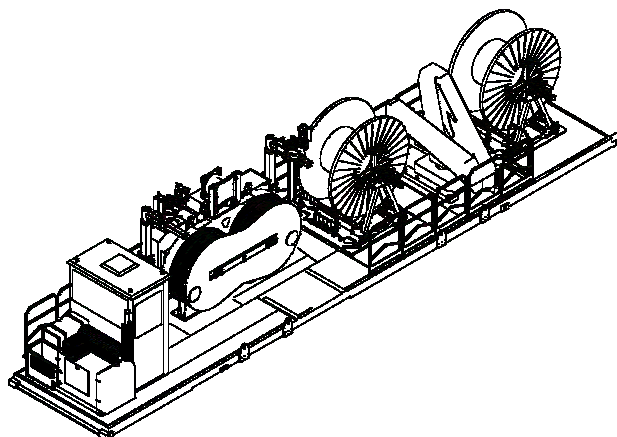
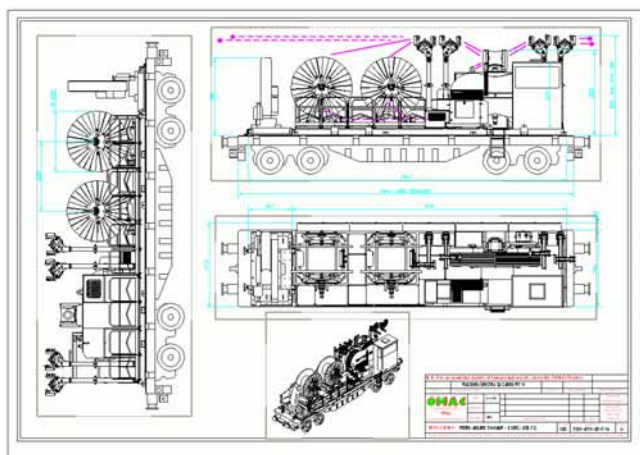
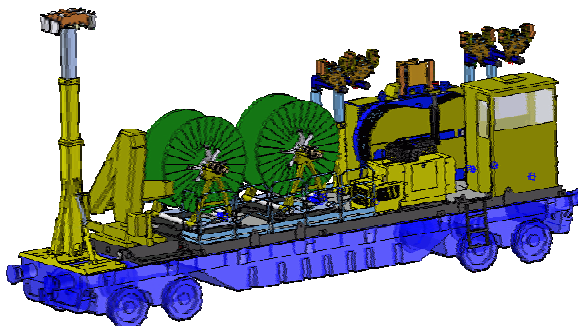
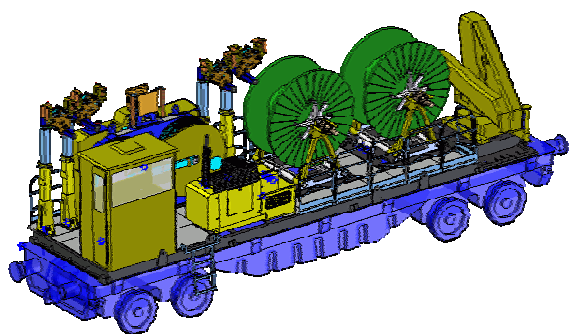
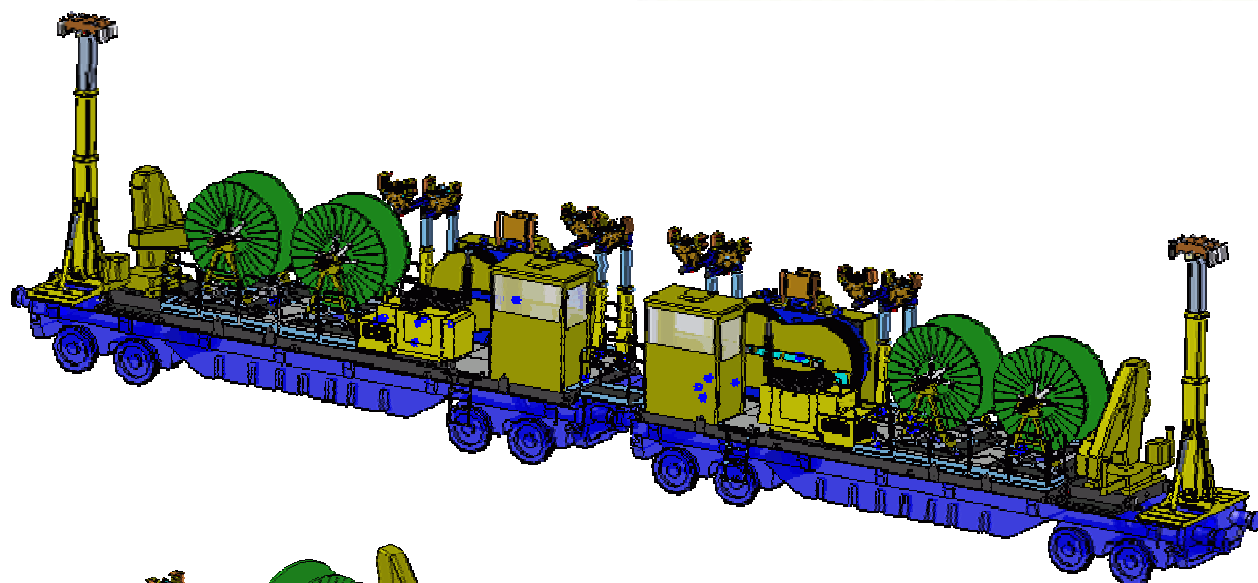
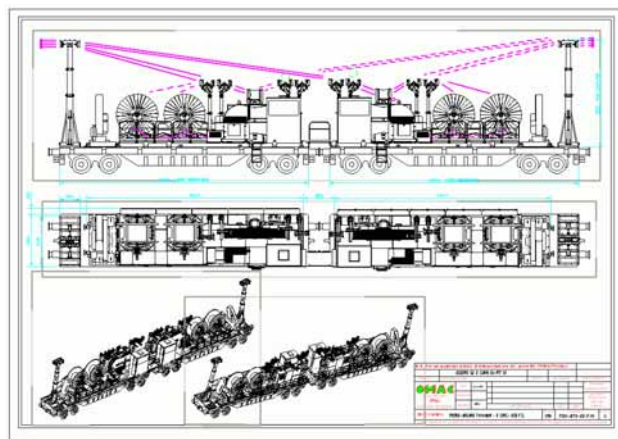
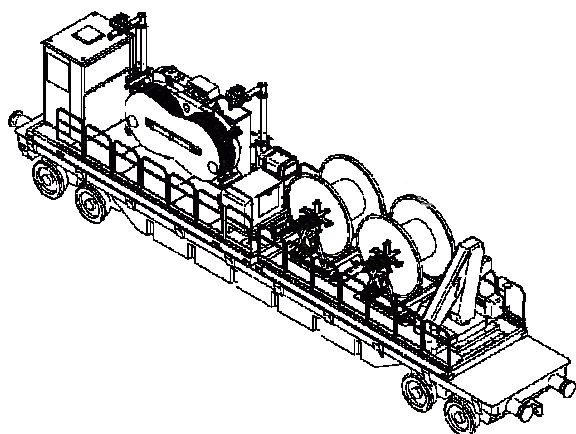
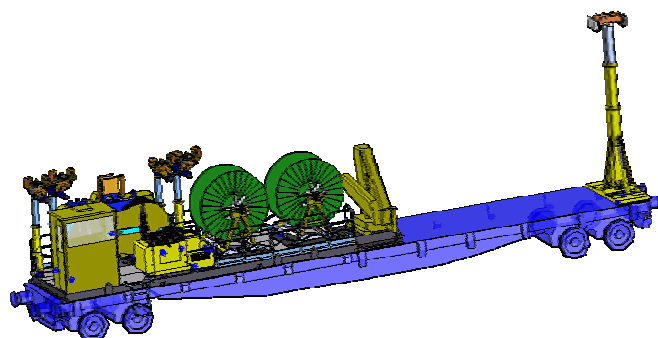
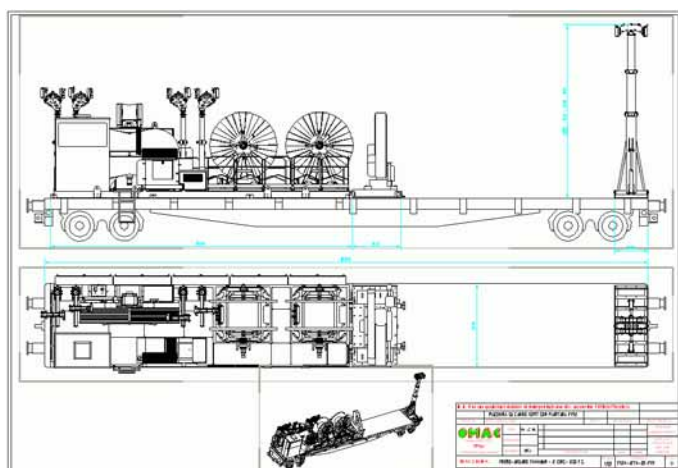
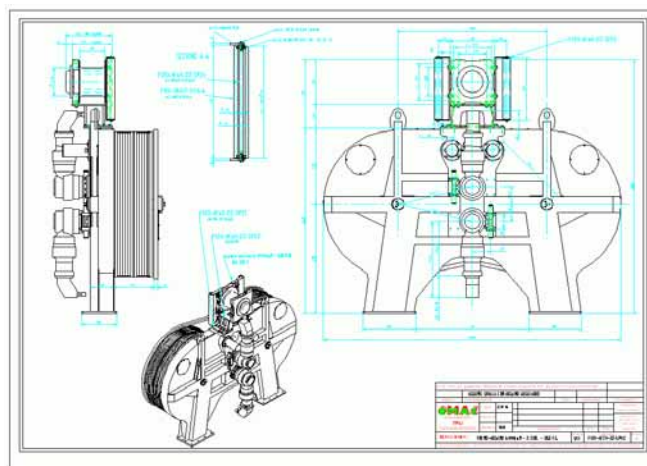
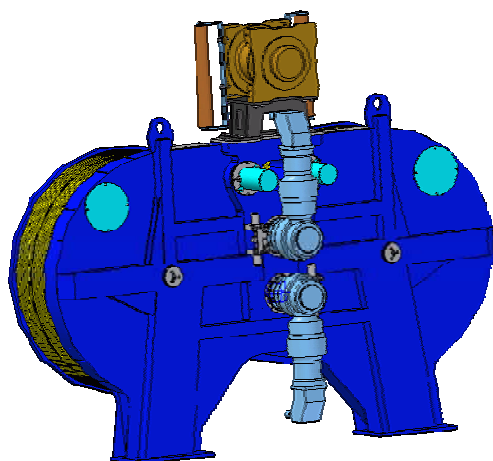
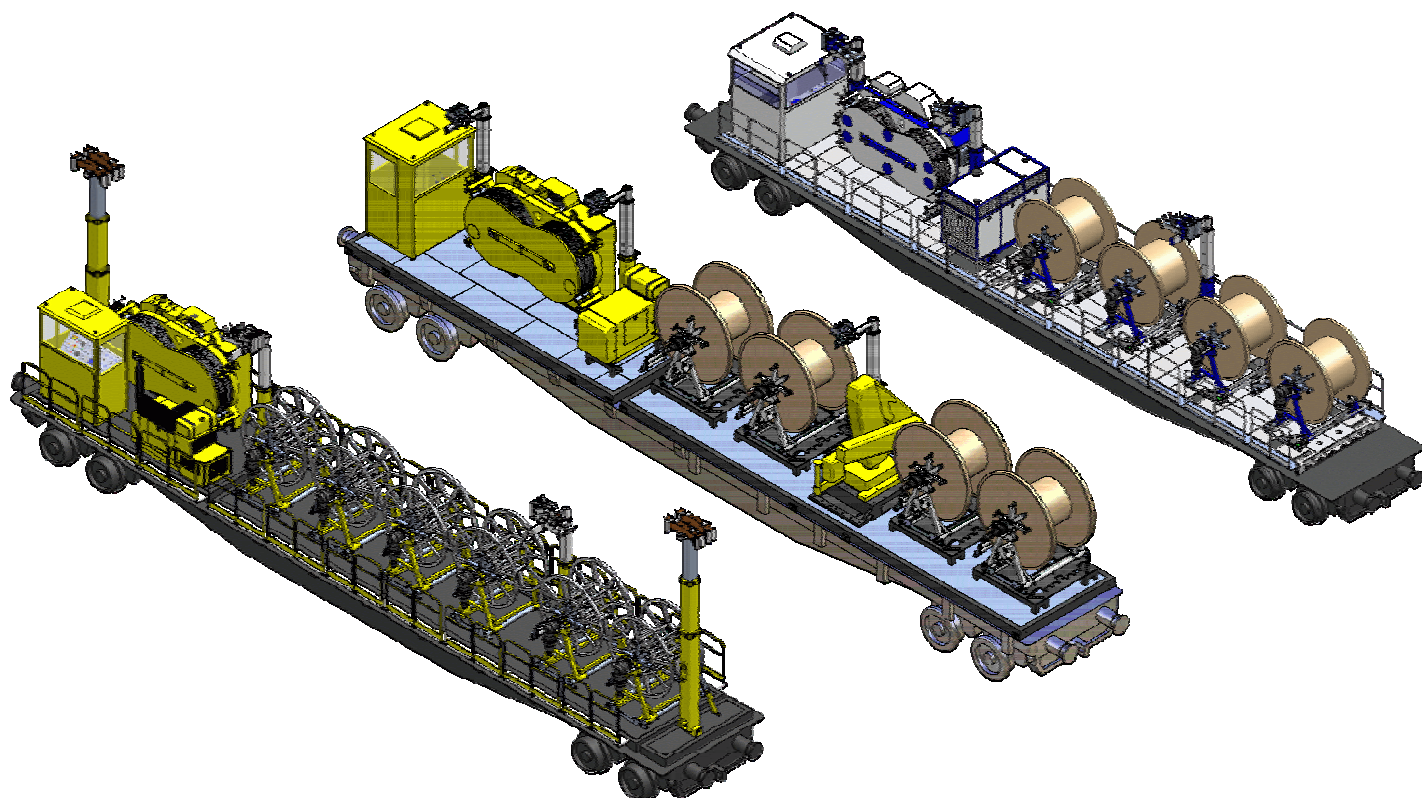




OMAC Italy

STRINGING EQUIPMENT FOR RAILWAY CATENARY LINES







These systems are specifically designed for stringing and tensioning the contact wires and the carrier wires of railways catenary transmission lines. They are suitable either for stringing new lines or renewing old ones.

The elements of the group are fitted on a wagon supplied by the Customer.

The system can be controlled and operated by a single operator, and permits to work at variable speed of wagon maintaining meanwhile the tensioning force (set by the operator) at constant values. Furthermore, the system can grant a valuable accuracy in the force applied to the wires.

The systems can be realised in either unidirectional or bidirectional version: the bidirectional ones can work in either directions of the wagon.

Accordingly to the number of wires to work with, they can be provided with 2, 3 or 4 independent circuits.

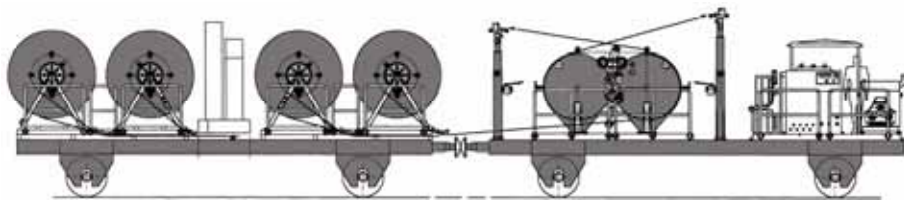
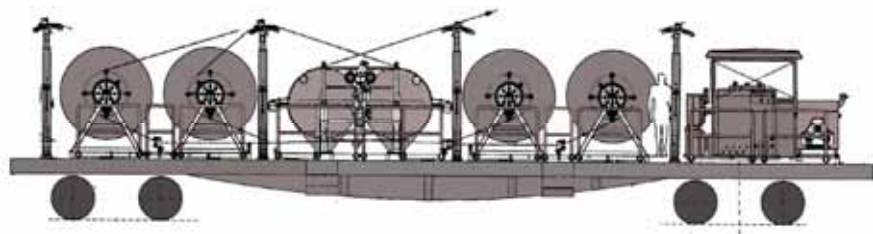
In this leaflet are shown some solution already realised. Our technical staff is pleased to study the specific solution to fit the different need of each Customer.

Tensioner/puller machine with four (4) hydraulic circuits, fit for stringing up to four wires, with separated controls.

These system can be positioned on a single railway flat wagon or on more separated wagons.



Single flat wagon version



Two flat wagons version

model F 120.AF.80.4.4.F (tensioner/puller)

Main technical data:

- a. unit fit for tension or recovery of n. 2 carrier wires and n. 2 contact wires
- b. number of hydraulic circuits: 4 with separated controls
- c. feeding: by hydraulic power pack
- d. bullwheels: Ø 1500 mm
- e. performances : (*)
- f. continuous force $18,5 \text{ kN} + 18,5 \text{ kN} + 18,5 \text{ kN} + 18,5 \text{ kN} = \text{total } 74 \text{ kN}$
- g. max force $20 \text{ kN} + 20 \text{ kN} + 20 \text{ kN} + 20 \text{ kN} = \text{total } 80 \text{ kN}$

model F 120.80.4.4.F (tensioner)

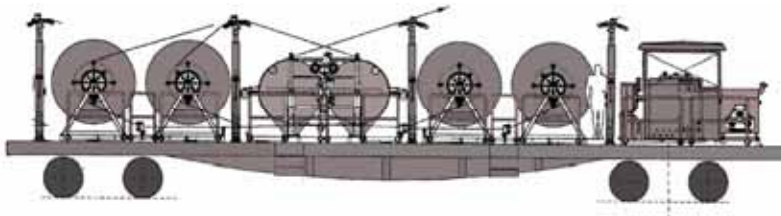
Main technical data:

- a. unit fit for tension of n. 2 carrier wires and n. 2 contact wires
- b. number of hydraulic circuits: 4 with separated controls
- c. feeding: self propelled hydraulic circuits, by means of the bullwheels rotation
- d. bullwheels: Ø 1500 mm
- e. performances : (*)
- f. continuous force $18,5 \text{ kN} + 18,5 \text{ kN} + 18,5 \text{ kN} + 18,5 \text{ kN} = \text{total } 74 \text{ kN}$
- g. max force $20 \text{ kN} + 20 \text{ kN} + 20 \text{ kN} + 20 \text{ kN} = \text{total } 80 \text{ kN}$

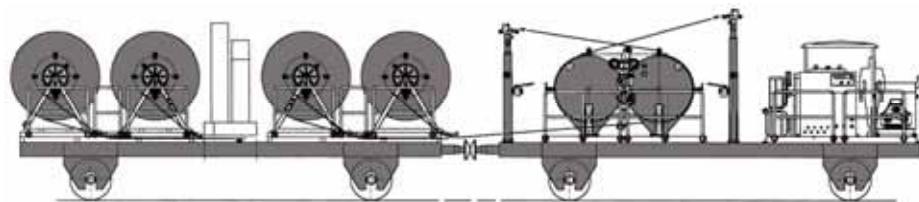
(*) PERFORMANCES CAN BE MODIFIED ON REQUEST

Tensioner/puller machine with three (3) hydraulic circuits, fit for stringing up to four wires, with separated controls.

These system can be positioned on a single railway flat wagon or on more separated wagons.



Single flat wagon version



Two flat wagons

model F 120.AF.70.4.3.F (tensioner/puller)

Main technical data:

- a. unit fit for tension or recovery of n. 2 carrier wires and n. 2 contact wires
- b. number of hydraulic circuits: 3 with separated controls
- c. feeding: by hydraulic power pack
- d. bullwheels: Ø 1500 mm
- e. performances : (*)
- f. continuous force $18,5 \text{ kN} + 18,5 \text{ kN} + 30 \text{ kN} = \text{total } 67 \text{ kN}$
- g. max force $20 \text{ kN} + 20 \text{ kN} + 35 \text{ kN} = \text{total } 75 \text{ kN}$

model F 120.70.4.3.F (tensioner)

Main technical data:

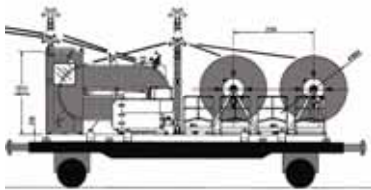
- a. unit fit for tension of n. 2 carrier wires and n. 2 contact wires
- b. number of hydraulic circuits: 3 with separated controls
- c. feeding: self propelled hydraulic circuits, by means of the bullwheels rotation
- d. bullwheels: Ø 1500 mm
- e. performances : (*)
- f. continuous force $18,5 \text{ kN} + 18,5 \text{ kN} + 30 \text{ kN} = \text{totale } 67 \text{ kN}$
- g. max force $20 \text{ kN} + 20 \text{ kN} + 35 \text{ kN} = \text{totale } 75 \text{ kN}$

(*) PERFORMANCES CAN BE MODIFIED ON REQUEST



Tensioner/puller machine with two (2) hydraulic circuits, fit for stringing two, with separated controls.

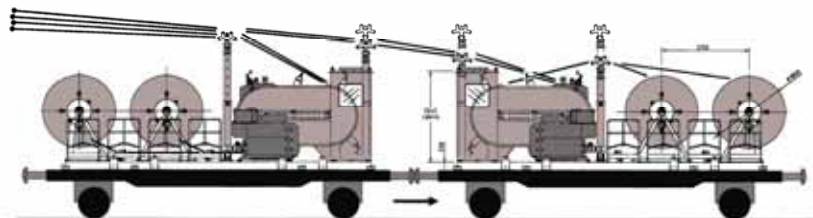
These system can be positioned on a railway flat wagon towed type or self moving type.



Single unit system



Furthermore, thanks to our modular construction method adopted, two systems can be joined together in order to create a complete unit suitable to string up to four wires simultaneously.



Two joined units system

model F 120.AF.40.2.2.F (tensioner/puller)

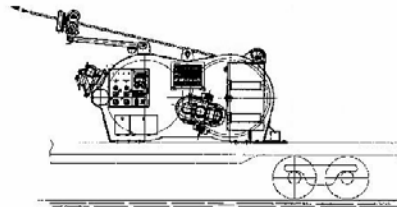
Main technical data (referred to a single unit):

- a. unit fit for tension or recovery of n. 1 carrier wire and n. 1 contact wire
- b. number of hydraulic circuits: 2 with separated controls
- c. feeding: by hydraulic power pack
- d. bullwheels: Ø 1500 mm
- e. performances : (*)
- f. continuous force 18,5 kN + 18,5 kN = total 37 kN
- g. max force 20 kN + 20 kN = total 40 kN

(*) PERFORMANCES CAN BE MODIFIED ON REQUEST



Tensioner/puller machine with single (1) hydraulic circuit, with single control device, fit for stringing one or two wires.



These system can be positioned on a railway flat wagon elf moving type or towed type.

The construction method is including a base framework which allow to position the machine easily and temporarily in case of railway flat wagon on hire.

Furthermore two joined units allow to create a complete unit suitable to string up to four wires simultaneously.



model F 200.AF.30.2 (tensioner/puller)

Main technical data:

- unit fit for tension or recovery of n. 1 carrier wire and n. 1 contact wire
- number of hydraulic circuits: 1 with single control
- feeding: by hydraulic power pack built in the machine
- bullwheels: Ø 1200 mm
- performances : (*)
- continuous total force 25 kN



These machines can be also provided with bullwheels Ø 1500 mm and with 40 kN of total force.

model F 200.30.2 (tensioner)

Main technical data:

- unit fit for tension of n. 1 carrier wire and n. 1 contact wire
- number of hydraulic circuits: 1 with single control
- feeding: by hydraulic power pack built in the machine
- bullwheels: Ø 1200 mm
- performances : (*)
- continuous total force 25 kN
- max total force 30 kN

(*) PERFORMANCES CAN BE MODIFIED ON REQUEST

Panels with control and command devices, for all the functions of the equipment. The panels can be done with different versions in relation to the method of control adopted.



STANDARD CONTROL PANEL, the stringing machine command is executed directly, by means of hydraulic pressure regulation, May be necessary to adjust the operative parameters during the working phase.



CONTROL PANEL WITH ELECTRONIC INSTRUMENT, the stringing machine command is executed by means of pre-set of the parameters necessary for the execution of the work, before starting the job.

This control system can be completed with a suitable device for the job data recording and

STANDARD CONTROL PANEL WITH ELECTRONIC INSTRUMENT INCORPORATED.

The stringing machine command is executed by means of pre-set of the parameters necessary for the execution of the work. Moreover this version of panel allow data store and/or data print directly, data are referred to all information acquired during the execution of the work, like: pulling/tension forces, stringing speed, length of the wires laid, temperature, etc.



CONTROL PANEL WITH FULLY ELECTRONIC FUNCTIONS MANAGEMENT.

After the set of parameters necessary for the execution of the work, all data are transmitted to a PLC computer that provide to manage and control the stringing machine, which become ready to start in a completely autonomous and automatic mode. Besides the system execute in a constant and continuous mode, the processing of data acquired with the

parameters set so that no more regulations are needed. This function is particularly appreciated in case of stop and go of the machine during the stringing operations.



CHARACTERISTICS OF THE HYDRAULIC TENSIONER “ONLY” MACHINES

The machine series named HYDRAULIC TENSIONER can operate independently, without the supply of power through an hydraulic pump and moreover an hydraulic power pack equipped with endothermic engine.

The machine is suitable to operate as a “tensioner only”, allowing to perform the tension of the wires/conductors in a continuous and constant mode.

The machine cannot operate as a “puller” for the recovery of the wires/conductors under the tension load.

In the railway field this kind of machine doesn't involve any particular matters, a part from the consideration that during the stringing operations the railway wagon carrying the machine, cannot move back with the wires under tension load, because in this case the machine would lose the tension load with the consequently releasing of all the wires/conductors.

To facilitate the necessary preparation of the machine, operation of loading of the wires/conductors around bullwheels, it is possible to provide the machine with a bullwheels “free rotation” device; in this way it is possible to carry out the operation easier.

CHARACTERISTICS OF THE TENSIONER-PULLER MACHINES

Series of machine that feed by an hydraulic power pack unit, can operate both as a TENSIONER so as a PULLER, for the tensioning or recovery of contact wires and carrying wires.

The hydraulic circuit can work independently, allowing the simultaneously functions of tensioner and puller.

The hydraulic power pack is composed of a diesel engine that acts a mechanical coupler with incorporated the variable displacement pumps fit for the command of hydraulic circuits of the machine, and the hydraulic pumps, gears type, fit for the command of the motorized drum reel stands.

On the power pack unit are installed all the electro-valves, valves and components of the hydraulic circuits and also the suitable hydraulic oil filters.

MAIN CONSTRUCTION ELEMENTS OF THE MACHINES

- * Steel capstans lined with interchangeable multi-grooved nylon rings.
- * Hydraulic circuit that allows to maintain constantly the set tensioning value either with wagon stopped or changing the stretching velocity.
- * Group (reduction/multiplier unit, negative brake and hydraulic motor) mounted on a device fit to acquire the tensioning force values.
- * Mechanical intake with encoder for send a signal to the metercounter and speed-display on the command panel.
- * Safety negative brake manually operated, by means of the operator, in case of hydraulic circuit troubles and/or break down.
- * Machine base framework with couplings for lifting the machine and anchoring it on a platform.
- * Supports with nylon rollers fit for driving the contact wire on capstan's grooves.
- * Side protection of the machine, particularly of the capstans.
- * Centralised couplings for connecting the machine to the hydraulic power pack (if provided) for operating the machine like a tensioner or a puller.
- * All of the equipment models can be supplied with suitable framework provided of Twist Lock type attachments, to facilitate the operation of transport and placing the equipment of the railway wagon.
- * There is also the possibility to provide the machines with additional optional devices.



**ALL OF MACHINES AND EQUIPMENT ARE CE MARKED, IT MEANS THAT
ARE COMPLY TO THE APPLICABLE NORMS IN FORCE**

TENSION VALUES READING SYSTEM

On the mechanical transmission group (reduction motor) are positioned the load cells that acquire the tension force applied on the conductors, by means of dynamometers it is possible to read the braking/pull value on the wires in that very instant with an appreciable accuracy and depending from the kind of devices installed.

Referring to the practical use, after the operator has set the tension value needed directly on the command panel, it is necessary to give the start to activate the tension force and so automatically and gradually (counter pull action) the TENSIONER/PULLER machine keep the wires at the presetted force tension value (counter pull action with stop wagon) so as the system is ready to start the work.

Simultaneously the reel stands become working and also them execute the necessary counter pull action.

In relation to the type of controls provided, the system can receive and transmit the data in real time, so as to compare and maintain inside the tolerance field values, equivalent for:

A) STANDARD CONTROL SYSTEM :

field of tolerance +/- 10% approx. on mid - high tension values and +/- 12% approx. on mid - low tension values.

B) ELECTRONIC CONTROL SYSTEM :

field of tolerance +/- 5% approx. on mid - high tension values and +/- 7% approx. on mid - low tension values.

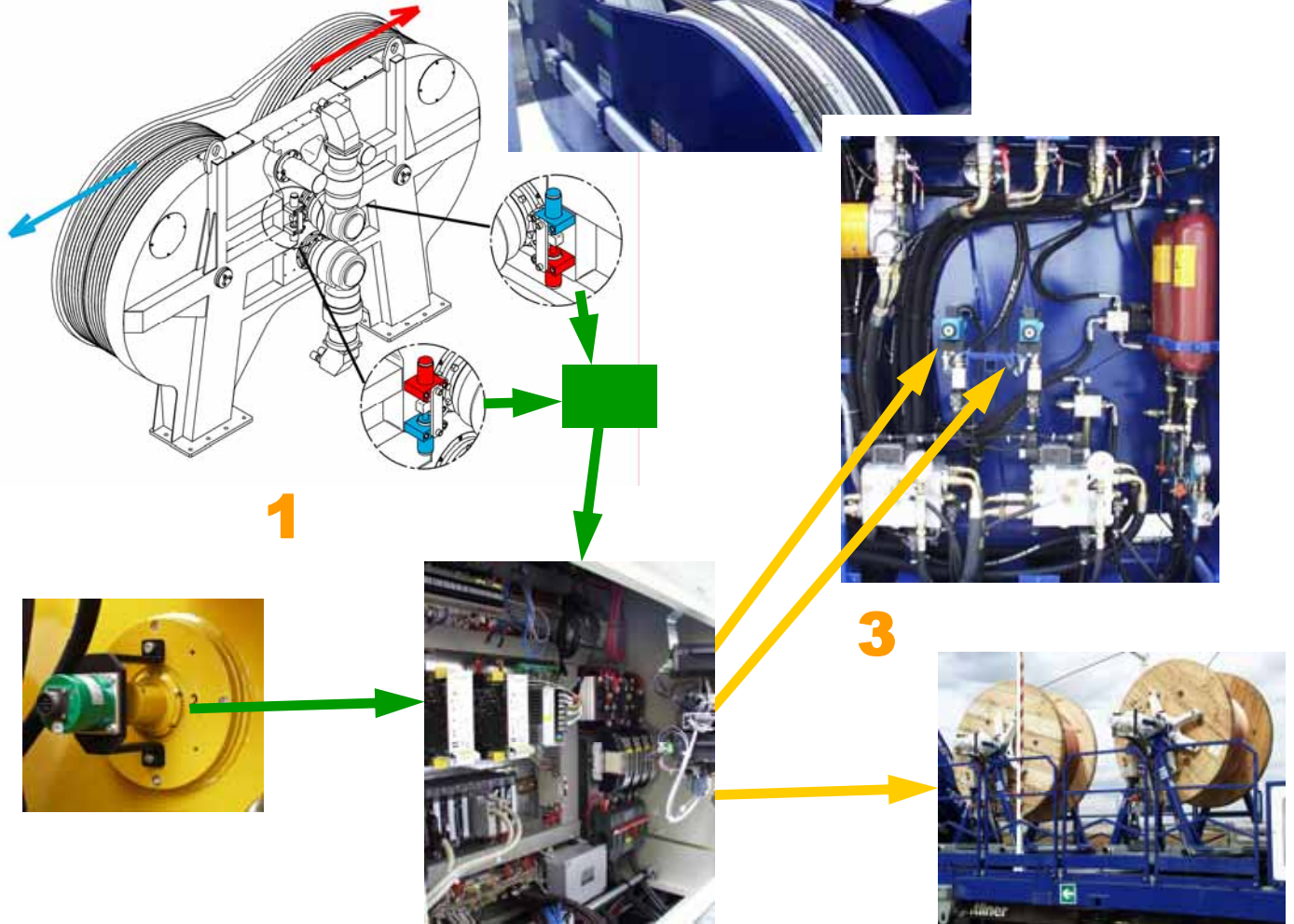
C) ELECTRONIC CONTROL SYSTEM WITH PLC COMPUTER:

field of tolerance +/- 3% approx. on mid - high tension values and mid - low tension values.

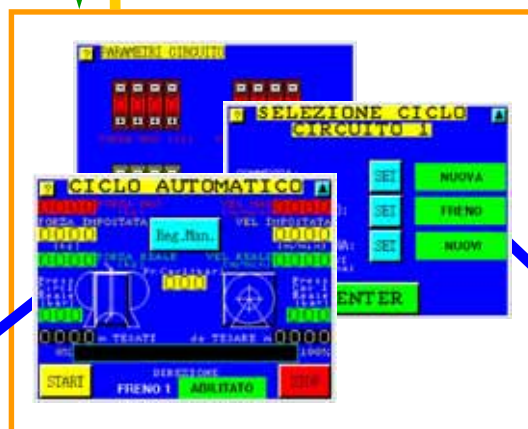
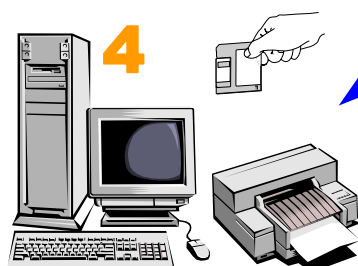
This system also gives in real time, the data of stringing speed and wire laid meters.

Duration of work (hours), temperature, storage and printing of all data acquired during the work.

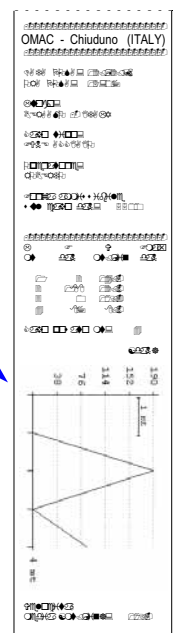
**SYSTEM FOR RAILWAY
CATENARY STRINGING
(2 CIRCUITS)**



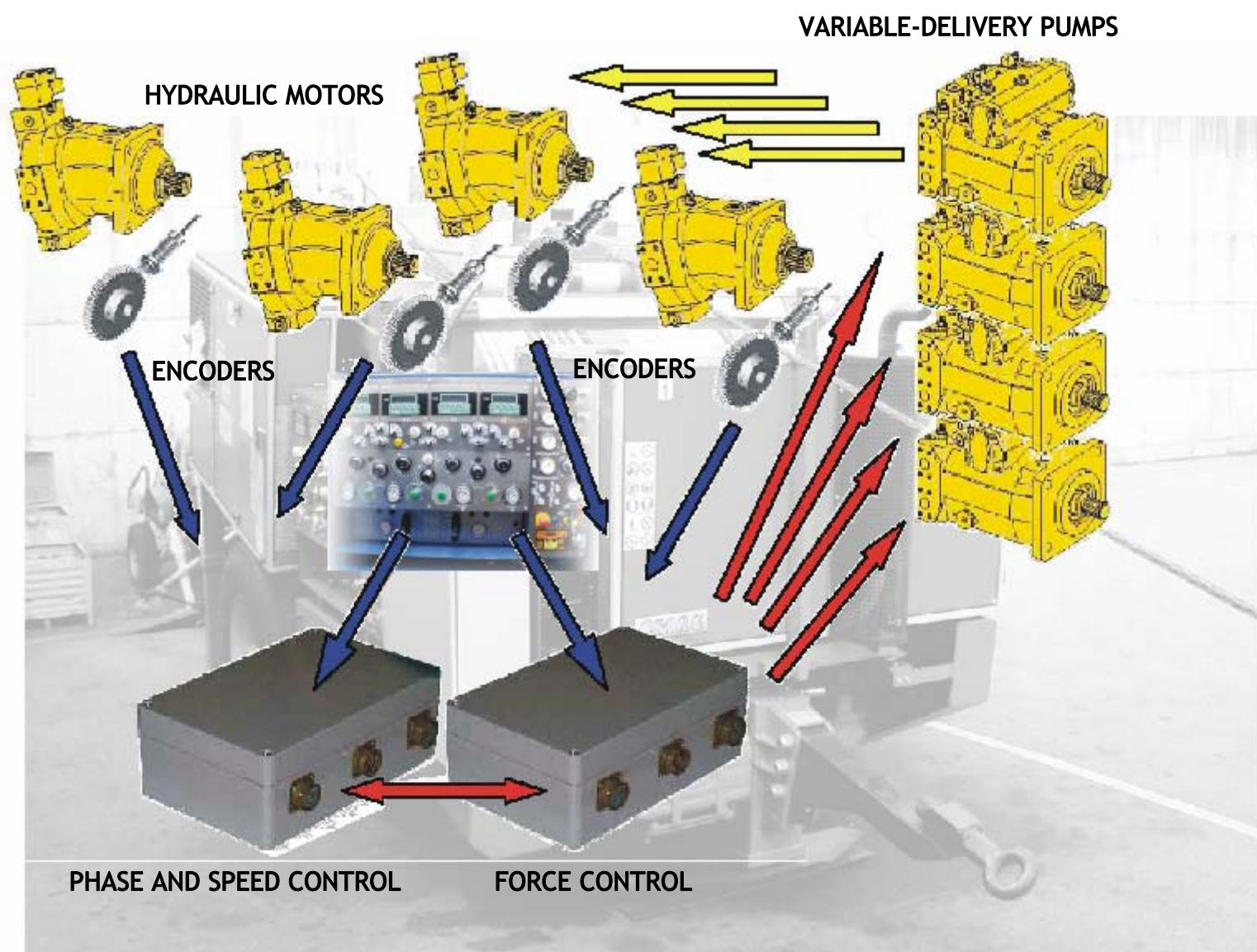
The sensors (1) monitors the data and send them to the SmartPanel electronic control system (2), The control system computes the data and controls the elettrovalves (3) and the circuits.
The data are stored and can be transmitted to a PC (4).



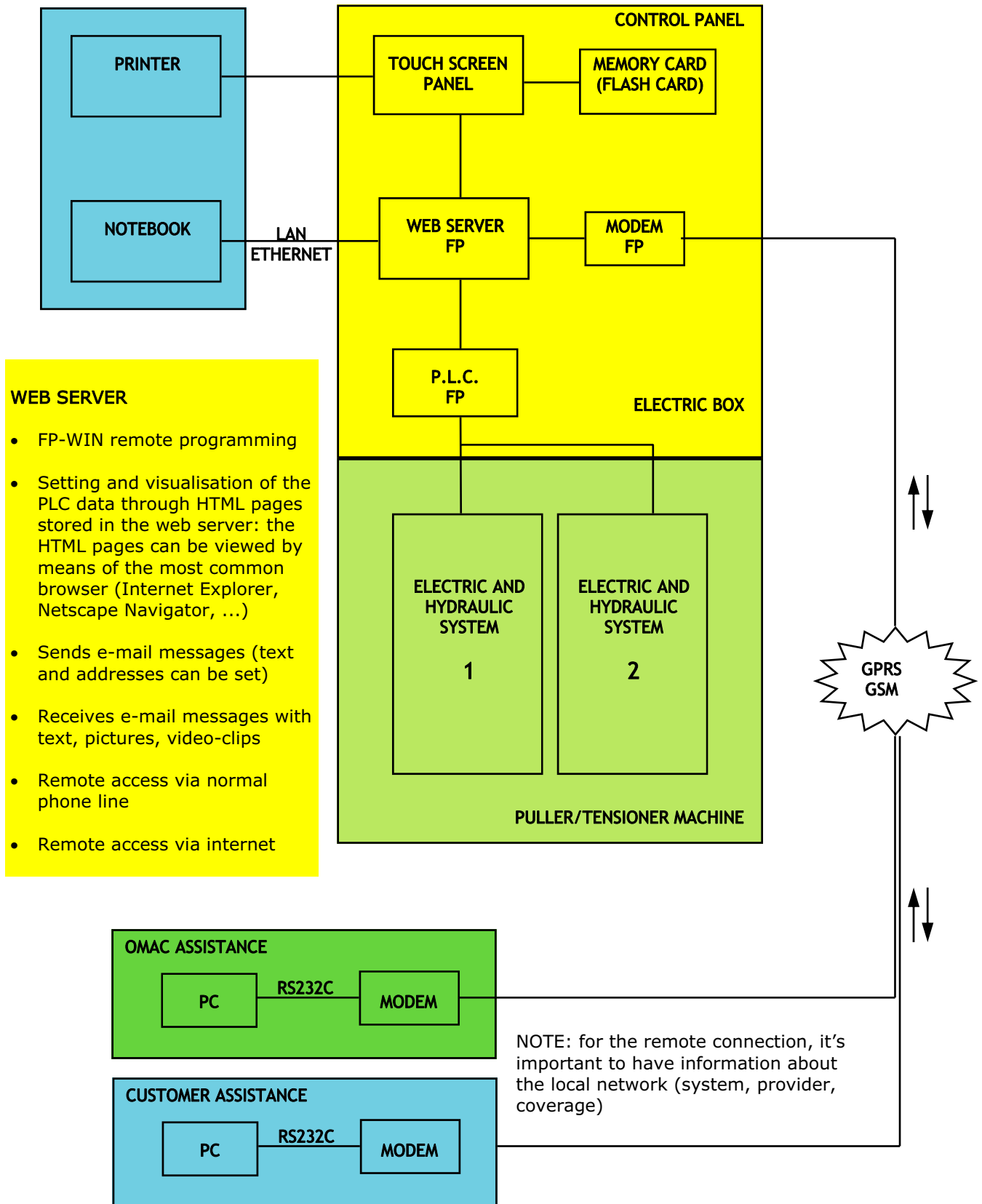
**SmartPanel
Control System**



ELECTRONIC CONTROL SYSTEM



REMOTE ASSISTANCE (optional feature)



Auxiliary equipment



The recovering units are destined to the railway field purposes, besides are studied for execute the recovering of the old wires under tension (mechanical), (winch use) and for the new wires stringing (tensioner use); during the railways lines renewal.

The elements which are composing the units can be placed on a wagon supplied by the Customer. The system permits to work at variable speed and allows in the same time, to maintain constant the braking values set by the operator.



PULLING FORCE AND RECOVERY REEL CAPACITY ON DEMAND.

DRUM-STANDS FOR WINDING/UNWINDING THE CABLE



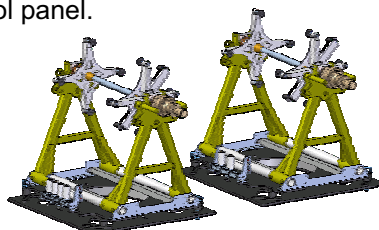
Drum stand which allow the braking of the wire directly on the containing drum, during the wire stringing. Braking force control by means of an autonomous hydraulic circuit.



Drum stands that permits the tensioning/braking of the wires directly on the respective containing drums. Braking force control by means of a disk brake with mechanical command.



Drum stand which allow the braking of the wire directly on the containing drum, during the wire stringing. Braking or recovery force action operated by means of the hydraulic circuit connected directly to the hydraulic power pack and controlled by the main command control panel.





HYDRAULIC POWER UNIT



ROPE-DRIVE ASSEMBLY



ROUTABLE STANDS

MAIN AND SECOND ELECTRIC BOARDS



LIFTING BEAM



OPERATOR CAB



ELECTRONIC DEVICES



TELESCOPIC RODS



SERVICE WINCH



CRANE



ROPE-PRESSER SYSTEM



FIRE-EXTINGUISH SYSTEM



REEL-STANDS 3-4 TON CAPACITY



ASSEMBLY WITH 4 REEL-STANDS



CONTROL PANEL OF MACHINE WITH
2 CIRCUITS AND 4 REEL-STANDS



CAPSTANS (2 CIRCUITS)



CONTROL PANEL OF MACHINE WITH 2 CIRCUITS AND 2 REEL-STANDS









**REEL-WINDER
CONTROL PANEL**



CABLE-CONTROL





3-4 TON CAPACITY
1 CIRCUIT
1 CABLE
ELECTRIC MOTOR



3-4 TON CAPACITY
2 CIRCUITS
1-2 CABLES
TENSIONER ONLY



RECOVERING UNIT



**3-4 TON CAPACITY
1 CIRCUITS / 2 CABLES
TENSIONER ONLY**



RAILWAY CATENARY STRINGING EQUIPMENT
WITH TENSION FORCE CONTROLLING SYSTEM





WIRE GUIDING ROLLERS



**MULTI-GROOVED BULL-
WHEELS**



ADJUSTABLE TELESCOPIC MAST



SILENCED POWER UNIT



HYDRAULIC POWER PACK UNIT



MOTORIZED REEL-STANDS



REEL-STAND WITH ROTATING BASE



**DEVICE TO CHECK THE QUANTITY OF CABLE
WINDED ON THE REEL**



Roller for pressing 2 cables



Roller for pressing 1, 2, 3 or 4 cables



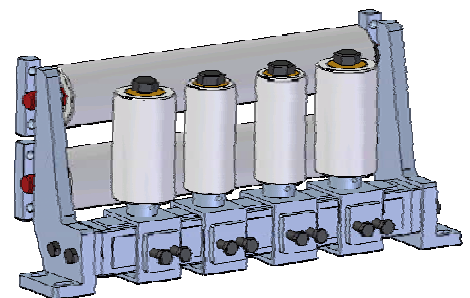
Cable clamping device, fit for 1, 2, 3 or 4 cables



Cable-driver for 2 cables



Cable-driver for 4 cables



Adjustable cable-driver for 4 cables

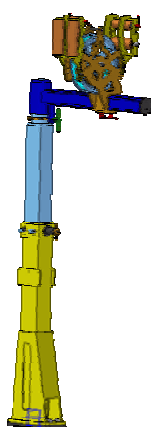
Telescopic mast



Telescopic mast,
sq. 150 mm, h= 2,00-3,10 m



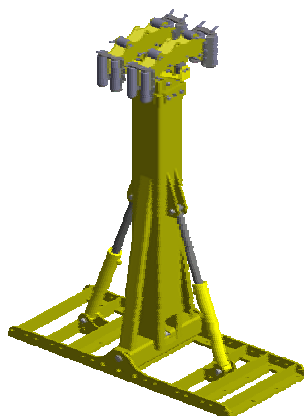
Telescopic mast,
sq. 180 mm, h= 2,00-3,00 m



Telescopic mast,
sq. 220 mm, h= 2,50-3,80 m



Telescopic fingers, independent,
equipped with rollers and radio
controlled



Telescopic mast,
sq. 300 mm, h= 3,00-5,00 m



*Our products can be customized
to accomplish your needs*

Main references

ALSTOM *FRANCE*
 SCLE *FRANCE*
 CYMI *SPAIN*
 NEOPUL *PORTUGAL*
 DELTA TRAZIONE *ITALY*
 ALSTOM *ITALY*
 COMETI *ITALY*
 DONELLI *ITALY*
 SCLE *ITALY*
 SIRT *ITALY*
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