

converting



INDUSTRY APPLICATION GUIDE

**Converting
Industry**
Static Solutions to
Improve Production
and Profitability

Meech International

More than 6000 customers worldwide have benefited from the expertise and product-based solutions provided by Meech International. With an unparalleled knowledge of the effects of static in manufacturing processes, the company has developed an impressive portfolio of static control and cleaning systems. These are designed to enable customers to improve their own production processes and hence profitability.

Throughout the world, businesses benefit from Meech expertise. A truly international company, Meech has its headquarters in the UK and additional operations in the USA, Belgium, Hungary and China, supported by a worldwide distribution network covering over 50 countries.

Meech has built its present success on offering its customers outstanding levels of:

- Applications Knowledge
- Flexibility of Approach
- Innovation
- Speed of Response

...and these are the qualities that will continue to underpin future growth.

Meech Technology

For further information, please refer to the Meech web site (www.meech.com) or the "Static Electricity: Causes and Cures" booklet.

Static Elimination

Meech provides solutions based on both AC and Pulsed DC technologies for optimum static control. AC technology takes normal mains voltage and boosts it (typically to 7kV) through a special transformer. This high voltage is carried to an array of emitter pins to create a high energy "corona". A very large number of positive and negative ions are generated following the AC cycle. A statically charged surface of either polarity passing close to this ion cloud will be quickly neutralised.

Meech special Pulsed DC technology transforms mains voltage into positive and negative outputs. Dedicated emitters produce alternating clouds of positive and negative ions. Frequency and ion balance (the relative proportion of positive and negative ions) can be adjusted to optimise long distance neutralisation for specific materials and process conditions.

Static Generation

Generating a controlled static charge on a non-conductive material will allow temporary adhesion between two or more surfaces of opposite polarity. A high DC voltage of up to 50kV (positive or negative, depending on the application) is carried to a special array of emitter pins to create a "corona". With the emitter pins positioned in close proximity to a grounded surface, material passing into the field will be charged and bonded to adjacent surfaces.

Cleaning

Dust contamination presents major problems in a wide range of manufacturing industries. The removal of dust can be substantially improved by the use of static control systems. Meech "JetStream" technology combines a specialist knowledge of static control and air flow to provide a unique design of manifold with an integrated ionisation system. Driven by energy efficient fans, the JetStream produces a high velocity blade of ionised air capable of removing contaminants down to 1 micron.

Static Control Problems in the Converting Industry

Problems with static electricity in the converting industries are numerous. Processes where static can be an issue include flat and wicket bag manufacturing, film sheeting and slitting, wind and rewind stations as well as printing.

The primary problems resulting from high levels of static in the converting industry are:

- Process Control & Quality Problems
- Dust Attraction & Contamination
- Operator Shocks
- Possible Fires & Explosions

Process Control & Quality Problems

The cost penalties associated with uncontrolled static electricity in manufacturing processes are many and varied. Static can force companies to run their machines at much slower speeds than might otherwise be the case. This is because the static charge can be a direct cause of production problems such as poorly wound reels, which can also be difficult to fit on to customers' machines and may cause feed problems.

Static electricity can also cause problems when sheeting or slitting. The static charge will cause the material to stick to itself or to the machine rollers and frame. The resulting mis-registering of the material results in scrap.

Dust Attraction & Contamination

The attraction of airborne contaminants as a result of static charge on a substrate is becoming more and more of an issue as the quality standards of companies continue to be raised.

The dust and particulates attracted by the high static charge on the web can result in high and expensive scrap rates. This is especially the case if the material is to be printed or used in the medical/food packaging industries.

Operator Shocks

This is becoming increasingly significant as companies strive to improve health and safety standards.

While static-related shocks can be painful, the effects are usually quite safe and short lived. However, the cost implications lie in the "recoil" that is associated with the initial shock. When an operator receives a shock there can be a moment of disorientation, bringing with it other hazards such as collision with other operators and/or machinery.

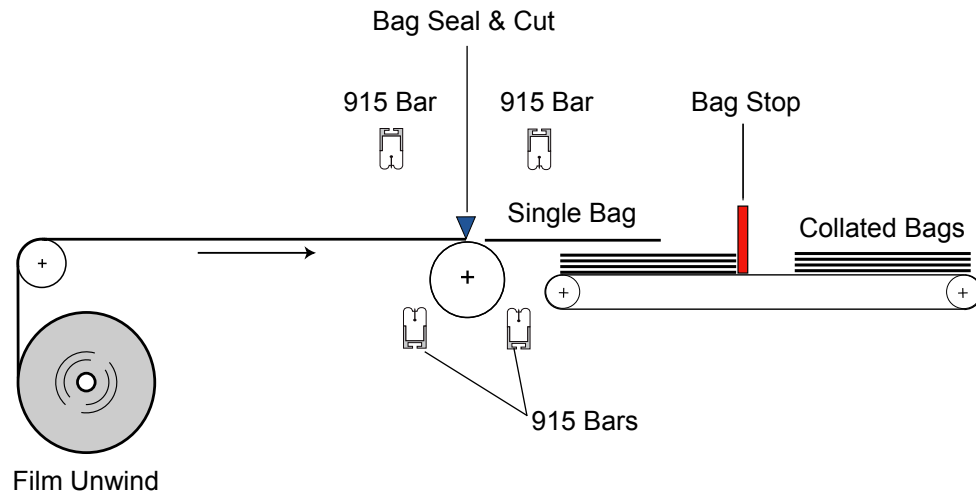
Fires & Explosions

The use of flammable gases and solvents is a necessity in many printing and converting processes.

Significant build up of static charge on the web could result in a static discharge and the associated risk of ignition of the flammable gases in the area. This at a minimum can result in a small localised fire, but has also been known to cause much more extensive damage such as burning down the production facility.

Applications

Flat Bag Manufacturing



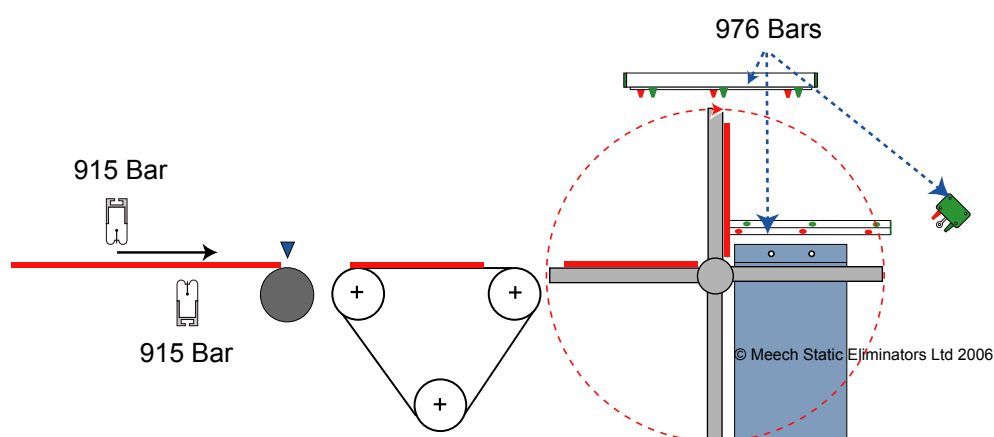
Problem:

1. Bags float as they exit the sealing area (reducing machine speed, and resulting in poor bag collation).
2. Bags cling together (resulting in poor bag collation and production losses).

Solution:

High performance Model 915 Bars positioned as shown above will prevent the film web from clinging to the seal-and-cut rollers and will also eliminate static from the single bag, ensuring trouble free stacking.

Wicket Bag Manufacturing



Problem:

The bags can either cling together or repel on the collated stack.

1. If they cling, it is difficult to get the stack into the boxes.
2. If they repel, the correct number of bags cannot be collated on the wicket pins. They also get, in both cases, poor product presentation.

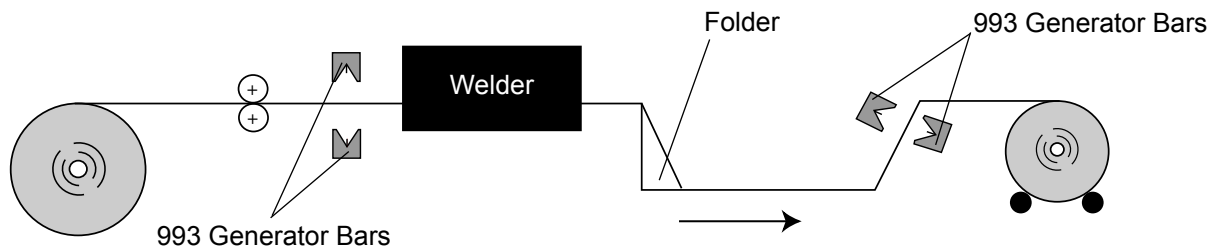
Solution:

Two Model 915 Bars should be installed on the flat film infeed, positioned just before the cut and seal draw roller.

Three Model 976 Bars installed as per the drawing will ensure that the single bags and also the collated stack are fully neutralised.

Applications

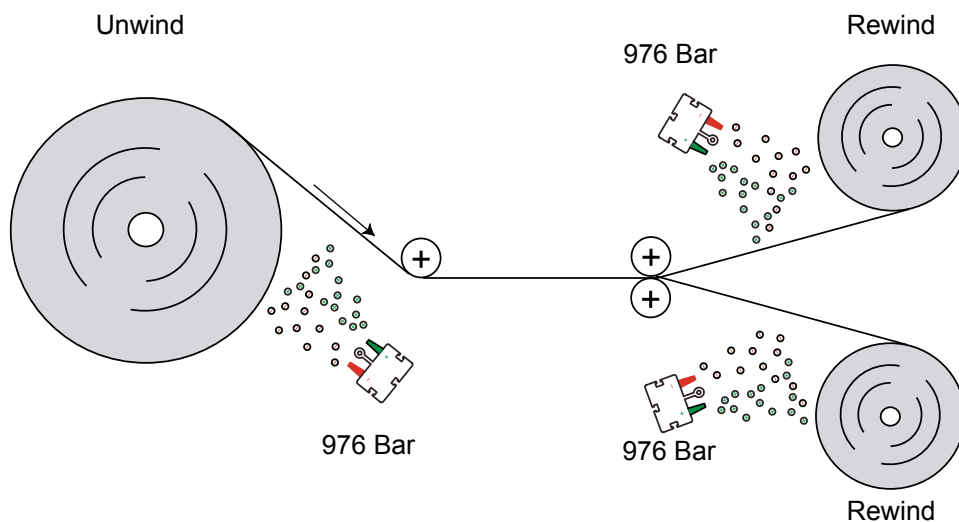
Bag On Roll



Problem:
When producing bags that have handle cut-outs on the leading (opening) edge, air flow can enter the handle inflating the individual bags and preventing tightly wound rolls on the rewinder. The bags can either cling together or repel on the collated stack.

Solution:
The pinning together of both sides of the web by use of Static Generator Bars will ensure that the bags remain firmly closed, thereby preventing the entry of air and ensuring tight rewinds.

Slitting



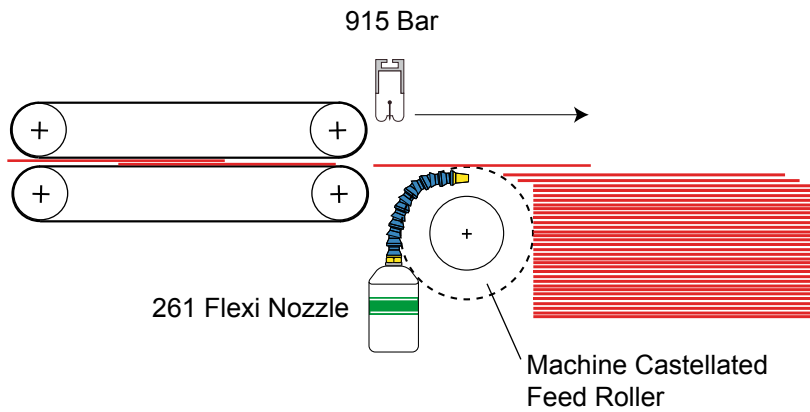
Problem:
A very high static charge can accumulate on rolls due to the "battery effect". This can cause various problems such as:

1. Unpleasant operator shocks.
2. Dust attraction, leading to contaminated stock.
3. Poor quality wound reels that can be difficult to fit on to machines and may cause feed problems.

Solution:
The most effective solution is to use Meech Pulsed DC technology with Model 976 Bars positioned as shown above. The positioning of a Model 976 Bar at the unwind reel is optional but, if fitted, will provide full control of static charges.

Applications

Sheeting



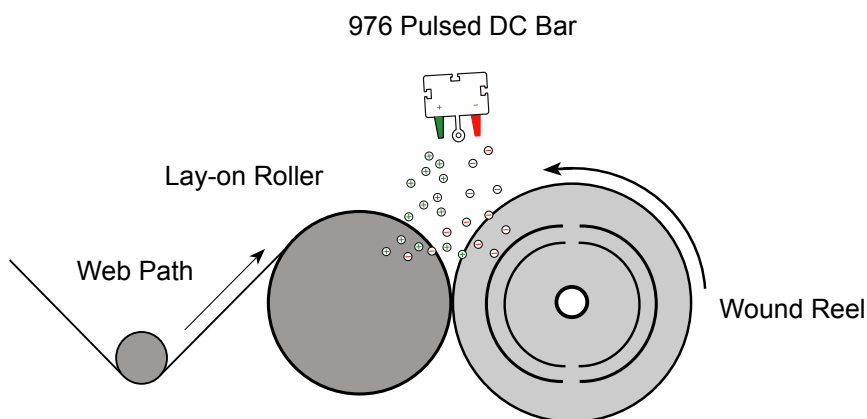
Problem:
When delivering single or shingled (overlapped) sheets on to either a conveyor or a stack, static causes the sheets to cling together resulting in collation problems.

The problem is more pronounced on shingle type delivery systems. It is important that the static charges are eliminated from between the individual sheets.

Solution:
Single or multiple 261 DC Ionisers fitted with flexible air output nozzles can be positioned in such a way that the ionised air flows between the sheets during the delivery process.

Model 915 Bars positioned as shown ensure full and effective neutralisation of static charges across the full sheet width.

Winding

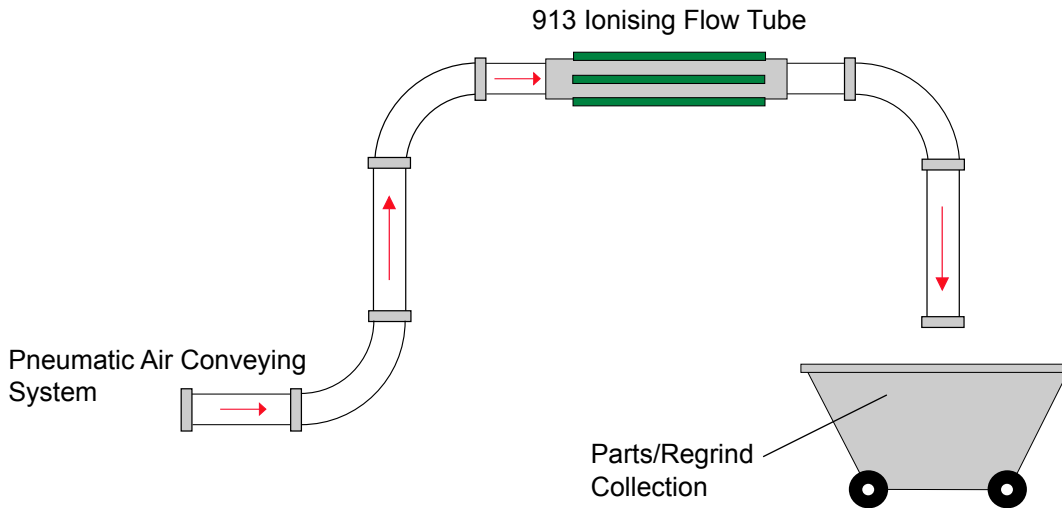


Problem:
Winders can accumulate very high static charges that result in shocks to operators, reduce quality of the reel and cause extra problems at unwinding.

Solution:
The solution depends on the specific design of the winder but the simplest solution is to fit a Model 976 Pulsed DC Bar over the reel. The ionised footprint should cover the whole length of the reel.

Applications

Trim Removal

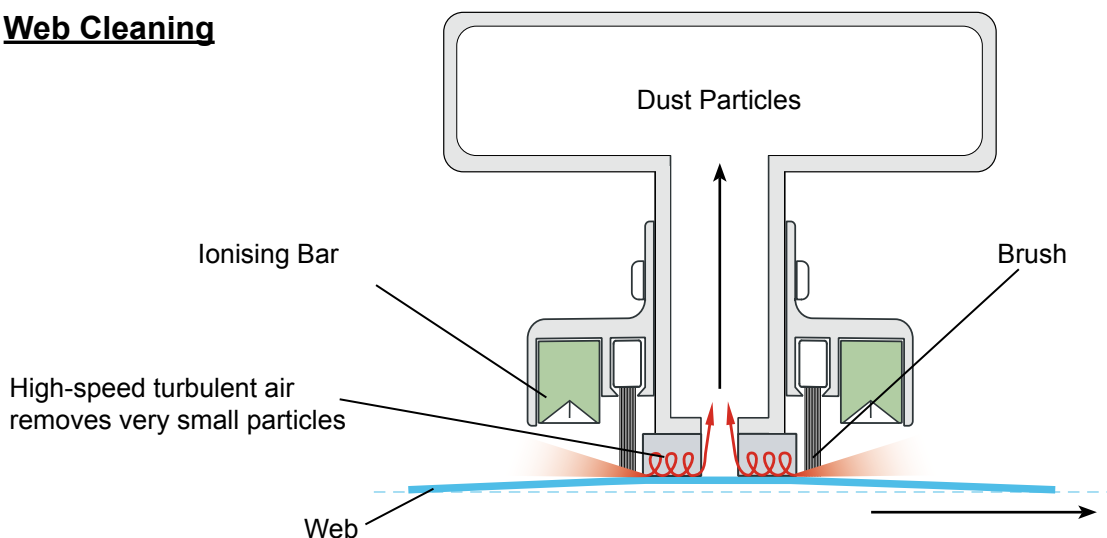


Problem:
The movement of material through ducting can result in static charges being generated due to friction between the material being conveyed and also between the material and the ducting walls.

Solution:
The placement of a Model 913 Ionising Air Flow Tube just prior to the area where blockages occur will remove the static charge and allow the material to flow freely through the ductwork.

This can result in bridging and blockage of restricted openings.

Web Cleaning



Problem:
Dirty webs can cause loss of profit and customer dissatisfaction, excessive down time on printing presses, high reject rates in laminating processes and unacceptable quality in pharmaceutical or food packaging.

Solution:
Using a combined process of static elimination, brushing and vacuum can provide effective removal of particulates from the web.

Applications for Feedback Control Systems

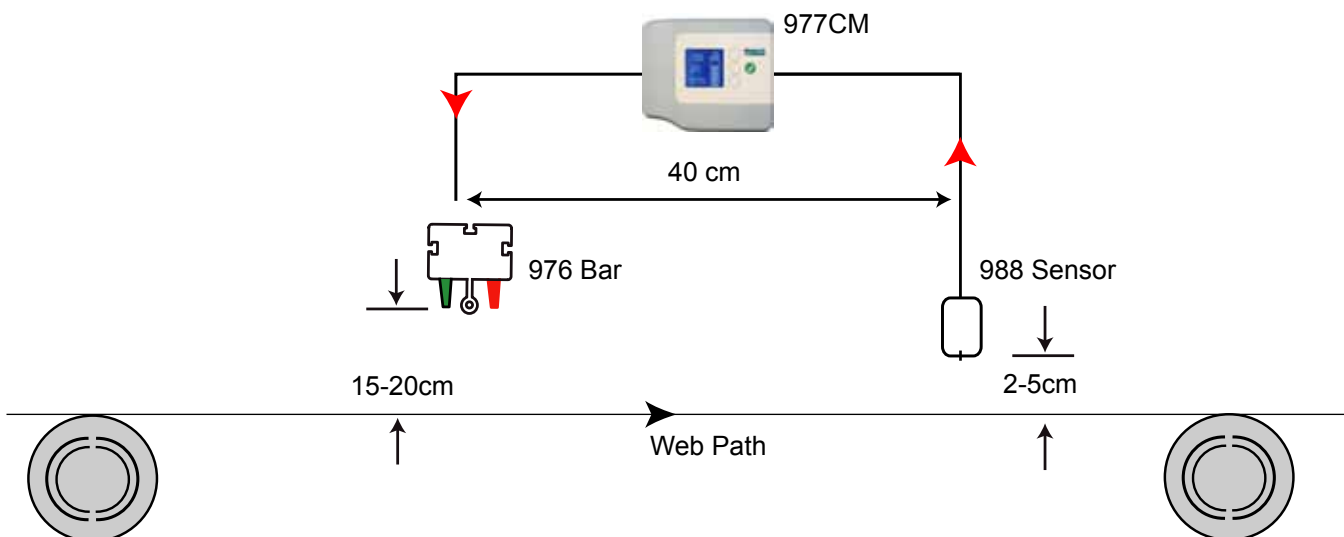
For very demanding applications, where the amount of static charge needs to be continuously monitored and ion output automatically adjusted, Automatic Feedback Systems are available.

These systems will:

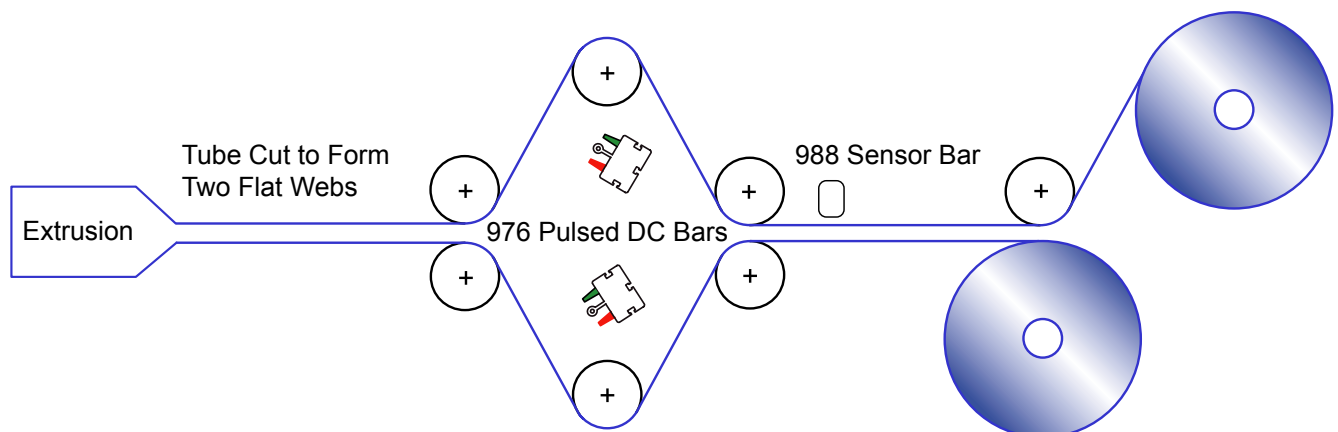
- Provide a closed loop signal to the ionisation controller so that its outputs are adjusted to optimise static charge removal.
- Monitor and display the performance of the associated ionisation system
- Provide outputs and alarm signals for data logging of system performance.

The Model 977CM Current Monitoring Pulsed DC Controller powers a 976 ionising bar and receives feedback control

Flat Web

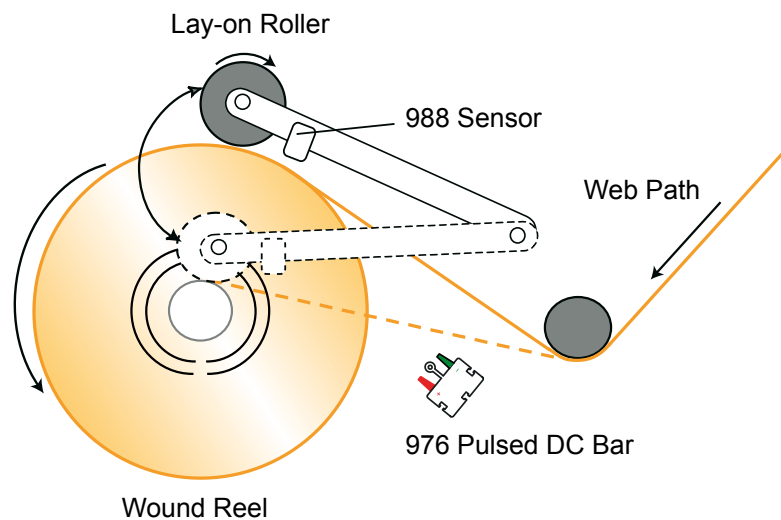


For a flat web application, the Sensor Bar should ideally be positioned approximately 40cm downstream from the 976 Bar, approximately 2-5cm from the surface of the web and in a position where the web is in free air.



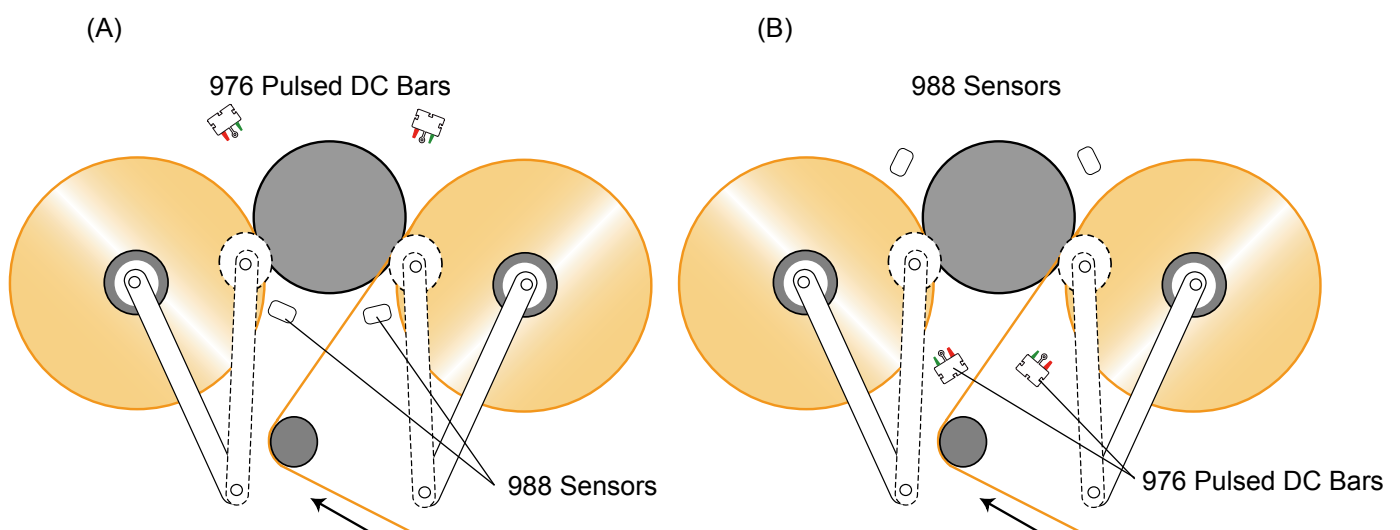
Applications for Feedback Control Systems

Winder



Installation on a typical slitter re-winder is more difficult, the challenge being to ensure that the Sensor Bar remains at as constant a distance as possible from the roll surface and is also positioned so as to avoid the ion field produced by the 976 Bar(s). This can be achieved by, for example, mounting the Sensor Bar on a lay-on roller arm. Surface re-winders are even more complex, as the ability to install the 976 Bars and the Sensor Bar in their ideal positions varies depending on machine make/design. The preferred positioning on a surface re-winder is as below (A).

Some designs of machine remove the finished reels from above so that there is insufficient space to position 976 Bars as shown in (A). In such cases, systems can be successfully installed by reversing the positions of the 976 Bars and Sensor Bars (B).



Product Summary



Model 915

The powerful performance of the Model 915 provides very fast decay times and effective ionisation up to distances of 152mm with a shockless design.



Model 904

The Model 904 is a constant voltage power supply, designed to provide a 7kV source for Meech AC ionising equipment.



Model 913

The Model 913 Flow Tube is designed to neutralise static charges on materials in handling and conveying systems.



Model 983v2

The Model 983 has been designed to provide accurate measurement of static electrical charges.



Model 935

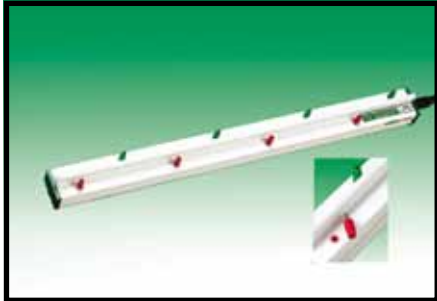
The Model 935 Ionising Blower provides effective long range ionisation over a large area.



Model Tornado F4 and F5

The Series Tornado Web Cleaning System has been designed to provide effective cleaning of the contaminants produced on all types of materials.

Product Summary



Model 976

The Model 976 Pulsed DC Bar is unique and has been designed to provide highly effective long range ionisation up to distances of 610mm. It is shockless and is easily maintained.



Model 977v3 and 977CM

The Model 977v3 and 977CM Pulsed DC Controllers have been designed to operate with the full industrial range of Meech PDC equipment.



Model 261F

The Model 261Flexi Nozzle is a small, lightweight ioniser with the discharge outlet extended by flexible knuckle trunking.



Model 986

The Model 986 DC Feedback System provides an "intelligent" approach to the optimum control of static charges in industrial processes.



Model 993R

The Model 993 is a high performance sparkless Generator Bar used with the Meech range of high voltage DC static generators.



Model 992v3

The Model 992v3 Static Generator creates a controlled level of static charge to impart temporary bonding between materials.



Meech International

2 Network Point
Range Road, Witney
OX29 0YN, UK

Tel: +44 (0)1993 706700
Fax: +44 (0)1993 776977

email: sales@meech.com

Meech Static Eliminators USA Inc.

2915 Newpark Drive
Norton, OH 44203
USA

Tel: +1 330 564 2000 / 1 800 232 4210
Fax: +1 330 564 2005

email: info@meech.com

Meech Elektrostatik SA

Av C Grandprez 27
B 4970, Stavelot
Belgium

Tel: +32 8086 2983
Fax: +32 8086 2821

email: mesa@meech.com

Meech CE

2151 Fót
Széchenyi út. 46
Hungary

Tel: +36 27535075
Fax: +36 27535076

email: ce@meech.com

Meech China

Room 205, Huana Hotel Office Tower
No. 1733 Lianhua Road
Shanghai 201103
China PR

Tel: + 86 21 6119 6723/ 6119 6724
Fax: + 86 21 6119 6725
Mobile: 01380169 2517

email: china@meech.com

Offices in:

●UK ●USA ●Belgium ●Hungary ●China
Trained Distributors Worldwide