

Installation instructions for plastic MAX cable ducts

For cabling and pipework in rail transport companies

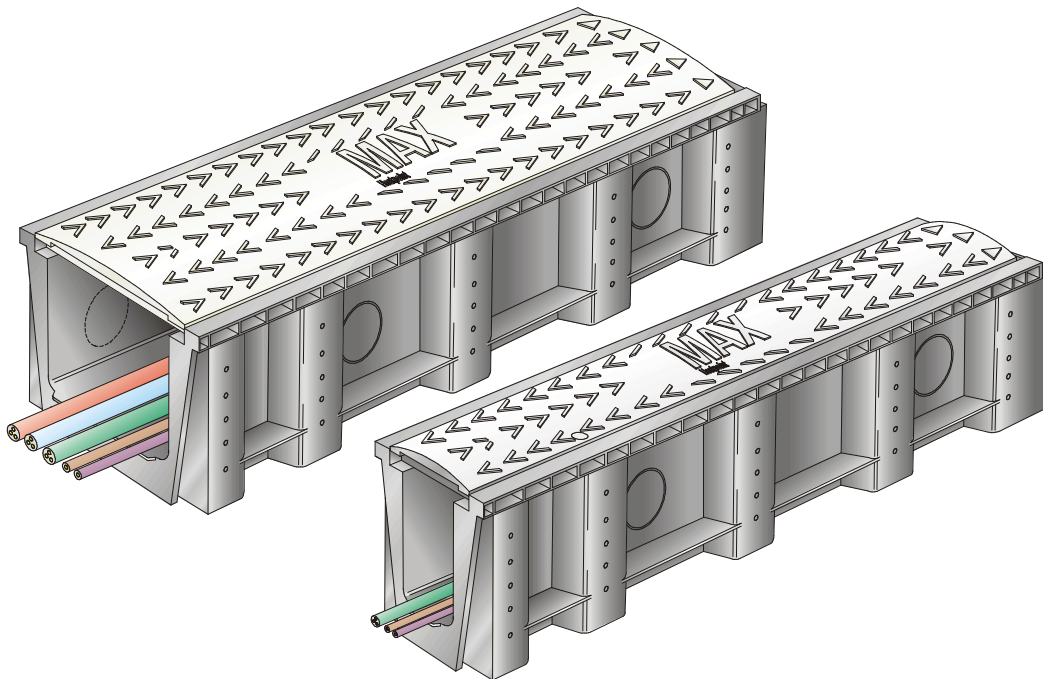


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1 General

These installation instructions describe how and under which conditions the plastic cable duct should be installed and the possible requirements for the building process.

1.1 Scope

These instructions contain specifications and guidelines for using and mounting the plastic cable duct for cabling in rail transport companies.

The cable duct consists of a duct on to which a sealable plastic lid is fitted.

The cable duct is lightweight and easy to handle which ensures that the installation can be performed efficiently and in accordance with Health and Safety regulations (weight and safety).

2 Description of the plastic MAX duct

2.1 Composition of the cable duct

The plastic cable duct consists of a dark grey duct on to which a sealable light grey plastic lid is fitted.

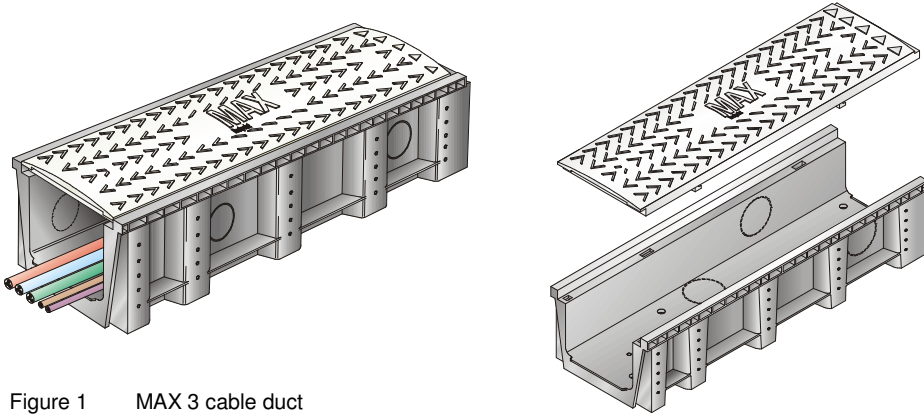


Figure 1 MAX 3 cable duct

2.2 Principle of the plastic MAX duct

The cable duct is used along the railroad and in work areas. The ducts are hooked into each other lengthwise creating a stable alignment. The lid is hooked in the duct making sure that the top of the lid is at ground level.

The result is a duct alignment correctly locked into place that is vandalism resistant and can withstand large mechanical loads.

2.3 Features of the cable duct

A few important and relevant practical properties of the duct and lid:

- The cable duct includes two strong closed upper edges in which the lid is placed. This prevents the duct from becoming contaminated.
- The lid has no vulnerable protruding parts. The probability of cracks and similar is minimal.
- The ducts are closed off to resist vandalism because the method for locking the lid in place is concealed (combined pull-slide movement). No nails, screws or such are used (*).
- The wide MAX 3 duct is suited for the placement of an additional separating duct (for physically separating cables and pipework).
- The interior of the duct is flat and smooth which minimises the chances of damage to the cables and pipework during laying activities.
- The ducts slide into each other and are clicked into place with a dovetail.
- The cable duct with lid is resistant to heavy loads (including sharp frost).
- The light grey lid colour limits the heating up of the duct (by the sun).

(*) Only available for the MAX 3 cable duct. The lid of the MAX 2 cable duct is (as yet) fastened using two screws.

The construction is resistant to heavy loads from above but also from inside due to the local expansion of cables and pipework. Each individual lid has to be opened and closed without influencing the next lids.

2.4 Technical specifications of the cable duct

2.4.1 Dimensions

The Max cable duct dimensions

MAX 2	Internal size	1000 x 100 x 155 mm (L x W x H)
	External size	1000 x 200 x 230 mm (L x W x H)
MAX 3/H	Internal size	1000 x 240 x 155 mm (L x W x H)
	External size	1000 x 340 x 230 mm (L x W x H)

(H = hooking lid)

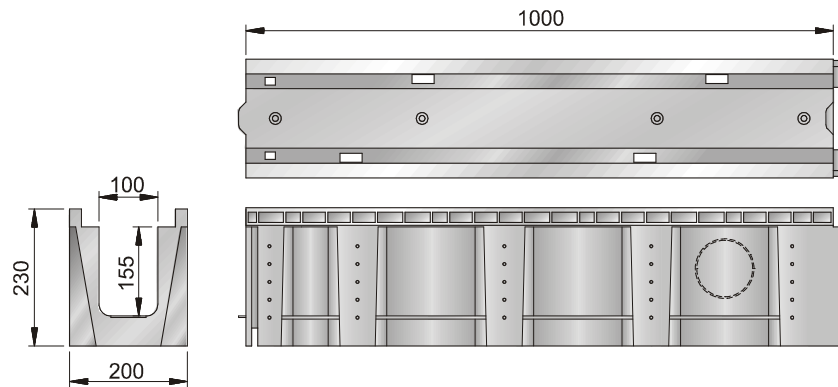


Figure 2 MAX 2 cable duct dimensions

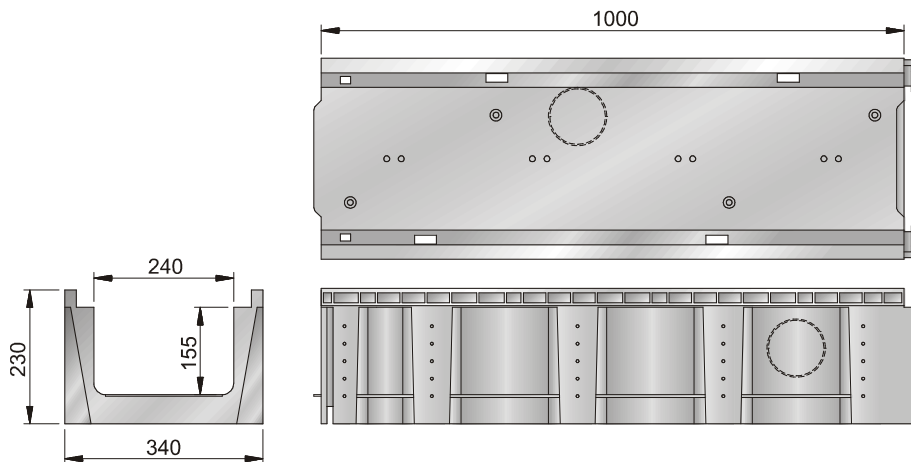


Figure 3 MAX 3/H cable duct dimensions

2.4.2 Weight

- MAX 2 cable duct : 5.0 kg
- MAX 2 lid : 2.5 kg
- MAX 3/H cable duct : 6.0 kg
- MAX 3/H lid : 3.5 kg

2.4.3 Material

- Cable duct : recycled PE/PP
- Lid : HDPE
- Combustibility properties : Class K1 DIN53438 - UL94V2 (flame retardant)
- Expansion coefficient : duct and lid - 0.2mm/m[°]K
- Lid load : ->15 kN on 250 x 75 mm surface in accordance with DIN-EN1433 with test class A15.
-> 1 kN on 100 cm² (from within on the inside of the lid)
- Thermal properties : durability -25°C to +70°C
- Breakdown voltage : 70kV/mm in accordance with IEC6243-1
- Lid colour : According to RAL7035 (light grey)
- Chemical resistance : Water, oil, greases and all other foreign material to be expected in the environment of train tracks.

The basic material for the cable duct and lid includes a small percentage of additives to improve the fire and UV resistance.

2.4.4 Overview of the special features of the MAX cable duct

All the special properties of the cable duct and lid are indicated in the figure below:

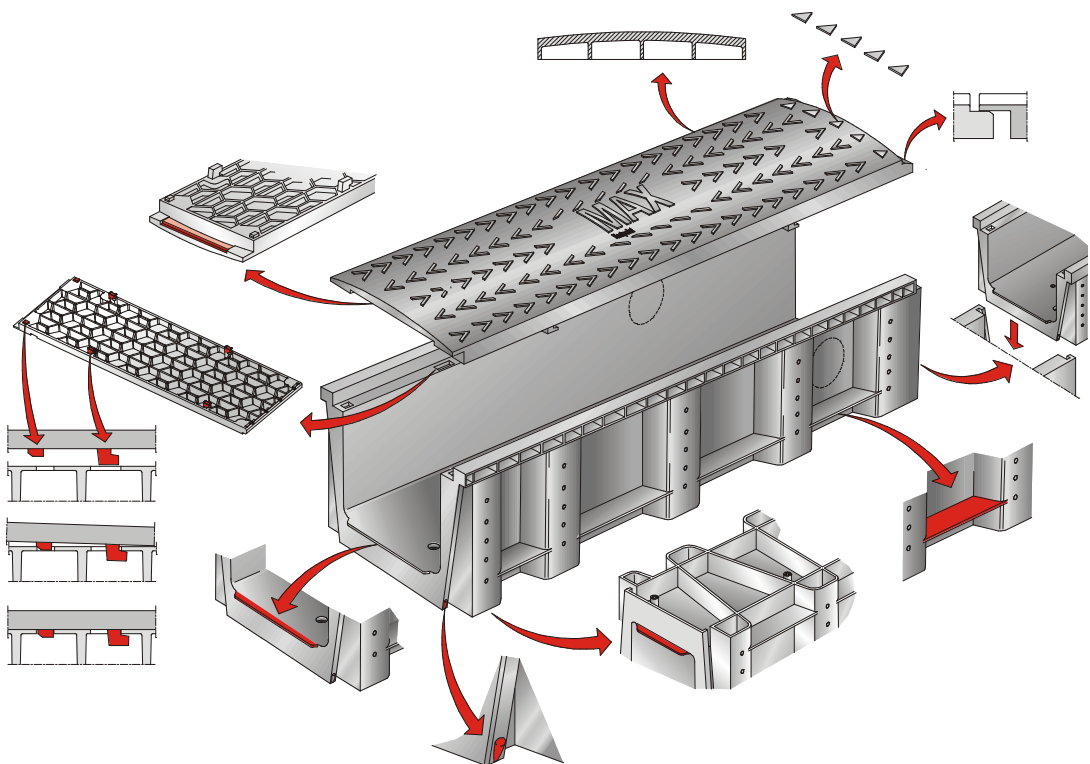


Figure 4 Special properties of the MAX 3/H cable duct

Explanation:

- 1 The lid has a wall thickness of approx. 7 mm and a special 5 mm thick honeycomb structure. As a consequence of this structure, the duct and the lid will not be damaged under normal practical conditions.
- 2 The lid includes a narrow edge (overlap) which falls over the adjacent duct. The function is:
 - To prevent the entry of dirt or vermin into the product.
 - To allow for expansion and shrinkage of a lid as a result of changes in temperature.
 - To open and close the lid.
- 3 The lid includes a non-skid structure. This is important in preventing that a person should slip when the lid is wet or icy.
- 4 The lid includes Δ symbols indicating the direction for positioning the duct.
- 5 The lid is closed in a vandal-resistant manner by using 4 strong lid hooks in combination with 2 position ridges which lock the lid on to the duct. The slide-and-click system (MAX 3/H) ensures that the lid can only be removed when aware of how the fastening system works. No nails or screws are used (except for the MAX 2).
- 6 The lid includes a 1 mm ventilation slot for air circulation purposes at one of the crosscut edges.
- 7 The underside of the duct has a 5 mm honeycomb structure to strengthen the cable duct.
- 8 The bottom of the cable duct has drainage openings.
- 9 The side wall of the cable duct is partially double-walled to ensure sagging is highly unlikely.
- 10 The side wall of the cable duct has a few holes to discharge the potential upward pressure of groundwater.
- 11 The side wall of the cable duct has horizontal stabilising partitions. These partitions take care of the downward pressure if the cable duct is laid in the ground. Sand or other material is pressed down above these partitions to ensure that the cable duct does not move upwards due to vibration.
- 12 The duct has a dovetail connection to link one duct to another. A click connection in the dovetail prevents the cable ducts from moving away from each other due to subsidence or if the foundation rough grading was not sufficient when laying the cable ducts.
- 13 The cable duct has preperforated openings at the sides to lead cables in or out.

3 Use of the plastic cable duct

3.1 Application area

Plastic cable ducts are mainly used in the following industries:

- Signalling
- Telecommunications
- Energy supply
- Point heating
- Lighting
- Water pipes
- Gas pipes

4 Laying of the plastic cable duct

4.1 General

The plastic MAX cable duct is meant to be laid in the ground. The soil structure can consist of sand, earth, ballast, etc.

The cable duct is laid according to specific procedures which differ according to the soil structure (also refer to section 4.7).

Namely - Sandy ground
- Ballast ground

4.2 Required tools

- Shovel or minidigger to dig the trench.
- Broom.
- Installation toolkit with at least span wire, rubber and steel hammer, saw and lid lifting jack and possibly torx screws and torx keys.

4.3 Processing temperature

The plastic cable duct may only be laid when the environmental temperature is higher than 5°C. Prevent striking or dropping of the cable ducts and lids when the cable ducts are laid at the lower range temperatures (especially between 5 and 10°C).

4.4 Guidelines

The following aspects are to be considered guidelines when laying and after laying the plastic cable products.

- The cable duct alignment may not be used as a route for cars.
- The top of the lid should be laid at ground level.
- The ducts should be correctly slid into each other to ensure a stable cable duct alignment.
- The cable duct should be supported using (concrete) tiles at the crosscut cable duct edges when the foundation is uneven (for example, ballast soil).

4.4.1 Railway crossing

The following guideline is applicable to railway crossings due to the higher risk of vandalism (depending on the customer):

- Within a distance of 100 metres from a railway crossing each lid should always be fastened with two torx screws (in the two flat sections of the upper part of the lid, at the side where the lid overlaps).

4.4.2 Bends

Bends should be used when the specific angular displacement in the alignment cannot be laid using the standard cable ducts.

The following corner cable ducts are available (also refer to H.5):

- Horizontal bends for standard bends at ground level. This concerns standard bends with an angular displacement of 15°, 30°, 45° and 90°.
- Horizontal branch (T-piece) for standard branches (90°) at ground level.
- Horizontal bend and branch (T-piece) with radius for bends at ground level. This concerns bends and branches for cables with a large bending radius that cannot be laid using a standard bend.
 - The standard design of the MAX 2 T-piece has a maximum radius of $R = 30$ cm.
 - The standard design of the MAX 2 90° bend has a maximum radius of $R = 54$ cm.
 - The standard design of the MAX 3/H T-piece has a maximum radius of $R = 44$ cm.
 - The standard design of the MAX 3/H 90° bend has a maximum radius of $R = 54$ cm.
(the indicated radius is the bending radius at the external side of the cable. Also refer to H 8, annexes 7 and 8).
- Vertical bends for standard bends starting from ground level downwards. This concerns standard bends with an angular displacement of 15° and 30°. The exact angular displacement depends on the type of cables.
- Cable crossings where the cable ducts cross at a right angle over or under (also refer to H 8, annexes 7 and 8).

The horizontal standard bends, bends with branches and bends with radius are available in left and right models. Left and right are always determined from the direction that the cable ducts are laid. Take this into account when taking stock of the available material on site.

The vertical bends are universal bends.

4.6 Work method

The procedure to lay the cable ducts is included in an annex.

It is important to select the correct laying instructions for the soil structure on site.

A) Short overview of the procedure for **sand soil** (also refer to H8, Annex 1)

1. Dig the trench as accurately as possible either manually or by using a machine. The trench dimensions are 45 x 24 cm (width x height, excl. the thickness of the undertile) for the MAX 3/H and 31 x 24 cm (width x height, excl. the thickness of the undertile) for the MAX 2. Remove all (larger) stones.
2. Loosen approximately 5 cm of the soil using a shovel or similar tool to ensure the cable duct can be pressed down sufficiently (for stability purposes).
3. Place a span wire of sufficient length to ensure the trench is straight. The span wire should be spanned at ground level. This means approximately 20 cm above the bottom of the trench. A laser can, naturally, also be used.
4. Place the 1st cable duct in the trench. Take the direction in which the cable ducts are laid into account. It should be possible to slide the 2nd cable duct from above into the previous cable duct. Ensure that the cable duct is sufficiently slid into the previous cable duct. The cable ducts should click into each other (via the mounting ridge). The upper part of the cable duct should be level with the span wire. Use a rubber hammer to lower the cable ducts if required. Hammer only on the edge of the cable duct, not the bottom of the cable duct!
5. Use the shovel to add enough sand under the horizontal (stabilising) partitions. The cable ducts are now firmly laid in the ground and cannot subside.
6. Add sand up to the upper part of the cable duct and compact the sand with your foot (tamp down). If you use a machine, ensure you do not damage the upper edge of the cable ducts.
7. Clean the cable duct using a broom and lay the required cables and pipes.
8. Place the lid in the direction the cable ducts are laid (refer to the arrows on the lid) on the MAX 3/H cable duct making sure that the four hooks are in the cable duct recesses. Use your foot to slide the lid in the direction that the cable ducts are laid to ensure that the lid hooks into the cable ducts (press the centre of the lid downwards). The lid is correctly placed when the two positioning ridges fall into the recesses.

B) Short overview of the procedure for **ballast** foundation (also refer to H 8, annex 2)

1. Dig the trench as accurately as possible either manually or using a machine. The trench dimensions are 45 x 24 cm (width x height, excl. the thickness of the undertile) for the MAX 3/H and 31 x 24 cm (width x height, excl. the thickness of the undertile) for the MAX 2. Remove all (larger) stones.
2. Place a concrete or plastic 30 x 30 x 5 cm undertile in the trench in such a way that there is a tile under the transition from one cable duct to the next; that is, a tile every metre. (The cable ducts cannot subsidize.)
3. Check the placing of the tiles using a spirit level to ensure the trench is straight. A laser can, naturally, also be used.
4. Place the 1st cable duct in the trench. Take the direction in which the cable ducts are laid into account. It should be possible to slide the 2nd cable duct from above into the previous cable duct. The cable ducts should click into each other (via the mounting ridge). The upper part of the cable duct should be level with the span wire.
5. Add ballast, gravel or similar up to the upper level of the cable duct.
6. Clean the cable duct using a broom and lay the required cables and pipes.

7. Place the lid in the direction the cable ducts are laid (refer to the arrows on the lid) on the MAX 3/H cable duct making sure that the four hooks are in the cable duct recesses. Use your foot to slide the lid in the direction that the cable ducts are laid to ensure that the lid hooks into the cable ducts (press the centre of the lid downwards). The lid is correctly placed when the two positioning ridges fall into the recesses.

General remarks:

- a) Bends or special cable duct pieces may be required under the following conditions:
- The cables go further underground at the beginning or at the end of a cable duct alignment.
 - The cables are split halfway through the cable duct alignment, for example the cables go to a point.
 - A cable duct has to be shortened to fit the alignment.
 - The alignment crosses (at a right angle) an existing cable duct alignment.
- b) The standard cable duct alignment may, without using bends, be laid as follows (using the available tolerance in the dovetail connection):
- The (vertical) deviation may not be greater than 5 cm over a continuous distance of five metres (from ground level upwards or downwards).

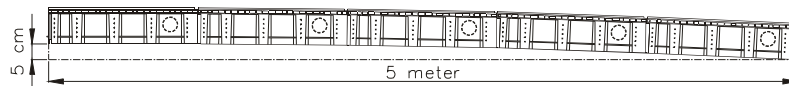


Figure 5 Lateral view of the vertical deviation

- The (horizontal) deviation may not be greater than 25 cm over a continuous distance of five metres.

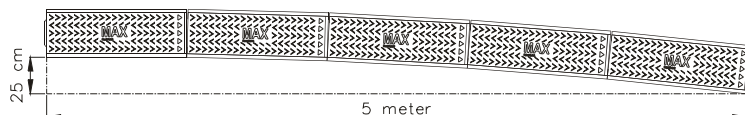


Figure 6 View from above of the horizontal deviation

- c) Two steel screws are used for the MAX 2 cable duct. The cable duct and the lid already have the required recesses for these screws.

4.7 Special details when mounting the cable duct

The following special conditions may be applicable when laying a cable alignment:

- 1) Coupling piece to shorten the cable duct (also refer to H 8, annex 4).
When the cable duct has to be shorter than the standard one metre, the cable duct can be shortened using a manual saw. Remove the central section of the cable duct. Both ends are required and cannot be removed.
- 2) Take the possible expansion or contraction of the cables and pipes to be laid due to internal and/or external temperature influences (heat developed by the cables / solar energy) into account. At least the following aspects are important:
 - The temperature during the laying of the cables and pipes.
 - Expansion coefficient for the cables and pipes.
 - Length of the cables and pipes.
 - Remaining available space in the cable ducts after the cables and pipes have been laid.
- 3) The plastic MAX duct has preperforated leadthroughs to lead cables in or out at the sides (or along the bottom of the duct). This leadthrough has a standard diameter of 100 mm. A plastic flexible tube may be fitted and fixed to this.
- 4) At crossings of cable ducts these need to pass one over the other. This may be implemented by using a combination of bends (also refer to Ch. 8, Annexes 7 and 8).
- 5) The ends of the MAX duct can be sealed by applying end plates which prevent the entry of dirt. At one end this is a trapezoidal plate which slides into the dovetail. On the other side there is a seal using a rectangular plate and two screws (also refer to sections 5.2 and 5.3).

4.8 Fitting and removing the lid

A lid can easily be fitted and removed (provided you are familiar with the instructions, also refer to Ch. 8, Annex 3).

Short overview of the procedure for fitting the lid

1. Place the lid on top of the duct in the proper direction (with the hooks into the duct recesses).
2. Use your foot to press the lid (in the centre) downwards slightly and slide the lid in one go in the lengthwise direction (the direction of the triangular symbols on the lid) to ensure that the lid hooks into the cable duct and that the position ridges fall into the duct recesses.
Do not apply any undue force.

Short overview of the procedure for removing the 1st lid

1. Place a metal lid lifting jack between the end of the duct and the lid (in the ventilation slot) in order to lift the lid by a few millimetres. The position ridges are pressed upwards.
2. Place the sharp end of a hammer between the other end of the lid and the adjacent lid.
3. Press the hammer on to the duct and, at the same time, twist the hammer a quarter turn in order to force the lid hooks from the duct.
4. Remove the lid manually.

Short overview of the procedure for removing the 2nd and further lids

1. Take hold of the end of the next lid and lift (position ridges from duct) and pull (hooks from duct) the lid in one go from the duct.

4.9

Separating duct

A separating duct can be fitted to physically separate certain cables from other cables. This separating duct can only be used in the MAX 3/H duct.

When separating, the separating ducts should be joined to one another by using a coupling element. This has to do with the possibility of a sparking voltage. When fitting the separating ducts, the possibility of expansion should also be taken into account (also refer to section 8, Annex 5).

→ At a processing temperature of approx. 0 °C, the separating ducts to be joined should be placed as far apart as possible (distance of approx. 60 mm).

→ At a processing temperature of approx. 30 °C the separating ducts to be joined should be placed as close apart as possible (distance of approx. 10 mm).

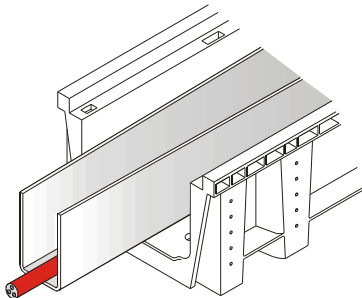
At intermediate temperatures an appropriate distance should be kept.

Specifications:

Type 1 separating duct	: outer dimensions 90x145 mm (WxH), 4 mm thickness
Type 2 separating duct	: outer dimensions 69x132 mm (WxH), 4 mm thickness
Standard length per separating duct	: 5 meters
Material	: Flame retardant plastic according to UL94V2
Coupling element	: 20 cm length incl. 4x slot hole

A separating duct is placed in the MAX duct unattached.

The coupling element is fixed to the separating duct using 4 plastic fasteners.



5

Ordering method

The plastic MAX duct materials may be ordered from:

Steelco-Teknikk AS

Kabelgata 1b

0580 Oslo

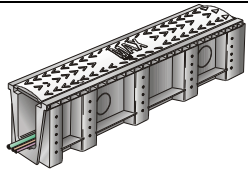
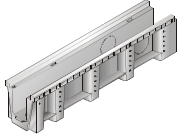
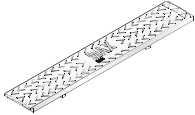
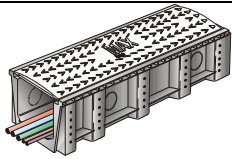
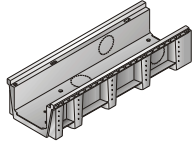
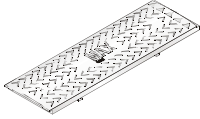
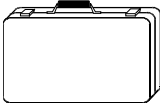

Tel: +47 21 38 49 10

Fax. +47 21 38 49 11

www.steelco.no

5.1

Order list of standard materials for the cable duct

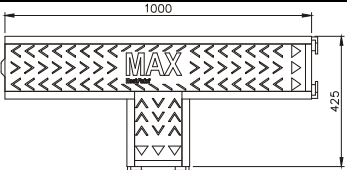
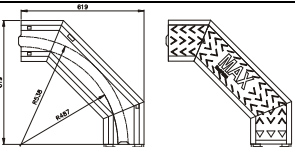
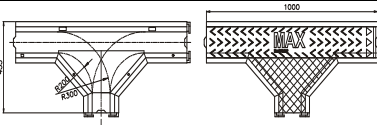
Pos.	Part number	Description of MAX 2 duct LEFT	Image
1	H802101100	Plastic duct type MAX-2 completely incl. lid.	
2	H802101115	Plastic duct type MAX-2 (without lid)	
3	H802101125	Plastic lid type MAX-2 (without duct)	
4	H803101100	Plastic duct type MAX-3/H completely incl. lid	
5	H803101115	Plastic duct type MAX-3/H (without lid)	
6	H803101125	Plastic lid type MAX-3/H (without duct)	
7	H810901200	Montage suitcase	
8	H810901250	Torx screws (per 100 pieces) to connect the lid (exclusively for railway crossing)	

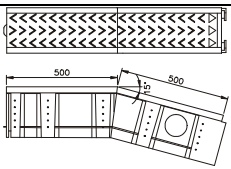
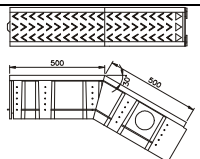
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


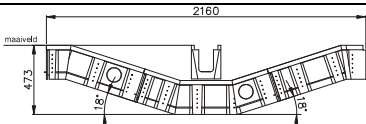
Optional ordering of special MAX 2 duct designs

Pos.	Part number	Description of MAX 2 duct LEFT	Image
1	H802201015	Horizontal MAX 2 bend with lid 15° LEFT in lengthwise direction incl. fastening materials	
2	H802201030	Horizontal MAX-2 bend with lid 30° LEFT in lengthwise direction incl. fastening materials	
3	H802201045	Horizontal MAX-2 bend with lid 45° LEFT in lengthwise direction incl. fastening materials	
4	H802201090	Horizontal MAX-2 bend with lid 90° LEFT in lengthwise direction incl. fastening materials	
5	H802401090	T-piece MAX-2 90° with splitting and lid LEFT in lengthwise direction incl. fastening materials	
6	H802201590	Horizontal MAX-2 bend 90° with radius LEFT in lengthwise direction incl. fastening materials (also refer to chapter 8, enclosure 7)	
7	H802401590	T-piece MAX-2 90° with splitting and radius LEFT in lengthwise direction incl. fastening materials (also refer to chapter 8, enclosure 7)	

Pos.	Part number	Description of MAX 2 duct RIGHT	Image
1	H802201115	Horizontal MAX 2 bend with lid 15° RIGHT in lengthwise direction incl. fastening materials	
2	H802201130	Horizontal MAX-2 bend with lid 30° RIGHT in lengthwise direction incl. fastening materials	
3	H802201145	Horizontal MAX-2 bend with lid 45° RIGHT in lengthwise direction incl. fastening materials	
4	H802201190	Horizontal MAX-2 bend with lid 90° RIGHT in lengthwise direction incl. fastening materials	

5	H802401190	T-piece MAX-2 90° with splitting and lid RIGHT in lengthwise direction incl. fastening materials	
6	H802201690	Horizontal MAX-2 bend 90° with radius RIGHT in lengthwise direction incl. fastening materials (also refer to chapter 8, enclosure 7)	
7	H802401690	T-piece MAX-2 90° with splitting and radius LEFT in lengthwise direction incl. fastening materials (also refer to chapter 8, enclosure 7)	

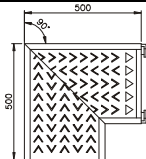
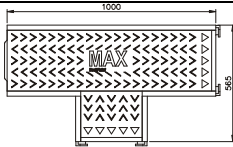
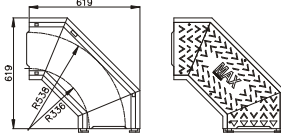
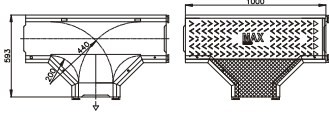
Pos.	Part number	Description MAX-2 duct	Image
1	H802301015	Vertical MAX 2 bend with lid 15° universal incl. fastening materials	
2	H802301030	Vertical MAX-2 bend with lid 30° universal incl. fastening materials	

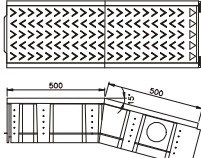
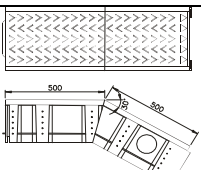
Pos.	Part number	Description MAX-2 sundries	Image
1	H802900100	End plate for MAX 2 duct type (trapezoidal)	
2	H802900110	End plate for MAX 2 duct type (rectangular, incl. 2 screws)	
3	H802900150	Coupling part for shortening MAX 2 duct	
4	H802401300	Crossing with MAX 2 consisting of 3 bends, incl. fastening materials (also refer to section 8, Annex 7)	



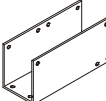
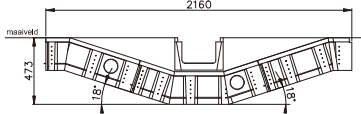
5.3 Optional ordering of special MAX 3/H duct designs

Pos.	Part number	Description MAX-3/H duct LEFT	Image
1	H803201015	Horizontal MAX-3/H bend with lid 15° LEFT in lengthwise direction incl. fastening materials	
2	H803201030	Horizontal MAX-3/H bend with lid 30° LEFT in lengthwise direction incl. fastening materials	
3	H803201045	Horizontal MAX-3/H bend with lid 45° LEFT in lengthwise direction incl. fastening materials	
4	H803201090	Horizontal MAX-3/H bend with lid 90° LEFT in lengthwise direction incl. fastening materials	
5	H803401090	T-piece MAX-3/H 90° with splitting and lid LEFT in lengthwise direction incl. fastening materials	
6	H803201590	Horizontal MAX-3/H bend 90° with radius LEFT in lengthwise direction incl. fastening materials (also refer to chapter 8, Annex 8)	
7	H803401590	T-piece MAX-3/H 90° with splitting and radius LEFT in lengthwise direction incl. fastening materials (also refer to chapter 8, Annex 8)	

Pos.	Part number	Description MAX-3/H duct RIGHT	Image
1	H803201115	Horizontal MAX-3/H bend with lid 15° RIGHT in lengthwise direction incl. fastening materials	
2	H803201130	Horizontal MAX-3/H bend with lid 30° RIGHT in lengthwise direction incl. fastening materials	
	H803201145	Horizontal MAX-3/H bend with lid 45° RIGHT in lengthwise direction incl. fastening materials	

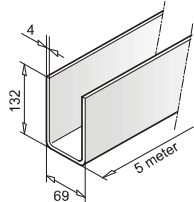
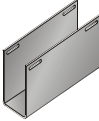

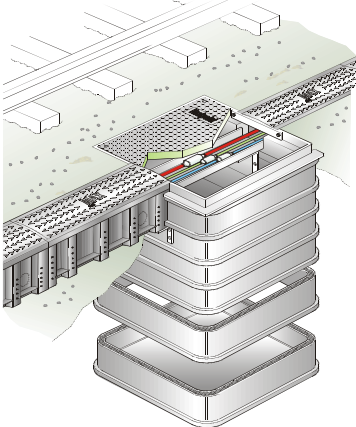
4	H803201190	Horizontal MAX-3/H bend with lid 90° RIGHT in lengthwise direction incl. fastening materials	
5	H803401190	T-piece MAX-3/H 90° with splitting and lid RIGHT in lengthwise direction incl. fastening materials	
6	H803501190	Horizontal MAX-3/H bend 90° with radius RIGHT in lengthwise direction incl. fastening materials (also refer to chapter 8, Annex 8)	
7	H803401690	T-piece MAX-3/H 90° with splitting and radius RIGHT in lengthwise direction incl. fastening materials (also refer to chapter 8, Annex 8)	

Pos.	Part number	Description MAX-3/H duct	Image
1	H803301015	Vertical MAX-3/H bend with lid 15° universal incl. fastening materials	
2	H803301030	Vertical MAX 2 bend with lid 30° universal incl. fastening materials	

Pos.	Part number	Description MAX-3/H sundries	Image
1	H803900100	End plate for MAX-3/H duct type (trapezoidal)	
2	H803900110	End plate for MAX 2 duct type (rectangular, incl. 2 screws)	
3	H803900150	Coupling part for shortening MAX-3/H duct	
4	H803401300	Crossing with MAX-3/H consisting of 3 bends, incl. fastening materials (also refer to section 8, Annex 8)	

5.4 Optional ordering of separating duct and accessories

Pos.	Part number	Description separating duct	Image
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1	H810200110	Seperation duct type 2, size: 69x132x5000mm (outside sizes)	
2	H810210120	Coupling element for type 2 separating duct	
3	H810050150	20 mm fastener for fitting the coupling element	
4	H501100100	Inspection pit for coupling to MAX-duct	

5.5 Shipment

The cable ducts are supplied in the following quantities per pallet (110x120 cm):

189 units of MAX 2 lids	90 units of MAX 3 lids
77 units of MAX 2 ducts	42 units of MAX 3 ducts

The pallets include sufficient plastic wrapping and tie-raps to prevent the material from shifting or falling.

A full lorry can ship a maximum of 24 pallets.

The quantities listed on the packing slip should match the actual quantities delivered. In case of deviations, this should be established upon delivery and noted on the return packing slip signed by the customer.

5.6 Storage and packing

Wooden pallets and packing materials become the property of the customer upon delivery and should be discarded by the customer in an environmentally friendly manner.

5.7 Inspection and completion

Prior to completion, special attention should be paid to the following aspects during the inspection:

- Damage and/or breakage of the duct and/or lid
- Secure fit of the lid on to the duct
- Use of the appropriate fasteners in bends and near railway crossings
- Proper application of the filling sand (or ballast) at the sides of the duct.

5.8 Guarantee

The guarantee period is for 12 months starting from the date of delivery (date on packing slip). In case of a defective products or parts, Steelco-Teknikk AS must receive written notification from the customer within 2 weeks of delivery.

The guarantee is void if the ducts and lids are not installed according to the instructions or have in any way been handled improperly.

6 Disposal instructions

The duct, lid and screws do not contain any environmentally hazardous substances and can therefore be disposed of easily and special instructions are not required.
It is also possible to recycle the materials and send them to a specialist processing company.

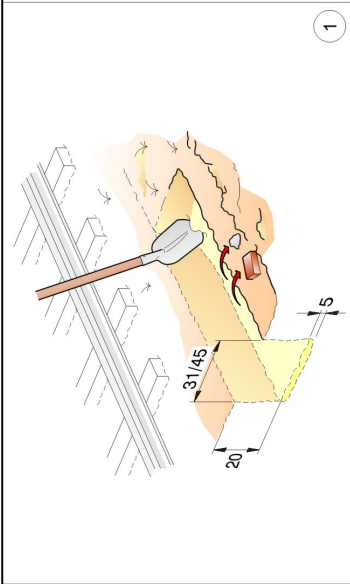
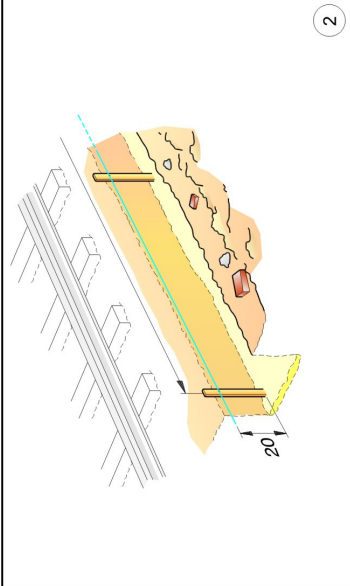
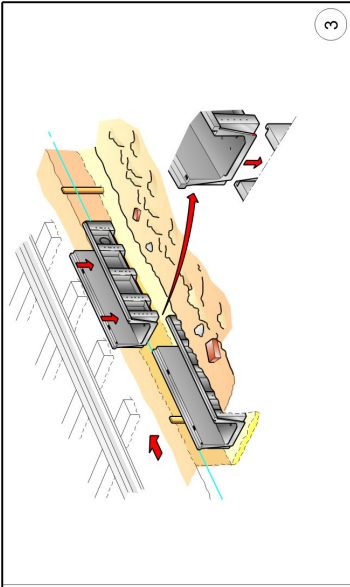
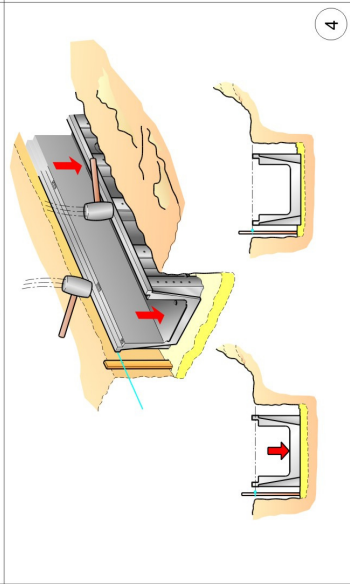
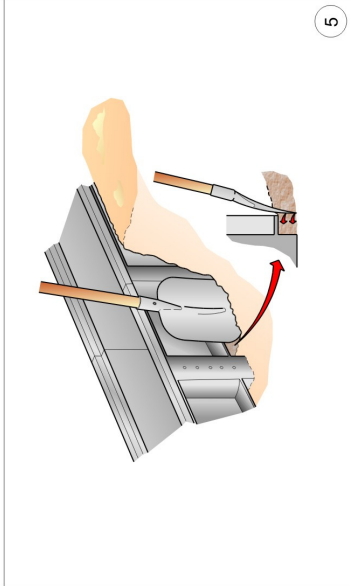
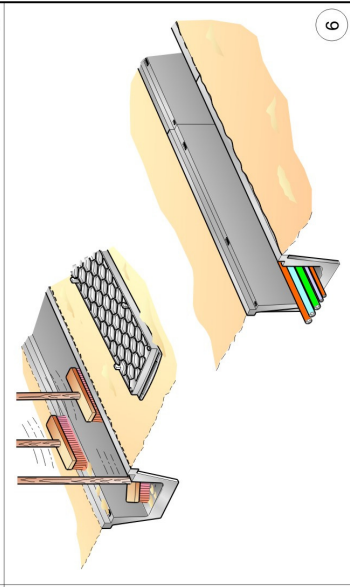
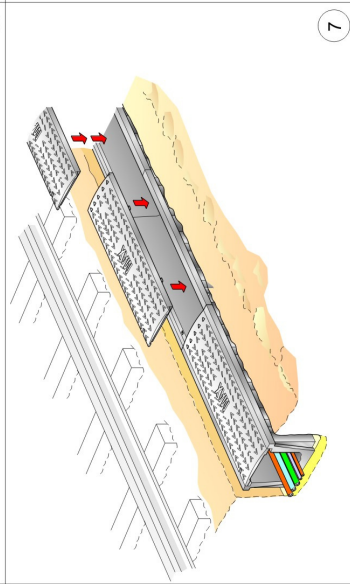
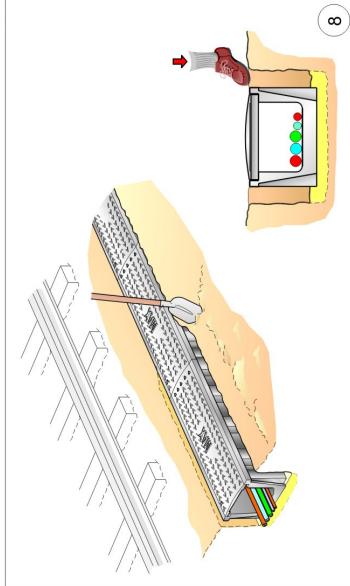
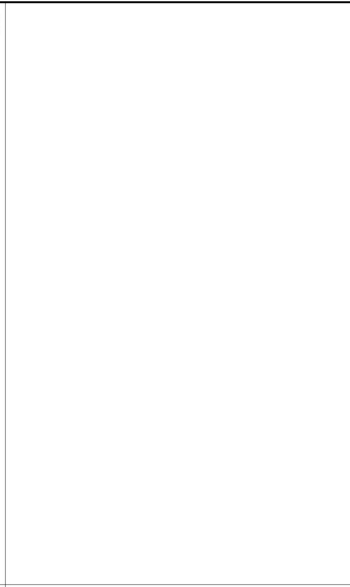

8

List of Annexes

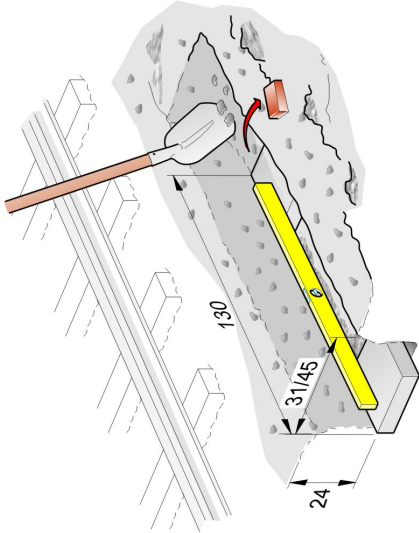
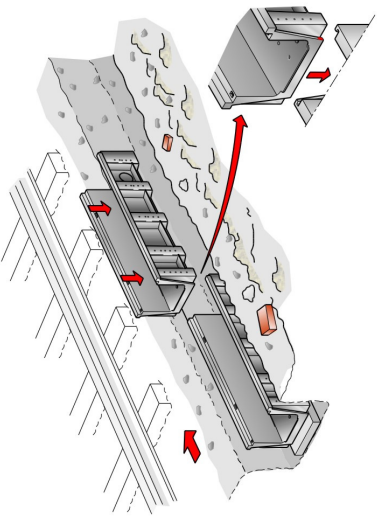
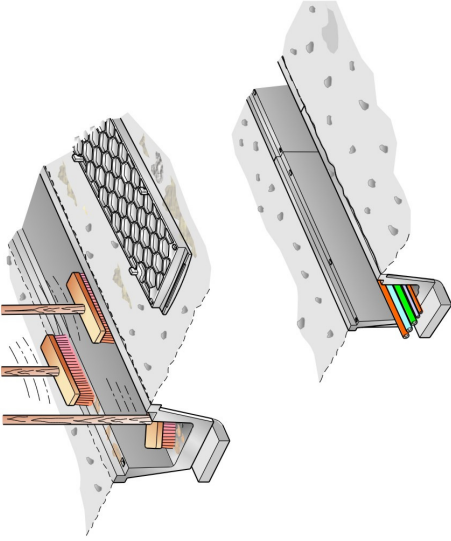
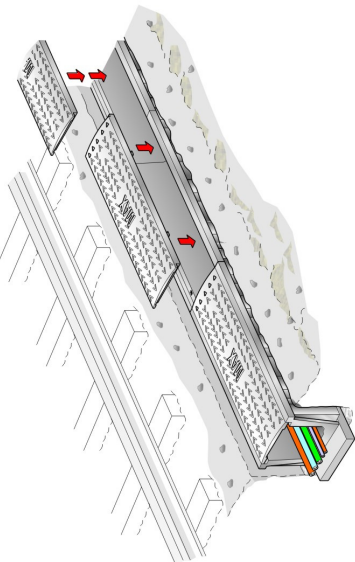
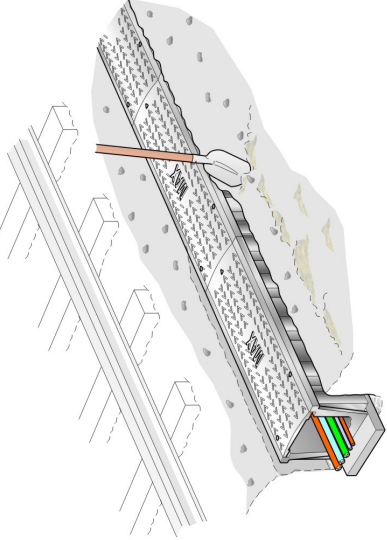

- 1 Installation instructions for MAX duct type in sandy soil
- 2 Installation instructions for MAX duct type in ballast
- 3 Fitting and removing the lid for the MAX duct type
- 4 Coupling piece for shortening MAX duct type
- 5 Separating duct with coupling element
- 6 Laying plan for plastic cable duct specials
- 7 MAX 2 bends (enlarged)
- 8 MAX 3/H bends (enlarged)

drawing H330515 version 1.3

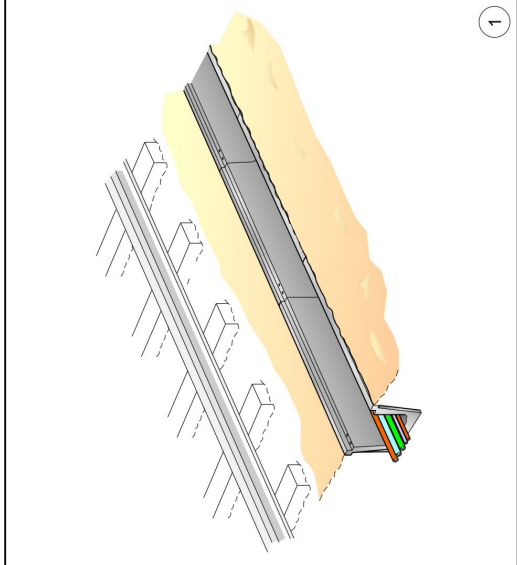
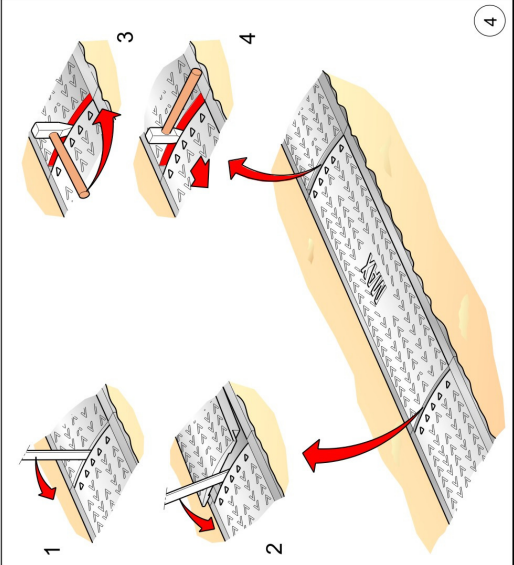

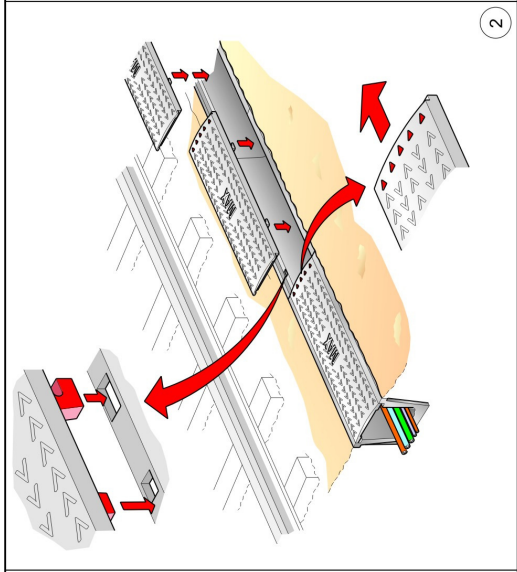
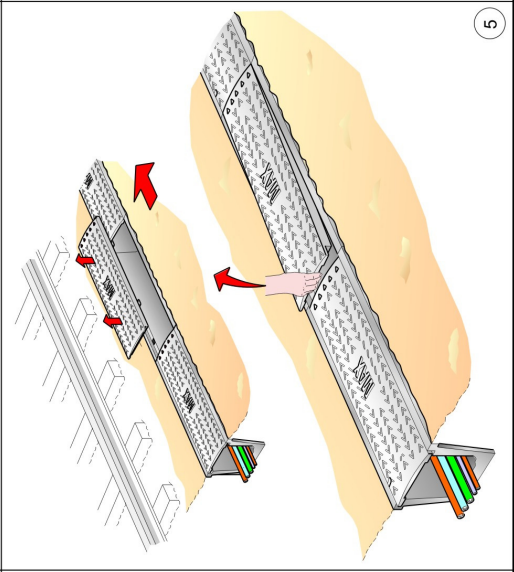
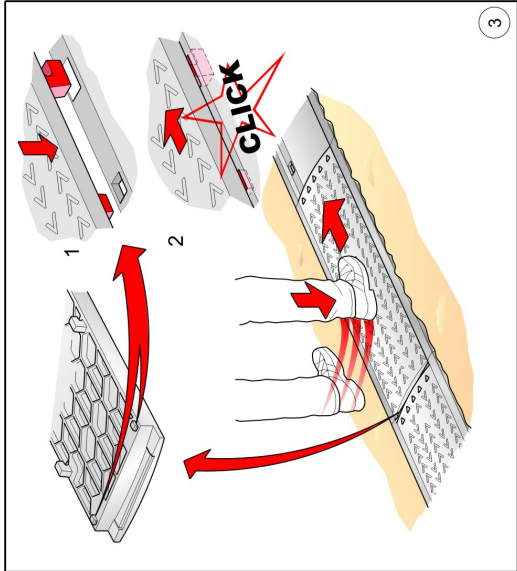
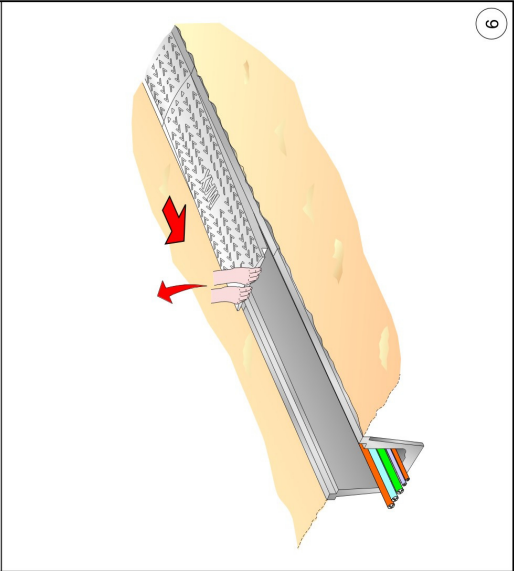
Annex 1 Installation instructions for MAX duct type in sandy soil

 <p>1</p>	 <p>2</p>	 <p>3</p>
 <p>4</p>	 <p>5</p>	 <p>6</p>
 <p>7</p>	 <p>8</p>	 <p>9</p>
 <p>Denemarkenweg 17 • 2411 RK Bodegraven • The Netherlands T: +31(0)172 651 006 • F: +31(0)172 651 410 • info@heatpoint.nl • www.heatpoint.nl</p>		
<p>Work method MAX-2 / MAX-3 duct for sand soil</p>		
<p>Scale: Drw.: VNPR.NL Drw. no.: H330515-ENG Version: 1,3</p>		
<p>Date: 25-06-2009 Format: A4 Material:</p>		

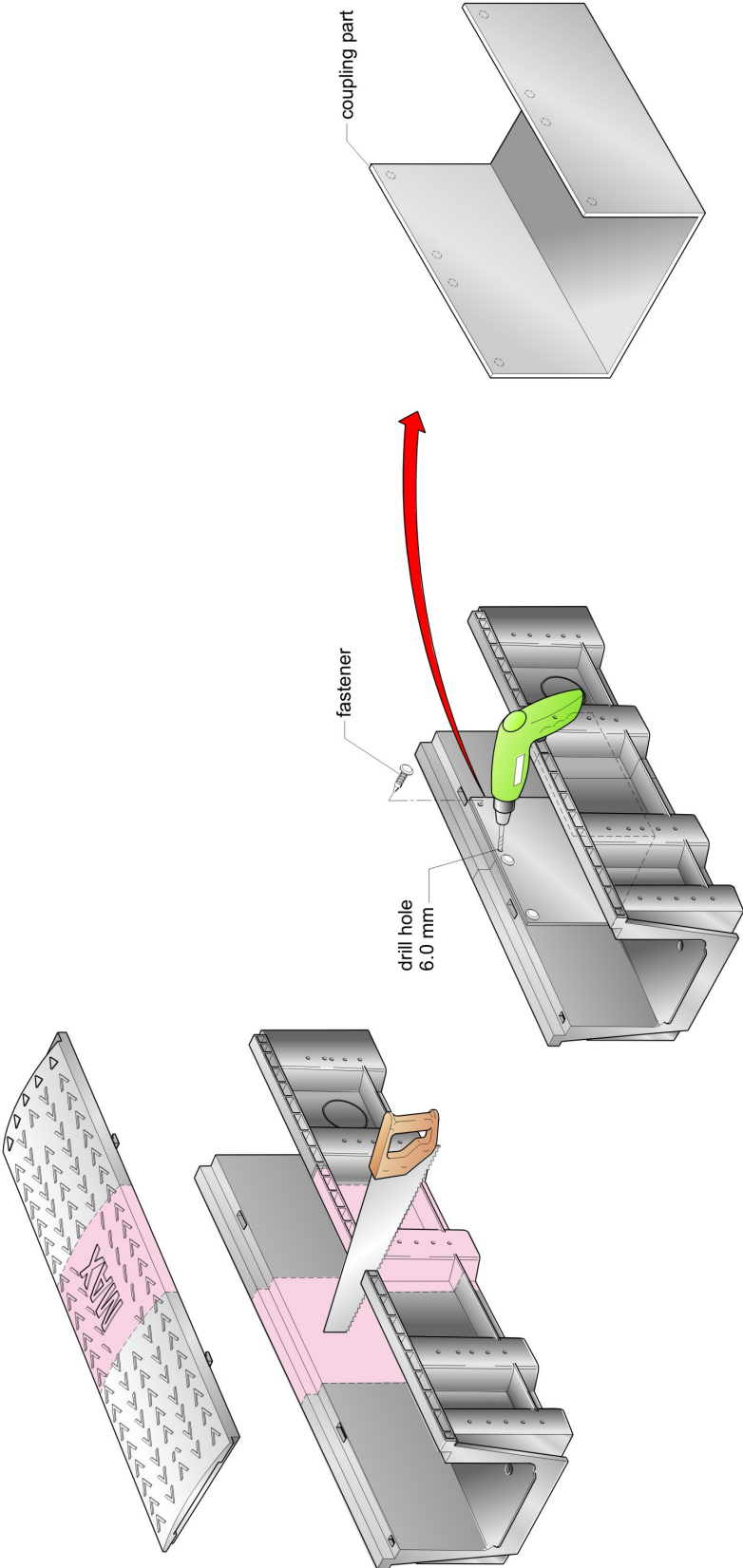

Annex 2 Installation instructions for MAX duct type in ballast

 <p>1</p>	 <p>2</p>	 <p>3</p>	 <p>4</p>	 <p>5</p>	<p>Scale: Drw.: VNPR.NL Drw. no.: H330525-ENG Version: 1,3</p>	 <p>Denemarkenweg 17 • 2411 RK Bodegraven • The Netherlands T: +31(0)172 651 006 • F: +31(0)172 651 410 • info@heatpoint.nl • www.heatpoint.nl</p>	<p>Work method MAX-2 / MAX-3 duct for ballast foundation</p>	<p>Date: 25-06-2009 Format: A4 Material:</p>
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Annex 3 Fitting and removing the lid for the MAX duct type

 <p>1</p>	 <p>2</p>	 <p>Denemarkenweg 17 • 2411 RK Bodegraven • The Netherlands T: +31(0)172 651 006 • F: +31(0)172 651 410 • info@heatpoint.nl • www.heatpoint.nl</p>
 <p>3</p>	 <p>4</p>	<p>Fitting and removing lid MAX duct</p>
 <p>5</p>	 <p>6</p>	<p>Scale: Drw.: VNPR.NL Date: 25-06-2009 Format: A4 Version: 1,2 Material:</p>

Annex 4 Coupling piece for shortening MAX duct type

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Annex 5 Separating duct with coupling element

coupling piece

fastener (4x)

separating duct

separating duct without attachment in MAX duct

coupling piece

10mm

30mm

Scale:

Drw.: VNPR.NL

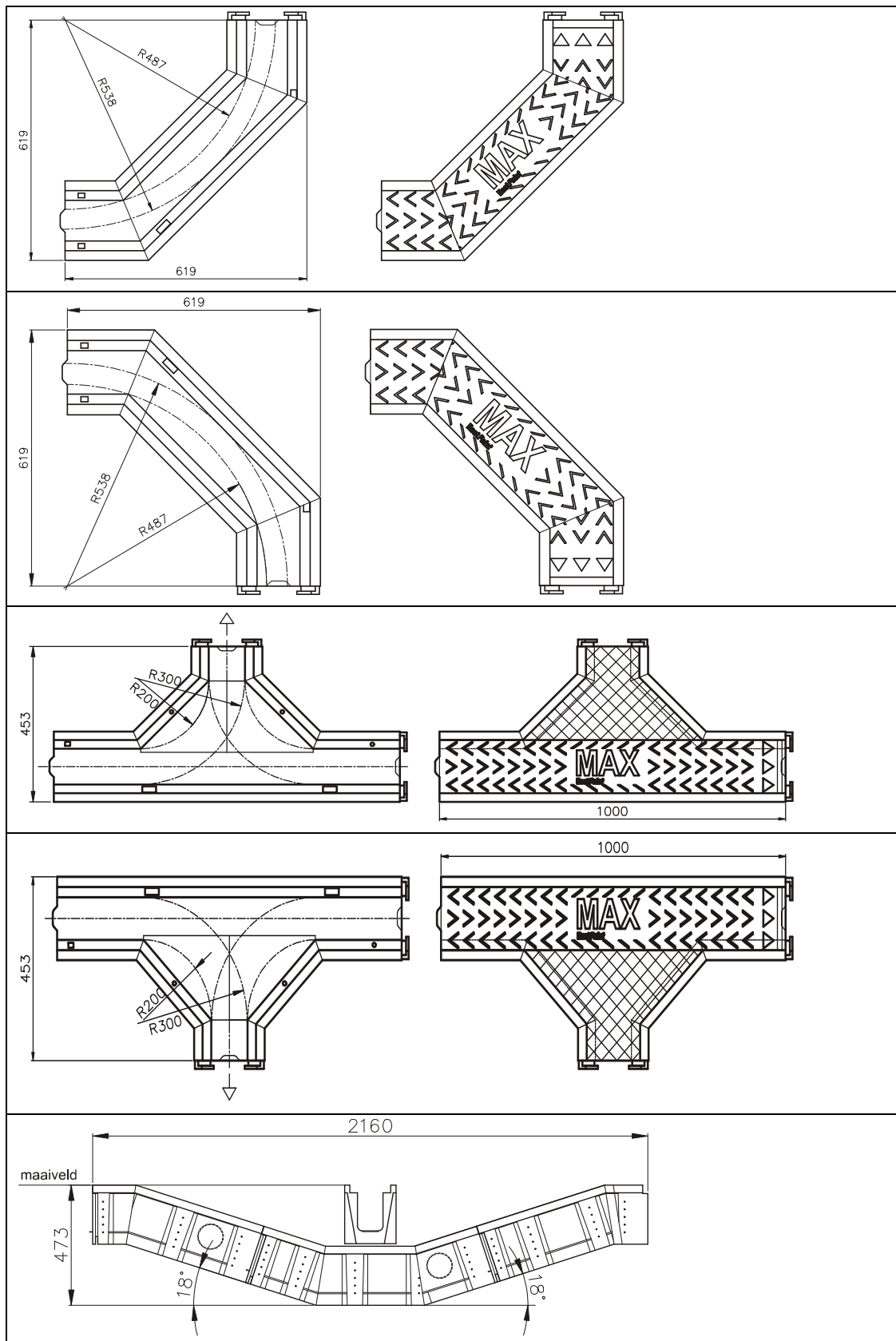
Dwg. no.: H331116-ENG

Version: 1,4

**SEPARATING DUCT
with
coupling piece**

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Annex 7 MAX 2 bends (enlarged)



Annex 8 MAX-3/H bends (enlarged)

