



DIAPER TECHNOLOGY LINE

Advanced Tension Controlled  
Unwinding Technology for  
Hygiene Sector Applications



*building the future*



# NEW GENERATION

# FIBER TENSION CONTROL

# SOLUTIONS



## DIAPER TECHNOLOGY LINE

A new era in Tension Controlled Unwinding Technology for Diaper Manufacturing Processes.

Based on DIAPER FEEDER device core-technology, MATRIXCUBE is the new concept 'Tension Controlled' Product Line coming from the latest 20+ years B TSR experience in providing high-tech products and advanced Solutions in Hygiene Sector.

A new step to the future in Diaper Manufacturing Processes with further applicative benefits in terms of Production Efficiency, Production Cost Saving, TOP Quality Product.

A plug&play, modular and full comprehensive technology available in several configurations and three main product lines (MATRIXCUBE1, MATRIXCUBE2, MATRIXCUBE3).

Now coming equipped with the new and unique 'TRIO CONTROL LOOP' Function (B TSR Patent), a new step ahead for better tension control in the insertion point of the machine

## WHY 'MATRIX CUBE' TECHNOLOGY

- **'TOP' Quality Standards Goal** Ensures the highest diaper quality, in terms of desired elasticity features.
- **Production Process Efficiency Maximization** Ensures a continuous process cycle at simultaneous high production capacity. Minimizes machine stops.
- **Extra-production Costs Prevention** Minimizes yarn breakages (and consequent second rate production and machine stops). Reduces yarn wastes (during bobbin change over step).
- **Minimizes Labour Costs** Minimizes machine operator time for production control / empty spools replacement ('Defilé' Feeding System).
- **Immediate Machine Stop** In case a fiber breakage or tension anomaly occurs the machine is immediately stopped, thus avoiding further extra-production costs.





## DIAPER FEEDER Device

### FEATURES & BENEFITS

- **'Full Digital' Technology**  
DIAPERFEEDER device core technology, featuring simultaneous dual control on both yarn feeding tension and yarn running speed for the complete elastic yarn feeding control
- **New TFS Sensor Technology (BTSR Patent)**  
New design with minimization of static contacts bringing significant reduction of spandex stress and breakage
- **Fiber Constant Tension Control**  
high feeding tension values fiber control at very low running speed, without pretension
- **TOP Performance**  
drastic process simplification, simultaneous TOP Quality Product, Production Efficiency and Cost Saving results
- **Fully programmable**  
easy parameter setting (Tension Profiler, % tolerances, ...) for diversified working conditions
- **Advanced Graphic Display**  
real-time working parameters monitoring



## MATRIXCUBE Product Line

### FEATURES & BENEFITS

- **The latest Tension Controlled Unwinding Technology**  
available on the market
- **Advanced Modular Creel System**  
thus ensuring TOP flexibility
- **Extended Product Lines**  
Three Product Lines - MATRIXCUBE1, MATRIXCUBE2, MATRIXCUBE3 - for the most diversified and demanding diaper manufacturers' needs
- **NEW 'TRIO CONTROL LOOP' Function (BTSR Patent)**  
for the most precise desired elastic feeding tension value in the machine insertion point
- **Double 'Head and Tail'**  
feature for higher efficiency in production
- **Advanced ergonomics and user-oriented design**  
for user-friendly customer satisfaction



## CENTRALIZED PROGRAMMING AND MONITORING



### MATRIX TOUCH

#### Centralized Programming and Monitoring

MATRIX TOUCH advanced touch screen display for easy programming and real time monitoring of production process status also in graphical form.

## DIAPER FEEDER



*New TFS Sensor design for minimization of static contacts and reduction of spandex stress and breakages*



*Advanced Digital Display for real-time operational information reading*

*Ergonomic Keys for easy operation and synchronized alarm signaling*

*Double adjustable fiber coil separator system*

## NEW 'TMS' TENSION AND METERING SENSOR



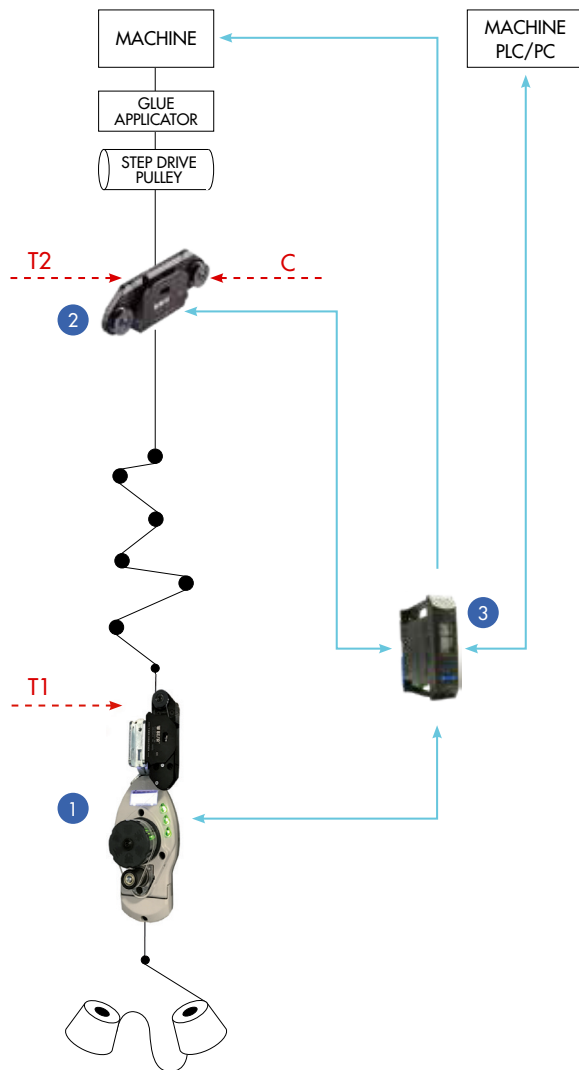
### **Fiber Feeding 'Tension and Metering' measurement capability in one single device**

- New design with minimization of static contacts bringing significant reduction of spandex stress and breakages
- Settable Quality Control Setting levels (WARNING - ALARM - TRIO-LOOP Mode setting)
- TRIO-LOOP Mode Setting - Precise 'Metering' Capability, thus contributing to keep the desired feeding tension value in proximity to the insertion point of the fiber in the machine
- A new diagnostic and Advanced Control Tool
- Retrofit possibility both in terms of easy replacement of previous generation TS55 Tension Sensors and upgrade from DUO-LOOP to TRIO-LOOP BTR Patented Fiber Feeding Control System

# 'TRIO CONTROL LOOP' Function

## Get the most accurate Fiber Feeding Tension Control (BTSR Patent)

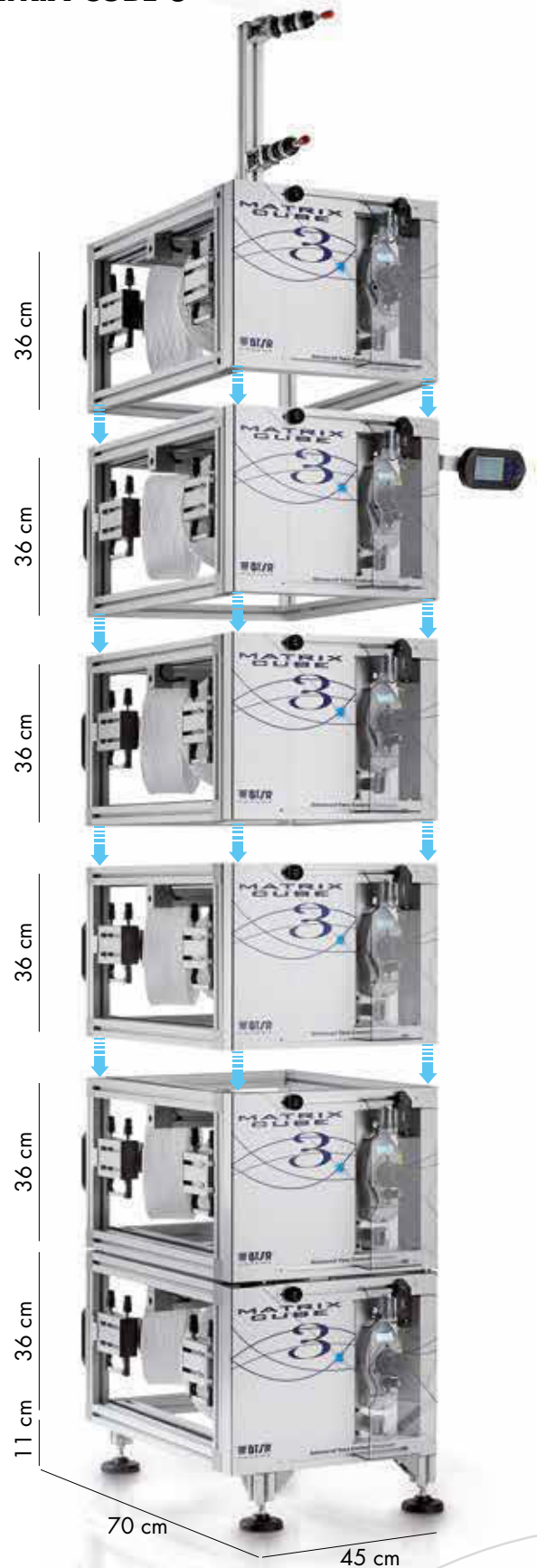
From the creel system (through DIAPER FEEDER device **1**) up to the machine fiber insertion point through (TMS **2**)



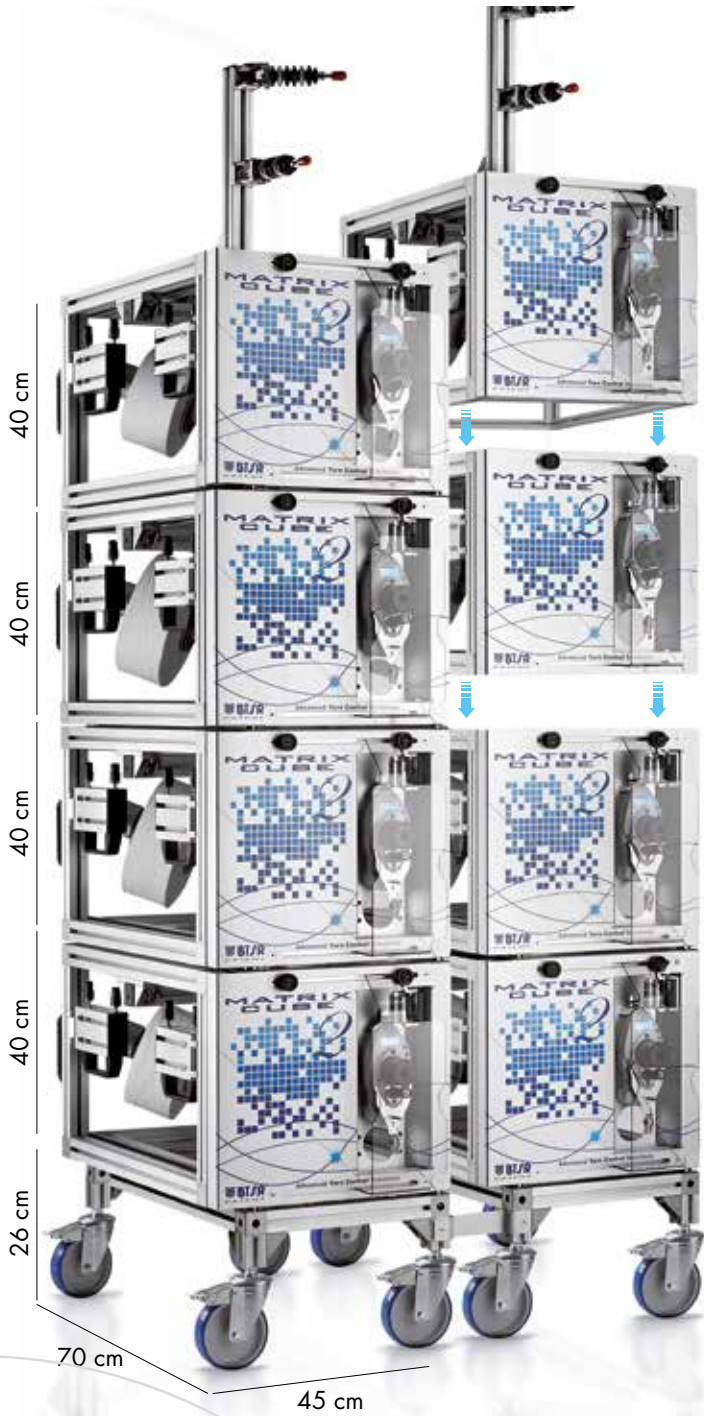
### HOW IT WORKS

- 1** DIAPER FEEDER Fiber Feeding Device
  - Controls and adjusts the output fiber feeding tension value according to the T1 Set-Point value, thus automatically compensating Constant Tension from full to empty package (First Loop)
- 2** TMS TENSION AND METERING SENSOR Device
  - Measures the T2 fiber feeding tension value and downstream fiber consumption C and sends information to SM-DIN MULTILoop Unit
- 3** SM-DIN MULTILoop Management Unit
  - Manages and controls all units
  - Receives TMS Tension and Metering Sensor information
  - Adjusts DIAPER FEEDER Set-Point tension value, by automatically compensating the friction arising upstream the TMS sensor during the fiber path (Second Loop) and monitoring the TMS Sensor downstream extra-frictions (Third Loop) by guaranteeing constant fiber consumption C.
  - Ensure the precise desired fiber feeding tension value in the last fiber machine insertion point

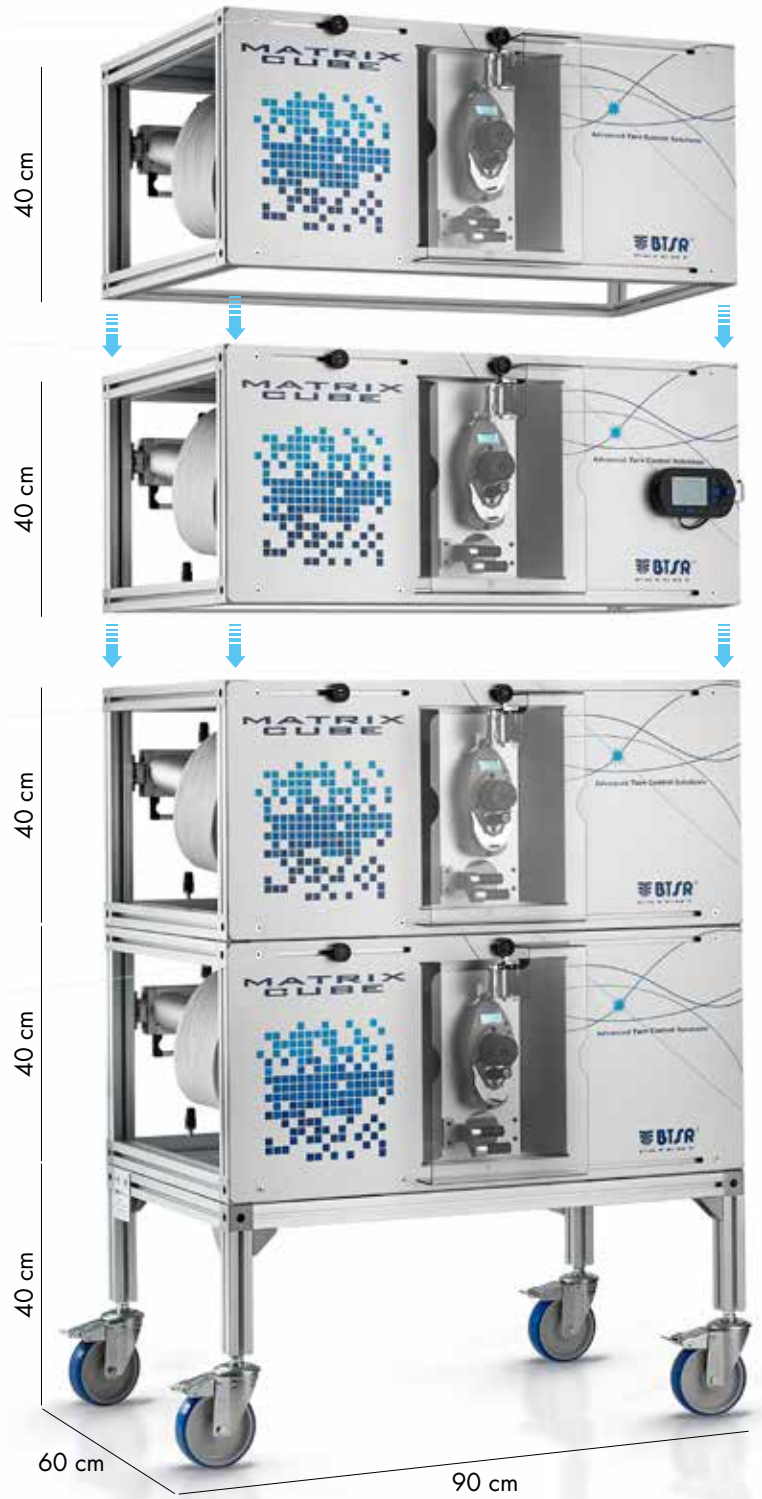
## MATRIX CUBE 3

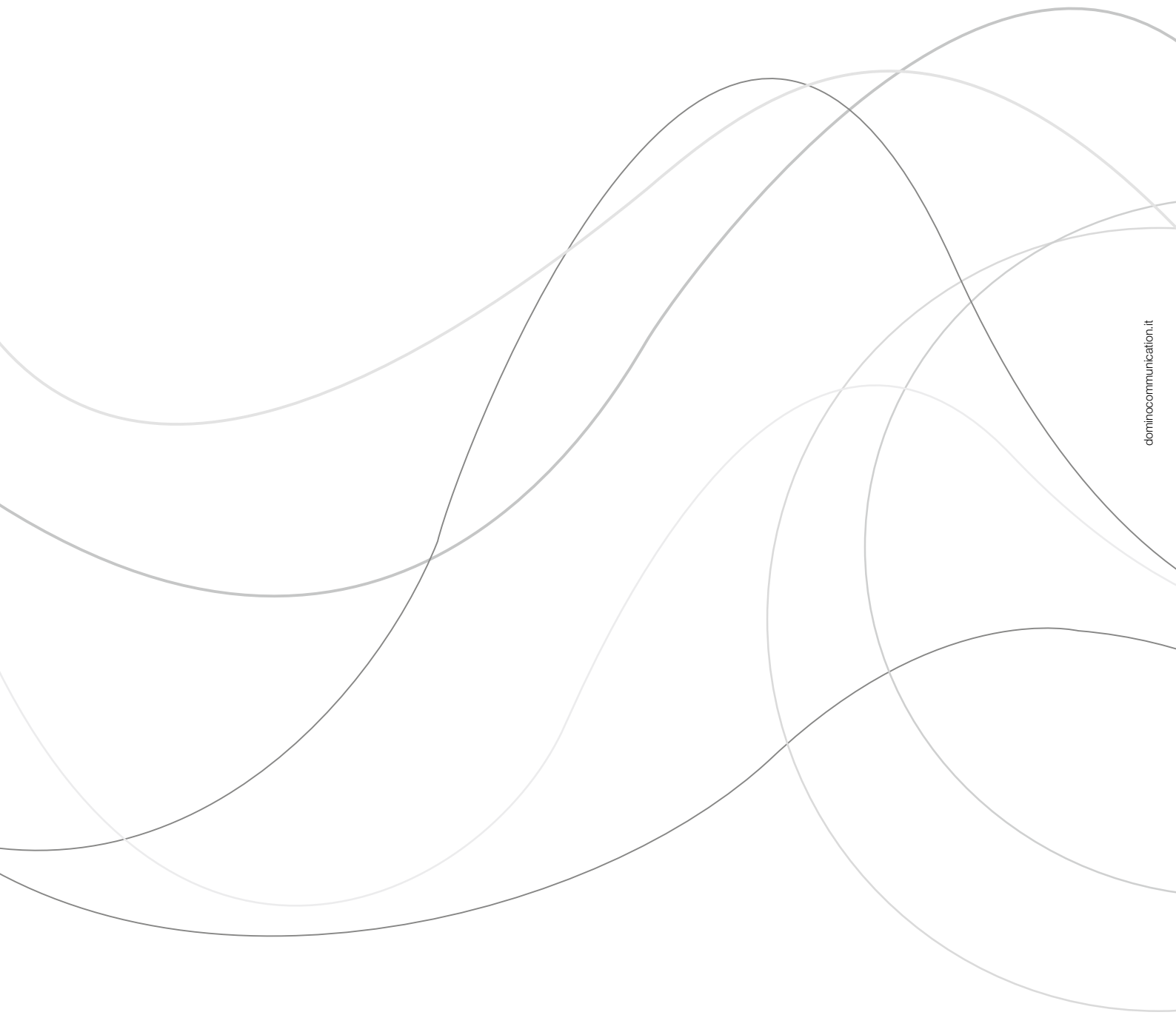


**MATRIX CUBE 2**



**MATRIX CUBE 1**





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