

ESA PRINTING ASSIST SYSTEM
ESA 静电吸墨辅助印刷系统



eltex

electrostatic
innovations



Electrostatic Printing Assist
ESA POWER TOP GNH63
ESA高效上置式GNH63
静电吸墨辅助系统

1 NEED 需求

Why does gravure printing actually need electrostatic printing assist systems? 为何凹版印刷真的需要静电吸墨辅助系统?



In most packaging and decorative gravure printing presses, electrostatic printing assist systems are now a matter of course, because they provide substantial improvement in ink transfer, even at high printing speeds. The final product is a higher-quality printed image having high ink and color density.

在大多数包装和装饰凹版印刷机中，静电吸墨辅助印刷系统已成了标准配置，即使在高速印刷下它在油墨转移上也能提供实质性的改善，最终产品是具有高油墨量和色彩密度更高质量的印刷图像。

2 BENEFITS 效益

What is the benefit of an electrostatic printing assist system in packaging and decorative gravure printing? 静电吸墨辅助印刷系统对包装和装潢凹版印刷有什么效益?

The use of electrostatic printing assist systems is a virtual necessity in packaging and decorative printing. The competitiveness of products often relies on the visual impression created by the packaging or decorative design.

High quality design needs high print quality. This can best be achieved with electrostatic support, because it is the only technology that effectively prevents “missing dots”.

A packaging or decorative gravure press optimized with an electrostatic printing assist system (ESA) provides an immediate competitive advantage – ensuring that your customers will get the best in printing quality.



在包装和装饰凹版印刷中，使用静电吸墨辅助印刷系统是有实质性必要的。因为有竞争力的产品经常依靠由包装或装潢设计产生视觉印象。

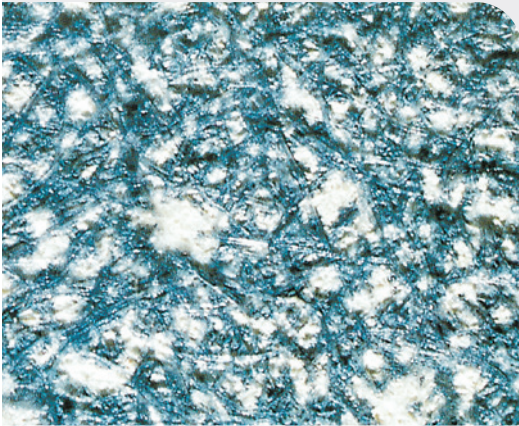
高质量设计需要高印刷质量，用静电吸墨辅助系统是最好实现的，因为它是唯一能有效防止油墨丢点的技术。

一台充分利用了**ESA**静电吸墨辅助系统的包装或装饰凹版印刷机提供了立竿见影的竞争优势—确保你的客户获得最佳的印刷质量。

3

PRIMARY ISSUE 主要问题

How do missing dots actually occur? 丢点或漏白实际上如何产生的？



乍一看，纸张表面似乎很光滑。但是，如果你通过显微镜观察，你会发现纸张的表面是粗糙的。在捏合间隙，这种不规则的纤维密林（例如在70线/厘米）在每平方厘米上要面对4900个网点单元。所有的那些网点单元都要在分离瞬间将它们的油墨转移到到纸张上。

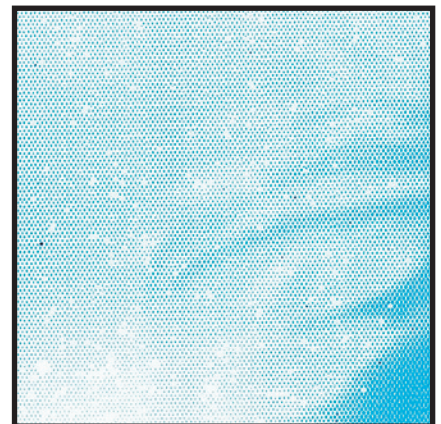
这项任务本来就很难，如果有些纸张表面的可压缩性差，没有很好的弹性或柔韧性，这就使得这项任务的完成变得更加困难。

因此，仅靠机械加压通常不能实现完全的网点无漏白油墨转移。符合印刷标准的卡纸、薄膜、涂布材料或预浸渍材料同样也存在这一问题。

At first glance, the paper surface appears to be smooth. But, if you look at it through a microscope, you will see that it has a rough surface. In the nip, this irregular “fiber jungle” (in a 70 l/cm screen, for example) is faced with 4,900 cells per square centimeter. All of those cells are expected to transfer their ink content to the paper within a split second.

This task, already difficult, is made even harder by the fact that some papers have poor surface compressibility and are not exactly elastic or pliant.

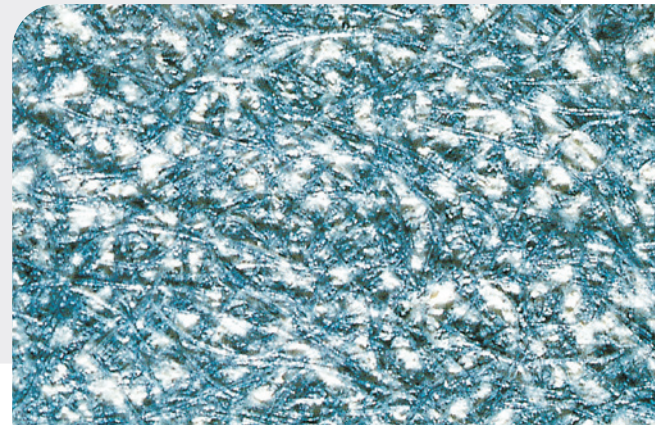
Thus, mechanical contact alone does not always result in a missing dots-free ink transfer. The printability criteria of cardboard, film, coated substrates or pre-impregnated materials also exhibit this problem.



4

SOLUTION 解决办法

What can electrostatic printing assist actually do to improve printing? 静电吸墨辅助印刷系统实际上能改善印刷那些东西?



由ESA静电吸墨辅助系统在印刷捏合间隙产生的电磁场迫使油墨完全推出网穴并转移到材料上。

The electric field generated by the ESA in the printing nip causes the ink to be pulled out of the cells and transferred onto the substrate.

结果

- The results**
- > Ink transfer to the paper or the film surface with point accuracy – without excessive impression roller pressure. Missing dots are now a thing of the past.
 - > Optimal printing results and regular ink density in all gradation ranges, especially in light and middle tones.
 - > Improved print results also on critical to be printed paper substrates, cardboards, films and pre-impregnated materials.
 - > Higher production speeds
 - > Longer service life of the impression roller coatings through reduced impression roller line pressure.

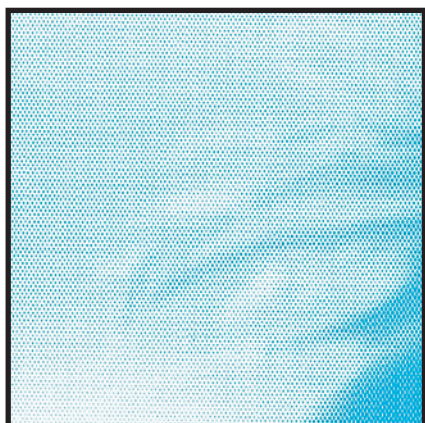
> 油墨全部被转移到纸张或薄膜表面 — 无需过分的压印辊压力。丢点成了过去的事情。

> 最佳的印刷效果和在所有层次上的正常色彩密度，尤其是中浅色调上。

> 同样可以改善难印刷的纸张材料、卡纸、薄膜和预浸渍材料上。

> 更高的生产速度

> 通过减少压印辊线压，延长压印辊包胶层的使用寿命。



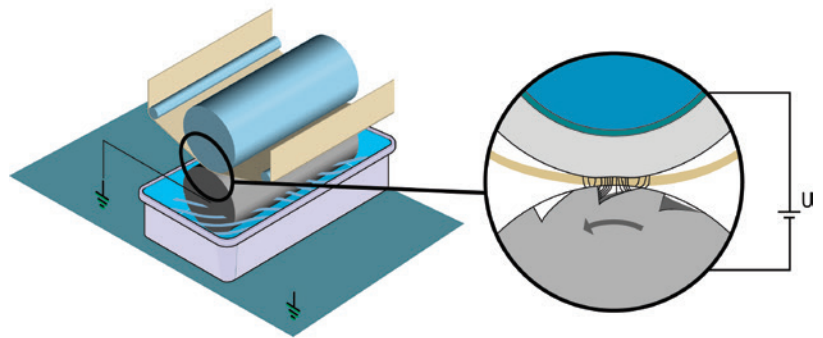
5 PRINCIPLE 原理

What is the principle applied in the electrostatic printing assist? 应用在静电吸墨辅助系统的基本原理是什么？

The Eltex electrostatic printing assist, ESA for short, is based on the principle of the plate-type capacitor. This means that a homogeneous electric field is generated between two plates, in which a dielectric is pulled to one side.

The electrostatic printing assist applies this principle in the nip – at precisely the point where the ink is to be transferred onto the substrate surface.

This principle of ink transfer with electrostatic support works evenly over the entire width of the web and operates reliably from the slowest to the highest production speed.



ELTEX奥电胜静电吸墨辅助印刷系统，简单地说基于片状电容的原理，这也就是说均匀的电磁场在两块极板之间产生，绝缘体被推向另一侧。

静电吸墨系统在捏合间隙运用这一原理，精确地将网点油墨转移到材料表面。

这个采用电磁支持的油墨转移原理运用到整个卷材幅宽表面，从最慢到最快生产速度下都实现可靠运行。

6 STRUCTURE 结构

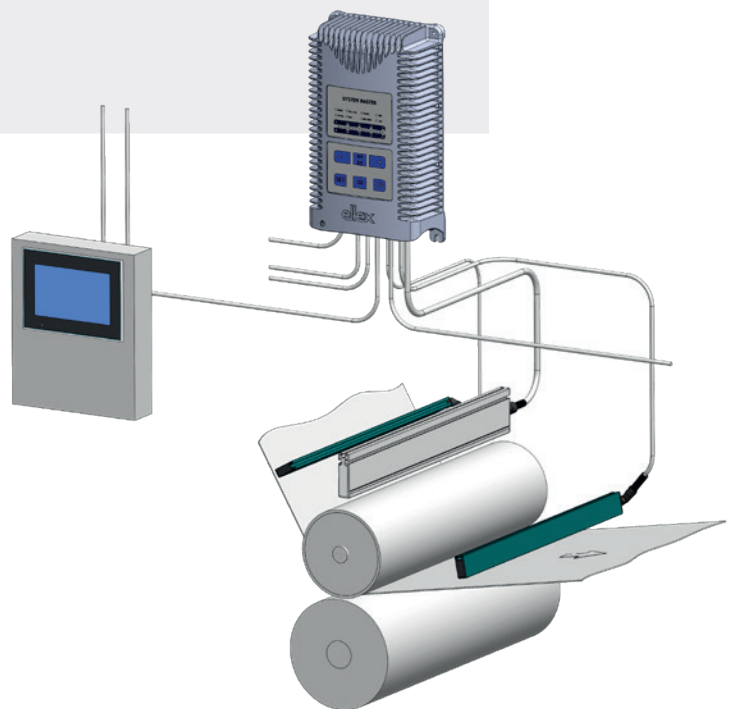
How is the ESA system structured? 静电吸墨辅助印刷系统是如何构成的？

The POWER TOP GHN63 printing assist system guarantees optimum ink transfer to flexible materials. This enables a very high quality to be achieved in packaging and decorative gravure printing.

The incoming paper or film web is discharged by the discharging bar to eliminate any existing electrostatic charge. The impression roller bar transfers the charge onto the conductive layer of the impression roller cover and builds up the nip voltage required in the print nip.

The gap voltage (300 ... 900 V DC) ensures that the ink is transferred completely and precisely from the ink cells to the substrate without high impression roller pressure. The discharge bar on the outlet side eliminates any residual charges on the paper or film surface.

A two- or three-layer impression roller is used for the ESA POWER TOP GHN63 system. The impression roller ensures an even charge distribution in the print nip.



高效上置式GNH63静电吸墨辅助印刷系统确保最佳的油墨转移到柔性材料。这可以在包装印刷和装饰凹版印刷上达到非常高的印刷质量。

进来纸张或者薄膜材料被静电消除棒消除存在的任何静电。压印辊放电棒传递静电在压印辊导电层上，在印刷压区建立起需要的压区电压。

捏合电压（300...900VDC）确保油墨完整和精确地从印刷网穴转移到材料上，不需要更高的压印辊压力。出料侧的静电棒消除任何残留在纸张或者薄膜表面的静电。

两层或三层压印辊使用在高效上置式GNH63静电吸墨系统上。压印辊确保在印刷压区中的电场均匀分布。

7 SAFETY 安全

Isn't high voltage dangerous?
高压危险吗?



The Eltex high voltage generator supplies targeted and controlled high voltage. This guarantees the highest level of safety.

ELTEX高压发生器提供定向的和可控的高压电，这确保了最高的安全级别。

Two safety circuits must be noted. First is the safety of the system for use in hazardous areas. Furthermore, the switching of the ESA must be carried out according to the prescribed safety circuit. Consideration of these circuits ensures optimum safety.

两个安全电路必须注意，第一个是在危险区域使用系统的安全性，此外，开启静电吸墨系统必须遵守要求的安全电路，这些安全电路的考虑确保了最佳安全性。

The safety of the POWER TOP GNH63 system is further improved with performance level d.

高效上置式GNH63系统的安全性进一步提升到D级水平。

ESA POWER TOP GNH63 高效上置式GNH63静电吸墨系统

How does the ESA printing assist system reach Performance Level d? 静电吸墨辅助是如何达到D级性能的?

The ESA POWER TOP GNH63 system

In gravure printing, the ESA electrostatic printing assist ensures complete and precise ink transfer to the paper, cardboard or film surface. This avoids missing dots, which occur particularly in the light and mid-tone range.

The Eltex POWER TOP GNH63 system is available in hazardous area in gas groups IIA and IIB and can be used in water-based gravure printing.

高效上置式GNH63静电吸墨系统

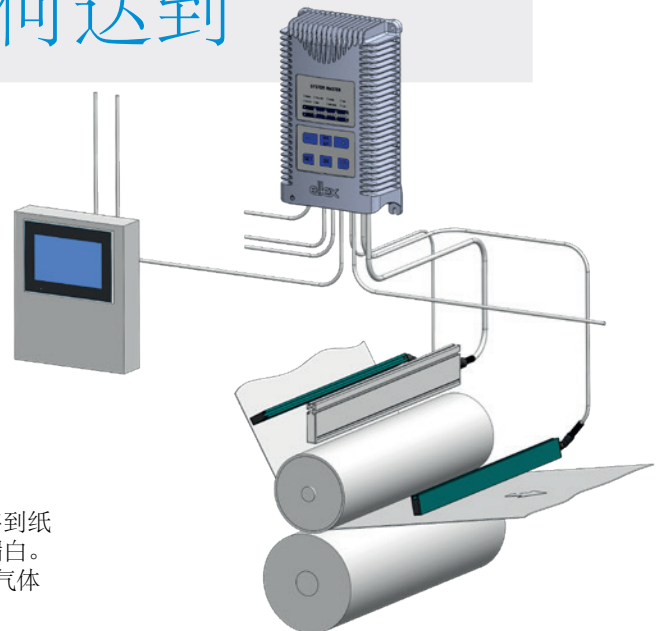
在凹版印刷中，静电吸墨辅助系统确保完全和精确的油墨转移到纸张、卡纸或薄膜表面。这避免了尤其是在中线网容易出现的漏白。ELTEX高效上置式GNH63静电吸墨辅助系统可以使用在气体IIA和IIB的危险区域，并且可以用于水溶性凹版印刷。



通过增加功能安全性减少风险

采用PCTL的至强静电发生器，GNH63静电吸墨辅助印刷系统达到D级性能。根据EN 13849安全标准，这是一个关于安全可靠性的关键参数。

自动诊断鉴定情况确保更低的操作错误和减少在印刷机上的故障，现有的GNH61静电吸墨系统通过升级发生器和静电棒接头成GNH63系统，也能达到D级性能。



Risk reduction through increased functional safety

With the POWER TOP generator PCTL, the ESA GNH63 printing assistance system achieves performance level d. This is an important parameter for the reliability of safety-related functions according to the safety standard EN 13849.

The automatic diagnosis of critical situations ensures fewer operating errors and reduces failures at the press. Existing ESA GNH61 systems can also achieve performance level d by upgrading (generator and bar plug connection) to the GNH63 system.

9 COMPONENTS 部件

What components does an ESA system consist of? 静电吸墨系统由那些部件组成?

Visualisation with Eltex Connected Control ECC

Software for CAN bus communication for managing and controlling the ESA system POWER TOP GNH63 and additional Eltex components for installation on a Windows PC.

Also available as panel PC with installed software.

ECC远程控制系统

用于管理和控制静电吸墨辅助系统的通过CAN bus通讯软件和另外安装于Windows操作系统的电脑上的ELTEX零部件。平板电脑的安装和软件也是可以提供的。



Advantages

- > easy configuration of the functions
- > current display of all relevant system statuses
- > display and output of available process data
- > individual grouping of the single devices
- > high security through three password levels
- > industry 4.0 compliant

优点:

- > 简易功能的配置
- > 所有相关系统状态的实时显示
- > 显示和可提供运行数据输出
- > 单个设备的独立集群
- > 通过三级密码保护的高安全性能
- > 符合工业4.0

高压发生器

系统采用高效PCTL高压发生器运行。静电发放和静电消除电源的电气控制部分一起装在一个紧凑的机箱里，所有电气联控是简单进入的，得益于CAN bus概念，发生器可以通过ECC远程监控运行。

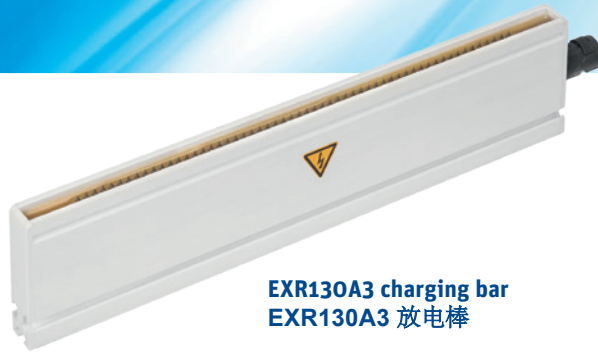
发生器同样可提供按键式或显示屏式。



The High voltage generators

The system is operated by the Eltex high-voltage generators POWER CHARGER PCTL. The power supply for charging and discharging as well as the control electronics are accommodated in a compact housing part. All electrical connections are easily accessible. Thanks to the CAN bus concept, the generators can be operated via the ECC remote control.

The POWER CHARGER is available as a membrane keyboard or in the display version.



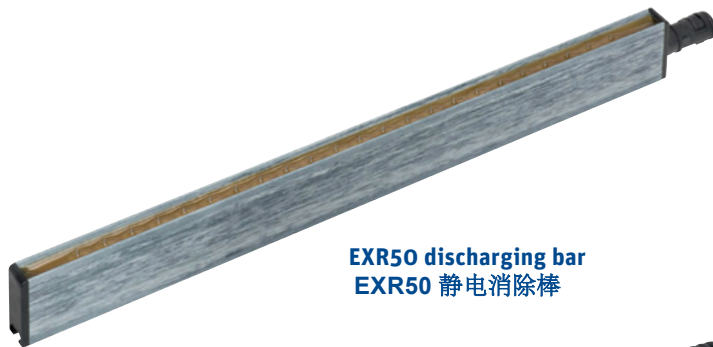
EXR130A3 charging bar
EXR130A3 放电棒

The charging component

The necessary nip voltage is built up via the impression roller bar EXR130A3 – a safe and maintenance-friendly electrode.

放电部件

通过安全和维护简单的EXR130A3压印辊放电棒，必要的压区电压就建立起来了。



EXR50 discharging bar
EXR50 静电消除棒

The discharging bars

A substrate to be printed naturally has electrical charge profiles. The material web must be discharged before entering the printing nip. This is done either with the AC discharging bar EXR50 or with the passive discharging bar RG52.

An additional discharging bar can be installed as an option to neutralise the web at the outlet.

静电消除棒

印刷的材料自然会产生静电。进入印刷压区前材料必须消除静电。这通过交流型EXR50静电消除棒或被动式RG52静电消除棒实现。



RG52 passive discharging bar
RG52被动式静电消除棒

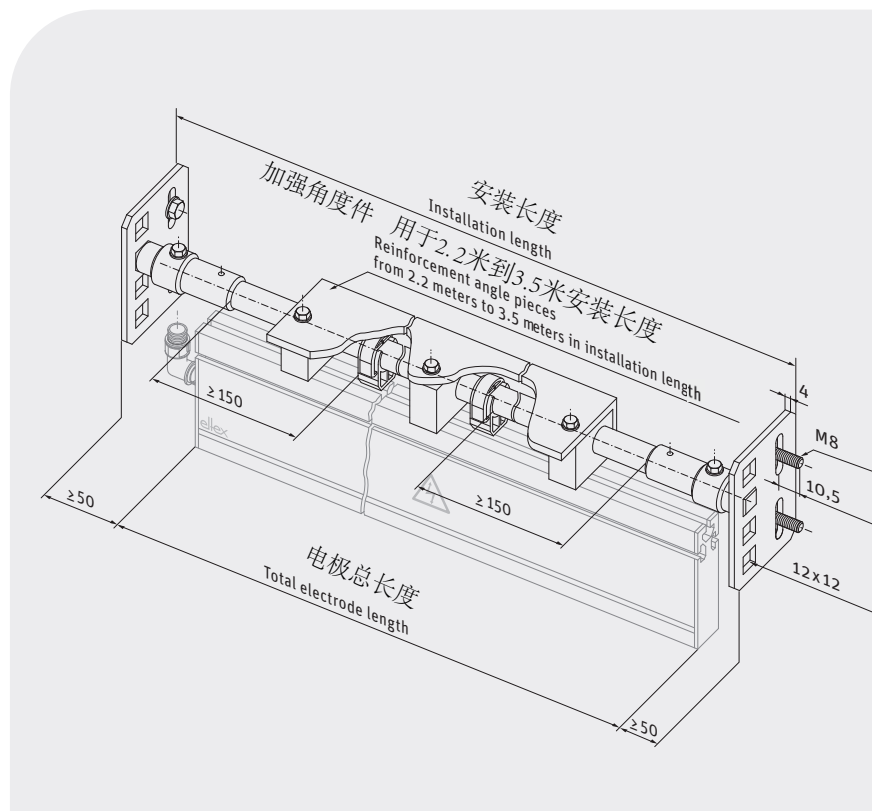
The brackets

In order to position the bars at the correct distances, one holder per bar is required.

支架

为了将静电棒安装在正确距离的位置，每一根棒的安装支架都是需要的。

- > The standard bracket HA02 made of a GRP rod with spring mechanism, if necessary with reinforcing bracket and two end pieces.
- > The bar can be positioned in different ways depending on the shape, size and installation location of the perforated plates.
- > Bracket HA01 can be used alternatively. It consists of a simple angle bracket and has no spring mechanism.
- > HA02标准支架用玻璃钢管带机械弹簧制造。如果有必要，可加强支架和两头零件。
- > 根据预开孔板的形状、尺寸和安装位置，静电棒可以有不同方式定位安装。
- > HA01支架可以单独使用，它由单个角度支架组成，没有弹簧机械件。



10 PROJECT ENGINEERING 项目工程

How is the ESA GNH63 system engineered and installed? GNH63静电吸墨系统如何设计和安装的？

The project engineering

Project engineering includes the following work based on technically clear specifications from drawings or measured data:

项目工程

项目工程包括下列通过画图或测量数据获得技术详细规格的工作。

- > determining the length of the bars
- > positioning of the bars, fixing of the perforated plates/adaptor plates for installation in the press
- > clarification of all cable lengths
- > creating the system parts list and definition of all variant specifications

> 决定静电棒长度

> 静电棒安装位置、预开孔板固定/适配板

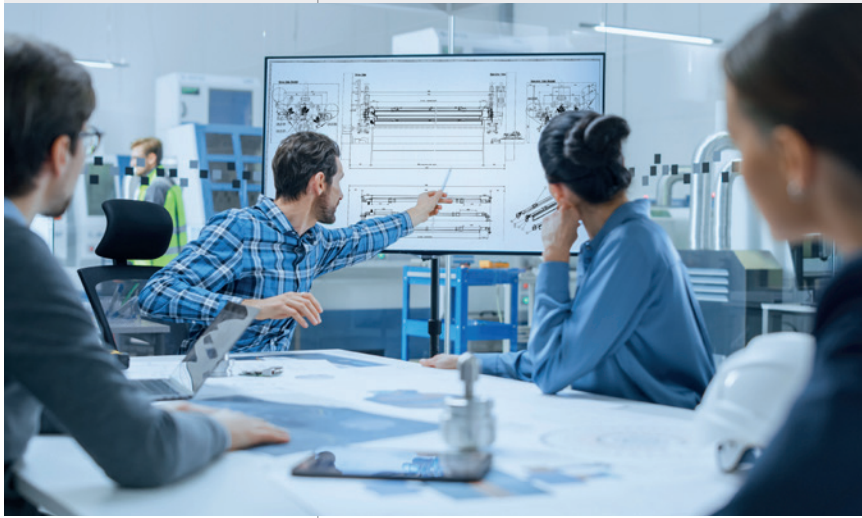
> 确认所有电缆长度

> 创建系统零部件清单并定义各种不同规格

Installation/commissioning

Commissioning is only carried out by an Eltex technician if Eltex has also done the project engineering for the order. It includes the following activities:

- > assembly of the ESA system (mechanical and electrical)
- > laying and connecting the cables
- > setting the charging and discharging bars
- > reviewing mechanical installation
- > configuration of the generators and the Eltex Connected Control ECC
- > checking the safety circuit
- > training for printers / service personnel
- > accompanying print tests



测量

为获得必要的规划和安装GNH63静电吸墨辅助系统的信息，您将会有一名ELTEX技术人员执行您的印机的测量任务。

或者您可以提供给我们详细的项目工程数据。

Taking measurements

In order to obtain the necessary information for planning the installation of the ESA POWER TOP GNH63 system, you can have an Eltex technician carry out the measurement of your press.

Or you provide us with clear data for project engineering.

安装/调试

项目工程由ELTEX完成后，调试亦会由ETELX技术人员负责执行，包括如下工作：

- > 组装静电吸墨系统（机械和电气）
- > 布线和接线
- > 固定放电棒和消除棒
- > 检查机械安装
- > 配置发生器和ELTEX远程监控
- > 检查安全电路
- > 培训印刷工/服务人员
- > 进行印刷测试

11 VARIABILITY 可变性

The suitable ESA POWER TOP GNH63 system – variably tailored to your needs

合适的高效上置式GNH63静电吸墨辅助系统—可根据您的需要定制

The Eltex POWER TOP ESA System GNH63 is much more variable than all previous Eltex ESA systems. Choose your system from the modules power, discharge, operation and service and configure your system.

ELTEX高效上置式静电吸墨辅助系统比以前的ELTEX静电吸墨系统有更多的变化，从下列发生器、静电消除、操作和服务模块中选择您的系统，并配置您的系统。

发生器

Power

75 W | 24 V

75 W | 90 - 264 V

150 W | 90 - 264 V

静电消除

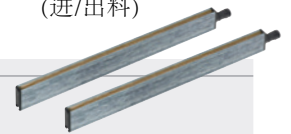
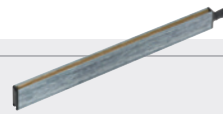
Discharge

1根被动式静电消除棒
1 passive bar
(outlet)
(出料)

1根主动式静电消除棒
1 active bar
(outlet)
(出料)

2根被动式静电消除棒
2 passive bars
(in/outlet)
(进/出料)

2根主动式静电消除棒
2 active bars
(in/outlet)
(进/出料)



操作

Operation

发生器上的显示器

Display on generator



ECC远程监控

Bus via ECC



集成监控

own visualisation



服务

Service

测量

Measuring



项目工程

Project Engineering



安装 / 调试

Installation/Commissioning



12 RETROFITTING 改装

Can I upgrade my existing ESA system? 我可以升级现有的静电吸墨系统吗?

Existing ESA Top Loading systems can be retrofitted to the new ESA POWER TOP GNH63 system.

现有的上置式静电吸墨系统可以改装为新的
高效上置式GNH63系统。

Components such as bars and existing cabling are made suitable for the GNH63 system by small modifications.

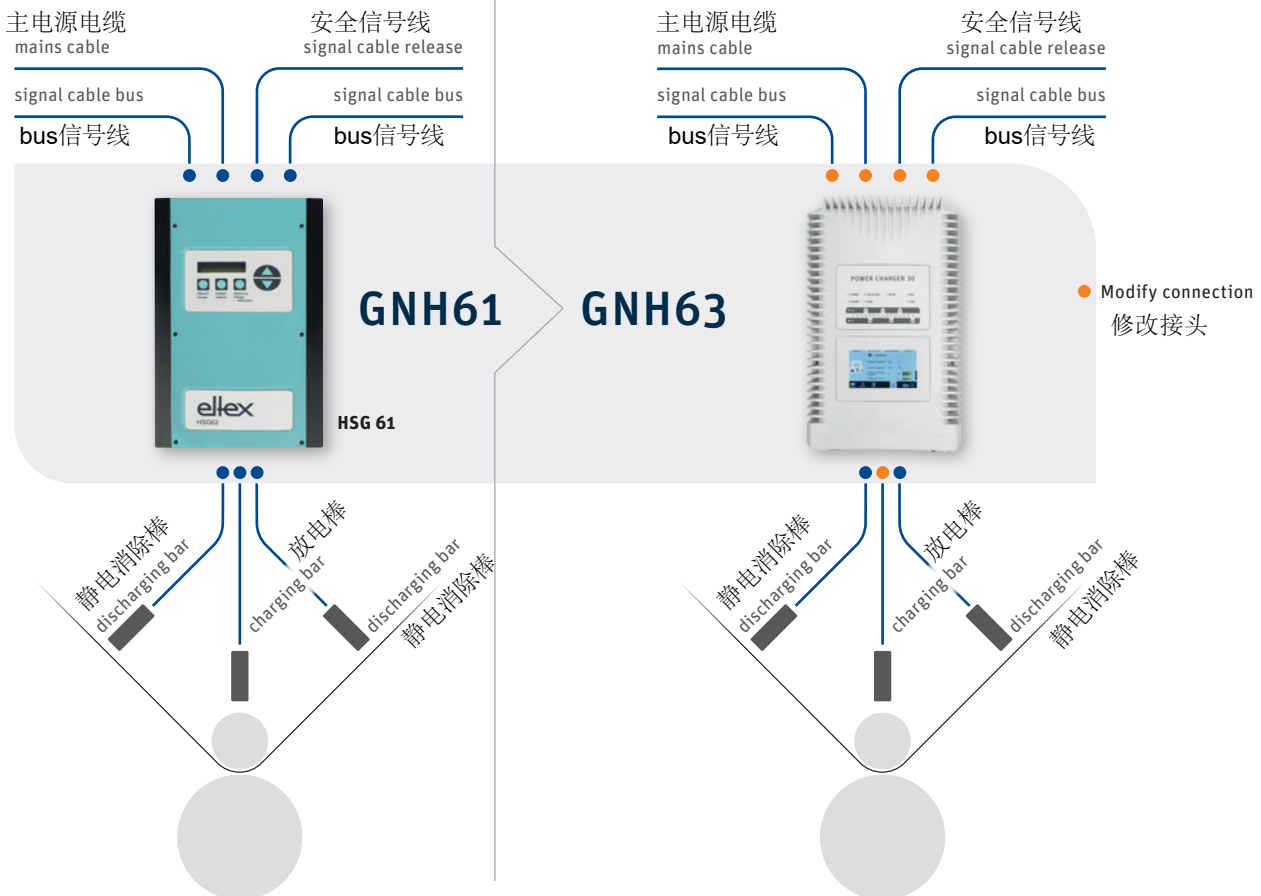
Contact us:

We will be pleased to offer you the most suitable retrofit.

通过一些细小的修改，使静电棒和现有电缆等组件适用于GNH63系统。

请和我们联系:

我们乐于向您提供最合适的改装方案。



What can we do for you? 我们能为你做什么？

ELTEX奥电胜与用户长期保持着密切的联系。信息的公开交流产生了定制和特定具体的解决方案。联合问题分析、大纲概要和详细规划、现状—我们的每一个项目都伴随着先进的制造技术和与现有设备、开机、维护和服务的整合。

您对ELTEX奥电胜静电吸墨印刷辅助系统或其他ELTEX静电创新产品感兴趣吗？

我们将竭诚为您提供在您的应用中使用Eltex奥电胜技术以及我们的服务范围。请随时和我们联系。

Eltex is in permanent and close contact with users. The open exchange of information results in custom-made and specific solutions. Joint problem analyses, outline and detail planning, state-of-the-art manufacturing and integration into existing equipment, start-up, maintenance and service accompany each of our projects.

Are you interested in Eltex printing assist systems or in any other Eltex electrostatic innovation? We will be happy to inform you about using Eltex technology in your application and about our range of services. Please contact us.



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