Panasonic®

For keeping

High-Tro-Reel Operation Manual

〈Non-Tension Type〉

The product-life is different in use conditions and the service space, however, It is possible to use it for about t 10 years by regularly maintaining and the regular service in correct construction.

- Before using, be sure to read through this Operation / Installation Manual and use the product correctly.
- After reading, keep this Operation / Installation Manual with you for your reference.
- Ask qualified electrician for troubleshooting and maintenance.
  Please be sure to show this Operation / Installation Manual to that engineer.
- We have quality, strive to improve reliability, however, It finally becomes difficult the continuing use due to the deterioration of the material.Deterioration is different in use conditions like the availability and the ambient environment, etc. butdegrading the year.
  In the worst case degradation is the cause of the fire burning. so we recommend early inspection and replacement.
  - For a long time - you use this product on your own, "Maintenance Table" Please always check regularly once a year based on the least.
  - If you have trouble checking in, please contact the electrician.
  - This product is an important asset - customers. Please check and the following things must be observed.
  - This product is an important asset of customers. Please check and understand the following text carefully.

  In addition, safety precautions, to the extent expected by the Company are listed.

Precautions on installation

Installation of the High-Tro-Reel must be performed only by a licensed electrician. To prevent injury or accidents, always pay attention to the following points.

⚠ Warning

- **Do not modify the Tro-Reel HS in any way.** Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- **Do not use where exposure occurs.** Otherwise, electric shock, fire or damage due to falling of equipment may occur
- **Use at ambient temperature -10 °C ~ 40 °C. If you use outside this temperature range, please contact Panasonic Corporation.**
- **If any abnormalities occur, turn off the power immediately and contact a qualified electrician for inspection and repair.**
  Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- **The replacement product is required for electrical worker qualifications.**
- **Do not use the collector shoes past replacement indication lines.**
  Otherwise, a unit may produce sparks, causing fire, poor contact or separation of collector arms from wires.
- **To prevent electric shock, be sure to turn off the power before starting any inspection.** Otherwise, electric shock may occur.
- **Be sure to do a pre-use test run of equipment and do periodic inspections.**
  Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- **When damage and crack occurred in the insulating sheath of the duct, please change the duct.**
  Otherwise sparking may occur, causing fire, poor contact, or derailing of the trolley, etc.

⚠ Caution

- **This product is for general indoor use only. Do not use this product for a damp place, a place where corrosive gas is generated or a place where cutting oil is directly splashed.** Electric shock, fire or damage due to equipment falling may occur.
- **Collector shoes use a dry lubrication system. Do not apply any other lubricants to the collector shoes or a unit's conductor surface.poor contact may occur.**
- **Traveling speed must be 120m/min. or less (60m/min.or less in guide caps mounting section). However, further restrictions may be necessary depending on the load and voltage types. for details, please contact Panasonic Corporation,**
  Otherwise, a unit may produce sparks, causing fire, poor contact or separation of collector arms from wires.
- **If products are not used for a long period of time, the unit's conductor surfaces may become oxidized, resulting in poor contact.**
  Clean the conductors before resuming operation and be sure to do periodic inspections to prevent fire or electric shock.
- **During the inspection, wear protective gear such as helmets and gloves. Observe may cause injury .**
- **When mounting the duct to the hanger, stuff a duct into a hanger not to pinch a hand. Observe may cause injury to your fingers.**
- **When remove the duct from the joiners, pull it out while holding the tip of the duct. so that the duct may not jump out from Joyner.**
  Observe, damage to the ducts, may cause injury.
- **When filing the ends of the duct, use protective gear such as glasses.** Otherwise, your finger may be injured.
- **Be sure to remove burrs using file after cutting, drilling.** Observe may cause injury to your fingers.
- **When replacing the current collector arm, Be sure that collector arms are mounted parallel to the duct unit with no twisting.**
  Failure to conform to this table may cause poor collector arm contact or separation from wires.
- **When replacing the collector, be sure to confirm the duct unit phase (R.S.T) before connecting the leads to the load.**
  Failure to do so may cause fire due to sparks.

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Panasonic®

保管用

HIGH-TRO-REEL 操作说明书

（非张力型）

使用条件、场所虽然不同，但是只要正确施工，并且进行定期检查及定期维护，就能使用10年左右。

- ■使用本产品前，务必仔细阅读本操作施工说明书，并按说明正确使用。
- ■务必妥善保管本操作施工说明书。
- ■本设备的故障处理等维护工作请委托电气施工单位。委托时务必将本操作施工说明书提供给对方。
- ■我公司长期以来致力于提高产品的质量及可靠性，但因部材的老化可能导致产品最终难以继续使用（使用寿命）。
  老化程度会因使用率、使用环境等使用条件的不同而不一样，但老化会年复一年持续。
  部材老化严重时，会导致烧毁以及火灾，因此建议时时进行检查并及时更换。
  - 为能够长期使用本产品，请用户务必根据“维护表”进行定期检查。
  - 检查时如发现问题，请与电气施工单位联系。
  - 本产品是用户的重要财产，在检查的同时务必遵守以下事项。

  （本手册包括我公司所能设想的安全注意事项）

安全使用时的注意事项 务必遵守

为防止人身伤害及财产损害，以下就务必遵守事项加以说明。

⚠警 告

禁 止

- ●绝对不能对本产品进行改造。
  否则可能导致触电、火灾以及坠落事故。
- ●请勿在可能结露的场所使用。
  否则可能导致触电、火灾以及坠落事故。

务必遵守

- ●在环境温度为－10℃～40℃时使用。在上述以外情况下使用时，请咨询本公司。
- ●一旦发生异常，需迅速切断电源，联络电工技术人员，委托其进行处理，并向其提供本操作施工说明书。否则可能导致触电、火灾以及坠落事故。
- ●更换产品时，施工人员必须具备电工技术人员资格。
- ●不能使用超过磨损警戒线的集电子。
  否则可能因电火花而导致火灾、接触不良以及集电臂的脱轨等事故。
- ●检查时，务必切断电源后进行检查。否则可能导致触电。
- ●必须进行试运转、定期检查。检查后必须进行试运转。
  否则可能导致触电、火灾以及坠落事故。
- ●本体绝缘护套破损或有裂纹时，须更换本体。
  否则可能因电火花而导致火灾、接触不良以及集电臂的脱轨等事故。

⚠注 意

禁 止

- ●本产品为室内专用产品。请勿在湿气较重、有腐蚀性气体产生以及直接接触切削油等场所使用。
  否则可能导致触电、火灾以及坠落事故。
- ●集电子为干式润滑方式的集电子，因此需将其他润滑剂涂抹在集电子及本体的导体表面。
  否则可能导致接触不良。

务必遵守

- ●长期不使用时，本体的导体表面会被氧化，可能导致接触不良，因此使用前必须进行导体清洁及定期检查。
  否则可能导致触电、火灾事故。
- ●检查时务必佩戴安全帽及手套等防护用具。否则可能受伤。
- ●将本体安装在吊夹上时，须将本体插入吊夹以防夹手。否则可能导致手指受伤。
- ●将本体从连接件上拆卸下时，本体可能会顺势脱出，因此须在压住本体前端的同时抽出。
  否则可能导致本体破损、划伤。
- ●在进行本体末端加工时，须佩戴眼镜等防护用具。否则可能对眼睛造成伤害。
- ●进行切断、开孔加工之后，须使用电工刀或锉刀等去除切断面上的毛刺。
  否则可能导致手指受伤。
- ●更换集电臂时，集电臂须与本体平行，且不能弯曲。否则可能导致接触不良、集电臂的脱轨等事故。
- ●在更换集电子以及将导线与负载连接时，须确认本体的相位（R·S·T）后再进行接线。
  否则可能因电火花而导致火灾事故。
- ●产品须在行进速度为 120m/ 分以下时（安装导向盖的部位为 60m/ 分以下）使用。
  但会因现场负载以及电压种类不同而有所限制。详情请咨询本公司。
  否则可能因电火花而导致火灾、接触不良以及集电臂的脱轨等事故。

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■HIGH-TRO-REEL（非张力型）的维护计划

使用条件、场所虽然不同，但是只要能够正确施工、定期检查和定期维护，就能使用10年左右。

请以本维护计划为基准，根据维护表进行检查。
具体检查项目请参照维护表。

电气施工单位进行的维修

开始使用　5年　10年

本 体	・导体表面有无明显污渍（3～6个月）→使用导体清洁器或擦机布等进行清扫。 ・确认本体有无弯曲现象（3～6个月）→修正。 ・确认本体有无从吊夹脱落（3～6个月）→将本体安装在吊夹上。 ・确认绝缘护套有无裂纹、缺口（3～6个月）→更换本体。	产品更换建议
连接件 中心馈电连接件	・确认固定螺丝有无松动（3～6个月）→拧紧。 ・确认树脂部有无破损（3～6个月）→更换产品。	
吊夹 导向盖 绝缘片	・确认固定螺丝有无松动（3～6个月）→拧紧。 ・确认树脂部有无破损（3～6个月）→更换产品。	
集电臂	・确认安装螺栓有无松动（1～3个月检查1次）→拧紧。 ・确认有无磨损至集电子的磨损警戒线（1～3个月）→ 如果已经磨损至磨损警戒线，则需更换集电子。 ・确认弹簧、旋转轴有无破损（1～3个月）→ 有破损或异常时，须更换产品。	

■试运转・定期检查

请注意

●※试运转时的检查项目。（进行定期检查时也请对这些项目进行检查）
●为了安全使用，建议正式运行后，1个月检查一次。
●检查周期请根据稼动率以及周围环境等，以下列检查周期为基准自行设定（每年至少1次以上）。

结果		处理	
	○：无异常		○：需更换
	●：有异常		●：已更换
			△：需调整
			▲：已调整

名称		检查日期	年　月　日	检查员	

名称	检查内容	处理・对策	※试运转	结果	处理	检查周期（基准）
本体	导体表面有无附着异物或明显污渍	用专用清洁器或擦机布等进行清扫				集电臂 流通次数为100万次
	导体表面有无电弧划痕	有电弧划痕时，用锉刀等去除后，再用细砂纸等打磨 ※无法修正时，请更换本体				
	绝缘护套有无破损和裂纹	绝缘护套前端的厚度小于1.1mm时，请进行更换	○			
	本体弯曲起伏是否在公差内 ・弯曲允许尺寸：基准±5mm ・起伏允许尺寸：基准±3mm	请修正到公差内尺寸 ・调整本体长度或连接件的位置 ・调整吊夹的安装位置	○			
	本体有无明显扭曲、弯曲	修正明显的扭曲、弯曲 ※无法修正时，请更换本体。	○			
	本体有无从吊夹脱落或脱轨	有脱落或脱轨时，确认吊夹的状态后重新安装	○			
	导体的磨损量是否适度 ・导体磨损量在0.5mm以下	导体的磨损量超过基准值时，请更换本体 如果可能在下次维护前达到基准值，也请提早更换				
	绝缘护套和集电子旋转轴（树脂部分）有无相互干扰	请确认本体导体和集电子的磨损情况，必要时进行更换				
连接件（中心馈电连接件）	树脂部有无破损和裂纹	有破损和裂纹产生时，需更换产品				
	固定螺丝有无松动	拧紧	○			
	导体之间的安装尺寸是否合适 ・10℃以下：5～13mm ・11℃～40℃：3～10mm	请调整到合适的间距尺寸 ・调整本体长度或连接件的位置 ・调整吊夹的安装位置	○			
	连接件的安装尺寸是否合适 ・10℃以下：3003mm ・11℃～40℃：3000mm	请调整到合适尺寸	○			
	本体切断及末端加工尺寸是否合适 ・本体切断尺寸：连接件之间的尺寸（中心尺寸） 对于L："L-3mm" ※中心馈电连接部位也相同 ・末端加工尺寸：距导体表面27.5mm 去除绝缘护套	请调整到合适尺寸	○			
	本体导体及表层是否确实插入	将本体插好	○			
吊夹	吊夹的安装间距是否合适 ・直线部分：400mm以下 ・曲线部分：400mm以下	修正到合适的安装间距	○			
	固定螺丝有无松动	拧紧	○			
	吊夹有无破损和裂纹	有破损和裂纹产生时，需更换产品	○			
导向盖	树脂部有无破损和裂纹	有破损和裂纹产生时，需更换产品	○			
	树脂部的磨损量是否适度 ・树脂磨损量在0.5mm以下 ※导体滑动面没有从导向盖滑动面突出去。而且集电子的流通次数以500万次为基准。	导向盖树脂部的磨损量达到0.5mm以上时，请进行更换				
	固定螺丝有无松动	拧紧	○			
	导向盖之间的安装尺寸是否在公差范围内 ・导向盖之间的间隙：10～20mm ・水平方向：2mm以下 ・垂直方向：2mm以下 ※转向架负载重物时及无负载（无重物）时都在以上范围内	修正到公差范围内尺寸	○			
	导向盖之间的间隙尺寸是否合适 ・10～20mm	调整到合适的间隙尺寸	○			

名称	检查内容	处理・对策	※ 试运转	结果	处理	检查周期 （基准）
绝缘片	树脂部有无破损和裂纹	有破损和裂纹产生，需更换产品	○			集电臂 流通次数为 100 万次
	固定螺丝有无松动	拧紧	○			
	不需要信号线时，电线末端有无用绝缘胶带绝缘	将电线末端用绝缘胶带绝缘，以免妨碍集电臂的行进	○			
集电臂	集电臂的可动范围是否合适 ·单级型（角棒用）、串联型（角棒用） 从导体滑动面到安装角棒中心： 55mm ～ 75mm 以内 ·串联型（用平板） 从导体滑动面到安装板表面： 55mm ～ 75mm 以内 ·单级型（无座板） 从导体滑动面到安装板表面： 50mm ～ 70mm 以内	请将从集电臂基准面到本体导体滑动面的间距修正到基准值以内	○			集电臂 行进距离为 3000km
	集电子的安装部与本体的中心是否吻合 ·安装公差：中心 ±3mm	修正到中心位置	○			
	集电臂是否与本体平行，且无弯曲	使集电臂与本体平行安装	○			
	集电子的磨损是否已到磨损警戒线或行进距离是否超过 2 万 km	已磨损到磨损警戒线，即使只磨损了一部分或者行进距离超过 2 万 km，也请更换集电臂 如果在下次维护前可能到达磨损警戒线，也请提早更换				
	集电子表面有无附着异物、明显污渍或毛刺	用擦机布或砂纸等清除				
	集电子有无电弧划痕	用锉刀等打磨				
	集电子的树脂部有无磨损	调整集电臂的安装尺寸已有明显磨损时，请更换集电子				
	集电子移动是否顺畅	不顺畅时，请更换集电子或集电臂	○			
	集电臂有无弯曲、变形等异常	有异常时，请更换集电臂	○			
	弹簧有无缺口、破损	有缺口、破损时，请更换集电臂	○			
	集电子导线有无余裕	请不要给集电子增加负载，保持导线松弛	○			
	导线绝缘护套有无破损	有破损时，请更换集电臂	○			
	集电臂的固定螺丝及端子螺丝有无松动	拧紧	○			
	导线的连接端子位置（R·S·T·E 及信号线）是否正确	请重新拧紧连接端子	○			
全体	进行上述确认后，再确认绝缘电阻。 使用电压在 300V 以下时， ·对地电压 150V 以下：0.1MΩ以上 ·对地电压 150V 以上：0.2MΩ以上 使用电压在 300V 以上时，绝缘电阻则为 0.4 MΩ 以上					集电臂 流通次数为 100 万次

Panasonic® HIGH-TRO-REEL 施工说明书
（非张力型）

■施工前，务必仔细阅读本操作施工说明书，并安说明正确施工。
■本产品的施工人员，须具备电工技术人员资格。
■施工结束后请将本操作施工说明书交给保全负责人保管。

安全使用时的注意事项 务必遵守

为防止人身伤害及财产损害，以下就务必遵守事项加以说明。

⚠警 告

禁 止

●**绝对不能对本产品进行改造。**
否则可能会导致触电、火灾以及坠落事故。
●**请勿在可能结露的场所使用。**
否则可能会导致触电、火灾以及坠落事故。

务必遵守

●**在环境温度为－10℃～40℃时使用。**
在上述以外情况下使用时，请咨询本公司。
●**本产品的施工需遵循电气设备技术标准。在电源一次侧需使用合适的过电流断路器。**
●**按照本操作施工说明书正确施工。**
施工不当，可能导致触电、火灾以及坠落事故。

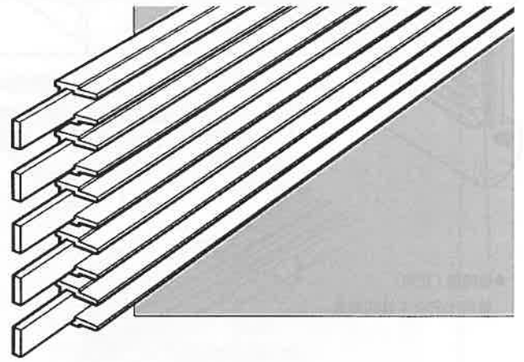
⚠注 意

禁 止

●**本产品为室内专用产品。请勿在湿气较重、有腐蚀性气体产生以及直接接触切削油等场所使用。**
否则可能导致触电、火灾以及坠落事故。

务必遵守

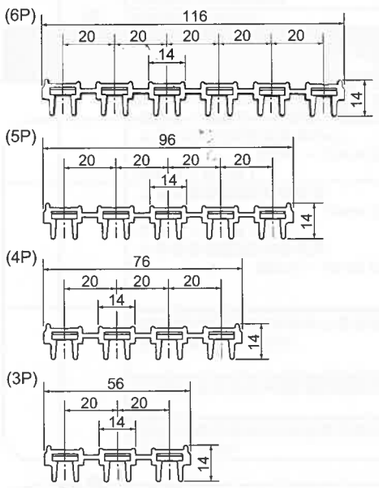
●**施工时本体的开口部须向下或横向。**
如果开口部向上，可能因电火花而导致火灾、接触不良以及集电臂的脱轨等事故。
●**本体绝缘护套出现破损和裂纹时，须更换本体。**
否则可能因电火花而导致火灾、接触不良以及集电臂的脱轨等事故。
●**将本体安装进吊夹时，须将本体插入吊夹以防夹手。**否则可能导致手指受伤。
●**将本体从连接件或导向盖上拆卸下时，本体可能会顺势脱出，因此须在按住本体前端的同时抽出。**
否则可能导致本体破损、划伤。
●**对本体末端加工时，须佩戴眼镜等防护工具。**否则可能对眼睛造成伤害。
●**进行切断、开孔加工之后，须使用电工刀或锉刀去除切断面上的毛刺。**
否则可能导致手指受伤。
●**请在标示的额定、负载电容的范围内使用。**如果超出范围，可能导致烧损或火灾事故。
●**本产品需牢牢固定在营造材料上之后才能铺设。**否则可能导致火灾、坠落事故。
●**安装本产品的营造材料需牢牢固定。**否则可能导致坠落事故。
●**务必使用接地用的本体与地线连接。**



HIGH-TRO-REEL（非张力型）施工方法

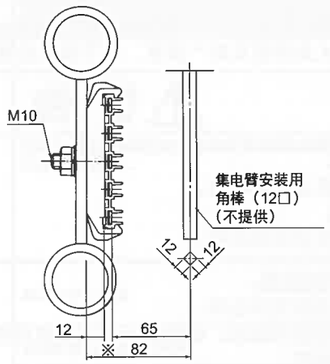
（施工说明图以 3P 为例进行说明。4P・5P・6P 也同样适用。）

●断面尺寸图　（单位：mm）

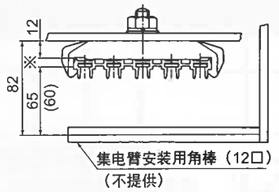


标准安装方法（5P）　（单位：mm）

●标准铺设



●水平铺设



（ ）内的尺寸是集电臂（无座板）用的尺寸，安装在集电臂安装板上。
※标记为 HIGH-TRO-REEL 的导体滑动面的尺寸。

●绝缘片
用于在线体中设置异电压区域。

●集电臂
移动的同时并集电。请在行进速为 120m/ 分以下（安装导向盖部位为 60m/ 分）时使用。
1P 600V 30A（单级型）
1P 600V 60A（串联型）

●中心馈电连接件
同时进行本体的连接与外部电源的供电。

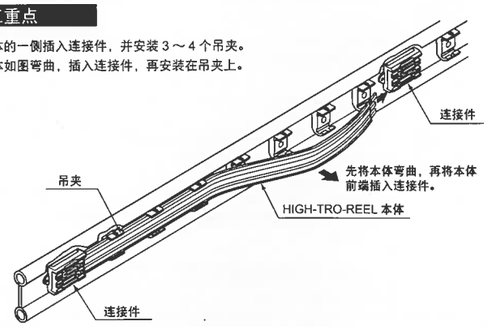
●HIGH-TRO-REEL（非张力型）本体
3P・4P・5P・6P 600V 60A 标准长度为 3m

●吊夹
以 40mm 的间距将本体固定在轨道一侧。

●导向盖（直角）
兼用作闭合末端的端盖。

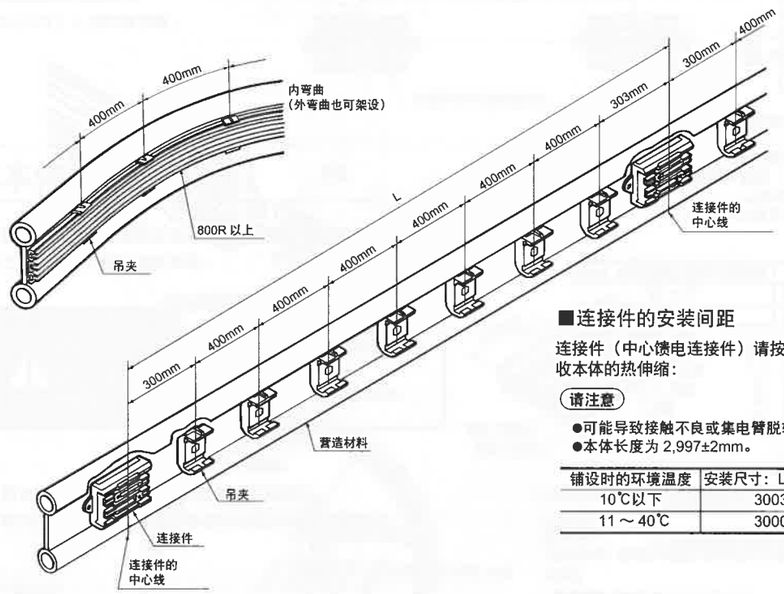
施工重点

1. 在本体的一侧插入连接件，并安装 3 ～ 4 个吊夹。
2. 将本体如图弯曲，插入连接件，再安装在吊夹上。



1 连接件、吊夹的安装间距

■吊夹的安装间距，无论直线部分还是曲线部分，均为 400mm 以下



■连接件的安装间距

连接件（中心馈电连接件）请按下表尺寸进行安装。以便吸收本体的热伸缩：

请注意

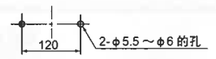
●可能导致接触不良或集电臂脱轨等事故。
●本体长度为 2,997±2mm。

铺设时的环境温度	安装尺寸：L（mm）	连接件导体之间的尺寸（mm）
10℃以下	3003	5 ～ 13
11 ～ 40℃	3000	3 ～ 10

2 连接件的安装

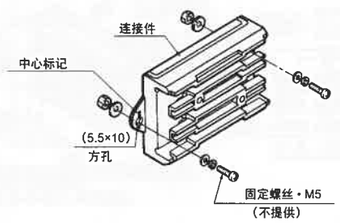
1. 按照下图，在营造材料上开孔。

●在营造材料上开先导孔（3P,4P,5P,6P 均适用）

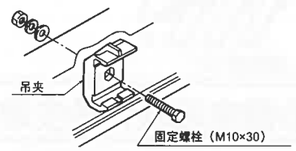


请注意
以连接件的中心标记为基准开孔。

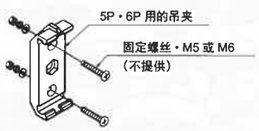
2. 将连接件对准中心标记，用固定螺丝安装在营造材料上。



3 吊夹的安装

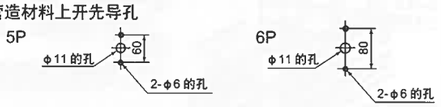


●使用 5P,6P 的吊夹，用 2 个螺丝固定时



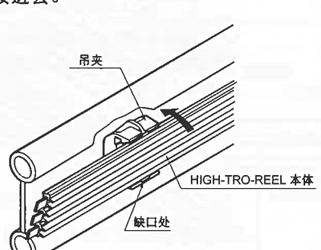
（在 5P,6P 用的吊夹上，用 2 个螺丝固定时）

●在营造材料上开先导孔



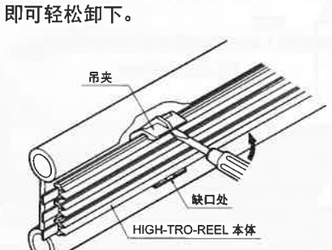
4 将本体装入吊夹

将本体一侧嵌入吊夹内，
另一侧用手按进去。



■本体的拆卸

将⊖螺丝刀插入吊夹的缺口处，
上下开启，即可轻松卸下。



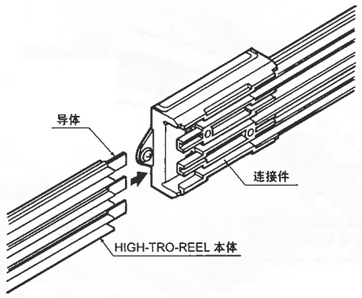
5 本体的连接方法

将本体按照箭头方向插入连接件。

请注意

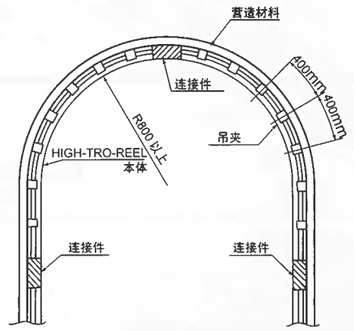
连接件（中心馈电连接件）请按下表尺寸进行安装。以便吸收本体的热伸缩：。
否则可能导致接触不良或集电臂脱轨等事故。
安装HIGH-TRO-REEL本体时，注意不要使本体发生异常变形或弯曲（上下方向：±3mm以内）。
否则可能导致接触不良、集电臂脱轨等事故。

铺设时的环境温度	连接部分导体之间的尺寸（mm）
10℃以下	5～13
11～40℃	3～10



请注意

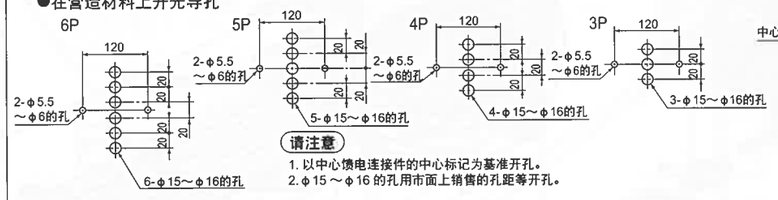
向内弯曲时，在曲线部分的中间设置一个连接件。
（向外弯曲时，在任何地方均可安装。）



6 中心馈电连接件的安装

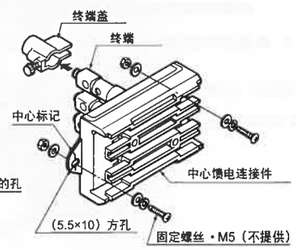
1. 如下图，在营造材料上开孔。
2. 取下终端盖，插入营造材料，用固定螺丝对准中心标记进行安装。

●在营造材料上开先导孔



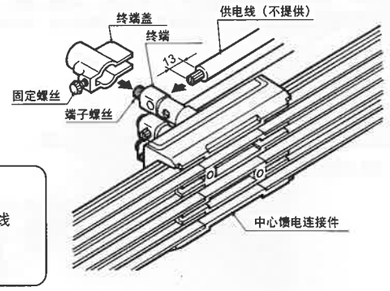
请注意

1. 以中心馈电连接件的中心标记为基准开孔。
2. φ15～φ16 的孔用市面上销售的孔距等开孔。



7 对本体供电的方法

1. 将供电线的绝缘护套剥开 13mm，插入终端，并牢牢连接在端子上。必须牢固地连接在端子上，否则可能导致火灾事故。
2. 将终端盖插入终端并用固定螺丝固定在端子上。

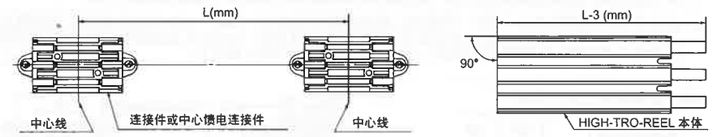


⚠注 意

1. 供电线应使用 5.5～22mm² 的线。
2. 先将同包装中的压接套管套接好后，再将信号用供电线（0.75～2mm²）与终端连接。
否则可能导致火灾事故。

8 本体切断

按照连接件之间的尺寸（中心尺寸）L，将本体切断。

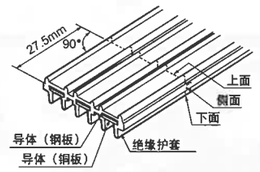


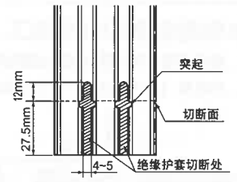
9 本体的末端加工

1. 使用划线器和钢锯将本体绝缘片的上面、侧面和下面按照图中尺寸切断。
上面请切至导体的钢板部分。

⚠注 意

用钢锯切断时，请勿划伤导体（铜板）。
否则可能导致火灾或坠落事故。

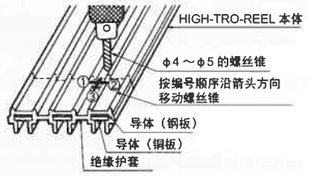




2. 用φ4～φ5 的螺丝锥按照图示切断绝缘片。
如上图所示，微微鼓起切断面，就能完全取下绝缘片。

请注意

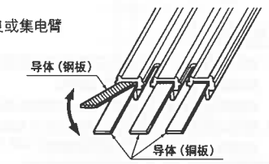
1. 请勿划伤导体（铜板）。
2. 用螺丝锥切断绝缘片时，请与本体保持直角。



3. 如图所示，将带有切痕的导体（钢板）折弯并切断。

请注意

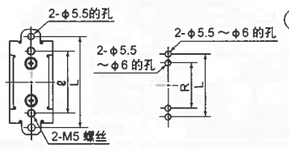
切断导体、绝缘护套后，请用电工刀或锉刀去除毛刺。
否则可能导致接触不良或集电臂脱轨等事故。



10 导向盖

1. 如下图所示，在营造材料上开孔。

●在营造材料上开先导孔



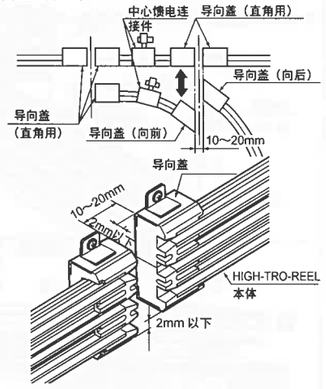
●安装方法
L 尺寸：从正面安装
ℓ 尺寸：从背面安装

请注意

请严格遵守各部分的安装尺寸。
否则可能导致接触不良或集电臂脱轨等事故。

极　数	L(mm)	ℓ(mm)
3P 用（直角・向前・向后）	73	50
4P 用（直角・向前・向后）	93	70
5P 用（直角・向前・向后）	113	90
6P 用（直角・向前・向后）	133	110

■导向盖的作用



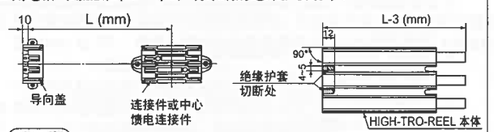
2. 用固定螺丝固定在营造材料上，并将本体插入导向盖。

请注意

请使用串联型集电臂，将转换部分的行进速度设定为 60m/ 分以下。

本体的切断、末端加工

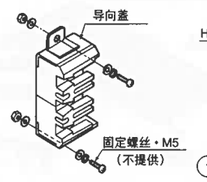
1. 按照连接件和导向盖间的尺寸，将本体切断。
2. 用电钻（螺丝锥φ4～φ5）将末端的绝缘护套切下。

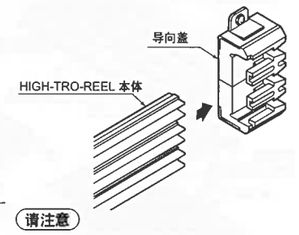


请注意

切断本体后，请用电工刀或锉刀将断面的毛刺去除。
否则可能导致接触不良。

■本体的安装





请注意

请确认固定螺丝牢牢固定好。
否则可能导致坠落事故。

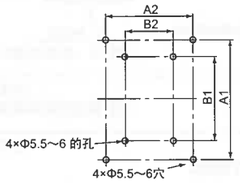
11 线分割器的安装

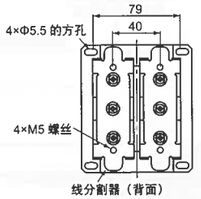
1. 如下图所示，在营造材料上开孔。从正面安装和从背面安装的开孔位置也有所不同。
2. 将线分割器用固定螺丝（M5：不提供）安装在营造材料上，再将 HIGH-TRO-REEL 本体插入线分割器。

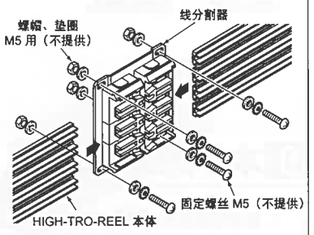
请注意 集电臂应使用串联型集电臂，最高流通速度应在 120m/ 分以下。

●在营造材料上开先导孔

安装方法		4P	5P
从正面安装	A1	97	117
	A2	79	79
从背面安装	B1	70	90
	B2	40	40

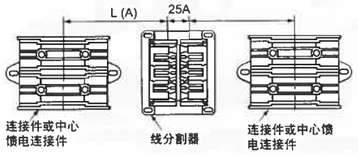


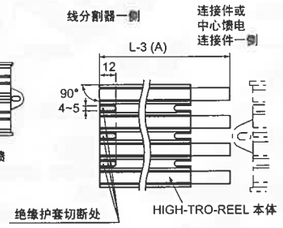




本体的切断和末端加工

1. 按照连接件和线分割器之间的尺寸，将本体切掉 3mm。
2. 用电钻（螺丝锥 φ4 ～ 5）如右图所示，将末端绝缘护套切开。



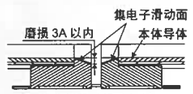


请注意

1. 切断本体后，请用电工刀或锉刀将断面毛刺去除。
   并用锉刀去除导体切断面的边。
   否则可能导致接触不良或集电臂脱轨等事故。
2. 请将与吊夹之间的安装间隔设定为 400mm 以下。
   否则可能导致集电臂脱轨等事故。

电源线分割器的更换

如果线分割器的集电子滑动面比导体表面磨损 3mm 时，需更换线分割器。
如果在下次维护前磨损可能达到 3mm 时，也请提早更换。

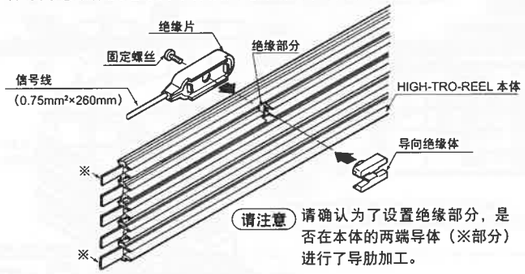


⚠注 意

须在磨损范围内使用线分割器。
否则可能导致集电臂脱轨、因电火花而导致的火灾或接触不良等事故。

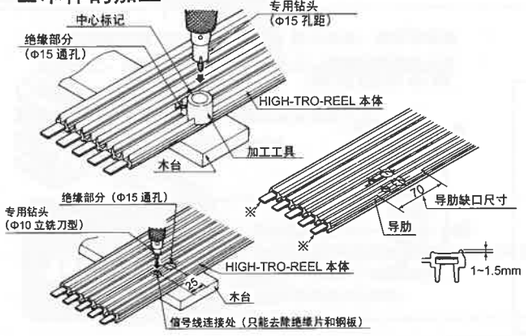
12 绝缘片

1. 使用绝缘片用的工具在本体上开孔。
2. 将导向绝缘体及绝缘片本体插入绝缘部分，并用螺丝固定。



请注意 请确认为了设置绝缘部分，是否在本体的两端导体（※部分）进行了导肋加工。

■本体的加工



■绝缘片的用途

用 途	本 体 开 孔
信号线的绝缘	Φ15 通孔
信号线的绝缘 ＋ 单侧供电	Φ3 中心孔，25mm，25mm，Φ10（只能去掉绝缘护套和钢板），可装在左右两边，Φ15 通孔
修补用 两侧供电	Φ3 中心孔，25mm，25mm，Φ15 通孔，Φ10（只能去掉绝缘护套和钢板）

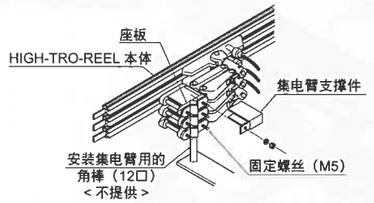
请注意

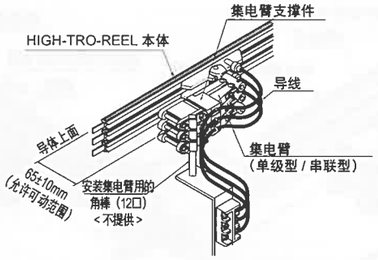
1. 将 HIGH-TRO-REEL 本体放在木台上，插入加工工具（如图所示，将中心标记标在内侧）进行开孔。
2. 用立铣刀、孔锯开孔时，需与本体保持直角。
3. 绝缘部分的开孔，为避免冲击绝缘片，应小心开孔。
4. 孔锯中可能会残留碎屑，请用 ⊖ 螺丝刀清除。
5. 本体两端导体（※部分）设置绝缘部分时，请用电工刀在本体的导肋切开缺口。
6. 开孔后，请用电工刀将切断面的毛刺去除。
   否则可能导致接触不良。
7. 信号线连接部分开孔后，务必将中心孔（Φ3）的毛刺处理干净。
   否则可能导致接触不良。
8. 不要信号线时，用绝缘胶带使电线末端绝缘并固定，以防影响集电臂行进。

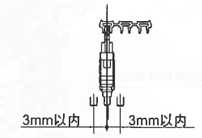
13 集电臂的安装

■串联型•单级型（角棒用）

①集电臂的支撑件从座板上面安装。
②请将 HIGH-TRO-REEL 的导体上面到集电臂安装角棒中心的距离设定为 65mm（集电臂的允许可动范围 65±10mm 的中心值）。
③请保证本体的中心和集电臂的中心在 3mm 以内。

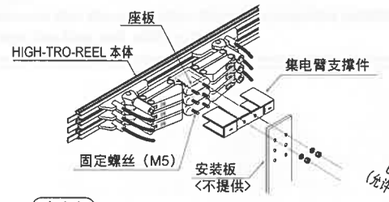


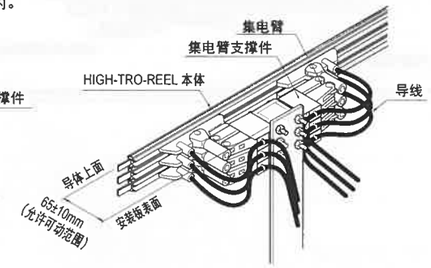


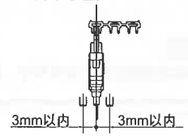


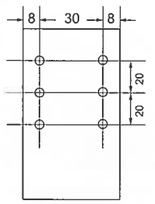
■串联型（平板用）

①集电臂的支撑件安装在座板和安装板之间。
②请将 HIGH-TRO-REEL 的导体上面到集电臂安装板表面之间的距离设定为 65mm（集电臂的允许可动范围 65±10mm 的中心值）。
③请保证本体的中心和集电臂的中心在 3mm 以内。







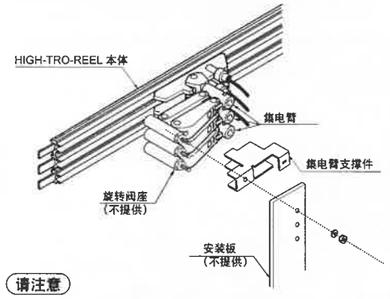


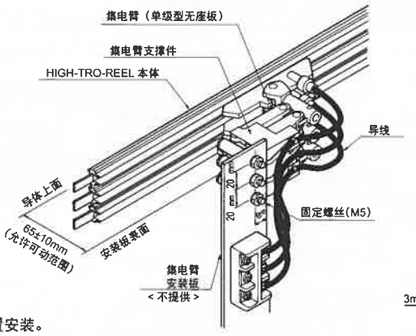
请注意

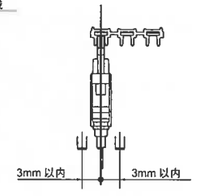
- 集电臂的安装间距为 20mm。
- 在营造材料上进行先导孔加工时，先导孔的间距为 30mm，从安装板边距 8mm 处开始加工。

■单级型（无座板）

①集电臂的支撑件安装在旋转阀座和安装板之间。
②请将 HIGH-TRO-REEL 的导体上面到集电臂安装板表面的距离设定为 65mm（集电臂的允许可动范围为 65±10mm 的中心值）。
③请保证本体的中心和集电臂的中心在 3mm 以内。





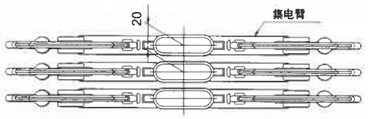


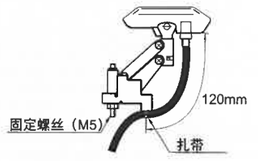
请注意

- 集电臂的安装间距为 20mm，在距安装板边缘 8mm 的位置安装。

请注意

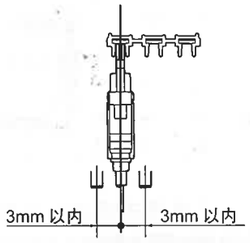
1. 请严格遵守各部分的安装尺寸。设备运行中请保证集电臂在 65±10mm（单级型（无座板）时为 60±10mm）的允许范围内使用。
   ～否则可能导致接触不良或集电臂脱轨等事故。～
2. 集电臂的安装间距为 20mm。
   ～否则可能导致接触不良或集电臂脱轨等事故。～
3. 集电臂必须与本体平行安装，且不能弯曲。
   ～否则可能导致接触不良或集电臂脱轨等事故。～
4. 请确认并联时电轨本体的中心和集电臂的中心在 3mm 以内。
   ～否则可能导致接触不良或集电臂脱轨等事故。～
5. 集电臂的导线请用同包装中的扎带固定。换集电子时，请使用市场销售的扎带（长 100mm 以下，宽 3mm 以下），将其固定在集电臂支撑件上。保持导线松弛（导线固定位置到集电子底部大概为 120mm），以免影响集电子行进。
   ～否则可能导致集电子不均匀磨损及表皮破损等～
6. 导线与负载连接时，须确认本体的相位 (R.S.T) 后再进行接线。
7. 将无焊端子固定到端子台时，请勿过度缠绕导线。
   ～否则可能导致集电子不均匀磨损及表皮破损等～
8. 对集电臂支撑件进行施工时，因坠落等导致产品变形及破损时，请进行更换。
   ～否则可能导致集电子不均匀磨损及表皮破损等。～

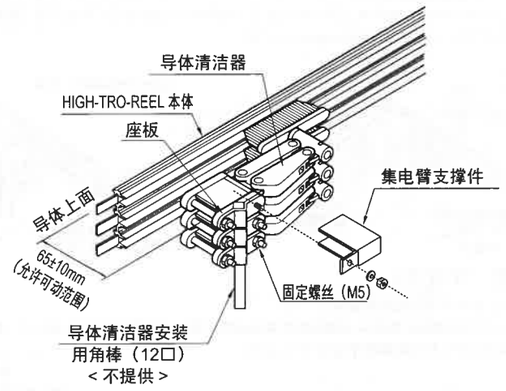




14 导体清洁器的安装方法

① 集电臂支撑件从座板上面安装。
② 请将 HIGH-TRO-REEL 的导体上面到导体清洁器安装角棒中心是距离
设定为 65mm
（集电臂的允许可动范围为 65±10mm 的中心值）。
③请保证本体的中心和导体清洁器的中心在 3mm 以内。

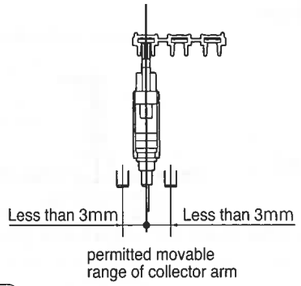




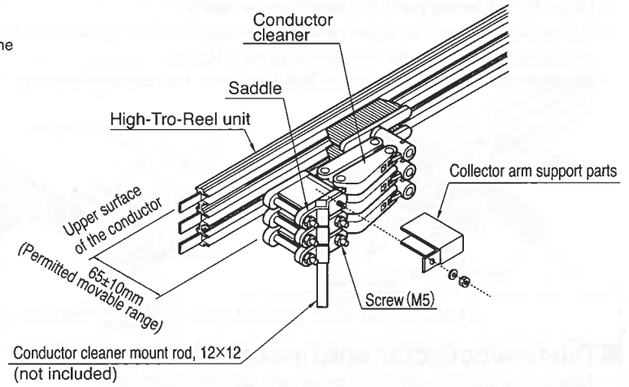
请注意
·导体清洁器必须与本体平行，且不能弯曲。

14 Mounting a conductor cleaner

①Mount the supporting parts of collector arm on saddle
②Set the distance from the upper surface of the High-Tro-Reel conductor to the center of collector cleaner mount rod to 65mm (Central value of the collector cleaner permitted movable range 65±10 mm)
③Mount the center of collector cleaner to less than 3mm from center of the High-Tro-Reel conductor.



cleaner

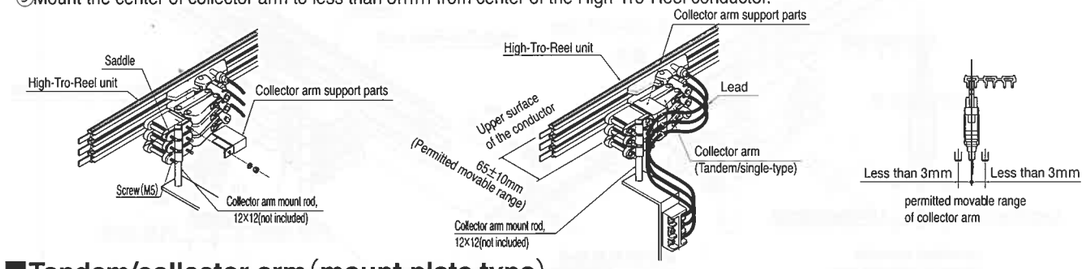


note
· Be sure that the conductor cleaner is mounted parallel to the High-Tro-Reel unit with no twisting.

13 Collector arm installation

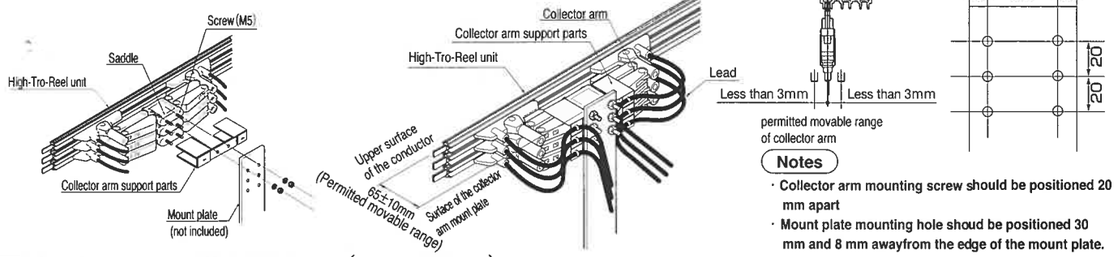
■Tandem/single-type collector arm (mount rod type)

①Mount the supporting parts of collector arm on saddle
②Set the distance from the upper surface of the High-Tro-Reel conductor to the center of collector arm mount rod to 65mm (Central value of the collector arm permitted movable range 65±10 mm)
③Mount the center of collector arm to less than 3mm from center of the High-Tro-Reel conductor.



■Tandem/collector arm (mount plate type)

①Mount the supporting parts between saddle and the mount plate.
②Set the distance from the upper surface of the High-Tro-Reel conductor to the center of collector arm mount plate to 65mm (Central value of the collector arm permitted movable range 65±10 mm)
③Mount the center of collector arm to less than 3mm from center of the High-Tro-Reel conductor.

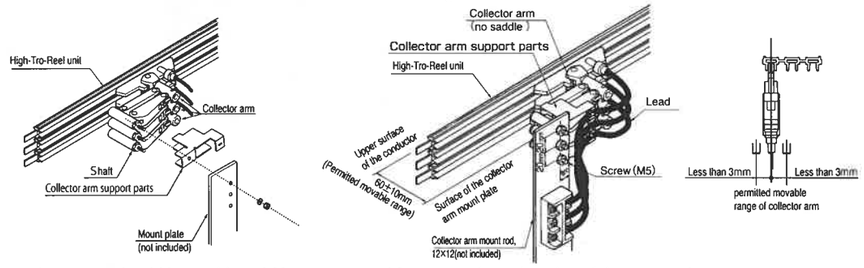


Notes

- **Collector arm mounting screw should be positioned 20 mm apart**
- **Mount plate mounting hole shoud be positioned 30 mm and 8 mm awayfrom the edge of the mount plate.**

■single-type collector arm (no saddle)

①Mount the supporting parts between the top of saddle and the mount plate.
②Set the distance from the upper surface of the High-Tro-Reel conductor to the upper surface of the collector arm mount plate to 60mm. (Central value of the collector arm permitted movable range 60±10 mm)
③Mount the center of collector arm to less than 3mm from center of the High-Tro-Reel conductor.

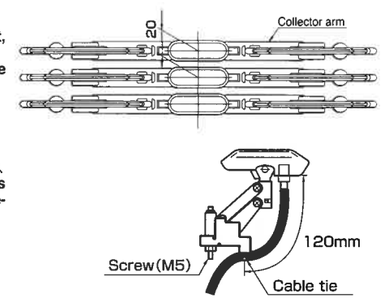


note

·Collector arm mounting screw should be positioned 20 mm apart and 8 mm awayfrom the edge of the mount plate.

note

1. **Be sure to use only the specified dimensions for each mounting part. For operating the equipment, set the collector arm within permitted movable range of 65±10mm (60±10mm for single).**
2. **Collector arm mounting screw should be positioned 20 mm apart and Collector arms (single-type with no saddle excluded) must be positioned close toeach other as shown in the drawing at right.**
3. **Be sure that collector arms are mounted parallel to the High-Tro-Ree unit with no twisting.**
   Failure to conform to this table may cause poor collector arm contact or separation from wires.
4. **Mount the center of collector arm to less than 3mm from center of the High-Tro-Reel conductor.**
   Failure to conform to this table may cause poor collector arm contact or separation from wires.
5. **Hold the leads in using the cable ties (included) When exchange the replacement part of collector, hold the leads in using the cable ties(length less than 100 mm and width less than 3 mm) which is sold generally.Then, keep slack in the leads (The length of lead to fix is about 120 mm from replacement part of collector). Do not influences movement of the collector arm.**
   Failure to occur biased wear of collector arm and fragment of sheath.
6. **Be sure to confirm the High-Tro-Ree unit phase (R.S.T) before connecting the leads to the load.**
7. **When mount the Insulated terminals to the terminal,Do not twist more than required.**
   Failure to occur biased wear of collector arm and fragment of sheath.
8. **Exchange of the collector aim once in exchange three times of replacement part of collector.**
9. **When mount the collector arm support parts,If it is changed or damaged by fall, Exchange the new parts.**
   Failure to occur biased wear of collector arm and fragment of sheath.



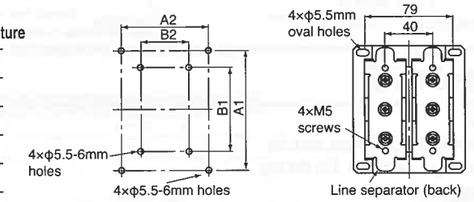
11 Line separator installation

1. Drill holes in the building structure as shown below. Hole positions are different according to whether it will be installed from or back.
2. Screw a line separator to the building structure using screws (M5; not included) and insert the High-Tro-Reel unit into the line separator.

Notes **Use a tandem-type collector arm and set the maximum traveling speed to 120m/min, or lower.**

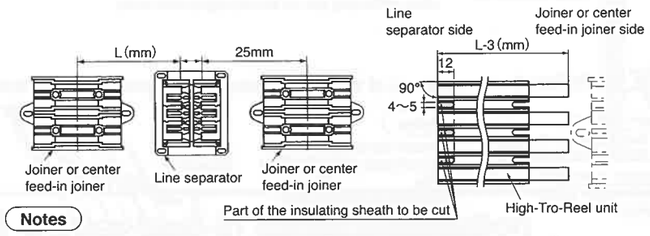
● **Preparatory drilling on building structure**

Mounting method		For 4P	For 5P
Installed from front	A1	97	117
	A2	79	79
Installed from back	B1	70	90
	B2	40	40



Cutting the High-Tro-Reel unit and insulating sheath

1. Line up the High-Tro-Reel unit between the center points of joiner and the line separator, and cut 3mm off of one end.
2. Cut the insulating sheath as shown in the drawing at right using an electric drill with a φ 4 to 5 bit.

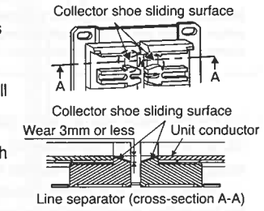


Notes

1. **After cutting, remove the burrs from cut surfaces using an electrical knife or file. Remove sharp edges from the conductor using a file or similar tool.**
   Failure to do so may cause poor contact or derailment of the collector arm.
2. **Set the intervals between hangers at 400mm or less. Intervals longer than this may result in derailment of the collector arm.**

Replacing line separators

Line separators should be replaced when the collector shoe sliding surface of the line separator has worn down 3mm from the conductor surface. Line separators should also be replaced early when it is possible that the wear amount will reach 3mm before the next inspection. at right using an electric drill with a φ4 to 5 bit.

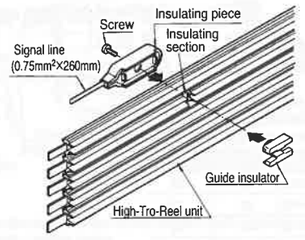


⚠Caution

Use line separators within the wear range.
Failure to do so may result in derailment of the collector arm, fires due to sparking, or poor contact.

12 Insulating piece installation

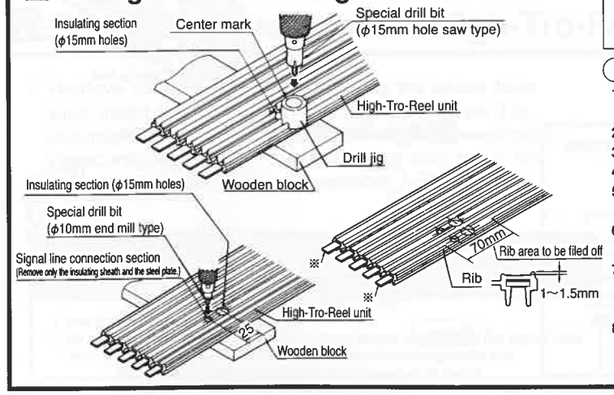
1. Drill holes in the High-Tro-Reel unit using the special jig (insulating piece drill jig).
2. Insert a guide insulator and a insulating piece into the insulating section and screw them in.



■Usage of insulating piece

Usage	Hole drilling in the High-Tro-Reel unit
Signal line insulation	φ15mm holes
Signal line insulation + One-side power feed	φ3mm (center hole), 25mm 25mm, φ10mm (Remove only the insulating sheath and the steel plate.), Can be attached to either side., φ15mm holes
Dual-side power feed for repair	φ3mm (center hole), 25mm 25mm, φ10mm (Remove only the insulating sheath and the steel plate.), φ10mm (Remove only the insulating sheath and the steel plate.), φ15mm holes

■Drilling holes in the High-Tro-Reel unit

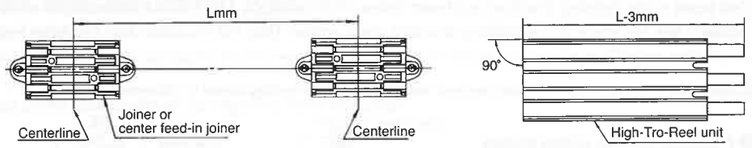


Notes

1. **Position the High-Tro-Reel unit on a wooden block and drill holes using the drill jig (positioning the center mark inside the jig.)**
2. **Hold the end mill or hole saw drill upright against the High-Tro-Reel unit when drilling.**
3. **For insulating sections, drill holes slowly to prevent damage to the insulating sheath.**
4. **Remove cutting chips from the hole saw drill with a flat tip screwdriver.**
5. **When making both ends (*section) of the High-Tro-Reel conductor insulating sections, remove the rib with a knife.**
6. **Remove the burrs from both cut surfaces using a knife or a file. Failure to do so may cause poor collector arm contact.**
7. **After drilling holes in the signal line joint, be sure to remove the burrs from the φ3mm center hole on conductor sliding surface. Failure to do so may cause poor collector arm contact.**
8. **If signal lines are not needed, insulate the end of the line with vinyl tape so that it wonit affect collector arm travel.**

8 Cutting the High-Tro-Reel unit

Line up the High-Tro-Reel unit between the center points of the two joiners (central dimension L) and cut 3mm off of one end.

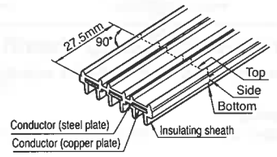


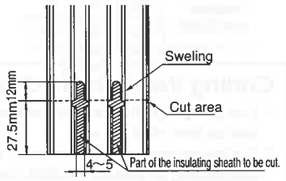
9 Cutting the High-Tro-Reel unit

1. Mark the length to be cut off on the High-Tro-Reel unit as shown below, and cut the top, sides and bottom of the insulating sheath using a hacksaw. On the top surface, make a thin cut down to the conductor steel plate.

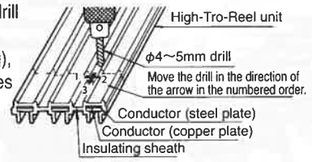
⚠Caution

Be careful not to damege the conductor (copper plate) when cutting with a hacksaw. Damage may cause fire or damege due to falling of equipment.





2. Cut the insulating sheath using ϕ4~5mm drill bit, as shown in the right drawing. Slightly exaggerating the cut to the sides (swelling), as shown in the right upper drawing, makes the insulating sheath easier to remove.



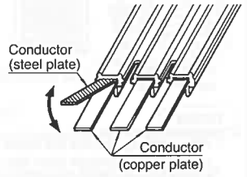
Notes

1. **Be careful not to damage the lower conductor (copper plate.)**
2. **Hold the drill upright against the High-Tro-Reelunit when cutting the insulating sheath.**

3. Break off the upper conductor (steel plate) at the cut line.

Notes

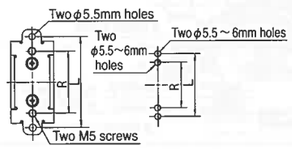
Remove the burrs from both cut surfaces using a knife or a file.
Failure to do so may cause poor collector arm contact or separation from wires.



10 Guide cap installation

1. Drill holes in the building structure as shown below.

●Preparatory drilling on building structure



●Installation procedure

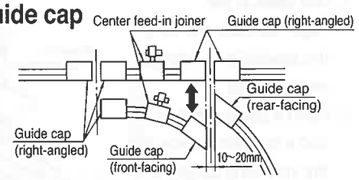
L size: front-mounting ℓsize: front-mounting

Notes

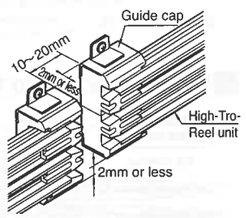
Be sure to use only the specified dimensions for each mounting part.
Failure to do so may cause poor collector arm contact or separation from wires.

Number of poles (item)	L (mm)	ℓ(mm)
3P (right-angled, front, rear-facing)	73	50
4P (right-angled, front, rear-facing)	93	70
5P (right-angled, front, rear-facing)	113	90
6P (right-angled, front, rear-facing)	133	110

■Usage of guide cap



2. Screw a guide cap to the building structure and insert the High-Tro-Reel unit into the guide cap.

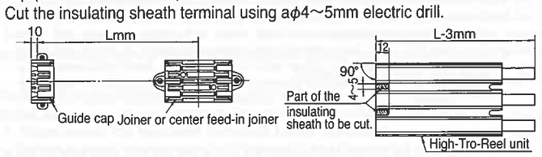


Notes

Use a tandem-type collector arm and set traveling speed at switching sections to 60m/min. or lower.

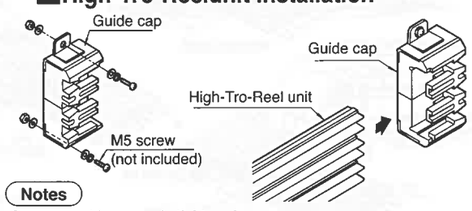
Cutting the High-Tro-Reel unit and insulating sheath

1. Line up the High-Tro-Reel unit between the center points of the joiner and the guide cap (central dimension"L") and cut 3mm off of one end.
2. Cut the insulating sheath terminal using aϕ4~5mm electric drill.



Notes **Remove the burrs from both cut surfaces using a knife or a file.**
Failure to do so may cause poor collector arm contact.

■High-Tro-Reelunit installation



Notes

Screws must be securely tightened.
Failure to do so may cause damage due to falling of equipment.

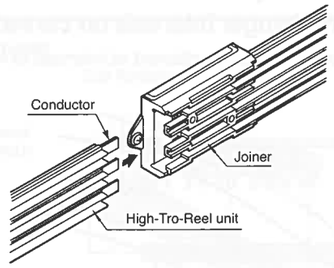
5 High-Tro-Reel unit connection

Insert the High-Tro-Reel unit into the joiner in the direction of the arrow.

Notes

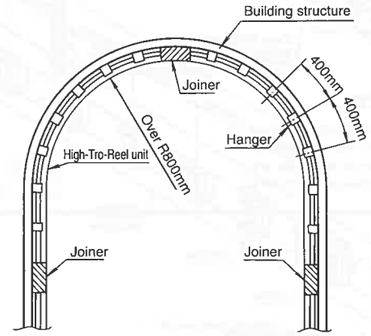
When mounting the High-Tro-Reel unit,
Be careful to maintain the proper form and layout.
Do not be meandering (up and down direction ±3mm or less)
Failure to do so may cause poor collector arm contact or separation from wires.

Ambient temperature during installation	Distance between conductors at joint (mm)
10℃or lower	5~13
11~40℃	3~10



Notes

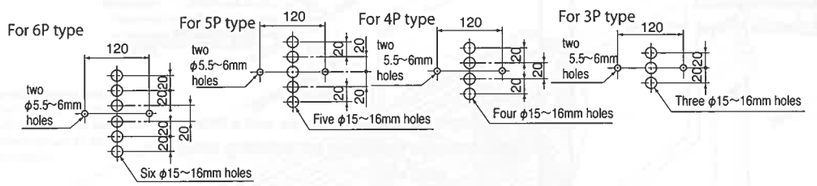
For inward curves, position a joiner (or joint) at the center of the curve. (For outward curves, a joiner can be positioned on any part of the unit.)

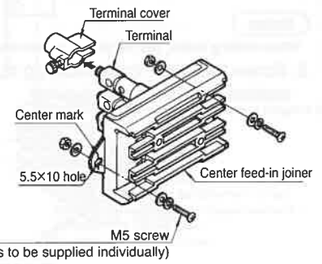


6 Center feed-in joiner installation

1. Drill holes in the building structure as shown below.
2. Remove the terminal cover, insert the joiner into the building structure, line it up with the center mark, and screw it in.

●Preparatory drilling on building structure.





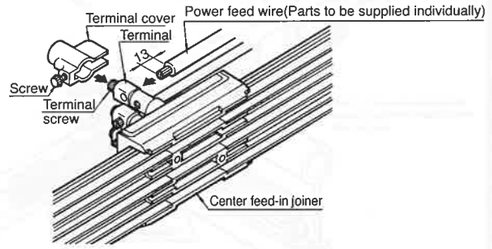
Notes **When drilling holes, use the center mark of the center feed-in joiner as a reference.**
Use a hole saw to drill ϕ15~16mm holes.

7 Supplying power to the High-Tro-Reel

1. Remove 13mm of the sheath covering the power feed wire, insert the wire into the terminal, and screw it in securely with the terminal screw. Terminal screws must besecurely tightened. Failure to do so may cause fire.
2. Screw the terminal cover to the terminal.

⚠Caution

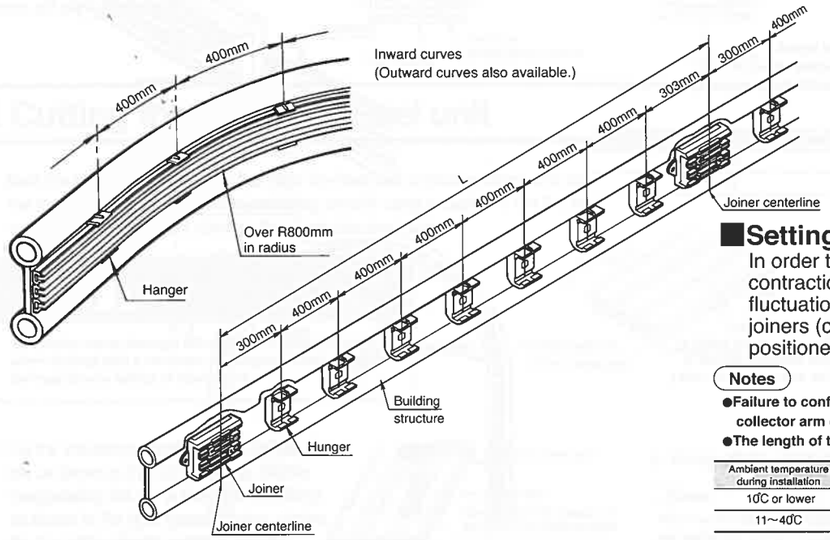
1. **Use 5.5 to 22mm² power feed wires.**
2. **Be sure to crimp the inclvded crimp sleeve before connecting the signal feed wire (0.75 to 2mm²) to the terminal. Failure to do so may cause fire.**



1 Setting joiner and hanger intervals

■Setting hanger intervals on curved sections

Hangers should be positioned at intervals of 400mm or less for straight sections and curved sections.



■Setting joiner intervals

In order to absorb expansion and contraction due to temperature fluctuations in the High-Tro-Reel unit, joiners (center feed-in joiners) must be positioned as below.

Notes

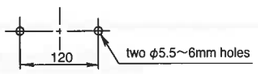
- **Failure to conform to this table may cause poor collector arm contact or separation from wires.**
- **The length of the joiner is 2997±2mm.**

Ambient temperature during installation	Mounting size: L (mm)	Distance between conductors at joint (mm)
10℃ or lower	3003	5~13
11~40℃	3000	3~10

2 Joiner installation

1. Drill holes in the building structure as shown below.

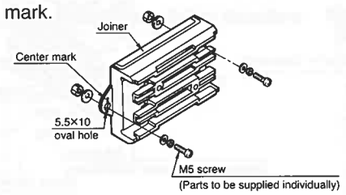
- **Preparatory drilling on building structure (for 3P, 4P, 5P and 6P)**



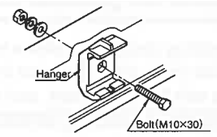
Notes

When drilling holes, use the joiner center mark as a reference.

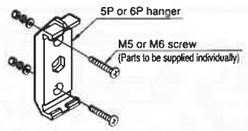
2. Screw the joiner to the building structure in line with the center mark.



3 Hanger installation

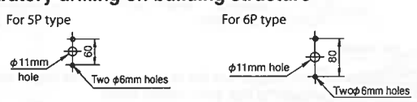


- **Fixing 5P or 6P hangers using two screws**



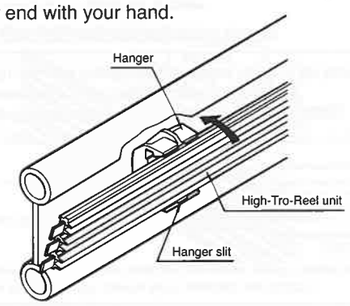
(Applicable when two screws are used to fix 5P or 6P hangers.)

- **Preparatory drilling on building structure**



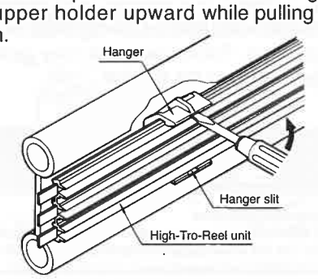
4 Mounting the High-Tro-Reel unit on a hanger

Insert one end of the High-Tro-Reel unit into the hanger and push the other end with your hand.



■Removing the High-Tro-Reel unit

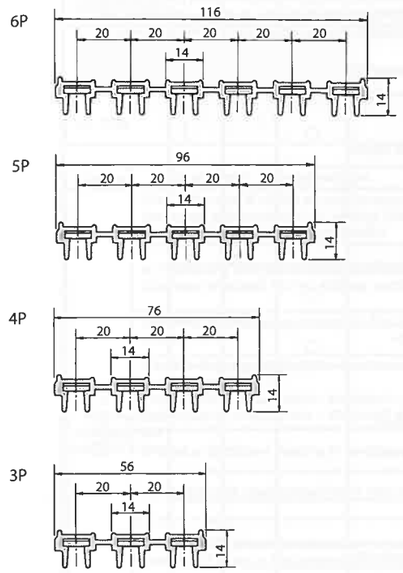
Insert a flat tip screwdriver into the hanger slit. Then, lift the upper holder upward while pulling the lower holder down.



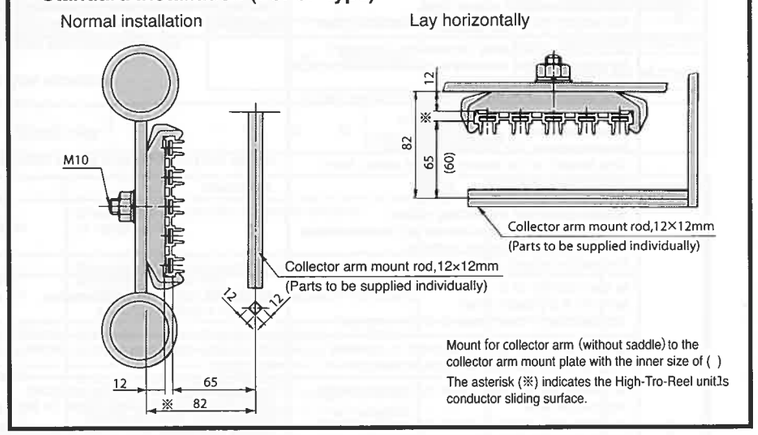
Installation Procedures for High-Tro-Reel <Non-Tension Type>

(Install explanation of this product is described with 3P and Installations of 4P and 5P, 6P like in the same way.)

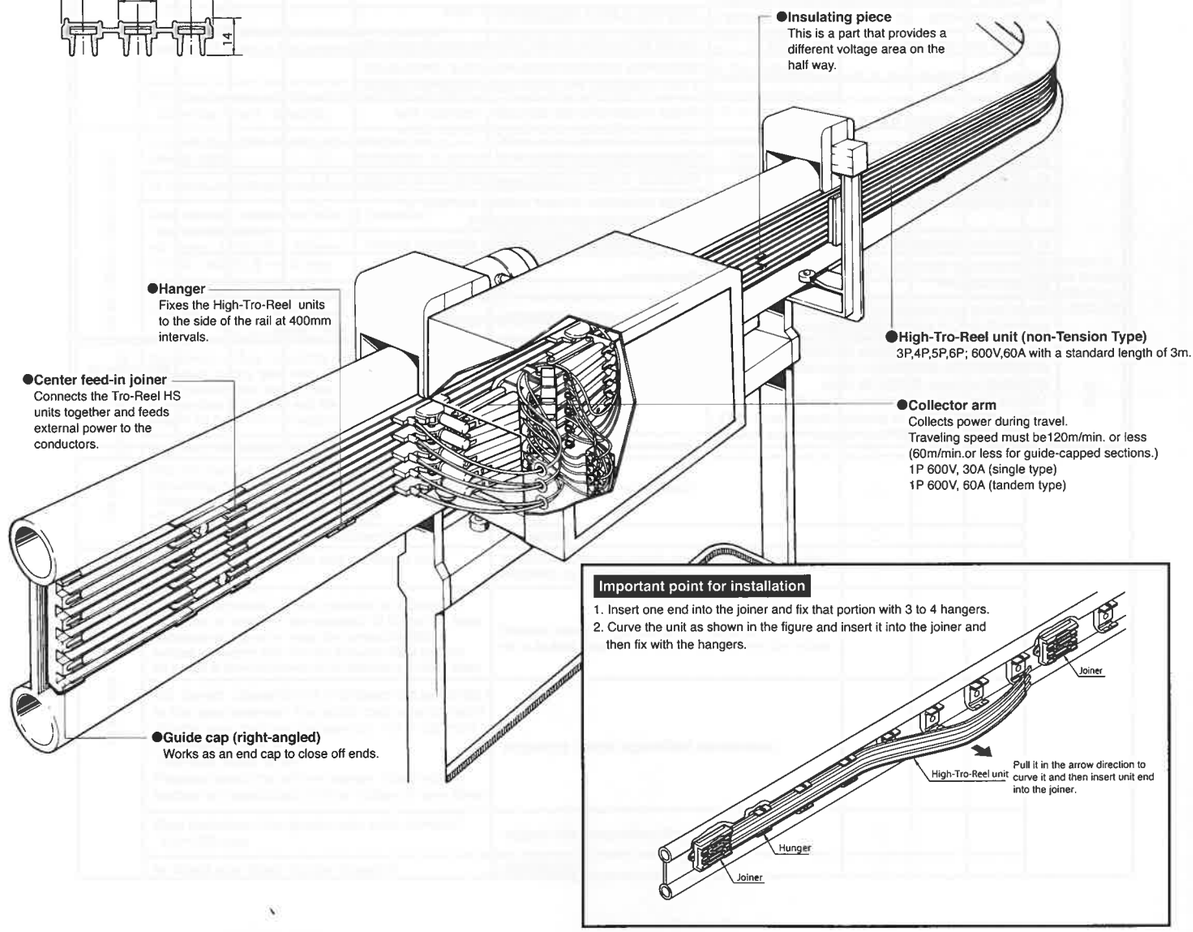
- **Cross-section**



- **Standard installation (For 5P type)**



Unit : mm



Important point for installation

1. Insert one end into the joiner and fix that portion with 3 to 4 hangers.
2. Curve the unit as shown in the figure and insert it into the joiner and then fix with the hangers.

Name	Contents of inspection	Remedy	※	Result	Measures	Inspection cycle (standard)
Insulating piece	Is there any cracked or broken on plastic section?	Retighten.	○			the number of passes through the collector's arm:1,000,000
	Is there any fixed screw loosen?	Adjust the position of Hunger.	○			
	If do not need the signal lines, Are isolated the end of the wire by insulating tape ?	Insulate the end of an electric wire with insulating tape,without disturbing the driving arm collector.	○			
Collector arm	Is the arm installing dimension correct? Single-type (for mounting rod), tandem-type (for mounting rod) The length of to the center of themounting rod from the sliding surface (movable range): 65±10mm tandem-type (for mounting plate) The length of to themounting plate from the sliding surface (movable range): 65±10mm Single-type (for mounting plate) The length of to the center of themounting plate from the sliding surface (movable range): 60±10mm	Adjust the collector arm in the reference value.	○			Distance of the collector arm :3000km
	Is the center of a duct and the collector arm on a straight line? Installation Tolerance: ± 3mm center"	Adjust its mounting dimension.	○			
	Is the collector arm attached in parallel with a duct, so that it cannot twist?	Mount the collector arm in parallel with the duct.	○			
	Is there any serious wear to replacement indication line Is there any serious wear to replacement indication line? or,Does exceed a travel distance of 20,000 km?	Collector shoes should be replaced when they partially wear down to the replacement indication line. Please exchange the collector shoes ahead of time when it will be worn out to the replacement indication line by the time of the next check. by the time of the next check.				
	Are there significant contamination,foreign matter adhering , occurred burr in collector?	Remove it with sandpaper or wes.				
	Is there any ark generated protrusion ?	Remove the protrusion (convex) on thearc scratch using a file.				
	Is there wear of plastic part of the collector plastic part?	Adjust the collector arms mounting dimensions. If there is significant wear, please replace the current collector.				
	Does the collector move smoothly?	If the motion is not smooth, replace the current collector and the collector arm.	○			
	Is there any curve or variation on the arm?	Replace the arm if there is curve or variation	○			
	Is there any chip or broken?	Replace if chip or broken spring pin is found.	○			
	Is the collector shoes pulled by the lead wire?	If the collector shoes pulled, correct to have extra length on lead wire.	○			
	Is there any damage on the sheath of lead wire?	If there is damage, replace the collector shoes.	○			
	Are there any terminal screws or thefixed screws loosen?	Retighten.	○			
	Is not there any mistake in the contact terminal position (R, S, T, E, and signal connection line) of a lead?	Make a tightening of the connection terminals	○			
unit	After checking the above construction, to determine the insulation resistance. Working voltage 300V or less 150V or less voltage to ground: Longer than 0.1MΩ 150V or higher voltage to ground: Longer than 0.2MΩ Working voltage 300V or higher, than 0.4MΩ					the number of passes through the collector's arm:1,000,000

Trial run・Periodic inspection

Notes

- For using safely, please inspect the system one month after starting regular operation.
- The inspection cycle is mentioned below. However, determine your own inspection cycle based on the actual operating rate and environmental condition.

Notes

<To Maintenance manager>

- Inspections item at the time of the pre-use test run(Checking at periodic inspection).
- For using safely, please inspect the system one month after starting regular operation.
- **The inspection cycle is mentioned below. However, determine your own inspection cycle based on the actual operating rate and environmental condition.**
- **Items in bold: Inspection items requiring particular attention.**

Result		Measures	
	○ : Normal		○: Exchange required
			●: Finished with exchange
	× : Abnormaliy		△: Adjustment required
			▲: Finished with adjustment

A title		Check day	Y D M	The check person in charge	

Name	Contents of inspection	Remedy	※	Result	Measures	Inspection cycle (standard)
Tro-Reel unit	Check to see if there is any foreign particles adhering on its sliding surface or if it is seriously contaminated.	Clean with a specific purpose cleaner or waste cloth.				
	Is there any ark generated protrusion (convex shaped) on its sliding surface?	Remove any protrusion (convex) on the arc scratch using a file. ※ If you can not fix, please replace the duct. scratch using a file.				
	Is there damage and crack at the insulating sheath ?	If the tip of the sheath thickness is 1.2mm or less, please replace insulation	○			
	What is the meander of the duct or swell in the regulations? The serpentine tolerance: standard ± 5 mm Tolerance of modulation ·: standard ± 3mm	Adjust it within specified size. ·Adjust the length of the duct, or Aalign the joiner. ·Adjust the mounting position of the hangers.	○			
	Is there a significant twisting or bending of the duct?	Correct the twisting or bending of the duct. ※ If you can not fix, replace the duct.	○			
	Isn't the unit dislocated from the hanger?	Review for any dislocated position on the unit. Correct if any.	○			
	Amount of wear of the conductor is correct? Amount of wear of the conductor :0.5 mm or less	If it exceeds a threshold amount of wear, please replace the main conductor In case of wearing down to the replacement indication line at next inspection, please replace earlier than usual.				
	Don't the insulated sheath and the resin part of collector spinning shaft touch?	Check the amount of wear of the collector and conductor of the duct, replace it if necessary.				
Joiner(Center feed-in joiner)	Are not there the cracks and damaged on a plastic part?	When damage and crack occurred in the fixed end insulator, please change it.				
	Is there any fixed screw loosen?	Retighten.	○			
	Are correct clearance size of between the conductors ? ·Or less · 10 ℃: 5 ~13 mm ·11 ℃ ~ 40 ℃: 3 ~10 mm	Adjust the proper clearance size. ·Adjust the length of the duct, or Aalign the joiner. ·Adjust the mounting position of the hangers.	○			
	Are correct joiner mounting size? ·Or less · 10 ℃: 3003 mm · 11 ℃ ~ 40 ℃: 3000 mm	Adjust it within specified size.	○			
Joiner (Center feed-in joiner)	Are correct cutting size of the duct or the duct end ? • The duct cutting Size: size of between Joiner (L) -3mm ※ The same is the case of the Center Feed-in Joiner . ·Cutting Size of the duct end :Remove the insulating sheath 27.5mm from the edge of the duct,	Adjust it within specified size.	○			
	Are insert the conductor and sheath of a duct certainly?	Insert the duct to ensure.	○			
Hanger	Did you set up the correct size and mounting hangers? ·Straight sections: Max 400 mm ·Curved section : Max 400 mm	Adjust to the proper pitch	○			
	Is there any fixed screw loosen?	Retighten.	○			
Guide cap	Are not there the cracks and damaged on aplastic part?	When damage and crack occurred in the fixedend insulator, please change it.	○			
	Amount of wear of the plastic is correct? Amount of wear of the plastic :0.5 mm or less Exchange of a guide is when the conductor sliding surfaces will become taller than the guide-cap sliding surfaces, the number of times of passage of the collector is 5 million times.	Please exchange, when the amount of wear of a guide cap resin part is 0.5 mm or more.				
	Are correct clearance size of between the guide cap ? Is the gap between the guide cap size correct? ·Guide cap mutual clearance: 10 ~ 20mm Horizontal: Max 2mm Vertical: Max 2mm Please have the above range, even when loaded to rated load on the trolley at any time.	Adjust it within specified dimension.	○			
	Gap between the guide cap size correct? ·10~20 mm	Adjust its mounting dimension.	○			
	Is there any fixed screw loosen?	Retighten.	○			

■ Maintenance schedule of High-Tro-Reel unit

The product-life is different in use conditions and the service space, however, It is possible to use it for about t 10 years by regularly maintaining and the regular service in correct construction.

Please check by the maintenance table based on this maintenance schedule.
Refer to the maintenance table for a concrete check item.

Maintenance done by the electrical work trader.

	At introduction / The 5th year / The 10th year
High-Tro-Reel	・Check the presence of remarkable dirt of the surface of the conductor. (Once every 3 to 6 months) → Clean it with the cotton waste etc. ・Check the Tro-Reel unit doesn't become it in a zigzag line. (Once every 3 to 6 months) →Review the size between conductors in the joint. ・Check the Tro-Reel unit is not away from the hanger. (Once every 3 to 6 months) →Install the Tro-Reel unit on thehanger. ・Check whether there is not crack and a lack of the insulation sheath (Once every 3 to 6 months) →Product exchange recommendation that exchanges the Tro-Reel unit.
Joiner Center feed-in joiner	・Check whether there is loosening of the fixation screw or the terminal screw. (Once every 3 to 6 months) →Retighten. ・Check whether the resin has not been damaged. (Once every 3 to 6 months) →Exchange products.
Hanger Guide cap Insulating piece	・Check whether there is loosening of the nut. (Once every 3 to 6 months) →Retighten. ・Check whether the resin has not been damaged. (Once every 3 to 6 months) →Exchange products.
Collector arm	・Check whether there is loosening of the bolt. (Once every 1 to 3 months) →Retighten. ・Check whether wear has reached the replacement line. (Once every 1 to 3 months) →Exchange the collector, when worn out to the replacement line. ・Check damage of spring pin and rotation axis, wear-out of metal fittings of spring receiving. (Once every 1 to 3 months)→Exchange products when damage or abnormality is found. Please keep normal.

Product exchange recommendation.

Panasonic®

High-Tro-Reel Installation Manual

〈Non-Tension Type〉

■ Before assembling, be sure to read through this Operation / Installation Manual for correct assembly.
■ The work must be performed by a qualified engineer.
■ After setup、Please pass this Operation Manual / Installation Manual to the customer.

Precautions on installation

Installation of the High-Tro-Reel must be performed only by a licensed electrician. To prevent injury or accidents, always pay attention to the following points.

⚠ Warning

- **Do not modify the Tro-Reel HS in any way.**
  Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- **Do not use where exposure occurs.**
  Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- **Use at ambient temperature -10 °C ~ 40 °C. If you use outside this temperature range, please contact Panasonic Corporation.**
- **Install this product according to the construction rules in Electrical Equipment Technical Standards .**
  Especially for the primary side of power supply of the duct, use an adequate over-current breaker.
- **Installation must be carried out correctly according to this Installation/Operation Manual included with the products.**
  Improper installation may result in electric shock, fire or damage due to equipment falling.

⚠ Caution

- **This product is for general indoor use only. Do not use this product for a damp place, a place where corrosive gas is generated or a place where cutting oil is directly splashed.**
  Electric shock, fire or damage due to equipment falling may occur.
- **Position the opening of a unit facing downward or sideways. If installed with the opening facing upward, a unit may produce sparks, causing fire, poor contact or separation of collector arms from wires.**
- **When damage and crack occurred in the insulating sheath of the duct, please change the duct.**
  Otherwise sparking may occur, causing fire, poor contact, or derailing of the trolley, etc.
- **When mounting the duct to the hanger, stuff a duct into a hanger not to pinch a hand.**
  Observe may cause injury to your fingers.
- **When remove the duct from the joiners, pull it out while holding the tip of the duct. so that the duct may not jump out from Joyner.**
  Observe, damage to the ducts, may cause injury.
- **When filing the ends of the duct, use protective gear such as glasses.**
  Otherwise, your finger may be injured.
- **Be sure to remove burrs using file after cutting, drilling.**
  Observe may cause injury to your fingers.
- **Use products only within the specified rating and load capacity.**
  Violation of specified ranges may cause burning or fire.
- **Firmly fix this product to the material of construction and construct it.**
  Otherwise, fire or damage due to falling of equipment may occur.
- **Construct the material of construction that installs the product firmly.**
  Otherwise, damage due to falling of equipment may occur.