



OPTIMA

Automatic wire cutting
and sleeving system



OPTIMA

Automation is key to increase productivity and quality for high volume and serial production. Having a scalable solution which also satisfies high-mix low volume productions is ideal to respond to the needs of the market.

The design of the Optima Line revolves around this concept. The modular and flexible platform offers automated features while addressing a large variety of productions, for different materials, work volumes or industry applications.

Performance

Frequently done manually, sleeving includes numerous time-consuming steps from printing to insertion. With the Optima, you will benefit from a significant productivity gain in your wire processing.

With its ergonomic and intuitive design coupled with high production speed, the Optima delivers a highly advanced and versatile solution for your needs.

Quality

With fully controlled processes, the Optima guarantees high quality result. Demanding manual operations such as labelling or sleeving are now 100% repetitive and fully operator independent, not only in the execution but in the control as well. Vision control is integrated here with artificial intelligence features verifying the marking and detecting presence.

▶ **Sleeving process**

Safety

Repetitive manual tasks can lead to musculoskeletal disorders over time. By automating sleeving and labelling, operators will be able to focus on more added value tasks while preserving their health. Heat guns are also involved in the manual process when shrinking is required and can reach very high temperature. This risk is now prevented.

Flexibility

Multiple tasks are needed throughout the value chain, which may vary depending on customer applications or industries. Flexibility is therefore key to justify an automated industrial solution suited for a variety of needs. The Optima line has been segmented in essential functions that can be added with time onto your machine. Upgradability is at the core of the design. Your machine will follow your technical needs as well as your investment capacity.

Efficiency

Mindful of economical and environmental concerns, the Optima includes features to minimize wire waste while reducing its power consumption. It features a compact design and energy saving standby mode to start production only when needed.

Standards

The Optima machine complies with CE Standards and has "CE" label. The Optima machine also complies with European directives:

- Machinery directive 2006/42/CE
- Low voltage directive 2006/95/CE

And with the standards:

- Machine: NF EN 60204-1 – Machine Electrical Security

REVOLUTION
IN SLEEVE AND WIRE PROCESSING

WEALTH OF FUNCTIONS

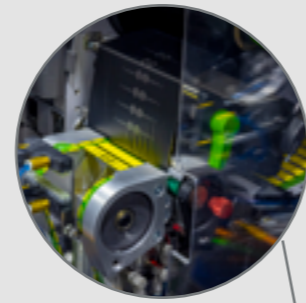
FOR A FULLY SCALABLE MODULAR LINE



ADS
SINGLE SPOOL
DEREELER
MULTI-SPOOL
DEREELER



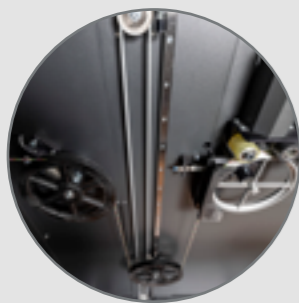
WSI
SLEEVE INSERTION



WSI
SLEEVE MARKING
AND CONTROL



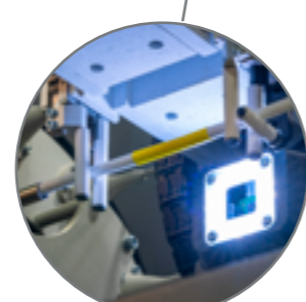
WCT
COILING AND
TYING SYSTEM



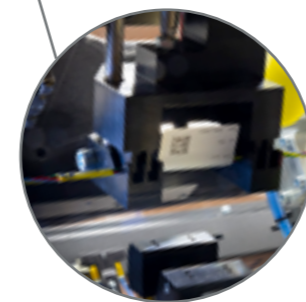
OPTIMA C
TENSIONING DEVICE WITH
FORCE MONITORING



OPTIMA C
CUTTING



WSI
SHRINKING WITH VISION
CONTROL



WEL
LABELLING



STO
SORTING AND
OPTIONAL CONVEYOR



▲ Optima 600 configuration with 2 spool dereeler and WCT, MSI, WEL modules

CUTTING OPTIMA C

Performance and quality

The Optima C is a powerful, automatic wire processing machine for single or twisted wires from gauge 6 to 26. The Optima C is extremely easy to operate and provides reliable performance. Operation via the touchscreen requires just a short training course and is supported by the intuitive software EasyProd.

Multiple sensors are integrated to detect the following on dereeling:

- End of spools
- Cable cut
- Cable over tension

And on the cutting unit:

- Cable knots, splices and bare wire (optical detector performance: detection of cable diameter variation of 1/128" (0.2 mm) at 2 m/s (400 ft. /min)
- Safety enclosure opening
- Pneumatic pressure fault

A tensioning system is fully integrated inside the machine. A reactive electrical motor applies a constant force on the wire in line with international dereeling standards.

Economical

The large diameter of the external coder ensures a constant contact on the wire leading to a high dereeling accuracy. An ingenious additional wheel will automatically hold the wire in place and reduce the speed when the end of the spool is detected through tensioning force drop. End of spool wire waste is drastically reduced. Waste is also a concern at the start of the production. A pneumatic gripper near the cutter allows a wire set up with a reduced waste, down to 50 mm (1.97 in).

Low maintenance

The reliable motorized double-belt drive pulls in the cable at high speed in cutting mode. Cable traction can be precisely controlled for each cable type with the machine software by programming acceleration, deceleration and production speed for the best performance and accuracy. Length tolerances:

- 0 to +20 mm (0 to 0.79 in) for cables under 4 m (13 feet) length
- 0 to +0.5% for cables over 4 m (13 feet) length

The cable is not centered on the belts allowing them to be turned and to double their lifetime.

A powerful cutter can process wire up to gauge 6 and specific blades can be set depending on the requirement.

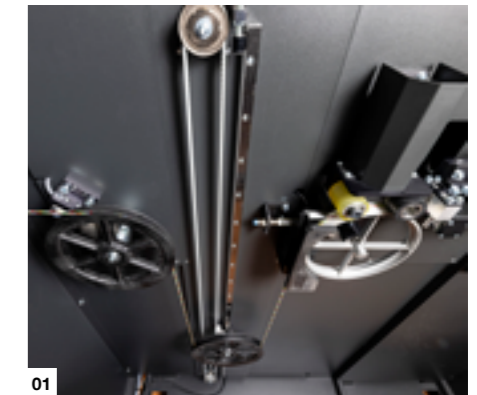
The cut is made by a system using two blades "V" shaped rounded, mounted head to tail, which provided a non-ovalized clear and clean cut. Changing blades is quick and easy to optimize set-up time.

Ergonomic

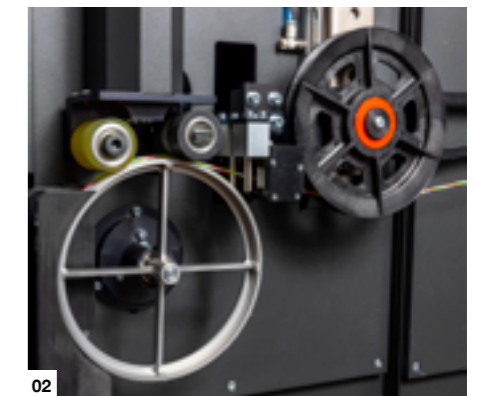
The experience gained over the years has highlighted the need for an even more user-friendly machine, on the hardware as well as on the software side. A completely new HMI, a touch screen set on adjustable arm, sliding door for full access, wire feeding assistance or even an intuitive LED indicator along the entire machine are some of the many features in place to ease the use and the support of the machine.

The control system which includes the EasyProd software, developed by Komax, is built around the following components:

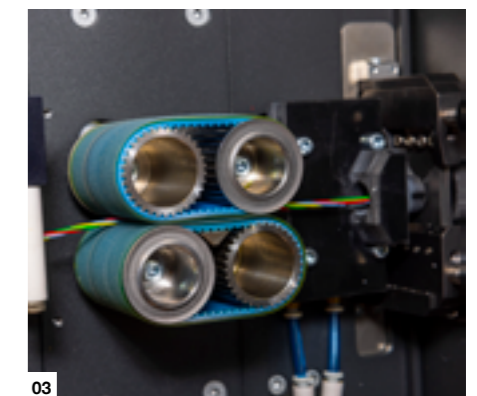
Operating system	Windows® 10 IOT
Case/form factor	Fanless without any rotating part
Memory	4GB min
Hard drive	SSD
Video card	Integrated
Available ports	4 × USB 3.0 1 × RJ-45 (to connect the computer to the factory network)
Standard monitor	24-inch side mounted touch screen



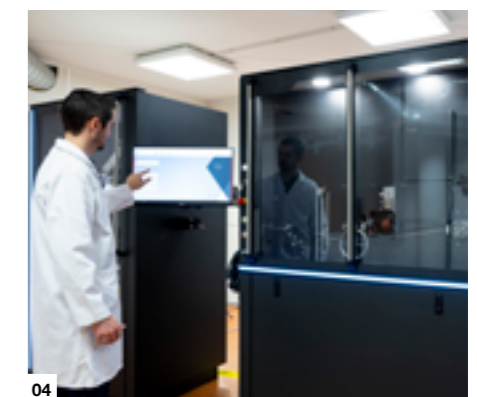
01



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- 01 Innovative tensioning device with controlled applied force.
- 02 External coder with large diameter ensuring great accuracy and reactivity.
- 03 Integrating Komax Kappa driving and cutting unit.
- 04 Intuitive (and visually appealing) LED display along the machine and the dereeler.

DEREELERS

Adaptable

Flexibility was also considered for the machine input. From a single spool to 40 multipool motorized dereelers, with manual or automatic feeding systems, your configuration will suit your needs.

Single spool motorized dereeler

This standard compact unit is ideal for gauge-sorted production with limited change over.

2 spool dereeler

Set on configurable rolls, each station can process spools from a small standard 250 mm (9.84 in) / 25 kg (55 lb) up to a massive 600 mm (23.62 in) diameter / 75 kg (165 lb) covering a very large range. Wire extremities are clamped at the output of the dereeler for manual but optimized loading/unloading.

Spool characteristics

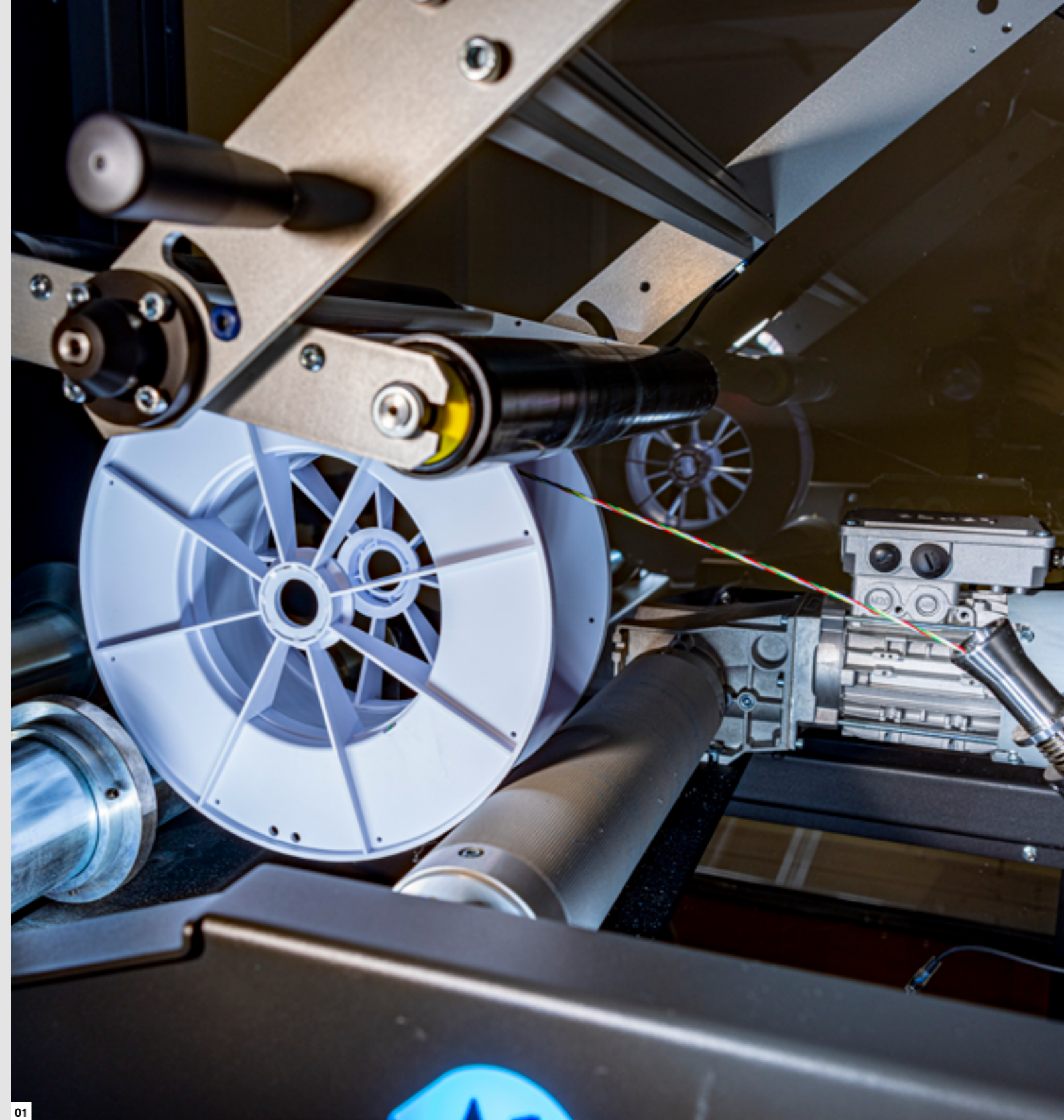
	Single spool dereeler	2 spool dereeler	Multipool
	Maximum weight: 25kg (55 lb) A: 150 to 250 mm (5.90 to 9.84 in) D: 250 to 400 mm (9.84 to 15.75 in) B: Inner axis: 20 mm (0.79 in), 25.4 mm (1 in) or 38 mm (1.5 in)	Maximum weight: 75kg (165 lb) A: 150 to 350 mm (5.90 to 13.78 in) D: 250 to 600 mm (9.84 to 23.62 in)	Maximum weight: 25kg (55 lb) A: 150 to 250 mm (5.90 to 9.84 in) D: 250 to 400 mm (9.84 to 15.75 in) B: Inner axis: 20 mm (0.79 in), 25.4 mm (1 in) or 38 mm (1.5 in)

Multi-spool motorized dereeler and automatic feeding system (AFS)

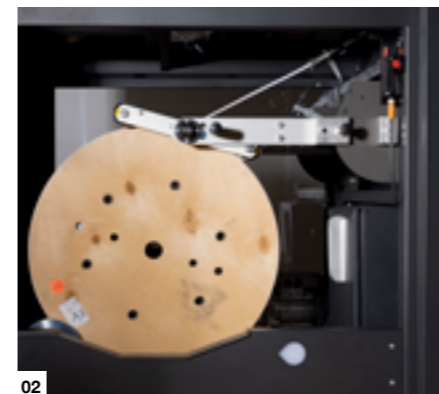
This de-reeling system offers the best production flexibility. It is designed to eliminate most of the wire spool loading operations and to minimize wire changeover through complete automation. You can produce a whole harness from a single production file without wasting time with spool loading processes.

The dereeling station is automatically selected by the machine software according to the cable to be loaded or unloaded.

- Configuration: up to 5 cabinets of 8 spools per cabinets maximum (4 each side)
- Spool counts: up to 40 spools. Upgradable by adding additional cabinet.



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- 01 Small spool mounted on a 2 spool dereeler (manual feeding)
- 02 Station can process large wooden spools up to 600 mm (23.62 in) diameter / 75 kg (165 lb)
- 03 User-friendly software with touch screen interface

POST-CUTTING MODULE OVERVIEW

POST-CUTTING OPTIONS (WCT MANDATORY)

COILING PAN

Post-cutting automation might not be part of your current scope of interest, therefore the Optima comes as standard with a 220 mm (8.66 in) motor-driven coiling pan.

The rotating speed of the coiling pan is adjusted to the cable speed to ensure perfect wire looms. 300 mm (11.81 in) and 400 mm (15.75 in) pans are available as an option.

Thanks to the modularity of the Optima range, upgrades are always possible to meet evolving capability requirements.

WCT COILING TYING SYSTEM & STORAGE

The first step of the post-cutting automation, the WCT system allows users to automatically coil and tie (using plastic twisted ties) the wire.

After tying, the coiled cable is automatically handled and placed in a box at the machine output. This box is mounted on a cart, easily transferred away to the next processing station.

WSI AUTOMATIC SLEEVE INSERTION

The WSI module brings automation to the very manual and time-consuming sleeving process.

With up to 3 printers, the module prints the sleeve, verifies the marking by vision control, positions the sleeve onto the wire (on the extremities or along the wire) and can be completed with an innovative IR heat shrinking unit.

Automation in processes like these increases quality, productivity and health and safety.

WEL WIRE EXTREMITY LABELLING

Labelling is the best way to add information on the wire and efficiently guide the operator in the following manufacturing steps.

Fully programmable, the WEL module can label each wire extremity. Labels can contain information from the production file in different forms, including barcode, DataMatrix and QR code.

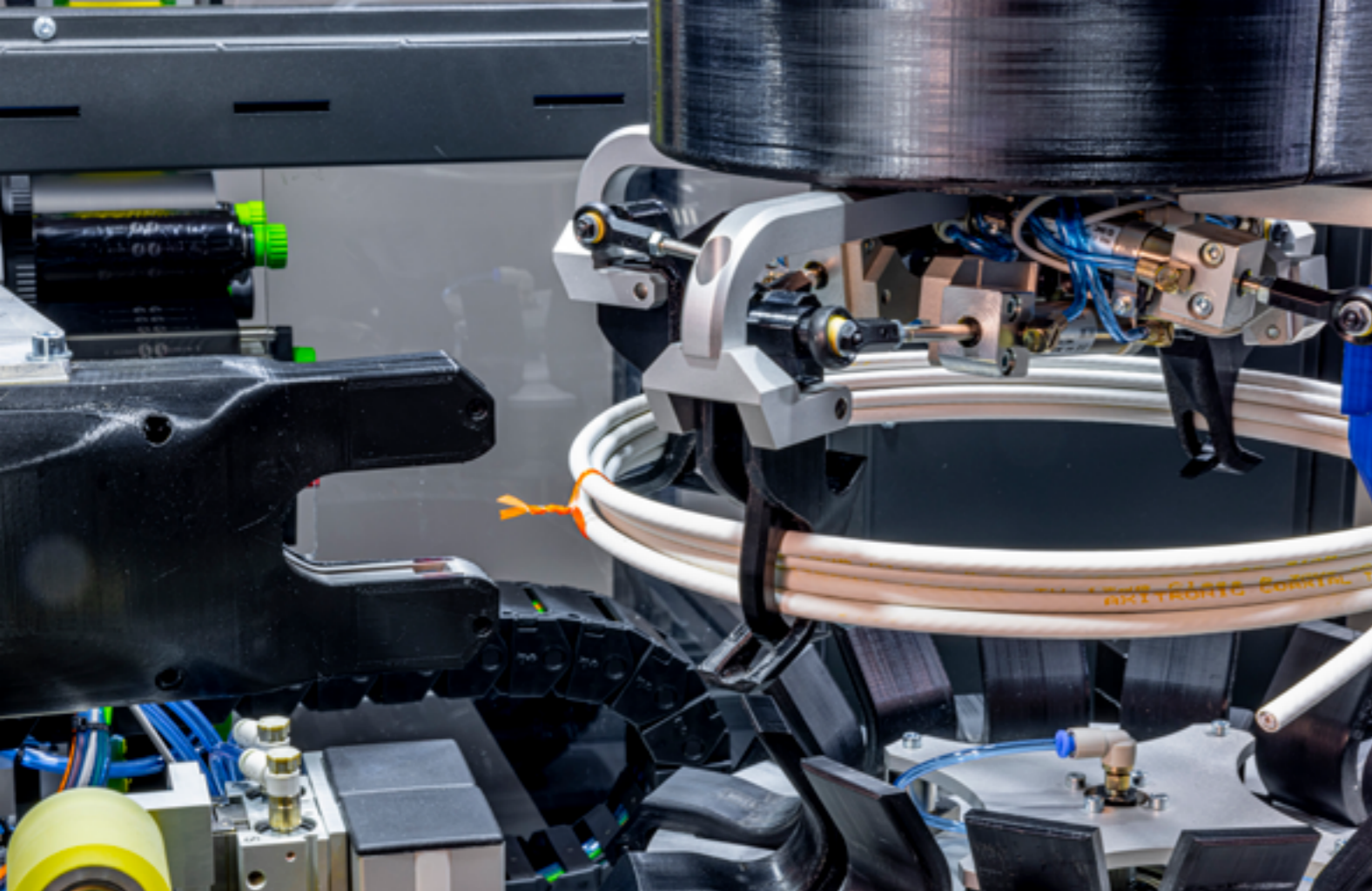
STO STORAGE

Once produced, the coiled wire is stored in a production box at the output of the machine. With the WCT, a single box set on a cart is provided as standard.

Conveyor options are available to meet the workshop production flow.

Traceability is available through box management with QR-code.





WCT COILING TYING SYSTEM & STORAGE

First automation step

If cutting to length is the primary function of the Optima C, processed wire handling comes immediately after as an essential secondary one. With capabilities of Coiling, Tying and Storage, the WCT answer this need as the first step of automation.

Versatile coiling

Coiling at a diameter of 280 mm (11.02 in), Optima can handle lengths from 150 mm (5.90 in) up to 250 m (9.84 in), equivalent to a maximum wire coil section of 35 mm (1.38 in). The wire is handled by 2 ingenious independent and fully programmable grippers set on a linear tray. These 2 grippers transfer wire extremities from cutting to coiling, stopping on the way for sleeving, shrinking and labelling when the modules are available. Wires that are too short to be coiled are moved to storage directly.

▲
The WCT module automatically ties the coiled wire with up to 3 non metallic and easy to remove ties.

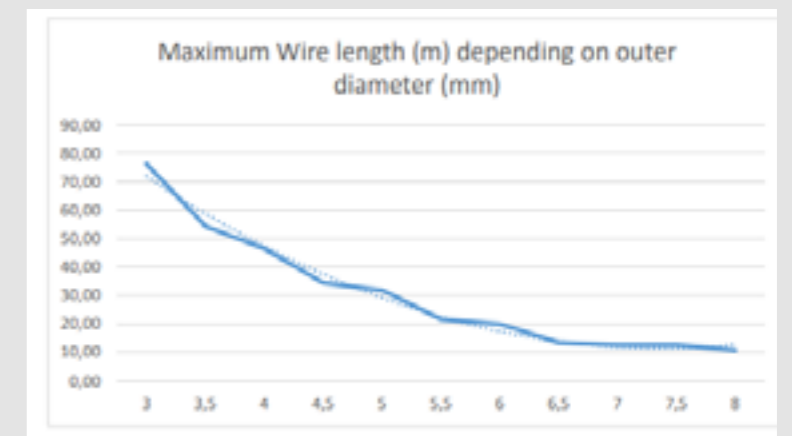
The integrated coiling drum is an inspired piece of engineering. With the first extremity always located, an applied torque ensures a perfect coil. The drum system is retractable to facilitate the pick up of the wire loom.

Innovative tying

Taping is the usual method used to tie the loom till the next assembly step. Untying it can be very demanding labor for the operator, leading in the long run, to musculo-skeletal disorders. This new design places up to 3 ties on the loom, with controlled twist for effortless removal with a simple pull. Ties are non metallic to meet FOD protocols.

The minimum length estimated to coil and tie a cable is 1.3 meters (3.28 feet).

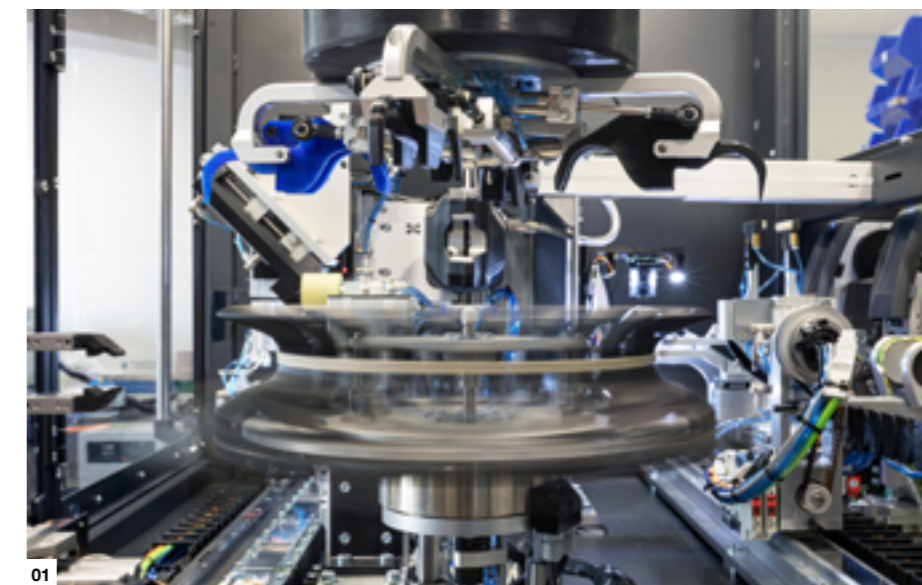
- Cable type: single core, shielded and unshielded wires, unjacketed or jacketed multi-core cables, optical fibers
- Gauges: AWG 26 to AWG 6 (outer diameters from 0.8 mm to 8 mm)
- Cable length processed:
from 150 mm (5.90 in) with coiling pan or WCT
from 250 mm (9.84 in) with WSI module
- Wire coil diameter: 280 mm (11.02 in)
- Wire coil section: 35 mm max. (1 inch)
- Weight: 1 Kg max. (2.2 lb)



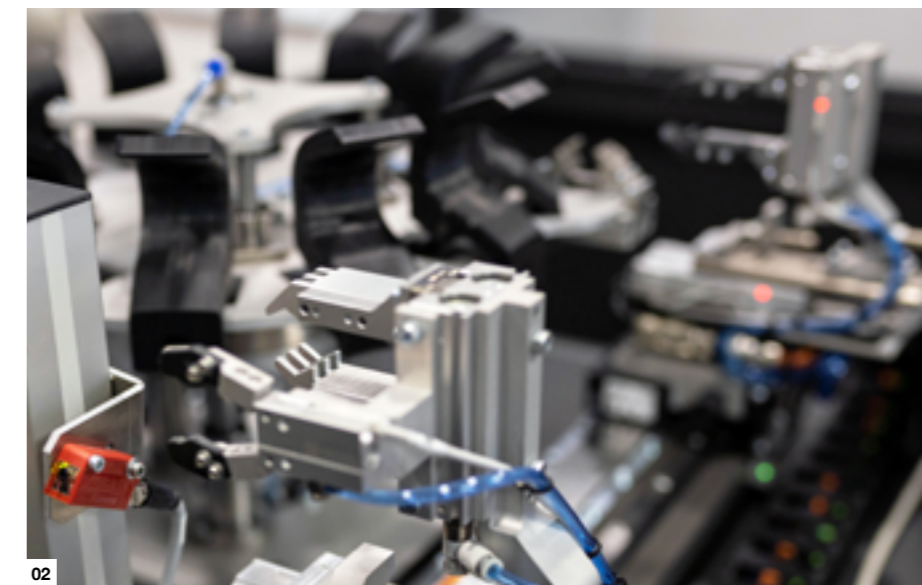
Storage

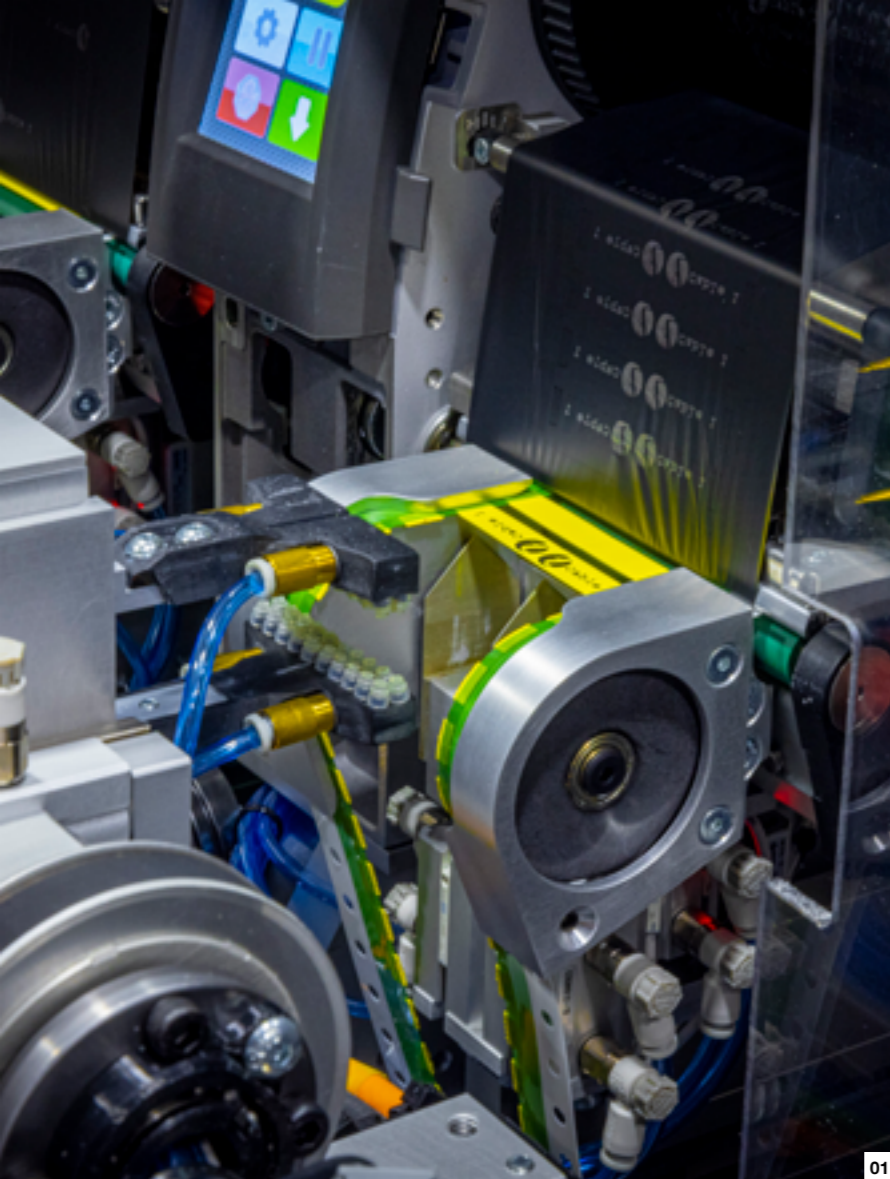
As standard, the WCT comes with a storage system with a single production box set on a cart. The operator manually retrieves the box once the production is done. For a more automated solution, storage configuration can be upgraded with a conveyor reducing operator intervention even further.

01
The 280 mm coiling system in motion.



02
The 2 ingenious independent and fully programmable grippers handle wire extremities.





01

WSI

AUTOMATIC SLEEVE INSERTION ON WIRE

A revolution

From manual to automation, the Optima range offers a major step towards increased quality, productivity and safety with the WSI module.

Flexibility

With up to 3 printers integrated and 5 different sizes of sleeve, the machine can handle a large variety of production types without any operator intervention.

A carousel of 10 tubes of 5 different diameters supports the sleeves. This carousel also has a notch to eliminate the cable waste at the start of production.

Depending on the configuration, the WSI can insert sleeves only at the extremities of the wire as commonly used or up to 11 sleeves along the wire.

Quality

A vision system to control the marking ensures that every single sleeve inserted on the wire is compliant to specifications, preventing any reworking during assembly. Faulty printed sleeves are ejected and reprinted automatically without operator intervention.

Safety

A specific device using Infrared radiation can be added just after the sleeve insertion module, to shrink the sleeve and hold it in place on the cable. This unit offers a constant and controlled shrinking process completely independent from the operator. Handling of a dangerous heat gun is no longer required during the sleeving process.

Full production cycle:

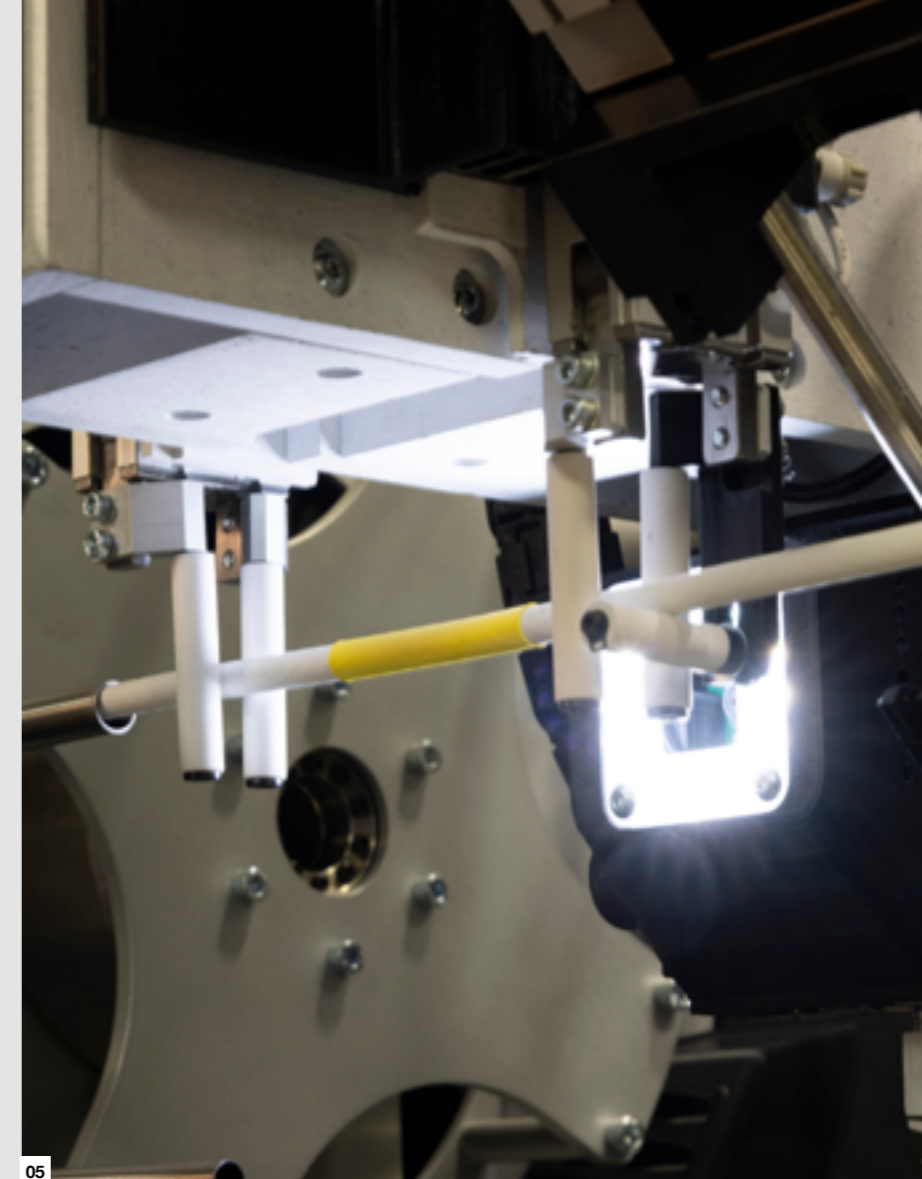
01
The sleeve is printed according to the production file. A vision control is performed to verify the marking.

02
The marked sleeve is carefully picked and loaded onto the tube of the carousel.

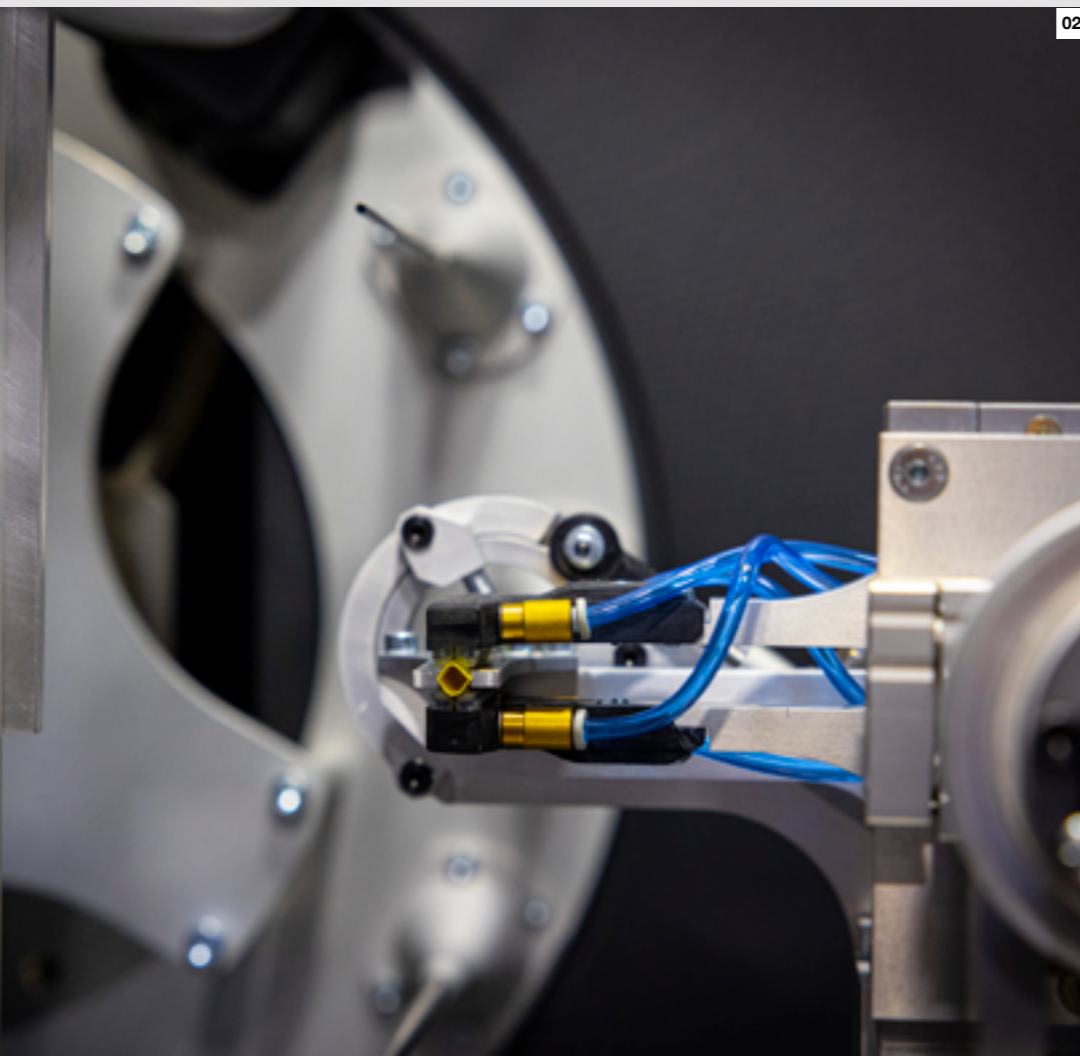
03
Once the sleeves installed, the carousel rotates to bring the loaded tube to the output of the cutter. Loading is done in the background.

04
2 independent grippers handle the wire extremities and the sleeve positioning.

05
An innovative IR heat system can shrink the sleeve after a presence detection by vision control.



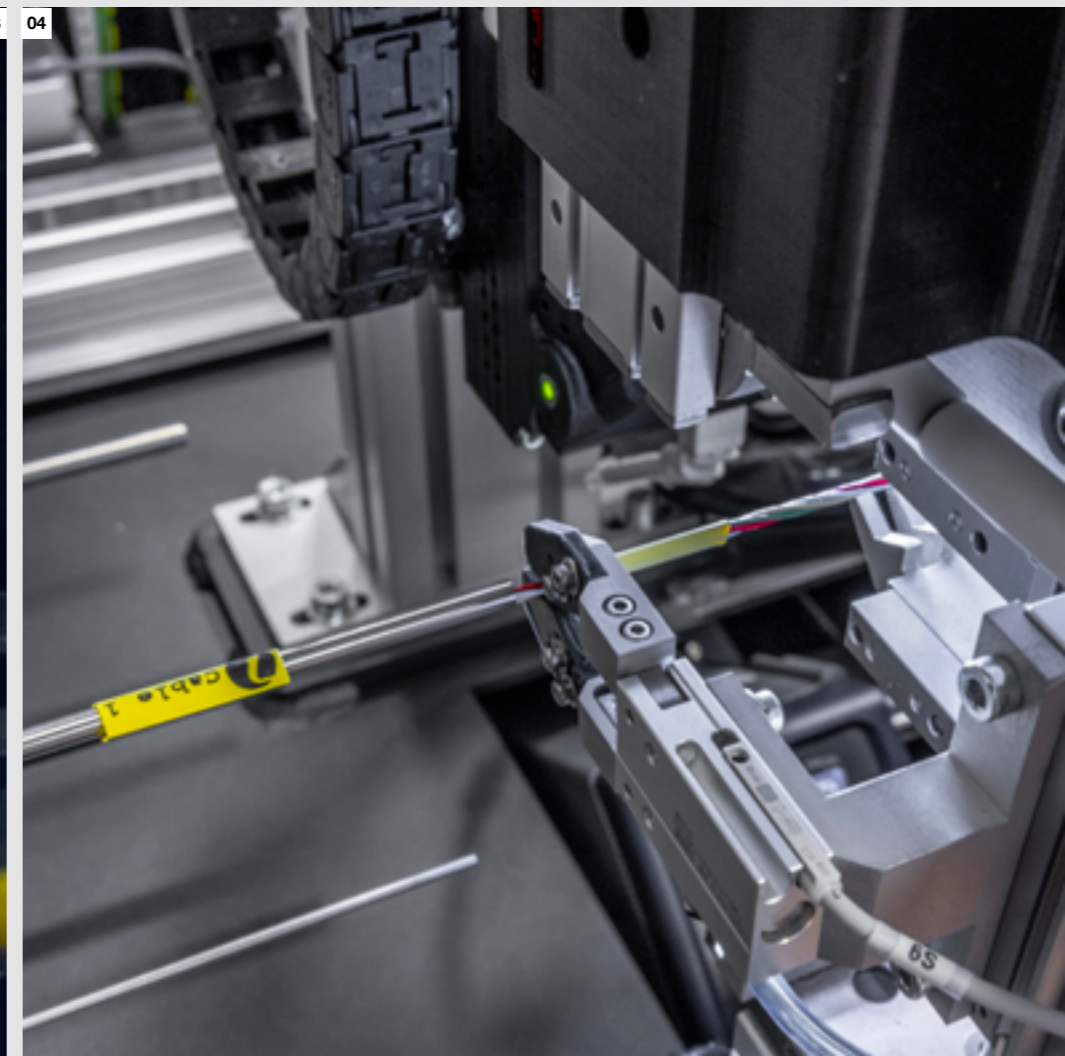
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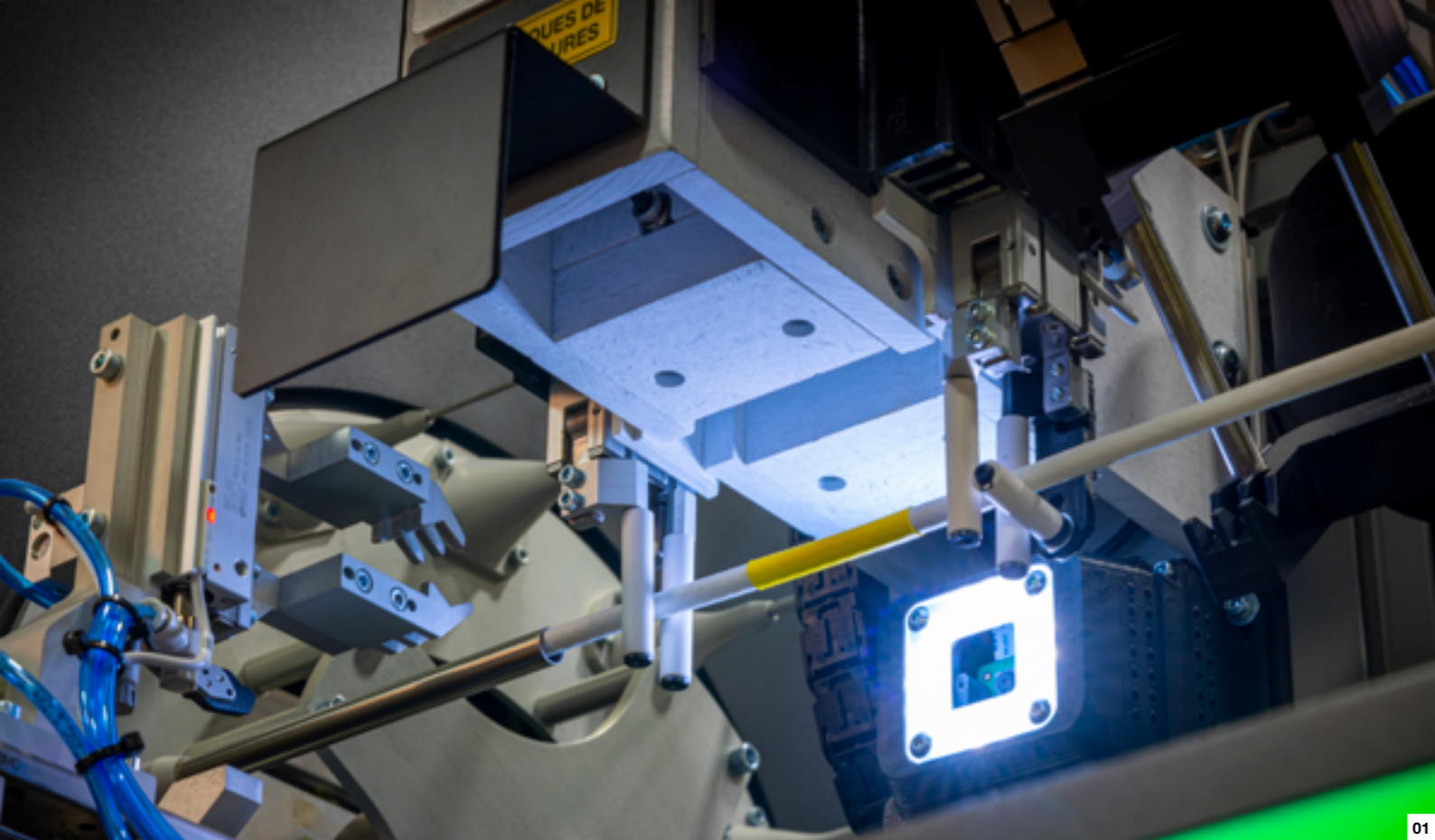
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01 04



04 The WEL module automatically labels wire extremities with customizable content.

Productivity

The time-consuming manual process of sleeve printing and control, wire cutting, sleeve insertions, heat shrinking, and coiling is now fully automated in the Optima platform. A gain up to 45% is expected compared to manual process, without a full-time operator in front of the machine.

In line with the standards

The sleeve length is 50 mm (1.97 in), or 2 x 25mm / 2 x 0.98 in (precut sleeve).



The compatible range includes almost all sleeve dimensions listed in the table.

Sleeve size	Maximum wire diameter
3.2 mm / 1/8 in	1.8 mm / 5/64 in
4.8 mm / 3/16	2.7 mm / 1/8 in
6.4 mm / 1/4 in	4.2 mm / 5/32 in
9.5 mm / 3/8 in	6.9 mm / 9/32 in
12.7 mm / 1/2 in	8.5 mm / 5/16 in



02



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01 Heat shrinking performed by IR radiation oven
 02 Wide range of sleeve sizes
 03 Optimized sleeve printer access for easy maintenance

WEL WIRE EXTREMITY LABELLING SYSTEM

In addition to the WCT, this option allows extremity labels to be stuck automatically on produced wires.

Both end labels are placed on the wire before being coiled. It is possible to place a label only at one end, or no label according to your needs. Integrated in the EasyProd software, information printed on the label can be tailored to customer needs.

First extremity label is placed at 80 mm (3.15 in) from the first wire extremity and the second extremity label is placed at a minimum of 135 mm (5.31 in) from second wire extremity.

Benefit

- Faster cable labelling, reducing operating costs and operator dependence during the process.
- Wire identification
- Information for extremity wire processing printed on label
- In combination with sleeve insertion option, the sleeve can be held on the wire to prevent it from being lost

Label specifications

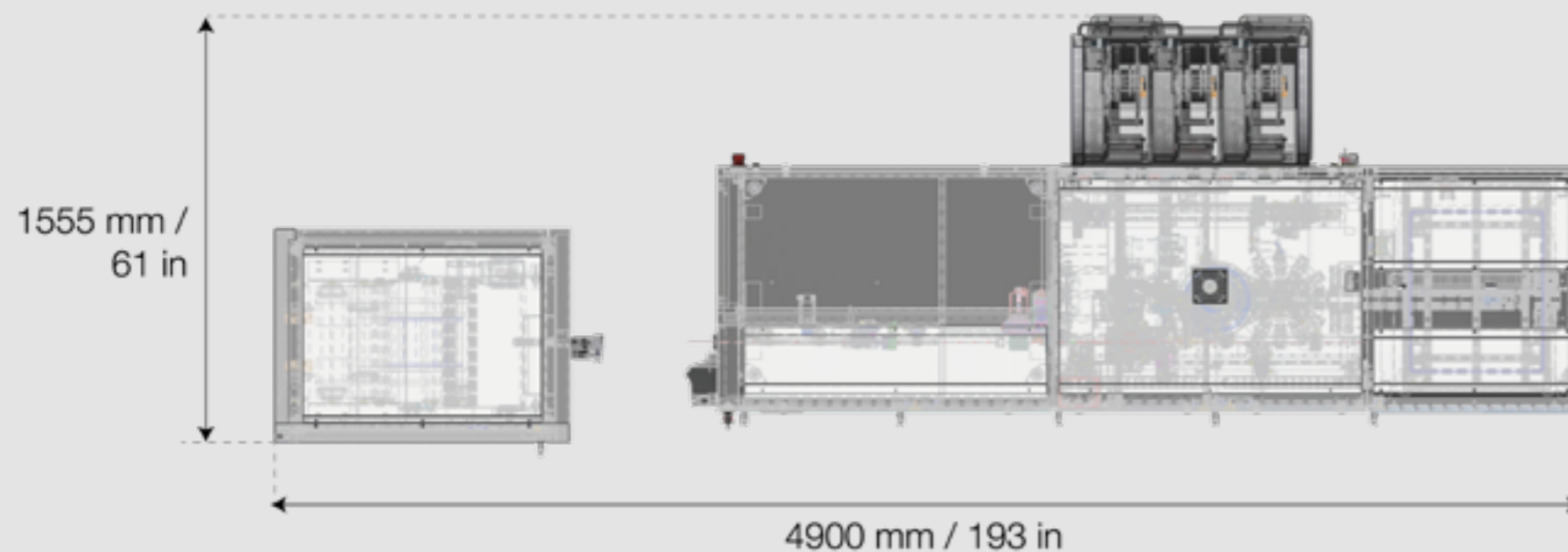
Labels will be provided with a top-coated, permanent adhesive, direct thermal paper that provides enhanced durability or applications where moisture and surface abrasion are a factor.

- Printing specification: thermal
- Dimensions max. - label size: 1.57 x 1.77 in (40 mm x 46 mm)
- Quantity per paravent packing 1500 labels



05

05 High ergonomics with label printer set on sliding tray and intuitive LED indicator.



▲ Configuration: Optima 600 with ADS 2 spools

Options and accessories

Dereeler	ADS 1 spool • ADS 2 spools • Multispool with AFS up to 40 spools
Optima C	Label printer • Coiling pan sensor • 220 mm (8.66 in) / 300 mm (11.81 in) / 400 mm (15.75 in) coiling pan • Traceability • OPC-UA Connectivity • Spool lifter
WCT	Standard 280 mm (11.02 in) coiling
WSI	Extremity sleeving (2 sleeves) • Multi sleeves up to 4 (4x25 mm / 4x0.98 in) • Multi sleeves up to 11 sleeves • Additional printer • Sleeve vision control (included) • Heat shrink unit • Heat shrink vision control (included)
WEL	Standard extremity labelling
STO	Standard 1 box • Conveyor 11 boxes • Extremity alignment • Box traceability • Box divider options

Specifications

Wire size range OD	AWG 26 to AWG 6 - 0.8 to 8 mm (1/34 in to 5/16 in)
Wire type	Single-core, jacketed, unshielded multi-core, shielded multi-core
Cable length	Maximum cable length function of cable OD: - 250 mm (9.84 in) to 10 m (33 feet) for cable with 8 mm OD (5/16 in) - 250 mm (9.84 in) to 75 m (246 feet) for cable with 3 mm OD (1/8 in)
Proceeded sleeves	Sleeves in rolls Length : 50 mm or 2 x 25 mm (precut sleeve) / 1.97 in or 2 x 0.98 in Size : 3.2mm (1/8 in), 4.8mm (13/64 in), 6.4mm (15/64 in), 9.5mm (23/64 in), 12.7mm (1/2 in)
Sleeves printer	Up to 3 allowing 3 different types of sleeve to be processed (color and/or size)
Sleeves by cable (depending on the WSI configuration)	0 to 2 (for 50 mm) 0 to 4 (for 2 x 25 mm) 0 to 11 (for 50 mm)
Extremity labels	Thermal printing, size : 40 mm x 46 mm (1.57 to 1.81 in) Information printed tailored to customer needs
Spool characteristics	Refer to dereeler page
Interface	24" touch screen with EasyProd software
Operating system	Microsoft Windows 10
Ambient temperature	+15°C to +35°C
Humidity	< 80%, not condensing
Noise level	< 75 dB
Electrical connection	1 x 200 – 240 V 50/60Hz; 1.2 kVA
Air supply	6 bar, dry and oil-free
Conformity	CE

Komax – leading the field now and in the future

As a pioneer and market leader in the field of automated wire processing, Komax provides its customers with innovative and sustainable solutions for any situation that calls for precise contact connections. Komax manufactures series and customer-specific machinery for various industries, catering to every degree of automation and customization. Its range of quality tools, test systems, and intelligent networking solutions complete the portfolio, and ensure safe and efficient production.

Komax is a globally active Swiss company with development and production facilities on several continents. Komax uses its extensive distribution and service network, which includes local companies and their employees, to support customers across the world on site, thus ensuring the availability and value of their investments after equipment commissioning through standardized service processes.

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