

## Data Sheet | Item Number: 231-642/109-000

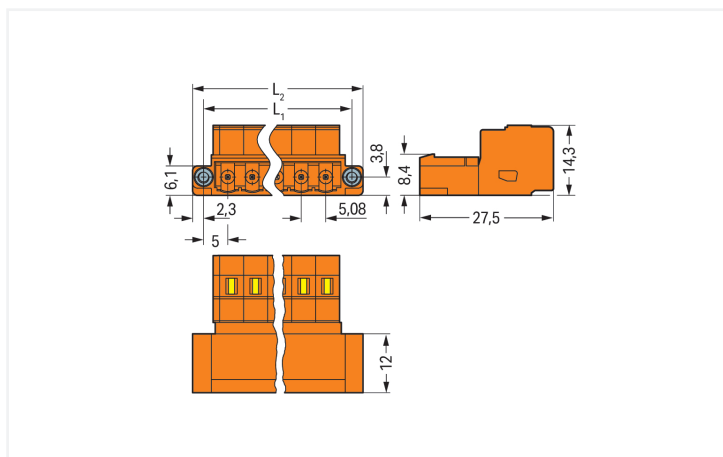
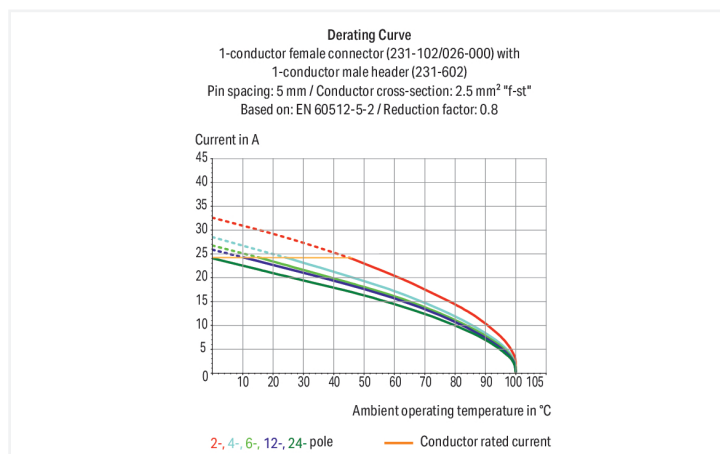
1-conductor male connector; CAGE CLAMP®; 2.5 mm<sup>2</sup>; Pin spacing 5.08 mm; 12-pole;  
Threaded flange; orange

<https://www.wago.com/231-642/109-000>



Color: ■ orange

Similar to illustration



Dimensions in mm

$L1 = (\text{pole no.} \times \text{pin spacing}) + 5.4 \text{ mm}$   
 $L2 = (\text{pole no.} \times \text{pin spacing}) + 10 \text{ mm}$

Male connector, 231 Series, 0° conductor exit to connection direction

This male connector (item number 231-642/109-000) simplifies electrical installations. Ensure that the strip lengths are between 8 and 9 mm when connecting conductors to this male connector. This product features one conductor terminal and utilizes CAGE CLAMP®. Our reliable and maintenance-free CAGE CLAMP® connection makes it easy to connect all conductor types without having to prepare the conductor. For example, you don't need to crimp ferrules. The dimensions are (70.86 x 14.3 x 27.5) mm (width x height x depth). This male connector is suitable for conductor cross sections ranging from 0.08 mm<sup>2</sup> to 2.5 mm<sup>2</sup>.

Tin is used for coating the contact surfaces.



| Notes              |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety Information | The MCS – <i>MULTI CONNECTION SYSTEM</i> includes connectors without breaking capacity in accordance with DIN EN 61984. When used as intended, these connectors must not be connected/disconnected when live or under load. When used as intended, these connectors must not be connected/disconnected when live or under load. The circuit design should ensure header pins, which can be touched, are not live when unmated. |
| Variants:          | Other pole numbers<br>Gold-plated or partially gold-plated contact surfaces<br>Other versions (or variants) can be requested from WAGO Sales or configured at <a href="https://configurator.wago.com/">https://configurator.wago.com/</a> .                                                                                                                                                                                    |

| Electrical data                 |       |                |       |
|---------------------------------|-------|----------------|-------|
| Ratings per                     |       | IEC/EN 60664-1 |       |
| Overvoltage category            | III   | III            | II    |
| Pollution degree                | 3     | 2              | 2     |
| Nominal voltage                 | 320 V | 320 V          | 630 V |
| Rated impulse withstand voltage | 4 kV  | 4 kV           | 4 kV  |
| Rated current                   | 12 A  | 12 A           | 12 A  |
| Approvals per                   |       | UL 1059        |       |
| Use group                       | B     | C              | D     |
| Rated voltage                   | 300 V | -              | 300 V |
| Rated current                   | 15 A  | -              | 10 A  |
| Approvals per                   |       | UL 1977        |       |
| Rated voltage                   | 600 V |                |       |
| Rated current                   | 15 A  |                |       |
| Approvals per                   |       | CSA            |       |
| Use group                       | B     | C              | D     |
| Rated voltage                   | 300 V | -              | 300 V |
| Rated current                   | 15 A  | -              | 10 A  |

| Connection Data                                   |                                            |
|---------------------------------------------------|--------------------------------------------|
| Clamping units                                    | 12                                         |
| Total number of potentials                        | 12                                         |
| Number of connection types                        | 1                                          |
| Number of levels                                  | 1                                          |
| Connection 1                                      |                                            |
| Connection technology                             | CAGE CLAMP®                                |
| Actuation type                                    | Operating tool                             |
| Actuation direction 1                             | Operation parallel to conductor entry      |
| Actuation direction 2                             | Operation perpendicular to conductor entry |
| Solid conductor                                   | 0.08 ... 2.5 mm² / 28 ... 12 AWG           |
| Fine-stranded conductor                           | 0.08 ... 2.5 mm² / 28 ... 12 AWG           |
| Fine-stranded conductor; with insulated ferrule   | 0.25 ... 1.5 mm²                           |
| Fine-stranded conductor; with uninsulated ferrule | 0.25 ... 2.5 mm²                           |
| Strip length                                      | 8 ... 9 mm / 0.31 ... 0.35 inches          |
| Pole number                                       | 12                                         |
| Conductor entry direction to mating direction     | 0 °                                        |

| Physical data |                        |
|---------------|------------------------|
| Pin spacing   | 5.08 mm / 0.2 inches   |
| Width         | 70.86 mm / 2.79 inches |
| Height        | 14.3 mm / 0.563 inches |
| Depth         | 27.5 mm / 1.083 inches |

| Mechanical data          |     |
|--------------------------|-----|
| Variable coding          | Yes |
| Anti-rotation protection | Yes |

| Plug-in connection                 |                     |
|------------------------------------|---------------------|
| Contact type (pluggable connector) | Male connector/plug |
| Connector (connection type)        | for conductor       |
| Mismating protection               | No                  |
| Locking of plug-in connection      | Threaded flange     |

| Material data                      |                                                                          |
|------------------------------------|--------------------------------------------------------------------------|
| Note (material data)               | <a href="#">Information on material specifications can be found here</a> |
| Color                              | orange                                                                   |
| Material group                     | I                                                                        |
| Insulation material (main housing) | Polyamide (PA66)                                                         |
| Flammability class per UL94        | V0                                                                       |
| Clamping spring material           | Chrome-nickel spring steel (CrNi)                                        |
| Contact material                   | Electrolytic copper (E <sub>Cu</sub> )                                   |
| Contact Plating                    | Tin                                                                      |
| Fire load                          | 0.282 MJ                                                                 |
| Weight                             | 19 g                                                                     |

| Environmental requirements |                 |
|----------------------------|-----------------|
| Limit temperature range    | -60 ... +100 °C |
| Processing temperature     | -35 ... +60 °C  |

| Environmental Testing                                                                               |                                                     |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Test specification:<br>Railway applications –<br>Rolling stock –<br>Electronic equipment            | DIN EN 50155 (VDE 0115-200):2022-06                 |
| Test procedure:<br>Railway applications –<br>Rolling stock equipment –<br>Vibration and shock tests | DIN EN 61373 (VDE 0115-0106):2011-04                |
| Spectrum/Mounting location                                                                          | Service life test, Category 1, Class A/B            |
| Functional test with noise-like oscillations                                                        | Test passed according to Section 8 of the standard  |
| Frequency                                                                                           | f <sub>1</sub> = 5 Hz to f <sub>2</sub> = 150 Hz    |
| Acceleration                                                                                        | 0.101g (highest test level used for all axes)       |
| Test duration per axis                                                                              | 10 min.                                             |
| Test directions                                                                                     | X, Y and Z axes                                     |
| Monitoring of contact faults and interruptions                                                      | Passed                                              |
| Voltage drop measurement before and after each axis                                                 | Passed                                              |
| Simulated service life test through increased levels of noise-like oscillations                     | Test passed according to Section 9 of the standard  |
| Frequency                                                                                           | f <sub>1</sub> = 5 Hz to f <sub>2</sub> = 150 Hz    |
| Acceleration                                                                                        | 0.572g (highest test level used for all axes)       |
| Test duration per axis                                                                              | 5 h                                                 |
| Test directions                                                                                     | X, Y and Z axes                                     |
| Extended testing: Monitoring of contact faults and interruptions                                    | Passed                                              |
| Extended testing: Voltage drop measurement before and after each axis                               | Passed                                              |
| Shock test                                                                                          | Test passed according to Section 10 of the standard |
| Shock pulse form                                                                                    | Half sine                                           |
| Acceleration                                                                                        | 5g (highest test level used for all axes)           |



| Environmental Testing                                                 |                   |
|-----------------------------------------------------------------------|-------------------|
| Shock duration                                                        | 30 ms             |
| Number of shocks (per axis)                                           | 3 pos. und 3 neg. |
| Test directions                                                       | X, Y and Z axes   |
| Extended testing: Monitoring of contact faults and interruptions      | Passed            |
| Extended testing: Voltage drop measurement before and after each axis | Passed            |
| Vibration and shock stress for rolling stock equipment                | Passed            |

| Commercial data       |                        |
|-----------------------|------------------------|
| Product Group         | 3 (Multi Conn. System) |
| PU (SPU)              | 25 pcs                 |
| Packaging type        | Box                    |
| Country of origin     | DE                     |
| GTIN                  | 4045454029241          |
| Customs tariff number | 85366930000            |

| Product Classification |                      |
|------------------------|----------------------|
| UNSPSC                 | 39121409             |
| eCl@ss 10.0            | 27-44-03-09          |
| eCl@ss 9.0             | 27-44-03-09          |
| ETIM 9.0               | EC002638             |
| ETIM 10.0              | EC002638             |
| ECCN                   | NO US CLASSIFICATION |

| Environmental Product Compliance          |                                      |
|-------------------------------------------|--------------------------------------|
| RoHS Compliance Status                    | Compliant,With Exemption             |
| RoHS Exemption                            | 6(c)                                 |
| SCIP notification number (Austria)        | 0bf7c89b-b195-4fcb-911c-9edc227707bc |
| SCIP notification number (Belgium)        | 2b3caa05-524d-4568-b312-8c38c5e898c7 |
| SCIP notification number (Bulgaria)       | d1942e0a-2474-4a6e-84a7-d3127d85b2bd |
| SCIP notification number (Czech Republic) | 9ec89500-88dc-4c82-afdf-0ec765c58696 |
| SCIP notification number (Denmark)        | 643d375c-66fc-4da7-a010-1b90c5814982 |
| SCIP notification number (Finland)        | 3ddc5a55-cbd0-40c2-a660-e0643a99f2b9 |
| SCIP notification number (France)         | f64fe4ef-4c76-4b80-a6f4-8640cef0fc44 |
| SCIP notification number (Germany)        | cc520526-74a1-4642-be8e-c02d1b9363e5 |
| SCIP notification number (Hungary)        | aabed05b-138c-4595-9ef4-48ed3bc09007 |
| SCIP notification number (Italy)          | 58088bd9-70dc-40f1-a3e7-d8c2d85f71b4 |
| SCIP notification number (Netherlands)    | e10b7bba-d6cf-4cd3-8d8f-b2942e0404b9 |
| SCIP notification number (Poland)         | d1908bc5-c333-4b78-99e7-176de478dd9d |
| SCIP notification number (Romania)        | 6461fcbe-a029-4193-888f-2d2ab2c5e5f4 |
| SCIP notification number (Sweden)         | 223a9e56-00b6-4fa6-8d6a-d21a5f088c5a |



Approvals / Certificates

General approvals



| Approval                              | Standard  | Certificate Name |
|---------------------------------------|-----------|------------------|
| CB<br>DEKRA Certification B.V.        | IEC 61984 | NL-113351        |
| CSA<br>DEKRA Certification B.V.       | C22.2     | 1466354          |
| KEMA/KEUR<br>DEKRA Certification B.V. | EN 61984  | 71-130478 REV.1  |
| UL<br>UL International Germany GmbH   | UL 1977   | E45171           |
| UR<br>Underwriters Laboratories Inc.  | UL 1059   | E45172           |

Declarations of conformity and manufacturer's declarations



| Approval                      | Standard | Certificate Name |
|-------------------------------|----------|------------------|
| Railway<br>WAGO GmbH & Co. KG | -        | Railway Ready    |

Approvals for marine applications



| Approval                  | Standard  | Certificate Name |
|---------------------------|-----------|------------------|
| BV<br>Bureau Veritas S.A. | IEC 60998 | 11915/E0 BV      |

Downloads

Environmental Product Compliance

| Compliance Search                                   |
|-----------------------------------------------------|
| Environmental Product Compliance<br>231-642/109-000 |



Documentation

| Additional Information                               |
|------------------------------------------------------|
| Technical Section<br>03.04.2019<br>pdf<br>2027.26 KB |



CAD/CAE-Data

| CAD data                        |
|---------------------------------|
| 2D/3D Models<br>231-642/109-000 |



| CAE data                             |
|--------------------------------------|
| EPLAN Data Portal<br>231-642/109-000 |
| ZUKEN Portal<br>231-642/109-000      |





1 Compatible Products

1.1 System counterpart

1.1.1 Female connector/socket



**Item No.: 231-312/107-000**  
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 12-pole; Screw flange; orange



**Item No.: 2231-312/107-000**  
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 12-pole; Screw flange; 2,50 mm²; orange



**Item No.: 231-2312/107-000**  
2-conductor female connector; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 12-pole; Screw flange; orange

1.2 Optional Accessories

1.2.1 Coding

1.2.1.1 Coding



**Item No.: 231-129**  
Coding key; snap-on type; light gray

1.2.2 Cover

1.2.2.1 Cover



**Item No.: 231-669**  
Lockout caps; for covering unused clamping units; orange

1.2.3 Ferrule

1.2.3.1 Ferrule



**Item No.: 216-301**  
Ferrule; Sleeve for 0.25 mm² / AWG 24; insulated; electro-tin plated; yellow



**Item No.: 216-302**  
Ferrule; Sleeve for 0.34 mm² / 22 AWG; insulated; electro-tin plated; light turquoise



**Item No.: 216-201**  
Ferrule; Sleeve for 0.5 mm² / 20 AWG; insulated; electro-tin plated; electrolytic copper; acc. to DIN 46228, Part 4/09.90; white



**Item No.: 216-101**  
Ferrule; Sleeve for 0.5 mm² / AWG 22; uninsulated; electro-tin plated; silver-colored



**Item No.: 216-202**  
Ferrule; Sleeve for 0.75 mm² / 18 AWG; insulated; electro-tin plated; gray



**Item No.: 216-102**  
Ferrule; Sleeve for 0.75 mm² / 18 AWG; uninsulated; electro-tin plated; silver-colored



**Item No.: 216-203**  
Ferrule; Sleeve for 1 mm² / AWG 18; insulated; electro-tin plated; red



**Item No.: 216-103**  
Ferrule; Sleeve for 1 mm² / AWG 18; uninsulated; electro-tin plated



**Item No.: 216-204**  
Ferrule; Sleeve for 1.5 mm² / AWG 16; insulated; electro-tin plated; black



**Item No.: 216-104**  
Ferrule; Sleeve for 1.5 mm² / AWG 16; uninsulated; electro-tin plated; silver-colored



1.2.4 Insulation stop

1.2.4.1 Insulation stop



**Item No.: 231-670**  
Insulation stop; 0.08-0.2 mm<sup>2</sup> / 0.2 mm<sup>2</sup> "s"; white



**Item No.: 231-671**  
Insulation stop; 0.25 - 0.5 mm<sup>2</sup>; light gray



**Item No.: 231-672**  
Insulation stop; 0.75 - 1 mm<sup>2</sup>; dark gray

1.2.5 Jumper

1.2.5.1 Jumper



**Item No.: 231-910**  
Jumper; for conductor entry; 10-way; insulated; gray



**Item No.: 231-902**  
Jumper; for conductor entry; 2-way; insulated; gray



**Item No.: 231-903**  
Jumper; for conductor entry; 3-way; insulated; gray



**Item No.: 231-905**  
Jumper; for conductor entry; 5-way; insulated; gray



**Item No.: 231-907**  
Jumper; for conductor entry; 7-way; insulated; gray

1.2.6 Marking

1.2.6.1 Marking strip



**Item No.: 210-331/508-103**  
Marking strips; as a DIN A4 sheet; MARKED; 1-12 (200x); Height of marker strip: 2.3 mm/0.091 in; Strip length 182 mm; Horizontal marking; Self-adhesive; white



**Item No.: 210-332/508-202**  
Marking strips; as a DIN A4 sheet; MARKED; 1-16 (160x); Height of marker strip: 3 mm; Strip length 182 mm; Horizontal marking; Self-adhesive; white



**Item No.: 210-332/508-205**  
Marking strips; as a DIN A4 sheet; MARKED; 1-32 (80x); Height of marker strip: 3 mm; Strip length 182 mm; Horizontal marking; Self-adhesive; white



**Item No.: 210-331/508-104**  
Marking strips; as a DIN A4 sheet; MARKED; 13-24 (200x); Height of marker strip: 2.3 mm/0.091 in; Strip length 182 mm; Horizontal marking; Self-adhesive; white



**Item No.: 210-332/508-204**  
Marking strips; as a DIN A4 sheet; MARKED; 17-32 (160x); Height of marker strip: 3 mm; Strip length 182 mm; Horizontal marking; Self-adhesive; white



**Item No.: 210-332/508-206**  
Marking strips; as a DIN A4 sheet; MARKED; 33-48 (160x); Height of marker strip: 3 mm; Strip length 182 mm; Horizontal marking; Self-adhesive; white

1.2.7 Strain relief

1.2.7.1 Strain relief housing



**Item No.: 232-642**  
Strain relief housing; for female and male connectors; 2 parts; Pin spacing 5.08 mm; 12-pole; orange



1.2.8 Tool

1.2.8.1 Operating tool



**Item No.: 210-720**  
Operating tool; Blade: 3.5 x 0.5 mm; with a partially insulated shaft; multicoloured



**Item No.: 210-657**  
Operating tool; Blade: 3.5 x 0.5 mm; with a partially insulated shaft; short; multi-coloured



**Item No.: 209-132**  
Operating tool; for connecting comb-style jumper bar; made of insulating material; 2-way; natural



**Item No.: 280-440**  
Operating tool; made of insulating material; 10-way; white



**Item No.: 209-130**  
Operating tool; made of insulating material; 1-way; for 264 Series (1-/2-way), 280, 281 Series (up to 3-way); natural



**Item No.: 231-291**  
Operating tool; made of insulating material; 1-way; loose; red



**Item No.: 231-131**  
Operating tool; made of insulating material; 1-way; loose; white



**Item No.: 280-432**  
Operating tool; made of insulating material; 2-way; white



**Item No.: 280-433**  
Operating tool; made of insulating material; 3-way; white



**Item No.: 280-434**  
Operating tool; made of insulating material; 4-way; white



**Item No.: 280-435**  
Operating tool; made of insulating material; 5-way; gray



**Item No.: 280-436**  
Operating tool; made of insulating material; 6-way; white



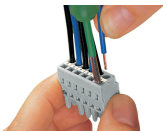
**Item No.: 280-437**  
Operating tool; made of insulating material; 7-way; white



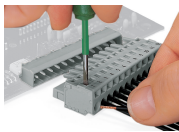
**Item No.: 280-438**  
Operating tool; made of insulating material; 8-way; white

Installation Notes

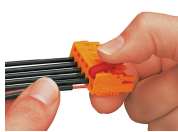
Conductor termination



Inserting a conductor via 3.5 mm screwdriver – CAGE CLAMP® actuation parallel to conductor entry.



Inserting a conductor via 3.5 mm screwdriver – CAGE CLAMP® actuation perpendicular to conductor entry.

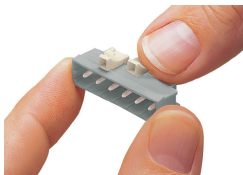


Inserting a conductor into CAGE CLAMP® unit via operating tool (231-291).



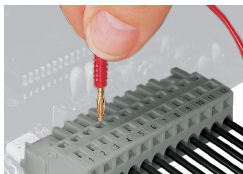
Inserting a conductor via operating tool.

Coding



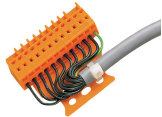
Coding a male header – fitting coding key(s).

Testing



Testing – female connector with CAGE CLAMP®  
Integrated test ports for testing perpendicular to conductor entry via 2 or 2.3 mm Ø test plug

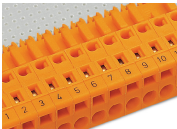
Installation



Male connector with strain relief plate

Strain relief housing shown with a male connector equipped with CAGE CLAMP®

Marking



Labeling via direct marking or self-adhesive strips.