OPGW INSTALLATION & SAFETY ON CROSSINGS
## MACHINES

<table>
<thead>
<tr>
<th>CODE</th>
<th>RANGE</th>
<th>LAYOUT</th>
<th>BULL WHEEL DIAMETER</th>
<th>GROOVES NUMBER</th>
<th>ENGINE POWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARS001</td>
<td>3.5 kN</td>
<td>Single</td>
<td>120 mm</td>
<td>6</td>
<td>3.3 kW</td>
</tr>
<tr>
<td>ARS200</td>
<td>15 kN</td>
<td>Single</td>
<td>200 mm</td>
<td>7</td>
<td>13 kW</td>
</tr>
<tr>
<td>ARS403</td>
<td>35 kN</td>
<td>Single</td>
<td>325 mm</td>
<td>7</td>
<td>25 kW</td>
</tr>
<tr>
<td>FRS301</td>
<td>25 kN</td>
<td>Single</td>
<td>1500 mm</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>AFS303</td>
<td>25 kN</td>
<td>Single</td>
<td>1500 mm</td>
<td>5</td>
<td>34 kW</td>
</tr>
</tbody>
</table>

### OPGW ANTI-TORQUE DEVICES AND FIBER OPTIC CLAMP

<table>
<thead>
<tr>
<th>CODE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RFF / MOF</td>
<td>4.35</td>
</tr>
</tbody>
</table>

### TRACTION MACHINE

<table>
<thead>
<tr>
<th>CODE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT / TMR</td>
<td>4.40</td>
</tr>
</tbody>
</table>

### CRADLE BLOCKS

<table>
<thead>
<tr>
<th>CODE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABR</td>
<td>4.45</td>
</tr>
</tbody>
</table>
**OPGW INSTALLATION & SAFETY ON CROSSINGS**

High precision and top safety level

Tesmec offers a complete line of machines and equipment dedicated to Earth Wire and OPGW installations and reconductoring.

We can provide a full and customized package for live line OPGW reconductoring; similar equipment can be used as a safety system in case of road and rail crossings.

All the products are designed according with IEC TR 61328, ensuring the top level of safety, reducing all the risks for operators and preventing conductor damages.
OPGW INSTALLATION & SAFETY ON CROSSINGS: OUR VALUE PROPOSITION

PULLER & TENSIONER

Solution for new lines.
The match between Tesmec puller and tensioner is the right choice for stringing a new OPGW or ground wire line. The main features of the puller - light weight, reliability and multi-functionality - joined with the 1500 capstan diameter of the tensioner are the best solution ensuring high precision and reliable performances.
The grooves are made of high resistance nylon sectors, according to IEC TR 61328. This hard surface has several advantages that prevent damages on the OPGW, the most important are:
+ Low torsional stress resulting in no birdcaging risk.
+ Smooth self alignment of the cable at the bottom of the groove.
+ No need to change conductor reeving direction according to cable formation.

ANTI-TORQUE DEVICES

Easy passage.
The combination of the OPGW anti-twisting devices RFF and the clamp for fiber optic MOF model guarantees the best protection from the torque preventing all the risks related to its damage. RFF is specifically designed to connect the pulling rope with an OPGW: its two arched rods facilitate the overtake of the blocks and two counterweights avoid cable twisting. The clamp model MOF has special liners shaped on the exact OPGW external diameter.

TRACTION MACHINE

One system for two applications.
Traction machine is the best solution for live line replacement of Earth Wire/OPGW with OPGW and safety nets on critical crossing.
The key features of this machine are high speed and pulling capacity that means:
+ Heavy operations, such as safety nets and longer span.
+ Operating times reduction.

PULLER TENSIONER

Reliable reconductoring.
AFS303, in addition to all the advantages related to the hard surface (see the previous box), allows the max. precision level during reconductoring operations:
+ The pull pre-setting system controls the stringing tension with high precision (+-5% accuracy).
+ Single drive pinion transmission ensures same speed of the bull-wheels while torque value can be different. This prevents slippage or overloads on the cable.
ARS001
HYDRAULIC PULLER

**Max Pull** 3,5 kN
**Continuous Pull** 2,5 km/h
**Max Speed** 2,4 km/h

* at 20°C and at sea level

**Hydraulic Transmission**
Closed hydraulic circuit for stepless speed variation in both rotating directions.

<table>
<thead>
<tr>
<th>Performance *</th>
<th>Characteristics</th>
<th>Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max pull</td>
<td>Bull-wheel diameter 120 mm</td>
<td>Gasoline 3,3 kW</td>
</tr>
<tr>
<td>Continuous pull</td>
<td>Bull-wheel material ALUMINIUM</td>
<td>Cooling system AIR</td>
</tr>
<tr>
<td>Max speed</td>
<td>Max nylon rope diameter 8 mm</td>
<td>Starting system by handle</td>
</tr>
<tr>
<td></td>
<td>Max Capacity 500 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight (dry) 80 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Composed by Cable level winder, reel modular 23 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Puller modular 28 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine plus pump modular 29 kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of grooves 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suitable for 1 rope</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Layout Single</td>
<td></td>
</tr>
</tbody>
</table>

**Configuration**
ARS200
HYDRAULIC PULLER

MAX PULL
15 kN

MAX SPEED
3,6 km/h

ROPE DIAMETER
8 mm

MULTI PURPOSE MACHINE

COMPACT DESIGN

PERFORMANCE *

Max pull 15 kN
Speed at max pull 0,7 km/h
Max speed 3,6 km/h
Pull at max speed 4 kN
* at 20°C and at sea level

HYDRAULIC TRANSMISSION
Closed hydraulic with pull pre-setting system that automatically adjust pulling speed.

CHARACTERISTICS

Bull-wheel diameter 200 mm
Bull-wheel material STEEL
Max rope diameter 8 mm
Weight (dry) 500 kg
Number of grooves 7
Suitable for 1 rope
Layout Single

ENGINE

Gasoline 13 kW (18 hp)
Cooling system AIR
Electrical system 12 V

CONFIGURATION
Negative self-acting hydraulic brake. Hydraulic dynamometer with set-point and automatic control of maximum pull. On board automatic reel winder with level wind, for mod. BOF370 for 500 m of Ø 8 mm rope.

AVAILABLE DEVICES

ALL102 Pulling rope locking device when capstan is used (compulsory for EC market)
ALL105 Rigid axle and towing bardetachable, for manual towing
ALL107 Capstan (diameter=220 mm equipped with guide rope rollers)
ALL111 Swivel guide rope roller.
ALL112 Trailer 80 km/h. EC type-approved for road circulation with hook Ø 40 mm and lighting system.

ARSE200 with ALL112

ARSE200 with ALL111

Picturs & drawings can be different according to technical specifications - updating programme variations without notice are possible.
ARS403
HYDRAULIC PULLER

**PERFORMANCE * **
- Max pull: 31/35 kN*
- Speed at max pull: 1,2 km/h
- Max speed: 3/3,6 km/h*
- Pull at max speed: 12 kN
- * at 20°C and at sea level

**HYDRAULIC TRANSMISSION**
Closed hydraulic with pull pre-setting system that automatically adjust pulling speed.

**CHARACTERISTICS**
- Bull-wheel diameter: 325 mm
- Bull-wheel material: STEEL
- Max rope diameter: 13 mm
- Weight (dry): 980 kg
- Number of grooves: 7
- Suitable for: 1 rope
- Layout: Single

*According to emission level

**ENGINE**
- Diesel
- 19 kW(26 hp)
- 25 kW (34 hp)*
- Cooling system: WATER
- Electrical system: 12 V

**CONFIGURATION**
- Negative self-acting hydraulic brake.
- Hydraulic dynamometer with set-point and automatic control of maximum pull.
- Control instruments for hydraulic system and Diesel engine.
- Rigid axle 30 km/h.
- Mechanical front stabiliser.
- Grounding connection point.
- On board automatic reel winder with level wind, suitable for mod. BOF010 and BOF020.
- Reel shaft AXR001.
- Pull pre-setting system.

**AVAILABLE DEVICES**
- **ALL110** Underground cable pulling attachment.
- **ALL111** Swivel guide rope roller.
- **ALL112** Trailer 80 km/h. EC type-approved for road circulation with hook Ø 40 mm and lighting system.
- **AXR001** Extra shaft.
- **DLR300** Electronic pull and speed recorder.

Pictures & drawings can be different according to technical specifications - updating programme variations without notice are possible.
**FRS301**

**HYDRAULIC TENSIONER**

<table>
<thead>
<tr>
<th>MAX PULL</th>
<th>MAX SPEED</th>
<th>ROPE DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 kN</td>
<td>5 km/h</td>
<td>36 mm</td>
</tr>
</tbody>
</table>

**DESIGNED FOR OPGW**

**PRECISE, GREEN AND SILENT**

---

### PERFORMANCE *

- Max tension 25 kN
- Max speed 5 km/h
- * at 20°C and at sea level

### HYDRAULIC TRANSMISSION

Half closed hydraulic circuit with tension presetting system.

### CHARACTERISTICS

- Bull-wheel diameter 1500 mm
- Bull-wheel material NYLON
- Max conductor diameter 36 mm
- Weight (dry) 1950 kg
- Number of grooves 5
- Suitable for 1 conductor
- Layout Single

### CONFIGURATION

- Negative self-acting hydraulic brake.
- Hydraulic dynamometer.
- Mechanical meter counter.
- Rigid axle 30 km/h.
- Gearbox with 3 operating positions:
  - Neutral position (with free bull-wheels for conductor loading and unloading).
  - Low tension position (1.5 ÷ 5 kN).
  - Nominal tension position.
- Mechanical front stabiliser.
- Grounding connection point.

---

**DESIGNED FOR OPGW**

**PRECISE, GREEN AND SILENT**

---

**Bull-wheel diameter** 1500 mm

**Bull-wheel material** NYLON

**Max conductor diameter** 36 mm

**Weight (dry)** 1950 kg

**Number of grooves** 5

**Suitable for** 1 conductor

**Layout** Single

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**Pictures & drawings can be different according to technical specifications - updating programme variations without notice are possible.**
**AFS303**

**HYDRAULIC PULLER TENSIONER**

- **Max Pull**: 25 kN
- **Max Speed**: 4,25 km/h
- **Conductor Diameter**: 36 mm

**PERFORMANCE** *
- Max pull / tension: 25 kN
- Speed at max pull / tension: 2,5 km/h
- Max speed: 4,25 km/h
- Pull / tension at max speed: 15 kN
- * at 20°C and at sea level

**HYDRAULIC TRANSMISSION**
Closed hydraulic with pull pre-setting system that automatically adjust pulling speed.

**CHARACTERISTICS**
- Bull-wheel diameter: 1500 mm
- Bull-wheel material: NYLOH
- Max conductor diameter: 36 mm
- Maxrope diameter: 10 mm
- Weight (dry): 2700 kg
- Number of grooves: 5
- Suitable for: 1 rope / conductor
- Layout: Single

**ENGINE**
- Diesel: 34 kW (46 hp)
- Cooling system: WATER
- Electrical system: 12 V

**CONFIGURATION**
- Negative self-acting hydraulic brake.
- Hydraulic dynamometer with set-point and automatic control of maximum pull.
- Digital meter counter.
- Control instruments for hydraulic system and Diesel engine.
- Rigid axle 30 km/h.
- Hydraulic power pack to control 1 drum stand with hydraulic motor or 1 reel winder.
- Gearbox with 3 operating positions:
  - Neutral position (with free bull-wheels for conductor loading and unloading).
  - Low tension position (1 ÷ 5 kN).
  - Nominal tension position.
- Hydraulically front stabiliser.
- Grounding connection point.

**AVAILABLE DEVICES**
- **ALL005**: Hydraulic power for compressor.
- **ALL037**: Preheating device up to -30°C.
- **ALL051**: Cable remote control kit (AXC005 not included).
- **ALL059**: Radio remote control kit (AXH007 not included).
- **ALL071**: Hydraulic rope / conductor clamp for reel / drum change operations.
- **ALL089**: Electronic connection and synchronisation between machines.
RFF
OPTICAL GROUND WIRE (OPGW) ANTI-TORQUE DEVICES - RFF

SHAPED FOR SMOOTH OPERATIONS
SWIVEL INCLUDED

MOF470
CLAMP FOR FIBER OPTIC - MOF

RIGID DESIGN AVOIDS DAMAGES ON FIBER
INTERCHANGEABLE AND MACHINED JAWS

<table>
<thead>
<tr>
<th>RFF</th>
<th>MODELS</th>
<th>DIMENSIONS</th>
<th>WORKING LOAD</th>
<th>WEIGHT</th>
<th>FOR PULLEYS Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RFF001</td>
<td>L: 3900</td>
<td>R: 330</td>
<td>10 KN</td>
<td>60 Kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>400 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>500 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>650 mm</td>
</tr>
<tr>
<td></td>
<td>RFF010</td>
<td>L: 4300</td>
<td>R: 500</td>
<td>10 KN</td>
<td>63 Kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>800 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1000 mm</td>
</tr>
</tbody>
</table>

MOF470

PERFORMANCE
Working load 10 kN

CHARACTERISTICS
Diameter range 6÷23
Weight 4 Kg
Material Hot forged steel

CONFIGURATION
Aluminium interchangeable jaws part number GTRXX; conductor diameter to be specified on order.

Pictures & drawings can be different according to technical specifications - updating programme variations without notice are possible.
**TMT020**

**TRACTION MACHINE**

*Highest traction force available*  
*Can be pulled back in case of stop*  
*Up to 1000 m range with 2 remotes*

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**TMR030**

**RECOVERY DEVICE**

*Automatic locking system*  
*Drag the traction machine to finish the span*

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**TMT020**

**PERFORMANCE**  
- Max traction speed: 33 m/min  
- Max traction force: 110 kg  
- Max slope: 20°

**CHARACTERISTICS**  
- Weight: 55 kg  
- Robot weight: 40 kg  
- Battery weight: 15 kg  
- Two electrical motors: 24 V  
- Conductors diameter range: 10÷46 mm  
- Material: ALUMINIUM alloy  
- It can cross mid-span joint up to CH=60  
- Vulcanized wheels

**REMOTE CONTROL**  
Two compact radio remote control units with double push-button transmission. Device operative range up to 1000 (m).

**AVAILABLE DEVICES**  
**ALL304**  
Extra battery.

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**TMR030**

**CHARACTERISTICS**  
- Max weight: 40 kg  
- Wheels material: NYLON  
- Detachable ballasts for easy lifting

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ABR058
BRAKING DEVICE

LIGHT AND COMPACT
ALLOWS THE FINAL RECOVERY OF THE CRADLES

PERFORMANCE
Working load 1,5 kN

CHARACTERISTICS
Weight 4,5 kg
Conductors diameter range 10÷30 mm
Wheels material nylon
Frame material ALUMINIUM

ABR053
CRADLE BLOCK

LIGHT AND EASY
ADJUSTABLE FOR DIFFERENT DIAMETERS

PERFORMANCE
Working load 1 kN

CHARACTERISTICS
Weight 1,4 kg
Rollers material NYLON
Frame material ALUMINIUM

ABR045
CRADLE BLOCK

SUITABLE ALSO ON MIDSPAN JOINTS
ADJUSTABLE FOR DIFFERENT DIAMETERS

PERFORMANCE
Working load 2 kN

CHARACTERISTICS
Weight 2 kg
Rollers material NYLON
Frame material Galvanized STEEL
Internal surface covered by nylon plates
ABR064
CRADLE BLOCK

SUITABLE ALSO ON MIDSpan JOINTS
ADJUSTABLE FOR DIFFERENT DIAMETERS

PERFORMANCE
Working load 2 kN

CHARACTERISTICS
Weight 1,9 kg
Rollers material NYLON
Frame material Alluminium. Connection made of steel
Internal surface covered by nylon plates

ABR059
CRADLE BLOCK

COUNTERWEIGHT FOR EASY ROTATION
QUICK OPEN/CLOSE SYSTEM

PERFORMANCE
Working load 2 kN

CHARACTERISTICS
Weight 2 kg
Roller material NYLON
Frame material Galvanized STEEL
Internal surface covered by nylon plates

ABR021
CRADLE BLOCK

EARTH WIre GROUNDED DURING THE OPERATIONS
QUICK LOCKING SYSTEM FOR GUIDE ROPE

PERFORMANCE
Working load 2 kN

CHARACTERISTICS
Weight 1,8 kg
Rollers material NYLON
Frame material Galvanized STEEL
Internal surface covered by nylon plates

Pictures & drawings can be different according to technical specifications - updating programme variations without notice are possible.
SUGGESTED METHODOLOGY WITH ABR021

1. Installation of the cradle block ABR021 by the guide rope pulled by traction machine.

2. The ABR021 move on the existing ground wire by using the upper roller; the pulling rope is laid out at the same time on the lower roller.

3. The OPGW is pulled by the pulling rope on the lower rollers.

4. All the OPGW is laid out on the lower roller and all the pulling rope is removed.

5. All the ABR021 are rotated upside down in order to have the OPGW in the final position.

6. The G.W. is removed pulling back the rope on the lower rollers.

7. All the ABR021 are removed by the guide rope pulled by hands or winch, with minimum sag ensured by the breaking device.