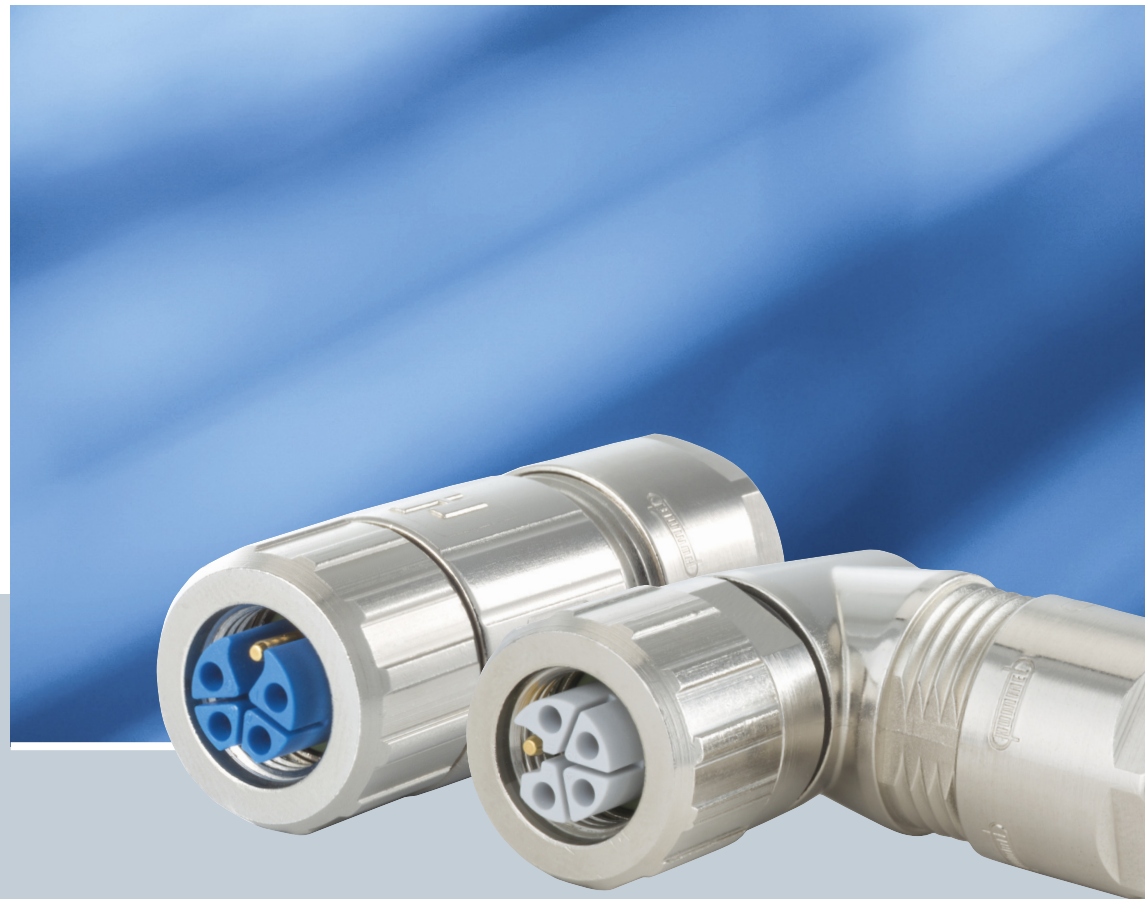


M12 POWER



THE COMPACT AND POWERFUL M12 CONNECTOR



HUMMEL — smart & reliable



HUMMEL AG is a renowned manufacturer of connection technology and components for electric and heating areas. The medium sized family business stands for quality, precision, reliability and pronounced service consciousness. A wide vertical range of manufacture with in-house development, construction, toolmaking, manufacturing, electroplating and assembling from a single source, offers best conditions for implementing individual solutions.



TABLE OF CONTENT

Connectors M 12 Power ▶ 12



Connectors M 16 ▶ 17



Connectors M 12 Power ▶ 13



Technical Information ▶ 8

HUMMEL International ▶ 22



Housing



Inserts / Pinouts



Contacts



Accessories

Further information can be found in our Technical Centre at www.hummel.com

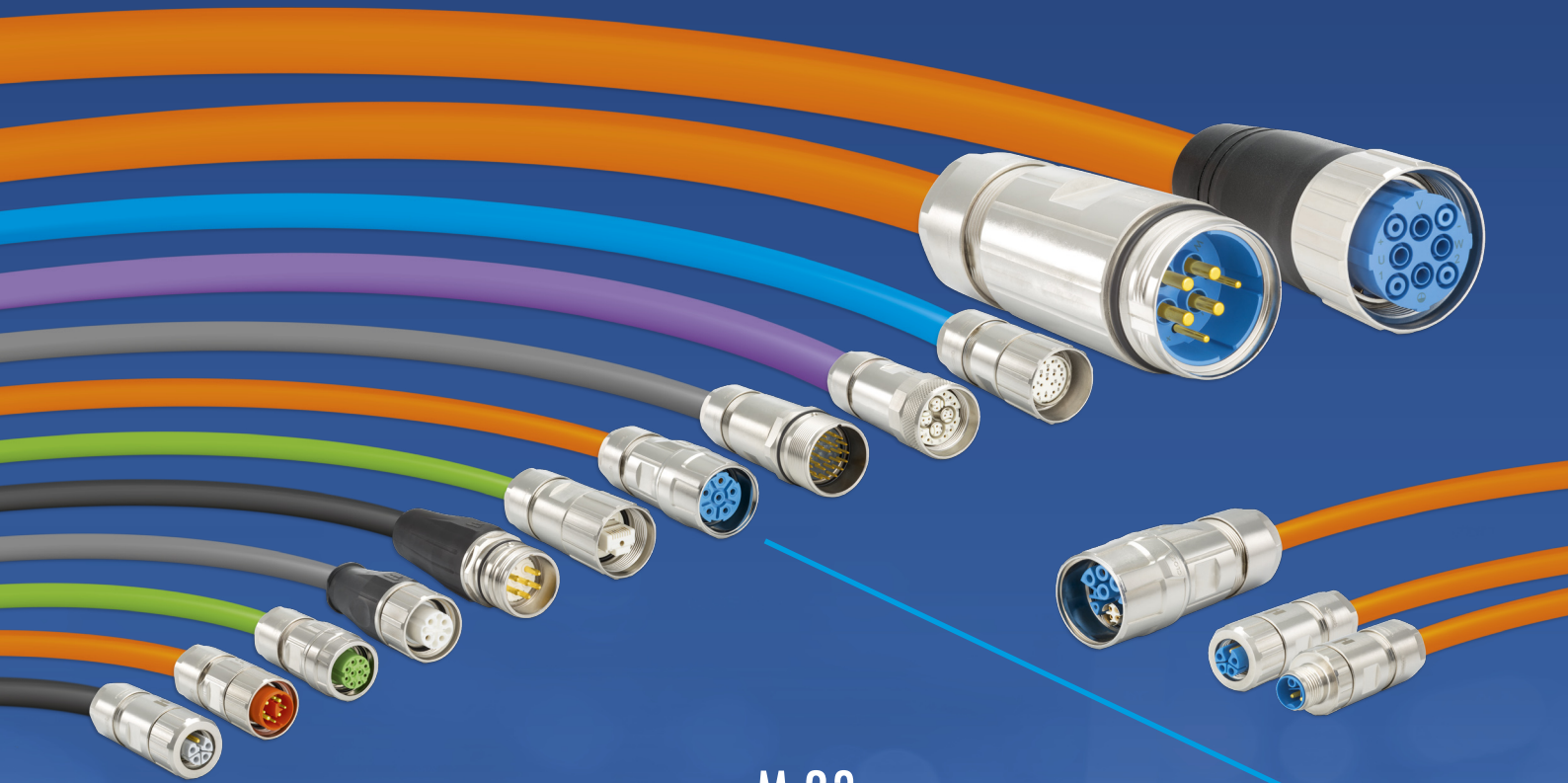


- // Assembly instructions
- // Crimping, assembly, disassembly
- // Crimping tool instructions for use
- // Crimp settings
- // Coding
- // Certificates & approvals
- // Derating curves

<https://www.hummel.com/en/circular-connectors/technical-center>



HUGE RANGE: M 12 – M 40



M 12 Power

M 23

Signal Connectors

Power Connectors

CIRCULAR CONNECTORS

Industrial Ethernet

M 16

PROFINET

M 23 RJ 45

Customized Solutions

M 40

M 23 Hybrid

TWILOCK

Moulded Cordsets



RoHS

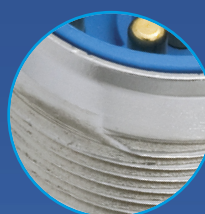
File-No. E 213337

TWILOCK / TWILOCK-S

- // Quick Connect with Polygon Lock
- // Multi functional: Ideal with TWILOCK and screw connection
- // Easy handling, exceptional functionality
- // Resistant to vibration



Clearly defined:
OPEN – CLOSE



Multi functional: Special thread
allows use of TWILOCK and
screw connection



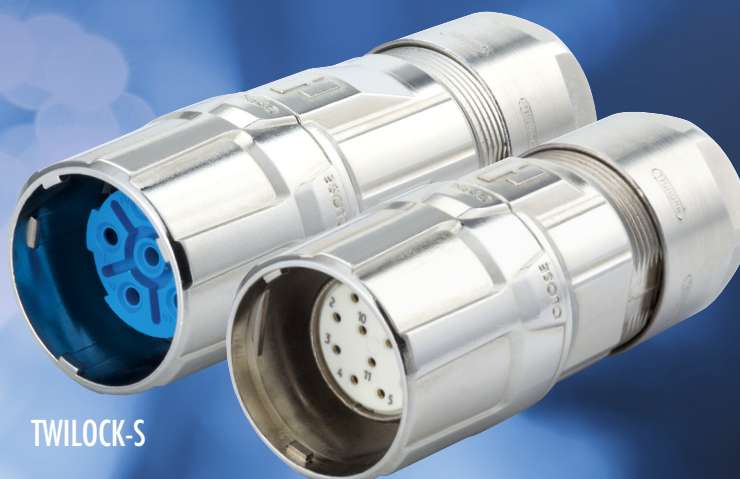
Locking with a slight rotation
or release of the connection



TWILOCK-S-Version
intermateable with Speedtec



TWILOCK



TWILOCK-S

Rated current

The **rated current** is the current that each contact of a connection can simultaneously transfer continuously.

Rated voltage

The **rated voltage** is the voltage for which a connector is designed. In operation, the rated voltage is the maximum continuously applied voltage.

Functional earth (FE)

Functional earth is an electrical conductor to ensure the functions and thus normal operation of installations and devices.

Functional earthing conductor: Earthing conductor provided for functional earthing.

Functional earthing: Earthing a point or points in a system or in an installation or in equipment, for purposes other than electrical safety.

Protective earth (PE)

Protective earth is an electrical conductor provided for the purposes of safety, for protection against electric shock. It is also called an earth conductor, earthing or "earth" for short. Its task in electric systems is to protect living beings in case of a fault.

PE conductor: Protective earth for the purposes of protective earthing

Protective earthing: Earthing a point or points in a system or in an installation or in equipment for purposes of electrical safety.

Contact overlapping

The **contact overlapping** or wipe length of connectors generally denotes the possible overlap area of the pin and receptacle. The greater this area, the more reliable the connection is due to higher possible tolerance allowance (tolerance compensation).

To ensure the IP degree of protection and the necessary contact overlapping, at HUMMEL the cable and coupling connectors must be fully engaged and locked.

Test voltage

The **test voltage** is the voltage that a connector must withstand under certain specifications without flashover or disruptive discharge via or through the insulation and at least corresponds to the r.m.s. withstand voltage in EN 61984.

The value of the test voltage is higher than the rated withstand voltage and serves to verify the dielectric strength of the connector.

Connectors

Connectors that are designed to be engaged or disengaged in normal use when live or under load. These are also called connectors with breaking capacity (CBC). A classic example in households is the SCHUKO plug (earthed 2-pin plug).

Connectors that are not deemed to be engaged or disengaged in normal use when under load or live are also named COC (connectors without breaking capacity).

HUMMEL connectors are usually classified as COC, i.e. they may not be engaged or disengaged when live!

Mating Cycles

One insertion and withdrawal (engaging and disengaging) of connectors is called a mating cycle (also called a cycle of mechanical operation or engaging cycle). The number of mating cycles is an important characteristic for connectors and plugs. It defines the life of a connector during which there is no loss in its transfer/transmission quality. The number of mating cycles is influenced above all by the quality of the contact surface. Use of high-quality and durable contact coatings reduces surface abrasion on mating.

Pollution degree

The **pollution degree** is a numerical value that indicates the level of pollution expected in the micro-environment and is a parameter used in the design of clearances and creepage distances of electrical equipment. It denotes the potential pollution of an open, unengaged connector in a specific environment. The EN 60664-1 standard differentiates between four categories:

- **Pollution degree 1:** No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
- **Pollution degree 2:** Only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected. (typical for households, business premises, laboratories or test areas.)
- **Pollution degree 3:** Conductive pollution occurs or dry non-conductive pollution occurs, which becomes conductive due to condensation which is to be expected. (typical for industrial firms or workshops.)
- **Pollution degree 4:** Continuous conductivity occurs due to conductive dust, rain or other wet conditions. If connectors are used under a higher pollution degree, the voltage values must be reduced. Contact our technical specialists to find out more.

Safety note

In case of operating voltages greater than 50 volt, the connectors listed in this catalogue must be used with conducting housing parts in accordance with the safety provisions of DIN VDE 0100-410; IEC 60364-4-41. These safety provisions specify that relevant connectors may not be engaged or disengaged when live. Otherwise, no protection against electric shock is ensured.



Further information is available on our website:

<https://www.hummel.com/de/rundsteckverbinder/technik-center/allgemeine-technische-hinweise>



HUMMEL connectors may not be engaged or disengaged when live. To ensure the IP degree of protection (IP rating) and the necessary contact overlapping, the cable and coupling connectors must be fully engaged and locked.

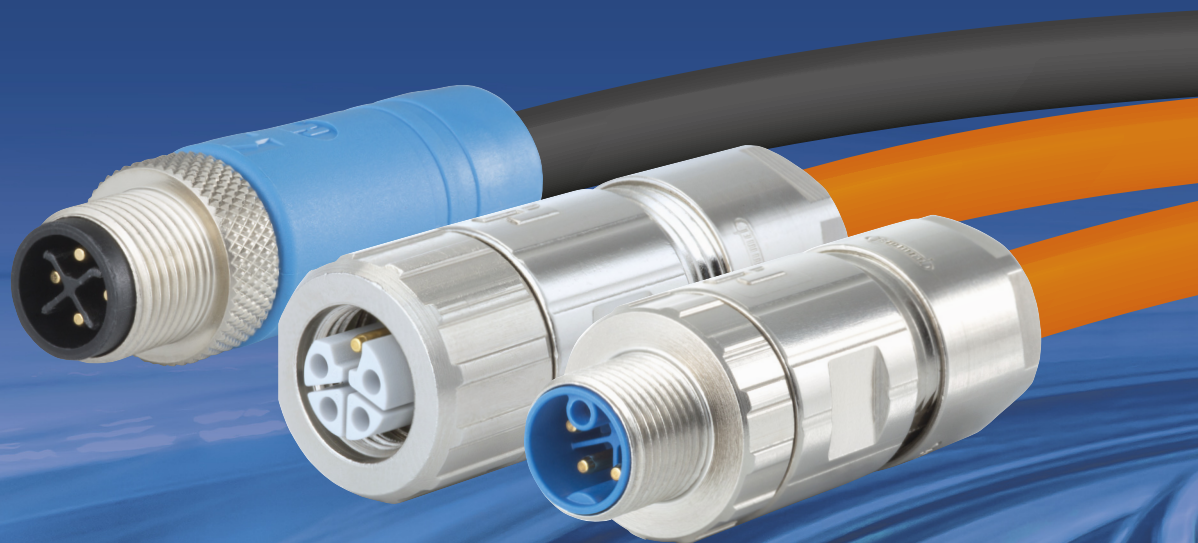
CONNECTORS M 12 POWER

The M 12 Power connector impresses with its compact design and high power transmission. This connector enables entirely new applications and capabilities. It is available in numerous versions.

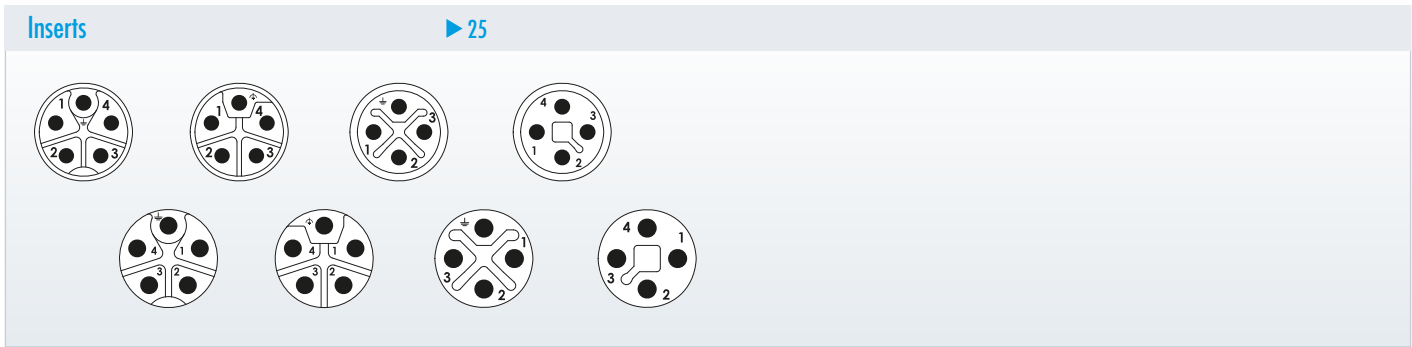
- // Straight Connector, male and female thread
- // Right Angle Connector, male and female thread
- // Panel Connectors
- // Moulded Cordsets
- // Field attachable connectors
- // Accessories
- // Cable Assembly

 File-No. E 213337


REG.-Nr. F394



Product overview



Mechanical Data	Materials and Technical Data
Housing	Brass / Die Cast INOX AISI 316 L TPU (moulded versions)
Housing surface	Nickel plated Other surfaces upon request
Inserts (for contacts)	PBT Fire protection class V-0
Contacts	Copper alloy / Brass
Contact Area	Gold plated
Minimum mating cycles	> 100
Sealings / O-rings	Viton® (FKM / FPM) / Buna-N / HNBR
Temperature range	-40°C – 125°C (-40°F – 257°F) (K + L) -40°C – 85°C (-40°F – 185°F) (S + T)
Type of contacts	Crimp (K + L) / Screw Terminal (S + T)
Protection Class	IP 67 / IP 69K
Cable diameter range	3 – 11 mm (.11 – .43")

Electrical Data	S	T	K	L
Coding	S	T	K	L
Colours	black	dark grey	blue	grey
Number of positions	4 (3 + PE)	4	5 (4 + PE)	5 (4 + FE)
Terminal Cross Section [mm ²]	0,5 – 1,5	0,5 – 1,5	0,75 – 2,5	0,75 – 2,5
AWG	AWG 20 – 16	AWG 20 – 16	AWG 18 – 14	AWG 18 – 14
Nominal current ¹ [A]	12	12	16	16
Nominal voltage ² [V~] degree of pollution ^{3 4}	630	63	630	63
Test voltage (Breakdown voltage) ³ [V~]	3310	840	3310	840
Insulation resistance [MΩ]	> 10 ²	> 10 ²	> 10 ²	> 10 ²
Max. contact resistance [mΩ]	< 3	< 3	< 3	< 3

^{1), 2), 3), 4)} See Technical Information page 8



Housings

⚠ Pin inserts mountable with male thread housings only. Socket inserts mountable with female thread housings only.

Straight Connector, Female Thread

Cable-Ø	Coding	Part Number
3 – 6 mm (.11 – .23")	.....K, L.....	A712-7.K10.300.000
5 – 9 mm (.20 – .35")	.....K, L.....	A712-7.K10.400.000
8 – 11 mm (.31 – .43")	.....K, L.....	A712-7.K10.500.000
3 – 6 mm (.11 – .23")	.....S, T.....	A712-7.S10.300.000
5 – 9 mm (.20 – .35")	.....S, T.....	A712-7.S10.400.000
8 – 11 mm (.31 – .43")	.....S, T.....	A712-7.S10.500.000

▶ 15 |
 ▶ 20

Straight Connector, Male Thread

Cable-Ø	Coding	Part Number
3 – 6 mm (.11 – .23")	.....K, L.....	A712-7.K20.300.000
5 – 9 mm (.20 – .35")	.....K, L.....	A712-7.K20.400.000
8 – 11 mm (.31 – .43")	.....K, L.....	A712-7.K20.500.000
3 – 6 mm (.11 – .23")	.....S, T.....	A712-7.S20.300.000
5 – 9 mm (.20 – .35")	.....S, T.....	A712-7.S20.400.000
8 – 11 mm (.31 – .43")	.....S, T.....	A712-7.S20.500.000

▶ 15 |
 ▶ 20

Right Angle Connector, Female Thread

Cable-Ø	Coding	Part Number
3 – 6 mm (.11 – .23")	.....K, L.....	A712-7.K30.300.000
5 – 9 mm (.20 – .35")	.....K, L.....	A712-7.K30.400.000
8 – 11 mm (.31 – .43")	.....K, L.....	A712-7.K30.500.000
3 – 6 mm (.11 – .23")	.....S, T.....	A712-7.S30.300.000
5 – 9 mm (.20 – .35")	.....S, T.....	A712-7.S30.400.000
8 – 11 mm (.31 – .43")	.....S, T.....	A712-7.S30.500.000

▶ 15 |
 ▶ 20

Right Angle Connector, Male Thread

Cable-Ø	Coding	Part Number
3 – 6 mm (.11 – .23")	.....K, L.....	A712-7.K31.300.000
5 – 9 mm (.20 – .35")	.....K, L.....	A712-7.K31.400.000
8 – 11 mm (.31 – .43")	.....K, L.....	A712-7.K31.500.000
3 – 6 mm (.11 – .23")	.....S, T.....	A712-7.S31.300.000
5 – 9 mm (.20 – .35")	.....S, T.....	A712-7.S31.400.000
8 – 11 mm (.31 – .43")	.....S, T.....	A712-7.S31.500.000

▶ 15 |
 ▶ 20

Housing without inserts and contacts

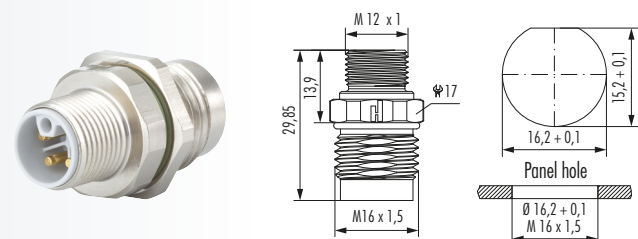
Pin inserts mountable with male thread housings only. Socket inserts mountable with female thread housings only.

Panel connector male thread, single hole front mounted

Cable-Ø **Coding** **Part Number**

Thread M 16K, LA712-7.K42.000.000
 Thread M 16 INOXK, LA712-7.K42.000.004
 Thread M 20S, TA712-7.S42.000.000

with lock nut „rotation protection“
 Thread M 16K, LA712-7.K42.000.006
 Thread M 20S, TA712-7.S42.000.006

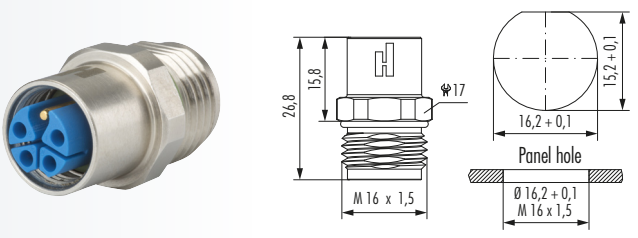


Panel connector female thread, single hole front mounted

Cable-Ø **Coding** **Part Number**

Thread M 16K, LA712-7.K44.000.000
 Thread M 16 INOXK, LA712-7.K44.000.004
 Thread M 20S, TA712-7.S44.000.000

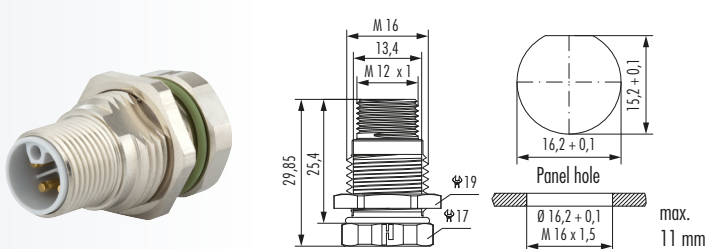
with lock nut „rotation protection“
 Thread M 16K, LA712-7.K44.000.006
 Thread M 20S, TA712-7.S44.000.006



Panel connector male thread, single hole rear mounted

Cable-Ø **Coding** **Part Number**

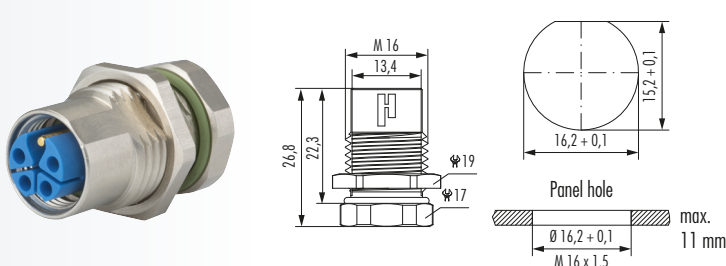
Thread M 16K, LA712-7.K50.000.000
 Thread M 20S, TA712-7.S50.000.000



Panel connector female thread, single hole rear mounted

Cable-Ø **Coding** **Part Number**

Thread M 16K, LA712-7.K51.000.000
 Thread M 20S, TA712-7.S51.000.000





Housings

Pin inserts mountable with male thread housings only. Socket inserts mountable with female thread housings only.

Panel connector male thread, front mounting	Cable-Ø	Coding	Part Number
	flange 20 x 20 mm, 4 x 2,7 mm	.....K, L.....	A712-7.K40.000.000
	flange 25 x 25 mm, 4 x 2,7 mm	.....S, T.....	A712-7.S40.000.000
	4 x holes 3,2 mm ¹		



Panel connector male thread, single hole front mounted, orientable	Cable-Ø	Coding	Part Number
	Thread M 20	.....S, T.....	A712-7.S42.200.000
	Drawing shows coding S + T		



Panel connector female thread, single hole front mounted, orientable	Cable-Ø	Coding	Part Number
	Thread M 20	.....S, T.....	A712-7.S44.200.000
	Drawing shows coding S + T		





Pin inserts mountable with male thread housings only. Socket inserts mountable with female thread housings only.

Inserts K-coding		Type	Part Number
<p>Insert pin mating view</p>	<p>Insert socket mating view</p>	Crimp insert, pins, 4 + PE without contacts.....	A712-7.K03.941.101
		Required contacts: 4 x pins, 1 x socket PE	
		Crimp insert, sockets, 4 + PE without contacts.....	A712-7.K03.941.102
		Required contacts: 4 x sockets, 1 x pin	
		max. wire insulation Ø 2,9 mm	
		▶ 16	
Inserts L-coding		Type	Part Number
<p>Insert pin mating view</p>	<p>Insert socket mating view</p>	Crimp insert, pins, 4 + FE without contacts.....	A712-7.L03.941.101
		Required contacts: 4 x pins, 1 x socket PE	
		Crimp insert, sockets, 4 + FE without contacts.....	A712-7.L03.941.102
		Required contacts: 4 x sockets, 1 x pin	
		max. wire insulation Ø 2,9 mm	
		▶ 16	
Inserts S-coding		Type	Part Number
<p>Insert pin mating view</p>	<p>Insert socket mating view</p>	Insert with pins 3 + PE contacts with screw termination.....	A712-7.S05.931.105
		Insert with sockets 3 + PE contacts with screw termination.....	A712-7.S05.931.106
Inserts T-coding		Type	Part Number
<p>Insert pin mating view</p>	<p>Insert socket mating view</p>	Insert with pins 4-pole contacts with screw termination.....	A712-7.T05.904.105
		Insert with sockets 4-pole contacts with screw termination.....	A712-7.T05.904.106



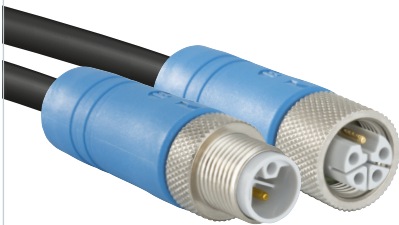
Contacts / Crimp Tool Setting for HUMMEL Crimp Contacts (Crimp Tool 7.000.900.908)

Contacts	Type	Crimp Range	Part Number
	Crimp pin 1,5 mm, machined	0,75 mm ²	A712-7.010.901.521
	Crimp pin 1,5 mm, machined	1,5 mm ²	A712-7.010.901.531
	Crimp pin 1,5 mm, machined	2,5 mm ²	A712-7.010.901.541
	Crimp socket 1,5 mm PE, machined	0,75 mm ²	A712-7.010.911.522
	Crimp socket 1,5 mm PE, machined	1,5 mm ²	A712-7.010.911.532
	Crimp socket 1,5 mm PE, machined	2,5 mm ²	A712-7.010.911.542
	Crimp socket 1,5 mm, machined.....	0,75 mm ²	A712-7.010.901.522
	Crimp socket 1,5 mm, machined.....	1,5 mm ²	A712-7.010.901.532
	Crimp socket 1,5 mm, machined.....	2,5 mm ²	A712-7.010.901.542



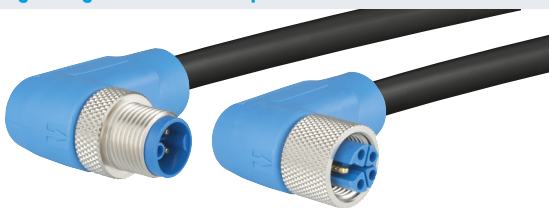
M 12 Power Moulded Cordsets, Open cable end

Straight Connector / Open cable end



		M 12 Coding K	M 12 Coding L	M 12 Coding S	M 12 Coding T
Cable (1,5 mm²) PUR					
unshielded	female	A712-KFS413UPxxx	A712-LFS413UPxxx	A712-SFS313UPxxx	A712-TFS043UPxxx
	male	A712-KMS413UPxxx	A712-LMS413UPxxx	A712-SMS313UPxxx	A712-TMS043UPxxx
shielded	female	A712-KFS413SPxxx	A712-LFS413SPxxx	A712-SFS313SPxxx	A712-TFS043SPxxx
	male	A712-KMS413SPxxx	A712-LMS413SPxxx	A712-SMS313SPxxx	A712-TMS043SPxxx
Cable (2,5 mm²) PUR					
unshielded	female	A712-KFS414UPxxx	A712-LFS414UPxxx		
	male	A712-KMS414UPxxx	A712-LMS414UPxxx		
shielded	female	A712-KFS414SPxxx	A712-LFS414SPxxx		
	male	A712-KMS414SPxxx	A712-LMS414SPxxx		

Right Angle Connector / Open cable end

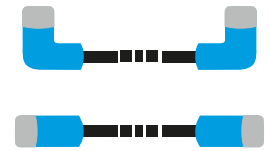


		M 12 Coding K	M 12 Coding L	M 12 Coding S	M 12 Coding T
Cable (1,5 mm²) PUR					
unshielded	female	A712-KFA413UPxxx	A712-LFA413UPxxx	A712-SFA313UPxxx	A712-TFA043UPxxx
	male	A712-KMA413UPxxx	A712-LMA413UPxxx	A712-SMA313UPxxx	A712-TMA043UPxxx

Please add required cable length to part number:

1,5 m	xxx replaced by: 015
2 m	xxx replaced by: 020
5 m	xxx replaced by: 050
10 m	xxx replaced by: 100
15 m	xxx replaced by: 150

The length can be chosen in decimetre (0,1 m) steps. INOX upon request.



M 12 Power Moulded Cordsets, Extension Cord

Extension cord: Straight Connector / Straight Connector

		M 12 Coding K	M 12 Coding L	M 12 Coding S	M 12 Coding T
Cable (1,5 mm²) PUR					
unshielded	female / male	A712-KFSMS413UPxxx	A712-LFSMS413UPxxx	A712-SFSMS313UPxxx	A712-TFSMS043UPxxx
shielded	female / male	A712-KFSMS413SPxxx	A712-LFSMS413SPxxx	A712-SFSMS313SPxxx	A712-TFSMS043SPxxx
Cable (2,5 mm²) PUR					
unshielded	female / male	A712-KFSMS414UPxxx	A712-LFSMS414UPxxx		
shielded	female / male	A712-KFSMS414SPxxx	A712-LFSMS414SPxxx		

Extension cord: Right Angle Connector / Right Angle Connector

		M 12 Coding K	M 12 Coding L	M 12 Coding S	M 12 Coding T
Cable (1,5 mm²) PUR					
unshielded	female / male	A712-KFAMA413UPxxx	A712-LFAMA413UPxxx	A712-SFAMA313UPxxx	A712-TFAMA043UPxxx

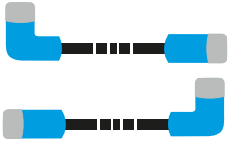
Please add required cable length to part number:

1,5 m	xxx replaced by: 015
2 m	xxx replaced by: 020
5 m	xxx replaced by: 050
10 m	xxx replaced by: 100
15 m	xxx replaced by: 150

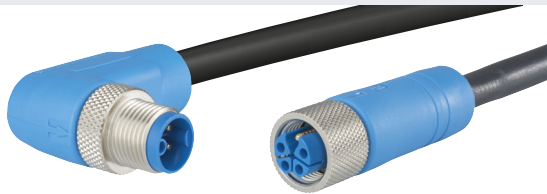
The length can be chosen in decimetre (0,1 m) steps. INOX upon request.



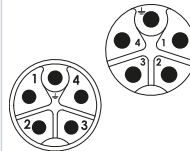
Extension cord with overmoulded Right Angle Connectors



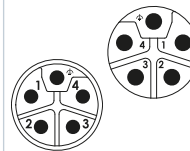
Extension cord: Straight Connector / Right Angle Connector



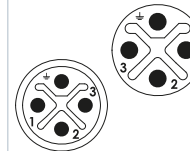
M 12 Coding K



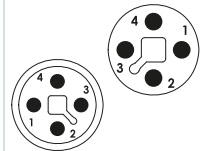
M 12 Coding L



M 12 Coding S



M 12 Coding T



Female Straight Connector / Male Right Angle Connector, Cable (1,5 mm²) PUR

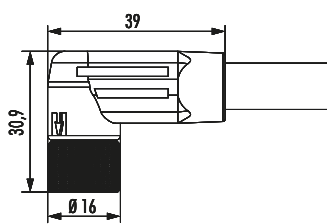
unshielded	female / male	A712-KFSMA413UPxxx	A712-LFSMA413UPxxx	A712-SFSMA313UPxxx	A712-TFSMA043UPxxx
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Female Right Angle Connector / Male Straight Connector, Cable (1,5 mm²) PUR

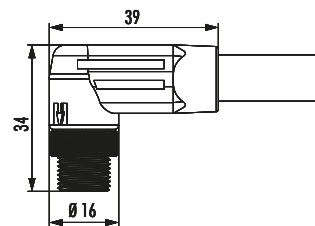
unshielded	female / male	A712-KFAMS413UPxxx	A712-LFAMS413UPxxx	A712-SFAMS313UPxxx	A712-TFAMS043UPxxx
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INOX upon request

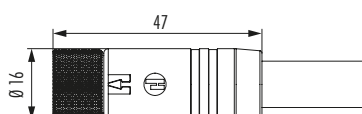
Right Angle Connector, female thread



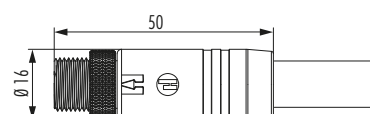
Right Angle Connector, male thread



Straight Connector, female thread



Straight Connector, male thread





Accessories

Accessories	Type	Part Number
	Plastic protective cap for connectors with male thread with female thread	A712-7.000.980.161 A712-7.000.980.162
	Brass protective cap for connectors with female thread	A712-7.010.900.163
	Brass protective cap for connectors with male thread	A712-7.010.900.162
	Brass protective cap with chain for connectors with female thread Length 70 mm	A712-7.010.9S0.705
	Brass protective cap with chain for connectors with male thread Length 70 mm	A712-7.010.9S0.704
	Crimp tool for manual crimping of machined crimp contacts for signal connectors M 12	7.000.900.908
	Tool Adapter for tightening or loosening knurled nuts for M 12 Power/M 16	7.010.900.191
	Screw Tool, adjustable 0.5 – 1.7 Nm	7.010.900.190

Limited Liability

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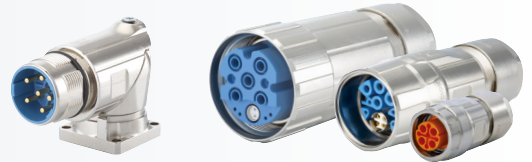
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