

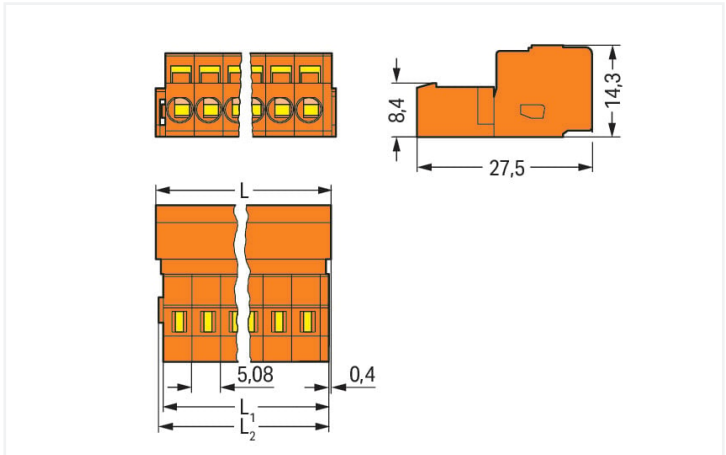
Data Sheet | Item Number: 231-650

1-conductor male connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 20-pole; 2,50 mm²; orange

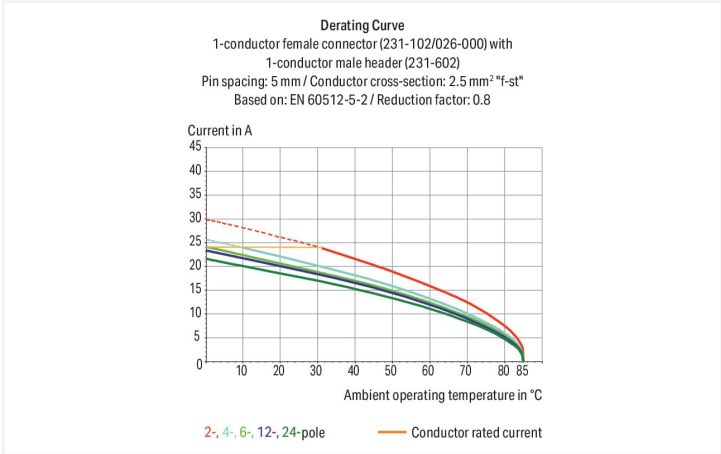
<https://www.wago.com/231-650>



Color: ■ orange



Dimensions in mm  
 $L = (\text{pole no.} - 1) \times \text{pin spacing} + 8.2 \text{ mm}$   
 $L1 = L - 1.7 \text{ mm}$   
 $L2 = L - 1.2 \text{ mm}$



- Universal connection for all conductor types
- Easy cable pre-assembly and on-unit wiring via vertical and horizontal CAGE CLAMP® actuation
- For wire-to-wire and board-to-wire connections
- Versions available with snap-in mounting feet or flanges for panel or through-panel mounting
- With coding fingers

Notes	
Safety information	The MCS – MULTI CONNECTION SYSTEM 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 Gold-plated or partially gold-plated contact surfaces 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				Approvals per UL 1059			
Overvoltage category	III	III	II	Use group	B	C	D
Pollution degree	3	2	2	Rated voltage	300 V	-	300 V
Nominal voltage	320 V	320 V	630 V	Rated current	15 A	-	10 A
Rated surge voltage	4 kV	4 kV	4 kV				
Rated current	12 A	12 A	12 A				

Approvals per UL 1977				Approvals per CSA			
Rated voltage	600 V			Use group	B	C	D
Rated current	15 A			Rated voltage	300 V	-	300 V
				Rated current	15 A	-	10 A

Connection data

Connection points	20	Connection 1	
Total number of potentials	20	Connection technology	CAGE CLAMP®
Number of connection types	1	Actuation type	Operating tool
Number of levels	1	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	20
		Conductor entry direction to mating direction	0°

Physical data

Pin spacing	5.08 mm / 0.2 inches
Width	104.8 mm / 4.126 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








Material data		
Note (material data)		<a href="#">Information on material specifications can be found here</a>
Color		orange
Material group		I
Insulation material		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		0.501 MJ
Weight		30.4 g

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

Commercial data		
Product Group		3 (Multi Conn. System)
eCl@ss 10.0		27-44-03-09
eCl@ss 9.0		27-44-03-09
ETIM 8.0		EC002638
ETIM 7.0		EC002638
PU (SPU)		10 pcs
Packaging type		Box
Country of origin		DE
GTIN		4044918261180
Customs tariff number		85366930000

Environmental Product Compliance		
RoHS Compliance Status		Compliant, No Exemption

### Approvals / Certificates

General approvals			Declarations of conformity and manufacturer's declarations		
   					
Approval	Standard	Certificate Name	Approval	Standard	Certificate Name
CB DEKRA Certification B.V.	IEC 61984	NL-39756/A1	Railway WAGO GmbH & Co. KG	-	Railway Ready
CSA DEKRA Certification B.V.	C22.2	1466354			
KEMA/KEUR DEKRA Certification B.V.	EN 61984	71-121453			
UL UL International Germany GmbH	UL 1977	E45171			
UR Underwriters Laboratories Inc.	UL 1059	E45172			



Approvals for marine applications



Approval	Standard	Certificate Name
ABS American Bureau of Ship- ping	-	19-HG1869876-PDA
DNV DNV GL SE	-	TAE000016Z
LR Lloyds Register	IEC 61984	96/20035 (E5)

Downloads

Environmental Product Compliance

Compliance Search
Environmental Product Compliance 231-650



Documentation

Additional Information
Technical Section
03.04.2019
pdf 2027.26 KB



CAD/CAE-Data

CAD data
2D/3D Models 231-650



CAE data
EPLAN Data Portal 231-650
ZUKEN Portal 231-650



1 Compatible Products

1.1 System counterpart

1.1.1 Female connector/socket



[Item No.: 232-320/026-000](#)  
1-conductor female connector, angled;  
CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08  
mm; 20-pole; 2,50 mm²; orange



[Item No.: 232-420/026-000](#)  
1-conductor female connector, angled;  
CAGE CLAMP®; 2.5 mm²; Pin spacing  
5.08 mm; 20-pole; 2,50 mm²; orange



[Item No.: 231-320/026-000](#)  
1-conductor female connector; CAGE  
CLAMP®; 2.5 mm²; Pin spacing 5.08 mm;  
20-pole; 2,50 mm²; orange



[Item No.: 231-320/027-000](#)  
1-conductor female connector; CAGE  
CLAMP®; 2.5 mm²; Pin spacing 5.08 mm;  
20-pole; clamping collar; 2,50 mm²; oran-  
ge



[Item No.: 231-320/031-000](#)  
1-conductor female connector; CAGE  
CLAMP®; 2.5 mm²; Pin spacing 5.08 mm;  
20-pole; clamping collar; 2,50 mm²; oran-  
ge



[Item No.: 231-320/037-000](#)  
1-conductor female connector; CAGE  
CLAMP®; 2.5 mm²; Pin spacing 5.08 mm;  
20-pole; Lateral locking levers; 2,50 mm²;  
orange



[Item No.: 231-320/008-000](#)  
1-conductor female connector; CAGE  
CLAMP®; 2.5 mm²; Pin spacing 5.08 mm;  
20-pole; Snap-in mounting feet; 2,50  
mm²; orange



[Item No.: 231-320/102-000](#)  
1-conductor female connector; CAGE  
CLAMP®; 2.5 mm²; Pin spacing 5.08 mm;  
20-pole; with integrated end plate; 2,50  
mm²; orange



1.1.1 Female connector/socket



**Item No.: 2231-320/026-000**  
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 20-pole; 2,50 mm²; orange



**Item No.: 2231-320/031-000**  
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 20-pole; clamping collar; 2,50 mm²; orange



**Item No.: 2231-320/037-000**  
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 20-pole; Lateral locking levers; 2,50 mm²; orange



**Item No.: 2231-320/008-000**  
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 20-pole; Snap-in mounting feet; 2,50 mm²; orange



**Item No.: 2231-320/102-000**  
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5.08 mm; 20-pole; with integrated end plate; 2,50 mm²; orange



**Item No.: 232-280**  
THT female header; angled; Pin spacing 5.08 mm; 20-pole; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-280/031-000**  
THT female header; angled; Pin spacing 5.08 mm; 20-pole; clamping collar; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-280/039-000**  
THT female header; angled; Pin spacing 5.08 mm; 20-pole; Locking lever; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-280/047-000**  
THT female header; angled; Pin spacing 5.08 mm; 20-pole; Spacer flange; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-180**  
THT female header; straight; Pin spacing 5.08 mm; 20-pole; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-180/031-000**  
THT female header; straight; Pin spacing 5.08 mm; 20-pole; clamping collar; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-180/039-000**  
THT female header; straight; Pin spacing 5.08 mm; 20-pole; Locking lever; 0.6 x 1.0 mm solder pin; orange



**Item No.: 232-180/047-000**  
THT female header; straight; Pin spacing 5.08 mm; 20-pole; Spacer flange; 0.6 x 1.0 mm solder pin; 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.: 216-321**  
Ferrule; Sleeve for 0.25 mm² / AWG 24; insulated; electro-tin plated; yellow



**Item No.: 216-151**  
Ferrule; Sleeve for 0.25 mm² / AWG 24; uninsulated; electro-tin plated



**Item No.: 216-131**  
Ferrule; Sleeve for 0.25 mm² / AWG 24; uninsulated; electro-tin plated; silver-colored



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



**Item No.: 216-322**  
Ferrule; Sleeve for 0.34 mm² / 22 AWG; insulated; electro-tin plated; light turquoise
































**Item No.: 216-132**  
Ferrule; Sleeve for 0.34 mm² / AWG 24; uninsulated; electro-tin plated



**Item No.: 216-152**  
Ferrule; Sleeve for 0.34 mm² / AWG 24; uninsulated; electro-tin plated



1.2.3.1 Ferrule

 <b>Item No.: 216-241</b> Ferrule; Sleeve for 0.5 mm² / 20 AWG; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; white	 <b>Item No.: 216-201</b> Ferrule; Sleeve for 0.5 mm² / 20 AWG; insulated; electro-tin plated; white	 <b>Item No.: 216-221</b> Ferrule; Sleeve for 0.5 mm² / 20 AWG; insulated; electro-tin plated; white	 <b>Item No.: 216-141</b> Ferrule; Sleeve for 0.5 mm² / 20 AWG; un-insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 1/08.92
 <b>Item No.: 216-101</b> Ferrule; Sleeve for 0.5 mm² / AWG 22; un-insulated; electro-tin plated; silver-colored	 <b>Item No.: 216-121</b> Ferrule; Sleeve for 0.5 mm² / AWG 22; un-insulated; electro-tin plated; silver-colored	 <b>Item No.: 216-242</b> Ferrule; Sleeve for 0.75 mm² / 18 AWG; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; gray	 <b>Item No.: 216-262</b> Ferrule; Sleeve for 0.75 mm² / 18 AWG; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; gray
 <b>Item No.: 216-202</b> Ferrule; Sleeve for 0.75 mm² / 18 AWG; insulated; electro-tin plated; gray	 <b>Item No.: 216-222</b> Ferrule; Sleeve for 0.75 mm² / 18 AWG; insulated; electro-tin plated; gray	 <b>Item No.: 216-142</b> Ferrule; Sleeve for 0.75 mm² / 18 AWG; un-insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 1/08.92	 <b>Item No.: 216-102</b> Ferrule; Sleeve for 0.75 mm² / AWG 20; un-insulated; electro-tin plated; silver-colored
 <b>Item No.: 216-122</b> Ferrule; Sleeve for 0.75 mm² / AWG 20; un-insulated; electro-tin plated; silver-colored	 <b>Item No.: 216-243</b> Ferrule; Sleeve for 1 mm² / AWG 18; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; red	 <b>Item No.: 216-263</b> Ferrule; Sleeve for 1 mm² / AWG 18; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; red	 <b>Item No.: 216-203</b> Ferrule; Sleeve for 1 mm² / AWG 18; insulated; electro-tin plated; red
 <b>Item No.: 216-223</b> Ferrule; Sleeve for 1 mm² / AWG 18; insulated; electro-tin plated; red	 <b>Item No.: 216-103</b> Ferrule; Sleeve for 1 mm² / AWG 18; un-insulated; electro-tin plated	 <b>Item No.: 216-143</b> Ferrule; Sleeve for 1 mm² / AWG 18; un-insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 1/08.92	 <b>Item No.: 216-123</b> Ferrule; Sleeve for 1 mm² / AWG 18; un-insulated; electro-tin plated; silver-colored
 <b>Item No.: 216-204</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; insulated; electro-tin plated; black	 <b>Item No.: 216-224</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; insulated; electro-tin plated; black	 <b>Item No.: 216-244</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; black	 <b>Item No.: 216-264</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; black
 <b>Item No.: 216-284</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 4/09.90; black	 <b>Item No.: 216-124</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; un-insulated; electro-tin plated	 <b>Item No.: 216-144</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; un-insulated; electro-tin plated; electrolytic copper; gastight crimped; acc. to DIN 46228, Part 1/08.92; silver-colored	 <b>Item No.: 216-104</b> Ferrule; Sleeve for 1.5 mm² / AWG 16; un-insulated; electro-tin plated; silver-colored
 <b>Item No.: 216-106</b> Ferrule; Sleeve for 2.5 mm² / AWG 14; un-insulated; 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 mm² / 0.2 mm²  
"s"; white



**Item No.: 231-671**  
Insulation stop; 0.25 - 0.5 mm²; light gray



**Item No.: 231-672**  
Insulation stop; 0.75 - 1 mm²; 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 Tool

1.2.7.1 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; multicoloured



**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



**Item No.: 209-130**  
Operating tool; made of insulating material; 1-way; for 264 Series (1-1/2-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



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



**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

1.2.7.1 Operating tool



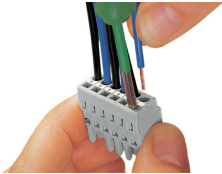
Item No.: 280-437  
Operating tool; made of insulating material; 7-way



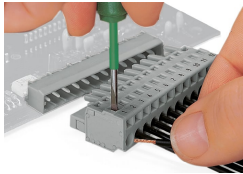
Item No.: 280-438  
Operating tool; made of insulating material; 8-way

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.

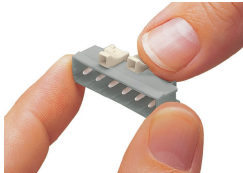


Inserting a conductor into CAGE CLAMP® unit via operating tool (231-291).



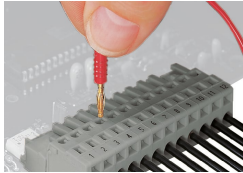
Inserting a conductor via operating tool.

Coding



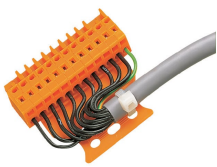
Coding a male header – fitting coding key(s).

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.