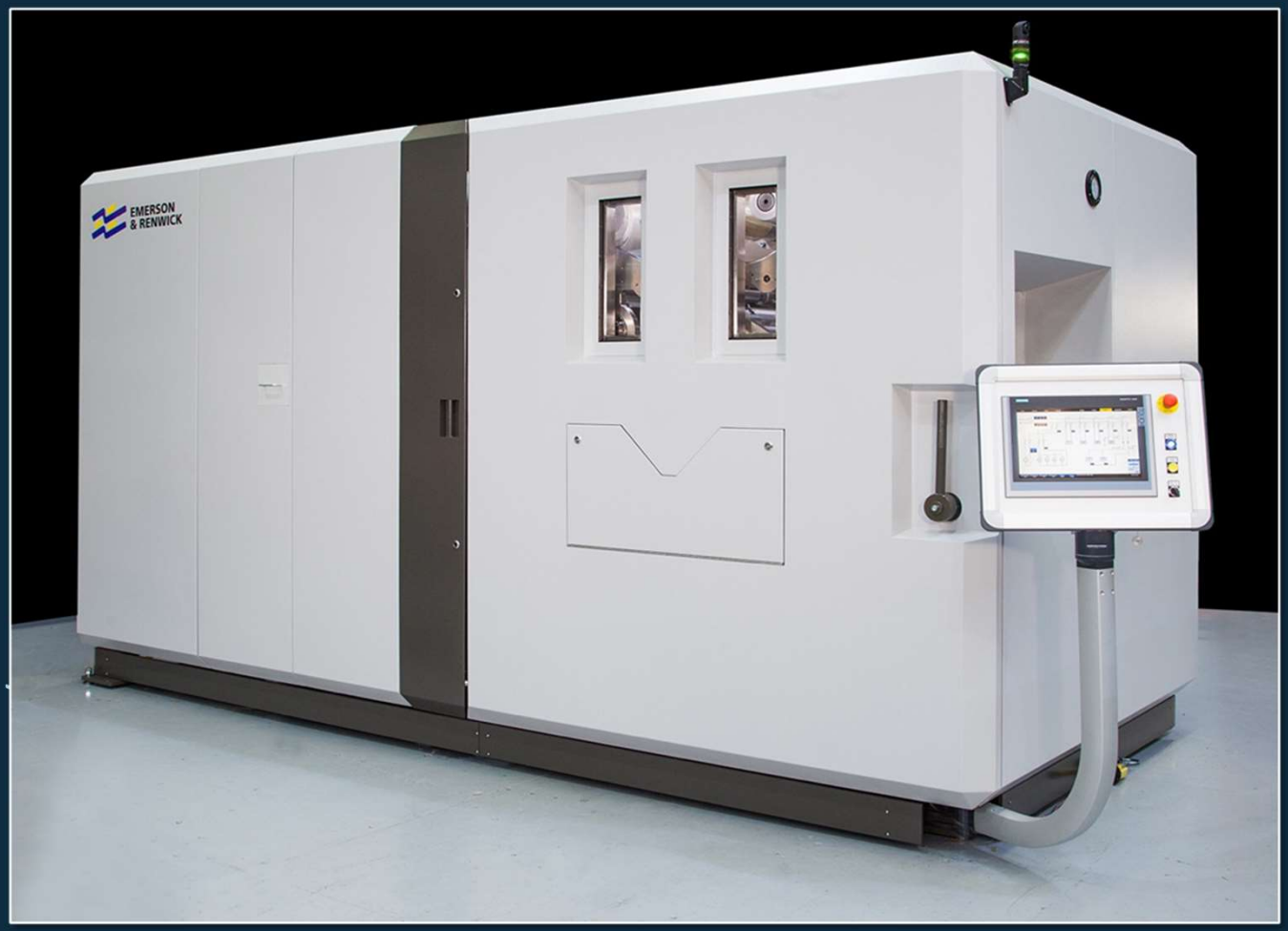
E+R GROUP

Genesis Vacuum Coater

2023

Introduction



Introduction

Configurable to meet your immediate needs
Versatile to meet your changing needs
Scalable from R&D to Production
Targeted to bring new technology and applications to a wide range of markets, accelerating commercial realisation

Display
Smart phones, TV, Laptop, E-reader etc.
Energy and Solar
Battery, Flexible solar cells etc.
Plastic Electronics
Light-weight and low-cost sensors, Flexible Semi-conductors, Wearable sensors, Self-monitoring structures
Surface Enhancement
Hydrophobic, oleo-phobic, dirt-repellent surfaces, enhanced surface energy etc.
Barrier
Flexible Packaging Films, High Barrier and Ultra-High Barrier
Security
Holograms, de-metallisation, high refractive index coatings

Vacuum System

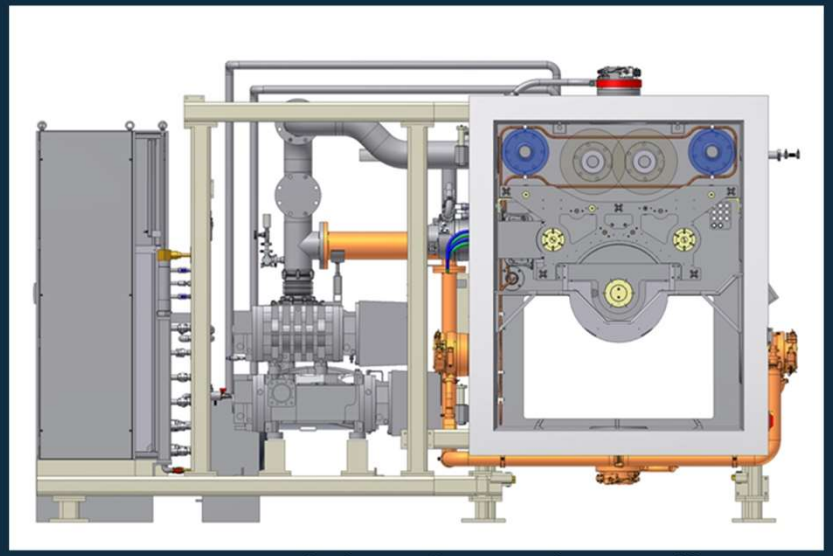
Standard
Industrial scale pumping system with optimised vacuum sequence for accelerated pump down times
Oxygen rated pumps support the widest range of process requirements
Stainless steel vessel and pipework with polished internal vessel surfaces

Configurable
Select a pre-defined technology option for the chosen zones
Turbo-molecular pumping subject to process
Diffusion pumping option subject to process
Booster pumping option subject to process

Optimised and Scalable
Select the pumping capacity to suit your needs
Initial process requirements will define required pumping capacity
Additional pumping may be added as process scale-up occurs

Additional Options
Cryogenerator
Independently pumped pre-treatment or post-treatment zones
Corrosive duty pumps

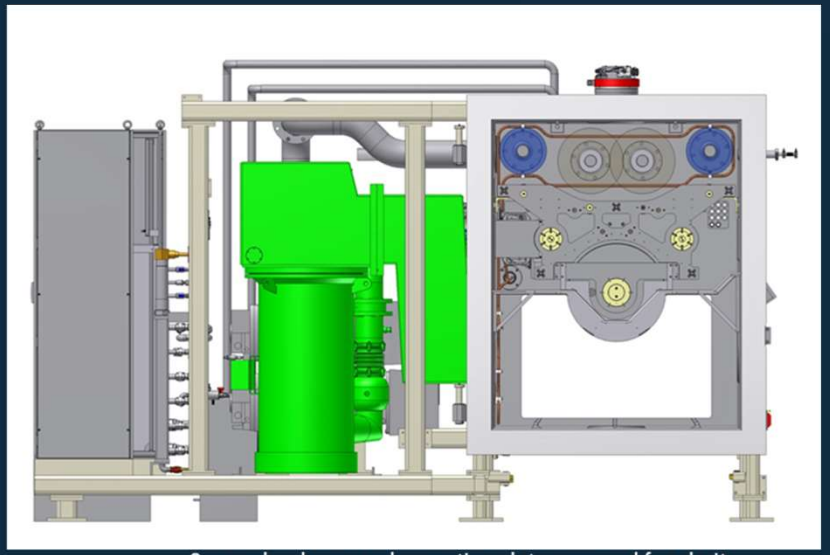
Vacuum System – Example Pumping Options



Source hardware and mounting plate removed for clarity

Turbo-molecular Pumped System

- Ideally suited to Sputter, E-Beam, Etch etc.
- Mechanical backing set, oxygen duty
- Booster Pump *optional*
- Wind zone – dedicated turbo-molecular pump
- Pre/Post treat zone – dedicated turbo pump *optional*
- Source zones – dedicated turbo pump per zone



Source hardware and mounting plate removed for clarity

Diffusion Pumped System

- Ideally suited to Thermal Evaporation
- Mechanical backing set, oxygen duty
- Booster Pump *optional*
- Wind zone – dedicated turbo-molecular pump
- Pre/Post treat zone – dedicated turbo pump *optional*
- Source zone - pumped via diffusion pump

+ Source System

Standard

- Large diameter, non-magnetic Stainless Steel coating drum
  - -20 deg C to +90 deg C operation
- Drum shielding to suit web width
- Interchangeable sources via modular cart system
  - Each cart module houses all hardware for that source e.g. power supplies, gauging, gas feed, shielding etc.

Configurable

- Select a pre-defined technology option for the deposition zones
  - Sputter - Planar, Dual Planar, Rotatable, Dual Rotatable, Active Anode, HIPIMS
  - ALD
  - E-Beam
  - PACVD/Hollow Cathode
  - Reactive Ion Etch
  - Thermal
- Combine technology options
- Define a customised technology option for specific requirements

Optimised and Scalable

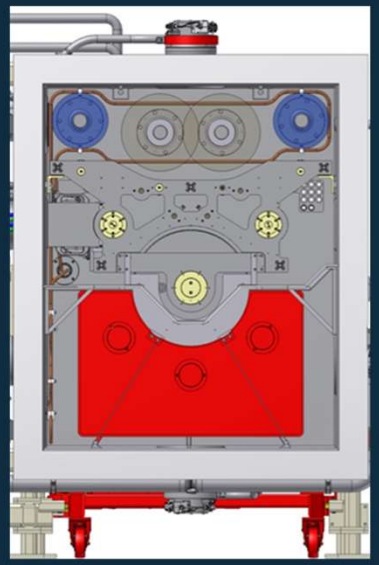
- Select the source hardware to suit your needs
  - Initial process requirements will define source selection and number of sources
  - Additional or supplementary sources may be added as process scale-up occurs

+ Source System

- Additional Options
  - Integrated process chiller/heater
  - High temperature drum system
    - Operation up to +200 deg C
  - Pre or Post Treatment zones may be populated with a range of technologies
    - Deposition sources
    - Plasma Treatment
    - Ion Beam
    - Etc.
  - In-line process sensing
    - Wide range of options may be fully integrated into the system
      - Plasma Emission
      - RGA/OGA
      - Optical Monitor
      - Resistance Monitor
      - Etc.
  - Closed-loop Sputter control
    - Impedance Control
    - OES Control
  - Source Viewing
    - Polarised viewing windows
    - Strobe viewing system
    - Camera

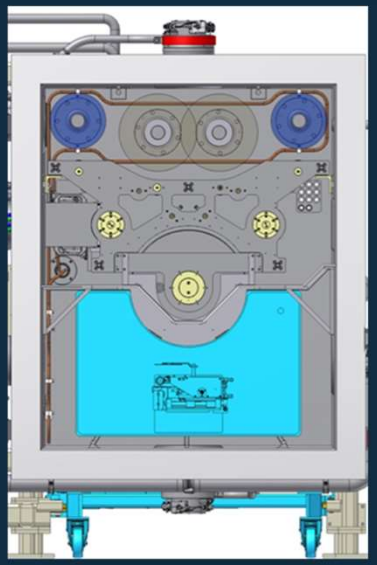
+ Source System

+ Source System – Option Examples



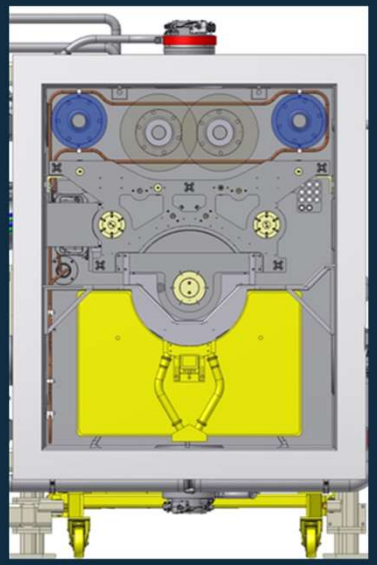
Sputter Source

- Example configuration
- Shows 3-off single rotatable cathodes
- Planar, dual planar or dual rotatable available upon request



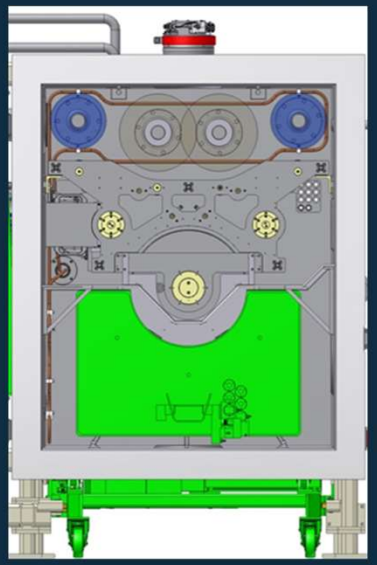
E-Beam Source

- Example configuration
- Shows 1-off e-beam
- Additional sources may be incorporated upon request



Etch Source

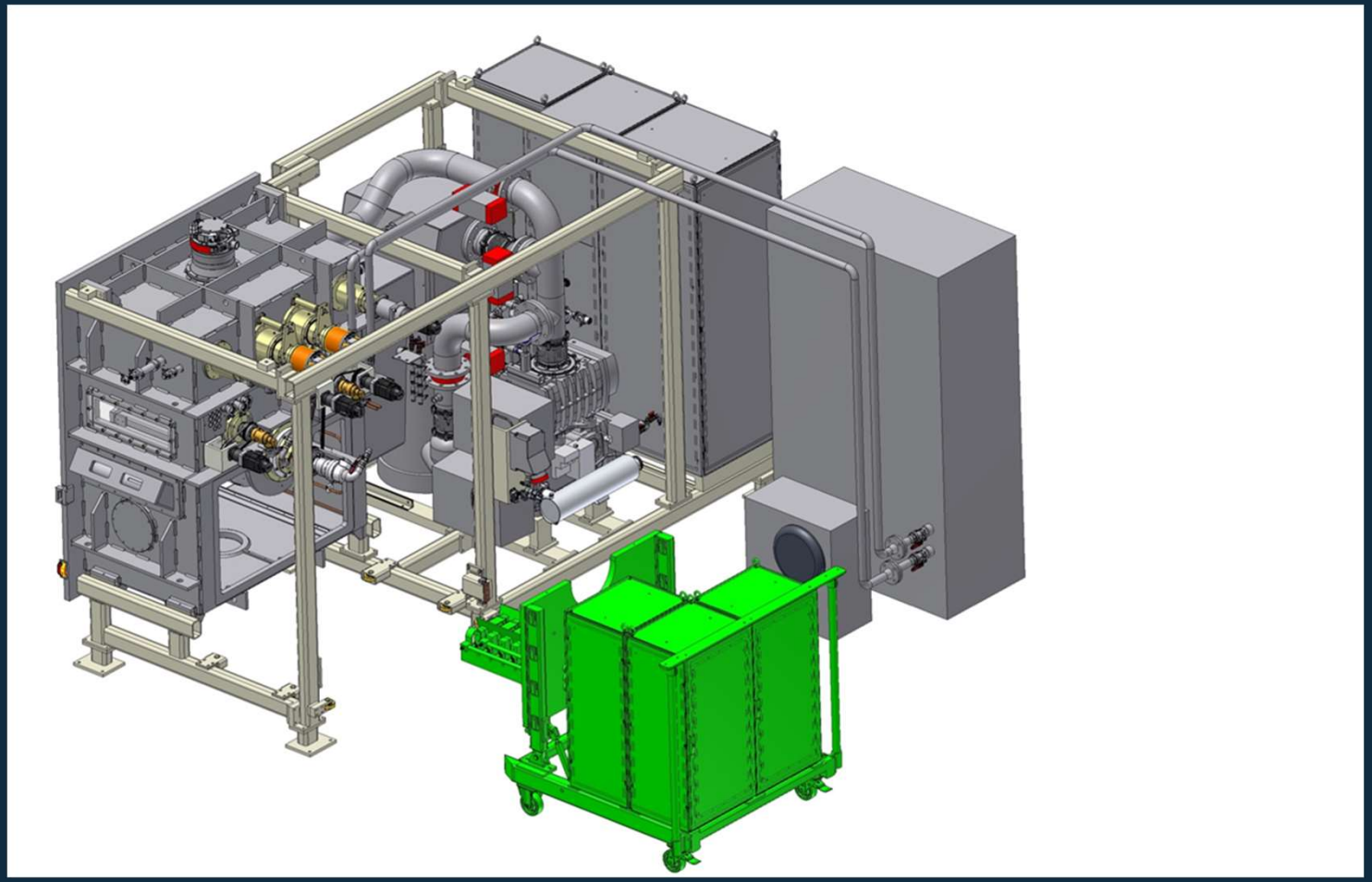
- Example Configuration
- Shows 1-off etch so
- Mini chamber design contains gases
- Additional sources may be incorporated upon request



Thermal Source

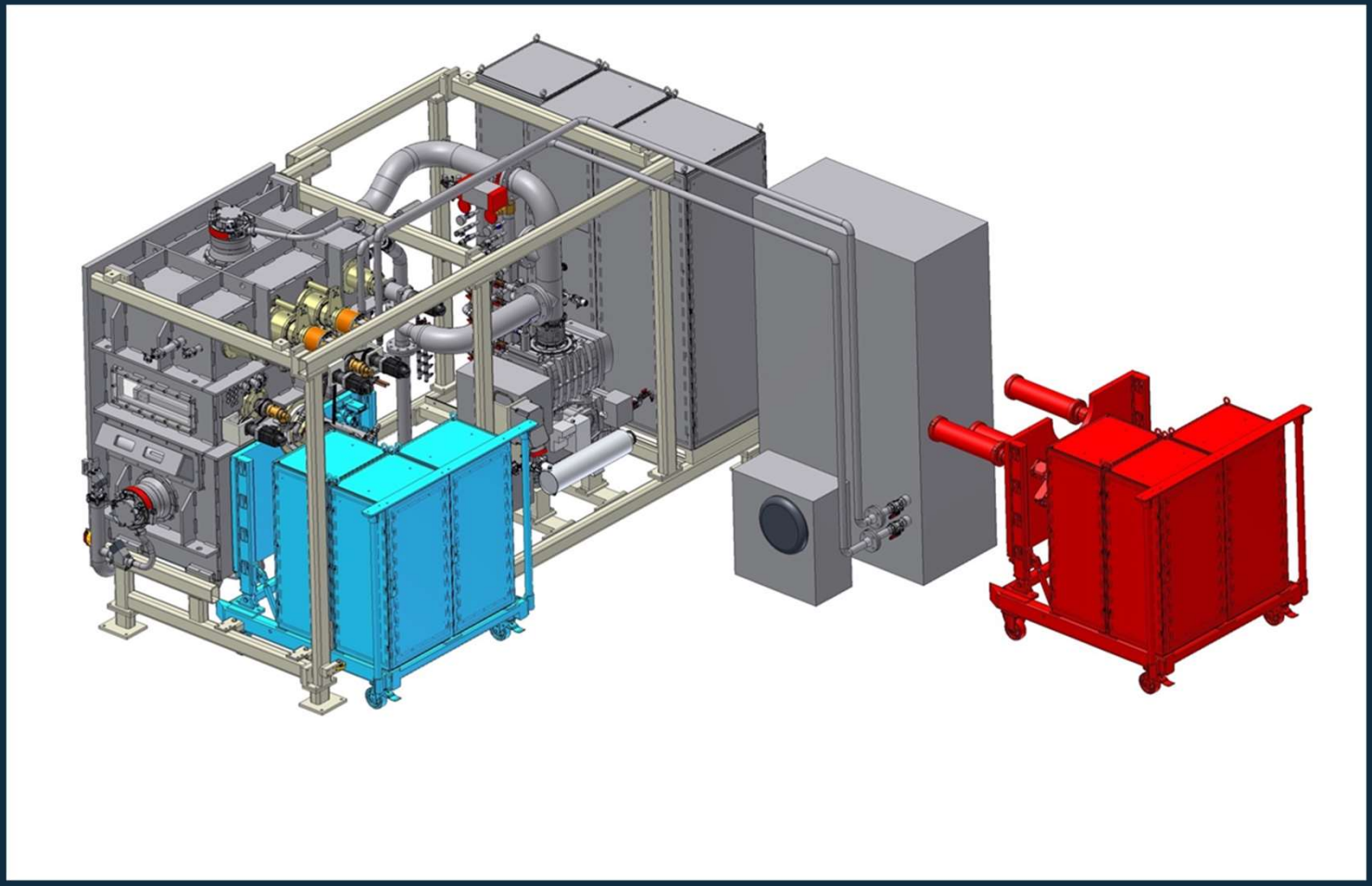
- Example configuration
- Shows 1-off thermal evaporation source.
- Required coating width determines the number of evaporators

+ Source System – Module removal example



- **Thermal evaporation** module installed in machine
- Vent machine to allow removal of module then disconnect module services
- Remove module manually
- Perform cleaning and/or maintenance
- Replace module
- Connect module services

+ Source System – Module interchange example



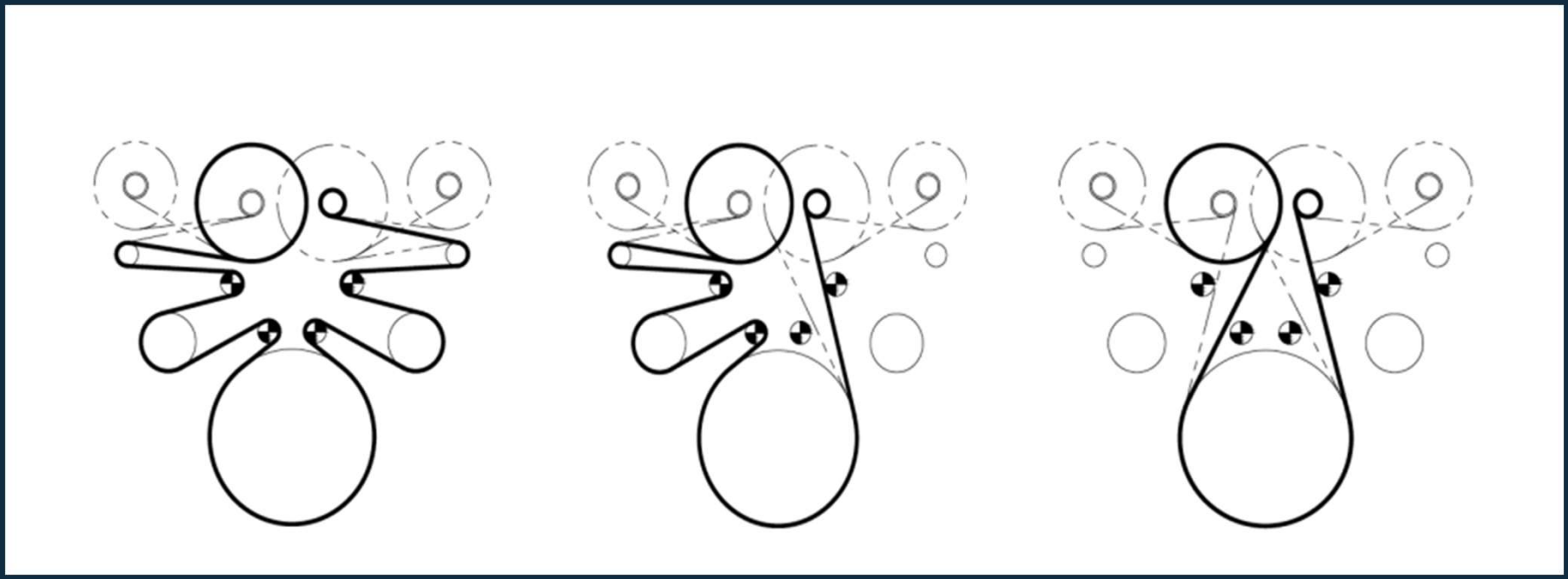
- **Sputter** module in place with **e-beam** module ready
- Vent machine to allow removal of module then disconnect module services
- Remove module manually
- *Park* the **sputter** module and insert the **e-beam** module
- Connect module services

+ Winding System

- Standard
  - Suitable for flexible substrates up to 500mm wide @ 400mm dia.
    - Films PET, PI, PEN etc
    - Flexible Glass
    - Foils
  - Multi-axis servo-driven system
    - Highest accuracy speed holding for sensitive control
    - Siemens or Rockwell pre-defined options
  - 5-off drive web system incl. pre and post drum capstans
  - Fully bi-directional, multi-pass operation
  - Wide tension range
    - 10-200N

- Configurable
  - Wide speed range
    - 0.1 to 20 mpm
    - 1 to 200 mpm
  - Full contact, partial contact and non contact modes included.
    - No face contact mode for especially sensitive substrates bypasses face contact rollers
  - De-interleave/Interleave Option may be incorporated
    - Additional 2-off winder systems

+ Web Transport System – Standard Web Path Options



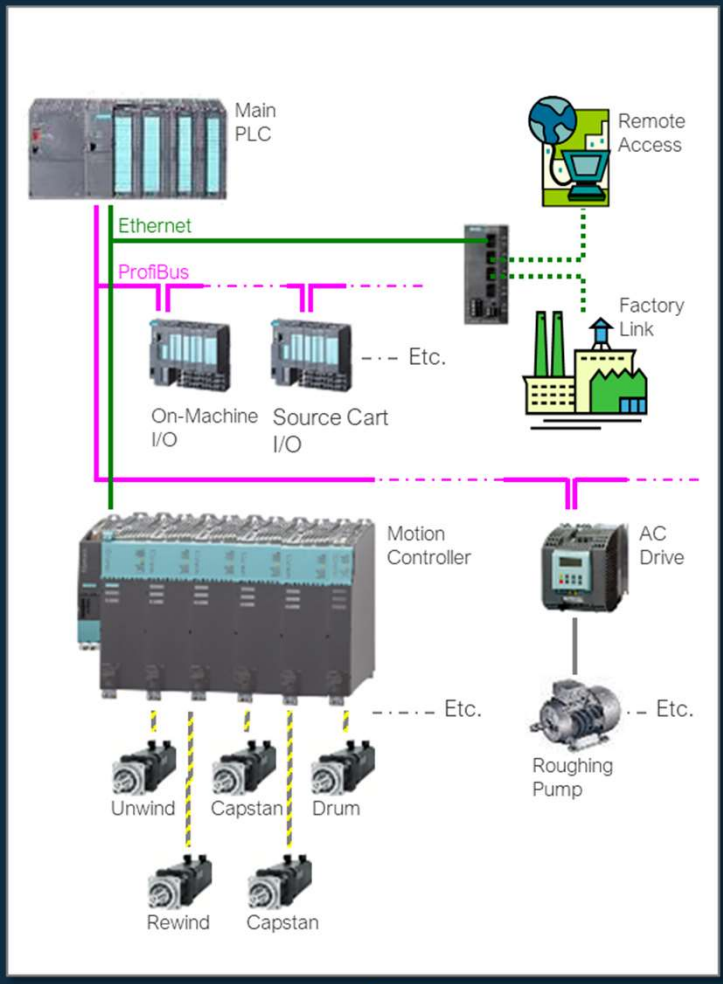
Full contact

Partial contact

Non- contact

+ Control System

- Control hardware selected from ‘Global’ players. Reliable and robust equipment with excellent support around the world
- Electrical controls and HMI housed on-machine
  - ‘Plug and play’ at site. Simply connect power and communications link
  - Rapid start-up. On-site re-commissioning requirements are minimised
- Advanced touchscreen interface for enhanced user experience and visibility of key parameters, settings, machine status etc.
- Open architecture allows for integration of various third-party production management, data logging or analysis tools
- Remote diagnostic connection as standard via secure VPN



+ Technology Centre

E&R has invested significantly to create a demonstration and development facility. At its heart is a fully specified and fully operational *Genesis* Vacuum Coater.

Key features

- Turbo-molecular pumping variant with optional booster pump included.
- Pumps specified corrosive duty
- Plasma pre-treatment for web surface enhancement
- Seven drive web winding system includes de-interleave and interleave function
  - Direct drive motors utilised on main winders to enhance available speed range of processing
- Sources
  - Gencoa Dual Rotatable Magnetron with SpeedFlo closed-loop PEM
  - Dedicated CVD/RIE deposition system

- Process drum chiller/heater system incorporated for -20 deg C to +90 deg C
- Incorporates a number of monitoring options – further options available

Available for trials, process qualification and development work

- Users may purchase time with or without technician support
- Customer modules can be pre-validated in the demonstration machine prior to delivery

THANK-YOU

Any Questions?

Find out more at www.eandr.com