



Kenex overhead radiation shielding systems and surgical lamps

Installation / maintenance instructions

(Issue 17)

Date of installation:

Installation is in accordance with structural analysis of ceiling / supporting structure:

Yes

No

Comments:

Each step of relevant installation procedure has been completed fully:

Yes

No

Comments:

Name of installer:

Signature of installer:

Company / department:

Kenex serial number (s):

Device location:

These instructions should be read before commencing installation

Disclaimer

Kenex is not responsible and cannot be held liable for unauthorised modifications made to its products, or for unsuitable and unintended use. Improper alterations or use may adversely affect safety or reliability.

Prior to installation, a structural engineer must check that the ceiling is strong enough to provide proper support for the attached system. The installation must then be inspected by the engineer and certified in accordance with any regional construction regulations.

The layout of the installation, the selection of appropriate installations fastenings and torque values is the sole responsibility of the structural engineer.

The contents of this document are believed to be free from errors and omissions. However, Kenex makes no warranties with respect to content and disclaims any implied warranties.

Important

The electrical or mechanical instructions, referred to in this manual should be carried out by suitably qualified engineers who have sole responsibility for this work. Carefully read the information contained in this manual before beginning to assemble and install the equipment. Failure to read and understand the warnings and instructions could lead to serious injury and property damage.

Components or devices manufactured by other companies should not be combined with Kenex products without prior guidance and permission from Kenex.

WARNING

Collision of the radiation shields or surgical lamps with other equipment might cause damage and may cause them to fall.

Applicability

This manual applies to **Kenex** overhead counterpoise radiation shields types 350, 351, 354, type 3001 ceiling tracks and surgical lamps.

Kenex reserves the right to change specifications and contents of this manual without notice.

Quality management systems and certification

Kenex is certified to ISO 13485 for the design & manufacture of medical devices.

Kenex has in place methodology for identifying, addressing and evaluating risk in accordance with standard ISO 14971. Where appropriate all Kenex products are CE certified.

Quality standards

Kenex medical devices are designed and manufactured in accordance with IEC 60601-1 and must be maintained in accordance with IEC 62353.

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Questions & comments

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Contents

	System component identification	5
1	Ceiling column installation	6
1.1	Column installation - direct to a concrete ceiling	6 - 8
1.1.1	Column installation - using counter plates with threaded rods	8
1.1.2	Column installation - using heavy load anchors	8
2	Anchorage plate installation - fixed to ceiling channels	9
3	Anchorage plate installation - fixed to a framework above a false ceiling	10
4	Anchorage void kit installation - attached to a concrete ceiling above a suspended ceiling	11 - 13
5	Anchorage ring & plate installation - attached to a concrete ceiling above a suspended ceiling	14 - 15
6	Ceiling track installation - attached to a load bearing ceiling	16 - 29
6.1	Track installation - to load bearing Unistrut® P1000 or equivalent <u>across</u> ceiling channels	17 - 23
6.2	Track installation - to load bearing Unistrut® P1000 or equivalent <u>parallel</u> to ceiling channels	24 - 27
6.3	Track installation - to a load bearing ceiling / structure	28 - 29
7	Wall bracket installation	30
7.1	Wall bracket installation - drilling securing holes	30
7.2	Wall bracket installation - connecting electrical supply	30
7.3	Wall bracket installation - securing wall bracket to the wall	31
7.3.1	Wall bracket installation - using a counter plate with continuous threaded bolts	31
7.3.2	Wall bracket installation - using stud bolts	31
8	Attaching a suspension arm - to a wall bracket	32
9	Attaching a suspension arm - to a ceiling column	33
10	Attaching a suspended device to a suspension arm (radiation shields and surgical lamps)	34 - 36
11	Suspension arm adjustments	37
11.1	Spring arm height adjustments	37
11.2	Spring arm counterbalance adjustments	37
12	Radiation shield adjustments	38
12.1	Radiation shield adjustments - type 350 & 351	38
12.2	Radiation shield adjustments - type 354	38
13	LED surgical lamp installation requirements	39
14	System maintenance	40
15	maintenance	41
15.1	maintenance - general use	41
15.2	maintenance - cleaning	41
15.3	maintenance - routine checks	41
16	Suspension arm spare parts	42
17	Securing bolt data	43
18	Weights and dimensions	44
19	Ceiling column drilling template	45
20	System maintenance record sheet	46

System component identification



Dual mount
ceiling column



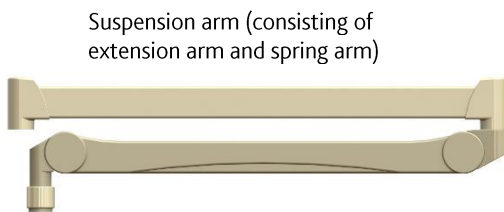
Wall bracket



Suspended shield
Type 350



Surgical lamps



Suspension arm (consisting of
extension arm and spring arm)



2.5 m or 4.2 m
Ceiling track



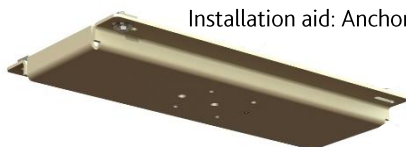
Suspended shield
Type 351



Installation aid:
Anchorage ring & plate



Suspended shield
Type 354



Installation aid: Anchorage plate



Installation aid:
Anchorage void kit

1. Ceiling column installation

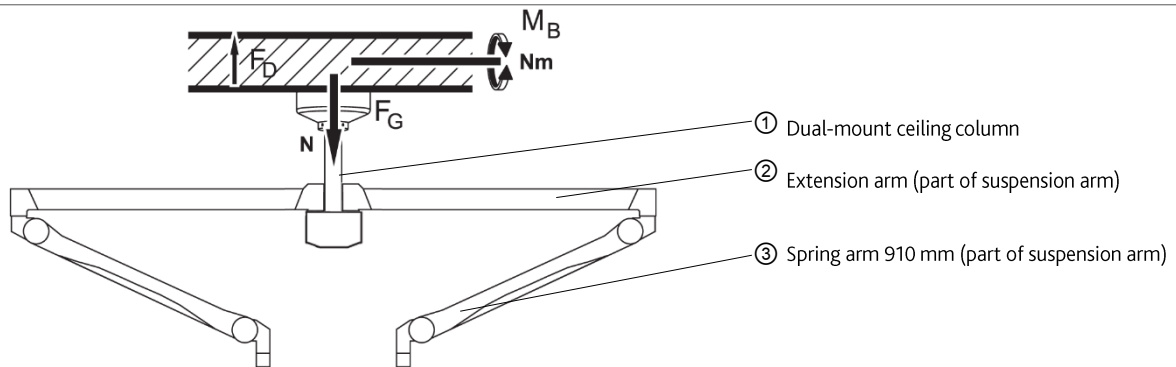
Requirements to be met prior to installation

Prior to installation, a structural engineer of record must ensure that the ceiling is designed in such a way that the loads of the installed pendant system can be securely borne and transferred. The load bearing capacity of the ceiling must be checked by structural analysis and confirmed by means of an acceptable certificate. The installation must be inspected by the engineer and certified in accordance with any regional construction regulations. The layout of the installation, the selection of appropriate installations fastenings and torque values is the sole responsibility of the structural engineer.

Warning: Do not alter the length of a ceiling column or remove any securing screws. Note: Standard columns have an overall length of 80 cm. Ceiling column of 40 cm, 60 cm and 100 cm are also available.

Ceiling column load data – Maximum permissible loads with two attached suspension arms

Figure 1



Maximum extension arm length L (mm)	Maximum device load (kg)	Maximum bending moment MB (Nm)
600	21	690
750	18	740
950	15	790

1 x 80 cm dual mount ceiling column
2 x suspension arms (maximum length 1860 mm)
2 x 15 kg device weight

Vertical load (F_G) = 579 N
Maximum tension bolt force at the ceiling column flange = 4.0 kN

1.1 Column installation - Direct to a concrete ceiling (steps described on page 8)

Requirements with regard to fastening elements and their use

Due to the diversity of ceiling structure types, no fastening elements are included for attaching the ceiling column directly to a concrete ceiling. Suitable fastenings should be determined following a structural analysis of the ceiling, and with reference to Section 17 - Securing bolt data.

Note: The position of attached suspension arms depends upon the position of the lower mounting pivots of the installed ceiling column. When planning the location of the ceiling column, the swivel ranges of the extension arms must be considered. One pivot has an electrical connection.

Note: When attaching the ceiling column directly to the raw ceiling, it is not possible to subsequently align the pendant system vertically (vertical adjustment can be made when attaching to Kenex installation aids #300/P/012 or #300/P/014). The raw ceiling surface must therefore be absolutely horizontal and uniform.

WARNING

Prior to any installation work, disconnect all poles of any power supply source in the ceiling which is to be used for subsequent connection to the ceiling column (see figure 4 on page 8).

Ceiling column mounted with counter plates (see figure 2)

The recommended method applicable in most cases for attaching a ceiling column to an existing raw ceiling (3) is to use counter plates (1) with continuous threaded rods (2) (not included in the scope of delivery). In order to ensure that the load is correctly distributed, the flange of the ceiling column (4) must be flush with the raw ceiling (3).

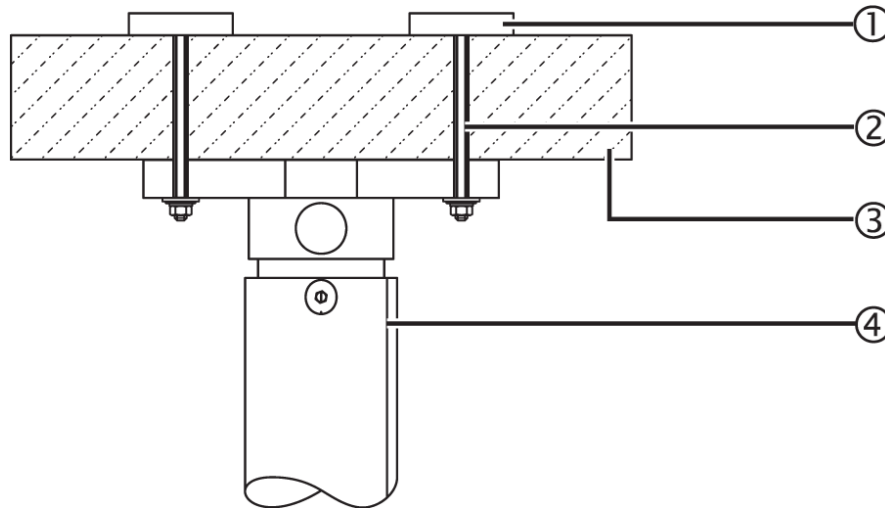


Figure 2

Ceiling column fixed with heavy load anchors (see figure 3)

If fixing with counter plates is not possible, heavy load anchors (1) (not included in the scope of delivery) can be used under certain conditions, which must be checked:

- The raw ceiling must be at least 120 mm thick.
- Only use heavy load anchors (1) of a size determined by the structural engineer.
- In order to ensure that the load is correctly distributed, the flange of the ceiling column (3) must be flush with the raw ceiling (2).

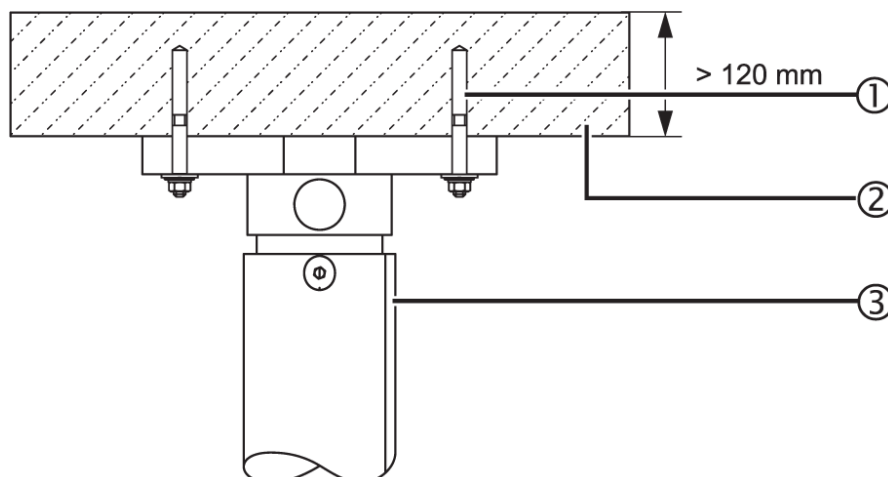


Figure 3

1.1.1 When using counter plates with threaded rods (see figure 2)

Step 1

Refer to Section 19 drilling template. The through holes on the flange plate have a diameter of 13.8 mm; the distance between holes must be 106 mm (150 mm PCD). Drill 4 straight holes from below, through the raw ceiling and carefully clean dust and fragments from the holes. (If an electrical supply is required, ensure a clearance hole is drilled for the cable so that it can be positioned via the cut-out in the side of the flange plate – see figure 4).

Step 2

Drive 4 counter plates with specified threaded rods (not included in the scope of supply) from the top of the raw ceiling through the drilled holes.

Step 3

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy on the ceiling column and slide down for access to the top flange. Slide the column flange onto the threaded rods and add a washer and nut (not included in the scope of supply) to each rod. Tighten the 4 nuts to the torque value stated by the structural engineer.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

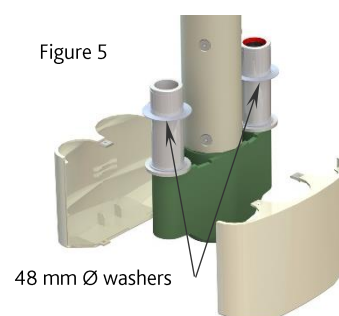
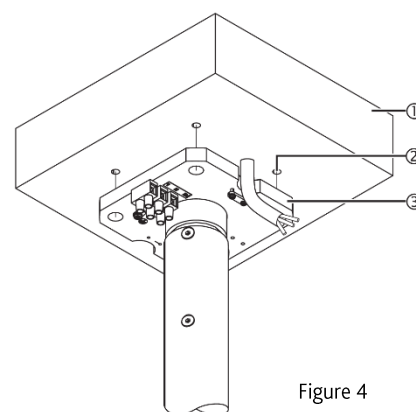
Step 4

Check the ceiling column is flush with the ceiling, is securely in place and aligned vertically using a spirit level. If included, check the supply cable for damage and connect to the terminal block so that it is not exposed to tensile stress.

Step 5

Push the column flange canopy upwards to cover the flange and tighten the 3 setscrews to secure. Ensure that the 48 mm Ø washer on each pivot suspension arm mounting point is first moved upwards (figure 5), then attach the plastic covers to the lower pivot assembly by bringing the two halves together ensuring that the inner tags are correctly inline.

Note: Fastening elements for subsequent mounting of the extension arms are included on both pivots.



1.1.2 When using heavy load anchors (see figure 3)

Step 1

Refer to Section 19 drilling template. The through holes on the flange plate have a diameter of 13.8 mm; the distance between the holes must be 106 mm (150 mm PCD). Drill 4 holes in accordance with the fastening element manufacturer's specifications and note that the minimum depth of the fastening must be complied with. Carefully clean dust and fragments from the holes. (If an electrical supply is required, ensure a clearance hole is drilled for the cable so that it can be positioned via the cut-out in the side of the flange plate – see figure 4).

Step 2

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy and slide it down to gain access to the top flange. Attach the column flange to the ceiling using 4 heavy duty anchors (not included in the scope of supply) in accordance with instructions given by the fastening element manufacturer and tighten crosswise to a torque value given by the structural engineer.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 3

Continue as for Step 4 to Step 5 above.

2. Anchorage plate installation - (and ceiling column) #300/P/004 fixed to ceiling channels

Note: Prior to installation, a structural engineer of record must ensure that the ceiling is designed in such a way that the loads of the anchorage plate and pendant system can be securely borne and transferred (see Section 17 – Securing bolt data). The load bearing capacity of the ceiling must be checked by structural analysis and confirmed by means of an acceptable certificate. The installation must be inspected by the engineer and certified in accordance with any regional construction regulations. The layout of the installation is the sole responsibility of the structural engineer. The installer must ensure that the two ceiling channels at 650 mm +/- 45 mm apart, onto which the Kenex anchorage plate is to be attached, are horizontal and parallel.

Note: Sectional dimensions of the ceiling channels are 41 x 41 mm. Structural capacity: Unistrut® P1000 or equivalent.

Step 1

Note: The position of the attached suspension arms depends upon the orientation of the lower mounting pivots on the installed ceiling column. When planning the location of the column, the swivel ranges of the extension arms must be considered (see section 18).

Note: One pivot has electrical connection.

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy and slide it down to gain access to the top flange.

Step 2

Use the four M10 x 50 mm long hexagon head setscrews, shakeproof washers and plain washers (supplied with the ceiling column) to attach the column flange to the central holes in the anchorage plate (figure 6) securing with the M10 full nuts and plain washers (supplied with the anchorage plate). Apply Loctite® 243 to the threads and tighten to 35 Nm torque.

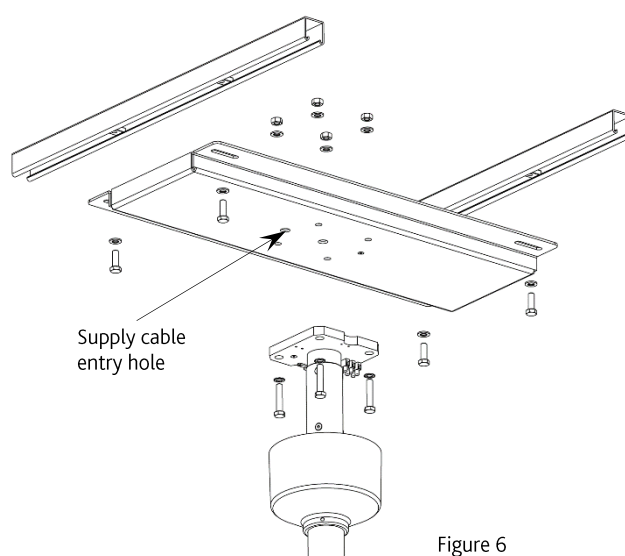


Figure 6

Step 3

If the ceiling column does not require electrical connection, proceed to Step 4. Ensure any supply cable is positioned above the central holes of the anchorage plate, ready to be passed through the 'supply cable hole' (see figure 6) as the plate is raised to the ceiling during Step 4.

Step 4

Use the four supplied M10 x 30 mm long hexagon head setscrews, channel nuts and washers to attach the anchorage plate to the ceiling channels. Apply Loctite® 243 to the threads and tighten to 35 Nm torque.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 5

Connect any supply cable to the terminal block on the ceiling column flange.

Step 6

Push the column flange canopy upwards to cover the flange and tighten the 3 setscrews to secure. Ensure the 48 mm Ø washer on each suspension arm pivot mounting point is first moved upwards (figure 7), then attach the plastic covers to the lower pivot assembly by bringing the two halves together ensuring the inner tags are correctly inline.

Note: Fastening elements for subsequent mounting of the extension arms are included on both pivots.

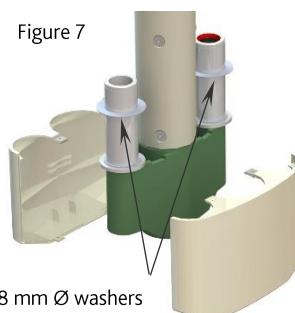


Figure 7

48 mm Ø washers

3. Anchorage plate installation - (and ceiling column) #300/P/004 fixed to a framework above a suspended ceiling

Note:

The anchorage plate (1) may be mounted above a suspended ceiling (2) onto a suitable support framework with bracing (3) fixed to the raw concrete ceiling (4) (figure 9). These procedures assume that professional architectural or engineering services have been consulted with reference to Section 17 – Securing bolt data. The installation, selection of installation hardware and torque values must be determined by a structural engineer. The anchorage plate must be horizontal.

Step 1

Attach the anchorage plate to the framework.

Step 2

Note: The position of the attached suspension arms depends upon the orientation of the lower mounting pivots on an installed ceiling column. When planning the location of the column, the swivel ranges of the extension arms must be considered (see section 18). **Note:** One pivot has electrical connection.

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy and slide it down to gain access to the top flange.

Step 3

Use four M10 x 50 mm long hexagon head setscrews, shakeproof washers and plain washers (supplied with the ceiling column) to attach the column flange to the central holes in the anchorage plate securing with the M10 full nuts and plain washers (supplied with the anchorage plate). Apply Loctite® 243 to the threads and tighten to 35 Nm torque.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 4

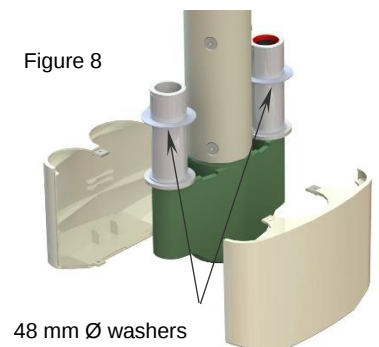
Close the aperture in the false ceiling around the vertical column tube. Slide the column flange canopy up towards the flange and tighten three setscrews to secure.

Step 5

Ensure that the 48 mm Ø washer on each suspension arm pivot mounting point is first moved upwards (figure 8), and then attach the plastic covers to the lower pivot assembly by bringing the two halves together ensuring that the inner tags are correctly inline.

Note: Fastening elements for subsequent mounting of the extension arms are included on both pivots.

Figure 8



48 mm Ø washers

Note: Kenex installation aids #300/P/012 (anchorage void kit - section 4) and #300/P/014 (ceiling anchorage ring and plate - section 5) may also be mounted onto a framework in the void between a suspended ceiling and a solid concrete ceiling. Both provide for the vertical adjustment of the attached ceiling column.

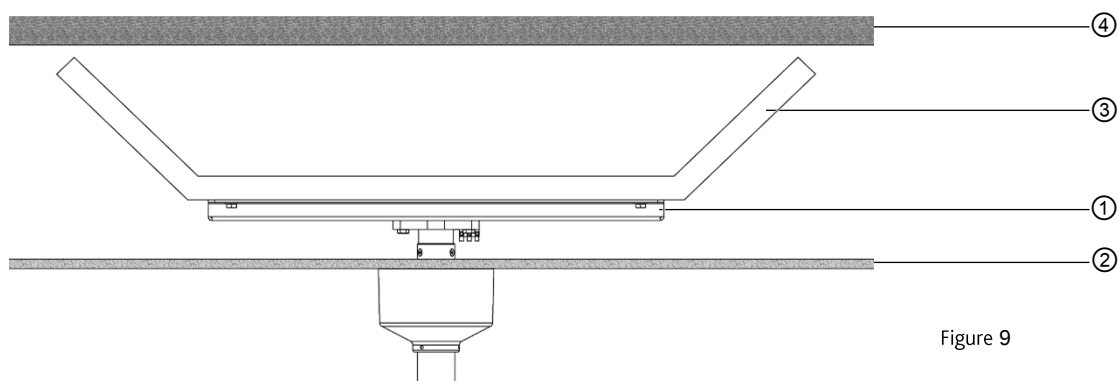


Figure 9

4. Anchorage void kit installation - (and ceiling column)

#300/P/012 attached to a concrete ceiling above a suspended ceiling

Note:

The anchorage void kit may only be attached to a horizontal ceiling of suitable strength to support the applied load. Due to diverse ceiling structures, no ceiling fastening elements are included with the ceiling anchorage ring. These procedures assume that professional architectural or engineering services have been consulted with reference to Section 17 – Securing bolt data. The installation, selection of installation hardware and torque values must be determined by a structural engineer.

Note:

The recommended method applicable in most cases for attaching an anchorage void kit to an existing raw ceiling is to use counter plates with continuous threaded rods (not included in the scope of delivery), similar to those described in section 1 – figure 2.

The ceiling anchorage void kit is designed to provide an effective platform for mounting a Kenex ceiling column in a vertical void between a concrete and suspended ceiling of between 300 mm and 900 mm (see figure 10). The void distance may result in the requirement to install a different length ceiling column instead of the standard 80 cm version.

Product description (see figure 11)

The anchorage void platform (3) is supplied in kit form. Once assembled according to the ceiling void distance, it is mounted onto the 6 downward facing M12 x 70 mm threaded studs (2) protruding from the ceiling mounted anchorage ring (1). The column top flange (4) of the ceiling column (6) is then bolted onto the lowermost plate of the anchorage void platform (3).

The opening in the suspended ceiling can be closed around the vertical tube of the column once work has been completed. The column flange canopy (5) is then moved upwards to the suspended ceiling.

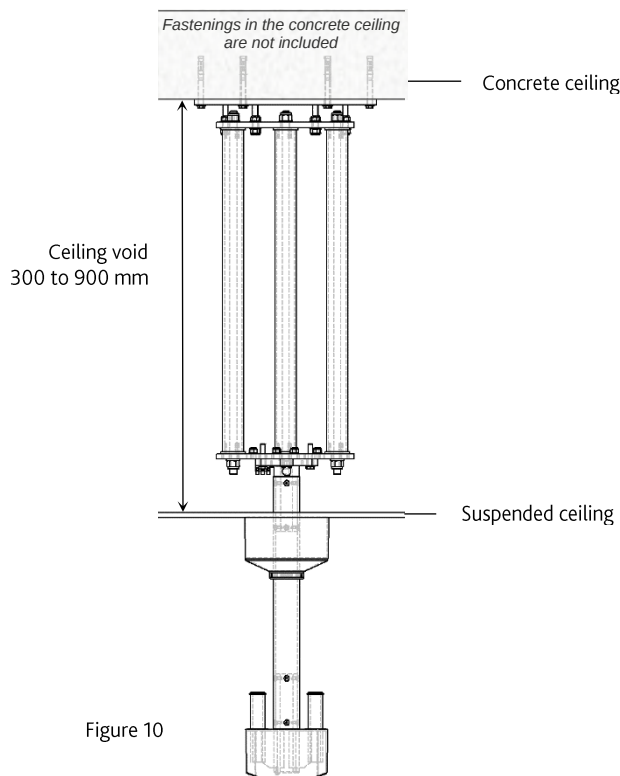


Figure 10

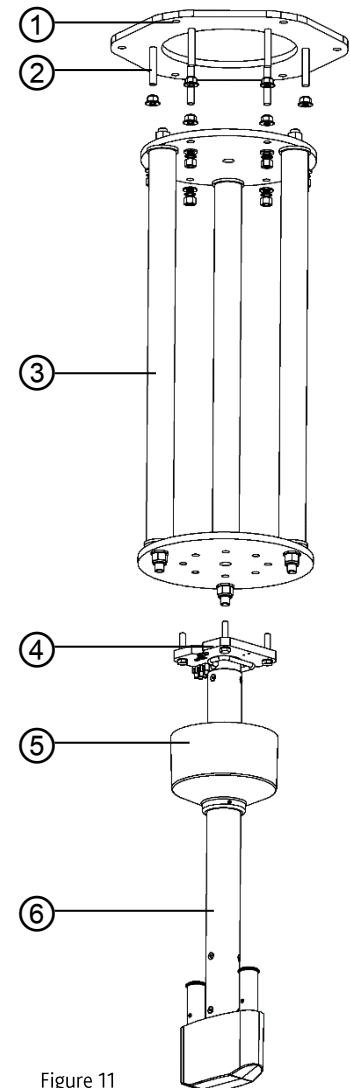


Figure 11

Attaching the anchorage ring (1) to the ceiling

Step 1

Using the supplied bore template, transfer the position of 6 equally spaced 13 mm Ø holes (at 380 mm PCD) in the 420 mm Ø anchorage ring. Drill 6 bore holes of a size and depth to the requirements defined by the structural engineer.

Step 2

Blow out dust and fragments and attach the anchorage ring using 6 heavy duty anchors or threaded rods and counter plates (not included in the scope of supply) in accordance with instructions given by the fastening element manufacturer and tighten crosswise to a torque value given by the structural engineer.

Assembling the Anchorage void platform (3)

Step 3

Measure the distance between the concrete ceiling, and the uppermost surface of the suspended ceiling tile (the ceiling void) and cut each of the three 48 mm Ø tubes to a length 180 mm less than the ceiling void dimension. Cut each of the three M16 threaded studs to a dimension 85 mm longer than the cut tube length. Screw an M16 full nut onto each threaded rod leaving 50 mm protruding.

Step 4 (figure 12)

Place a locating disc (without pins) above the nut and screw each threaded rod into M16 tapped holes in the upper plate (at 120 degrees apart) until the rod protrudes from the other side by 25 mm. Ensure that the locating disc is between the nut and the plate. Tighten each M16 full nut to 150 Nm.

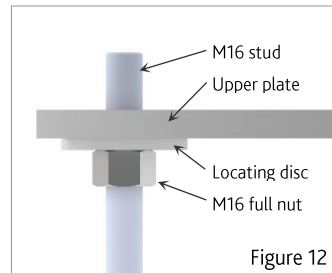


Figure 12

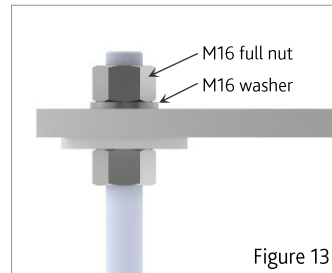


Figure 13

Step 5 (figure 13)

Apply Loctite® 243 to each protruding threaded rod, and add an M16 washer and secure with a M16 full nut. Tighten each nut to 50 Nm.

Step 6 (figure 14 & 15)

Drive three 4 mm Ø pins into each of the three installed locating discs until they touch the upper plate. Slide a 48 mm Ø tube over each threaded rod onto the locating disc ensuring that the pins connect with the inside of the tube.

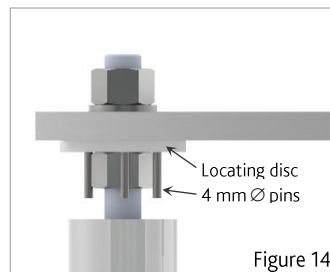


Figure 14

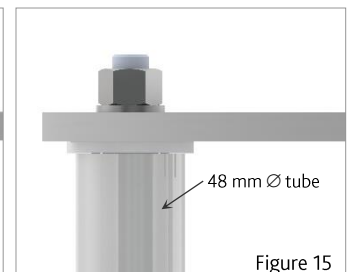


Figure 15

Step 7 (figure 16)

Insert three 4 mm Ø pins into each of the three remaining locating discs ensuring each pin protrudes from only one side of the disc. Place each locating disc onto the threaded rods with the pins facing into each tube.

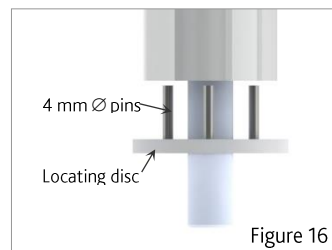


Figure 16

Step 8 (figure 17)

Attach the lower plate (via M16 clearance holes 120 degrees apart). Apply Loctite® 243 to each protruding threaded rod and secure using M16 washers and M16 full nut with nylon. Tighten to 150 Nm.

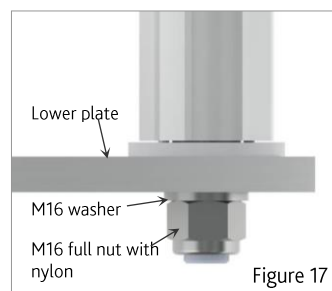
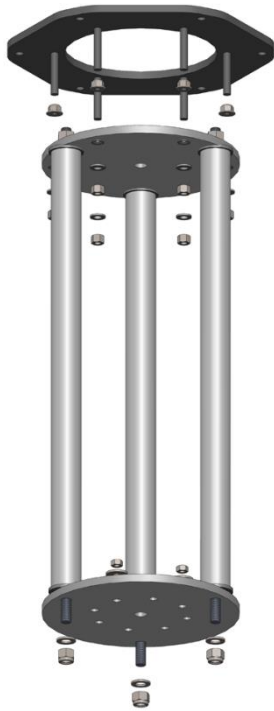


Figure 17

Attaching the Anchorage void platform (3) to the installed anchorage ring (1)



Step 9

Screw an M12 flange nut onto the threaded rods on the installed anchorage ring with the flange of each nut facing down. Position three nuts, each 120° apart, approximately 40 mm down from the surface of the anchorage ring. Position the others approximately 25 mm down from the surface of the anchorage ring.

Step 10

Slide the anchorage void platform assembly over the threaded rods and locate up against the three nuts that are 40 mm down from the surface of the ring, (lowest nuts). Add a plain washer, shakeproof washer and M12 full nut onto each of these rods and tighten sufficiently to ensure that the platform assembly is stable. Vertical adjustment is achieved by altering the position of each pair of nuts at the anchorage ring. Use a spirit level to check vertical alignment.

Step 11

Position all six flange nuts down against the surface of the upper plate. Add the remaining plain and shakeproof washers and three M12 full nuts. Apply Loctite® 243 to the threads and tighten all six M12 nuts equally cross-wise to 25 Nm.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 12

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy and slide it down to gain access to the top flange.

Step 13

Use the four M10 x 50 mm long hexagon head setscrews, shakeproof washers and plain washers (supplied with the ceiling column) to attach the column flange to the central holes in the anchorage plate (see figure 11) securing with the M10 full nuts and plain washers (supplied with the anchorage kit). Apply Loctite® 243 to the threads and tighten to 35 Nm torque.

Step 14

Connect any supply cable to the terminal block on the ceiling column flange. Push the column flange canopy upwards to cover the flange and tighten the 3 setscrews to secure. Ensure that the 48 mm Ø washer on each suspension arm pivot mounting point is first moved upwards (figure 19), and then attach the plastic covers to the lower pivot assembly by bringing the two halves together ensuring that the inner tags are correctly inline.

Note: Fastening elements for subsequent mounting of the extension arms are included on both pivots.

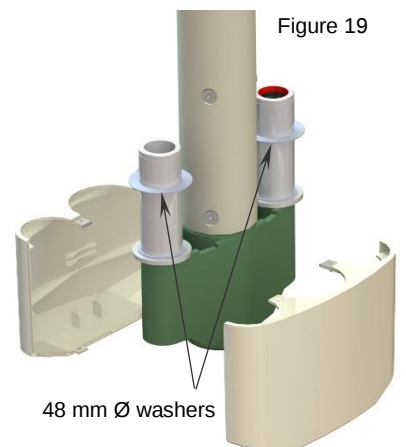


Figure 19

48 mm Ø washers

5. Anchorage ring & plate installation - (and ceiling column)

#300/P/014 attached to a concrete ceiling above a suspended ceiling

Note:

The anchorage ring may only be attached to a horizontal ceiling of suitable strength to support the applied load. Due to diverse ceiling structures, no ceiling fastening elements are included with the anchorage ring and plate. These procedures assume that professional architectural or engineering services have been consulted with reference to Section 17 – Securing bolt data. The installation, selection of installation hardware and torque values must be determined by a structural engineer.

Note:

The recommended method applicable in most cases for attaching an anchorage ring to an existing raw ceiling is to use counter plates with continuous threaded rods (not included in the scope of delivery), similar to those described in section 1 – figure 2.

The ring and plate provide an amount of vertical adjustment to the attached ceiling column. However, the ceiling should be within 1.5° of horizontal.

The ceiling anchorage ring and plate is designed to provide an effective platform for mounting a Kenex ceiling column in a vertical void between a concrete and suspended ceiling of between 85 mm and 300 mm (see figure 20). The void distance may result in the requirement to install a longer ceiling column instead of the standard 80 cm version.

Product description (see figure 21)

The column top flange (4) of the ceiling column (6) is first bolted onto the 300 mm Ø attachment plate (3), which in turn is mounted onto the 6 downward facing M12 x 70 mm threaded studs (2) protruding from the ceiling mounted anchorage ring (1).

The opening in the suspended ceiling can be closed around the vertical tube of the column once work has been completed. The column flange canopy (5) is then moved upwards to the suspended ceiling.

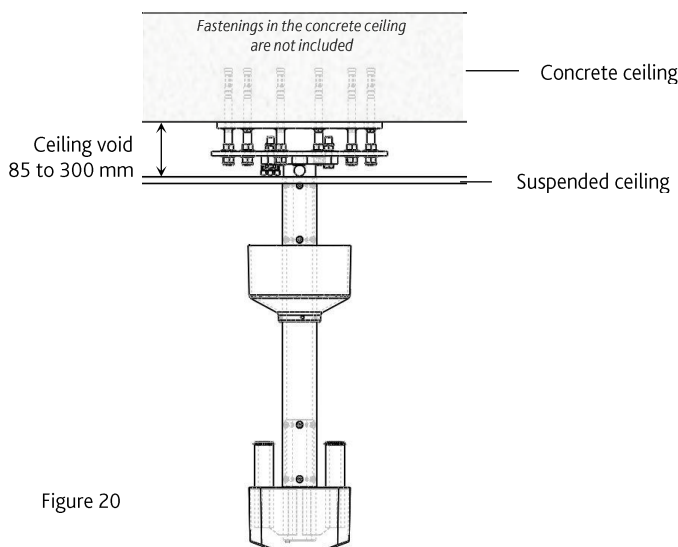


Figure 20

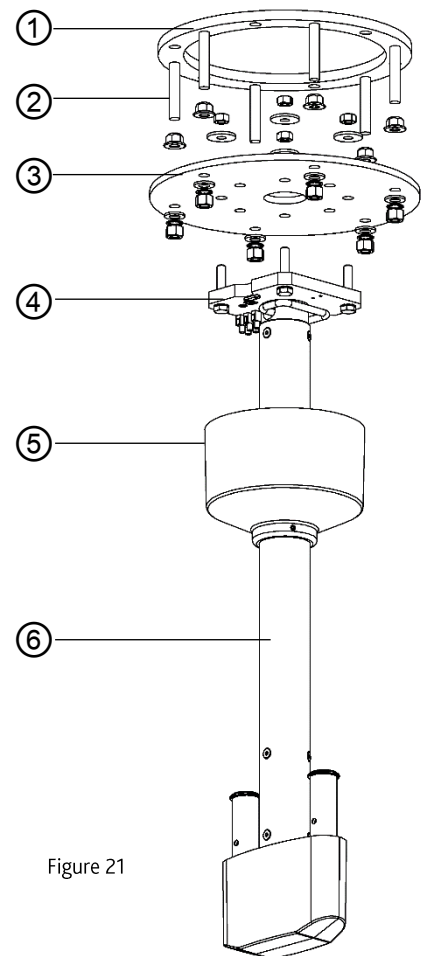


Figure 21

Step 1

Using the supplied bore template, transfer the position of 6 equally spaced 13 mm Ø holes (at 270 mm PCD) in the 300 mm Ø anchorage ring. Drill 6 bore holes of a size and depth according to the requirements defined by the structural engineer.

Step 2

Blow out dust and fragments and attach the anchorage ring using 6 heavy duty anchors or threaded rods and counter plates (not included in the scope of supply) in accordance with instructions given by the fastening element manufacturer and tighten crosswise to a torque value given by the structural engineer.

Step 3

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy and slide it down to gain access to the top flange.

Step 4

Note: The position of attached suspension arms depends upon the orientation of the lower mounting pivots on an installed ceiling column. When planning the location of the column, the swivel ranges of the extension arms must be considered (see section 18). **Note:** One pivot has electrical connection.

Mount the ceiling column onto the attachment plate using the four, M10 x 50 mm hexagon head setscrews, shakeproof washers and plain washers (supplied with the ceiling column) and the M10 full nuts and plain washers (supplied with the ceiling anchorage ring & plate). Apply Loctite® 243 to the threads and tighten all nuts equally cross-wise using a torque wrench to 35 Nm.

Step 5

Screw an M12 flange nut onto the threaded rods on the installed anchorage ring with the flange of each nut facing downwards. Position three nuts (each 120° apart) approximately 40 mm down from the surface of the anchorage ring. Position the others approximately 25 mm down from the surface of the anchorage ring.

Step 6

Position the attachment plate & column onto the threaded rods and locate up against the 3 nuts that are 40 mm down from the surface of the anchorage ring, (lowest nuts). Add a plain washer, shakeproof washer and M12 full nut onto each of these rods and tighten sufficiently to ensure that the attached plate and column is stable. The three-point mounting design provides vertical adjustment of the ceiling column by altering the position of each pair of nuts on each threaded rod. Use a spirit level to check the vertical alignment.

Step 7

After verifying the vertical setting, position all six flange nuts down against the top surface of the attachment plate. Add the remaining plain and shakeproof washers and three M12 full nuts. Apply Loctite® 243 to the threads and tighten all six M12 full nuts equally cross-wise using a torque wrench to 25 Nm.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 8

Connect any supply cable (if required) to the terminal block located on the flange of the ceiling column.

Step 9

Push the column flange canopy upwards to cover the flange and tighten the 3 setscrews to secure. Ensure that the 48 mm Ø washer on each suspension arm pivot mounting point is first moved upwards (figure 22), and then attach the plastic covers to the lower pivot assembly by bringing the two halves together ensuring that the inner tags are correctly inline.

Note: Fastening elements for subsequent mounting of the extension arms are included on both pivots.

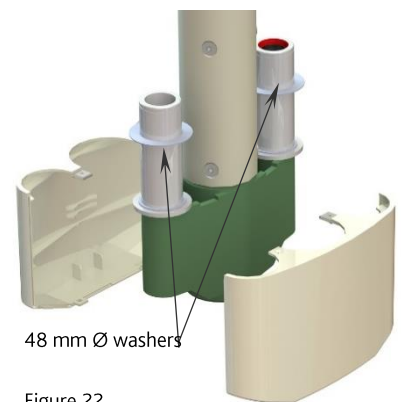


Figure 22

6. Ceiling track installation - (and ceiling column)

#3001/TC/250 (2.5 m long) attached to a load bearing ceiling
 #3001/TC/420 (4.2 m long) attached to a load bearing ceiling

Note: Alternative length tracks are available to special order.

Requirements to be met prior to installation

Prior to installation, a structural engineer of record must ensure that the ceiling is designed in such a way that the loads of the installed track and pendant system can be securely borne and transferred (see Section 17 – Securing bolt data). The load bearing capacity of the ceiling must be checked by structural analysis and confirmed by means of an acceptable certificate. The installation must be inspected by the engineer and certified in accordance with any regional construction regulations. The layout of the installation is the sole responsibility of the structural engineer.

Note:

Sectional dimensions of the required ceiling channels are 41 x 41 mm. Structural capacity: Unistrut® P1000 or equivalent. If a track is to be supported on an alternative structure, obtain guidance from a structural engineer of record.

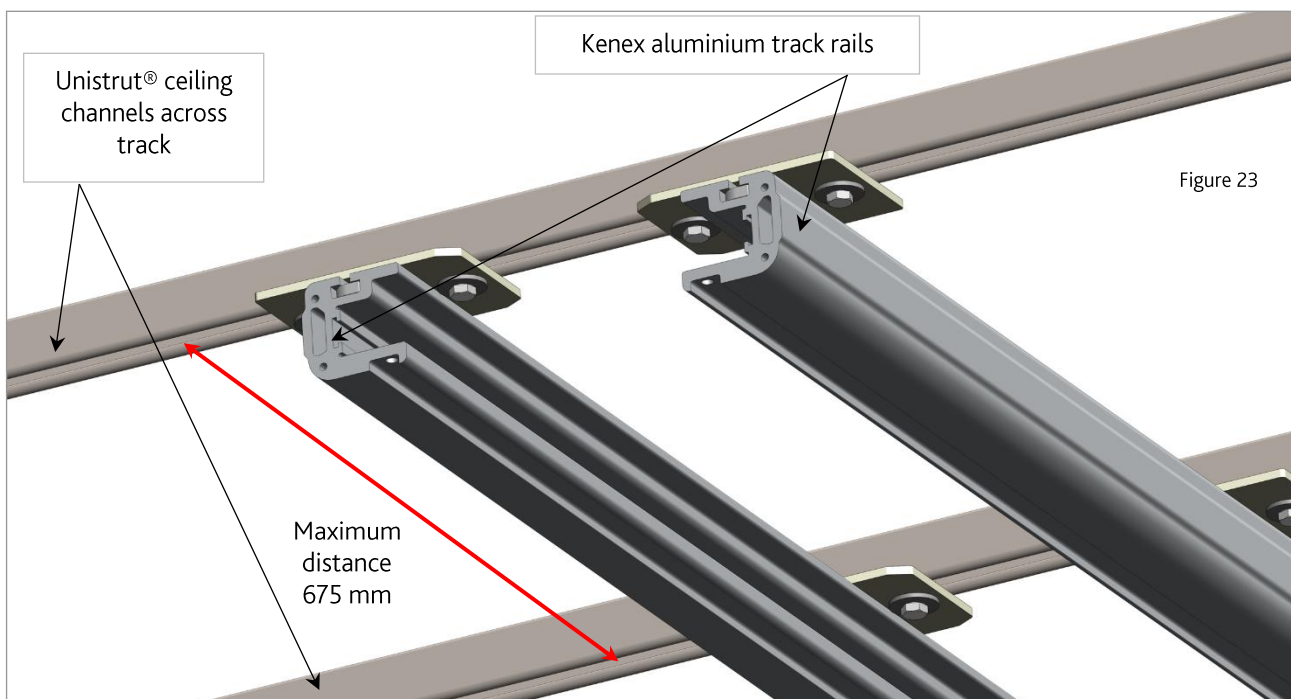
- It is recommended that the track is mounted across Unistrut® P1000 or equivalent ceiling channels
- A track must be suspended from a minimum of four (for a 2.5 m track) or seven (for a 4.2 m track) equally spaced Unistrut® P1000 or equivalent ceiling channels
- All ceiling channels must be horizontal, level and in the same plane
- The distance between the centres of each ceiling channel must be between 600 mm and 675 mm
- The track must not extend more than 400 mm beyond the last ceiling channel
- If the track is to be supported on *parallel* Unistrut® P1000 or equivalent (or any other load bearing structure additional kit #3001/3.23 (for a 2.5 m track) or #3001/3.24 (for a 4.2 m track) must be used

Note:

The track is attached to ceiling channels using ceiling installation plates on each side. Installation plates are not designed to carry a secondary device / assembly.

Important note

Unistrut® ceiling channels across the track must be equally spaced. Maximum distance between each = 675 mm (minimum of 600 mm).



6.1 - Attaching to Unistrut® P1000 or equivalent across ceiling channels

Important note

When attaching track rails it is important that a minimum & maximum overhang at the end of each rail is observed.

Minimum rail overhang = 60 mm (from centre of Unistrut® channel to track end)

Maximum rail overhang = 400 mm (from centre of Unistrut® channel to track end)

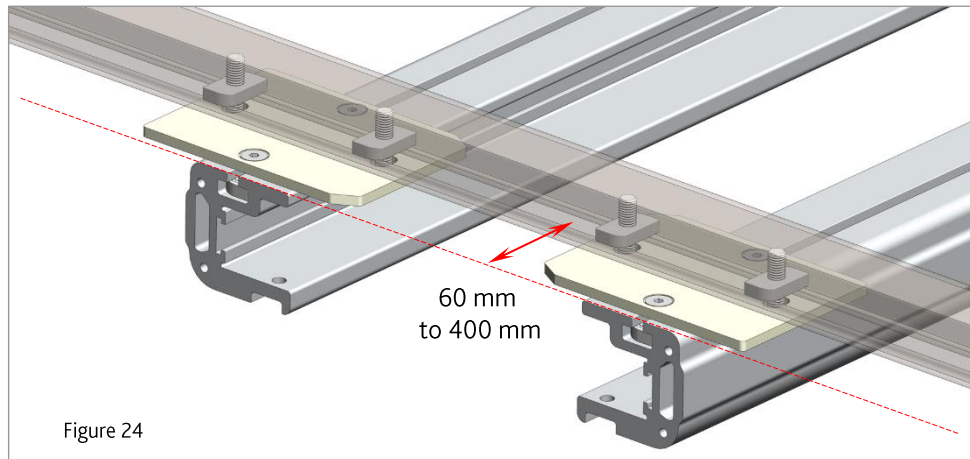


Figure 24

Step 1

Decide the location of the ceiling track. Accurately measure the distance between each of the Unistrut® ceiling channels used to support the track rails.

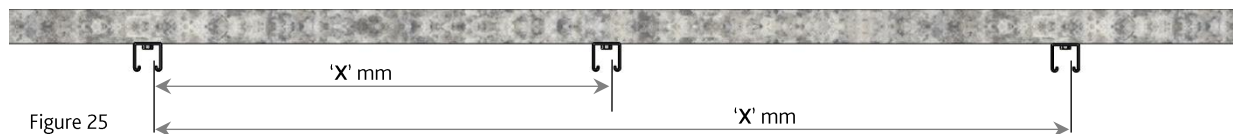


Figure 25

Step 2

Transfer the distance measurements (shown in blue) from Step 1, to the upper surface of both track rails. When transferring the dimensions ensure the rails are correctly configured so the 'open' side of each rail face one another.

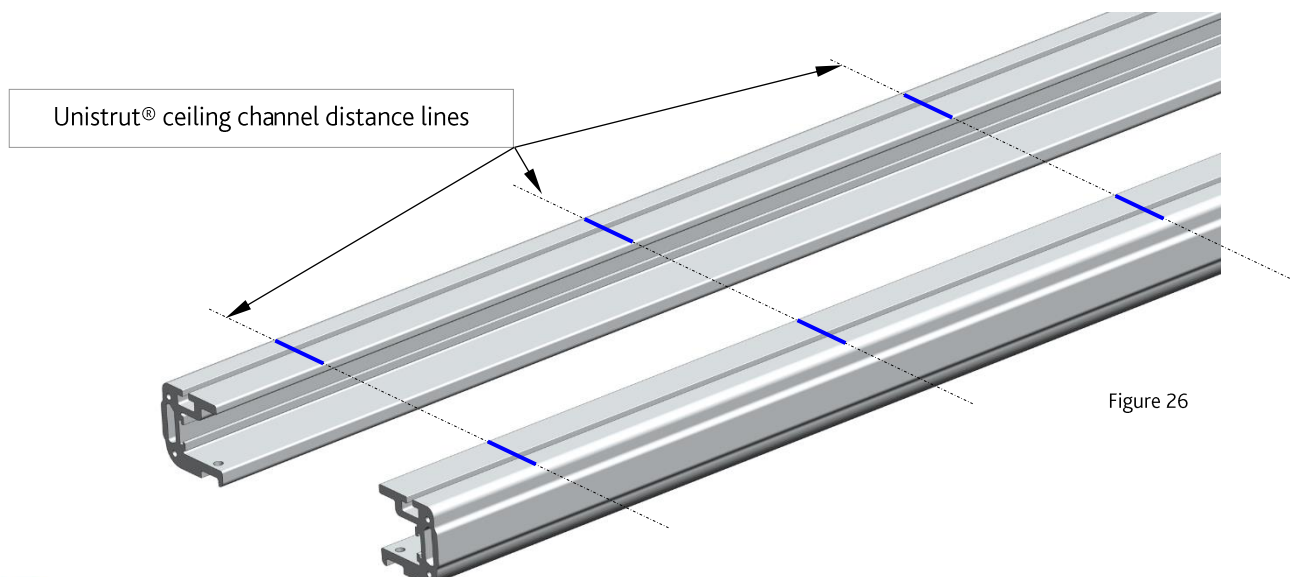


Figure 26

Step 3

Mark a line (shown in red) 54 mm to one side of the each 'distance' line, which the ceiling installation plates will be secured against (at Step 6).

Note: Ensure these lines are marked in line with those on the other rail.

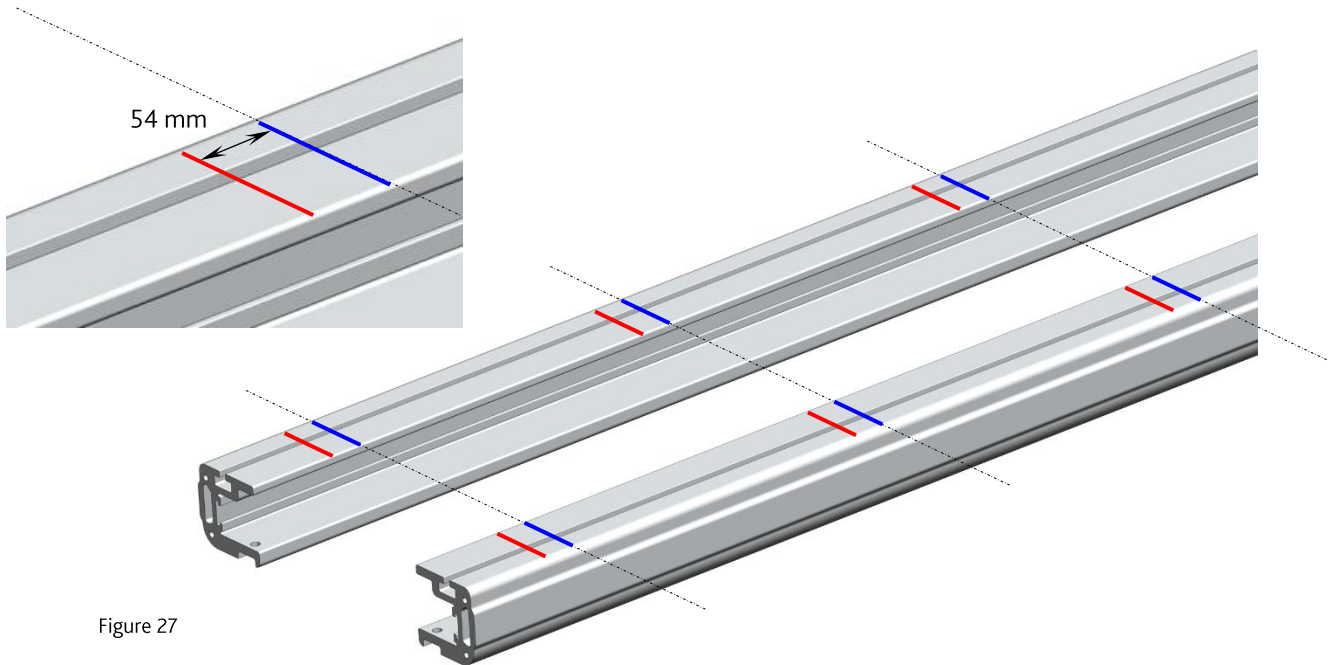


Figure 27

Step 4

Slide 14 (for a 4.2m rail) or 8 (for a 2.5m rail) M8 Unistrut® channel nuts into the 'T' slot in both rails, ensuring the flat surface of the nut is facing downwards.

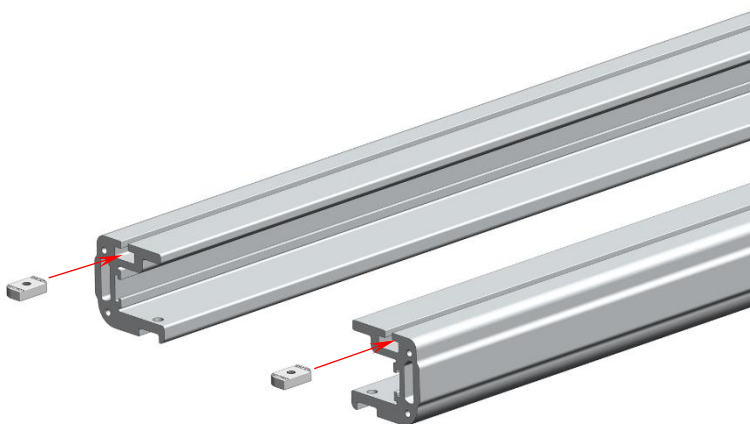


Figure 28

Step 5

Important: Ensure the chamfered corners of the ceiling installation plates are positioned as shown, and that the countersunk holes are uppermost. Loosely attach the ceiling installation plates to each track rail (7 for each 4.2 m rail, 4 for each 2.5 m rail) using the M8 x 20 hexagon head countersunk screws provided and the M8 Unistrut® channel nuts installed at Step 4.

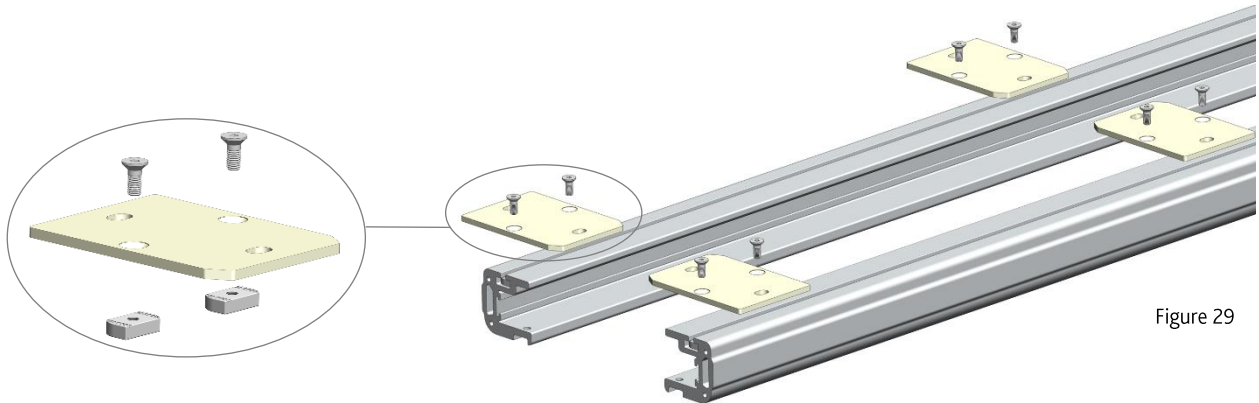


Figure 29

Step 6

Slide each of the ceiling installation plates to the line (shown in red) 54 mm from the distance line. Apply Loctite® 243 to the threads of the M8 x 20 hexagon head countersunk screws and tighten to 28 Nm.

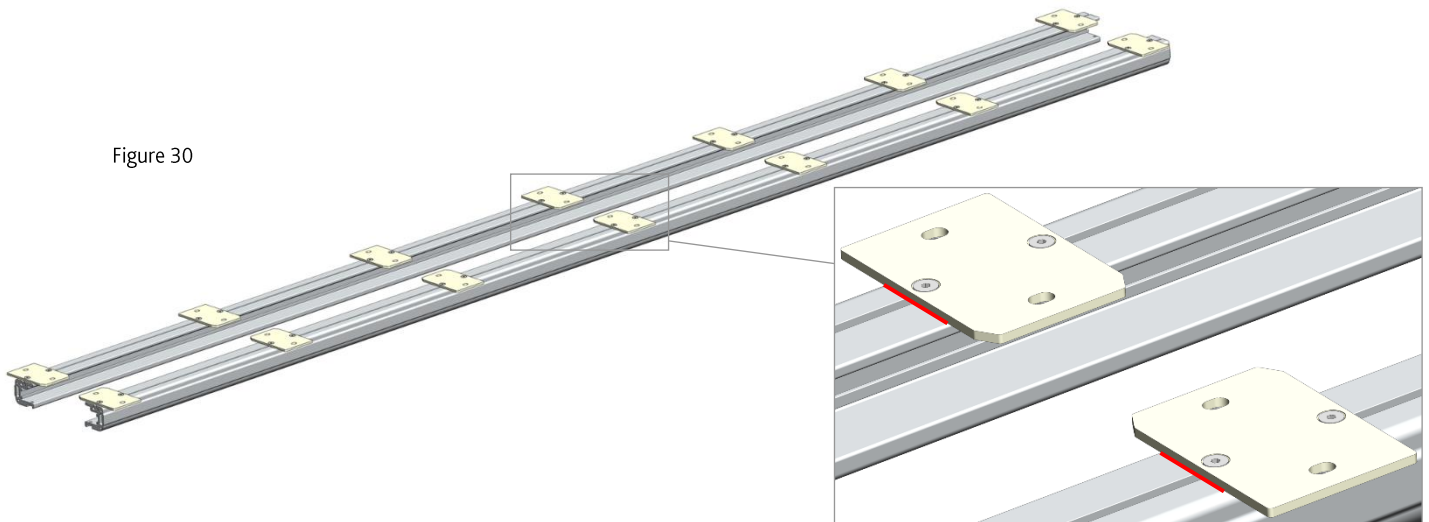


Figure 30

Step 7

Loosely attach two M10 x 40 mm hexagon head set screws, washers, and M10 Unistrut® channel nuts to the ceiling installation plate at either end of each aluminium rail (apply Loctite® 243 to the threads which will engage with the Unistrut® channel nuts). Ensure the flat (smooth) side of the M10 Unistrut® channel nuts are uppermost.

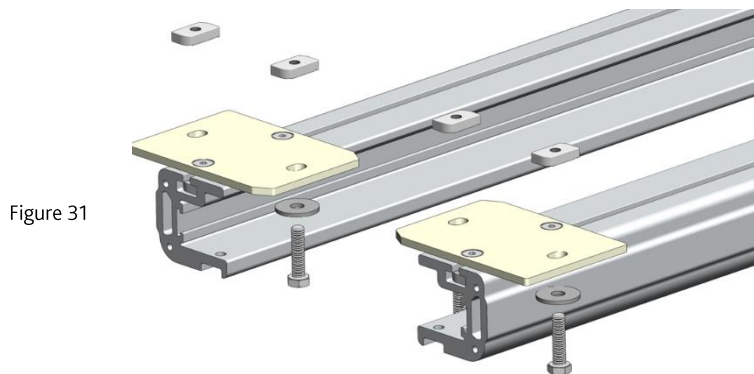
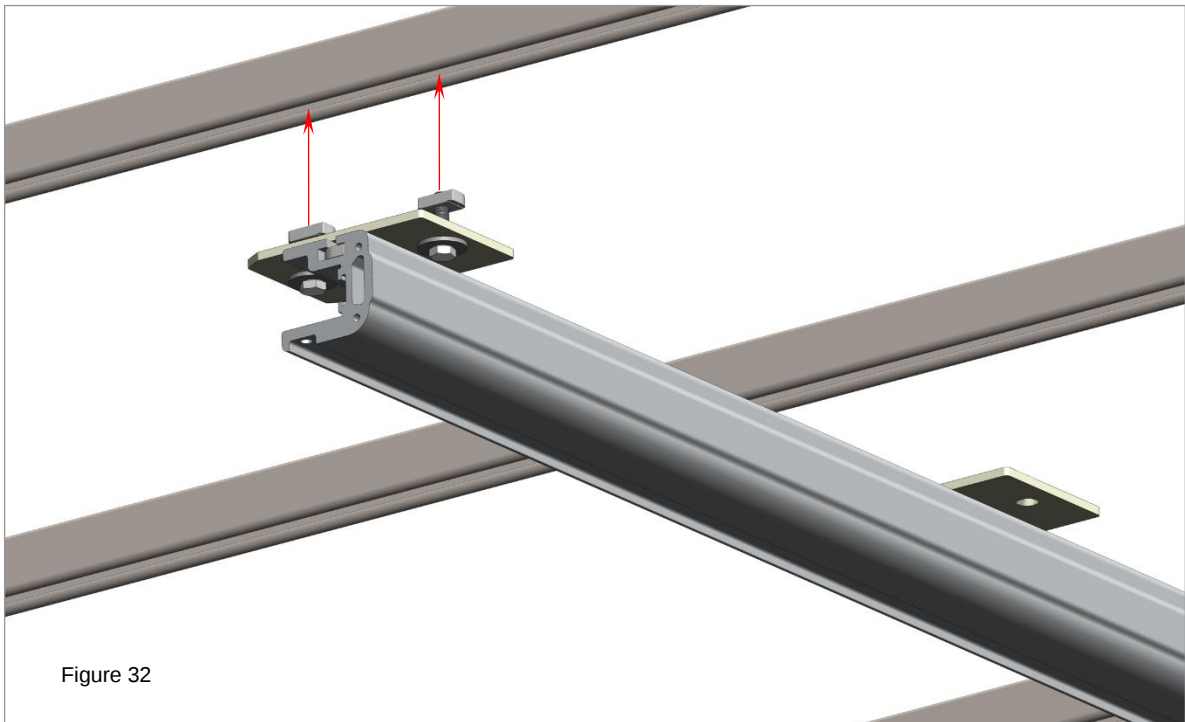


Figure 31

Step 8

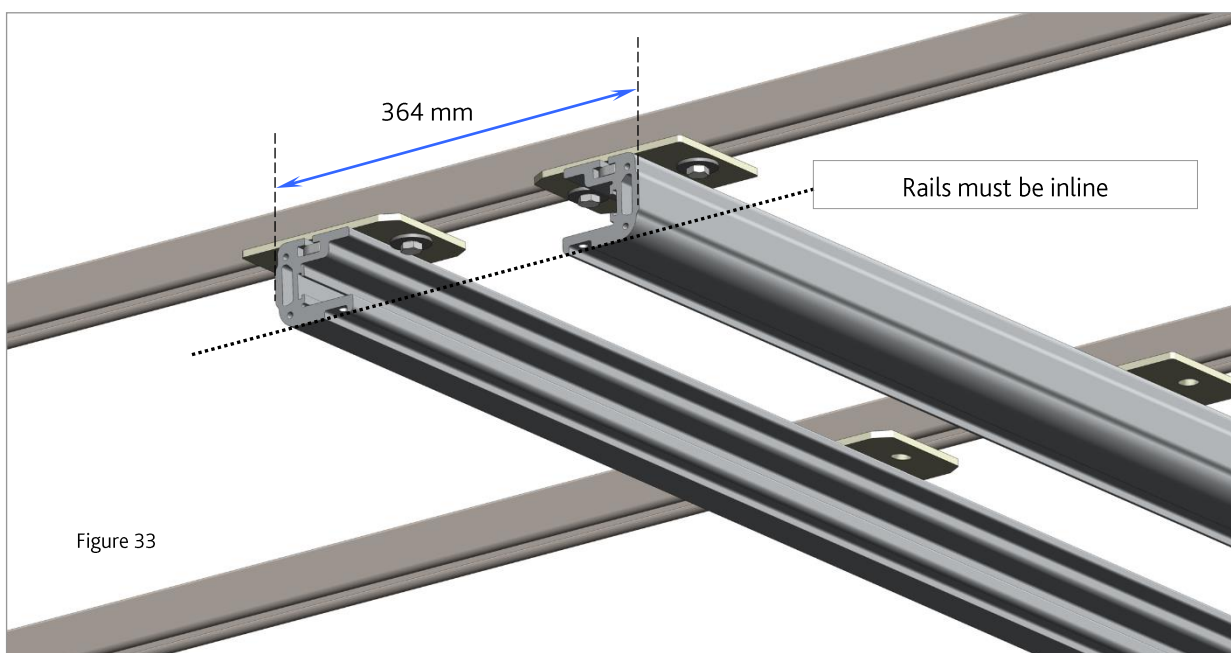
With the help of another, raise one aluminium rail and attach to the Unistrut® ceiling channels. Ensure the M10 Unistrut® channel nuts are correctly secured (the long dimension at 90 degrees to the Unistrut® rail).

**Step 9**

Tighten each of the four M10 x 40 mm hexagon head set screws to 35 N/m.

Step 10

Attach the second Kenex track rail using the same process as described, ensuring the track rail outer edges are 364 mm apart, and that both track rail ends are inline.



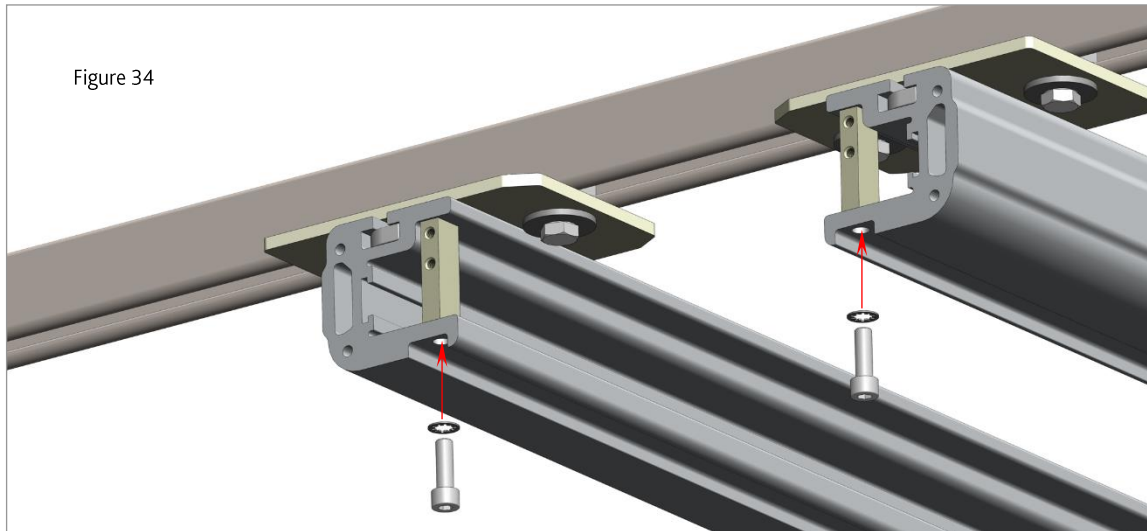
Step 11

Secure the remaining ceiling installation plates using two M10 x 40 mm hexagon head set screws, washers, and M10 Unistrut® channel nuts for each plate. Ensure the flat (smooth) side of the M10 Unistrut® channel nuts are uppermost. Apply Loctite® 243 to the threads which will engage with the Unistrut® channel nuts.

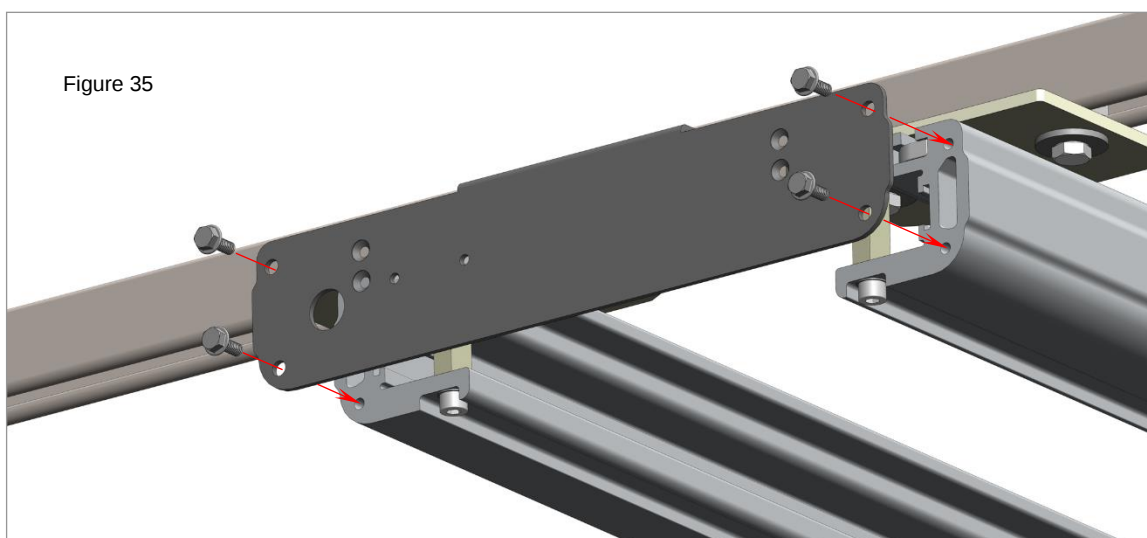
Ensure the M10 Unistrut® channel nuts are correctly secured in place (across the Unistrut® rail). Tighten each M10 x 40 mm hexagon head set screw to 35 N/m.

Step 12

Loosely attach a cover end stop bar to one end of each track rail using the M8 x 25 mm hexagon head socket cap screws and M8 shakeproof washer supplied. Apply Loctite® 243 to the threads.

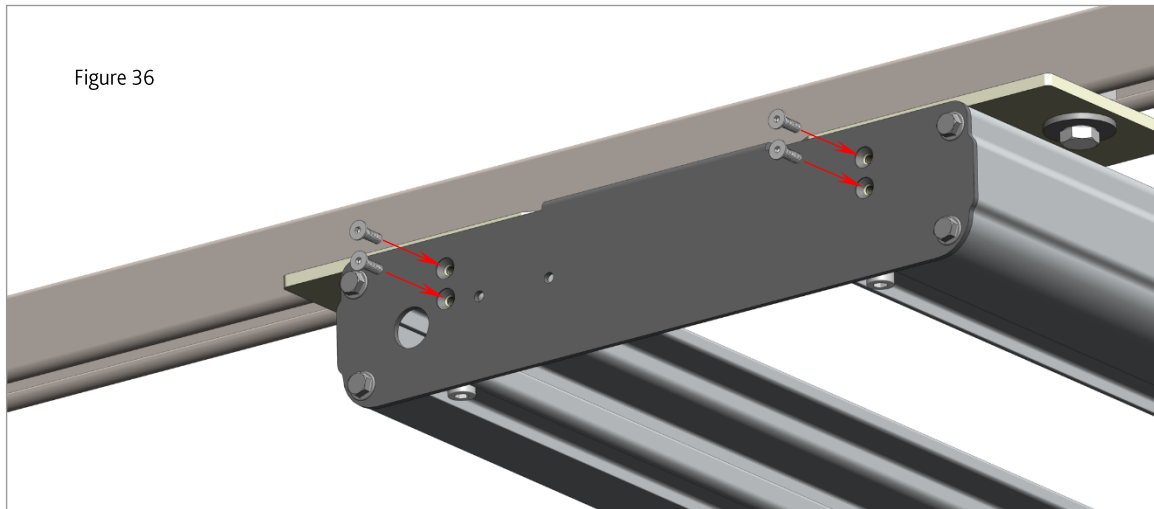
**Step 13**

Attach one end cover using four M6 x 16 mm washer hexagon screws. Tighten to 20 N/m.



Step 14

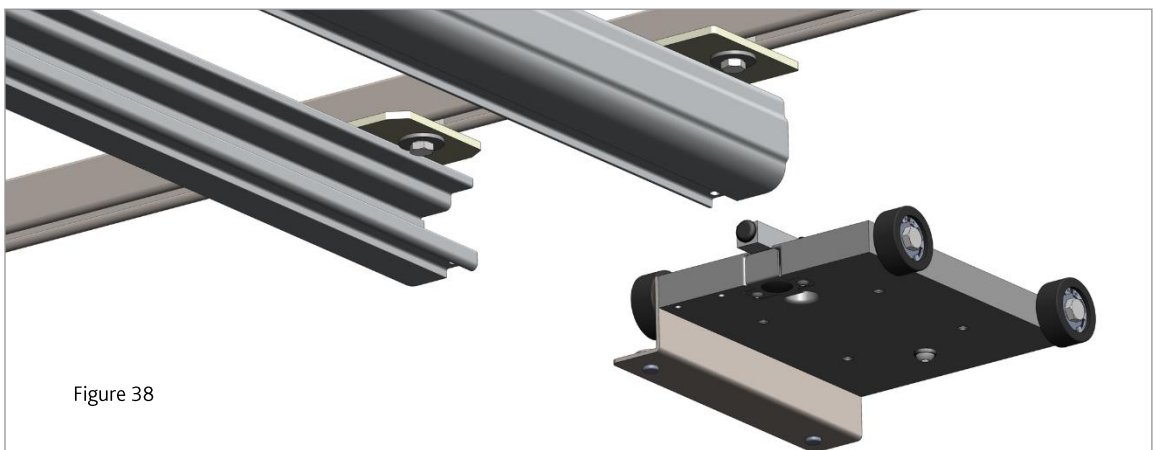
Secure the end cover to the end cover support bars using four M5 x 16 mm countersunk screws. Tighten to 7 N/m.

**Step 15**

Tighten two M8 x 25 mm hexagon head socket cap screws (attached at Step 12 - circled in red below) to 19 N/m.

**Step 16**

Install the carriage assembly into the open end of the track rails.



Step 17

Attach and secure the second end cover and end cover support bars (as detailed in Step 11-14).

Step 18

Ensure all fixings are tight and the track carriage can move freely along the entire length of the track rails.

Step 19

Loosen three M6 socket setscrews, located around the bottom lip of the 18 cm Ø column flange canopy and slide it down to gain access to the top flange.

Step 20

Note: The position of attached suspension arms depends upon the orientation of the lower mounting pivots on an installed ceiling column. When planning the location of the column, the swivel ranges of the extension arms must be considered (see section 18). **Note:** One pivot has electrical connection.

Use the four M10 x 50 mm long hexagon head set screws, shakeproof washers and plain washers (supplied with the ceiling column) to attach the column flange to the four central holes in the track carriage. Apply Loctite® 243 to the threads and tighten all screws equally cross-wise using a torque wrench to 35 Nm.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 21

If the ceiling column does not require electrical connection, proceed to Step 22. Ensure any supply cable for connection to the column leaves the ceiling adjacent to the track, approximately half along its length. A service loop can be formed by extending the cable approximately 60 cm down (for a 2.5m track) or 105 cm (for a 4.2m track), thereby permitting full travel of the track carriage. Alternatively, install cable management system #3001/TC/250/EC (for a 2.5 m track) or #3001/TC/420/EC (for a 4.2 m track) – supplied separately. Pass the supply cable up through the bell mouth connector (see figure 39) on the track carriage and connect to the terminal block located on the ceiling column flange.

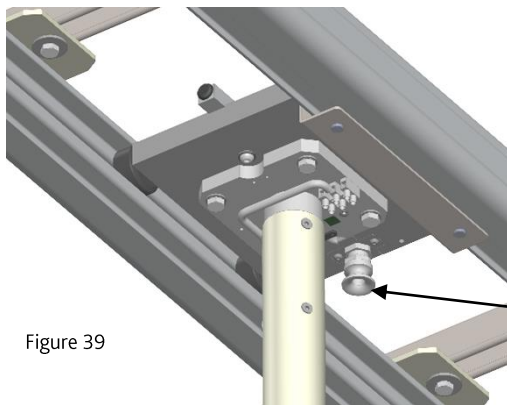


Figure 39

Cable entry point

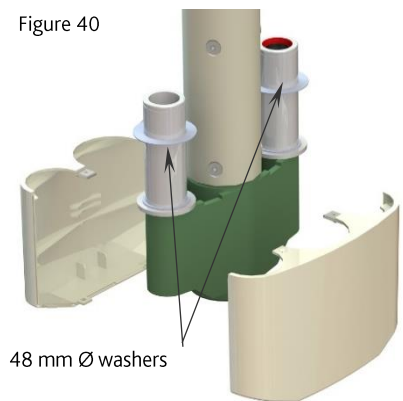


Figure 40

48 mm Ø washers

Step 22

Slide the column flange canopy of the ceiling column up over the flange and tighten three setscrews to secure.

Step 23

Ensure that the 48 mm Ø washer on each pivot mounting point of the column is first moved upwards (figure 40), then attach the plastic covers to the lower pivot assembly by bringing the two halves together ensuring that the inner tags are correctly inline.

Note: Fastening elements for subsequent mounting of the extension arms are included on both pivots.

Step 24

Suspension arms can now be installed (see Section 9).

6.2 - Attaching to Unistrut® P1000 or equivalent parallel ceiling channels (using separately supplied joining bar kit #3001/3.23 or #3001/3.24)

Requirements to be met prior to installation

Prior to installation, a structural engineer of record must ensure that the ceiling is designed in such a way that the loads of the installed track and pendant system can be securely borne and transferred (see Section 17 – Securing bolt data). The load bearing capacity of the ceiling must be checked by structural analysis and confirmed by means of an acceptable certificate. The installation must be inspected by the engineer and certified in accordance with any regional construction regulations. The layout of the installation is the sole responsibility of the structural engineer.

Note:

Sectional dimensions of the required ceiling channels are 41 x 41 mm. Structural capacity: Unistrut® P1000 or equivalent. If a track is to be supported on an alternative structure, see Section 6.3.

- It is recommended that the track is mounted across Unistrut® ceiling channels (see Section 6.1)
- If the track is to be supported on two parallel Unistrut® P1000 or equivalent ceiling channels, additional kit #3001/3.23 (for a 2.5 m track) or #3001/3.24 (for a 4.2 m track) should be used
- Both ceiling channels must be horizontal, level and in the same plane
- The distance between the centres of each ceiling channel must be 330 mm

Note:

The track is attached to the ceiling channels (via kit #3001/3.23 or #3001/3.24) using ceiling installation plates on each side. Installation plates are not designed to carry a secondary device / assembly.

Important note

Unistrut® parallel ceiling channels must be equally spaced. Distance between each ceiling channels = 330 mm.

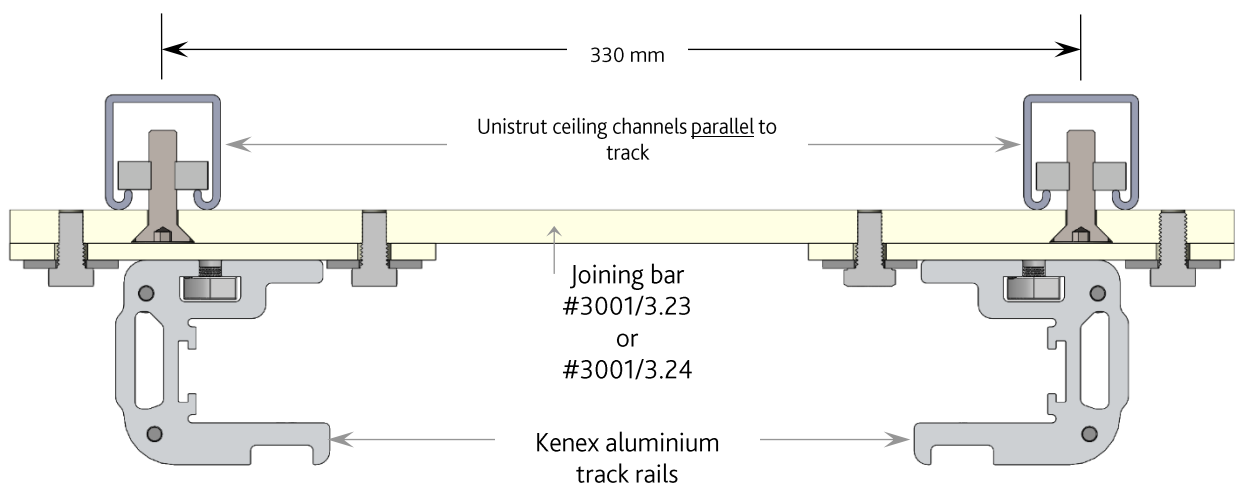
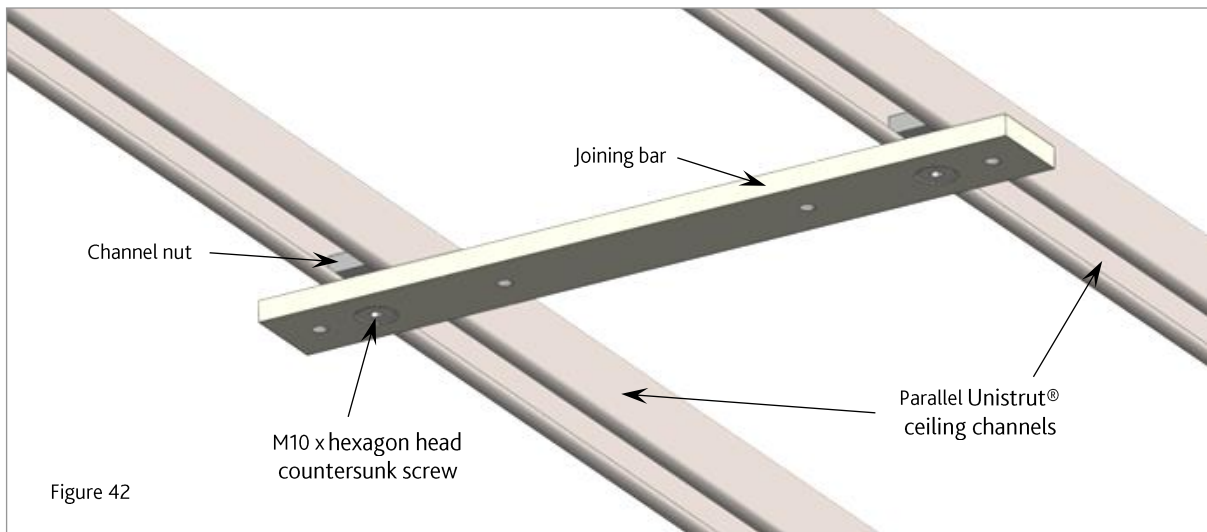


Figure 41

Step 1

Insert one M10 channel nut into each of the two Unistrut® ceiling channels at the location of the first joining kit. Using the M10 x 40 mm hexagon head countersunk screws provided, apply Loctite® 243 and attach one joining bar to the two parallel Unistrut® ceiling channels, ensuring the joining bar is at 90 degree to the ceiling channels. Tighten the screws to 35 N/m.

**Important note:**

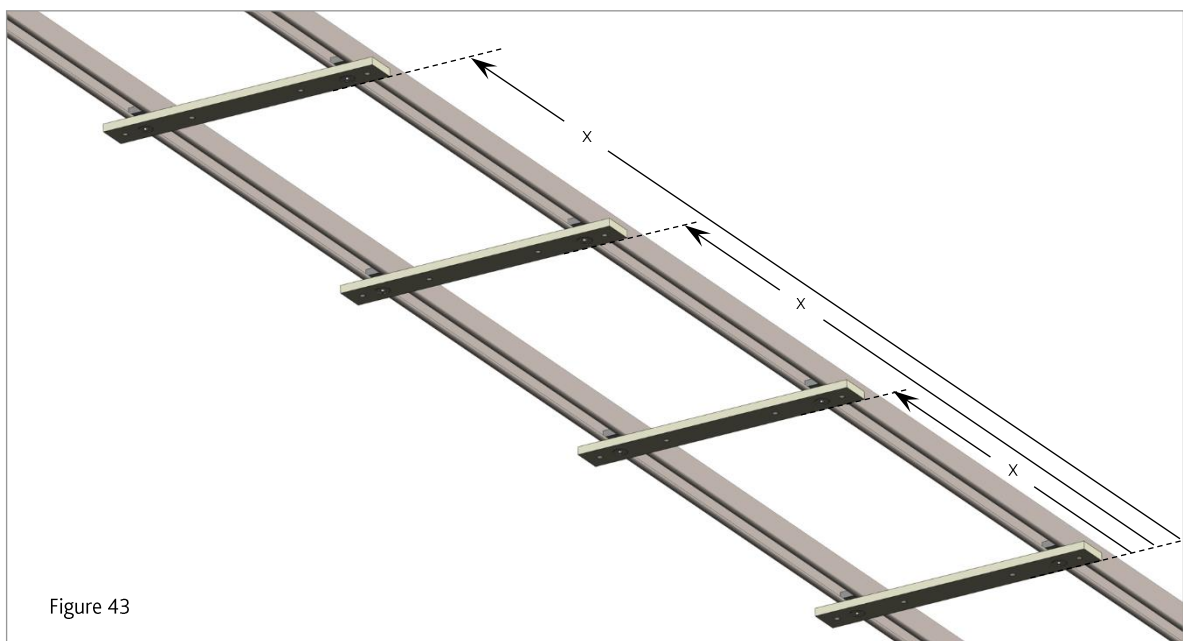
Each remaining joining bar must be located in the parallel rails at an equal distance from one another, and at 90 degrees to the ceiling channels. Ensure that the subsequently installed track does not overhang either end joining bar by more than 400 mm or less than 60 mm (see Figure 24).

Step 2

Attach the remaining joining bars as described in Step 1 ensuring each are parallel with one another.

Step 3

Accurately measure the distance between the joining bars (as shown below).

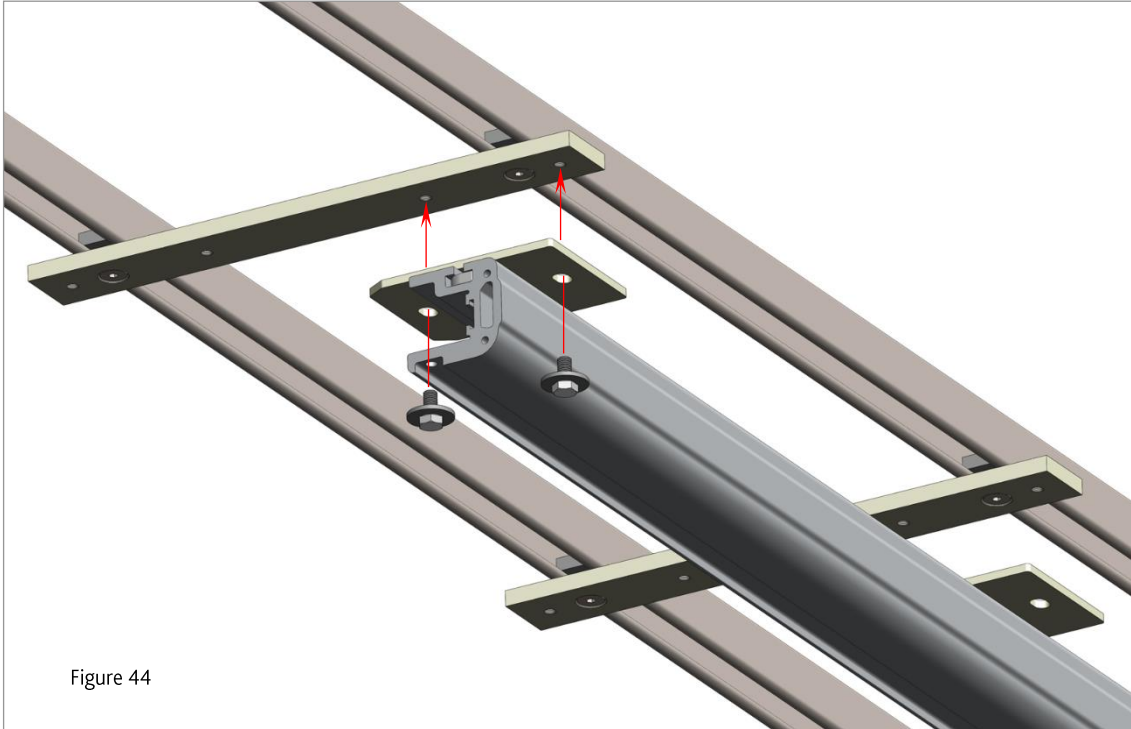


Step 4

Continue from Step 2 (Section **6.1**) though to Step 6.

Step 5

Apply Loctite® 243 to eight M10 x 20 mm hexagon head set screws (four for each end of one track rail). With the help of another, raise one aluminium track rail and attach to the installed joining bar ensuring the M10 x hexagon head set screw (with washer) engages with the threaded holes and tighten each to 35 N/m.



Step 6

Secure the remaining installation plates to the joining bars using the M10 x 20 mm hexagon head set screws and washers. Apply Loctite® 243 to each screw and tighten to 35 N/m.

Step 7

Attach the second Kenex track rail using the same process as described.



Figure 46



Figure 47

Step 8

Continue from Step 12 (Section [6.1](#)) though to Step 24.

6.3 - Attaching to a load bearing structure / ceiling (using separately supplied joining bar kit #3001/3.23 or #3001/3.24)

Requirements to be met prior to installation

Prior to installation, a structural engineer of record must ensure that the ceiling is designed in such a way that the loads of the installed track and pendant system can be securely borne and transferred (see Section 17 – Securing bolt data). The load bearing capacity of the ceiling must be checked by structural analysis and confirmed by means of an acceptable certificate. The installation must be inspected by the engineer and certified in accordance with any regional construction regulations. The layout of the installation is the sole responsibility of the structural engineer.

- It is recommended that the track is mounted across Unistrut® ceiling channels (see Section 6.1)
- If the track is to be supported on a load bearing structure other than Unistrut® or equivalent ceiling channels, additional kit #3001/3.23 (for a 2.5 m track) or #3001/3.24 (for a 4.2 m track) should be used
- The supporting structure must ensure the attached joining bar kit (#3001/3.23 or #3001/3.24) can be mounted horizontal, level and in the same plane
- The fixings supplied with the joining bar kit should not be considered appropriate for all installations
- The joining bar kits must be secured via the two M10 countersunk holes, at a distance of 330 mm
- The distance between outside edges of the two aluminium track rails must be 364 mm

Note:

The track must be attached to the supporting structure (via kit #3001/3.23 or #3001/3.24) using ceiling installation plates on each side. Installation plates are not designed to carry a secondary device / assembly.

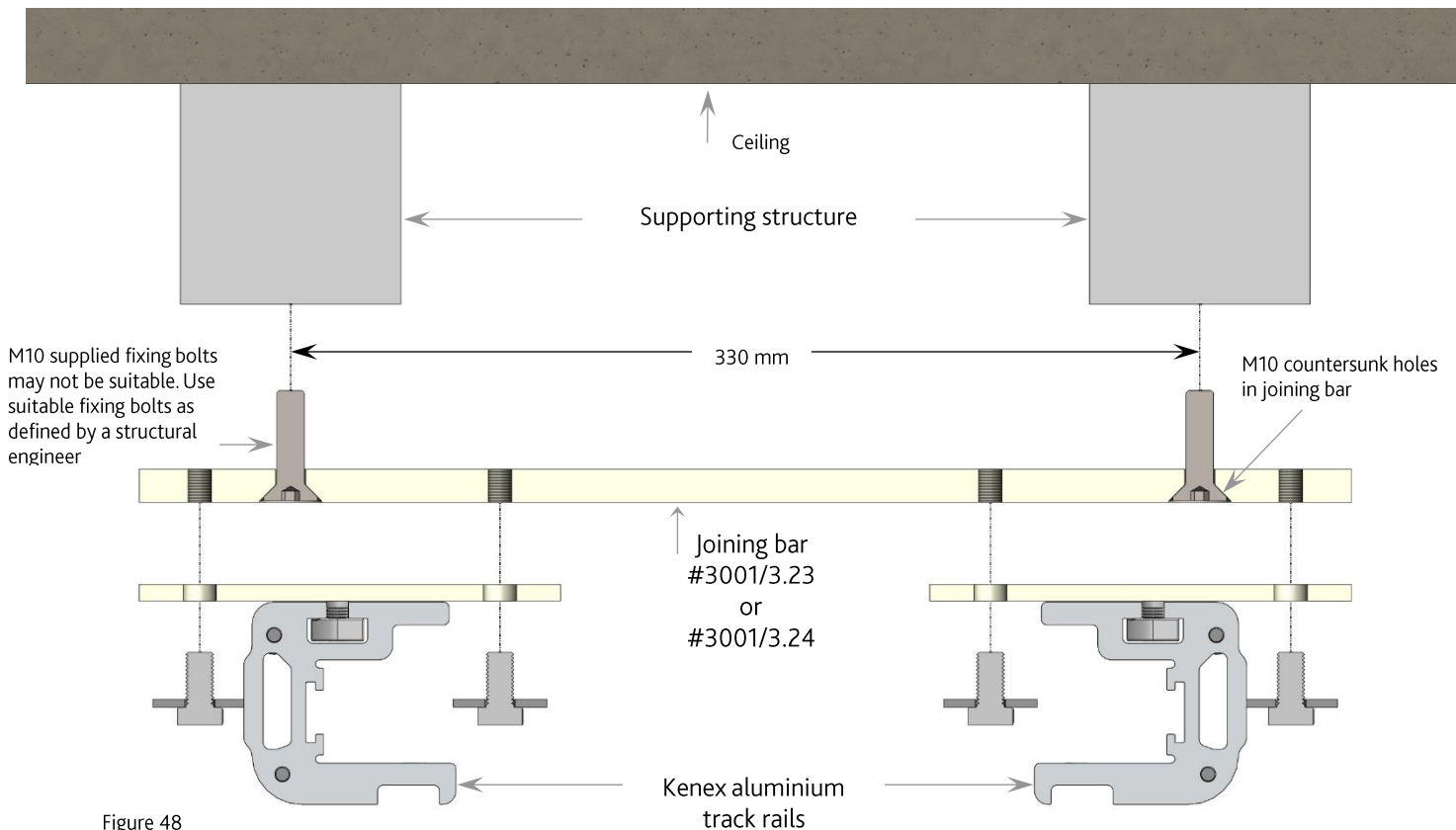


Figure 48

Step 1 (Note: Reference can be made to Section 6.2)

Ensure the ceiling / load bearing structure is designed in such a way that the loads of the installed track and pendant system can be securely borne and transferred.

Securely attach each of the joining bars using appropriate fixings. Ensure each joining bar is at an equal distance from one another and are parallel to one another. Ensure that the subsequently installed track does not overhang either end joining bar by more than 400 mm or less than 60 mm (see Figure 24).

Step 2

Continue from Step 2 (Section 6.1) though to Step 6.

Step 3

Continue from Step 5 (Section 6.2) though to Step 7.

Step 4

Continue from Step 12 (Section 6.1) though to Step 24.

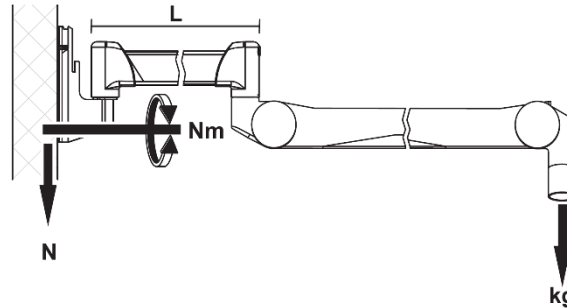
7. Wall bracket installation

Note: The wall bracket must be attached to a wall of suitable strength to support the applied load. Due to diverse wall structures, no fastening elements are included. These procedures assume that professional architectural or engineering services have been consulted with reference to the load data shown below. The installation, selection of installation hardware and torque values must be determined by a structural engineer.

Note: It is recommended that 'counter plates' (see Section 7.3.1) are used when attaching the wall bracket.

Wall bracket load data

Figure 49



Maximum extension arm length L (mm)	Maximum device load (kg)	Bending moment (Nm)
600	15	320
750	13	320
950	10	306
Maximum extension arm length L (mm)	Vertical weight load (N)	Maximum tension bolt force (N)
600	260	1730
750	245	1730
950	225	1660

7.1 - Drilling securing holes

Step 1

Decide the location of the wall bracket and transfer the 12 mm fixing hole positions by using the wall bracket as a jig (these holes are 190 mm apart). Ensure the marked holes are vertical, and drill holes suitable for the preferred fixing method (see section 7.3.1 or 7.3.2).

7.2 - Connecting electrical supply (see figure 50)

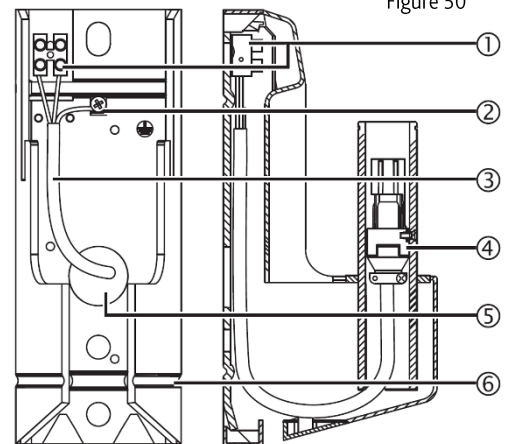
Note:

The wall bracket is equipped with a 3-pole plug coupling (4). If the attached suspension arm, requires electrical connection (e.g. for an examination lamp), proceed to Step 1 below. If the suspension arm does not require electrical connection (e.g. for supporting a radiation shield), continue to section 7.3.

Step 1

Ensure electrical supply is off, and prevented from being switched on. Route supply cable (3) through hole (5) of the bracket (6), and connect to terminal block (1), ensuring the earthing cable is connected to the earthing terminal (2).

Figure 50



7.3 - Securing wall bracket to the wall

Note:

The wall bracket (3) should be mounted perpendicularly in order to ensure that the installed suspension arm can be freely and safely positioned. To ensure that the load is correctly distributed, the wall bracket must be flush with the wall.

7.3.1 - Using a counter plate with continuous threaded bolts (see figure 51)

Step 1

Decide the location of the wall bracket and transfer the fixing hole positions by using the wall bracket as a jig. Ensure the marked holes are vertical.

Step 2

Drill holes in the wall suitable for the threaded studs of the counter plate (not included in the scope of supply).

Step 3

Attach the counter plate (1), with continuous threaded bolts (2) and secure the wall bracket (3) using nuts determined by the structural engineer, to a torque value given by the structural engineer.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 4

Attach the plastic clip-on covers.

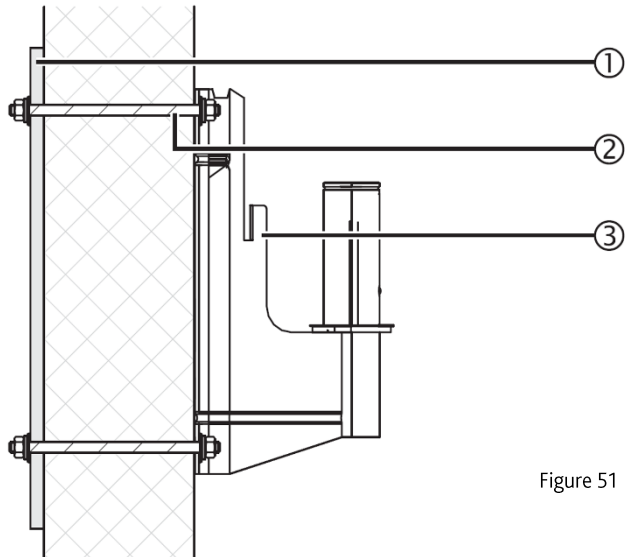


Figure 51

7.3.2 - Using stud bolts (see figure 52)

Step 1

Decide the location of the wall bracket and transfer the fixing hole positions by using the wall bracket as a jig. Ensure the marked holes are vertical.

Step 2

Drill holes in the wall suitable for the stud bolts (not included in the scope of supply).

Step 3

Secure stud bolts in accordance with instructions given by the fastening element manufacturer and tighten to a torque value given by the structural engineer.

Note: Suitable paint can be applied to fastenings to detect any loosening after they have been tightened.

Step 4

Attach the plastic clip-on covers.

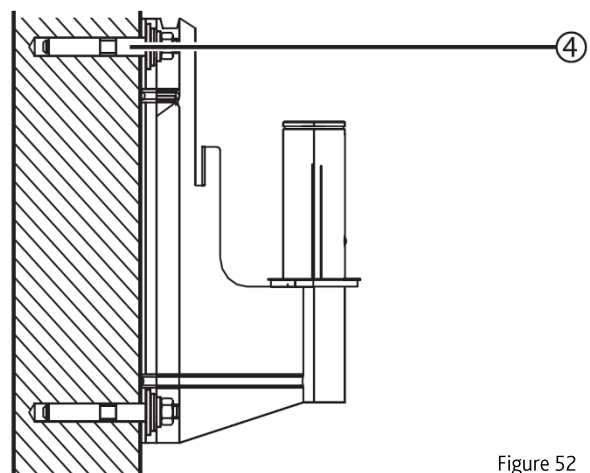


Figure 52

8. Attaching a suspension arm - to a wall bracket

IMPORTANT

A competent engineer must install the arm and the subsequently suspended shield or lamp.

Ensure any power supply to the wall bracket is disconnected before installing the suspension arm. Protect the supply from being switched on during this procedure.

Step 1

Remove any supplied sleeve and the suspension arm retaining circlip and washer from the wall bracket pivot.

Ensure that the 47.9 mm (outside diameter) washer supplied with the wall bracket is located on the pivot (figure 53). Lightly apply grease to the pivot and slide the suspension arm onto it ensuring that it is fully located (figure 54).

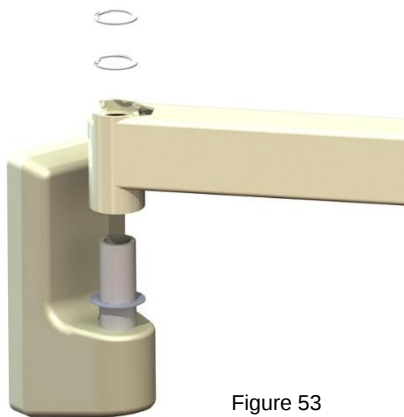


Figure 53

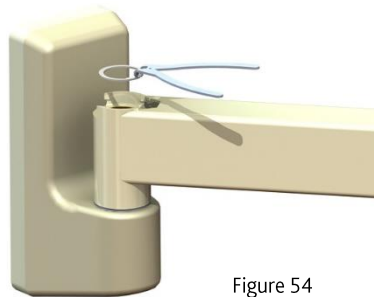


Figure 54



Step 2

Place the 39.9 mm (outside diameter) washer onto the pivot and secure the suspension arm by locating the circlip in the pivot groove (figure 54) using suitable circlip pliers. **Warning:** Ensure the circlip is fully engaged into the pivot groove.

Step 3

If attaching a suspension arm equipped with an electrical connection, ensure the arm's internal electrical connector is fully seated into the electrical supply connector in the wall bracket.

Step 4

Attach the supplied plastic covers around the end of the suspension arm (figure 55). Ensure the small locking tags are in position and press the two halves together.

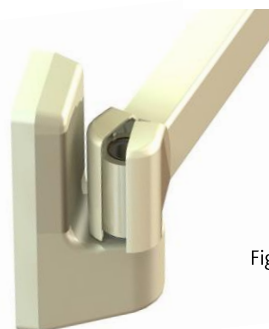


Figure 55

9. Attaching a suspension arm - to a ceiling column

IMPORTANT

A competent engineer must install the arm and the subsequently suspended shield or lamp.

Ensure any power supply to the ceiling column is disconnected before installing the suspension arm. Protect the supply from being switched on during this procedure.

Note: The suspension arm may or may not have electrical connections dependent upon the suspended device. Each ceiling column has two pivot points, only one has an electrical connection. Ensure that the correct type of suspension arm is fitted to the appropriate pivot point.

Step 1

Remove any supplied sleeve and the suspension arm retaining circlip and washers from the chosen pivot. Ensure that the 47.9 mm (outside diameter) washer supplied with the ceiling column is located on the pivot (see figure 56). Lightly apply grease to the pivot and slide the suspension arm onto it ensuring that it is fully located (see figure 57).

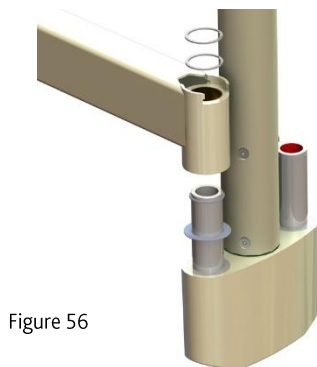


Figure 56

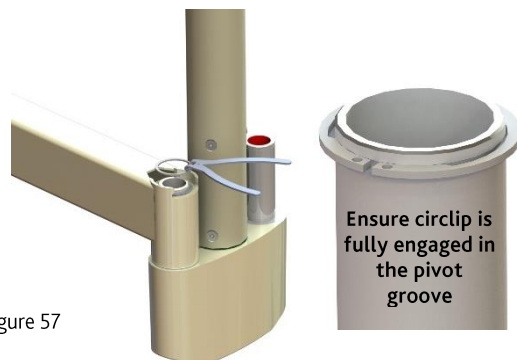


Figure 57

Step 2

Place the 39.9 mm (outside diameter) washer onto the pivot and secure the suspension arm by locating the circlip in the pivot groove (figure 57) using suitable circlip pliers. **Warning:** Ensure the circlip is fully engaged into the pivot groove.

Step 3

If attaching a suspension arm equipped with an electrical connection, ensure the arm's internal electrical connector is fully seated into the electrical supply connector in the ceiling column.

Step 4

Attach the supplied plastic covers around the end of the suspension arm (figure 58). Ensure the small locking tags are in position and press the two halves together.

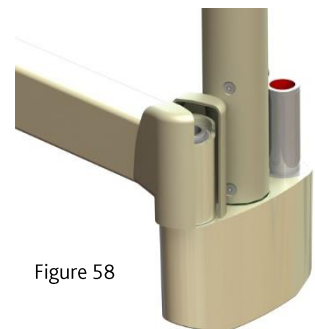


Figure 58

Step 5

Attach the suspended device (see section 10).

10. Attaching a suspended device to a suspension arm

WARNING

The suspension arm is supplied with the spring arm section restricted to the horizontal position. The suspended device should be attached when the spring arm is in this position; with height adjustments made afterwards (see Section 11). If the spring arm is pulled down below the horizontal, before the device is properly attached and the arm is not held, it will rapidly move upwards which could cause injury or damage.

Ensure any power supply to the suspension arm is disconnected before attaching the suspended device. Protect the supply from being switched on during this procedure.



Suspended
lead glass shield
(2.0 mm Pb)
Type 350
(lower curtain 0.5 mm Pb)



Suspended
lead acrylic shield
(0.5 mm Pb)
Type 351



Suspended
lead acrylic shield
(0.5 mm Pb)
Type 354



Surgical lamps

Note:

All Kenex surgical lights are supplied ready to connect to their suspension arm. No additional lamp to suspension arm wiring is required (see note below regarding transformer connection).



Note: Surgical lamp installation (figure 59)

An internal electrical connection in the lamp pivot connects with an internal electrical connection in the lamp arm when the two are pushed together.

Note: Electrical connection

All lamps are supplied complete with an internal or external electrical transformer. For lamps supplied with an external transformer, the supply cabling should be connected to the transformer (see instructions separately supplied) before its output connection is made to a ceiling column or wall bracket terminal block. For lamps supplied with an internal transformer, the supply cabling should be connected directly to the ceiling column or wall bracket terminal.

Note:

An identification label on each Kenex lamp indicates electrical supply requirements.

Figure 59

Step 1

Prepare the device to be attached to the suspension arm:-

1.1 - Shield model 350

Remove the flexible curtain from its transport location and re-attach using the securing bar and two supplied handles. Continue from step 2.



1.2 - Shield model 351

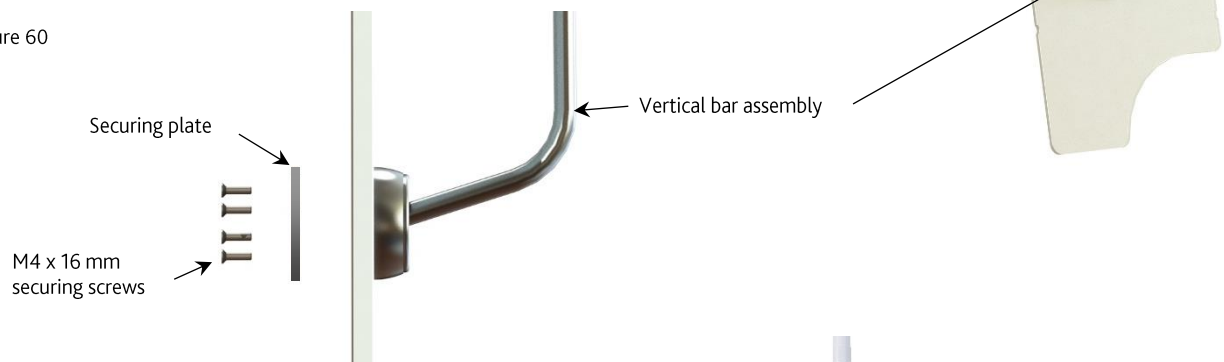
Attach the optional flexible lead curtain (if supplied) using the installation instructions supplied with the curtain. Remove any protective wrapping from the window. Continue from step 2.



1.3 - Shield model 354

Remove the vertical bar assembly from the suspension arm packaging and attach it to the suspension arm as described in steps 2 to 5. Remove the four M4 x 16 mm socket countersunk head screws holding the securing plate. Remove any protective wrapping from the window and locate onto the spigot of the vertical bar assembly (figure 54), ensuring any cut-out in the window is positioned in the required orientation. Re-attach the securing plate using the four M4 screws. Apply Loctite® 222 and tighten to torque 2.0 Nm. Continue from step 2.

Figure 60



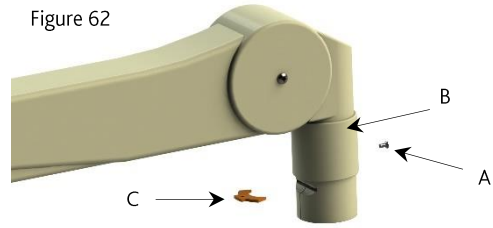
1.4 - Surgical lamp

Ensure any supplied handle not already fixed to the lamp is attached.



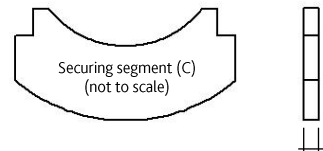
Step 2

Figure 61: Remove the collar limiting snap-ring (D) and retain. Figure 62: Unscrew, remove and retain the M3 x 6 mm Phillips Pozidriv raised countersunk head collar retaining screw (A). Slide the retaining collar (B) upwards to reveal the retained securing segment (C). Remove and retain the segment.



Step 3

Important: Ensure the securing segment dimension is as described (figure 63), and apply grease to the segment (C).



Minimum thickness = 1.5 mm

Figure 63

Step 4 - To secure any device

WARNING: When attaching the device to the spring arm, it is important to ensure the retaining segment (C) is fully engaged through the slot in the spring arm and into a groove in the device pivot. The retaining collar must be located correctly. Failure to ensure this may result in the device detaching from the arm resulting in injury or damage.

Apply grease to the device pivot and slide it into the spring arm whilst the arm is constrained at the horizontal position. Secure the device (figure 64) by inserting segment (C) through the spring arm slot. Ensure the segment is in the pivot groove and slide collar (B) down (with the collar fixing screw hole uppermost). Fix the collar in place using screw (A) and tighten to 0.5 Nm (do not over tighten and do not apply Loctite®). Re-attach the collar limiting snap ring (D) (figure 65).

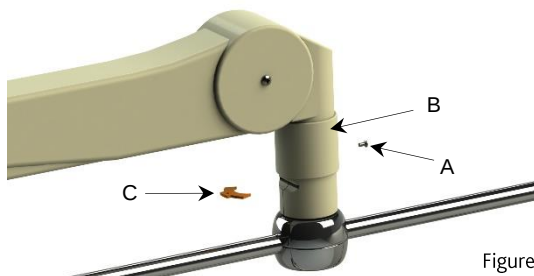


Figure 64

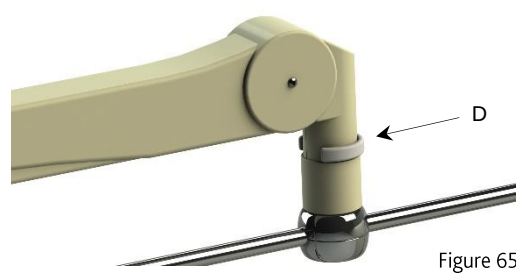


Figure 65

Step 5

Adjust the spring arm height movement range and make any required counterbalance adjustments (see Section 11).

11. Suspension arm adjustments

WARNING

The suspension arm is supplied with the spring arm section restricted to the horizontal position. The suspended device should be attached when the spring arm is in this position, with height adjustments made afterwards. If the spring arm is pulled down below the horizontal, before the device is properly attached and the arm is not held, it will rapidly move upwards which could cause personal injury or damage.

Ensure any power supply to the suspension arm is disconnected before adjustments are made. Protect the supply form being switched on during this procedure.

11.1 - Spring arm height adjustments

Step 1

Inset the long end of a 5 mm across flats Allen key into an opening in the spring arm at the end above the suspended device.

Pull the spring arm down slightly and turn the Allen key anti-clockwise (viewed from the arrow). Continue adjusting by first moving the arm down then turning the key until the desired maximum height is obtained.

Check that the arm cannot collide with anything and re-adjust if required.

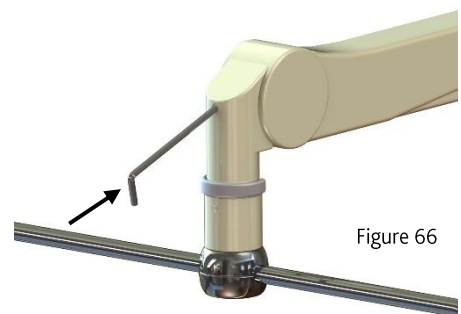


Figure 66

Step 2

Move the device up & down to its maximum positions and re-adjust if required.

11.2 - Spring arm counterbalance adjustments

Step 1

If the device does not maintain the required height, the weight capacity counterbalance should be adjusted. This is carried out by inserting the long end of a 5 mm across flats Allen key into an opening in the spring arm at the end under the extension arm.

Hold the spring arm up at an angle of approximately 30 degrees above the horizontal and turn the Allen key as specified below (when viewed from the arrow).

- If the device moves downwards too easily turn **anti-clockwise**.
- If the device moves upwards too easily turn **clockwise**.

Step 2

Move the device up & down to its maximum positions and re-adjust if required.

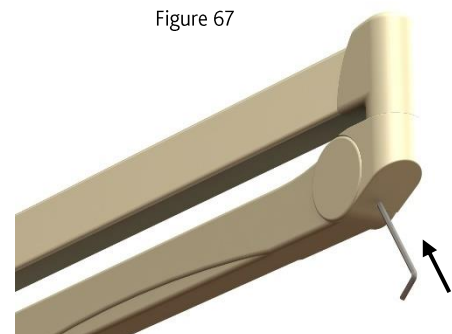


Figure 67

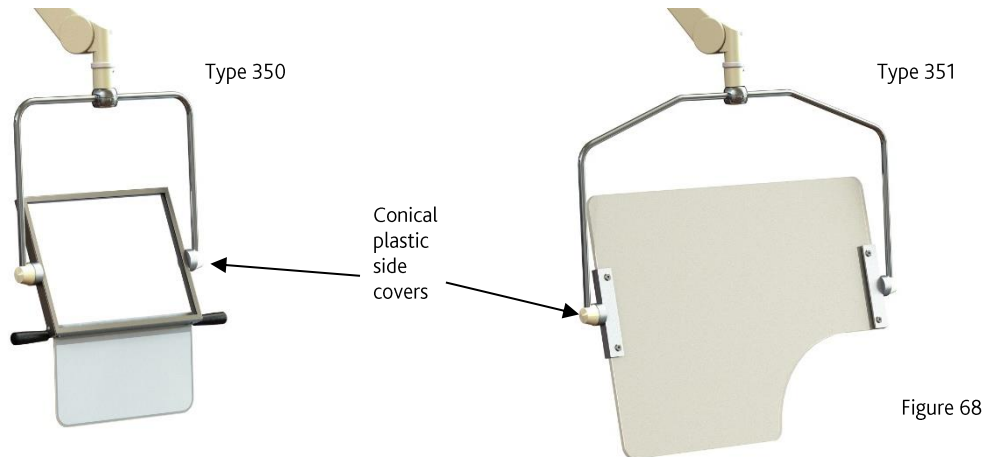
12. Radiation shield adjustments

Each shield is supplied with a pre-loaded friction setting which enables the required window position to be maintained. These friction settings can be easily adjusted as desired.

12.1 - Shield type 350 & 351

Step 1

Remove the conical plastic side covers. Use a 2.5 mm across flats Allen key to turn each of the two M5 socket head setscrews per side, clockwise by a small amount to increase friction. Replace the plastic covers.



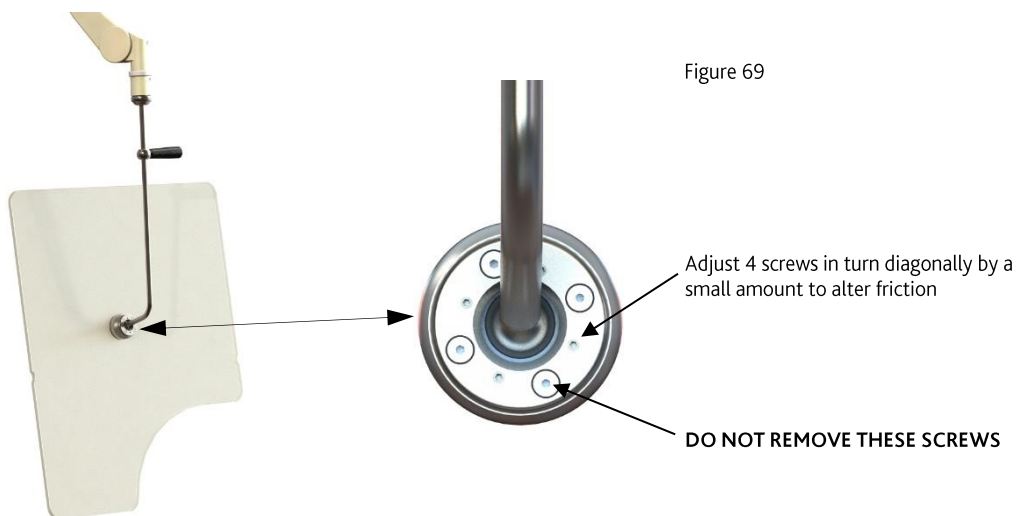
12.2 - Shield type 354

Step 1

Use a 2 mm across flats Allen Key to turn each of the four M4 socket head set screws clockwise in by a small amount to increase the friction at the central ball & socket joint. Check the friction after each opposite screw is adjusted. Do not over tighten.

WARNING

Figure 69: Do not loosen other screws. This may disassemble the ball & socket joint and cause the window to fall.



13. LED surgical lamp installation requirements

For lamps supplied without a transformer mounted inside the lamp head, the cross-sectional size of supply cables from the transformer depend on the cable length and the power consumption of the lamp head. The recommended cross-sections are shown in the following table:

Power Consumption (W)	Single cable length (m) 5	Single cable length (m) 10	Single cable length (m) 20	Single cable length (m) 50	Single cable length (m) 70
Mach LED 130F / 16W	1	1	1.5	4	6
Mach LED 150F / 24W	1	1	1.5	4	6
Mach LED 150FP / 24W	1	1	1.5	4	6
Mach LED 150MC / 35W	1	1	1.5	4	6
Mach LED 300DF SC / 37W	1	1	1.5	4	6
Mach LED 6MC / 87W	1	1.5	4	10	10
	Cable section (mm ²)				

14. System maintenance

Note:

It is important that the complete pendent system is maintained correctly. Failure to ensure that the following procedures are undertaken may result in damage to property or injury. Kenex suspended systems are manufactured in accordance with requirements of IEC 60601-1. Repeated inspections must be carried out in accordance with IEC 62353.

WARNING

Do not remove any suspended device from the suspension arm without first ensuring that the vertical movement is restricted to the horizontal position. Refer to Section 11.1 – Spring arm height adjustments. To do otherwise will cause the arm to move up with force and could cause damage or injury.

Important – Ensure the following:-

- All power sources are disconnected and prevented from being reconnected whilst maintenance is conducted
- Inspection must be performed by competent personnel
- Inspection intervals must be observed
- This installation manual must be accessible
- After 10 years, conduct the 36 month procedure annually
- Inspection evidence should be recorded in Section 20 (maintenance record sheetp)

Every 12 months – The complete suspended system

- Check that parts are not deformed
- Check that there are no defects in the paint / surface finish
- Check that all plastic covers are in place and free from cracks
- Check that all identification numbers and serial labels are clearly visible
- Check suspension arm counterbalance and height settings, adjust if required (see Section 11)
- Ensure all moving parts are smooth running and performing correctly, grease or replace if required
- Check the complete system (suspension arms, ceiling column, ceiling track and any installed installation aids) for any abnormal movement

Every 36 months – The complete suspended system

- Check the dimensions of the suspension arm securing segment and grease (see Section 10). Replace securing segment if below minimum dimension
- Grease the suspended device journal (see Section 10)
- Check that the circlip at the extension / spring arm joint is fully located in the pivot groove (see Section 16, item 2) Remove covers (item 17) for access



- If symptoms of a significant collision are apparent, remove from service and check structural integrity

Note:

Replacement system parts are available from Kenex. Replacement suspension arm parts are detailed in Section 16.

15. Maintenance

**Retain instructions for future use.
Instructions only apply to devices supplied by Kenex (Electro-Medical) Ltd.**

15.1 - General use

- **Caution** - Damage or injury may result from collision between devices and other equipment. If this occurs stop using the device and have it inspected.
- Check device is functioning correctly before use.
- X-ray shielding devices with 0.5 mm Pb equivalent are only suitable for secondary x-ray radiation protection.

15.2 - Cleaning

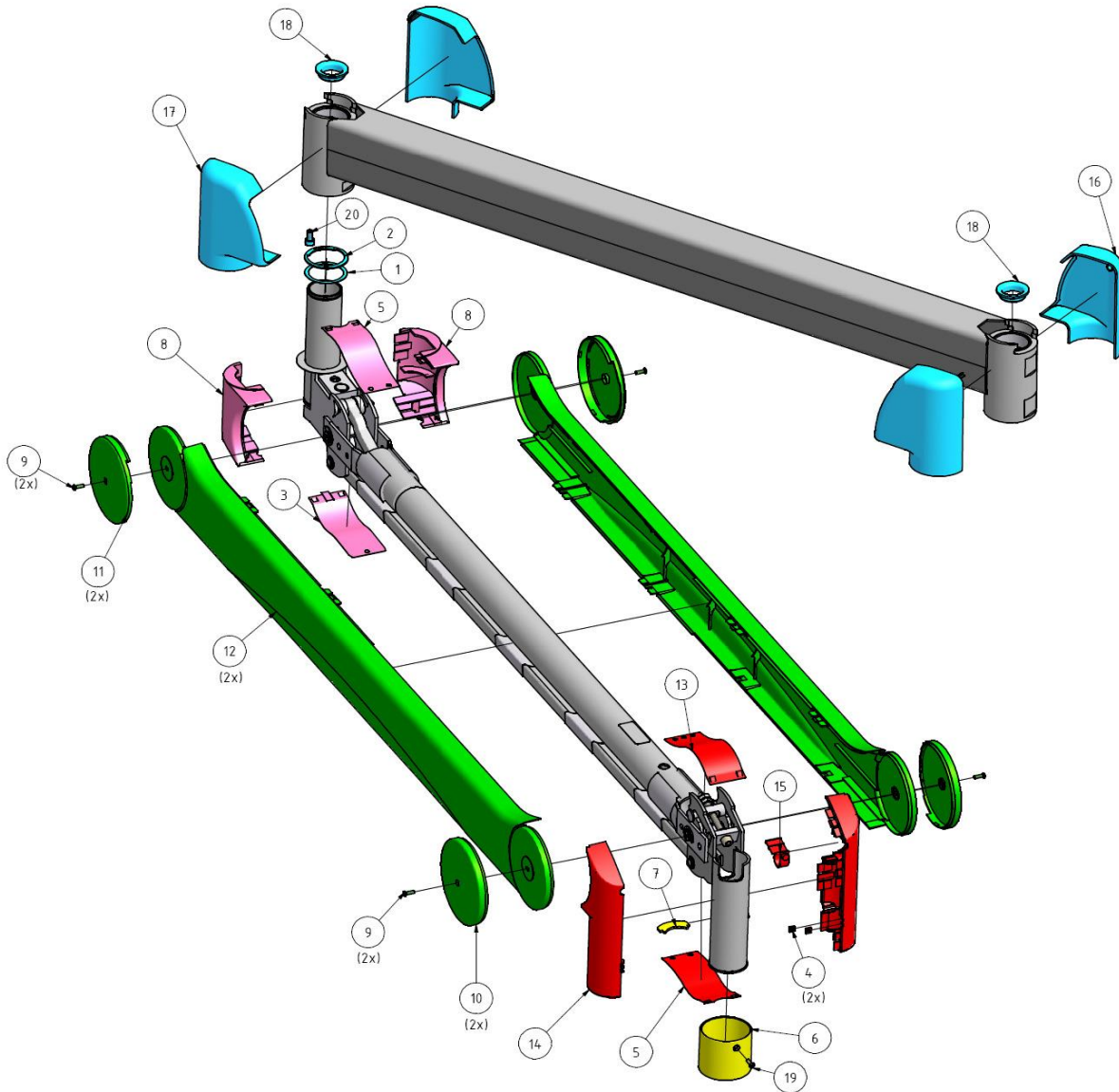
- **Caution** - Ensure any power supply is disconnected.
- All devices should be cleaned using a mild soap solution or a regular hand dishwashing product. Do not spray on – wipe on with a damp cloth. Ensure liquid materials do not dry on lead glass / lead acrylic transparent shields, as this can cause damage.

15.3 - Routine checks

- **Caution** - If a device is in collision, or is not free moving, stop using it and have it inspected.
- Service intervals must be followed (section 14) and recorded in section 20.

For technical support, contact:- support@kenex.co.uk or +44 (0)1279 417241

16. Suspension arm spare parts



KIT	COMPRISES OF:-	PRODUCT CODE
BLUE KIT	1x washer ^① , 1x circlip ^② , 4x covers ^{⑮⑯⑰} , 2x bushing ^⑱ , 1x head screw ^⑳	300/ARM2000/KIT01
PINK KIT	1x lower cover strip (back) ^③ , 1x cover ^⑤ , 1x joint cover (pair) ^⑧	300/ARM2000/KIT02
GREEN KIT	4x countersunk screws ^⑨ , 2x front cover ^⑩ , 2x rear cover ^⑪ , 2x cover ^⑫	300/ARM2000/KIT03
YELLOW KIT	1x securing sleeve ^⑥ , 1x securing segment ^⑦ , 1x countersunk screw ^⑲	300/ARM2000/KIT04
RED KIT	2x M3 square nuts ^④ , 1x cover strip ^⑤ , 1x top cover strip ^⑬ , 1x joint cover (pair) ^⑭ , 1x hole cover ^⑮	300/ARM2000/KIT05

17. Securing bolt data

Note:

Due to the diversity of ceiling structure types, no ceiling fastening elements are included with the installation aids covered by this manual.

The installation, selection of installation hardware and torque values must be determined by a structural engineer.

17.1 – Attaching a Kenex ceiling column

- Directly to a concrete ceiling
Maximum bolt force = 4 kN
- Onto a steel structure
Maximum bolt force = 4 kN
- Directly into steel
Maximum bolt force = 4 kN

17.2 – Attaching anchorage plate 300/P/004

- To a structural framework
Maximum bolt force = 3.3 kN

17.3 – Attaching anchorage void kit 300/P/012

- Directly to a concrete ceiling
Maximum bolt force = 2.2 kN

17.4 – Attaching anchorage ring and plate 300/P/014

- Directly to a concrete ceiling
Maximum bolt force = 1.6 kN

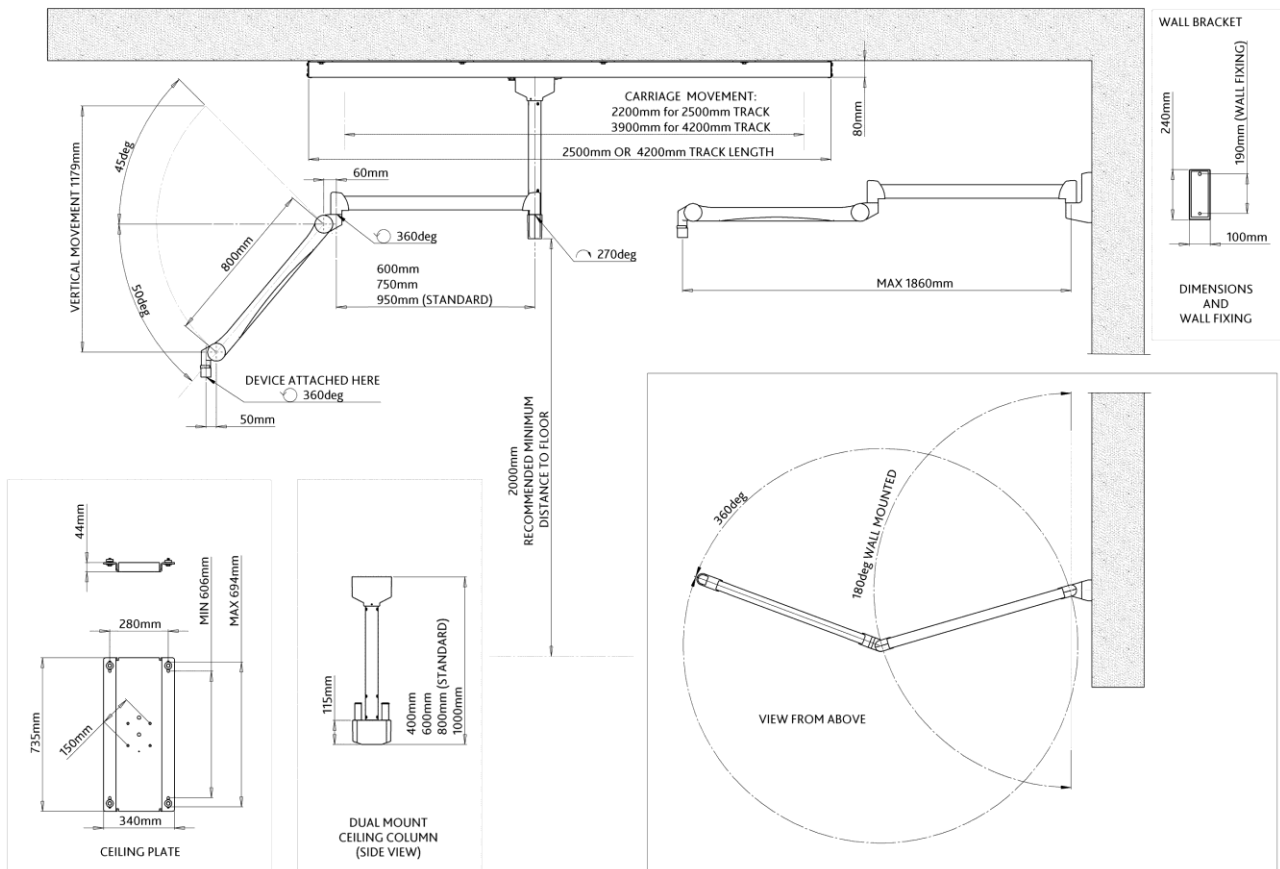
17.5 – Attaching ceiling track to Unistrut® P1000 or equivalent ceiling mounted channels

- Maximum bolt force = 3.2 kN

17.6 – Attaching wall bracket to wall

- Maximum bolt force = 1.7 kN

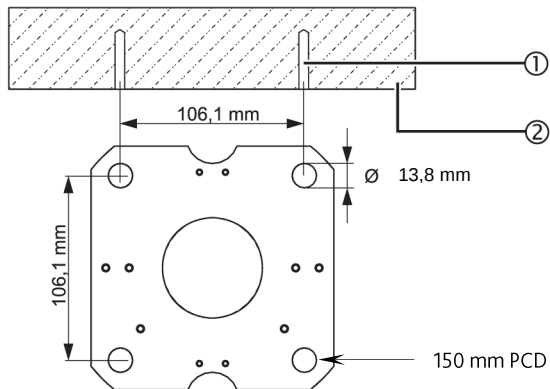
18. Weights and dimensions



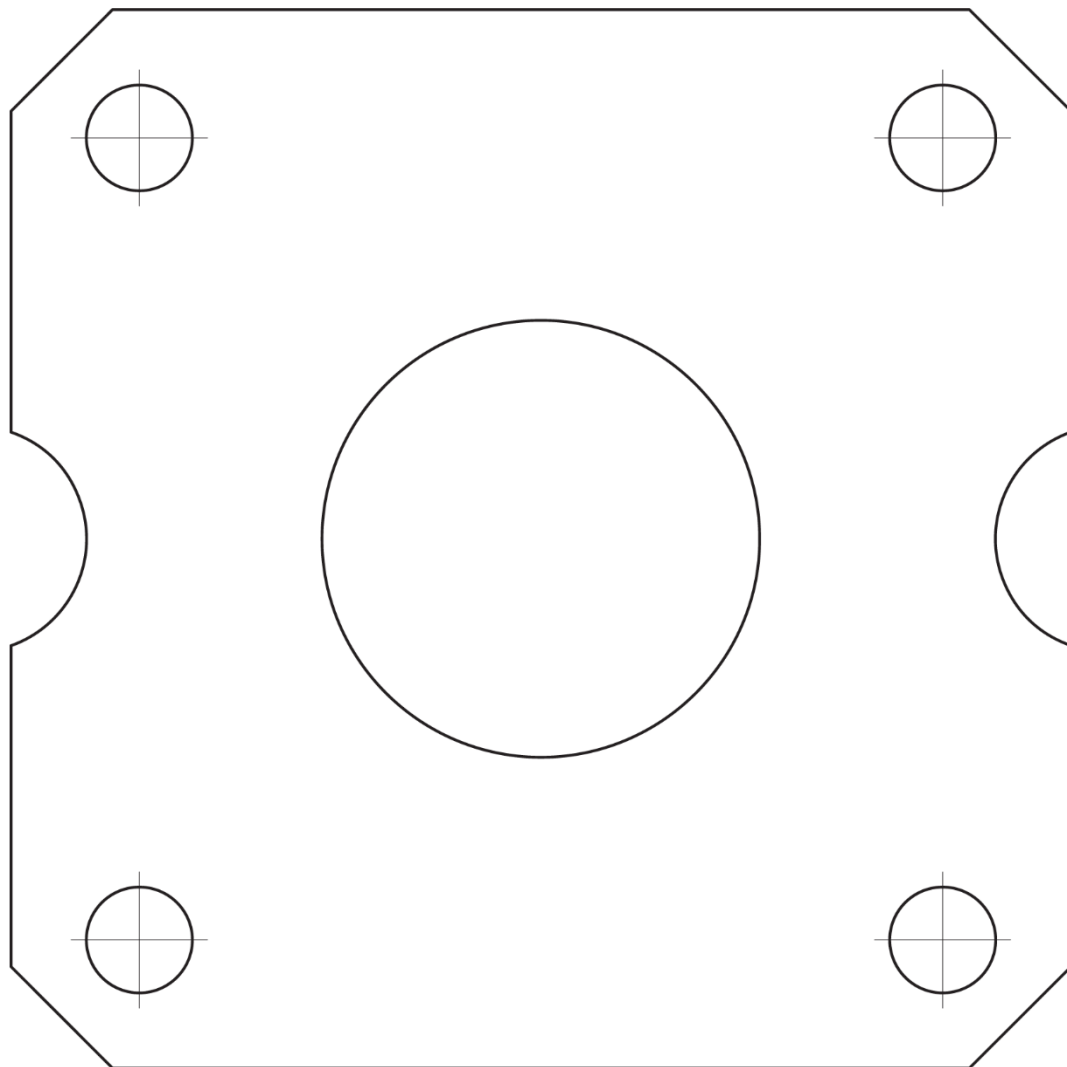
Shielding system weights:

Dual mount ceiling column (80 cm)	12.8 kg
Suspension arm	10.5 kg
Suspended shield	12 kg (maximum)
Examination lamp	17 kg (maximum)
Wall bracket	2 kg
Ceiling track - 2.5 m	50 kg
- 4.2 m	72 kg
Installation aid - Anchorage plate	15 kg
Installation aid - Anchorage void kit	37 kg (maximum)
Installation aid - Anchorage ring and plate	8 kg

19. Ceiling column drilling template



Mark out and drill 4 holes ① in the concrete ceiling ② of a size and depth as determined by the structural engineer.



Check the scale accords with the above dimensions when printing this template

20. System maintenance record sheet

Refer to Section 14 (System maintenance) for appropriate 12 month or 36 month procedure.

12 month maintenance conducted

Date:
Signed:

☐

36 month maintenance conducted

Date:
Signed:

☐

12 month maintenance conducted

Date:
Signed:

☐

36 month maintenance conducted

Date:
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12 month maintenance conducted

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36 month maintenance conducted

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12 month maintenance conducted

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12 month maintenance conducted

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NOTES



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