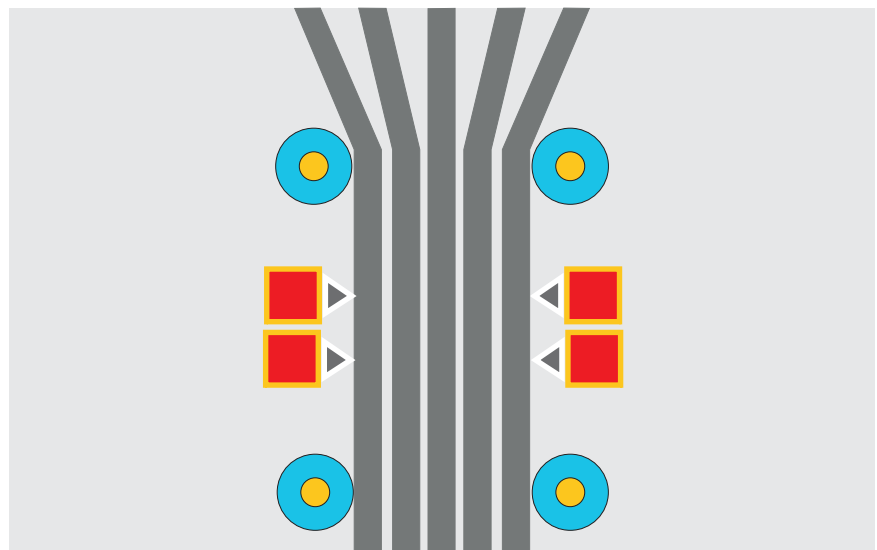


Operating Instructions



Z00349y

POWER TACK Ribbon Tacking series GHH37

BA-en-9013-2304



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#: The optional components or functions are marked with this symbol.

Dear customer

The POWER TACK electrostatic ribbon tacking system serie GHH37 is intended for use in folders and is designed to interlock the incoming paper webs using static electricity such that dog earings and creases are avoided.

The charging electrodes are mounted after the multi-layer rollers and ahead of the of the cross cutter. The paper webs run between the electrodes and are charged up in the process. The ribbon tacking system is made in several different designs and can be installed in all commercial folders.

The system offers the following benefits:

- copy collating without turned corners
(with optimum mechanical setting of the collector cylinder)
- higher machine speeds
- ultimate bundle formation
- cost savings through better machine efficiency
- good converting of the finished products

Please read these instructions carefully before starting the unit. This will help you prevent personal injuries and damage to property.

Simply give us a call if you have any suggestions, proposals or ideas for improvements. We greatly appreciate the feedback from the users of our appliances.

1. System description

1.1 Function

In practical use the ribbon tacking makes use of the fact that charges with unequal polarity attract each other and charges with the same polarity repel each other.

What is known as Coulomb force then acts on the charge carriers:

$$\vec{F} = \frac{Q \cdot \vec{E}}{2} = \frac{Q \cdot U}{2r} \vec{r}$$

whereas

Q the positive or negative charge (unit = Coulomb = [As]),

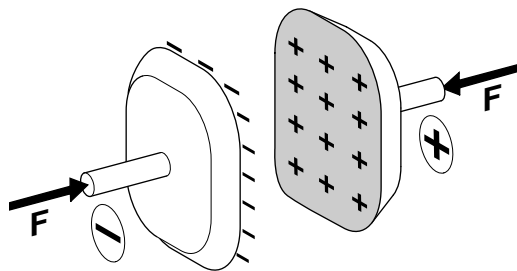
\vec{E} the electrical field,

U the applied voltage in Volt,

r the distance of the charges from each other,

\vec{r} the unit vector.

Fig. 1:
Force \vec{F} acting
on a plate-type
capacitor



The plates of the plate-type capacitor shown above attract each other with the force \vec{F} .

The acting force therefore depends on the quantity of the charge available and the distance of the charges with unequal polarity from each other.

In good insulators the charge remains on the surface and flows off again after a certain time (relaxation time).

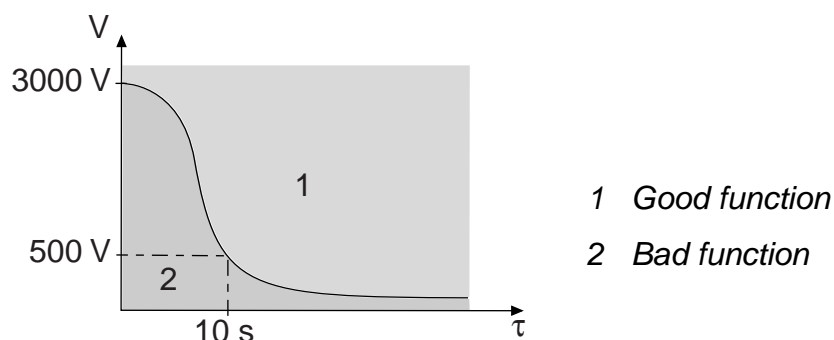
The relaxation time is determined by the insulation resistance ρ of the surface and its dielectric constant ϵ . The greater the insulation resistance, the greater the relaxation time T.

$$T = \epsilon \cdot \rho, \text{ with } \rho = [\Omega \cdot \text{m}].$$

For the efficient use of static attraction it is necessary that the applied charge does not leak off too quickly.

If a high voltage of 3,000 V is applied, it is allowed to decay to 500 V within 10 seconds. If it decays quicker, the function of the ribbon tacking will be impaired.

Fig. 2:
Relation between
charge applied
and time τ in
which it leaks off



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1.2 Principle of ribbon tacking

High voltage generators generate positive and negative high voltages which are passed on to the charging electrodes mounted in the folder. The positive and negative are arranged in opposition to each other. The paper webs pass between the electrodes.

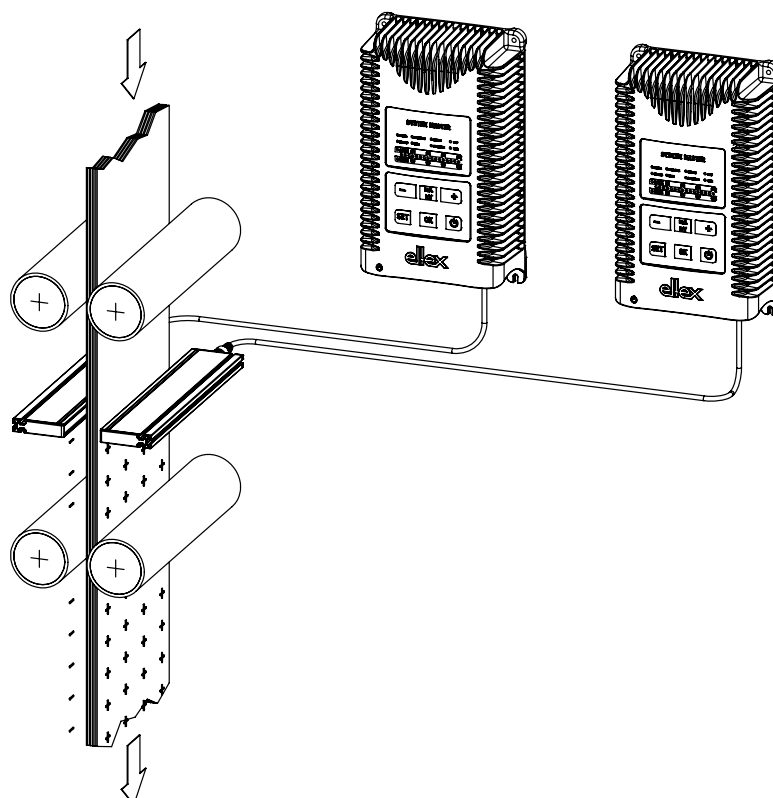


Fig. 3:
Principle of elec-
trostatic ribbon
tacking

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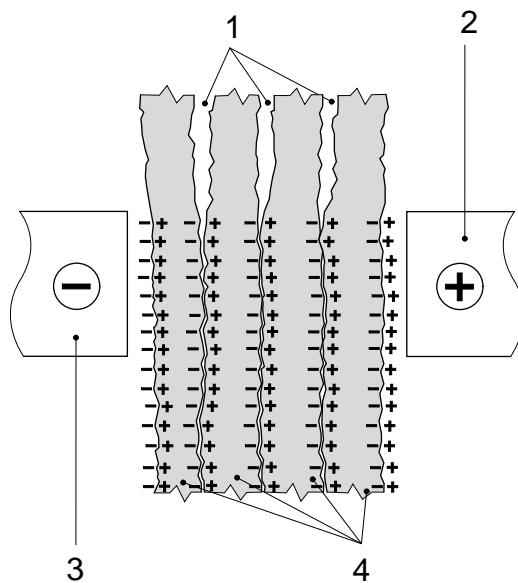


Fig. 4:
Charge shift inside
the paper webs

- 1 Spaces
- 2 Positive electrode
- 3 Negative electrode
- 4 Paper webs

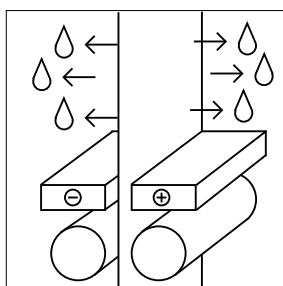
The limit charge density is exceeded at the tips of the electrodes, and electrically charged particles are emitted. These particles settle on the surface of the paper web. The paper web now carries a positive charge on one side and a negative charge on the other.

The Coulomb force causes the paper webs to attract each other, the air in between will be displaced and the paper webs will be pressed against each other. The paper webs now adhere to each other, i.e. they are interlocked. In addition, the charges applied to the outer paper webs cause a charge shift on the inner paper webs and so provide additional adhesion on the inside. Even when the outer paper webs are removed, the remaining paper webs adhere to each other.

The adhesive effect is sustained until the charge applied has leaked off again. For ribbon tacking to be effective, the paper used must keep its charge until after the collector cylinder.

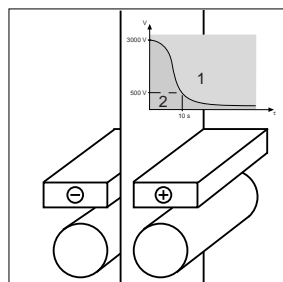
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The system will function best if:



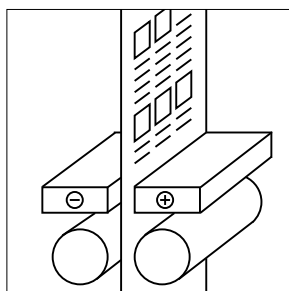
the paper is not too moist, i.e. if it has high static resistance,

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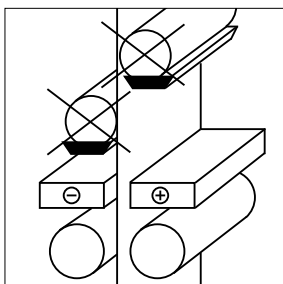
no heavily mineralized paper is used (i.e. “conductive paper” for high voltage, e.g. some recycling type papers)
(1 good function, 2 bad function),

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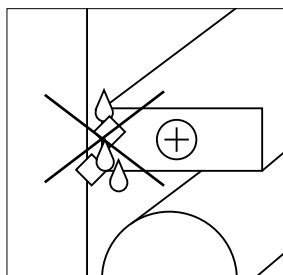
unsuitable papers are printed with large areas (illustrations, lettering, because the printing ink is normally highly resistive),

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no water-silicone emulsions reduce the insulation resistance of the paper surface, or wet the electrodes.

Z00085y



the electrodes are free from paper dust, moisture, oil and grease. Dirty electrodes lose their efficiency.

Z00086y

Fig. 5:

1.3 System outline

These operating instructions describe the maximum configuration of the system. Depending on design, not all components or functions may be available in your version. The optional components or functions are marked with the following symbol: #

The individual components are described on the next page.

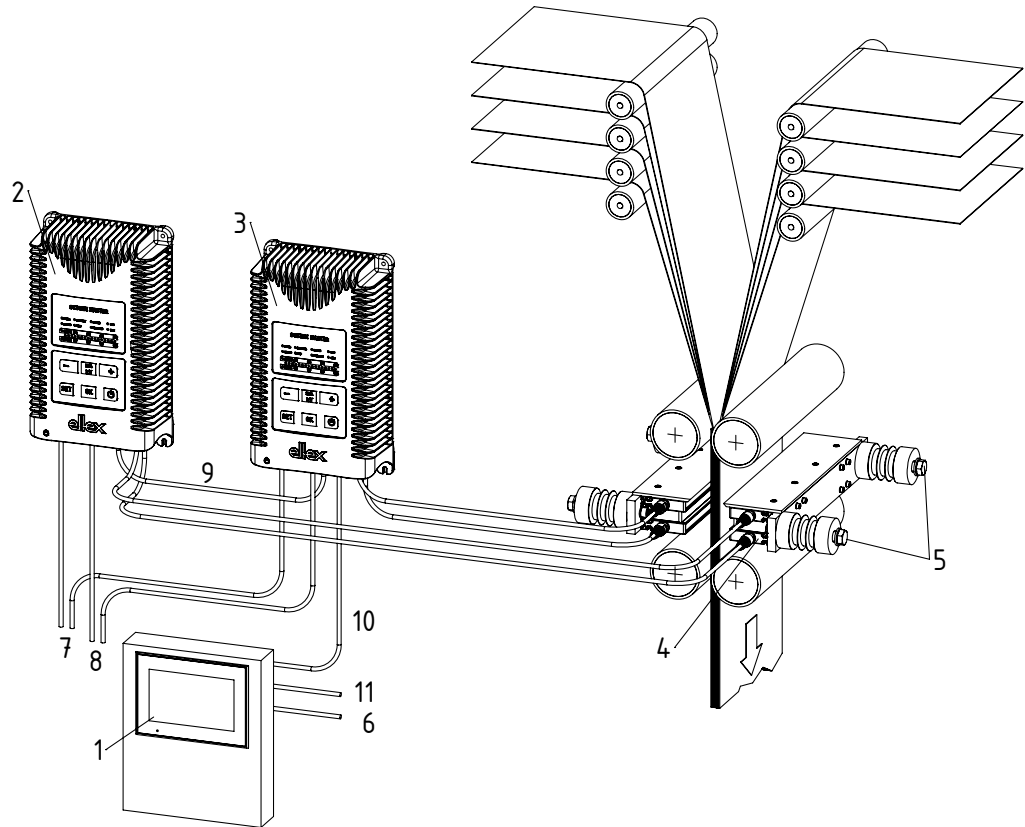


Fig. 6:
System and
component outline
(example ST/H2,
double row ribbon
tacking)

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1.4 System components

Item	Designation	Function	Type	Number
1 #	Visualization system Eltex Connected Control ECC (supplied by: Eltex)	The Eltex Connected Control ECC is a multifunctional control unit for the operation, visualization, parameterization and monitoring of supported end devices. It assumes the central role for controlling the entire fieldbus network and monitors the devices connected to it.	ECC_S/EG ECC_S/EI ECC_S/GG ECC_S/GI ECC_S/NG ECC_S/NI ECC_S/SU ECC_S/SE ECC_S/SP	1/system
2	High voltage generator (supplied by: Eltex)	Supplies the charging electrode with positive high voltage and monitors the releases.	PCRT/_P_	1/system
3	High voltage generator (supplied by: Eltex)	Supplies the charging electrode with negative high voltage and monitors the releases.	PCRT/_N_	1/system
4	Charging electrode (supplied by: Eltex)	The charging electrode transfers positive or negative high voltage onto the incoming webs and interlocks them. Positive and negative electrodes are arranged in opposition to each other.	STR130A3/_ R130A3L/_	2 (GHH37-1) or 4 (GHH37-2)
5	Brackets and insulators for the charging electrodes (supplied by: Eltex)	Depending on machine layout and folder model, different brackets and holder systems are used for the charging electrodes. Electrode spacing 40 or 90 mm.	ST/T1, ST/T2 ST/H1, ST/H2	1/system

Cable connections

Item	Designation	Connections on site (customer)	Type	Number
6 #	Mains lead visualization system ECC Power supply 24 V DC / 4.2 A DIN rail housing	Open cable end	KN/DD_____ 115047	1/system
7	Mains lead generators	Open cable end	KN/GD____ (AC) KN/HD____ (DC)	1/generator
8	Release leads charging from the protective circuit to the generator	Open cable end	CS/AMO____	1/generator
9 #	CAN bus lead*		CS/CFMG____	Σ generators -1
10 #	CAN bus lead* to the visualization system ECC		CS/CFMG____	1/system
	Charging electrode cable	Part of the electrode	-	-
11 #	Control room integration visualization system ECC	T-distributor M12, 5-pin shielded customer connection as required (plug, socket, wire end ferrule)	114854 CS/C____	1/system
*Please contact us for further interfaces to the generators.				

1.5 System options

Depending on the folder model in which the system is installed, the ribbon tacking system is available in different design versions.

System GHH37-1

Bracket ST/T1:

Two charging electrodes are mounted opposite each other. The bracket is designed such that a second row of electrodes can be retrofitted. The electrode spacing is then 40 mm.

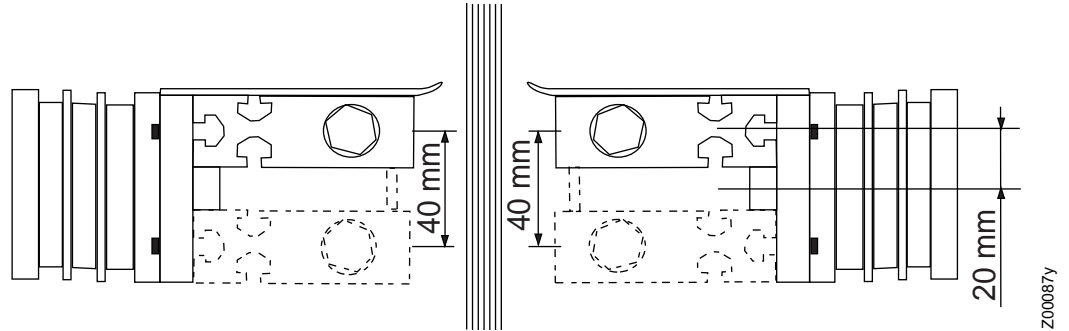


Fig. 7:
Design ST/T1

Bracket ST/H1:

Two charging electrodes are mounted opposite each other. The bracket is designed such that a second row of electrodes can be retrofitted. The electrode spacing is then 90 mm.

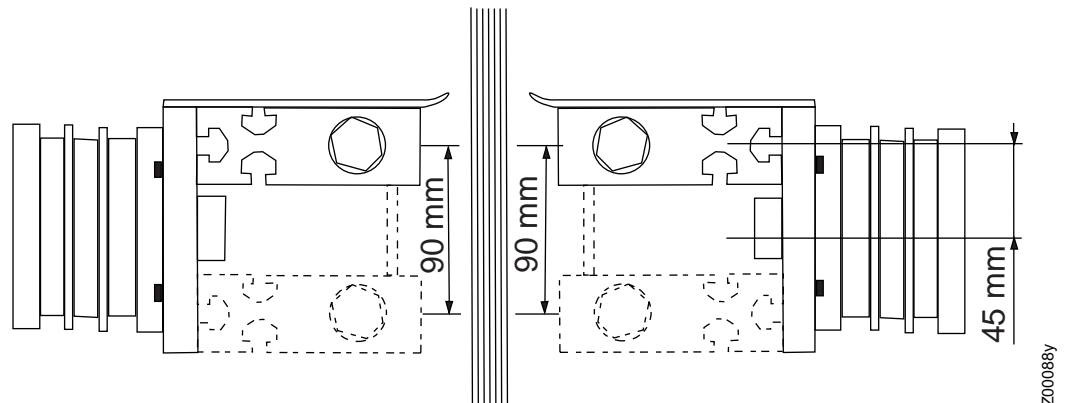


Fig. 8:
Design ST/H1

System GHH37-2

Bracket ST/T2:

Two charging electrodes each (4 in total) are mounted in opposition to each other. The electrode spacing is then 40 mm.

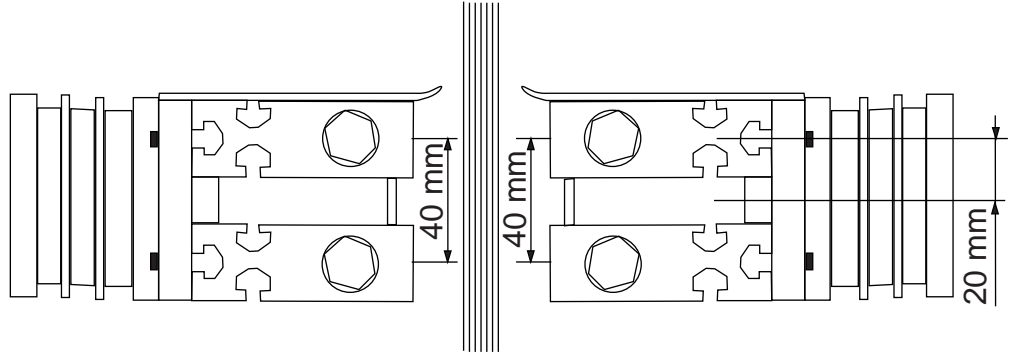


Fig. 9:
Design ST/T2

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Bracket ST/H2:

Two charging electrodes each (4 in total) are mounted in opposition to each other. The electrode spacing is then 90 mm.

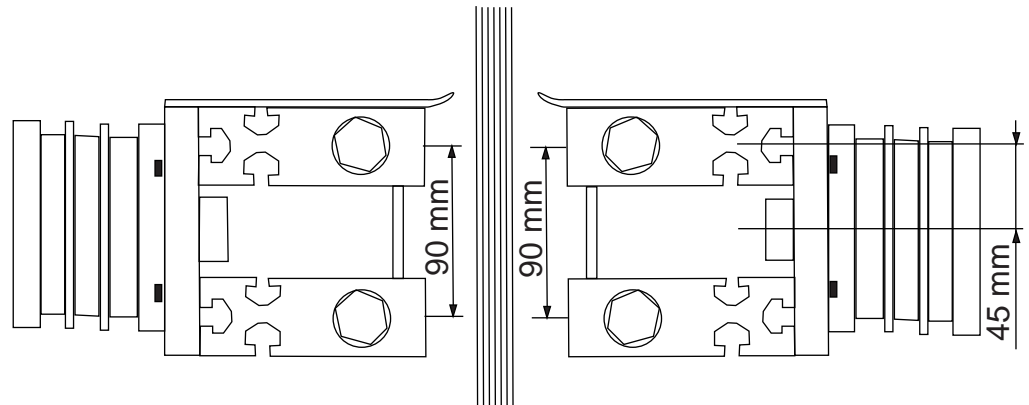


Fig. 10:
Design ST/H2

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The electrodes are mounted after the multi-layer rollers and ahead of the cross cutter.

If there is no space downstream from the multi-layer rollers to mount the electrodes, they can also be mounted ahead of the roller. In this case the electrodes ought to be as close as possible to the multi-layer roller to make sure that the paper webs run close to each other.

2. Safety

The units have been designed, built and tested using state-of-the-art engineering, and have left the factory in a technically and operationally safe condition. If used improperly, the units may nevertheless be hazardous to personnel and may cause injury or damage. Read the operating instructions carefully and observe the safety instructions.

For warranty conditions, please refer to the General Terms and Conditions (GTC), see www.eltex.de.

2.1 Identification of risks and hazards

Possible risks and hazards resulting from the use of the units are referred to in these operating instructions by the following symbols:



Warning!

This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in serious personal injuries.



Caution!

This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in damage to property.

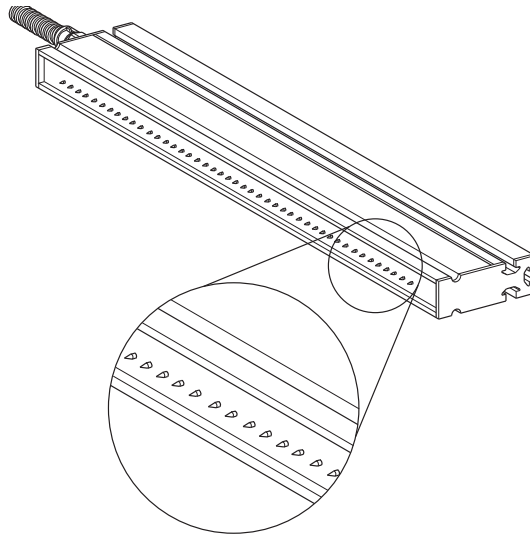
2.2 Contact protection



Warning!

- The site of installation and/or use of the units is outside the control of Eltex, contact protection against inadvertent contact of the electrodes and of live components by personnel as specified by the employer's liability insurance association may have to be provided (e.g. DGUV V3 in Germany). Contact protection devices made of conductive material must be grounded.
- Do not touch the emission tips of the charging electrode (see Fig. 11) - risk of injury!
- Do not touch the emission tips with conductive objects (e.g. screw drivers, cabinet key, watch, body parts, etc.).
- Do not short-circuit two or more emission tips by touching these at the same time.
- Make sure that the electrodes are clean at all times. Dirt results in malfunctions and early wear. Conductive dirt settling on the electrode can cause fire.

Fig. 11:
Emission tips of
the charging elec-
trode



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2.3 Inspection of the protective resistors - contact protection

The function and the appearance of the protective resistors must be inspected at regular intervals. The inspection intervals are specified in the accident prevention regulations, as amended (e.g. in Germany DGUV V3).

Please observe the information in the separate operating instructions for the corresponding electrode R130A3 / R130A3L.

2.4 Technical advance

The manufacturer reserves the right to make changes to the technical specifications without prior notice in order to adapt the units to state-of-the-art engineering. Eltex will provide the latest information on any changes or modifications in the operating instructions on request.

2.5 Proper Use

The ribbon tacking system may only be used for web adhesion/ribbon tacking in folders. Other uses are not permitted.

The manufacturers will not assume any liability and warranty if the unit is used improperly or used outside the intended purpose.

Modifications and changes of the system are permitted only if described and approved in the operating instructions.

Use only original Eltex spare parts and accessories.

2.6 Work and operational safety



Warning!

Please observe the following instructions and [chapter 2 "Safety", page 15](#) in their entirety and precisely!

Always observe the regulations for electrical equipment applicable in your country.

- Before installing, rectifying operating faults and performing cleaning and maintenance work on the units and the associated components, the power supply must be disconnected (see [chapter 5 "Maintenance", page 33](#), [chapter 6 "Troubleshooting", page 34](#)).
- During any and all work, the machine on which the devices are installed must not be in operation (see [chapter 5 "Maintenance", page 33](#), [chapter 6 "Troubleshooting", page 34](#)).
- All work on the devices may only be performed by qualified electricians (see [chapter 3 "Installation and assembly", page 21](#), [chapter 5 "Maintenance", page 33](#), [chapter 6 "Troubleshooting", page 34](#)).
- The electrodes passively absorb energy from the moving substrate web. The high voltage cable must be plugged in or grounded to the generator. If the high voltage cable is disconnected, the plug is live (high voltage) and applies with full power on the plug; this may cause a spark discharge and may lead to a risk of injury. Disconnected high voltage plugs are not permitted or have to be grounded (see [chapter 5 "Maintenance", page 33](#)).
- To guarantee the safe operation of the device, the described conditions (protective circuit, enabling, installation of the units, electrical connection etc.) must be observed. Refer to the notices in [chapter 3 "Installation and assembly", page 21](#).
- Before switching on the generator for the first time, make sure that the housing is permanently grounded via the ground terminal (cable length 0.5 meters: $\varnothing 2.5 \text{ mm}^2$). Failure to observe this precaution can result in charges developing on the surface of the housing (see [chapter 3 "Installation and assembly", page 21](#)).
- The operator of the plant is responsible for the proper function of the protective circuit. The protective circuit must be installed for each individual generator separately and each generator housing must be permanently grounded via the ground terminal (cross section min. 2.5 mm^2).
When setting the ribbon tacking system into operation, the proper function of the protective circuit must be checked for each folder (see [chapter 3.1 "Protective circuit, enable signals", page 21](#)).
- A redundant release signal is required if the generator must comply with the safety requirements of DIN EN 13849. To this end, the two signals "Release +" and "Release -" must be transmitted via separate switching

paths; hardwiring of the two release signals +/- is prohibited (see [chapter 3.1 "Protective circuit, enable signals", page 21](#)).

- To prevent leakage currents which may damage the electrode and the mounting material, the following spacings and distance are to be maintained during assembly (see [chapter 3.2 "Assembling the charging electrodes", page 23](#)).
- Due to its surface conductivity, water-silicone emulsion severely impairs the proper function of the ribbon tacking system. Condensation settling on the electrodes can cause creepage currents which destroy the electrode. Condensation on the electrodes caused by water-silicone emulsions renders the warranty null and void.
Note: The electrodes must be clean, i.e. not contaminated with substances such as grease, oil, water-silicone emulsion, etc. If water-silicone emulsions are used, a trap device must be fitted to ensure that emulsion cannot drip onto the electrodes (see [chapter 3.2 "Assembling the charging electrodes", page 23](#)).
- Disconnect and/or connect the mains cable on the socket only when the generator is switched off (see [chapter 3.5 "Electrical connection", page 26](#)).
- When using external protection fusing for generators, the following circuit-breaker must be used: 6 A; tripping characteristic D (see [chapter 3.5 "Electrical connection", page 26](#)).
- Before switching on the system the user must make sure that the installation and the connections have been carried out correctly. If they have, the supply voltage may be switched on via the master switch of the folder.
The operating switches of the generators and of the visualization system must be switched on at all times; they are activated/deactivated via the main switch of the folder.
After switching on the system, check the proper function of the protective circuit.
Note!
If the visualization system is connected to the generators via the CAN bus, the unit can be operated only with the visualization system (as long as the parameter "keyboard lock" of the appropriate generator is set to active) .
In this case the generator will not respond to direct operation via the operating keys, observe the notes in [chapter 4.1 "Startup", page 27](#).
- Do not touch the screen of the visualization system with pointed or sharp objects! This may damage the touch sensitivity of the screen (see [chapter 4 "Operation", page 27, chapter 5.4 "Visualization system Eltex Connected Control ECC #", page 34](#)).

- Check the components of the system at regular intervals for any damage to electric leads and high voltage cables. Any damaged components must be repaired or replaced before continuing to operate the units or the units must be disabled. Refer to the notices in [chapter 5 "Maintenance", page 33](#).
- The generator must be checked regularly to ensure its proper functioning. The cooling ribs must be kept clean and the connections of the high voltage cables must be free of dirt and other foreign matter (see [chapter 5.1 "High voltage generator", page 33](#)).
- If the housing cover is removed and the supply voltage is switched on at the same time, contact protection is no longer effective. Always disconnect the power before opening the power supply units.
- Make sure that the electrodes are clean at all times. Conductive pollution on the electrodes can cause fire. A large paper dust layer of more than 1 mm thickness is considered as a danger. Refer to the notices in [chapter 5.2 "Electrodes", page 33](#).
- To ensure the proper and trouble-free function of the electrodes, clean the electrodes at least once a week using compressed air free of oil and water (max. 6×10^5 Pa) and must be cleaned using a brush with soft plastic bristles. Do not damage the emission tips of the electrodes. Wait until the solvent has evaporated before putting the generator back into operation to avoid a risk of deflagration (see [chapter 5.2 "Electrodes", page 33](#)).
- Do not touch the emission tips if the high voltage supply is connected! If the high voltage supply is connected, reflex responses to electrical irritation can lead to secondary accidents; the charging electrode as such is safe to touch. If contact is made (≤ 20 tips), the energy transferred is so low that there is no risk of injury (see [chapter 2.2 "Contact protection", page 15](#)).
- Potential risk for wearers of cardiac pacemakers:
The contact of several emission tips with the hand can trigger or suppress a single impulse. Such a single influence is irrelevant. A repeated contact during a short period can be excluded because the electrical irritation causes a warning effect.
- The operation of the electrodes can generate ozone. The ozone concentration levels developing near the electrodes depend on many different factors such as site of installation, electrode current and voltage, air circulation, etc., and can therefore not be specified in general terms.
If the maximum allowable concentration of ozone must be observed at the site of installation of the electrode, the concentration must be measured on site.
The AGW value (maximum admissible concentration) serves to assess the ozone concentration at the workplace. The user must make sure

that the appropriate national AGW value is at no times exceeded, e.g. in Germany the ozone concentration occurring during the operation of the system must not exceed the recommended value based on international limits of 0.06 ml/m³ (0.12 mg/m³).

- Charges developing on personnel:
When working near the electrodes (<1 m), always wear conductive footwear.
Please note all national regulations with reference to electrostatic charges (e.g. TRGS 727 in Germany, "Vermeidung von Zündgefahren infolge elektrostatischer Aufladung").

3. Installation and assembly

3.1 Protective circuit, enable signals

The protective circuit has the following functions:

Protective circuit installed by customer	Generator
Master switch of machine ON	Supply voltage ON
Machine speed >1m/s	High voltage enabled
in the event of web break, rapid/brake stop	High voltage deactivated

To guarantee the safe operation of the unit, the following enable conditions must be observed:

Web break

The charge enable function must be switched off by the protective circuit of all connected generators immediately after a web break occurs. Some machines allow the operator to continue in spite of the web break sensor responding (web break override). Blocking the enable function must be safeguarded in this case.

Minimum speed

The minimum printing speed required for enabling the charging function is 1 m/s. The enable function ought to be set such that it is activated just short of the minimum production speed.

After charging has been enabled, maintenance and cleaning work is not allowed. If required, charging should not be enabled until higher speeds are reached.



Caution!

The operator of the plant is responsible for the proper function of the protective circuit.

The protective circuit must be installed for each individual generator separately.

When setting the ribbon tacking system into operation, the proper function of the protective circuit must be checked for each unit.

Each generator housing must be permanently grounded via the ground terminal (cross section min. 2.5 mm²).

Protective circuit



Warning!

The operator of the plant is responsible for the proper function of the protective circuit.

When setting the ribbon tacking system into operation, the proper function of the protective circuit must be checked for each folder.

Disconnect and/or connect the mains cable on the socket only when the generator is switched off.

When using external protection fusing for generators, the following circuit-breaker must be used:

6 A; tripping characteristic D in compliance with DIN EN 60898-1 (VDE 0641-11).

A protective circuit of the following type must be installed for each folder:

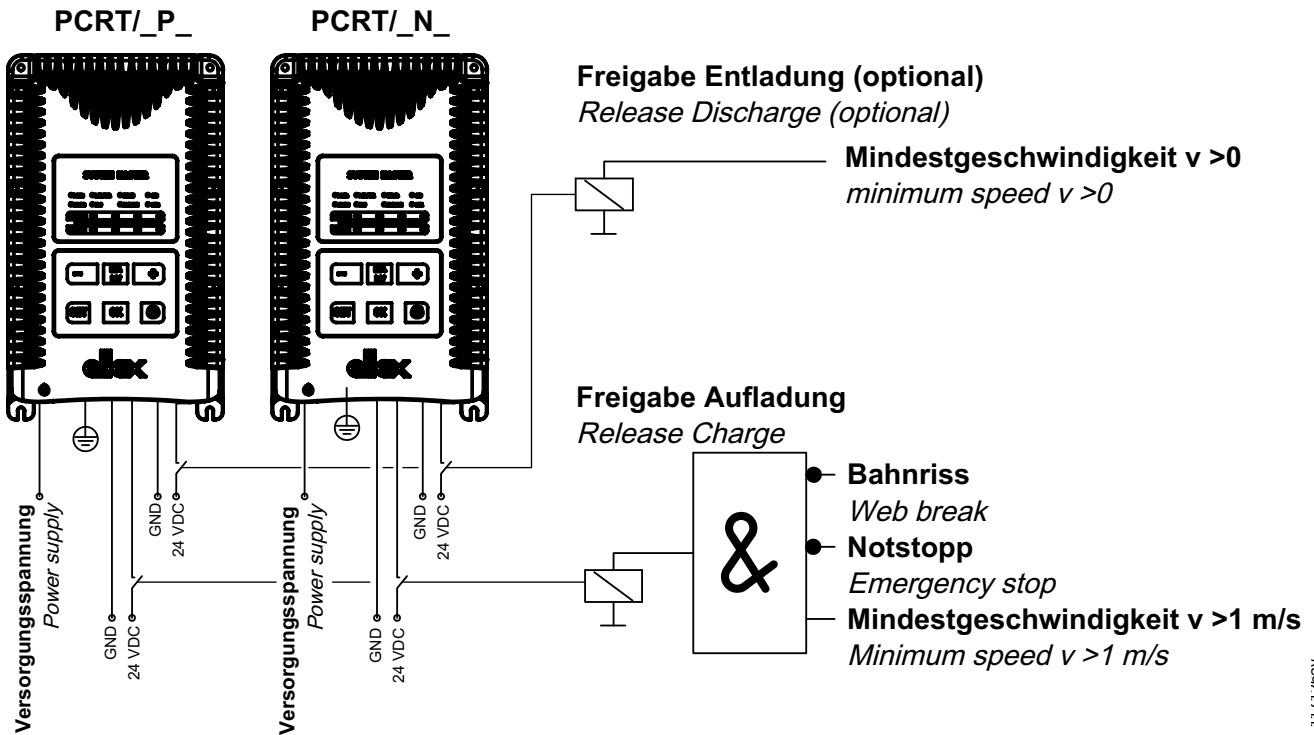


Fig. 12: protective circuit



A redundant release signal is required if the generator must comply with the safety requirements of DIN EN 13849. To this end, the two signals “Release +” and “Release -” must be transmitted via separate switching paths; hardwiring of the two release signals +/- is prohibited.

3.2 Assembling the charging electrodes

The electrodes are normally mounted in the folder downstream from the first multi-layer roller and ahead of the cross cutter. If there is insufficient space, the electrodes can also be installed ahead of the multi-layer roller (as close as possible to the multi-layer roller).

- Each electrode or electrode pair has two attachment points, one on each insulator (M16). Attach the insulators to the machine using angle brackets (e.g. steel brackets).
Eltex supplies: electrodes, GRP bracket, insulators with screws. The customer to supply additional mounting material for attachment to the machine, such as steel angle pieces.



Caution!

To prevent leakage currents which may damage the electrode and the mounting material, the following spacings and distance are to be maintained during assembly:

- no conductive objects must be located at a minimum distance of 40 mm around the electrode and the insulator (except at the assembly surfaces); a space of 60 mm must be kept above the electrode needles.
- the electrodes must be mounted on both sides at the same distance from the paper web (30 mm). The distance must not be smaller than 30 mm from the paper web!
- any optional discharge electrodes must be mounted at a minimum distance of 120 mm from the charging electrode.
- The high voltage cables are permanently attached to the electrode. The high voltage cable must be routed with a bending radius of > 60 mm.



Caution!

Due to its surface conductivity, water-silicone emulsion severely impairs the proper function of the ribbon tacking system.

Condensation settling on the electrodes can cause creepage currents which destroy the electrode. Condensation on the electrodes caused by water-silicone emulsions renders the warranty null and void.

The following specifications must therefore be observed:

- The electrodes must be clean, i.e. not contaminated with substances such as grease, oil, water-silicone emulsion, etc.
- If water-silicone emulsions are used, a trap device must be fitted to ensure that emulsion cannot drip onto the electrodes.

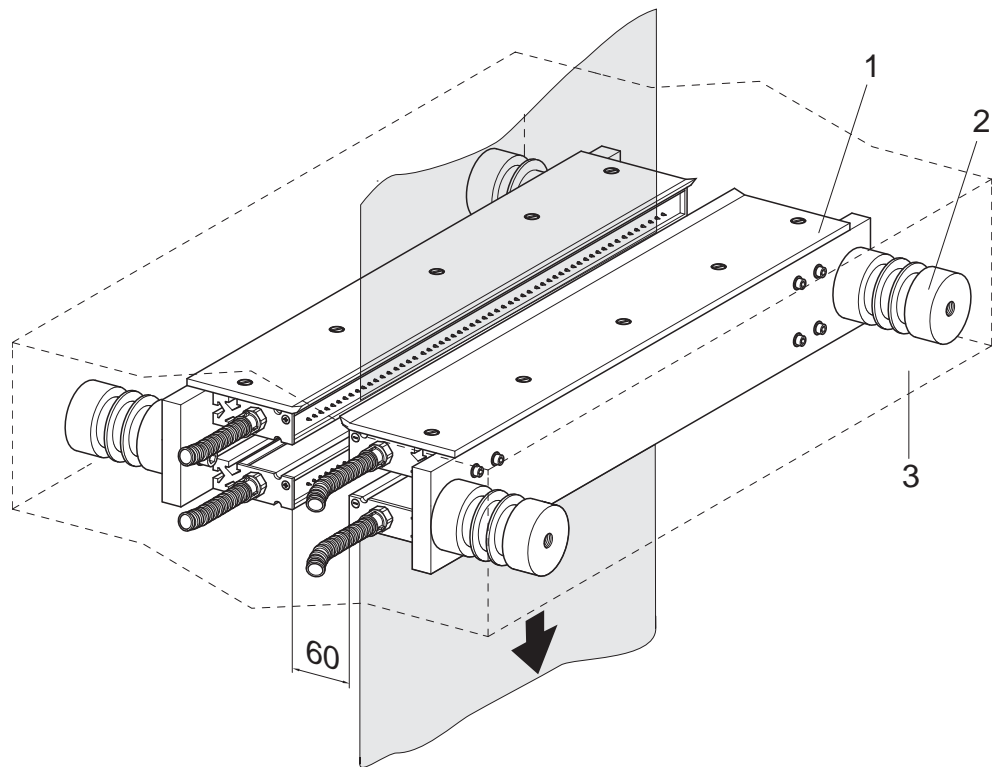
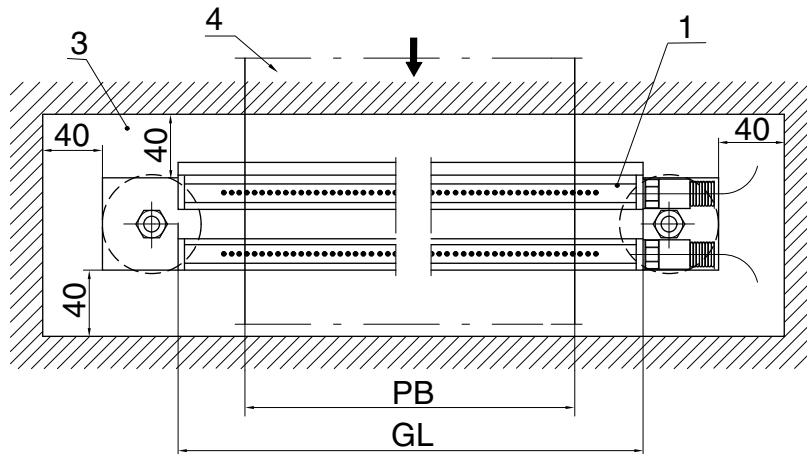


Fig. 13:
*Installing the
 charging electrode*

- 1 *Charging electrode with mounting bracket*
- 2 *Insulator*
- 3 *Area (dashed line) no grounded conductive material
 (dimensions, see text)*

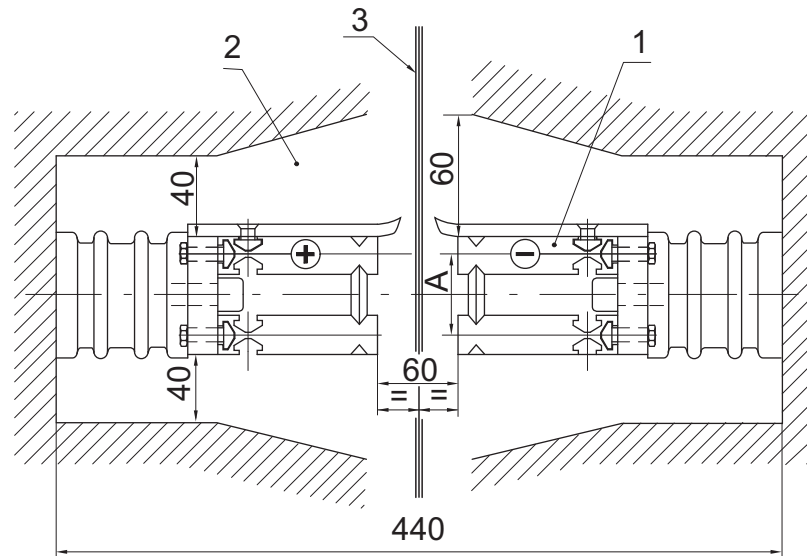
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Fig. 14:
Installing the
charging
electrode,
front view



Z00110y

Fig. 15:
Installing the
charging
electrode,
side view



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- 1 Charging electrode with mounting bracket
- 2 Area no grounded conductive material (dimensions, see text)
- 3 Paper web
- PB Paper web width
- GL Total length (dimensions see table page 36 and page 37)
- A ST/T2: 40 mm, ST/H2: 90 mm

3.3 High voltage generator

Please observe further device-specific information in the separate operating instructions of the high voltage generator POWER CHARGER PC.

3.4 Visualization system Eltex Connected control ECC

Please observe further device-specific information in the separate operating instructions of the visualisazion system Eltex Connected control ECC.

3.5 Electrical connection

The following electrical connections must be made:

- Protective circuits to be provided on site, with enable leads on both high voltage generators, connection to analog interface
- Supply voltage to the generators and to the visualization system
- Connecting the CAN bus between the generators and the visualization system
- High voltage cable of the charging electrodes to the generators
- Ground connection of all generators using a cross section of minimum 2.5 mm²



Warning!

Disconnect and/or connect the mains cable on the socket only when the generator is switched off.

When using external protection fusing for generators, the following circuit-breaker must be used:

6 A; tripping characteristic D in compliance with DIN EN 60898-1 (VDE 0641-11).

4. Operation



4.1 Startup

Before switching on the system the user must make sure that the installation and the connections have been carried out correctly. If they have, the supply voltage may be switched on via the master switch of the folder.

The operation of the generators and the visualization system is shown by display message on each of the appliance.

The operating switches of the generators and of the visualization system must be switched on at all times; they are activated/deactivated via the main switch of the folder.

After switching on the system, check the proper function of the protective circuit.

Note!

If the visualization system is connected to the generators via the CAN bus, the unit can be operated only with the visualization system (as long as the parameter "keyboard lock" of the appropriate generator ist set to active). In this case the generator will not respond to direct operation via the operating keys.



Caution!

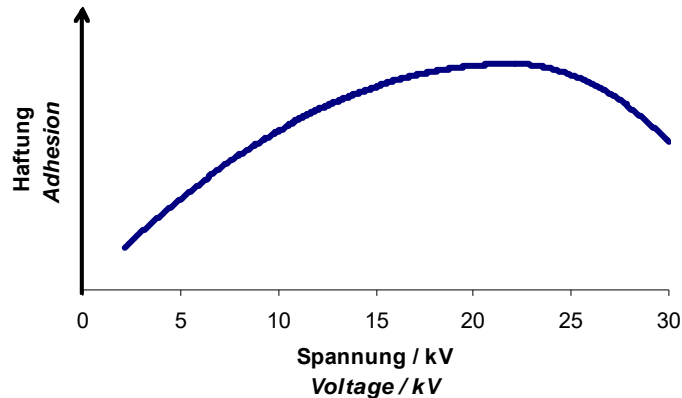
Do not touch the screen of the visualization system with pointed or sharp objects! This may damage the touch sensitivity of the screen!

4.2 Setpoint setting

Tests have clearly shown, that **too much output power** of the ribbon tacking **reduces** the adhesion of the copies!

The explanation for this unexpected reaction: The air near the electrodes and the rollers will be ionised by the high voltages of the ribbon tacking. Ionised air is electrically conductive. This conductive air is carried away by the paper web and results in an electrical short-circuit between the charged web surfaces. The charge leaks off, especially at the critical edges of the web, an the adhesion decreases.

With which voltage a maximum adhesion can be achieved depends on the paper, the inking and the number of single webs. In most of the cases voltages of about ± 22 kV are optimal. Higher voltages also lead to more wear at electrodes and guiding rollers!



These values are only intended as setting aid. The optimum setpoint can be ascertained by a minimum number of turned corners at the collecting cylinder, which can be checked using a strobe light. Make sure that the adjustment of the collecting cylinder is mechanically correct!

If the number of turned corners is too high, lower the setpoint in step by step increments. If the result worsens, increase the setpoint.

The correct setpoint guarantees good interlocking of the ribbons through the folder and hence folding without turned corners. If the Setpoint is set too high, the efficiency of the ribbon tacking can reduce. The reason for this is that once the maximum surface charge density has been reached and the ionisation in the surrounding area is increasing, the charge carriers are emitted in a random scatter which partially discharges the paper surface.

Setpoint setting at the generator and the visualization system:

basic value: 15 kV (corresponds to 50 %), solicited input in percent

4.3 Operating the system directly via the generator POWER CHARGER PCRT

Please see all further device-specific information in the separate operating instructions of the high voltage generator POWER CHARGER PC.

Ribbon tacking can be operated on each folder via the two generators. For the setpoint settings, see chap. 4.2.

Selecting the Setpoint of the generator power (details see chap. 4.2 Setpoint Setting)

The settings of the ribbon tacking system depend on the electrical properties of the paper used, the number of webs. Normally, settings selected between 40% and 50% are adequate. The rule of thumb is: select only as much electrical power to make sure that no turned corners develop at a certain machine speed.

The 50% setting can be considered the starter setting. If turned corners are found with this setting, it is recommended to first reduce the setting.

4.4 Operating the system via the visualization system Eltex Connected Control ECC

Please observe all further device-specific information in the separate operating instructions of the Eltex Connected Control ECC, if you are using the visualization system ECC.



Fig. 16:
Startup

All relevant settings can be made via the ECC visualization system. All current process data, states and corresponding error or warning messages are displayed and the enabling or disabling of the high voltage and the acknowledgment of the corresponding messages are possible. An individual view and optimal display are freely configurable and allow high operating comfort for every application.

4.4.1 Rapid start-up

Folders, generators and visualization system are switched on, the machine is enabled:

Variant 1

- select preset parameters via "Preset"
- mark the parameter set
- load the parameter set

Variant 2

- Set the desired setpoint for each generator, if desired, then save it in the visualization system as a parameter set

4.4.2 Emergency operation without visualization system ECC

Should the visualization system fail, the direct operation of the generators is enabled after 5 seconds. All settings can then be made directly at the generators (see operating instructions of the high voltage generator POWER CHARGER, chap. 4 "Operation").

4.5 Operating the system via the control room integration

With the support of standardized fieldbus protocols, the system can directly be integrated into a machine network. Details for the integration into the control room or the machine control can be found in the separate device and protocol descriptions. Please also note the chapter "Installation" in the operating instructions of the POWER CHARGER generator.

4.5.1 Functions and default settings, Charging parameters

Function	Description	Setting options	Default setting
Setpoint Charging	Setting the setpoint of the charging in percent for conversion to the absolute value	0 - 100 %	73 %
Operation mode Charging	Selection of the operating status of the charging	Ribbon Tacking, current constant	Ribbon Tacking
Symmetry setting	Global setting of the symmetry of the positive and negative high voltage generator to each other	0 %: 100 % (negative : positive) 100 % : 0 % (negative : positive)	50 % : 50 %
Setpoint Voltage Charging	Optional setting of the high voltage setpoint Charging	1,500 V - 30,000 V	22,000 V
Setpoint Current Charging	Optional setting of the current setpoint Charging	PCTL/___L, PCTL/___S: 50 µA - 3,750 µA PCTL/___H: 50 µA - 7,500 µA	PCTL/___L, PCTL/___S: 3,750 µA PCTL/___H: 7,500 µA
Ramp time Charging	Ramp-up time of the high voltage Charging	100 mx - 10,000 ms	500 ms
Hard flashes Factor	Setting of the sensitivity for the detection of hard flashes	25 % - 40 %	25 %
Soft flashes Factor	Setting of the sensitivity for the detection of soft flashes	10 % - 25 %	10 %
Limit Flash count	Limit for the detection of errors or warnings of the respective flash counter	0 - 1,000 (0: setting deactivated)	10
Nominal resistance Charging	Determined standardized resistance of the charge for the detection of pollution	0 kΩ - 1,000,000 kΩ	0 kΩ
Pollution monitoring	Pollution detection of the charging electrodes	<ul style="list-style-type: none"> • OFF • ON • Calibration 	OFF

4.5.2 Functions and default settings, General parameters

Function	Description	Setting options	Default setting
High voltage Release Mode	Release mode of the high voltage	<ul style="list-style-type: none"> Autostart Analog setpoint HMI Fieldbus 	Fieldbus
LED Balken Modus	Switching the view of the LED bar of the generator	<ul style="list-style-type: none"> Voltage Current 	Voltage
Keyboard lock	Deactivation or activation of the keyboard lock for setting directly at the generator	<ul style="list-style-type: none"> Inactive Active 	Inactive (Stand-alone-mode) Active (operation with ECC)

4.5.3 Functions and default settings, Interface parameters

Function	Description	Setting options	Default setting
Analog Setpoint	Selection of the setpoint setting with analog interface	<ul style="list-style-type: none"> OFF Current 0 - 20 mA Voltage 0 - 10 V OFF and limiter signal Current 0 - 20 mA and limiter signal Voltage 0 - 10 V and limiter signal 	OFF
Only for device versions with CANopen® interface			
CANopen® node address	Node address setting of the CANopen® network	1 - 127	99
CANopen® Baud rate	Baud rate setting of the CANopen® network	10 kBit/s, 25 kBit/s, 50 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1000 kBit/s	125 kBit/s

5. Maintenance



Warning!

Electric shock hazard!

- Do not carry out any maintenance or repair work without first switching off the high voltage generator and disconnecting the supply voltage.
- The machine on which the devices are installed must not be in operation.
- The electrodes passively absorb energy from the moving substrate web. The high voltage cable must be plugged in or grounded to the generator. If the high voltage cable is disconnected, the plug is live (high voltage) and applies with full power on the plug; this may cause a spark discharge and may lead to a risk of injury. Disconnected high voltage plugs are not permitted or have to be grounded.
- Repairs and maintenance work may only be performed by qualified electricians.

5.1 High voltage generator

The generator must be checked regularly to ensure its proper functioning. The cooling ribs must be kept clean and the connections of the high voltage cables must be free of dirt and other foreign matter. The intervals for the check depend on the application and must hence be defined by the user according to the operating conditions. The generator itself does not require any maintenance.

Please observe further device-specific information in the separate operating instructions of the high voltage generator POWER CHARGER PC.

5.2 Electrodes



Warning!

Risk of injury!

Do not touch the emission tips of the electrodes.

To ensure the proper and trouble-free function of the electrodes, clean the electrodes at least once a week using compressed air free of oil and water (max. 6×10^5 Pa) and must be cleaned using a brush with soft plastic bristles (see [chapter 8 "Spare parts and accessories", page 38](#)).

Deposits of grease, glue, ink etc. on the electrodes must be cleaned off with the solvent normally used in the respective printing process. Do not immerse electrodes and high voltage cables in solvent! Rub electrode body dry with a non-fluff rag.

If polluted heavily, clean the electrodes at shorter intervals. Remove any dust deposits and fluff from the electrodes or close to the electrodes.

Conductive pollution on the electrodes can cause fire. A large paper dust layer of more than 1 mm thickness is considered as a danger.



Caution!

Risk of deflagration!

Do not damage the emission tips of the electrodes.

Wait until the solvent has evaporated before putting the generator back into operation to avoid a risk of deflagration.

5.3 Inspection of the protective resistors - contact protection

The function and the appearance of the protective resistors must be inspected at regular intervals. The inspection intervals are specified in the accident prevention regulations, as amended (e.g. in Germany DGUV V3).

Please observe the information in the separate operating instructions for the corresponding electrode R130A3 / R130A3L.

5.4 Visualization system Eltex Connected Control ECC #

The visualization system don't require any maintenance.

The Touch Screen can be cleaned with a standard cleaning agent for LCD monitors (IT devices).



Caution!

Do not touch the screen of the visualization system with pointed or sharp objects! This may damage the touch sensitivity of the screen!

6. Troubleshooting

**6.1 Error messages Visualization system
Eltex Connected Control ECC #**

Error messages and measures appear in plain text on the display of the visualization system. Besides messages on soiled electrodes, all generator error messages may appear.

6.2 Error messages Generator POWER CHARGER PCRT



Warning!

Electric shock hazard!

- Do not carry out any maintenance or repair work without first switching off the high voltage generator and disconnecting the supply voltage.
- The machine which has the units fitted must not be in operation.
- Repairs and maintenance work may only be performed by qualified electricians.

Defect/error	Defect/cause	Remedy
Numbers of turned corners increasing	<ul style="list-style-type: none"> • Dirty electrodes. • Electrodes soiled by water-silicon-emulsion • Unsuitable conditions (paper too moist, mineral content of the paper too high, unprinted surfaces. 	<ul style="list-style-type: none"> • Clean electrodes. • Install trap / guard for water-silicon-emulsion, clean electrodes, if necessary, install hot-air dryer after water-silicon application station. • Adapt operating conditions to the requirements of ribbon tacking as far as possible (see chap. 1.2).
Generator cannot be switched on	<ul style="list-style-type: none"> • Defective fuse. • Supply voltage not connected. 	<ul style="list-style-type: none"> • Replace fuse (see name plate). • Activate or connect supply voltage.
Decrease in efficiency	Polluted charging electrode / mounting	<p>Clean the electrodes / mountings using compressed air free of oil and water and a brush with soft plastic bristles. Use a suitable solvent to remove dirt or grease (see chap. 5 "Maintenance"). (No continuous sparking (electric arc) must be visible on the electrode tips).</p> <p>Caution! Do not immerse the charging electrode in solvent.</p>
Decrease in efficiency	Defective charging electrode	<p>Check the charging element for any defects which may be caused by creepage currents.</p> <p>Replace the charging electrode and install it to make sure that creepage currents can not develop. See chap. 3 "Installation and assembly".</p>
Decrease in efficiency	Worn charging electrode	<p>Depending on application, the emission tips are subject to more or less wear and tear. If the tips have burnt down to a distance of 3 mm from the encapsulating compound, replace the charging electrode.</p>

7. Dimensions brackets

Electrostatic ribbon tacking system bracket ST/T1 and ST/H1 (single row)

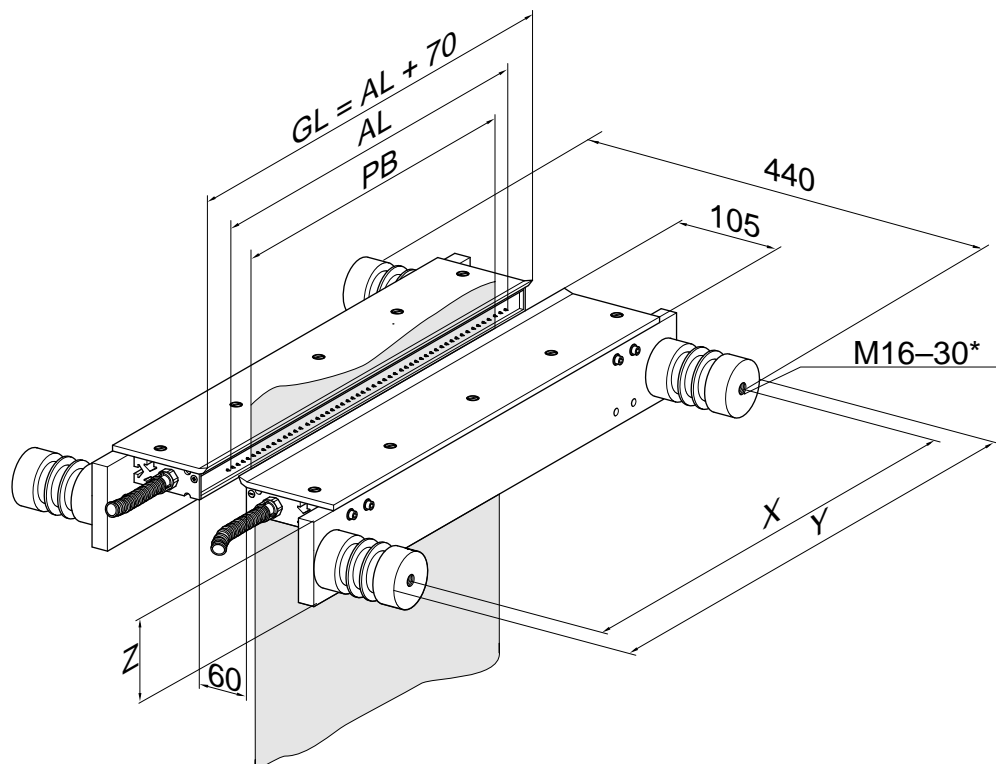


Fig. 17:
Dimensions,
bracket ST/T1 and
ST/H1

PB = Paper width * = deep
GL = Total length AL = Active length

Z00344y

Bracket ST/T1 and ST/H1						
Bracket	Max. paper width	Max. aktive length AL of the electrode	X	Y	ST/T1:Z	ST/H1:Z
A	300	315	420	480	60	110
B	500	515	620	680	60	110
C	620	635	740	800	60	110
D	700	715	820	880	60	110
E	800	815	920	980	60	110
F	1000	1015	1120	1180	60	110

**Electrostatic ribbon tacking system bracket ST/H2 and ST/T2
(double row)**

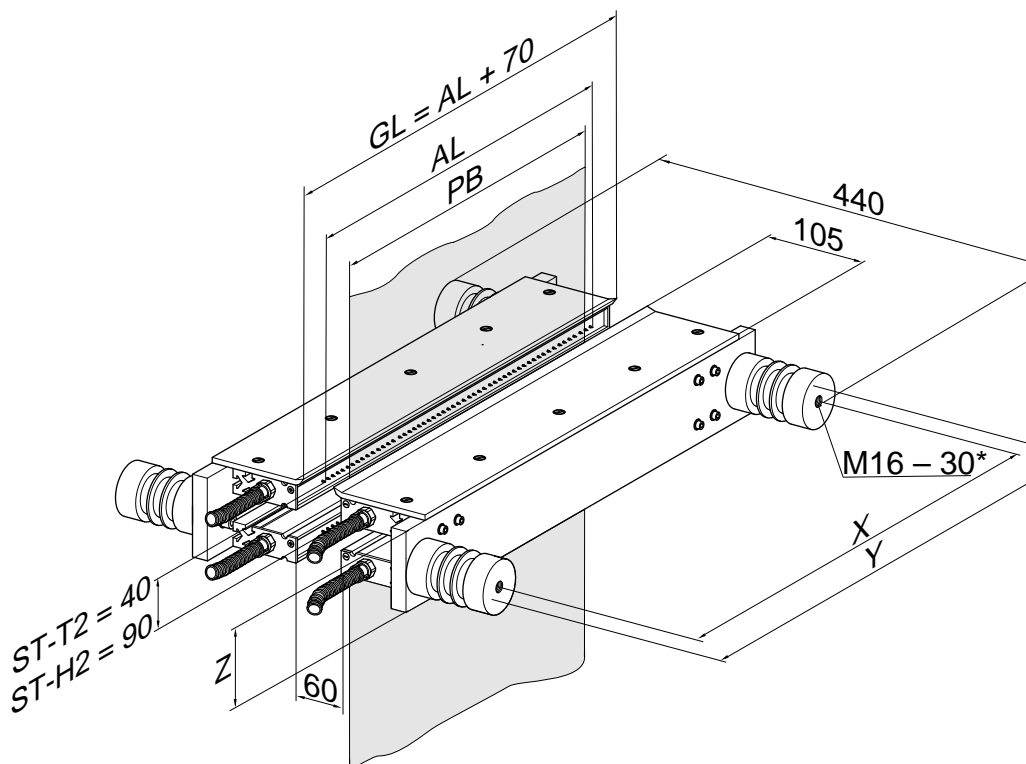


Fig. 18:
Dimensions,
bracket ST/H2 and
ST/T2

PB = Paper width AL = Active length
GL = Total length * = deep

Z00345Y

Brackets ST/H2 and ST/T2							
Bracket	Max. paper width	Max. active length AL of the electrode	X	Y	ST/T2: Z	ST/H2: Z	
A	300	315	420	480	60	110	
B	500	515	620	680	60	110	
C	620	635	740	800	60	110	
D	700	715	820	880	60	110	
E	800	815	920	980	60	110	
F	1000	1015	1120	1180	60	110	

8. Spare parts and accessories

Article	Reference code
High voltage generator for negative high voltage (design of the cable connection and the plug type after consultations with ELTEX)	PCRT/_N
High voltage generator for positive high voltage (design of the cable connection and the plug type after consultations with ELTEX)	PCRT/_P
Charging electrode (specify active length of electrode and length of cable)	STR130A3/_ _ _ _
Charging electrode with air support (specify active length of electrode and length of cable)	R130A3L/_ _ _ _
Cover between electrodes (center), 24 mm width (specify length)	101051
Cover between electrodes (center), 74 mm width (specify length)	101050
Assembly material for electrodes: Slide nut with screws and washers	105826
Distributor box for high voltage cable, max. 4 electrodes connectable	PCV
Electrode grounding	117174
Interface cable, analog interface generator Charging open cable end on customer side (specify length)	CS/AMO_ _ _ _
Mains cable generator, AC open cable end on customer side (specify length)	KN/GD_ _ _ _
Mains cable generator, DC open cable end on customer side (specify length)	KN/HD_ _ _ _
CAN bus cable, CAN bus plug both ends 1x male, 1x female (specify cable length)	CS/FMG_ _ _ _
T-distributor M12, 5-pin shielded	114854
Mains cable visualization system open cable end on customer side (specify length)	KN/DD_ _ _ _
Power supply unit DIN rail 24 V DC, 100 W 85 V AC - 264 V AC; 45 - 65 Hz	115047

Article	Reference code
Plug Y Set for prefabricating the high voltage cable with flexible tube for 30 kV charging electrodes resp. modification set for charging plug Y	117985
Cleaning brush with handle	RBR22
Operating instructions (specify language)	BA-xx-9013

Please specify the article number when ordering.

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Eltex-Elektrostatik-Gesellschaft mbH
Blauenstraße 67-69
79576 Weil am Rhein | Germany
Phone +49 (0) 7621 7905-422
eMail info@eltex.de
Internet www.eltex.de