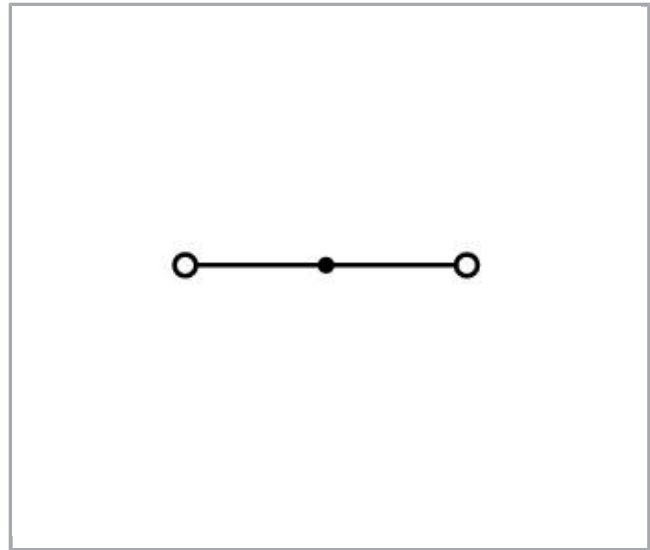
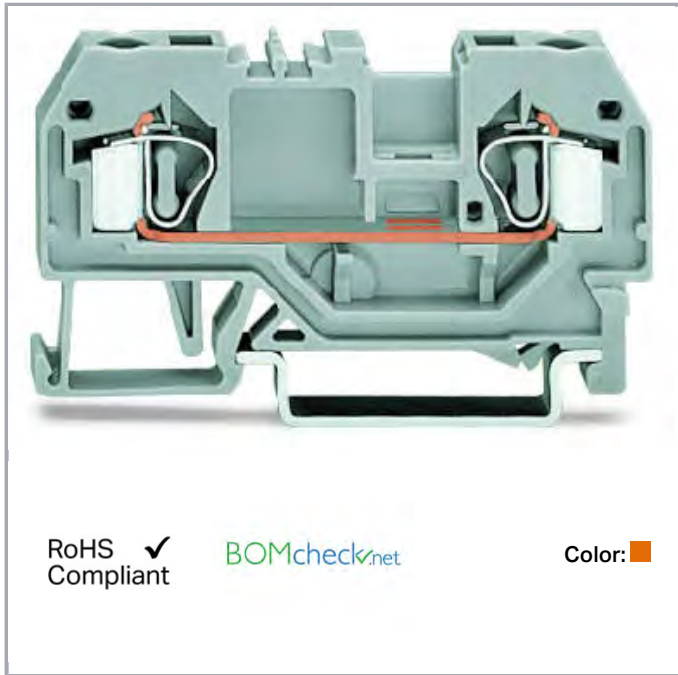


## Data sheet | Item number: 281-902

2-conductor through terminal block; 4 mm<sup>2</sup>; center marking; for DIN-rail 35 x 15 and 35 x 7.5; CAGE CLAMP®; 4,00 mm<sup>2</sup>; orange



### Item description

#### Note:

##### Terminating Aluminum Conductors

WAGO spring clamp terminal blocks are suitable for solid aluminum conductors up to 4 mm<sup>2</sup>/12 AWG if WAGO "Alu-Plus" Contact Paste is used for termination.

##### "Alu-Plus" Contact Paste Advantages:

- Automatically destroys the oxide film during clamping.
- Prevents fresh oxidation at the clamping point.
- Prevents electrolytic corrosion between aluminum and copper conductors (in the same terminal block).
- Provides long-term protection against corrosion.

Using terminal blocks with CAGE CLAMP® Spring Pressure Connection Technology, **aluminum conductors must first be cleaned with a blade** and then immediately be inserted into the clamping units filled with "Alu-Plus" Contact Paste.

It is also possible to apply WAGO "Alu-Plus" **additionally** on the whole surface of the aluminum conductor before termination.

Subject to changes. Please also observe the further product documentation!



Please note that the nominal currents must be adapted to the reduced conductivity of the aluminum conductors::

2.5 mm<sup>2</sup> = 16 A

4 mm<sup>2</sup> = 22 A

## Data

### Electrical data

#### Ratings per IEC/EN 60664-1

| Ratings per                 | IEC/EN 60947-7-1                                                     |
|-----------------------------|----------------------------------------------------------------------|
| Nominal voltage (III/3)     | 800 V                                                                |
| Rated surge voltage (III/3) | 8 kV                                                                 |
| Rated current               | 32 A                                                                 |
| Legend (ratings)            | (III / 3) $\triangleq$ Overvoltage category III / Pollution degree 3 |

### Connection data

|                                   |                                            |
|-----------------------------------|--------------------------------------------|
| Connection technology             | CAGE CLAMP®                                |
| Actuation type                    | Operating tool                             |
| Connectable conductor materials   | Copper<br>Aluminum                         |
| Solid conductor                   | 0,08 ... 4 mm <sup>2</sup> / 28 ... 12 AWG |
| Fine-stranded conductor           | 0,08 ... 4 mm <sup>2</sup> / 28 ... 12 AWG |
| Strip length                      | 9 ... 10 mm / 0.35 ... 0.39 inch           |
| Total number of connection points | 2                                          |
| Total number of potentials        | 1                                          |
| Number of levels                  | 1                                          |
| Wiring type                       | Front-entry wiring                         |

### Geometrical Data

|                                    |                    |
|------------------------------------|--------------------|
| Width                              | 6 mm / 0.236 inch  |
| Height from upper-edge of DIN-rail | 29 mm / 1.142 inch |
| Depth                              | 59 mm / 2.323 inch |

### Mechanical data

|               |                 |
|---------------|-----------------|
| Design        | horizontal type |
| Mounting type | DIN-35 rail     |
| Marking level | Center marking  |

Subject to changes. Please also observe the further product documentation!

## Material Data

|                     |                      |
|---------------------|----------------------|
| Color               | orange               |
| Insulation material | Polyamide 66 (PA 66) |
| Fire load           | 0.145 MJ             |
| Weight              | 7.9 g                |

## Commercial data

|                       |               |
|-----------------------|---------------|
| Packaging type        | BOX           |
| Country of origin     | DE            |
| GTIN                  | 4044918485074 |
| Customs tariff number | 85369010000   |

## Approvals / Certificates

### Country specific Approvals

| Logo                                                                               | Approval                                     | Additional Approval Text | Certificate name |
|------------------------------------------------------------------------------------|----------------------------------------------|--------------------------|------------------|
|   | <b>CCA</b><br>DEKRA Certification B.V.       | EN 60947, IEC 60947      | NTR NL-7454/A1   |
|  | <b>CSA</b><br>DEKRA Certification B.V.       | C22.2 No. 158            | 1505034          |
|  | <b>KEMA/KEUR</b><br>DEKRA Certification B.V. | EN 60947                 | 71-107288        |

### Ship Approvals

| Logo                                                                                | Approval                                  | Additional Approval Text | Certificate name |
|-------------------------------------------------------------------------------------|-------------------------------------------|--------------------------|------------------|
|   | <b>ABS</b><br>American Bureau of Shipping | -                        | 20-HG1941090-PDA |
|  | <b>BV</b><br>Bureau Veritas S.A.          | EN 60947                 | 07436/E0 BV      |

Subject to changes. Please also observe the further product documentation!



**DNV GL**  
Det Norske Veritas, Germanischer Lloyd

-

TAE00001V2



**LR**  
Lloyds Register

EN 60947

91/20112  
(E9)

#### UL-Approvals

| Logo                                                                             | Approval                                    | Additional Approval Text | Certificate name |
|----------------------------------------------------------------------------------|---------------------------------------------|--------------------------|------------------|
|  | <b>UR</b><br>Underwriters Laboratories Inc. | UL 1059                  | E45172           |

#### Counterpart

#### Compatible products

#### Carrier rail

|                                                                                    |                                                                                                                                       |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                    | <b>Item no.: 210-112</b><br>Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; slotted; according to EN 60715; "Hole width 25 mm" |
|  | <b>Item no.: 210-113</b><br>Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; unslotted; according to EN 60715                   |
|  | <b>Item no.: 210-114</b><br>Steel carrier rail; 35 x 15 mm; 1.5 mm thick; 2 m long; unslotted; similar to EN 60715                    |
|  | <b>Item no.: 210-115</b><br>Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; slotted; according to EN 60715; "Hole width 18 mm" |

Subject to changes. Please also observe the further product documentation!


**Item no.: 210-118**

Steel carrier rail; 35 x 15 mm; 2.3 mm thick; 2 m long; unslotted; according to EN 60715


**Item no.: 210-196**

Aluminum carrier rail; 35 x 8.2 mm; 1.6 mm thick; 2 m long; unslotted; similar to EN 60715; silver-colored


**Item no.: 210-197**

Steel carrier rail; 35 x 15 mm; 1.5 mm thick; 2 m long; slotted; similar to EN 60715


**Item no.: 210-198**

Copper carrier rail; 35 x 15 mm; 2.3 mm thick; 2 m long; unslotted; according to EN 60715; copper-colored


**Item no.: 210-504**

Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; slotted; galvanized; according to EN 60715


**Item no.: 210-505**

Steel carrier rail; 35 x 7.5 mm; 1 mm thick; 2 m long; unslotted; galvanized; according to EN 60715


**Item no.: 210-506**

Steel carrier rail; 35 x 15 mm; 1.5 mm thick; 2 m long; unslotted; galvanized; similar to EN 60715

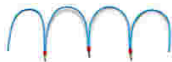

**Item no.: 210-508**

Steel carrier rail; 35 x 15 mm; 1.5 mm thick; 2 m long; slotted; galvanized; similar to EN 60715

**Jumper**

**Item no.: 210-103**

Wire commoning chain; insulated; 50 connections; black


**Item no.: 210-123**

Wire commoning chain; insulated; 50 connections


**Item no.: 249-123**

Push-in type wire jumper; insulated; wire length 180 mm; Conductor cross section 0.75 mm<sup>2</sup>


**Item no.: 249-125**

Push-in type wire jumper; insulated; wire length 60 mm; Conductor cross section 0.75 mm<sup>2</sup>


**Item no.: 249-126**

Push-in type wire jumper; insulated; wire length 110 mm; Conductor cross section 0.75 mm<sup>2</sup>


**Item no.: 249-127**

Push-in type wire jumper; insulated; wire length 250 mm; Conductor cross section 0.75 mm<sup>2</sup>


**Item no.: 281-402**

Adjacent jumper; insulated; IN = IN terminal block; gray


**Item no.: 281-409**

Alternate jumper; insulated; IN = IN terminal block; gray


**Item no.: 281-422**

Adjacent jumper; insulated; IN = IN terminal block; yellow-green

Subject to changes. Please also observe the further product documentation!



**Item no.: 281-482**  
Comb-style jumper bar; insulated; 2-way; IN = IN terminal block; gray



**Item no.: 281-483**  
Comb-style jumper bar; insulated; 3-way; IN = IN terminal block; gray



**Item no.: 281-485**  
Comb-style jumper bar; insulated; 5-way; IN = IN terminal block; gray



**Item no.: 281-490**  
Comb-style jumper bar; insulated; 10-way; IN = IN terminal block; gray



**Item no.: 281-492**  
Alternate comb-style jumper bar; insulated; 2-way; IN = IN terminal block; gray



**Item no.: 283-414**  
Step-down jumper; insulated; from 16 mm² to 4 mm²; Nominal current 32 A; gray



**Item no.: 284-413**  
Step-down jumper; insulated; from 10/6 mm² to 6/4 mm²; Nominal current 30 A; gray



**Item no.: 284-414**  
Step-down jumper; insulated; from 10/6 mm² to 4/2.5/1.5 mm²; Nominal current 15 A; gray



**Item no.: 709-110**  
Wire commoning chain; insulated; 4 connections; 3 x 110 mm; black



**Item no.: 709-111**  
Wire commoning chain; insulated; 3 connections; 2 x 120 mm; black



**Item no.: 709-112**  
Wire commoning chain; insulated; 3 connections; 2 x 170 mm; black



**Item no.: 781-452**  
Staggered jumper; insulated; from 1 to 2; Spacing: 6 mm; gray



**Item no.: 781-453**  
Staggered jumper; insulated; from 1 to 3; Spacing: 6 mm; gray



**Item no.: 781-454**  
Staggered jumper; insulated; from 1 to 4; Spacing: 6 mm; gray



**Item no.: 781-455**  
Staggered jumper; insulated; from 1 to 5; Spacing: 6 mm; gray



**Item no.: 781-456**  
Staggered jumper; insulated; from 1 to 6; Spacing: 6 mm; gray

#### End plate



**Item no.: 281-328**  
End and intermediate plate; 2.5 mm thick; gray



**Item no.: 281-329**  
End and intermediate plate; 2.5 mm thick; orange

Subject to changes. Please also observe the further product documentation!



**Item no.: 281-330**  
Separator plate; 2 mm thick; oversized; gray



**Item no.: 281-331**  
Separator plate; 2 mm thick; oversized; orange



**Item no.: 284-334**  
Step-down cover plate; 1 mm thick; for 2-, 3- and 4-conductor terminal blocks; gray



**Item no.: 284-344**  
Step-down cover plate; 1 mm thick; for 2-, 3- and 4-conductor terminal blocks; orange

#### General accessories



**Item no.: 281-407**  
Test plug; 6 mm wide; Nominal current 24 A; for 0.08 mm<sup>2</sup> - 2.5 mm<sup>2</sup>; 2,50 mm<sup>2</sup>; gray

#### Insulation stop



**Item no.: 281-470**  
Insulation stop; 0.08 - 0.2 mm<sup>2</sup> "s" (0.14 mm<sup>2</sup> "f-st"); 5 pieces/strip; white



**Item no.: 281-471**  
Insulation stop; 0.25 - 0.5 mm<sup>2</sup>; 5 pieces/strip; light gray



**Item no.: 281-472**  
Insulation stop; 0.75 - 1.5 mm<sup>2</sup>; 5 pieces/strip; dark gray

#### Protective Warning Marker



**Item no.: 281-415**  
Protective warning marker; with high-voltage symbol, black; for 5 terminal blocks; yellow

#### assembling



**Item no.: 209-106**  
Mounting carrier; for isolated mounting on DIN 35 rails; gray



**Item no.: 709-153**  
Cover; Type 1; suitable for cover carrier, type 1; 1 m long; transparent

#### Marking accessories



**Item no.: 2009-115**  
WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; white



**Item no.: 2009-115/000-002**  
WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; yellow



**Item no.: 2009-115/000-006**  
WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; blue



**Item no.: 2009-115/000-007**  
WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; gray

Subject to changes. Please also observe the further product documentation!


**Item no.: 2009-115/000-012**

WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; orange


**Item no.: 2009-115/000-017**

WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; light green


**Item no.: 2009-115/000-023**

WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; green


**Item no.: 2009-115/000-024**

WMB-Inline; for Smart Printer; 1500 pieces on roll; stretchable 5 - 5.2 mm; plain; snap-on type; violet


**Item no.: 209-140**

Group marker carrier; gray


**Item no.: 209-141**

Group marker carrier; gray


**Item no.: 209-142**

Group marker carrier; gray


**Item no.: 209-185**

Adaptor; gray


**Item no.: 249-105**

Group marker carrier; gray


**Item no.: 793-501**

WMB marking card; as card; not stretchable; plain; snap-on type; white


**Item no.: 793-501/000-002**

WMB marking card; as card; not stretchable; plain; snap-on type; yellow


**Item no.: 793-501/000-005**

WMB marking card; as card; not stretchable; plain; snap-on type; red


**Item no.: 793-501/000-006**

WMB marking card; as card; not stretchable; plain; snap-on type; blue


**Item no.: 793-501/000-007**

WMB marking card; as card; not stretchable; plain; snap-on type; gray


**Item no.: 793-501/000-012**

WMB marking card; as card; not stretchable; plain; snap-on type; orange

Subject to changes. Please also observe the further product documentation!



**Item no.: 793-501/000-017**

WMB marking card; as card; not stretchable; plain; snap-on type; light green



**Item no.: 793-501/000-023**

WMB marking card; as card; not stretchable; plain; snap-on type; green



**Item no.: 793-501/000-024**

WMB marking card; as card; not stretchable; plain; snap-on type; violet



**Item no.: 793-5501**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; white



**Item no.: 793-5501/000-002**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; yellow



**Item no.: 793-5501/000-005**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; red



**Item no.: 793-5501/000-006**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; blue



**Item no.: 793-5501/000-007**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; gray



**Item no.: 793-5501/000-012**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; orange



**Item no.: 793-5501/000-017**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; green



**Item no.: 793-5501/000-023**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; light green



**Item no.: 793-5501/000-024**

WMB marking card; as card; for terminal block width 5 - 17.5 mm; stretchable 5 - 5.2 mm; plain; snap-on type; violet

#### check



**Item no.: 209-170**

Test plug adapter; 8.3 mm wide; for 4 mm Ø test plugs; suitable for 1.5 mm<sup>2</sup> - 10 mm<sup>2</sup> tbs; gray



**Item no.: 249-144**

L-type test plug module; modular; with spring-loaded contact pin; Center module; 2,50 mm<sup>2</sup>; gray

Subject to changes. Please also observe the further product documentation!

|                                                                                  |                                                                                                                                                                                   |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Item no.: 249-146</b><br>L-type spacer module; modular; e.g., bridging commoned terminal blocks; gray                                                                          |
|  | <b>Item no.: 249-147</b><br>B-type test plug module; modular; 2,50 mm <sup>2</sup> ; gray                                                                                         |
|  | <b>Item no.: 249-148</b><br>B-type spacer module; modular; e.g., for bridging commoned terminal blocks; gray                                                                      |
|  | <b>Item no.: 280-404</b><br>Test plug adapter; 5 mm wide; for test plug 210-137 (2.3 mm Ø); suitable for 1.5 mm <sup>2</sup> - 4 mm <sup>2</sup> tbs; gray                        |
|  | <b>Item no.: 281-418</b><br>Test plug module; modular; suitable for all WAGO 281, 776, 777 and 781 series rail-mounted terminal blocks with jumper slots in the current bar; gray |
|  | <b>Item no.: 281-419</b><br>Spacer module; modular; bridging commoned terminal blocks; gray                                                                                       |

#### ferrule

|                                                                                    |                                                                                                                                                                                            |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>Item no.: 216-106</b><br>Ferrule; Sleeve for 2.5 mm <sup>2</sup> / AWG 14; uninsulated; electro-tin plated                                                                              |
|    | <b>Item no.: 216-201</b><br>Ferrule; Sleeve for 0.5 mm <sup>2</sup> / 20 AWG; insulated; electro-tin plated; white                                                                         |
|   | <b>Item no.: 216-202</b><br>Ferrule; Sleeve for 0.75 mm <sup>2</sup> / 18 AWG; insulated; electro-tin plated; gray                                                                         |
|  | <b>Item no.: 216-203</b><br>Ferrule; Sleeve for 1 mm <sup>2</sup> / AWG 18; insulated; electro-tin plated; red                                                                             |
|  | <b>Item no.: 216-204</b><br>Ferrule; Sleeve for 1.5 mm <sup>2</sup> / AWG 16; insulated; electro-tin plated; black                                                                         |
|  | <b>Item no.: 216-205</b><br>Ferrule; Sleeve for 2.08 mm <sup>2</sup> / AWG 14; insulated; electro-tin plated; yellow                                                                       |
|  | <b>Item no.: 216-206</b><br>Ferrule; Sleeve for 2.5 mm <sup>2</sup> / AWG 14; insulated; electro-tin plated; blue                                                                          |
|  | <b>Item no.: 216-241</b><br>Ferrule; Sleeve for 0.5 mm <sup>2</sup> / 20 AWG; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; white |
|  | <b>Item no.: 216-242</b><br>Ferrule; Sleeve for 0.75 mm <sup>2</sup> / 18 AWG; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; gray |
|  | <b>Item no.: 216-243</b><br>Ferrule; Sleeve for 1 mm <sup>2</sup> / AWG 18; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; red     |
|  | <b>Item no.: 216-244</b><br>Ferrule; Sleeve for 1.5 mm <sup>2</sup> / AWG 16; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; black |

Subject to changes. Please also observe the further product documentation!

**Item no.: 216-246**

Ferrule; Sleeve for 2.5 mm<sup>2</sup> / AWG 14; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; blue

**Item no.: 216-301**

Ferrule; Sleeve for 0.25 mm<sup>2</sup> / AWG 24; insulated; electro-tin plated; yellow

**Item no.: 216-302**

Ferrule; Sleeve for 0.34 mm<sup>2</sup> / 22 AWG; insulated; electro-tin plated; green

**tools****Item no.: 210-657**

Operating tool; Blade: 3.5 x 0.5 mm; with a partially insulated shaft; short

**Item no.: 210-658**

Operating tool; Blade: 3.5 x 0.5 mm; with a partially insulated shaft; angled; short

**Item no.: 210-720**

Operating tool; Blade: 3.5 x 0.5 mm; with a partially insulated shaft

**Downloads****Documentation****Additional Information**

Technical explanations

Apr 3, 2019

**CAD/CAE-Data****CAD data**

2D/3D Models 281-902

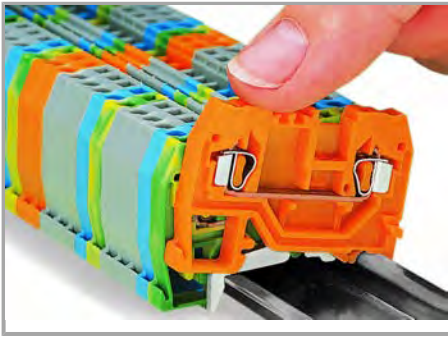
**CAE data**

EPLAN Data Portal 281-902

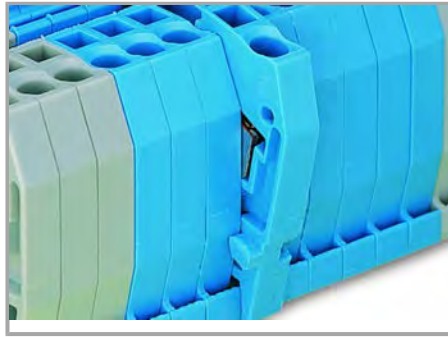
WSCAD Universe 281-902

**Installation Notes****Assembly**

Subject to changes. Please also observe the further product documentation!



Snapping a terminal block onto the carrier rail.



Quick assembly keys prevent reverse mounting.



Removing a terminal block from the assembly.



Steel carrier rails are not suited for PEN (ground and N-conductor) applications per EN 60947-7-2 (VDE 0611, Part 3).

## Inserting a conductor



## CAGE CLAMP® connection

Inserting a conductor.

Subject to changes. Please also observe the further product documentation!



**CAGE CLAMP® connection**

Inserting a conductor.



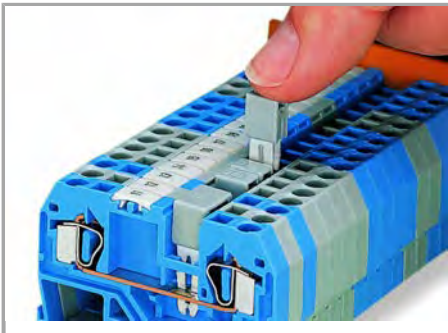
**CAGE CLAMP® connection**  
Removing a conductor.



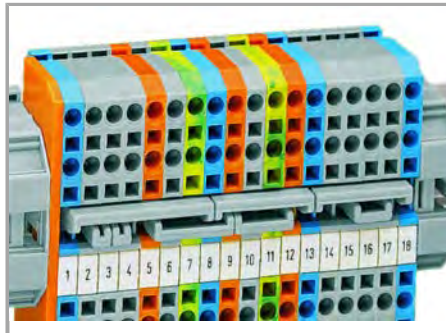
Inserting insulation stops.

With ferruled conductors, it is necessary to use a terminal block one size larger than the conductor's nominal cross-section.

## Commoning



Commoning using an adjacent jumper (280-402).



Staggered jumpers for sophisticated circuit requirements – push jumpers down until fully inserted.

Push jumper down until fully inserted.

Subject to changes. Please also observe the further product documentation!



Subject to changes. Please also observe the further product documentation!



## Wire jumpers

When installing machines or control systems, it is often necessary to make an additional connection between two terminal blocks that are not next to each other on the rail. In such cases, WAGO's touch-proof, push-in type wire jumpers are the ideal solution.

These jumpers are compatible with the following rail-mount terminal blocks:

- 279 Series (1.5 mm<sup>2</sup>/16 AWG),
- 
- 280/775/780 Series (2.5 mm<sup>2</sup>/14 AWG)
- 
- 281/769/776/777/781 and 880 Series (4 mm<sup>2</sup>/12 AWG)
- 

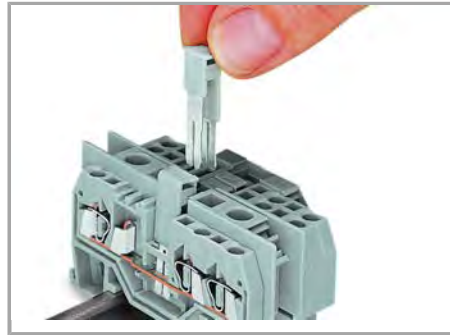
They are available in three conductor lengths (60, 110 and 250 mm), allowing up to 60 terminal blocks to be commoned depending on their width (see table on the right).

Compared with the 279 Series, the 280/775/780 and 281/776/777/781 Series can also accommodate two wire jumpers, allowing the use of commoning chains. Furthermore, the 280/769/775/780/880 and 281/776/777/781 Series allow both wire jumper and adjacent jumper to be simultaneously plugged into a same terminal block.

Subject to changes. Please also observe the further product documentation!

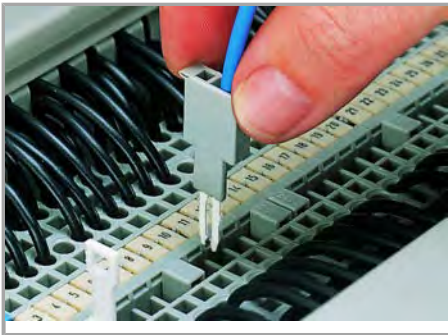


Commoning using comb-style jumper bars. Push comb-style jumper bars down until fully inserted.



Commoning terminal blocks of different sizes via step-down jumpers.

## Testing



Testing with a test plug

(picture shows a test plug fitted with CAGE CLAMP®).



Testing with a test plug

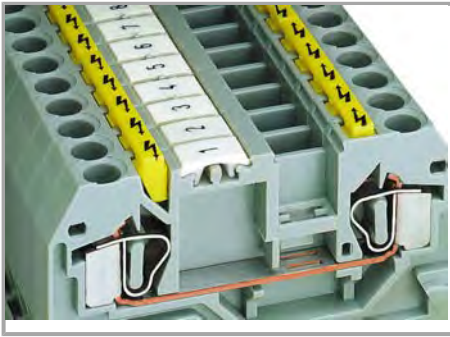
(picture shows 209-170 Test Plug Adapter).



The test plug modules are directly plugged into the jumper contact slot of the current bar.

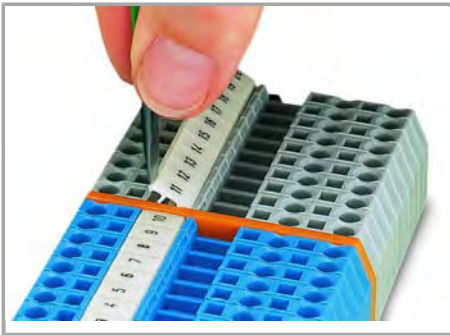
## Cover

Subject to changes. Please also observe the further product documentation!



Protective warning markers inserted into the operating slots.

#### Marking



Marking via WMB Multi Marking System.

Subject to changes. Please also observe the further product documentation!