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## ETHERLINE®

### Data communication systems for Ethernet technology

Our ETHERLINE® data products open up a secure, fast, and reliable path to the future of Ethernet applications like PROFINET®. The systems are made up of durable, robust cable and connection components for passive and active network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.

#### Application range

- Industry and building networks
- Industrial machinery and plant engineering
- Automation technology
- Control engineering

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2 pair cable

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4 pair cable

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Industrial Ethernet cable for stationary applications

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## Quick select chart &amp; cable attributes

## 2 pair cable

Application	Product	Page	Category	Part number	Jacket material	Size	Outer diameter in	
Stationary	ETHERLINE® CAT.5/5e	236	CAT.5	2170893	PVC	22 AWG	0.256	
			CAT.5e	2170891	PVC	22 AWG	0.252	
				2170933	PVC/PVC	22 AWG	0.307	
				2170280	halogen-free	24 AWG	0.229	
				2170281	PUR	24 AWG	0.229	
	ETHERLINE® ARMORED	241	CAT.5	2170496	PVC/PE	22 AWG	0.366	
Flexible	ETHERLINE® CAT.5/5e	237	CAT.5	2170886	PVC	22 AWG	0.256	
			CAT.5e	2170901	PVC	22 AWG	0.244	
				2170283	halogen-free	26 AWG	0.213	
				2170284	PUR	26 AWG	0.228	
	ETHERLINE® 105C Plus	240	CAT.5e	2170636	TPE	22 AWG	0.244	
	ETHERLINE® HYBRID	242	CAT.5	2170887	halogen-free	22 AWG + 16 AWG/4c	0.406	
	ETHERLINE® ROBUST	255	CAT.5e	2170451	TPE	22 AWG	0.268	
ETHERLINE® ROBUST FR	256	CAT.5e	2170454	TPE	22 AWG	0.268		
Continuous flex	ETHERLINE® CAT.5/5e	238	CAT.5	2170894	PUR	22 AWG	0.256	
			CAT.5e	2170289	PUR	26 AWG	0.240	
				2170289NA	PUR	26 AWG	0.228	
Torsion	ETHERLINE® TORSION	239	CAT.5	2170888	PUR	22 AWG	0.256	

	Approvals	Special features	Cable attributes, see page 648			
			oil resistance	flame resistance	motion type	mechanical protection
	PROFINET®, EtherCAT®, UL AWM, UL/CSA CMG	fast connect, 600V	OR-00	FR-03	FL-01	MP-01
	PROFINET®, EtherCAT®, UL/CSA CMX	—	OR-00	FR-02	FL-01	MP-01
	PROFINET®, EtherCAT®, UL/CSA CMG	for outdoor use and direct burial	OR-00	FR-03	FL-01	MP-01
	—	—	OR-00	FR-01	FL-01	MP-01
	UL/CSA AWM	1000V	OR-04	FR-01	FL-01	MP-05
	PROFINET®, EtherCAT®	steel armored, for outdoor use and direct burial	OR-00	FR-00	FL-00	MP-01
	PROFINET®, EtherCAT®, UL AWM, UL/CSA CMG, ECOLAB	fast connect, 600V	OR-00	FR-03	FL-02	MP-01
	PROFINET®, EtherCAT®, UL/CSA AWM	—	OR-00	FR-01	FL-02	MP-01
	UL/CSA AWM	1000V	OR-04	FR-01	FL-02	MP-05
	PROFINET®, EtherCAT®, UL/CSA AWM	high temperature (105°C)	OR-04	FR-00	FL-02	MP-05
	PROFINET®, EtherCAT®, UL AWM	hybrid cable for power with Ethernet applications	OR-00	FR-01	FL-02	MP-01
	PROFINET®	UV & chemical resistance	OR-01	FR-01	FL-02	MP-01
	PROFINET®, EtherCAT®	UV & chemical resistance	OR-01	FR-02	FL-02	MP-01
	PROFINET®, EtherCAT®, UL/CSA CMX	fast connect	OR-04	FR-02	CF-01	MP-05
	UL/CSA AWM	tested for 2.5 million flex cycles; 1000V	OR-04	FR-00	CF-02	MP-05
	UL/CSA AWM	tested for 2.5 million flex cycles; 1000V	OR-04	FR-00	CF-02	MP-05
	PROFINET®, EtherCAT®, UL AWM	—	OR-04	FR-01	FL-02*	MP-05

\* Torsion ± 180°/m

## Quick select chart & cable attributes

### 4 pair cable

Application	Product	Page	Category	Part number	Jacket material	Size	Outer diameter in
Stationary	ETHERLINE® CAT.5e	243	CAT.5e	2170296	halogen-free	24 AWG	0.248
				2170297	PUR	24 AWG	0.248
				2170298	halogen-free + inner jacket	24 AWG	0.296
	ETHERLINE® CAT.6A/CAT.7	247	CAT.6A	2170464	PVC	22 AWG	0.343
				2170465	PUR	22 AWG	0.343
				2170466	halogen-free	22 AWG	0.343
			CAT.7	2170474	PVC	22 AWG	0.343
				2170475	PUR	22 AWG	0.343
				2170476	halogen-free	22 AWG	0.343
Flexible	ETHERLINE® CAT.5e	244	CAT.5e	2170299	halogen-free	26 AWG	0.240
				2170300	PUR	26 AWG	0.240
	ETHERLINE® HEAT 6722	252	CAT.5e	2170850	PUR	24 AWG	0.303
			CAT.6A	2170581	PUR	24 AWG	0.319
			CAT.7	2170582	PUR	24 AWG	0.319
	ETHERLINE® TRAY	253	CAT.5e	2170450	PVC	22 AWG	0.380
	ETHERLINE® FIRE PH120	254	CAT.5e	2170905	halogen-free FRNC	23 AWG	0.327
	ETHERLINE® ROBUST	255	CAT.7	2170452	TPE	23 AWG	0.355
				2170453	TPE	26 AWG	0.256
		256	CAT.7	2170455	TPE	24 AWG	0.355
				2170456	TPE	26 AWG	0.256
ETHERLINE® CAT.7	250	CAT.7	2170934	PUR	26 AWG	0.250	
Continuous flex	ETHERLINE® CAT.5e	245	CAT.5e	2170489	PUR	26 AWG	0.248
	ETHERLINE® CAT.6	246	CAT.6	2170488	PUR	26 AWG	0.307
	ETHERLINE® CAT.6A	248	CAT.6A	2170484	PUR	24 AWG	0.355
				2170485	PVC	24 AWG	0.355
	Torsion	ETHERLINE® TORSION	249	CAT.6A	2170482	PVC	24 AWG
2170483					PUR	24 AWG	0.355

	Approvals	Special features	Cable attributes, see page 648			
			oil resistance	flame resistance	motion type	mechanical protection
	–	–	OR-00	FR-01	FL-01	MP-01
	UL/CSA AWM	1000V	OR-04	FR-01	FL-01	MP-05
	–	halogen-free inner jacket for extra protection	OR-00	FR-01	FL-01	MP-01
	–	PiMF construction: pairs are individually shielded with foil tape	OR-00	FR-03	FL-01	MP-01
			OR-04	FR-01	FL-01	MP-05
			OR-00	FR-03	FL-01	MP-01
			OR-00	FR-03	FL-01	MP-01
			OR-04	FR-01	FL-01	MP-05
			OR-00	FR-03	FL-01	MP-01
	–	–	OR-00	FR-01	FL-02	MP-01
	UL/CSA AWM	1000V	OR-04	FR-01	FL-02	MP-05
	PROFINET®	high temperature (105°C)	OR-04	FR-01	FL-02	MP-05
	EtherCAT®, UL CMR, UL AWM	600V, PLTC	OR-02	FR-05	FL-02	MP-01
	PROFINET®	–	OR-00	FR-03	FL-01	MP-01
	PROFINET®	UV & chemical resistance	OR-01	FR-01	FL-02	MP-01
	–					
	PROFINET®, EtherCAT®	UV & chemical resistance	OR-01	FR-02	FL-02	MP-01
	–					
	cRUus	–	OR-04	FR-01	FL-02	MP-05
	UL/CSA AWM	tested for 2.5 million flex cycles, 1000V	OR-04	FR-00	CF-02	MP-05
	UL/CSA CMX	–	OR-04	FR-02	CF-01	MP-05
	PROFINET®, UL/CSA AWM, CMX	1000V	OR-04	FR-02	CF-01	MP-05
	PROFINET®, UL/CSA CMG	–	OR-00	FR-03	CF-01	MP-01
	PROFINET®, UL/CSA CMG	–	OR-00	FR-03	FL-02*	MP-01
	PROFINET®, UL/CSA AWM, CMX	1000V	OR-04	FR-02	FL-02*	MP-05

\* Torsion ± 180°/m

# ETHERLINE® 2 pair: CAT.5/CAT.5e; stationary

## Industrial Ethernet cable for stationary applications



ETHERLINE® CAT.5/5e cables provide reliable network communication in demanding industrial environments. The high quality foil and braid shield assure protection from EMI. Cables meet the transmission requirements for Category 5 or 5e.

### Recommended applications

Stationary applications; industrial field and cell level networking; PLCs, sensors, and other network devices; dry and damp rooms; transmission rates up to 10/100 Mbit/sec

### Approvals



### Construction

- Conductors:** solid bare copper
- Pairs:** 2 twisted pairs or star quad
- Insulation:** polyethylene
- Shielding:** foil and copper braid
- Jacket:** PVC; green or black • polyurethane or halogen-free; teal

### Application advantage

- Double screening ensures high transmission reliability in areas with EMI
- Flame retardant
- Highly oil- and abrasion-resistant PUR jacket
- Conforms to PROFINET® standard
- Suitable for EtherCAT® & EtherNet/IP applications
- Fast connect style allows for quick installation
- Suitable for PoE per IEEE 802.3at

Cable attributes page 648

See attribute list by part number on page 232

Complete the installation



Fast connect stripping tool  
page 262



RJ45 connectors  
page 257

ÖLFLEX® CONNECT solution



ÖLFLEX® CONNECT CABLES  
page 605

### Technical data

<p><b>Minimum bend radius:</b> - for stationary use: - 2170893: 10 x cable diameter - 2170891: 3 x cable diameter - 2170494: 4 x cable diameter - 2170280, 2170281: 8 x cable diameter</p> <p><b>Temperature range:</b> - 2170893, 2170281: -40°C to +80°C - 2170891: -40°C to +75°C - 2170494: -25°C to +80°C - 2170280: -30°C to +80°C</p> <p><b>Nominal voltage:</b> (not for power applications) - 2170893: 600V (UL AWM) - 2170281: 1000V - all other P/Ns: 125V</p>	<p><b>Characteristic impedance:</b> 100Ω ± 15Ω</p> <p><b>Color code:</b> - 2170893, 2170891, 2170494: white, yellow, blue, orange - 2170280, 2170281: white/orange &amp; orange, white/green &amp; green</p> <p><b>Approvals:</b> UL: AWM 21576 (2170281) AWM 21694 (2170893) PLTC (2170893) CMG (2170893, 2170494) CMX (2170891) Canada: c(UL) CMG (2170893, 2170494) c(UL) CMX (2170891) cRU AWM I/II A/B FT2 (2170281) Additional: RoHS</p>
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Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.5</b>											
2170893	22 AWG/2pr	solid	PVC	green	PROFINET®, UL/CSA CMG, UL AWM, 600V	yes	yes	0.256	6.5	47	53112210
<b>CAT.5e</b>											
2170891	22 AWG/2pr	solid	PVC	green	PROFINET®, UL/CSA CMX	no	yes	0.252	6.4	38	53112210
2170933	22 AWG/2pr	solid	PVC*	black	PROFINET®, UL/CSA CMG	no	yes	0.307	7.8	42	53112220
2170280	24 AWG/2pr	solid	halogen-free	teal	–	no	yes	0.229	5.8	30	53112210
2170281	24 AWG/2pr	solid	PUR	teal	UL/CSA AWM, 1000V	no	yes	0.229	5.8	36	53112210

\* Inner and outer jacket

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# ETHERLINE® 2 pair: CAT.5/CAT.5e; flexible

## Industrial Ethernet cable for flexible applications



Flexible ETHERLINE® CAT.5/5e cables are constructed with a high-quality foil and copper braid shield for reliable data transfer in areas where EMI is pervasive. The different jacket materials provide excellent protection against oil, flame, or sunlight. A Low Smoke Zero Halogen (LSZH) jacketed cable is available for applications where human safety and damage to electronic components are a concern.

### Recommended applications

Flexible applications; wiring of industrial network devices, sensors, actuators, and cordsets

### Approvals



### Construction

**Conductors:** stranded bare copper • 2170886: stranded tinned copper

**Pairs:** 2 twisted pairs or star quad

**Insulation:** polyethylene • 2170901: polyolefin

**Shielding:** foil and copper braid

**Jacket:** PVC; green or black • polyurethane or halogen-free; teal

### Application advantage

- Excellent EMI protection
- Oil-, flame- & UV-resistant jacket
- Conforms to PROFIBUS® standard
- Suitable for EtherCAT® & EtherNet/IP applications
- Fast connect style allows for quick installation
- **Suitable for PoE per IEEE 802.3at** (see table below)

#### Cable attributes page 648

See attribute list by part number on page 232

#### Complete the installation



Fast connect stripping tool  
page 262



RJ45 connectors  
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#### ÖLFLEX® CONNECT solution



Industrial Ethernet cordsets  
page 620

### Technical data

<p><b>Minimum bend radius:</b> - for flexible use: 15 x cable diameter</p> <p><b>Temperature range:</b> - 2170886: -20°C to +60°C - 2170901: -10°C to +70°C - 2170283, 2170284: -5°C to +60°C</p> <p><b>Nominal voltage:</b> (not for power applications) - 2170886: 600V (UL AWM) - 2170284: 1000V - all other P/Ns: 125V</p> <p><b>Characteristic impedance:</b> 100Ω ± 15Ω</p>	<p><b>Color code:</b> - 2170886, 2170901: white, yellow, blue, orange - 2170283, 2170284: white/orange &amp; orange; white/green &amp; green</p> <p><b>Approvals:</b> UL: AWM 21576 (2170284) AWM 21694 (2170886) PLTC (2170886) CMG (2170886) **NEC: Class 1 Division 2 per NEC Article 501 Canada: c(UL) CMG (2170886) cRU AWM I/II A/B FT2 (2170284) Additional: ECOLAB (2170886) RoHS</p>
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Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.5</b>											
2170886**	22 AWG/2pr	7 wire	PVC	green	PROFINET®, UL/CSA CMG, UL AWM, 600V, ECOLAB	yes	yes	0.256	6.5	45	53112210
<b>CAT.5e</b>											
2170901	22 AWG/2pr	7 wire	PVC	black	PROFINET®	no	yes	0.244	6.2	40	53112210
2170283*	26 AWG/2pr	7 wire	halogen-free	teal	—	no	no	0.213	5.4	29	53112210
2170284*	26 AWG/2pr	7 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.228	5.8	30	53112210

\* Max cable run: 196 ft (60 m)

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# ETHERLINE® 2 pair: CAT.5/CAT.5e; continuous flex

## Industrial Ethernet cable for continuous flex applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5

LAPP KABEL STUTTGART ETHERLINE® CAT.5e

ETHERLINE® CAT.5/5e cables are suitable for cable track applications and other moving machinery parts. The special cable design allows easy cable routing, yet provides excellent protection from EMI. The polyurethane outer jacket is halogen-free and resistant against oil, abrasion, and UV light.

### Construction

**Conductors:** stranded bare copper • 2170894: tinned copper  
**Pairs:** 2 twisted pairs or star quad  
**Insulation:** polyolefin • 2170894: polyethylene  
**Shielding:** copper braid • 2170894: foil and copper braid  
**Jacket:** polyurethane; green or teal

### Recommended applications

Continuous flex applications; cable tracks; cordsets; wiring of network devices; dry or damp environments

### Approvals



### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Easy cable routing
- Protection from EMI
- Fast connect style allows for quick installation
- Suitable for PoE per IEEE 802.3at (see table below)

#### Cable attributes page 648

See attribute list by part number on page 232\*

#### Complete the installation



Fast connect stripping tool  
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RJ45 connectors  
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#### ÖLFLEX® CONNECT solution



Industrial Ethernet cordsets  
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### Technical data

<p> <b>Minimum bend radius:</b>                  - for stationary use: 8 x cable diameter                  - for continuous flexing: 15 x cable diameter</p> <p> <b>Temperature range:</b>                  - 2170894 &amp; 2170289:                  - for continuous flexing: -20°C to +60°C                  - for stationary use: -30°C to +70°C                  - 2170289NA:                  - for continuous flexing: -5°C to +50°C                  - for stationary use: -40°C to +70°C</p> <p> <b>Nominal voltage:</b> (not for power applications)                  - 2170894: 100V                  - 2170289 &amp; 2170289NA: 1000V</p>	<p> <b>Characteristic impedance:</b> 100Ω ± 15Ω</p> <p> <b>Color code:</b>                  - 2170894: white, yellow, blue, orange                  - 2170289: white/orange &amp; orange;                                    white/green &amp; green                  - 2170289NA: white/orange &amp; orange;                                    white/blue &amp; blue</p> <p> <b>Approvals:</b>                  UL: CMX (2170894)                        AWM 21576 (2170289, 2170289NA)                  Canada: c(UL) CMX (2170894)                            cRU AWM I/II A/B FT2                                    (2170289, 2170289NA)                  Additional: RoHS                  *UL Verified ID A522492: Continuous Flex Test Method Verified</p>
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Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.5</b>											
2170894	22 AWG/2pr	7 wire	PUR	green	PROFINET®, UL/CSA CMX	yes	yes	0.256	6.5	42	53112210
<b>CAT.5e</b>											
2170289*	26 AWG/2pr	19 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.240	6.1	32	53112210
2170289NA*	26 AWG/2pr	19 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.228	5.8	32	53112210

\* Max cable run: 196 ft (60 m)

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# ETHERLINE® 2 pair: CAT.5 TORSION

## Industrial Ethernet cable suitable for torsion stress

LAPP KABEL STUTTGART ETHERLINE® CAT.5 TORSION



ETHERLINE® TORSION is a 2 pair industrial Ethernet cable designed for high-torsion stress applications. It is tested with more than 1 million bending cycles and a right/left movement of 180° per meter.

### Construction

**Conductors:** stranded tinned copper

**Pairs:** star quad

**Insulation:** foamed polyethylene

**Shielding:** tinned copper braid; non-woven wrap

**Jacket:** halogen-free polyurethane; green

### Recommended applications

Stationary, flexible, continuous flex, and torsion applications; recommended for drip loop applications, e.g., in wind turbines

### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Suitable for high torsion stress
- High-quality shield provides excellent EMI protection
- Highly abrasion-resistant PUR jacket
- Halogen-free and flame retardant
- Suitable for PoE per IEEE 802.3at

### Approvals



Cable attributes page 648

OIL	OR-04	FLAME	FR-01
MOTION	FL-02*	MECH.	MP-05

\* Torsion ± 180°/m

Complete the installation

	SKINTOP® MS-SC page 522		RJ45 connectors page 257
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ÖLFLEX® CONNECT solution

	ÖLFLEX® CONNECT CABLES page 605
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### Technical data

<b>Minimum bend radius:</b>	5 x cable diameter	<b>Characteristic impedance:</b>	100Ω ± 15Ω
<b>Temperature range:</b>	-40°C to +80°C	<b>Color code:</b>	white, yellow, blue, orange
<b>Nominal voltage:</b>	100V (not for power applications)	<b>Approvals:</b>	UL: AWM 21161 Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.5</b>											
2170888	22 AWG/2pr	19 wire	PUR	green	PROFINET®, UL AWM	no	yes	0.256	6.5	35	53112210

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# ETHERLINE® 2 pair: CAT.5e 105C Plus; flexible

## Industrial Ethernet cable for high temperature flexible applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5e 105 Plus



ETHERLINE® 105C is designed to perform in high temperature applications. The 2 pair construction includes foil and braid shielding and a TPE-based jacket.

### Construction

Conductors: bare copper wire

Insulation: polyethylene

Shielding: foil and copper braid

Jacket: TPE; green

### Recommended applications

Flexible high temperature applications; installation in hollow shaft between gear units and pitch system; PLCs, sensors, and other network devices

### Approvals



### Application advantage

- Highly temperature resistant (105°C permanent, 120°C temporary)
- No need for additional protection against high temperatures
- Suitable for EtherCAT® & EtherNet/IP applications
- Conforms to PROFINET® standard
- Optimum EMC
- **Suitable for PoE per IEEE 802.3at**

#### Cable attributes page 648

OIL	OR-04	FLAME	FR-00
MOTION	FL-02	MECH.	MP-05

#### Complete the installation



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#### ÖLFLEX® CONNECT solution



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page 605

### Technical data

<b>Minimum bend radius:</b> - for stationary use: 10 x cable diameter - for flexible use: 15 x cable diameter	<b>Nominal voltage:</b> 125V (not for power applications)
<b>Temperature range:</b> - for stationary use: -40°C to +105°C (up to +120°C for temporary loads) - for flexible use: -30°C to +105°C	<b>Characteristic impedance:</b> 100Ω ± 15Ω
	<b>Color code:</b> white, yellow, blue, orange
	<b>Approvals:</b> RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.5e</b> 2170636	22 AWG/2pr	7 wire	TPE	green	PROFINET®	no	yes	0.244 6.2	36	53112210

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## ETHERLINE® 2 pair: CAT.5 ARMORED

### Industrial Ethernet cable for harsh industrial environments

LAPP KABEL STUTTGART ETHERLINE® CAT.5 ARMORED



ETHERLINE® ARMORED has a foil and braid shield and comes with two layers of galvanized steel tape. This allows the cable to provide reliable data transmission in even the roughest industrial environments.

#### Construction

**Conductors:** solid bare copper

**Pairs:** star quad

**Insulation:** polyethylene

**Shielding:** PVC inner jacket; foil and braid; two layers of galvanized steel tape

**Jacket:** polyethylene; black

#### Recommended applications

Harsh industrial environments; stationary applications

#### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Rodent protection
- High transmission reliability
- UV-resistant jacket
- Suitable for PoE per IEEE 802.3at

#### Approvals



Cable attributes		page 648	
OIL	OR-00	FLAME	FR-00
MOTION	FL-00	MECH.	MP-01

Complete the installation		ÖLFLEX® CONNECT solution	
SKINTOP® MS-SC page 522	RJ45 connectors page 257	ÖLFLEX® CONNECT CABLES page 605	

#### Technical data

<b>Minimum bend radius:</b> - for stationary use: 10 x cable diameter - for flexible use: 15 x cable diameter	<b>Nominal voltage:</b> 125V (not for power applications)
<b>Temperature range:</b> - for stationary use: -40°C to +70°C - for flexible use: -20°C to +60°C	<b>Characteristic impedance:</b> 100Ω ± 15Ω
	<b>Color code:</b> white, yellow, blue, orange
	<b>Approvals:</b> RoHS

Part number	Construction	Stranding	Jacket material		Jacket color		Approvals	Fast connect	PoE	Nominal outer diameter		Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
			inner	outer	inner	outer				in	mm		
<b>CAT.5</b>													
2170496	22 AWG/2pr	solid	PVC	PE	green	black	PROFINET®	no	yes	0.366	9.3	83	53112230

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# ETHERLINE® 2 pair: CAT.5 HYBRID

## Industrial Ethernet cable for power with Ethernet applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5 HYBRID



ETHERLINE® HYBRID is a CAT.5 hybrid data cable for data transmission and power supply for industrial usage. The cable is designed for stationary installation and occasional movement. The separately screened core pairs ensure transmission reliability in areas with a high load of electromagnetic capacity.

### Recommended applications

Flexible power with Ethernet applications

### Approvals



### Construction

**Conductors:** stranded bare copper

**Pairs:** data and power pairs each twisted together

**Insulation:** power pairs: halogen-free compound • data pairs: polyethylene

**Shielding:** data pairs: foil and copper braid

**Jacket:** halogen-free; green

### Application advantage

- Data and power transmission with one cable
- Suitable for EtherCAT® & EtherNet/IP applications
- Halogen-free
- Flame retardant
- Sunlight resistant
- Suitable for PoE per IEEE 802.3at

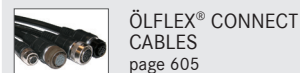
#### Cable attributes page 648

OIL	OR-00	FLAME	FR-01
MOTION	FL-02	MECH.	MP-01

#### Complete the installation



#### ÖLFLEX® CONNECT solution



### Technical data

<b>Minimum bend radius:</b>	- for stationary use: 5 x cable diameter - for flexible use: 10 x cable diameter	<b>Characteristic impedance:</b>	100Ω ± 15Ω
<b>Temperature range:</b>	-20°C to +70°C	<b>Color code:</b>	- power pairs: black with white numbers - data pairs: white & blue; yellow & orange
<b>Nominal voltage:</b>	(not for power applications) - power pairs: 100V - data pairs: 150V	<b>Approvals:</b>	UL: AWM 21282 Additional: RoHS
<b>Test voltage:</b>	- power pairs: 1000V - data pairs: 700V		

Part number	Construction	Stranding data pair	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	
<b>CAT.5</b>											
2170887	22 AWG/2pr + 16 AWG/4c	7 wire	halogen-free	green	PROFINET®, UL AWM	no	yes	0.406	10.3	103	53112230

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## ETHERLINE® 4 pair: CAT.5e; stationary

### Industrial Ethernet cable for stationary applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5e



ETHERLINE® 4 pair cables for stationary applications are suitable for CAT.5e data transmission. Designed with a foil and braid shield, the cable is protected against EMI and can be used in areas where reliable data transmission is key. The cable is available with a PUR or halogen-free jacket, or with a double halogen-free inner and outer jacket.

### Recommended applications

Stationary applications; industrial field and cell level networking; PLCs, sensors, and other network devices; dry and damp rooms

### Approvals



### Construction

**Conductors:** solid bare copper

**Pairs:** 4 pairs twisted together

**Insulation:** foam skin

**Shielding:** foil and tinned copper braid

**Jacket:** polyurethane or halogen-free; teal • 2170298:  
halogen-free inner & outer jackets

### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Excellent EMI protection
- Flame retardant
- Suitable for PoE per IEEE 802.3at

Cable attributes

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See attribute list by part number on page 234

Complete the installation



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page 605

### Technical data

<b>Minimum bend radius:</b> - for stationary use:	8 x cable diameter
<b>Temperature range:</b>	-30°C to +80°C
<b>Nominal voltage:</b> - 2170297: - 2170296, 2170298:	(not for power applications) 1000V 125V
<b>Test voltage:</b>	1000V

<b>Characteristic impedance:</b>	100Ω ± 15Ω
<b>Color code:</b>	white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
<b>Approvals:</b>	UL: AWM 21576 (2170297) Canada: cRU AWM I/II A/B FT2 (2170297) Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter		Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
								in	mm		
<b>CAT.5e</b>											
2170296	24 AWG/4pr	solid	halogen-free	teal	–	no	yes	0.248	6.3	36	53112210
2170297	24 AWG/4pr	solid	PUR	teal	UL/CSA AWM, 1000V	no	yes	0.248	6.3	42	53112210
2170298	24 AWG/4pr	solid	halogen-free*	teal	–	no	yes	0.296	7.5	54	53112220

\* Inner and outer jacket

# ETHERLINE® 4 pair: CAT.5e; flexible

## Industrial Ethernet cable for flexible applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5e



ETHERLINE® 4 pair CAT.5e cables designed for flexible applications come with a foil and braid shield for EMI protection. Jacket options include polyurethane and a Low Smoke Zero Halogen (LSZH) compound for applications where human safety and damage to electronic components are a concern.

### Construction

**Conductors:** stranded bare copper

**Pairs:** 4 pairs twisted together

**Insulation:** polyethylene

**Shielding:** foil and tinned copper braid

**Jacket:** polyurethane or halogen-free; teal

### Recommended applications

Flexible applications; wiring of industrial network devices, sensors, actuators, and cordsets

### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- High-quality foil and braid protect against EMI
- Flame retardant
- LSZH jacket available

### Approvals



#### Cable attributes

page 648

See attribute list by part number on page 234

#### Complete the installation



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#### ÖLFLEX® CONNECT solution



Industrial Ethernet cordsets page 620

### Technical data



#### Minimum bend radius:

- for stationary use: 8 x cable diameter
- for flexible use: 15 x cable diameter



#### Temperature range:

- 2170299:
  - for stationary use: -20°C to +75°C
  - for flexible use: -5°C to +50°C
- 2170300:
  - for stationary use: -40°C to +80°C
  - for flexible use: -5°C to +60°C



#### Nominal voltage:

- (not for power applications)
- 2170299: 125V
- 2170300: 1000V



#### Test voltage:

- 2170299: 700V



#### Characteristic impedance:

- 100Ω ± 15Ω



#### Color code:

- white/blue & blue,
- white/orange & orange,
- white/green & green,
- white/brown & brown,



#### Approvals:

- UL: AWM 21576 (2170300)
- Canada: cRU AWM I/II A/B FT2 (2170300)
- Additional: RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter		Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
								in	mm		
<b>CAT.5e cable</b>											
2170299	26 AWG/4pr	7 wire	halogen-free (LSZH)	teal	—	no	no	0.240	6.1	32	53112210
2170300	26 AWG/4pr	7 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.240	6.1	36	53112210

Max cable run: 196 ft (60 m)

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## ETHERLINE® 4 pair: CAT.5e; continuous flex

### Industrial Ethernet cable for continuous flex applications

LAPP KABEL STUTTGART ETHERLINE® CAT.5e



This ETHERLINE® 4 pair cable is suitable for CAT.5e continuous flex applications in harsh industrial environments where EMI is pervasive. The rugged polyurethane jacket offers excellent protection against oils and abrasion, and is also halogen-free.

#### Construction

**Conductors:** stranded bare copper

**Pairs:** 4 pairs twisted together

**Insulation:** polyolefin

**Shielding:** tinned copper braid

**Jacket:** polyurethane; teal

#### Recommended applications

Continuous flex applications; cable tracks; cordsets; wiring of network devices in dry or damp rooms

#### Approvals

Cable attributes page 648

OIL	OR-04	FLAME	FR-00
MOTION	CF-02*	MECH.	MP-05

Complete the installation

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cordsets  
page 620

#### Technical data

<b>Minimum bend radius:</b>	- for stationary use: 8 x cable diameter - for continuous flexing: 15 x cable diameter	<b>Characteristic impedance:</b> 100Ω ± 15Ω
<b>Temperature range:</b>	- for stationary use: -30°C to +80°C - for continuous flexing: -20°C to +70°C	<b>Color code:</b> white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
<b>Nominal voltage:</b>	1000V (not for power applications)	<b>Approvals:</b> UL: AWM 21576 Canada: cRU AWM I/II A/B FT2 Additional: RoHS
<b>Test voltage:</b>	1000V	*UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
CAT.5e											
2170489	26 AWG/4pr	19 wire	PUR	teal	UL/CSA AWM, 1000V	no	no	0.248	6.3	36	53112210

Max cable run: 196 ft (60 m)

# ETHERLINE® 4 pair: CAT.6; continuous flex

## Industrial Ethernet cable for continuous flex applications

LAPP KABEL STUTTGART ETHERLINE® CAT.6



Designed with 4 pairs, a foil and braid shield, and a rugged PUR jacket, this ETHERLINE® cable meets CAT.6 requirements. It can be used in continuous flex applications.

### Construction

- Conductors:** stranded tinned copper
- Pairs:** 4 pairs divided by central filler element
- Insulation:** polypropylene
- Shielding:** FRNC inner jacket; foil and braid
- Jacket:** polyurethane; green

### Recommended applications

Continuous flex applications; cable tracks; cordsets

### Application advantage

- PUR outer jacket is highly resistant to oils, abrasion, and UV radiation
- Premium screening against EMI
- Suitable for EtherCAT® & EtherNet/IP applications

### Approvals



Cable attributes page 648

OIL	OR-04	FLAME	FR-02
MOTION	CF-01*	MECH.	MP-05

Complete the installation

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ÖLFLEX® CONNECT solution

	ÖLFLEX® CONNECT CABLES page 605
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### Technical data

<b>Minimum bend radius:</b> - for stationary use: 4 x cable diameter - for continuous flexing: 7.5 x cable diameter	<b>Test voltage:</b> 700V
<b>Temperature range:</b> - for stationary use: -40°C to +80°C - for continuous flexing: -30°C to +70°C	<b>Characteristic impedance:</b> 100Ω ± 15Ω
<b>Nominal voltage:</b> 100V (not for power applications)	<b>Color code:</b> white & blue, white & orange, white & green, white & brown
	<b>Approvals:</b> UL: CMX Canada: c(UL) CMX Additional: RoHS *UL Verified ID A522492: Continuous Flex Test Method Verified

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	
CAT.6											
2170488	26 AWG/4pr	19 wire	PUR	green	UL/CSA CMX	no	no	0.307	7.8	42	53112220

Max cable run: 196 ft (60 m)

## ETHERLINE® 4 pair: CAT.6A/CAT.7; stationary

### Industrial Ethernet cable for stationary applications

LAPP KABEL STUTTGART ETHERLINE® P PiMF CAT.6A



LAPP KABEL STUTTGART ETHERLINE® H PiMF CAT.7



ETHERLINE® CAT.6A and CAT.7 cables are suitable for stationary applications. The 4 pairs are individually wrapped in metal foil and the overall braid provides additional protection against EMI. Three different jacket options are available.

#### Construction

**Conductors:** solid bare copper

**Pairs:** 4 pairs, individually shielded with foil tape

**Insulation:** polyethylene

**Shielding:** overall copper braid

**Jacket:** PVC, polyurethane, or halogen-free; green

#### Recommended applications

Stationary applications in harsh industrial environments; dry or damp rooms; CAT.6A = 500 MHz; CAT.7 = 600 MHz

#### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- PUR jacket is highly resistant to mineral oils and abrasion
- Suitable for PoE per IEEE 802.3at

#### Approvals



Cable attributes

page 648

See attribute list by part number on page 234

Complete the installation



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page 620

#### Technical data

**Minimum bend radius:**  
- for stationary use: 10 x cable diameter

**Temperature range:**  
- PUR & PVC: -40°C to +80°C  
- halogen-free: -25°C to +80°C

**Nominal voltage:** 100V (not for power applications)

**Test voltage:** 700V

**Characteristic impedance:** 100Ω ± 15Ω

**Color code:**  
white/blue & blue,  
white/orange & orange,  
white/green & green,  
white/brown & brown

**Approvals:** RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter		Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
								in	mm		
<b>CAT.6A</b>											
2170464	22 AWG/4pr	solid	PVC	green	—	no	yes	0.343	8.7	66	53112220
2170465	22 AWG/4pr	solid	PUR	green	—	no	yes	0.343	8.7	61	53112220
2170466	22 AWG/4pr	solid	halogen-free	green	—	no	yes	0.343	8.7	67	53112220
<b>CAT.7</b>											
2170474	22 AWG/4pr	solid	PVC	green	—	no	yes	0.343	8.7	66	53112220
2170475	22 AWG/4pr	solid	halogen-free PUR	green	—	no	yes	0.343	8.7	61	53112220
2170476	22 AWG/4pr	solid	halogen-free FRNC	green	—	no	yes	0.343	8.7	67	53112220

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# ETHERLINE® 4 pair: CAT.6A; continuous flex

## Industrial Ethernet cable for continuous flex applications



This ETHERLINE® 4 pair cable meets CAT.6A requirements and is suitable for continuous flex applications. Individually shielded pairs and an overall braid shield protect the cable from EMI and allow reliable, high-speed data transfer. The cable is available with a PVC or halogen-free polyurethane jacket.

### Construction

**Conductors:** stranded tinned copper

**Pairs:** 4 pairs individually shielded with aluminum compound foil

**Insulation:** foam skin

**Shielding:** overall copper braid

**Jacket:** PVC or polyurethane; green

### Recommended applications

Continuous flex applications; cable tracks; moving machine parts; harsh environments; qualified for CAT.6A = 10 Gbits/s

### Approvals



### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Qualified for 10 Gigabit Ethernet
- Premium shielding against EMI
- Oil-resistant jacket
- Conforms to PROFINET® standard
- Suitable for PoE per IEEE 802.3at

**Cable attributes** page 648

See attribute list by part number on page 234 \*

**Complete the installation**

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**ÖLFLEX® CONNECT solution**

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### Technical data

<p> <b>Minimum bend radius:</b> - for continuous flexing: 15 x cable diameter</p> <p> <b>Temperature range:</b> - for stationary use: -40°C to +80°C - for continuous flexing: -10°C to +70°C</p> <p> <b>Nominal voltage:</b> (not for power applications) - 2170484: 1000V - 2170485: 125V</p> <p> <b>Characteristic impedance:</b> 100Ω ± 15Ω</p>	<p> <b>Color code:</b> white &amp; blue, white &amp; orange, white &amp; green, white &amp; brown</p> <p> <b>Approvals:</b> UL: AWM 21576 (2170484) CMX per UL 444 (2170484) RU AWM 80°C 1000V (2170484) CMG per UL 444 (2170485) Canada: c(UL) CMX (2170484) cRU AWM I/II A/B FT2 (2170484) c(UL) CMG FT4 (2170485) Additional: RoHS *UL Verified ID A522492: Continuous Flex Test Method Verified</p>
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Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.6A</b>											
2170484	24 AWG/4pr	7 wire	PUR	green	PROFINET®, UL/CSA AWM, CMX	no	yes	0.355	9.0	60	53112220
2170485	24 AWG/4pr	7 wire	PVC	green	PROFINET®, UL/CSA CMG (75°C)	no	yes	0.355	9.0	59	53112220

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# ETHERLINE® 4 pair: CAT.6A TORSION

## Industrial Ethernet cable for torsion stress



ETHERLINE® 4 Pair: CAT.6A TORSION cable meets CAT.6A requirements and can be used in torsion applications. The premium shielding allows reliable, high-speed data transfer. Jacket options include PVC and halogen-free polyurethane.

### Construction

- Conductors:** stranded tinned copper
- Pairs:** 4 pairs individually shielded with aluminum compound foil
- Insulation:** foam skin
- Shielding:** overall copper braid
- Jacket:** PVC or polyurethane; green

### Recommended applications

High-torsion stress applications; harsh industrial environments

### Approvals



### Application advantage

- Suitable for EtherCAT® & EtherNet/IP applications
- Suitable for high-torsion stress
- Qualified for 10 Gigabit Ethernet
- Excellent EMI protection
- Oil-resistant jacket
- Conforms to PROFIBUS® standard
- Suitable for PoE per IEEE 802.3at

#### Cable attributes page 648

See attribute list by part number on page 234

#### Complete the installation



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### Technical data

<b>Minimum bend radius:</b>	15 x cable diameter	<b>Color code:</b>	white & blue, white & orange, white & green, white & brown
<b>Temperature range:</b>	-40°C to +80°C - for stationary use: -10°C to +70°C - for flexible use:	<b>Approvals:</b>	UL: CMG per UL 444 (2170482) AWM 21576 (2170483) CMX per UL 444 (2170483) RU AWM 80°C 1000V (2170483) Canada: c(UL) CMG FT4 (2170482) c(UL) CMX (2170483) cRU AWM I/II A/B FT2 (2170483) Additional: RoHS
<b>Nominal voltage:</b>	(not for power applications) - 2170482: 125V - 2170483: 1000V		
<b>Characteristic impedance:</b>	100Ω ± 15Ω		

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.6A</b>											
2170482	24 AWG/4pr	7 wire	PVC	green	PROFINET®, UL/CSA CMG	no	yes	0.355	9.0	59	53112220
2170483	24 AWG/4pr	7 wire	PUR	green	PROFINET®, UL/CSA AWM, CMX, 1000V	no	yes	0.355	9.0	60	53112220

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# ETHERLINE® 4 pair: CAT.7; flexible

## Industrial Ethernet cable for flexible applications



LAPP KABEL STÜTTGART ETHERLINE® CAT.7



ETHERLINE® CAT. 7 flexible cables are designed for flexible applications and come with an overall foil and braid shield and individually shielded pairs for EMI protection.

### Construction

**Conductors:** stranded bare copper

**Pairs:** 4 pairs individually shielded with aluminum compound foil

**Insulation:** polyethylene

**Shielding:** foil & tinned copper braid

**Jacket:** halogen-free polyurethane; green

### Recommended applications

Flexible applications; wiring of industrial network devices, sensors, actuators, and cordsets

### Approvals



### Application advantage

- Can be used in dry or damp rooms
- Qualified for 10 Gigabit Ethernet
- Suitable for EtherCAT® & EtherNet/IP applications
- Excellent EMI protection
- Space-saving due to small cable diameter
- Robust halogen-free outer jacket

#### Cable attributes page 648

<b>OIL</b> OR-04	<b>FLAME</b> FR-01
<b>MOTION</b> FL-02	<b>MECH.</b> MP-05

#### Complete the installation

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#### ÖLFLEX® CONNECT solution

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### Technical data

<b>Minimum bend radius:</b> - for installation: 4 x cable diameter - for torsion & flexing: 10 x cable diameter	<b>Characteristic impedance:</b> 100Ω ± 15Ω
<b>Temperature range:</b> - for installation: -50°C to +80°C - for flexible use: -40°C to +80°C	<b>Color code:</b> white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
<b>Nominal voltage:</b> 125V (not for power applications)	<b>Approvals:</b> UL: AWM 21576 Canada: cRU AWM I/II A/B FT2

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter		Approx. weight	SKINTOP® MS-SC
								in	mm	lbs/mft	PG thread
<b>CAT.7</b>											
2170934	26 AWG/4pr	7 wire	PUR	green	UL AWM, CMX	no	no	0.250	6.4	31	53112210

Max cable run: 196 ft (60 m)

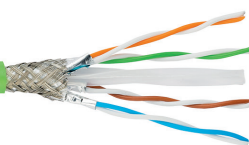
EtherCAT® is a registered trademark of Beckhoff Automation GmbH. Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section. If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

# ETHERLINE® 4 pair: CAT.7 TORSION

Industrial Ethernet cable for torsion stress



LAPP KABEL STÜTTGART ETHERLINE® CAT.7 TORSION



ETHERLINE® CAT. 7 TORSION meets CAT. 7 requirements and can be used in torsion applications. The premium shielding allows reliable, high-speed data transfer.

## Construction

- Conductors:** stranded tinned copper
- Pairs:** 4 pairs individually shielded with aluminum compound foil
- Insulation:** polyethylene
- Shielding:** overall copper braid
- Jacket:** halogen-free polyurethane; green

## Recommended applications

High-torsion stress applications; harsh industrial environments

## Approvals



## Application advantage

- Suitable for high-torsion stress
- Qualified for 10 Gigabit Ethernet
- Suitable for EtherCAT® & EtherNet/IP applications
- Excellent EMI protection
- Halogen-free & oil resistant
- Suitable for PoE per IEEE 802.3at

### Cable attributes page 648

OIL	OR-04	FLAME	FR-02
MOTION	T-01	MECH.	MP-05

### Complete the installation

SKINTOP® MS-SC page 522	RJ45 connectors page 257
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### ÖLFLEX® CONNECT solution

ÖLFLEX® CONNECT CABLES page 605
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## Technical data

<b>Minimum bend radius:</b> - for installation: 8 x cable diameter - for torsion & flexing: 15 x cable diameter	<b>Characteristic impedance:</b> 100Ω ± 15Ω
<b>Temperature range:</b> - for installation: -40°C to +80°C - for flexible use: -30°C to +70°C	<b>Color code:</b> white & blue, white & orange, white & green, white & brown
<b>Nominal voltage:</b> 125V (not for power applications)	<b>Approvals:</b> UL: CMX AWM 21576 Canada: c(UL) CMX

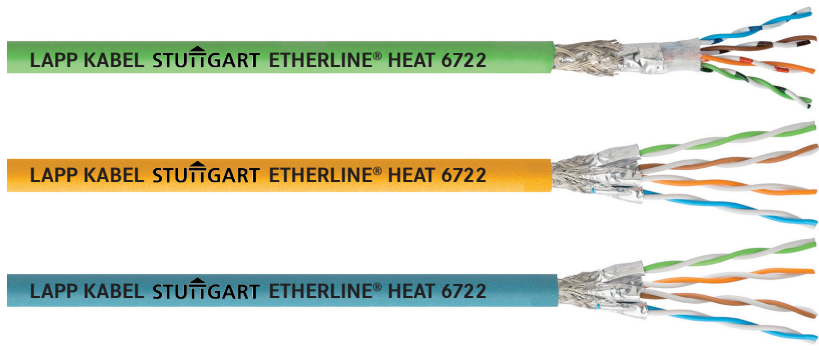
Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	Fast connect	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.7</b>											
2170481	24 AWG/4pr	7 wire	PUR	green	UL AWM, CMX	no	yes	0.367	9.4	64	53112220

Max cable run: 279 ft (85 m)

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# ETHERLINE® HEAT 6722

Flexible special Ethernet cable for high-temperature applications



ETHERLINE® HEAT 6722 CAT.5e, CAT.6A, and CAT.7 cables are suitable for flexible applications. They are heat resistant up to 105°C and are also suitable for outdoor applications.

## Recommended applications

connecting camera, info/entertainment, and ticketing systems in transportation environments

## Approvals



Cable attributes		page 648	
OIL	OR-04	FLAME	FR-01
MOTION	FL-02	MECH.	MP-05

Complete the installation	
SKINTOP® MS-SC page 522	RJ45 connectors page 257

ÖLFLEX® CONNECT solution	
ÖLFLEX® CONNECT CABLES page 605	

Technical data	
<b>Minimum bend radius:</b>	<ul style="list-style-type: none"> <li>- for stationary use: 10 x cable diameter</li> <li>- for flexible use: 15 x cable diameter</li> </ul>
<b>Temperature range:</b>	<ul style="list-style-type: none"> <li>- for stationary use: -40°C to +105°C</li> <li>- for flexible use: -30°C to +105°C</li> </ul>
<b>Nominal voltage:</b>	125V (not for power applications)
<b>Characteristic impedance:</b>	100Ω ± 15Ω
<b>Color code:</b>	<ul style="list-style-type: none"> <li>- CAT.5e: white/blue &amp; blue, white/orange &amp; orange, white/green &amp; green, white/brown &amp; brown</li> <li>- CAT.6A/7: white &amp; blue, white &amp; orange, white &amp; green, white &amp; brown</li> </ul>
<b>Approvals:</b>	RoHS

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread	
<b>CAT.5e</b>										
2170850	24 AWG/4pr	7 wire	PUR	green	PROFINET®	yes	0.303	7.7	48	53112220
<b>CAT.6A</b>										
2170581	24 AWG/4pr	7 wire	PUR	yellow	PROFINET®	yes	0.319	8.1	52	53112220
<b>CAT.7</b>										
2170582	24 AWG/4pr	7 wire	PUR	blue	PROFINET®	yes	0.319	8.1	52	53112220

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# ETHERLINE® TRAY CAT.5e; flexible

## Tray-rated industrial Ethernet cable for flexible applications

LAPP KABEL STUTTGART ETHERLINE® TRAY CAT.5e



ETHERLINE® TRAY CAT.5e cables are designed for flexible applications. Designed with a foil and braid shield, the cable is protected against EMI and can be used in areas where reliable transmission is key.

### Construction

- Conductors:** stranded bare copper
- Pairs:** 4 pairs twisted together
- Insulation:** thermoplastic-based insulation
- Shielding:** foil and tinned copper braid
- Jacket:** PVC; green

### Recommended applications

Flexible applications, cable trays, industrial machinery, plant infrastructure

### Application advantage

- Wide application range due to multiple certifications
- Designed for tray applications (PLTC-ER)
- Suitable for EtherNet/IP applications
- Suitable for PoE per IEEE 802.3at

### Approvals



Cable attributes		page 648
OIL	OR-02	FLAME FR-05
MOTION	FL-02	MECH. MP-01

Complete the installation	
SKINTOP® MS-SC	page 522
90° RJ45 connectors	page 259

ÖLFLEX® CONNECT solution	
ÖLFLEX® CONNECT CABLES	page 605

### Technical data

<b>Minimum bend radius:</b>	- for stationary use: 10 x cable diameter - for flexible use: 15 x cable diameter	<b>Color code:</b>	white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
<b>Temperature range:</b>	- for stationary use: -40°C to +80°C - for flexible use: -25°C to +80°C	<b>Approvals:</b>	UL: CMR per UL 444 CMG per UL 444 PLTC-ER per UL 13 AWM 2570 80°C 600V NEC: Class 1 Division 2 per NEC Article 501 Canada: c(UL) CMG Additional: RoHS 2
<b>Nominal voltage:</b>	600V (not for power applications)		
<b>Characteristic impedance:</b>	100Ω ± 15Ω (1 - 100 MHz)		

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter in	Nominal outer diameter mm	Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
<b>CAT.5e</b>										
2170450	22 AWG/4pr	7 wire	PVC	green	UL CMR, UL AWM, PLTC-ER, 600V	yes	0.380	9.6	77	53112230

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section. If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

# ETHERLINE® FIRE CAT.5e PH 120

Halogen-free industrial Ethernet cable for harsh flame conditions

LAPP KABEL STUTTGART ETHERLINE® FIRE CAT.5e PH 120



ETHERLINE® FIRE for stationary applications is suitable for CAT.5e data transmission. The halogen-free and flame-retardant (FRNC) jacket allows for this cable to perform in harsh fire conditions for at least 120 minutes.

## Construction

- Conductors:** solid bare copper
- Pairs:** 4 pairs twisted together
- Insulation:** polyolefin; special fire-retardant tape
- Shielding:** foil tape
- Jacket:** halogen-free FRNC; red

## Recommended applications

Industrial areas that use fire as a tool; highly combustible and/or fire-prone areas

## Approvals



## Application advantage

- Flame retardant acc. to IEC 60332-1 & IEC 60332-3-24
- Double shielded for ensured EMI effectiveness
- Maintains integrity for a minimum of 120 minutes in the event of fire (PH 120 Classification acc. to EN50200)
- Suitable for PoE per IEEE 802.3at

### Cable attributes page 648

OIL	OR-00	FLAME	FR-03
MOTION	FL-01	MECH.	MP-01

### Complete the installation

	SKINTOP® MS-SC page 522		RJ45 connectors page 258
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### ÖLFLEX® CONNECT solution

	ÖLFLEX® CONNECT CABLES page 605
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## Technical data

<b>Minimum bend radius:</b>	15 x cable diameter	<b>Characteristic impedance:</b>	100Ω ± 15Ω
<b>Temperature range:</b>	-20°C to +70°C	<b>Color code:</b>	white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
<b>Nominal voltage:</b>	125V (not for power applications)		

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter		Approx. weight	SKINTOP®
								lbs/mft		
<b>CAT.5e</b>										
2170905	23 AWG/4pr	solid	FRNC	red	—	yes	0.327	8.3	50	53112220

Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section. If not otherwise specified, all values relating to the product are nominal values. Photographs are not to scale and are not true representations of the products in question.

**ETHERLINE® ROBUST****Chemical-resistant industrial Ethernet cable for flexible applications**

LAPP KABEL STUTTGART ETHERLINE® ROBUST CAT.5e



LAPP KABEL STUTTGART ETHERLINE® ROBUST CAT.7



ETHERLINE® ROBUST flexible cables are suitable for CAT.5e and CAT.7 applications that require a higher level of chemical, UV, and weather resistance. They are designed with a foil and braid shield to protect against EMI and ensure reliable data transmission.

**Recommended applications**

Machine tool building; medical technology; laundries; car washing equipment; chemical industry; composting plants; sewage works; food & beverage industry, especially for production and processing of dairy and meat products

**Approvals**

Cable attributes		page 648	
OIL	OR-01	FLAME	FR-01
MOTION	FL-02	MECH.	MP-01

**Complete the installation**

SKINTOP®  
MS-SC  
page 522



RJ45  
connectors  
page 257

**ÖLFLEX® CONNECT solution**

ÖLFLEX® CONNECT  
CABLES  
page 605

**Technical data****Minimum bend radius:**

- for stationary use: 8 x cable diameter
- for flexible use: 10 x cable diameter

**Color code:**

- 2 pair: white & yellow, blue & orange
- 4 pair: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown

**Temperature range:**

- for stationary use: -50°C to +80°C
- for flexible use: -40°C to +80°C



**Characteristic impedance:** 100Ω ± 15Ω

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter		Approx. weight	SKINTOP® MS-SC
							in	mm	lbs/mft	PG thread
<b>CAT.5e</b>										
2170451	22 AWG/2pr	7 wire	TPE	black	PROFINET®	yes	0.268	6.8	34	53112210
<b>CAT.7</b>										
2170452	23 AWG/4pr	7 wire	TPE	black	PROFINET®	yes	0.355	9.0	50	53112220
2170453	26 AWG/4pr	7 wire	TPE	black	—	no	0.256	6.5	24	53112210

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Recommended SKINTOP® assumes minimal OD variance. Additional configurations are available; please see our SKINTOP® section.

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# ETHERLINE® ROBUST FR

## Chemical-resistant industrial Ethernet cable for flexible applications



ETHERLINE® ROBUST FR flexible cables are suitable for CAT.5e and CAT.7 applications that require a flame-retardant jacket as well as chemical, UV, and weather resistance. They are designed with a foil and braid shield to protect against EMI and ensure reliable data transmission.

### Recommended applications

Machine tool building; medical technology; laundries; car washing equipment; chemical industry; composting plants; sewage works; food & beverage industry, especially for production and processing of dairy and meat products

### Approvals



### Construction

- Conductors:** stranded bare copper
- Pairs:** CAT.5e: 2 pair • CAT.7: 4 pair
- Insulation:** polyolefin
- Shielding:** CAT 5: overall foil and copper braid  
CAT 7: foiled pairs and overall copper braid
- Jacket:** TPE; black

### Application advantage

- Flame-retardant jacket
- Suitable for indoor and outdoor applications
- Suitable for EtherCAT® and EtherNet/IP applications
- **Suitable for PoE per IEEE 802.3at** (see table below)

Cable attributes		page 648	
OIL	OR-01	FLAME	FR-02
MOTION	FL-02	MECH.	MP-01

Complete the installation	
SKINTOP® MS-SC page 522	RJ45 connectors page 258

ÖLFLEX® CONNECT solution	
ÖLFLEX® CONNECT CABLES page 605	

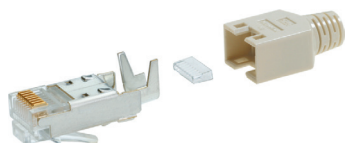
### Technical data

<b>Minimum bend radius:</b>	- for stationary use: 4 x cable diameter - for flexible use: 10 x cable diameter	<b>Color code:</b>	- 2 pair: white & yellow, blue & orange - 4 pair: white/blue & blue, white/orange & orange, white/green & green, white/brown & brown
<b>Temperature range:</b>	- for stationary use: -50°C to +80°C - for flexible use: -40°C to +80°C		
<b>Characteristic impedance:</b>	100Ω ± 15Ω (1 - 100 MHz)		

Part number	Construction	Stranding	Jacket material	Jacket color	Approvals	PoE	Nominal outer diameter		Approx. weight lbs/mft	SKINTOP® MS-SC PG thread
							in	mm		
<b>CAT.5e</b>										
2170454	22 AWG/2pr	7 wire	TPE	black	PROFINET®	yes	0.268	6.8	37	53112220
<b>CAT.7</b>										
2170455	24 AWG/4pr	7 wire	TPE	black	PROFINET®	yes	0.355	9.0	54	53112230
2170456	26 AWG/4pr	7 wire	TPE	black	—	no	0.256	6.5	27	53112220

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## RJ45 CAT.5 Hirose TM11



### Application advantage

- Suitable for 26 AWG stranded conductors
- Anti-kink protection
- Screened against EMI
- Bend protection & guide plate included

### Approvals



#### Contact tools



Hirose  
crimp tool  
page 262

Part number	Conductor	Conductor size	Max. cable outer diameter		Pack size
			in	mm	
CE6321	4	26 AWG	0.228	5.8	50

## RJ45 CAT.5 Stewart SS37



### Application advantage

- Suitable for 26 AWG stranded conductors
- Anti-kink protection
- Screened against EMI
- Bend protection & guide plate included

### Approvals



#### Contact tools



Stewart  
crimp tool  
page 262

Part number	Conductor	Conductor size	Max. cable outer diameter		Pack size
			in	mm	
CE6323	4	26 AWG	0.255	5.7	50

## RJ45 CAT.5e FM45, field wireable



### Application advantage

- Suitable for solid and stranded conductors
- Provides IP20 protection
- Tool-free, re-switchable field termination
- Tension- and vibration-resistant
- Can accommodate both screened and unscreened cables
- IDC/piercing terminal acc. to IEC 60352-4

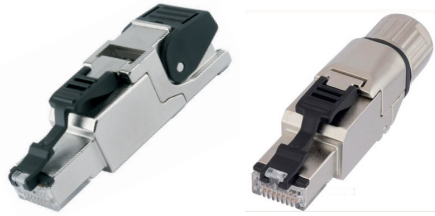
### Approvals



Part number	Conductor	Conductor size	Max. cable outer diameter		Pack size
			in	mm	
21700540	8	26 - 23 AWG*	0.315	8.0	1

\* 22 AWG is possible, with restrictions.

## RJ45 CAT.5e for PROFINET®



### Application advantage

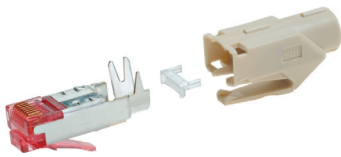
- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Color coded to PROFINET® standards
- Conforms to IEC 60603-7-51

### Approvals



Part number	Conductors	Design style	Conductor size		Cable outer diameter		Pack size
			stranded	solid	in	mm	
21700605	4	Clamp	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10
21700651	4	Round	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1

## RJ45 CAT.6 Hirose TM21



### Application advantage

- Suitable for solid and stranded conductors
- Anti-kink protection
- Screened against EMI
- Bend protection & guide plate included

### Approvals



#### Contact tools



Hirose crimp tool  
page 262

Part number	Conductors	Conductor size	Max. cable outer diameter		Pack Size
			in	mm	
CE6324	8	26 - 24 AWG	0.26	6.6	50

## RJ45 CAT.6A, field wireable



### Application advantage

- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Supports 10 Gigabit Ethernet
- Color coded to TIA/EIA-568 standards
- Conforms to IEC 60603-7-51
- Suitable for PROFINET® applications

### Approvals



Part number	Conductors	Design style	Color code	Conductor size		Cable outer diameter		Pack size
				stranded	solid	in	mm	
21700600	8	Clamp	T568A	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10
21700601	8	Clamp	T568B	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.354	5.0 - 9.0	10
21700615	8	Clamp	T568A	27 - 24 AWG (19 wire)	26 - 24 AWG	0.197 - 0.354	5.0 - 9.0	10
21700616	8	Clamp	T568B	27 - 24 AWG (19 wire)	26 - 24 AWG	0.197 - 0.354	5.0 - 9.0	10
21700652	8	Round	T568A	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1
21700653	8	Round	T568B	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1
21700654	8	Round	T568A	27 - 24 AWG (19 wire)	26 - 24 AWG	0.217 - 0.394	5.5 - 10.0	1
21700655	8	Round	T568B	27 - 24 AWG (19 wire)	26 - 24 AWG	0.217 - 0.394	5.5 - 10.0	1

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## RJ45 CAT.6A Industry 10G connectors



### Application advantage

- Suitable for solid and stranded conductors
- Nickel-plated brass housing
- Supports 10 Gigabit Ethernet
- Provides IP68 protection
- Conforms to IEC 60603-7-51

### Approvals



Part number	Conductors	Color code	Description	Conductor size		Cable outer diameter		Pack size
				stranded	solid	in	mm	
<b>Plug</b>								
21700630	8	T568A	inclusive RJ45 connector plug	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.355	5 - 9	1
21700631		—	dust cap	—	—	—	—	10
<b>Receptacle</b>								
21700632	8	T568B	inclusive RJ45 connector receptacle	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.355	5 - 9	1
21700633		—	dust cap	—	—	—	—	10

## RJ45 90° CAT.5e



### Application advantage

- Die-cast zinc housing
- Suitable for PROFINET® applications
- Suitable for solid and stranded conductors
- Configurable in 4 90° positions

### Approvals



Part number	Conductors	Conductor size		Cable outer diameter		Pack size
		stranded	solid	in	mm	
21700638	4	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10	1

## RJ45 90° CAT.6A



### Application advantage

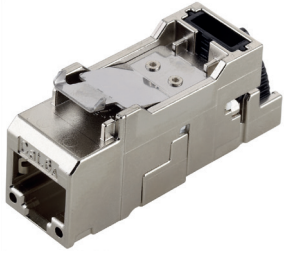
- Die-cast zinc housing
- Suitable for PROFINET® applications
- Suitable for solid and stranded conductors
- Configurable in 4 90° positions

### Approvals



Part number	Conductors	Color code	Conductor size		Cable outer diameter		Pack size
			stranded	solid	in	mm	
21700636	8	T568A	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1
21700639	8	T568A	26 AWG (19 wire)	26 - 24 AWG	0.217 - 0.394	5.5 - 10.0	1
21700637	8	T568B	27 - 22 AWG (7 wire)	24 - 22 AWG	0.217 - 0.394	5.5 - 10.0	1

## RJ45F CAT.6A



### Application advantage

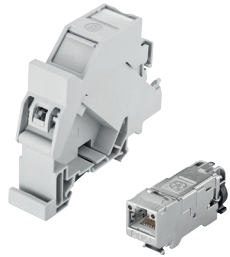
- Suitable for solid and stranded conductors
- Die-cast zinc housing
- Color-coded to PROFINET® standards
- Supports 10 Gigabit Ethernet
- Conforms to IEC 60603-7-51

### Approvals



Part number	Color code	Conductor size		Max. cable outer diameter	
		stranded	solid	in	mm
21700611	T568A	27 - 22 AWG (7 wire)	26 - 22 AWG	0.354	9.0
21700612	T568B	27 - 22 AWG (7 wire)	26 - 22 AWG	0.354	9.0

## HS RJ45F CAT.6A



### Application advantage

- Suitable for solid and stranded conductors
- Color-coded to PROFINET® standards
- Integrated strain relief for cables (OD up to 9 mm)
- Supports 10 Gigabit Ethernet
- Conforms to IEC 60603-7-51

### Approvals

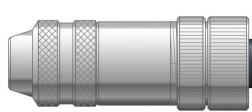
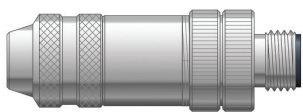


Part number	Color code	Conductor size		Cable outer diameter	
		stranded	solid	in	mm
21700613	T568A	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.354	5.0 - 9.0
21700614	T568B	27 - 22 AWG (7 wire)	26 - 22 AWG	0.197 - 0.354	5.0 - 9.0

## M 12 field wireable connectors

male

female



### Application advantage

- Shielded design
- IP67 protection

Part number		Number of positions	Thread size	Max. conductor size	Cable outer diameter	
male	female				in	mm
C5E201C	C5E200C	8	PG 9	18 AWG	0.234 - 0.312	6 - 8

### Technical data

🌡️	Temperature range:	max. 85°C
⚡	Nominal voltage:	up to 60V
📶	Nominal current:	up to 4A

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## M 12 CAT.6A field wireable connectors



### Application advantage

- Easy on-site assembly
- For 10 Gbit/sec data transmission acc. to CAT.6A
- Can be used for Power over Ethernet applications
- Robust and vibration resistant

### Technical data

🌡️ Temperature range:	-40°C to +85°C
⚡ Nominal voltage:	48V
📶 Nominal current:	0.5A
Ω Contact resistance:	100 mΩ

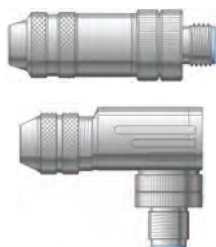
Part number	Connector	Number of positions	Coding	Fast connect	Conductor size		Cable outer diameter	
					stranded	solid	in	mm
21700602	male M12	8	X-coded	yes	27 - 22 AWG (7 wire)	24 - 22 AWG	0.197 - 0.382	5.0 - 9.7

### Approvals

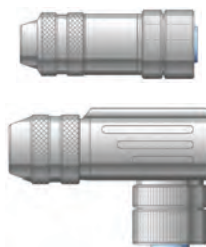


## M 12 field wireable connectors for PROFINET®

male



female



### Technical data

🌡️ Temperature range:	-40°C to +85°C
⚡ Nominal voltage:	250V
📶 Nominal current:	4A
😊 Coding:	D-coded

Part number		Connector design	Number of positions	Thread size	Fast connect
male	female				
C5E203C	C5E202C	straight	4	PG 9	yes
C5E205C	C5E204C	90°	4	PG 9	yes

## M 12 FT IE

22262022



21700617



21700618



### Application advantage

- Designs for front and rear wall mounting
- Die-cast zinc housing
- IP67 protection

### Approvals



Part number	Description	Number of positions	Coding
22262022	feed through connector	4	D-coded
21700617	front panel mount connector	8	X-coded
21700618	rear panel mount connector	8	X-coded

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If not otherwise specified, all values relating to the product are nominal values.  
Photographs are not to scale and are not true representations of the products in question.

## CCR FA cable coupler



### Application advantage

- Die-cast zinc housing
- Supports 10 Gigabit Ethernet

### Approvals



Part number	Conductor size		Cable outer diameter		Pack size
	stranded	solid	in	mm	
21700623	24 AWG - 22 AWG (7 wire)	24 AWG - 22 AWG	0.197 - 0.382	5 - 9.7	1

## RJ45 crimping tools

RJ45 Hirose



RJ45 Stewart



Part number	For RJ45 connectors	Pack size
<b>RJ45 Hirose</b>		
CE5091	TM11/TM12, 8-pole	1
<b>RJ45 Stewart</b>		
CE5093	SS378, 8-pole	1
CE5092	RJ plug: 4-, 6-, 6-DEC, & 8-pole	1

## Fast connect stripping tool



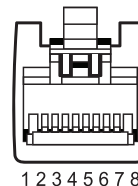
Part number	Description	Cable outer diameter		Pack size
		in	mm	
21124030	stripping tool kit with blade	0.098 - 0.315	2.5 - 8.0	1
21124040	stripping tool without blade	0.098 - 0.315	2.5 - 8.0	1
21124041	blade cartridge	—	—	1

## Continuous flex Industrial Ethernet cordsets

### 4-pair CAT.5e extension cordsets with two 8-wire RJ45 connectors



#### Pin out



- 1 = white/orange (+TX)
- 2 = orange (-TX)
- 3 = white/green (+RX)
- 4 = blue
- 5 = white/blue
- 6 = green (-RX)
- 7 = white/brown
- 8 = brown

The use of RJ45 connector in Ethernet network protocols is common. ETHERLINE® continuous flex CAT.5e cable offers a unique solution for the demanding needs of motion systems, where a network connection has been integrated for program interface from remote locations. These cordsets are in stock. Cordsets with M12 connector options, other motion types, and custom cable lengths are also available, see page 620.

#### Technical data

<b>Material:</b>	- contact carrier:	polycarbonate	<b>Rated voltage:</b> - cable:	42V	
	- molded head:	thermoplastic polyurethane; black (color is typical, not standard)		1000V (not for power applications)	
	- contacts:	gold-plated brass	<b>Rated current:</b>	1.5A	
	- shield:	copper braid or foil & copper braid		<b>Conductor stranding:</b>	stranded bare copper
	- cable jacket:	polyurethane; teal			<b>Protection class:</b>
- conductor insulation:	polyethylene	NEMA 1, 3, 4, 6P			
<b>Temperature range:</b>	-20°C to +70°C				

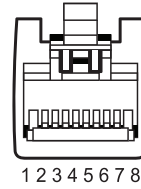
Part number continuous flex	Connector 1	Connector 2	Cable length m
C5E001F1	RJ45 shielded	RJ45 shielded	1
C5E001F2	RJ45 shielded	RJ45 shielded	2
C5E001F5	RJ45 shielded	RJ45 shielded	5
C5E001F10	RJ45 shielded	RJ45 shielded	10

## Continuous flex PROFINET® cordsets

### 2-pair CAT.5 extension cordsets with two 8-wire RJ45 connectors



#### Pin out



- 1 = yellow (TD+)
- 2 = orange (TD-)
- 3 = white (RD+)
- 4 = N/C
- 5 = N/C
- 6 = blue (RD-)
- 7 = N/C
- 8 = N/C

These molded cordsets utilize high quality ETHERLINE® CAT.5 continuous flex cable and integral molded strain relief. For motion applications, these cordsets are designed to provide interconnection between simple devices (sensors and actuators) and high level devices (PLCs and computers). These cordsets are in stock. Cordsets with M12 connector options, other motion types, and custom cable lengths are also available, see page 624.

#### Technical data

<b>Material:</b>	- contact carrier:	polycarbonate	<b>Rated voltage:</b>	42V
	- molded head:	thermoplastic polyurethane; black (color is typical, not standard)		- cable:
	- contacts:	gold-plated brass	<b>Rated current:</b>	1.5A
	- shield:	foil & tinned copper braid		<b>Conductor stranding:</b>
	- cable jacket:	polyurethane; green	<b>IP Protection class:</b>	
	- conductor insulation:	polyethylene		
<b>Temperature range:</b>	-20°C to +60°C			

Part number continuous flex	Connector 1	Connector 2	Cable length m
CPN001F1	RJ45 shielded	RJ45 shielded	1
CPN001F2	RJ45 shielded	RJ45 shielded	2
CPN001F5	RJ45 shielded	RJ45 shielded	5
CPN001F10	RJ45 shielded	RJ45 shielded	10