

## FEATURES

- Professional four-wire speaker cables
- Force / Sense configuration for voltage pickup at speaker terminal
- Over-current protection
- Accurate measurements
- Oxygen free copper
- High power capability
- Low cable resistance
- Various configuration available
- Easy measurement setup
- High Temperature range



All cables distributed as part of the KLIPPEL ANALYZER SYSTEM are high quality, professional audio cables. The Speaker Cable is connecting the hardware unit with the device under test whereas the Amplifier Cable is connecting the power amplifier with the hardware unit. They are specified to work at high power levels guaranteeing high accuracy of the measured signals, high flexibility, robustness and safety to the user. Default configurations as well as user definable terminations connecting to any speaker terminal are available. Using a 4-wire force-sense configuration for voltage pickup directly at the speaker terminal, high precision even for longer cables and high currents is maintained.

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## 1 Amplifier Cable

The Amplifier Cable connects any 1 or 2 channel audio power amplifier with the hardware unit. If using a mono amplifier the 2 channels of the hardware unit may be driven from the mono output (connect 1+ w/ 2+ and 1- w/ 2-). If not using touch protected connectors the user has to ensure safe operation.





Configuration	Speakon® connector			
Hot wire first speaker channel				1+
Cold wire first speaker channel				1-
Hot wire second speaker channel				2+
Cold wire second speaker channel				2-
Cable termination		Length	Max. Current	Article #
Blank terminals, crimped ferrule		1.5 m	30 A <sub>rms</sub>	2300-010
Blank terminals, crimped ferrule + 2 separate Speakon® Connectors  (included with QC + R&D cable set, coming with the hardware)		1.5 m	30 A <sub>rms</sub>	2300-017
1:1 Speakon® Connector, 4-wire Color-coded "AMPLIFIER"-cable (CH 1: 1+ / 1- CH 2: 2+ / 2-) included with KA3 Amp-Card		0.5 m	30 A <sub>rms</sub>	2300-006
1:1 Speakon® Connector, 4-wire Color-coded "AMPLIFIER"-cable (CH 1: 1+ / 1- CH 2: 2+ / 2-) included with DYNACORD Amps		1.5 m	30 A <sub>rms</sub>	2300-009
1:1 Speakon® Connector, 4-wire  For 2-Channel - Single Output amplifiers: (CH 1: 1+ / 1- CH 2: 2+ / 2-)		1 m 2 m 5 m 10 m	30 A <sub>rms</sub>	2300-012 2300-011 2300-013 2300-014

**Note:**

- For Distortion Analyzer Rev. 1.0 – 2.0 and Power Monitor 8 Rev.1.1 cables are distributed with fuses for over-current protection. Distortion Analyzer Rev. >= 2.1 and Power Monitor 8 Rev. >= 2.0 have built in fuses in the hardware devices. Production Analyzer are equipped in all revisions with built in fuses.
- 2-channel amp – with 1 combined Speakon® Output: CH 1: 1+ / 1- CH 2: 2+ / 2-
  - Art-No: 2300-011, 2300-012, 2300-013, 2300-014, 2300-017 could be used
- 2-channel amp – with 2 separate Speakon® Outputs:  
Cable label = Speakon® Label: CH1: 1+ = 1+, 1- = 1-, 2+ = 1+ (2<sup>nd</sup> plug), 2- = 1- (2<sup>nd</sup> plug)
  - Art-No: 2300-017 could be used
- 2-channel amp – with Binding Post Outputs: CH 1: 1+ / 1- CH 2: 2+ / 2-
  - Art-No: 2300-010, 2300-017 could be used
- 2-channel amp in Bridged Mode – with Binding Post Outputs: 1+ & 2+ and 1- & 2- have to be connected to the same Binding Post (used Binding Post for Bridged Mode according amp spec)
  - Art-No: 2300-010, 2300-017 could be used
- 2-channel amp in Bridged mode – with Speakon® Output:
  - Art-No: 2300-017 could be used
- Single channel amp – with Binding Post Output:  
1+ & 2+ and 1- & 2- have to be connected to the same Binding Post
  - Art-No: 2300-010, 2300-017 could be used
- Single channel amp – with Speakon® Output:
  - When 1+ & 2+ and 1- & 2- are connected inside the amp
    - Art-No: 2300-011, 2300-012, 2300-013, 2300-014, 2300-017 could be used
  - When output signal is only provided at Speakon® 1+ / 1- terminals:
    - Art-No: 2300-017 could be used
- 2 crimped ferrules cannot be mounted into one Speakon® terminal. Binding Posts have to be used or the crimped ferrules have to be removed and wires soldered directly into the Speakon® plug.

## 2 Speakon-Speakon Extension Cable

<p>The Speakon® - Speakon® Extension Cables are available in two configurations:</p> <ul style="list-style-type: none"> <li>• Speakon® female to Speakon® female cables with 4 x 2.5 mm<sup>2</sup> wires can be connected to any Speakon® cable with female plug by the included Speakon® male to Speakon® male adapter.</li> <li>• Speakon female to Speakon® male cables with 4 x 4 mm<sup>2</sup> wires can be connected to any Speakon® cable with female plug directly. Use this type to minimize cable losses.</li> </ul>					
<b>Configuration</b>	1:1 connection of Speakon contacts 1+, 1-, 2+, 2-				
<b>Cable termination</b>		<b>Length</b>	<b>SpeakonCoupling</b>	<b>Max. Current</b>	<b>Article #</b>
<p>1:1 Speakon® Connectors, female – female, 4 x 2.5 mm<sup>2</sup> wires</p> <p>+</p> <p>1:1 Speakon® male - male coupling</p>		<p>1 m</p> <p>2 m</p> <p>5 m</p> <p>10 m</p>	included	30 A <sub>rms</sub>	<p>2300-015</p> <p>2300-016</p> <p>2300-007</p> <p>2300-008</p>
<p>1:1 Speakon® Connectors, female – male, 4 x 4 mm<sup>2</sup> wires</p>		<p>5 m</p> <p>10 m</p> <p>15 m</p>	not needed	40 A <sub>rms</sub>	<p>2300-032</p> <p>2300-031</p> <p>2300-033</p>

### 3 Speaker Cable

The Speaker cable connects the device under test with the hardware unit.

All speaker cables are 4 wire (Kelvin configuration) for precise voltage measurement.

The user must select one of the available cable terminations.

<b>Length</b>	2,20 m	Other length on request
<b>Configuration</b>		Speakon® contact
Hot wire force		1+
Cold wire force		1-
Hot wire sense		2+
Cold wire sense		2-

For Force / Sense Configuration 1+ and 2+ as well as 1- and 2- have to be connected.

#### Cable termination

The Speaker cables are available in 3 configurations. Please select according to your requirements.

- All cables are equipped with ø4 mm rigid guard safety plug

#### High Precision Speaker Cable

Article # 2300-004 - *Not available anymore!*

- True 4-wire (Kelvin) configuration up to the tip of clamps
- especially suited for low resistance measurements
- recommended for high current measurements
- for fast and safe contact on flat conductor bars
- specified for 16 A<sub>rms</sub>
- specified for -20 to +70°C



#### General Purpose Speaker Cable

Article # 2300-005


- Alligator Test Clip
- for general applications
- specified for 32 A<sub>rms</sub> / 1000 V<sub>rms</sub>
- specified for -20 to +70°C
- 4-wire configuration ends at the alligator 4mm input (included with cable set for RnD & QC application)



#### Extended Temperature Range Speaker Cable

Article # 2300-025 - *Not available anymore!*


- Alligator Test Clip
- for Power Test and climate testing applications
- specified for 32 A<sub>rms</sub> / 1000 V<sub>rms</sub>
- specified for -40 to +105°C
- 4-wire configuration ends at the alligator 4mm input (included with cable set of Power Test System)



<b>Speaker Cable Without Clips</b> Article # 2300-023	
<ul style="list-style-type: none"> <li>• for use of own connectors or clips</li> <li>• specified for 32 A<sub>rms</sub> / 1000 V<sub>rms</sub></li> <li>• specified for -20 to +70°C</li> <li>• 4-wire configuration ends at the alligator 4mm input</li> </ul>	

## 4 General Speaker Cable Specifications

Parameter	Symbol	Min	Typ.	Max	Unit
Conductor cross section	$A_{cable}$		2.5		mm <sup>2</sup>
Cable diameter	$d_{cable}$		10		mm
Resistance	$R_{DC}$		7.5 15mOhm/m		Ω/km
Temperature	$t_{amb}$	-25		70	°C
High Temperature Cable on request (Standard cable for Power Monitor 8 Speaker Cable)	$t_{amb}$	-50		180	°C

## 5 Clips for Speaker Cables

Separate clips are available for replacement purpose.		
Pair of true 4-wire Kelvin Clips	Art. # 2300-022 <i>Not available anymore!</i>	
<ul style="list-style-type: none"> <li>• True 4-wire (Kelvin) configuration up to the tip of clamps</li> <li>• especially suited for low resistance measurements</li> <li>• recommended for high current measurements</li> <li>• for fast and safe contact on flat conductor bars</li> <li>• specified for 16 A<sub>rms</sub></li> <li>• specified for -20 to +70°C</li> </ul>		

Pair of Alligator Clips	Art. # 2300-020	
<ul style="list-style-type: none"><li>• Alligator test clip</li><li>• for general applications</li><li>• specified for 32 A<sub>rms</sub> / 1000 V<sub>rms</sub></li><li>• specified for -20 to +70°C</li><li>• 4-wire configuration ends at the alligator 4mm input</li></ul> <p>(included with cable set for QC applications, included with Scanning Vibrometer System, added to modified Distortion Analyzer “High Current” and “High Power” Version)</p>		
Pair of Micro-Speaker Clips	Art. # 2300-024	
<ul style="list-style-type: none"><li>• Small alligator test clip</li><li>• for general and micro speaker applications</li><li>• specified for 15 A<sub>rms</sub> / 300 V<sub>rms</sub></li><li>• 4-wire configuration ends at the alligator 4mm input</li></ul> <p>(included with Scanning Vibrometer System, Included with Vacuum Measurement Kit)</p>		

## 6 Various Information

<b>XLR Cable</b>	1 m included in analyzer cable set (coming with the hardware) 2 m included in Phantom powered Mic Sets 1 m, 2 m, 5 m, 10 m, 15 m, 20 m are available
<b>BNC Cable</b>	2 m included in IEPE powered Microphone Sets 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m are available
<b>Lemo Extension Cable</b>	Connecting analyzer hardware and laser controller. 5 m, 20 m, 25 m are available

Find explanations for symbols at:

<http://www.klippel.de/know-how/literature.html>

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