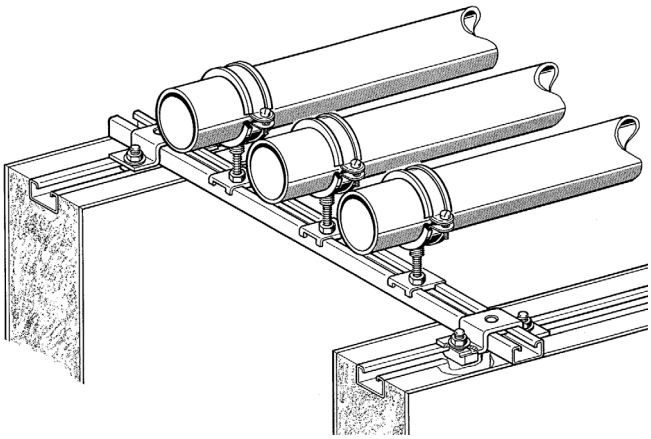
Pipeline running vertically fixed to cross-bar



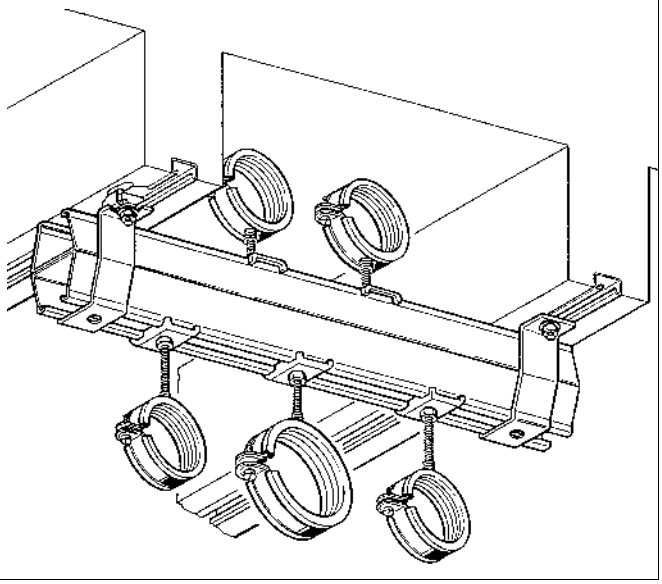
Fixing to the floor using channel and slide arrangement



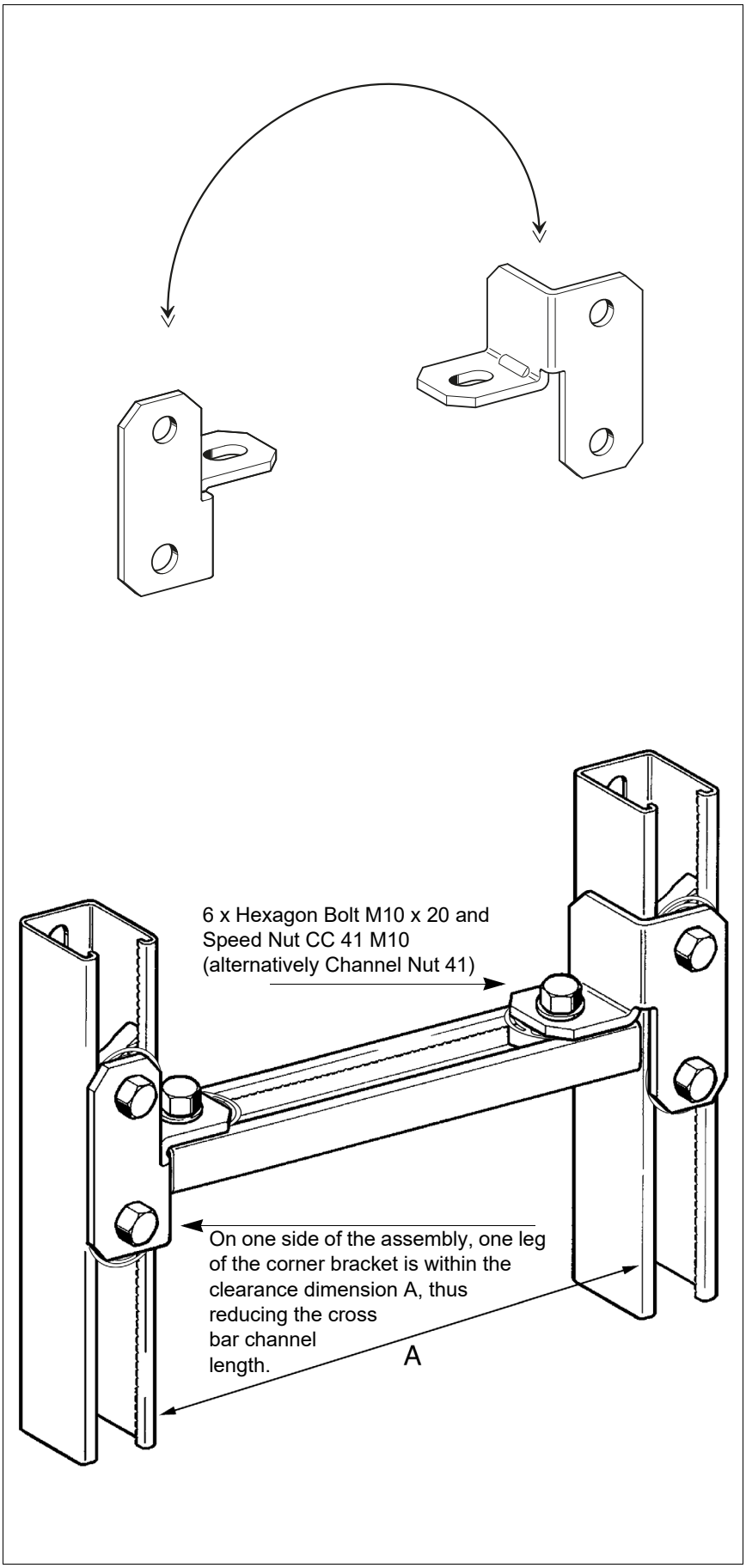
Crossbar arrangement fixed to cast-in channel



Crossbar arrangement fixed to cast-in channel



Corner Bracket EW for Cross Supports

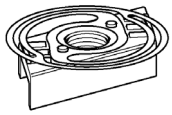


Corner Brackets are suitable for all Channels with a width of 41mm. They enable a cross bar to be formed with the open slot at a 90 degree axis to the supporting channels.

Brackets can be used symmetrically on both sides to form the cross bar.

The use of 6 Speed Nuts CC 41 M10 optimises the assembly.

Speed Nut CC 41



Note:

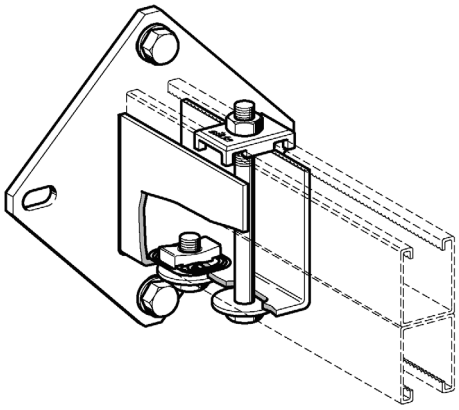
- *Length of the Channel = A - 10 mm*

Wall, Floor and Ceiling suspension of Channels with End Support WBD

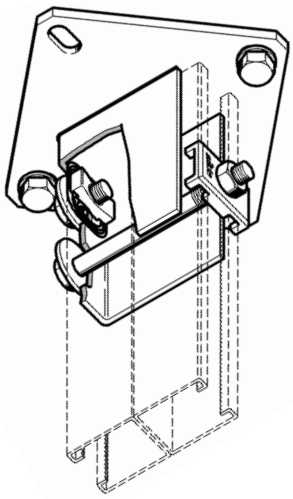
Application examples for double Channels in the 41 series (41/21/1.5 D, …, 41-75/75/3.0 D)

All components necessary for the complete channel assembly to the end support are included.

Wall suspension



Ceiling suspension



In case the slot at the end of the Channel is blocked by a Clamping Unit KL1, the suspension must be constructed by using Channel Nut CC 41 and Hexagon Bolt.

Please refer to the data sheets in our catalogue for permissible Anchor loads. The data given is applicable for two Anchors arranged in the direction of the force (see wall suspension suggestions).

Connecting parts for fixing the End Support WBD to the building structure is to be ordered separately.

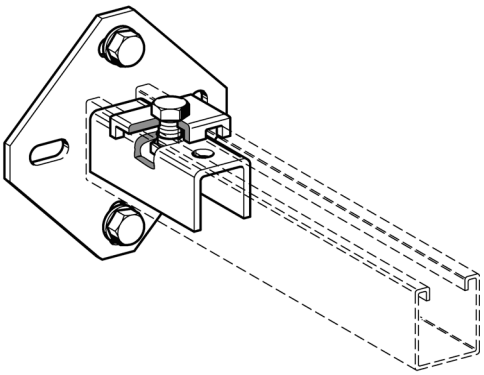
In case of ceiling suspension it has to be considered that the anchors chosen, should be able to carry the total load.
- Weight of the pipelines
- Weight of the structure
- Thrust of the pipes.

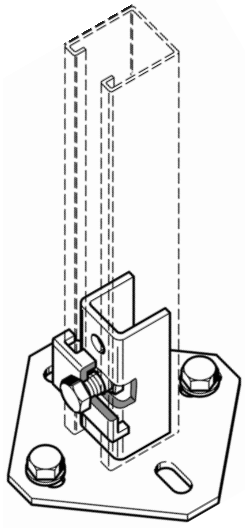
Caution!
- *For safety reasons, at least one bolt must be deadlocked to ensure a secure hold to the ceiling.*

Application examples for single Channels in the 41 series (41/21/1.5, …. 41-75/75/3.0)

All components necessary to complete the channel assembly using holding brackets HK, are included.

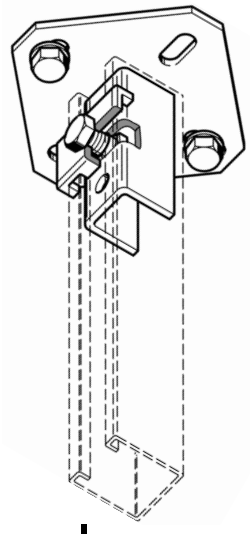
Wall suspension



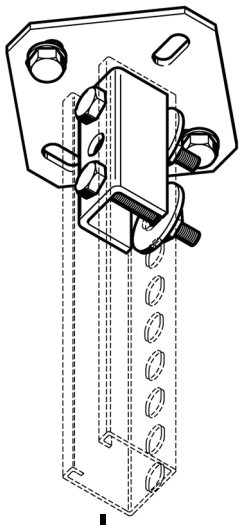


Floor suspension

Ceiling suspension
(anchor loads are to be considered)



Holding Bracket HK 41 installed according to the regulations, a load of max. 2 kN is bearable.



When installed with at least one through-bolt, a load of up to 7kN is permissible. Bolted parts have to be ordered separately.

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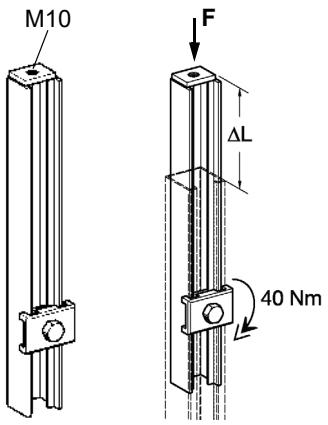
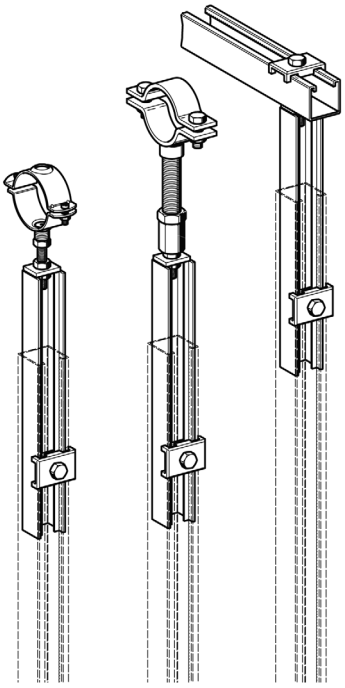
Channel Extension ST 41



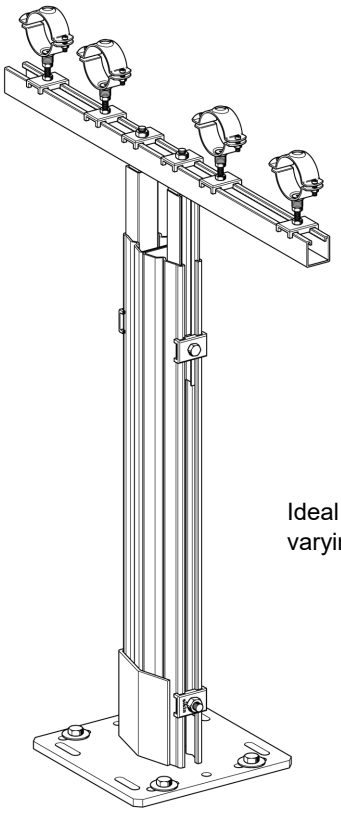


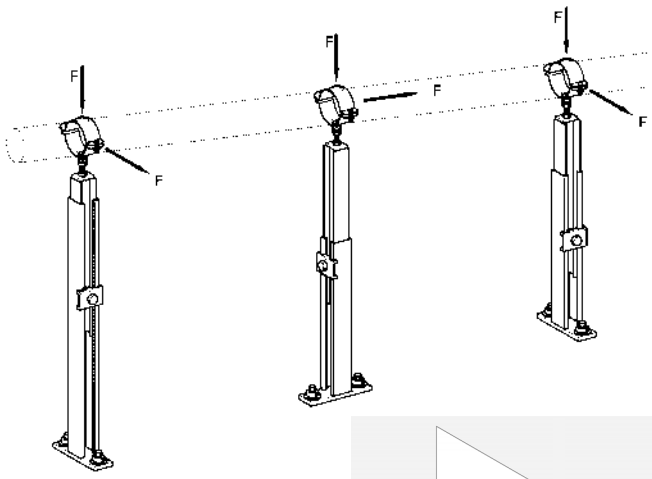
Pre-assembled with Holding Bracket 41 and Hexagon Bolt

At tightening torque 40 Nm, load capacity F up to 1.5 kN.

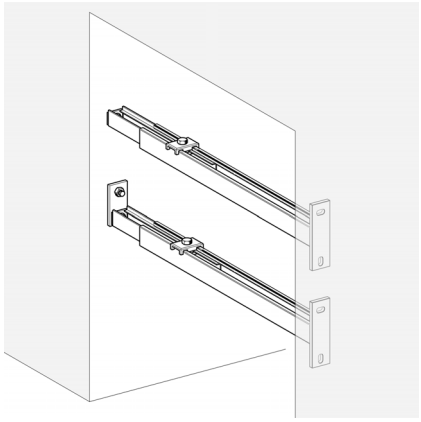
Continuous extension for Cantilever Brackets and Channels in series 41 (Channel height S 41 mm):

- Adjustable up to 200mm in the case of pipe gradients and falls, or compensation of dimensional tolerances on site
- Suspension of pipe lines using Grub Screw M10 or Adapter
- Face fixing to channels using Holding Bracket 41 and Hexagon Bolt
- 'Telescopic' effect of channel extension ST 41 allows cross-bars to be built into structural opening within corridors and risers and secured using Bolt Anchors Z Plus 10/30



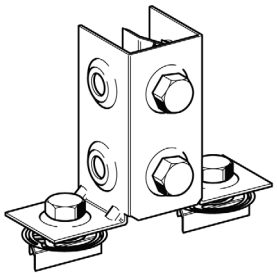


Ideal for installing individual or multiple pipes with varying datum levels

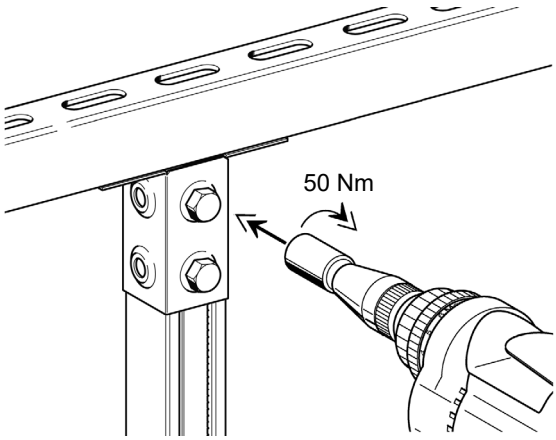


Angle Connector CC-2 used as channel connector or for fixing to building structure.

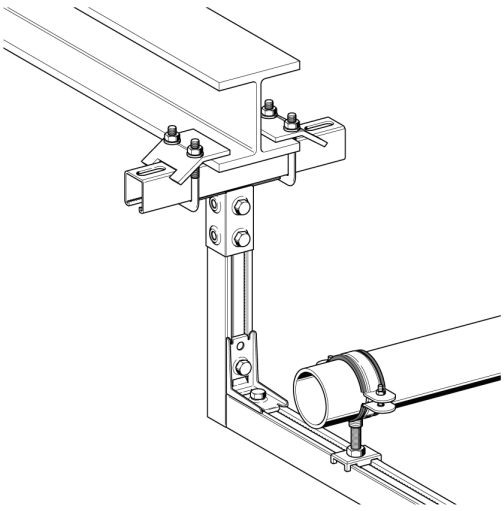
Angle Connector CC-2 as channel connector



Used for linking channels of the 41 series at an angle of 90 degrees

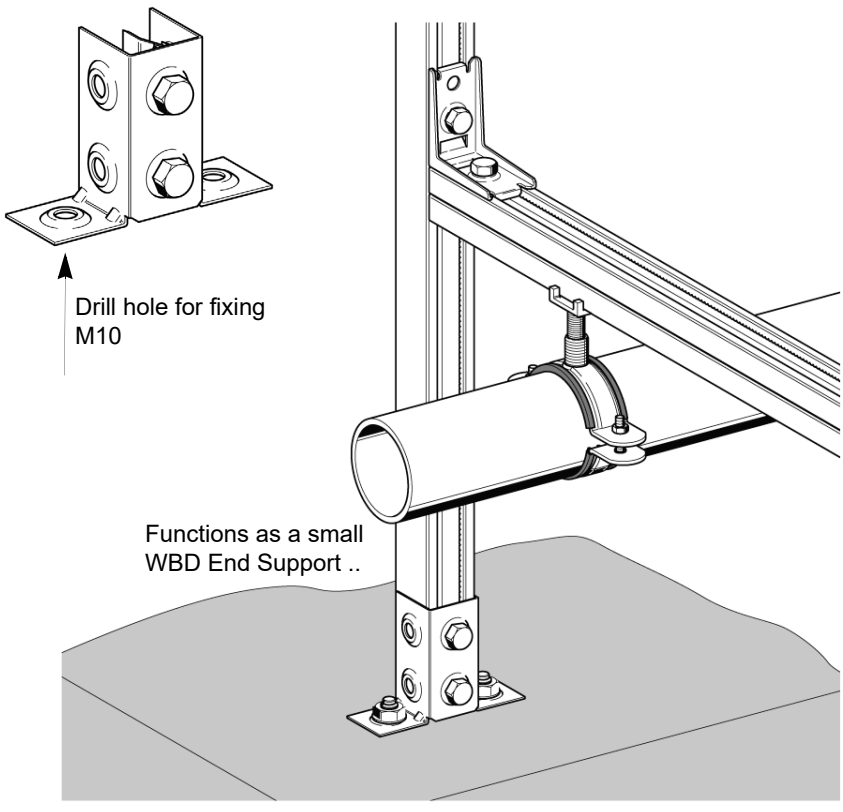


serrated edge Channel Nuts ensure a positive form-lock making the connector resilient up to 3kN



In combination with Angle Connector CC 41 Stabil 90°, suitable to create three-dimensional frame structures, by modifying the connectors, channel orientation can be changed

Angle Connector CC 41-2 W - fixing to the building structure



Prominent features of Angle Connector CC 41-2

- Solid format and high rigidity.
- Fast installation by pressing on the pre-assembled bolt heads to lock into the channels.
- Locks automatically when installed in place, and supports its own weight to prevent slip of the connector within the channel, prior to torquing the bolt heads.
- The connection offers high torsional rigidity.

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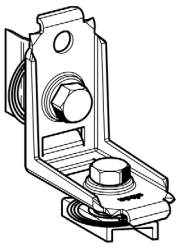
Angle Connector CC 41 and Flat Fittings CC for frame structures

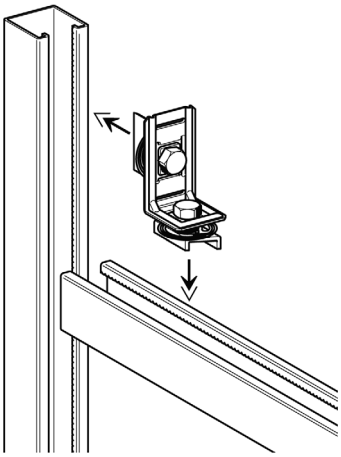
Fixing of Angle Connector CC 41-90° (alternatively Angle Connector CC 41 Stabil or Type "W" for wall suspension)

Angle Connector CC 41 Stabil



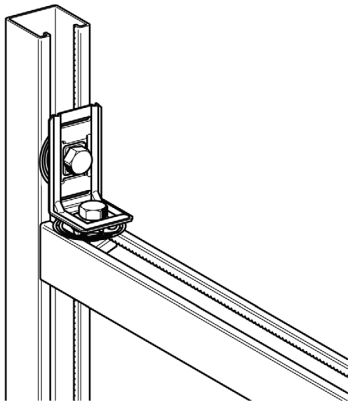
1

Place the Channel in the desired position, put the pre-assembled connection element in place by pressing on the bolt head.



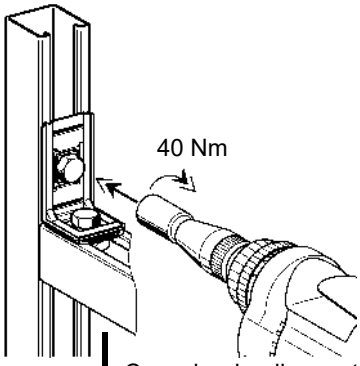
2

Serrated edge Speed Nuts CC41 will automatically lock and support the self-weight of the cross bar.



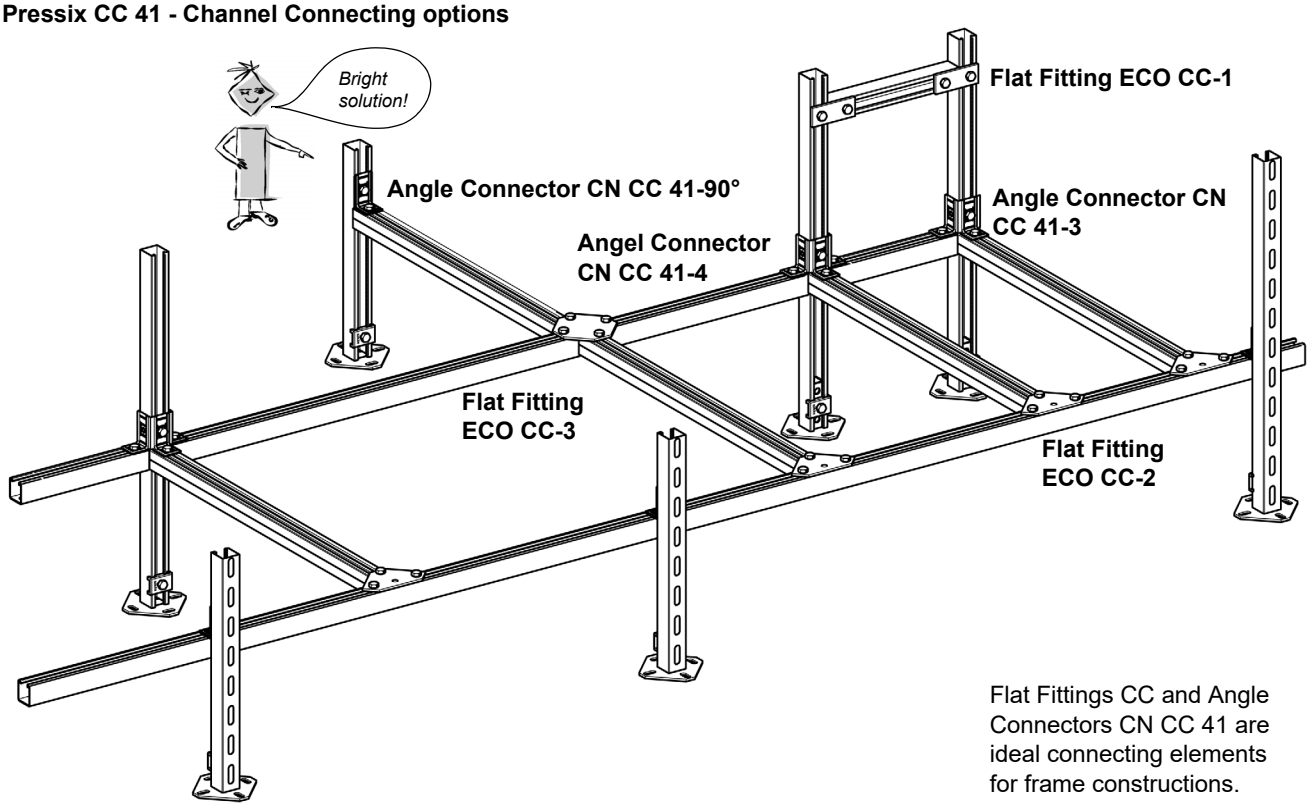
3

Torque down - ready fixed!



Cross bar loading up to 2kN in shear on face of adjoining vertical channel

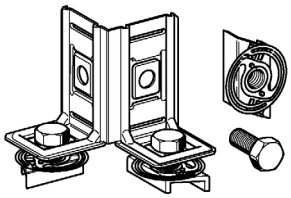
Pressix CC 41 - Channel Connecting options



Flat Fittings CC and Angle Connectors CN CC 41 are ideal connecting elements for frame constructions.

Angle Connector CN CC 41 for assembly of frames

Angle Connector CN CC 41-3
used to establish a junction with 3 Channels



1

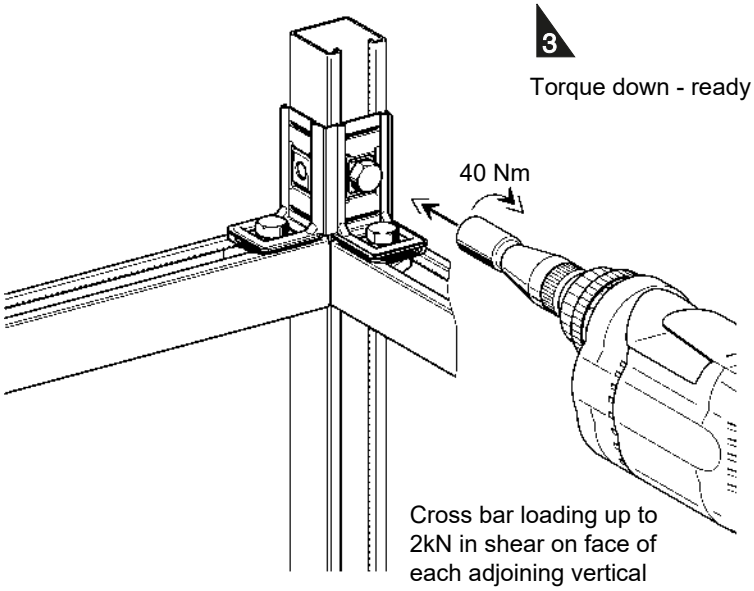
Place the Channel in the desired position, put the pre-assembled connection element in place by pressing on the bolt head.

2

Serrated edge Speed Nuts CC41 will automatically lock and support the self-weight of the cross bars.

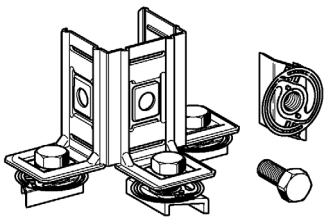
3

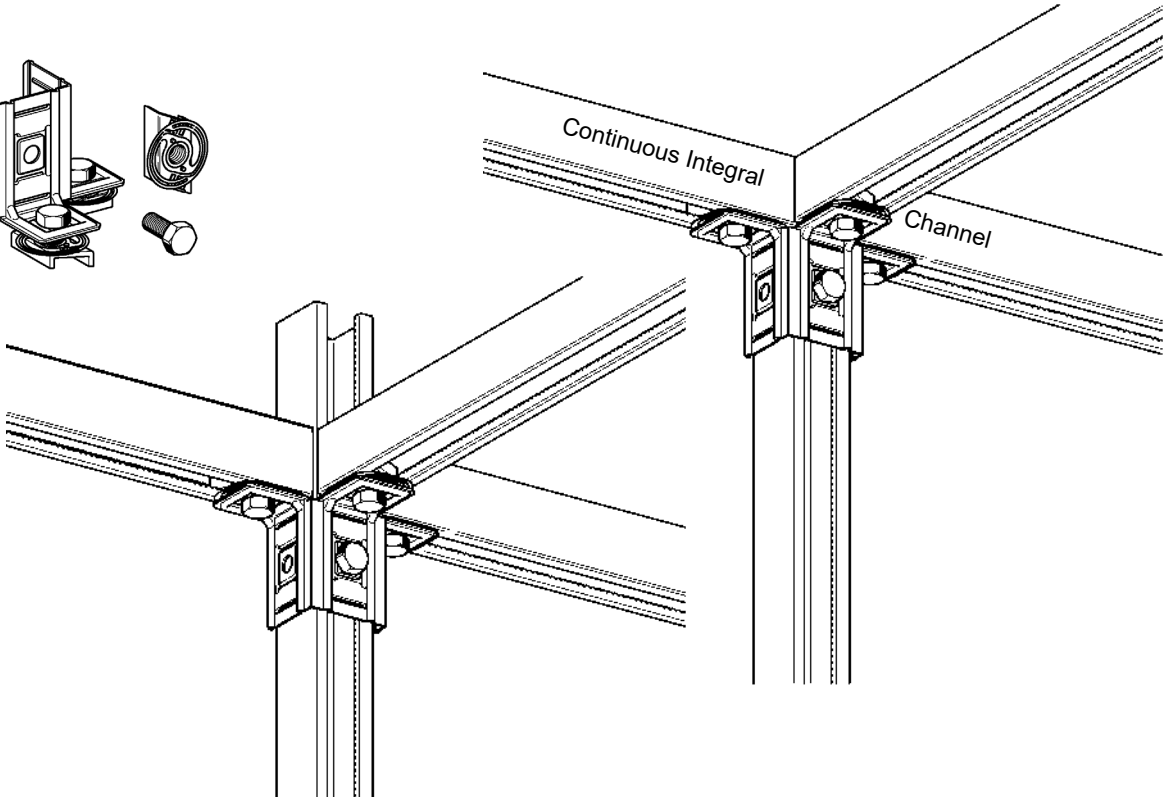
Torque down - ready fixed!



Cross bar loading up to 2kN in shear on face of each adjoining vertical channel.

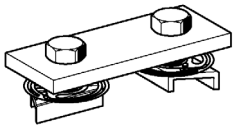
Angle Connector CN CC 41-4
used to establish a junction with 4 Channels

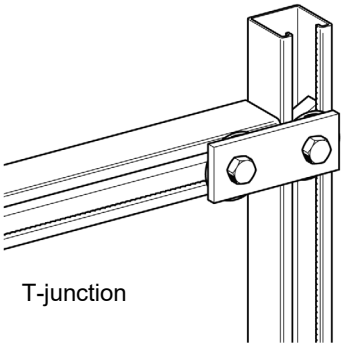




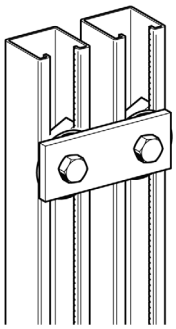
Flat Fitting ECO CC for frame assembly

Flat Fitting ECO CC-1



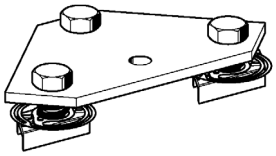


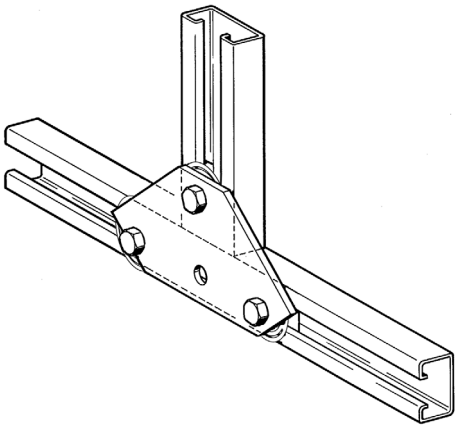
T-junction

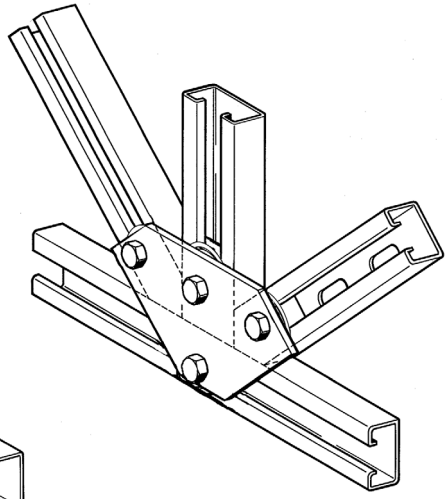


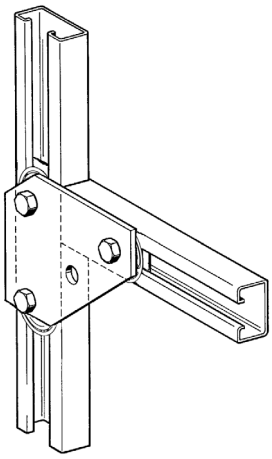
parallel connection

Flat Fitting ECO CC-2
used to establish a junction with at least 2 Channels

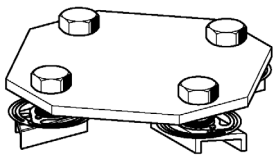


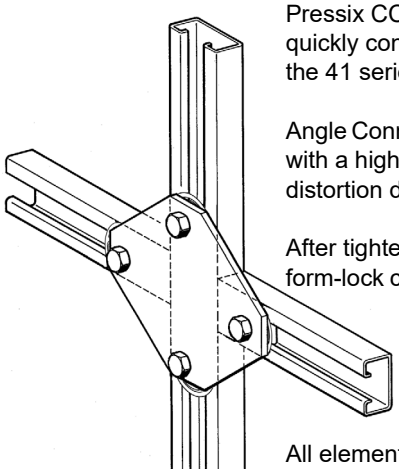






Flat Fitting ECO CC-3
used to establish a junction with 3 Channels





Pressix CC pre-assembled Flat Fittings for quickly connecting two or more channels of the 41 series.

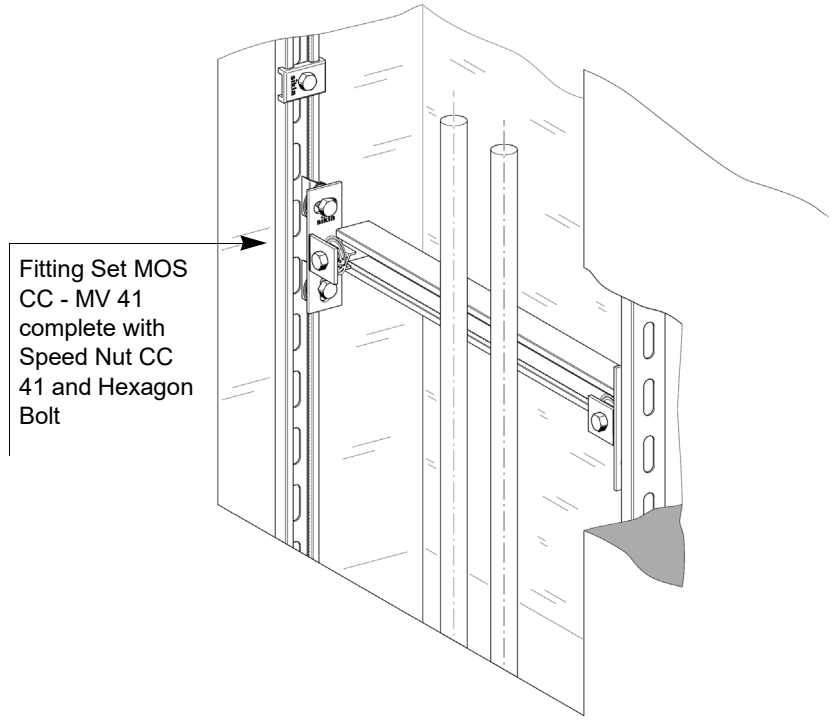
Angle Connectors Pressix CC are constructed with a high torsional stiffness to avoid distortion during installation and operation.

After tightening all the bolts, a positive form-lock connection to the channels is made.

All elements are removable.

T-Bracket set MOS CC and Support Bracket CC for cross bar installation

Installation to Risers



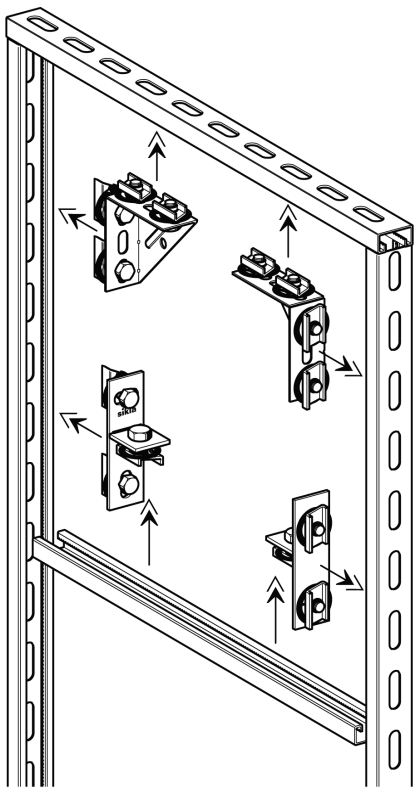
Assembly:

1. Connect T-Bracket sets MOC CC-MV 41 into vertical channels
2. Connect horizontal channel into T-Bracket MOS CC-MV 41
3. Adjust and tighten all connections

Note:

- *T-Bracket Set MOS is suitable only when installed at both ends of the channel cross bar.*

Frame mounting



Order with Pressix CC parts

- Channel
- Support Bracket CC
- T-Bracket set MOS CC-MH 41

Compared to ordering with conventional products

- Channel
- Support Bracket
- Fitting Set
- Channel Nut
- Washer
- Hexagon Bolt

All threaded parts pre-assembled to Pressix CC products resulting in faster installation, and also fewer components to get lost on site or in the workshop.

No headaches with calculating the correct size of threaded bolt or channel nut to fit the bracket components as Pressix CC parts have the correct connecting parts pre-assembled.

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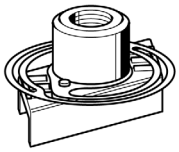
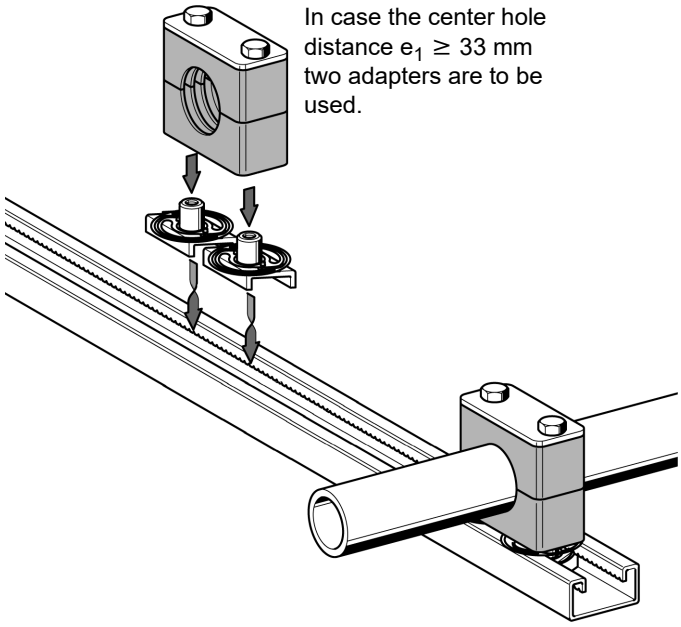
Adapter and Insulated Foot Plate

Adapter NT CC 41 DIN 3015



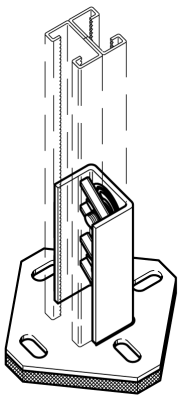


In case the center hole distance $e_1 \geq 33$ mm two adapters are to be used.

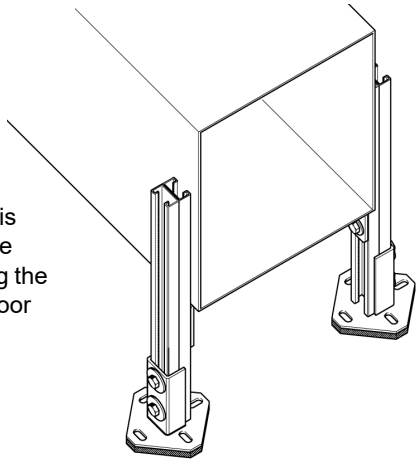
Advantages
Especially in cases where the fixing spot is difficult to access, adapter NT CC 41 enables a secure suspension of Tube Clamps acc. DIN 3015 (light and heavy duty)

By pressing, the adapter turns into place in the channel opening, staying adjustable till the holding bracket has been fixed securely.

Insulated Foot Plate SHB HCP



Suitable for flat roof or floor membranes



The rubber insulation pad is permeable to water and the steel parts are HCP making the foot plate suitable for outdoor use

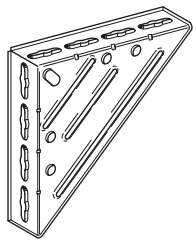
Advantages
Complete foot plate unit including insulation pad, can be used for assembly of frames on flat roofs with non-penetrable membranes.

Suitable to assemble frames made from Pressix 41 channels up to 62mm profile depth.

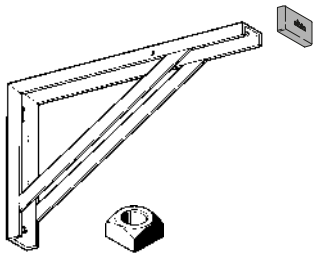
Various footplate sizes enable the correct load spread onto the roofing material.

Products

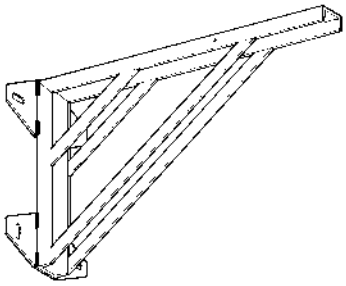
Support Bracket WK 100/100
150/150
200/200



Support Bracket WK 300/200
550/350

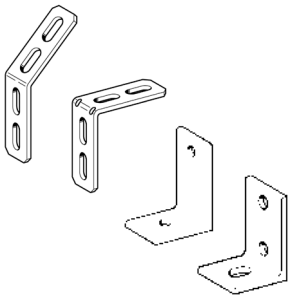


Support Bracket WK 725/400
880/550

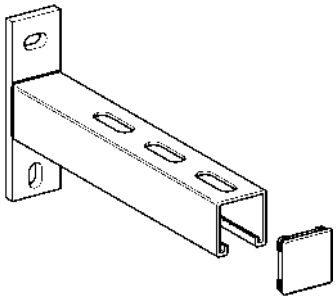


Tie Rod STR

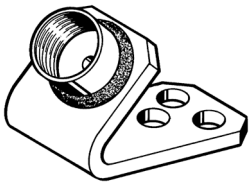
Fixing Bracket MW S



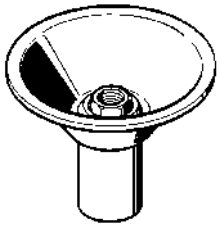
Cantilever Bracket AK



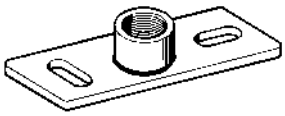
Socket Angle ST



Support Cone SMD 1

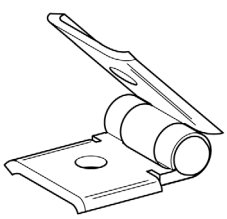


Mounting Plate GPL

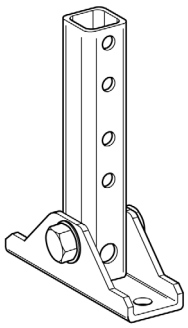


see Fixed Points

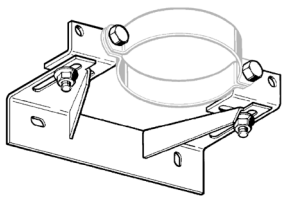
Universal Joint JOI 41 V HCP



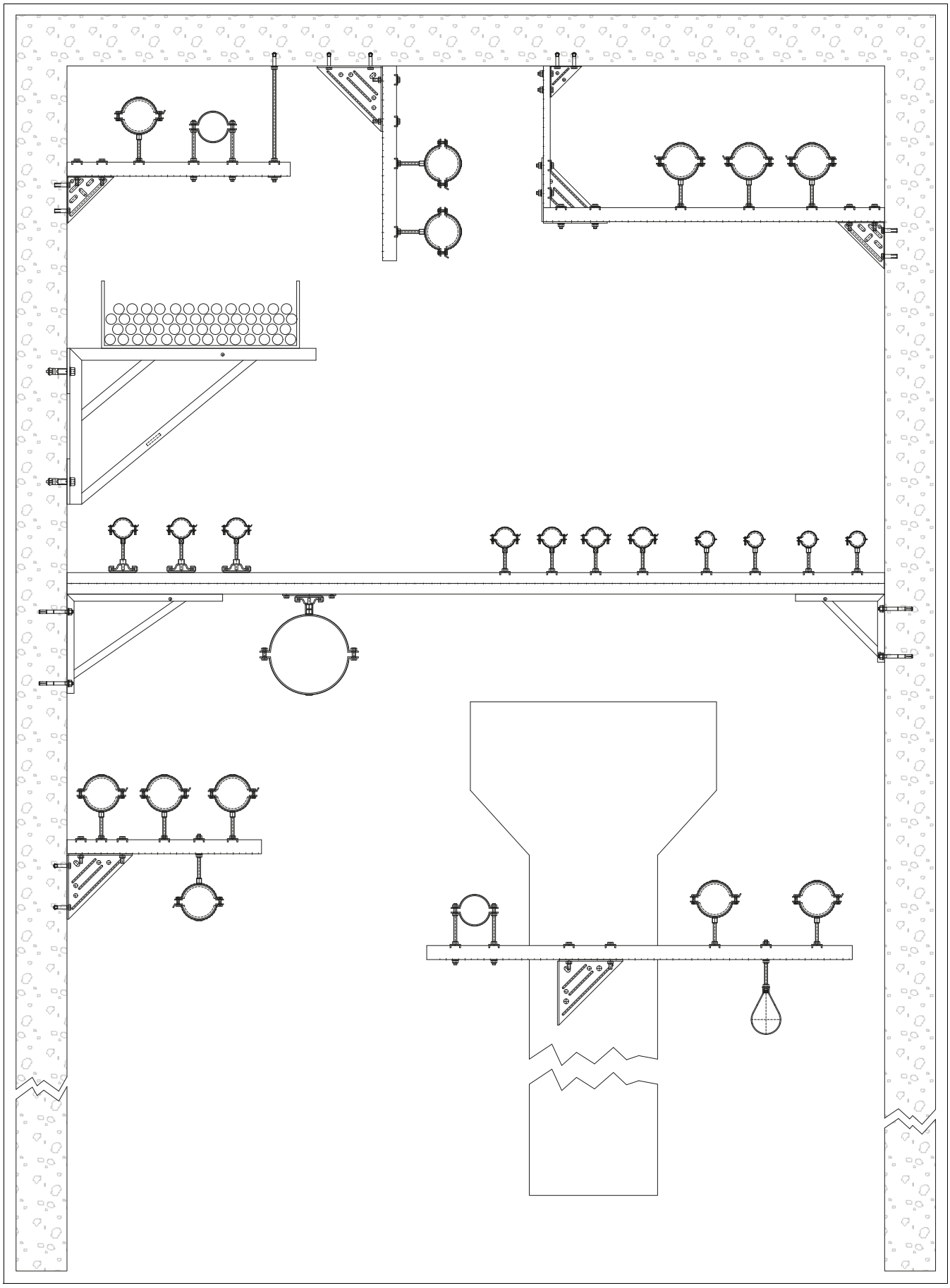
Universal Joint JOI 41 V HCP



SFK Bracket



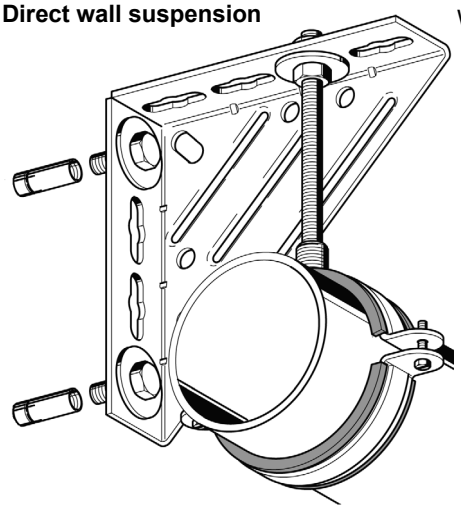
Application examples for Support Brackets (Sikla-CAD-library)



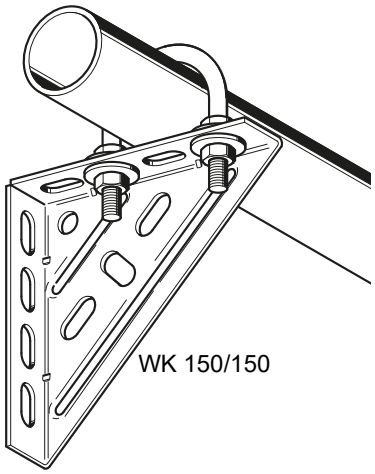
Support Bracket WK 100/100, …., WK 200/200 with reinforcement indents for extra support

Direct wall suspension

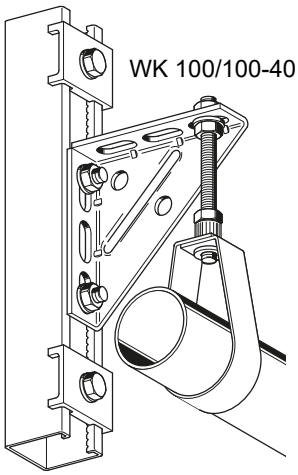
WK 200/200



Can also be mounted rotated by 180°

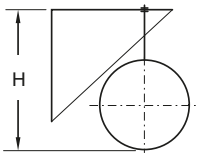


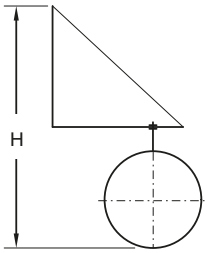
WK 150/150

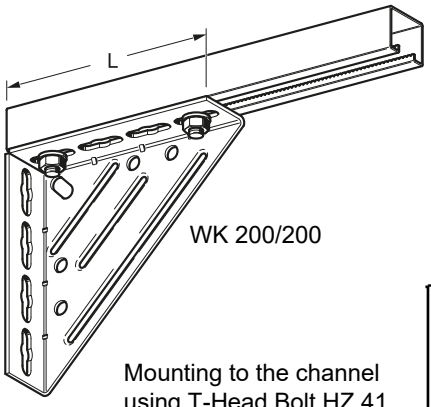


WK 100/100-40

Space saving formation, if height H is limited



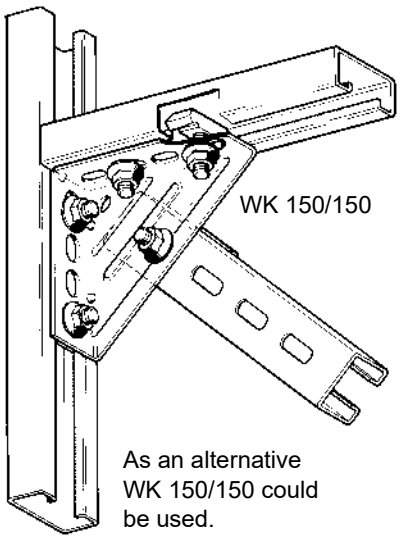




The projecting cantilever length can be extended using channels. For large projecting lengths (>2,5 x L), additional support with a Socket Angle is required.

WK 200/200

Mounting to the channel using T-Head Bolt HZ 41 M12x25 or Channel Nut HZ 41 M12; alternative fixing using Speed Nut CC 41 M12.



WK 150/150

As an alternative WK 150/150 could be used.

▲
The channel is installed directly to the wall, thus increasing the axial spacing of the fixings, which allows for a higher load capacity.

Support Bracket 150/150 can be used as a webbing plate.
The centre hole allows the channel to be fixed at 45 degrees.

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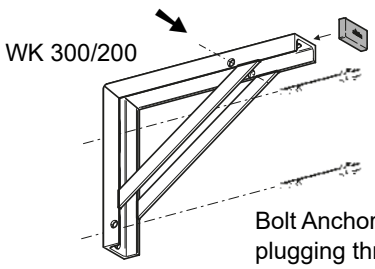
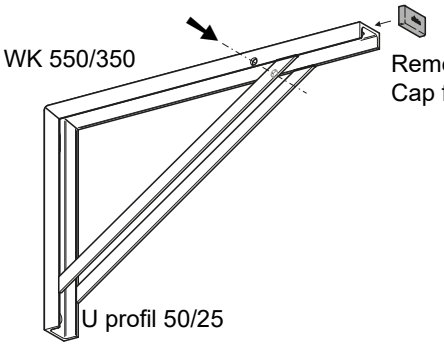
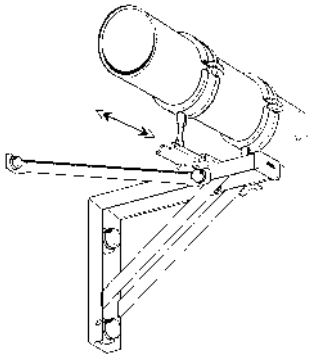
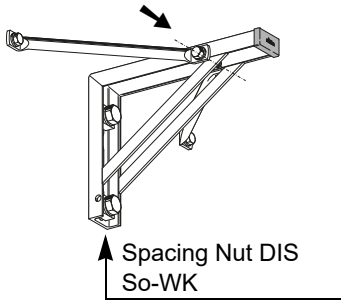
Support Bracket WK 300/200, …., WK 880/550 made of C-Section steel

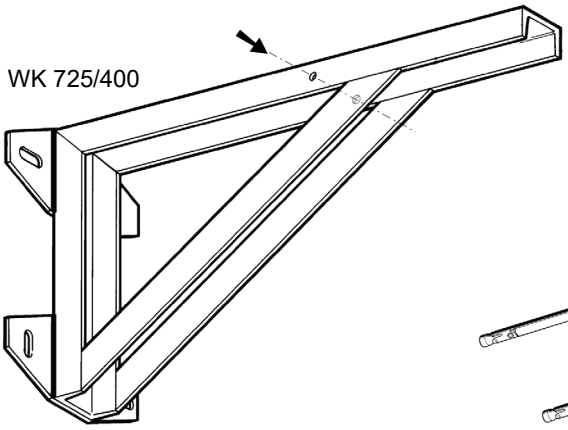


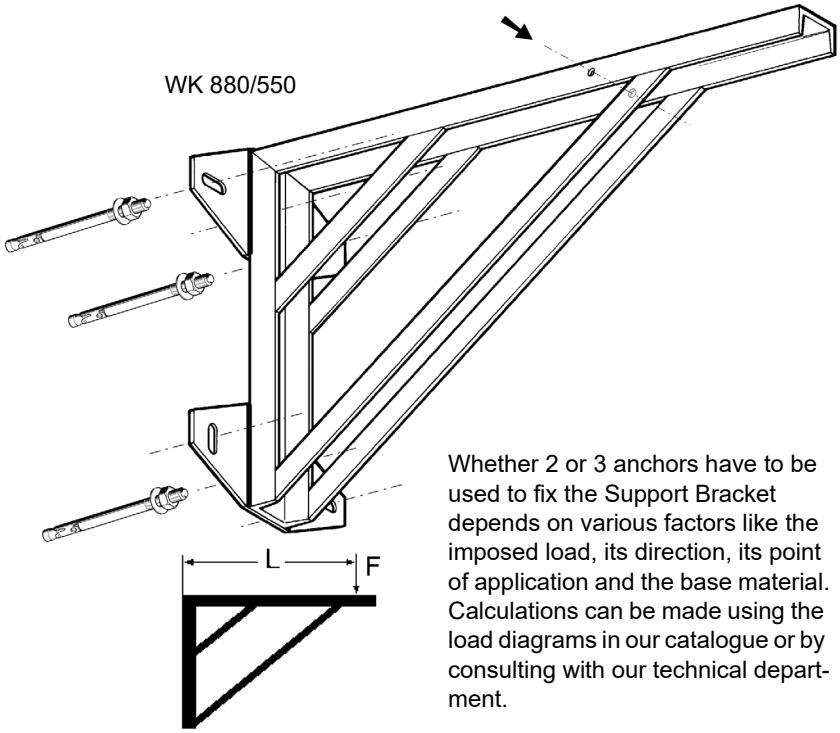


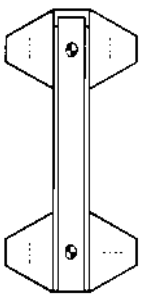


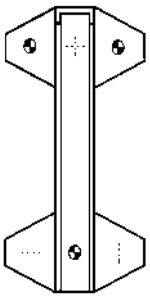


Lateral forces (e.g. due to pipe movement on sliding supports), require lateral Tie Rods ↘ (on one or both sides). Pre-drilled connection holes are provided to the sides of the Support Brackets.
For all brackets of sizes 300/200, ..., 880/550 suitable 45 degree Tie Rods are available for each size.



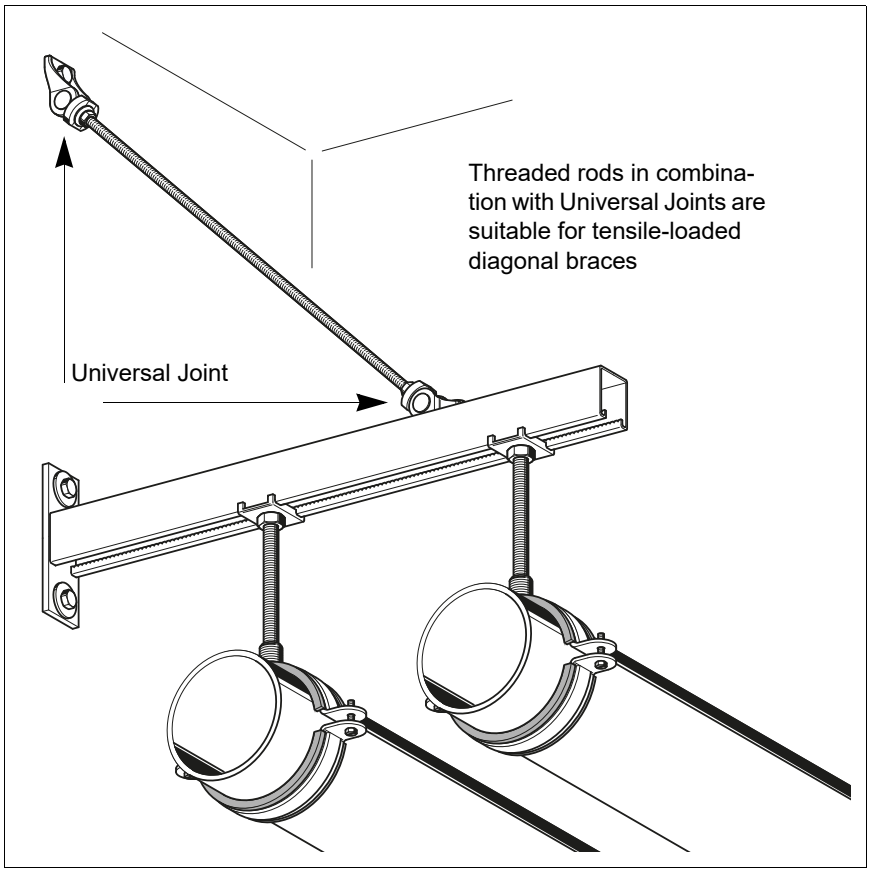



2 Anchors


3 Anchors

Whether 2 or 3 anchors have to be used to fix the Support Bracket depends on various factors like the imposed load, its direction, its point of application and the base material. Calculations can be made using the load diagrams in our catalogue or by consulting with our technical department.

Socket Angles for bracing Cantilevers



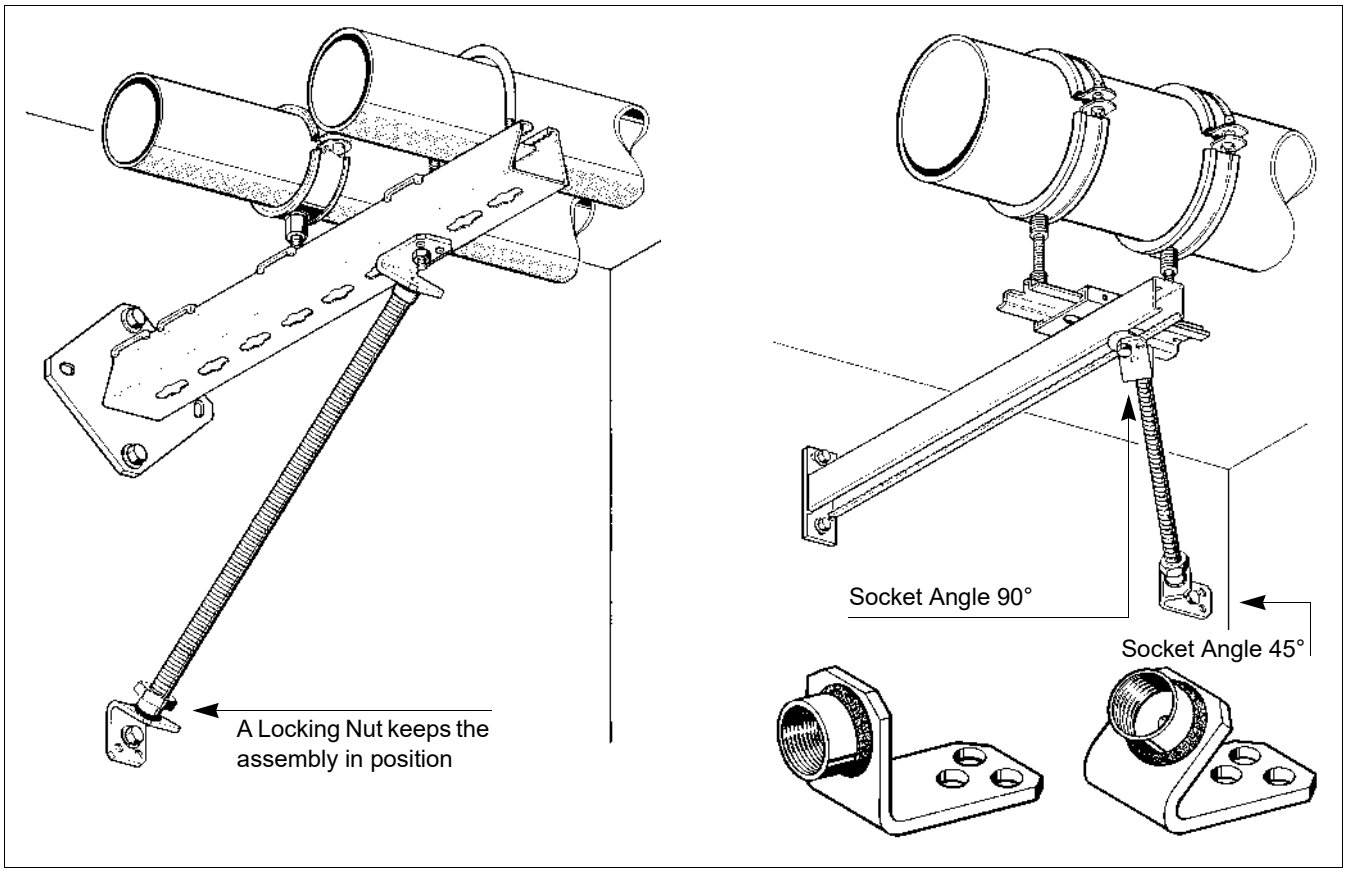
Longer cantilever lengths and / or higher loadings require additional bracing to support the Cantilever Brackets.

Compression loaded braces require a greater cross-sectional area in the bracing element e.g. Sikla Threaded Tubes with Socket Angles.

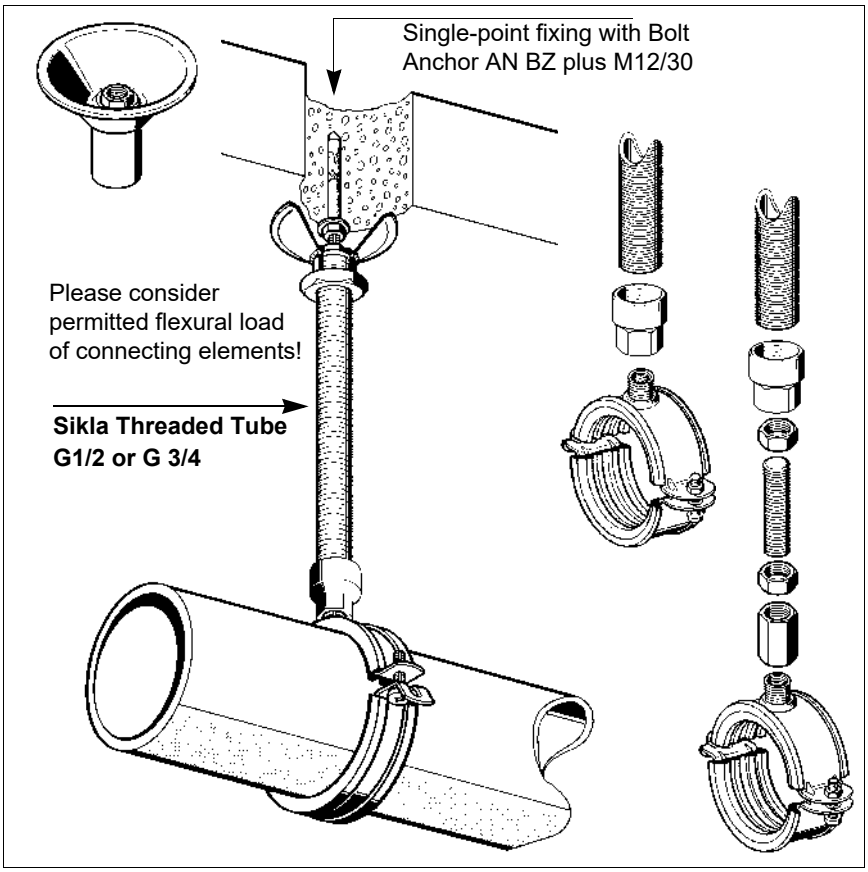
Socket Angles can also be used as lateral braces to resist lateral loads, in both tension and compression.

Note

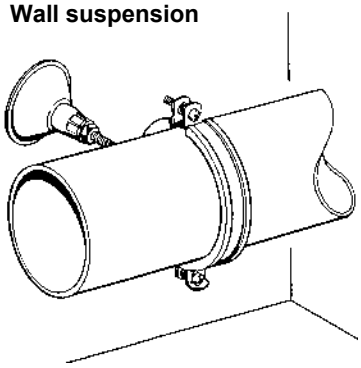
- *To resist lateral forces, the installation of a lateral brace is required*



Support Cone SMD 1 to create rigid connections



Wall suspension

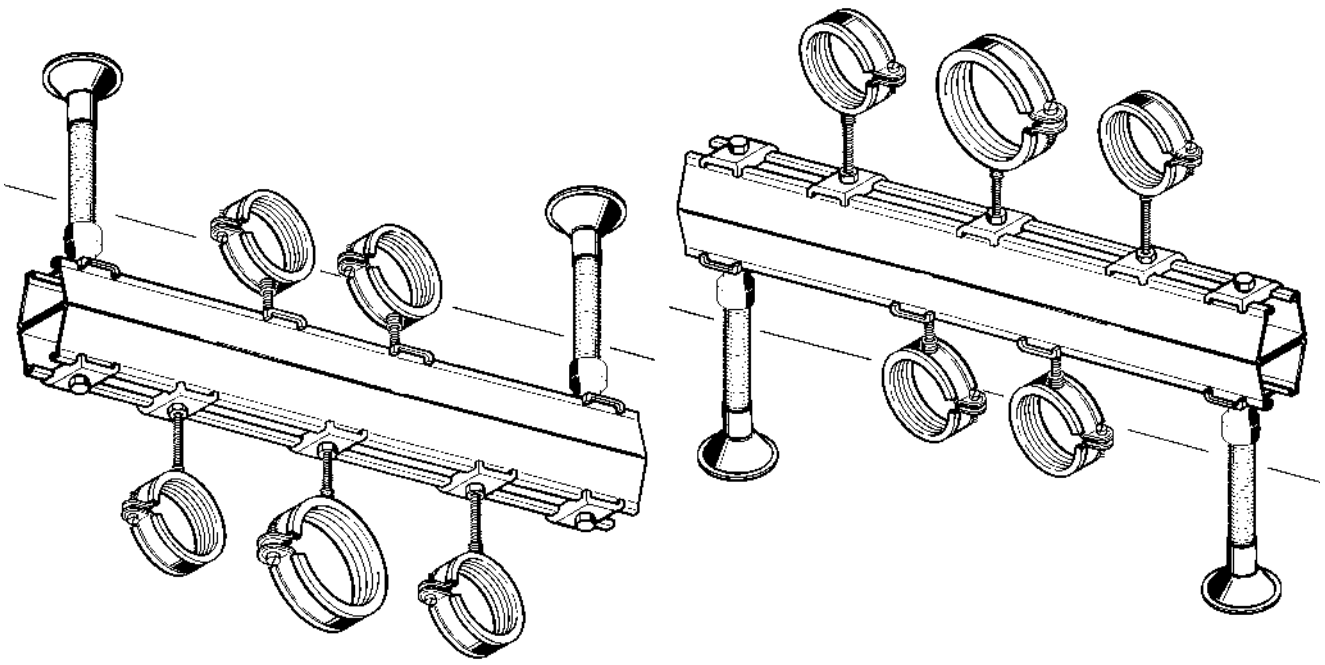


Connection by using Adapter AD to the Triple Thread Nut 3G of Pipe Clamps: Stabil D-3G, Ratio S, Ducting Clamp PLU, Refrigeration Clamp SKS Top-2C.

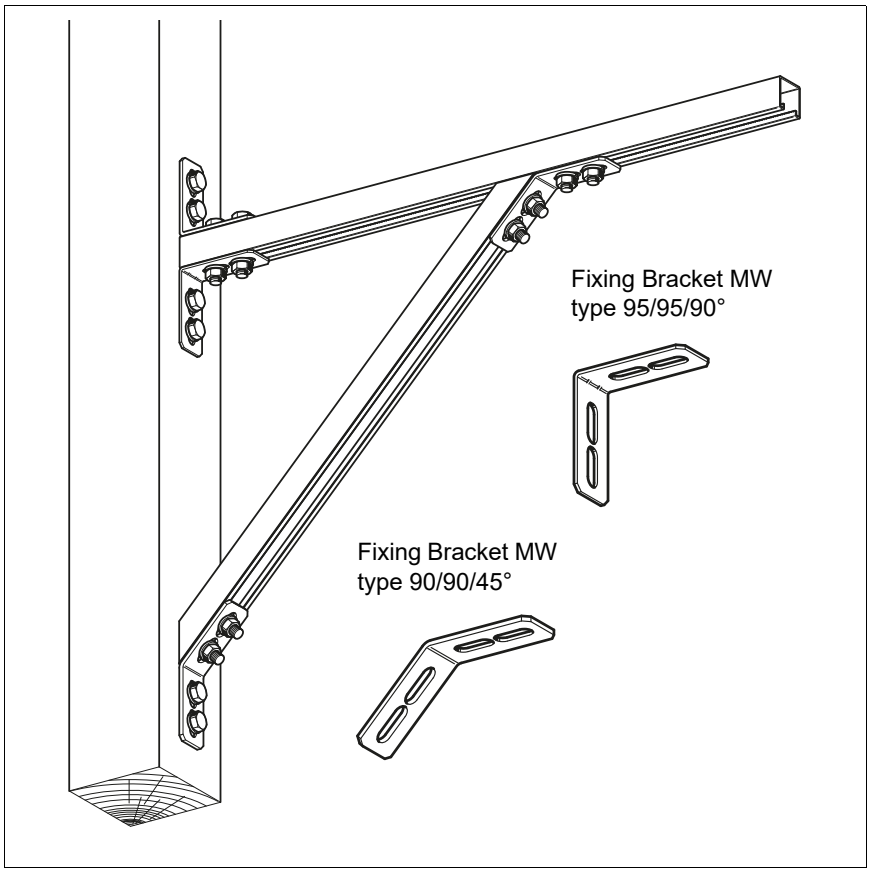
Connection by using Grub Screw, height adjustable. Free length of the Grub Screw: max. 2 x thread diameter.

Due to the shape, Support Cone SMD 1 can bear the same load in all mounting plane directions.

Ceiling suspension or floor-mounted frame



Fixing Brackets for special solutions and various fixings



Various fixing brackets, channels and connecting elements enable the construction of diverse special cantilevers.

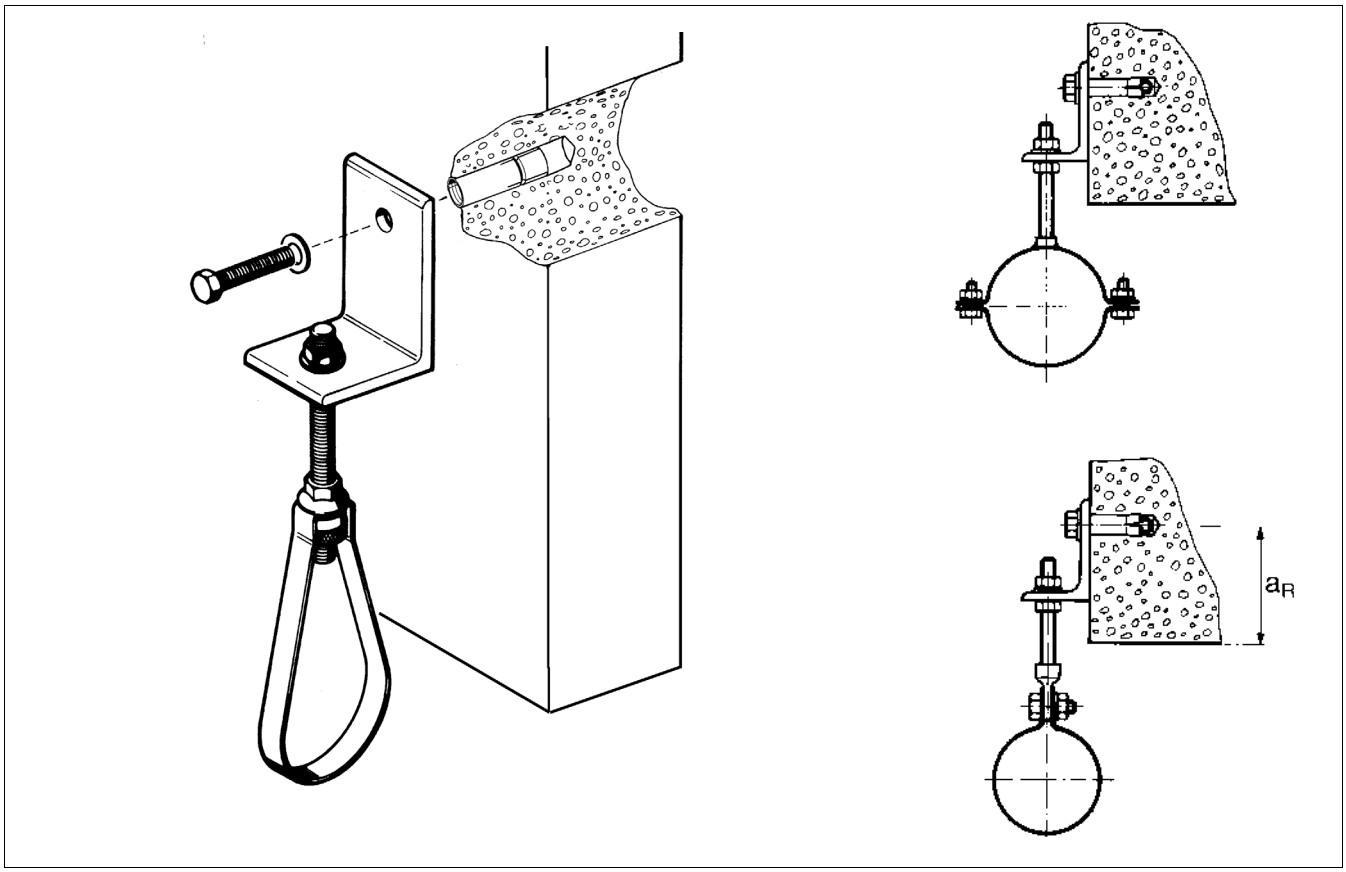
Note

- *The alternative use of appropriate types of angle Connectors CN CC Stabil simplifies the installation.*

Fixing Bracket suitable for plant engineering and sprinkler installations.

Caution!

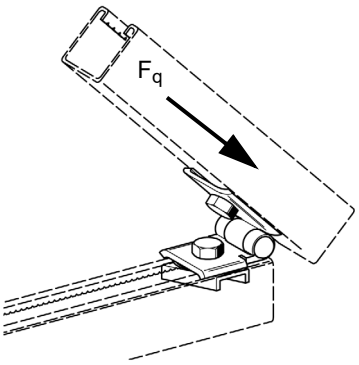
- *Consider the regulations for Anchors regarding edge distance a_R .*

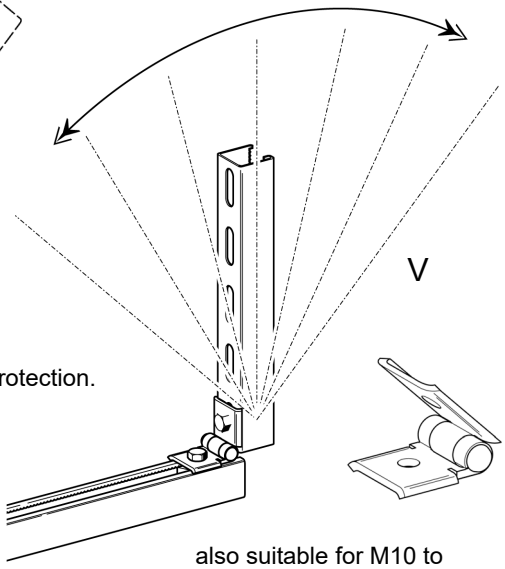


Joint JOI V - HCP and JOI 41 T - HCP for Channel MS 41

Joint JOI V - HCP

Connection through channelslot with Speed Nut NT CC 41-M10 and Hexagon Bolt SKT M10x20, resilient from F_q till 2 kN per connection. Tightening torque 40 Nm





Combination with further HCP-products for optimized system-orientated corrosion protection.

also suitable for M10 to structure connection

Advantages:

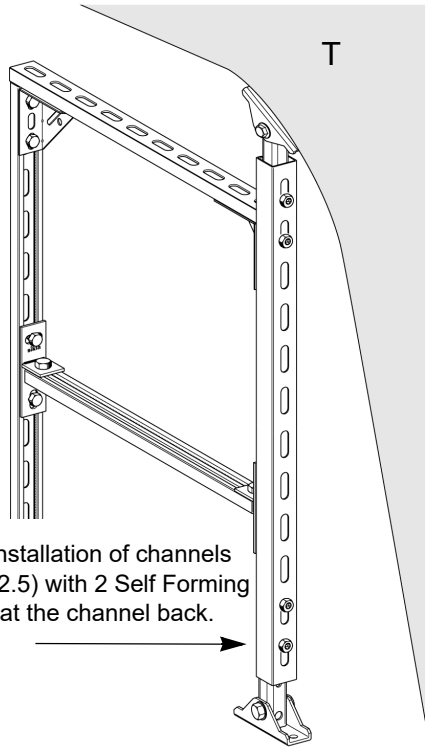
- Suitable for a flexible pivoting connection between channel and building structure or channel and other profile / material.
- For the connection of channels MS41 with step-less angular adjustment 0...180 degrees, e.g. lateral support of cantilever brackets.
- When fixing to a sloped surface, level channels can be formed by using the pivot to off-set the gradient of the supporting structure.
- HCP coating for maximum protection.

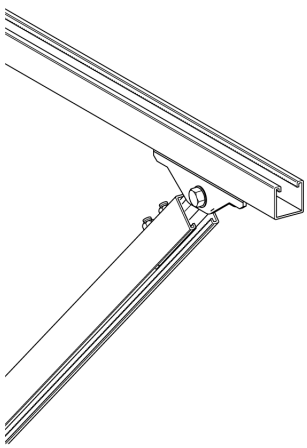
HCP

- ***High Corrosion Protection*** *corrosion protection equivalent to the level of hot-dipped-galvanising or higher.*

Joint JOI 41 T - HCP

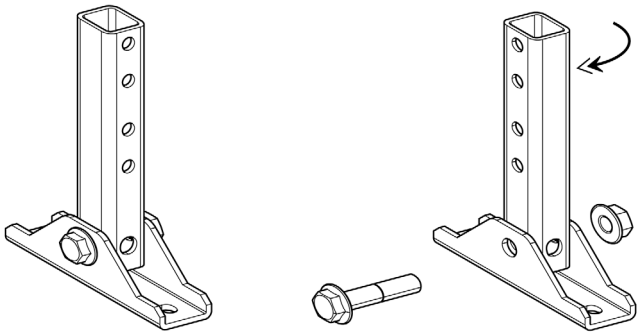
Perfect for connecting with further elements in the range Pressix CC 41 channel system.





1

Channelslot orientation is possible in all directions.
After unscrewing the thread bolt, the square nut should be turned by 90° and the lock nut will be rescrewed.



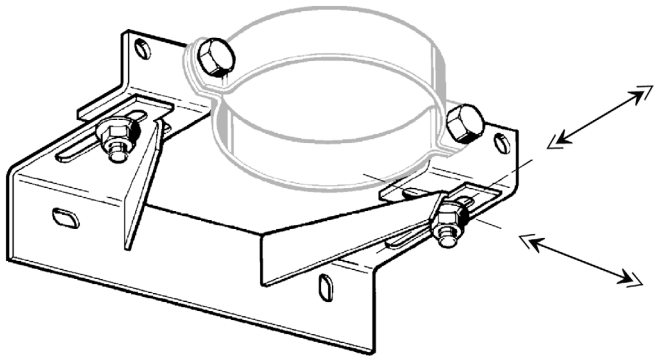
2

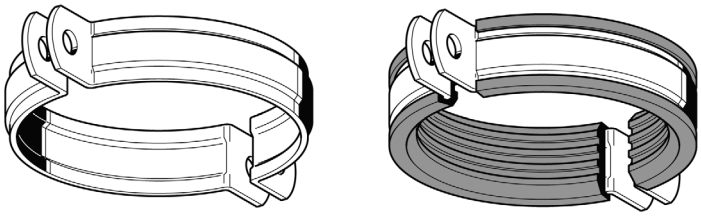
Quick an secure installation of channels (preferably 41/41/2.5) with 2 Self Forming Screws FLS F 80 at the channel back.

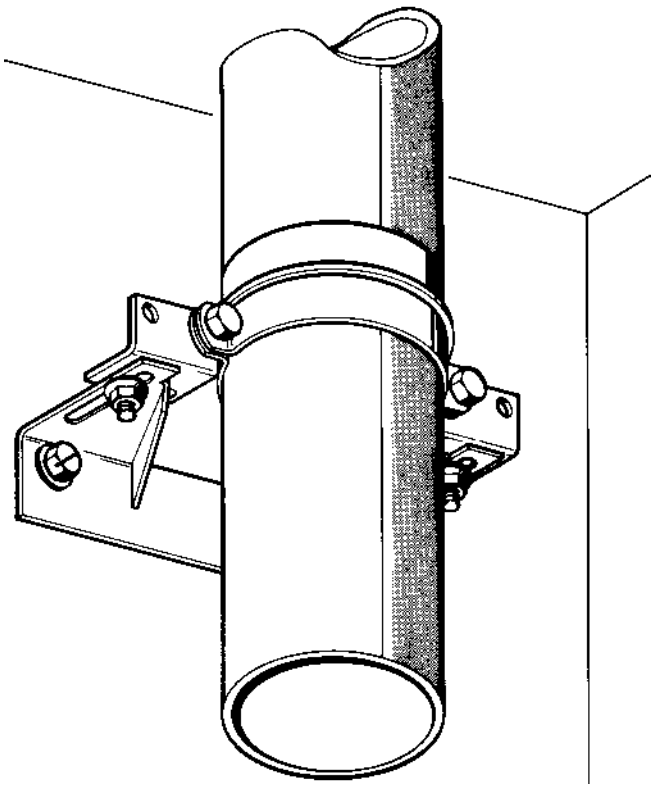
3

On site installation of the base plates with 2 anchors M10 (axial anchor distance 100mm).

SFK Bracket for SML Pipes of DN 100 - DN 150







The distance from the wall can be adjusted using the elongated holes in the cantilever.

Elongated slots in the pipe clamp joining brackets allow for adjustment to suit the required width of pipe clamp diameter.

Note

- *The Pipe Clamp must be ordered separately :*

  Stabil D or
  Stabil D with Lining

  for
  DN 100
  DN 125
  DN 150

Note

- *Nuts and bolts for mounting the Pipe Clamps are supplied with the Bracket.*

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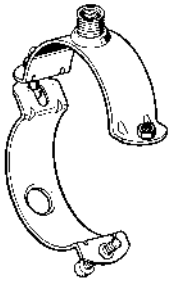
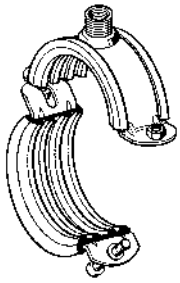
Products

Stabil D

Stabil D-3G

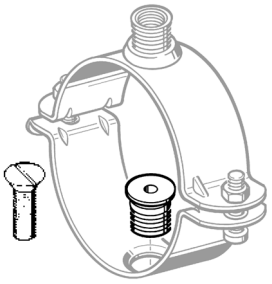


Stabil D-3G w/ Lining

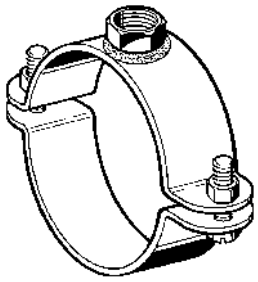


SBR/EPDM ; Silicone

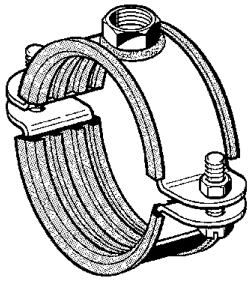
Multi-Thread Connector NT 3G



Stabil D-M16

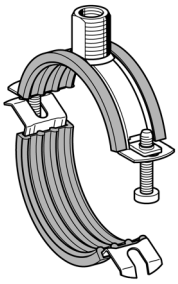


Stabil D-M16 w/ Lining



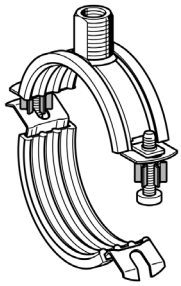
SBR/EPDM ; Silicone

Ratio S



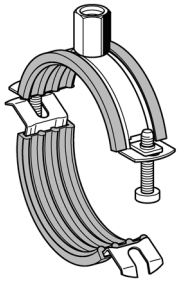
SBR/EPDM

Ratio S-K



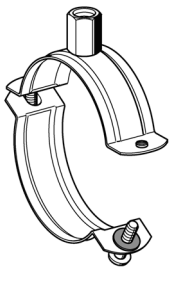
SBR/EPDM

Ratio LS

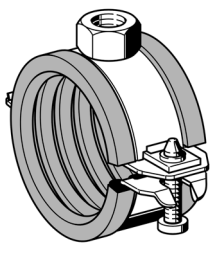


SBR/EPDM ; Silicone

Duo Clamp SRS



Ratio S M8



SBR/EPDM

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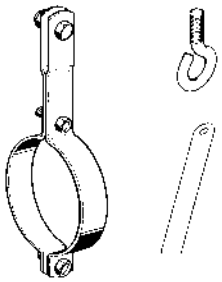
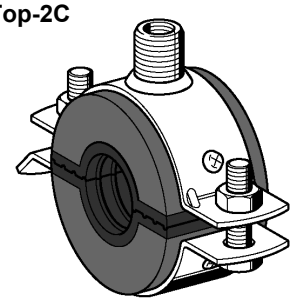
Products

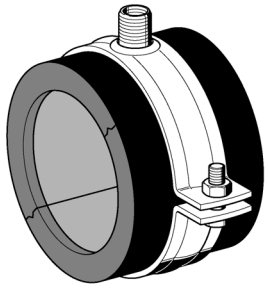
Stabil Type C



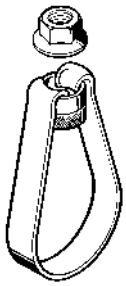
Chilled Water Clamp SKS Top-2C



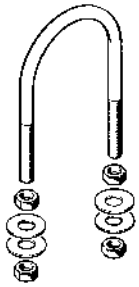
Chilled Water Clamp LKS



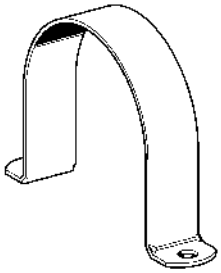
Pipe Loop RSL N



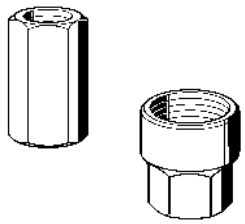
U-Bolt RUB



U-Clamp RUC

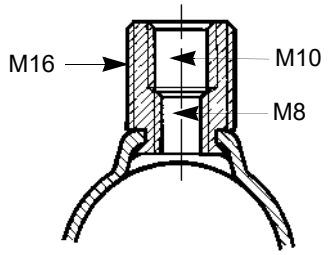


Adapter AD f/f

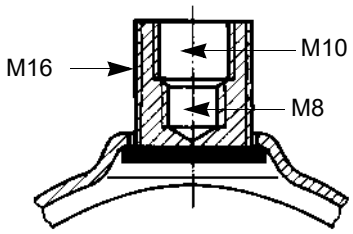


Connection options to pipe clamps with Triple-Thread Connector NT 3G (M16, M10, M8)

Types for small diameters
Stabil D-3G up to 1/2“ with Lining up to 3/4“ wo. Lining

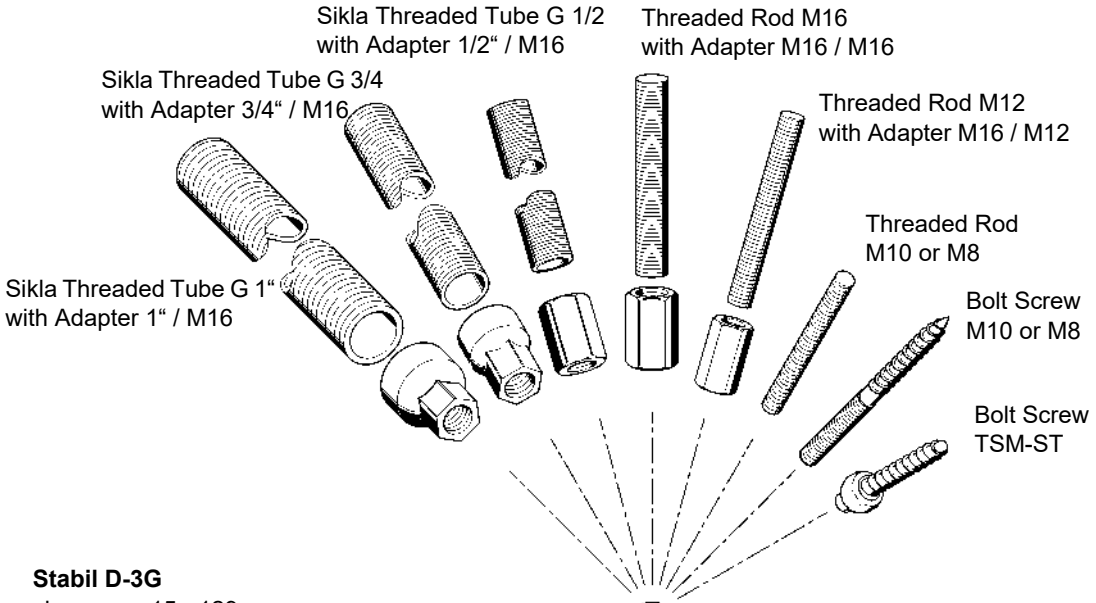


Multi-Thread Connector NT 3G for all types mentioned below

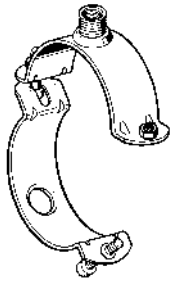


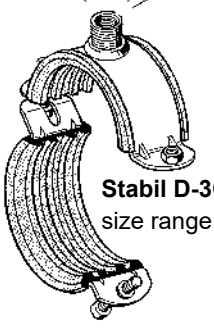
Each Triple Thread NT 3G has
1 external and
2 internal threads,
offering multiple connection options.

Some Connecting Nuts are equipped with flats (width across flats 13 mm) for easy adjustment of the clamp using a spanner.



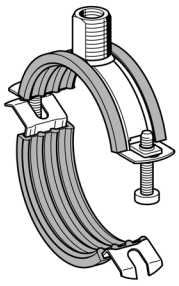
Stabil D-3G
size range 15 - 129 mm





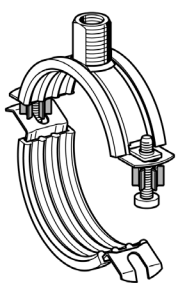
Stabil D-3G; w/ Lining; w/ Silicone Lining
size range 14 - 115 mm

Ratio S (up to 6“)
size range 38 - 170 mm
2G (M8 / M10) for sizes 12 - 35 mm

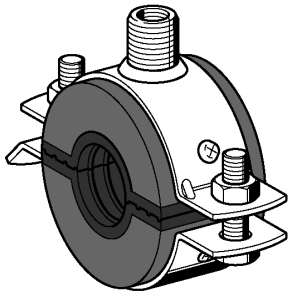


Bonded rubber lining

Ratio S-K
types 40, ... , 160 mm
2G (M8 / M10) for sizes 16, ... , 32 mm



Chilled Water Clamp SKS Top-2C
types 17, ... , 89mm



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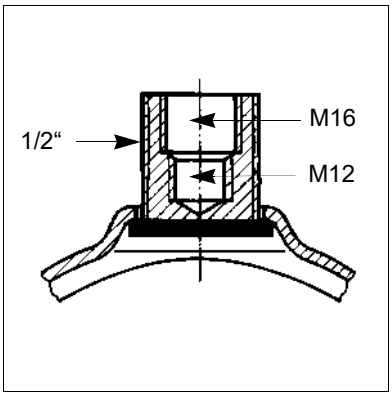
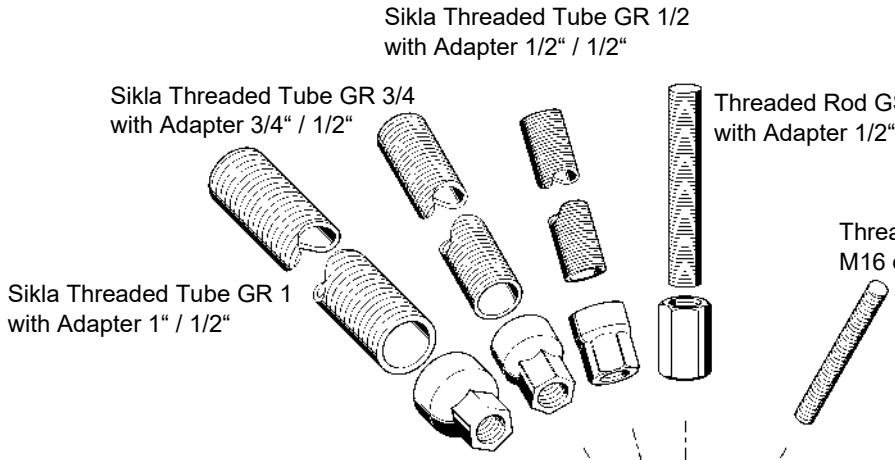
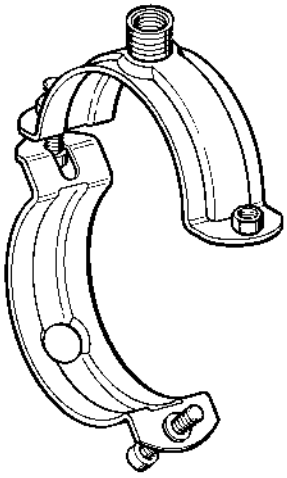
Connection options to pipe clamps with Triple-Thread Connector NT 3G (1/2", M16, M12)

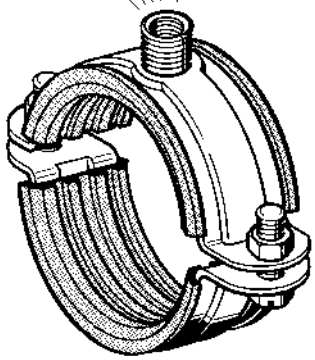


In public areas and industrial plants, especially for bigger pipe diameters the Stabil series should be used.



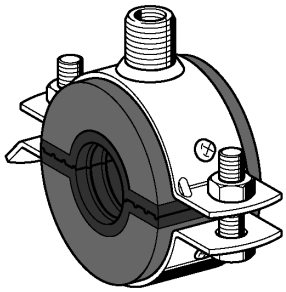
Stabil D-3G (5“ - 10“)
size range 133 - 316 mm





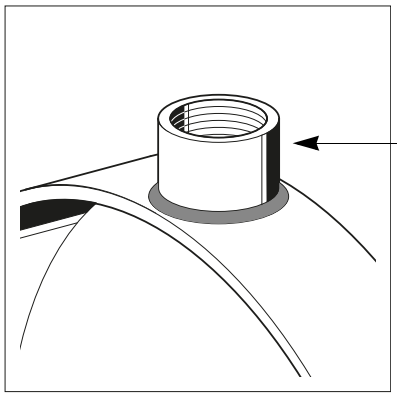
Stabil D-3G; w/ Lining; w/ Silicone Lining (5“ - 10“)
size range 124 - 318 mm

A modified version of the Stabil D-3G is the basis of the **Chilled Water Clamp SKS Top-2C**
types 219, ... , 324 mm

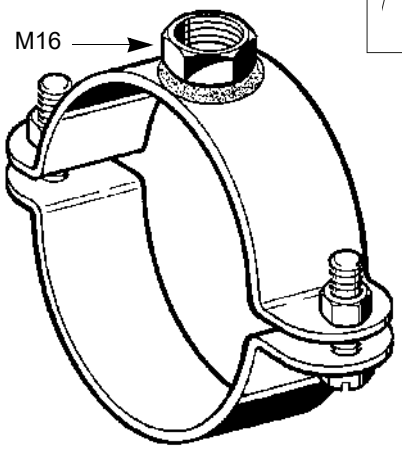


Connection options to Stabil D Pipe Clamps (from 218mm onwards); Sound Absorption Lining

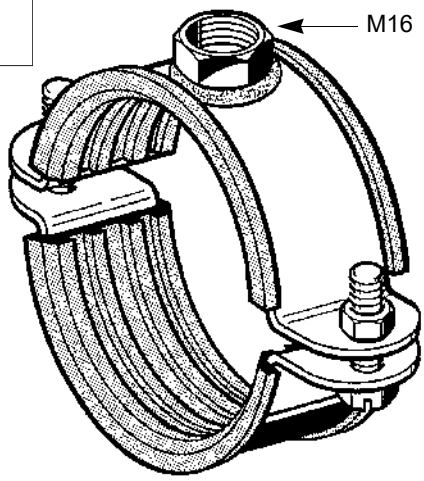
Stabil D-M16



Available with an alternative welded-on thread connector:
- Hexagon Nut NT M20
- Socket 1/2“
- Socket 3/4“
- Socket 1“



size range 218 - 521 mm



size range 315 - 521 mm

Sound Absorption Lining for Pipe Clamps

Material	Colour	Temperature range [°C]	Suitable for pipes made from		
			Steel	VA	Plastic
SBR / EPDM	black	-50 … +110	●	●	◑ [1]
SBR / EPDM	beige	-50 … +110	●	●	●
Silicone [2] [3]	red	-60 … +200, temporary +300	●	●	●
Ceramic Fibre Tape, self-adhesive	white	… +500	●	●	○

[1] not suitable for PVC / suitable for PE, PP, PB.
[2] not permitted in certain areas (e.g. paint shops in the automotive industry)
[3] approved by VdS.

● suitable
◑ partially suitable
○ not suitable

Note:
DIN 4102 Sikla Sound Absorption Lining SBR/ EPDM and Silicone belongs to fire classification B2.

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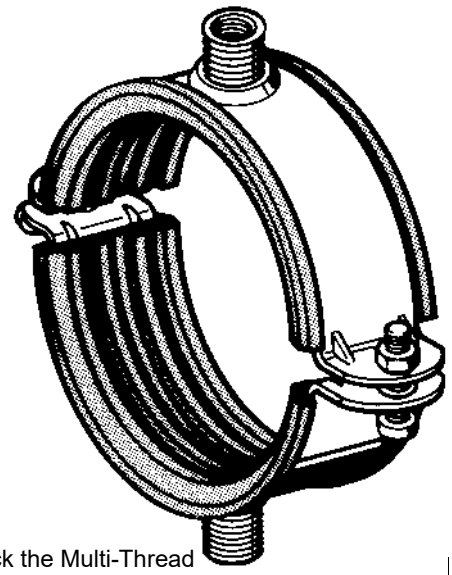
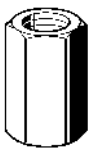
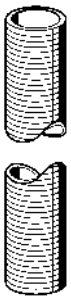
Connection options to Stabil D-3G : Suspension



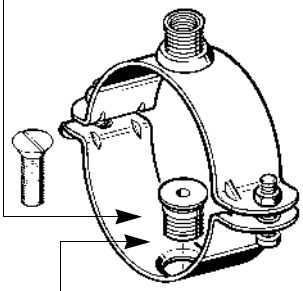
Lock the Multi-Thread Connector NT 3G using an Adapter (e.g. 1/2“ / M16)



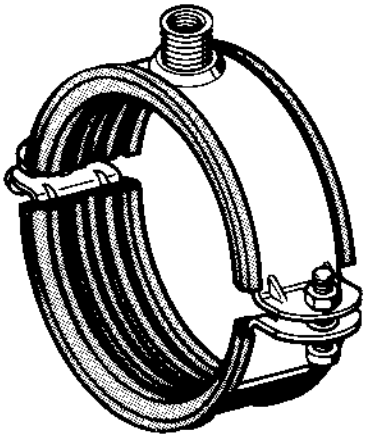
Sikla Threaded Tube (e.g. G1/2)



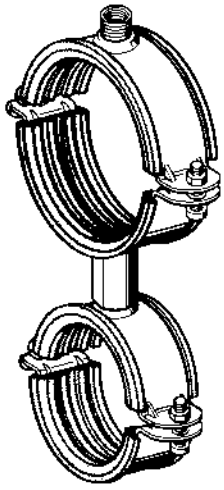
Exception:
for size range up to 3/4“ (with sound absorption lining up to 1/2“) use Countersink Screw SCR M8 x 20



Multi-Thread Connector NT 3G

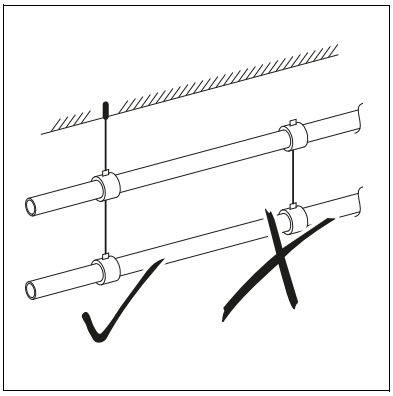


Direct connection with Adapter M16/M16



Note:

- *Pipes have to be attached directly to the building structure. They must not be used to fasten other components (based on EN 806-4: 2010-06)*



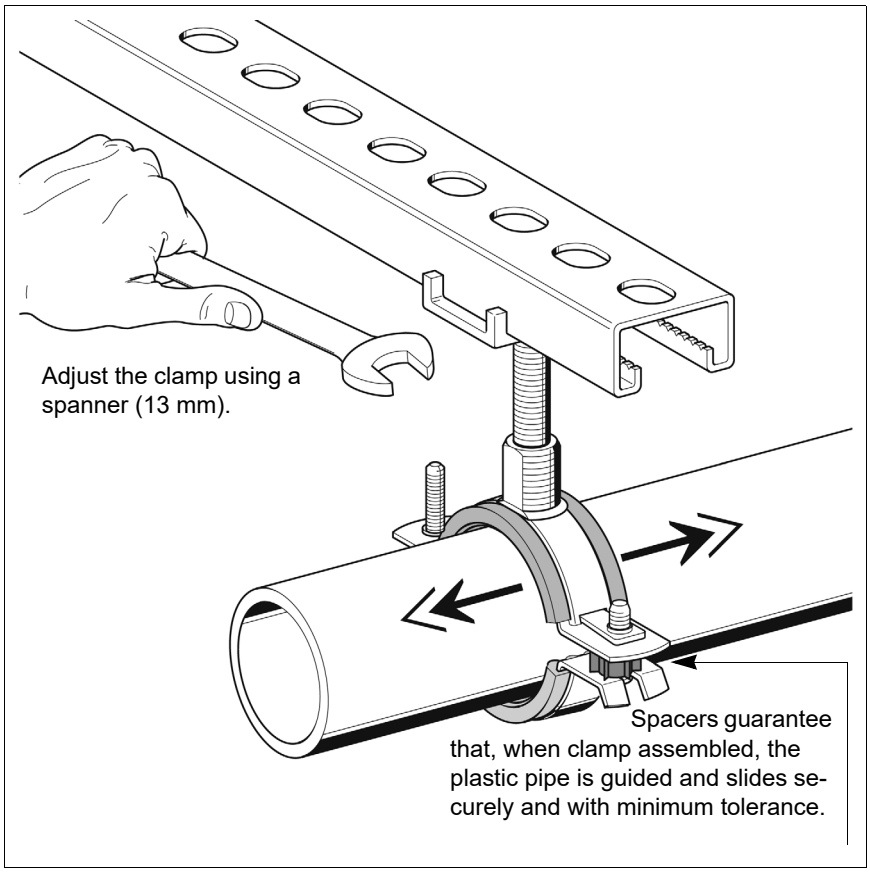
✔**correct:** a second pipe may be suspended to a pipe clamp which has been fixed to the building structure.

✗ **wrong:** a pipe should not be suspended from another pipe.

Caution!

- *This arrangement is only permissible when the pipes connected do not expand in alternate directions.*

Ratio S-K for plastic pipes



Two-piece Pipe Clamp with spacers and sound absorption lining for smooth, noiseless sliding of plastic pipes.

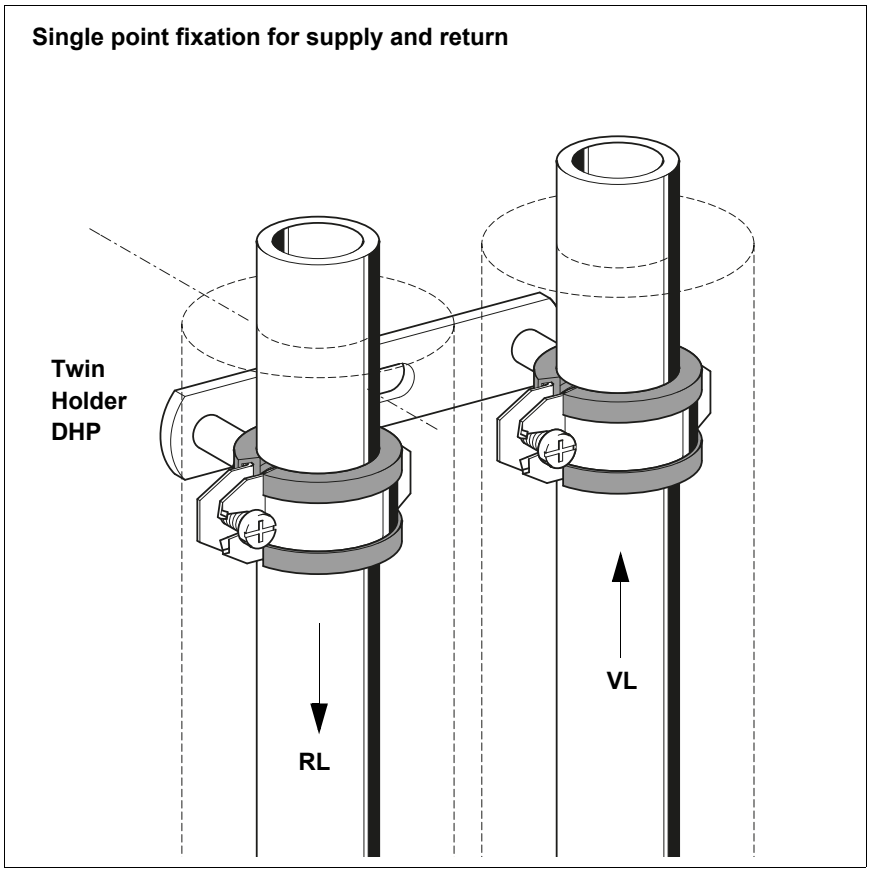
Note:

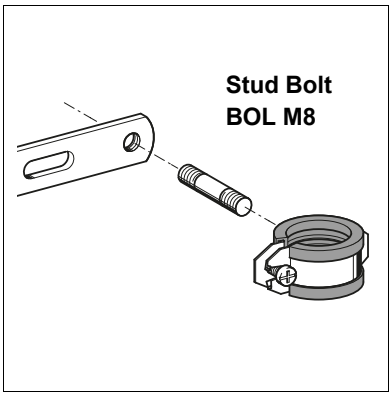
- *In order to cater for frictional forces, Ratio S-K clamps have to be fixed in short distance to the building structure or to a solid base.*

The form-fitted rubber profile is sticked in the clamp. This alleviates the installation of pipes and secures the sliding.

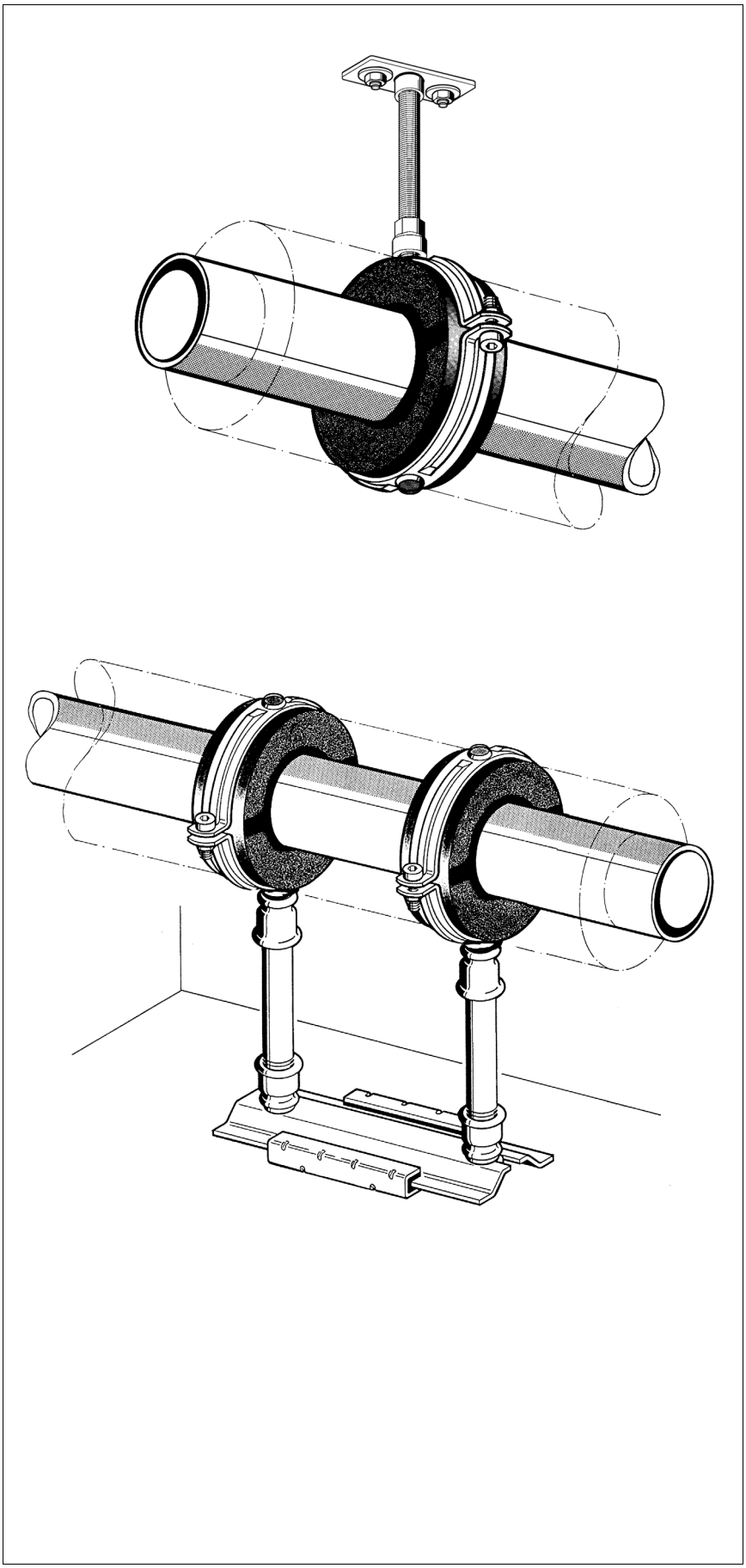
The compound of the rubber, prevents diffusion of plasticisers into the plastic pipe.

Single point fixation for supply and return





Chilled Water Clamp SKS Top-2C



Used for chilled water pipes and refrigeration pipework installations. In these cases, the installation of metal pipe clamps directly to the pipe walls is not permitted.

- The insulation of the chilled water clamp (two-part foam technique) prevents cold bridging with the pipe wall and thereby also avoids corrosion.
- The insulation insert made up of PUR (polyurethane foam sp. gr. 250kg/m3) is securely bonded to the clamp
- No sealant is required. The surface of the chilled water remains clean and permits a diffusion-resistant insulation against the pipe wall.
- Secure adhesion by means of the insulation insert lining (synthetic rubber) according to test of FIW Munich.
- PUR foam ensure a reliable compensation of pipe dia. tolerances and a first class sound absorption with an insert loss up to 25dB(A).

Note:

- *Pipes containing chilled fluids contract when operational, therefore movement must be allowed for in the pipe support.*

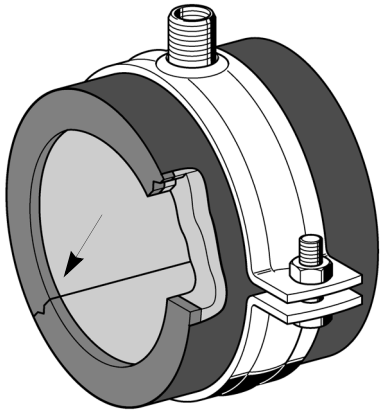
Chilled Water Clamp LKS

Configuration and characteristics

Insulation element consists of 2 form-joined layers of PUR coated with a black aluminum foil, complete with pipe clamp.
The insulation insert is already bonded into the pipe clamp thus removing the need to assemble on site.

At both open end-faces, polyurethane foam for optimal adhesion with adjoining insulation to pipes.
e.g. PE-foam or foamglas for common **insulation thicknesses**:

LKS H for 13 mm
LKS M for 19 mm
LKS T for 32 mm.



A low-priced alternative made of PUR rigid foam (specific gravity 120 kg/m³) has the best insulating properties by low thermal conductivity.

Application

Suitable for secure prevention of condensation water at the pipe support.

An optimal diffusion-tight connection with the pipe insulation is easily and safely achieved by fixing usual insulation materials to the clamp faces using adhesive.

Note:

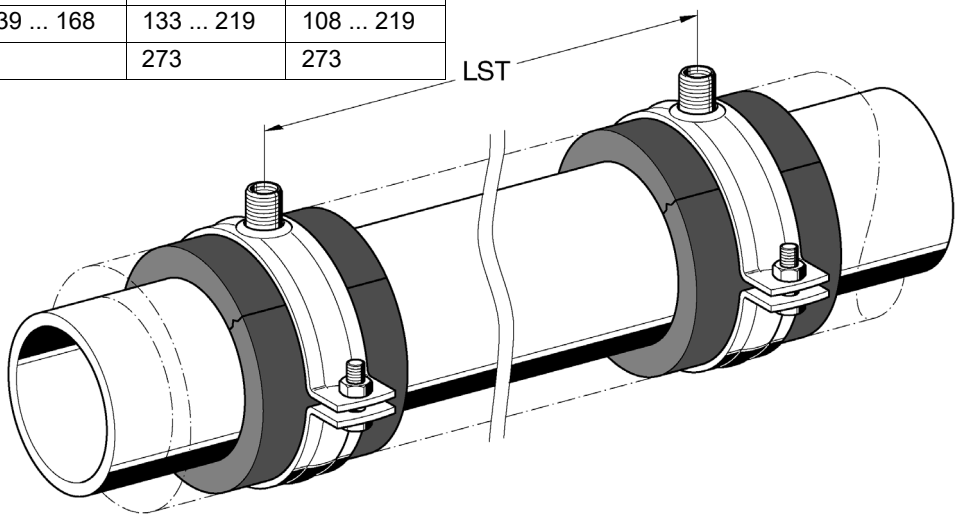
- *PUR elements with low density require careful storage, handling and installation.*

Connection and pipe span

On-site connection with Adapter AD and Threaded Tube GR, in case of pipe expansion > 3 mm Slide Element GLE has to be used.

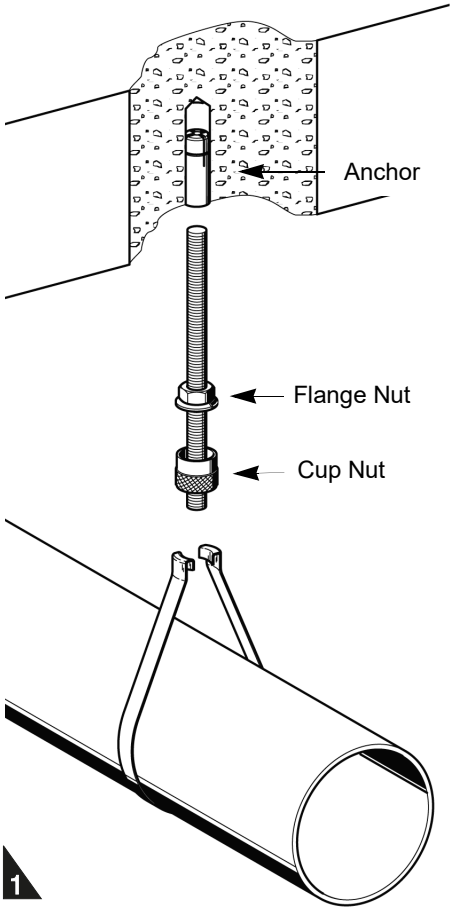
The effective span based on DIN 1988 may be applied for LKS H (all types) and LKS M (15 … 168), from LKS M 219 up to max. 5 m.

Multi-Thread Connector	LKS H	LKS M	LKS T
M8 / M10	15 ... 133	15 ... 114	15 ... 89
M12 / M16 / 1/2“	139 ... 168	133 ... 219	108 ... 219
M16		273	273



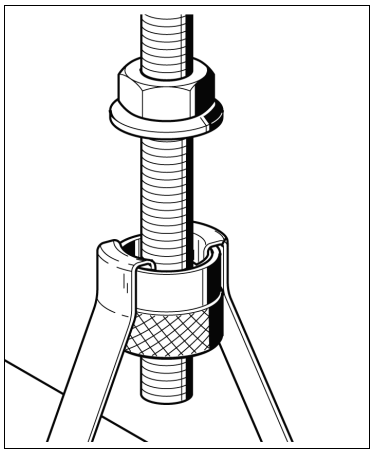
Installation of Pipe Loops

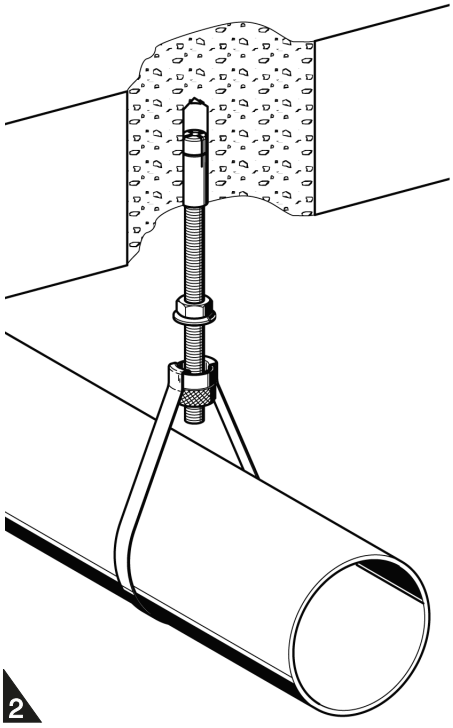
Pipe Loop RSL N

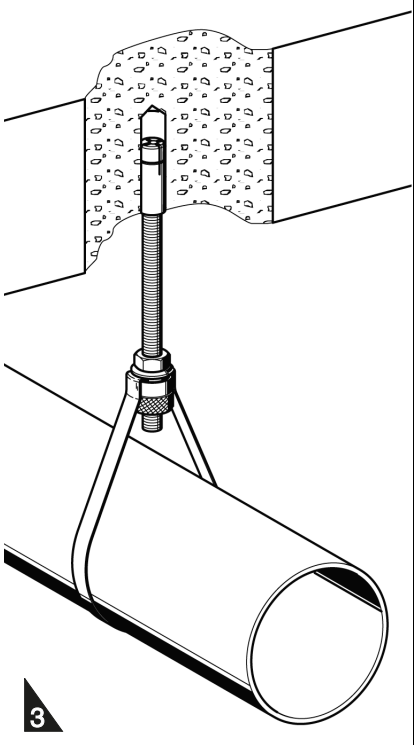


Note regarding Pipe Loop RSL N:

- *After height adjustment is complete, lock Pipe Loop RSL N using the flange nut!*

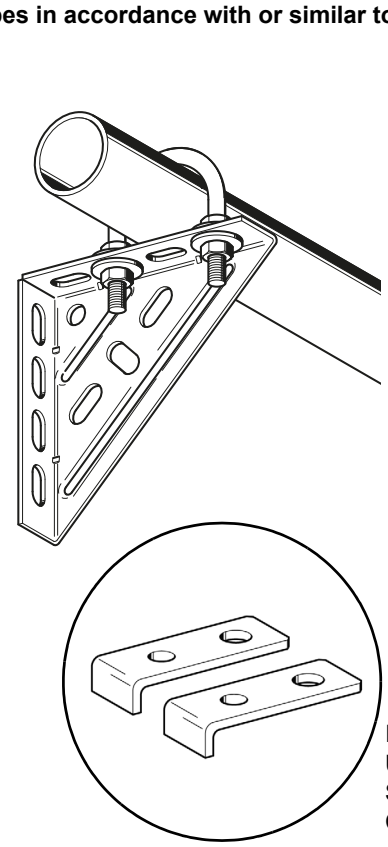


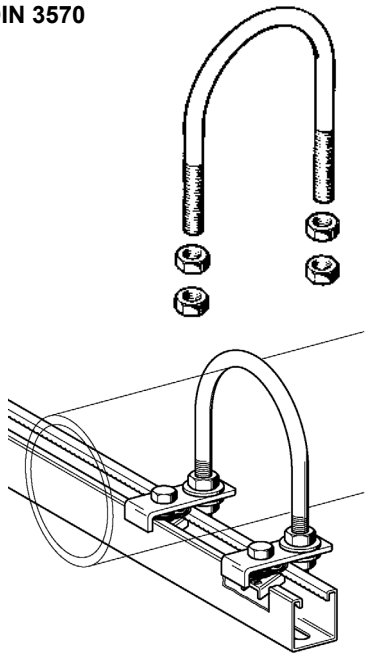




Installation Guidelines for the Use of U Bolt RUB and U Clamp RUCI

Types in accordance with or similar to DIN 3570





Installation on Channel with 1 set U-Bolt Support UBF, Hexagon Bolt SKT M10 x 25 and Speed Nut NT CC.

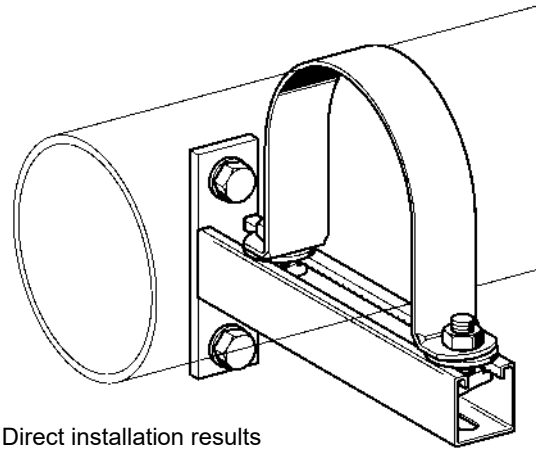
Scope of delivery always includes 4 nuts.

U bolts should be installed vertically. Using them horizontally can result in high bending stresses on the clamp.

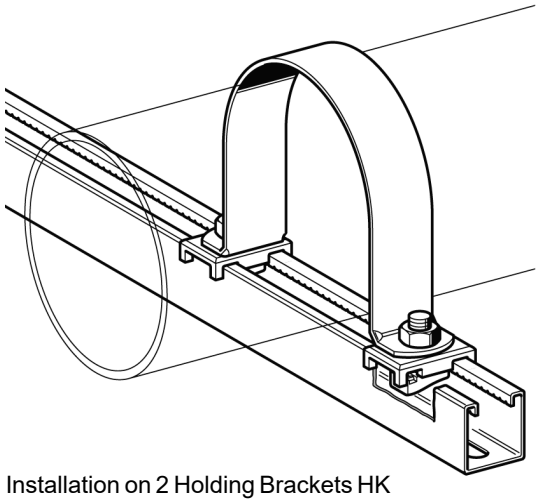
Note:

- *U Bolts should preferably be used as Guided Supports.*

U Clamp RUC



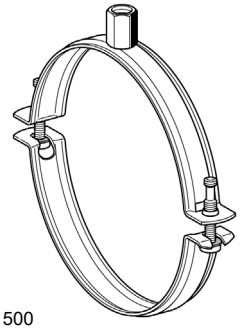
Direct installation results in a fixed bearing.



Installation on 2 Holding Brackets HK 41 provides the necessary clearance for a Guided Support.

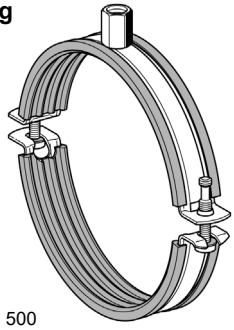
Products

Ducting Clamp PLU 2G



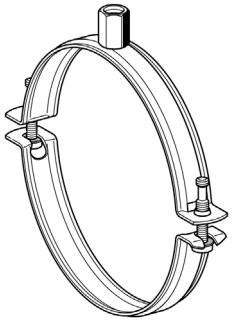
≤ DN 500

Ducting Clamp PLU 2G with lining

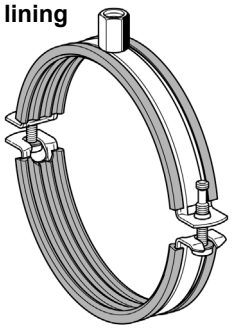


≤ DN 500

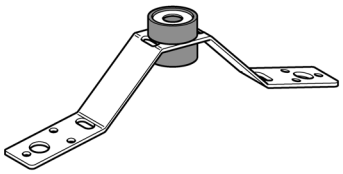
Ducting Clamp PLU TOP 2G



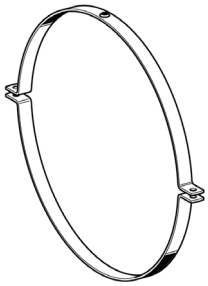
Ducting Clamp PLU TOP 2G with lining



Ducting Strap LUB

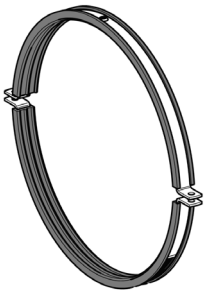


Ducting Clamp PLU



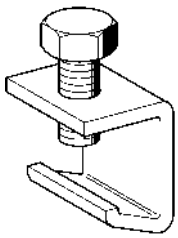
DN 560 - 1250

Ducting Clamp PLU with lining

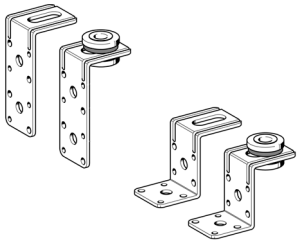


DN 560 - 1250

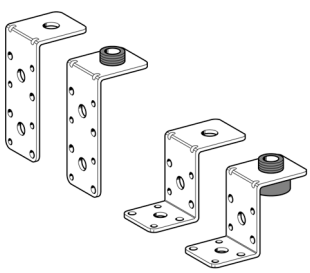
Ducting Bracket LCO



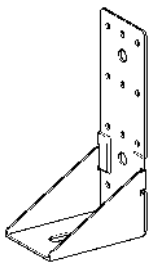
Ducting Angle LUW



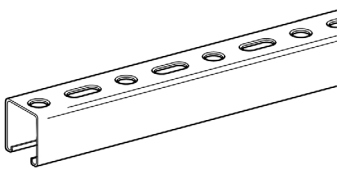
Ducting Angle LUW A



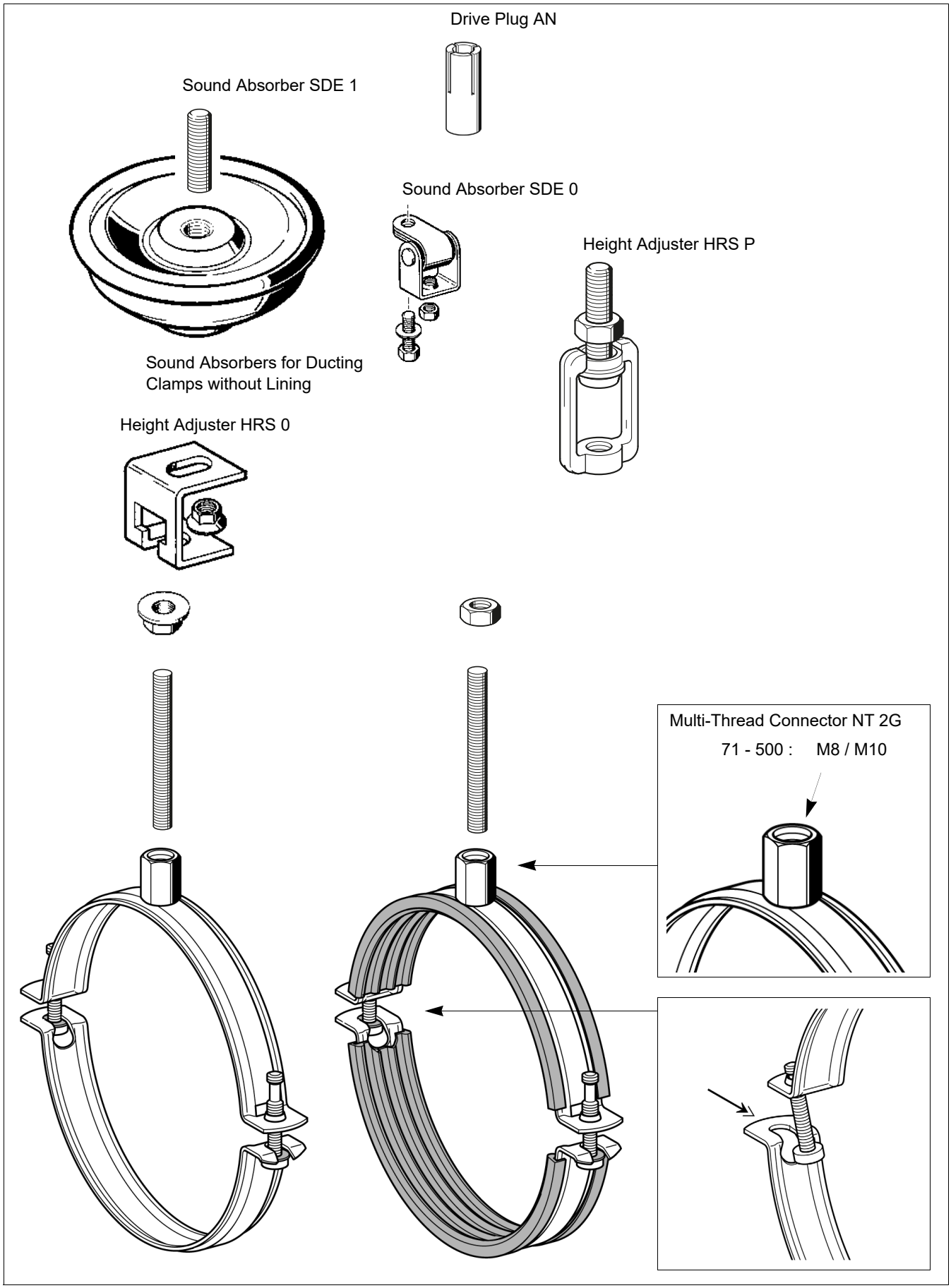
Ducting Angle LUW Stabil



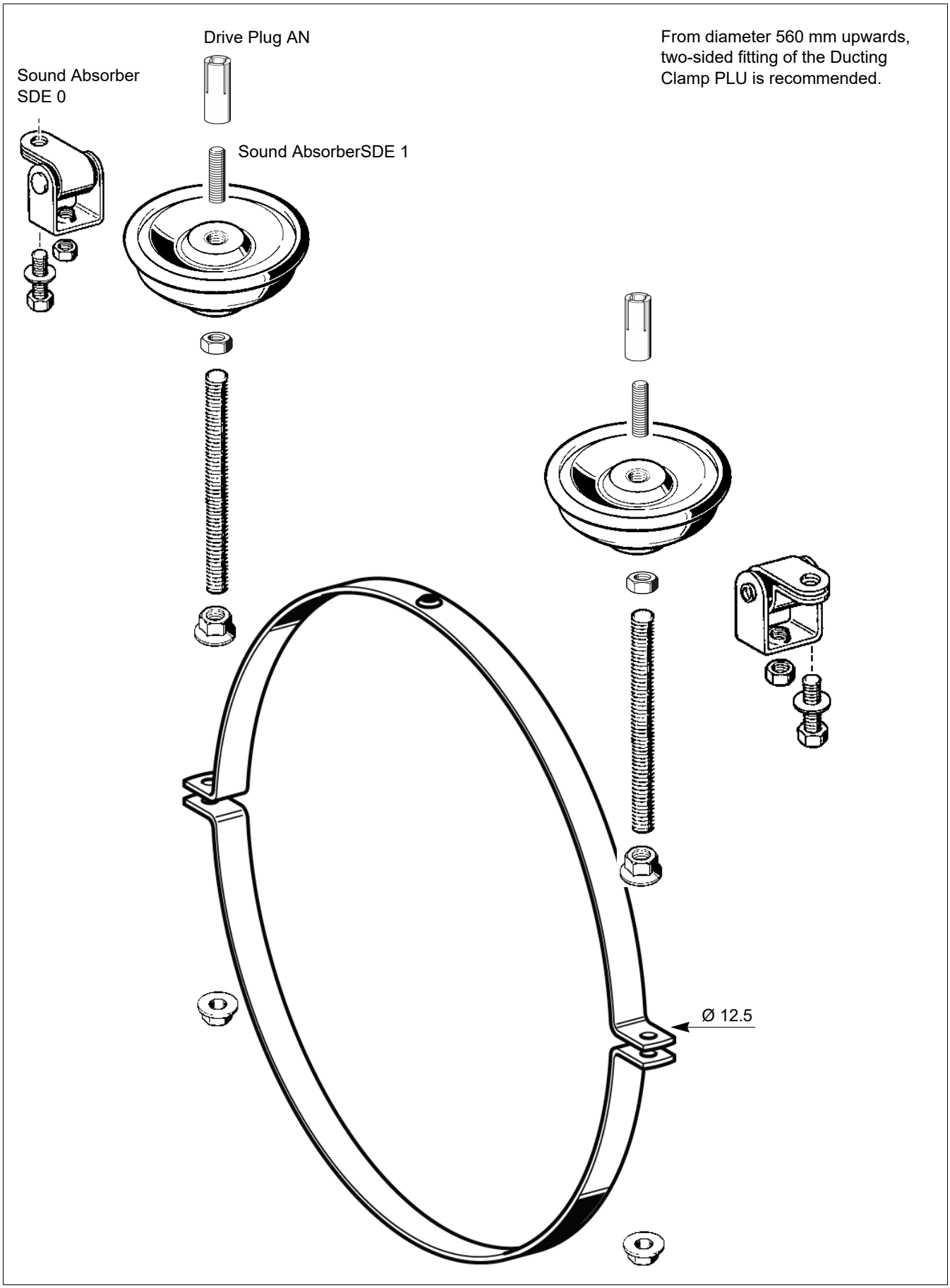
Channel MS 27-1.25



Single Point Mounting for Ducting Clamps PLU Diameter 71 - 500

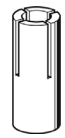


Two point fitting for Ducting Clamps PLU Diameter 560 - 1250 without lining.



Two point fitting for Ducting Clamps PLU of Diameter 560 - 1250 with lining

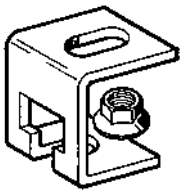
Drive Plug AN

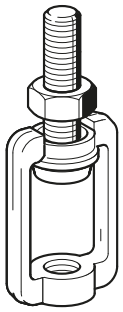


From diameter 560 mm upwards, two-sided fitting is recommended.

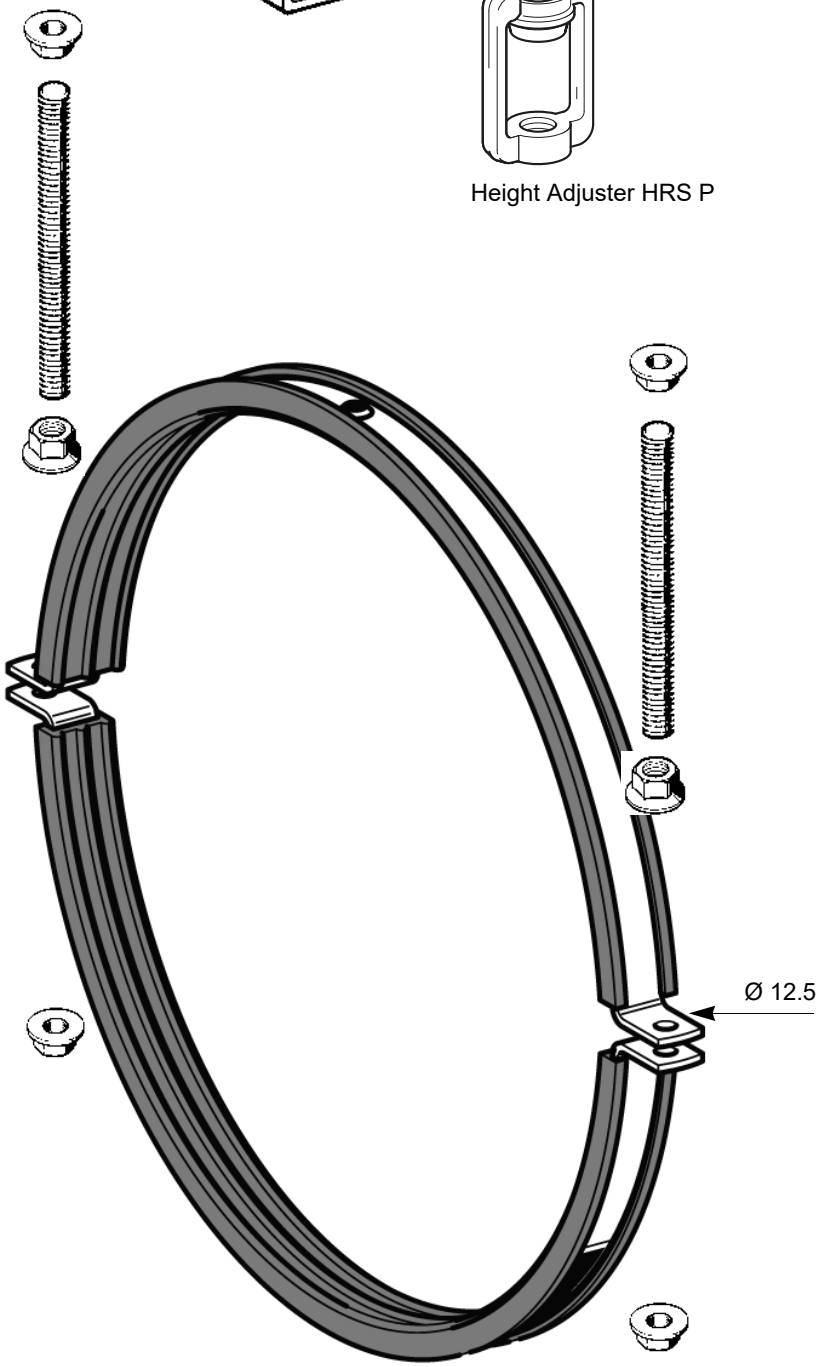
Insulation lining makes the clamp suitable for sound absorption fixings according to DIN 4109 - sound protection requirements.

Height Adjuster HRS 0

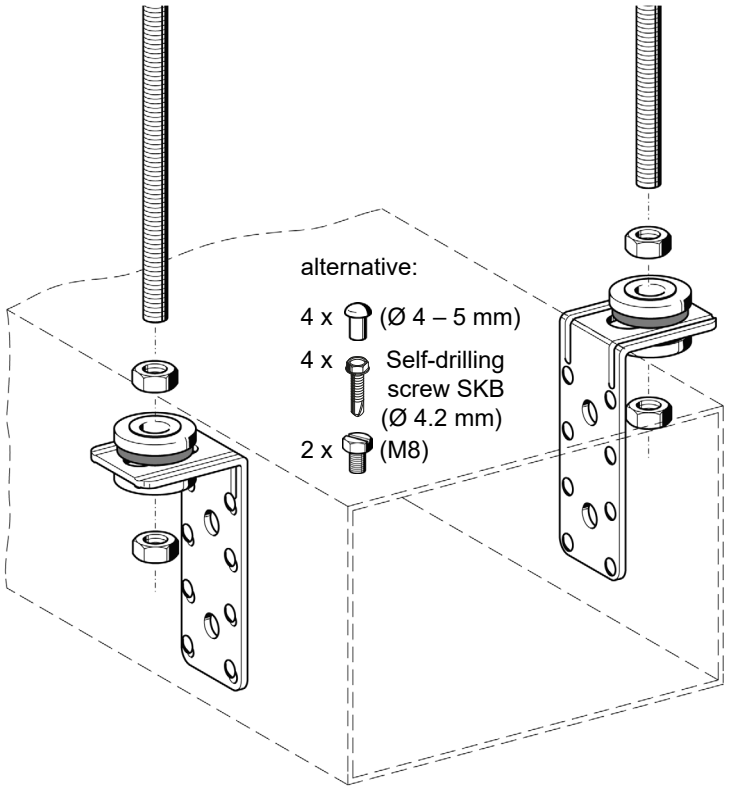




Height Adjuster HRS P



Ducting Angles LUW for mounting rectangular Ducts



LUW SL / A-SL

Fixing of the Ducting Angle LUW to the duct by 4 to 8 steel rivets or tapping screws.

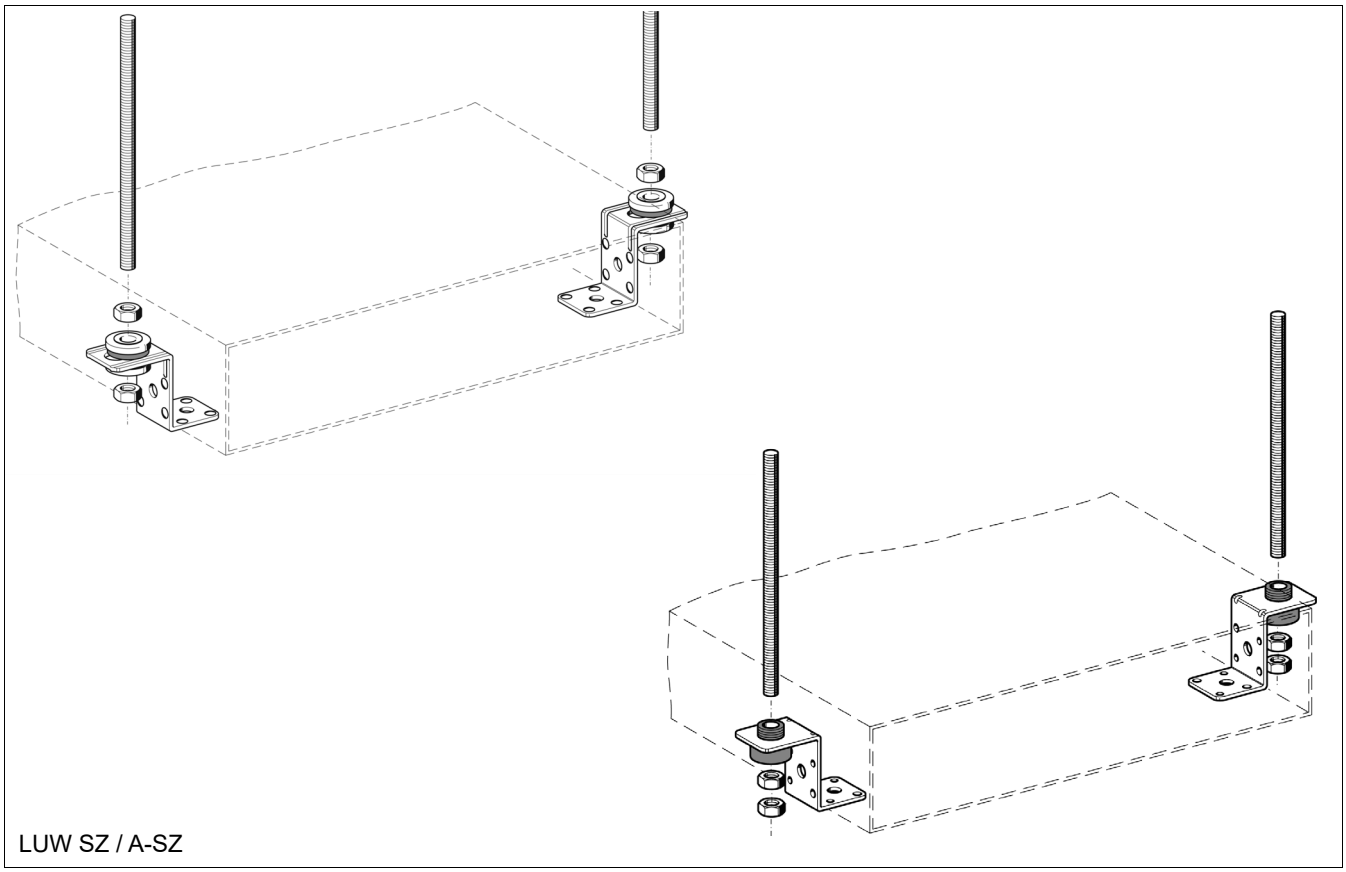
Captive insulation washers are used for sound absorption installations according to DIN 4109 - sound protection requirements.

Ducting Angle LUW SL for soundproof of ceiling suspensions of ductwork.

Note:

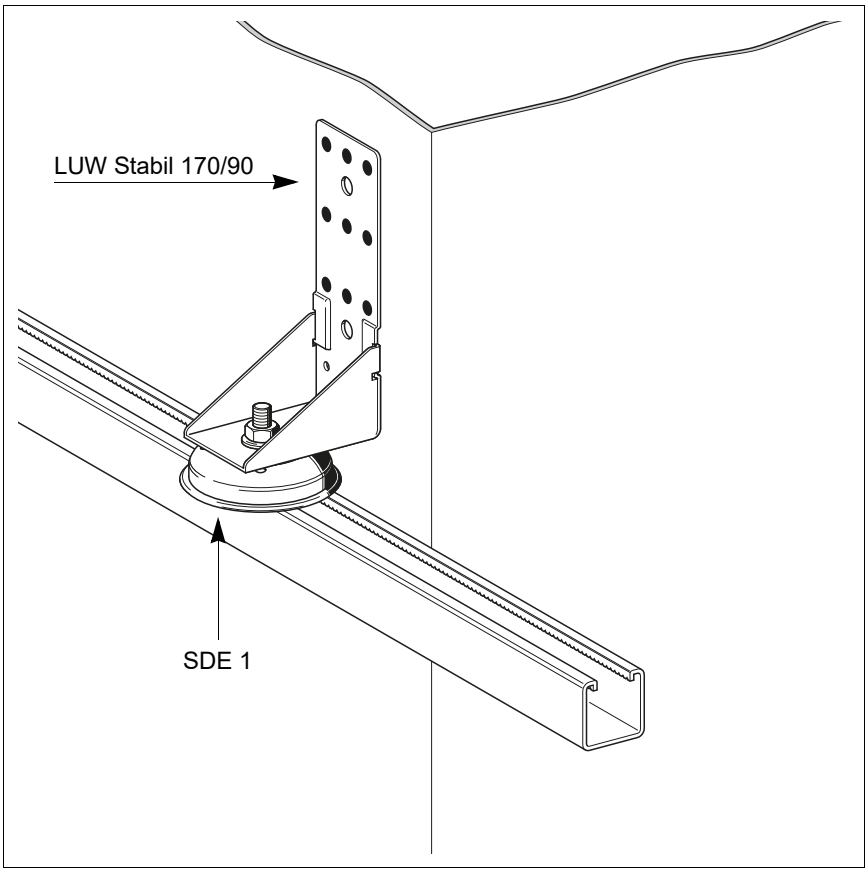
- *In case of vibration of the duct, lock nuts must be used.*

Ducting Angle LUW SL for soundproof ceiling suspension of wide, flat ducts.



LUW SZ / A-SZ

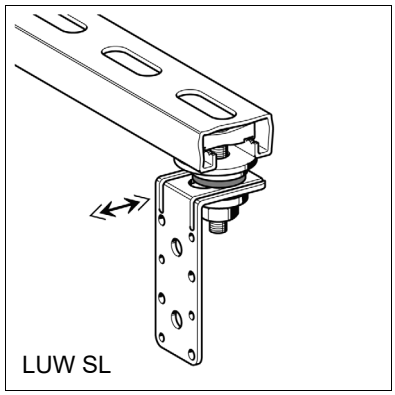
Fixing examples of rectangular Ducts

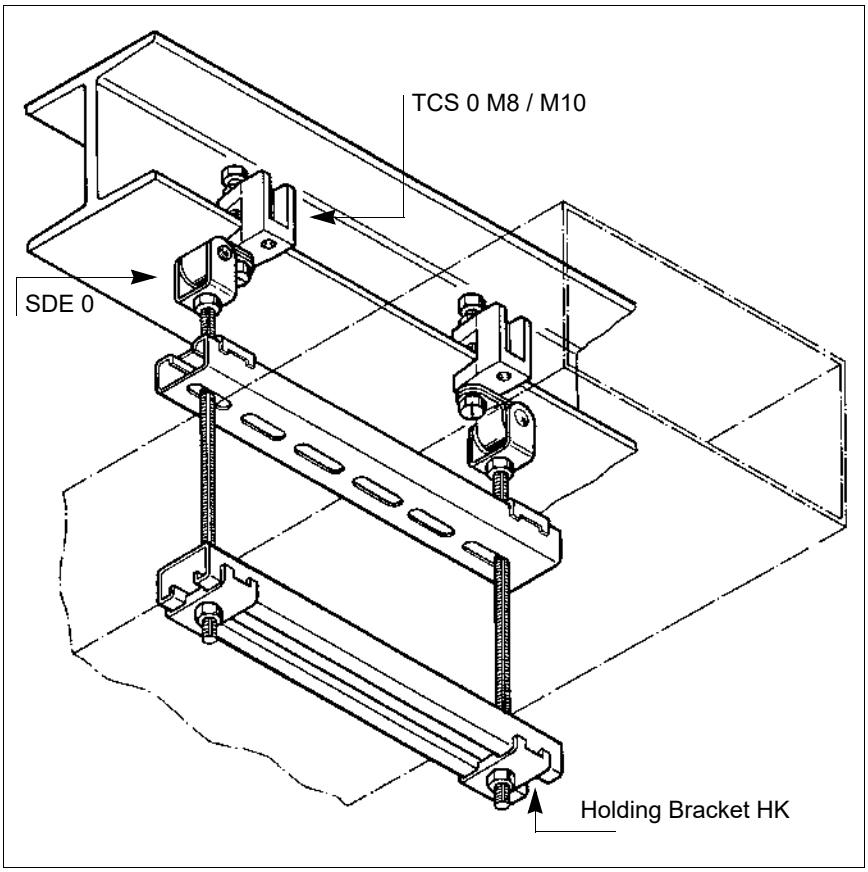


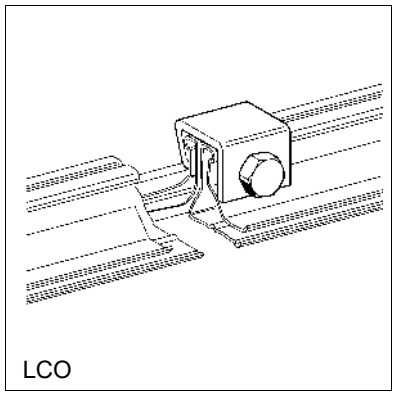
Fixing vertical ducts on a suitable support (horizontal channel).

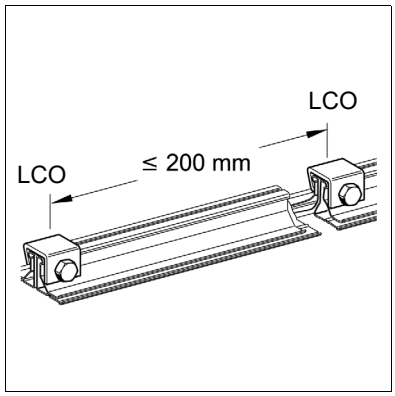
Ducting Angle LUW Stabil fixed onto the sound absorption unit SDE 1 is suitable for sound absorption installations according to DIN 4109 - sound protecting requirements.

Installation tolerances are compensated for by the Ducting Angle LUW SL by means of slot adjustment.

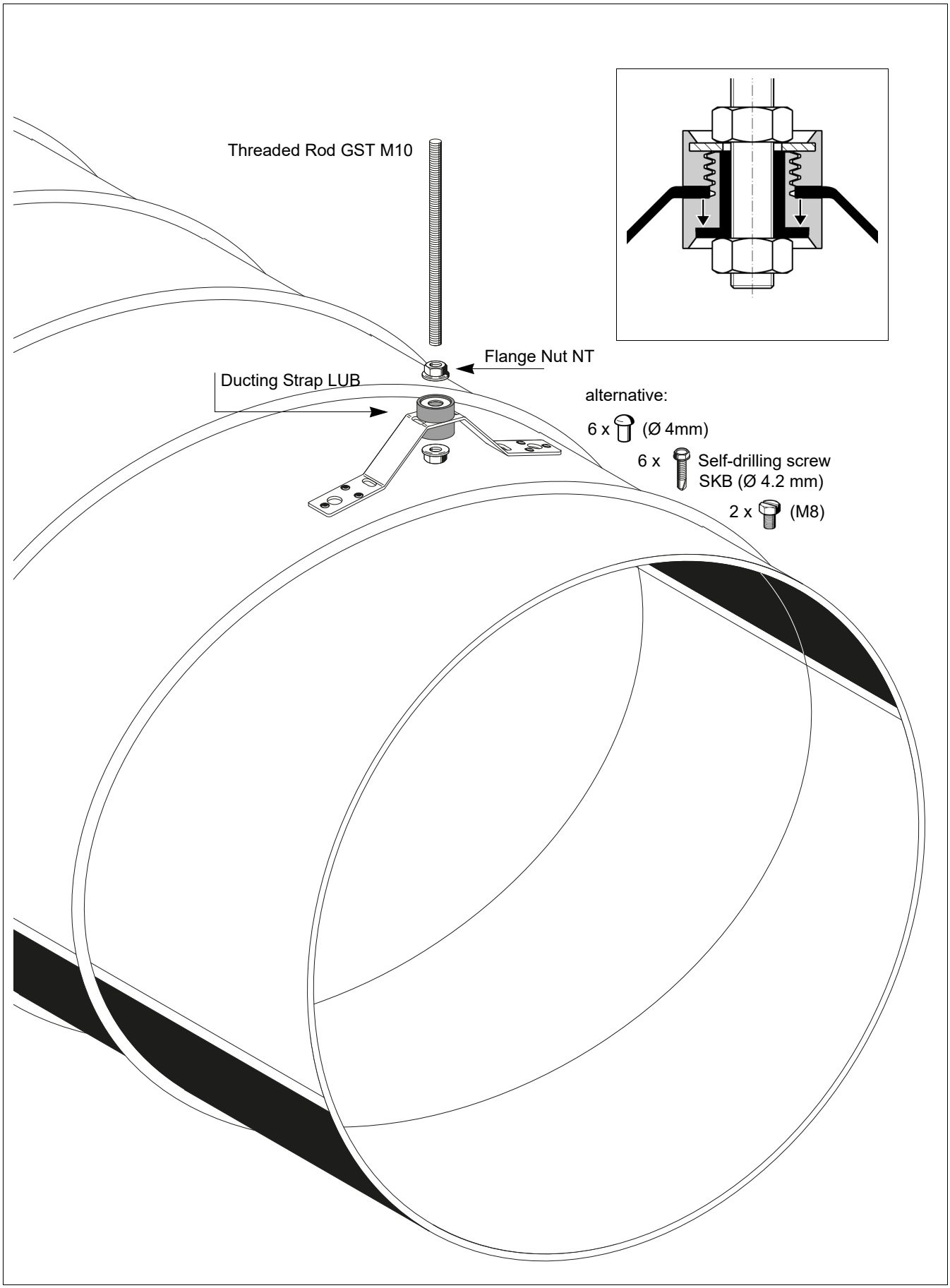






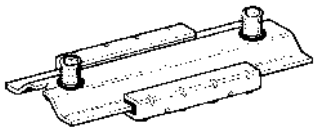


Ducting Strap LUB for Spiral Seam Ducts



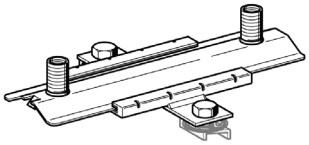
Products

Slide Set GS H3G



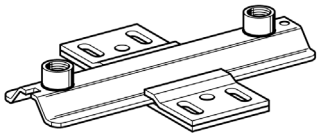
Standard; ULTRAglide

Slide Set GS CC-H3G2-PL

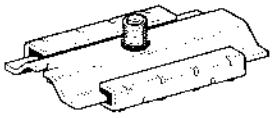


Standard; ULTRAglide

Slide Set GS F 80 1G2

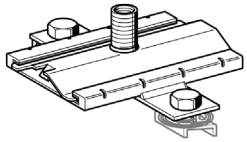


Slide Set GS H3G



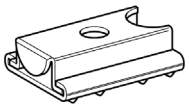
Standard; ULTRAglide

Slide Set GS CC-H3G-PL

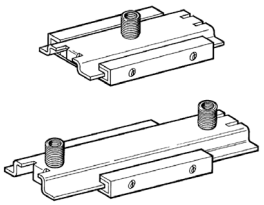


Standard; ULTRAglide

Slide Set GS 1G

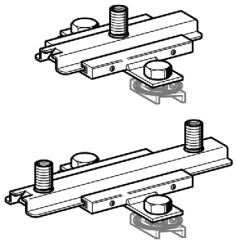


Slide Set GS 2G + 2G2



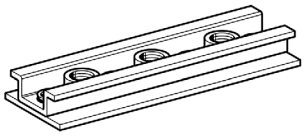
Standard; ULTRAglide

Slide Set GS CC-2G-PL + CC-2G2-PL

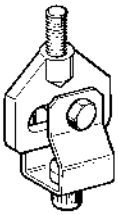


Standard; ULTRAglide

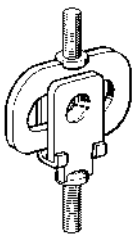
Slide Element GS 41



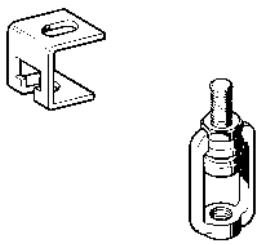
Slide Element GLE J



Slide Element GLE LC



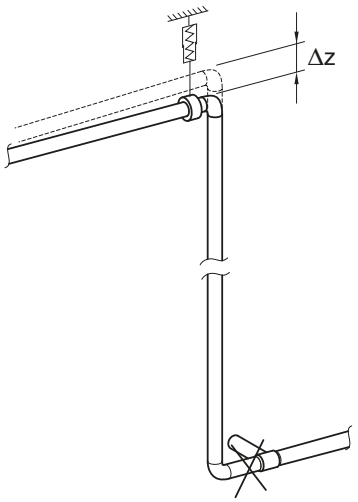
Height Adjuster HRS; 0; P



2019-10

Sliding Supports for Compensation of Thermal Expansion

"Natural" compensation of expansion by L or U shaped bends

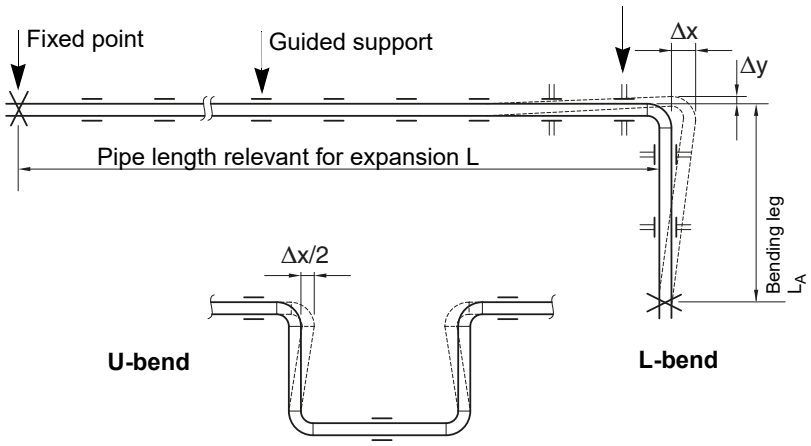


Fixed points should be located close to the pipe branches.

Vertical drop

If a pipe has to be fixed close to a vertical drop return, either a spring hanger or a spring support is recommended from 3mm vertical expansion onwards.

In case of 2-Dimensional expansion, an XY slide combination is recommended before and after the pipe bend.

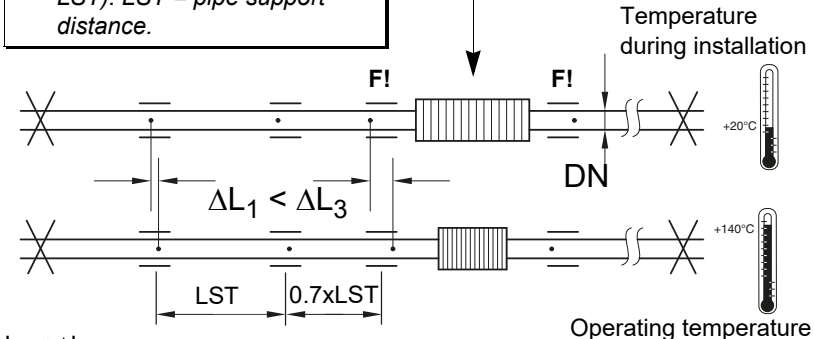


"Mechanical" compensation by axial expansion joint

Caution!

- *Directly before and after the expansion joint, in a distance of 2 x pipe diam., two guided supports are required. Normally, the subsequent guided support should be installed with a shorter distance (0.7 x LST). LST = pipe support distance.*

Normally, an axial expansion joint is positioned half-way between 2 fixed points.
Please consider the installation guidelines of the manufacturer.



$\Delta L_1 < \Delta L_3$

Annotations illustrate the expansion behaviour of the pipe. The longer the distance between the sliding support and the fixed point, the greater the sliding distance. Therefore, the installation position (off-centre position) of the slide plate relative to the holder has to be determined to allow for the full sliding distance to be accommodated by the sliding support. The location and the expected sliding distance and direction of movement must be taken into consideration.

Caution!

- *For pipework 200NB and above, and for pipe support distances greater than 250mm from the building structure, slide set H3G/1 should be used. If required, the pipe is to be guided laterally as well to prevent buckling.*

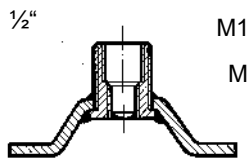
Caution!

- *When slide supports are installed, it has to be considered that the sliding plate part fluctuates around the centre position under operating temperature. Consider direction of movement!*

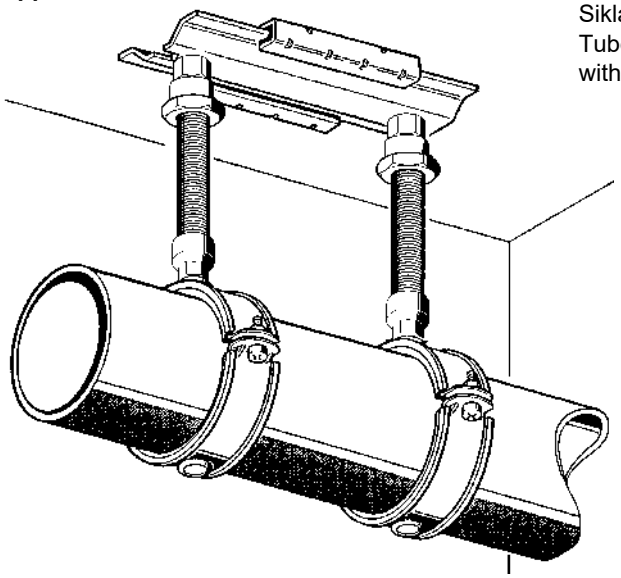
Note:

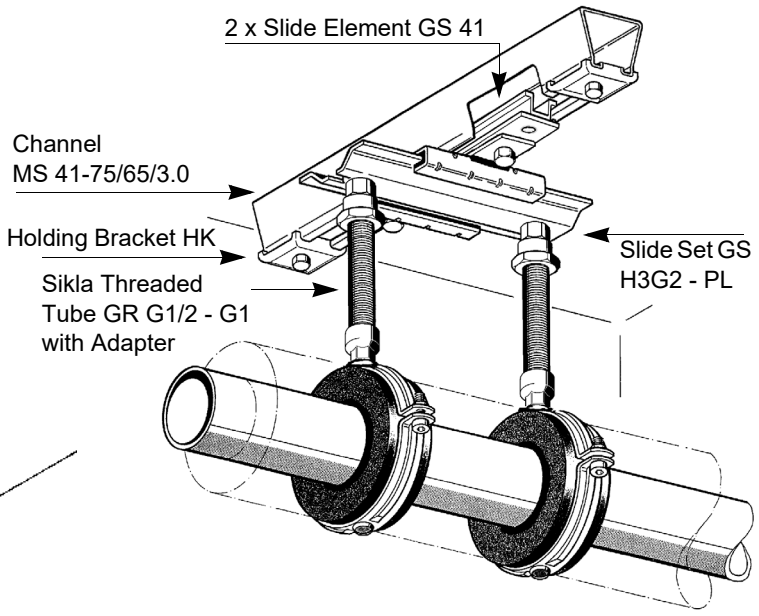
- *Plastic pipes expand approx. 10 x more than metal pipes. For exact calculation of length variation see chapter "Pipeline technology".*

Slide Set GS H3G



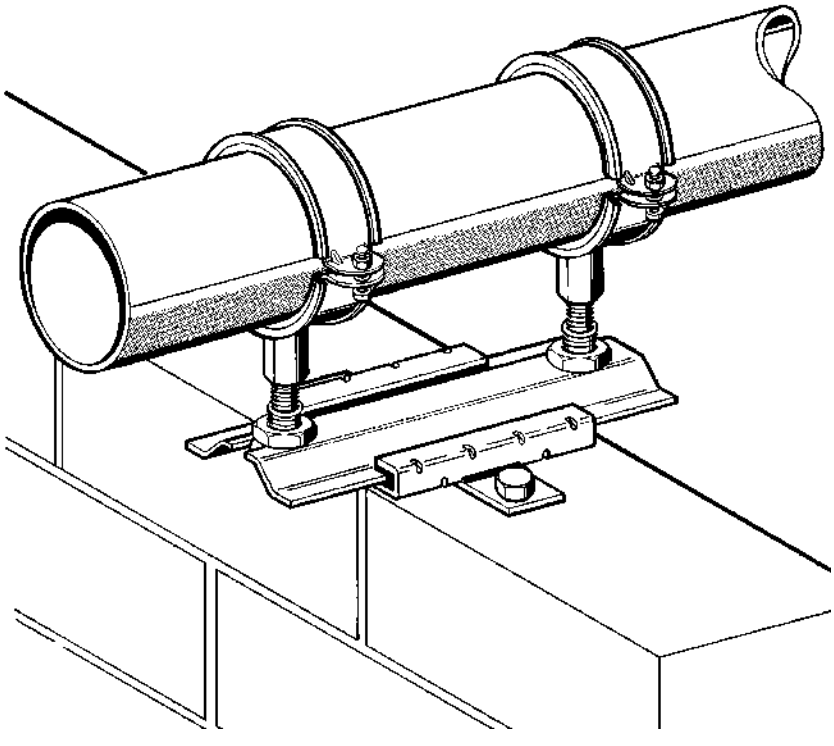
Ceiling suspension with long suspended support made from Sikla Threaded Tube GR





XY slide combination
allows free sliding in one plane, maintaining a constant height of the pipe run.

Slide Set GS H3G2 - PL



Note:

- *Support elements to the Slide Set must be adequately rigid. For greater support distances use Threaded Tubes GR*

The Slide Set GS H3G is used as a restricting guided support.

Plastic slide rails (for a max. temperature of up to 130°C) guarantee noiseless sliding.

Max. sliding distance for
H3G/1 = 140 mm

Note:

- *The thread connections of the Slide Set are secured against resultant bending moments with adapters or Locking Nuts.*

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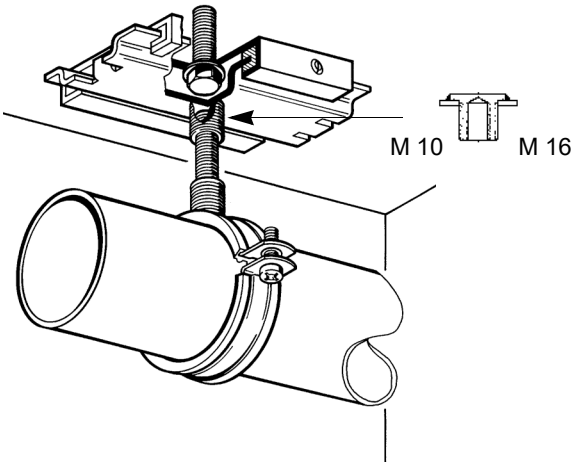
Application Examples for Slide Set GS H3G and 2G

Note:

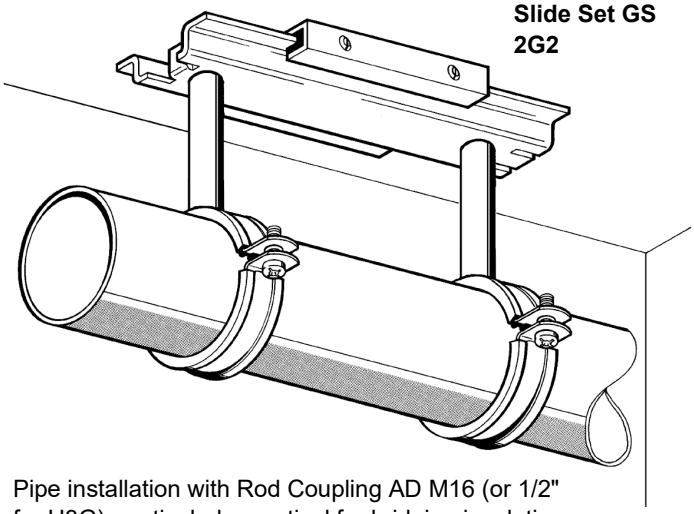
- *When using the version ULTRAglide with special nano coating, the resulting friction force is halved.*

Slide Set GS 2G

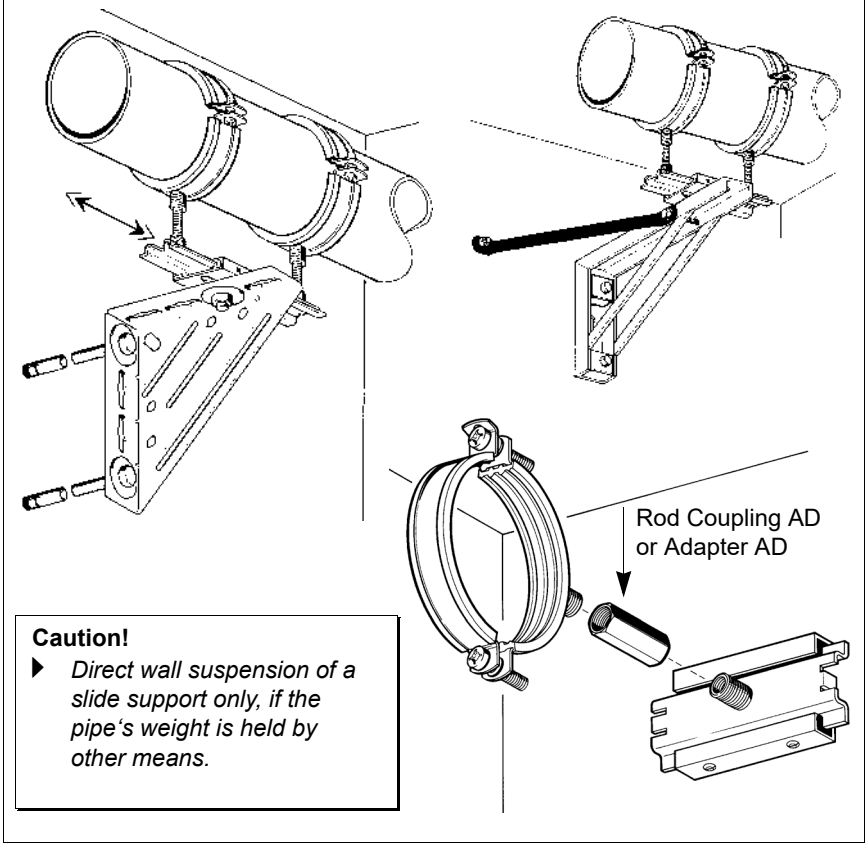
Installation with one anchor



Slide Set GS 2G2



Pipe installation with Rod Coupling AD M16 (or 1/2" for H3G), particularly practical for bridging insulation thicknesses in increments 45, 100 or 150mm.



Caution!

- *Direct wall suspension of a slide support only, if the pipe's weight is held by other means.*

For wall suspension, the best and safest solution is to fix the Slide Sets GS onto Support Brackets WK.

All Support Brackets WK made of section steel have holes positioned correctly, so that Tie Rods STR, which are available as accessory, can be bolted on immediately.

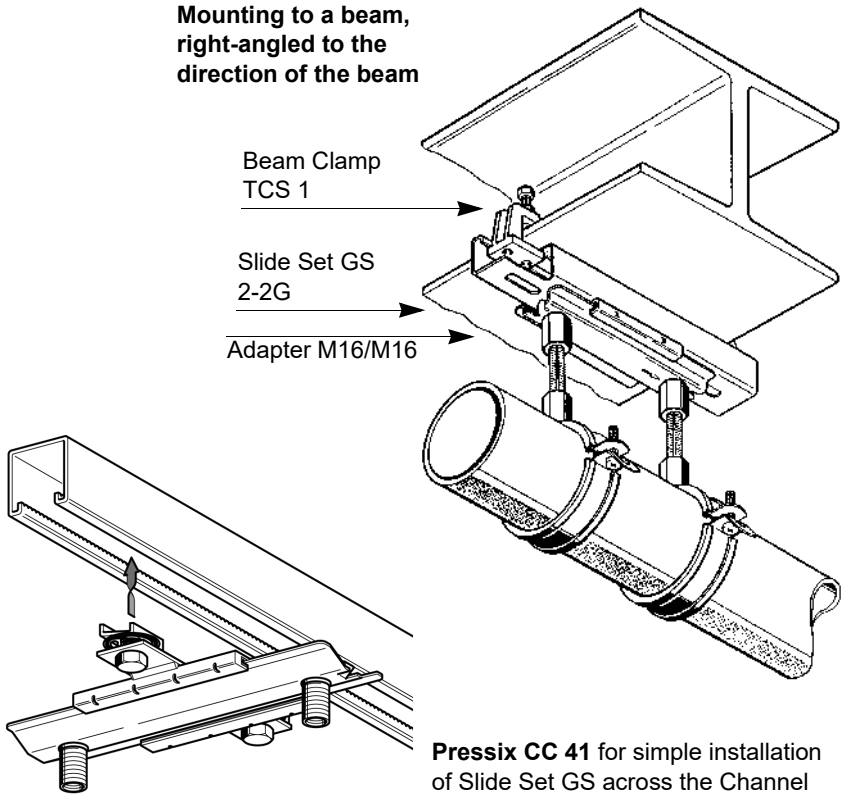
Note:

- *Only with smallest wall distances (up to approx. 150 mm) the Support Bracket WK can be installed without lateral brace.*

For fixing in short distance from the Wall this arrangement is possible with Stabil D-3G and Ratio S.

Application Examples for Slide Set GS H3G and 2G

Mounting to a beam, right-angled to the direction of the beam



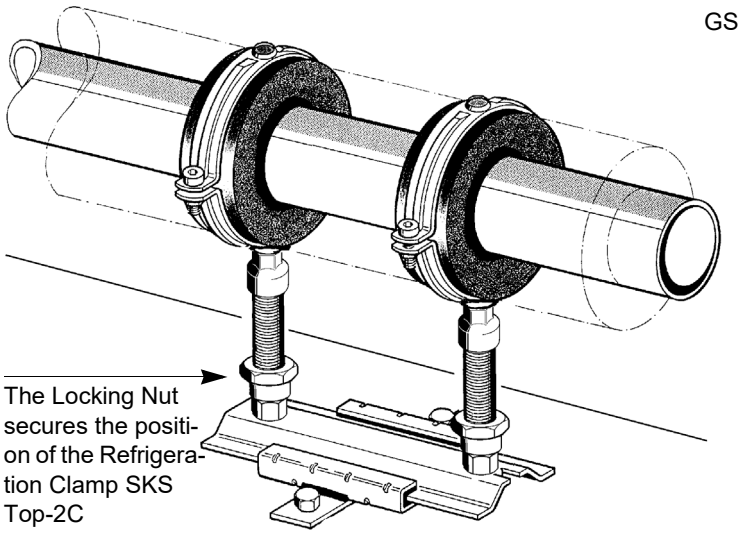
Pressix CC 41 for simple installation of Slide Set GS across the Channel MS

Note:

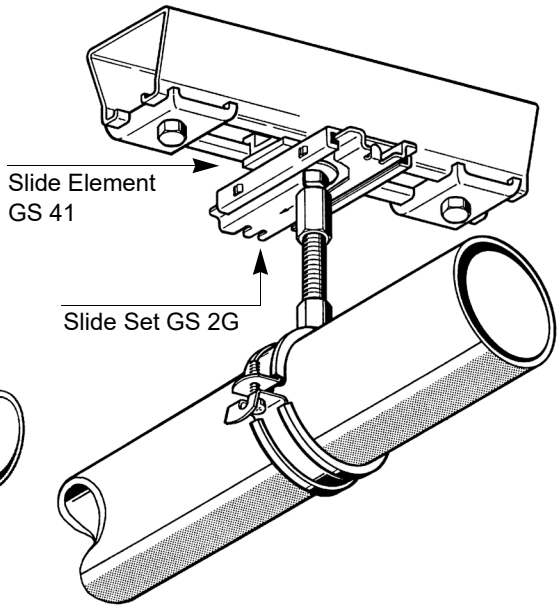
- *In case of an imposed lateral load, the permissible bending moment of the channel should not be exceeded.*

In exceptional cases it is allowed to weld on the beam (with permission of the structural engineer).
Before welding the plastic guide rail has to be taken out of the base body.

When floor-mounting a refrigeration pipe, Slide Set GS H3G/1 is recommended. Sikla Threaded Tubes are used as rigid connecting parts.

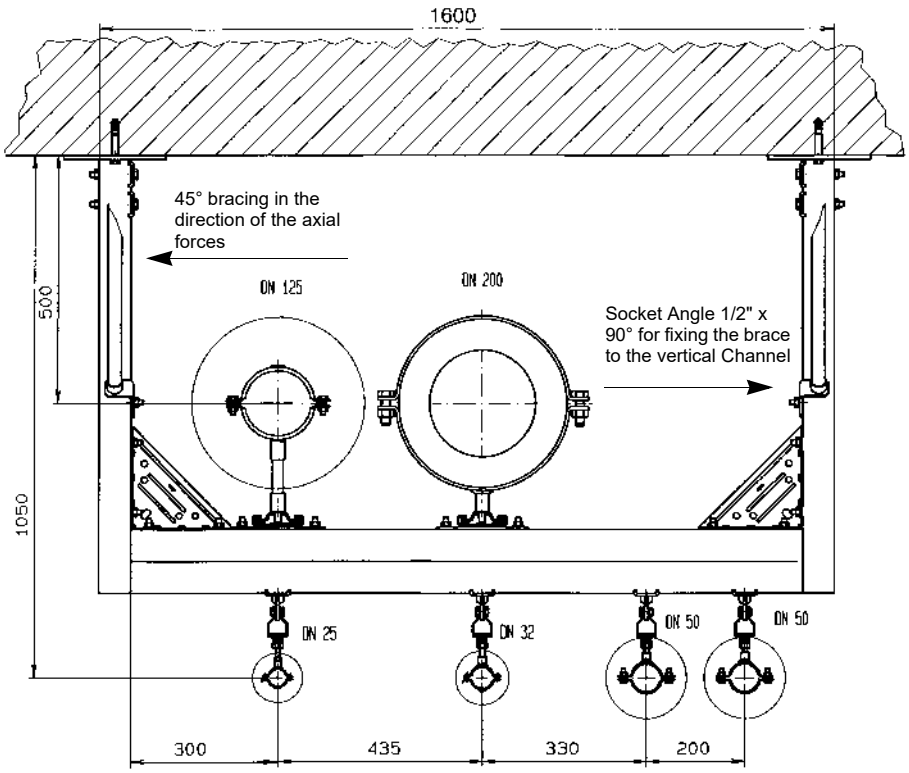


XY slide combination

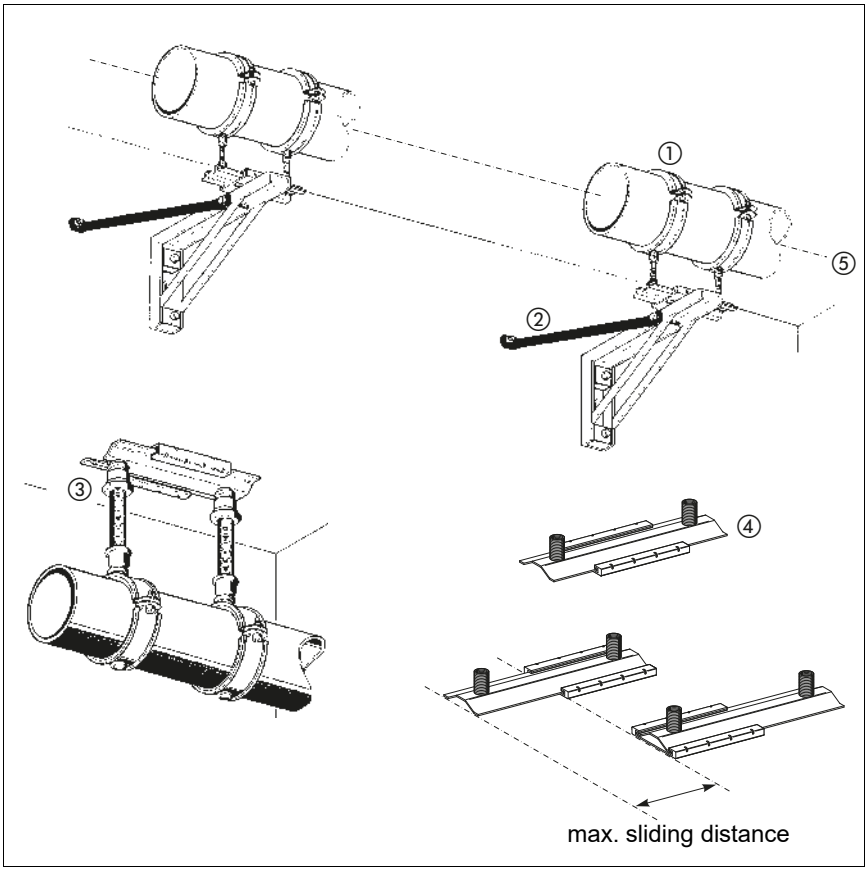


2019-10

Basic Rules for the Installation of Slide Supports



When building frames, Socket Angles are suitable for assembling braces.



① Slide supports for horizontal pipe runs are primarily designed **for floor-mounted or ceiling-suspended pipework.**

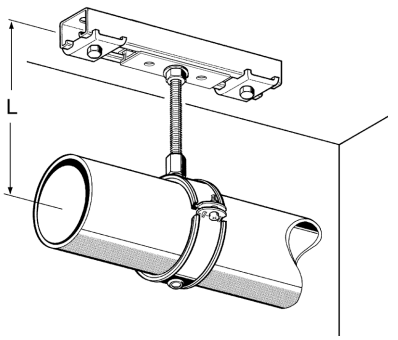
② Slide supports have to transfer friction forces in the direction of the pipe axis. Therefore their installation requires **lateral bracing at each support position.**

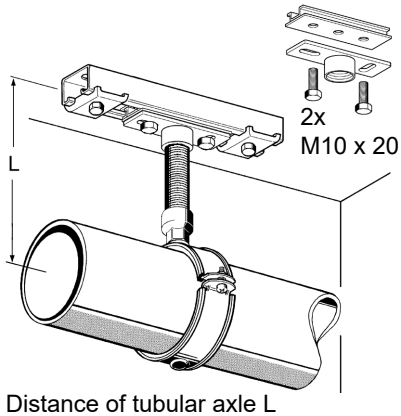
③ The **connecting parts** between the Side Set GS and the pipe clamp are to be designed to accommodate bending forces. The connecting nuts of the sliding plate part are to be secured using Lock Nuts.

④ Under operating conditions, the sliding plate part fluctuates **around the centre position**. The direction and distance **of sliding movement has to be considered** during installation.

⑤ Slide supports must be aligned according to the pipe axis and / or direction of movement.

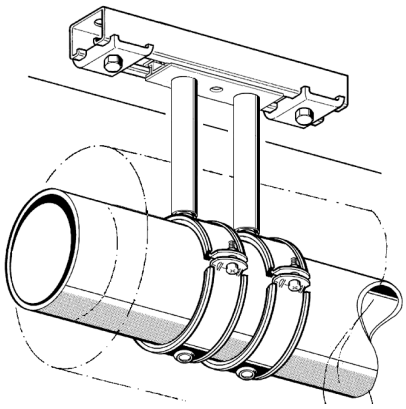
Slide Element GS 41 and Laws of Friction at Slide Supports





Distance of tubular axle L
for single hanger up to 350 mm.

Double support with 2x
- Threaded Stud GST M10x 25
- Reducer AD m/ f 16/ 10
- Round Rod Coupling AD RD f/f M16 for bridging the insulation.



Note:

For dimensioning of connecting elements (Threaded Stud GST / Threaded Tube GR) the bending moment of the frictional force F_R has to be considered.

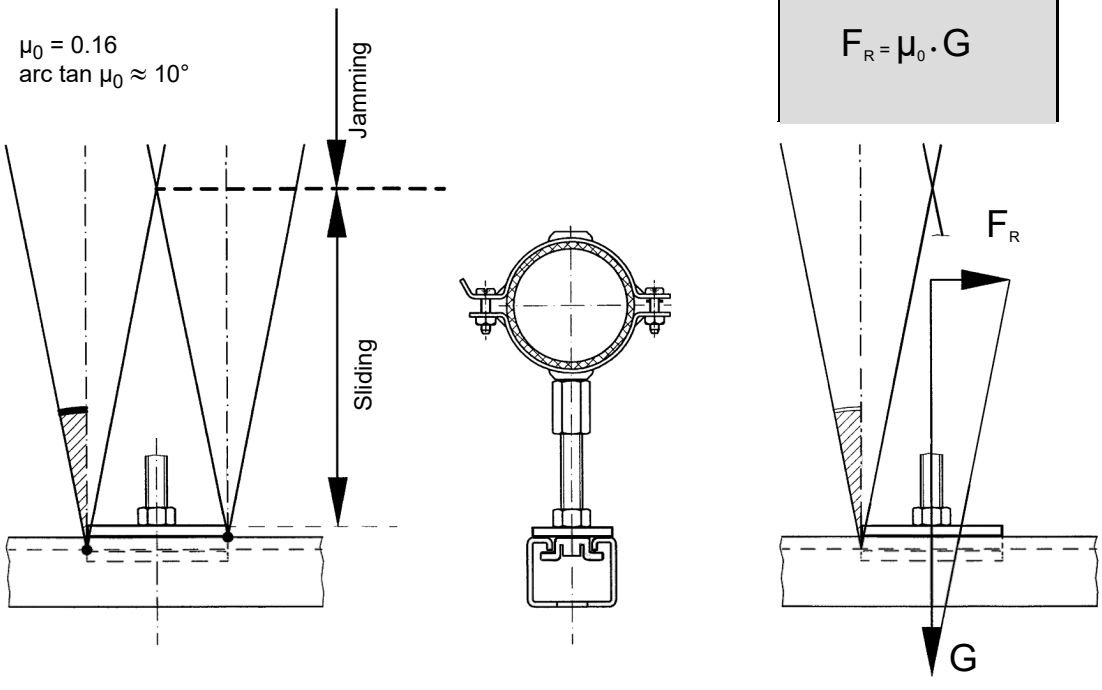
Possible application in every Channel of system 41:
- Single support with Threaded Stud GST M10
- Single support with mounting plate GPL stabil up to G1"
- Double support.

A special saddle serration of the channels allows sliding suspension also with channelopening showing down.
The distance in which the Slide Element 41 is able to move is only restricted by the channel length.

Especially when using pipe clamps with lining, a close distance to the slide plane has to be kept.
The risk of jamming depends on the distance (and not on the weight) of the pipe.

▼

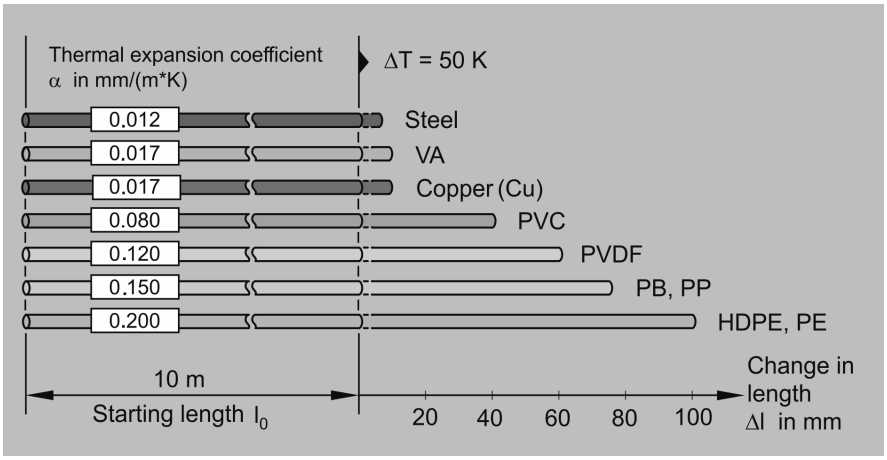
Laws of friction at slide supports GS



Determination of linear expansion, distances to the building structure and friction force

Pipes need freedom ...

Please help with your knowledge to select the right products and avoid problems!

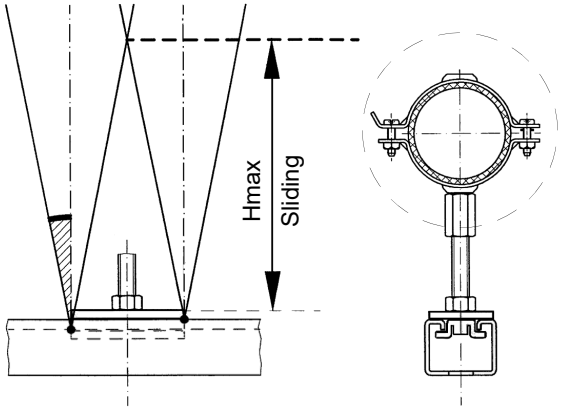


1 A steam pipeline ss, length L = 50 m Ø 219.1 x 3.0 installed at TE = 20° C and reaches an operating temperature of TB = 130° C.

What max. change of length has to be expected and which product has to be selected as guided support?

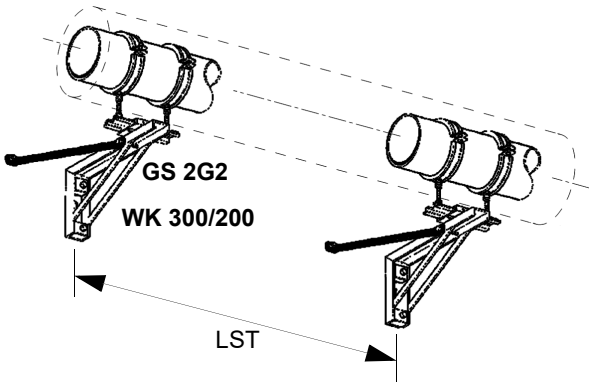
2 Insulated pipeline Ø 60.3 x 2.9 mounted onto a sliding element 4´

What is the max. distance Hmax from pipe centre to slider allowed for secure sliding?



3 Hot water pipeline Ø 114.3 x 3.6 with insulation thickness 100 mm fixed on Guided Set 2-2G which is mounted on WK 300/200 LST = 4 m apart.

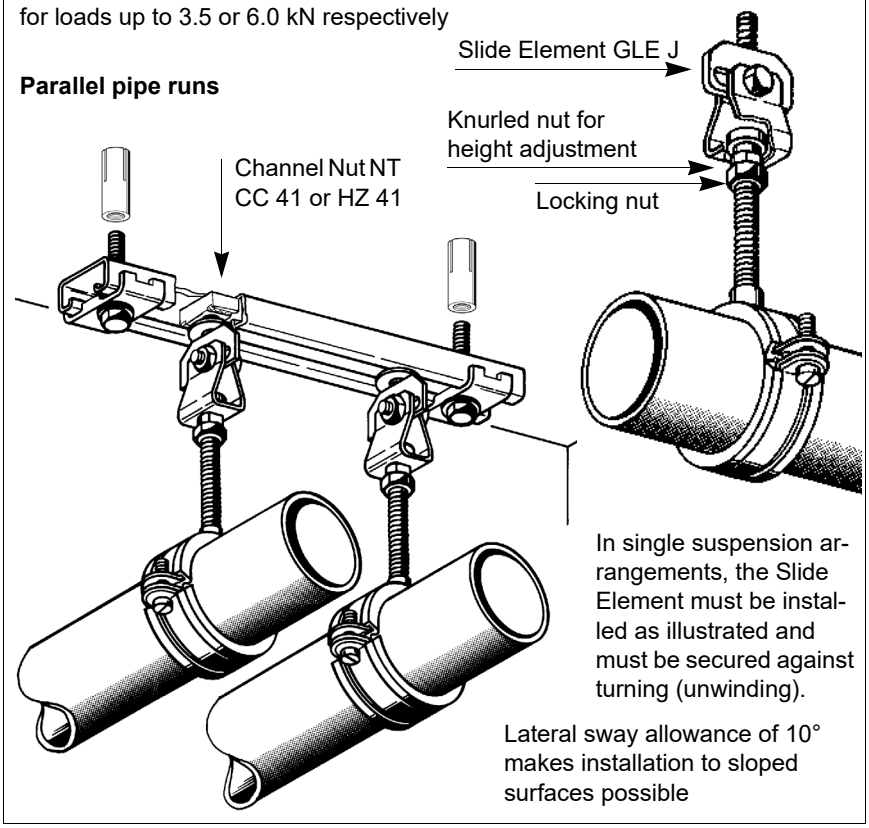
What friction force F_R results?



Slide Element GLE J

Types M8 … M16 **Single support**
for loads up to 3.5 or 6.0 kN respectively

Parallel pipe runs



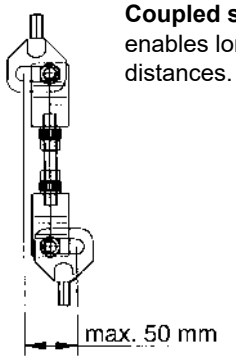
In single suspension arrangements, the Slide Element must be installed as illustrated and must be secured against turning (unwinding).

Lateral sway allowance of 10° makes installation to sloped surfaces possible

The knurled nut of Slide Element GLE J allows height adjustment of 15mm, the sliding distance is 25mm.

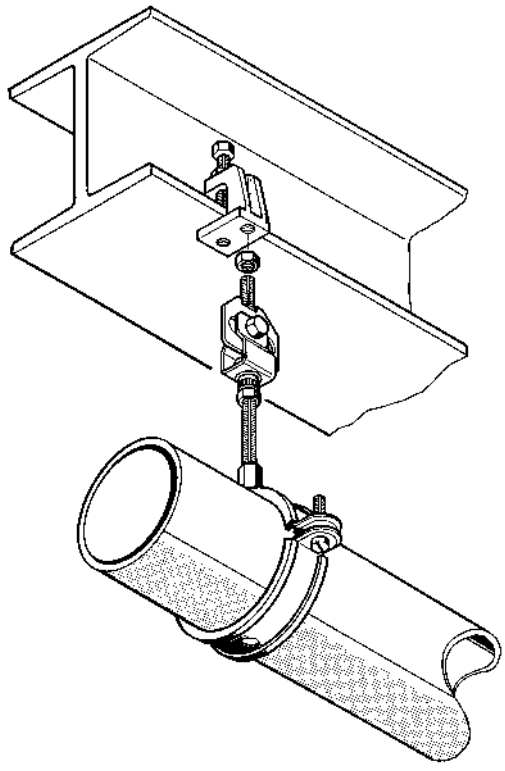
Caution!

- *As soon as the height has been adjusted, the knurled nut has to be fixed with a locking nut.*

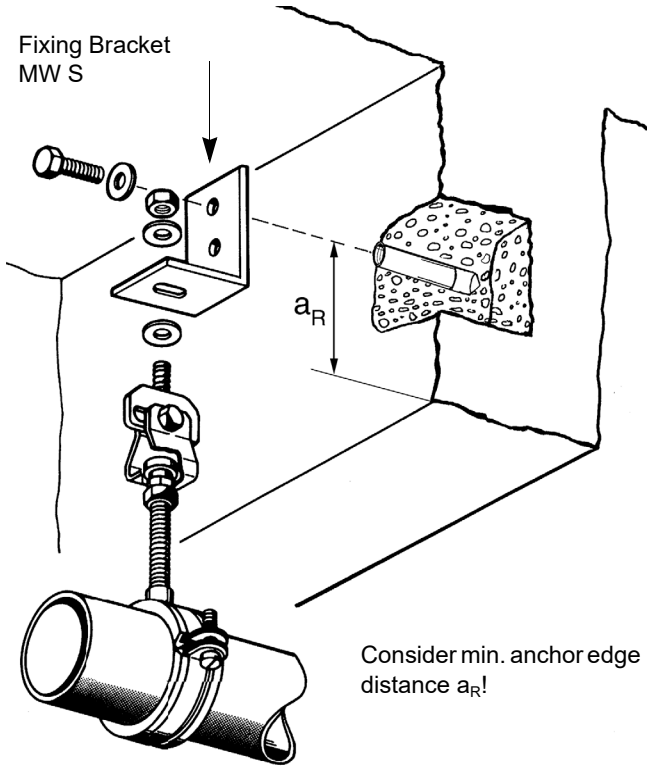


Coupled suspension enables longer sliding distances.

Installation to steel beams



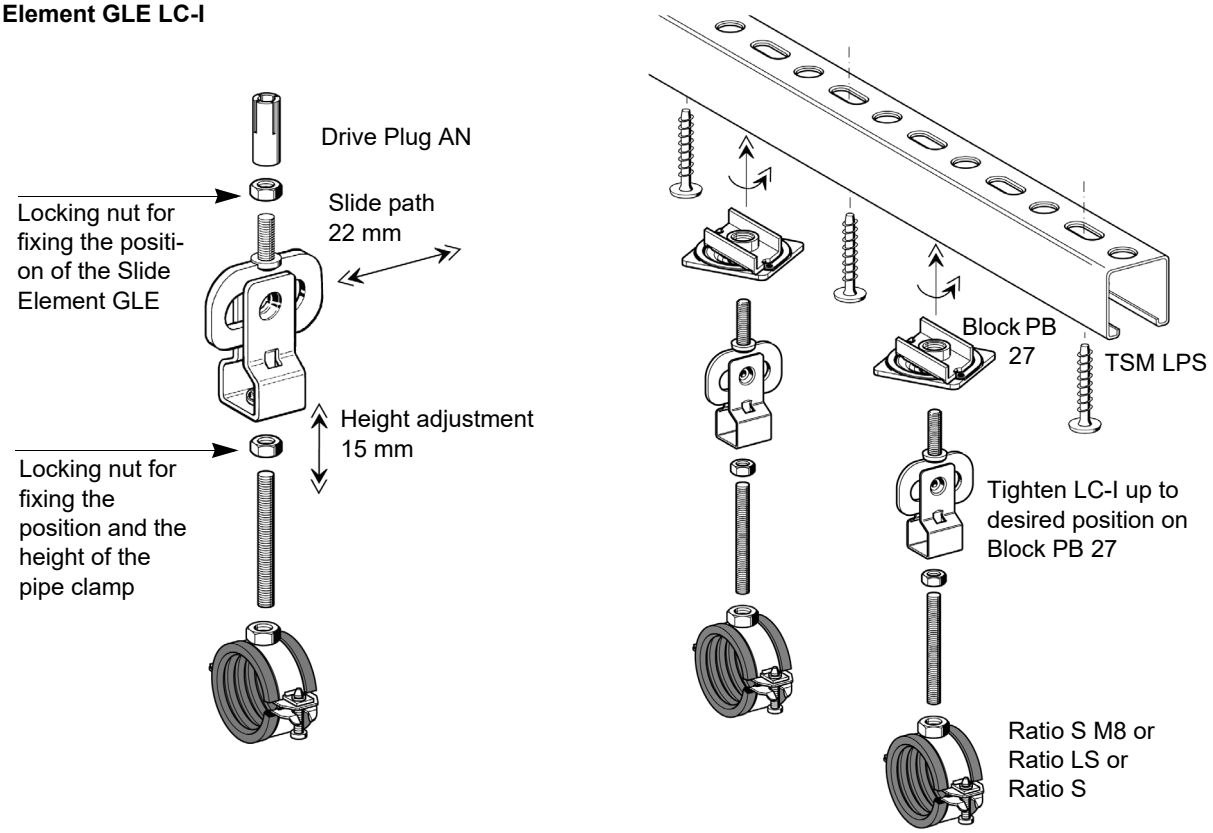
Installation to concrete beams



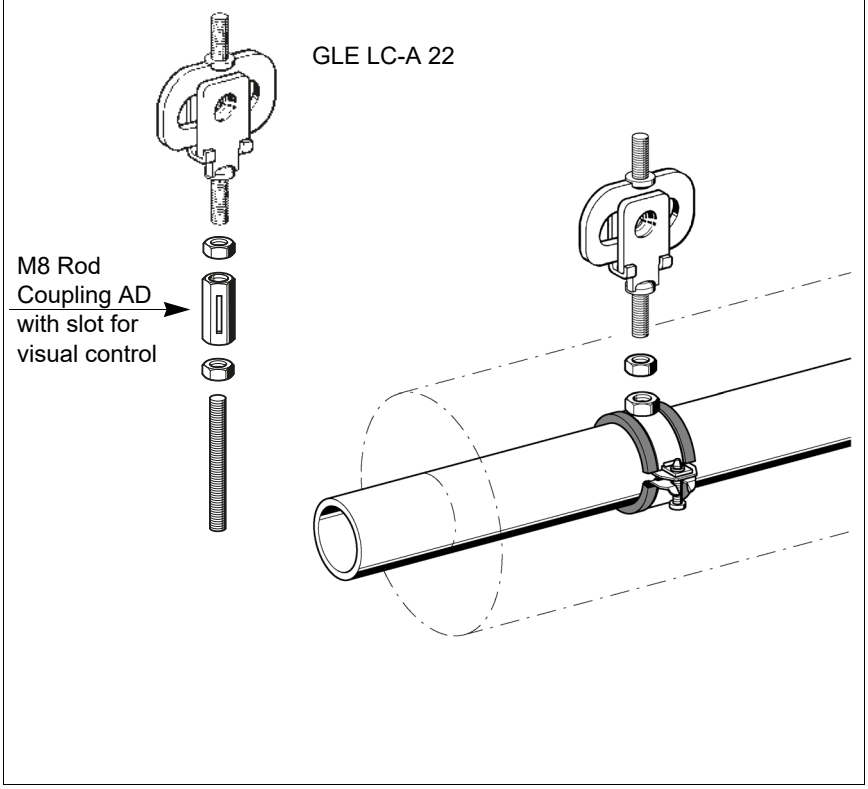
Consider min. anchor edge distance a_R!

Slide Element GLE LC

Slide Element GLE LC-I



Slide Element GLE LC-A

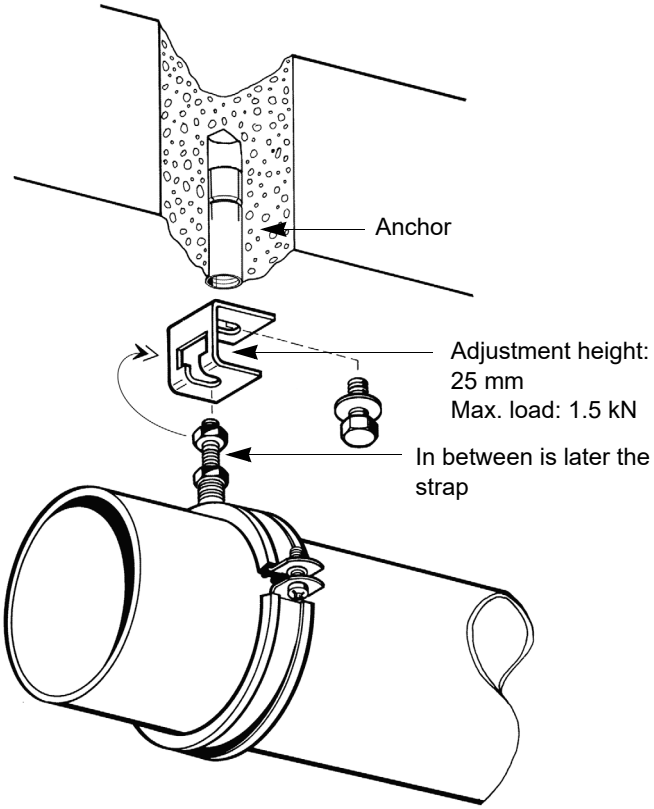


The LC-I and LC-A Slide Elements GLE fit to the lightweight system and can be combined with numerous parts of the Pressix high-speed installation system.

Slide Element GLE LC-A with lateral thread connection, especially suitable for direct installation to smaller pipes with insulation thickness up to 40 mm.

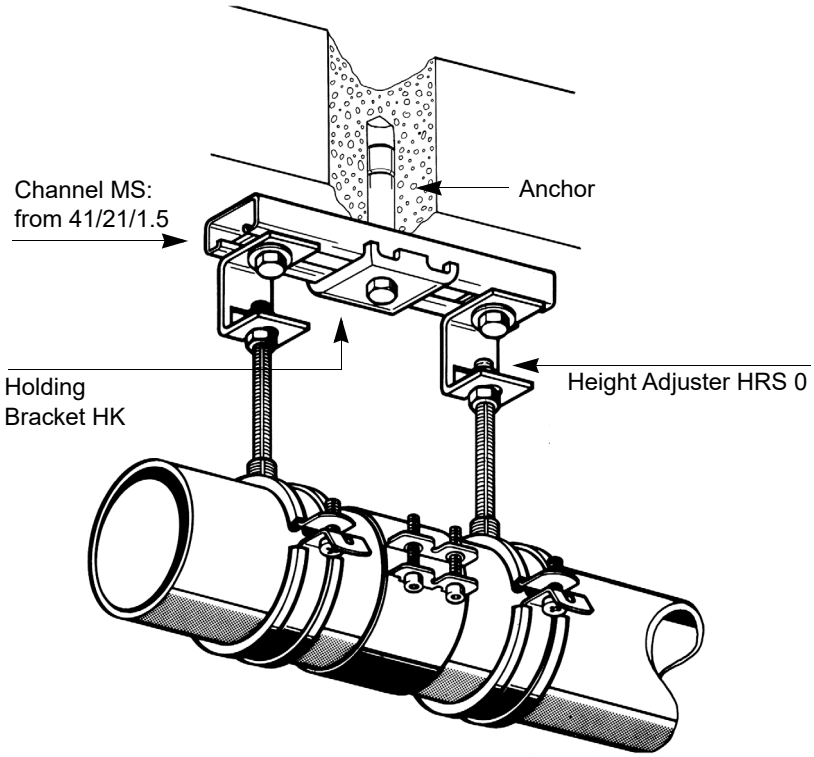
Height adjustment

Height Adjuster HRS 0 (up to M12)



Installation:

1. Unscrew the two Hexagon Nuts NT, the last one only a small amount.
2. The Threaded Stud GST is hooked into the Height Adjuster by the top Nut.
3. Precise height adjustment of the suspended support is achieved by turning the top Hexagon Nut against the Height Adjuster.
4. Lock the Adjuster in place using the unscrewed lower Nut.



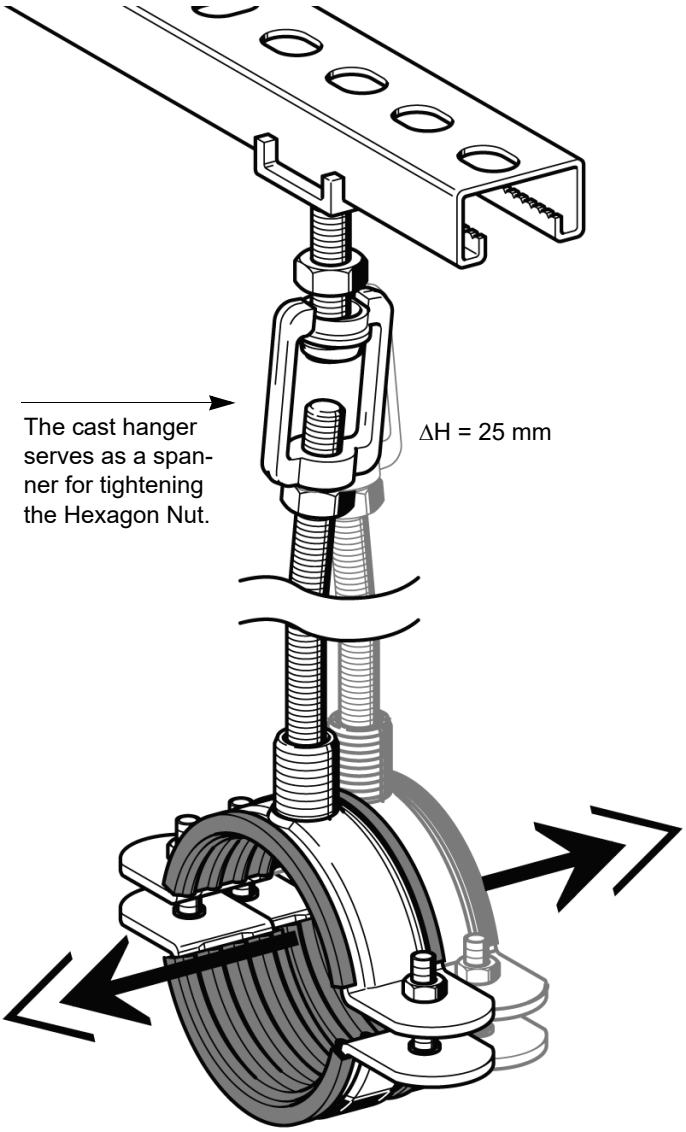
Height adjustment to acheive specific gradient and accurate alignment of pipeline, especially important in draining area.

Note:

- *For durably securing the adjusted height, the connection must always be fixed by a locking nut.*

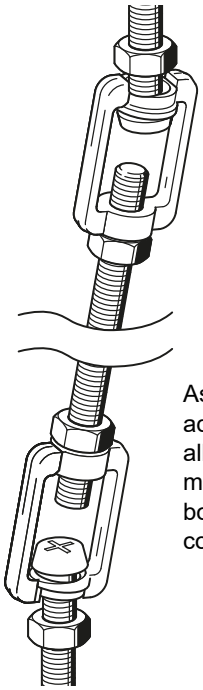
Height adjustment

Height Adjuster HRS P up to 4 kN



Caution!

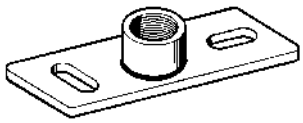
- *Fixing a locking nut to secure the cup nut the height adjusted is secured .*



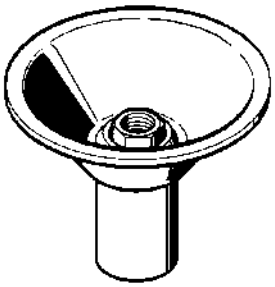
As both a height adjuster, and also allows pendular movements up to 7° both for singlular or coupled suspensions.

Products

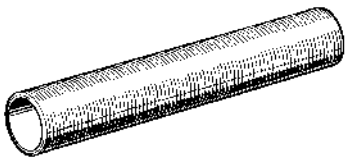
Mounting Plate GPL



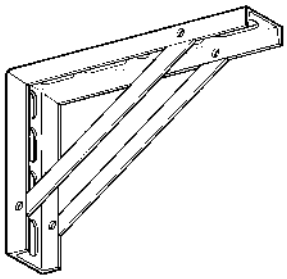
Support Cone SMD 1



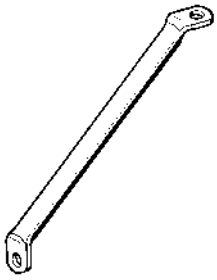
Threaded Tube GR



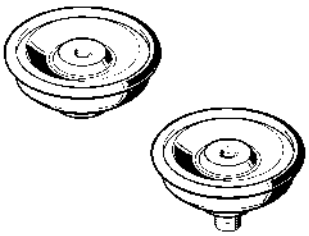
Support Bracket WK



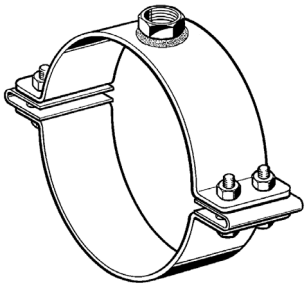
Tie Rod STR



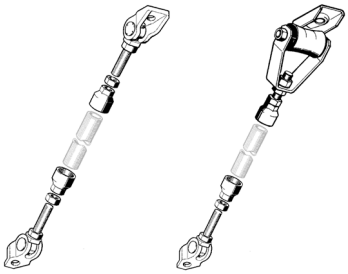
Sound Absorber SDE 1



Fixed Point Clamp FS

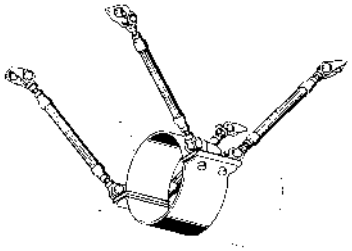


Mounting Kit VP

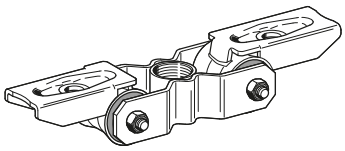


A/B; SDE 2

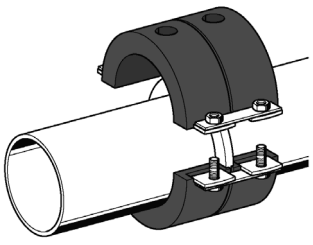
Fixed Point (trestle arrangement)



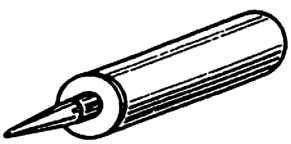
Sound Absorber SDE 2 - FP 1



Chilled Water Fixed Point Clamp FKS

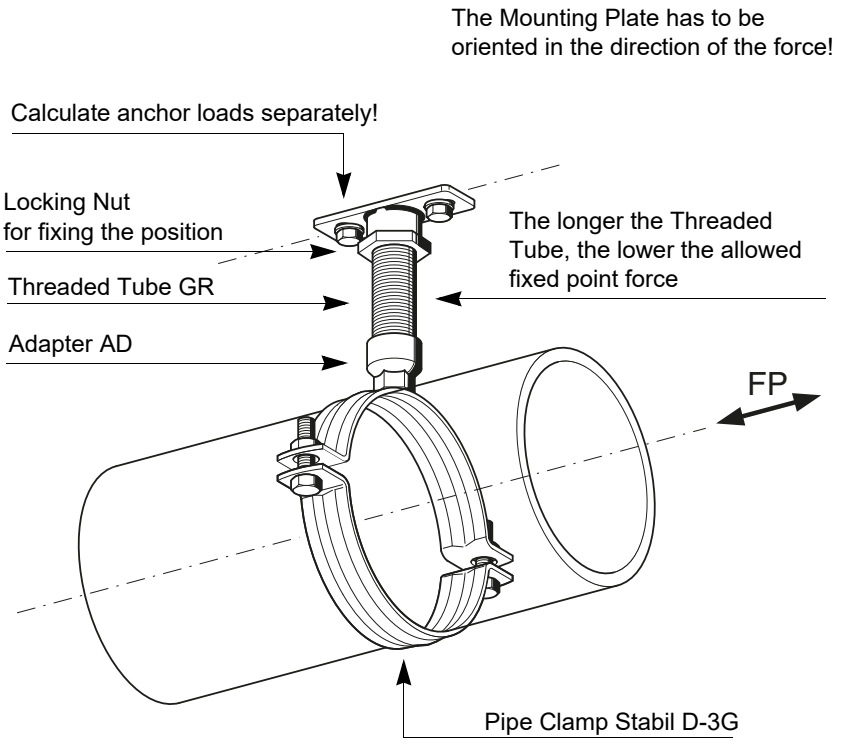


Sealant DP 30/45



Basic Assemblies

Mounting Plate GPL Stabil 1“ with Sikla Threaded Tube for fixed points up to 3 kN



Fixed points must resist the forces along the pipe axis, which occur

(1) due to temperature changes (ex pansion of the pipe) and/or

(2) due to hydrostatic pressure in „open“ systems (e.g. systems with axial expansion joints)

combination of forces:

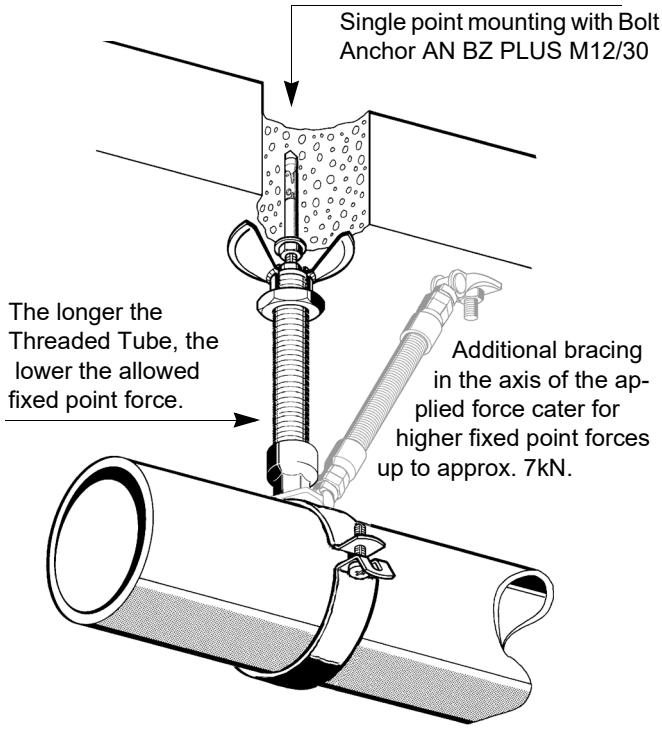
FP(1) = FR + FB
FP(2) = FR + FH + FF

FP = Fixed Point Force
FR = Friction Force
FB = Bending Force (bending leg)
FH = Force resulting from hydrostat. Pressure
FF = Spring Force (expansion joint)

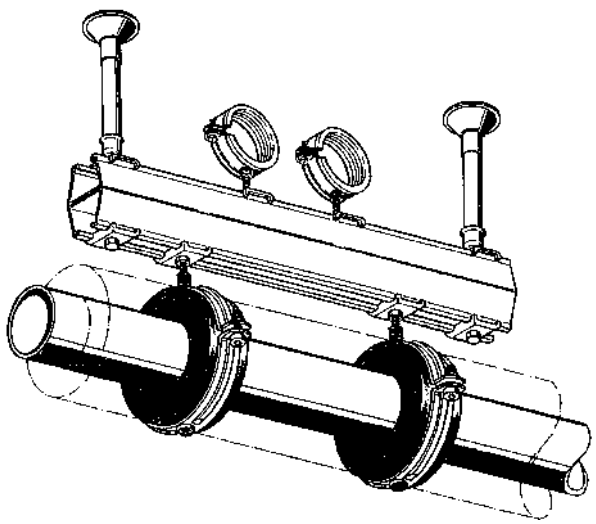
In order to safely avoid the pipes from slipping in the pipe clamps, stoppers have to be installed.

At the fixed point the max. dislocation of a pipe should not exceed 3 mm.

Support Cone SMD 1 3/4“ with Threaded Tube for fixed points up to 3 kN



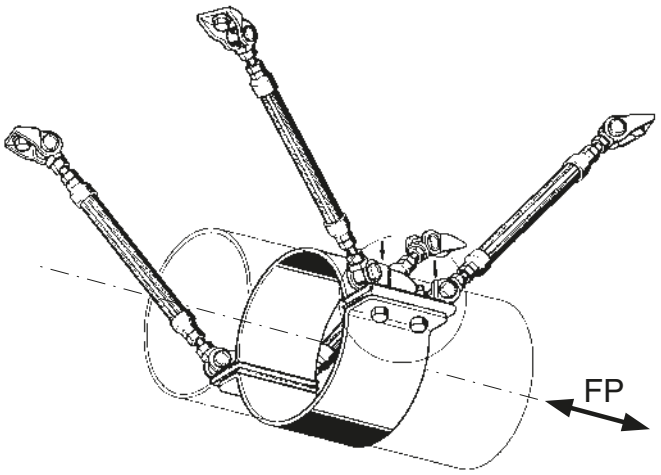
Two-point arrangements can cater for higher fixed point forces.



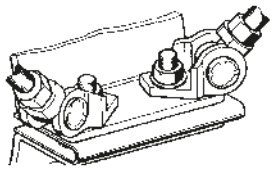
The load carrying capacity of the Support Cone SMD 1 is independent of the direction of force applied.

Trestle Arrangement (Assembly and Scope of Delivery)

Trestle arrangement for fixed points up to 35 kN



Universal Joints (type FP) are directly mounted onto the Fixed Point Clamp.



For the dimensioning of a Fixed Point in trestle arrangement, the following information is required

- Diameter of the pipe
- Fixed point force and the
- Distance of the pipe axis from the building structure.

Based on this information, our technical department will determine the components for the Fixed Point Package:

① Fixed Point Clamp FS
② Mounting Kit VP
③ Braces

in the dimensions required.

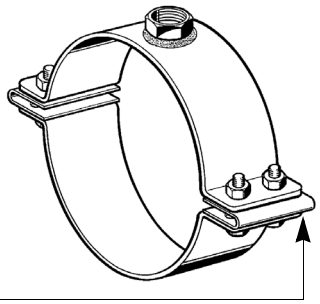
The greater the distance between the pipe and the supporting structure, the more solid the trestle arrangement should be.

Note:

- *There are two versions available, either with an angle of 45° or with 30° when space is limited.*

Each assembly consists of 3 components:

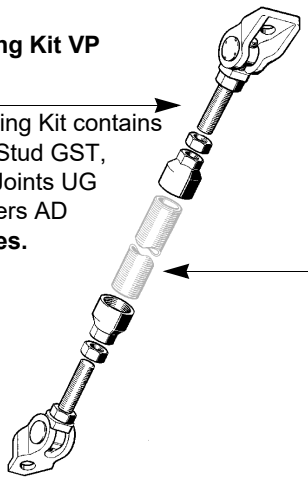
① Fixed Point Clamp FS



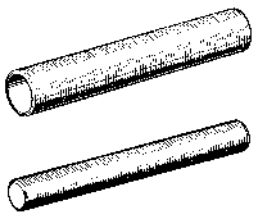
The spring inserts allow for absorbing high pipe anchor forces (up to approx. 15kN), without the need for welded stoppers.

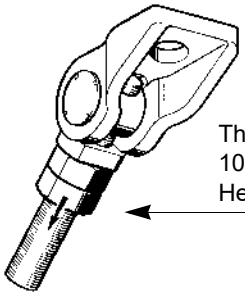
② Mounting Kit VP

The Mounting Kit contains Threaded Stud GST, Universal Joints UG and Adapters AD **for 4 braces.**



③ Threaded Tubes GR or Threaded Rods GST as braces





The Universal Joints UG are pre-assembled. 100 mm Threaded Studs GST and an additional Hexagon Nut NT already fixed.

Caution!

- *When pipe anchor forces are particularly high, or specific regulations have to be observed, additional means are necessary to cater for shear forces.*

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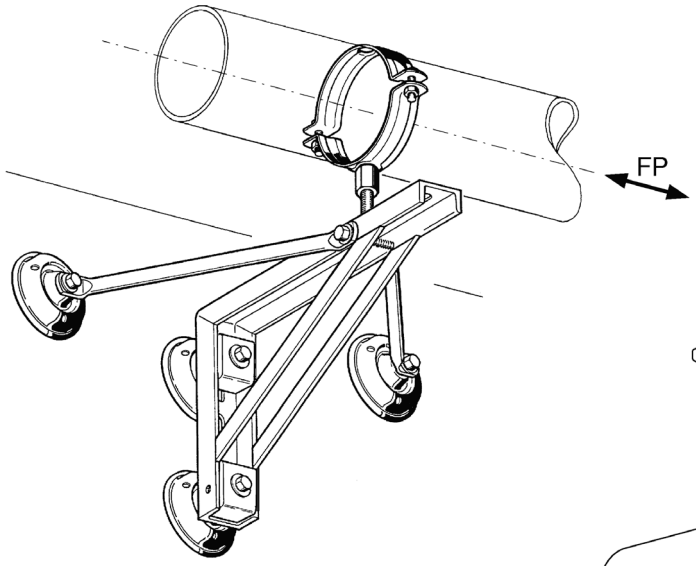
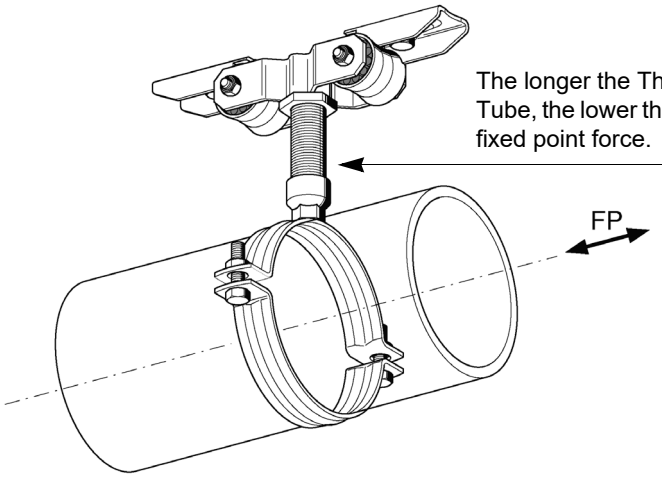
Soundproof Fixed Points

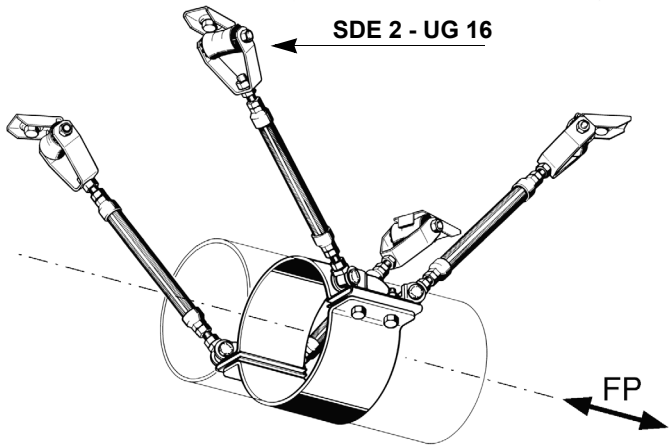
Support Bracket WK with Tie Rods STR on Sound Absorbers SDE 1 for fixed points up to 1.5 kN



Sound Absorbers SDE 2 - FP 1 for fixed points up to 3 kN



Trestle arrangement with 4 SDE 2-UG 16, for soundproof fixed points up to 25 kN (Type A, 45°)



Pipe Clamps with rubber lining can be used as soundproof fixed points, however only in case of low fixed point forces.

For higher force-resistance requirements, clamps without lining are used, and the sound absorption is provided at the connection to the substructure.

Highly resilient Fixed Points with a high sound absorption (up to 15 dB (A)) can be catered for when using a trestle arrangement including 4 SDE 2 Sound Absorbers UG 16 and a Fixed Point Clamp.

Caution!

- *When requirements are particularly high or specific regulations have to be considered, additional means are necessary to cater for shear forces.*

Procedure for designing of trestle arrangement

Input value D, H, FP, G

↓

FG = FP + G (in kN)

↓

Type tested static
State **Typ A** or **Typ B** and determine the support dimensions according to the diagram

↓

Calculation of
- fixing hole positions to substructure **LB, LL**
- **Length of threaded** tube for the braces **LAB**

↓

Select the Fixings / Anchors to the substructure and ensure the required axial distance between Fixings / Anchors is achievable.

↓

Order
Package 1 **Fixed Point Clamp FS** (complete)
Package 2 **Mounting Kit VP**
Package 3 **Threaded Tubes GR and Threaded Rods GST** (as braces)

↓

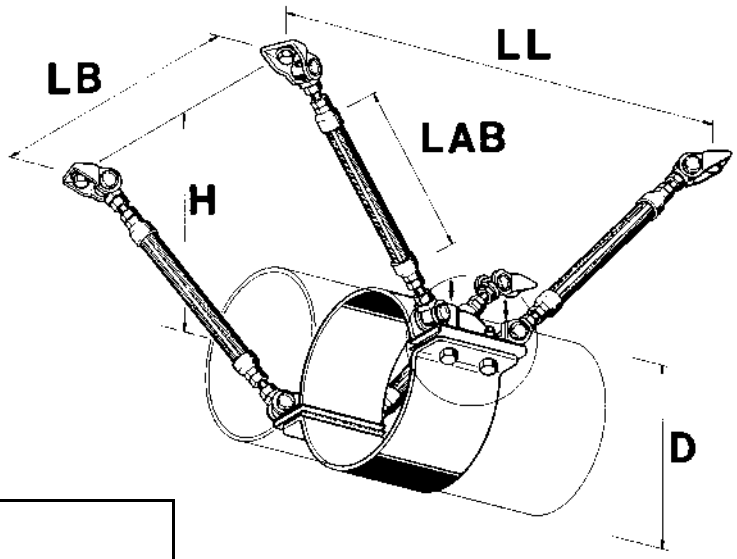
Consider the **installation details**. If necessary for higher pipe anchor forces, weld stoppers onto the pipe walls adjoining the edges of the Fixed Point Clamp.

The following input values are required:

D = Outer pipe diameter
H = Distance from pipe centre to substructure
FP = Fixed point force (Pipe anchor force)
G = Weight of the pipe at the fixed point

Determining total force **FG**

valid for
- Ceiling suspension
- Floor suspension
- Wall suspension (as downpipe)

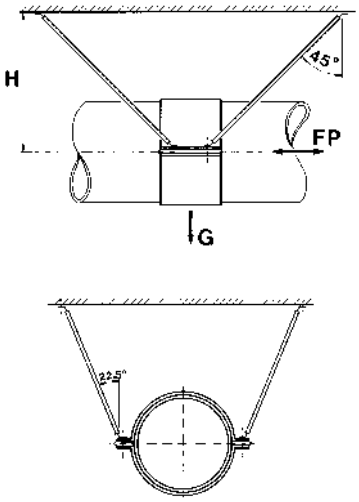


For correct dimensioning, please use the diagrams on the right - durable and secure connections are our common goal!

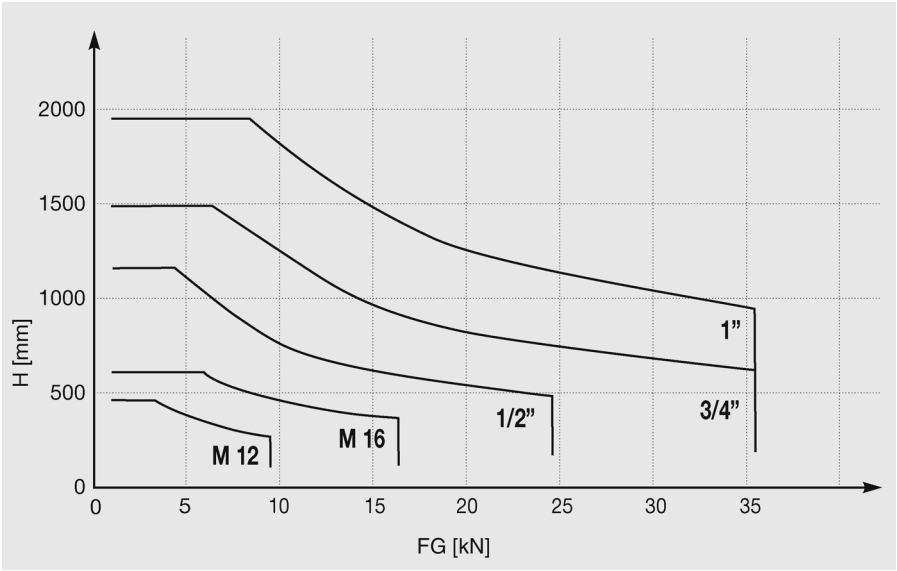
Type tested static for trestle arrangement Type A (45°) and type B (30°)

Typ A (45°) for higher fixed point forces

Symmetrical construction allows for the maximum fixed point force in either axial direction.



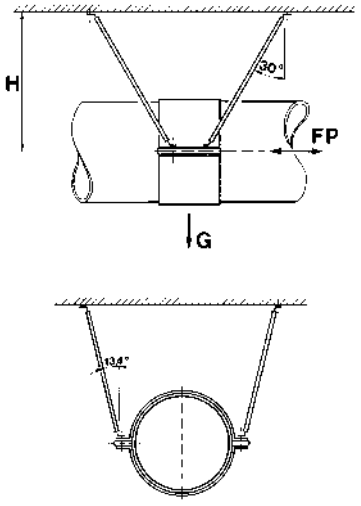
The diagram is valid for trestle arrangements without sound insulation up to 35 kN. For the type with sound insulation the loading limit is 25 kN.

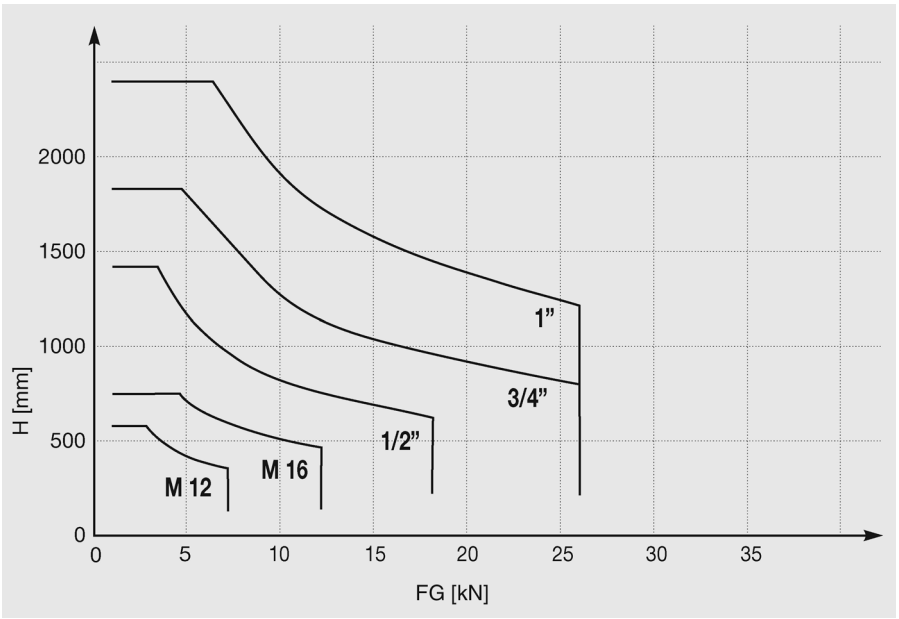


FG = FP + G

Typ B (30°) for narrower space limitations

The diagram is valid for trestle arrangements without sound insulation up to 26 kN. For the type with sound insulation the loading limit is 18 kN.

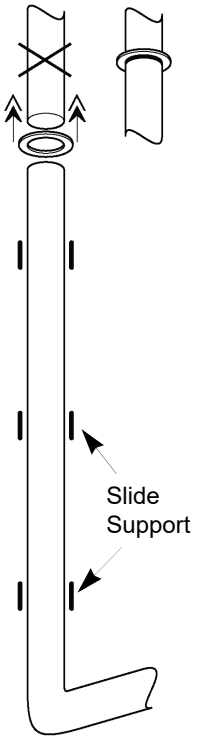




FG = FP + G

Chilled Water Fixed Point Clamp FKS - Installation to the pipe

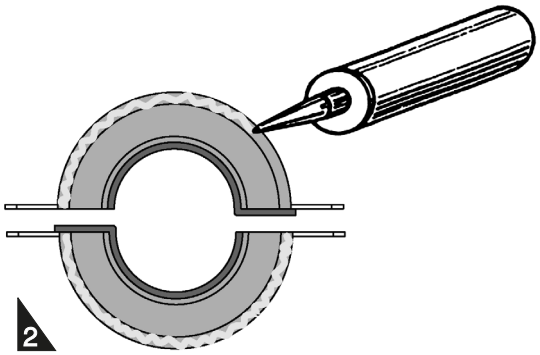
Preparation



1

STOP !

Before connecting the adjoining pipe piece, push the pressure ring over the end of the pipe. At the position required for the Fixed Point, weld or fuse the pressure ring to the pipe wall.



2

Apply sealant to the edge faces of the clamps such that the pressure ring will be fully sealed when the pipe clamp half-shells are pushed together onto the pressure ring.

Chilled Water pipes are subject to changing length. Slide Supports are necessary to accommodate this contraction and expansion of the pipe.

"Normal" Chilled Water Clamps and insulation inserts exert minimal clamping force to the pipe wall, so the axial thrust force on the Fixed Point has to be borne by the edge bearing surfaces of the pipe clamp shells (insulant material).

The pressure ring which is welded to the pipe wall, takes over this function and transfers the axial forces to the adjoining pipe clamp shell which is geometrically formed to fit against the pressure ring when installed.

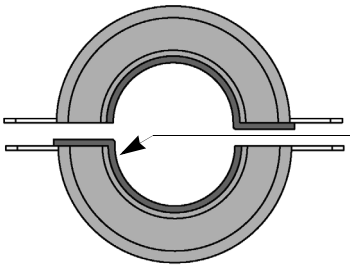
Note:

- *If the pressure ring has not been welded to the pipe during the pipe run installation, the pressure ring should be split and welded carefully around the pipe to ensure a consistent axial force resistance when used as the Fixed Point bearing ring.*

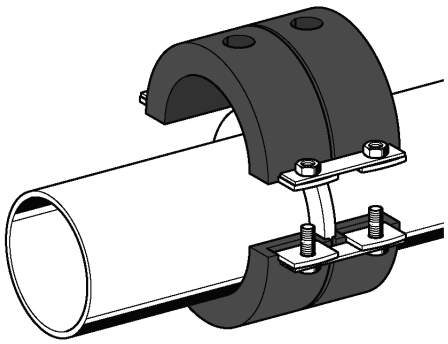
Installation Sound Absorber

3

Bring the half shells together against the pressure ring and connect the splice plates together.

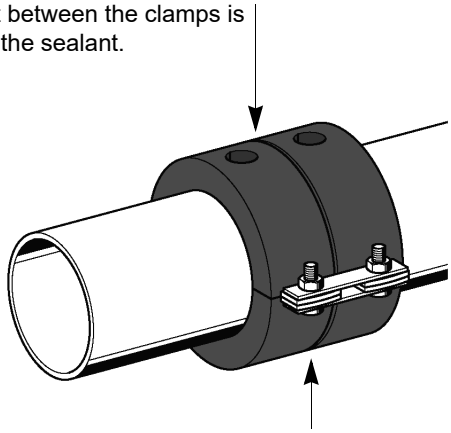


Between the cut edges of the pipe shells and the inner surface of the shell bores, a rubber insert has been integrated which allows a diffusion-free sealed connection to the chilled water or refrigeration pipe.



4

Check if the joint between the clamps is closed tightly by the sealant.



Scope of delivery

1 Pressure Ring
4 similar Half Shells
4 Connecting Plates
4 Hexagon Bolts
4 Hexagon Screws

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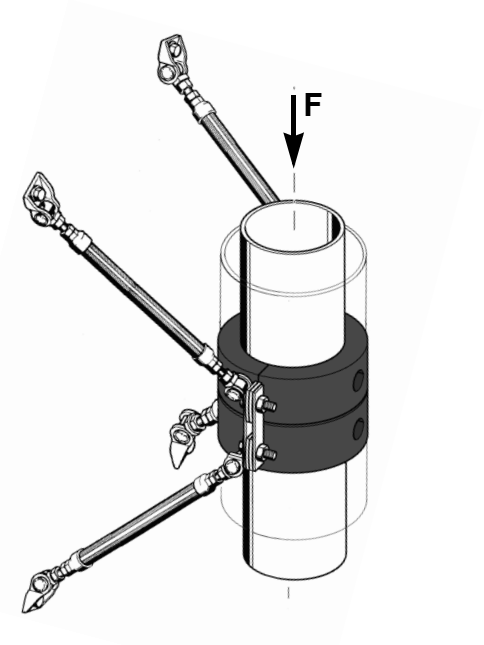
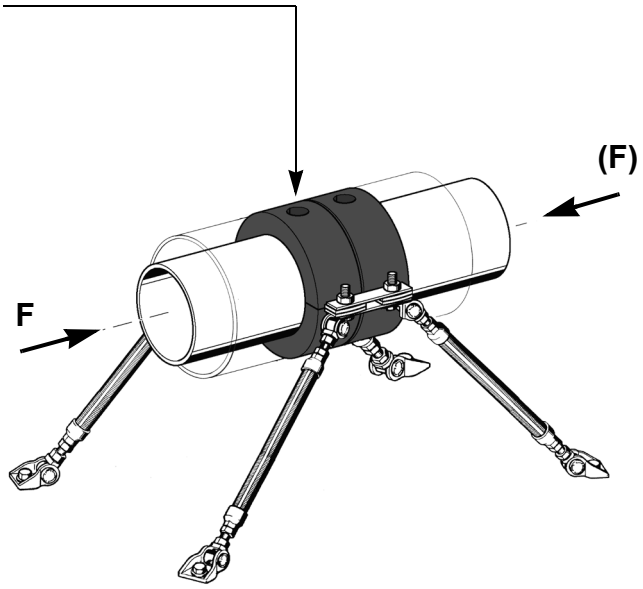
Chilled Water Fixed Point Clamp FKS - Installation to the building structure

Trestle Arrangement

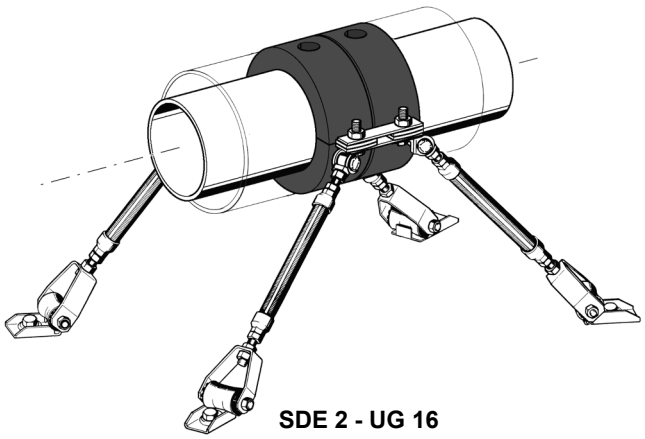


The self-weight of pipes in a riser can be borne by the Chilled Water Fixed Point Clamp.

The centric thread connectors can be used for supporting the weight of a horizontal pipe.



Trestle arrangement for sound-proofed fixed points



SDE 2 - UG 16

The symmetrical trestle arrangement allows for the pipe anchor forces to be resisted in either axial direction, and will be transferred appropriately into the building substructure to which it is attached.

Chilled Water Fixed Point Clamp with suitable Mounting Kits VP - two versions are available:

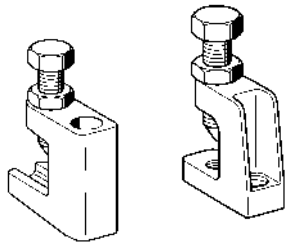
- without sound absorbtion (Mounting Kit VP A/B with UG)
- with sound absorbtion (Mounting Kit VP SDE2).

Note:

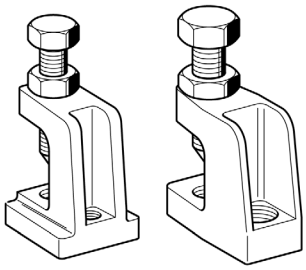
- *A compressive strength of 0.6 N/mm² is used for determining the allowable static compressive strength resistance of the PUR clamp material (density 250 kg/m³).*

Products

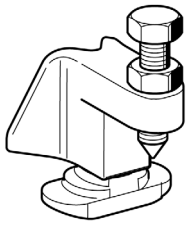
Beam clamp TCS 0



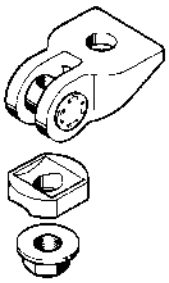
Beam clamp TCS 1/ TCS 2



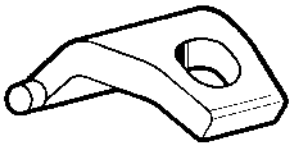
Beam clamp TCS 41



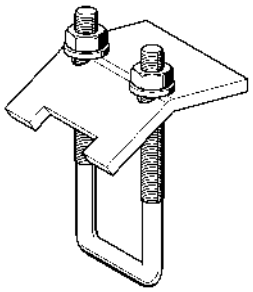
Universal Joint UG



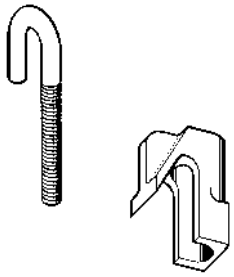
Beam Clip P



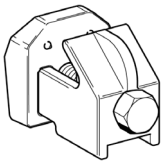
U-Holder SB 41



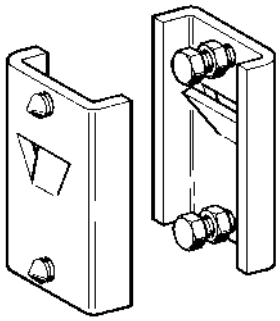
Threaded Hook GH
Hook Sleeve SP



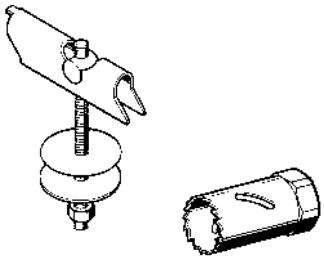
Bulb Flat Steel Beam Clamp



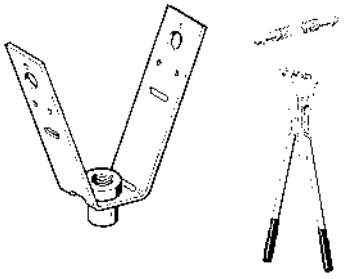
Clamping End SKL



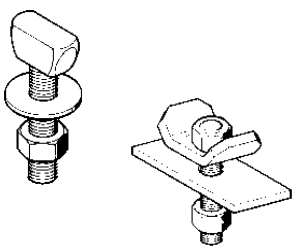
Toggle Stud KD **Hole Saw LS**



Roof Hanger TRH **Piercing Tool LOT**



Wedge Bolt KB **Clamp VBO C 40**



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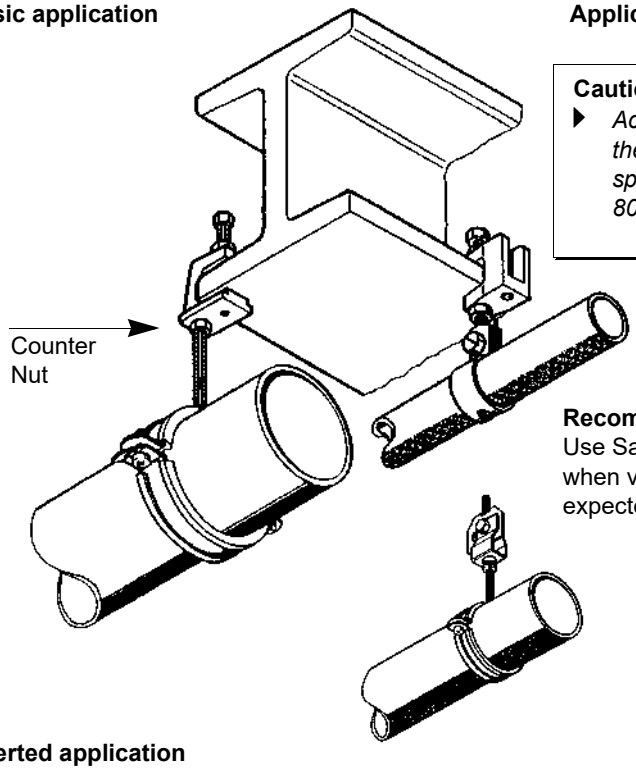
Beam Clamp - Single Support

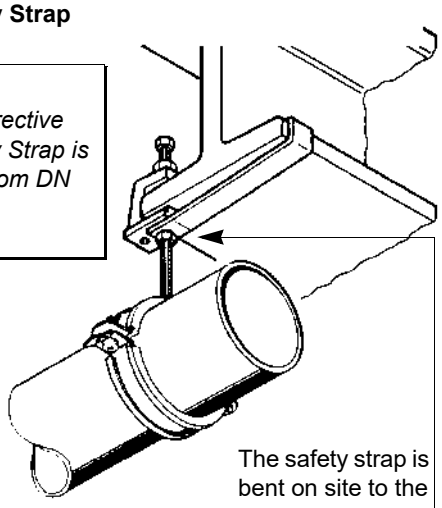
Basic application



Application with Safety Strap

Caution!

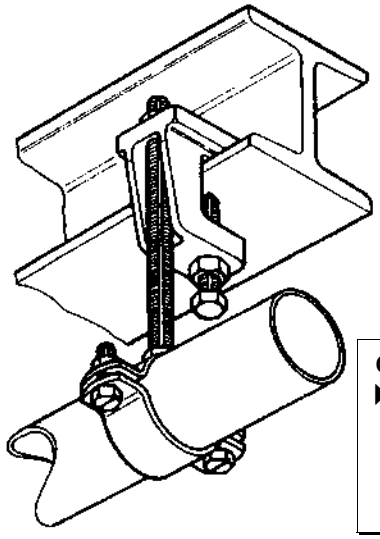
- *According to VdS-directive the use of the Safety Strap is specified for pipes from DN 80 onwards!*



Recommendation:
Use Safety Strap also, when vibrations are expected.

The safety strap is bent on site to the form of the beam, so that it securely encompasses the edge of the beam flange.

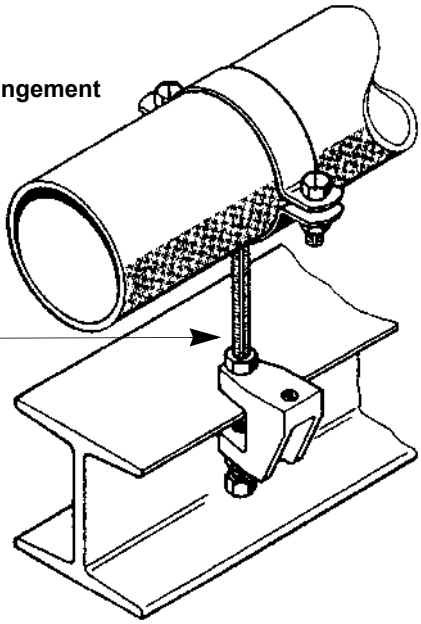
Inverted application

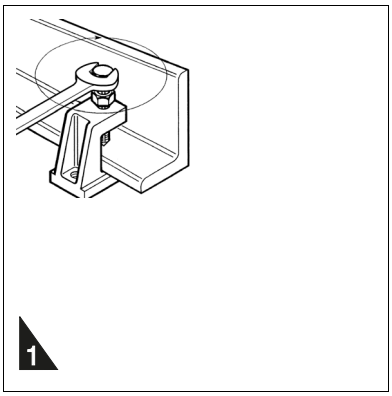


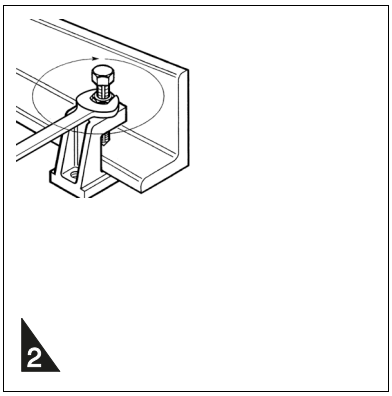
Caution!

- *This arrangement is allowed for parallel-flange beams only*

Standing arrangement



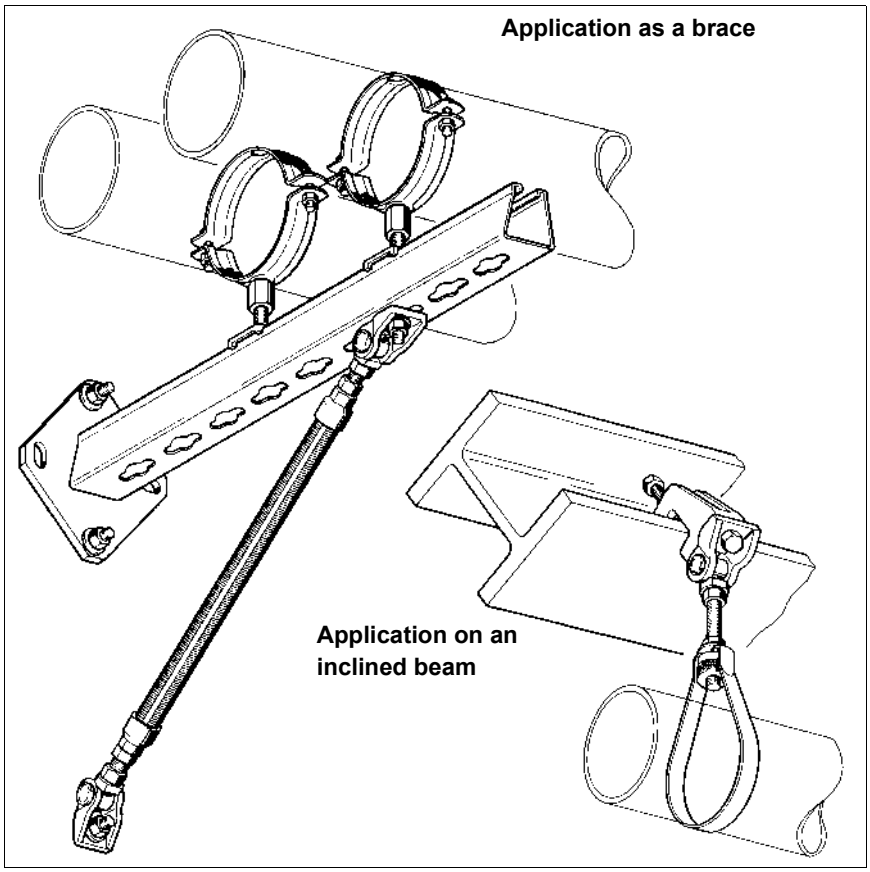




Caution!

- *Take note of the torque:*
  TCS 0: Rotate 1 revolution
  TCS 1 and TCS 2:
  Rotate min. 1 up to max. 1 1/2 revolutions.
  Then tighten locking nut.

Universal Joint for any variable Angle Adjustment



Braces can be installed with variable angles to their supporting surfaces. The combination with adapters allows for bracing arms with cross-sections up to Threaded Tube G1".

Application on an inclinded beam
The pivot head in the Universal Joint can rotate freely, allowing adjustment to any angle.
Tightening the locking nut against the adapter plate locks the position.

Caution!
- *In cases of dynamic loads it is necessary to secure the Beam Clamp TCS using a Safety Strap, possible in connection with another Beam Clamp TCS.*

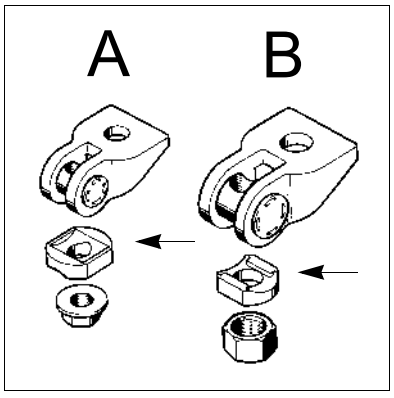


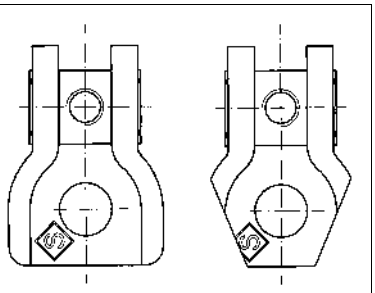
Figure A:

Type:
UG M8
UG M10

Figure B:

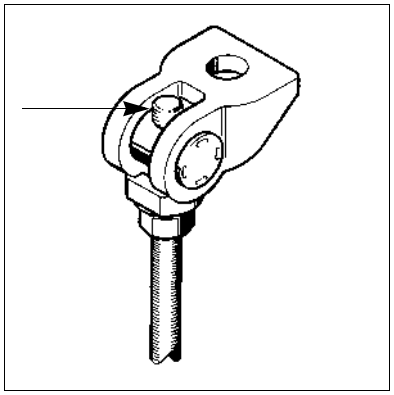
Type:
UG M12
UG M16
UG FP M12
UG FP M16

During installation, make sure the correct side of the adapter plate faces towards the body of the Universal Joint.



UG
M8 - M16

UG FP
M12 and M16



Note:
- *The Threaded Rod must be clearly visible after being screwed into the pivot head.*

Note:
- *Refer to VdS CEA directives for the recommendation of supporting thread sizes for Sprinkler pipes.*

Nominal size (NW)	Thread
≤ DN 50	M 8
> DN 50 - ≤ DN 100	M10
> DN 100 - ≤ DN 150	M12
> DN 150 - ≤ DN 200	M16

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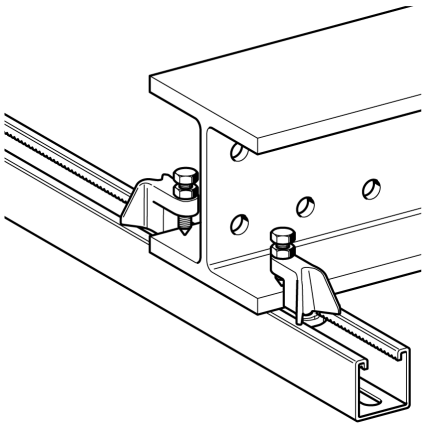
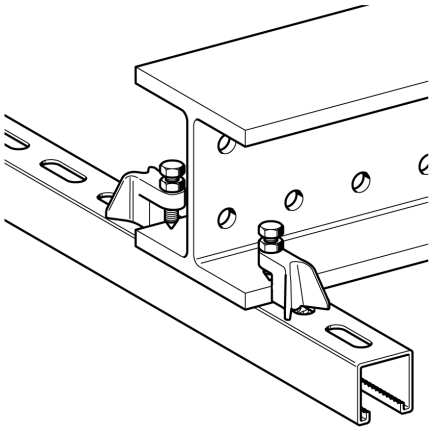
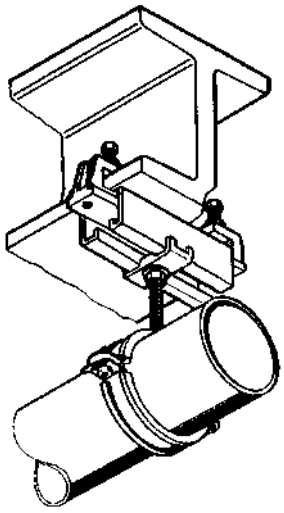
Beam Clamp TCS for Header Rails

with Beam ClampTCS 41



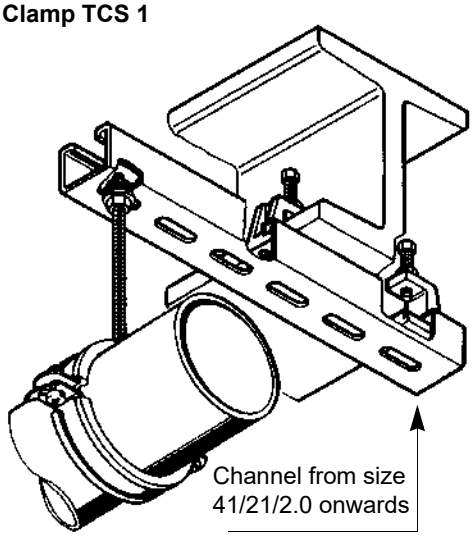


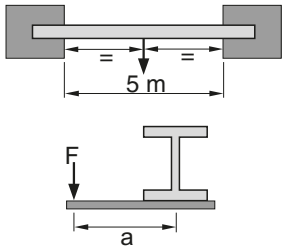
with Beam Clamp TCS 0; 1; 2



Beam clamps can attach into either the open face or rear slots of the channel, leaving the channel unobstructed for further installations.

Cantilever arrangement with Beam Clamp TCS 1





$$F_{zul} = \frac{M_b}{a}$$

$\sigma_{perm} \leq 160$ N/mm²
$f_{perm} \leq 2$ mm

Sample:
Beam shape IPB 160
and distance A = 50 cm

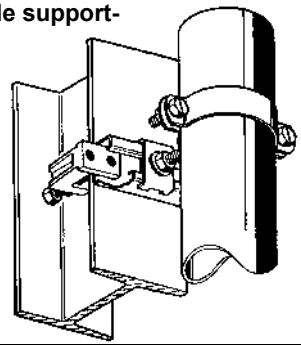
Note:

- *In cantilever arrangements, the permissible bending moment of the beam must not be exceeded.*

Beam	permissible bending moment M_b [Nm]
IPB 100	50
IPB 140	115
IPB 160	180
IPB 200	310
IPB 240	540
IPB 300	970
IPB 340	1350

$$F_{perm} = \frac{180\,Nm}{0{,}5\,m} = 360\,N$$

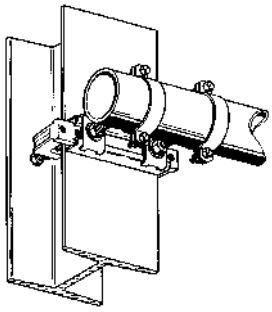
Vertical pipe on vertical beam
-single support-



Caution!

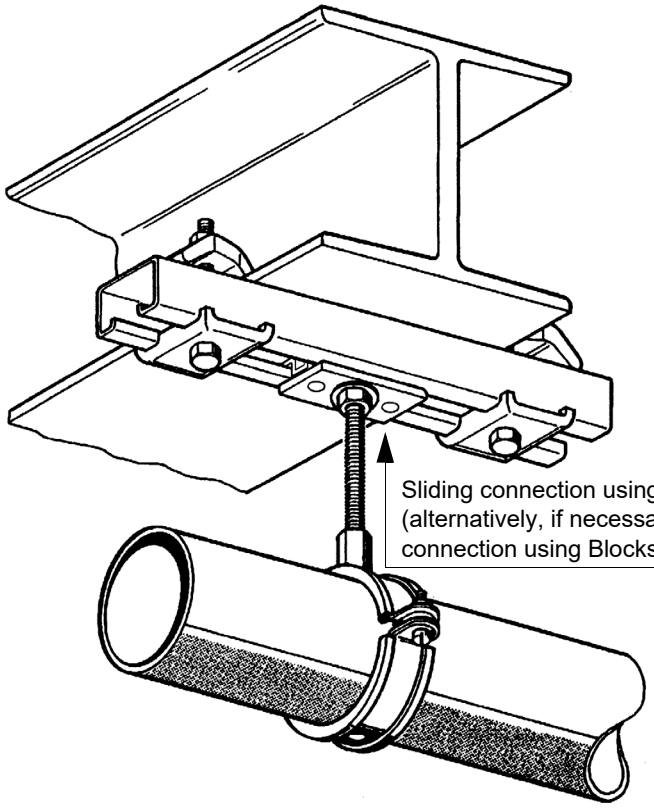
- *T-Head Bolt and Holding Bracket must be used! This arrangement requires Sikla Channel 41/21 or larger. Check permissible loadings by referring to the catalogue!*

Horizontal pipe
-twin mounting-



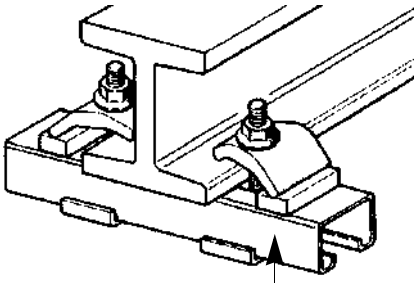
Beam Clip for Cross Support/ Dimensioning of Bolts

Installation within the flange width

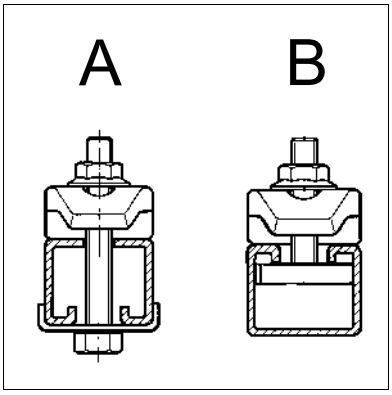


Sliding connection using Slide Set 41 (alternatively, if necessary, rigid connection using Blockset CC 41).

… on thick flanges



When dealing with very thick flanges, use shim plates. Shim plates exceeding 10 mm height must be tack welded to the crossmember!



Installation

Determination of the required bolt length Lmin:

Arrangement **A**
(with Hexagon Bolt)

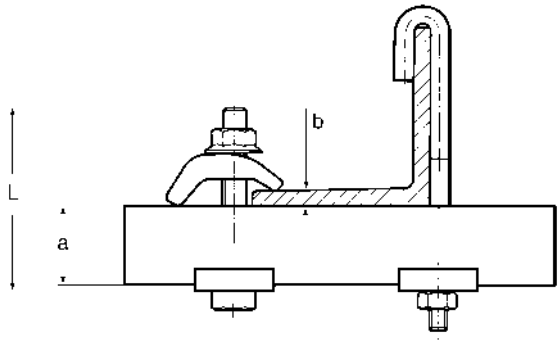
P1: Lmin = a + b + 37 [mm]
P2: Lmin = a + b + 43 [mm]
P3: Lmin = a + b + 48 [mm]
P4: Lmin = a + b + 55 [mm]

Arrangement **B**
(with T-Head Bolt)

P1: Lmin = b + 40 [mm]
P2: Lmin = b + 45 [mm]
P3: Lmin = b + 50 [mm]
P4: Lmin = b + 60 [mm]

Bolts used with Beam Clip:

P1: M 8 or M 10
P2: M 12
P3: M 16
P4: M 16



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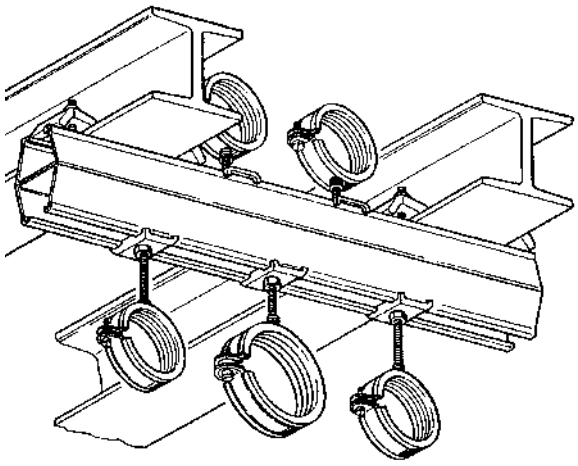
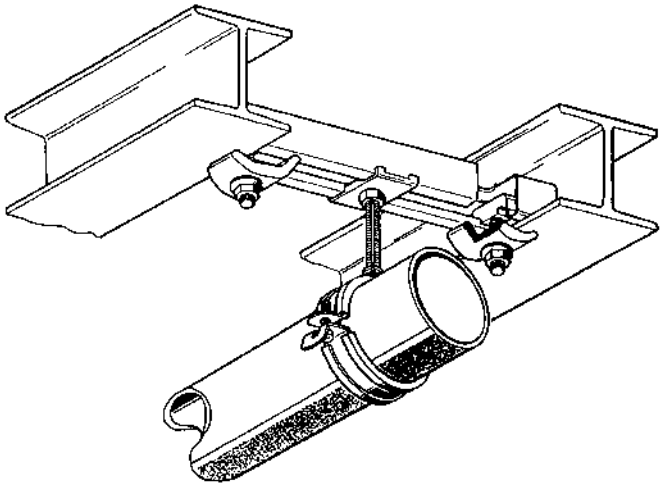
Beam Clip for Cross Member Support

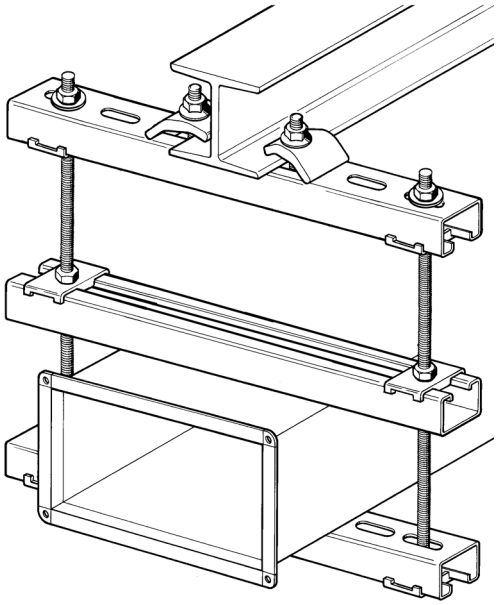
Tandem cross support using Channel 41-75/65/3.0 D



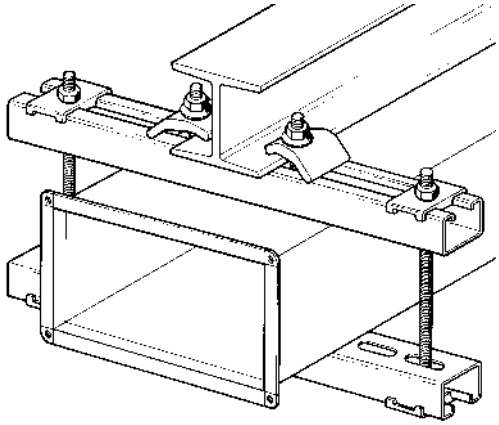
Cross member supported by opposing web faces of 2 beams

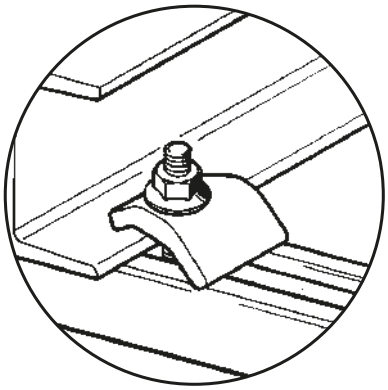


Installation of a duct -suspended arrangement-



Installation of a duct -directly below the beam-



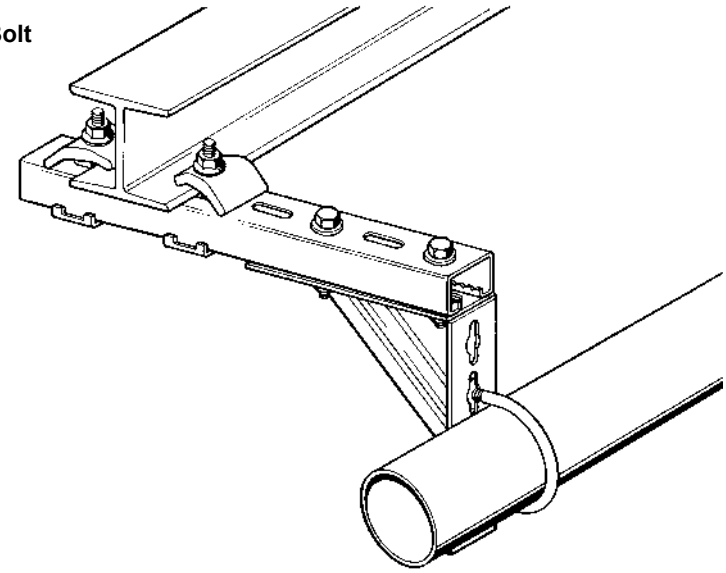


Note:

- *When using Beam Clips, always make sure that*
  - *the wider side is located at the Channel and*
  - *the smaller side at the beam.*

Beam Clip for Cantilever Support

Arrangement with U Bolt



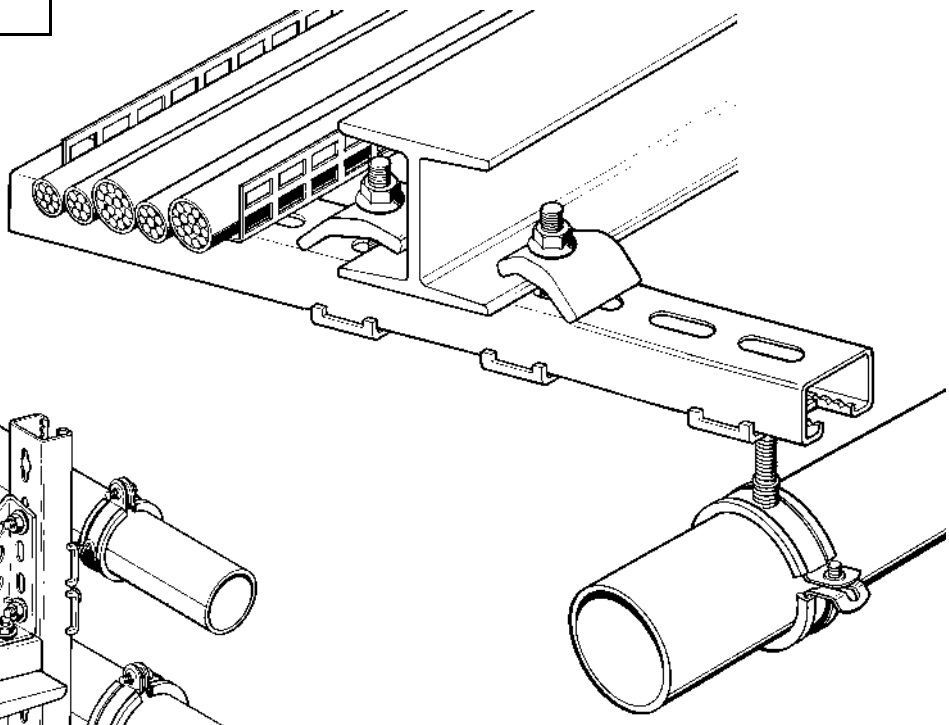
Note:

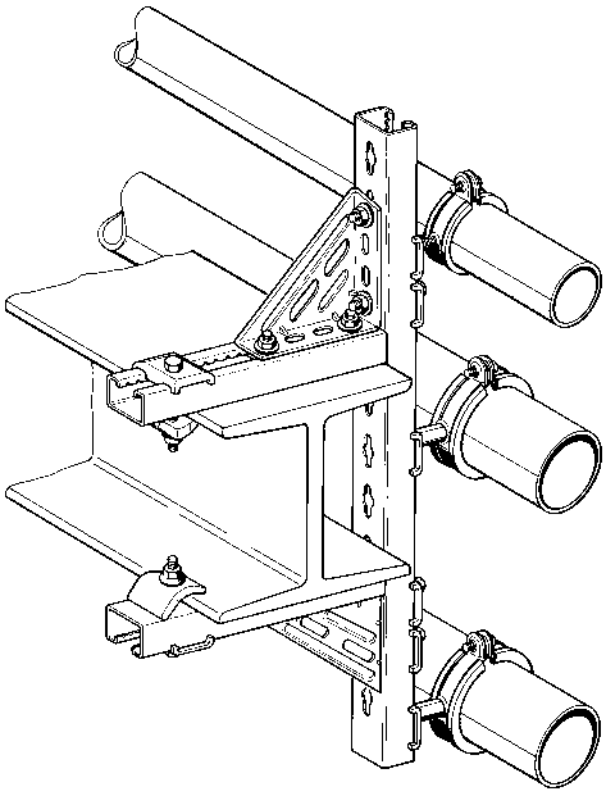
- *Use U Bolts only as guides. If they have to bear some vertical loads, U Bolts type DIN 3570 must be used.*

Caution!

- *The permissible bending moment of the beam must not be exceeded!*

Double-sided cantilever crossmember





Combination of Support Bracket and Channel with horizontal pipes running parallel to the IPB beam. When using this arrangement, make sure that no axial forces from the pipes exist, which may cause the supporting frame to twist.

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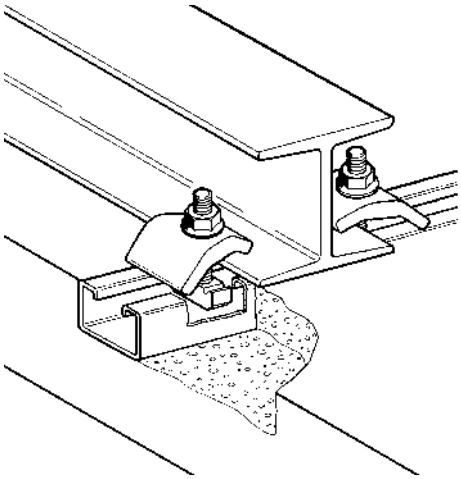
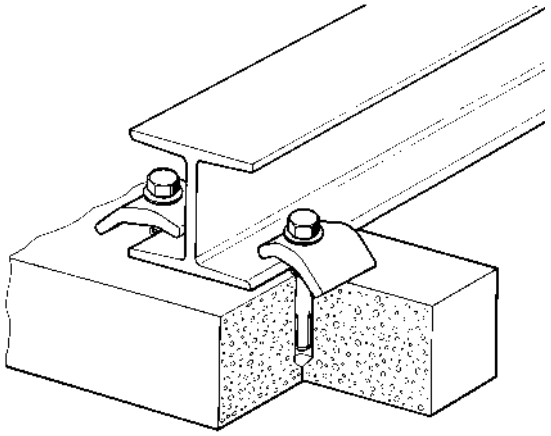
Beam Clip for Supports on Building Structures

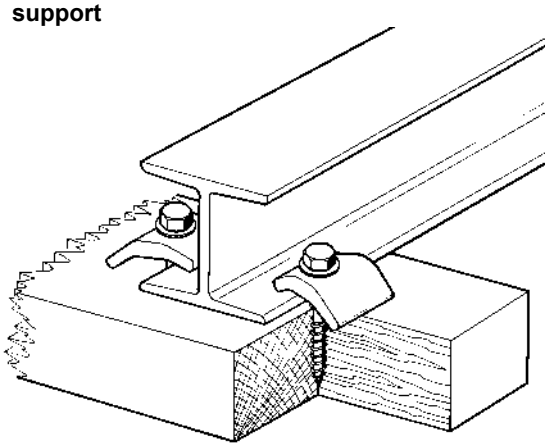
Installation to cast-in channel



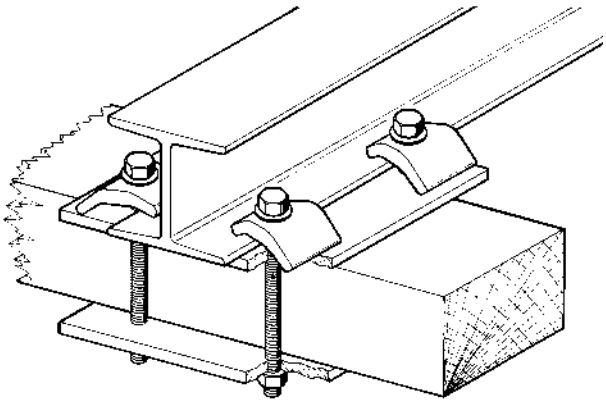
Installation with anchors



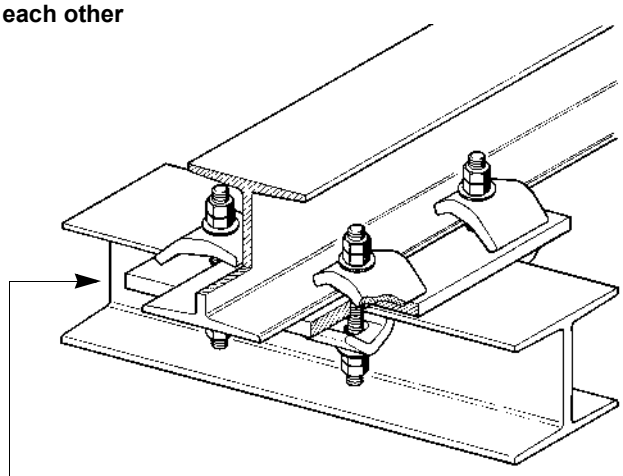
Installation on a timber support



Fixing of a timber joist to a steel beam

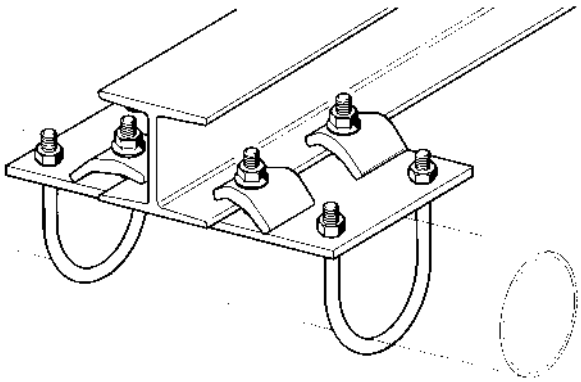


Fixing two beams crossing each other



Simotec Base Plate GPL can be used between the two beams.

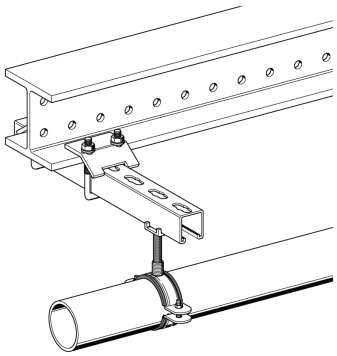
Pipe running directly below the beam



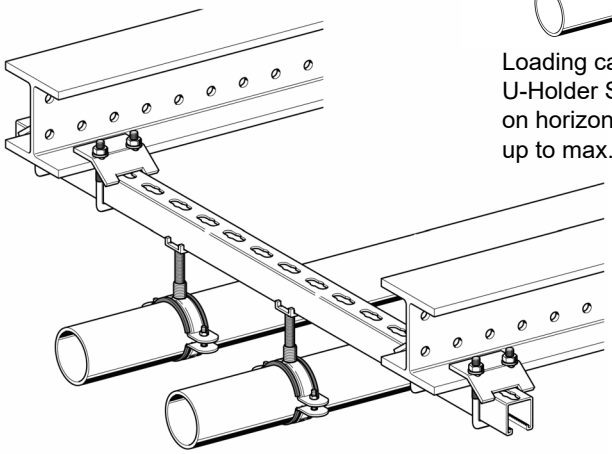
U-Holder SB 41

Arrangement above or below the beam

In all arrangements, the loading capacity of the beam has to be considered. In cantilever arrangements especially the torsional stiffness has to be considered



Loading capacity per U-Holder SB 41 M10 on horizontal beam up to max. 5kN.



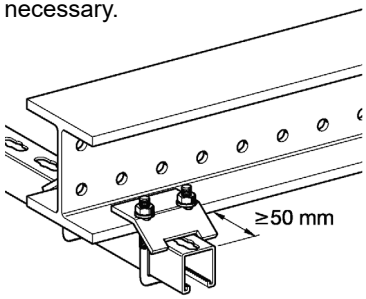
Calculation of loading capacity for horizontal beam with Sikla Structural Analysis Software SiPlan.

Direct installation of all rectangular single and double channels system 41 on steel beams with flange height up to max. 16 mm.

Note:

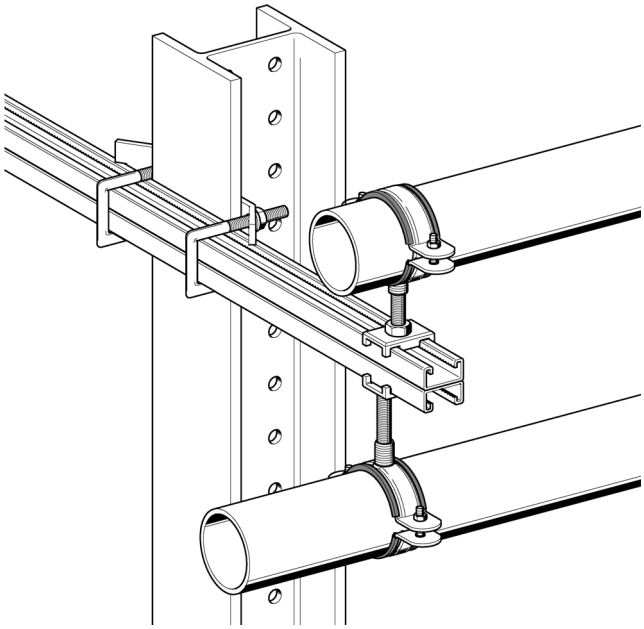
- *U-Holder SB should always be used in pairs.*

For secure support a minimal overhang of 50 mm is necessary.

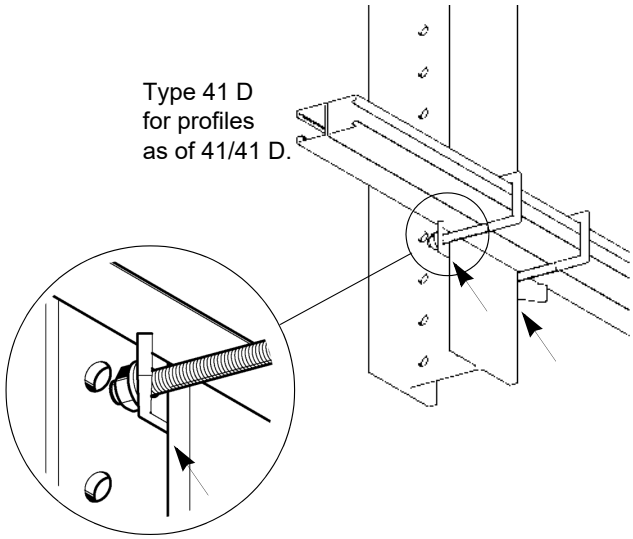


Lateral arrangement on the beam

Due to the geometry of the U-Holder, it is also possible to install Channels MS 41/41 and 41/21 D 90° rotated.



Type 41 D for profiles as of 41/41 D.

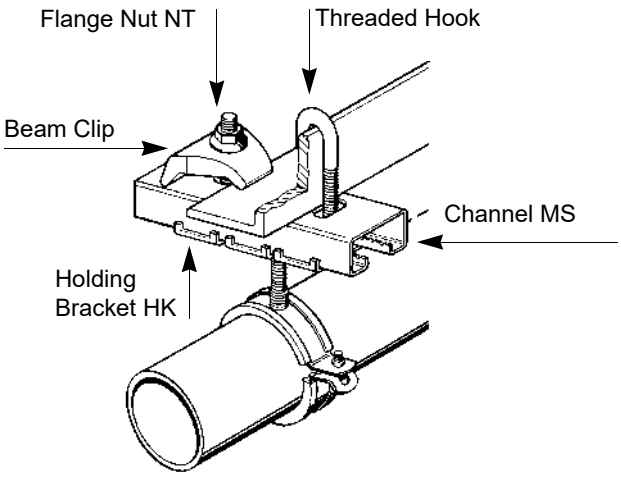


Caution!

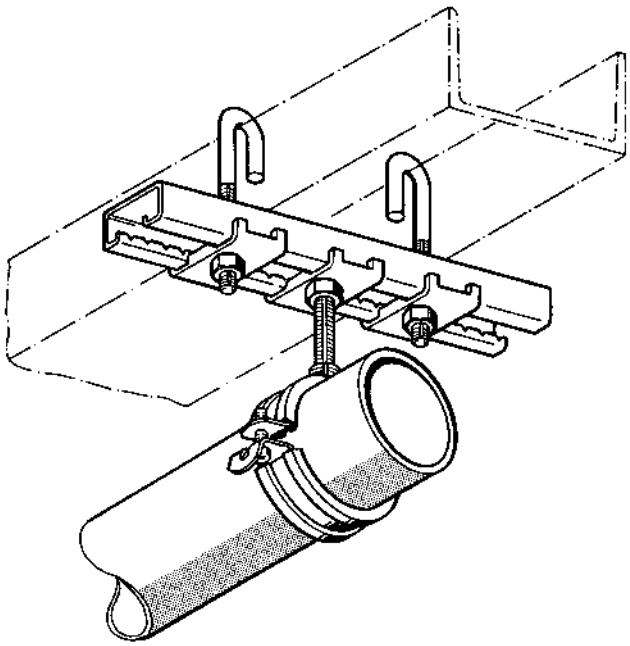
- *In lateral arrangement secure U-Holders against slipping (e.g. with 2 x TCS).*

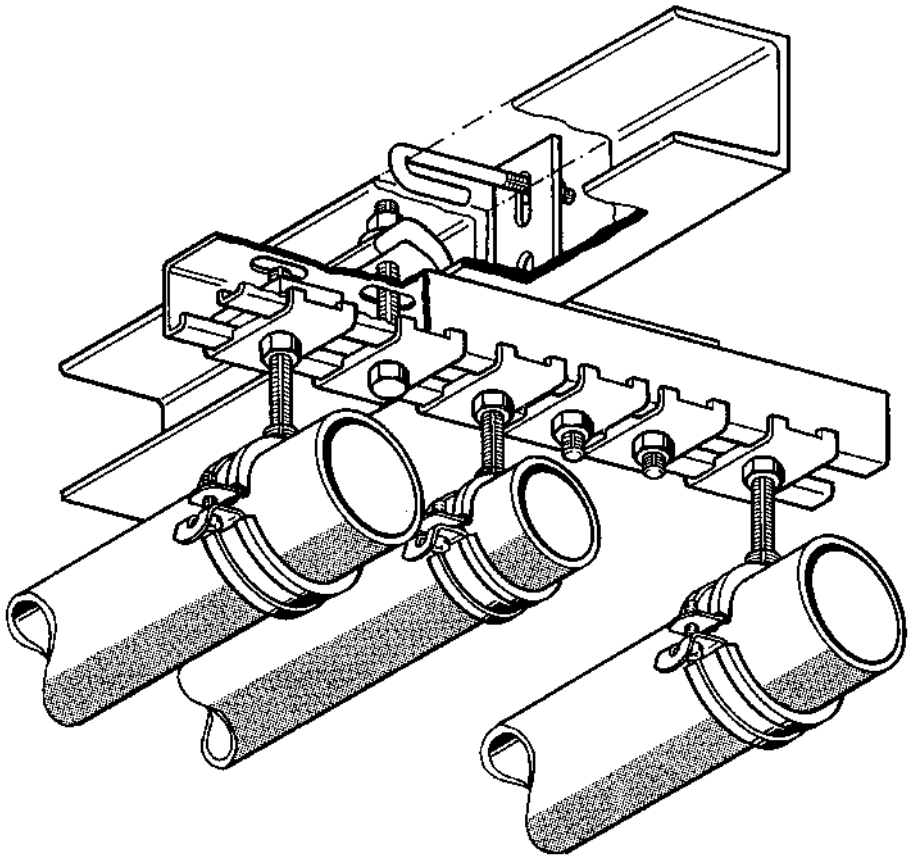
Threaded Hooks GH for Cross Supports

... hooked onto angle irons



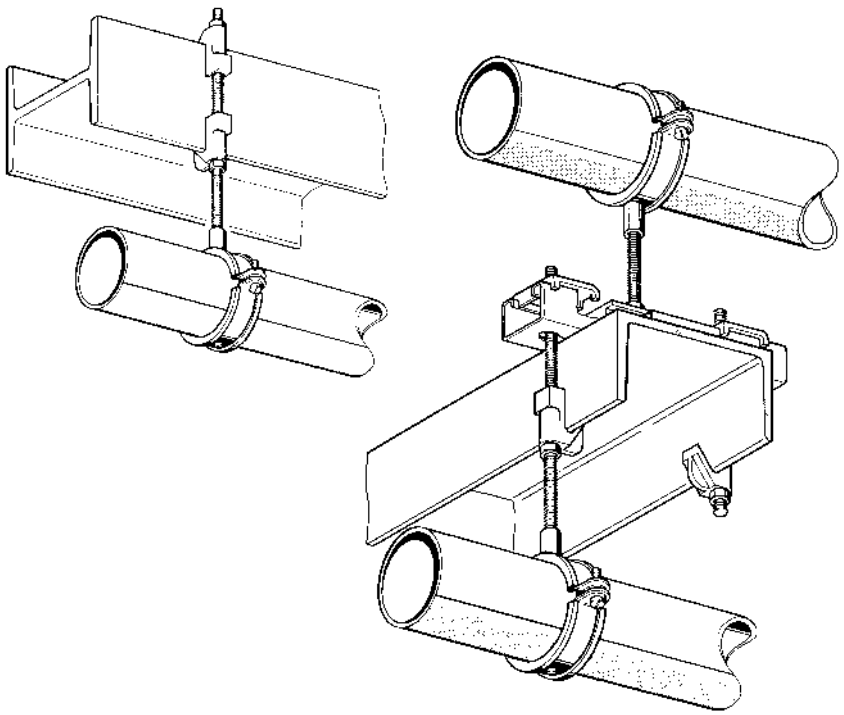
... hooked onto steel C-sections

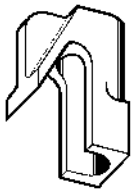




Hook Sleves SP and Bulb Flat Steel Beam Clamp for single supports

Hook sleeves may be attached to flanges of C-section or Ibeam steelwork in cases when the beam is rotated through 90°



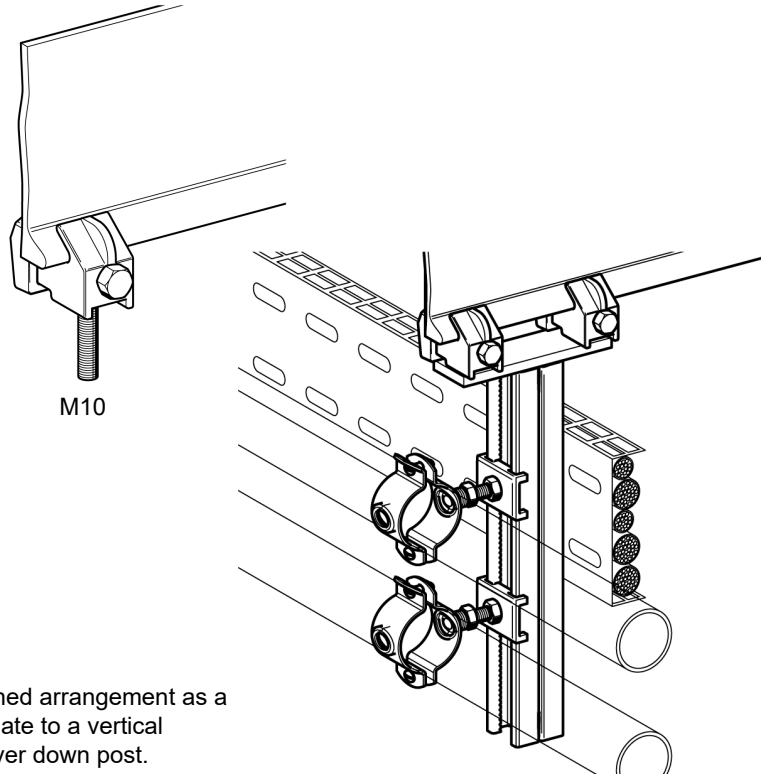


The Threaded Hook has a hole Ø13mm and is therefore suitable for Threaded Rods GST M8, M10, M12. If used with a M8 Threaded Rod, a Flange Nut NT is required.

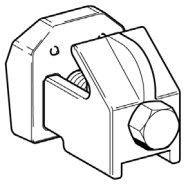
Caution!

The load values stated in the catalogue refer only to the Hook Sleeves. The load capacities of the supporting beam or building structure must be checked separately.

Installation to Bulb Flat steel (HP-profile)



Combined arrangement as a base plate to a vertical cantilever down post.



The Bulb Flat Beam Clamp is a solid connection element to fix pipework and electrical containment services to bulb flats HP (80 x 6 up to 160 x 6).

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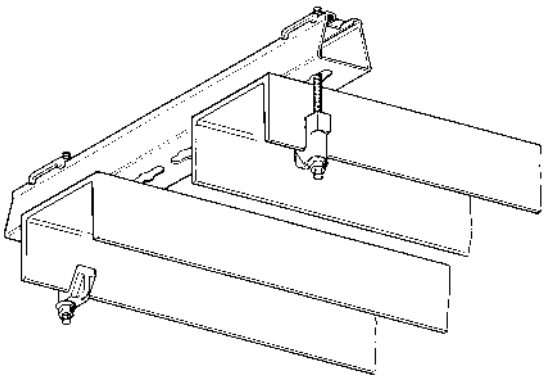
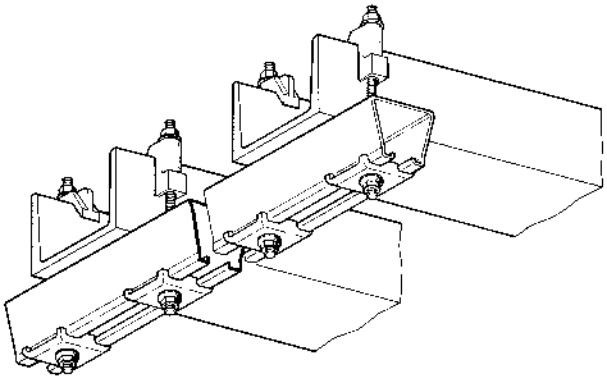
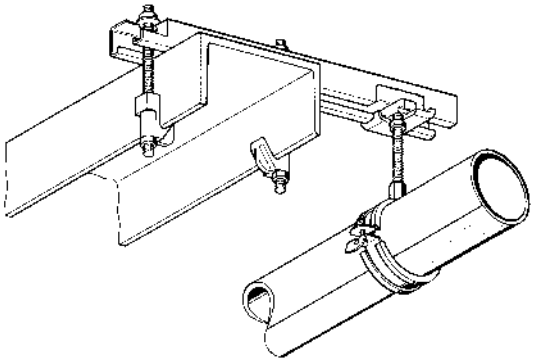
Hook Sleeves and Bulb Flat Beam Clamp for bracket installation

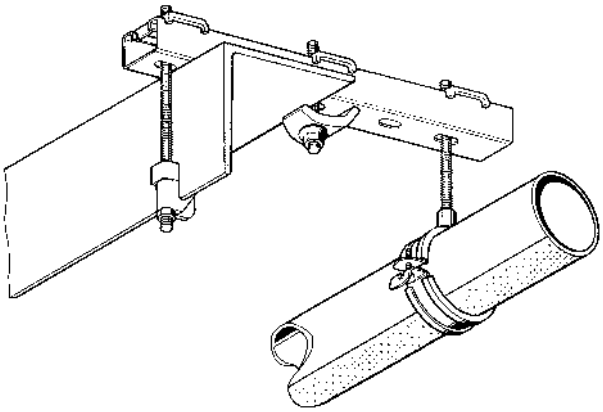


Arrangements to C-section steelwork mounted above or below the beam



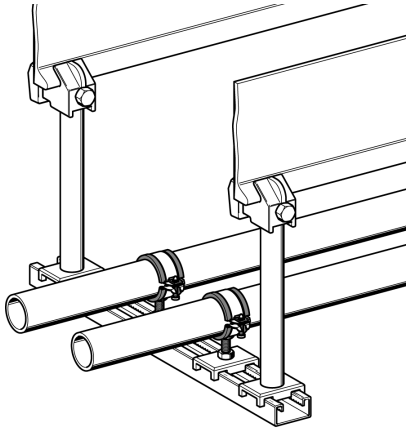


Cantilevers to C-section steelwork or angle irons

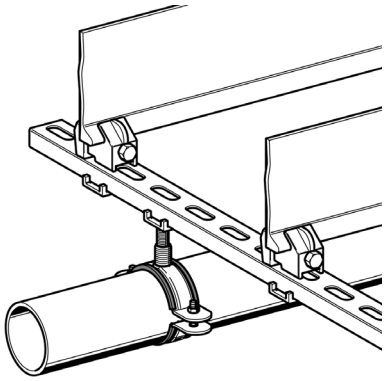


Note:

- *In cantilever arrangements, the permissible bending moment of the supporting beam must not be exceeded.*

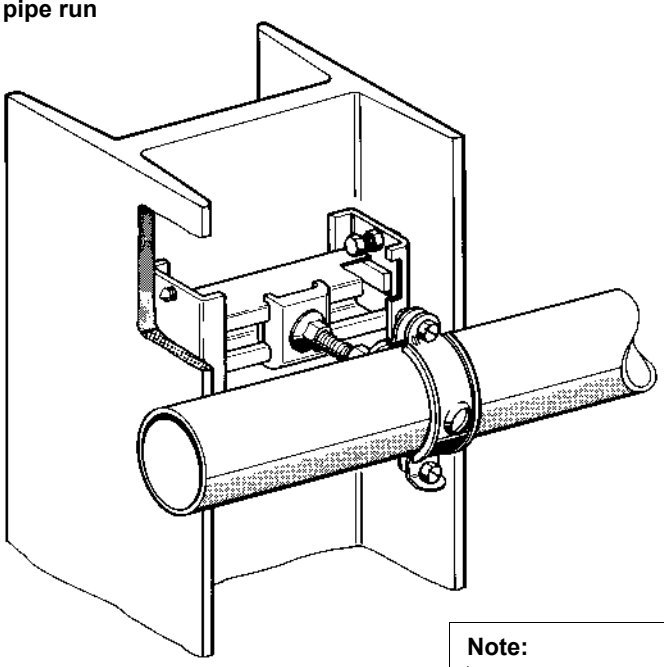


Suspended header rail to bulb flat steel (HP-profile).

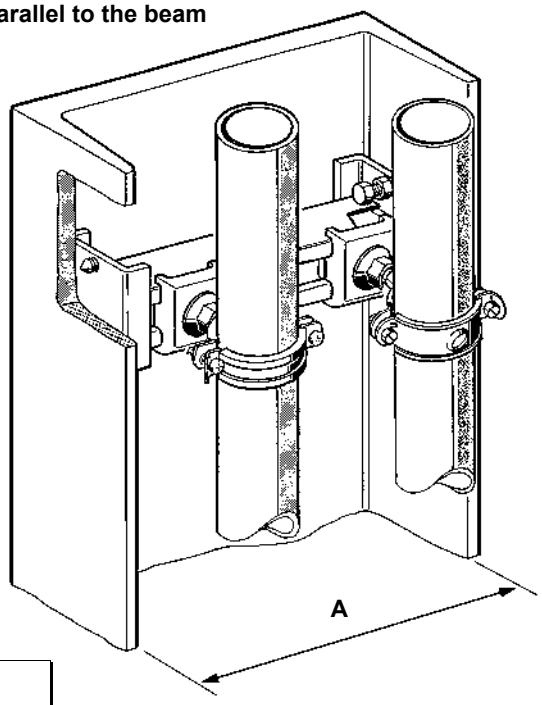


Clamping End set SKL for Installation to I-beam and C-section profiles between flanges

Vertical beam and horizontal pipe run



Pipe run parallel to the beam



Note:

- *Each Clamping End set SKL consists of two identical clamping plates. The support Channel between the end plates has to be cut to length on site.*
  Fix the SKL set as deep as possible within the beam profile.

Note:

- *Bolting torque: min. 1 up to max. 1 1/2 rotations*

  Lock after tightening!

Caution!

- *Excess tightening of the point screws may result in deformation of the beam.*

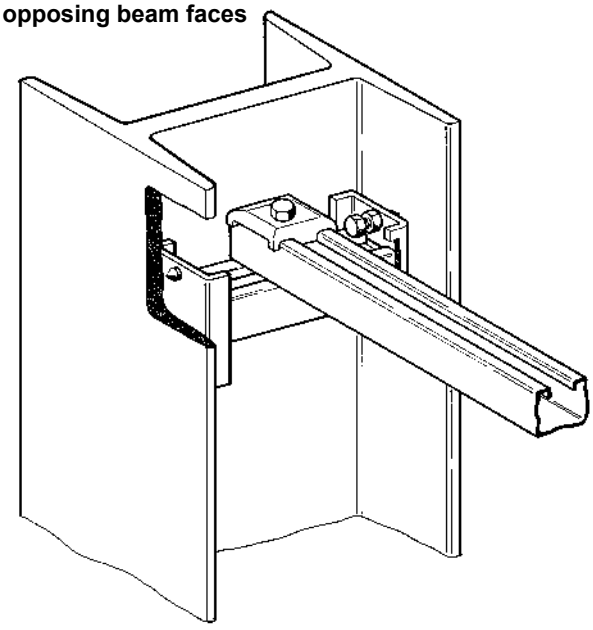
Cutting length of the Channel = A - 25 mm

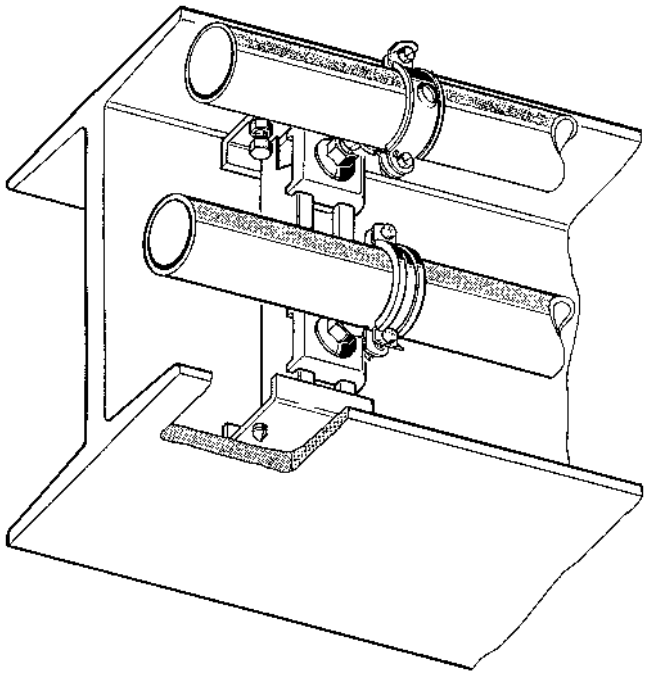
A = clearance between the flanges

Suitable for beams with A = 150 ... 800 mm

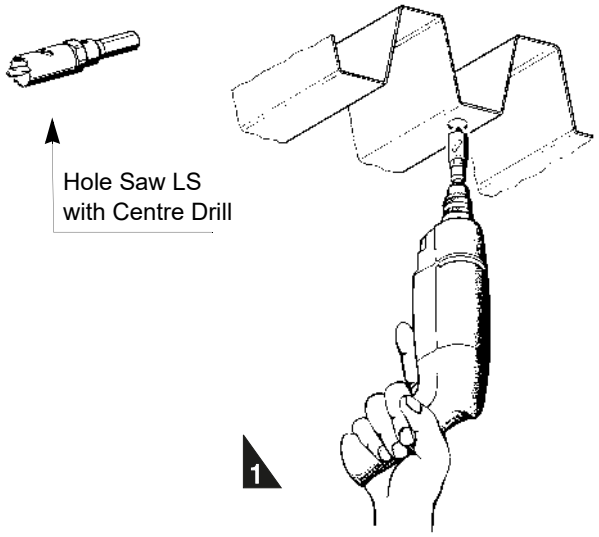
To be used in combination with Channels 41/41/2.5 or 41/45/2.5 and Holding Brackets HK 41.

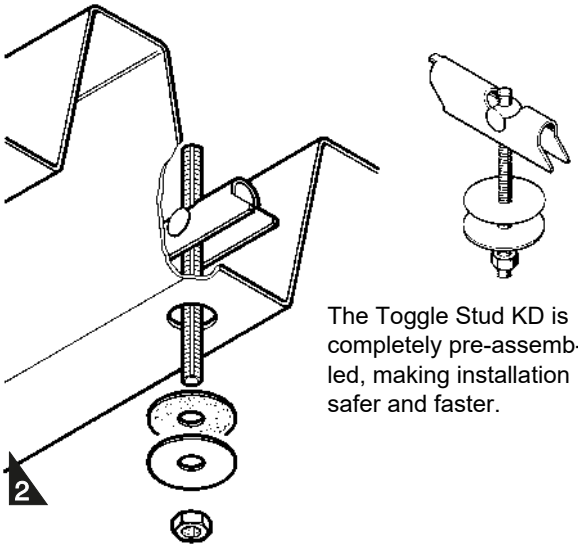
Cross-member support from webs between two opposing beam faces





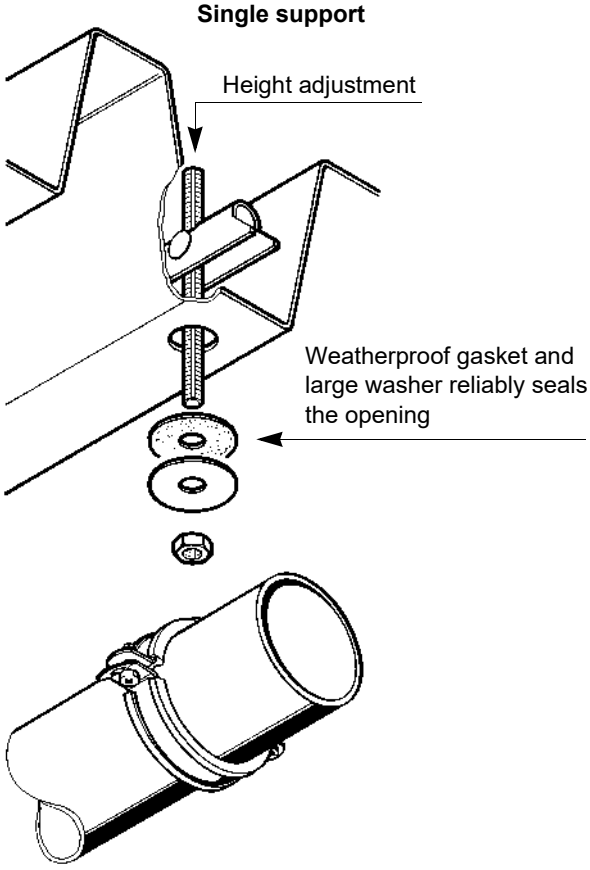
Toggle Stud KD for Installation to profiled Metal Decks



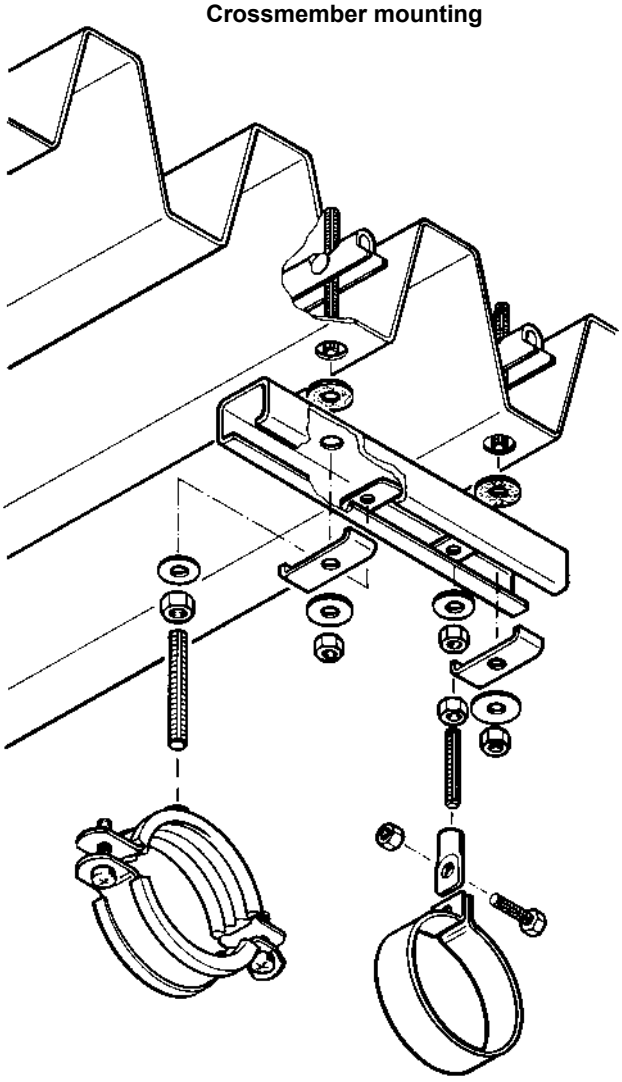


The Toggle Stud KD is completely pre-assembled, making installation safer and faster.

Single support



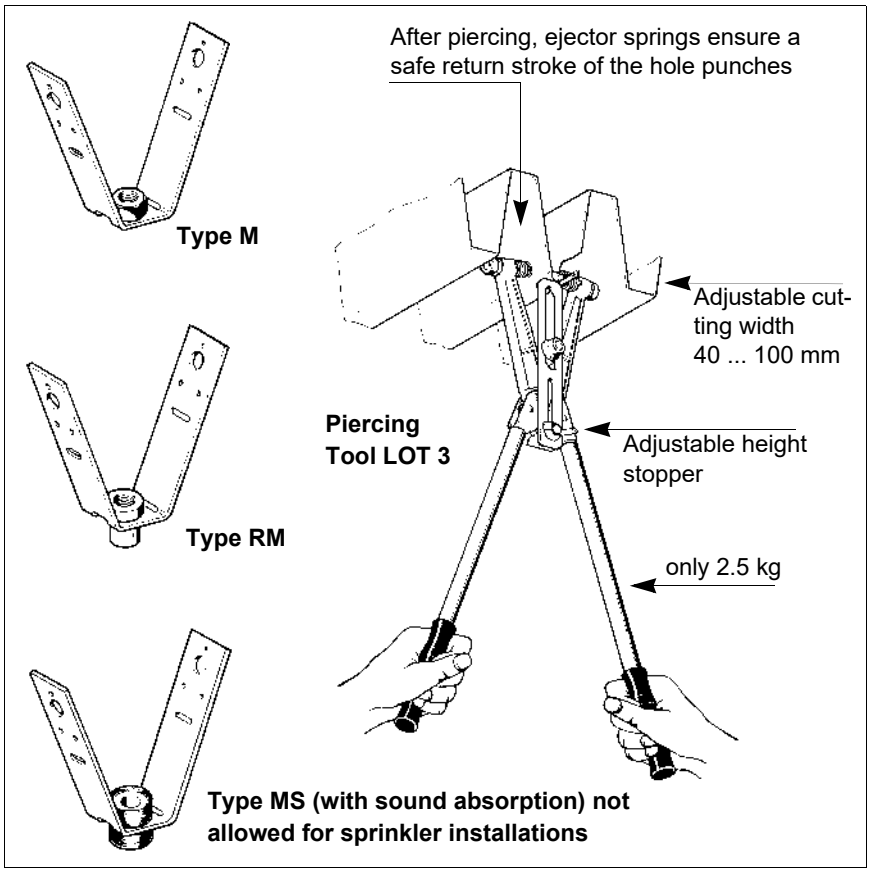
Crossmember mounting



Note:

- *Based on EN12845:*
  Pipes > Ø 50 mm must not be attached to trapezoidal steel roof panels.

Roof Hangers TRH for Installation to Profiled Metal Decking



Note:

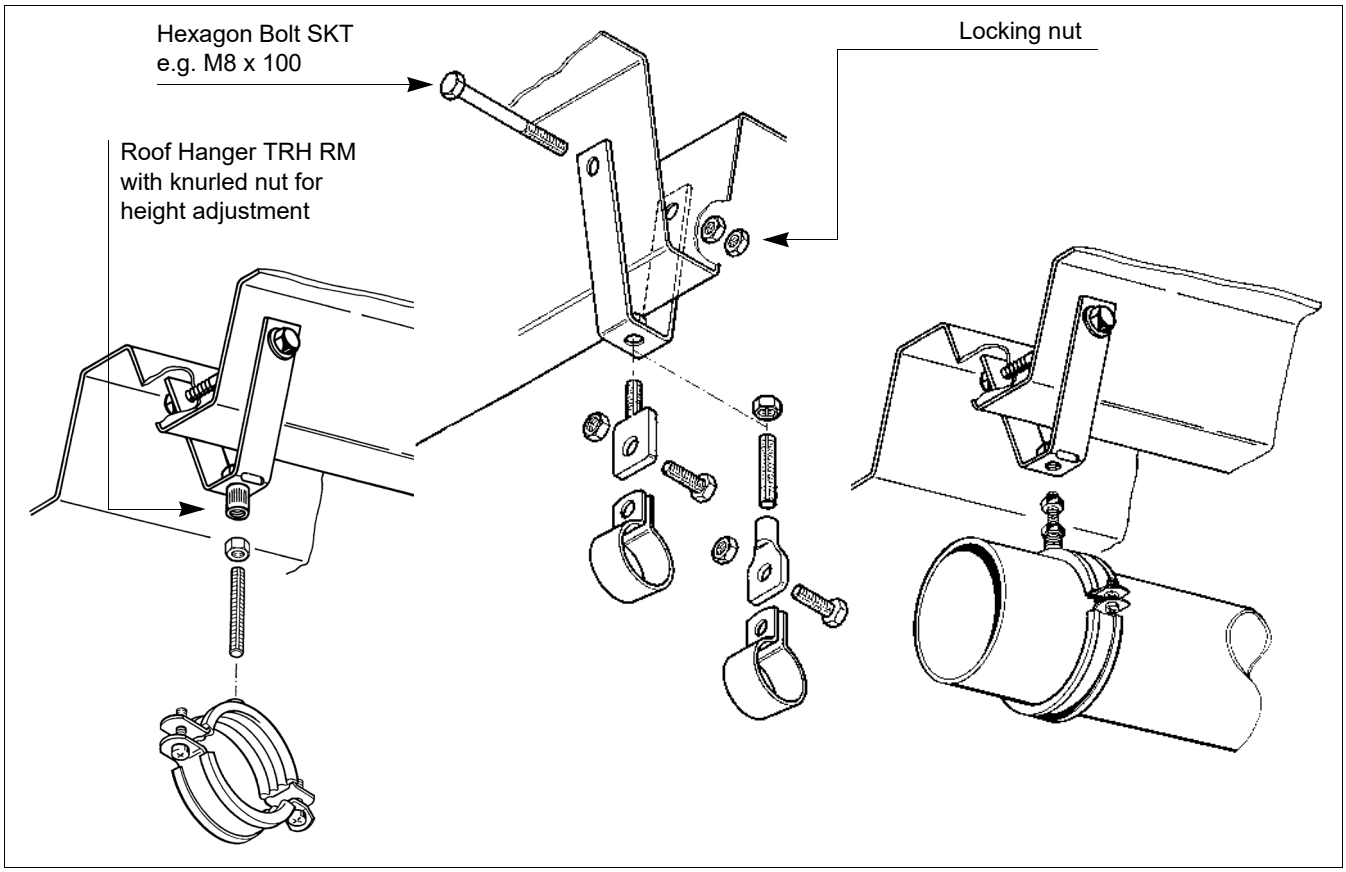
- *Based on EN12845: Pipes > Ø 50 mm must not be attached to trapezoidal steel roof panels.*

Height of perforation does not affect the loading capacity of the Roof Hanger TRH.

The greater the distance between the perforation and the bottom edge of the profile, the greater the stability of the Metal Decking Sheet.

Note:

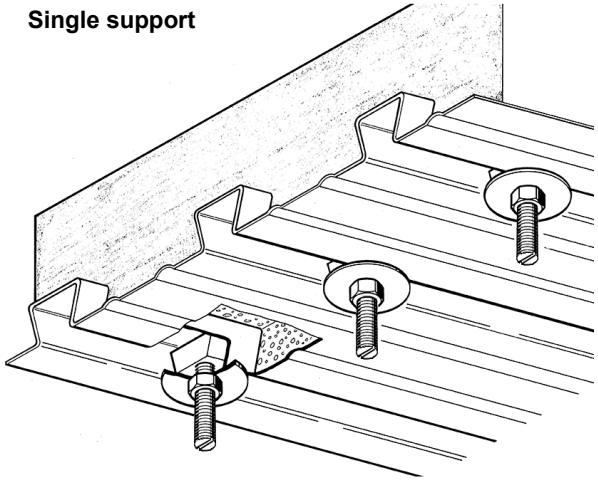
- *According to the VdS guidelines for sprinkler installations, all bolting has to be locked, e.g. with a locking nut at the horizontal bolt.*

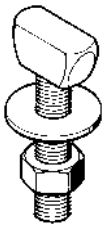


Fixing to Holorib and Cofrastra composite floors

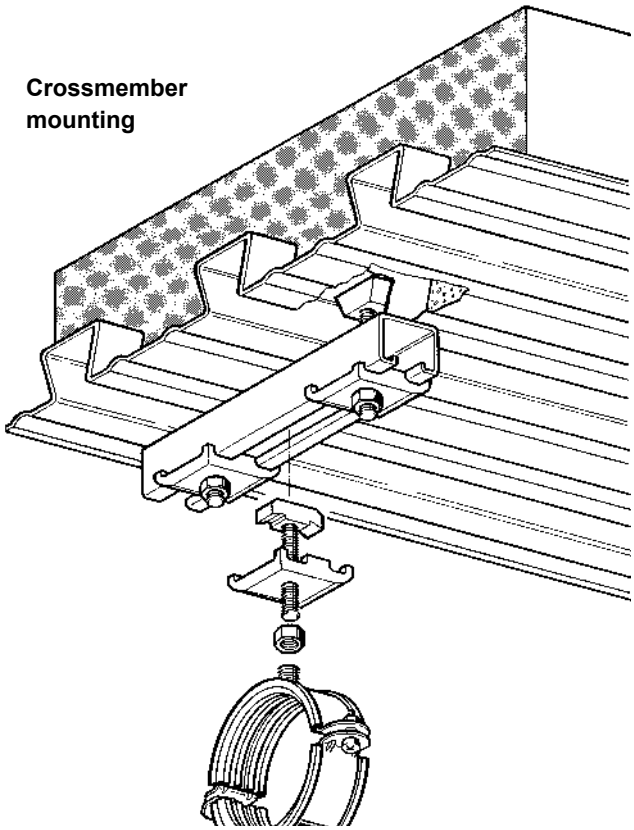
Wedge Bolt KB

Single support



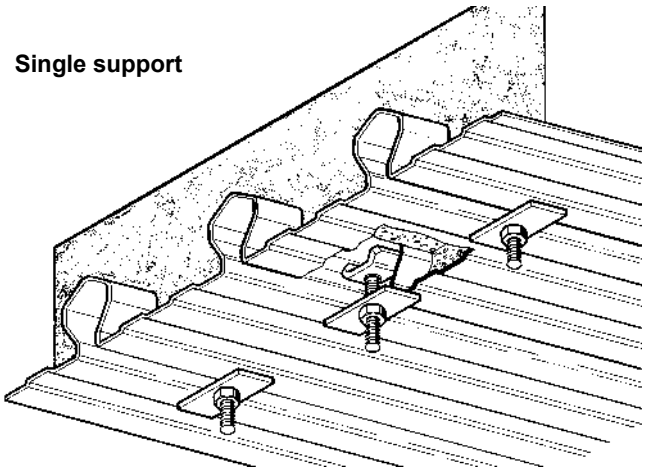


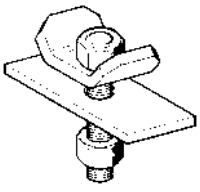
Crossmember mounting



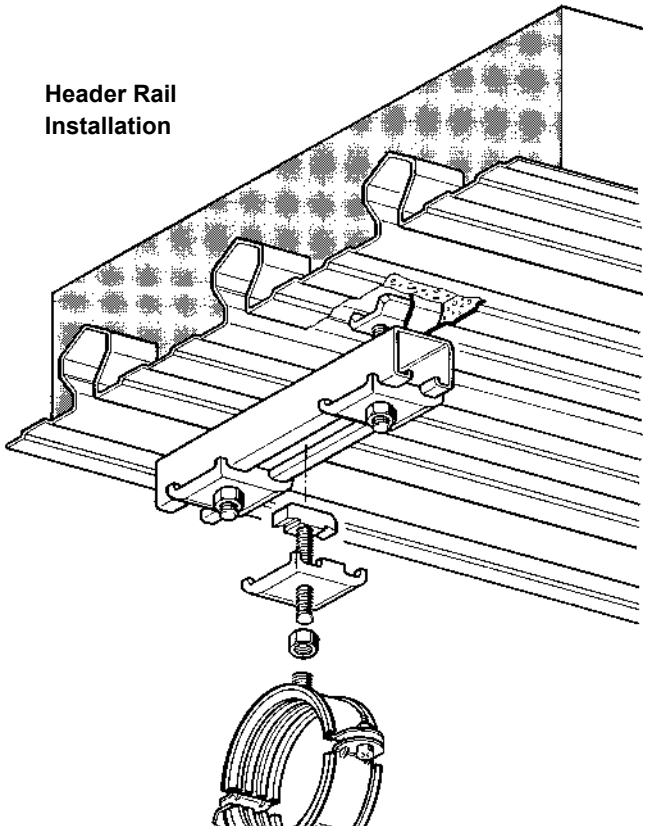
Clamp VBO C 40

Single support



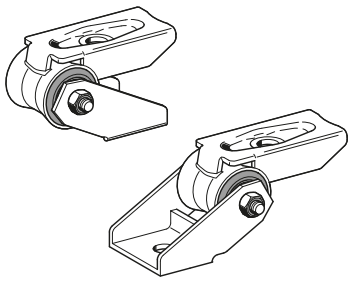


Header Rail Installation

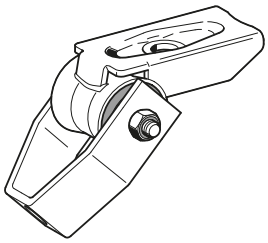


Products

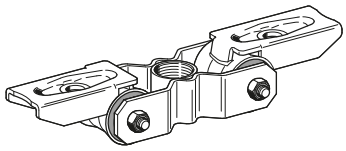
Sound Absorber SDE 2 - SBV, SBZ



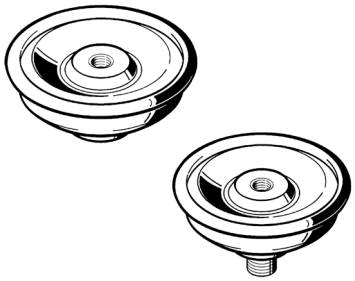
Sound Absorber SDE 2 - UG 16



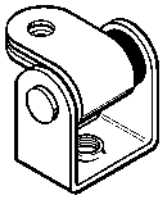
Sound Absorber SDE 2 - FP 1



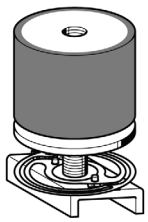
Sound Absorber SDE 1 - M10, 3G



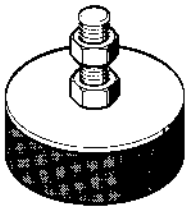
Sound Absorber SDE 0 - M8, M10



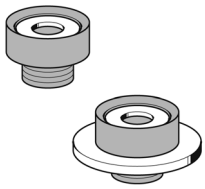
Acoustic Absorption Element AKE 41



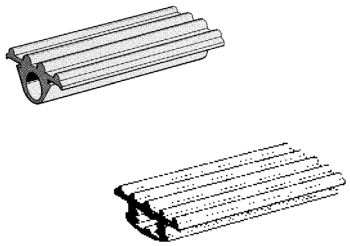
Rubber-Metal-Combination-Element GMT



Sound Absorption Unit SDE 27, 41



Channel Lining SAL 27, 41

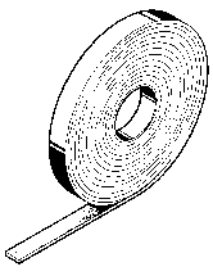


Rubber Profile SAL

SBR/EPDM; Silicone

Sponge Rubber Lining MSK

Glass Fibre Tape GSK



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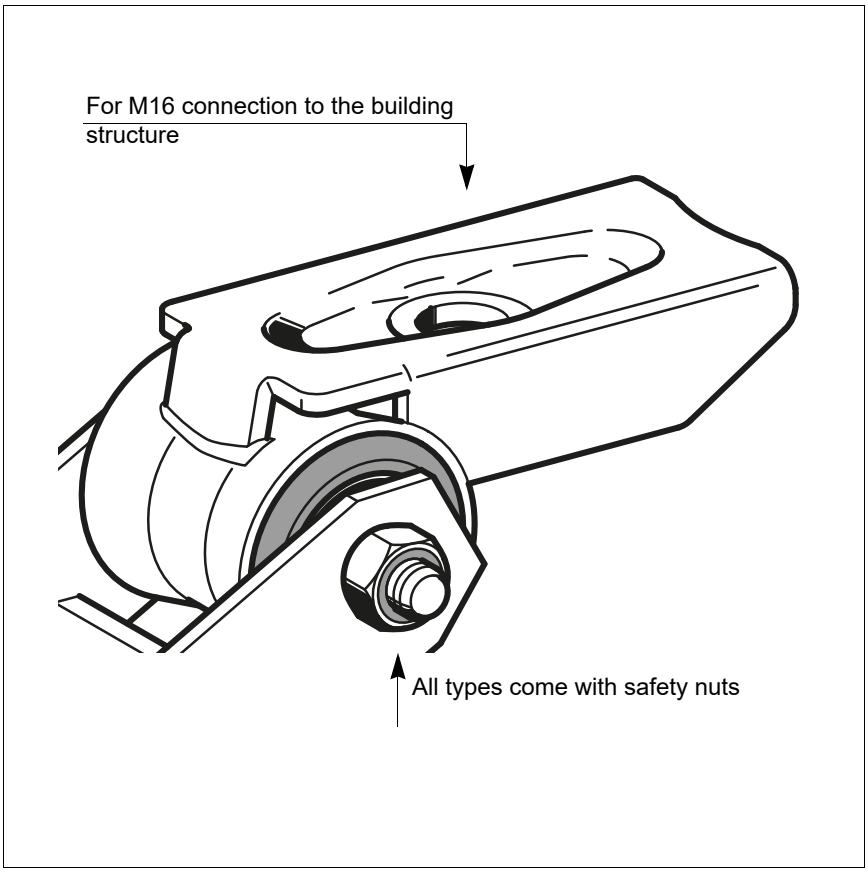
Sound Absorber SDE 2 (structure and overview)



According to the test certificate of the Fraunhofer Institute, the Sound Absorbers type SDE 2 guarantee sound absorption values of up to 15 dB(A), even under high loads.

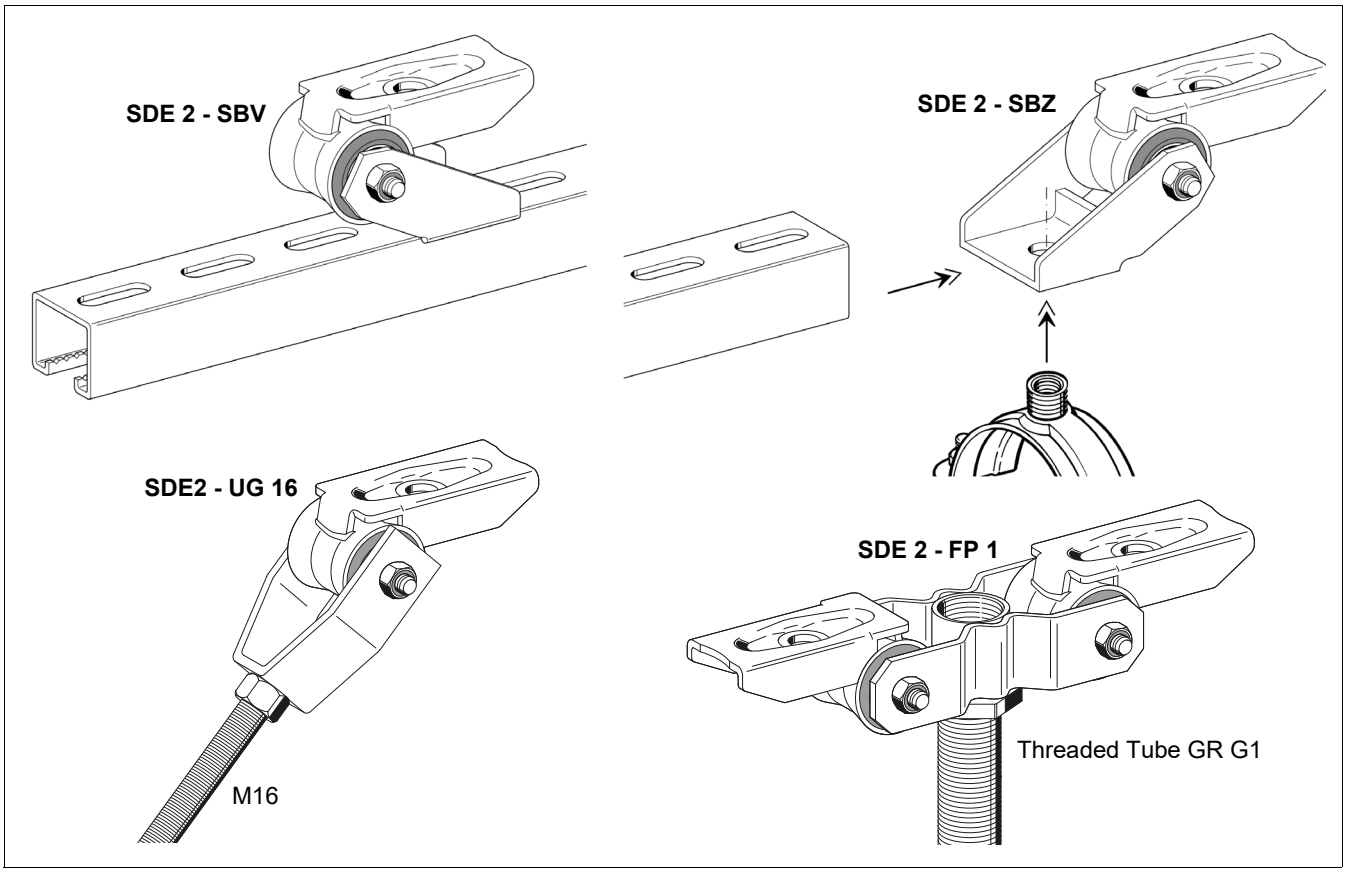
The symmetrical core, made of elastic foam PUR, is resistant up to 10kN in all directions of the rotation axis.

This same absorbing core is the basic material element of all SDE 2 types, and only differs by means of attachment to the connecting structure.

All types of the SDE 2 range can be fixed directly to the building structure or onto channels.

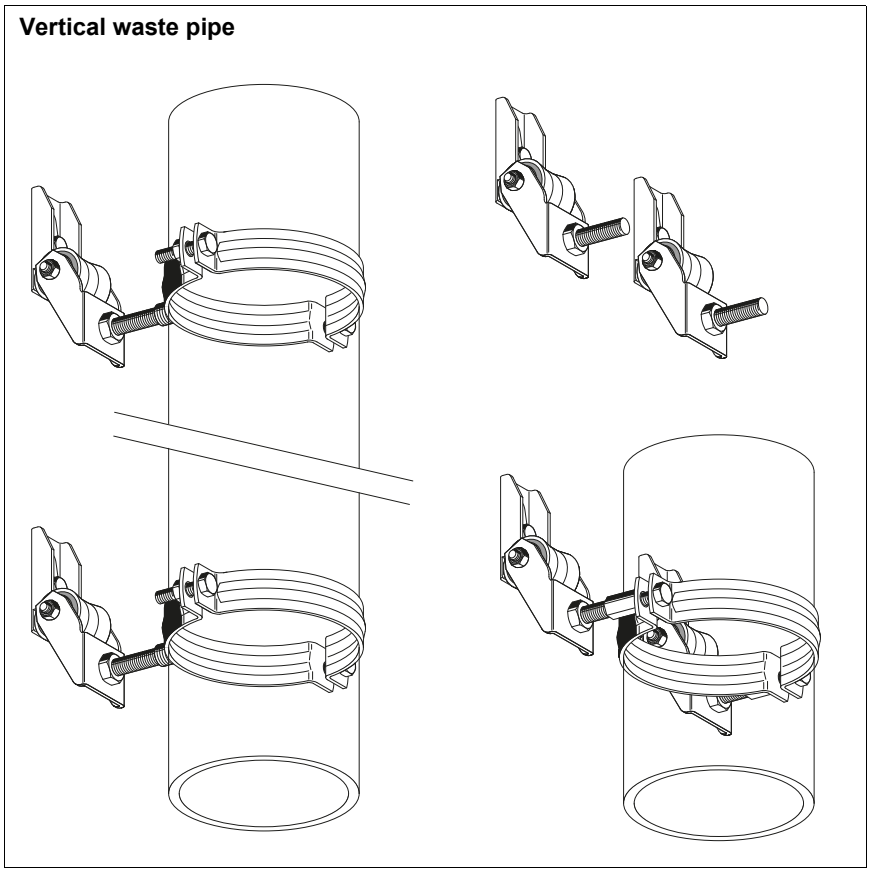
System-wise, connections can be made to:

- Channels MS
- Threaded Rod GST M16
- Threaded Tube GR G1 or
- Stabil D-3G Pipe Clamps



Soundproof Fixing with SDE 2

Vertical waste pipe



Examples for pipe installation according to soundproof requirement DIN 4109.

For every pipe section 2 pipe clamps are required.

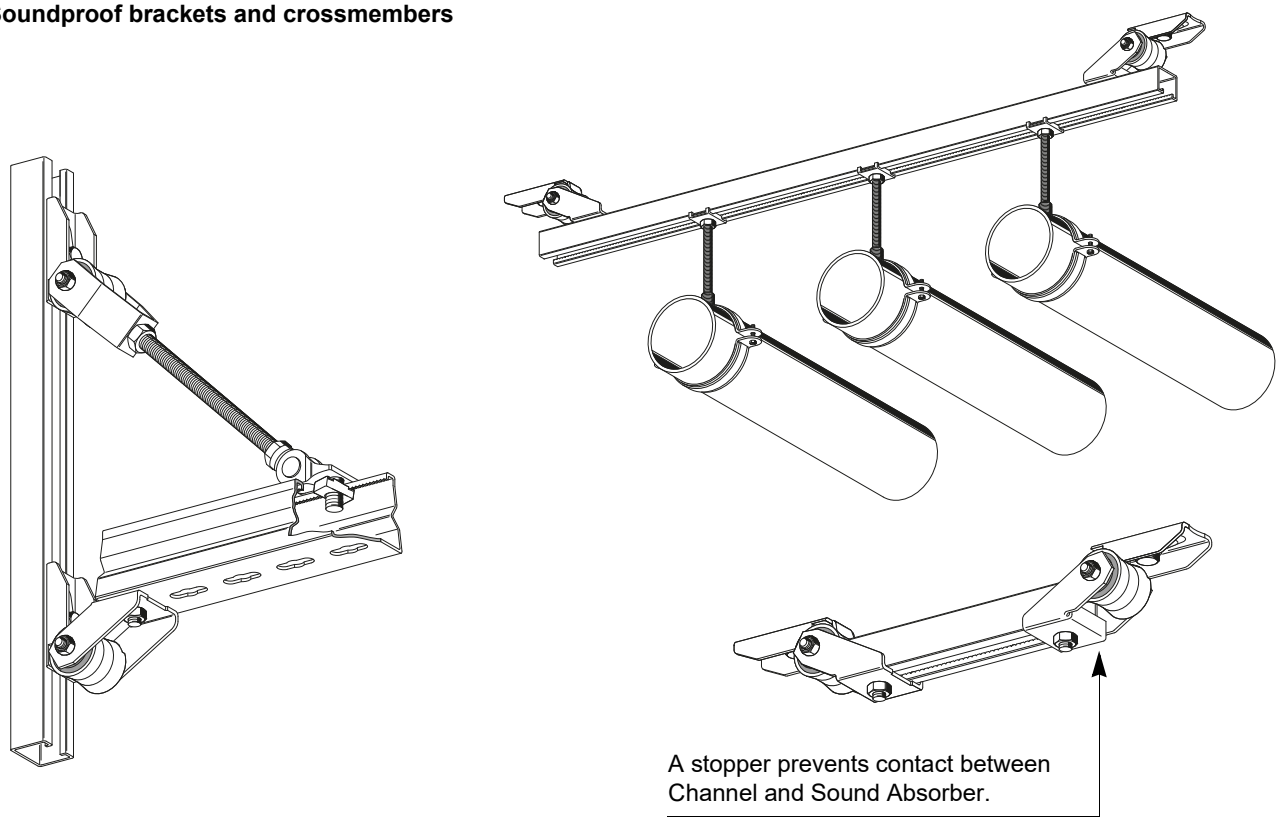
Options:
- single point mounting
- two point mounting.

To realize small clearances between pipe and wall and for pipes from size 200 mm onwards, two point mounting is recommended.

Note:
- *Check the stability of the connections.*

The combination of different types enables the soundproof fixing of various arrangements to crossmembers.
▼

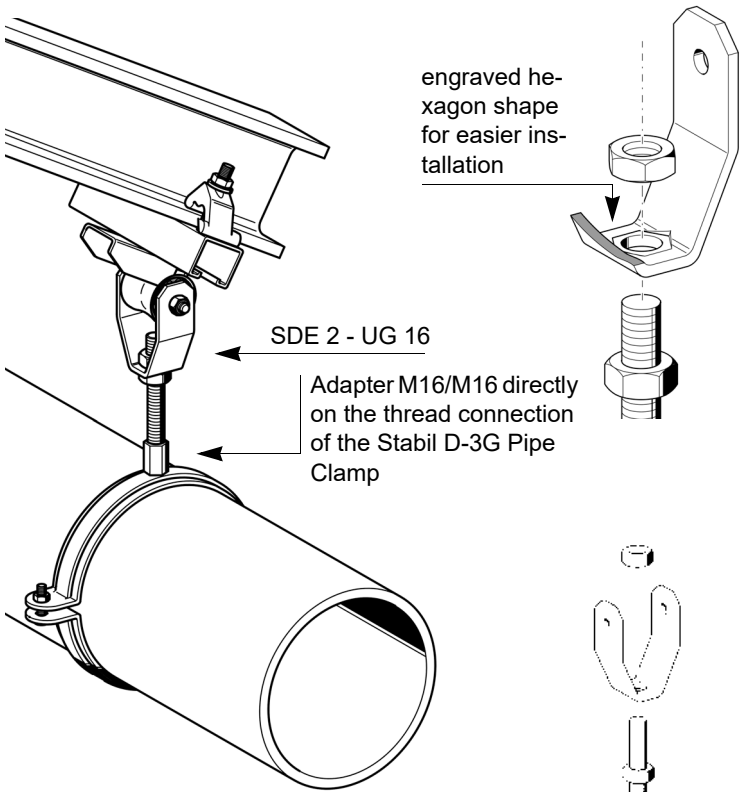
Soundproof brackets and crossmembers



A stopper prevents contact between Channel and Sound Absorber.

Diagonal connections and trestle arrangements

Soundproof brackets and crossmembers



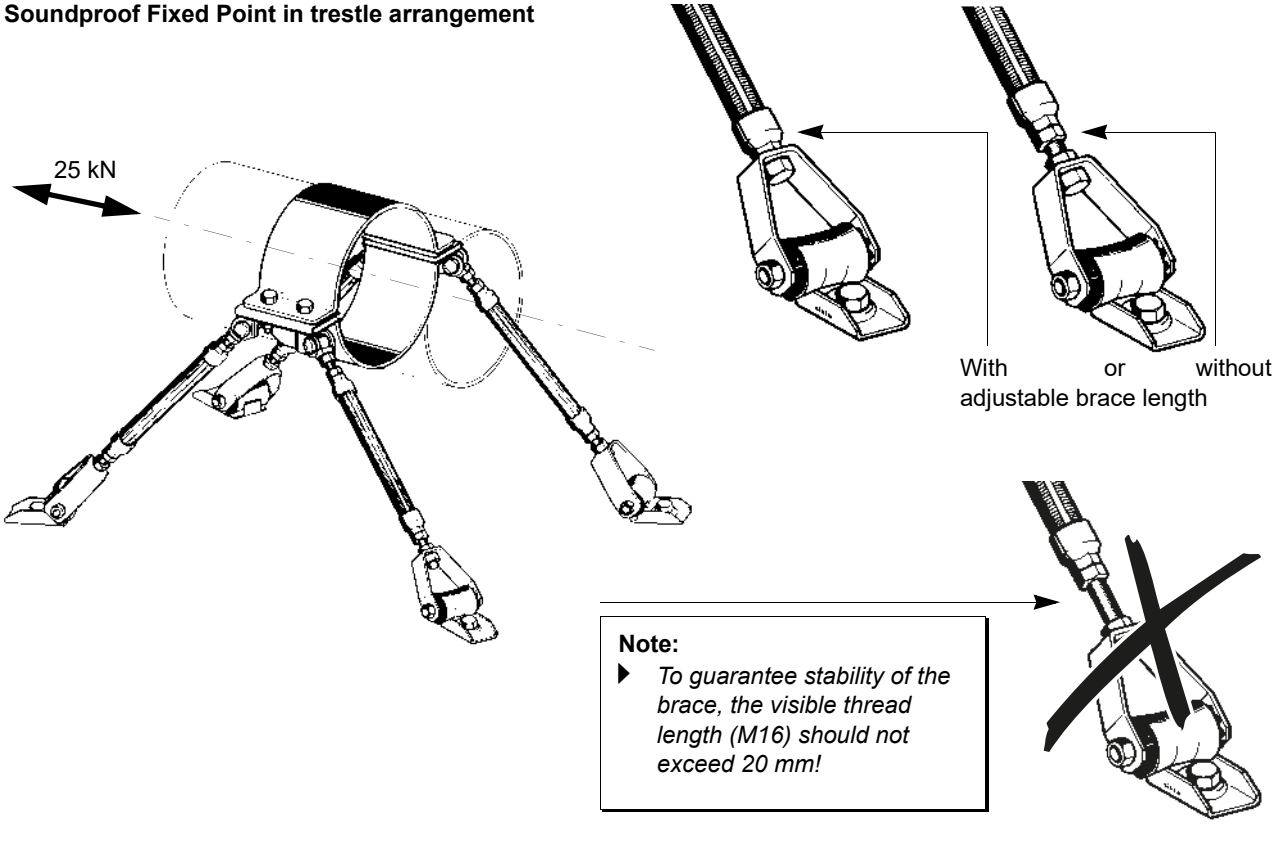
SDE 2 - UG 16:
Universal Joint with Sound Absorber!

Particularly suitable for soundproof fixing to
- inclined ceilings
- inclined steel beams
- for pendulous suspension.

Note:
- *Depending on the extent of vibration and potential of slip, connections to inclined beams must be additionally braced.*

Soundproof Fixed Point in trestle arrangement, consisting of 4 SDE 2 UG 16 resislient up to 25 kN and caters for sound absorption up to 15 dB(A).
▼

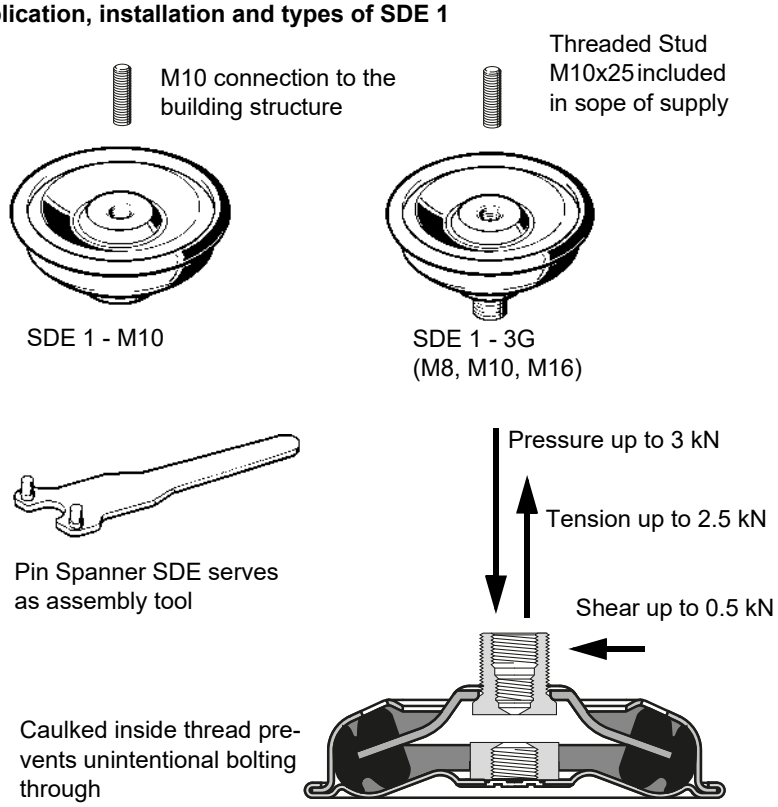
Soundproof Fixed Point in trestle arrangement



Note:
- *To guarantee stability of the brace, the visible thread length (M16) should not exceed 20 mm!*

Sound Absorber SDE 1

Application, installation and types of SDE 1



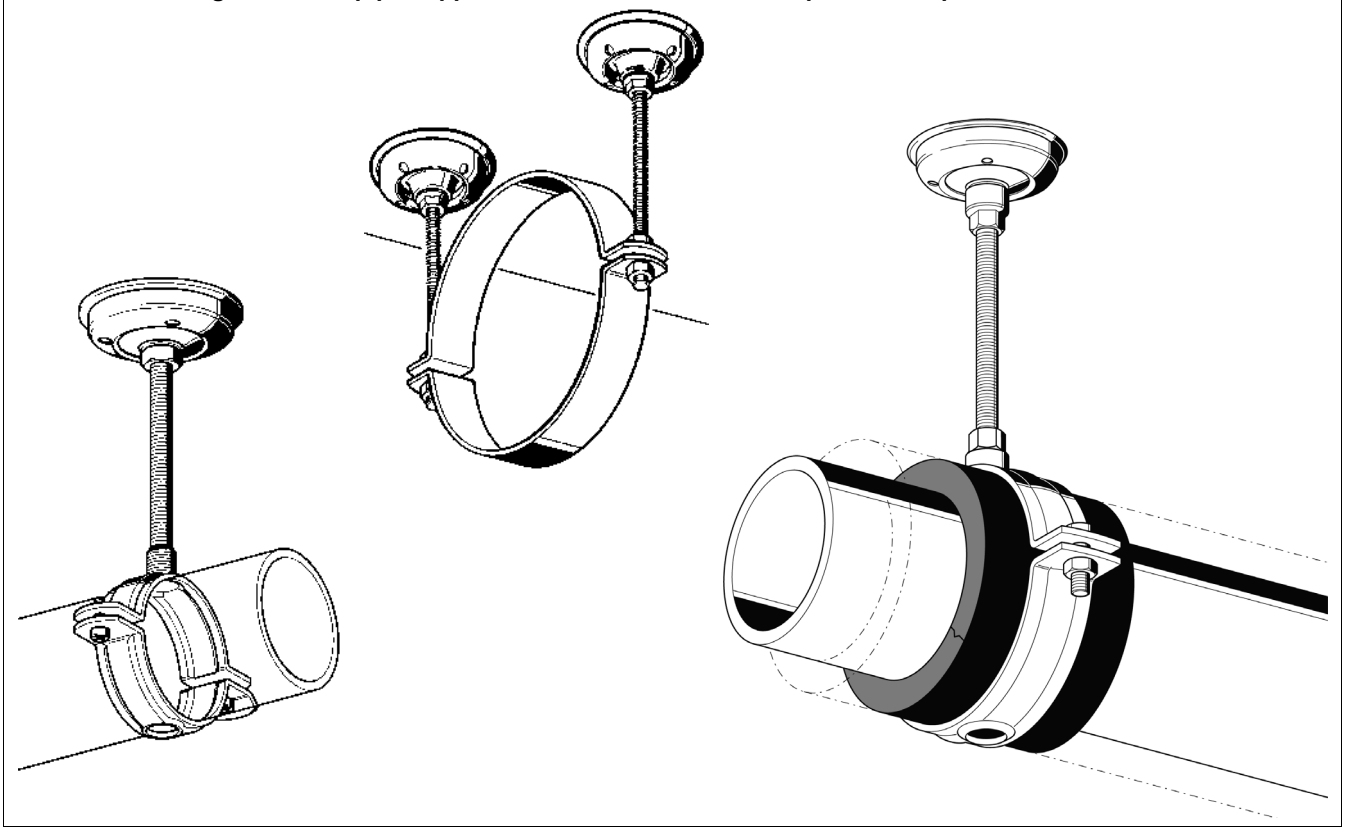
SDE1:
Sound absorption of up to 18.9 dB(A) on minimum space!

Particularly suitable for sound insulated fixing of
- pipe clamps
- crossmembers and
- brackets.

Note:
- *Threaded Studs can reduce extremely thrust capacity of construction, especially at greater lengths.*

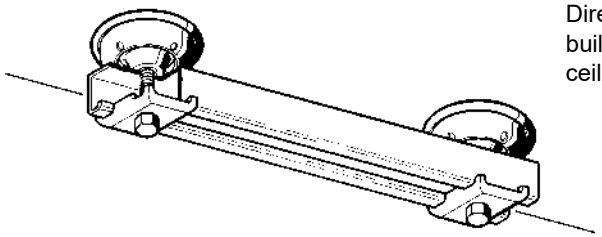
Using adapters, the SDE 1-3G enables connections through M16, Threaded Rods or Sikla Threaded Tubes up to G1.
▼

Alternative arrangements for pipe supports where the assemblies require sound protection to DIN 4109

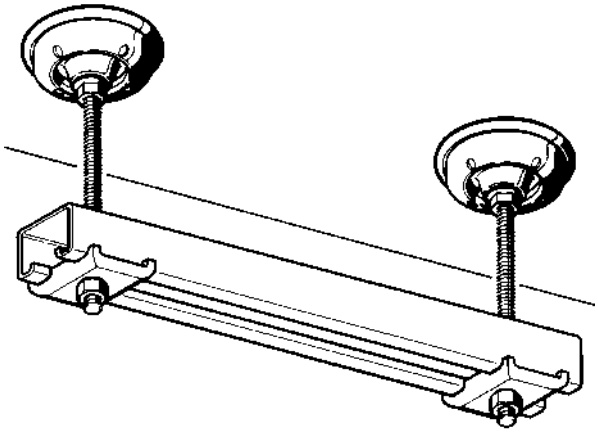


Sound Absorption for Crossmembers and Brackets

Soundproof crossmembers on SDE 1



Direct installation to the building structure for ceilings, walls or floors



Soundproof crossmembers: Channels are directly fixed to the SDE 1 using Holding Brackets HK and Hexagon Bolts SKT.

Note:

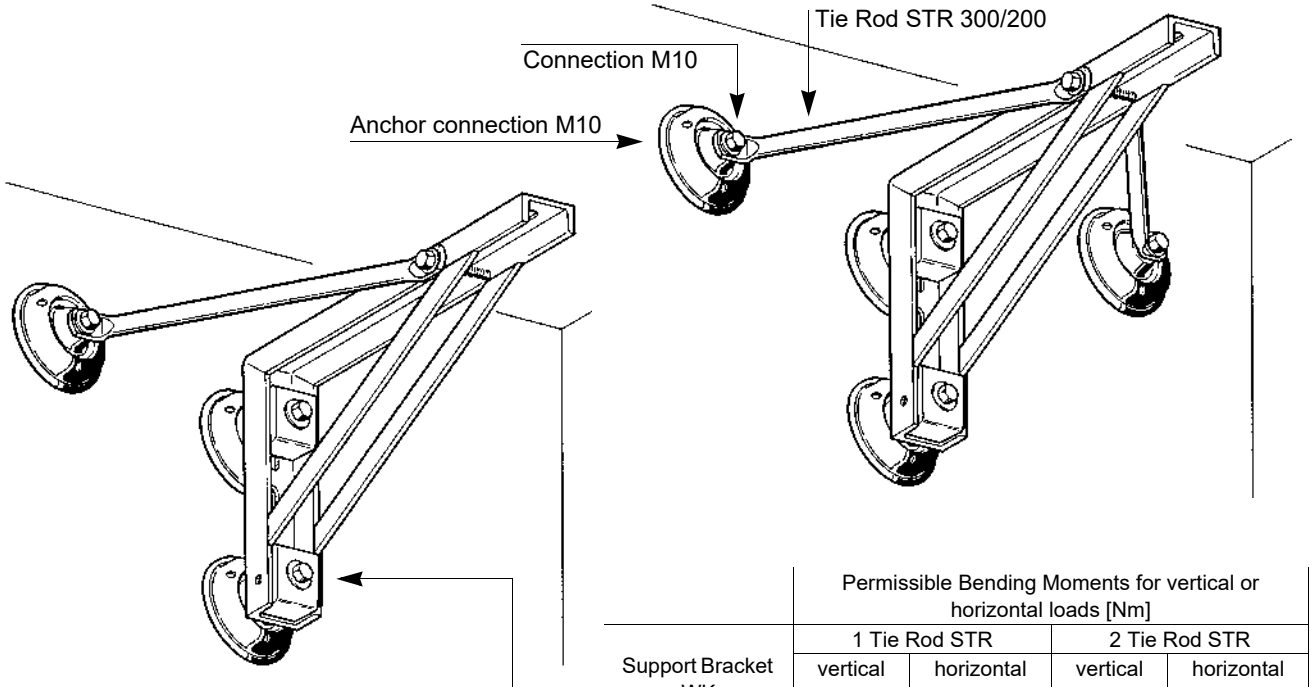
- *Suspended crossmembers are able to carry the weight of the pipes. When higher lateral forces appear, cantilevers must be used.*

Caution:

- *When fixing Support Brackets on SDE 1, at least one Tie Rod must be used.*

  Under load, the displacement of the bracket assembly has to be limited to a max. 3mm. Please consider bending moments which are listed in the table.

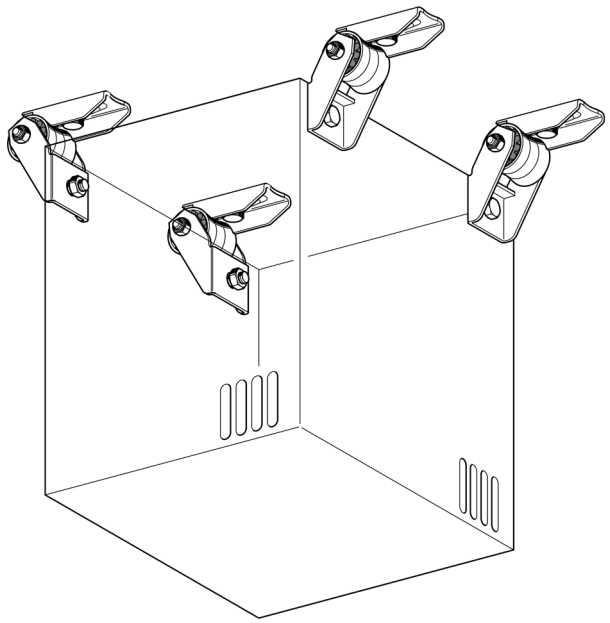
Soundproof Support Brackets with SDE 1 (Exampled are sizes 300/200 and 550/350)



Support Bracket WK	Permissible Bending Moments for vertical or horizontal loads [Nm]			
	1 Tie Rod STR		2 Tie Rod STR	
	vertical	horizontal	vertical	horizontal
300/200	220	180	300	330
550/350	360	330	450	650

Sound Absorption for Ducting Devices

Arrangements using Sound Absorbers SDE 2 Types SBZ and SBV



Types of sound absorber must be chosen according to the weight and installation situation.

Optimum combinations of sound absorber can enable better space-saving installation options.

Note:

- *For correct installation of connecting parts to the SDE 1, the length of the M10 or M12 Hexagon Bolts SKT have to be determined carefully.*

  L_{max} *= height of connecting parts + 10 mm*

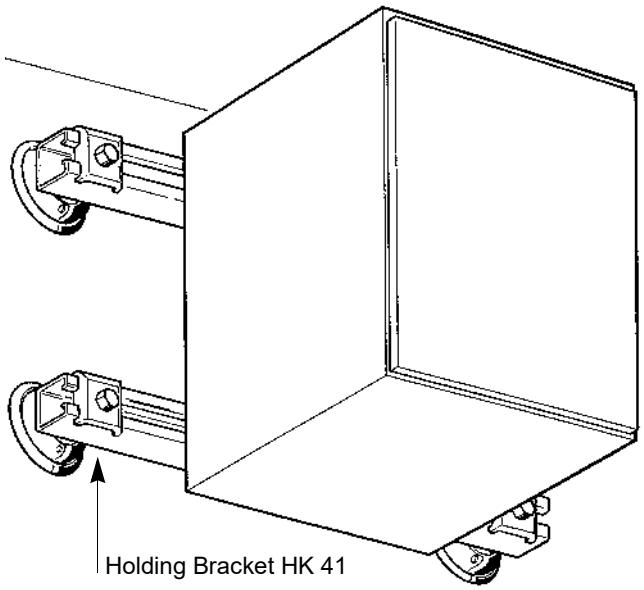
  L_{min} *= height of connecting parts + 7 mm*

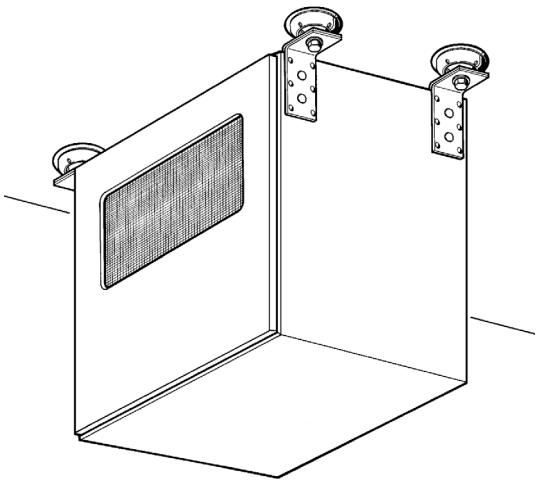
The height can be adjusted using washers.

▼

Sound Absorber SDE 1

Wall mounting on crossmembers, with the channels mounted either horizontally or vertically.





Direct ceiling or floor suspension using Ducting Angle L.

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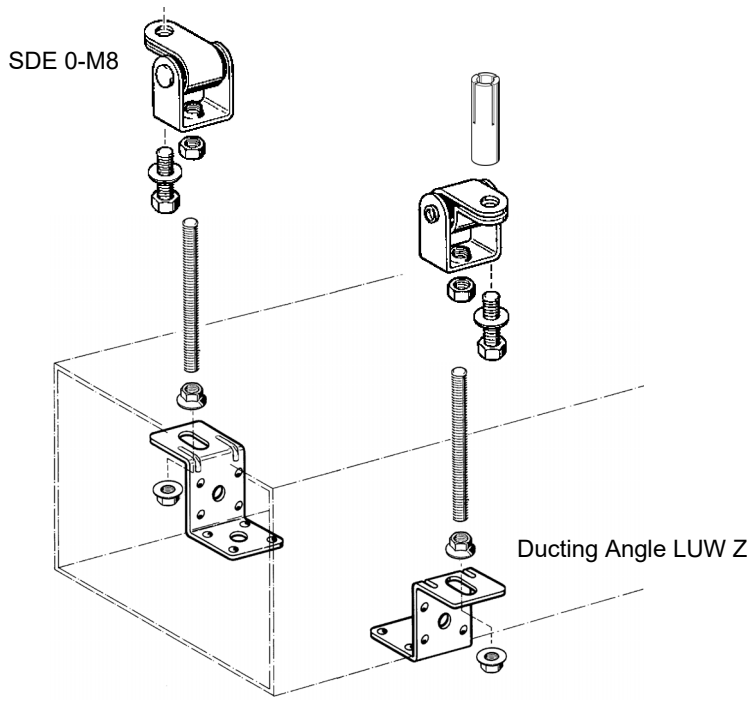
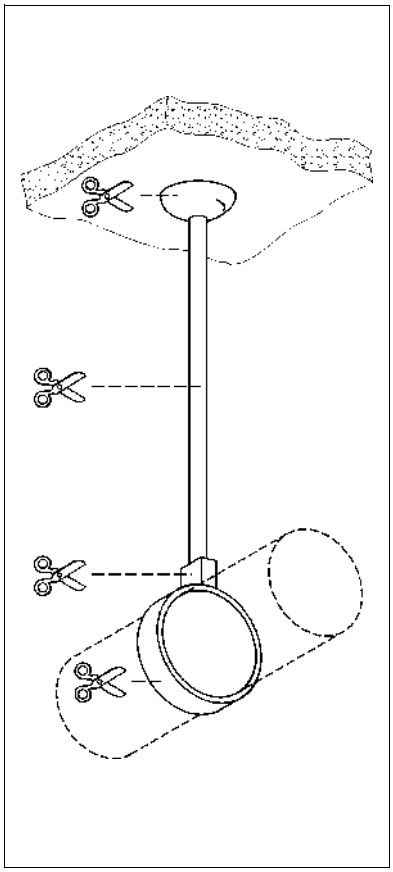
Application Examples and Standards

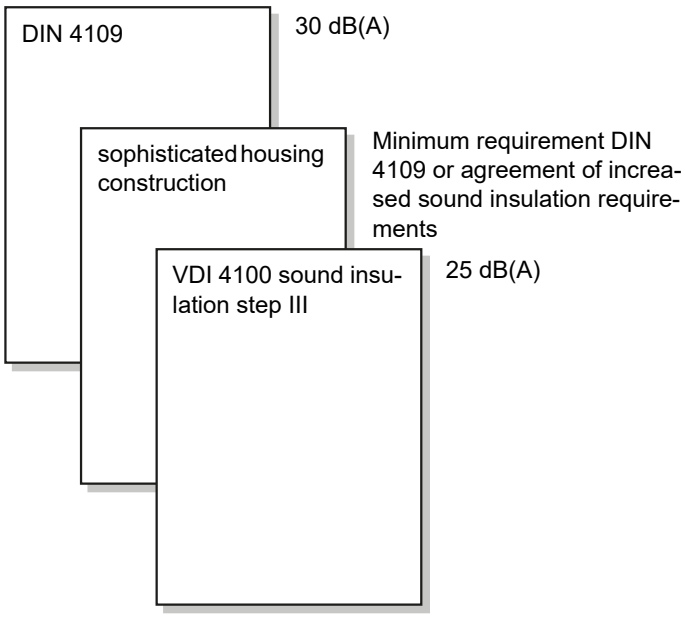
Sound Absorbers SDE 0 for rectangular and spiral ductwork





▲
Sound Absorbers can be fixed to every "interface" of construction. Though, values of insertion loss may not be simply added together !

Standards and Agreements



By the right application of sound absorbers, expensive recourse claims caused by reduced living comfort will be avoided.

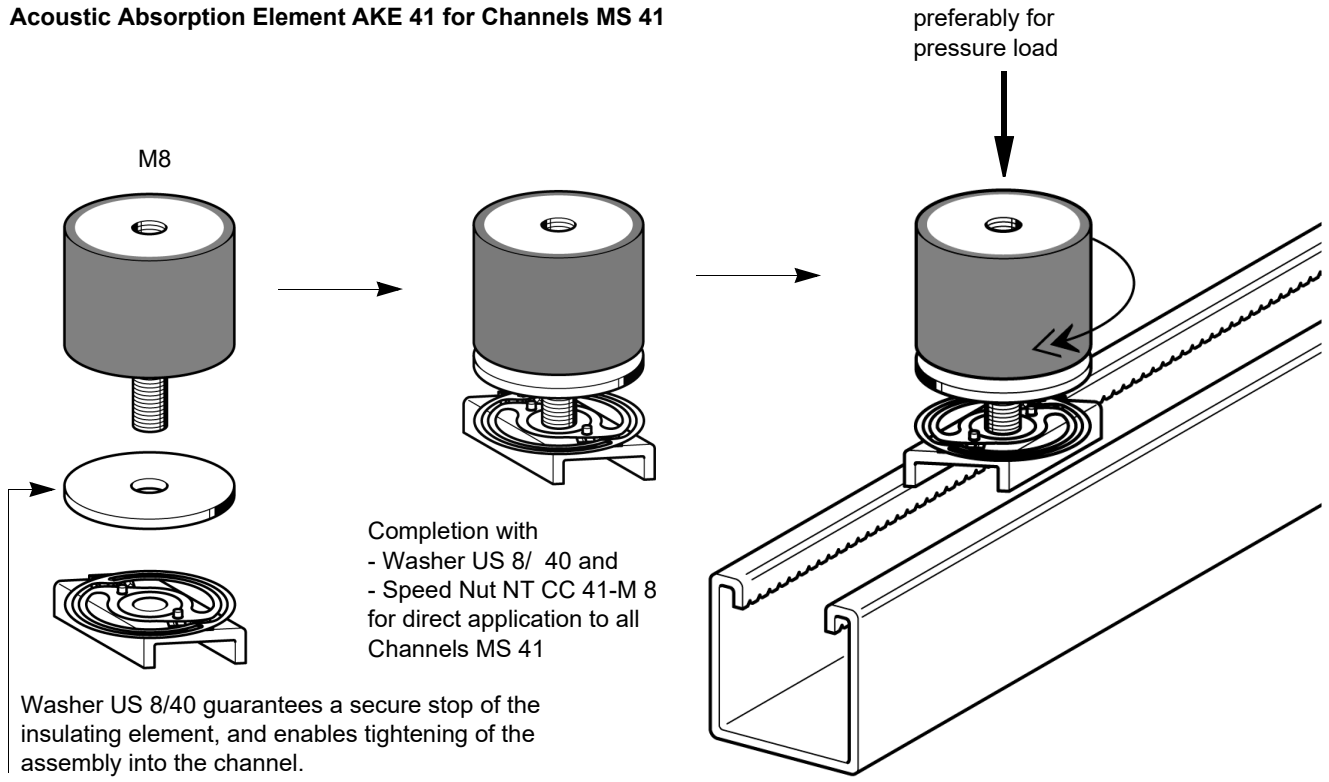
The permitted remaining sound level is stated in standards and other tendering determinations.

Note:

- *Sound absorption measures also improve the durability of installations and equipment by reducing the effects of vibration.*

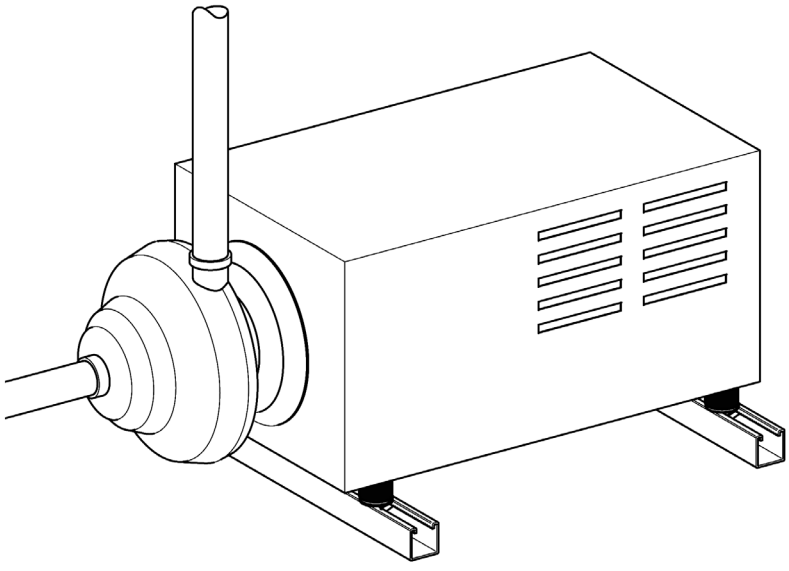
Acoustic Absorption Element AKE 41 and Rubber-Metal-Combination-Element GMT

Acoustic Absorption Element AKE 41 for Channels MS 41



Installation of pumps decoupled from structure-borne-noise by

- Acoustic Absorption Element AKE 41 (4 pieces) floor connection with Drive Plug AN M 8 or alternatively
- Rubber-Metal-Combination-Element GMT for setting up (1 set = 4 pieces)



Suitable for direct decoupling of devices like pumps, ventilators or channelconstructions according to sound absorbtion certificate DIN 4109.

Note!

- *Tensile and shear loads are typically not permitted when using the Acoustic Absorption Element AKE 41. For these exceptional cases where the element is subject to tensile and shear loads, reduced load ratings apply.*

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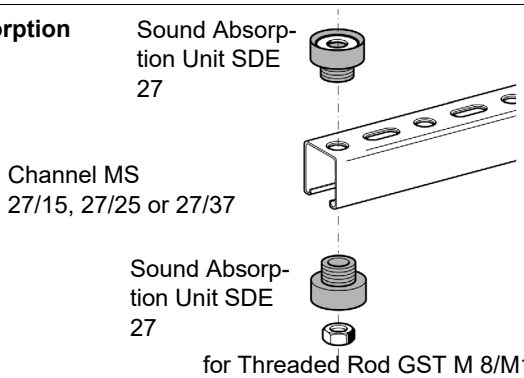
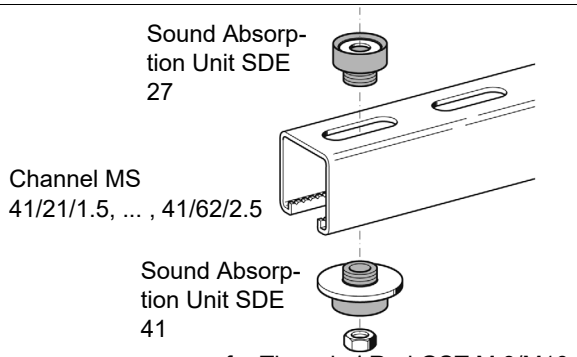
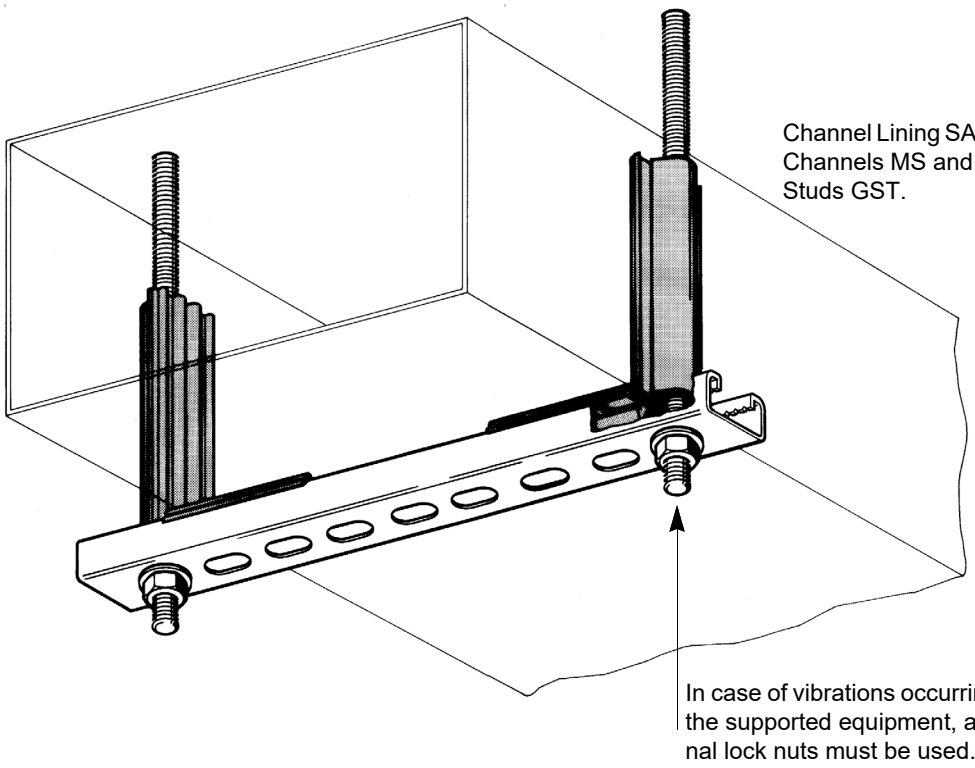
Sound Absorption Unit SDE for Channels MS, Rectangular Ducts on Channel Lining SAL

Sound Absorption Unit





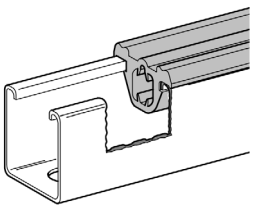
Channel Lining



Channel Lining SAL profiled to fit on Channels MS and over Threaded Studs GST.

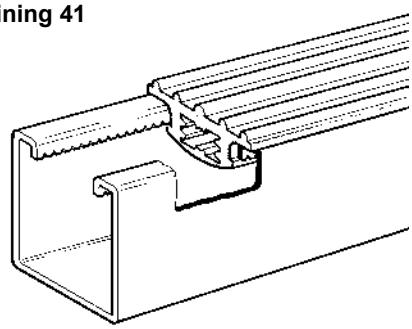
In case of vibrations occurring from the supported equipment, additional lock nuts must be used.

Channel



for Channels MS 27/15, 27/25 and 27/37

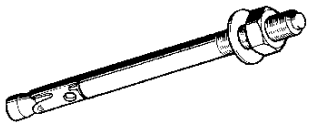
Channel Lining 41



for Channels MS 41/21/1.5, ... , 41-75/75/3.0

Products

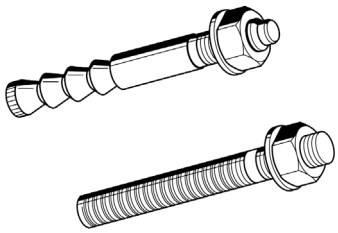
Bolt Anchor AN BZ PLUS



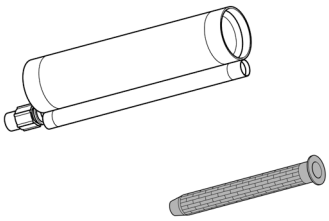
Drive Plug AN ES

Setting Tool for Drive Plug ANT

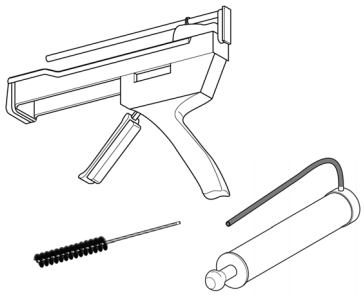
Resin Anchor Rod VMZ-A
Resin Anchor Rod VMU-A



Resin Injection Cartridge VMZ 345; VMU; VM-K / Perforated Sleeve SH

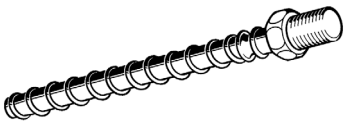


Assessories VMZ; VMU; VM-K

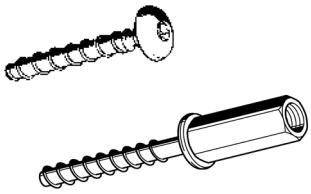


Dispenser; Steel brush; Blow-out Pump

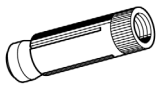
Screwbolt TSM-ST



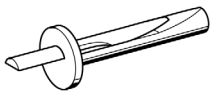
Screwbolt TSM-LP VZ 30
Screwbolt TSM-IM



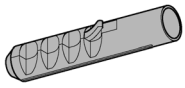
Hollow Core Anchor AN Easy



Nail Anchor PN 27

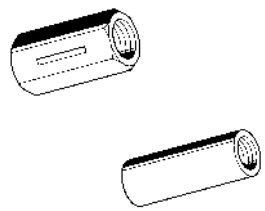


Nylon Plug AN



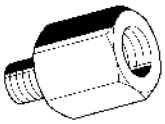
Products

Rod Coupling AD f/f

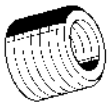


IG/IG; round

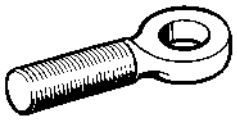
Reducer AD f/m



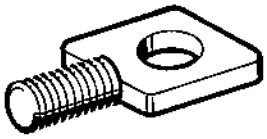
Reducer AD m/f



Eye Bolt SCR

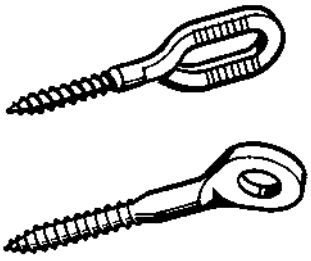


Flat Leaf Bolt SCR

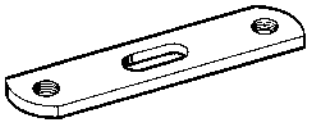


Link Eye SCB

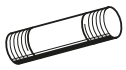
Eye Screw SCR
Eye Screw C RIN C



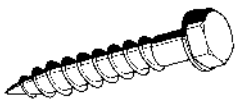
Twin Holder DHP M8



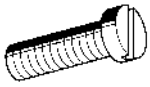
Threaded Spacer BOL M8



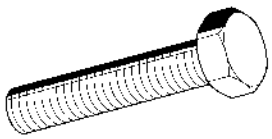
Hexagon Wood Screw SKH



Slotted Screw SCR



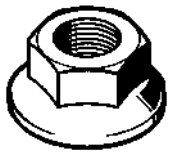
Hexagon Bolt SKT



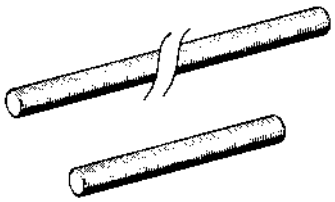
Products

Hexagon Nut NT

Flange Nut NT FLA

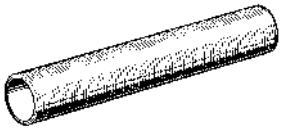


Threaded Rod GST
Threaded Stud GST

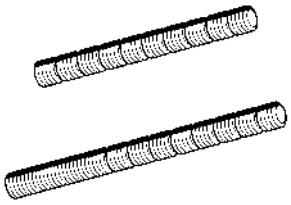


Locking Nut NT G

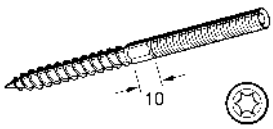
Threaded Tube GR



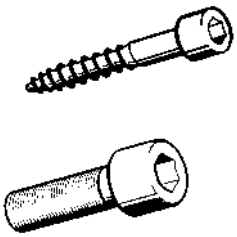
Grooved Rod GES PNS



Bolt Screw BSCR with collar

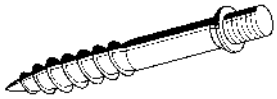


Hexagon Socket Screw SCR

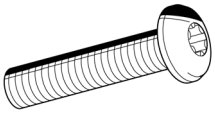


Washer US

Bolt Screw BSCR without collar



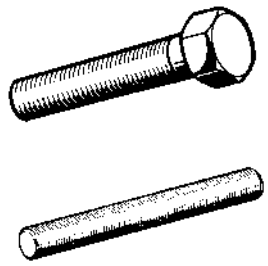
Flange Screw FLA HCP



Bolt Screw Adapter ANT BIT

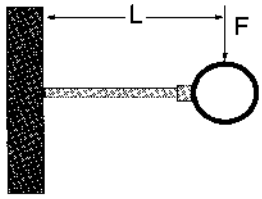
Load details for Bolts, Threaded Rods, Threaded Tube

Bolts and Threaded Rods



FK = Grade
μ_{ges} = 0.14

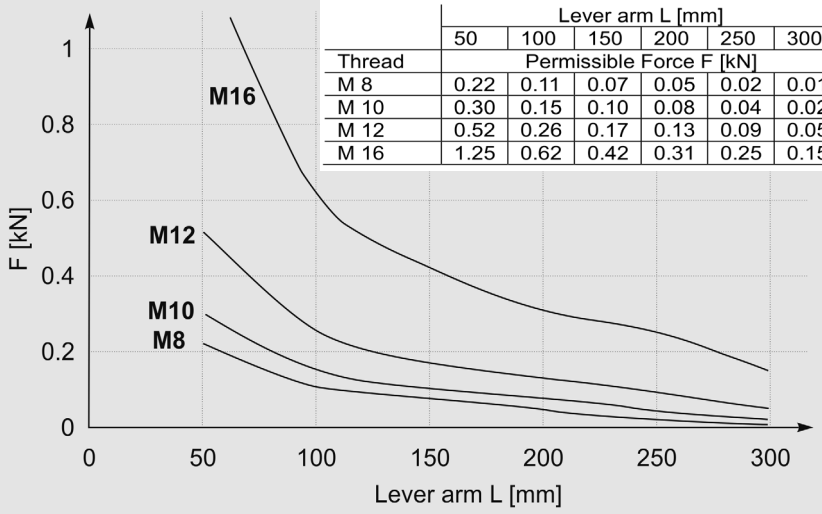
$\sigma_{adm} \leq 215$ N/mm² (FK 4.8)
$f_{adm} \leq 3$ mm



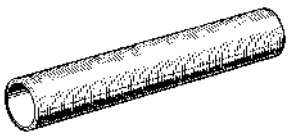
Thread	Permissible Load (tension) [kN]			Torque [Nm]	
	FK 4.8	FK 8.8	VA	FK 4.8	FK 8.8
M 8	8.0	15.6	4.6	12	25
M10	12.5	24.7	7.4	23	50
M12	18.1	35.9	10.8	40	85
M16	33.8	66.7	20.0	100	210

Permissible bending for threaded rod grade 4.8

Thread	Lever arm L [mm]					
	50	100	150	200	250	300
	Permissible Force F [kN]					
M 8	0.22	0.11	0.07	0.05	0.02	0.01
M 10	0.30	0.15	0.10	0.08	0.04	0.02
M 12	0.52	0.26	0.17	0.13	0.09	0.05
M 16	1.25	0.62	0.42	0.31	0.25	0.15



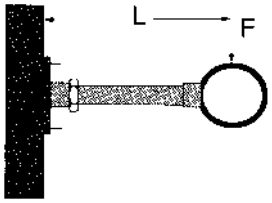
Threaded Tube



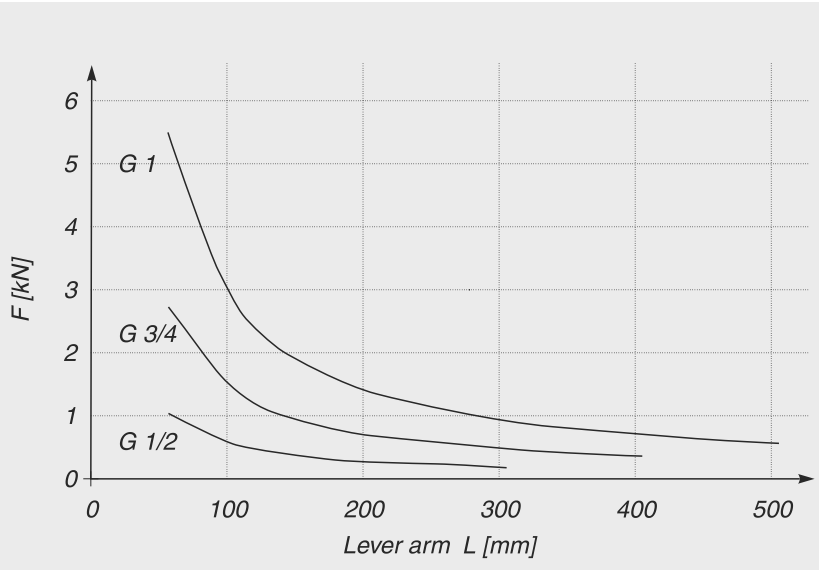
Thread acc. to DIN ISO 228

$\sigma_{adm} \leq 160$ N/mm²
$f_{adm} \leq 3$ mm

Anchor loads have to be calculated separately.

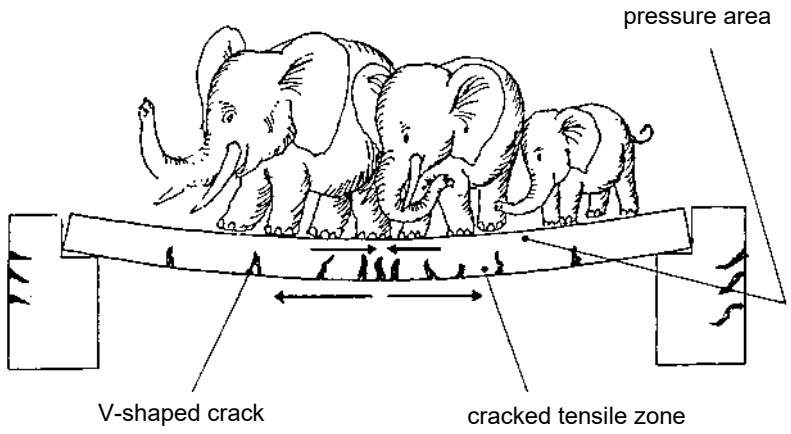


Thread	Permissible Load (tension) [kN]	Permissible Bending Moment [Nm]
G 1/2	18.0	53
G 3/4	28.3	138
G 1	41.4	277



Basics for heavy duty fixings

Tensile zone (cracked concrete)



The crack width usually is approx. 0.3 … 0.5 mm.

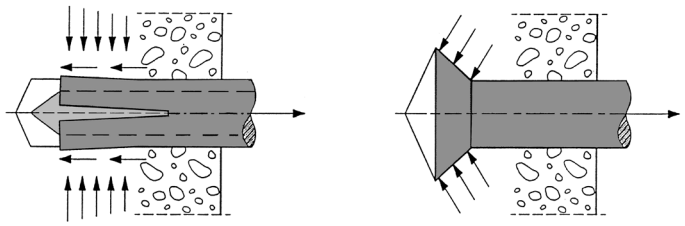
Tensile stress can cause cracks in all concrete parts of a building.

Areas particularly affected by tensile stress include the underside of slabs, and walls / columns under bending stresses.

Unless proven as a compression zone, all areas of concrete into which fixings and anchors are installed must be considered as cracked concrete.

Approvals
Anchorages must be dimensioned and calculated according to European Approvals **(ETA)**. The guidelines for these approvals are known as ETAGs and often statements on the characteristic load resistance of fixings to cracked concrete in the case of fire, can also be found here.

Function of Fixings



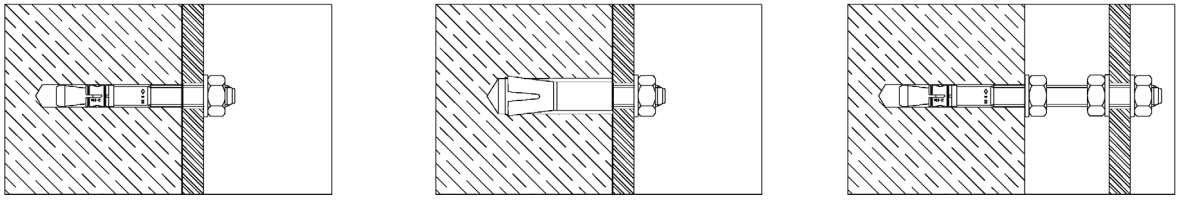
Friction by expansion

Form Locking

Anchors in cracked concrete have additional security through;

- automatic secondary expansion in case of crack expansion
- form locking by an undercut drill hole

Types of installation



Push-through installation
(Bolt Anchor)

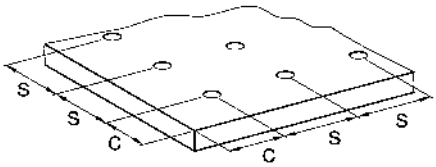
Pre-positioned installation
(internal thread anchor)

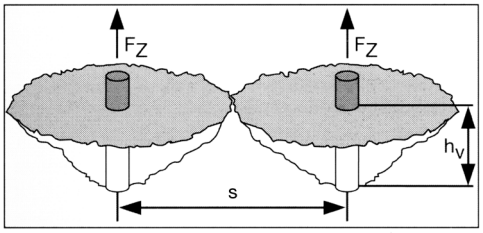
Stand-off installation
(Bolt Anchor)

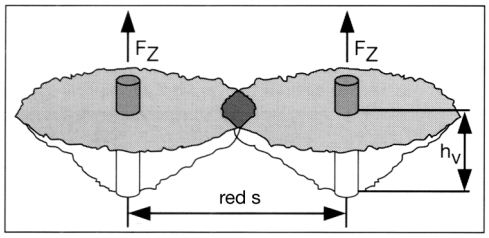
[Source: MKT]

Basics for heavy duty fixings

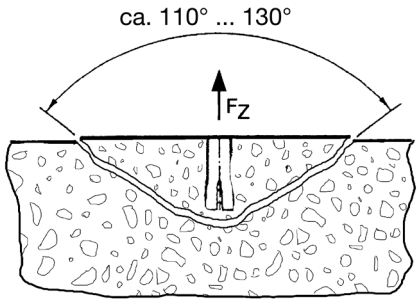
Axial spacing, edge distance, pull-out cone





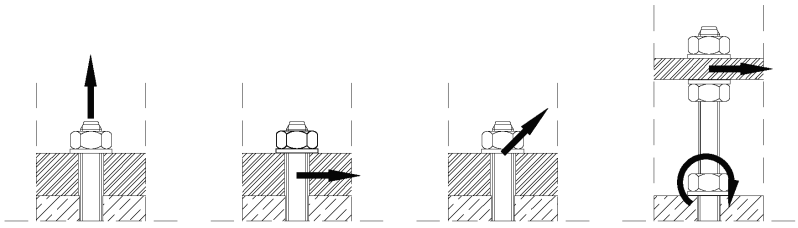


s = Axial spacing > red s = reduced axial spacing (in case of partial
c = Edge distance overlap of theoretical pull-out cones)
h = Component thickness
F_z = permissible loading (also N = normal force)



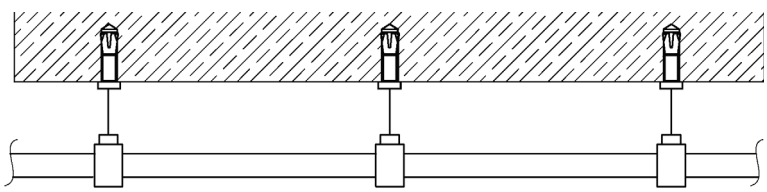
In the event of "concrete cone failure", a symmetrical cone of the concrete breaks away.
The anchor depth hv is therefore a determining factor in the load capacity.

Types of loading



tensile load | shear load | diagonal load | bending moment

Anchors for multiple use in non-structural applications



According to E**TAG** - part 6, a multiple fixing is existant when a pipeline has at least 3 fixings and the loading per point is max. 2 kN.
ETAG = Guide line for European Technical Approvals (ETA)

Basic rules for anchorages

① Load capacity:
Anchor type, base material strength and drill hole positions typically determine the load resistance of the anchorage.

② Concrete tensile area:
The load values often refer to the anchor performance in a concrete base material of class C20/25 (formerly B25).

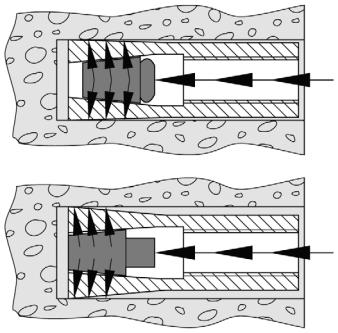
③ Corrosion protection:
Electro-galvanised anchors are typically only used only for dry indoor environments.
For damp environments and outdoors, anchors hot dip galvanised or made of stainless steel are typically specified.

④ Fire protection:
According to TRGI, the anchors for gas pipes must be manufactured from non-combustible steel; equally for fire protection of fixings according to comments from MLAR.

Installation instructions Drive Plug AN and Bolt Anchor AN BZ PLUS

Drive Plug AN ES

Setting Tool for Drive Plug ANT for secure installation.



Independent of small diameter tolerances of the drillhole, the "intelligent" expanding cone simplifies installation by allways developing the right pressure.

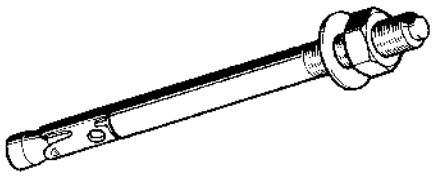
European Approvals (ETA) for multiple fixings used in non-structural systems in cracked concrete.

Load capacity is reduced in considering performance under exposure to fire.

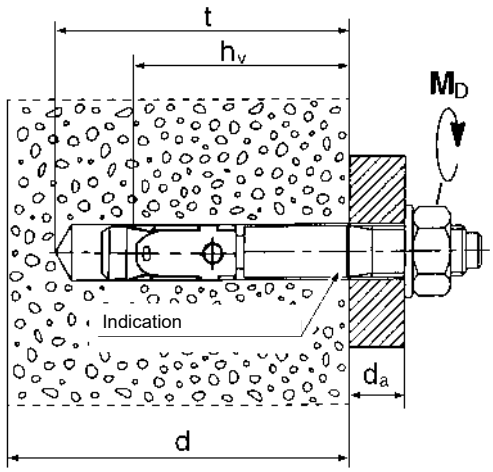
Advantages
- no special drill bit
- low impact energy when setting fixing
- suitable for pre-positioned installation.

Installation
1) Drill hole
2) Clean out the drilled hole
3) Set Drive Plug AN ES with Setting Tool ANT
4) Place installation item and connect to Drive Plug AN ES with correct length of threaded bolt or stud, and tightening torque.

Bolt Anchor AN BZ PLUS



Identical drill hole diameter to thread size



d = Thickness of components
d_a = Thickness of attachment parts
h_v = Anchor depth
M_D = specified tightening torque
t = Depth of drill hole

European Approvals (ETA) for multiple fixings used in non-structural systems in cracked concrete.

Load capacity is reduced in considering performance under exposure to fire.

Advantages
- no special drill bit
- low impact energy when setting fixing
- suitable for pre-positioned installation.

Installation
1) Drill hole
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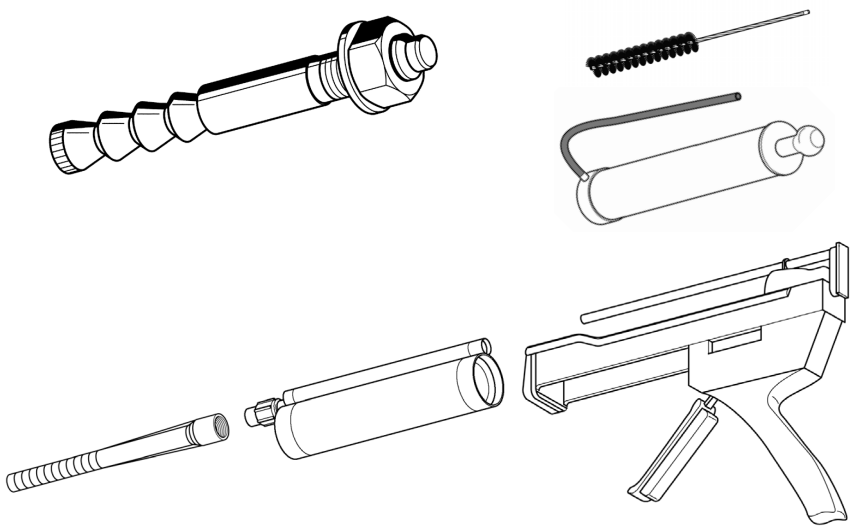
3) Set Drive Plug AN ES with Setting Tool ANT
4) Place installation item and connect to Drive Plug AN ES with correct length of threaded bolt or stud, and tightening torque.

2019-10

Installation of Resin Anchor System

Injection system VMZ



Resin and hardener are mixed together in the mixer nozzle during dispensing from the cartridge. From the bottom depth of the drill hole, inject the resin to fill a minimum of 2/3rds of the hole.

European Approvals (ETA) for multiple fixings used in non-structural systems in cracked concrete.

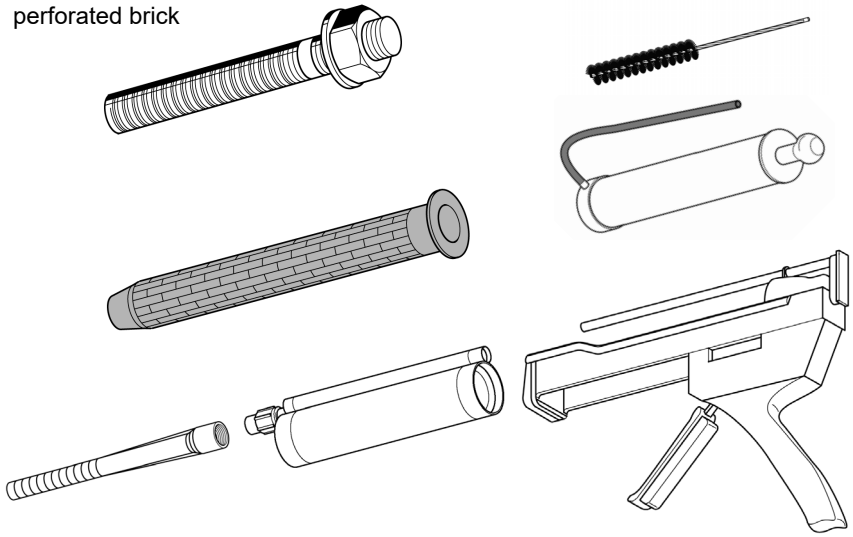
Load capacity is reduced in considering performance under exposure to fire.

Advantages
- no special drill bit
- unabated carrying capacity in wet drill holes
- processing from M12 on, even in water-filled drill hole
- processing temperature up to -5°C
- High load capacity with small edge distances and axial spacings

Installation
1) Drill hole
2) Brush out debris from the drilled hole
3) Blow out dust from the drilled hole
4) Fill the injection resin to the drilled hole
5) Screw in the anchor rod to the correct depth within the resin-filled hole
6) Allow resin to cure for the correct time (according to ambient installation temperature on site)
7) Affix connecting part and tighten down nut to specified torque.

Injection System VMU

Resin anchor stud VMU and perforated sleeve SH to be used in hollow or perforated brick



Suitable for brickwork (solid brick, sand-lime brick) and in combination with the Perforated Sleeve SH for:
- vertically perforated brick
- perforated sand-lime brick
- hollow brick made of gas concrete and concrete.

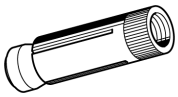
European Approval (ETA) for single fixation in uncracked concrete, general building inspection approval for anchorage in brickwork

Advantages
- no special drill bit
- Fixings possible to wet drill holes
- High load capacity with relatively small edge distances and axial spacings.

Installation
1) Drill hole
2) Brush out debris from the drilled hole
3) Blow out dust from the drilled hole
4) Install the perforated sleeve to the drilled hole (recommended for perforated brick)
5) Fill the injection resin to the perforated sleeve (100% fill)
6) Screw in the anchor rod to the correct depth within the resin-filled sleeve
7) Allow resin to cure for the correct time (according to ambient installation temperature on site)
8) Affix connecting part and tighten down nut to specified torque.

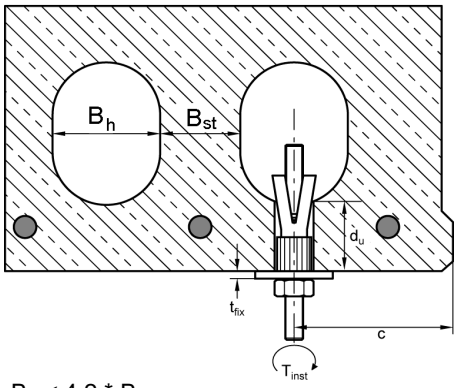
Installation Instructions Hollow Core Anchor Bolt

Hollow core anchor AN Easy



The anchor could be used, even if the bracing area is not inside the hollow chamber.

When tightening the screw, the conus is released from the anchor sleeve, roped in and tensed up



$B_h \leq 4.2 * B_{st}$

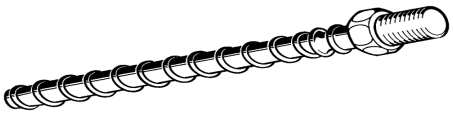
General building inspection approval of the DIBt for single fixation in prestressed concrete-hollow ceilings with stability ≥ C 45/55.

Considering reduced resilience suitable for exposure to fire.

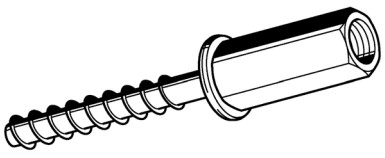
Advantages
- no special drill needed
- suitable for the assembly of standard bolts and threaded rods

Installation
1) Drill the bore hole
2) Drive in anchor flushy
3) After tightening to specified torque, directly resilient.

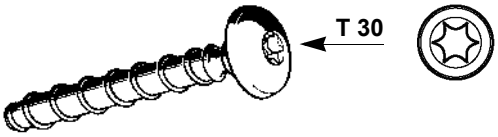
Screwbolt TSM-ST



Suitable for installation to concrete and masonry (sand-lime brick, solid brick, clinker and natural stone)



combined internal thread socket M8/M10



Screwbolt TSM-LP VZ 30
ideal for the installation of Channel 27 to concrete and masonry
Torx® -Connection T30 for a safe transfer of high torque during installation.
The screwbolt may be adjusted and is also removable.

European approval (ETA) for single fixation in cracked concrete.

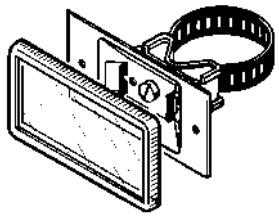
Load capacity is reduced in considering performance under exposure to fire.

Advantages
- minimal drilling effort (small diameter and short embedment depths)
- small edge and axial spacings possible
- removable fixing

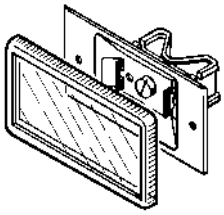
Installation
1) Drill the hole
2) Clean the drilled hole
3) Install with screw gun or impact driver.

Products

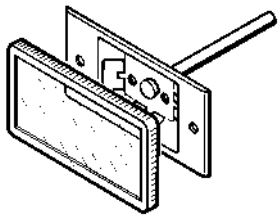
Universal Holder UNI with Fixing Strap



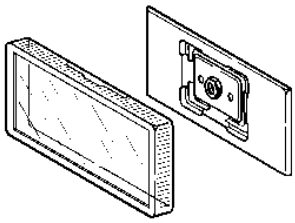
Universal Holder UNI without Fixing Strap



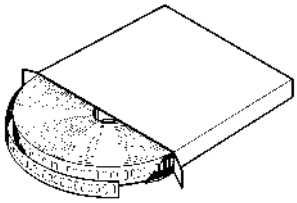
Welding Holder UNI



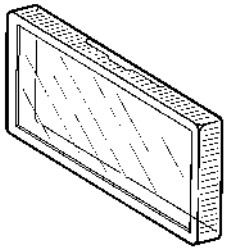
Screw Holder SHT



Fixing Strap LOH

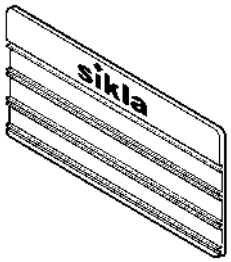


Clear Plastic Cover SHA

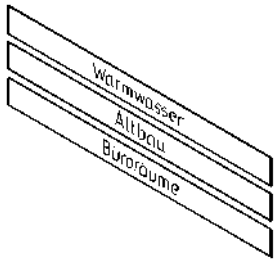


Printed Sign Plate LOG

Sign Plate for Inserts LOGN

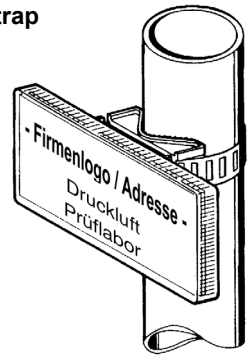


Insert SLT



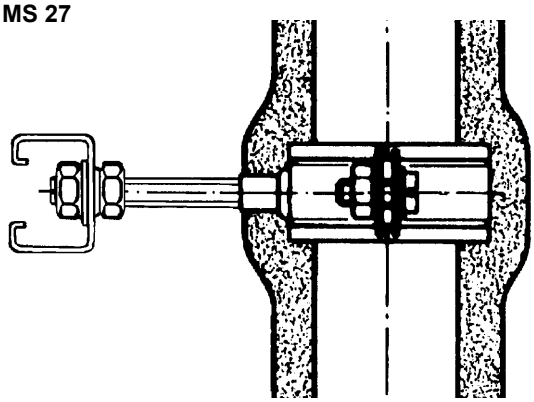
Application Examples

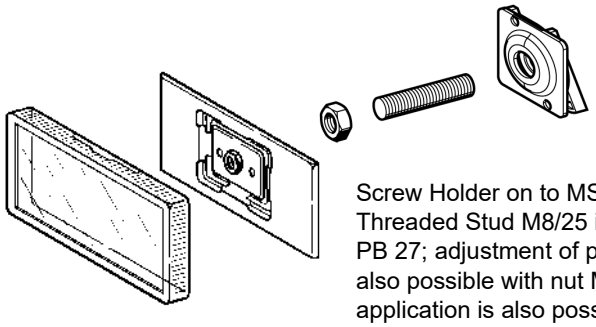
Universal Holder with Fixing Strap



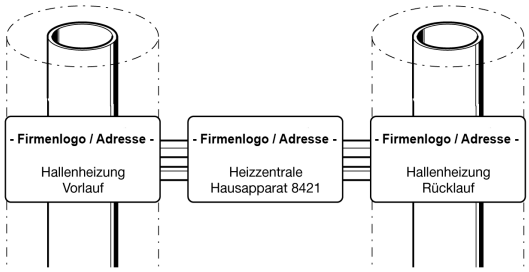
The Fixing Strap has to be bent around the pipe and slotted into the Holder. The assembly is firmly secured by tightening the centre bolt of the Holder.

Screw Holder on MS 27

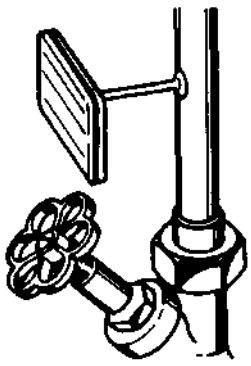




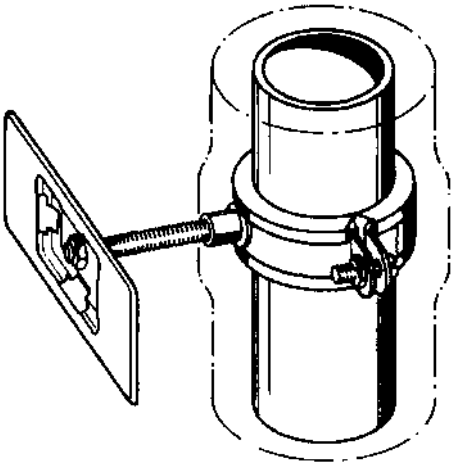
Screw Holder on to MS 27 with Threaded Stud M8/25 in Block PB 27; adjustment of position is also possible with nut M8. Vertical application is also possible.



Welding Holder



Screw Holder



It can be fixed directly on the pipeline.
For assembling of Screw Holder pipe clamps with M8 thread connection are necessary.

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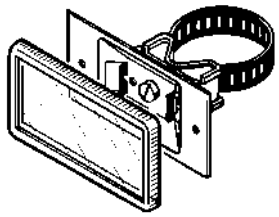

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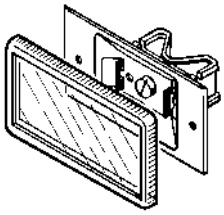
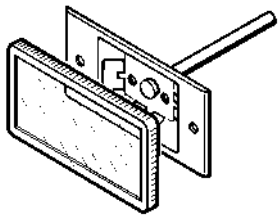
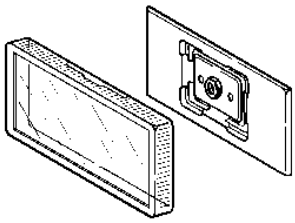


Welding Holder UNI



Screw Holder SHT



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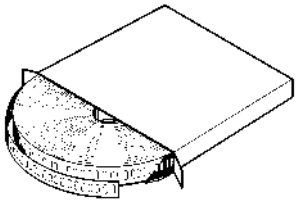

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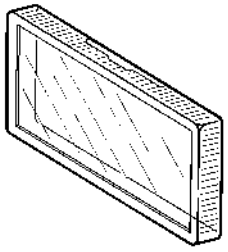

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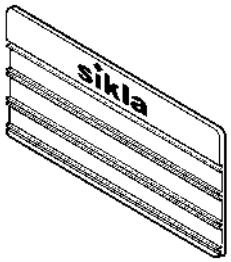
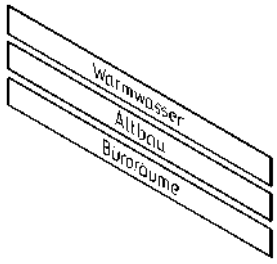
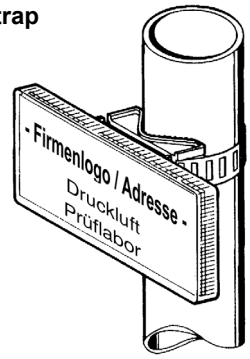


Insert SLT



Application Examples

Universal Holder with Fixing Strap



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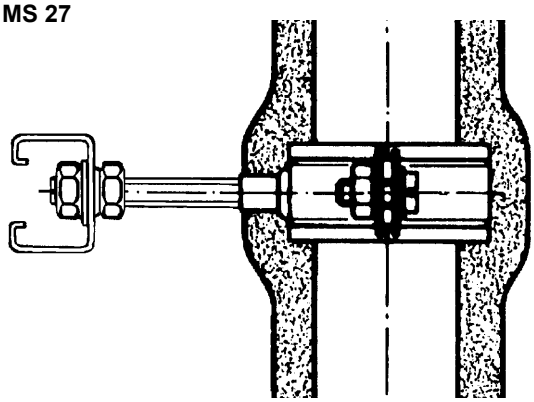

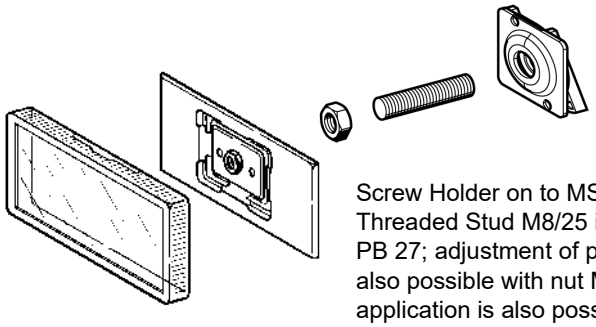

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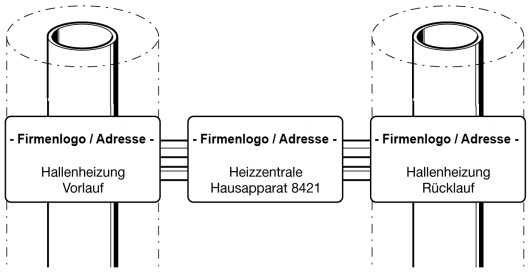
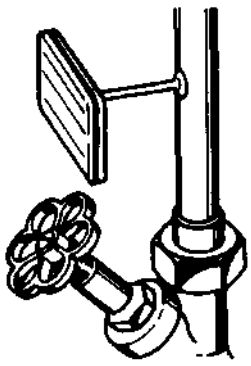
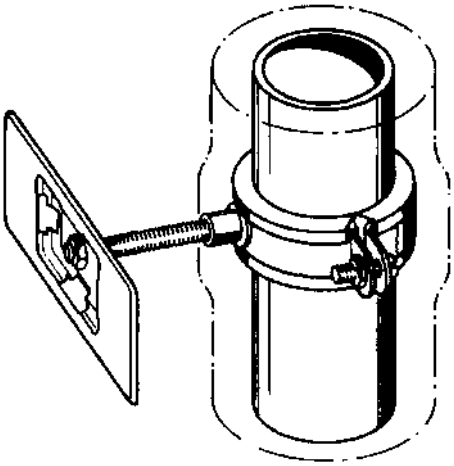


Welding Holder



Screw Holder



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Content

List of references

[1] Wagner, Walter: Rohrleitungstechnik, Vogel-Buchverlag, 10. Auflage, 2008
[2] Wagner, Walter: Planung im Anlagenbau, Vogel-Buchverlag, 2. Auflage, 2003
[3] Wagner, Walter: Festigkeitsberechnungen im Apparate und Rohrleitungsbau, Vogel-Buchverlag, 7. Auflage, 2007
[4] DVS 2210-01: Industrierohrleitungen aus thermoplastischen Kunststoffen
for additional advice on support distances determination for plastic pipes

Symbols

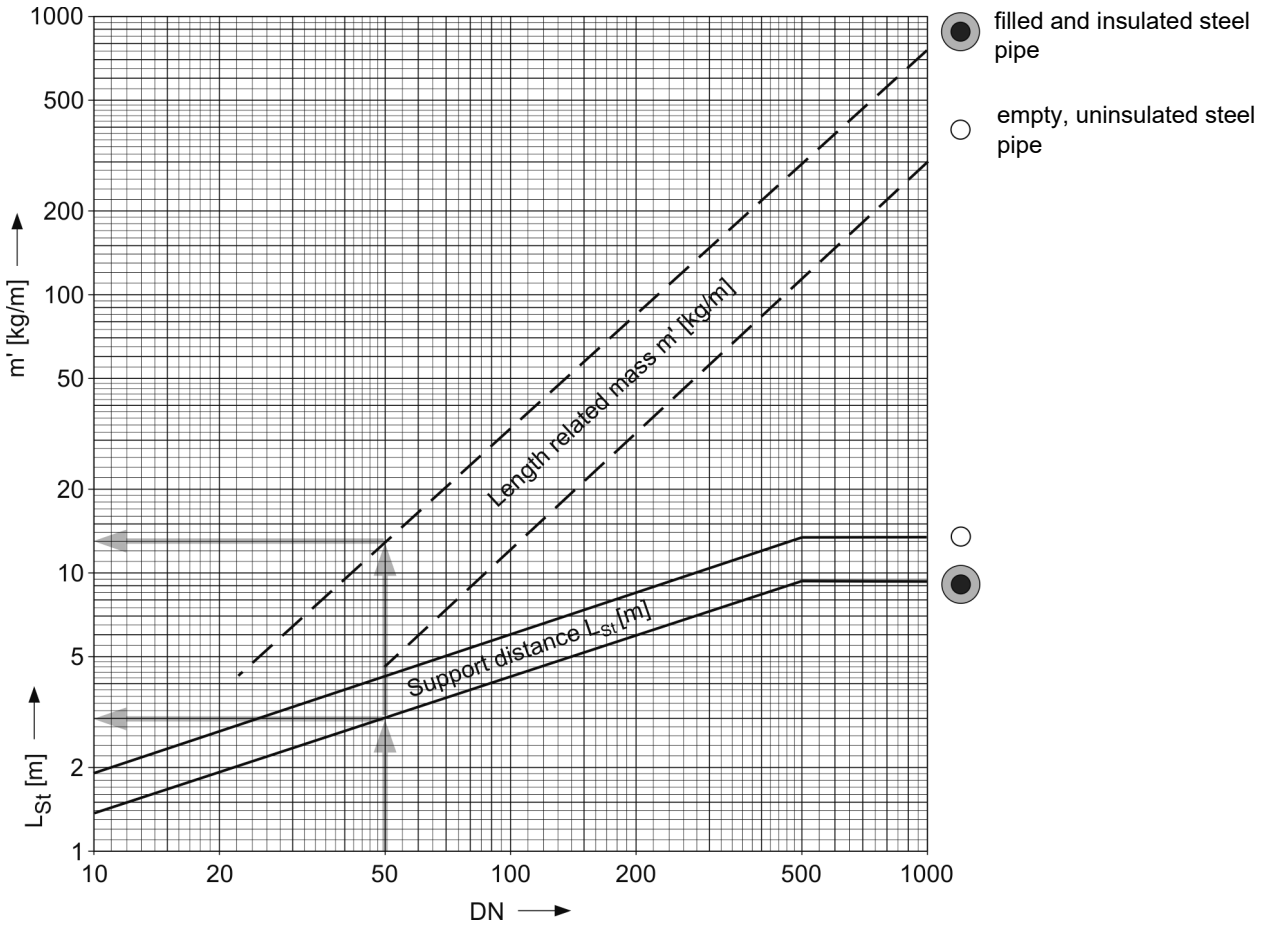
C	material property	[-]
Da	outer diameter	[mm]
Di	inner diameter	[mm]
DN	nominal diameter	[mm]
e	wall thickness	[mm]
E	modulus of elasticity	[kN/mm²]
FB	fixed point force from bending	[kN]
FF	spring force (at compensator)	[kN]
FH	hydrostatic force	[kN]
FP	fixed point force (total)	[kN]
FR	frictional force (in slide supports)	[kN]
G	weight	[kN]
G‘	weight / length	[kN/m]
KM	correction coefficient = f (medium)	[-]
KR	correction coefficient = f (row of pipes)	[-]
L	length of expanding pipe leg	[m]
LA	length of bending pipe leg	[m]
LSt	Support distance of pipe	[m]
m‘	mass / length	[kg/m]
p	internal pressure	[bar]
Re	yield strength	[N/mm²]
S	safety coefficient	[-]
T	Temperature	[°C]
ß	coefficient of thermal expansion	[mm/(m·K)]

Materials

A	Austenitic steel
Cu	Copper
F (Fe)	Ferritic Steel
HDPE	Polyethylene with high density
M	Martensitic steel
PE	Polyethylene
PP	Polypropylene
PVC	Polyvinyl chloride
PVDF	Polyvinyl denfluoride
St	Steel
VA	Stainless Steel

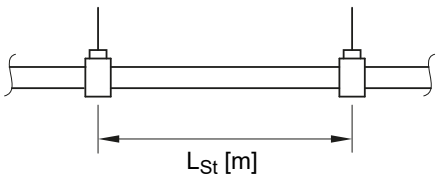
2019-10

Length related mass and support distances for steel pipes for plant constructions (standard values)

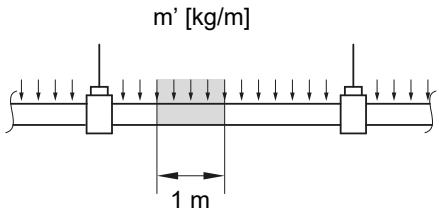


Example:
Steel pipe DN 50 with insulation (100%)

Support distance (standard values)
$L_{St} \approx 3$ m



Length related mass m' ≈ 13 kg/m



Note

(1) The given standard values are valid for steel pipes with normal thickness and up to a temperature of 400°C.
the length related mass is larger when the steel is thicker.
In case of weaker thickness (often in the range of stainless steel) the admissable support distance decreases.
(2) An analysis of elasticity shows the admissibility of the choosen support distance.
In case of exceeding the stated standard values and/ or constraints like high temperatures or influence of vibrations, a special engeneering proof incl. an analysis of elasticity is necessary.

Sources

Wagner, Walter: Rohrleitungstechnik, Vogel-Buchverlag, 10. Auflage, 2008;
DIN EN 13480-3: Metallische industrielle Rohrleitungen, 2002

Support distances in building services for pipes made of steel, copper, plastic (standard values)

Nominal Diameter	Nominal Diameter	Outside-Ø	SIKLA-Recommandation Pipes filled with water with insulation[1)]			DIN 1988-2 Pipes filled with water			
			Steel Pipe	Steel Pipe	Cu-Pipe	Steel Pipe	Cu-Pipe	PVC-Pipe	
[DN]	[Zoll]	[mm]	EN 10220 *DIN 2448 DIN 2458*	EN 10255 *DIN 2440*	EN 1057 *DIN 1786*	EN 10255 *DIN 2440*	EN 1057 *DIN 1786*	at 20°C	at 40°C
		12.0			1.00		1.25		
10		13.5	1.00						
		15.0			1.10		1.25		
		16.0						0.80	0.50
10	3/8“	17.2		1.20		2.25			
		18.0			1.20		1.50		
15		20.0	1.20					0.90	0.60
15	1/2“	21.3		1.50		2.75			
		22.0			1.30		2.00		
20		25.0	1.40					0.95	0.65
20	3/4“	26.9		2.00		3.00			
		28.0			1.50		2.25		
25		30.0	1.80						
		32.0						1.05	0.70
25	1“	33.7		2.50		3.50			
		35.0			1.60		2.75		
32		38.0	2.20						
		40.0						1.05	0.70
		42.0			1.80		3.00		
32	1 1/4“	42.4		2.90		3.75			
40		44.5	2.40						
40	1 1/2“	48.3		3.30		4.25			
		50.0						1.40	1.10
		54.0			2.00		3.50		
50		57.0	3.10						
50	2“	60.3		4.00		4.75			
		63.0						1.50	1.20
		64.0					4.00		
		75.0						1.65	1.35
65		76.1	3.30				4.25		
65	2 1/2“	76.1		4.75		5.50			
80		88.9	4.20				4.75		
80	3“	88.9		5.25		6.00			
		90.0						1.80	1.50
100		108.0	4.50				5.00		
100	4“	114.3		5.80		6.00			
		110.0						2.00	1.70
125		133.0	5.10				5.00		
125	5“	139.7		6.50		6.00			
		140.0						2.25	1.95
150		159.0	5.80				5.00		
		160.0						2.40	2.10
150	6“	168.3		7.20					
200	8“	219.1	7.80						

[1)] 100 % - Insulation with 100 kg/m³ and 1 mm steel sheat for pipes with normal thickness.

Support distances for plastic pipes (standard values according to producer)

Pipes made of PVC - hard

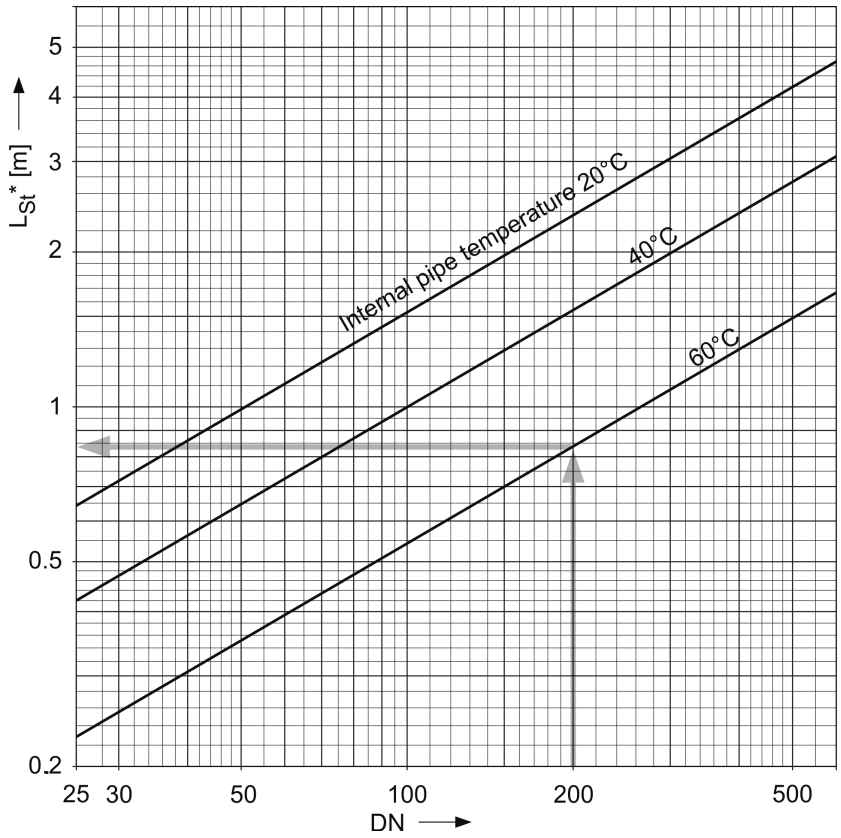
Medium	KM
gas	1.3
1 < density [g/cm³] ≤ 1.8	0.8

Pipe raw DIN 8062	KR
1	1.0
2	1.3
3	1.6
4	1.8
5	2.0
6	2.3

$$L_{St} = L_{St}^* \cdot KM \cdot KR$$

Example:
DN 200; T = 60°C; Gas; Pipe raw 5

L_{St} *= 0.83 m · 1.3 · 2.0 ≈ 2.1 m*



Pipes made of HDPE or PP

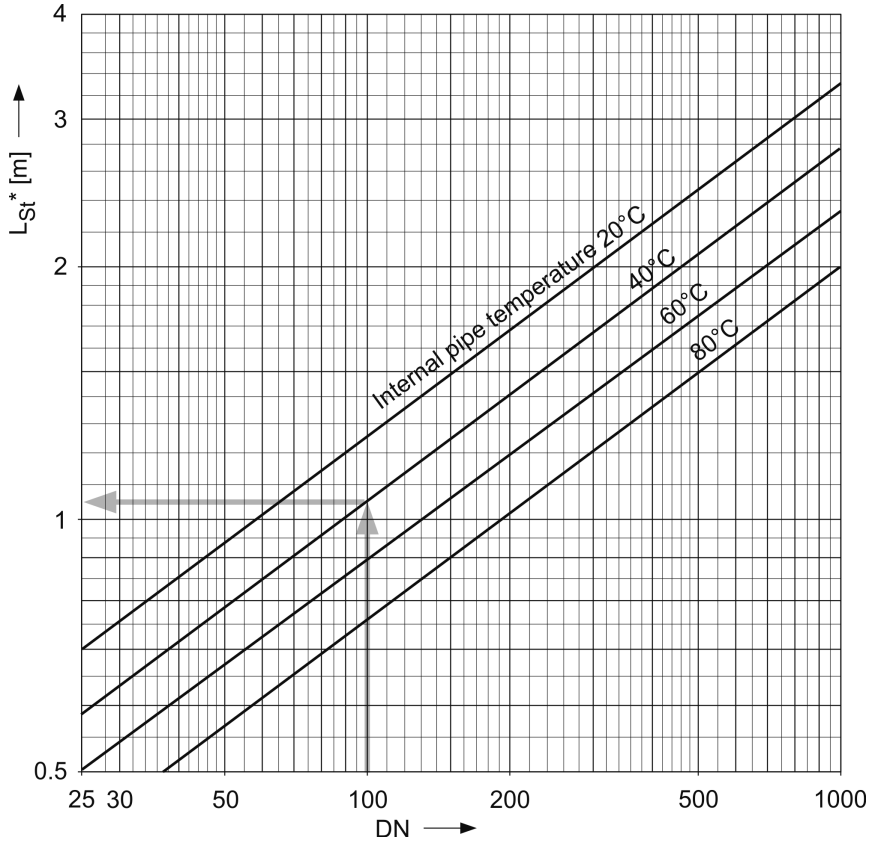
Medium	KM
gas	1.3
1 < density [g/cm³] ≤ 1.8	0.8

Pipe raw	KR	
	HDPE	PP
1 and 2	1.0	1.1
3	1.1	1.45
4	1.25	1.65
5	1.45	

$$L_{St} = L_{St}^* \cdot KM \cdot KR$$

Example:
HDPE; DN 100; T = 40°C; bulk material; Pipe raw 3

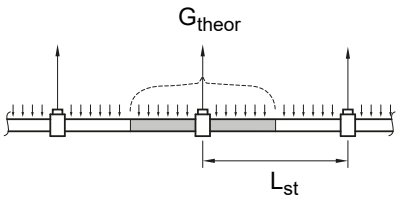
L_{St} *= 1.05 m · 0.8 · 1.1 ≈ 0.9 m*



Weight per support (Calculation, Simulation and Safety Coefficient S)

Theory

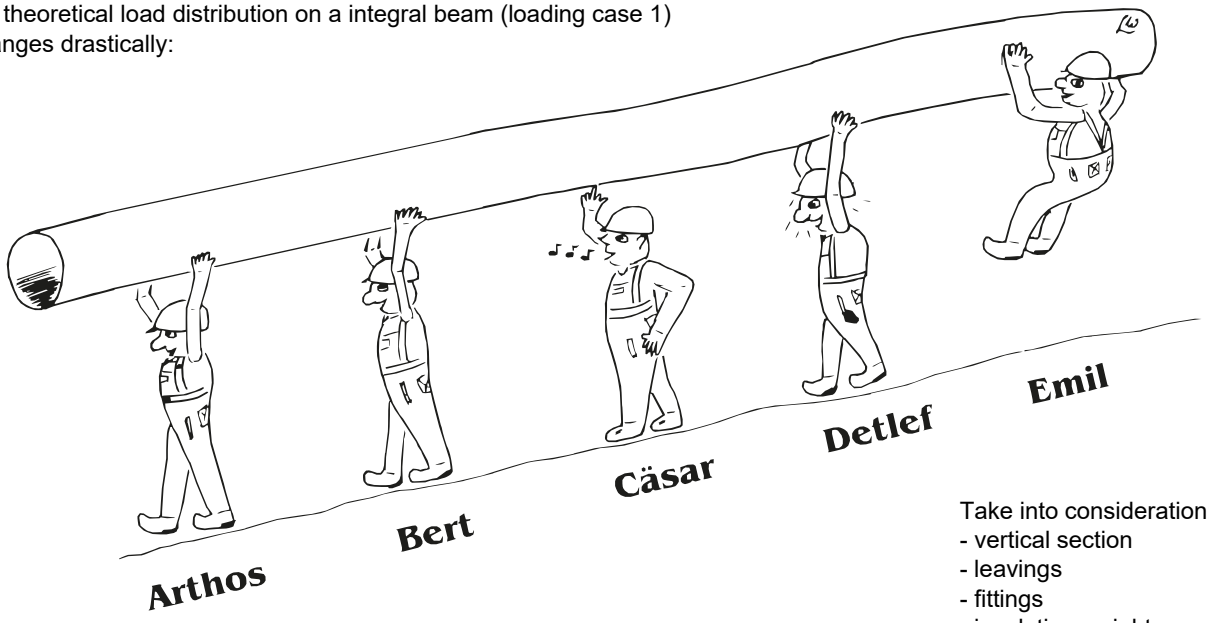
$$G_{theor} = G' \cdot L_{st}$$



Explanation:
For the static dimensioning of a pipe support, the weight which has to be carried by the clamp has to be calculated.
The length of pipe sections, assigned hypothetically, correspond with the support distance L_{st}.

Example:
D_a = 168.3 mm, DIN 2448, L_{st} = 4 m
m' = 38 kg/m ≈ 0.38 kN/m = G'
G_{thoer} = 0.38 kN/m · 4 m ≈ 1.5 kN

Practice
Considering practical margin conditions,
the theoretical load distribution on a integral beam (loading case 1)
changes drastically:



Take into consideration:
- vertical section
- leavings
- fittings
- insulating weight
- installation specialties.

loading case	loading per "support"" (kN)					max. "overweight"	valuation
	Arthos	Bert	Cäsar	Detlef	Emil		
1) all 5 supports	1.6	1.4	1.5	1.4	1.6	7 %	theory
2) Cäser pipes, 4 supports	1.3	2.5	-	2.5	1.3	67 %	normal case
3) Cäsar pipes + Emil is happy	1.7	1.2	-	4.6	-	207 %	extreme case

For this reason, in practice a security coefficient S should be taken into consideration. Based on the simulation approach, S will be rated 1.5... 2.5 depending on the application case.

$$G_{pract} = G' \cdot L_{st} \cdot S$$

Example:
D_a = 168.3 mm, DIN 2448
L_{st} = 4 m, G' = 0.38 kN/m
S = 2.0
G_{pract} = 0.38 kN/m · 4 m · 2 ≈ 3 kN

Note:
- *According to EN 13480 at load concentration points (e.g. valves, vertical pipe sections) additional supports must be provided.*

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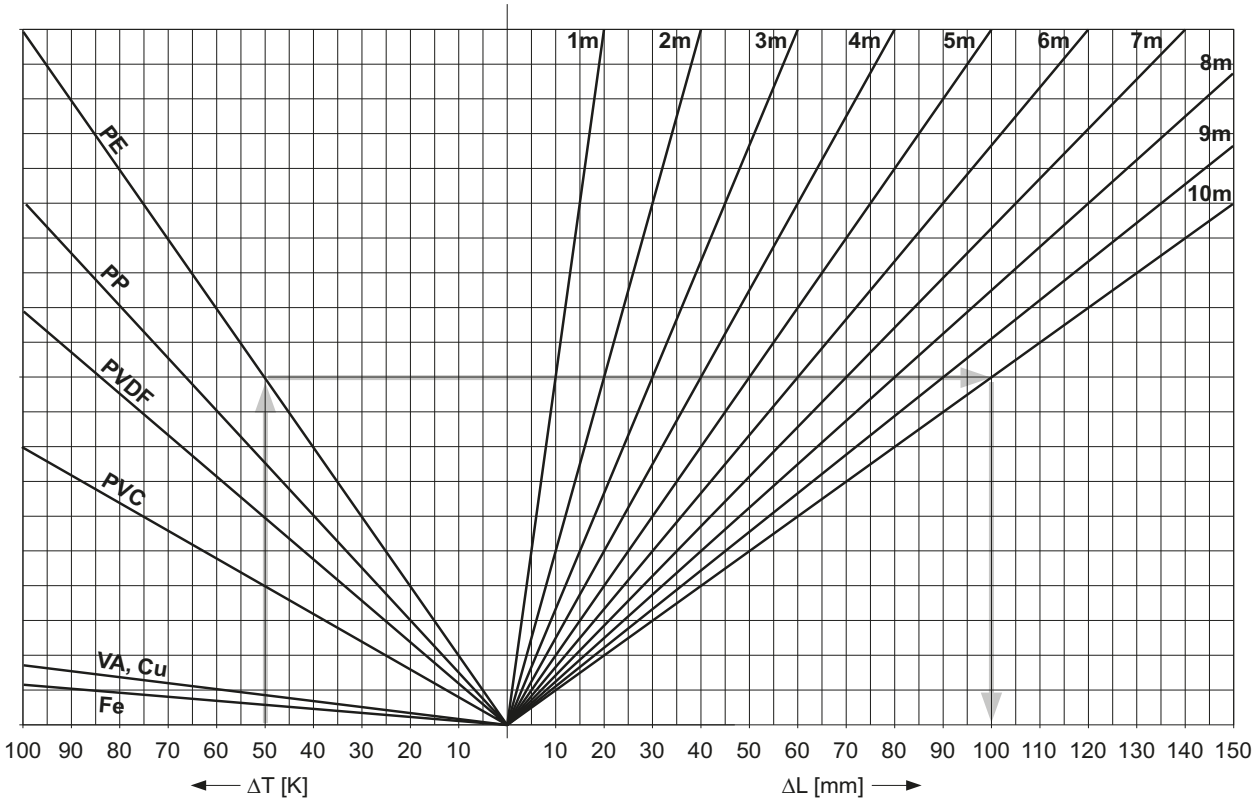
Length variation of pipes and coefficient of linear expansion

Graphic illustration of the variation in length



$$\Delta T = T_{operation} - T_{installation}$$

$$\Delta L = L \cdot \beta \cdot \Delta T$$

Example:
PE-Pipe; L = 10 m; $T_{operation}$ = 70 °C; $T_{installation}$ = 20 °C

ΔT = 70 °C - 20 °C = 50 K

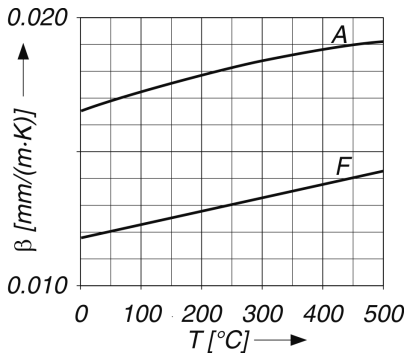
graphic illustration:
ΔT = 50 K → PE → L = 10 m → ΔL = 100 mm

mathematical solution:

$$\Delta L = 10\ m \cdot 0{,}2\ \frac{mm}{m \cdot K} \cdot 50\ K = 100\ mm$$

Coefficient of linear expansion

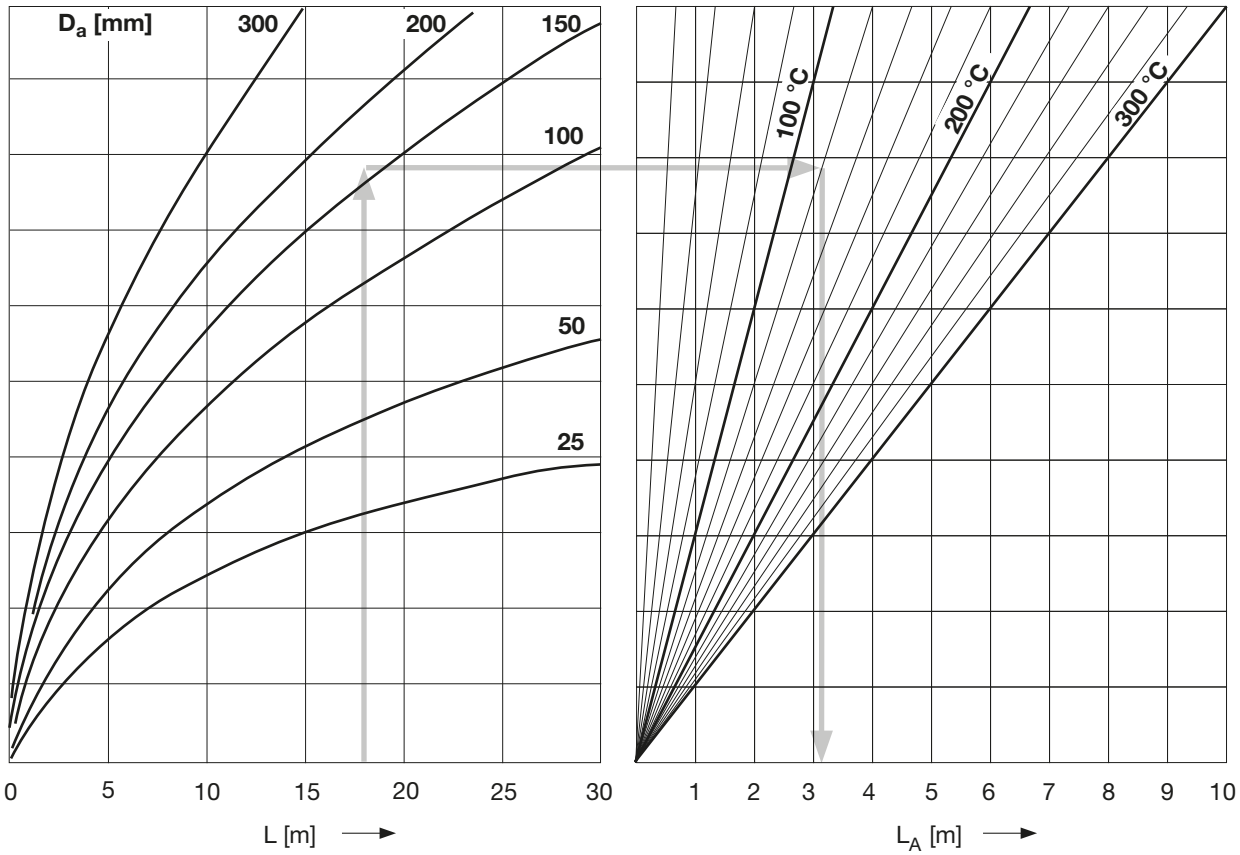
material	ß [mm/(m·K)]
HDPE, PE	0.200
PB, PP	0.150
PVDF	0.12 ... 0.18
PVC	0.080
A = Steel (VA), Cu	0.017
F = Steel (ferr.)	0.012



Note:
- *As temperature rises, the coefficient of linear expansion increases.*
  For this reason, calculations including for the integral linear expansion coefficient have to be used where temperatures exceed 200°C.

Minimum length for bending leg L_A of warming pipes (standard values)

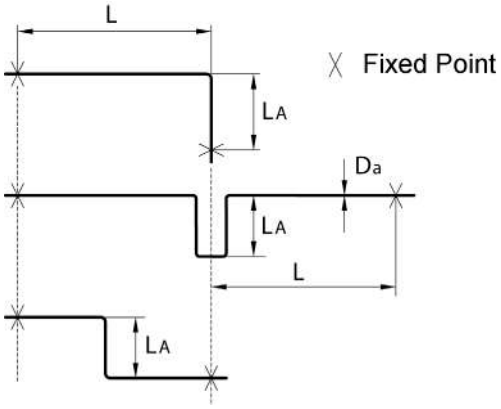
Pipes made of steel (ferritic, austenitic)



Example:
L = 18 m; DN 150 (D_a = 168.3 mm); T = 120 °C

Read: Minimum length for bending legs: L_A = 3.1 m

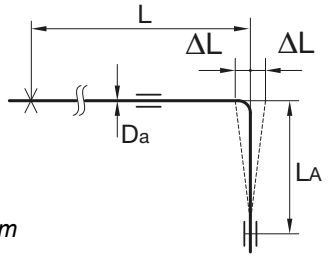
Valid for L-bending, U-bending and Z-bending according to diagram.



RPipe made from plastic

material	C
HDPE	26.0
MEPLA	33.0
PP	30.0
PVC	33.5
PVDF	21.6

$$L_A = C \cdot \sqrt{D_a \cdot \Delta L}$$



Example:
PP; L = 8 m; D_a = 160 mm; T = 80 °C

1.) Calculate linear expansion: ΔL = 72 mm

2.) $L_A = 30 \cdot \sqrt{160\text{mm} \cdot 72\text{mm}}$ *= 3200 mm = 3.2 m*

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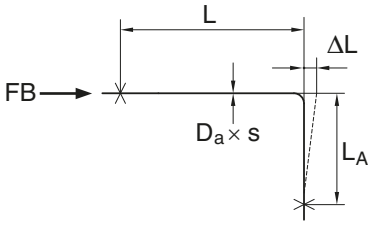
Fixed point force for pipes made of steel (approximated values)

Fixed point forces resulting from natural bends (Pipe expansion moves the bending leg)

$$FB = \frac{\Delta L}{10\ mm} \cdot FB_{10}$$

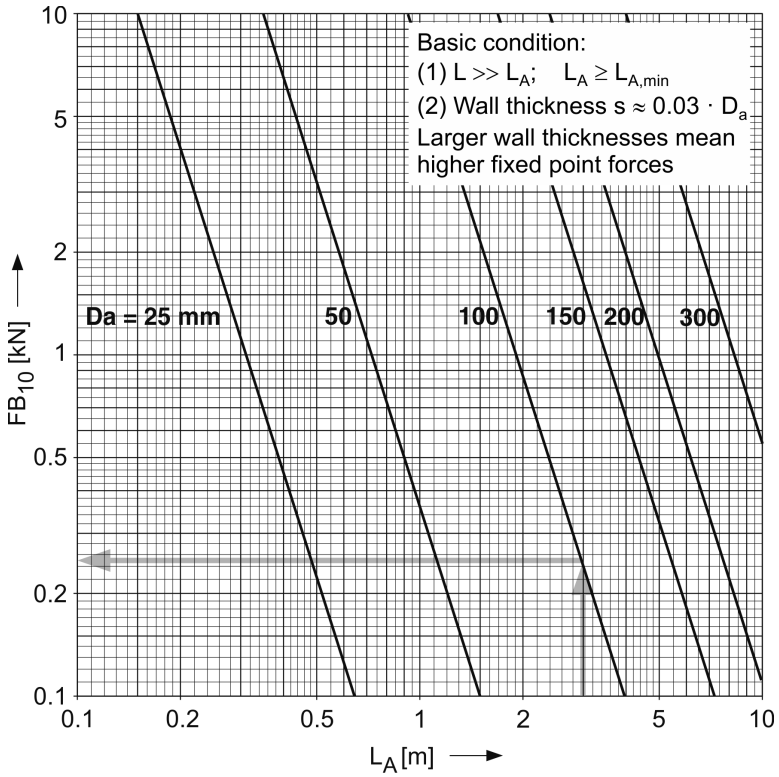


Example:
Steel Pipe DIN 2458, L = 15 m
L_A = 3 m; D_a = 101.6 mm; T = 120°C

→ Δ T = 100 K → Δ L = 18 mm

$$FB = \frac{18\ mm}{10\ mm} \cdot 0{,}25\ kN = 0.45\ kN$$

Note:
Fixed point force FP is larger than FB, because frictional forces of slide bearings have to be added: FP = FB + FR



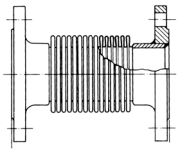
Fixed point force at axial compensators

$$FP = FH + FF + FR$$

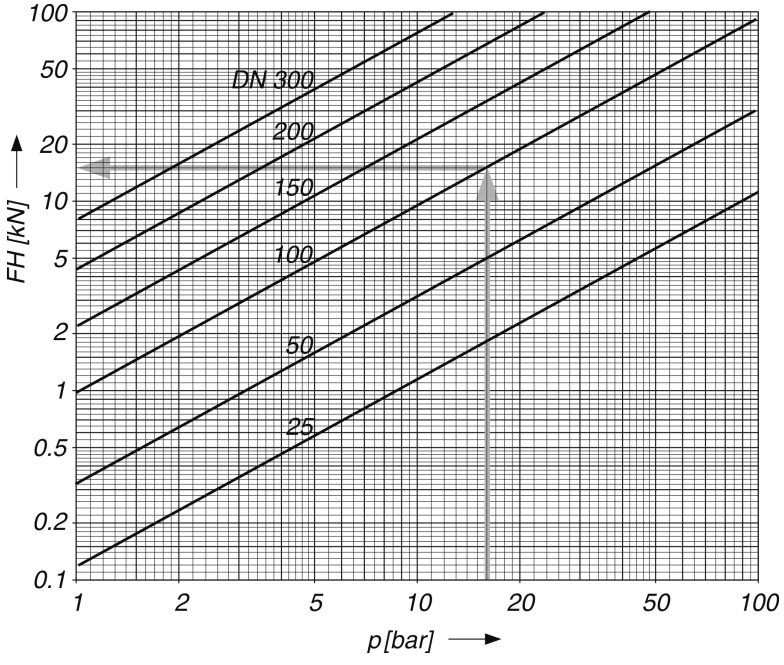
Example:
Axial compensator DN 100; p = 16 bar
→ hydrostatic force FH ≈ 15 kN

Note:
Normally FH constitutes the main part of fix point force.
But the complete fix point force FP is larger because the spring force of compensator (FF) and the frictional force of sliders (FR) have to be added.

Construction of an axial compensator (expansion joint) with flange

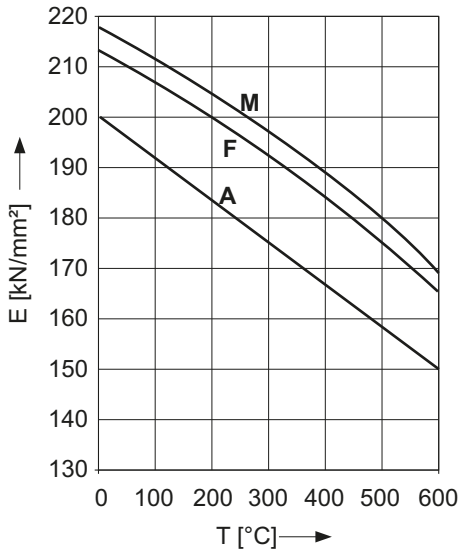


For exact calculation of hydrostatic force FH, the axial compensator (pipe expansion joint) has to be considered.



Material characteristics and restrictions for static loadings

Material properties



material	Yield point Re [N/mm²] at a temperature [°C]							
	50	200	250	300	350	400	450	500
S235JR (St 37)	235	161	143	122	-	-	-	-
1.4301	177	127	118	110	104	98	95	92
1.4401	196	147	137	127	120	115	112	110
1.4571	202	167	157	145	140	135	131	129

M = martensic
F = ferritic
A = austenitic

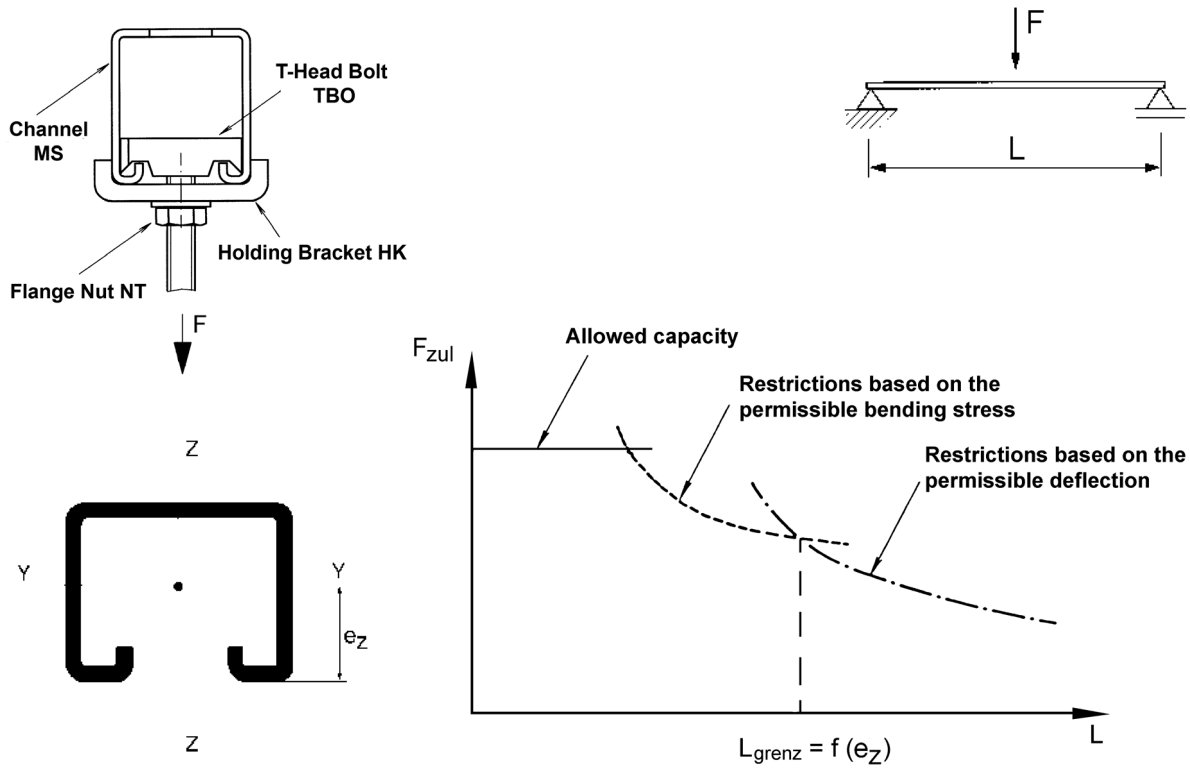
The yield point values for S235JR are valid for thickness up to 16 mm, according to AD 2000 MB W1.

Caution!

- *Because the strength features of steel decreases considerably at high temperature, reduced values have to be considered in the calculation. Interim values have to be interpolated.*

Note:
The specified values for Re are material features.
Safety factors have to be considered additionally.
For hot-dip galvanized products the maximum temperature limit is 250 °C.
S235JR (St 37) shouldn't be used at temperatures over 300°C.
Selecting the material, the creep-strength has to be considered when extraordinary high temperatures occur.

Restrictions for dimensioning a simply supported beam



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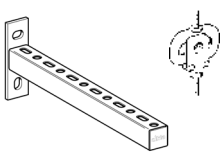
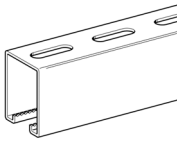
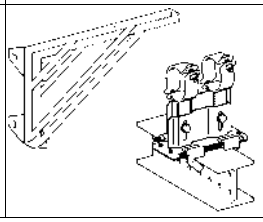
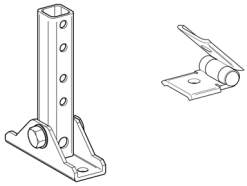
Corrosion protection

1. Corrosivity catagory acc. DIN EN ISO 12944-2

corrosivity catagory	corrosivity catagory	Outdoor (typical Examples)	Indoor (typical Examples)
C1	Very low	not applicable (outdoor min. C2 requirement)	Indoor dry conditions with a neutral environment. e.g. offices, shops, schools and hotels
C2	Low: minor	Atmosphere with low-level pollution. Mostly rural areas.	Unheated buildings where condensation can occur. e.g. warehouses, sports facilities
C3	Moderate	Town and industrial atmosphere. Moderate sulphur dioxide pollution. Coastal areas with low levels of atmospheric salt.	Production facilities with high humidity and moderate environmental pollution. e.g. food production plants, water treatment plants, dairies and breweries
C4	High	Industrial and coastal areas with moderate levels of atmospheric salt.	Chemical plants, swimming pools, boat sheds (above sea level)
C5-I (Industrial)	Very high	Industrial areas with high humidity and chemically aggressive atmospheres	Buildings or areas with almost permanent condensation or high levels of pollution
C5-M (Coastal)	Very high	Coastal and off-shore areas with high levels of atmospheric salt	Buildings or areas with almost permanent condensation or high levels of pollution

2. Coating or material selection in accordance with corrosivity category and intended use

			HCP = High Corrosion Protection = HCP Consistency at least as with hot dip metal coating	
Treatment	Electrogalvanising	Hot-dip galvanising		Zinc lamination coating
Medium	Electrolytic transfer of zinc ions	By means of temperature (≥ 450 °C): dipping in fluid zinc		Anorganic layer of zinc- and alu-lamination
Process	Galvanising, discontinuous clip	Continuous sendzimir treatment	Hot-dipped galvanised	Coating and curing at ca. 200 °C
Norms	DIN 50961	DIN EN 10346	DIN EN ISO 1461 (huge parts), DIN EN ISO 10684 (connecting elements)	DIN EN 13858 (huge parts), DIN EN ISO 10683 (connecting elements)
Coating thickness (standard values)	Sheet metal parts 8 ... 12 µm, norm- and thread parts 5 ... 8 µm	Hot-dip metal coating refined metal sheet ca. 15 µm	Small parts 55 µm, huge parts 70 µm, connecting elements ≥ M8 ca. 40 µm	Highest corrosion protection, up to more than 1200 h consistancy in salt spray test*) acc. MPA- Inspection report 901 2659 000.
Examples				

*) Salt spray test according to DIN EN ISO 9227

In cases where extraordinary corrosion occurs, we recommend additionally:

- **Cathodic dip paint -** scratch-resistant, durable, impact and saltwater resistant.
- **Powder-covering** - weatherproof and chemical resistant, RAL colour range or
- our synchronised range of stainless steel products **V4A**.

Talk to us - we will advise you.