Plasma Power-Supply
PLASMA TEC

from DC to UNIPOLAR to BIPOLAR
SERIES OVERVIEW
The PLASMA TEC-Series is a highly reliable, primary switched-mode power supply product line. The PLASMA TEC-Series reveals improved process technology for thin-film plasma applications. With this state of the art water-cooled power supplies, J. Schneider offers different application dedicated systems to suit the specific demand. The PLASMA TEC-Series are characterized by the most sophisticated, flexible and adjustable arc management with extremely low passive output energy, and a high output power density.

The PLASMA TEC power supplies are available in a wide output power range, 3kW, 5kW, 10kW, 12kW, 15kW or 20kW. Its modularity enables connections in parallel to increase the output power up to 200kW. Ideal for vacuum coating processes for hard and decorative coatings, architectural / industrial glass, flat-panel, semiconductor, data-storage, optical-, tribological- and solar applications.

PLASMA TEC DCP, PLASMA TEC AP, PLASMA TEC AC, PLASMA TEC MP products are dedicated for magnetron sputtering deposition and PECVD processing.

PLASMA TEC ARC series is special design for state of the art pulsed cathodic arc processes.

PLASMA TEC DCP provides a DC voltage or a unipolar pulsed output voltage, for planar or rotatable targets, with the most sophisticated, flexible, adjustable arc management. Ideal for single magnetron sputtering applications.

PLASMA TEC AP provides a DC voltage or a pulsed output voltage. In combination to the regular negative working pulses for thin film deposition the PLASMA TEC AP provides fully adjustable positive pulses including ARC detection to enhance the coating properties.

PLASMA TEC AC supplies a bipolar DC pulsed wide range output voltage, with the most advanced arc handling, for dual magnetron applications. Dedicated for defect free, state of the art processing of metals, oxides and nitrides.

PLASMA TEC MP virtually combines all functions in one device, an extremely flexible power supply. It is capable of all operating modes, an improved DC operation pulse, an unipolar pulsed operation and a bipolar pulsed operation.

PLASMA TEC ARC the new DC and pulsed DC cathodic ARC supply. Opens new process windows for advanced coatings for the pulsed cathodic ARC deposition technology. Optimized for stable, high rate processing and lowest droplet rate.
## SELECTION TABLE

<table>
<thead>
<tr>
<th></th>
<th>PLASMA TEC DCp</th>
<th>PLASMA TEC AP</th>
<th>PLASMA TEC AC</th>
<th>PLASMA TEC Mp</th>
<th>PLASMA TEC ARC</th>
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<tbody>
<tr>
<td>T = 1/ Freq.</td>
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<td>✓</td>
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</tr>
</tbody>
</table>

- **Parallel switched or synchronized mode**
  - ✓
- **Interfaces: analog / digital and RS232**
  - ✓
- **Touch Panel**
  - 0
- **Fieldbus: Profinet, Ethercat, CAN, Profinet**
  - 0

✓ = Standard, 0 = Option
Unipolar Pulsed DC Power-Supply
PLASMA TEC DCp

The PLASMA TEC DCp, the Unipolar Pulsed DC power supply from the proven J. Schneider PLASMA TEC power supply platform for PVD, is a switched-mode power supply with the state of the art CFPP (Current Fed Push Pull) technology. By the use of the CFPP technology the output of the power supply is a true current source, the most sophisticated solution for defect free plasma processing. The PLASMA TEC DCp delivers DC or unipolar pulsed DC at an output frequency of 76kHz. The power supply is available with 3kW, 5kW, 10kW or 20kW. The systems can be put in parallel mode to increase the power up to 160kW. The regulation of current, voltage and power reach most accurate values via digital regulation. The PLASMA TEC DCp is characterized by a high power density and great robustness. Extremely low stored output energy and a sophisticated, flexible, adjustable arc management. It is ideal for industrial applications as well as for research equipment for surface developments. Its main applications are in vacuum coating processes for hard/decorative, tribological and functional coatings, optical glasses, solar cells, architecture glasses or for flat screens.

- Optimized for defect-free processing, for state of the art thin film technologies
- Small footprint, up to 20kW in 3HU
- Extremely low internal stored energy (<3mJ / 10kW)
- Water cooled
BASIC TECHNICAL DATA:
Mains:
Input voltage: 3 x 400V AC ± 10%
Frequency: 50 / 60 Hz ± 5%

Output:
Nom. output voltage $V_{av}$ please see selection table
Nom. output power kW please see selection table
Nom. output current $A_{av}$ please see selection table
Max. ignition voltage $V_{ig}$ please see selection table
Nom. Output frequency 76kHz
Duty cycle 7.6% to 93.8% (1 to 12.2μsec)

Front view: 
Back view:

SELECTION TABLE:

<table>
<thead>
<tr>
<th>MAXIMUM OUTPUT RATING</th>
<th>MODULE NUMBER</th>
<th>ARTICLE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{av}$</td>
<td>$A_{av}$</td>
<td>kW</td>
</tr>
<tr>
<td>400–800</td>
<td>7.5 – 3.75</td>
<td>3</td>
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<tr>
<td>400–800</td>
<td>12.5 – 6.25</td>
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<td>400–800</td>
<td>25.0 – 12.5</td>
<td>10</td>
</tr>
<tr>
<td>400–800</td>
<td>50.0 – 25.0</td>
<td>20</td>
</tr>
</tbody>
</table>

www.j-schneider.de

J. Schneider Elektrotechnik GmbH
Helmholtzstraße 13 * 77652 Offenburg * Tel +49 (0) 781 206-0
The PLASMATEC Ap, the Unipolar Pulsed DC power supply from the proven J. Schneider PLASMATEC power supply platform for PVD, is a switched-mode power supply with the state of the art CFPP (Current Fed Push Pull) technology. By the use of the CFPP technology the output of the power supply is a true current source, the most sophisticated solution for defect free plasma processing. The PLASMATEC Ap alternatively provides a DC or unipolar pulsed DC current / voltage at an output frequency of 76kHz. Unique for this PLASMATEC Ap unit is the optional and fully active adjustable reverse pulse mode with Arc detection.

The power supply is available with 10kW. The systems can be put in parallel mode to increase the power up to 80kW. The regulation of current, voltage and power reach most accurate values via digital regulation. The PLASMATEC Ap is characterized by a high power density and great robustness. Extremely low stored output energy and a sophisticated, flexible, adjustable arc management. It is ideal for industrial applications as well as for research equipment for surface developments. Its main applications are in vacuum coating processes for hard/decorative, tribological and functional coatings, optical glasses, solar cells, architecture glasses or for flat screens.

- Optimized for defect-free processing, for state of the art thin film technologies
- Small footprint, up to 10kW in 3HU within active adjustable reverse pulsing
- Extremely low internal stored energy (<3mJ / 10kW)
- Water cooled
Active Pulsed DC Power-Supply
PLASMA TEC Ap

BASIC TECHNICAL DATA:
Mains:
Input voltage: 3 x 400V AC ± 10%
Frequency 50 / 60 Hz ± 5%

Output:
Nom. output voltage $V_{av}$ please see selection table
Nom. output power kW please see selection table
Nom. output current $A_{av}$ please see selection table
Max. ignition voltage $V_{ig}$ please see selection table
Nom. Output frequency 76kHz
Duty cycle (DC and unipolar pulse mode) 7.6% to 93.8% (1 to 12.2μsec)
Duty cycle (unipolar with reverse pulse) 7.6% to 77% (1 to 10μsec)

Front view:  

Back view

SELECTION TABLE:

<table>
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<tr>
<th>MAXIMUM OUTPUT RATING</th>
<th>MODULE NUMBER</th>
<th>ARTICLE NUMBER</th>
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<tr>
<td>$V_{av}$</td>
<td>$A_{av}$</td>
<td>kW</td>
</tr>
<tr>
<td>400-800</td>
<td>25.0 – 12.5</td>
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</tbody>
</table>

PLASMA TEC Ap 0k812k  
NDCR1703F01001
The PLASMA\textit{TEC AC}, the Bipolar Pulsed DC power supply from the proven J. Schneider PLASMA\textit{TEC} power supply platform for PVD and PECVD is a switched-mode power supply with the modern CFPP (Current Fed Push Pull) technology. By the use of the CFPP technology the output of the power supply is a true current source, the most sophisticated solution for defect free plasma processing. The PLASMA\textit{TEC AC} delivers a bipolar output current with an output frequency of 38.46 kHz. The pulse duration can be selected from 1µsec to 12.7µsec. This enables an ultra wide range duty cycle from 7.6% to 97.7%. The regulation of current, voltage and power reach most accurate values via digital regulation. Internal tap setting enable a flexible, wide output voltage range. The PLASMA\textit{TEC AC} is the ideal choice for dual magnetron applications.

- Optimized for defect-free processing, for state of the art thin film technologies
- Small footprint
- 12kW from up to 450V to 2800V
- Inherent Current Source Characteristic, that insures no current overshoot by an ARC
- Extremely low internal stored energy
- Water cooled
Bipolar Pulsed DC Power-Supply
PLASMA\text{T}EC\ AC

**BASIC TECHNICAL DATA:**

**Mains:**
- Input voltage: 3 x 400V AC ± 10%
- Frequency: 50 / 60 Hz ± 5%

**Output:**
- Nom. output voltage $V_{av}$: please see selection table
- Nom. output power kW: please see selection table
- Nom. output current $A_{av}$: please see selection table
- Max. ignition voltage $V_{ig}$: please see selection table
- Nom. Output frequency: 38.46kHz
- Duty cycle: 7.6% to 97.7% (1 to 12.7µsec)

**Front view:**

**Back view:**

**SELECTION TABLE:**

<table>
<thead>
<tr>
<th>$V_{av}$</th>
<th>$A_{av}$</th>
<th>kW</th>
<th>$V_{ig}$</th>
<th>MODULE NUMBER</th>
<th>ARTICLE NUMBER</th>
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<tr>
<td>400-800</td>
<td>12.5 – 6.25</td>
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<td>1400</td>
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<td>400-800</td>
<td>25 – 12.5</td>
<td>10</td>
<td>1400</td>
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<td>450-2800</td>
<td>26 – 4.3</td>
<td>12</td>
<td>2550</td>
<td>PLASMA\text{T}EC\ AC 2k84k3</td>
<td>NACR1325F01001</td>
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<td>28.5-10.4, 13.5-5.5, 16.6-4.5</td>
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<td>3550</td>
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<tr>
<td></td>
<td>32.5 – 6.5</td>
<td>12</td>
<td>1350</td>
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<td>NACR 1326F01001</td>
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<td>21.3-3.5, 15.6-6.5</td>
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<td>1800</td>
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<tr>
<td></td>
<td>22.5 – 7.3</td>
<td>15</td>
<td>1259</td>
<td>PLASMA\text{T}EC\ AC 2k07k3</td>
<td>NACR 1135F01001</td>
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<td></td>
<td>22.5-14.4, 15.4-10.4, 11.25-7.3</td>
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<td>1780</td>
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</table>

Height: 3 HU = 133.35mm
Width: 19\° = 482.6mm
Depth: 600mm = 725 mm inclusive plug

J.Schneider Elektrotechnik GmbH
Helmholtzstraße 13 * 77652 Offenburg * Tel +49 (0) 781 206-0

www.j-schneider.de
The PLASMA TEC Mp is the most flexible power supply from the proven J. Schneider PLASMA TEC power supply platform. The PLASMA TEC Mp power supplies provides / delivers multiple pulse shapes, an improved DC, unipolar pulse or bipolar pulse output current / voltage and are specially developed for plasma processes till 800V. In the range of 400V till 800V the full output power could be available.

At DC mode the device provides an improved DC output current / voltage which reduces the ARC tendency compared to pure standard DC.

At unipolar pulse mode the device provides an output frequency of 76kHz. The pulse duration can selected from 1µsec to 11µsec. This enables a wide range duty cycle from 7.6% to 85%.

At bipolar pulse mode the device provides an output frequency of 38kHz. The pulse duration also can selected from 1µsec to 11µsec, which comes up a duty cycle from 7.6% to 85%. The positive and negative pulses have the same output voltage. The number of pulses is adjustable from 1 till 255. The device is available with 5kW resp. 10kW and to increase the power it is possible to run up to 10 devices (100kW) in parallel mode.

The power supplies feature an extreme low output energy, an sophisticated flexible adjustable arc-management, a high power density as well as incomparable robustness. Therefore they are ideal for the use in industrial coating plants as well as in laboratories for coating development of glasses, photovoltaic cells, large area coating for glass or for flat panels. The regulation of current, voltage and power reach most accurate values via digital regulation.

- Optimized for defect-free processing, for state of the art thin film technologies
- Small footprint
- Inherent Current Source Characteristic, that insures low current overshoot by an ARC
- Extremely low internal stored energy
DC / Unipolar / Bipolar pulsed
PLASMA TEC Mp

BASIC TECHNICAL DATA:
Mains:
Input voltage: 3 x 400V AC ± 10%
Frequency 50 / 60 Hz ± 5%

Output:
Nom. output voltage V_{av} please see selection table
Nom. output power kW please see selection table
Nom. output current I_{av} please see selection table
Max. ignition voltage V_{ig} please see selection table
Nom. Output frequency unipolar 76kHz
Nom. Output frequency bipolar 38,46kHz
Duty cycle 7.6% to 85% (1 to 11µsec)

Front view: Back view:

<table>
<thead>
<tr>
<th>HEIGHT</th>
<th>WIDTH</th>
<th>DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 HU</td>
<td>19&quot;</td>
<td>600mm</td>
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<tr>
<td></td>
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</tr>
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<td></td>
<td>725 mm inclusive plug</td>
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SELECTION TABLE:

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<tr>
<th>MAXIMUM OUTPUT RATING</th>
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<th>ARTICLE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{av}</td>
<td>A_{av}</td>
<td>kW</td>
</tr>
<tr>
<td>400-800</td>
<td>12.5 – 6.25</td>
<td>5</td>
</tr>
<tr>
<td>400-800</td>
<td>25.0 – 12.5</td>
<td>10</td>
</tr>
</tbody>
</table>
The **PLASMA TEC ARC** is a high power switched mode power supply product line with state of the art CFPP (Current Fed Push Pull) technology. The **PLASMA TEC ARC** series are special designed for pulsed cathodic arc processes. The devices provide either straight DC or pulsed DC output current. In pulsed operation the base current and peak current and also the duty cycle can be set in a wide range. (Duty cycle can be set from 1-99%, the frequency 1-250Hz)

- Optimized for “droplet less” ARC / pulsed ARC processing
- Small footprint
- 12kW up to 400A (200A version planned)
- Inherent Current Source Characteristic, that insures stable ARC-Current (CFPP)
- Low stored energy
- Advanced pulsing capability (Multilevel Pulsing)
- Accurate Current Control with low overshoot
Pulsed Cathodic ARC-Supply
PLASMA TEC ARC

Basic Technical Data:
Mains:
Input voltage: 3 x 400V AC ± 10%
Frequency: 50 / 60 Hz ± 5%

DC-Mode:
Nom. output voltage: 10-30 DC (60V open voltage)
Nom. output power: 12 kW
Nom. output current: 400 A @ 30V

Pulsed-Mode:
Max. output voltage: 30 V (60V open voltage)
Max. output power: 12 kW
Max. output base current: 400 A @ 30V
Max. output peak current: 400 A @ 30V
Pulsing Frequency: 1Hz to 250Hz
Duty cycle: 1% to 99%
Minimum pulse length: 500µsec
Nominal output current in pulse mode:
\[ I_{av} = [I_{Base} \times (1 - \text{Duty Cycle})] + I_{Peak} \times \text{Duty Cycle} \]
e.g. \[ I_{av} = [80A \times (1 - 0,5)] + (200A \times 0,5) = 140A_{av} \]

Front view:
Back view:

Height: 3 HU = 133,35mm
Wide: 19" = 482,6mm
Deep: 600mm = 650 mm inclusive clamps

SELECTION TABLE:

<table>
<thead>
<tr>
<th>MAXIMUM OUTPUT RATING</th>
<th>MODULE NUMBER</th>
<th>ARTICLE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{av} )</td>
<td>( A_{av} )</td>
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<tr>
<td>30</td>
<td>200</td>
<td>6</td>
</tr>
<tr>
<td>30</td>
<td>400</td>
<td>12</td>
</tr>
</tbody>
</table>

J. Schneider Elektrotechnik GmbH
Helmholtzstraße 13 * 77652 Offenburg * Tel +49 (0) 781 206-0
Option 1: Touch panel in front plate

With the touch panel (resolution of 320 x 240 pixel in blue-white LED-backlight) the nominal values for the output values (voltage, current and rating) can be adjusted, the corresponding actual values, number of arcs, arcs / sec, ignitions, ignitions / sec as well as error messages can be read out. Also the release can be issued. With the touch panel more profound adjustments respectively parameterization of the unit is possible.

Option 2: Interfaces

For easy communication with a PLC there are 4 different fieldbus slave modules available:

- CANopen: 1 x Sub-D9 male, up to 1 Mbit/s
- PROFIBUS DP: 1 x Sub-D9 female, DP-V1, up to 12 Mbit/s
- PROFINET I/O-RT: 2 x RJ45, 100 Mbit/s, Class B Slave
- EtherCAT: 2 x RJ45, 100 Mbit/s, up to 1 ms cycle time

Necessary changes at the order number for the options:

NARC1436F 01 0 001

0 = Without Touch panel in front plate
1 = With Touch panel in front plate

01 = Standard Digital-/Analogue Interface
20 = additional PROFIBUS DP
30 = additional CANopen
40 = additional EtherCAT
50 = additional PROFINET
**INPUT CONNECTOR:**

<table>
<thead>
<tr>
<th>ARTICLE NUMBER</th>
<th>USABLE FOR</th>
<th>CABLE TYP</th>
<th>CABLE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDC70739F01002</td>
<td>PLASMA TEC DCp (5; 10kW)</td>
<td>non</td>
<td>0 meter</td>
</tr>
<tr>
<td>NDC41117F02002</td>
<td>PLASMA TEC Rp</td>
<td>Offlex 5 x 4mm²</td>
<td>2 meter</td>
</tr>
<tr>
<td>NDC41117F04002</td>
<td>PLASMA TEC AC (5; 10; 12kW)</td>
<td>Offlex 5 x 4mm²</td>
<td>4 meter</td>
</tr>
<tr>
<td>NDC41117F06002</td>
<td>PLASMA TEC Mp</td>
<td>Offlex 5 x 4mm²</td>
<td>6 meter</td>
</tr>
<tr>
<td>NDC41117F08002</td>
<td>PLASMA TEC ARC (6kW)</td>
<td>Offlex 5 x 4mm²</td>
<td>8 meter</td>
</tr>
<tr>
<td>NDC41117F10002</td>
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<td>Offlex 5 x 4mm²</td>
<td>10 meter</td>
</tr>
<tr>
<td>NDC71018F01002</td>
<td>PLASMA TEC DCp (20kW)</td>
<td>non</td>
<td>0 meter</td>
</tr>
<tr>
<td>NDC41018F02002</td>
<td>PLASMA TEC AC (15; 20kW)</td>
<td>Offlex 5 x 6mm²</td>
<td>2 meter</td>
</tr>
<tr>
<td>NDC41018F04002</td>
<td>PLASMA TEC AC (15; 20kW)</td>
<td>Offlex 5 x 6mm²</td>
<td>4 meter</td>
</tr>
<tr>
<td>NDC41018F06002</td>
<td>PLASMA TEC ARC (12kW)</td>
<td>Offlex 5 x 6mm²</td>
<td>6 meter</td>
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<tr>
<td>NDC41018F08002</td>
<td></td>
<td>Offlex 5 x 6mm²</td>
<td>8 meter</td>
</tr>
</tbody>
</table>

**OUTPUT CONNECTOR:**

<table>
<thead>
<tr>
<th>ARTICLE NUMBER</th>
<th>USABLE FOR</th>
<th>CABLE TYP</th>
<th>CABLE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDC70739F01001</td>
<td>PLASMA TEC Mp</td>
<td>non</td>
<td>0 meter</td>
</tr>
<tr>
<td>NHC41117F02001</td>
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<td>2 x RG213</td>
<td>2 x 2 meter</td>
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<tr>
<td>NHC41117F04001</td>
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<td>2 x RG213</td>
<td>2 x 4 meter</td>
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<td>NHC41117F06001</td>
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<td>2 x RG213</td>
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<td>NHC41117F08001</td>
<td></td>
<td>2 x RG213</td>
<td>2 x 8 meter</td>
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<tr>
<td>NDC71016F01001</td>
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<td>2 x 8 meter</td>
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<td>2 x 4 meter</td>
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<tr>
<td>NDC41018F06001</td>
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<tr>
<td>NDC41018F08001</td>
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<td>2 x Ecoflex 15</td>
<td>2 x 8 meter</td>
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<tr>
<td>NAC71325F01001</td>
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<td>0 meter</td>
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<tr>
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<td></td>
<td>2 x RG213</td>
<td>2 x 2 meter</td>
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<td>2 x 4 meter</td>
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