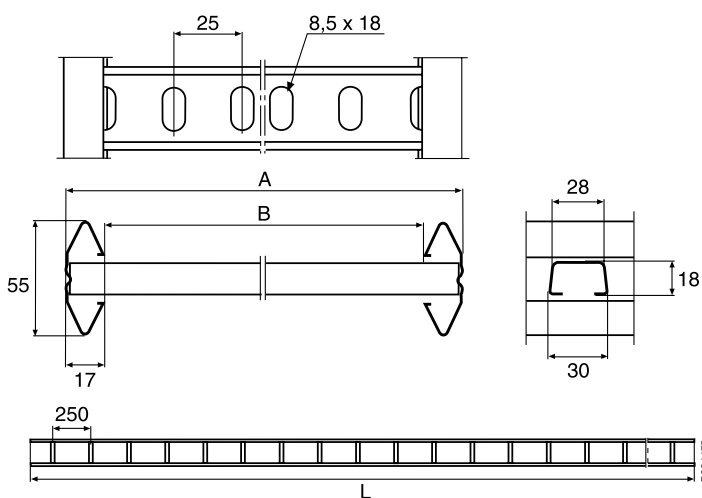
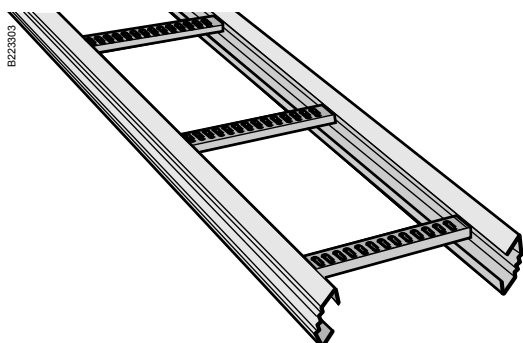


Installation instructions

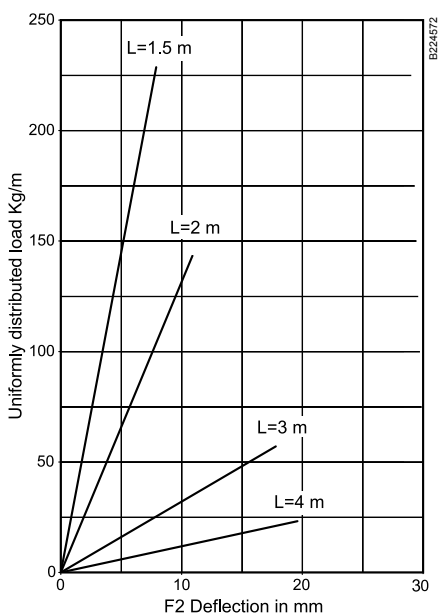
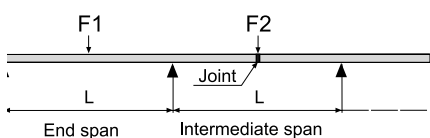
# Use and Installation

|   |  |  |
|---|--|--|
| 90° bend 15, interior and exterior .. 189 | Joint 21P..... 150                       | Thread lock B50 M8, M10..... 209       |
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### KHZSP/ KHZSPZ



#### Test model II



| Type       | L<br>m  | A<br>mm | B<br>mm |
|------------|---------|---------|---------|
| KHZSP 200  | 3, 4, 6 | 198     | 164     |
| KHZSP 300  | 3, 4, 6 | 298     | 264     |
| KHZSP 400  | 3, 4, 6 | 398     | 364     |
| KHZSP 500  | 3, 4, 6 | 498     | 464     |
| KHZSP 600  | 3, 4, 6 | 598     | 564     |
|            |         |         |         |
| KHZSPZ 200 | 6       | 198     | 164     |
| KHZSPZ 300 | 6       | 298     | 264     |
| KHZSPZ 400 | 6       | 398     | 364     |
| KHZSPZ 500 | 6       | 498     | 464     |
| KHZSPZ 600 | 6       | 598     | 564     |

#### Loadings

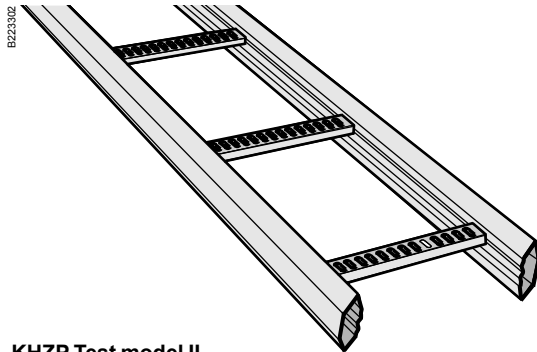
The ladders are tested according to IEC 61537, test model II - a joint in the intermediate span (F2).

#### Guaranteed load

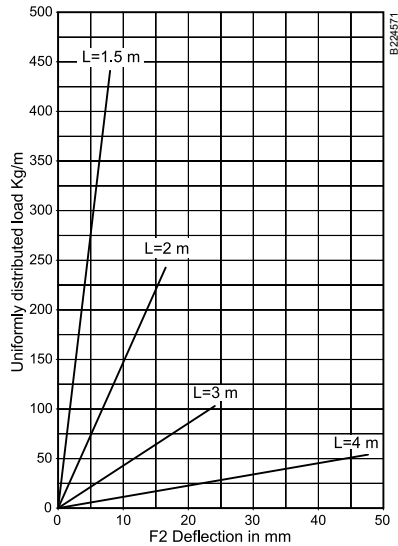
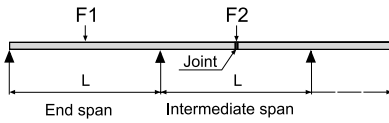
Guaranteed uniformly distributed load includes a minimum safety factor of 1.7 towards rupture. The diagram shows the deflection with Joint 21 for ladder widths up to 600 mm.

The cable ladders must not be used as walkways.

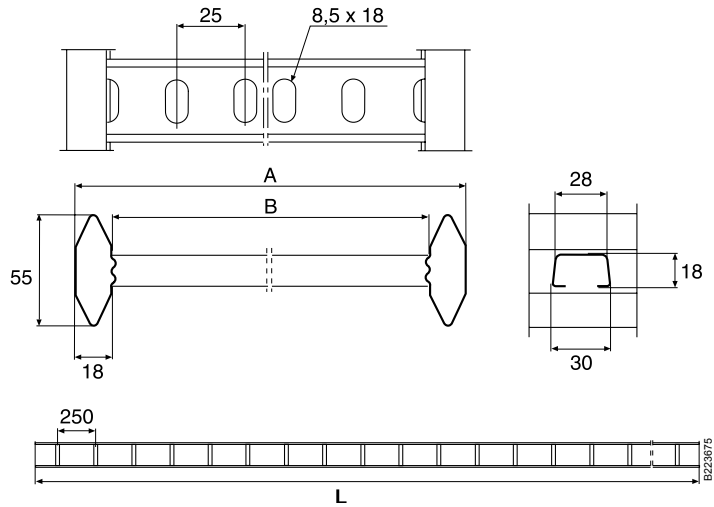
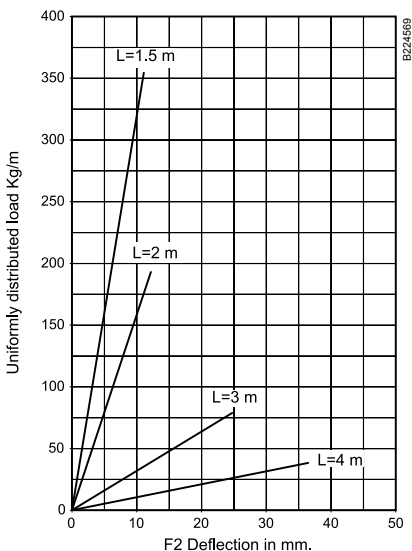
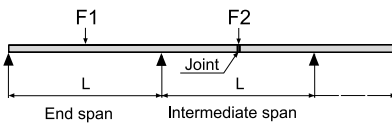
### KHZP / KHZPS



KHZP Test model II



KHZPS Test model II



| Type            | L<br>m | A<br>mm | B<br>mm |
|-----------------|--------|---------|---------|
| KHZP/KHZPS 150  | 6      | 147     | 111     |
| KHZP/KHZPS 200  | 6      | 197     | 161     |
| KHZP/KHZPS 300  | 6      | 297     | 261     |
| KHZP/KHZPS 400  | 6      | 397     | 361     |
| KHZP/KHZPS 500  | 6      | 497     | 461     |
| KHZP/KHZPS 600  | 6      | 597     | 561     |
| KHZP/KHZPS 800  | 6      | 797     | 761     |
| KHZP/KHZPS 1000 | 6      | 997     | 961     |
|                 |        |         |         |
| KHZP 150        | 3      | 147     | 111     |
| KHZP 200        | 3      | 197     | 161     |
| KHZP 300        | 3      | 297     | 261     |
| KHZP 400        | 3      | 397     | 361     |
| KHZP 500        | 3      | 497     | 461     |
| KHZP 600        | 3      | 597     | 561     |
| KHZP 800        | 3      | 797     | 761     |
| KHZP 1000       | 3      | 997     | 961     |

#### Loadings

The ladders are tested according to IEC 61537, test model II - a joint in the intermediate span (F2).

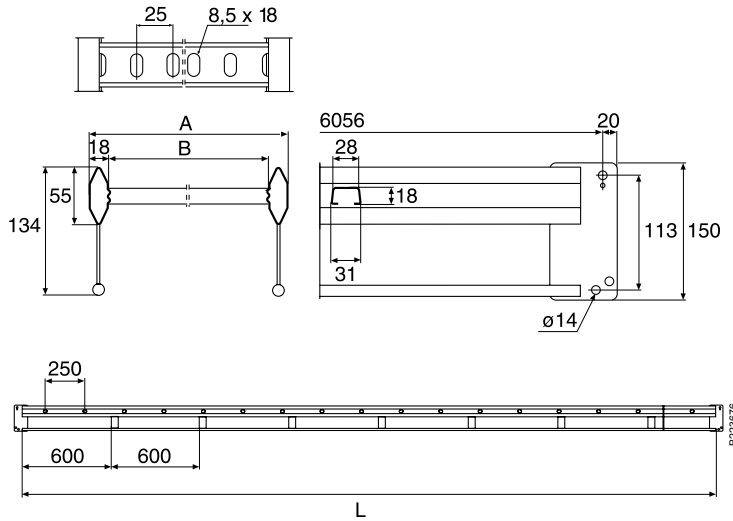
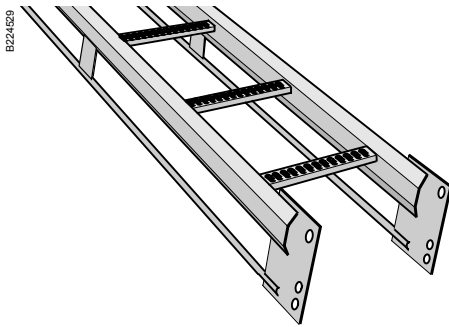
#### Guaranteed load

Guaranteed uniformly distributed load includes a minimum safety factor of 1.7 towards rupture.

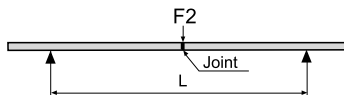
The diagrams show the deflection with Joint 21 for cable ladder widths up to 600 mm.

The cable ladders must not be used as walkways.

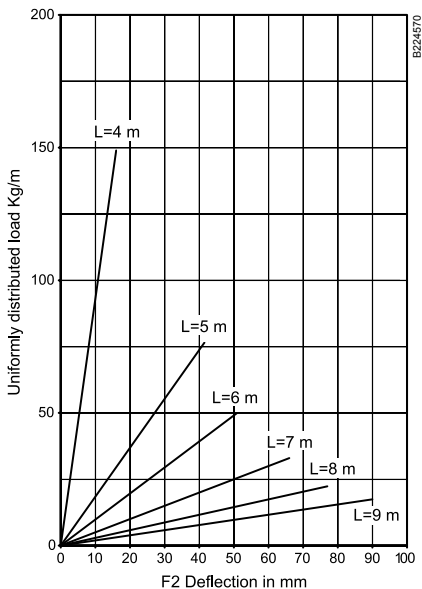
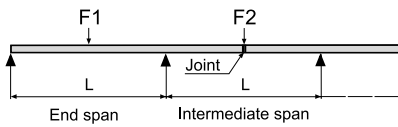
### KHZPV



#### Test model V



#### Test model II



| Type       | L<br>m | A<br>mm | B<br>mm |
|------------|--------|---------|---------|
| KHZPV 200  | 6      | 197     | 161     |
| KHZPV 300  | 6      | 297     | 261     |
| KHZPV 400  | 6      | 397     | 361     |
| KHZPV 500  | 6      | 497     | 461     |
| KHZPV 600  | 6      | 597     | 561     |
| KHZPV 1000 | 6      | 997     | 961     |

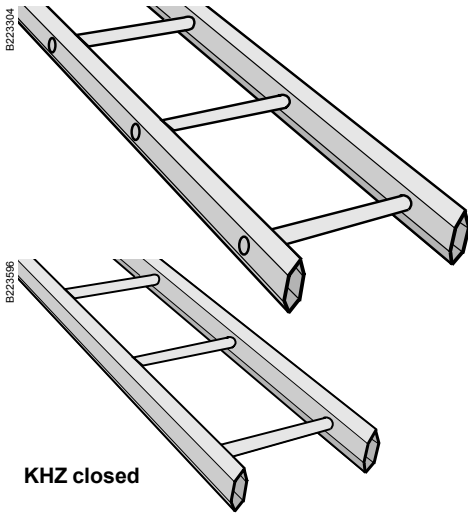
#### Loadings

The ladders are tested according to IEC 61537, test model II for bracket distance up to and including 4 m, test type V for bracket distance more than 4 m.

#### Guaranteed load

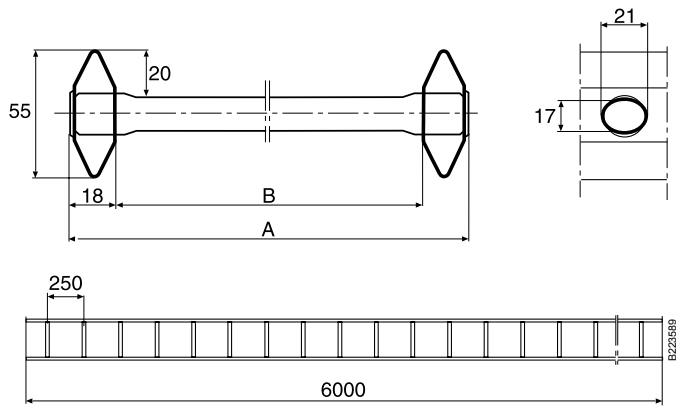
Guaranteed uniformly distributed load supported includes a minimum safety factor of 1.7 towards rupture. The diagram shows the deflection for cable ladder widths up to 600 mm.

The cable ladders must not be used as walkways.



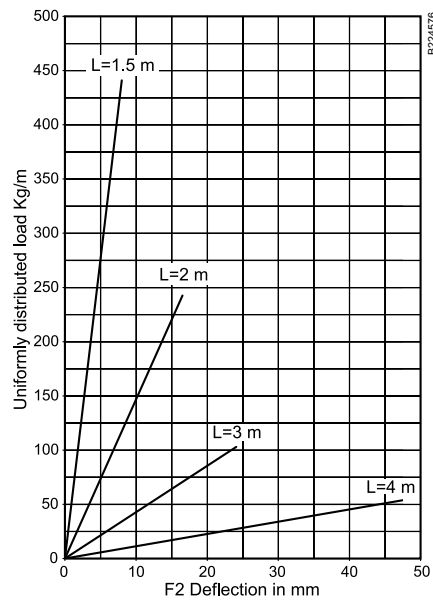
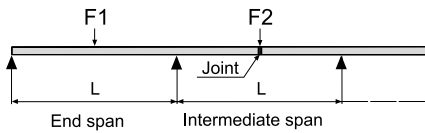
KHZ closed

### KHZ



| Type    | L<br>m | A<br>mm | B<br>mm |
|---------|--------|---------|---------|
| KHZ 150 | 6      | 147     | 111     |
| KHZ 200 | 6      | 197     | 161     |
| KHZ 300 | 6      | 297     | 261     |
| KHZ 400 | 6      | 397     | 361     |
| KHZ 500 | 6      | 497     | 461     |
| KHZ 600 | 6      | 597     | 561     |

### Test model II



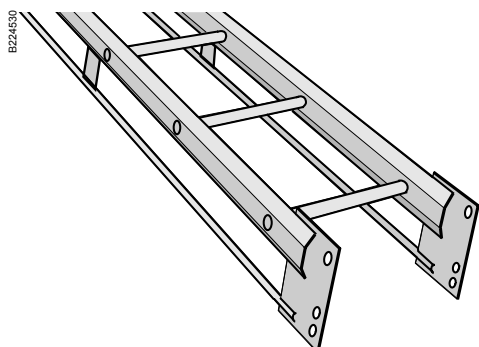
### Loadings

The ladders are tested according to IEC 61537, test model II - a joint in the intermediate span (F2).

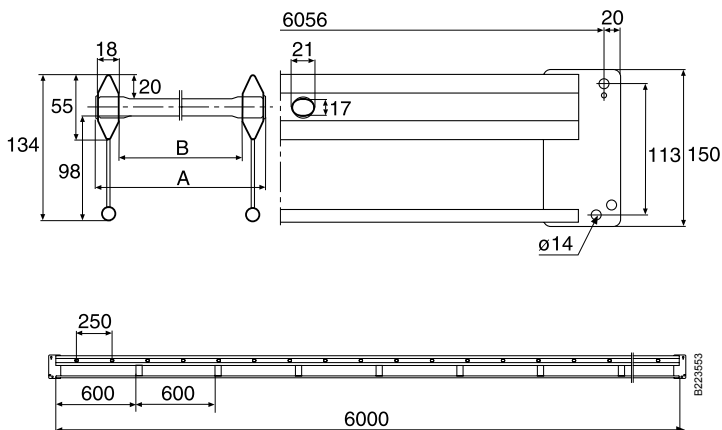
### Guaranteed load

Guaranteed uniformly distributed load supported includes a minimum safety factor of 1.7 towards rupture. The diagram shows the deflection with Joint 21 for cable ladder widths up to 600 mm.

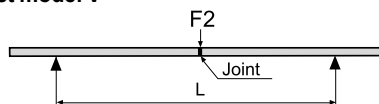
The cable ladders must not be used as walkways.



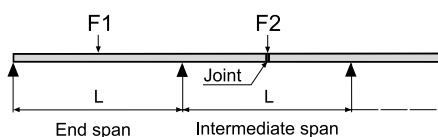
### KHZV



#### Test model V



#### Test model II



| Type     | L<br>m | A<br>mm | B<br>mm |
|----------|--------|---------|---------|
| KHZV 200 | 6      | 197     | 161     |
| KHZV 300 | 6      | 297     | 261     |
| KHZV 400 | 6      | 397     | 361     |
| KHZV 500 | 6      | 497     | 461     |
| KHZV 600 | 6      | 597     | 561     |

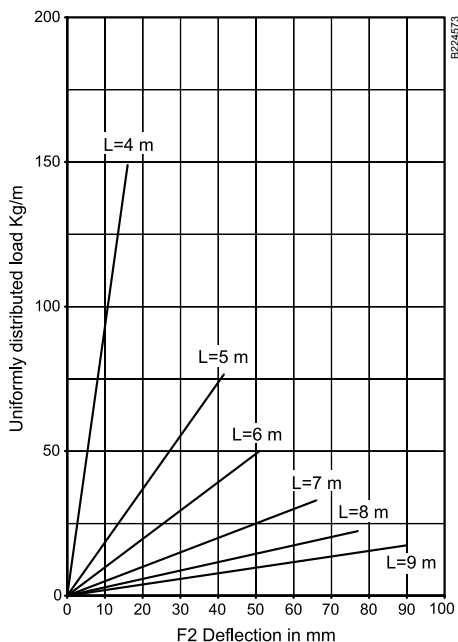
#### Loadings

The ladders are tested according to IEC 61537, test model II for bracket distance up to and including 4 m, test type V for bracket distance more than 4 m.

#### Guaranteed load

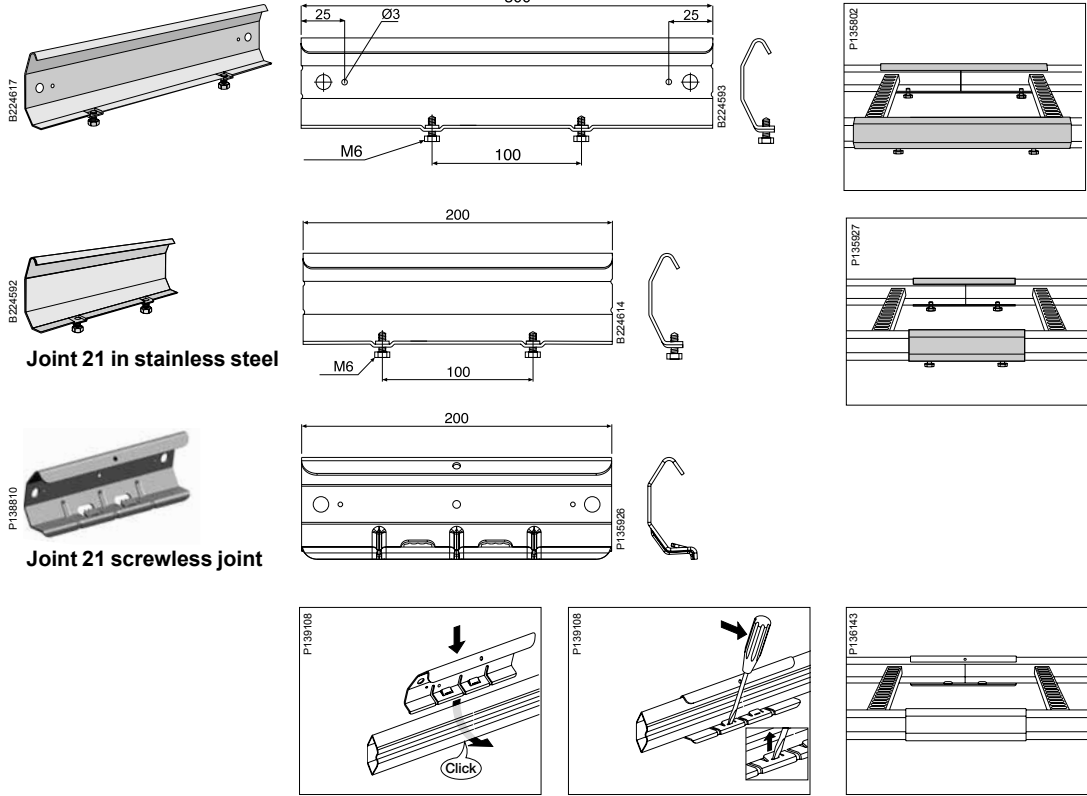
Guaranteed uniformly distributed load supported includes a minimum safety factor of 1.7 towards rupture. The diagram shows the deflection for ladder widths up to 600 mm.

The cable ladders must not be used as walkways.

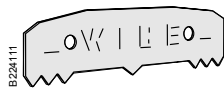


### Joint 21, with screws or screwless

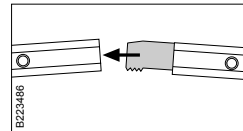
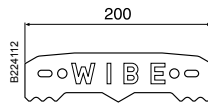
Joint to be used for straight, rigid joining of cable ladders, bends, junctions and risers. No extra earthing needed.



### Joint 9



Joint to be used for straight joining of cable ladders KHZ, KHZP and KHZPS. The teeth of the joint should face downwards. Under load, the ladders are prevented from slipping apart. If the joint is above a bracket, the teeth should face upwards.



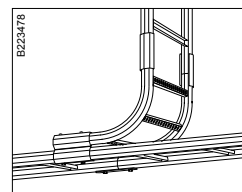
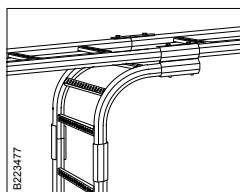
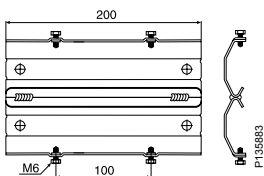
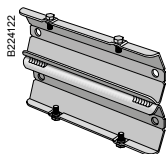
Joint 9 is used in straight joints of KHZ, KHZP and KHZPS.

**NOTE!** The teeth shall face downwards as shown in the figure. Under load, the ladders are prevented from slipping apart. If the joint is above a bracket, the teeth should face upwards.



### Dropper joint 32

Dropper joint used to form vertical branches in centre position under/on top of cable ladders.

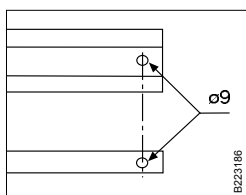
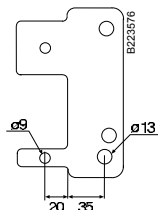
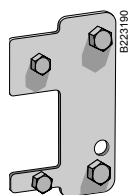


To be used together with Riser 18 to form vertical branches under Cable ladder KHZ, KHZP, KHZSP, KHZSPZ and KHZPS.

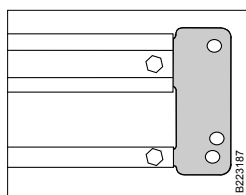
May also be used together with Riser 18 to form vertical branches on top of Cable ladder KHZ, KHZP, KHZSP, KHZSPZ and KHZPS.

### Joint 45

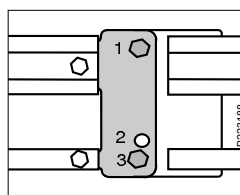
Joint to be fitted as a joining plate in a cut KHZV/KHZPV ladder.



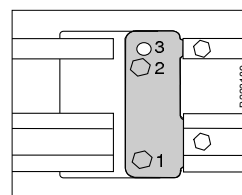
Cable ladders can be joined using separate joints.  
 - Cut the ends clean.  
 - Place the joints outside the ladders and mark where the holes shall be drilled.  
 - Drill 9 mm dia. holes.



- Insert the joint plates into the ladders and bolt them fast.



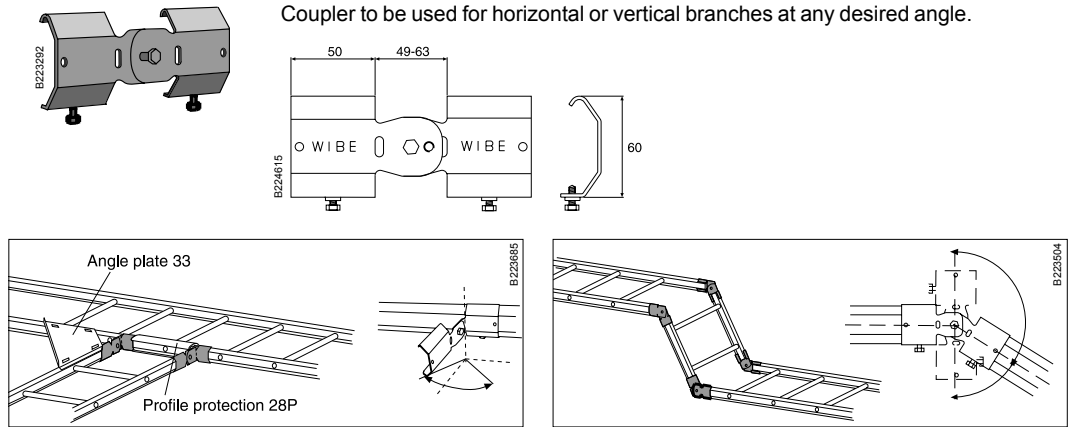
The holes are laterally displaced to avoid play in joints. If the ladders are mounted with arch pipes facing downwards, use holes 1 and 3.



If the ladders are mounted with arch pipes facing upwards, use holes 1 and 2.

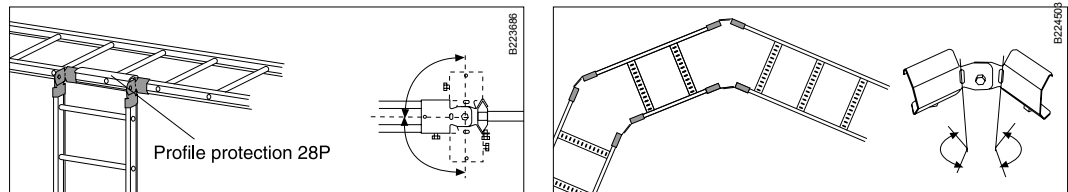
### Coupler 22

Coupler to be used for horizontal or vertical branches at any desired angle.



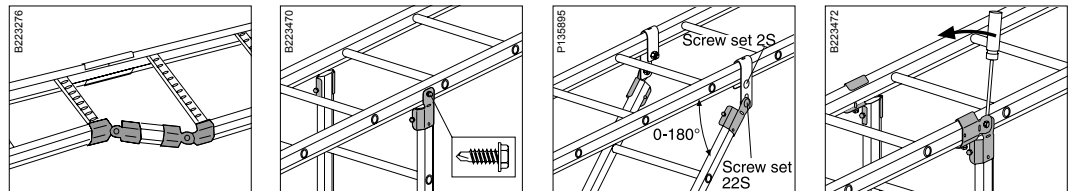
Coupler 22 is used for horizontal branching to the required angle. The cut length of the ladder ends determines the angle. Angle plate 33 is always recommended for horizontal branches. Use Profile protection 28P.

Coupler 22 is used to form vertical angles of the required size.



Coupler 22 is used to form vertical branches of the required angle. Mount Profile protection 28P. To be cut when required.

Use 4 Couplers 22 to form a horizontal bend in different angles. The cut lengths of the ladder ends determine the angle.



As an alternative at transition joining of KHZSP, KHZPS, KHZ and KHZP use 1 Joint 21 and 2 Couplers 22.

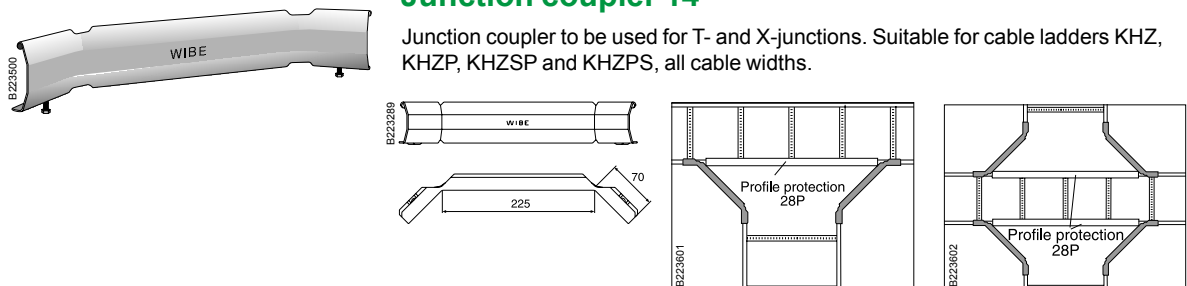
Vertical branching under the cable ladder with one part of Coupler 22 and plate screw.

Clamp 12 and one part of Coupler 22 can be used for branching under the cable ladder – allowing angles from 0 – 180°.

Use 2 Coupler 22 for vertical branching under the cable ladder. **Note!** The screw of Coupler 22 must be turned so that its head will be placed against the side profile of the cable ladder. Bend the coupler with a screwdriver.

### Junction coupler 14

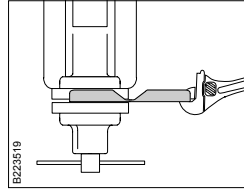
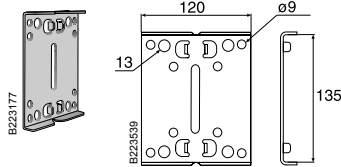
Junction coupler to be used for T- and X-junctions. Suitable for cable ladders KHZ, KHZP, KHZSP and KHZPS, all cable widths.



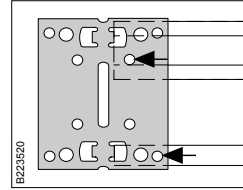
For T-junctions, use 2 Junction couplers 14. For X-junctions, use 4 Junction couplers 14. A bracket should be placed under the connecting ladder close to the connection. Profile protection 28P is recommended. To be cut to required length.

### Coupler 44

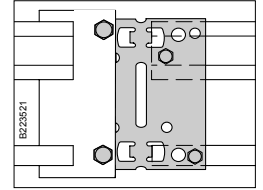
Coupler to be used for horizontal coupler of cable ladders KHZV/KHZPV. Also to be used for branches and as an end connection against a wall.



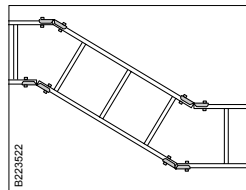
Coupler 44 may be bent to the required angle in a vice, using an adjustable spanner or similar.



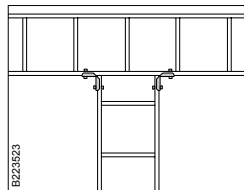
Use Coupler 44 as a drilling pattern on the cut ladder. Drill 9 mm dia. holes.



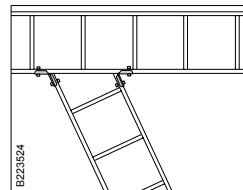
Assemble the cut and drilled ladders using M8x30 mm bolts. If the angle unit is mounted against a fixed joint plate use Screw set M12.



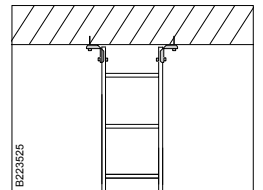
Angled cutting of the ladder ends determines the angle.



Straight branch.



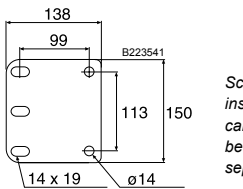
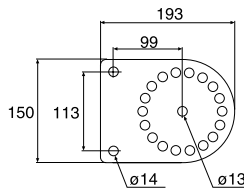
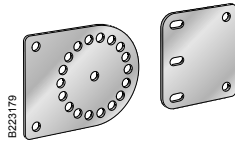
Angled branch.



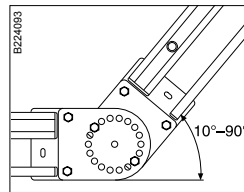
Use Coupler 44 as an end attachment for mounting ladders against walls or floors.

### Coupler 51

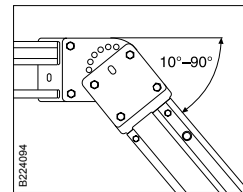
Coupler to be used as a self-supporting vertical coupler of cable ladders KHZV/ KHZPV.



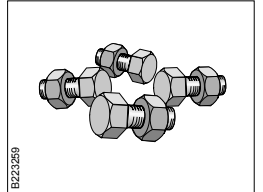
Screw set M12 for installation on the cable ladder is to be ordered separately.



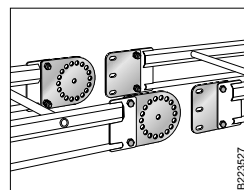
Rising. Adjustable from 10° to 90° gradually in steps of 20°.



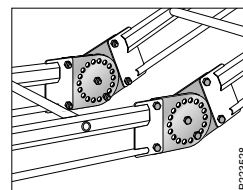
Sloping. Adjustable from 10° to 90° gradually in steps of 20°.



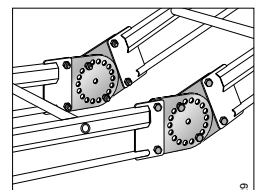
Screw set to be used for all joints with cable ladders KHZV and KHZPV.



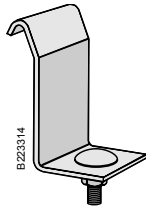
1. Install the plates on the ladder with Screw set M12.



2. Assemble the ladders in the centre hole with one of the included screws/nuts. Adjust to desired angle and fix the installation in one of the outer holes with screw/nut.

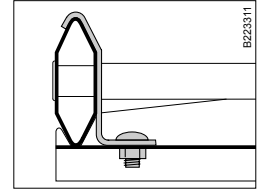
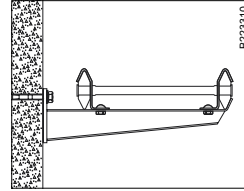
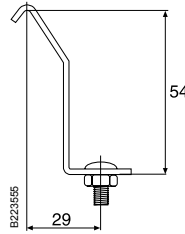


3. Move the nut in the centre hole to the opposite outer hole and tighten.



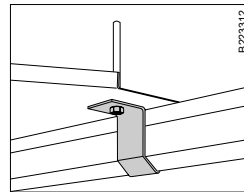
### Profile clamp 42

Profile clamp to be used for installations where the cable ladder is to be fixed to cantilever arms, support brackets, etc.

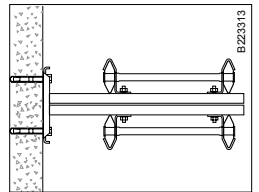


Use Profile clamp 42 for attaching KHZSP, KHZPS, KHZ and KHZP to Cantilever arm 50 and Support bracket 3. For small loads, mount the ladder with a clamp on each cantilever arm, alternately right side and left side.

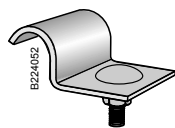
For installation of KHZSP, KHZPS, KHZ and KHZP on Support bracket 3, Profile clamp 42 is used.



To lock Angle plate 33/2, fit 2 Profile clamp 42.

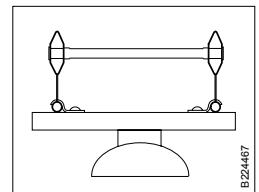
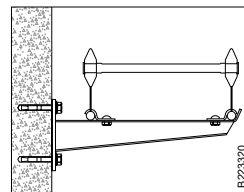
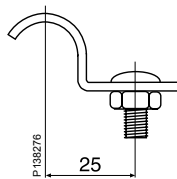


Cable ladders can be mounted directly on Vertical piece 20 or 20F with Profile clamp 42. Use T-bolt for mounting. Convenient at vertical installations in shafts.



### Profile clamp 43

Profile clamp to be used for installations where the cable ladders KHZV and KHZPV are to be fixed to cantilever arms, support brackets, etc.

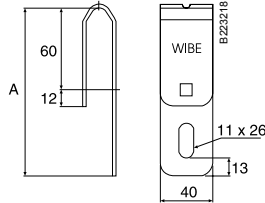
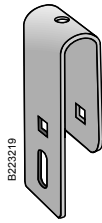


Use Profile clamp 43 to attach KHZV/KHZPV to Cantilever arm 50. For small loads, mount the ladder with a clamp on each cantilever arm, alternating right side and left side.

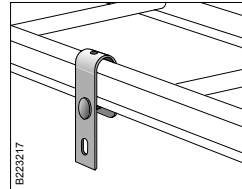
Pendant/Fixing rail 24/48, mounted under Cable ladder KHZV with Profile clamp 43, here used as carrier of lighting fittings.

### Clamp 12

Clamp to be used on the side profile of the cable ladder for installation of accessories.



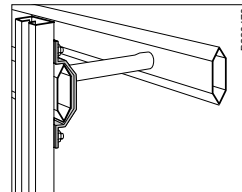
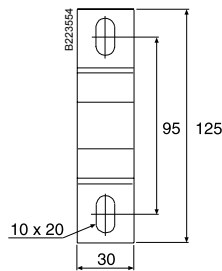
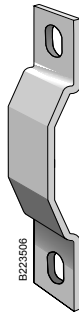
| Type         | A mm |
|--------------|------|
| Clamp12/70   | 125  |
| Clamp 12/120 | 175  |



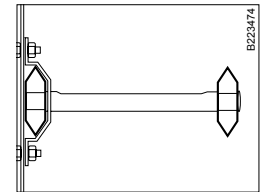
Clamp 12 can be used for installation of antenna brackets, junction boxes and so on. Use Screw set 2S for hot dip clamp or Screw set W37 or stainless steel clamp.

### Profile clamp 41

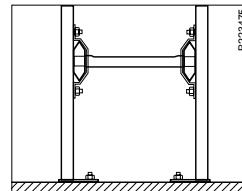
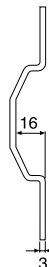
Profile clamp to be used to install a pendant/fixing rail or mounting plate, etc., on the cable ladder profile.



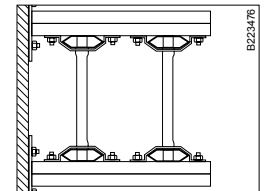
Mounting of pendant/fixing rail on ladder profile. Use Screw set 22S.



Installation of mounting plate for apparatuses. Use Screw set 22S.



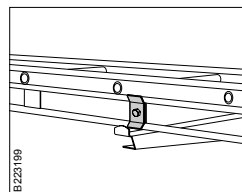
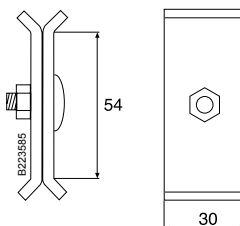
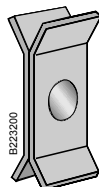
Mounting of cable ladder on floor pendants. Use T-bolts against the opening of the fixing rail.



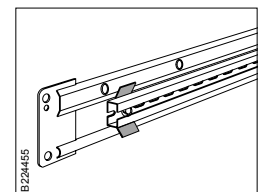
Mounting of cable ladders on wall pendants, such as in shafts. Use T-bolts against the opening of the fixing rail.

### Profile support piece 46

To be fitted between the ladder and the vault pipe when a support bracket is positioned between existing profile support pieces. For cable ladders KHZV and KHZPV.



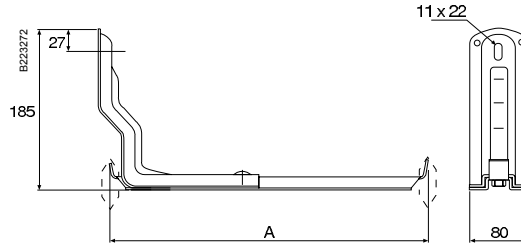
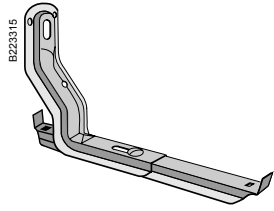
If a support bracket is placed between two profile support pieces, a Profile support piece 46 must be mounted between the arch pipes and the ladder. If the load is half the permitted load, exclude the Profile support piece 46.



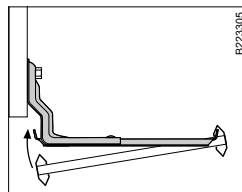
Profile support piece 46 can be installed as a fixing for different applications.

### Cantilever arm 30

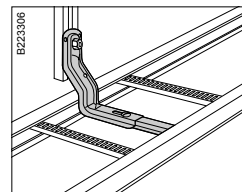
Cantilever arm for installation inside cable ladder KHZSP.



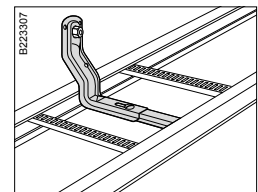
| Cantilever arm type | A mm |
|---------------------|------|
| 30/200              | 184  |
| 30/300              | 284  |
| 30/400              | 384  |
| 30/500              | 484  |
| 30/600              | 584  |



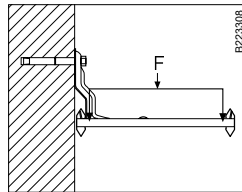
Installation of cable ladder KHZSP. Place the ladder on the outer tab and press it over the inner tab. When necessary, the ladder can be locked with a Profile clamp 43.



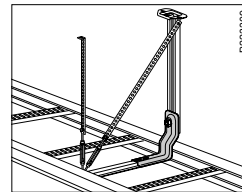
Installation on Vertical piece 2F. Cable ladder KHZSP can be adjusted max 40 mm.



Installation direct on wall. Cable ladder KHZSP is adjustable from 0–15 mm to the wall.



Breaking load for cantilever arm on wall, see table below.



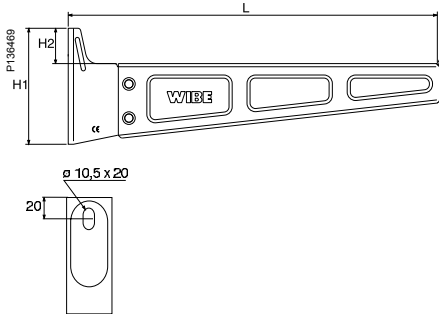
When you mount cable ladders that are 500-600 mm wide it might be necessary with a reinforcement of the outer edge of the cantilever arm. Installation band and stretching screw can be used for mounting in the ceiling or on a vertical piece.

#### Breaking load

| Cantilever arm type | Max. load F on cantilever arm at a deflection of 3° |     | Deflection at 3° deflection of cantilever arm mm | Breaking load |     |
|---------------------|---|-----|--|---------------|-----|
|                     | kN  | kg  |  | kN            | kg  |
| 30/200              | 2.0   | 200 | 10   | 2.3           | 230 |
| 30/300              | 1.9   | 190 | 15   | 3.5           | 350 |
| 30/400              | 1.2   | 120 | 20   | 3.0           | 300 |
| 30/500              | 0.8   | 80  | 26   | 2.4           | 240 |
| 30/600              | 0.6   | 60  | 31   | 2.0           | 200 |

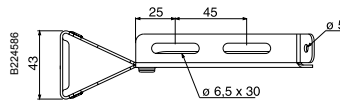
### Cantilever arm 50i

Cantilever arm to be used for lighter mountings on walls, vertical pieces or pendant/ fixing rails.

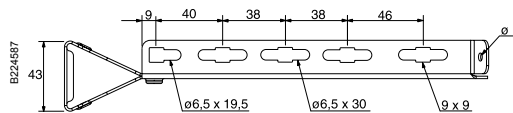


| Cantilever arm type | Size |       |       |
|---------------------|------|-------|-------|
|                     | L mm | H1 mm | H2 mm |
| 50i-200             | 250  | 85    | 28.5  |
| 50i-300             | 350  | 110   | 33.5  |
| 50i-400             | 450  | 115   | 31.0  |

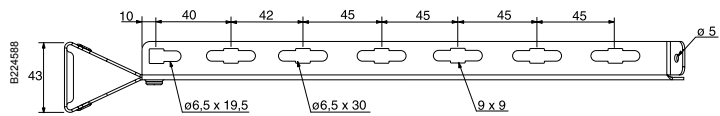
#### Widths = 100



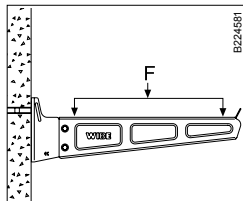
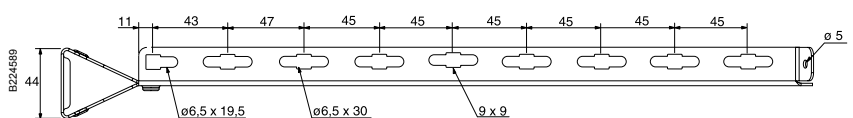
#### Widths = 200



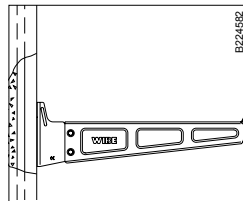
#### Widths = 300



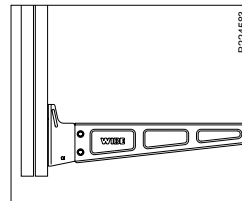
#### Widths = 400



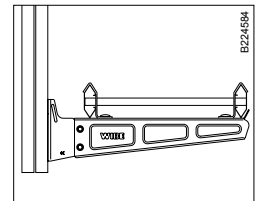
Installation of cantilever arm mounted to wall using Expansion bolt M8. Breaking load - See table below.



Installation of cantilever arm using T-bolt M8 on Fixing rail 24/26 x 53 for casting-in or Pendant/ Fixing rail wall mounted.



Installation of cantilever arm using T-bolt M8 on vertical piece. Check breaking load of the vertical piece.

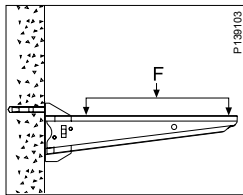
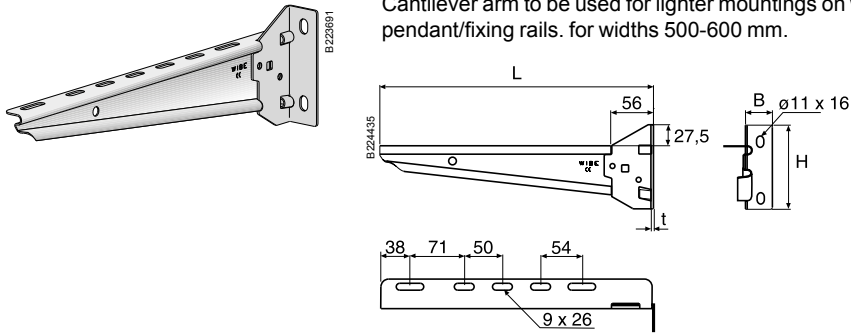


Cable ladder KHZSP mounted on Cantilever arm 50i, Profile clamp 42 is used.

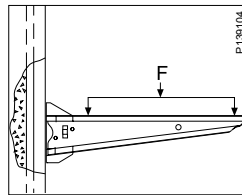
| Breaking load F - Mounted on wall |      |     |
|-----------------------------------|------|-----|
| Type of cantilever arm            | kN   | kg  |
| 50i-100                           | 2.30 | 230 |
| 50i-200                           | 2.15 | 215 |
| 50i-300                           | 2.20 | 220 |
| 50i-400                           | 2.35 | 235 |

### Cantilever arm 81

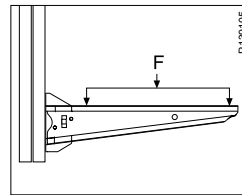
Cantilever arm to be used for lighter mountings on walls, vertical pieces or pendant/fixing rails. for widths 500-600 mm.



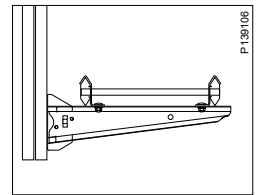
Installation of a cantilever arm to a wall using an Expansion bolt. Breaking load - see below.



Installation of a cantilever arm using a T-bolt on a Fixing rail 24/26 x 53 for casting-in or Pendant/Fixing rails mounted on the wall.

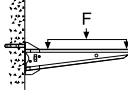
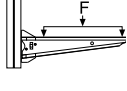


Installation of cantilever arm using T-bolt with vertical pieces. Breaking load - see below. Also check breaking load of the vertical piece.

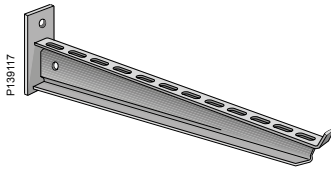


Cable ladder KHZSP mounted on Cantilever arm 81, Profile clamp 42 is used.

#### Size and Breaking load F

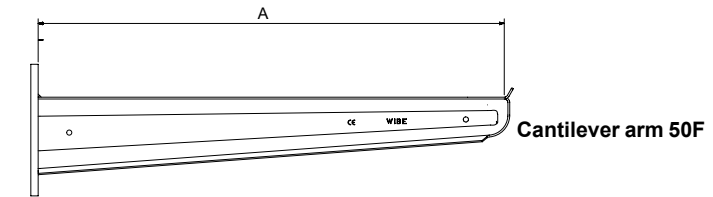
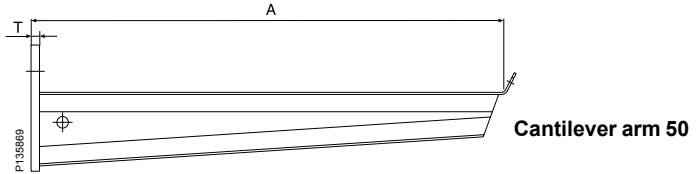
| Type                  | Size |      |      |      |  |     |  |     |
|-----------------------|------|------|------|------|--|-----|---|-----|
|                       | L mm | B mm | H mm | t mm | Mounted on wall<br>kN  | kg  | Mounted on P/F rail<br>24/48 with T-bolt 26<br>kN                                     | kg  |
| Cantilever arm 81/500 | 568  | 40   | 150  | 3.0  | 1.9  | 190 | 1.9   | 190 |
| Cantilever arm 81/600 | 658  | 40   | 150  | 3.0  | 1.9  | 190 | 1.9   | 190 |



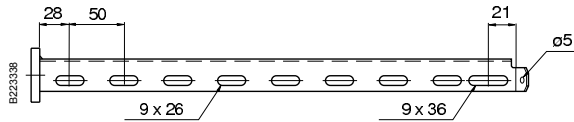


### Cantilever arm 50L, 50 and 50F

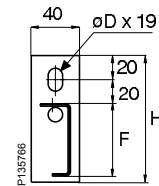
Cantilever arm for mounting on walls, pendant/fixing rails or vertical pieces.



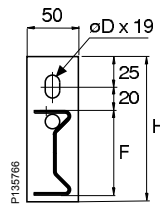
### Cantilever arm 50L and 50



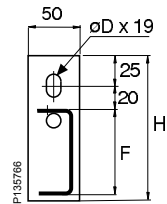
### 50L,50/100-300



### 50L,50/400-600



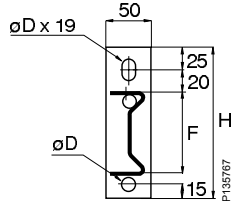
### 50/700-1000



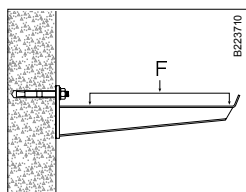
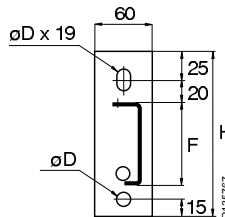
### Cantilever arm 50F



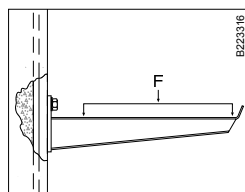
### 50F/200-600



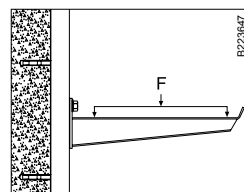
### 50F/1000



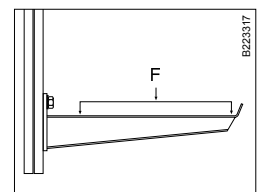
Installation of a cantilever arm to a wall using an Expansion bolt. Breaking load—see on next page.



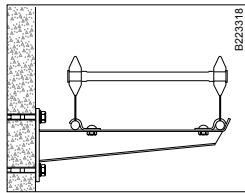
Installation of a cantilever arm using a T-bolt on a Fixing rail 24/26x53 rail for casting-in or Pendant/Fixing rails mounted on the wall. Breaking load—see on next page.



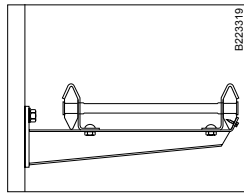
Mounting a cantilever arm using a T-bolt on a Pendant/Fixing rail mounted on a wall.



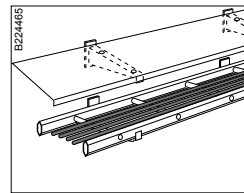
Installation of cantilever arm using T-bolt with vertical pieces. Breaking load—see on next page. Also check breaking load of the vertical piece.



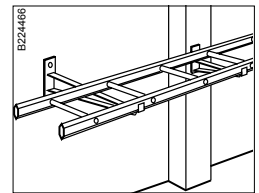
Profile clamp 43 is used for attaching a KHZV onto a Cantilever arm 50F.



For attaching a KHZSP, KHZ, KHZPS or KHZP cable ladder, mount Profile clamp 42. If it is only necessary to fix the cable ladder at the outer end of the bracket, use self-tapping sheet screws or suchlike with 5 mm dia. holes in the bracket and in the side section.



Cantilever arm 50F mounted upside down can be used for installation of tilted protective roofs.



Use Cantilever arm 50/700-1000 as support when cable ladders have to pass columns etc.

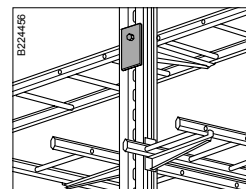
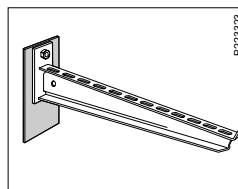
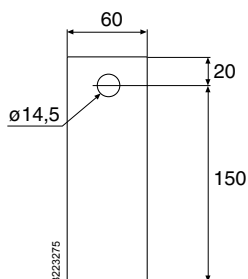
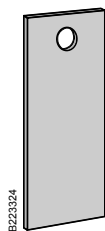
### Size and Breaking load F

| Type     | A mm | D mm | F mm | H mm | T mm | Mounted on wall |      | Mounted on P/F rail 24/48 with T-bolt 26F |      |
|----------|------|------|------|------|------|-----------------|------|---|------|
|          |      |      |      |      |      | kN              | kg   | kN  | kg   |
| 50L/100  | 150  | 12   | 34   | 85   | 4    | 1.5             | 150  | 1.5                                       | 150  |
| 50L/150  | 200  | 12   | 36   | 85   | 4    | 1.5             | 150  | 1.5                                       | 150  |
| 50L/200  | 250  | 12   | 39   | 85   | 4    | 1.5             | 150  | 1.5                                       | 150  |
| 50L/250  | 298  | 12   | 56   | 105  | 4    | 2.0             | 200  | 2.0                                       | 200  |
| 50L/300  | 348  | 12   | 60   | 105  | 4    | 2.0             | 200  | 2.0                                       | 200  |
| 50L/400  | 447  | 12   | 70   | 120  | 5    | 3.0             | 300  | 3.0                                       | 300  |
| 50L/500  | 548  | 12   | 77   | 140  | 6    | 3.0             | 300  | 3.0                                       | 300  |
| 50L/600  | 646  | 12   | 84   | 150  | 6    | 3.0             | 300  | 3.0                                       | 300  |
| 50/100   | 150  | 12   | 34   | 85   | 4    | 3.0             | 300  | 3.0                                       | 300  |
| 50/150   | 200  | 12   | 36   | 85   | 4    | 3.0             | 300  | 3.0                                       | 300  |
| 50/200   | 250  | 12   | 39   | 85   | 4    | 2.5             | 250  | 2.5                                       | 250  |
| 50/250   | 300  | 12   | 56   | 105  | 6*   | 4.0             | 400  | 4.0                                       | 400  |
| 50/300   | 350  | 12   | 60   | 105  | 6*   | 4.0             | 400  | 4.0                                       | 400  |
| 50/400   | 450  | 12   | 70   | 120  | 8*   | 6.5             | 650  | 6.5                                       | 650  |
| 50/500   | 550  | 12   | 77   | 140  | 8*   | 7.0             | 700  | 7.0                                       | 700  |
| 50/600   | 650  | 12   | 84   | 150  | 10*  | 7.0             | 700  | 7.0                                       | 700  |
| 50/700   | 750  | 12   | 90   | 150  | 10   | 6.0             | 600  | 5.5                                       | 550  |
| 50/800   | 850  | 12   | 95   | 160  | 10   | 5.5             | 550  | 5.2                                       | 520  |
| 50/900   | 950  | 12   | 100  | 160  | 10   | 5.3             | 530  | 4.8                                       | 480  |
| 50/1000  | 1050 | 12   | 105  | 170  | 10   | 5.0             | 500  | 4.2                                       | 420  |
| 50F/200  | 245  | 12   | 72   | 148  | 8    | 10.0            | 1000 | 10.0                                      | 1000 |
| 50F/300  | 345  | 12   | 79   | 175  | 8    | 10.0            | 1000 | 10.0                                      | 1000 |
| 50F/400  | 445  | 12   | 86   | 175  | 8    | 11.0            | 1100 | 9.0                                       | 900  |
| 50F/500  | 547  | 14   | 93   | 180  | 10   | 10.0            | 1000 | 8.0                                       | 800  |
| 50F/600  | 647  | 14   | 100  | 180  | 10   | 10.0            | 1000 | 8.0                                       | 800  |
| 50F/1000 | 1052 | 14   | 160  | 240  | 12   | 11.0            | 1100 | 8.0                                       | 800  |

\* Stainless steel: 50/250-300 T=4mm, 50/400-600 T=5mm.

### Back plate 40

Back plate to be used for installation behind Cantilever arm 50 to reduce the surface pressure on porous walls.

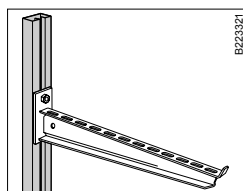
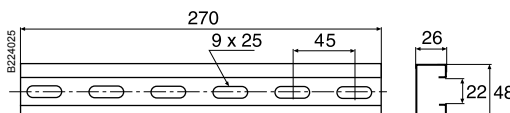
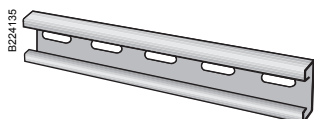


Mount Back plate 40 as shown in the illustration to reduce the surface stress on porous walls.

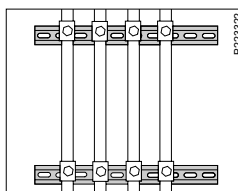
By using Back plate 40, a cantilever arm can be mounted on the side of Vertical piece 20F.

### Mounting rail 40

Mounting rail to be used for wall installation of cantilever arms on porous walls to reduce the surface pressure or to enable height adjustment of cantilever arms.



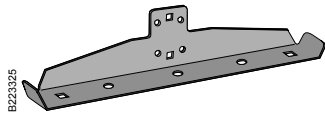
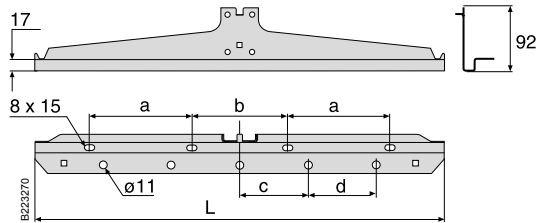
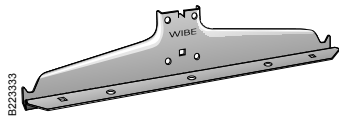
Mounting rails reduce the surface stress on porous walls. Mount the cantilever arm using T-bolt, which permits height adjustment.



Cables may be mounted on walls using Mounting rail 40 and a suitable Cable clamp Type A.

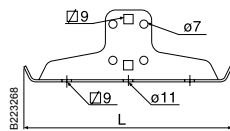
### Support bracket 3

Support bracket to be used for centre installation of cable ladders on pendant/fixing rails and vertical pieces.

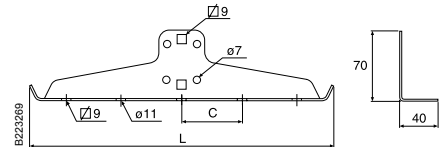


Stainless steel AISI 316L

3/150-200



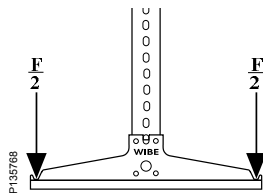
3/300-600



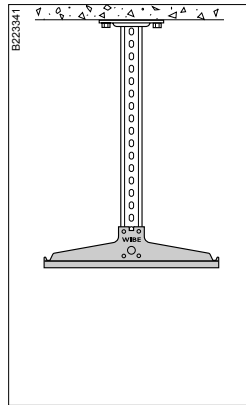
#### Size

| Type                  | L mm | Stainless steel L mm | a mm | b mm | c mm | d mm |
|-----------------------|------|----------------------|------|------|------|------|
| Support bracket 3/150 | 150  | 154                  | –    | 100  | –    | –    |
| Support bracket 3/200 | 200  | 204                  | –    | 100  | –    | –    |
| Support bracket 3/300 | 300  | 306                  | 70   | 100  | –    | –    |
| Support bracket 3/400 | 400  | 406                  | 70   | 100  | 100  | –    |
| Support bracket 3/500 | 500  | 506                  | 100  | 140  | 100  | –    |
| Support bracket 3/600 | 600  | 606                  | 150  | 140  | 100  | 100  |

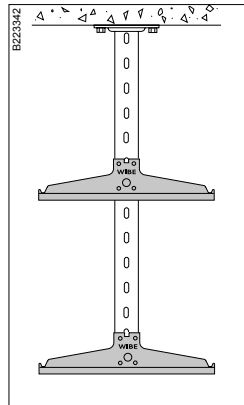
#### Breaking load for support bracket with symmetrical loading



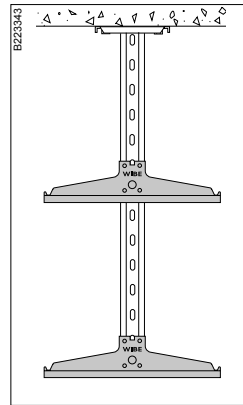
| Type                  | Breaking load F |      |
|-----------------------|-----------------|------|
|                       | kN              | kg   |
| Support bracket 3/150 | 16              | 1600 |
| Support bracket 3/200 | 16              | 1600 |
| Support bracket 3/300 | 16              | 1600 |
| Support bracket 3/400 | 12              | 1200 |
| Support bracket 3/500 | 12              | 1200 |
| Support bracket 3/600 | 10              | 1000 |



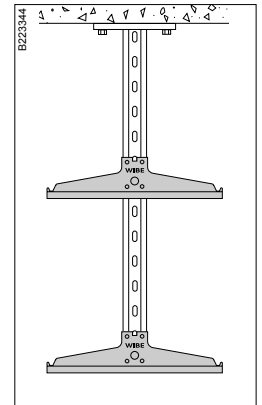
Mount Support bracket 3 on Vertical piece 2 with Screw set 22S.



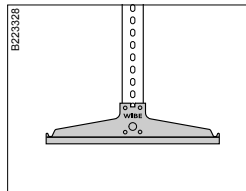
Mount Support bracket 3 on Vertical piece 2F with Screw set 22S.



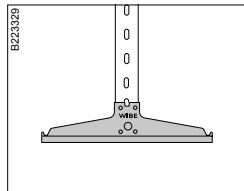
Mount Support bracket 3 on Vertical piece 20 with Screw set 20S.



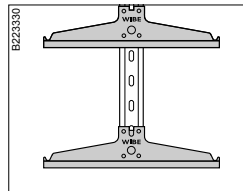
Mount Support bracket 3 on Vertical piece 20F with Screw set 2S.



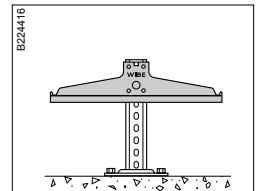
Mount Support bracket 3 on Pendant/Fixing rail 24/34 with Screw set 22S.



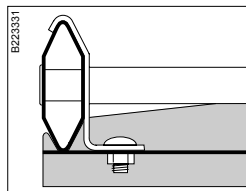
Mount Support bracket 3 on Pendant/Fixing rail 24/20 or 24/48 with Screw set 22S.



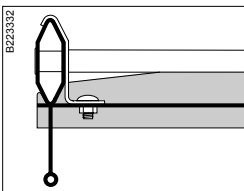
Support bracket 3 installed on Pendant/Fixing rail 24/20F with Screw set 2S.



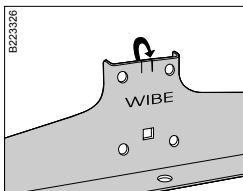
Support bracket 3 can be mounted on floor or under data floor with a suitable vertical piece.



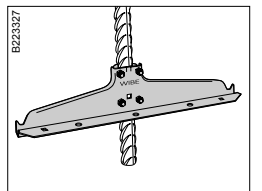
For installation of KHZSP, KHZ, KHZP and KHZPS on Support bracket 3 Profile clamp 42 is used.



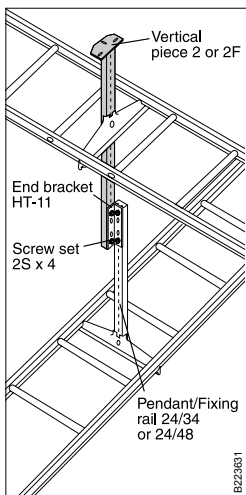
When attaching KHZV/KHZPV to Support bracket 3, use Profile clamp 42.



When attaching Support bracket 3 using clamp set M6 the tab must be bent up using a hammer or pair of pliers.



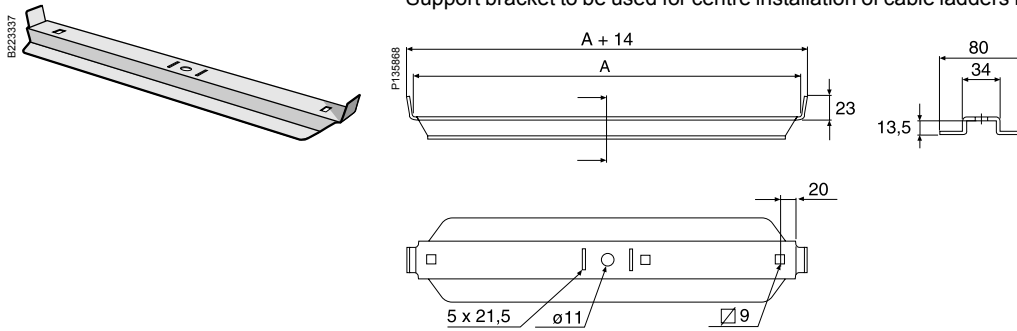
Support bracket 3 mounted on a rock bolt with Clamp set M6.



End bracket HT-11 permits the mounting of crossing cable ladders at different levels on the same pendant/fixing rail.

### Support bracket 6

Support bracket to be used for centre installation of cable ladders KHZSP.

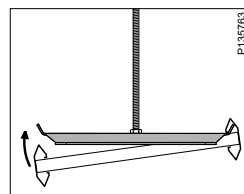


#### Size

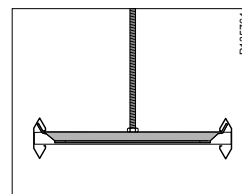
| Type                  | A mm |
|-----------------------|------|
| Support bracket 6/200 | 170  |
| Support bracket 6/300 | 270  |
| Support bracket 6/400 | 370  |
| Support bracket 6/500 | 470  |
| Support bracket 6/600 | 570  |

#### Breaking load for Support bracket 6 – symmetrical loading

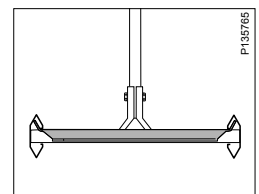
| Support bracket | Breaking load with Threaded rod W76 M10 |     | Breaking load with Pendant attachment W21 |     |
|-----------------|---|-----|---|-----|
|                 | kN                                      | kg  | kN  | kg  |
| 6/200           | 5.0                                     | 500 | 3.4                                       | 340 |
| 6/300           | 4.8                                     | 480 | 3.4                                       | 340 |
| 6/400           | 3.0                                     | 300 | 3.0                                       | 300 |
| 6/500           | 2.2                                     | 220 | 2.2                                       | 220 |
| 6/600           | 1.7                                     | 170 | 1.7                                       | 170 |



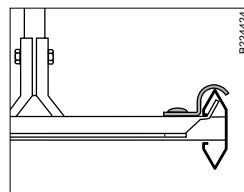
Support bracket 6 must be mounted inside cable ladder KHZSP.



Support bracket 6 mounted with Threaded rod W76 M10. Nut M10 must be used.



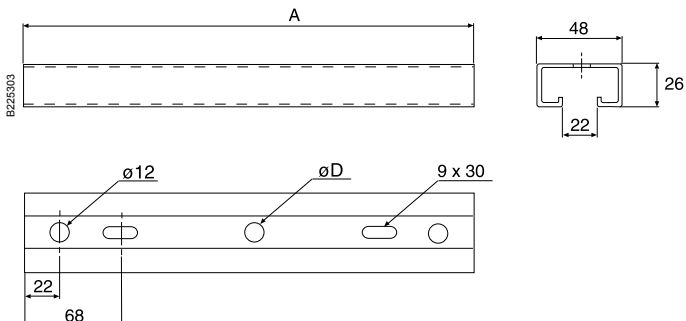
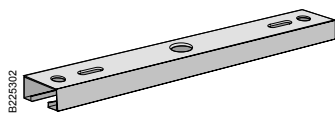
Support bracket 6 mounted with Pendant rail W32, Pendant attachment W21 and Screw set W37 from the Wibe cable Tray range.



Profile clamp 43 can be used to fix the cable ladder to the support bracket.

### Support bracket HSO

Support bracket to be mounted together with Threaded rod M10 or M16 for the installation of cable ladders.

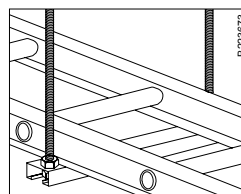
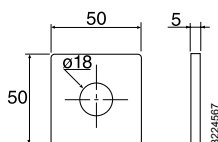
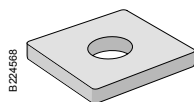


#### Size

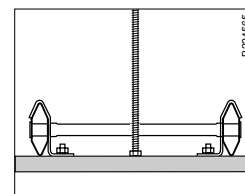
| Type                        | A mm | D mm |
|-----------------------------|------|------|
| Support bracket HSO/150 M10 | 210  | 12   |
| Support bracket HSO/200 M10 | 260  | 12   |
| Support bracket HSO/300 M10 | 360  | 12   |
| Support bracket HSO/400 M16 | 460  | 18   |
| Support bracket HSO/500 M16 | 560  | 18   |
| Support bracket HSO/600 M16 | 660  | 18   |

### Washer HSO M16

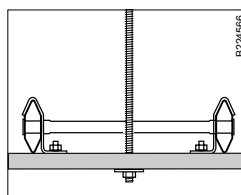
Washer to be used for centered mounting with Support bracket HSO M16 and Threaded rod M16.



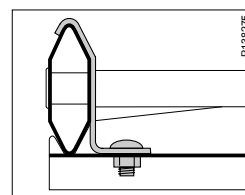
Support bracket HSO M10 installed with Threaded rod W76 M10.



Centered installation with Support bracket HSO M10, widths 150-300, Threaded rod W76 M10 and 2 Nuts M10.



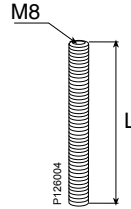
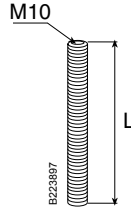
Centered installation with Support bracket HSO M16, widths 400-600, Threaded rod M16, 2 Nuts M16 and Washer HSO M16.



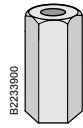
Profile clamp 42 is used to attach the cable ladder to the support bracket.

### Threaded rod B41 and W76 M8, M10

Used for installation of light cable ladders.

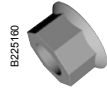


| Diametre and Surface treatment | L= 1000mm | L= 2000mm | L= 3000mm |
|--------------------------------|-----------|-----------|-----------|
| M8 EZ                          | W76       | -         | -         |
| M10 EZ                         | -         | W76       | W76       |
| M8 HDG                         | W76       | W76       | -         |
| M8 AISI                        | B41       | B41       | -         |
| M10 AISI                       | B41       | B41       | -         |



### Joint nut M8, M10

Used for joining of threaded rod.



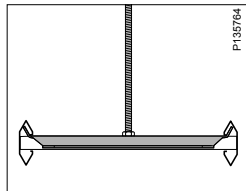
### Flange nut B43 M8, M10

Flange nut is mounted onto threaded rods in order to lock support brackets and ceiling brackets.

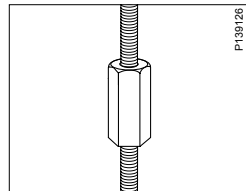


### Thread lock B50 M8, M10

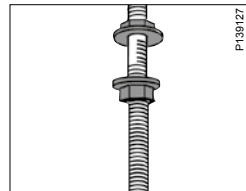
Used for joining of threaded rod.



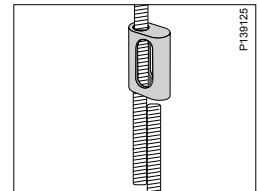
Support bracket 6 mounted with Threaded rod. Flange Nut B43 must be used.



Use Joint nut when joining 2 pieces of Threaded rod.



Flange nut B43 is mounted onto Threaded rod in order to lock support brackets and ceiling brackets.

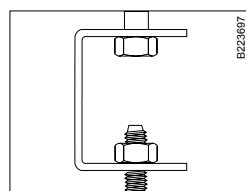
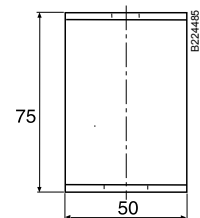
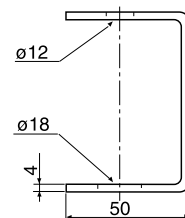
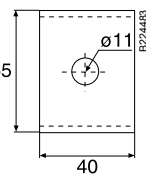
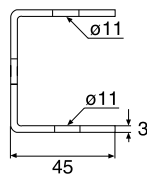


Thread lock B50 is used for the joining of threaded rod. Max. permitted load=80kg.



### Ceiling bracket TF-10 and TF-16

Ceiling bracket to be used for installation with threaded rods.

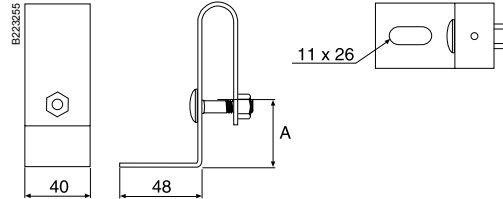
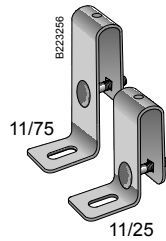


Ceiling bracket TF-10 or TF-16 installed with Threaded rod M10 or M16.

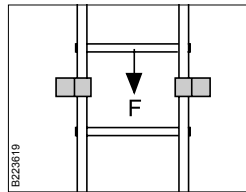


### Wall bracket 11/25 and 11/75

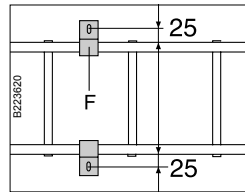
To be used for vertical or horizontal installations of cable ladders against a wall.



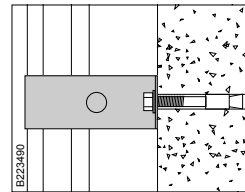
| Type               | A mm |
|--------------------|------|
| Wall bracket 11/25 | 25   |
| Wall bracket 11/75 | 75   |



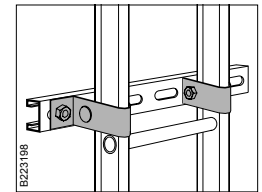
**Vertical mounting**  
(max. load - F)  
Wall bracket 11/25:  
300 kg (3 kN)  
Wall bracket 11/75:  
300 kg (3 kN)  
When mounting against a  
rung the max load is 500  
kg (5 kN) for wall bracket  
11/25.



**Horizontal mounting**  
(max. load - F)  
Wall bracket 11/25:  
250 kg (2.5 kN)  
Wall bracket 11/75:  
100 kg (1.0 kN)



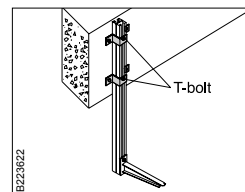
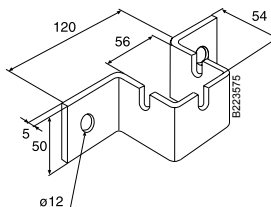
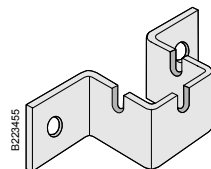
Mount wall brackets  
against walls using  
Expansion bolts.



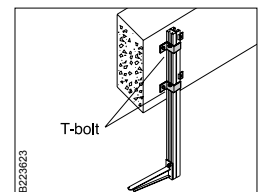
Pendant/fixing rails can  
be mounted on cable  
ladders using wall  
brackets for mounting  
equipment cubicles etc.  
Mount wall brackets on  
Pendant/fixing rails using  
Screw set 22S.

### Wall bracket 20

To be used at installation of Pendant/fixing rail 24/20 to ceiling beam or wall.



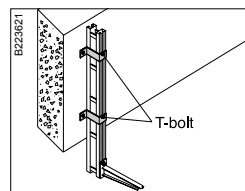
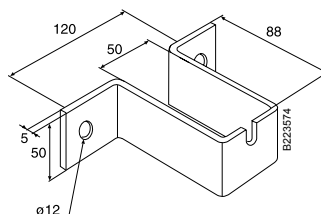
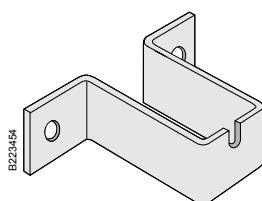
For cable ladder  
installations along a  
beam. Pendant/Fixing rail  
24/20 must be mounted  
with 2 Wall brackets 20  
and 2 T-bolts 26F-30  
placed in the centre outlet.  
This installation is also  
used for fixing to wall. Max  
vertical load  
700 kg (7 kN).



For cable ladder  
installations across a  
beam. Pendant/Fixing rail  
24/20 shall be mounted  
with 2 Wall brackets 20  
and 2 T-bolts 26F-30 in  
the side-outlets.

### Wall bracket 20F

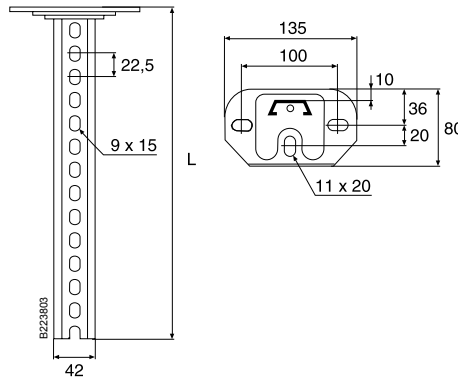
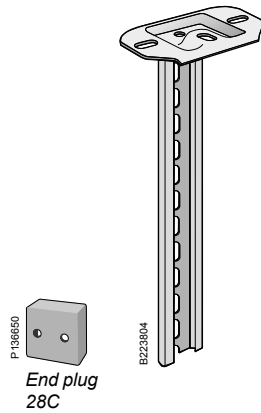
To be used at installation of Pendant/Fixing rail 20F to ceiling beam or wall.



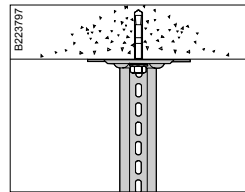
Pendant/Fixing rail  
24/20F must be mounted  
with 2 Wall brackets 20F  
and 2 T-bolts 26F-30 for  
cable ladders along  
beams. This installation is  
also used for fixing to  
wall. Max. vertical load  
700 kg (7 kN).

### Vertical piece 2

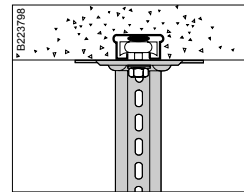
Vertical piece to be used for installation of Support bracket 3, symmetrical loading. Not suitable for cable ladders KHZV and KHZPV. Can be joined to Pendant/fixing rail 24/34 with Pendant joint 2J.



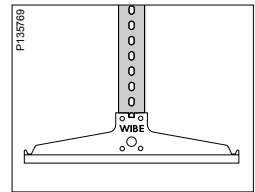
| Type                  | L mm |
|-----------------------|------|
| Vertical piece 2/300  | 279  |
| Vertical piece 2/400  | 392  |
| Vertical piece 2/500  | 504  |
| Vertical piece 2/700  | 729  |
| Vertical piece 2/1000 | 1022 |



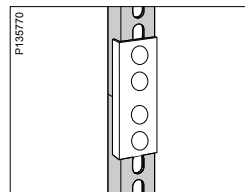
Mount Vertical piece 2 using an Expansion bolt or a concrete screw.



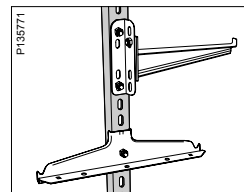
Mount Vertical piece 2 on a Fixing rail 24/26x53 for casting-in using T-bolt 26F.



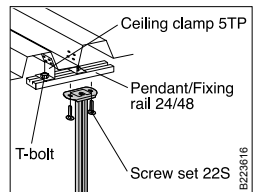
On Vertical piece 2, mount Support bracket 3 using Screw set 22S.



Vertical piece 2 can be joined to achieve the required length using Pendant/Fixing rail 24/34 and Pendant joint 2J.

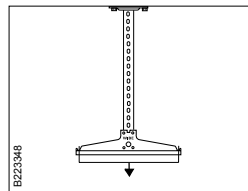


Cantilever arm 50 can, using End bracket HT-11, be mounted at 90° to the pendant/fixing rail. Only for lightweight mounting, such as data cables.

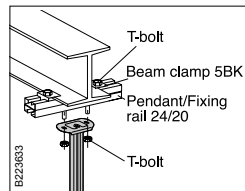


In ceilings with trapezoidal profile sheeting, mount Vertical piece 2 as shown above.

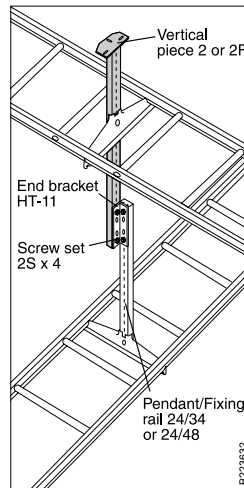
### Breaking load



Breaking load for Vertical piece 2 with a symmetrical loading = 1400 kg (14 kN). See also breaking load for support bracket 3.



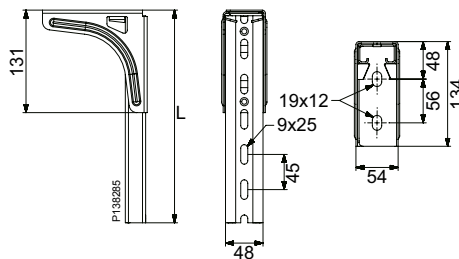
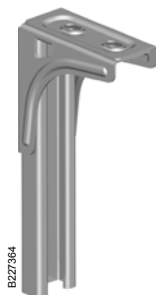
On beams in ceilings. When the beam flange thickness does not exceed 13 mm, use Beam clamp 5BK-10 and T-bolt 26F/40. For flange thicknesses not exceeding 30 mm use Beam clamp 5BK-30 and T-bolt 26F/50.



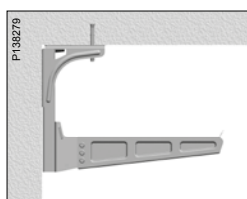
End bracket HT-11 permits the mounting of crossing cable ladders at different levels on the same pendant/fixing rail.

### Vertical piece 2Fi

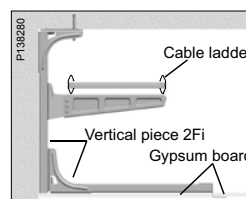
Vertical piece to be used for lighter mountings with Cantilever arm 50i and Cable ladder KHZSP.



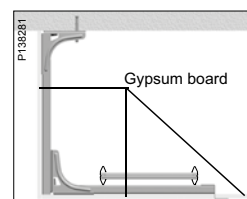
| Type                    | L mm |
|-------------------------|------|
| Vertical piece 2Fi-300  | 272  |
| Vertical piece 2Fi-500  | 497  |
| Vertical piece 2Fi-750  | 722  |
| Vertical piece 2Fi-1000 | 992  |



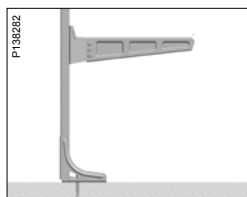
Vertical piece 2Fi can be mounted in ceiling close to wall.



Vertical piece 2Fi can be mounted horizontally on wall and on vertical piece as carrier of gypsum board.

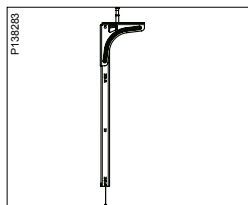


Vertical piece 2Fi can be used as carrier of gypsum boards in order to build in cable ladder passages.

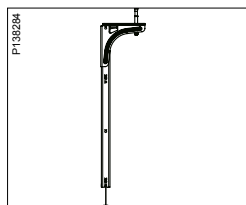


Vertical piece 2Fi is suitable for floor mounting.

### Breaking load



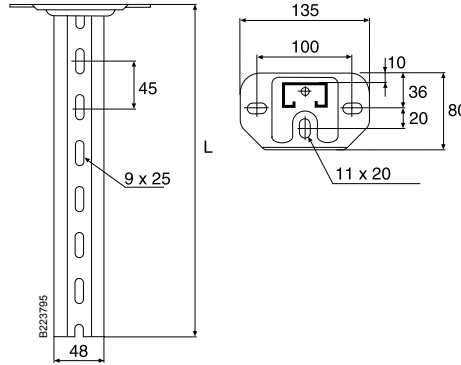
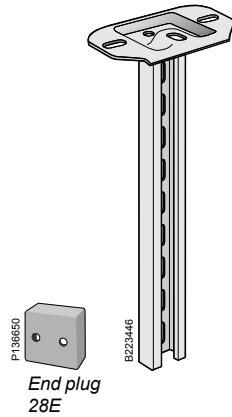
Vertical piece 2Fi mounted in the inner hole. Breaking load=500 kg (5 kN) at symmetrical loading.



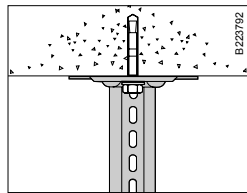
Vertical piece 2Fi mounted in the outer hole. Breaking load=100 kg (1 kN) at symmetrical loading.

### Vertical piece 2F

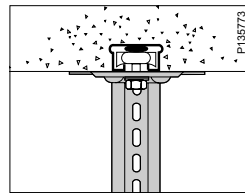
Vertical piece to be used for installation of Support bracket 3 or Cantilever arm 50. Can be joined to Pendant/fixing rail 24/48 with Pendant joint 2FJ. Can be mounted from the ceiling or on the floor. Can also be installed as a cantilever arm on a wall.



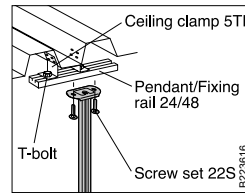
| Type                   | L mm |
|------------------------|------|
| Vertical piece 2F/280  | 280  |
| Vertical piece 2F/370  | 370  |
| Vertical piece 2F/505  | 505  |
| Vertical piece 2F/640  | 640  |
| Vertical piece 2F/730  | 730  |
| Vertical piece 2F/865  | 865  |
| Vertical piece 2F/1000 | 1000 |
| Vertical piece 2F/1500 | 1495 |



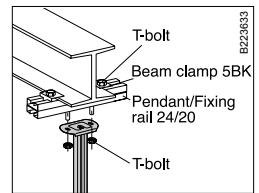
Mount Vertical piece 2F using Expansion bolt alt. Concrete screw.



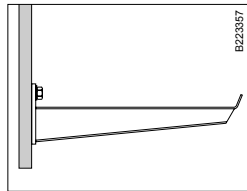
On Fixing rail forecasting-in, mount Vertical piece 2F using T-bolt.



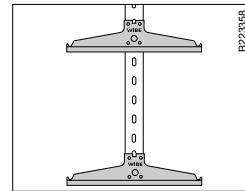
In ceilings with trapezoidal sheeting, mount Vertical piece 2F as shown above.



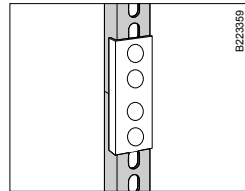
On beams in ceilings, mount Vertical piece 2F as shown in the figure above. When the beam flange thickness does not exceed 13 mm, use Beam clamp 5BK-10 and T-bolt 26F/40. For flange thicknesses not exceeding 30 mm use Beam clamp 5BK-30 and T-bolt 26F/50.



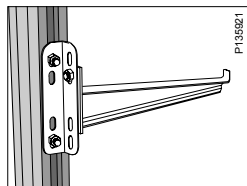
On Vertical piece 2F, mount Cantilever arm 50 using T-bolt.



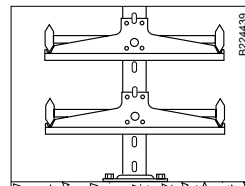
On Vertical piece 2F, mount Support bracket 3 using Screw set 22S.



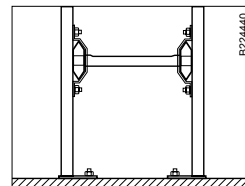
Vertical piece 2F can be joined to achieve the required length using Pendant/fixing rail 24/48 and Pendant joint 2FJ.



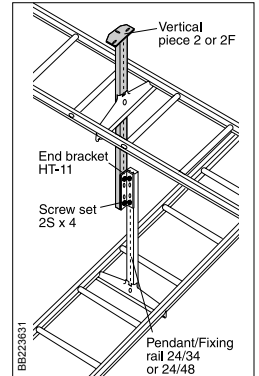
Cantilever arm 50 can, using End bracket HT-11, be mounted at 90° to the pendant/fixing rail. Only for lightweight installation of data cable type and suchlike.



Cable ladders mounted on Vertical piece 2F and Support bracket 3 can be used for cable installations in raised access floors.

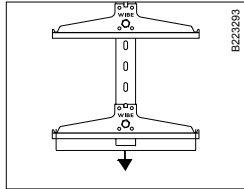


For installation on floor the cable ladders can be mounted with Vertical piece 2F, Profile clamp 41 and T-bolt.



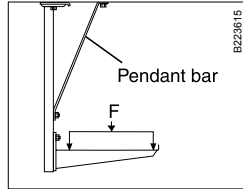
End bracket HT-11 permits mounting of crossing cable ladders on different levels on the same pendant/fixing rail.

### Breaking load symmetrical loading\*



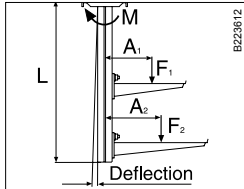
Breaking load for Vertical piece 2F (VP) = 2300 kg (23 kN) at symmetrical loading.

### VP + Pendant bar for reduction of deflection

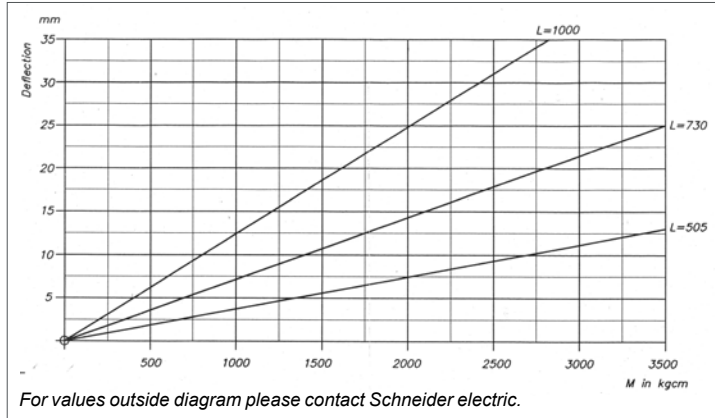


Deflection of Vertical piece 2F is reduced by installing Pendant bar 1 or Pendant/Fixing rail and Bracket 60/40. Loadings in accordance with chart below.

### Breaking load asymmetrical loading



$M = \sum F \times A$   
See also max loading for Cantilever arm 50 installed on pendant/fixing rail, page Cantilever arm 50L, 50 and 50F.



### Example

- Conditions:
- 2 m support distance.
  - 10 kg/m ladder
  - Two ladders, 200 and 300 mm
  - One-side loading
  - VP 2F/730
  - Bending?

$$M = \sum F \times A \text{ (kgcm)}$$

$$M = 10 \times 2 \times \frac{(20 + 6.5)}{2} + 10 \times 2 \times \frac{(30 + 6.5)}{2}$$

$$(F_1) \quad (A_1) \quad (F_2) \quad (A_2)$$

M = 760 kgcm - bending as per diagram, about 5.5 mm.

- Bending torque M is total sum of F x A (kgcm).  
 F = Cantilever arm loading (kg)  
 F = Loading (kg/m) x support distance (m).  
 A = Distance between loading and VP centre line (cm)  
 $A = \frac{\text{Ladder width}}{2} + 6.5 \text{ cm}$   
 L = VP length  
 Break load torque 6 000 (kgcm)

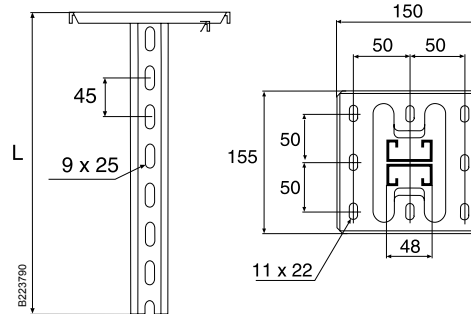
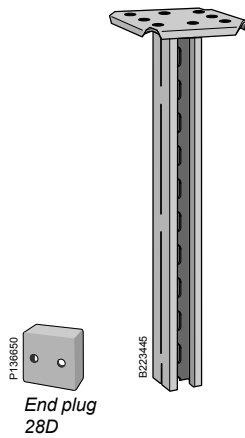
### Loading table for Vertical piece 2F installed as a cantilever arm

|              | Vertical piece 2F with Pendant bar 1/300 |               |
|--------------|--|---------------|
| Pendant type | 2F/700                                   | 2F/1000       |
| Ladder width | Breaking load                            | Breaking load |
| 150          | 120                                      | 75            |
| 200          | 125                                      | 80            |
| 300          | 135                                      | 90            |
| 400          | 140                                      | 100           |
| 600          | —  | 120           |

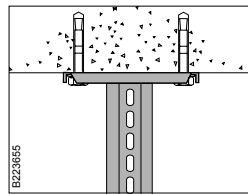
\*Safe working load according to IEC 61537 is breaking load divided by 1,7.

### Vertical piece 20

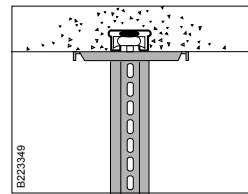
Vertical piece, two-sided, to be used for vertical installation together with Cantilever arm 50, from a ceiling or on a floor. Can also be installed as a cantilever arm on a wall.



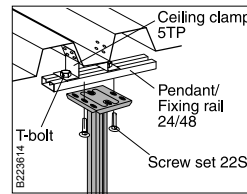
| Type                   | L mm |
|------------------------|------|
| Vertical piece 20/280  | 280  |
| Vertical piece 20/370  | 370  |
| Vertical piece 20/500  | 505  |
| Vertical piece 20/640  | 640  |
| Vertical piece 20/700  | 730  |
| Vertical piece 20/865  | 865  |
| Vertical piece 20/1000 | 1000 |
| Vertical piece 20/1500 | 1495 |
| Vertical piece 20/2000 | 1990 |
| Vertical piece 20/3000 | 2980 |



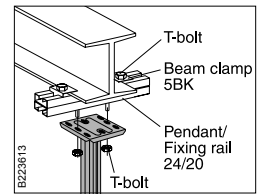
Mount Vertical piece 20 using Expansion bolt.



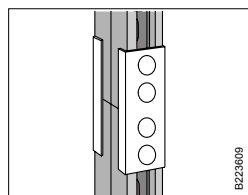
On fixing rail for casting-in, mount Vertical piece 20 using T-bolts.



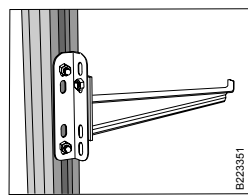
In ceilings with trapezoidal profile sheeting, mount Vertical piece 20 as shown above



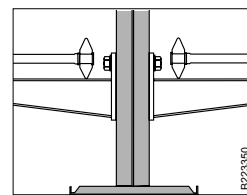
On beams in ceilings, mount Vertical piece 20 as shown in the figure above. When the beam flange thickness does not exceed 13 mm, use Beam clamp 5BK-10 and T-bolt 26F/40. For flange thicknesses not exceeding 30 mm use Beam clamp 5BK-30 and T-bolt 26F/50.



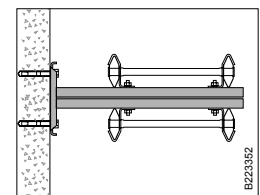
Vertical piece 20 can be joined to achieve the required length using Pendant/fixing rail 24/40 and Pendant joint 20J.



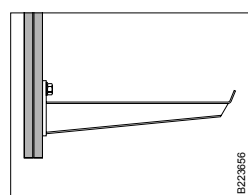
Using End bracket HT-11, Cantilever arm 50 can be mounted at 90° to the pendant/fixing rail. Only for lightweight mounting of data cable type and suchlike



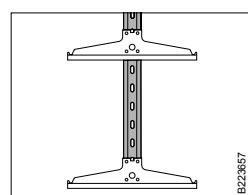
Vertical piece 20 is also suitable for floor mounting



Vertical piece 20 may be used for vertical mounting in a shaft, for example. Mount Wall bracket 11 or Profile clamp 42 using T-bolts. The vertical piece may also be mounted horizontally as a cantilever arm, such as when passing columns.

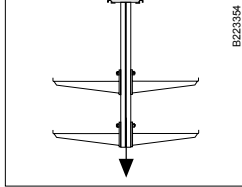


On vertical piece, mount Cantilever arm 50 using T-bolt. For loadings see Cantilever arm 50



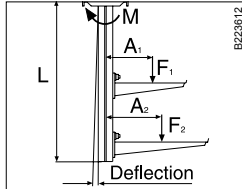
On Vertical piece 20, mount Support bracket 3 using Screw set 20S.

### Breaking load symmetrical loading\*

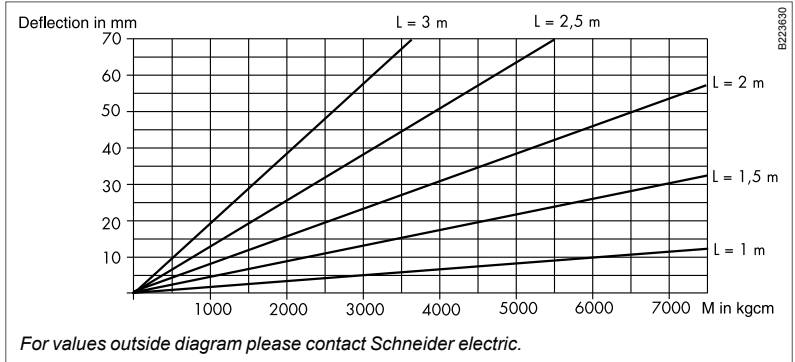


Breaking load for vertical piece (VP) = 3000 kg (30 kN).

### Breaking load asymmetrical loading



$M = \sum F \times A$   
 See also max loading for Cantilever arm 50 installed on pendant/fixing rail, page Cantilever arm 50L, 50 and 50F.



### Example

- Conditions:
- 2 m support distance.
  - 30 kg/m ladder
  - Two ladders, 400 and 600 mm
  - One-side loading
  - VP 20/1000
  - Bending?

$$M = \sum F \times A \text{ (kgcm)}$$

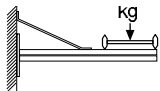
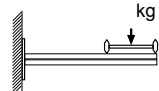
$$M = 30 \times 2 \times \frac{(40 + 7.7)}{2} + 30 \times 2 \times \frac{(60 + 7.7)}{2}$$

$(F_1) \quad (A_1) \quad (F_2) \quad (A_2)$

M = 3924 kgcm - bendingas per diagram, about 6 mm.

- Bending torque M is total sum of  $F \times A$  (kgcm).  
 F = Cantilever arm loading (kg)  
 F = Loading (kg/m) x support distance (m).  
 A = Distance between loading and VP centre line (cm)  
 $A = \frac{\text{Ladder width} + 7.7}{2}$  cm  
 L = VP length  
 Break load torque 19 000 (kgcm)

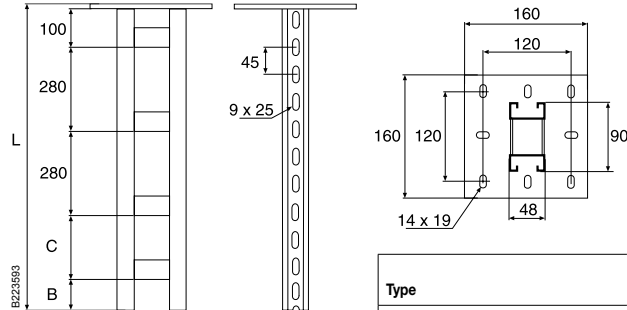
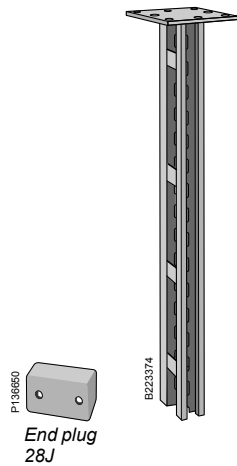
### Loading table for Vertical piece 20 installed as a cantilever arm

|                   |  |               |               |  |               |               |
|-------------------|---|---------------|---------------|---|---------------|---------------|
| Pendant type      | 20/700  | 20/1000       | 20/1500       | 20/700  | 20/1000       | 20/1500       |
| Width Ladder type | Breaking load   | Breaking load | Breaking load | Breaking load   | Breaking load | Breaking load |
| 150               | 380   | 210           | 155           | 230   | 165           | 115           |
| 200               | 400   | 240           | 160           | 250   | 170           | 115           |
| 300               | 425   | 270           | 165           | 280   | 175           | 120           |
| 400               | 450   | 300           | 170           | 310   | 180           | 125           |
| 600               | 280   | 130           | 280           | 170   | 90            | —             |

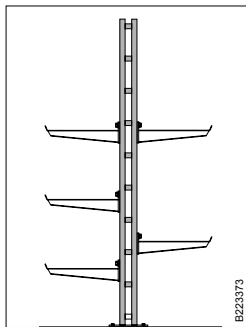
\*Safe working load according to IEC 61537 is breaking load divided by 1,7.

### Vertical piece 20F

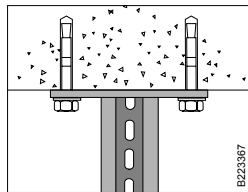
Vertical piece, two-sided, to be used for mounting from the ceiling or on the floor. Suitable for rather heavy loads.



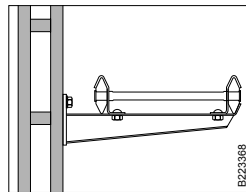
| Type                    | B mm | C mm | L mm |
|-------------------------|------|------|------|
| Vertical piece 20F/1000 | 50   | 280  | 995  |
| Vertical piece 20F/1500 | 70   | 195  | 1490 |
| Vertical piece 20F/2000 | 5    | 195  | 1985 |
| Vertical piece 20F/3000 | 70   | 280  | 2980 |



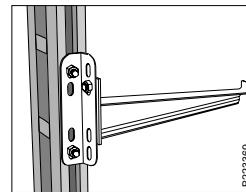
Floor mounting example.



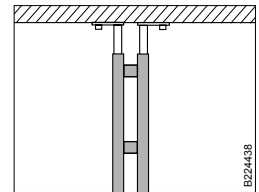
Mount Vertical piece 20F using Expansion bolt alt. Concrete screw.



Cantilever arm 50 can be mounted using T-bolt. For loads on Cantilever arm 50, see Cantilever arm 50L, 50 and 50F.

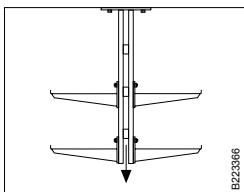


Using End bracket HT-11, Cantilever arm 50 can be mounted at 90° to the vertical piece. Only for lightweight mounting of data cable type or similar.



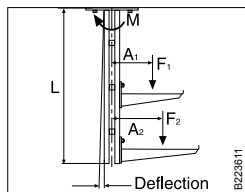
Vertical piece 20F mounted on floor can be fixed using Vertical piece 2 as ceiling bracket, adjustable in the pendant.

#### Breaking load Symmetrical loading\*

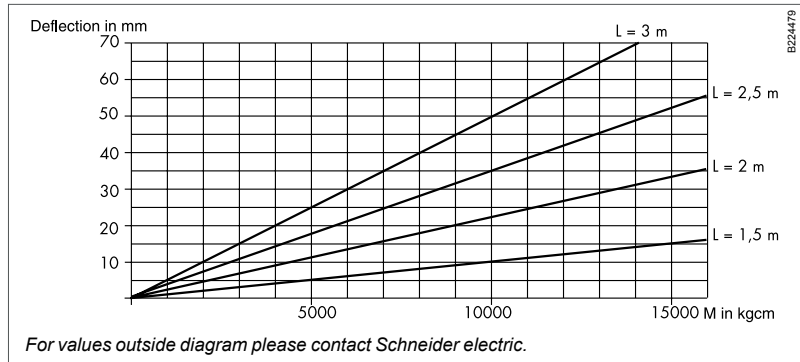


Breaking load for Vertical piece (VP) 20F = 5000 kg (50kN)

#### Breaking load asymmetrical loading



$M = \sum F \times A$   
Vertical piece 20F mounted in ceiling, see diagram.



#### Example

- Conditions:
- 2 m support distance 50 kg/m ladder
  - Two ladders, 400 and 600 mm
  - One-side loading
  - VP 20F/1500
  - Bending?

$$M = \sum F \times A \text{ (kgcm)}$$

$$M = 50 \times 2 \times \frac{(40 + 9.4)}{2} + 50 \times 2 \times \frac{(60 + 9.4)}{2}$$

$$(F_1) \quad (A_1) \quad (F_2) \quad (A_2)$$

M = 6880 kgcm - bending as per diagram, about 6 mm.

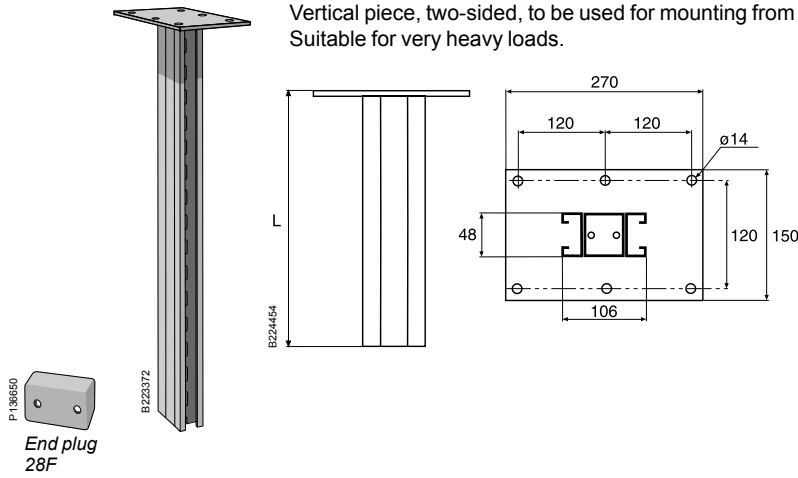
- Bending torque M is total sum of F x A (kgcm).
- F = Cantilever arm loading (kg)
  - F = Loading (kg/m) x support distance (m).
  - A = Distance between loading and VP centre line (cm)
  - A =  $\frac{\text{Ladder width} + 9.4}{2}$
  - L = VP length
  - Break load torque 30 000 (kgcm)

\*Safe working load according to IEC 61537 is breaking load divided by 1,7.

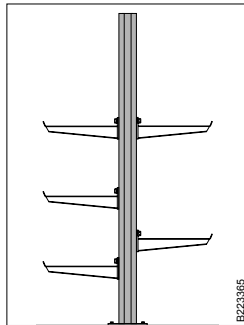


### Vertical piece 20FS

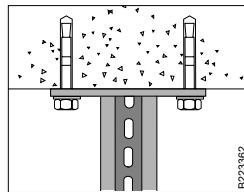
Vertical piece, two-sided, to be used for mounting from the ceiling or on the floor. Suitable for very heavy loads.



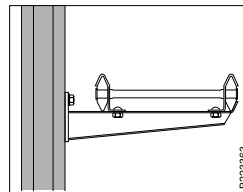
| Type         | L mm |
|--------------|------|
| VP 20FS/1500 | 1495 |
| VP 20FS/2000 | 1990 |
| VP 20FS/2500 | 2485 |
| VP 20FS/3000 | 2980 |



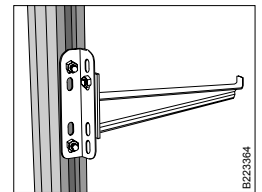
Vertical piece 20FS is suitable for floor mounting.



Mount Vertical piece 20FS using Expansion bolt and Concrete screw.

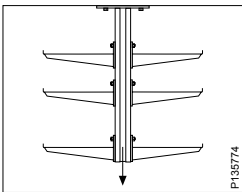


Mount Cantilever arm 50 using T-bolt. For loads on Cantilever arm 50, see Cantilever arm 50L, 50 and 50F.



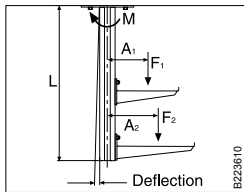
Using End bracket HT-11, Cantilever arm 50 can be mounted at 90° to the vertical piece. Only for lightweight mounting of data cable type or similar.

#### Breaking load Symmetrical loading

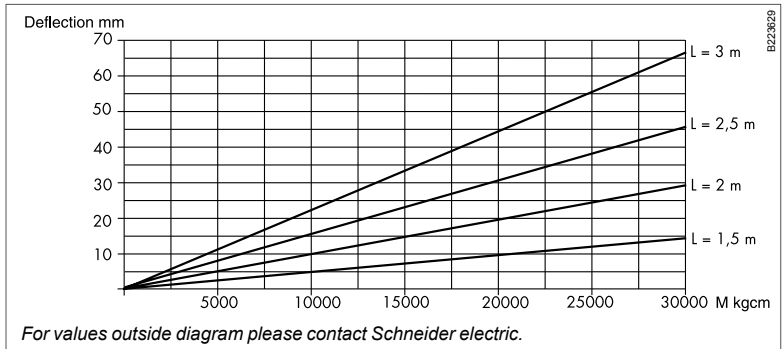


**Symmetrical loading**  
Breaking load for Vertical piece (VP) 20FS = 5000 kg (50 kN)

#### Breaking load asymmetrical loading



**Asymmetrical loading**  
 $M = \sum F \times A$  Vertical piece 20FS mounted in ceiling, see diagram.



#### Example

- Conditions:
- 2 m support distance 75 kg/m ladder
  - Two ladders, 400 and 600 mm
  - One-side loading
  - VP 20FS/1500
  - Bending?

$$M = \sum F \times A \text{ (kgcm)}$$

$$M = 75 \times 2 \times \frac{(40 + 10.4)}{2} + 75 \times 2 \times \frac{(60 + 10.4)}{2}$$

$$(F_1) \quad (A_1) \quad (F_2) \quad (A_2)$$

Bending torque M is total sum of F x A (kgcm).

F = Cantilever arm loading (kg)

F = Loading (kg/m) x support distance (m).

A = Distance between loading and VP centre line (cm)

A =  $\frac{\text{Ladder width} + 10.4}{2}$

L = VP length

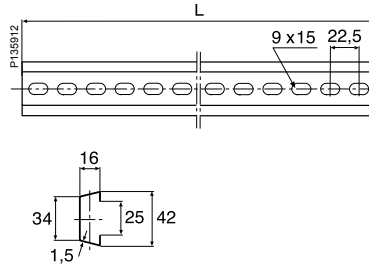
Break load torque 60 000 (kgcm)

\*Safe working load according to IEC 61537 is breaking load divided by 1,7.

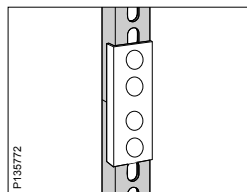
M = 10620 kgcm - bendingas per diagram, about 5 mm.

### Pendant/Fixing rail 24/34

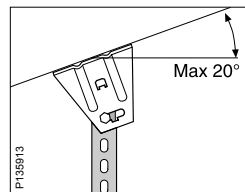
Pendant/Fixing rail for mounting of support brackets, cantilever arms, etc.



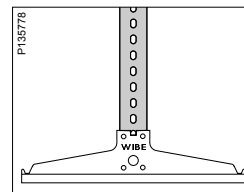
| Type                      | L mm   |
|---------------------------|--------|
| Pendant/Fixing rail 24/34 | 292.5  |
| Pendant/Fixing rail 24/34 | 382.5  |
| Pendant/Fixing rail 24/34 | 495.0  |
| Pendant/Fixing rail 24/34 | 697.5  |
| Pendant/Fixing rail 24/34 | 990.0  |
| Pendant/Fixing rail 24/34 | 2970.0 |



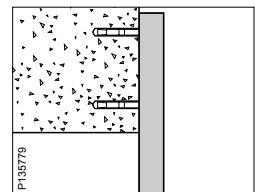
Vertical piece 2 may be joined to Pendant/Fixing rail 24/34 and Pendant joint 2J to achieve a suitable length.



Ceiling bracket 5 and 1 Screw set 22S together provide a vertical piece that can be mounted with up to 20° slope.



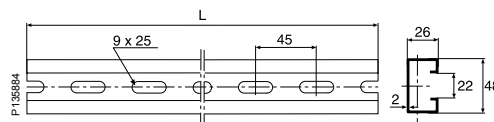
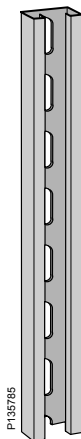
Mount Support bracket 3 using Screw set 22S.



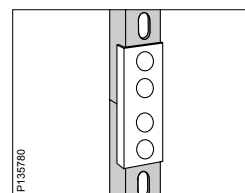
Side mounting of pendant/fixing rails may be done using 2 Expansion bolts alt. 2 Concrete screws.

### Pendant/Fixing rail 24/48

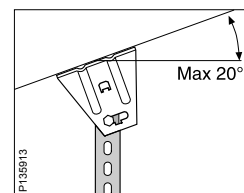
Pendant/Fixing rail for mounting of support brackets, cantilever arms, etc.



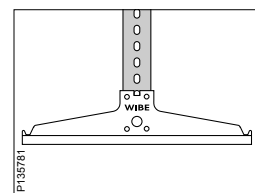
| Type                    | L mm |
|-------------------------|------|
| Pendant/Fix. rail 24/48 | 2970 |
| Pendant/Fix. rail 24/48 | 5940 |



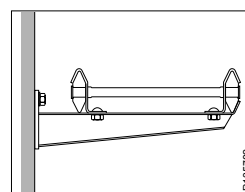
Vertical piece 2F may be joined using Pendant/Fixing rail 24/48 and Pendant joint 2FJ to achieve the required length.



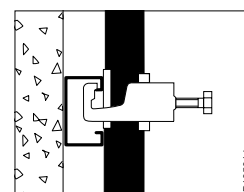
Ceiling bracket 5 and 1 Screw set 22S together provide a vertical piece that can be mounted with up to 20° slope. Only for mounting support brackets.



Mount Support bracket 3 using Screw set 22S.



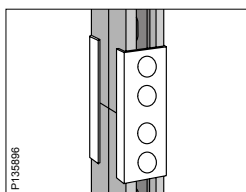
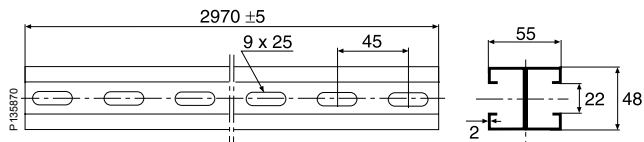
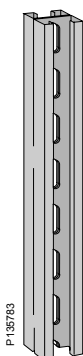
Mount Cantilever arm 50 using T-bolt.



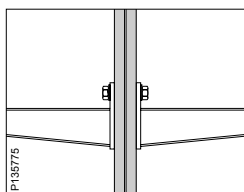
Cables are mounted on a Pendant/Fixing rail 24/48 using cable clamps of type A.

### Pendant/Fixing rail 24/20

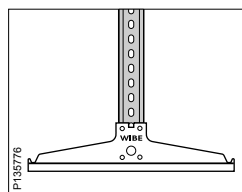
Pendant/Fixing rail for mounting of support brackets, cantilever arms, etc.



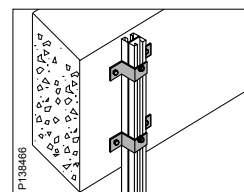
Vertical piece 20 may be joined using Pendant/Fixing rail 24/20 and Pendant joint 20J. Only for symmetrical loading.



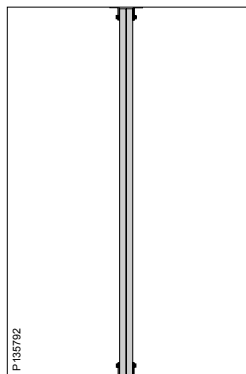
Mount Cantilever arm 50 using T-bolts.



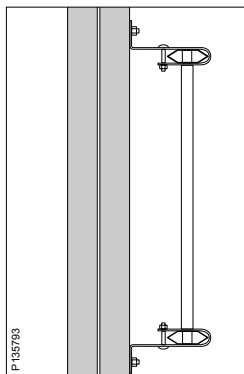
Mount Support bracket 3 using Screw set 20S.



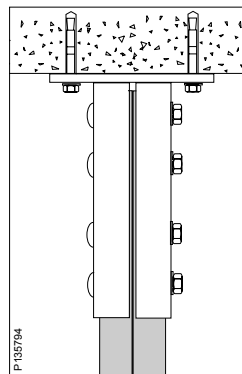
Pendant/Fixing rail can be mounted on beam or wall with Wall bracket 20.



Pendant/Fixing rail 24/20 may be mounted as a riser between the floor and ceiling using 4 Angle brackets 5L and 4 T-bolts.



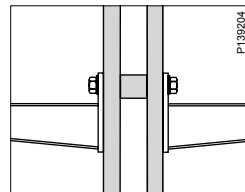
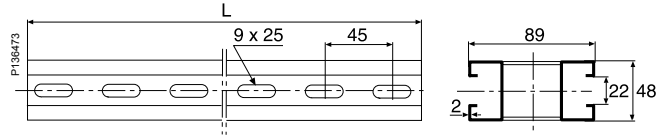
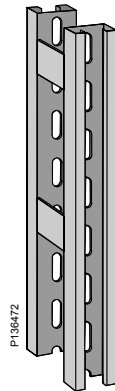
Cable ladder may be mounted vertically or horizontally on Pendant/Fixing rail 24/20 using Wall bracket 11/25 or 11/75 and T-bolt.



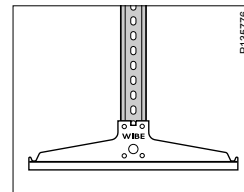
Pendant base plate 520 can be mounted as a ceiling or floor attachment.

### Pendant/Fixing rail 24/20F

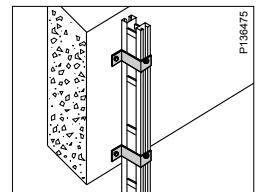
Pendant/Fixing rail for mounting of support brackets, cantilever arms, etc.



Mount Cantilever arm 50 using T-bolts.

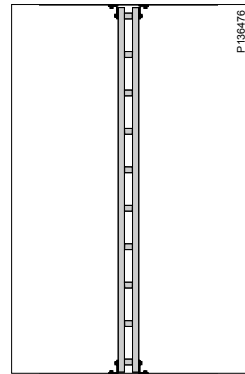


Mount Support bracket 3 using Screw set 2S.

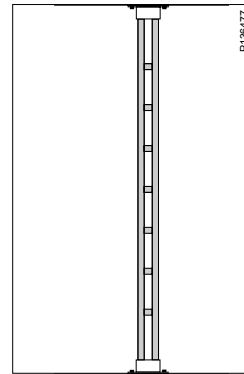


Pendant/Fixing rail 24/20F can be mounted on beam or wall with Wall bracket 20F

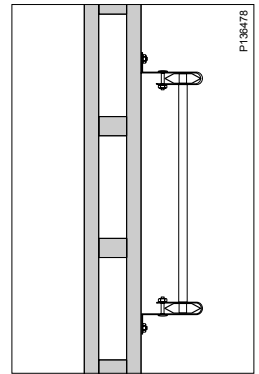
| Type                            | L mm |
|---------------------------------|------|
| Pendant/Fixing rail 24/20F-3000 | 2970 |
| Pendant/Fixing rail 24/20F-6000 | 5940 |



Pendant/Fixing rail 24/20F can be mounted as a riser between the ceiling and floor using 4 Angle brackets 5L and 4 T-bolts.



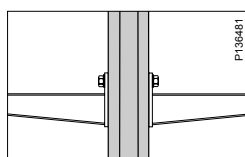
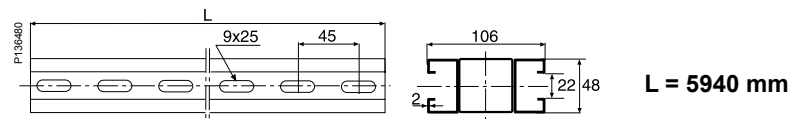
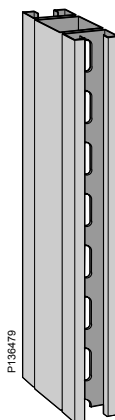
Mount Pendant/Fixing rail 24/20F between a floor and ceiling using 2 Rail fixing supports.



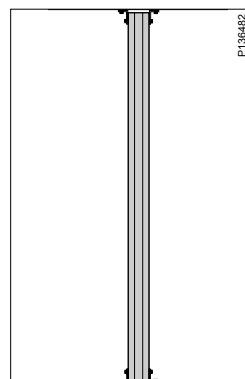
Cable ladder can be mounted vertically or horizontally on Pendant/Fixing rail 24/20F using Wall bracket 11/25 or 11/75.

### Pendant/Fixing rail 24/20FS

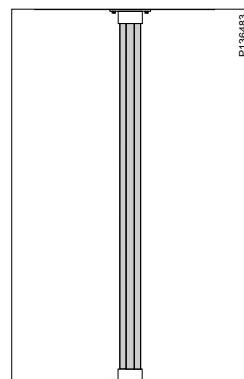
Pendant/Fixing rail for mounting of support brackets, cantilever arms, etc.



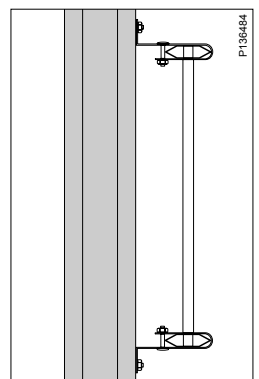
Mount Cantilever arm 50 using T-bolts.



Pendant/Fixing rail 24/20FS can be mounted as a riser between the ceiling and floor using 4 Angle brackets 5L and 4 T-bolts.



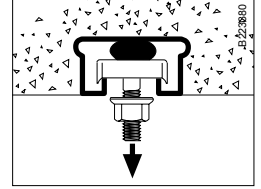
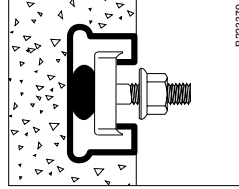
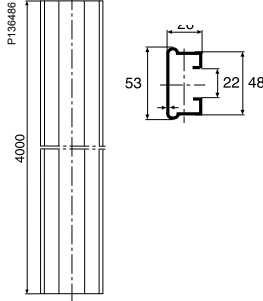
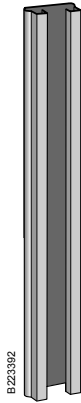
Mount Pendant/Fixing rail 24/20FS between floor and ceiling using 2 Rail fixing supports.



Cable ladders can be mounted vertically or horizontally on Pendant/Fixing rail 24/20FS using Wall bracket 11/25 or 11/75 and T-bolt.

### Fixing rail 24/26x53 for casting-in

Fixing rail for casting-in in wall and ceilings.

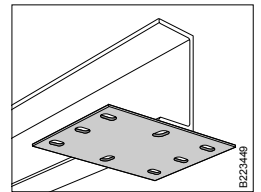
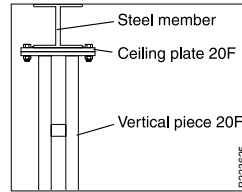
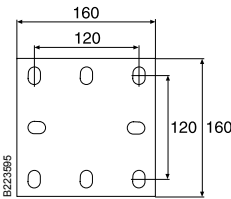
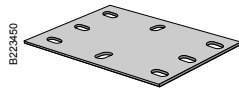


Fixing rail 24/26 x 53 for casting-in in walls and ceilings. Mount cantilever arms with T-bolt 26F.

Max. pull-out load: 1000 kg/0.5 m of casting-in fixing rail (Concrete class K200).

### Ceiling plate 20F

Ceiling plate to be used as a pre-drilled attachment for Vertical piece 20F to a steel member. The ceiling plate is welded in position.

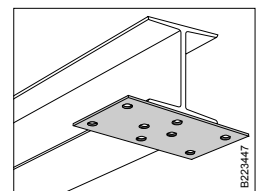
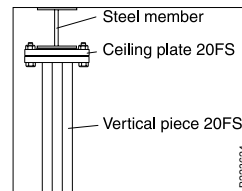
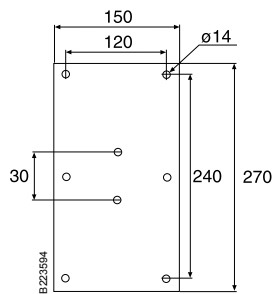
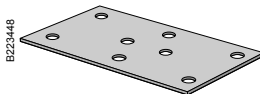


The ceiling plate is welded to the steel member. Permission to weld on the steel member is required. Remove all zinc at the weld. Post-treat using Galvafruid.

Use Ceiling plate 20F as a fully drilled attachment for Vertical piece 20F against a steel member. Secure the ceiling plate by welding. Remove all zinc at the weld. Post-treat using Galvafruid.

### Ceiling plate 20FS

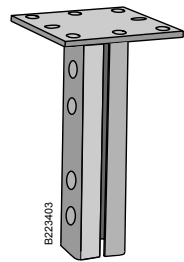
Ceiling plate 20F is used as a pre-drilled attachment for Vertical piece 20F to a steel member. The ceiling plate is welded in position.



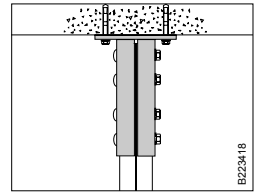
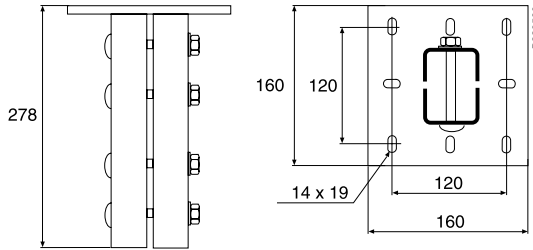
The ceiling plate is welded to the steel member. Permission to weld on the steel member is required. Remove all zinc at the weld. Post-treat using Galvafruid.

Use Ceiling plate 20FS as a fully drilled attachment for Vertical piece 20FS against a steel member. Secure the ceiling plate by welding. Remove all zinc at the weld. Post-treat using Galvafruid.

### Pendant base plate 520

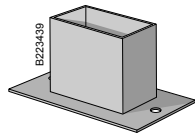


Pendant base plate to be used as a ceiling or floor base plate for Pendant/Fixing rail 24/20 in any desired length.

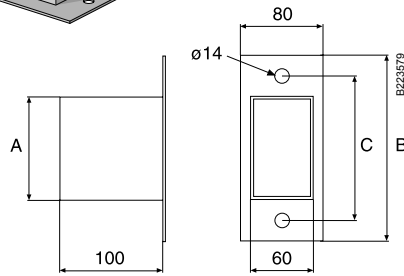


Vertical pieces of the required length can be mounted using Pendant base plate 520 and Pendant/Fixing rail 24/20.

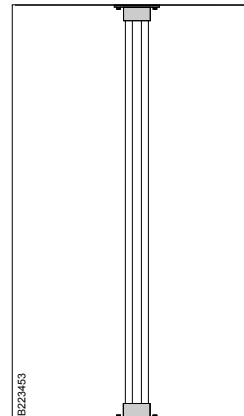
### Rail fixing support 24/20F, 24/20FS



Rail fixing support to be used with Pendant/fixing rails 24/20F and 24/20FS respectively, for mounting between floor and ceiling.



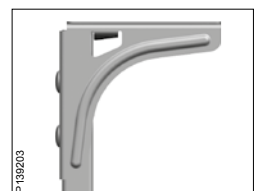
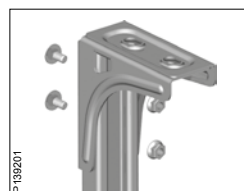
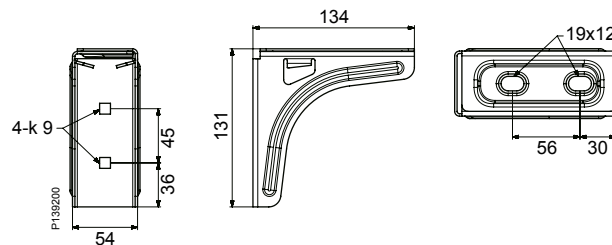
| Type                      | A mm | B mm | C mm |
|---------------------------|------|------|------|
| Rail fix. support 24/20F  | 100  | 165  | 135  |
| Rail fix. support 24/20FS | 120  | 185  | 155  |



1. Mount one of the rail fixing supports in the ceiling.
2. Adjust the pendant length.
3. Mount the rail fixing support for floor mounting on the pendant.
4. Insert the pendant in the rail fixing support in the ceiling.
5. Attach the bottom rail fixing support securely to the floor.

### Ceiling bracket 2Fi

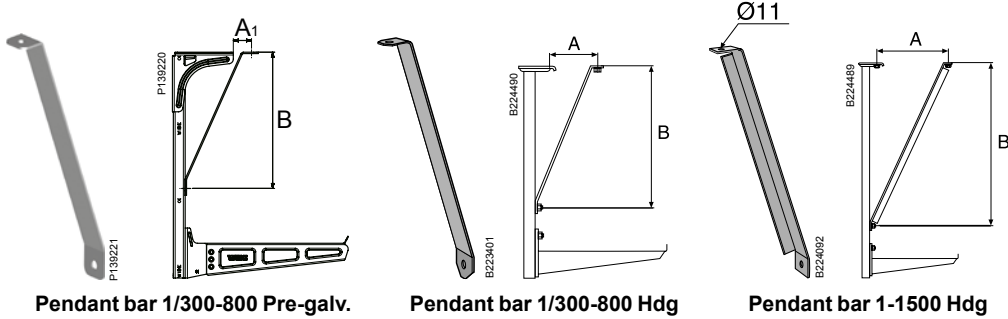
Ceiling bracket to be used on Pendant/fixing rail 24/48 to achieve the desired length of vertical pieces.



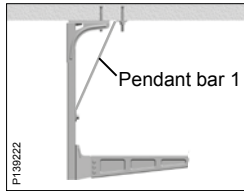
Ceiling bracket 2Fi and Pendant/Fixing rail 24/48, mounted together with 2 Screw sets 22S, are used when other lengths are required than those available for Vertical piece 2Fi.

### Pendant bar 1

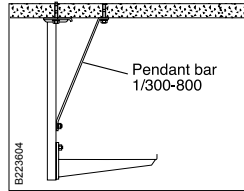
Pendant bar to be installed in order to reduce the deflection of heavily loaded vertical pieces. Installed with T-bolt and Expansion bolt.



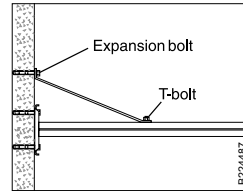
| Type   | A mm <sup>1</sup> | A mm   | B mm   |
|--------|-------------------|--------|--------|
| 1/300  | 40                | 80     | 300    |
| 1/500  | 40                | 130    | 500    |
| 1/800  | 125               | 215    | 800    |
| 1/1500 | Varies            | Varies | Varies |



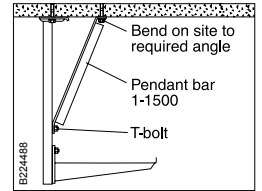
To reduce deflection of Vertical piece 2Fi at heavy loads on Cantilever arm 50i the Pendant bar 1 can be used. Install with T-bolt and Expansion bolt.



To reduce deflection of Vertical piece 2F at heavy loads on Cantilever arm 50 the Pendant bar 1 can be used. Install with T-bolt and Expansion bolt.



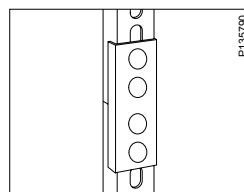
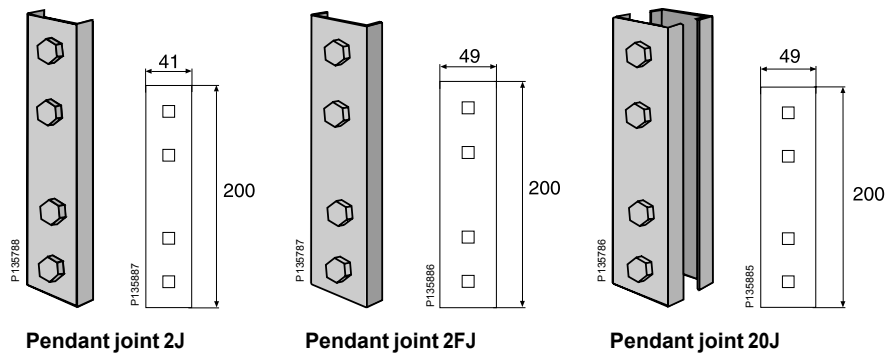
To be mounted to strengthen Vertical piece 20 when mounted horizontally. Use T-bolt and Expansion bolt.



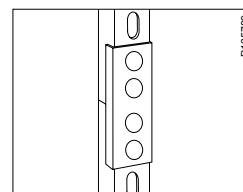
Mount this stay to reduce deflection of long Vertical pieces 2F, 20 and 20F.

### Pendant joint 2J, 2FJ and 20J

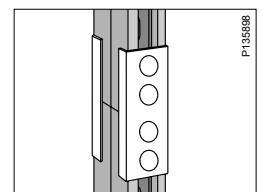
Pendant joint to be used for joining pendant/fixing rails and vertical pieces.



Pendant joint 2J, used for joining of Vertical piece 2 and Pendant/ Fixing rail 24/34.



Pendant joint 2FJ, used for joining of Vertical piece 2F and Pendant/ Fixing rail 24/48.

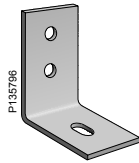


Pendant joint 20J, used for joining of Vertical piece 20 and Pendant/ Fixing rail 24/20. Only for symmetrical loading.

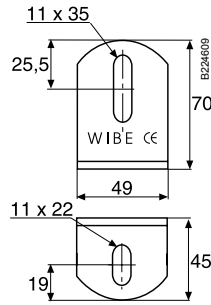
### Angle bracket 5L and 5LS



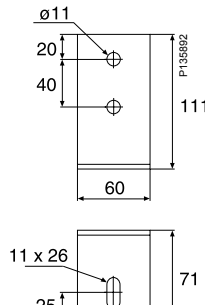
Angle bracket 5L



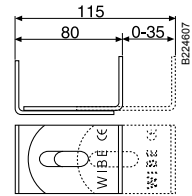
Angle bracket 5LS



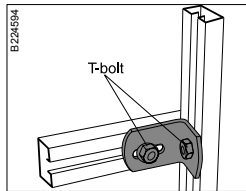
Angle bracket 5L



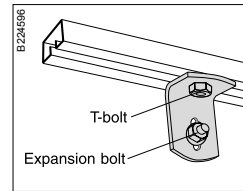
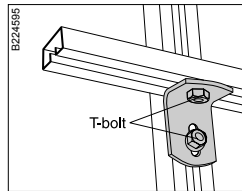
Angle bracket 5LS



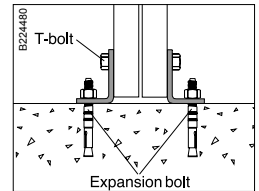
Adjustability 5L



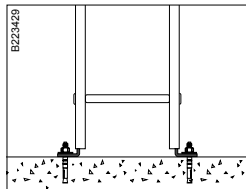
Installation examples for installation of pendant/fixing rails to different frameworks for installation of control panels, electric distribution boards, etc. Angle bracket 5L is used.



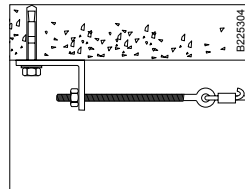
Mounting of a pendant/fixing rail on a wall. Use Angle bracket 5L or 5LS.



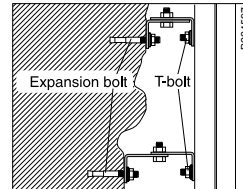
Mounting of a pendant/fixing rail against floor with Angle bracket 5L or 5LS.



Angle bracket 5L can be mounted inside the ladder profile and thus be used as an end connection against wall or floor.



Angle bracket 5L is installed in ceiling with Expansion bolt or concrete screw. Max. permitted loading 600 kg (6 kN).

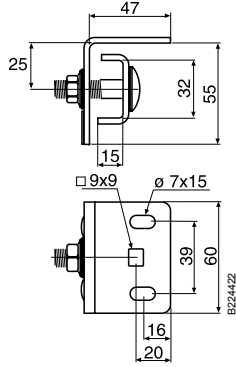
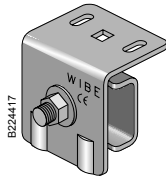


5LS can also be mounted as support behind pendant/fixing rails to compensate for irregularities in, for example, concrete walls.



### Combi bracket 53

Combi bracket to be used for the mounting of cable ladders and trays on seamed roofing sheets, etc. To be combined with plastic insulating plate 54.



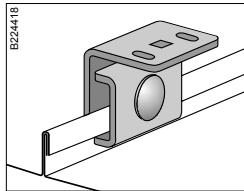
#### Breaking load\*

|  | Type of roofing sheet | Insulating plate | Permitted load |
|--|-----------------------|------------------|----------------|
|  | Bandsheet Prelac      | No               | F1=100 kg      |
|  | Copper sheeting       | Yes              | F2=50 kg       |
|  | Bandsheet Prelac      | No               | F3=100 kg      |
|  | Copper sheeting       | Yes              | F4=50 kg       |

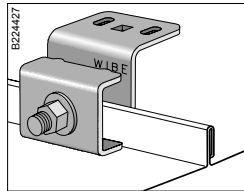
\* Loading values and fixing of roof sheet - follow the supplier's recommendations

**Test have been made of:**

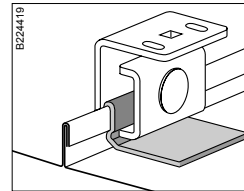
Bandsheet Prelac BLX t=0.6 SSAB tunnplåt Copper sheeting annealed SS 5015-80 t=0.6 Tightening torque at test=60Nm



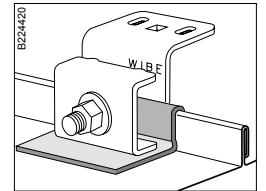
Combi bracket 53 mounted on seamed roofing sheet.



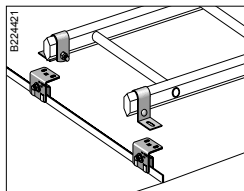
Alternative mounting of Combi bracket 53.



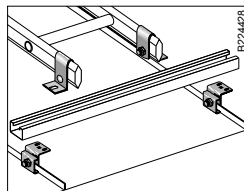
In order to avoid contact between Combi bracket 53 and copper sheeting, Insulating plate 54 must be used.



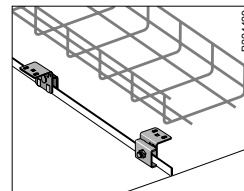
Alternative mounting of Combi bracket 53 and Insulating plate 54.



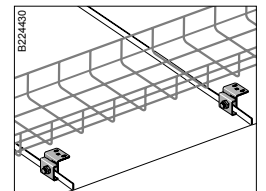
Cable ladder mounted across the seams of the roofing sheets with Combi bracket 53, Wall bracket 11/25 and Screw set 22S.



Cable ladder mounted along the seams of the roofing sheets with Combi bracket 53, Wall bracket 11/25, Screw set 22S, Pendant/ Fixing rail 24/48 and T-bolt 26F.



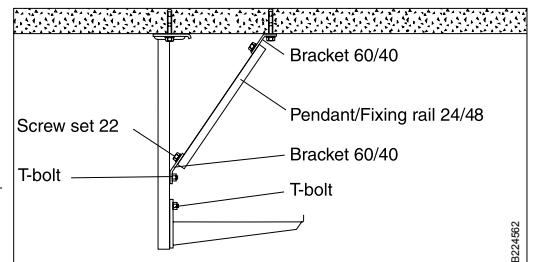
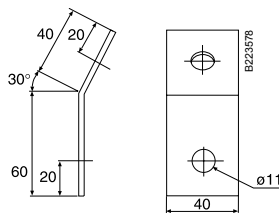
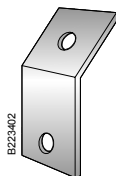
Mesh tray mounted along the seams of the roofing sheets with Combi bracket 53 and accessories from the Mesh tray programme.



Mesh tray mounted across the seams of the roofing sheets with Combi bracket 53 and accessories from the Mesh tray programme.

### Bracket 60/40

Bracket to be used together with Pendant/fixing rail 24/48 to reduce the deflection of long vertical pieces.

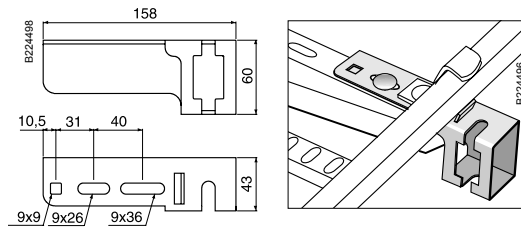


Use Bracket 60/40 together with Pendant/Fixing rail 24/48 to reduce the deflection of long Vertical pieces 2F, 20, 20F or 20FS. Cut the pendant/fixing rail to a suitable length on site.

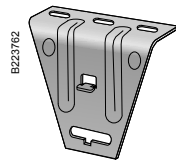


### Rod bracket 82

Rod bracket to be used together with Cantilever arm 50, in combination with threaded rod support.

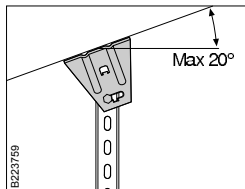
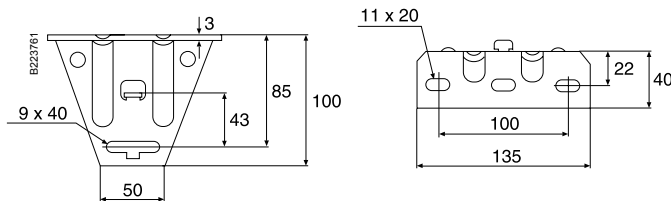


Rod bracket 82 mounted on Cantilever arm 50. Screw set 22S and Profile clamp 42 are to be used.

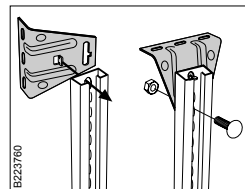


### Ceiling bracket 5

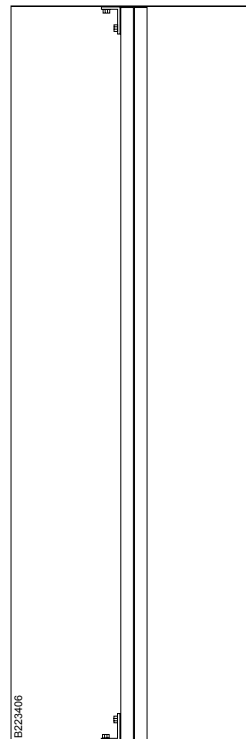
Ceiling bracket to be used for installations with Pendant/Fixing rails 24/34 and 24/48.



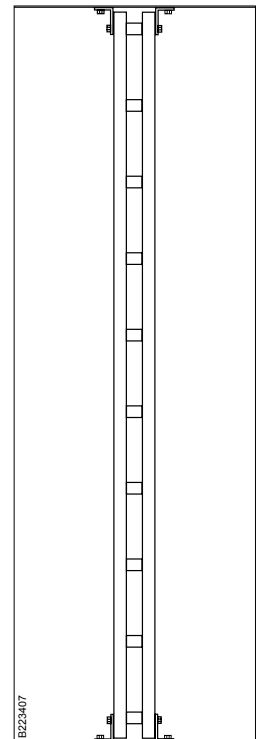
Using Pendant/Fixing rail 24/34 or 24/48, 1 Ceiling bracket 5 and 1 Screw set 22S it is possible to make a vertical piece that can be installed at an angle of up to 20°. Breaking load for rail 34 = 1000 kg (10 kN). Breaking load for rail 48 = 1200 kg (12 kN).



Mount Ceiling bracket 5 to the back of the pendant/fixing rail by turning the ceiling bracket 90° and inserting the tab into the hole in the rail. Then turn the ceiling bracket back and lock it in the required position using 1 Screw set 22S. When mounting it at a horizontal ceiling, lock the screw in the slot recess for better lateral stability. Ceiling bracket 5 can be tilted max. 20°.



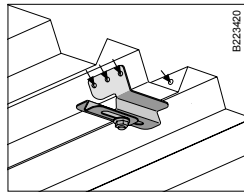
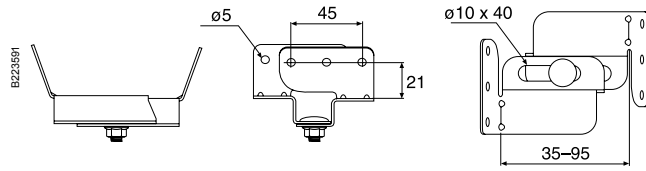
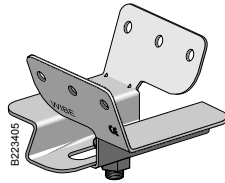
Pendant/Fixing rail 24/20 can, using 2 Ceiling brackets 5 and 2 T-bolts, be mounted between floor and ceiling (see also Angle bracket 5L).



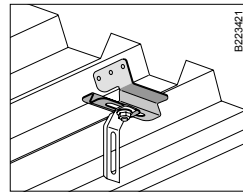
Pendant/Fixing rail 24/20F can, using 4 Ceiling brackets 5 and 4 T-bolts, be mounted between floor and ceiling (see also Angle bracket 5L).

### Ceiling bracket 5TPA

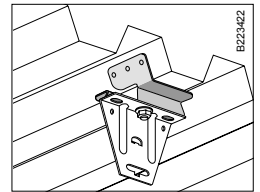
Ceiling bracket with telescopic function, to be used for mounting of various sizes of trapezoid plates.



Ceiling bracket 5TPA can be mounted in trapezoid plate with blind rivets or suitable screws. The bracket is adjustable from 35 to 95 mm.

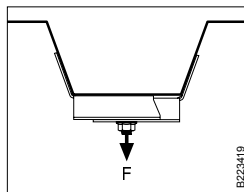


Pendant attachment W21 or Tube pendant attachment W73 (Wibe cable Tray) can be mounted in Ceiling bracket 5TPA with the existing screw.

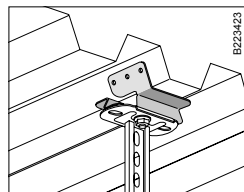


Ceiling bracket 5 or Ceiling attachment W31 can be mounted with the existing screw.

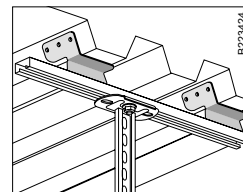
#### Breaking load



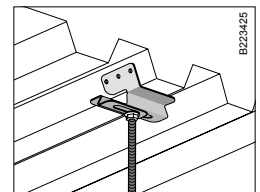
Ceiling bracket 5TPA can be loaded with  $F=150$  kg without deformation. For loading figures for thin plate or fixing elements, follow suppliers recommendations.



Vertical piece 2 or 2F can be mounted with the existing screw.



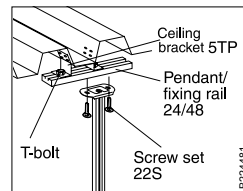
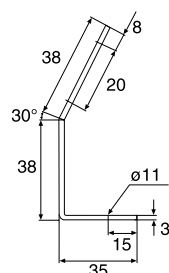
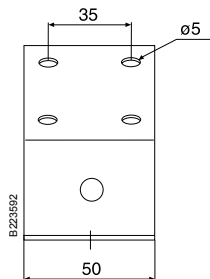
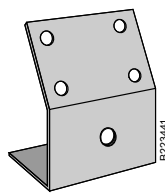
Install Mounting rail 40 between 2 Ceiling brackets 5TPA if the vertical piece must be adjusted sideways.



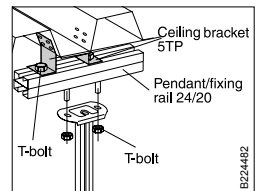
Pendant W76 M8 or M10 installed in Ceiling bracket 5TPA.

### Ceiling bracket 5TP

Ceiling bracket to be used in trapezoidal sheeting for installations of Pendant/Fixing rail 24/48.



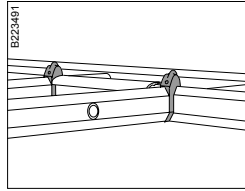
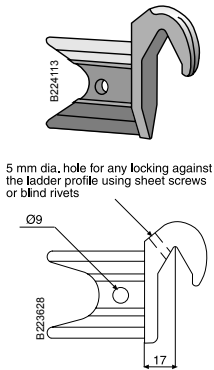
In ceilings with trapezoidal sheeting, mount Vertical piece 2, 2F or 20 using 2 Ceiling brackets 5TP, Pendant/Fixing rail 24/48, 2 T-bolts and Screw set 22S.



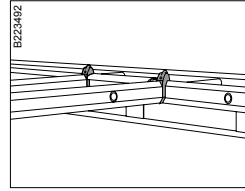
Alternatively Pendant/Fixing rail 24/20 may be used. This will require the use of 4 T-bolts.

### Fixed take-off hook 4

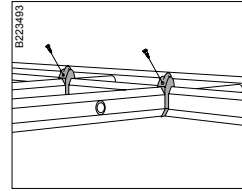
Fixed take-off hook to be used for 90° horizontal branches.



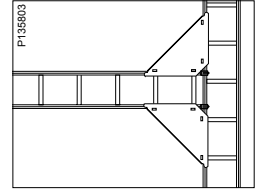
Fixed take-off hook 4 is used at 90° horizontal branches. Coupler 22 can also be used for straight angle formation.



KHZSP, KHZSPZ, KHZPS, KHZ and KHZP can also be used to form 90° angles from KHZV/ KHZPV using Fixed take-off hook 4. Mount Profile protection 28P.



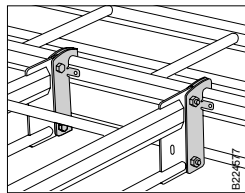
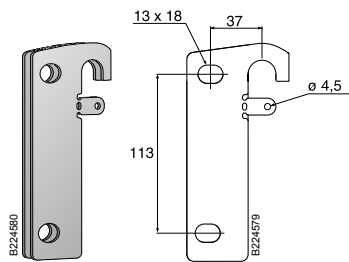
5 mm dia. hole for any locking against the section using sheet screws or blind rivets.



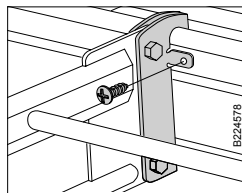
Angle plate 33 is always recommended at horizontal branches.

### Take-off hook 47

Take-off hook to be used on cable ladders KHZV and KHZPV to make 90° branches.



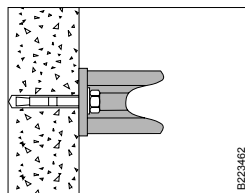
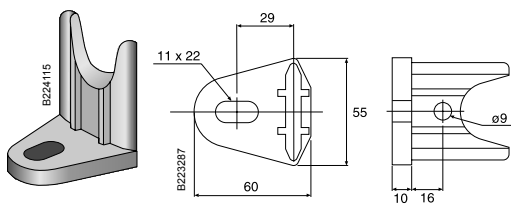
Use Take-off hook 47 to make 90° branches.



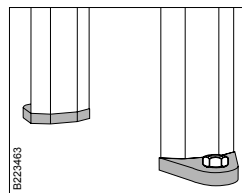
The extra hole, Ø 4.5, is to be used when earthing is demanded or if vertical locking of the ladder is needed. A self-drilling screw must be used.

### End connection 10

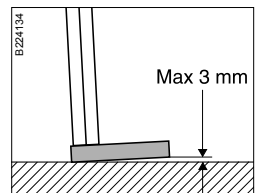
End connection to be used for the connection of a ladder vertically to a floor or horizontally to a wall.



The End connection 10 is mounted at the ladder end vertically against floors or horizontally against walls.



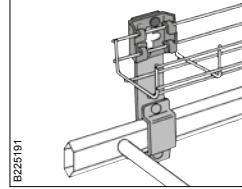
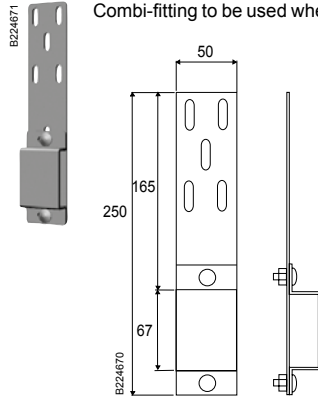
Mount the End connection 10 using Expansion bolts.



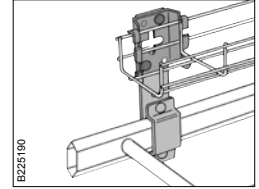
Max. tilt permitted = 3 mm before tightening the screw.

### Combi Fitting B21

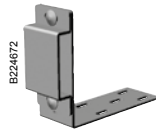
Combi-fitting to be used when mounting mesh trays onto cable ladders.



Defem Mesh tray 53 and 75 is mounted onto Combi Fitting B21 with Bracket B4 mini Bolt and Nut B13.

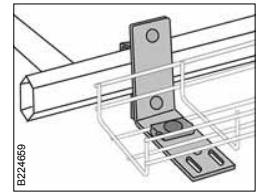
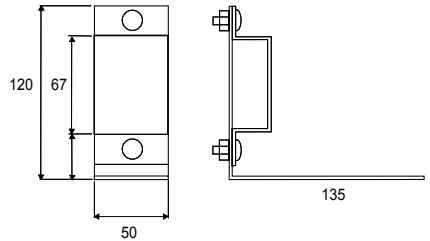


Defem Mesh tray 120 is mounted onto Combi Fitting B21 with Bracket B4 Bolt and Nut B13.



### Combi Fitting B21 90 degree

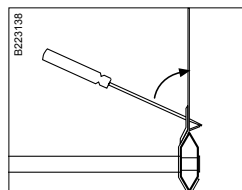
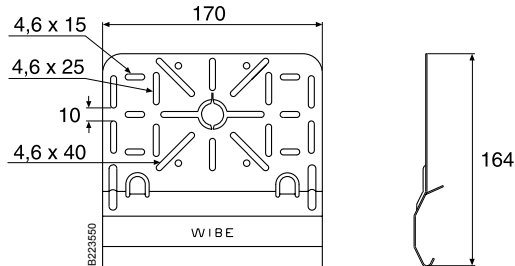
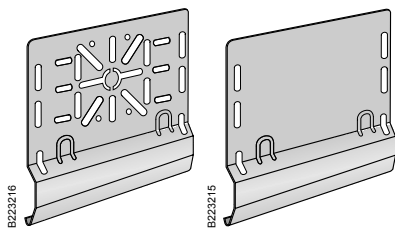
Combi-fitting to be used when mounting mesh trays onto cable ladders.



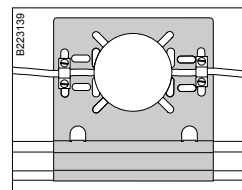
Defem Mesh tray 53, 75 and 120 is mounted onto Combi Fitting B21 90° with 1 Fitting B2, 1 Bolt and Nut B13.

### Junction box plate 35S

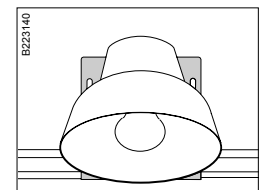
Installed upright or hanging from the profile. Locked with locking tabs.



Bend the tab towards the ladder section by using a screwdriver as a lever for mounting junction box plates.



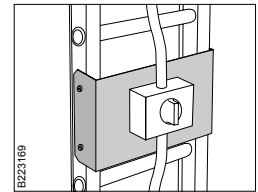
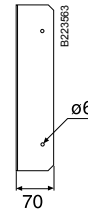
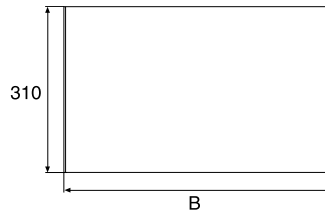
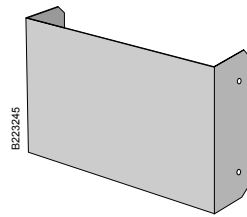
Junction box plates can be mounted in standing or hanging positions on the side sections. Strain-relief may be provided using the outermost holes and clamps or strips.



Light fittings can also be mounted on junction box plates.

### Installation plate 61

Installation plate to be used on vertical cable ladder installations for mounting of terminal boxes, contact breakers, etc.

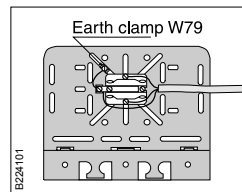
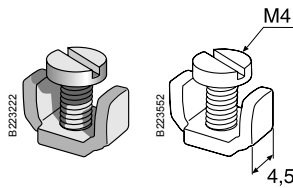


Used on vertical cable ladder installations for mounting of terminal boxes, contact breakers etc. Mount with self-tapping screw ST4.2 in the side profile.

| Type                      | B mm |
|---------------------------|------|
| Installation plate 61-200 | 200  |
| Installation plate 61-300 | 300  |
| Installation plate 61-400 | 400  |
| Installation plate 61-500 | 500  |
| Installation plate 61-600 | 600  |

### Earth clamp W79

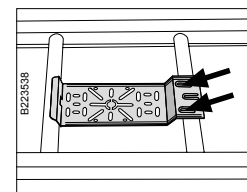
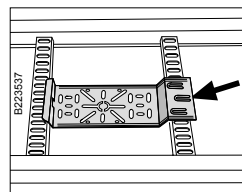
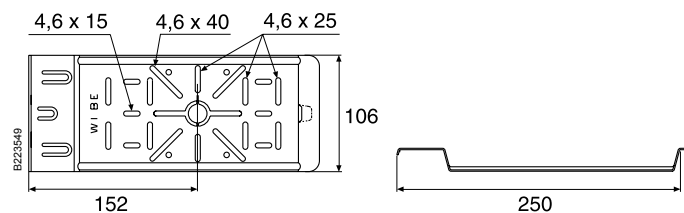
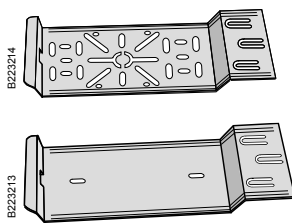
The earth clamp is used when protective earthing of the junction box plate is required.



Earth clamps are designed for use when protective earthing of the mounting plate is required for mounting apparatuses as per relevant heavy current directives. The oblong holes in the junction box plate (mounting plate) permit movement of the earth clamp so that it always comes under the casing of the apparatus. If the apparatus's earth clamp is not approved for joining protective earth conductors, it must pass unbroken through the apparatus's earth clamp to the junction box earth clamp (see the fig.).

### Junction box plate 35P

Junction box plate with holes, to be installed between rungs. Locked with appropriate locking tabs for each ladder. For junction boxes, electric light fittings, etc.

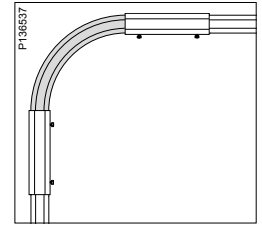
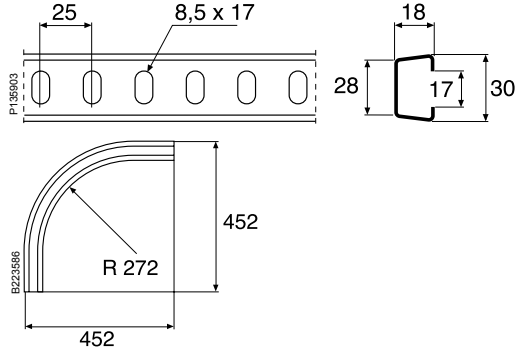
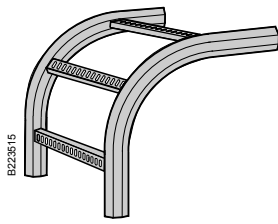


Mount junction box plates between the ladder rungs. On KHZSP, KHZSPZ, KHZPS, KHZP and KHZPV attach junction box plates by bending the central tab into the rung perforation using a screwdriver or suchlike.

Mount junction box plates on KHZ and KHZV by bending the two outer tabs towards the round rung using a screwdriver or suchlike

### Riser 18

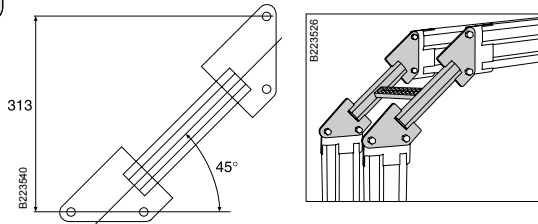
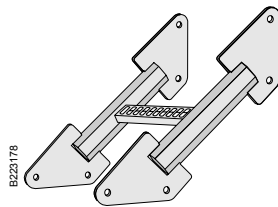
Riser piece to be fitted to the cable ladders by using Joint 21.



Join the cable ladders to Riser 18 using Joint 21.

### Riser coupler 49

Coupler to be used as a self-supporting vertical coupler of cable ladders KHZV/ KHZPV. Two screws M12 and nuts are included.

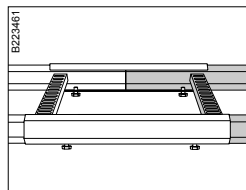
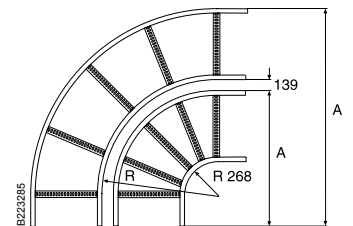
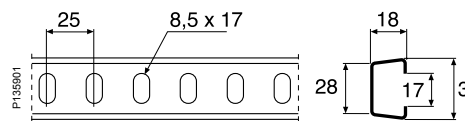
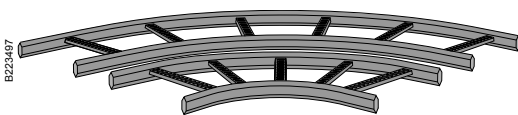


Mount Riser coupler 49 to form a 90° branch on KHZV/ KHZPV using 2 Screw sets M12. This provides a large radius for cables.

### 90° bend 15, interior and exterior

Interior bend piece to be fitted to the cable ladders by using Joint 21, creating a 90° bend. Inner radius 268 mm.

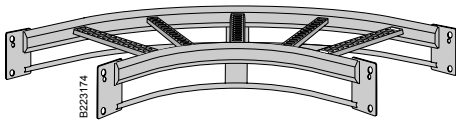
Exterior bend piece to be fitted to the cable ladders by using Joint 21, creating a 90° bend.



Join cable ladders to 90° bend using Joint 21.

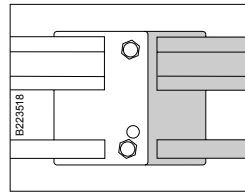
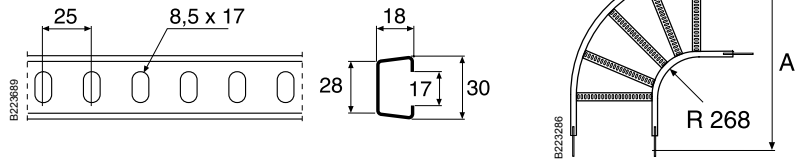
| Type             | R mm | A mm |
|------------------|------|------|
| <b>Interior</b>  |      |      |
| 90° bend 15/150  | 268  | 547  |
| 90° bend 15/200  | 268  | 597  |
| 90° bend 15/300  | 268  | 697  |
| 90° bend 15/400  | 268  | 797  |
| 90° bend 15/500  | 268  | 897  |
| 90° bend 15/600  | 268  | 997  |
| 90° bend 15/800  | 268  | 1197 |
| 90° bend 15/1000 | 268  | 1397 |

| Type             | R mm | A mm |
|------------------|------|------|
| <b>Exterior</b>  |      |      |
| 90° bend 15/150  | 554  | 703  |
| 90° bend 15/200  | 604  | 933  |
| 90° bend 15/300  | 704  | 1133 |
| 90° bend 15/400  | 804  | 1333 |
| 90° bend 15/500  | 904  | 1533 |
| 90° bend 15/600  | 1004 | 1733 |
| 90° bend 15/800  | 1204 | 2133 |
| 90° bend 15/1000 | 1404 | 2533 |



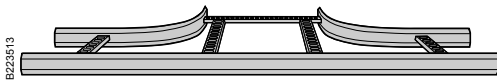
### 90° bend 55 interior

Interior bend piece to be fitted to cable ladders KHZV and KHZPV, creating a 90° horizontal bend.



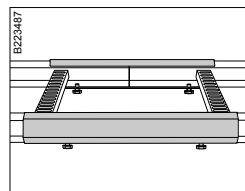
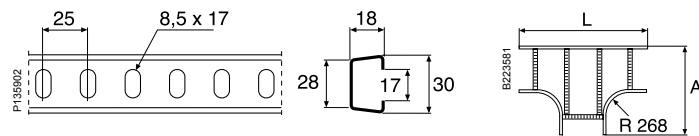
| Type             | A mm |
|------------------|------|
| 90° bend 55/200  | 625  |
| 90° bend 55/300  | 725  |
| 90° bend 55/400  | 825  |
| 90° bend 55/500  | 925  |
| 90° bend 55/600  | 1025 |
| 90° bend 55/1000 | 1425 |

For joining to KHZV and KHZPV, use Screw set M12



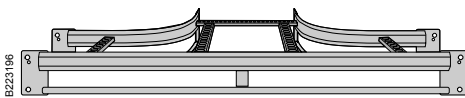
### T-junction 16

T-junction piece to be fitted to the cable ladders by using Joint 21.



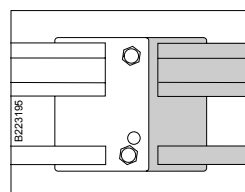
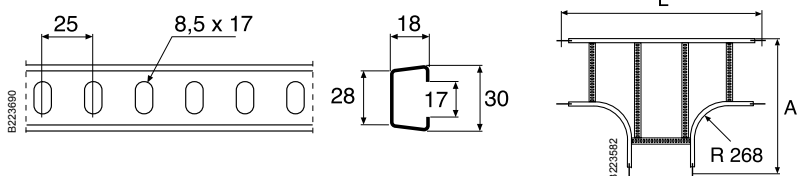
| Type               | A mm | L mm |
|--------------------|------|------|
| T-junction 16/150  | 547  | 944  |
| T-junction 16/200  | 597  | 997  |
| T-junction 16/300  | 697  | 1097 |
| T-junction 16/400  | 797  | 1197 |
| T-junction 16/500  | 897  | 1297 |
| T-junction 16/600  | 997  | 1397 |
| T-junction 16/800  | 1197 | 1597 |
| T-junction 16/1000 | 1397 | 1797 |

Join the cable ladders to T-junction 16 using Joint 21.



### T-junction 56

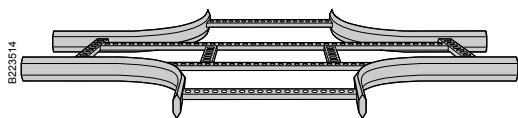
T-junction piece to be fitted to the cable ladders by using Joint 21.



| Type               | A mm | L mm |
|--------------------|------|------|
| T-junction 56/200  | 625  | 1050 |
| T-junction 56/300  | 725  | 1150 |
| T-junction 56/400  | 825  | 1250 |
| T-junction 56/500  | 925  | 1350 |
| T-junction 56/600  | 1025 | 1450 |
| 90° bend 55/800    | 1225 | 1650 |
| T-junction 56/1000 | 1425 | 1850 |

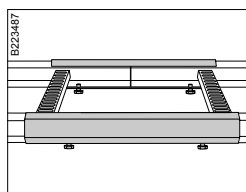
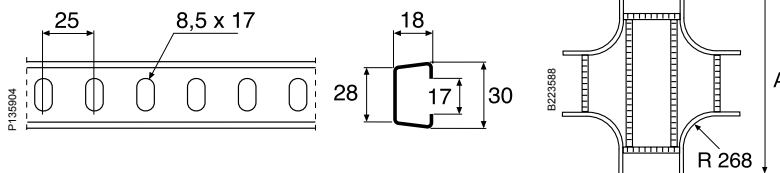
For joining to KHZV and KHZPV, use Screw set M12.





### X-junction 17

X-junction piece to be fitted to the cable ladders by using Joint 21.

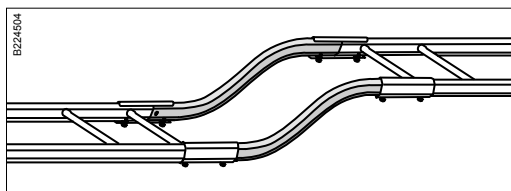
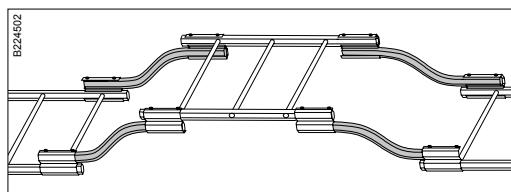
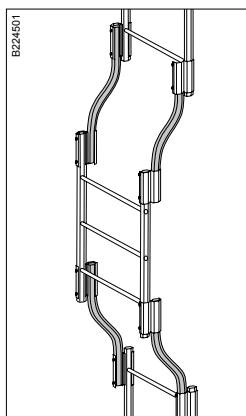
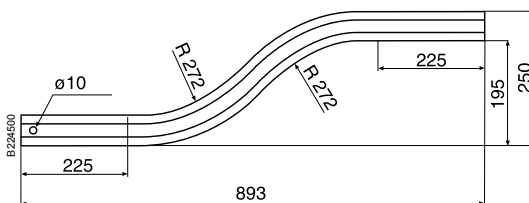
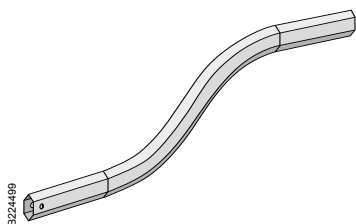


Join the cable ladders to X-junction 17 using Joint 21.

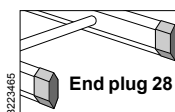
| Type               | A mm |
|--------------------|------|
| X-junction 17/150  | 547  |
| X-junction 17/200  | 997  |
| X-junction 17/300  | 1097 |
| X-junction 17/400  | 1197 |
| X-junction 17/500  | 1297 |
| X-junction 17/600  | 1397 |
| X-junction 17/800  | 1597 |
| X-junction 17/1000 | 1797 |

### S-bend 67

S-bend piece to be used as a transition between cable ladders mounted on different levels. Can be mounted both vertically and horizontally.

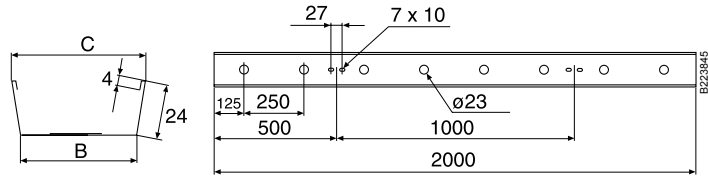
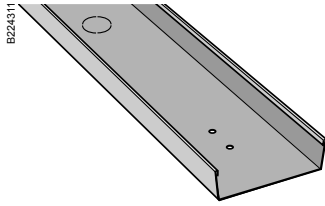


S-bend 67 can be mounted vertically or horizontally between cable ladders by using Dropper joint 32 or Joint 21.

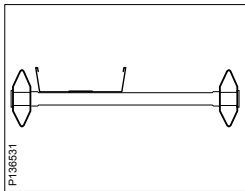


### Tele-conduit 36 with knock-out holes

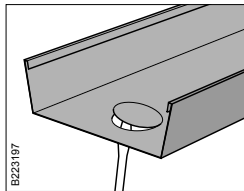
Tele-conduit to be used where a separate tray is required for low-tension cables. Knock-out holes in the bottom of the channel permit the cables to pass through.



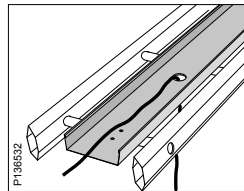
| Type                | B mm | C mm |
|---------------------|------|------|
| Tele-conduit 36/50  | 42   | 50   |
| Tele-conduit 36/100 | 92   | 100  |
| Tele-conduit 36/200 | 192  | 200  |



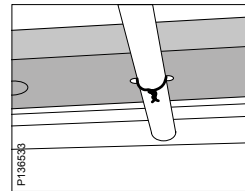
Mount Tele-conduit 36 whenever a special channel is required for low tension lines.



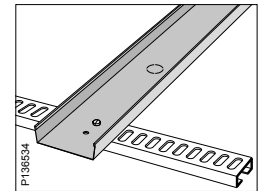
Whenever you wish to make a hole to let a cable through, press the knock-out piece from below using a screw-driver or suchlike



In the event of special needs, a sealing sleeve 22.5 or corresponding may be mounted in the hole.



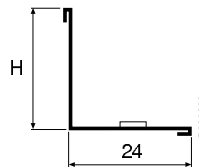
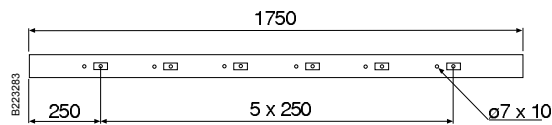
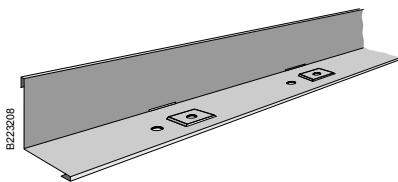
Attach Tele-conduit 36 onto KHZ and KHZV by tying with wire round rungs.



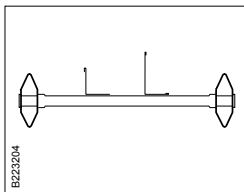
Attach Tele-conduit 36 to KHZSP, KHZSPZ, KHZPS, KHZP and KHZPV using Screw set W34 through the rung perforations.

### Dividing strip 39

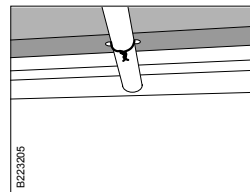
Dividing strip to be used to separate low-tension and high-tension cables.



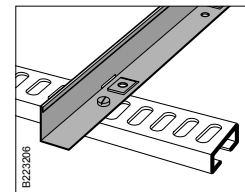
| Type                 | H mm |
|----------------------|------|
| Dividing strip 39/24 | 24   |
| Dividing strip 39/55 | 55   |



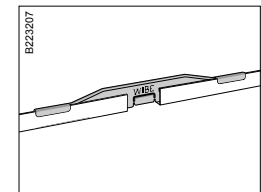
Mount one or more Dividing strips 39 to separate low and high tension cables.



Attach Dividing strip 39 to KHZ and KHZV by lashing around the rungs.



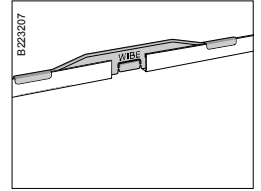
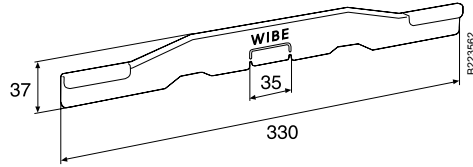
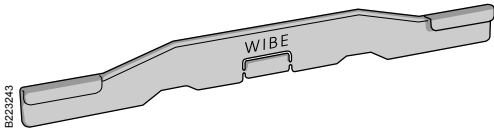
Attach Dividing strip 39 to KHZSP, KHZSPZ, KHZPS, KHZP and KHZPV using Screw set W34 through the rung perforations.



It is advisable to join dividing strips using Distance piece W39.

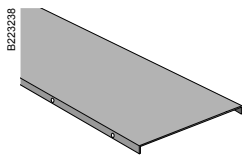
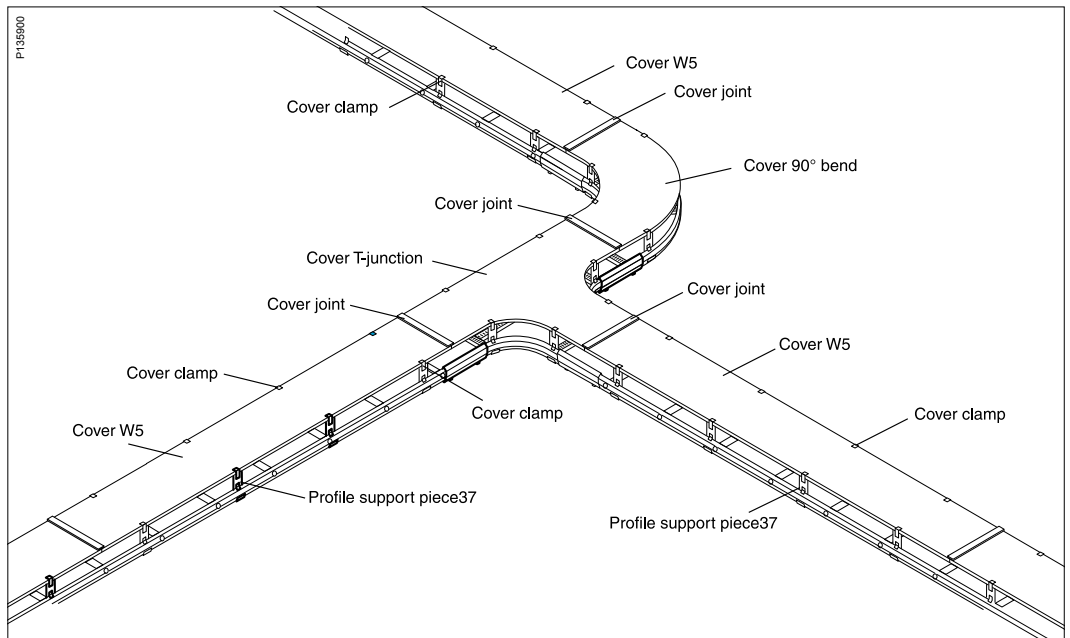
### Distance piece W39

Distance piece to be used for the joining of Dividing strips 39.

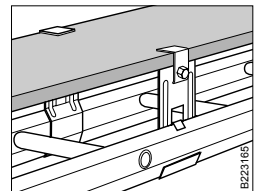
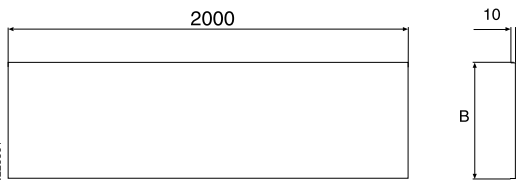


Mount one or more Dividing strips 39 to separate low and high tension cables.

### Cover W5

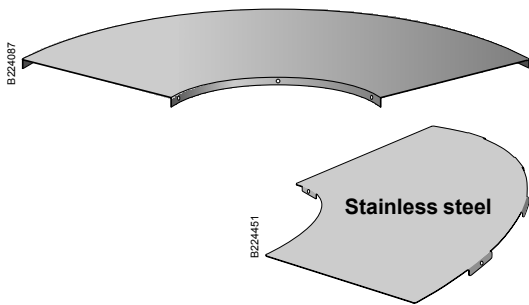


Cover to be used to protect the cable runs from dust, dirt, liquids, etc. Outdoors, it protects against rain and sun. Suitable for all cable ladders.



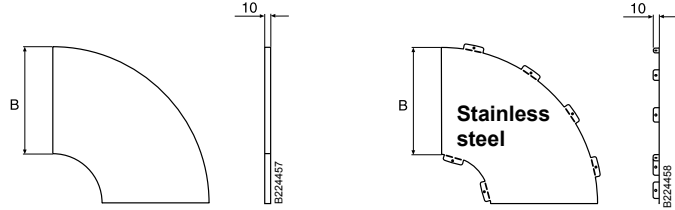
| Type            | Ladder width mm | B mm |
|-----------------|-----------------|------|
| Cover W5 - 150  | 150             | 151  |
| Cover W5 - 200  | 200             | 201  |
| Cover W5 - 300  | 300             | 301  |
| Cover W5 - 400  | 400             | 401  |
| Cover W5 - 500  | 500             | 501  |
| Cover W5 - 600  | 600             | 601  |
| Cover W5 - 800  | 800             | 801  |
| Cover W5 - 1000 | 1000            | 1001 |

Mount covers to protect the cable routes from dust, waste, liquids, etc. Outdoors, covers protect against rain and sun. All Wibe cable ladders can be fitted with covers. Mount covers using Profile support piece 37 and Cover clamp.



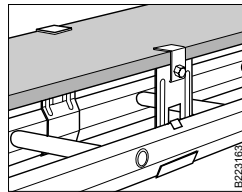
### Cover 90° bend

Cover to be used for 90° interior bends. To be installed with a Profile support piece 37, Cover clamp and Cover joint.

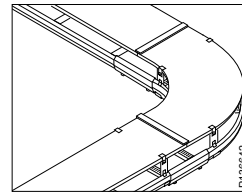


| Type            | Ladder width mm | B mm |
|-----------------|-----------------|------|
| 90° bend - 150  | 150             | 151  |
| 90° bend - 200  | 200             | 201  |
| 90° bend - 300  | 300             | 301  |
| 90° bend - 400  | 400             | 401  |
| 90° bend - 500  | 500             | 501  |
| 90° bend - 600  | 600             | 601  |
| 90° bend - 800  | 800             | 801  |
| 90° bend - 1000 | 1000            | 1001 |

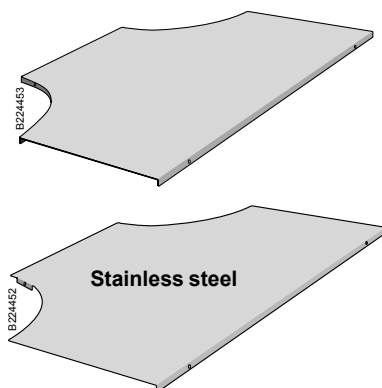
| Stainless steel Type | Ladder width mm | B mm |
|----------------------|-----------------|------|
| 90° bend - 150       | 150             | 147  |
| 90° bend - 200       | 200             | 197  |
| 90° bend - 300       | 300             | 297  |
| 90° bend - 400       | 400             | 397  |
| 90° bend - 500       | 500             | 497  |
| 90° bend - 600       | 600             | 597  |
| 90° bend - 800       | 800             | 797  |
| 90° bend - 1000      | 1000            | 997  |



Fasten cover to Profile support piece 37 using Cover clamp.

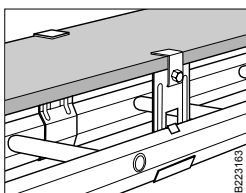
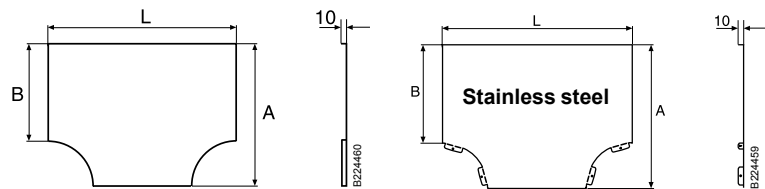


Mount with Profile support pieces 37, Cover clamps and Cover joints.

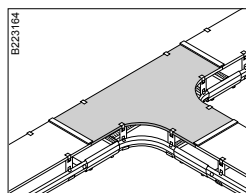


### Cover T-junction

Cover to be used for T-junctions. To be installed with a Profile support piece 37, Cover clamp and Cover joint.



Fasten cover to Profile support piece 37 using Cover clamp.



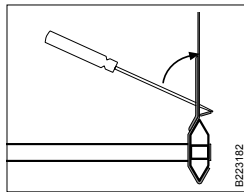
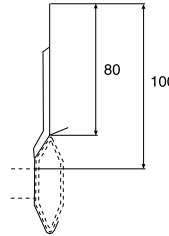
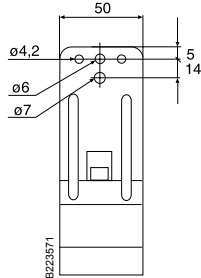
Mount with Profile support pieces 37, Cover clamps and Cover joints.

| Type + ladder width | A mm | B mm | L mm |
|---------------------|------|------|------|
| T-junction - 150    | 400  | 151  | 651  |
| T-junction - 200    | 450  | 201  | 701  |
| T-junction - 300    | 550  | 301  | 801  |
| T-junction - 400    | 650  | 401  | 901  |
| T-junction - 500    | 750  | 501  | 1001 |
| T-junction - 600    | 850  | 601  | 1101 |
| T-junction - 800    | 1050 | 801  | 1301 |
| T-junction - 1000   | 1240 | 1001 | 1501 |

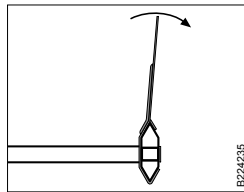
| Type + ladder width<br>Stainless steel | A mm | B mm | L mm |
|--|------|------|------|
| T-junction - 150                       | 402  | 147  | 657  |
| T-junction - 200                       | 452  | 197  | 707  |
| T-junction - 300                       | 552  | 297  | 807  |
| T-junction - 400                       | 652  | 397  | 907  |
| T-junction - 500                       | 752  | 497  | 1007 |
| T-junction - 600                       | 852  | 597  | 1107 |
| T-junction - 800                       | 1052 | 797  | 1307 |
| T-junction - 1000                      | 1242 | 997  | 1507 |

### Profile support piece 37

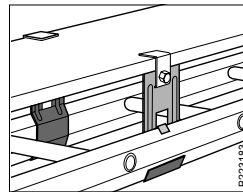
Profile support piece to be used when installing covers. To be mounted on approximately every 0.5 m along both sides of the cable ladder. Used together with cover clamp for locking covers.



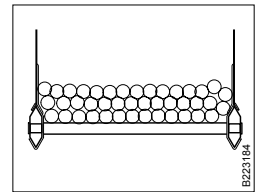
Mount Profile support piece 37 on the inside of the hexagonal section. Bend the tab towards the ladder section using a screwdriver as a lever.



Profile support piece 37 can be bent to fit the cover width.



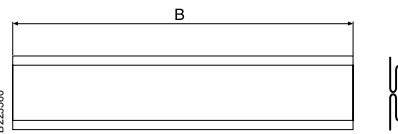
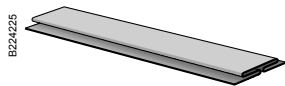
Lock the cover on the Profile support piece 37 using Cover clamps.



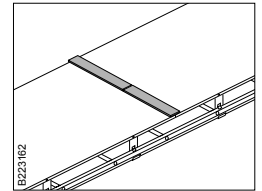
Profile support pieces 37 can be mounted as cable supports. Mount the attachments at about 0.5 m centres on both sides of the ladder.

### Cover joint

Cover joint to be inserted between covers.



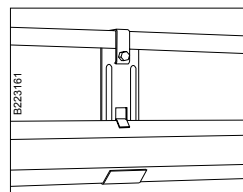
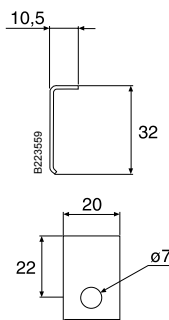
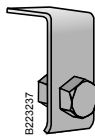
| Type            | Ladder width |      |
|-----------------|--------------|------|
|                 | mm           | B mm |
| Cover joint 150 | 10           | 125  |
| Cover joint 200 | 200          | 175  |
| Cover joint 300 | 300          | 275  |
| Cover joint 400 | 400          | 375  |
| Cover joint 500 | 500          | 475  |
| Cover joint 600 | 600          | 575  |



For width 800 or 1000 mm, use a combination of two smaller joints (e.g. 400+600 mm). Insert joints between covers.

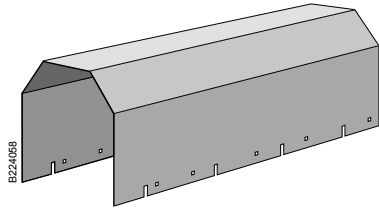
### Cover clamp

Cover clamps to be used when installing a cover on a Profile support piece 37.

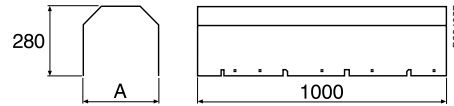


Cover clamps are required for mounting covers on Profile support piece 37.

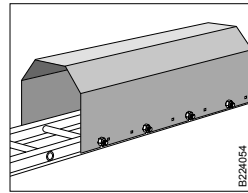
### Protecting cover



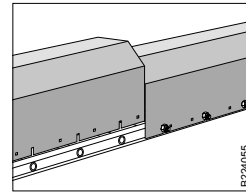
Cover to be used to protect the cable runs against ice and snow. Suitable for all cable ladder widths 300 and 400 respectively.



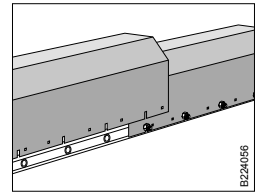
| Type                 | A mm |
|----------------------|------|
| Protecting cover 300 | 300  |
| Protecting cover 400 | 400  |



To be mounted on ladder KHZ with Intermediate connection bolt 29. When mounted on other ladders or when needed, drilling screw  $\text{Æ} 4.2$  is used.



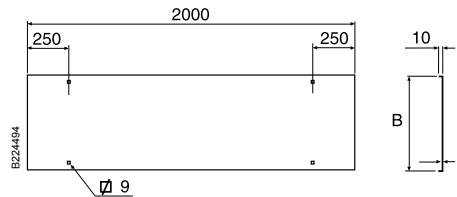
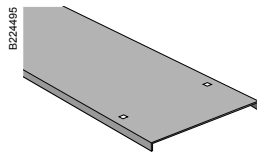
The covers can be mounted edge to edge.



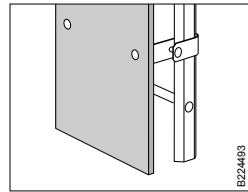
The covers can be mounted with overlap. The asymmetric hole pattern can be used to achieve a good fit.

### Cover 64

Cover to be used for vertically mounted cable ladders.



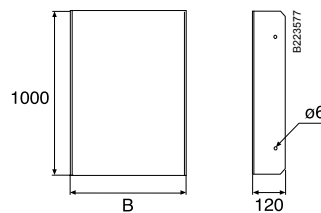
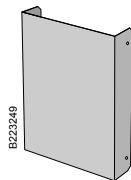
| Type          | B mm |
|---------------|------|
| Cover 64-150  | 151  |
| Cover 64-200  | 201  |
| Cover 64-300  | 301  |
| Cover 64-400  | 401  |
| Cover 64-500  | 501  |
| Cover 64-600  | 601  |
| Cover 64-800  | 801  |
| Cover 64-1000 | 1001 |



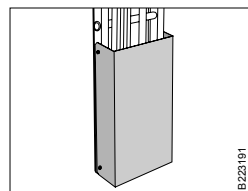
Cover 64 is to be mounted on the cable ladder with Wall bracket 11/25 or Wall bracket 11/75 and Screw set 22S. The covers are to be joined with Cover joints.

### Cover plate 65

Cover plate to be used on vertical cable ladder installations as protection of cables near the floor. To be mounted in the side profile with self-tapping screw ST4.2.

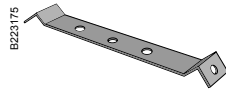


| Type         | B mm |
|--------------|------|
| Cover 65-200 | 200  |
| Cover 65-300 | 300  |
| Cover 65-400 | 400  |
| Cover 65-500 | 500  |
| Cover 65-600 | 600  |

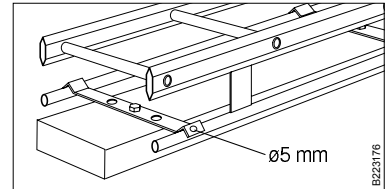
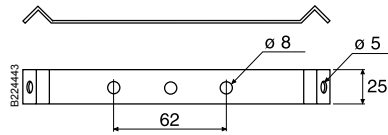


Used on vertical cable ladder installations as protection of cables near the floor. Mounted in the side profile with self-tapping screw ST4.2.

### Lighting bracket 200



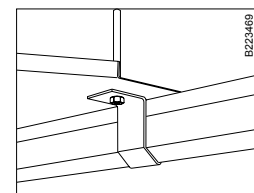
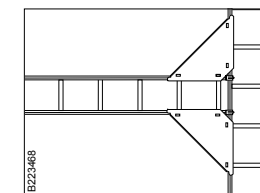
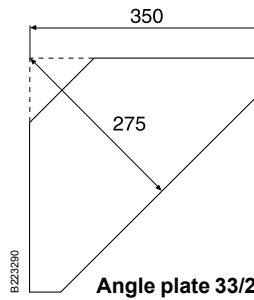
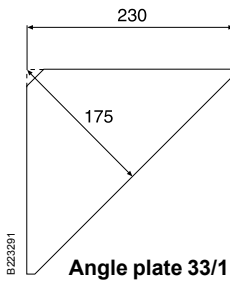
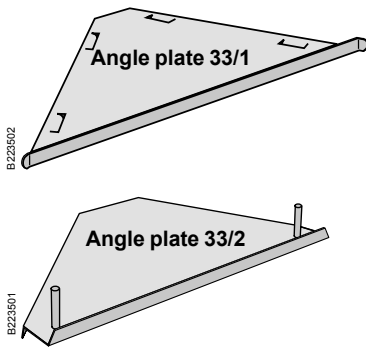
Lighting bracket to be used for the installation of lighting fittings beneath cable ladders KHZV and KHZPV 200.



Mount Lighting bracket 200 for KHZV/ KHZPV between the two lower tubes. If necessary, 5 mm dia. holes can be used for locking against the arch tube by means of blind rivets or sheet screws.

### Angle plate 33/1 and 33/2

Angle plate to be used together with 90° horizontal T-junctions. Recommended for all cable ladders.

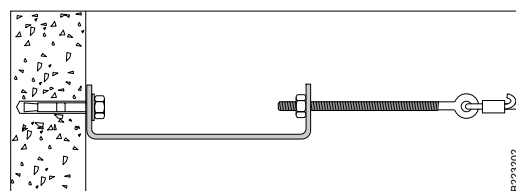
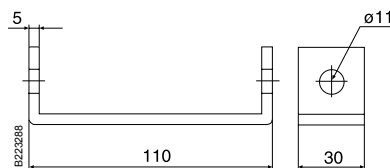
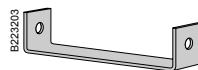


Angle plates are always recommended at 90° horizontal junctions.

To lock Angle plate 33/2, fit Profile clamp 42.

### Wall bracket HT-14

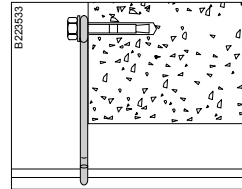
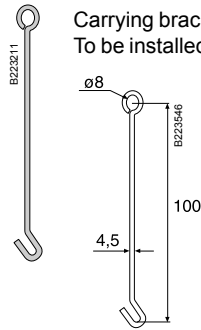
Bracket for wall installation



Wall bracket HT-14 is installed on wall with Expansion bolt or concrete screw.

### Carrying bracket HT-31

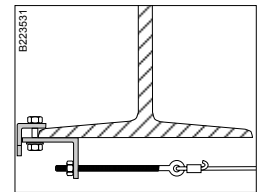
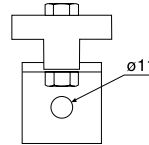
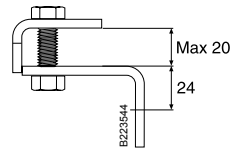
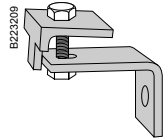
Carrying bracket to be used for ceiling installations.  
To be installed with Expansion bolt or concrete screw.



Carrying bracket HT-31 is installed on ceiling beam with Expansion bolt or concrete screw .

### Carrying bracket HT-152

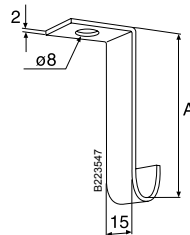
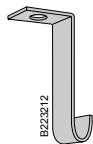
Carrying bracket to be used for easy I-beam installations.



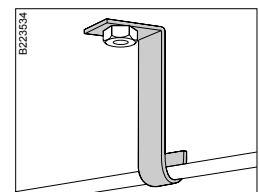
Carrying bracket is easily installed on I-beam.

### Carrying bracket HT-33/34

Carrying bracket to be used for ceiling installations.  
To be installed with Expansion bolt or concrete screw.



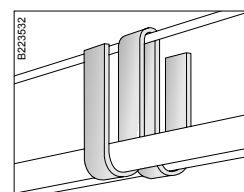
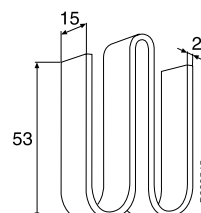
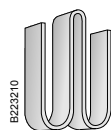
| Type  | A mm |
|-------|------|
| HT-33 | 14   |
| HT-34 | 38   |



Carrying bracket is installed in ceiling with Expansion bolt or concrete screw.

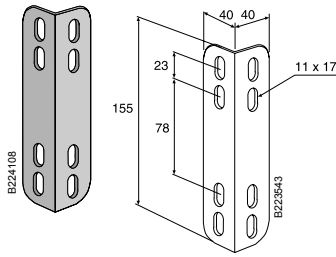
### Carrying sling HT-51

Carrying slings for cables.



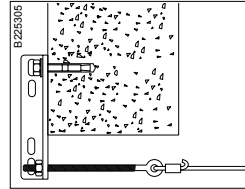
Carrying sling with space for 6 cables max. diam. 16 mm.



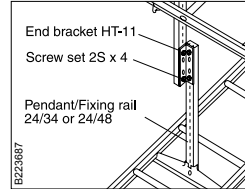


### End bracket HT-11

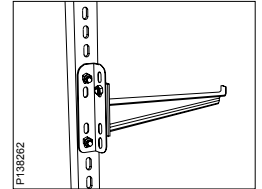
Used for assembling pendant/fixing rails to frames for switching cabinets and electrical control centres. Also suitable for assembling pendant rails for crossing cable runs. Also used as End Bracket for ceiling beam installation.



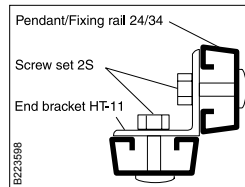
End bracket HT-11 is installed on ceiling beam with Expansion bolt or concrete screw.



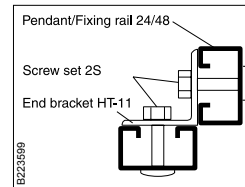
End bracket HT-11 permits mounting of crossing cable ladders in various planes on the same vertical piece.



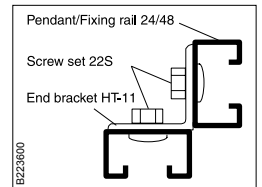
Cantilever arm 50 may, using End bracket HT-11, be mounted at 90° to the vertical piece. Only for lightweight mounting of data cable type or suchlike.



The HT-11 can be used when mounting together 2 Pendant/ Fixing rail 24/34, for example when assembling a stand.

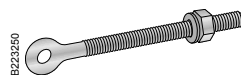


The HT-11 can be used when mounting together 2 Pendant/ Fixing rail 24/48 with the opening towards the attachment, for example when assembling a stand.

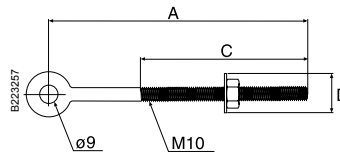


The HT-11 can be used when mounting together 2 Pendant/ Fixing rail 24/48, with the rear towards the attachment.

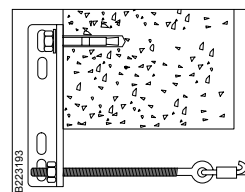
### Tightening loop HT



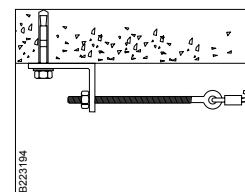
Tightening loop to be installed at the ends of steel wires.



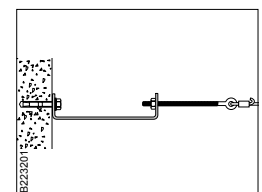
| Type                   | A mm | C mm | D mm |
|------------------------|------|------|------|
| Tightening loop HT-611 | 125  | 100  | 22   |
| Tightening loop HT-621 | 270  | 100  | 50   |
| Tightening loop HT-631 | 400  | 150  | 50   |



Tightening loop is installed in End bracket HT-11 for installation on ceiling beam.



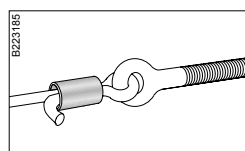
Tightening loop is installed in Angle bracket 5L for installation in ceiling.



Tightening loop is installed in Wall bracket HT-14 for installation on wall.

### Pipe HT-68 and HTR-68

Pipe for easy locking of wires. Ø 15 mm Length 25 mm.



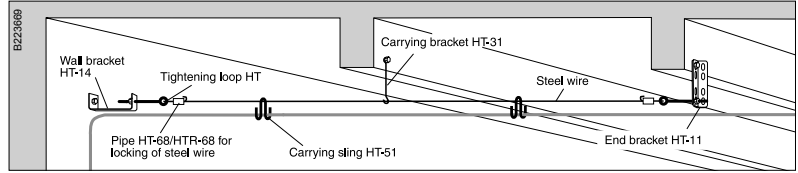
The steel cable is easily locked with the pipe.



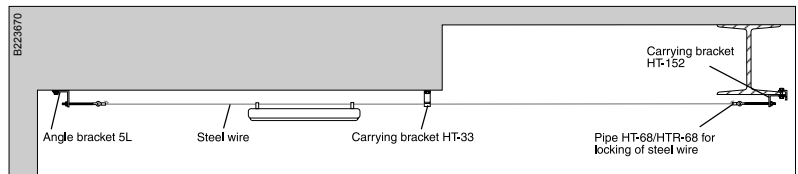
### Steel wire

Steel wire to be installed as carrier of one or more cables.

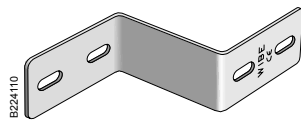
| Type     | Diam. mm | Breaking load kg |
|----------|----------|------------------|
| HT-2309  | 5.00     | 700              |
| HT-2311  | 6.15     | 970              |
| HTR-2322 | 2.50     | 450              |
| HTR-2323 | 3.00     | 700              |
| HTR-2324 | 4.00     | 1200             |



Steel wire installed in ceiling with beams.

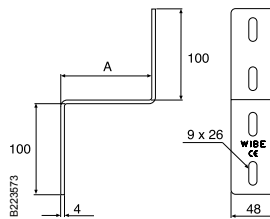


Steel wire installed in ceiling.

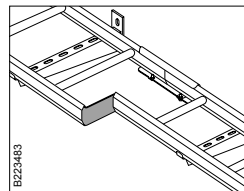


### Reducer 31

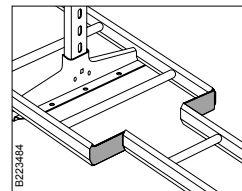
Reducer to be used for transition joining from a wide to a narrower cable ladder.



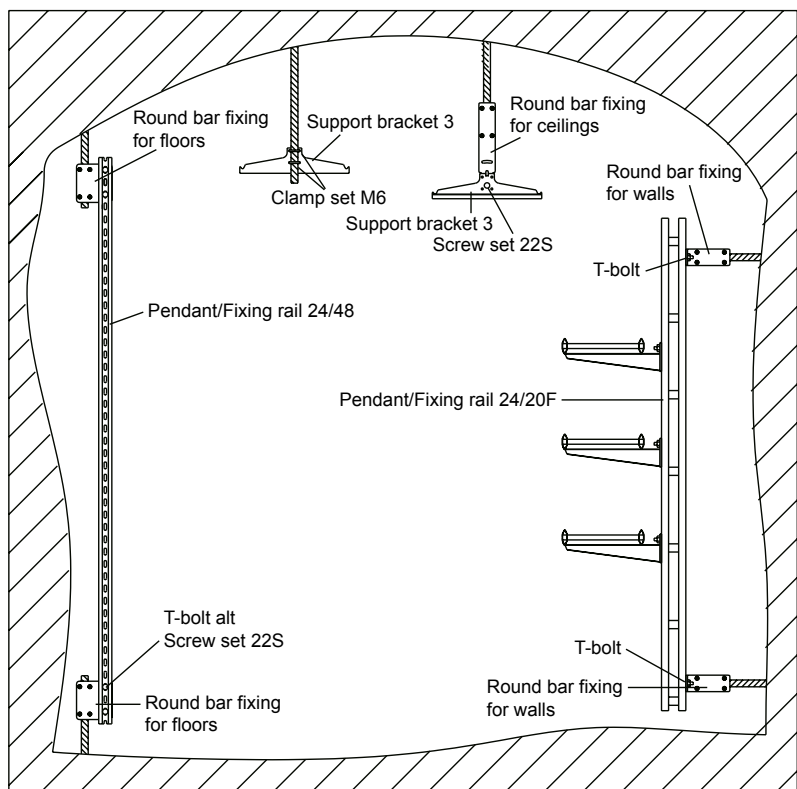
| Type           | A mm |
|----------------|------|
| Reducer 31/100 | 100  |
| Reducer 31/200 | 200  |
| Reducer 31/300 | 300  |
| Reducer 31/400 | 400  |



Reducer to be used for transition joining from a wide to a narrower cable ladder.

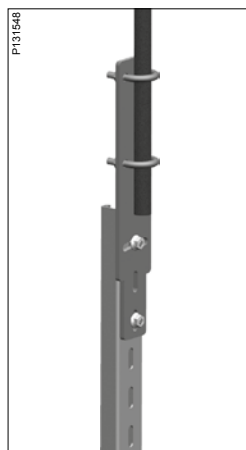
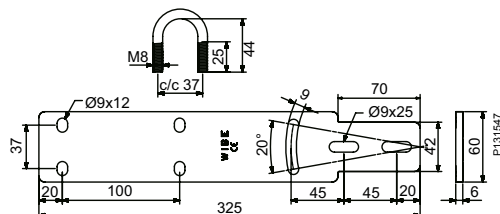


May also be used at centred transition joining



### Round bar fixing for ceilings

Round bar fixing to be used for mounting in underground cavities and tunnels.



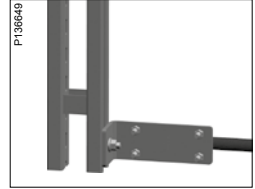
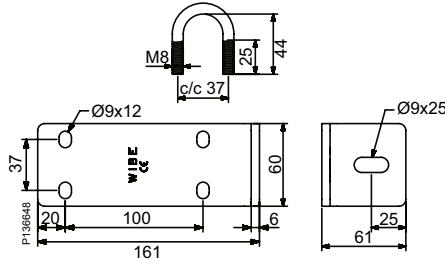
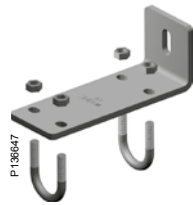
Round bar fixing for ceilings is mounted on pendant/fixing rail 24/48 with screw set 22S. Support bracket 3 is mounted directly on the fixing with Screw set 22S.



Using round bar fixing for ceilings, pendant/fixing rail 24/48 and screw set 22S it is possible to make a vertical piece that can be installed at an angle of up to 10°.

### Round bar fixing for walls

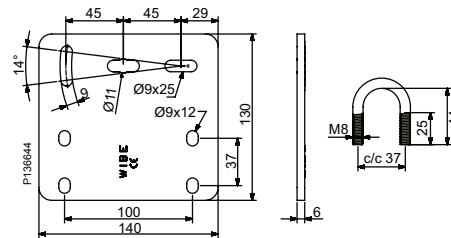
Round bar fixing to be used for mounting in underground cavities and tunnels.



Round bar fixing for walls mounted on Pendant/fixing rail 24/20F with T-bolt 26F.

### Round bar fixing for floors

Round bar fixing to be used for mounting in underground cavities and tunnels.



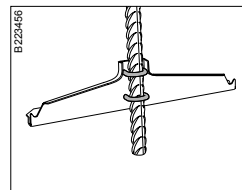
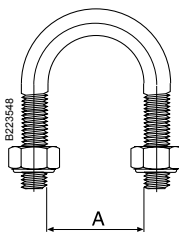
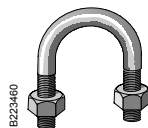
Round bar fixing for floors mounted on Pendant/fixing rail 24/48 with Screw set 22S.



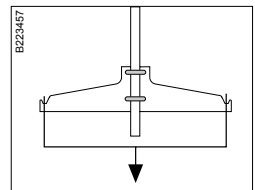
Round bar fixing for floors mounted on Pendant/fixing rail 24/48 with T-bolt 26F

### Clamp set M6

Clamp set to be used for the installation of Support bracket 3 directly on a roof bolt. The set includes two clamps and four locking nuts. M6-25 must be used for Support bracket 3 in hot-dip and pre-galvanised surface finish, whereas M6-20 must be used for Support bracket 3 in stainless steel and Installation plate 60 in all surface treatments.

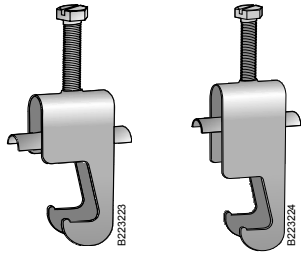


For installation of Support bracket 3 directly on ribbed bar 16-25 or fully threaded bar M16-M27.



Max. symmetrical loading 300 kg. Make sure the clamps grip the bar in a correct manner.

| Type  | Ø  |
|-------|----|
| M6-25 | 29 |
| M6-20 | 24 |



Cable clamp for 1 cable

Cable clamp for 2 cables

### Cable clamp type A

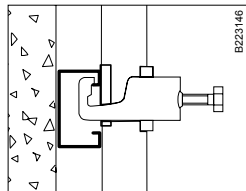
Cable clamp for fastening of cable on Pendant/Fixing rail 24/48 and on cable ladders KHZSP, KHZSPZ, KHZPS, KHZP and KHZPV, in combination with Insert piece EM.

#### Cable clamp A for 1 cable

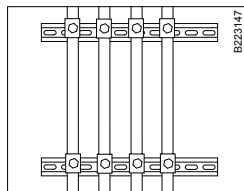
| Type              | For cable mm |
|-------------------|--------------|
| Cable clamp A1-12 | - 12         |
| Cable clamp A1-16 | 13 - 16      |
| Cable clamp A1-22 | 17 - 22      |
| Cable clamp A1-28 | 23 - 28      |
| Cable clamp A1-36 | 29 - 36      |
| Cable clamp A1-44 | 37 - 44      |
| Cable clamp A1-52 | 45 - 52      |
| Cable clamp A1-60 | 53 - 60      |
| Cable clamp A1-70 | 61 - 70      |

#### Cable clamp A for 2 cables

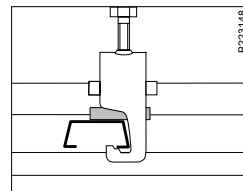
| Type              | For cable mm |
|-------------------|--------------|
| Cable clamp A2-12 | - 12         |
| Cable clamp A2-16 | 13 - 16      |
| Cable clamp A2-22 | 17 - 22      |
| Cable clamp A2-28 | 23 - 28      |
| Cable clamp A2-36 | 29 - 36      |
| Cable clamp A2-44 | 37 - 44      |



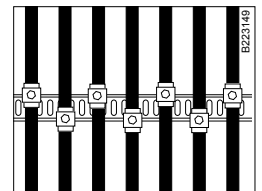
Use Cable clamp type A to attach cables to Pendant/Fixing rail 24/48. Use Insert piece EM.



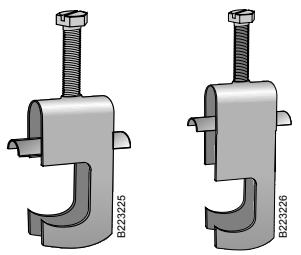
Mounting rail 40 with Cable clamp type A.



Use Cable clamp type A to attach cables to cable ladders KHZSP, KHZSPZ, KHZPS, KHZPV and KHZP. Use Insert piece EM.



In order to avoid torsion of the rung, cable clamps can be mounted opposite each other on the rung.



Cable clamp for 1 cable

Cable clamp for 2 cables

### Cable clamp type R

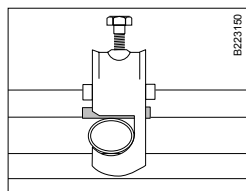
Cable clamp for fastening of one cable on on cable ladders KHZ and KHZV, in combination with Insert piece EM.

#### Cable clamp R for 1 cable

| Type              | For cable mm |
|-------------------|--------------|
| Cable clamp R1-12 | - 12         |
| Cable clamp R1-16 | 13 - 16      |
| Cable clamp R1-22 | 17 - 22      |
| Cable clamp R1-28 | 23 - 28      |
| Cable clamp R1-36 | 29 - 36      |
| Cable clamp R1-44 | 37 - 44      |
| Cable clamp R1-52 | 45 - 52      |
| Cable clamp R1-60 | 53 - 60      |
| Cable clamp R1-70 | 61 - 70      |

#### Cable clamp R for 2 cables

| Type              | For cable mm |
|-------------------|--------------|
| Cable clamp R2-12 | - 12         |
| Cable clamp R2-16 | 13 - 16      |
| Cable clamp R2-22 | 17 - 22      |
| Cable clamp R2-28 | 23 - 28      |
| Cable clamp R2-36 | 29 - 36      |
| Cable clamp R2-44 | 37 - 44      |
| Cable clamp R2-52 | 45 - 52      |
| Cable clamp R2-60 | 53 - 60      |

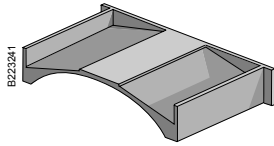


Cable clamp Type R is used for fastening cables on the cable ladders KHZ and KHZV. Insert piece EM must be installed.

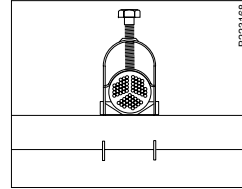
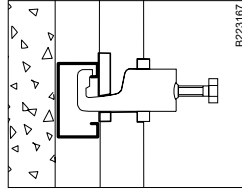
#### Tightening moment

When mounting, Insert piece EM is to be used. It is important that the clamp is not tightened too hard. The installer must watch out for deformations when tightening. Suitable tightening moment for clamps with M6-screw is 0.5-1.0 Nm and for clamps with M8-screw 1.0-1.5 Nm.

### Insert piece EM



Insert piece to be used in order to prevent pressure on the cable. The insert piece is placed between the cable and the rung from the same side where the clamp has been fastened to the rung.



Insert pieces increase the contact area of the cables.

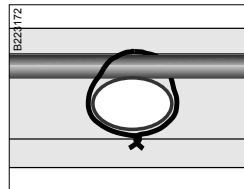
| Type    | For cable mm |
|---------|--------------|
| EM - 12 | - 12         |
| EM - 16 | 13 - 16      |
| EM - 22 | 17 - 22      |
| EM - 28 | 23 - 28      |
| EM - 36 | 29 - 36      |
| EM - 44 | 37 - 44      |
| EM - 52 | 45 - 52      |
| EM - 60 | 53 - 60      |
| EM - 70 | 61 - 70      |

### Lashing wire

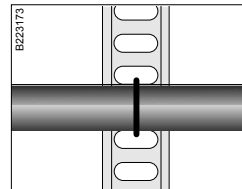


Lashing wire to be used for lashing of wires on cable ladders.

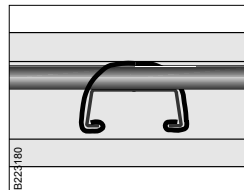
| Type       |  | Diam mm | Breaking load kg |
|------------|--|---------|------------------|
| HTR - 2303 | Lashing wire, stainless steel, white PVC | 1.25    | 92               |
| HTR - 2313 | Lashing wire, stainless steel, black PVC | 1.25    | 92               |
| HT - 2304  | Lashing wire, white PVC                  | 1.5     | 25               |
| HT - 2314  | Lashing wire, black PVC                  | 1.5     | 25               |



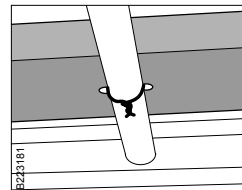
Cables are easily installed by lashing around the rungs of KHZ and KHZV.



Cables are easily installed by lashing through the perforations of the rungs or around the rungs of KHZSP, KHZSPZ, KHZPS, KHZP and KHZPV.



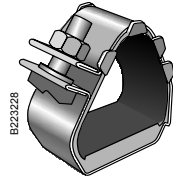
Cables are easily installed on KHZSP, KHZSPZ, KHZPS, KHZP and KHZPV by lashing in such a way that the lashing wire is pinched around the rung as shown.



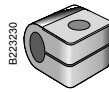
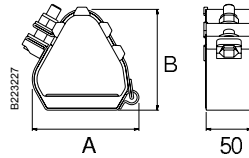
Dividing strips and teleconduits are attached to the ladder by lashing around the rungs of KHZ and KHZV

### Cable clamp ER

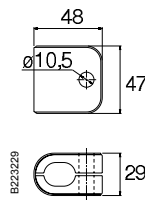
Cable clamp for the installation of cables on cable ladders with round or perforated rungs.



Cable clamp ER



Oval rung adaptor



| Type           | For cable mm | A mm | B mm |
|----------------|--------------|------|------|
| Cable clamp ER | 23 - 28      | 80   | 74   |
| Cable clamp ER | 27 - 32      | 82   | 81   |
| Cable clamp ER | 30 - 35      | 82   | 88   |
| Cable clamp ER | 33 - 38      | 85   | 94   |
| Cable clamp ER | 36 - 42      | 113  | 101  |
| Cable clamp ER | 40 - 46      | 115  | 108  |
| Cable clamp ER | 44 - 50      | 117  | 115  |
| Cable clamp ER | 48 - 55      | 120  | 129  |
| Cable clamp ER | 51 - 58      | 121  | 130  |
| Cable clamp ER | 55 - 62      | 156  | 138  |
| Cable clamp ER | 59 - 66      | 158  | 146  |
| Cable clamp ER | 63 - 70      | 160  | 150  |
| Cable clamp ER | 67 - 74      | 763  | 161  |
| Cable clamp ER | 71 - 78      | 165  | 168  |
| Cable clamp ER | 74 - 82      | 167  | 176  |
| Cable clamp ER | 77 - 85      | 169  | 181  |

**Tested at British short-circuit testing station.**  
**Test report no. BS/F 1265**

- Wibe cable ladder KHZ-600, KHZP-300 and KHZP-600. Cable clamp ER mounted on every rung.
- Wibe cable ladder KHZ-300. Cable clamp ER mounted on every other rung.

**Condition after test**

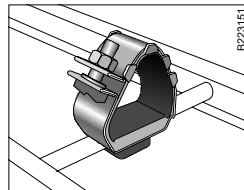
- 400 volt 58 kA symmetrical current (Peak 140 kA) during 0.1 second:
- All clamps remained secure
  - Some slight distortion of the ladder rungs
  - The cables were splayed out between the clamps but otherwise in good order.

**Test report no. BS/F 1268**

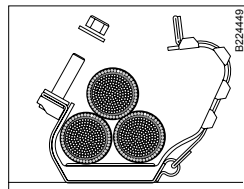
- Wibe cable ladder KHZ-600 and KHZP-600. Cable clamp ER mounted on every other rung

**Condition after test**

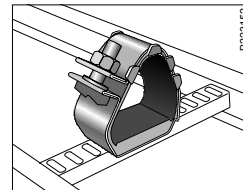
- 352 volt 64 kA symmetrical current (Peak 140 kA) during 0.1 second:
- All clamps remained secure
  - There was distortion of a number of the ladder rungs
  - The cables were splayed out between the clamps but otherwise in good order.



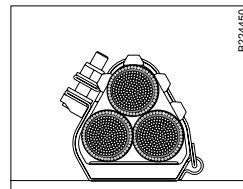
Remove the bottom plate of the clamp and mount it with Oval rung adapter on cable ladders with round rungs - KHZ and KHZV.



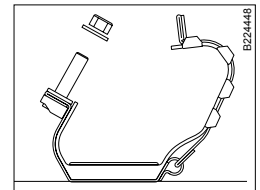
Mount the cables.



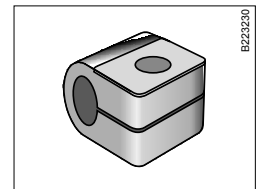
Remove the bottom plate of the clamp and mount it with 2 screw sets 74S on cable ladders with perforated rungs - KHZP, KHZPS, KHZSP, KHZSPZ and KHZPV.



Lock the clamp with the locking nut. Turn the nut to max. 4-5 Nm. The rubber lining must touch the cables but not so tight that the cables will be deformed



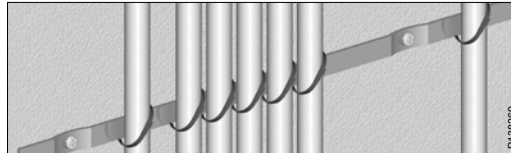
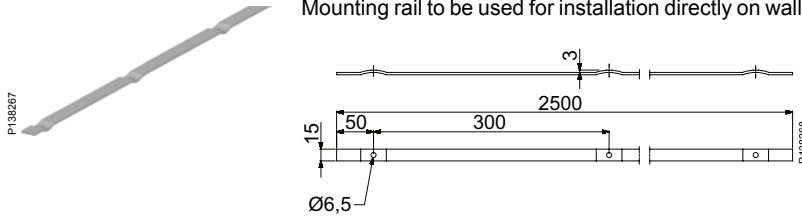
Remove the locking nut. Open the clamp.



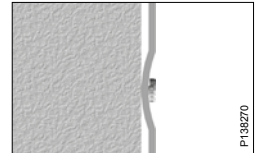
Oval rung adaptor, screw set included, to be used when mounting Cable clamp ER on oval rungs on the KHZ range.

### Mounting rail WMS15

Mounting rail to be used for installation directly on wall for lashing of cables.



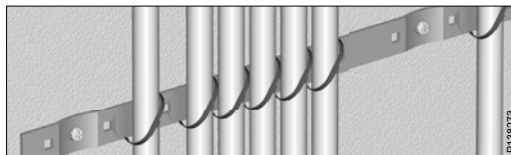
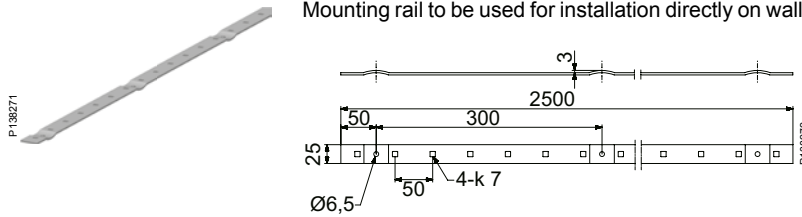
Mounting of cables with lashing wire, strips etc.



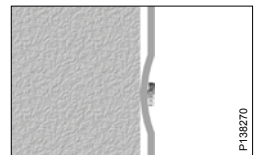
The mounting rail installed directly onto wall.

### Mounting rail WMS25

Mounting rail to be used for installation directly on wall for lashing of cables.



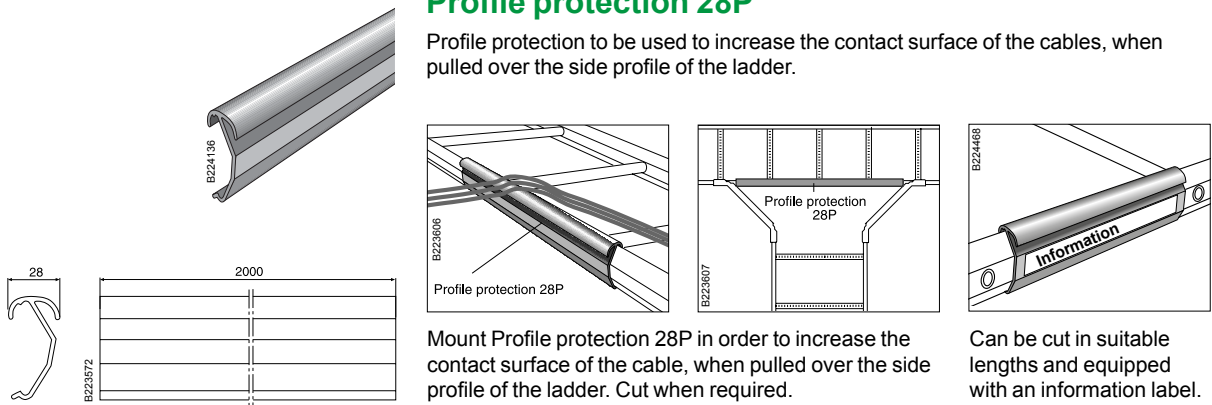
Mounting of cables with lashing wire, strips etc.



The mounting rail installed directly onto wall.

### Profile protection 28P

Profile protection to be used to increase the contact surface of the cables, when pulled over the side profile of the ladder.

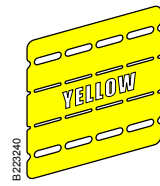


Mount Profile protection 28P in order to increase the contact surface of the cable, when pulled over the side profile of the ladder. Cut when required.

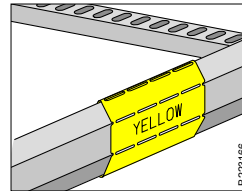
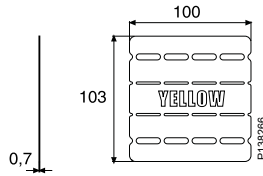
Can be cut in suitable lengths and equipped with an information label. Easy to mount on the ladder side profile.



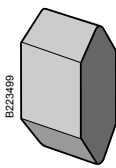
### Marking plate 93



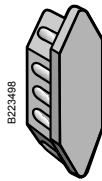
Marking plates are part of a colour marking system that is easy to use when you want to mark out the type of cable that is placed on the cable ladder



The Marking plate can be bent around the side profile on all Wibe cable ladders.



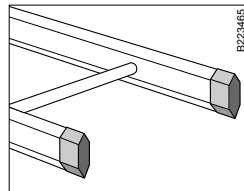
End plug 28



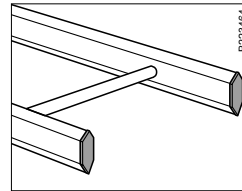
End plug 28i

### End plug 28 and 28i

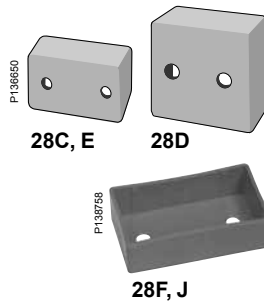
End plug to be mounted on ladder ends for sealing or protection.



Mount End plug 28 in ladder ends as protection.



Mount End plug 28i inside the ladder ends for sealing. Joining with Joint 19 or 21 can be made with End plug 28i left in the ladders ends.

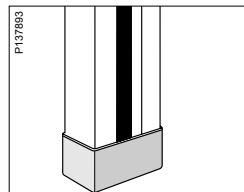


28C, E 28D

28F, J

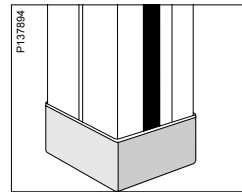
### End plug 28C, D, E, F and J

End plug to be mounted on pendant ends to provide protection against personal injury and to make the ends of the profiles more conspicuous.



End plug **28C** fits Vertical piece 2 and Pendant/ Fixing rail 24/34.

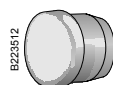
End plug **28E** fits Vertical piece 2F and Pendant/ Fixing rail 24/48.



End plug **28D** fits Vertical piece 20 and Pendant/ Fixing rail 24/20.

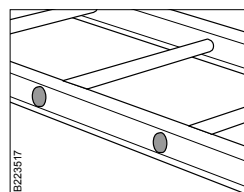
End plug **28F** fits Vertical piece 20FS and Pendant/ Fixing rail 24/20FS.

End plug **28J** for Vertical piece 20F and Pendant/ Fixing rail 24/20F



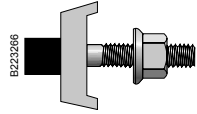
### Cross member plug 27

Cross member plug to be installed at the ends of the rungs of KHZ and KHZV. Used in premises with a high corrosion risk.

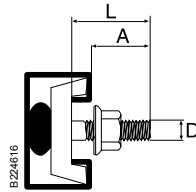


Mount Cross member plug 27 in KHZ and KHZV rung tube ends in premises with high relative humidity where the risk of corrosion is high

### T-bolt 26F

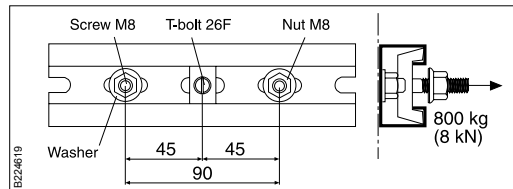


Easy to fit into the fixing rail. It is made to stick which makes it easier to mount and attach compared to a spring nut. It stays in place by itself even before it is fixed with the nut. To be used for the mounting of Cantilever arm 50 on Pendant/Fixing rail 24/48 and all vertical pieces except Vertical piece 2.

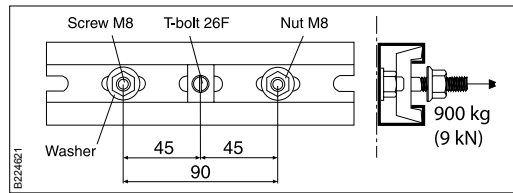


| Type | L mm | A mm |
|------|------|------|
| M8   | 30   | 24   |
| M10  | 30   | 24   |
| M10  | 40   | 34   |
| M8   | 50   | 44   |
| M10  | 50   | 44   |

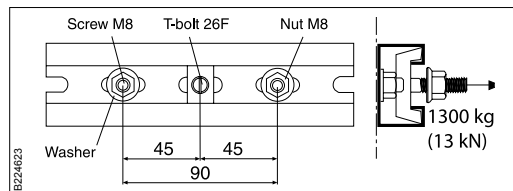
### Max permitted extraction force



T-bolt 26F M8/M10 + P/F-rail 24/48 + Washer 8,4x19x1,5



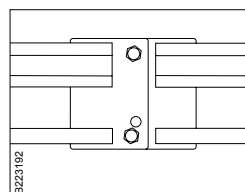
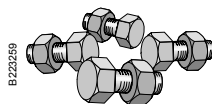
T-bolt 26F M8 + P/F-rail 24/48 + Washer 9x35x2



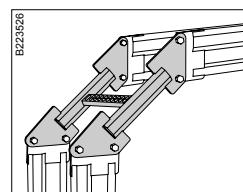
T-bolt 26F M10 + P/F-rail 24/48 + Washer 9x35x2

### Screw set M12

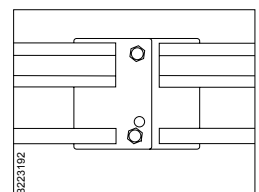
Screw set to be used for all joints with cable ladders KHZV and KHZPV.



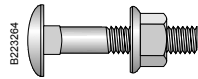
For joining ladders.



For joints with Riser coupler 49.



For joints with 90° bend 55 and T-junctions 56.



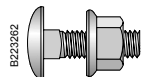
### Screw set 2S

Screw set to be used for fastening of Support bracket 3 on Pendant/fixing rail 24/20F and Angle bracket 5L to the opening on Pendant rail 24/34 and 24/48. Set including screw MVBF 8x40 and nut M6MF8.



### Screw set 20S

Screw set to be used for installation of Support bracket 3 on Pendant/fixing rail 24/20 and Vertical piece 20, Angle bracket 5L to the opening on Pendant rail 24/48 and 24/20. Set including screw MVBF 8x60 and nut M6MF8.



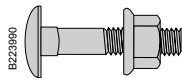
### Screw set 22S

Screw set to be used for installation of Support bracket 3 on Vertical piece 2 and 2F, Support bracket 3 and Ceiling bracket 5 on Pendant/fixing rails 24/34 and 24/48, Angle bracket 5L against the back of Pendant/fixing rails, Pendant/fixing rails back to back. Set including screw MVBF 8x16 and nut M6MF8.



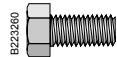
### Screw set W34

Screw set to be used for the fastening of dividing strips on cable ladders KHZSP, KHZSPZ, KHZPS and KHZPV. Set including screw MSCS 6x12 and nut M6MF 6.



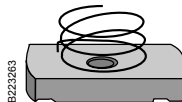
### Screw set W37

Screw set including bolt MVBF 8x35 and nut M6MF 8, to be used for the installation of Support bracket 3 on Vertical piece 20F.



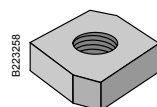
### Screw set M10 x 20

Screw to be used with Spring nut M10 for the installation of Cantilever arm 50 on Pendant/fixing rail 24/48.



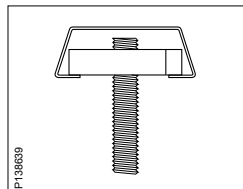
### Spring nut M8/M10

Spring nut to be used for fastening of accessories (control panels, etc.) on Pendant/fixing rail 24/48.

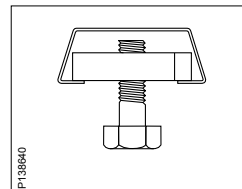


### Back nut M8

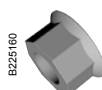
Back nut to be used for fastening of vertical pieces, etc., in the rungs of cable ladders KHZSP, KHZSPZ, KHZP, KHZPS and KHZPV.



Mounting with Threaded rod M8 and Backnut M8 in the cable ladder rungs.



Pendants etc. are mounted with Bolt M8 and Back nut M8 in the rungs.



### Flange nut B43 M8, M10

Used for joining of Threaded rod W76 M8 and M10.



### Thread lock B50 M8, M10

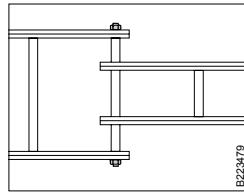
Used for joining of Threaded rod W76 M8 and M10.



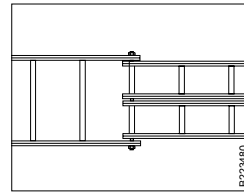
### Intermediate connection bolt 29

Intermediate connection bolt to be used at the transition from a broad to a narrower cable ladder KHZ.

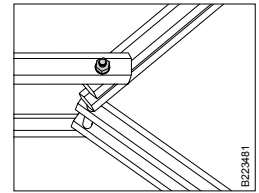
| Type                                | Bolt diam x length mm |
|-------------------------------------|-----------------------|
| Intermediate connection bolt 29/200 | M10 x 235             |
| Intermediate connection bolt 29/300 | M10 x 335             |
| Intermediate connection bolt 29/400 | M10 x 435             |
| Intermediate connection bolt 29/500 | M10 x 535             |
| Intermediate connection bolt 29/600 | M10 x 635             |



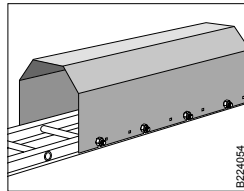
Intermediate connection bolts are used for changing from a broad to a narrower ladder. The broader ladder's last rung is cut to permit the narrower ladder to fit in. The intermediate connection bolt is mounted through the rungs of the KHZ ladder.



Intermediate connection bolts can also be used for transition from one wide ladder to two narrower ones.



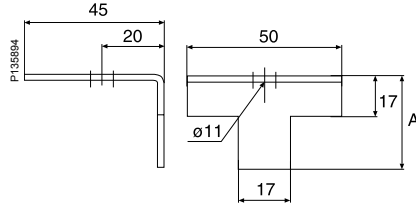
Intermediate connection bolt also permits formation of angles.



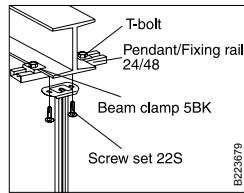
To be mounted on ladder KHZ with Intermediate connection bolt 29.

### Beam clamp 5BK

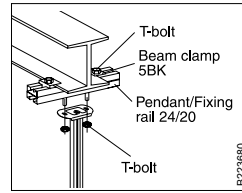
Beam clamp to be used for the installation of Vertical pieces 2, 2F or 20 on I-beams.



| Type   | A mm |
|--|------|
| Beam clamp 5BK-10, for flange thickness max 13 mm    | 30   |
| Beam clamp 5BK-30, for flange thickness max 14–30 mm | 50   |



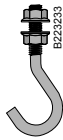
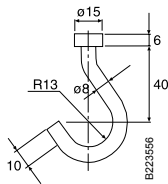
On ceiling beams, mount Vertical piece 2, 2F or 20 using 2 Beam clamps 5BK, Pendant/ Fixing rail 24/48 and Screw set 22S. For Beam clamp 5BK-10, use T-bolt 26F/40. For Beam clamp 5BK-30, use T-bolt 26F/50.



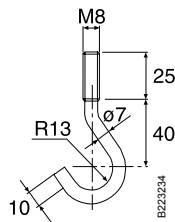
Alternatively, a Pendant/ Fixing rail 24/20 may be used. This will require 4 T-bolts.



Hot dip galv.

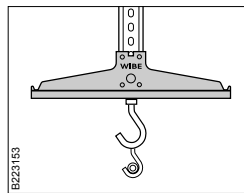


AISI 316L

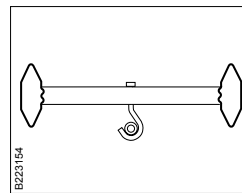


### Hook 8

Hook to be used for the installation of cables beneath Support bracket 3. Can also be installed in perforated rungs.

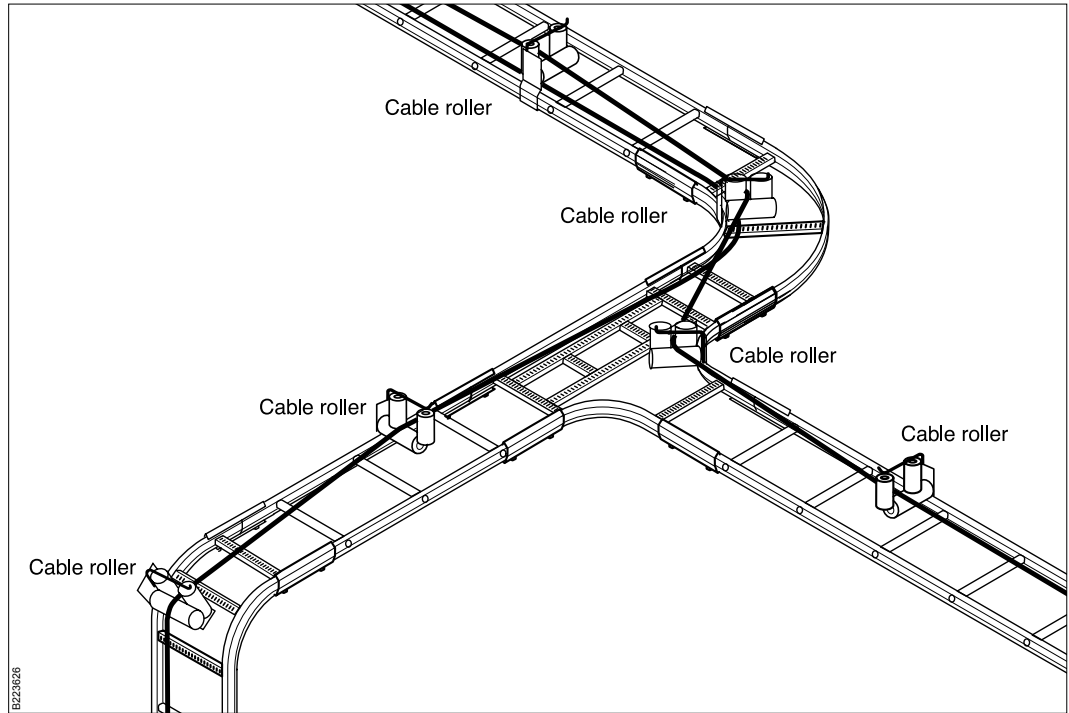


Hook 8 mounted beneath Support bracket 3 for installation of cables.

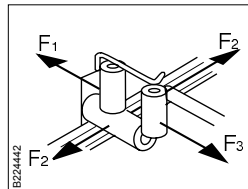
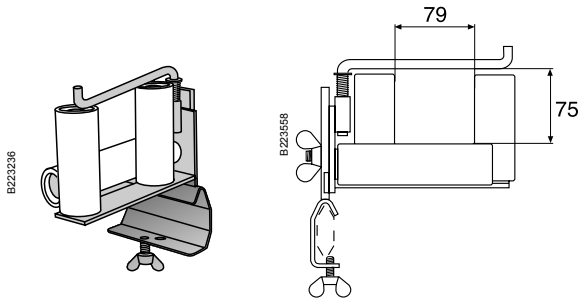


Hook 8 installed in a perforated rung.

### Cable roller S

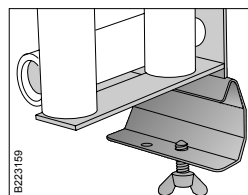


Cable roller used to facilitate the pulling of cables and lines. Easily installed on all Wibe cable ladders except the high-sided WHS ladders (outer mounting hole). Also suitable for external/internal profiles of all 90° bends, T-junctions, X-junctions and risers (inner mounting hole). With a height adjustment of 45 mm to leave room for cables to pass under the roller.

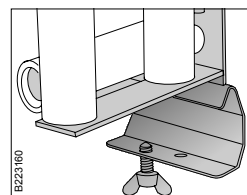


#### Load

Permitted loading  $F_1 = 100$  kg (KHZ, KHZP, KHZV) 35 kg (KHZSP)  
 Permitted loading  $F_2 = 125$  kg (KHZ, KHZP, KHZV) 35 kg (KHZSP)  
 Permitted loading  $F_3 = 100$  kg (KHZ, KHZP, KHZV) 35 kg (KHZSP)



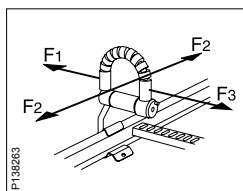
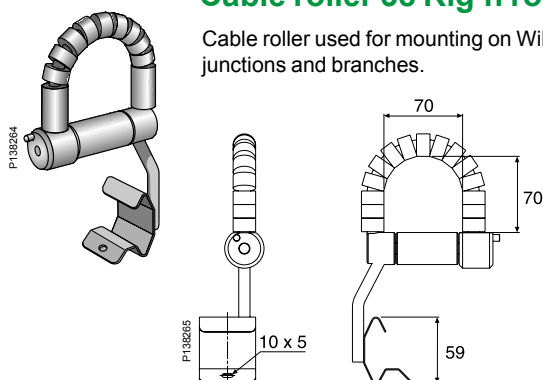
For fitting on 90°, T- and Xjunctions, use the inner mounting hole.



For mounting on ladders, use the outer mounting hole.

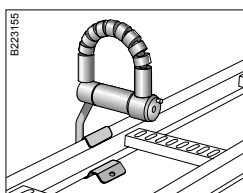
### Cable roller 38 Rig'n roll

Cable roller used for mounting on Wibe cable ladders with belonging junctions and branches.

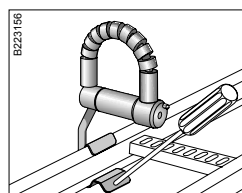


#### Load

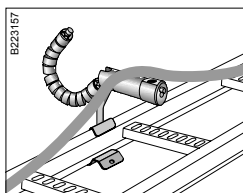
Permitted loading  $F_1 = 20$  kg (KHZ, KHZP, KHZV, KHZSP)  
 Permitted loading  $F_2 = 50$  kg (KHZ, KHZP, KHZV, KHZSP)  
 Permitted loading  $F_3 = 50$  kg (KHZ, KHZP, KHZV)  
 25 kg (KHZSP)



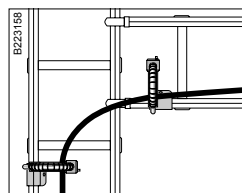
Cable roller 38 is to be mounted on the cable ladder profile.



Use a screw driver when dismantling the cable roller.



Open the cable roller by pressing the locking button and turn the loop aside.



The loop has rollers which make cable pulling over bends and junctions very easy.