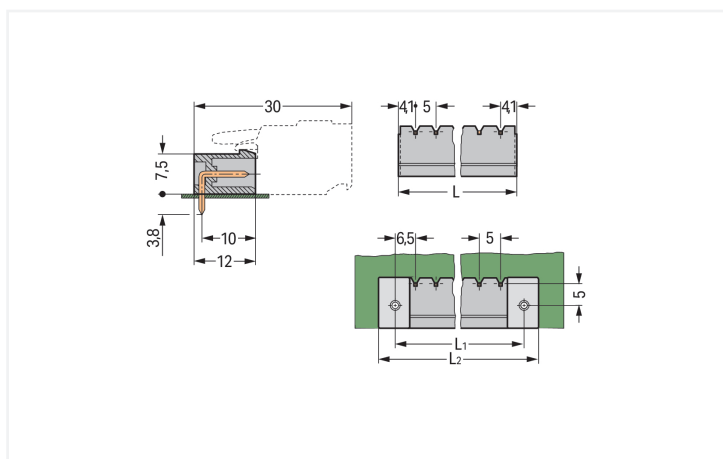
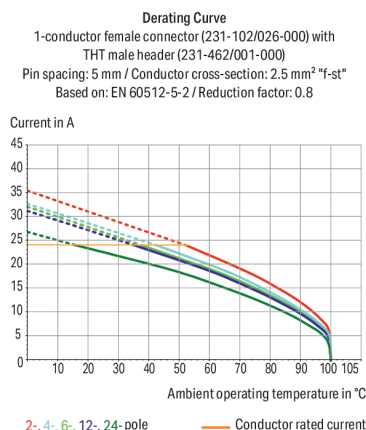


THT male header; 1.0 x 1.0 mm solder pin; angled; Pin spacing 5 mm; 19-pole; gray

<https://www.wago.com/231-449/001-000>



Color: gray



Dimensions in mm

$$L = (\text{pole no.} - 1) \times \text{pin spacing} + 8.2 \text{ mm}$$

$$L1 = L + 5 \text{ mm}$$

$$L2 = L1 + 7.4 \text{ mm}$$

Male connector, 231 Series, with 5 mm pin spacing

Our male connector (item number 231-449/001-000) ensures effortless electrical installations. Dimensions: (98.2 x 12.2 x 12) mm (width x height x depth).

The contact surface is coated with tin. THT is used to solder the pcb connector.

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
3.8 mm pin projection for male headers with straight solder pins
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				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	10 A	-	10 A
Rated impulse withstand 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	10 A	Rated voltage	300 V	-	300 V
		Rated current	10 A	-	10 A

Connection Data

Total number of potentials	19	Connection 1	
Number of connection types	1	Pole number	19
Number of levels	1		

Physical data

Pin spacing	5 mm / 0.197 inches
Width	98.2 mm / 3.866 inches
Height	12.2 mm / 0.48 inches
Height from the surface	8.4 mm / 0.331 inches
Depth	12 mm / 0.472 inches
Solder pin length	3.8 mm
Solder pin dimensions	1 x 1 mm
!	1.4 (+0.1) mm

Mechanical data

Variable coding	Yes
Anti-rotation protection	Yes

Plug-in connection

Contact type (pluggable connector)	Male connector/plug
Connector (connection type)	for PCB
Mismating protection	No
Mating direction to the PCB	0°

PCB contact

PCB contact	THT
Solder pin arrangement	over the entire male connector (in-line)
Number of solder pins per potential	1

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
Contact material	Electrolytic copper (E _{Cu})
Contact Plating	Tin
Fire load	0.106 MJ
Weight	5.9 g

Environmental requirements

Limit temperature range	-60 ... +100 °C	Environmental Testing	Test specification: Railway applications – Rolling stock – Electronic equipment	DIN EN 50155 (VDE 0115-200):2022-06	
Processing temperature	-35 ... +60 °C				
			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		



Commercial data	
Product Group	3 (Multi Conn. System)
PU (SPU)	50 pcs
Packaging type	Box
Country of origin	PL
GTIN	4044918866606
Customs tariff number	85366930000

Product Classification	
UNSPSC	39121409
eCl@ss 10.0	27-44-04-02
eCl@ss 9.0	27-44-04-02
ETIM 9.0	EC002637
ETIM 10.0	EC002637
ECCN	NO US CLASSIFICATION

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-113351	Railway WAGO GmbH & Co. KG	-	Railway Ready
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			

Approvals for marine applications

		
Approval	Standard	Certificate Name
ABS American Bureau of Ship- ping	-	24-0095975-PDA
BV Bureau Veritas S.A.	IEC 60998	11915/E0 BV
DNV DNV GL SE	-	TAE000016Z
PRS Polski Rejestr Statków	-	TE/1095/880590/23



Downloads			
Environmental Product Compliance			
Compliance Search			
Environmental Product Compliance	231-449/001-000		

Documentation			
Additional Information			
Technical Section	03.04.2019	pdf 2027.26 KB	

CAD/CAE-Data			
CAD data		CAE data	
2D/3D Models	231-449/001-000	EPLAN Data Portal	231-449/001-000
		ZUKEN Portal	231-449/001-000

PCB Design	
Symbol and Footprint via SamacSys	231-449/001-000
Symbol and Footprint via Ultra Librarian	231-449/001-000

1 Compatible Products	
1.1 System counterpart	
1.1.1 Female connector/socket	

Item No.: 232-119/026-000 1-conductor female connector, angled; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; 2,50 mm²; gray	Item No.: 232-219/026-000 1-conductor female connector, angled; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; 2,50 mm²; gray	Item No.: 231-119/027-000 1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; clamping collar; gray	Item No.: 231-119/031-000 1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; clamping collar; gray
Item No.: 231-119/026-000 1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; gray	Item No.: 231-119/037-000 1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; Lateral locking levers; gray	Item No.: 231-119/102-000 1-conductor female connector; CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; with integrated end plate; gray	Item No.: 2231-119/026-000 1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; 2,50 mm²; gray
Item No.: 2231-119/031-000 1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; clamping collar; 2,50 mm²; gray	Item No.: 2231-119/037-000 1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; Lateral locking levers; 2,50 mm²; gray	Item No.: 2231-119/102-000 1-conductor female connector; push-button; Push-in CAGE CLAMP®; 2.5 mm²; Pin spacing 5 mm; 19-pole; with integrated end plate; 2,50 mm²; 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

1.2.1.2 Intermediate plate



Item No.: [231-500](#)
Spacer; for formation of groups; light gray

1.2.2 Installation

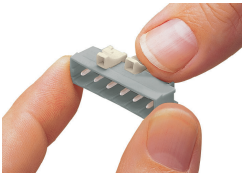
1.2.2.1 Mounting accessories



Item No.: [231-193](#)
Locking device; for male connectors; 1 part; gray

Installation Notes

Coding



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