CWF 2000

FIRST POSITIVE FEEDER

BTSR
building the future

CWF 2000

A STATE OF ART IN POSITVE FEEDING

Positive Feeding is a Radical Innovation.

A new state of Art, overcoming old breaking technology

The first 'Positive Feeder' Concept

10+ patents granting an exclusive technological solution

Incomparable performances & benefits

Drastic impact on coil winding operators'

daily experience, habits and future demand

MAIN BENEFITS

TOP PERFORMANCE AND VERSALITY
A single device able to cover a wide range of tensions and wire diameter. Fully programmable parameters according to the wire requirements and possibility to dynamically modify the copper wire control tension according to the operating stage ('Tension Profiler' Function).

MAXIMIZE THE PRODUCTION EFFICIENCY
A single device able to work at the maximum machine speed.

MINIMIZE LABOUR COST
Minimized machine operator time, thanks to advanced and user-friendly programming options.

EASY TO PROGRAMM AND MONITOR DATA
The Matrix Touch Coil controller external unit is able to program and control CWF units at a glance and monitoring the whole process production status even in graphical way.

A COMPACT SOLUTION
Easy "plug & play" installation.

VERY LOW MENTAINANCE
Thanks to the "dual drive" positive feeding, none part creates friction on the wire thus avoiding mechanical wear, dusting etc..).

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SMAL DETAILS MAKE A BIG DIFFERENCE

ADVANCE DIGITAL DISPLAY
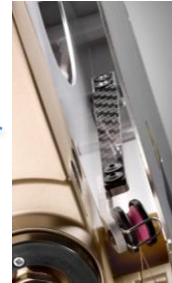
PROGRAMMABLE COMPENSATING ARM

DUAL DRIVE FEEDING SYSTEM WITH INPUT TENSION MEASURAMENT THROUGH MOTOR TORQUE CONTROL

HIGH PRECISION TENSION SENSOR LOAD CELL

MATRIX TOUCH DISPLAY CONTROLLER

TOUR OF THE PRODUCT

FULLY PROGRAMMABLE

Easy parameter setting (Tension Profiler up to 4 different working tension and take-up arm force, % tolerances, Tension error and Torque error ...) for an extraordinary flexibility.

HIGH TECH DIGITAL TECHNOLOGY

Featuring simultaneous dual control on both wire feeding tension and wire running speed-LWA for a complete feeding control.

ERGONOMIC KEYS

For easy operations.

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A SPECIAL PROGRAMMABLE AND COMPENSATING ARM

STORAGE AND RELEASE

Feature able to manage sudden wire absorption or release during the working process and simultaneously keeping constant the wire feeding tension at the same value as programmed (BTSR Patent).
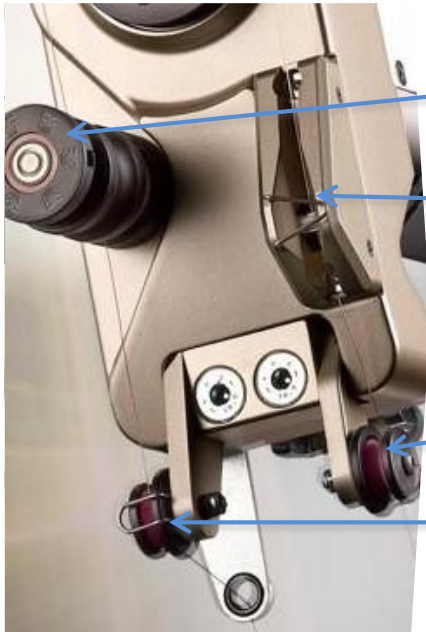
HIGH PERFORMANT MOTOR

Motor Driven and suitable to self adjust accordingly to the set Tension Profile.

SPECIAL MATERIALS

A carbon fiber (plus other special materials) Compensation Arm suitables for every process.

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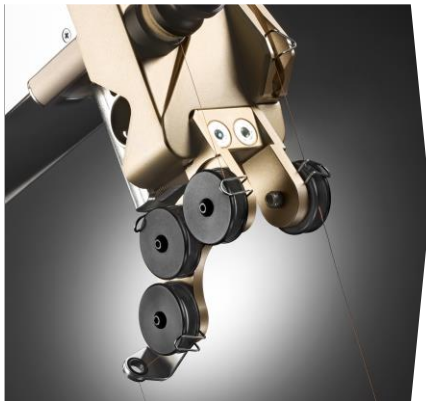## WE KNOW HOW TO CONTROL THE WIRE TENSION

PRE TENSION / CLEANER

TENSION SENSOR LOAD CELL

OUTPUT ROLLING WIRE GUIDE

INPUT ROLLING WIRE GUIDE

INPUT WIRE STABILIZER FOR HIGH TENSION APPLICATIONS.

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TENSION PROFILER (BTSR Patent)

Possibility to program up to 3 different wire feeding tension values without any interfacing or connection to the "coil winding machine" or up to 4 different wire feeding tension values during the winding cycle using two digital outputs.

1 ──────── PROGRAMM 1:
WRAPPING PHASE

    A. T1 (Wire Tension) - Wrapping
    B. Compensation Arm - Motor Position

2 ──────── PROGRAMM 2:
WINDING PHASE

    A. T2 (Wire Tension) - Winding
    B. Compensation Arm - Motor Position
    C. Speed Ramp UP/DOWN

3 ──────── PROGRAMM 3:
WRAPPING PHASE

    A. T3 (Wire Tension) - Wrapping
    B. Compensation Arm - Motor Position

Speed Ramp UP

Speed Ramp DOWN

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## THE ULTIMATE PLUG-IN TECHNOLOGY

CWF Model	Application
CWF2000/L	Low loads from 0.5 up to 200 grams
CWF2000/LSK	Low loads / working with skeiners
CWF2000	Standard from 5 grams up to 800 grams
CWF2000/H2	High Load from 800 grams up to 2000 grams
CWF2000/HCL	Needle winding / Brushless Motors

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TOTAL QUALITY CONTROL - FROM WIRE FEEDING BOBBIN TO FINAL COIL

DOUBLE CLOSED CONTROL LOOP (BTSR Patent)

FIRST CLOSED LOOP

SECOND CLOSED LOOP

MOTOR TORQUE POSITVE FEEDING

WIRE FEEDING BOBBIN

LWA

FINAL COIL
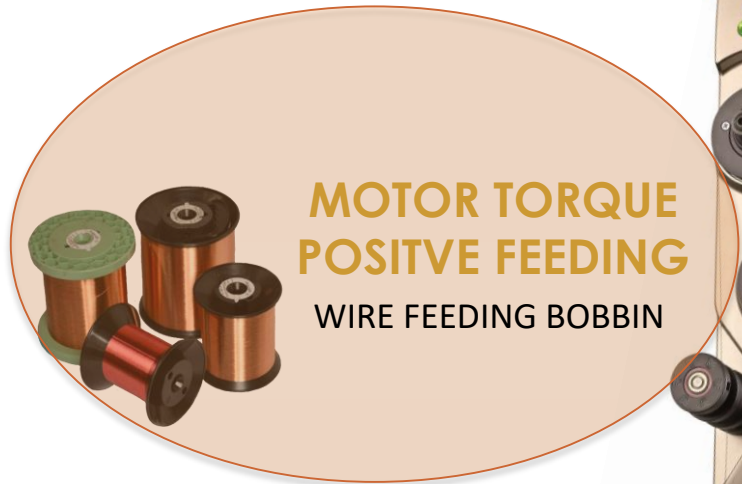
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FIRST CLOSED LOOP – HOW IT WORKS

MOTOR TORQUE POSITIVE FEEDING (BTSR Patent)

This function is operated by the motor force control (Torque).
In case of any INPUT wire tension variation due to the copper bobbins unwinding, CWF 2000 will detect such tension variation and will be able to adjust the motor torque in order to keep going feeding with constant tension, preventing any wire damaging during the process. Wire torque alarm is fully programmable in torque % and time, thus stopping the process in case of any anomaly.

INPUT
WIRE TENSION VARIATION

INPUT WIRE TENSION
ANOMALY DETECTED

Control INPUT GUARANTEED
Constant OUTPUT TENSION GUARANTEED

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MOTOR TORQUE POSITIVE FEEDING (BTSR Patent)

PREVENT WIRE INPUT DAMAGING FROM
BAD EDGE WIREBOBBIN

PREVENT INPUT WIRE DAMAGE DUE TO
INPUT WIRE ENTANGLEMENT
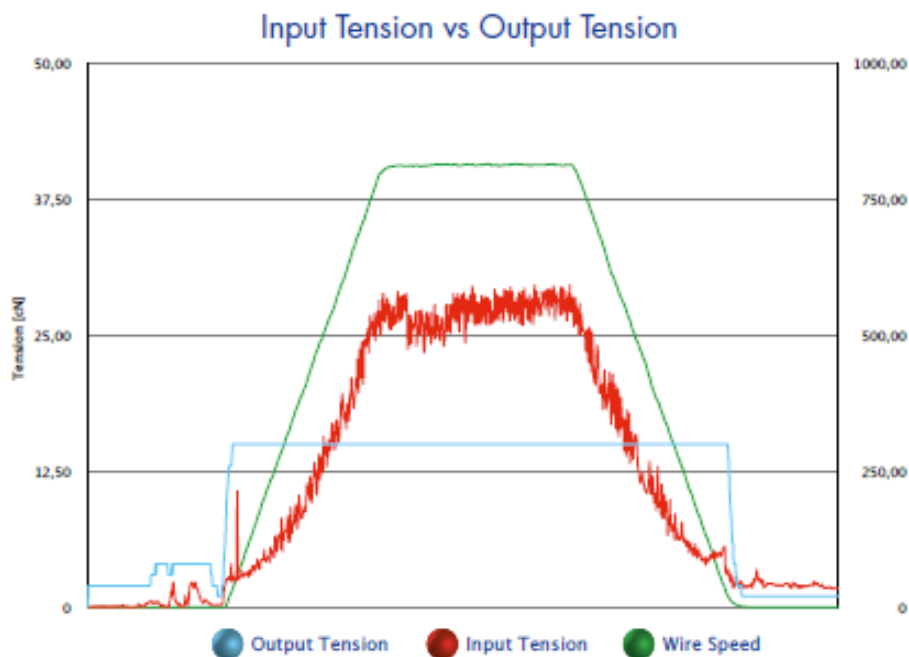
ANY OTHER PEAK INPUT TENSION
ANOMALY

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FIRST CLOSED LOOP - RESULT

INPUT/OUTPUT TENSION FULL CONTROL

CONSTANT TENSION VALUE GARANTEED.

Output Wire Tension (LIGHT BLUE color) is kept constant at the set value, despite of input wire feeding tension variations (RED color) and/or wire speed variations (GREEN color) during the working process.
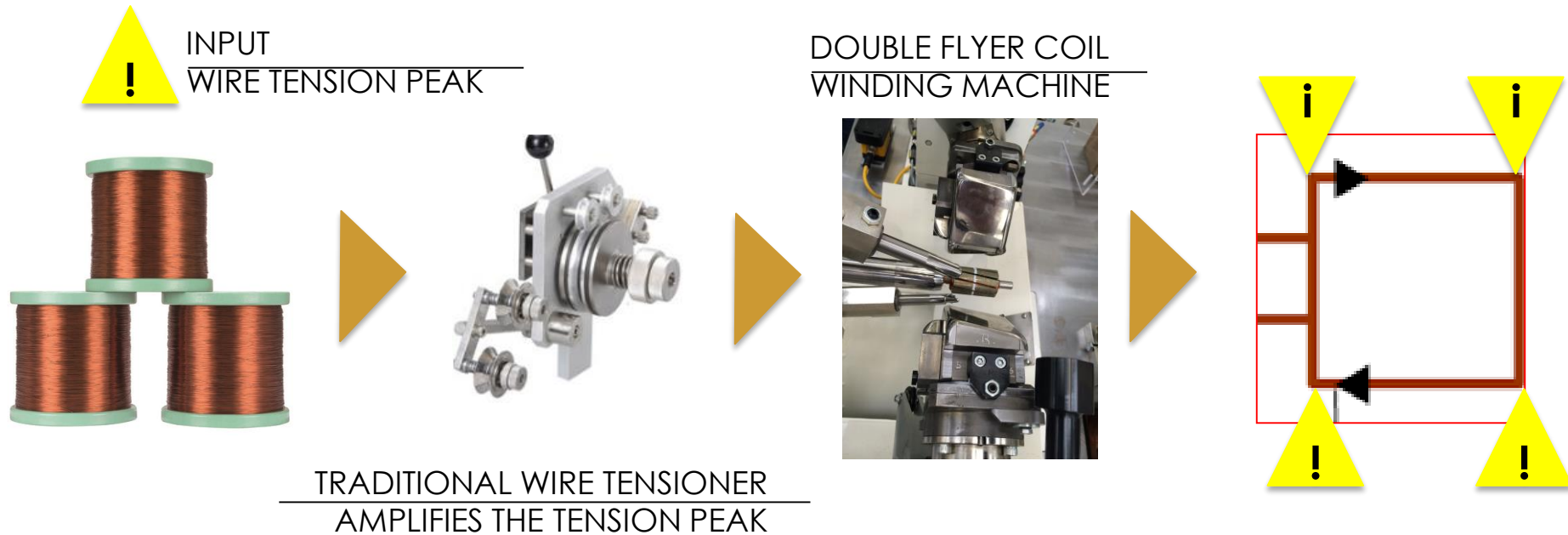
EXAMPLE

WHAT IS HAPPENING ON THE MARKET

With the **Traditional Wire Tensioner**, the machine is pulling the wire from the bobbin. After that, in case of a input tension peak coming from the bobbin, the Traditional Wire Tensioner, **operating as a Breaking**, amplifies it (tension peak) through the whole process. In case of a Double Flyer Coil Winding Process, the tension peak is amplified four times on the armature.

INPUT
WIRE TENSION PEAK

DOUBLE FLYER COIL
WINDING MACHINE

TRADITIONAL WIRE TENSIONER
AMPLIFIES THE TENSION PEAK

WHAT IS HAPPENING ON THE MARKET - RESULTS

WIRE TENSION PEAK CAUSES SMALL

INVISIBLE **ENAMELLING CRAK**

IT WILL CAUSE **SHORT CIRCUIT** AFTER
SOME TIME OF MOTOR RUNNING

EXAMPLE

CWF2000 IS THE ONLY SOLUTION

CWF 2000 is not breaking the wire instead CWF 2000 is feeding the wire from the bobbin to the machine. In case of any INPUT Tension Peak, CWF 2000 will detect such tension variation and will be able to adjust the motor torque in order to keep going feeding with constant tension, preventing any wire damaging during the process.
(Example) In case of a Double Flyer Coil Winding Process, the tension peak is eliminated because of **CONSTANT TENSION VALUE IS GARANTEED.**

INPUT
WIRE TENSION PEAK

DOUBLE FLYER COIL
WINDING MACHINE

CWF 2000 POSITIVE WIRE FEEDING DEVICE

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LWA (Length Of Wire Absorbed)(BTSR Patent)

LWA feature allows the monitoring of the wire consumption and allows to produce TOP QUALITY coils keeping a constant output wire consumption. LWA function: it controls and self-adjusts any wire tension variation occurring in all wire passages AFTER the Feeder.

1
STEP 1:
PRODUCE A MASTER COIL WITH
A DEFAULT LWA VALUE

2
STEP 2:
SET THE MIN/MAX LWA
TOLERANCE VALUES

3
STEP 3:
START PRODUCTION

4
STEP 4:
CWF 2000 IS REALTIME CHECKING
THE LWA OF EVERY COIL

TENSION and LWA values are related

when **T** *increase* → **LWA** *decreases*
when **T** *decrease* → **LWA** *increases*

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LWA (Length Of Wire Absorbed) (BTSR Patent)

BENEFiTS

DETECTS AND MONITOR
ANY DIMENSIONAL VARIATION OF COIL FORMERS

DETECTS AND MONITOR
A WRONG WIRE DIMENSION (DIAMETER/AWG)

DETECTS AND MONITOR
COIL WINDING MACHINE TOOTHED DRIVING BELT OUT OF ORDER (CORE SLIPPAGE)

DETECTS AND MONITOR
ACCUMULATION OF DIRTINESS INSIDE THE WIRE GUIDE

DETECTS AND MONITOR
DEMAGE OF WIRE GUIDE

DETECTS AND MONITOR
ANY MECHANICAL VARIATION OF FRICTION ON THE CONTACT POINTS AFTER THE CWF FEEDER

DETECTS AND MONITOR
WIRE PASSING THROUGH THE WIRE GUIDES WITH DIFFERENT ANGLES AND FRICTIONS (WRONG THREAD-UP)

LWA - EXAMPLE

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1

LWA = 10.000 m
CWF TENSION = 100 g

TENSION VARIATIONS
AFTER THE CWF 200

COIL TENSION
TCWF+T2+T3 = 115 g

T2 = 5 g

T3 = 10 g

AFTER CWF

ON COIL

TCWF = 100 g

TCOIL = 115 g

2

LWA = 10.000 m
CWF TENSION = 100 g

TENSION VARIATIONS
AFTER THE CWF 200

COIL TENSION
TCWF+T2+T3 = 115 g

T2 = 5 g

T3 = 10 g

AFTER CWF

ON COIL

TCWF = 100 g

TCOIL = 115 g

TENSION and LWA values are related

when *Tension* increase → *LWA* decreases
when *Tension* decrease → *LWA* increases

If *LWA* value is kept constant
→ *TENSION* value is kept constant

LWA - EXAMPLE

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1

$$\frac{\text{LWA = 10.000 m}}{\text{CWF TENSION = 100 g}}$$

TCWF = 100 g

$$\frac{\text{TENSION VARIATIONS}}{\text{AFTER THE CWF 2000}}$$

AFTER CWF

T2 = 5 g

T3 = 10 g

ON COIL

$$\frac{\text{COIL TENSION}}{\text{TCWF+T2+T3 = 115 g}}$$

TCOIL = 115 g

2

⚠ **LWA = 9.990 m** ⚠
CWF TENSION = 100 g

TCWF = 100 g

⚠ TENSION VARIATIONS AFTER THE CWF2000.
T3 CHANGE! EXAMPLE: DIRTINESS INTO WIRE GUIDE.

AFTER CWF

T2 = 5 g

T3 = 12 g ⚠
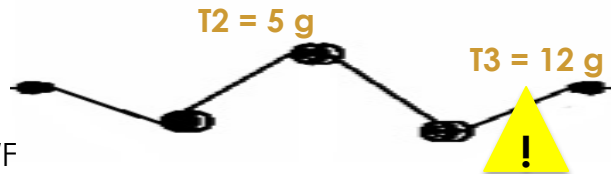
ON COIL

COIL TENSION ⚠
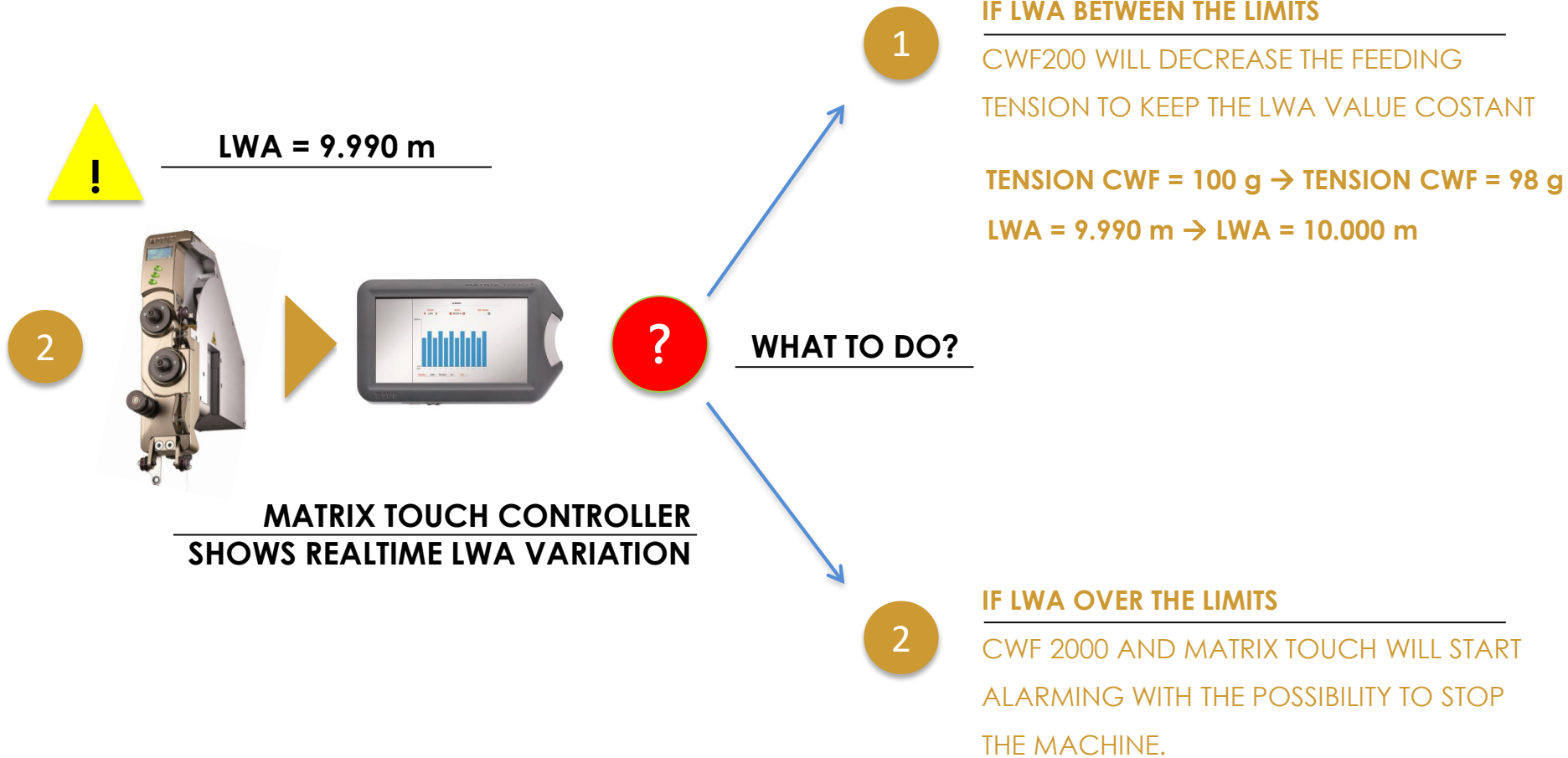TCWF+T2+T3 = 117 g

⚠ TCOIL = 117 g

TENSION and LWA values are related

when *Tension* increase → *LWA* decreases
when *Tension* decrease → *LWA* increases

⚠ *If LWA value change → TENSION value is changing*

LWA - EXAMPLE

LWA = 9.990 m

**MATRIX TOUCH CONTROLLER
SHOWS REALTIME LWA VARIATION**

? **WHAT TO DO?**

1 **IF LWA BETWEEN THE LIMITS**

CWF200 WILL DECREASE THE FEEDING
TENSION TO KEEP THE LWA VALUE COSTANT

TENSION CWF = 100 g → TENSION CWF = 98 g

LWA = 9.990 m → LWA = 10.000 m

2 **IF LWA OVER THE LIMITS**

CWF 2000 AND MATRIX TOUCH WILL START
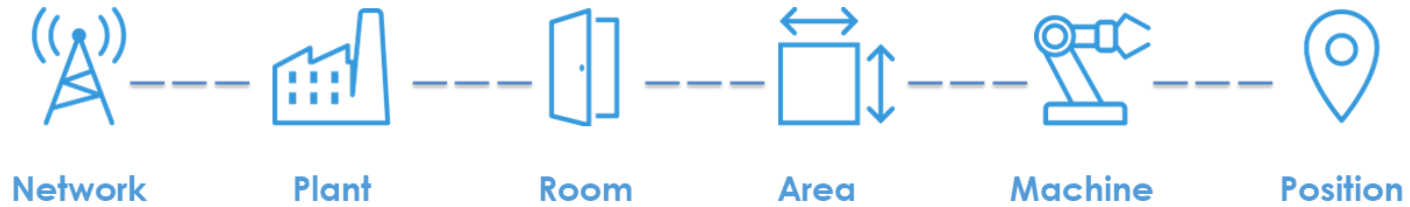ALARMING WITH THE POSSIBILITY TO STOP
THE MACHINE.

CWF 2000

MONITOR, TRACK,CONTROL EVERY WIRE POSITION FOR MULTIPLE MACHINES , PROCESSES AND PLANTS

WIRE AUTOMATION – INDUSTRY 4.0

Network   Plant   Room   Area   Machine   Position
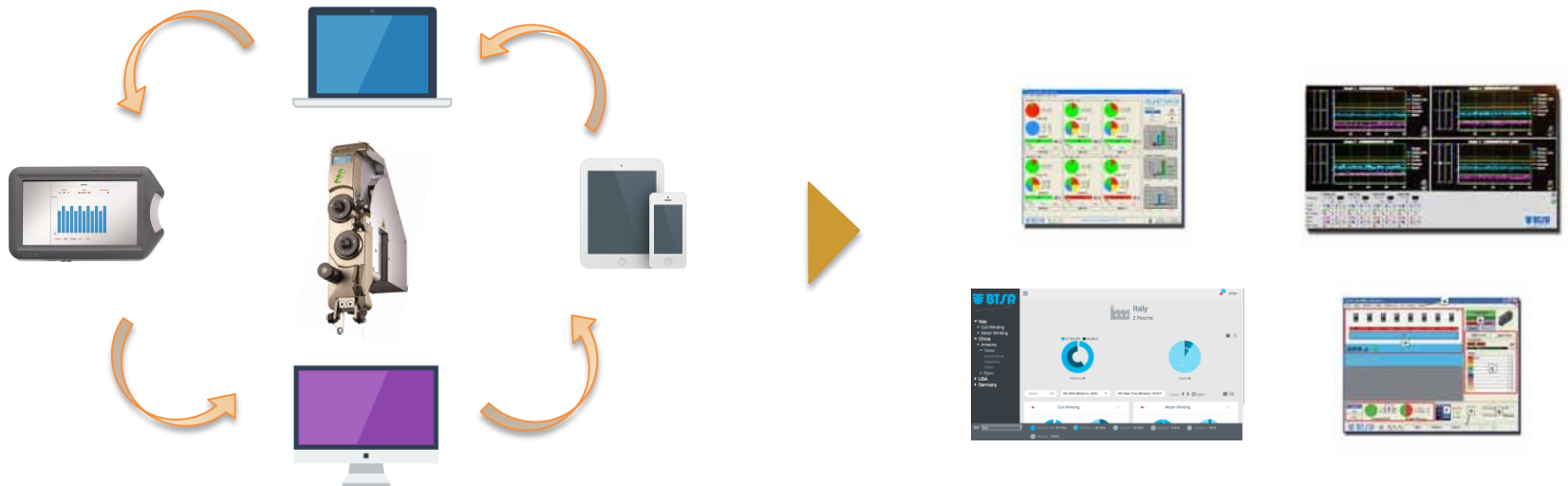
CWF 2000

PC LINK STUDIO & PC LINK WEB COIL (BTSR Patent)

PC LINK STUDIO, Suitable to update CWF 2000 software. Allow deep quality analysis of the coil process and machine development.

PC LINK WEB COIL, Suitable to monitor the whole department. CWF 2000 can be installed on any type and model of new or old coil winding machine. CWF 2000 + PC LINK SOFTWARE allow monitoring and programming the whole coil winding machines park (which can be not necessarily homogenous).

It is an unique INDUSTRY 4.0 remote programming monitoring & evaluation tool. This smart WIRE Feeding Control has been created to ease the programming of CWF by means of a very intuitive interface, thus allowing on site monitoring, quality check, production monitoring and forecast analysis. **PC LINK WEB COIL** is fully compatible with IOS and Android devices as it based on web technology.

MATRIX TOUCH COIL   PC LINK WEB COIL   PC LINK WEB COIL

Network   Plant   Room   Area   Machine   Position
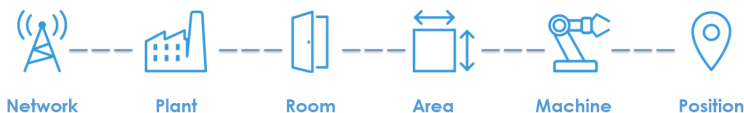
PC LINK WEB COIL (BTSR Patent) – INDUSTRY 4.0

CWF 2000 DEVICE CAN BE INSTALLED ON NEW OR OLD MACHINES

EVERY COIL WINDING MACHINE MANUFACTURER CAN INTEGRATE BTSR SOFTWARE FUNCTIONS IN THEIR MACHINE SOFTWARE

CWF 2000 + PC LINK WEB COIL SOFTWARE IS THE FIRST STANDARDIZATION CONCEPT ALLOWING TO MONITOR, COLLECT DATA AND CONTROL THE WHOLE PRODUCTION OF ANY TYPOLOGY OF WIRE COIL WINDING MACHINE COMING FROM DIFFERENT OEM OF NEW/OLD TECHNOLOGY.

CWF 2000 + PC LINK WEB COIL SOFTWARE ALLOWS TO MONITOR AND PROGRAM THE WHOLE WINDING MACHINE PARK, MADE UP BY NEW OLD COIL WINDING MACHINES WHICH CAN BE NOT NECESSARILY HOMOGENEOUS

CWF 2000 + PC LINK WEB COIL SOFTWARE IS ABLE TO TRACE THE WHOLE PRODUCTION, SAVING DATA FOR EVERY COIL PRODUCED WITH ALL DATA INCLUDING TENSION, SPEED, LWA, TORQUE (…). THE BIG DATA CONCEPT WILL GRANT THE HIGHEST QUALITY STANDARD TRECEABILITY OF ANY KIND PRODUCTION, SUCH AS AUTOMOTIVE. ALL DATA CAN BE STORED EITHER ON A LOCAL (STAND-ALONE PC, THROUGH ACCESS DATABASE) OR ON DISTRIBUTED (SQL SERVER – SAP ETC) DATABASE.

TOTAL PRODUCTION STANDARDIZATION

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IT IS ALL ABOUT ROI (Return On Investment)

PC LINK WEB COIL PRICE LIST

BTSR INDUSTRY 4.0 PACKAGE

LICENCE / MACHINE **SMDIN WEB COIL** **MATRIX TOUCH COIL** **PC-LINK WEB COIL**

Network   Plant   Room   Area   Machine   Position

WE HAVE A GOAL:

IMPROVE YOUR PRODUCTIVITY AND MAKE YOU STARTING SAVING MONEY.