



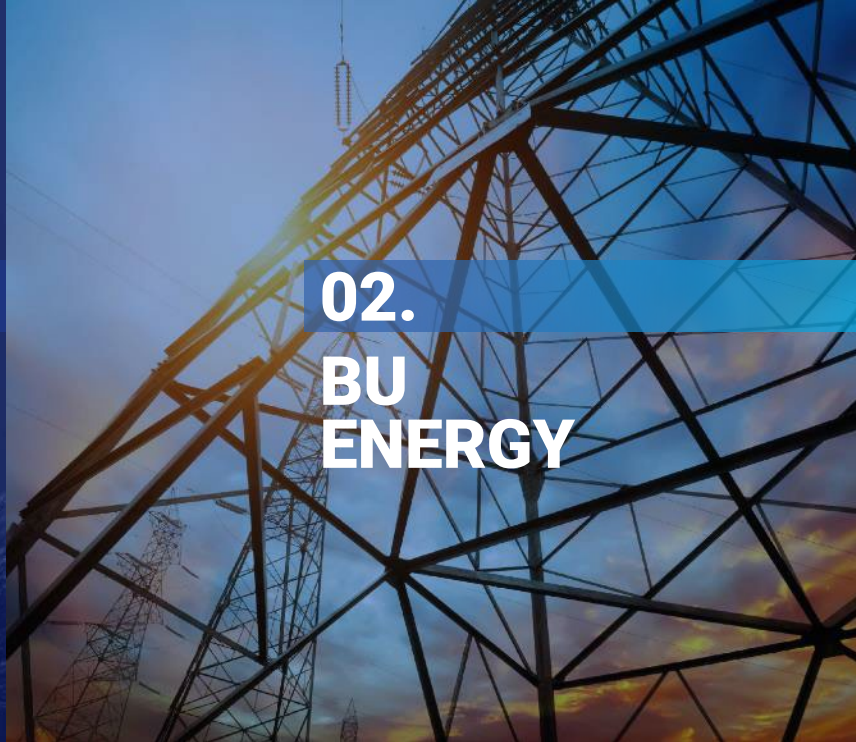
ENERGY
STRINGING

TESMEC

Index



01.
TESMEC
GROUP



02.
BU
ENERGY



03.
STRINGING
DIVISION



01.

**TESMEC
GROUP**

Tesmec Group at a glance

TESMEC designs, manufactures and distributes products, technologies and integrated solutions for the construction, maintenance and efficiency of the infrastructure related to the transport and distribution of energy, data and material (oil and derivatives, gas, water)



70+

Years of experience

1100+

Employees

8

Production plants

12

Subsidiaries

+135

Countries choose Tesmec

75%

Export

35+

Patents specifically developed



ENERGY STRINGING

- Solutions for power lines construction & maintenance
- Advanced methodologies for automating jobsite
- Zero emissions machines



ENERGY AUTOMATION

- Telecommunications solutions for HV Grids
- Grid Management: protection and metering solutions
- Sensors for fault passage indication, protection and monitoring



TRENCHERS & SURFACE MINERS

- Telecom networks, FTTH & long distance, power cable installation
- Oil & Gas, Water pipelines
- Bulk excavation, Quarries & Surfaces mining



RAILWAY

- Catenary lines installation & maintenance
- Diagnostic vehicles and systems
- Integrated platform for safe infrastructure

Worldwide success

energy

The common thread of our history,
which unites our business units

ENERGY STRINGING

Pioneers and leaders in the field of power line stringing

ENERGY AUTOMATION

Efficient and safe energy management solutions

TRENCHERS & SURFACE MINERS

Cable, Pipeline, Fiber Optic, Excavation and Surface Mining Technologies

RAILWAY

Products for electrification, maintenance and diagnostics of railway infrastructure



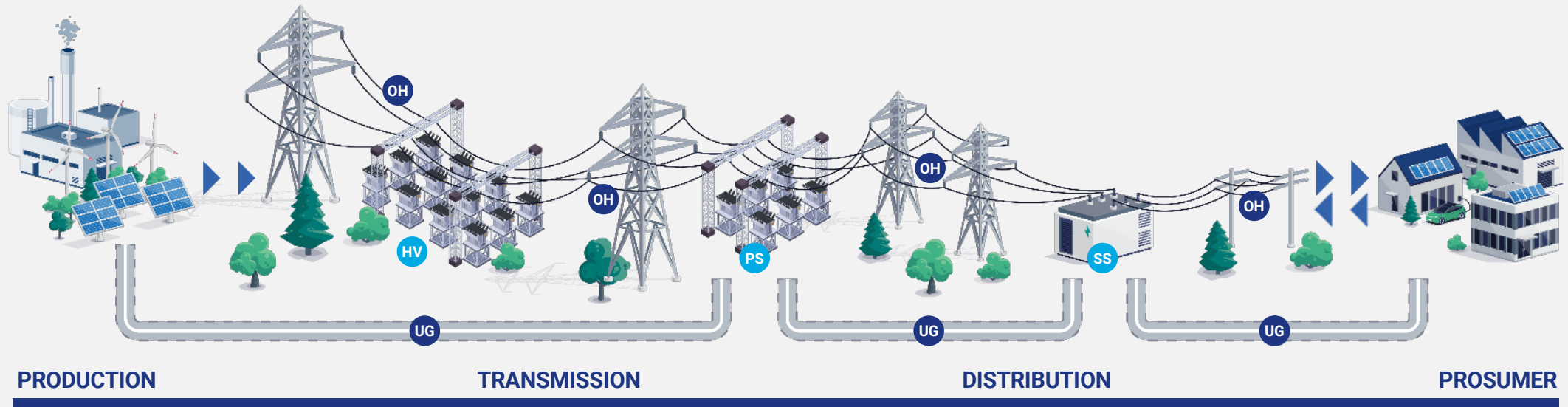


02.

BU ENERGY

**SOLUTION PROVIDER
FOR POWER GENERATION,
TRANSMISSION
AND DISTRIBUTION**

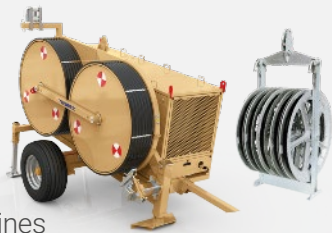
Advanced solutions for power generation, transmission and distribution



OH

OVERHEAD

Solutions for the installation and maintenance of overhead power lines



UG

UNDERGROUND

Complete range for cable laying and pipe maintenance



HV

SUBSTATION AUTOMATION SYSTEMS (SAS)

Based on IEC 61850



PS SS

PROTECTION, MONITORING AND CONTROL

of primary and secondary substations



ENERGY STRINGING

ENERGY AUTOMATION



- PROTECTION AND MONITORING
- REMOTE CONTROL
- TELECOMMUNICATIONS
- SMART METERING
- AUTOMATION SYSTEMS



Energy Stringing



- SOLUTIONS FOR CONSTRUCTION AND MAINTENANCE OF ELECTRICAL NETWORKS
- ADVANCED METHODOLOGIES FOR AUTOMATED CONSTRUCTION SITES
- ZERO EMISSION MACHINES





03.

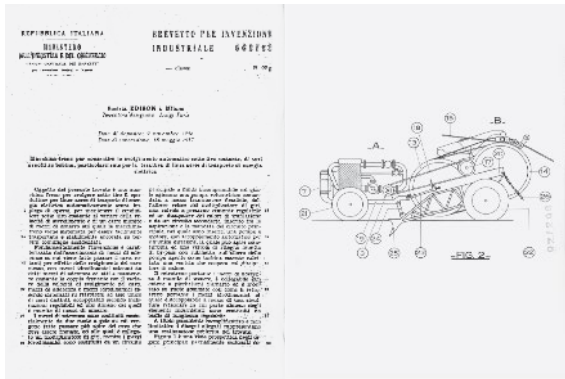
STRINGING DIVISION

**LINE MAINTENANCE
& CONSTRUCTION**



History of Innovation

For over 70 years we guide energy innovation worldwide



1951

Tesmec was founded

60's

Focus on hydraulic stringing solutions

First Stringing Patent granted by Edison on May 1957

2000's

Implementation of electronic controls

The first truck mounted pulley tensioner machine for multiple bundled conductor

Tesmec becomes the worldwide leader in stringing equipment

Large scale manufacturing and reaching the worldwide market

2018

New digital machines

Full Electric Machines
A New machine range. No emission, no hydraulic oil, no noise

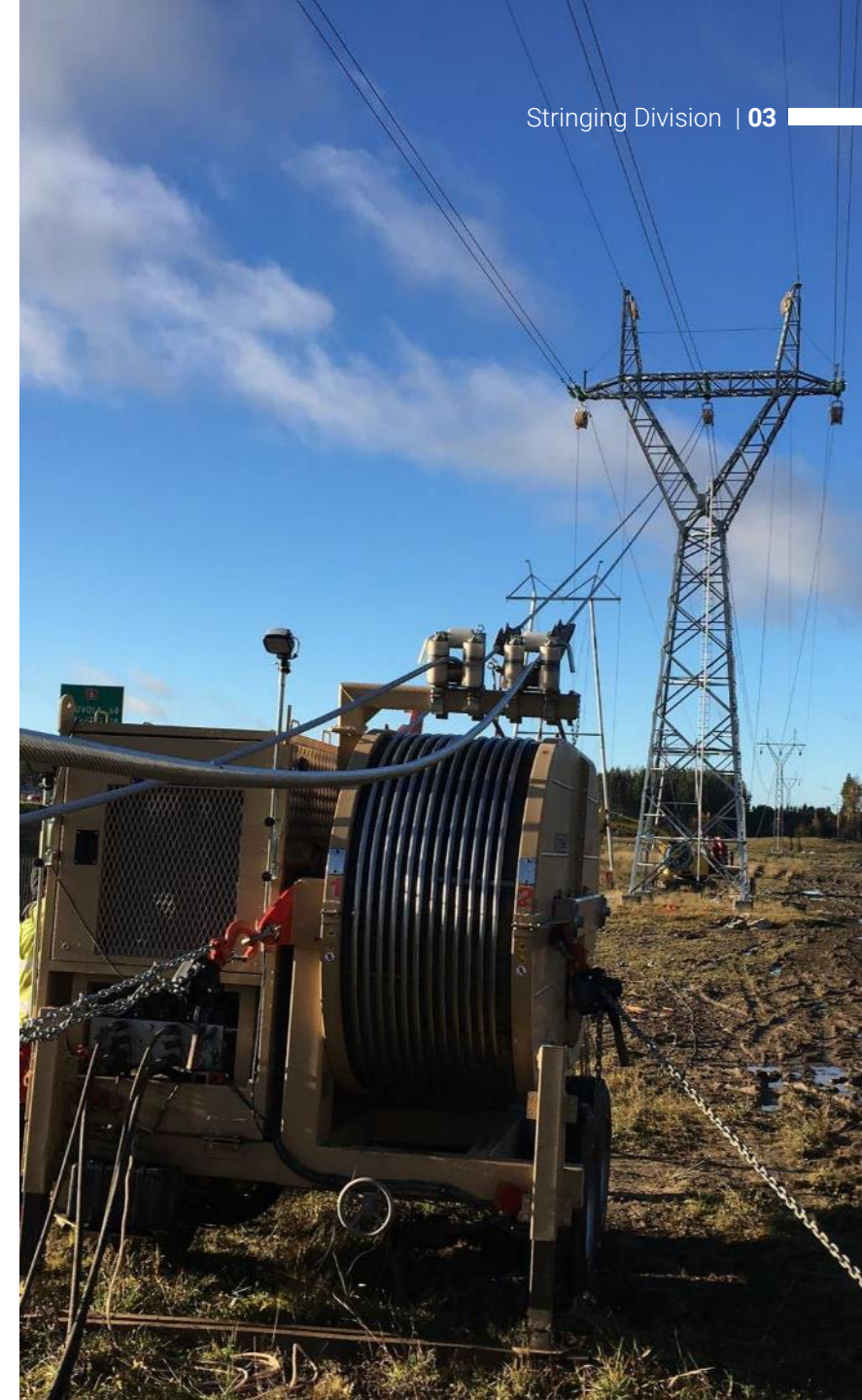
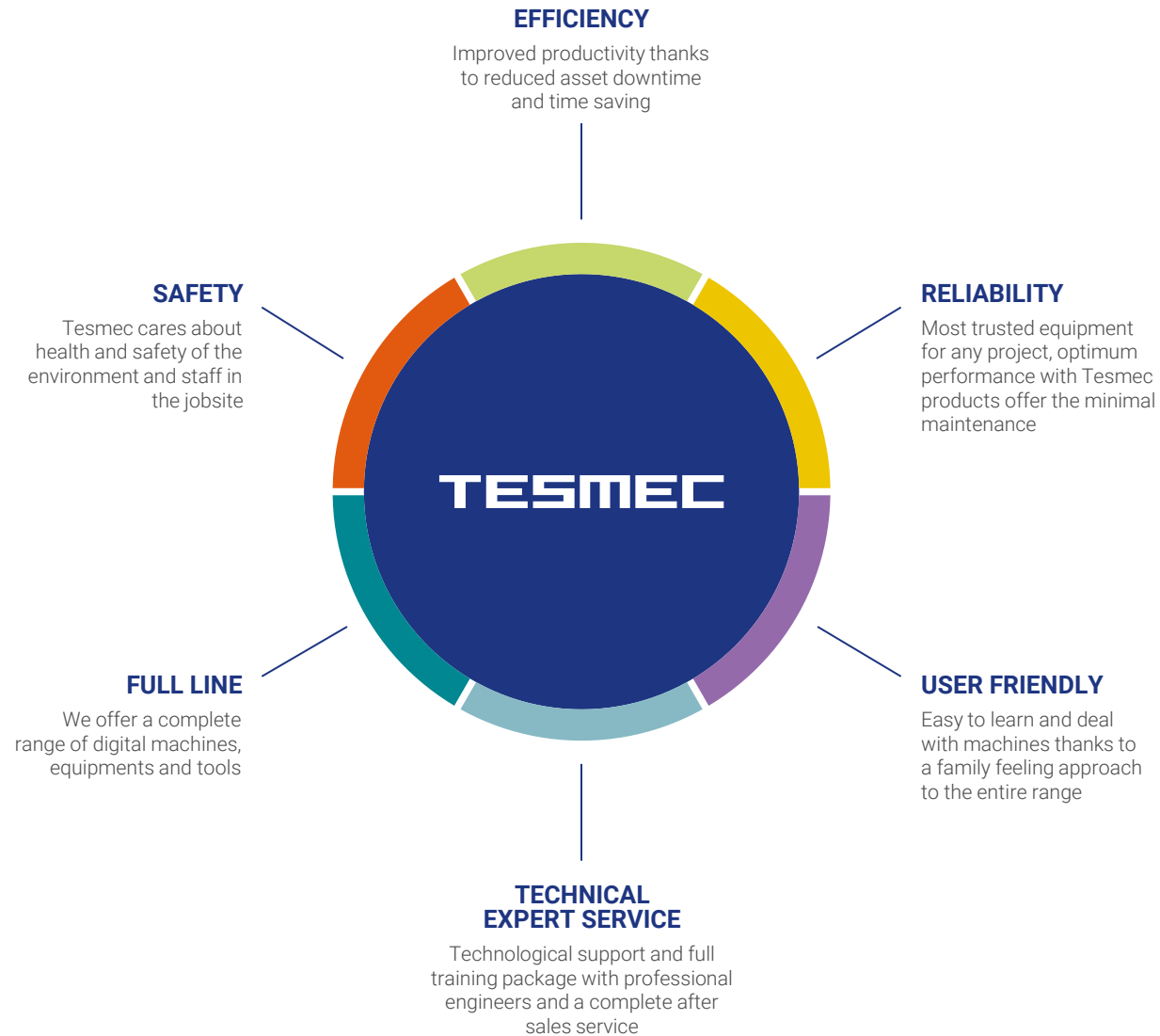
Tensioner for helicopter stringing at 20 km/h and with 4 levels safety system

The "Dual Machine Concept" for both aerial and underground stringing operation

2024

New digital range, electrical improvements and Teo suite launched

Integrated Value Proposition



Increased safety of the equipment in the jobsite

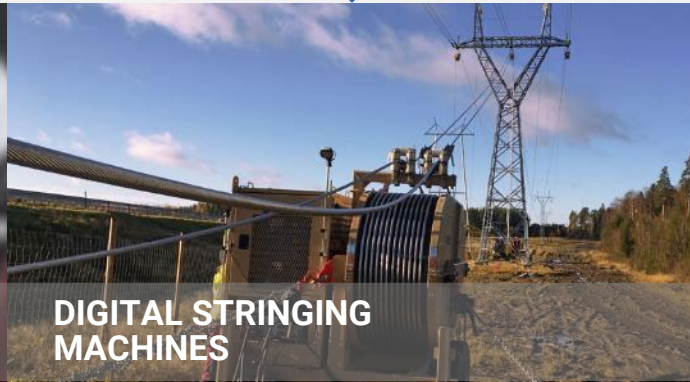
SOLUTIONS
TAILORED ON
CUSTOMERS
NEEDS

EASY RISK ASSESSMENT



FUA: ANTITWISTING STEEL ROPE WITH SAFETY FACTOR 3

- Anti-twist rope with Tesmec design
- Steel quality
- Long lasting life cycle



DIGITAL STRINGING MACHINES

- Automatic setting of the machine
- Remote monitoring system available
- Radio remote control
- Downtime reduction
- Integrated cover



HELICOPTER STRINGING MACHINE

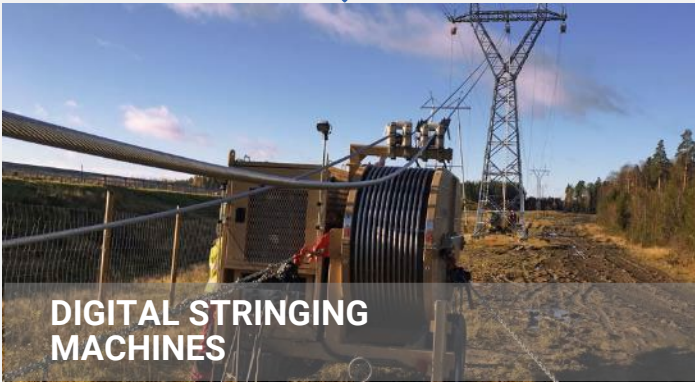
- **ADVANCED SECURITY SYSTEM**
Prevent the capstans from being stopped and loss of force on cable
- **3 SAFETY LEVEL**
In case of electrical failure, remote control failure, diesel engine failure or hydraulic circuit failure the machine allows the helicopter to carry on stringing

Focus on Efficiency

Reducing outage period and improve the efficiency of jobsites

SOLUTIONS
TAILORED ON
CUSTOMERS
NEEDS

TIME & COST REDUCTION



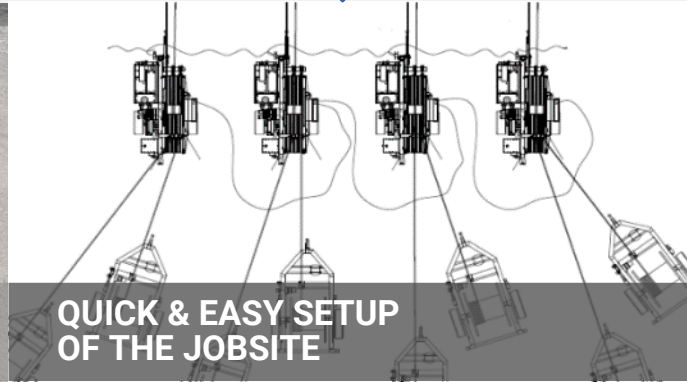
DIGITAL STRINGING MACHINES

- Easy startup: self-adjustment of parameters
- User-friendly interface
- Fleet management
- Reduced downtime



EASY TRANSPORTATION

- 80Km/h road axle available
- Self-propelled machines
- Truck mounted machines
- Detachable machines for helicopter transportation



QUICK & EASY SETUP OF THE JOBSITE

- **DIFFERENT JOBSITE CONFIGURATIONS**
Harness the potential of the available fleet with electronic synchronization, that allows the connection of similar machines, making them working as one.
- **ENSURE THE INTEGRITY OF THE CABLE**
Using machines and equipment that respect the characteristics of the new conductors.

TOWER ERECTION



The perfect match between hydraulic winches and derricks.

NEW POWERLINE CONSTRUCTION



For the installation of any type of conductor, including htls.

HELICOPTER STRINGING



The solution for the "direct stringing" by helicopter.

POWERLINE REFURBISHMENT



Line refurbishment & improvement with new generation conductors.

HUGE CROSSING



Customized projects to face natural obstacles.

OPGW INSTALLATION



Top level of precision & safety with our live line.

SAFETY ON CROSSING



The best solution for installation of safety nets on critical crossings.

UNDERGROUND CABLE LAYING



Solutions for a faster and safer jobsite.

Stringing & Laying Equipment

Our best deal for Overhead & Underground applications



OVERHEAD

UNDERGROUND

DIGITAL MACHINES

ESSENTIAL MACHINES

OVERHEAD TOOLS

DIGITAL MACHINES

UNDERGROUND TOOLS

- Digital puller-tensioners
- Digital pullers
- Digital tensioners
- Helicopter tensioners
- Continuous linear pullers

- Hydraulic pullers
- Hydraulic tensioners

- Hydraulic winches
- Drum elevators & reel winders
- Ropes, reels & joints
- Stringing & array blocks
- Bicycles and conductor cars
- Aluminium structures

- Digital pullers
- Full electric pullers

- Drum elevators
- Ropes
- Other tools

Digital Stringing Machines

New concept machines



USER FRIENDLY



SAFE



RELIABLE

Time & Costs reduction



Digital Monitoring System,
proactive maintenance approach



Full optional configuration
as a standard



Safety: automatic setting of the
machine, automatic self-diagnostic



Tesmec digital eco-system

Teo

Tesmec Evolution Onwards

**A COMPLETE
AFTER-SALES
EXPERIENCE:
ALL IN ONE SUITE,
MULTIPLE SERVICES.**



Teo

CTRL Room

A break through in the after sales offer that speeds up the remote support and offers a full overview on the stringing equipment.

Allows to monitor in real time:

- + the performance in jobsite
- + the global equipment status
- + the geolocalisation of the equipment



Connected jobsite

Teo is in continuous improvement: many other services will be released **soon**



Multiple applications

The **super powers** of the digital stringing machine



The new digital HMI & the Remote Control



INTUITIVE AND IMMEDIATE INTERFACE

Easy to use by every operator

IN HOUSE SOFTWARE

Fast and reliable after-sales service and technical assistance

COMPLETE CONTROL ON JOBSITE OPERATIONS

- Emergency Button
- Control of drum stand circuit pressure
- Pull parameters
- Rope/conductor clamp control
- Bull-wheels control

4 SCREEN PAGES SHOWING CONTROL PARAMETERS

- Tension & pressure of drum stand – PULLER
- Tension & pressure of drum stand – TENSIONER
- Machine performance
- Diesel engine parameters



TOOLBAR

General alarms of the machine & diesel engine
Machine configuration – Puller/Tensioner
Fuel reserve

DIAGNOSTIC
FEATURES

REMOTE MONITORING
SYSTEM

INTEGRATED
RECORDER

BETTER OVERVIEW
OF THE JOBSITE

HIGHER DEGREE
OF SAFETY

LESS NOISE

TN1201 - Helicopter digital tensioner

SAFETY LEVELS

Operator safety in each phase and condition

REMOTE CONTROL
FAILURE

ELECTRICAL
FAILURE

DIESEL ENGINE
FAILURE

HYDRAULIC CIRCUIT
FAILURE



THE MACHINE REMAINS ON
TO STRING

Fail-safe mode against
external events that could
affect the safety in the jobsite

SUITABLE FOR OPGW

- One machine for multiple purposes

STRINGING SPEED

- Up to 25 km/h
- Working with the helicopter

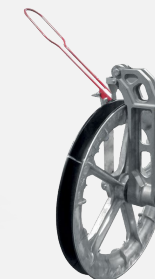
WORK WITH CVR841

- Ensures the best performance
- with the highest safety level
- Ad hoc drum stand for complex jobsite configuration



CES - PULLEYS FOR HELICOPTER STRINGING

- New version: -40% weight
- Bottom groove \varnothing 650 mm



REGISTERED PATENTS

- 1 UNIT FOR WINDING AND UNWINDING CABLES
- 2 CABLE-LAYING APPARATUS
- 3 SAFETY DEVICE FOR A CABLE STRETCHING MACHINE



MAX
PULL
30 kN



MAX
SPEED
25 km/h

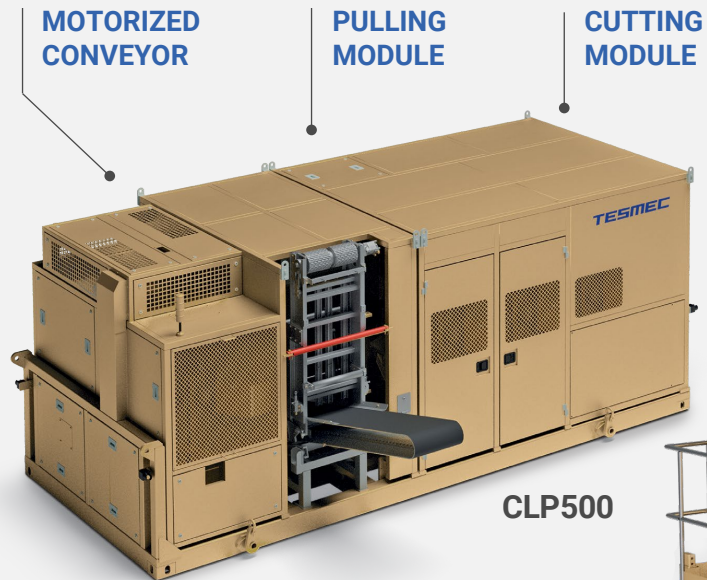


CONDUCTOR
DIAMETER
42 mm

Continuous Linear Puller (CLP)

RECONDUCTORING EQUIPMENT

The continuous linear puller offers an effective solutions for handling and recycling old conductors during reconductoring projects, cutting the used conductor into small manageable pieces that are easy to transport and ready to recycle.



COMPACT DESIGN

Without cutting module and conveyor belt

JOBSITE CONFIGURATION

Similar to a traditional puller-tensioner set up



MAX PULL
50 kN



MAX SPEED
3 km/h



CONDUCTOR DIAMETER
40 mm

FAIRLEAD FOR OH AND GROUND CONDUCTOR RECOVERY

STEEL ENCLOSURE WITH LOCKABLE DOORS

AUXILIARY WINCH CONTROL

FULL ELECTRONIC MANAGEMENT

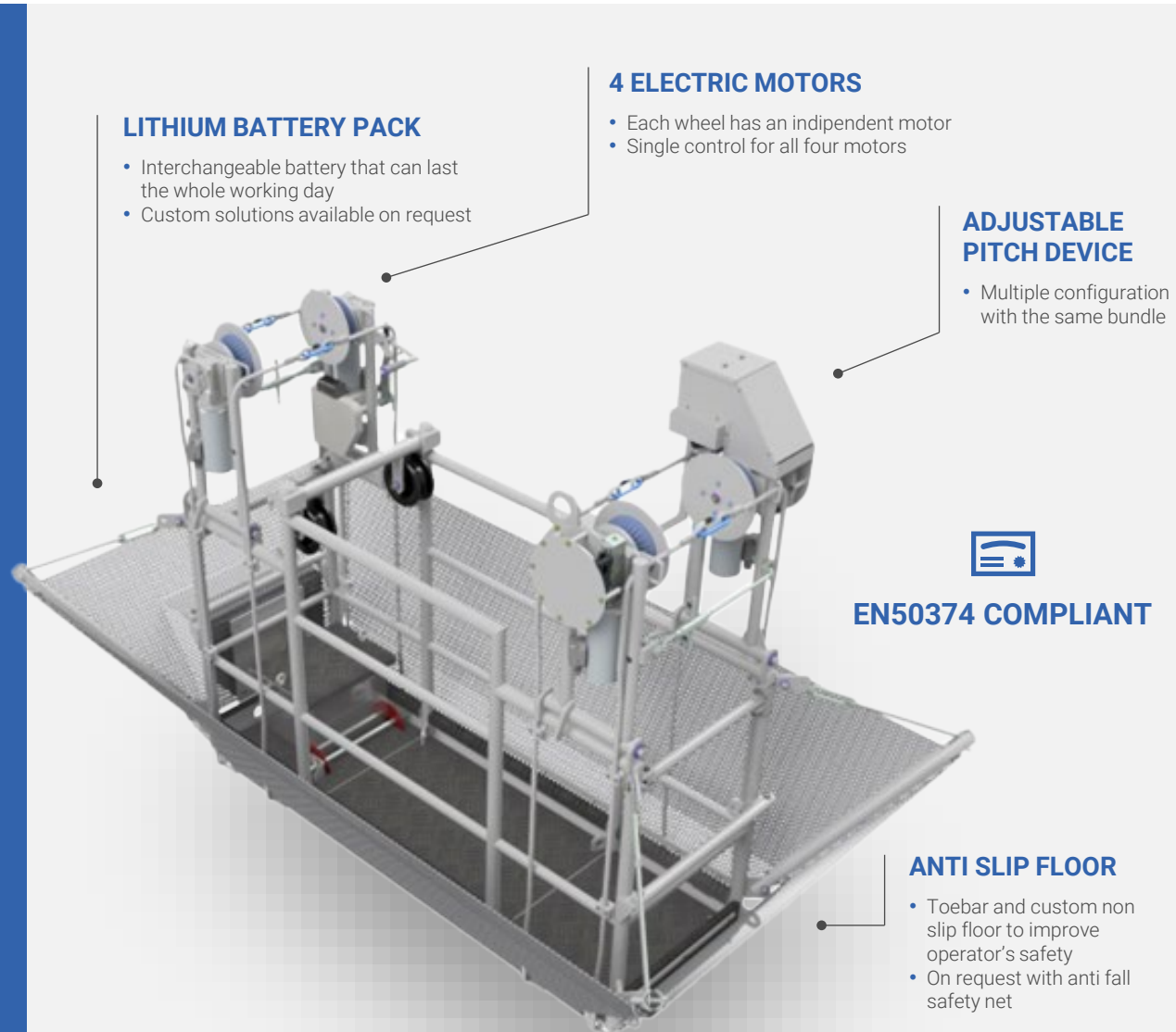
HIGHER DEGREE OF SAFETY

TRUCK OR TRAILER MOUNT CONFIGURATIONS

MANUAL AND AUTOMATIC USE

Full Electric Inspection Conductor Car

- 4-DRIVE ELECTRIC MOTOR
- ULTRA-RESISTENT AND ULTRA-LIGHT ALLOY ALUMINUM TUBULAR STRUCTURE
- NON-SLIP FLOORING, BOOM AND TOEBOARD
- SAFETY WIRE ROPES BETWEEN SUPPORT ARMS
- SIDE-MOUNTED HANDBRAKE
- CONTROL PANEL EQUIPPED WITH SAFETY RESET, EMERGENCY BUTTON AND HMI FOR BATTERY STATUS
- CORNER LIFTING HOOKS
- ANTI-FLEETING CUSTOM WHEEL DESIGN
- BIDIRECTIONALITY




LIGHTWEIGHT AND COMPACT
Ultra light, ultra resistant italian aluminum welded structure

Maximum load capacity 265kg

TAILOR-MADE ON CUSTOMERS' NEED

- Multiple dimensions available
- 1 or 2 operators configuration

		
POWER	MAX SPEED	LAYOUT
Full Electric	4 km/h	2, 3, 4 bundle

FULL ELECTRIC SOLUTIONS FOR T&D APPLICATIONS

Tesmec offers a range of full electric machines to face every jobsite condition: cutting edge digital machines in control and precision, for transmission or distribution projects.

SAFETY

- Durable hard cover
- Silent for operators at work
- Radio remote control

EFFICIENCY

- High working cycle
- Usable during charging
- On board reporting

URBAN CONTEXT

- No oil: clean working
- Quiet for citizens
- No emissions

RELIABILITY

- No exposed vital parts
- Fewer components
- Low maintenance

ECO-FRIENDLY

- No emissions
- No noise pollution
- Green incentives

PE1250
PE1350



MAX PULL

50-70 kN



MAX SPEED

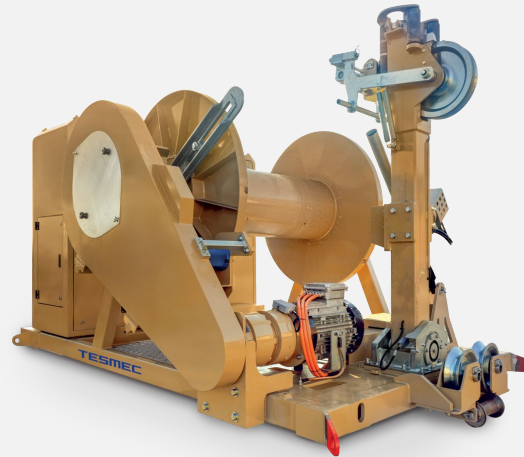
70 km/h



CONDUCTOR DIAMETER

15 mm

PES500



MAX PULL

20 kN



MAX SPEED

1.60 km/h



CONDUCTOR DIAMETER

16 mm

ELECTRIC MOTORS

POWER CONVERSION SYSTEM

POWER CONVERSION CONTROLLER

BATTERY STORAGE

BATTERY MANAGEMENT SYSTEM

REMOTE CONTROL & MONITORING

Long span stringing operations



STRINGING OPERATIONS
ON TOP OF THE **TWO**
HIGHEST TRANSMISSION
TOWERS IN THE WORLD

380 m
Higher than Tour Eiffel

The 13 mm diameter of FUH steel rope was strung on two sections.
The installation have been done with full success:

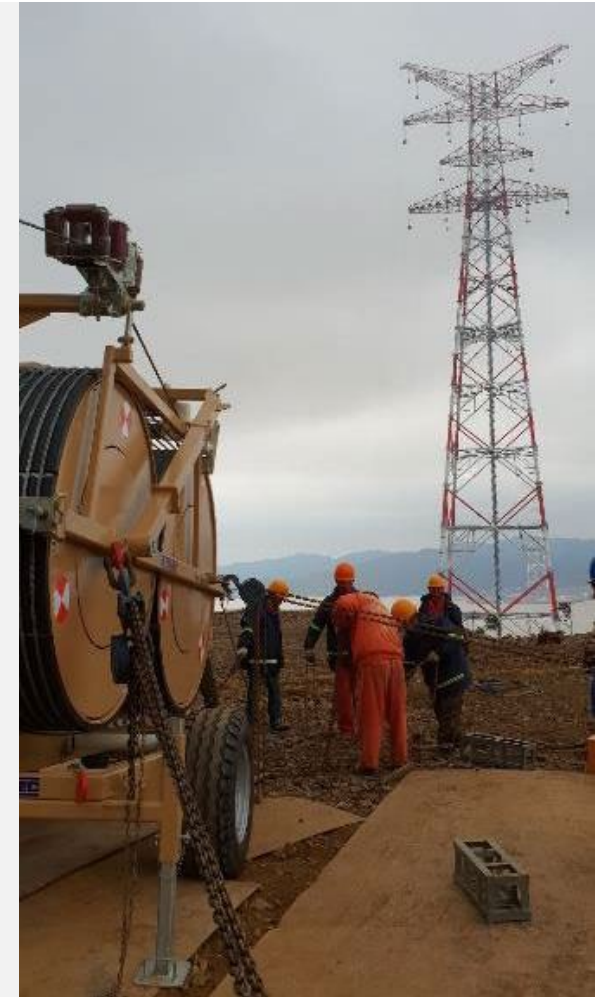
- Average speed around 15km/h on 4500m length
- Top speed 22km/h
- Pulling load 15kN - 20kN
- Average time 20-25min
- Counterweight 4000kg



Helicopter stringing

Extreme project in Zhejiang Province

- Tower height: 380 m
- Four bundled conductors: 500 kV
- Tensioner TN1216
- Reel Stand CVR829



Efficiency for attitude

RECONDUCTORING - USA

- NHPL Texas jobsite
- Live line reconductoring operations (with a by-pass phase)
- CTC ACCC conductor



TOWER ERECTION - INDIA

- Technical advice and training activity for tower erection works



FJORD CROSSING - NORWAY

- Special machines for fjord crossing and modular machines
- Voltage: 420 kV



TOP EFFICIENCY - BRAZIL

- 500 kV line, 6 T&D lines
- 5000 km long
- 70 sets of stringing equipment



4.0 MACHINES - FRANCE

- New single line double circuit AACSR PHLOX conductor



UNDERGROUND - UK

- UG Cable Laying - UK - Romford
- 3 x 33 kV cable pulling



EXTREME TEMPERATURE - RUSSIA

- Huge crossing of Lena river
- Two bundled conductors 220 kV
- Extreme conditions: -50°C (-58F)



LINE CONSTRUCTION - SAUDI ARABIA

- Yanbu-Madinah 380 kV line
- Longest project portion: 230 km
- 4-500 mm² AAAC conductors per phase



IN ALTITUDE - PERU

- 500 kV line at 1000 mt a.s.l.,
- 900 km long. 2 modular machines for stringing 4 bundled conductors per phase



After-sales services

Covering the entire machine life cycle

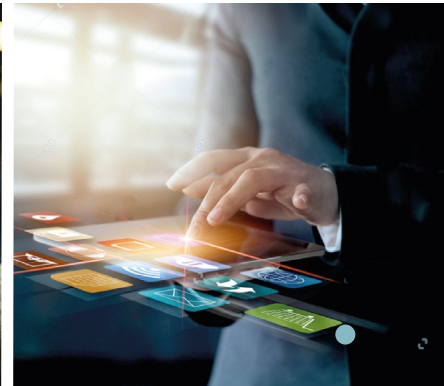
A TEAM OF EXPERT
TECHNICIANS ENSURES THE
TOP LEVEL OF SERVICE TO
REDUCE DOWNTIME AND
IMPROVE THE EFFICIENCY OF
THE MACHINES

**FOCUS TOWARD
THE CUSTOMER NEEDS
BY AN INTEGRATED AFTER-SALES
SERVICE PROPOSAL**



START

- Startup of the machine
- Training
- Special agreements for supply of Spare Parts



MAINTENANCE

- Technical Support onsite
- Remote assistance
- Refurbishing
- Retrofit and SW upgrade

USE

- Preventive Maintenance Program
- Original Spare Parts supply
- Shipment and export worldwide
- Technical Expert Service
- TEO: Tesmec Evolution Onwards

TESMEC
draw the way forward