



**el**tex

electrostatic  
innovations



# Electrostatic Printing Assist ESA POWER TOP GNH63

## 1 NEED

# Why does gravure printing actually need electrostatic printing assist systems?



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.

## 2 BENEFITS

# What is the benefit of an electrostatic printing assist system in packaging and decorative gravure printing?

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.

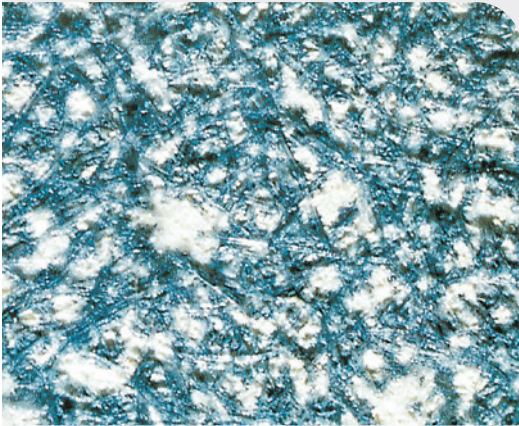
High quality design needs high print quality. This can best be achieved with electrostatic support, because it is the only technology that effectively prevents “missing dots”.

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.



### 3 PRIMARY ISSUE

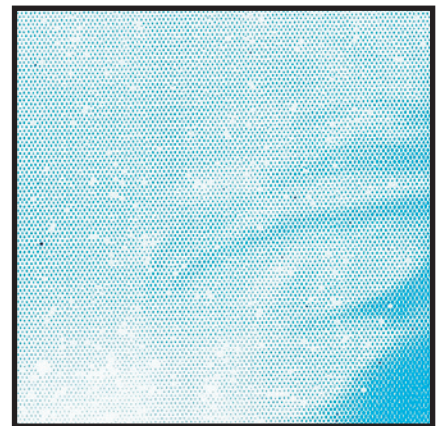
## How do missing dots actually occur?



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.

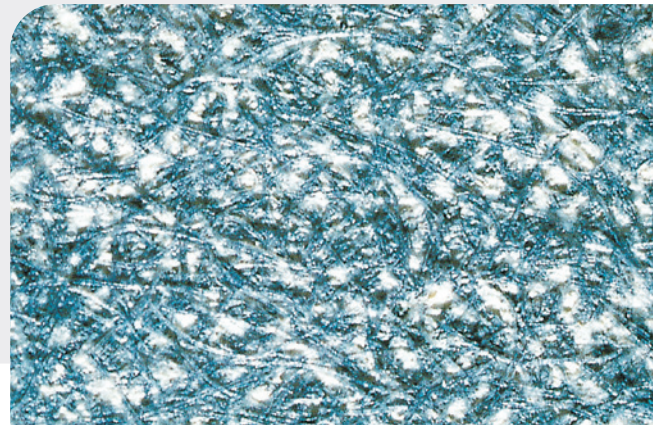
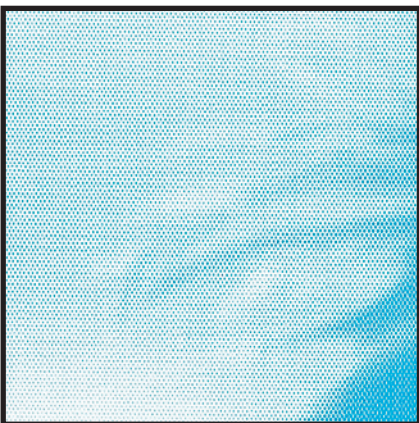
Thus, mechanical contact alone does not always result in a missing dots-free ink transfer. The printability criteria of cardboard, film, coated substrates or pre-impregnated materials also exhibit this problem.



## 4

## SOLUTION

# What can electrostatic printing assist actually do to improve printing?



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.

- 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.

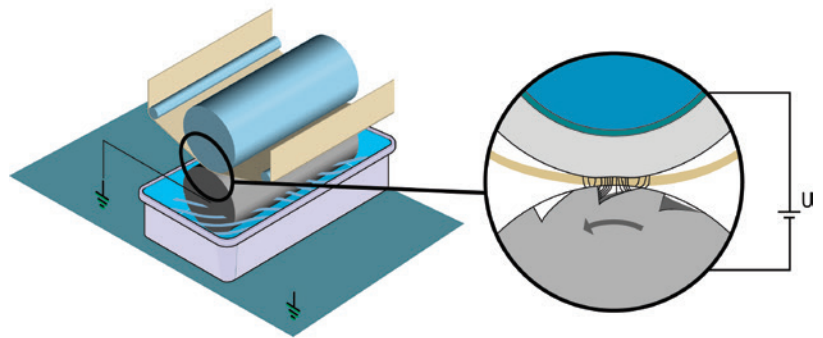
## 5 PRINCIPLE

# What is the principle applied in the electrostatic printing assist?

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.



## 6 STRUCTURE

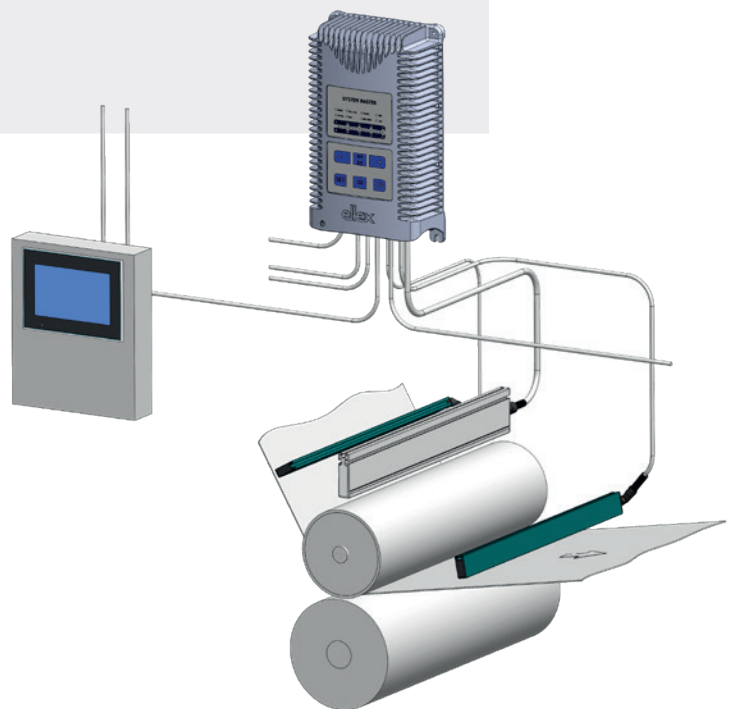
# How is the ESA system structured?

**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.



## 7 SAFETY

# Isn't high voltage dangerous?



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

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.

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



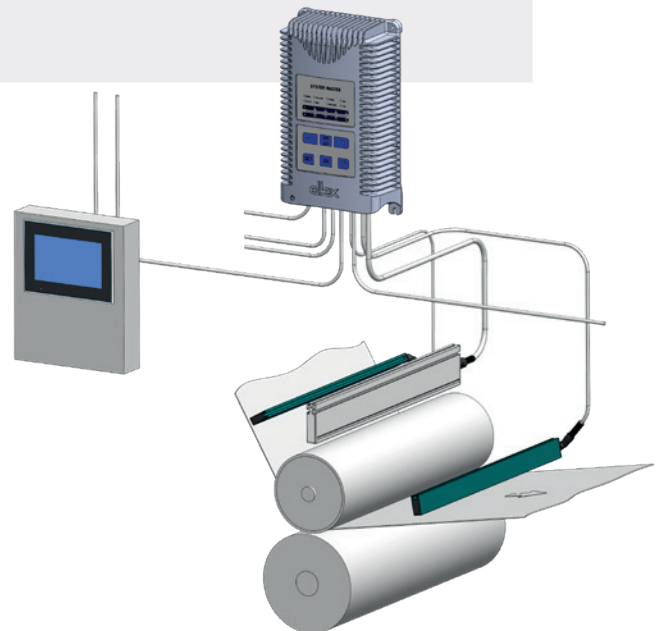
## 8 ESA POWER TOP GNH63

# How does the ESA printing assist system reach Performance Level d?

### 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.



### 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

# What components does an ESA system consist of?

### 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.



### Advantages

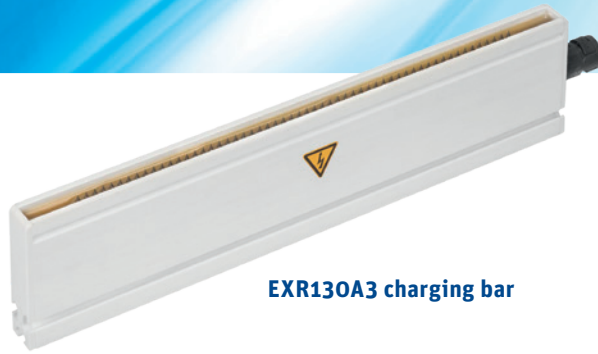
- easy configuration of the functions
- current display of all relevant system statuses
- display and output of available process data
- individual grouping of the single devices
- high security through three password levels
- industry 4.0 compliant



### 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.

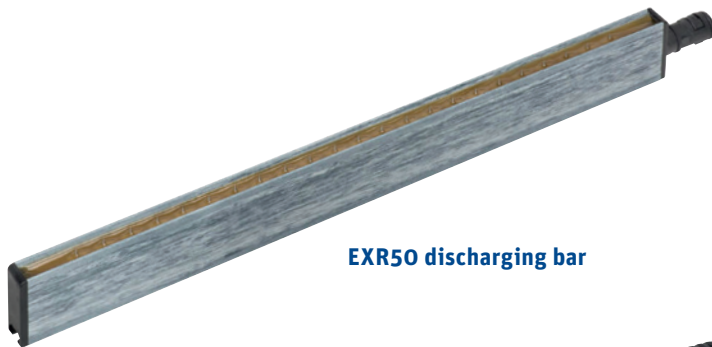
The POWER CHARGER is available as a membrane keyboard or in the display version.



**EXR130A3 charging bar**

**The charging component**

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



**EXR50 discharging bar**

**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.



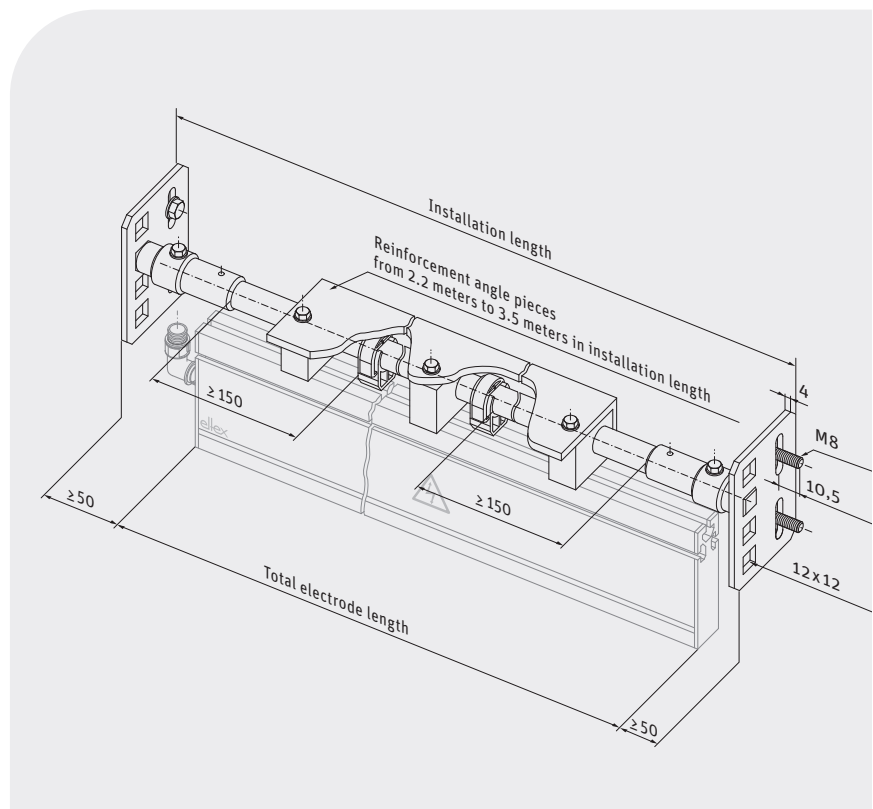
**RG52 passive discharging bar**

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

**The brackets**

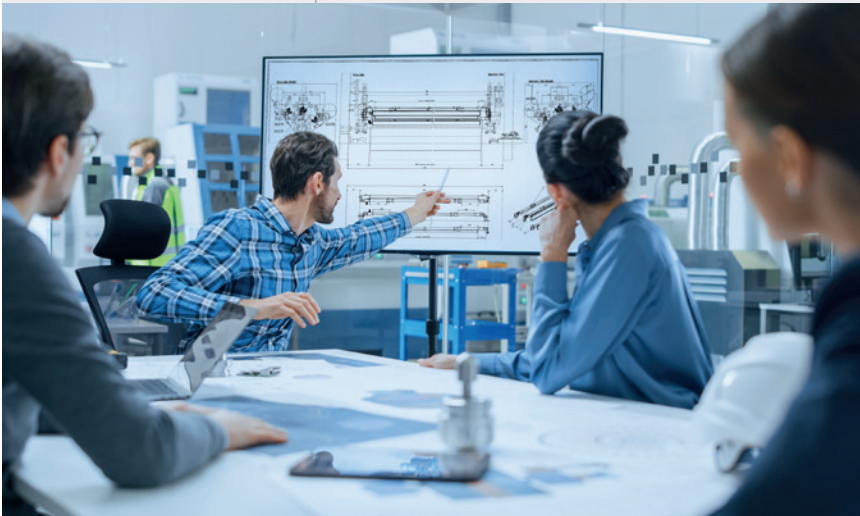
In order to position the bars at the correct distances, one holder per bar is required.

- 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.



## 10 PROJECT ENGINEERING

# How is the ESA GNH63 system engineered and installed?



### The project engineering

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

- 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

### 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.

### Installation/commissioning


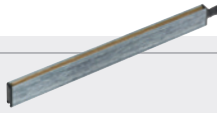

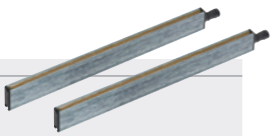






Commissioning is only carried out by an Eltex technician if Eltex has also done the project engineering for the order. It includes the following activities:

- 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

# 11 VARIABILITY

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

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.

<b>Power</b>	<b>75 W   24 V</b>	<b>75 W   90 – 264 V</b>	<b>150 W   90 – 264 V</b>	
<b>Discharge</b>	<b>1 passive bar (outlet)</b>	<b>1 active bar (outlet)</b>	<b>2 passive bars (in/outlet)</b>	<b>2 active bars (in/outlet)</b>
				
<b>Operation</b>	<b>Display on generator</b>	<b>Bus via ECC</b>	<b>own visualisation</b>	
				
<b>Service</b>	<b>Measuring</b>	<b>Project Engineering</b>	<b>Installation/Commissioning</b>	
				

## 12 RETROFITTING

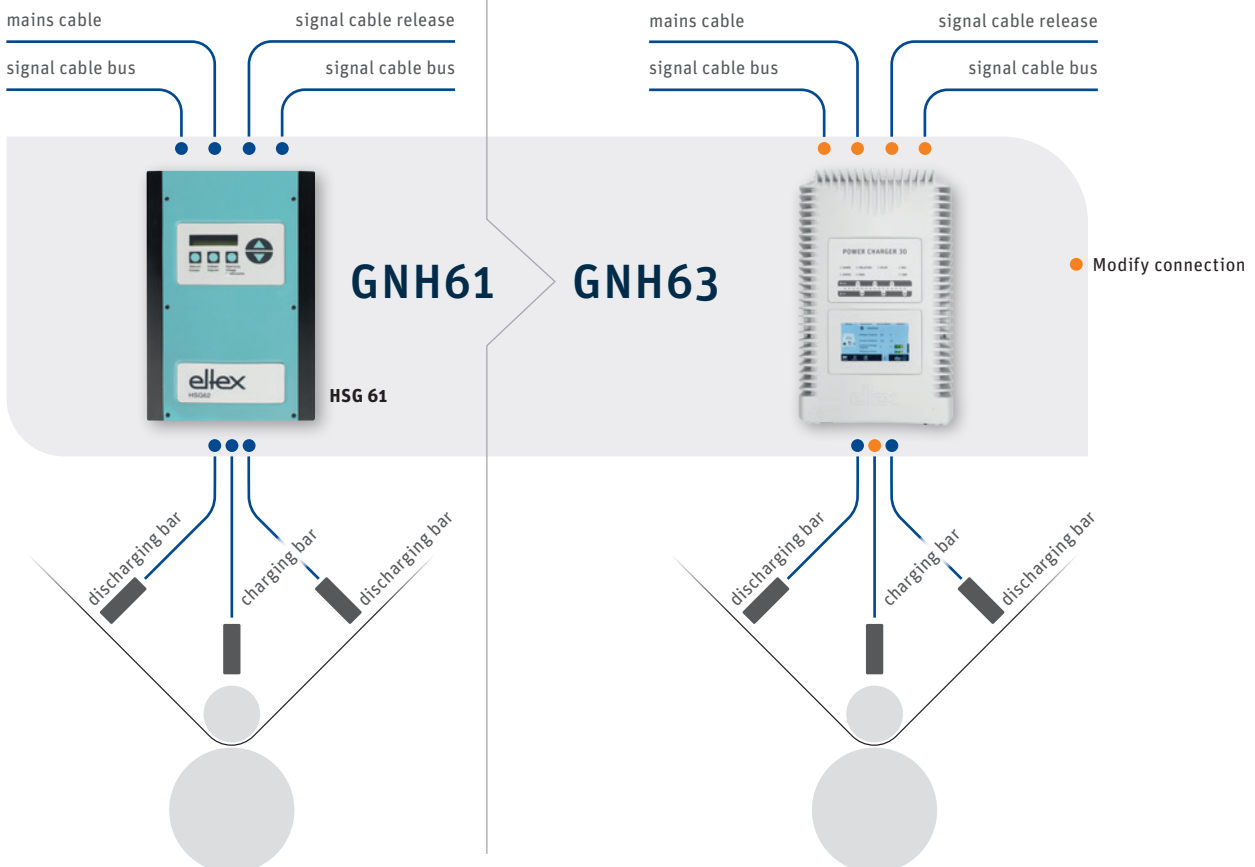
# Can I upgrade my existing ESA system?

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

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.



# What can we do for you?

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.