

# CIRCULAR CONNECTORS M40





# HUMMEL — smart & reliable





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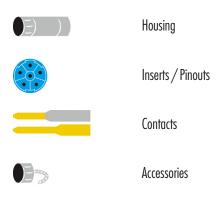
#### **Graphic & Layout:**

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#### Printer:

Druckerei Furtwängler GmbH, 79211 Denzlingen, Germany, Tel. +49 (0) 76 66 / 13 31. Printed on recycled paper in July 2024.





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



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



HUGE RANGE: M 12 - M 40



# CIRCULAR CONNECTORS

PROFINET Customized Solutions

Industrial Ethernet M 16 M 23 RJ 45 M 40

M 23 Hybrid

TWILOCK Moulded Cordsets













File-No. E 213337



- // Quick Connect
- // 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-S and screw connection



Locking with a slight rotation or release of the connection



intermateable with SpeedTec





## TECHNICAL INFORMATION

#### Rated curren

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 sofety, 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 in 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 greas.).
- 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.

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Further information is available on our website:

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



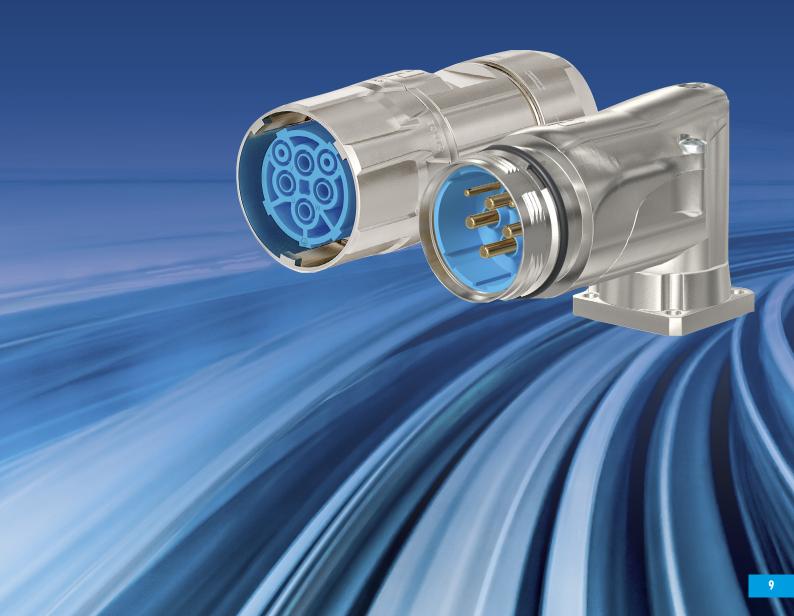
HUMMEL connectors may not be engaged or disengaged when live. To ensure the IP degree of protection (IP rating) and the necessary contact overlapping, the cable and coupling connectors must be fully engaged and locked.



# M 40 POWER CONNECTORS (SIZE 1,5)

Connector series M 40 is suitable for high current and is preferably used for heavy drive application. The high-quality housing out of metal fulfills all requirements, that are present in a rough industrial environment. Furthermore, it convinces through a long operational lifetime.

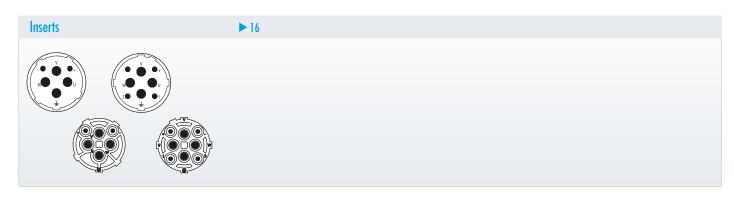
- // suitable for requirements with high current
- // safe EMC protection
- // Screw lock or quick release fastener
- // TWILOCK-S: intermateable with SpeedTec





## Product overview









Technical Data

Mechanical Data	Materials and Technical Data
Housing	Copper-Zinc alloy Die Cast
Housing surface	Nickel plated, other surface upon request
Inserts (for contacts)	Thermoplastic Polyamid PA 6 (Nylon 6/6), PBT Fire protection class V-0
Contacts	Brass Alloy
Contact surface at point of contact	Nickel and gold plated (0,25 µm)
Minimum mating cycles	> 500
Seals / O-Rings	Buna-N standard
	optional Viton® (FKM / FPM) (Viton is a registered trademark of DuPont)
Temperature range	-40 °C − 125 °C (-40 °F − 257 °F)
Type of contacts	Crimp
Protection	IP 67 / IP 69K per EN 60 529 (connected)
Cable diameter range	13 – 28 mm (.51" – 1.10")



Standard delivery of M 40 (size 1,5) Power Connector include Contact Insert.

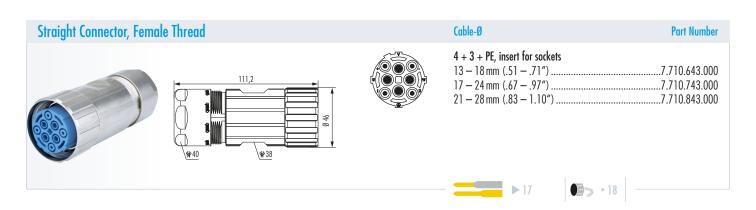
Electrical Data				
Number of positions	2 + 3	+ PE	4 + 3	B + PE
Number of contacts	2	4	4	4
Contact-Ø [mm]	2	3,6	2	3,6
Nominal current 1) [A]	28	55	28	55
Nominal voltage 2) [V~] degree of pollution 3 3)	300	600	300	600
Test voltage (Breakdown voltage) 4) [V~]	2500	4000	2500	4000
Insulation resistance $[\Omega]$	>1	013	>1	013
Max. contact resistance $[m\Omega]$	3	1	3	1

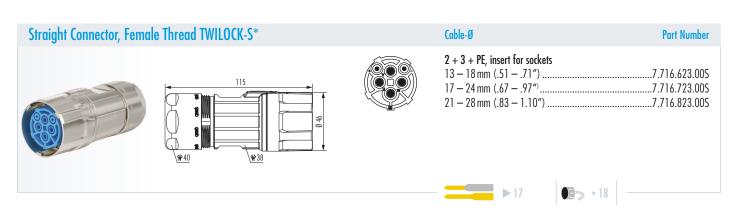


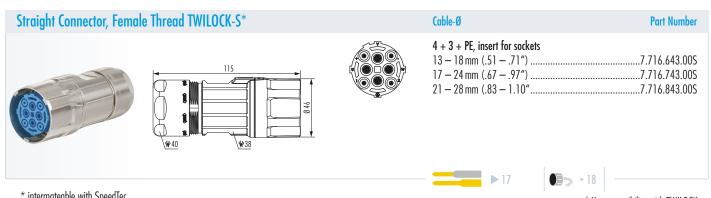


#### **Housings with inserts**

# Cable-Ø Straight Connector, Female Thread **Part Number** 2 + 3 + PE, insert for sockets





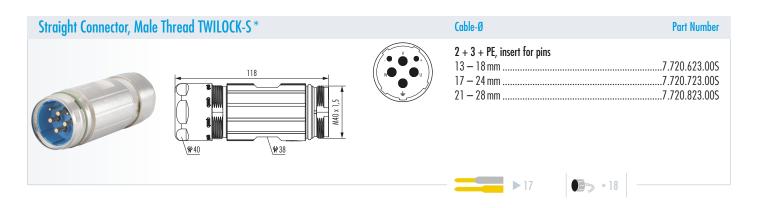


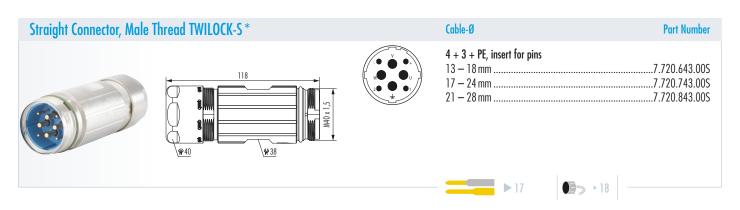
<sup>\*</sup> intermateable with SpeedTec

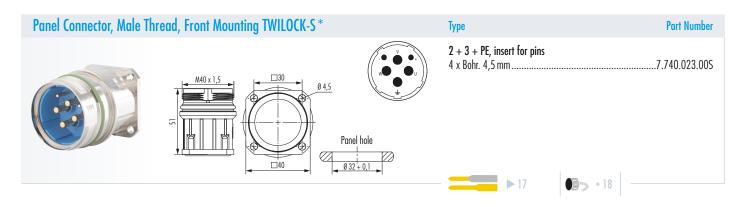


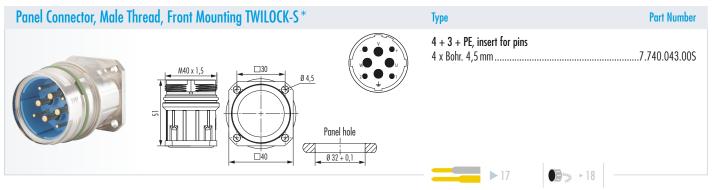


#### **Housings with inserts**







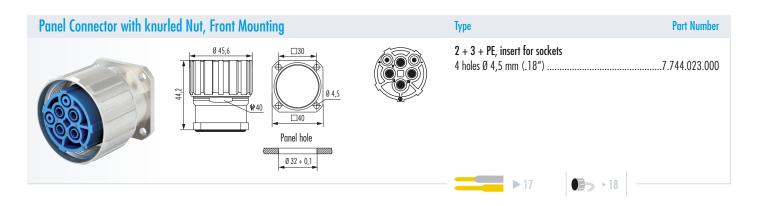


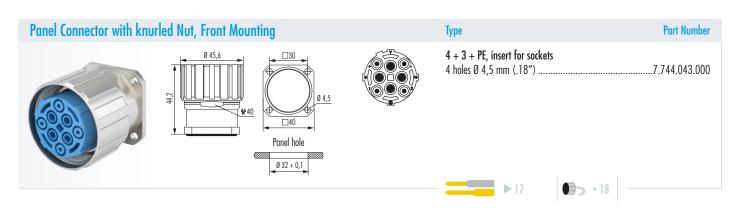
\* intermateable with SpeedTec

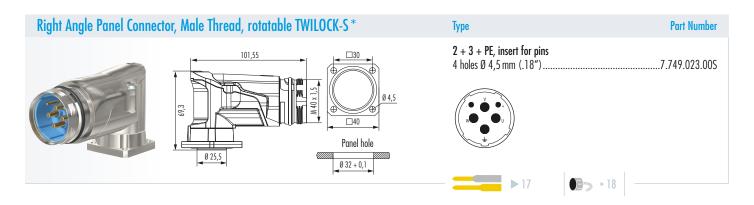


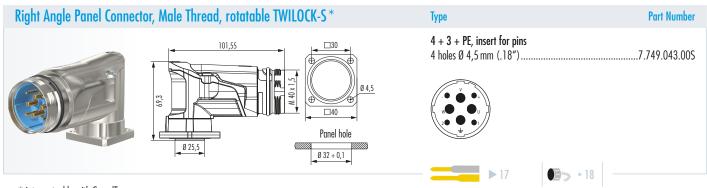


#### **Housings with Inserts**





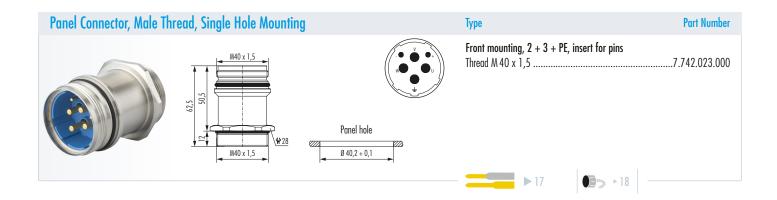


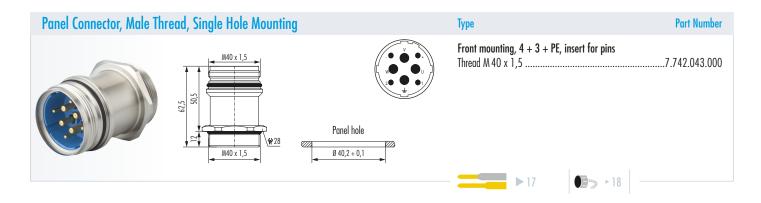


<sup>\*</sup> intermateable with SpeedTec



#### **Housings with Inserts**









# Inserts

Contact Arrangement, Mating View	Number of Poles	Required Contacts
	Insert for pins 2 + 3 + PE	
	Insert for sockets 2 + 3 + PE	
	Insert for pins 4 + 3 + PE	
	Insert for sockets 4 + 3 + PE	
Standard delivery of M 40 Hybrid Power C	onnector include Contact insert.	





Contacts

Contacts	Туре	Crimp Range	Part Number
	Crimp pin 2 mm, machinedCrimp pin 2 mm, machined		
	Crimp socket 2 mm, machinedCrimp socket 2 mm, machined		
	Crimp pin 3,6 mm, machined	1,5 — 4 mm² (AWG 16 — 12)	7.015.953.601
	Crimp socket 3,6 mm, machined	1,5 — 4 mm² (AWG 16 — 12)	7.015.953.602
	Crimp pin 3,6 mm, machined	6 mm² (AWG 10)	7.015.953.611
	Crimp socket 3,6 mm, machined	6 mm² (AWG 10)	7.015.953.612
	Crimp pin 3,6 mm, machinedCrimp pin 3,6 mm, machined	AWG 810 mm <sup>2</sup>	7.015.953.621 7.015.953.623
	Crimp socket 3,6 mm, machinedCrimp socket 3,6 mm, machined	AWG 810 mm <sup>2</sup>	7.015.953.622 7.015.953.624
	Crimp pin 3,6 mm, machined	16 mm² (AWG 6)	7.015.953.631
	Crimp socket 3,6 mm, machined	16 mm² (AWG 6)	7.015.953.632





# Contacts

Accessories	Туре	Part Number
	Plastic protective cap for connectors with female thread	7.000.900.152
	Plastic protective cap for connectors with male thread	7.000.900.151
	Brass protective cap for connectors with female thread	7.015.900.103
	Brass protective cap for connectors with male thread	7.015.900.102
	Brass protective cap with rope for connectors with female thread	7.015.9S1.003
	Brass protective cap with rope for connectors with male thread	7.015.9S1.002
	Adaptor flange for Straight Connectors	7.010.900.129





## Accessories

ccessories	Туре	Part Numbe
A	Adapter for Conduit Fittings	
	Poleon DN 23	
	Poleon DN 29	7.010.900.217
y.	Manual crimp tool machined crimp contacts until 10 mm² (AWG 8) for power connectors	
	battery pack crimp tool for connectors M 40 (European market only)	7 000 900 920
	crimping unit for crimp tool	
	locator for 2 mm contacts battery pack crimp tool	
	locator for 3,6 mm contacts at crimp tool	
	assembly instructions online: www.hummel.com	
	·	
₩.1	Crimp tool for manual crimping of machined crimp contacts 16 mm² (AWG 6)	7 በበበ ዐበባ ዐበና
	oi inocililea cililip collacis to lilili <sup>s</sup> (AVVO 0)	





# M 40 POWER CONNECTORS (SIZE 1,5) HYBRID

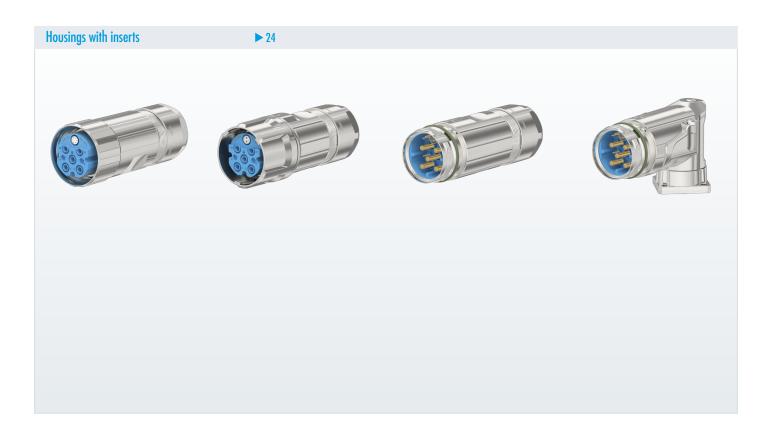
The M 40 Hybrid combines the power of the standard series with the versatility of a hybrid connector. This circular connector transmits power up to 55 A and parallel data rates up to 100 Mbit/s.

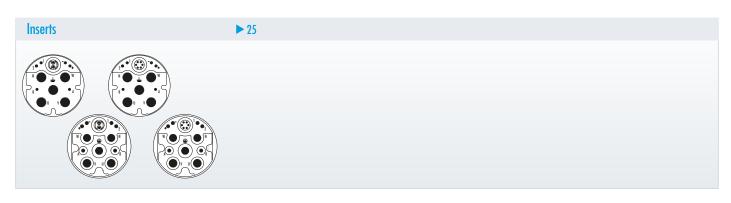
A special feature are the high electrical characteristics of the signal contacts A/B. They enable users in servo technology to achieve transmission rates of up to 300 V/7 A for brakes.





## Product overview









Technical Data

Mechanical Data	
Housing	Copper-Zinc alloy
· ·	Die Cast
Housing surface	Nickel plated, other surface upon request
Inserts (for contacts)	Thermoplastic Polyamid PA 6 (Nylon 6/6), PBT Fire protection class V-0
Contacts	Brass Alloy
Contact surface at point of contact	Nickel and gold plated (0,25 µm)
Minimum mating cycles	> 500
Seals / O-Rings	Buna-N standard
	optional Viton® (FKM / FPM) (Viton is a registered trademark of DuPont)
Temperature range	-40 °C - 125 °C (-40 °F - 257 °F)
Type of contacts	Crimp
Protection	IP 67 / IP 69K per EN 60 529 (connected)
Cable diameter range	13 – 28 mm (.51" – 1.10")



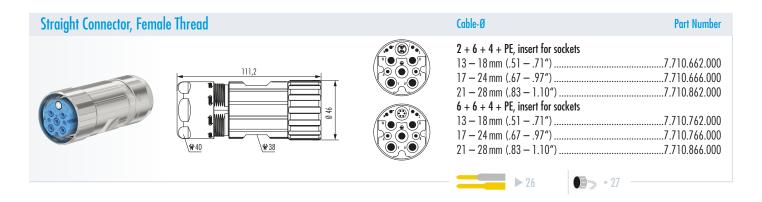
Standard delivery of M 40 / M 40 HYBRID (size 1,5) Power Connector include Contact Insert.

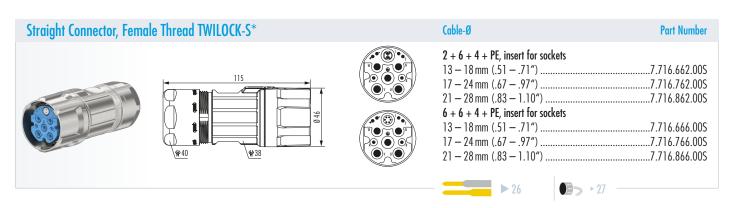
Number of positions	Power	Signal	Ethernet	
Number of contacts	4 + PE	4 + 2	2/6	
Contact-Ø [mm]	3,6 mm	1 mm	1 / 0,6 mm	
AWG [mm2]	$1.5 - 10  \text{mm}^2$	0,14 - 1,5 mm <sup>2</sup>	$0,14-1,5/0,05-0,34 \mathrm{mm}^2$	
Nominal current 1) [A]	55	7	2/1,2	
Nominal voltage 2) [V~] degree of pollution 3 3)	630 AC, 850 DC	150 / <b>300</b>	30	
Test voltage (Breakdown voltage) 4) [V~]	4000	500/1500	500	
Data transfer	-	_	Cat5e / Cat5	
Insulation resistance $[\Omega]$	> 1013	> 10 <sup>13</sup>	> 1013	
Max. contact resistance $[m\Omega]$	3 1	3 1	3 1	

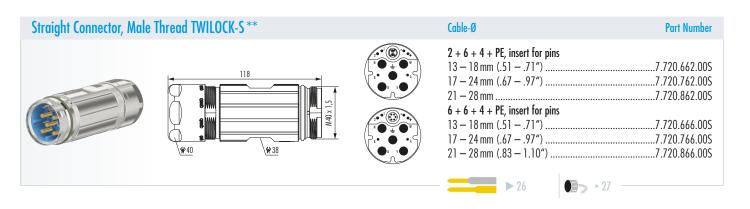


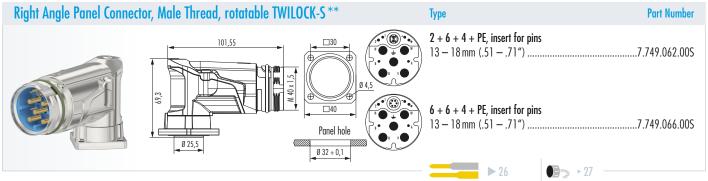


#### **Housings with inserts**









<sup>\*</sup> intermateable with SpeedTec

 $<sup>\</sup>star\star$  intermateable with HUMMEL, through 2 additional and powerful signal pins in HUMMEL specific contact arrangement







Inserts

Contact Arrangement, Mating View	Number of Poles	Required Contacts
	Insert for pins 2 + 6 + 4 + PE	
	Insert for sockets 2 + 6 + 4 + PE	
	Insert for pins 6 + 6 + 4 + PE	6 x crimp pins 1 mm
	Insert for sockets 6 + 6 + 4 + PE	6 x crimp sockets 1 mm

Contacts	Туре	Crimp Range	Part Number
	Crimp pin 0,6 mm, machined	0,05 — 0,34 mm² (AWG 30 — 22	7.010.960.611
	Crimp socket 0,6 mm, machined	0,05 — 0,34 mm² (AWG 30 — 22)	7.010.960.612
	Crimp pin 1 mm, machined Crimp pin 1 mm, machined	0,14 — 1 mm² (AWG 26 — 18) 0,75 — 1,5 mm² (AWG 20 — 16)	7.015.961.001 7.015.961.011
		0,14 — 1 mm² (AWG 26 — 18) 0,75 — 1,5 mm² (AWG 20 — 16)	
	Crimp pin 3,6 mm, machined Crimp pin 3,6 mm, machined	1,5 — 4 mm² (AWG 16 — 12)	7.015.963.611 7.015.963.621
	Crimp socket 3,6 mm, machined	1,5 — 4 mm² (AWG 16 — 12)	7.015.963.612 7.015.963.622





## Accessories

Accessories	Туре	Crimp Range	Part Number
	Adapter for Conduit Fittings Poleon DN 23Poleon DN 29		
	Crimp tool for manual crimping machined crimp contacts until 10 mm² (AWG 8) for power cobattery pack crimp tool for connectors M 40 (European marks crimping unit for 2mm contacts battery pack crimp tool (7.0° locator for 2 mm contacts battery pack crimp tool	et only) 15.952.003/7.015.952.004)	7.000.900.918
	Crimp tool for manual crimping of machined crimp contacts 16 mm² (AWG 6)		7.000.900.903
	Crimp tool for 0,6mm contacts and 1mm contacts Hybrid <sup>2</sup> locator for this crimp tool		



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# **ELECTRIC COMPONENTS**

# Cable Glands

Polyamide-, Brass- and Stainless steel, EMC-connections, Protection Ex e, Ex d, Ex ta



# **Circular Connectors**

M 12 Power to M 40, INOX, TWILOCK, Industrial Ethernet, Power, Signal, Hybrid-Connector, Moulded Cordsets





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