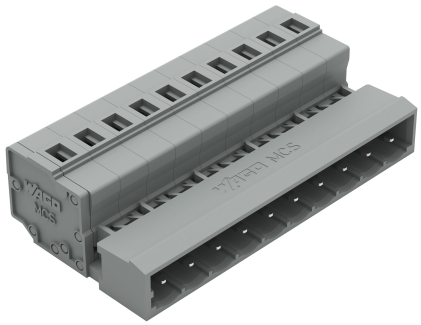
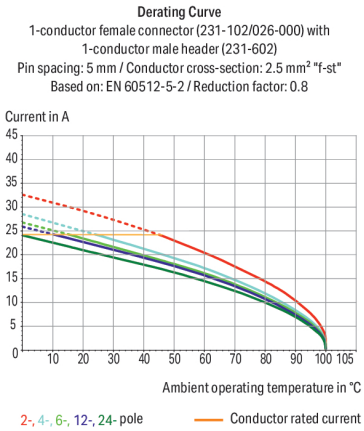
Data Sheet | Item Number: 231-610

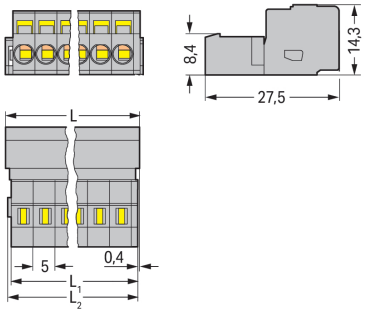
1-conductor male connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; gray

https://www.wago.com/231-610





Color: gray



Dimensions in mm
L = (pole no. – 1) x pin spacing + 8.2 mmL1 = L – 1.7 mmL2 = L – 1.2 mm

Male connector, 231 Series, CAGE CLAMP®

Enjoy easy electrical installations with this male connector (item number 231-610). Strip lengths must be between 8 and 9 mm when connecting conductors to this male connector. This product features one conductor terminal and utilizes CAGE CLAMP®. Our tried-and-tested universal connection known as CAGE CLAMP® is the industry standard for connection technology and electrical interconnections. The dimensions are (53.2 x 14.3 x 27.5) mm (width x height x depth). Depending on the type of conductor, this male connector is designed for conductor cross sections ranging from 0.08 mm² to 2.5 mm². Tin is used for coating the contact surfaces.

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 https://configurator.wago.com/.

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	10
Total number of potentials	10
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	10
Conductor entry direction to mating direction	0 °

Physical data

Pin spacing	5 mm / 0.197 inches
Width	53.2 mm / 2.094 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

Continued on next page

Material data

Note (material data)	Information on material specifications can be found here
Color	gray
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_{Cu})
Contact Plating	Tin
Fire load	0.228 MJ
Weight	15 g

Environmental requirements

Limit temperature range	-60 … +100 °C
Processing temperature	-35 … +60 °C

Environmental Testing

Test specification: Railway applications – Rolling stock – Electronic equipment	DIN EN 50155 (VDE 0115-200):2022-06
Test procedure: Railway applications – Rolling stock equipment – 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_1 = 5 Hz to f_2 = 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_1 = 5 Hz to f_2 = 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)
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

Continued on next page

Commercial data

Product Group	3 (Multi Conn. System)
PU (SPU)	50 pcs
Packaging type	Box
Country of origin	DE
GTIN	4044918258067
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,No Exemption

Approvals / Certificates

General approvals

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

Declarations of conformity and manufacturer's declarations

Approval	Standard	Certificate Name
Railway WAGO GmbH & Co. KG	-	Railway Ready

Approvals for marine applications

Approval	Standard	Certificate Name
ABS American Bureau of Shipping	-	24-0095975-PDA
DNV DNV GL SE	-	TAE000016Z
LR Lloyds Register	IEC 61984	96/20035 (E5)
PRS Polski Rejestr Statków	-	TE/1095/880590/23

Continued on next page

Downloads

Environmental Product Compliance

Compliance Search

Environmental Product Compliance 231-610

Documentation

Additional Information

Technical Section	03.04.2019	pdf 2027.26 KB

CAD/CAE-Data

CAD data

2D/3D Models 231-610

CAE data

EPLAN Data Portal 231-610

ZUKEN Portal 231-610

1 Compatible Products

1.1 System counterpart

1.1.1 Female connector/socket



Item No.: 232-110/026-000
1-conductor female connector, angled; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; 2,50 mm²; gray



Item No.: 232-210/026-000
1-conductor female connector, angled; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; 2,50 mm²; gray



Item No.: 731-510/031-000
1-conductor female connector, angled; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; clamping collar; DIN-35 rail/panel mounting; 2,50 mm²; gray



Item No.: 731-510/008-000
1-conductor female connector, angled; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Snap-in mounting feet; 2,50 mm²; gray



Item No.: 231-110/027-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; clamping collar; gray



Item No.: 231-110/031-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; clamping collar; gray



Item No.: 231-110/026-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; gray



Item No.: 231-110/037-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Lateral locking levers; gray



Item No.: 231-110/125-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Snap-in flange; gray



Item No.: 231-110/008-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Snap-in mounting feet; gray



Item No.: 231-110/102-000
1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; with integrated end plate; gray



Item No.: 2231-1110/327-004
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; 2,50 mm²; black



Item No.: 2231-1110/327-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; 2,50 mm²; gray



Item No.: 2231-1110/329-000/335-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Centered locking levers; Strain relief plate; gray



Item No.: 2231-1110/331-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; clamping collar; gray



Item No.: 2231-1110/327-047
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; direct marking; 2,50 mm²; gray



Item No.: 2231-1110/327-9037
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; direct marking; 2,50 mm²; gray



Item No.: 2231-1110/038-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Lateral locking levers; 2,50 mm²; gray



Item No.: 2231-1110/038-000/335-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Lateral locking levers; Strain relief plate; gray



Item No.: 2231-1110/126-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Snap-in flange; gray

Continued on next page

1.1.1 Female connector/socket



Item No.: 2231-1110/327-000/335-000
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Strain relief plate; gray



Item No.: 2231-1112/327-9037
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 12-pole; direct marking; 2,50 mm²; gray



Item No.: 2231-1116/327-9037
1-conductor female connector; lever; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 16-pole; direct marking; 2,50 mm²; gray



Item No.: 2231-110/026-000
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; 2,50 mm²; gray



Item No.: 2231-110/031-000
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; clamping collar; 2,50 mm²; gray



Item No.: 2231-110/037-000
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Lateral locking levers; 2,50 mm²; gray



Item No.: 2231-110/008-000
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Snap-in mounting feet; 2,50 mm²; gray



Item No.: 2231-110/102-000
1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; with integrated end plate; 2,50 mm²; gray



Item No.: 231-2110/037-000
2-conductor female connector; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; Lateral locking levers; gray



Item No.: 231-2110/026-000
2-conductor female connector; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 10-pole; with integrated end plate; gray



Item No.: 232-240/005-000/039-000
Female connector for rail-mount terminal blocks; 0.6 x 1 mm pins; angled; Locking lever; Pin spacing 5 mm; 10-pole; gray



Item No.: 232-240/005-000
Female connector for rail-mount terminal blocks; 0.6 x 1 mm pins; angled; Pin spacing 5 mm; 10-pole; gray



Item No.: 232-140/005-000/039-000
Female connector for rail-mount terminal blocks; 0.6 x 1 mm pins; straight; Locking lever; Pin spacing 5 mm; 10-pole; gray



Item No.: 232-140/005-000
Female connector for rail-mount terminal blocks; 0.6 x 1 mm pins; straight; Pin spacing 5 mm; 10-pole; gray



Item No.: 232-240
THT female header; angled; Pin spacing 5 mm; 10-pole; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-240/031-000
THT female header; angled; Pin spacing 5 mm; 10-pole; clamping collar; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-240/039-000
THT female header; angled; Pin spacing 5 mm; 10-pole; Locking lever; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-240/047-000
THT female header; angled; Pin spacing 5 mm; 10-pole; Spacer flange; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-140
THT female header; straight; Pin spacing 5 mm; 10-pole; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-140/031-000
THT female header; straight; Pin spacing 5 mm; 10-pole; clamping collar; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-140/039-000
THT female header; straight; Pin spacing 5 mm; 10-pole; Locking lever; 0.6 x 1.0 mm solder pin; gray



Item No.: 232-140/047-000
THT female header; straight; Pin spacing 5 mm; 10-pole; Spacer flange; 0.6 x 1.0 mm solder pin; gray

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.: 231-668
Lockout caps; for covering unused clamping units; gray

Continued on next page

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 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.: 210-331/500-103
Marking strips; as a DIN A4 sheet; MARKED; 1-12 (300x); Height of marker strip: 2.3 mm/0.091 in; Strip length 182 mm; Horizontal marking; Self-adhesive; white



Item No.: 210-332/500-202
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.: 210-332/500-205
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.: 210-331/500-104
Marking strips; as a DIN A4 sheet; MARKED; 13-24 (300x); Height of marker strip: 2.3 mm/0.091 in; Strip length 182 mm; Horizontal marking; Self-adhesive; white

Item No.: 210-332/500-204
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.: 210-332/500-206
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

Continued on next page

1.2.7 Strain relief

1.2.7.1 Strain relief housing



Item No.: 232-610
Strain relief housing; for female and male connectors; 2 parts; Pin spacing 5 mm; 10-pole; gray

1.2.8 Tool

1.2.8.1 Operating tool



Item No.: 231-231
Combination operating tool; red



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.: 210-250
Operating tool; for MCS MINI and MIDI with CAGE CLAMP® connection; red



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



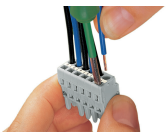
Item No.: 280-438
Operating tool; made of insulating material; 8-way; white



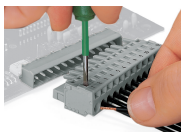
Item No.: 231-159
Operating tool; natural

Installation Notes

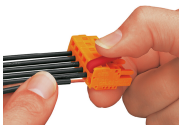
Conductor termination



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.



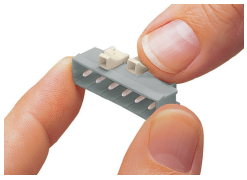
Inserting a conductor into CAGE CLAMP® unit via operating tool (231-291).



Inserting a conductor via operating tool.

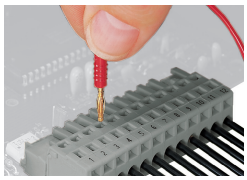
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Coding



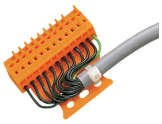
Coding a male header – fitting coding key(s).

Testing

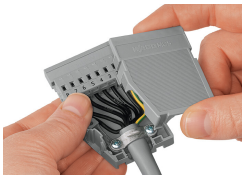


Testing – female connector with CAGE CLAMP®
Integrated test ports for testing perpendicular to conductor entry via 2 or 2.3 mm Ø test plug

Installation

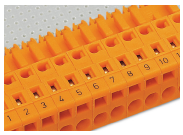


Male connector with strain relief plate



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

Marking



Labeling via direct marking or self-adhesive strips.