

DATA SHEET

# Cables with connectors & connector plugs for analog and digital sensors

## SPECIAL FEATURES

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### Cables with connectors

- Connection cables with rugged M12 plug connections
- IP67 and IP68/IP69K versions
- Hygienic connection cable version: gap-free construction, smooth surfaces, very easy to clean

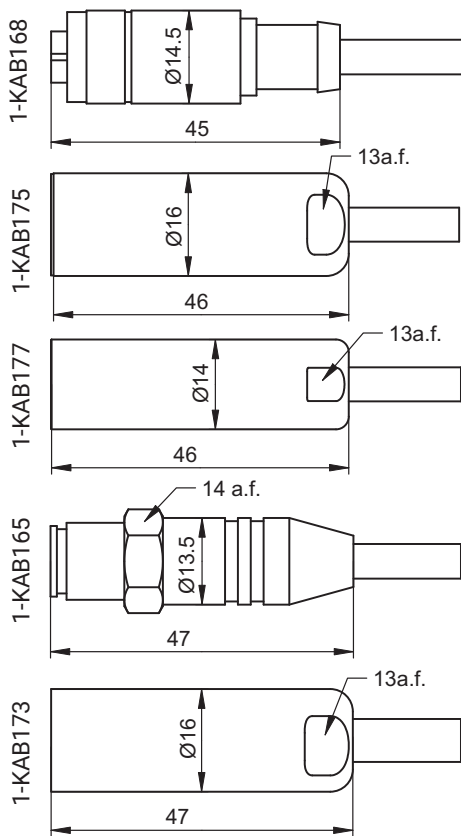
### Connector plugs

- Female connector for HBM load cells with fixed cable
- M12 plug connection with quick connection system
- Straight and angle versions

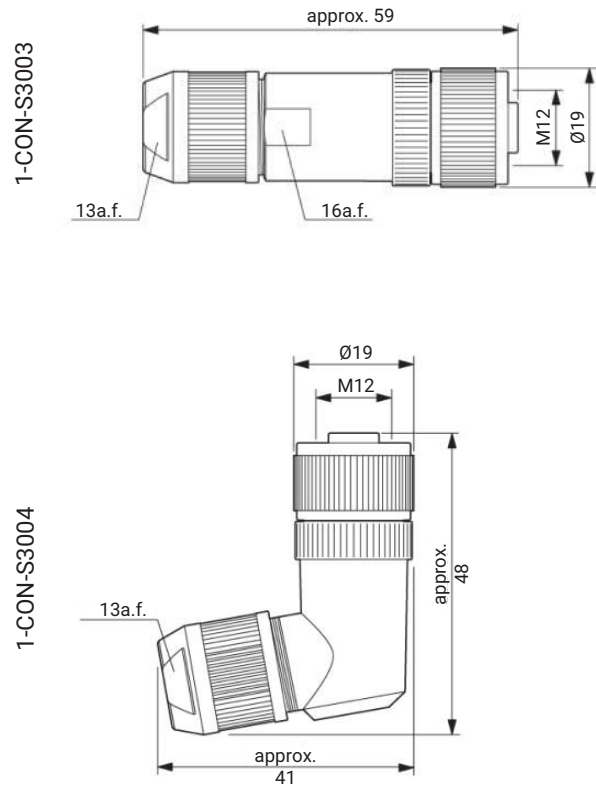


## DIMENSIONS

### Cables with connectors



### Connector plugs



Dimensions (in mm; 1 mm = 0.03937 inches)

## SPECIFICATIONS FOR CABLES WITH CONNECTORS

Type		1-KAB168	1-KAB175	1-KAB177	1-KAB165 <sup>1)</sup>	1-KAB173 <sup>2)</sup>
Suitable for sensor versions		Analog			Digital	
Cable version		PUR (halogen-free)	Hygiene design (halogen-free)		PUR (halogen-free)	TPE
IP rating to EN 60529 (IEC 529)		IP67	IP68/IP69K		IP67 <sup>3)</sup>	IP68/IP69K
Nominal (rated) temperature range	°C	-20 ... +80	-20 ... +100 (briefly +120°C)		-20 ... +80	-20 ... +100°C (briefly +120°C)
Number of cores		8	6		8	8
Core type		Stranded bare CU wire (32 x 0.1 mm)	Stranded bare CU wire (7 x 0.16 mm)		Stranded bare Cu wire (32 x 0.1 mm)	Stranded tinned CU wire (19 x 0.127 mm)
Wire cross-section	mm <sup>2</sup>	0.25	0.14		0.25	0.25
Outside diameter	mm	5.9 ± 0.2	5.2 ± 0.2		6.6 ± 0.2	7 ± 0.2
Conductor resistance	mΩ/m	79	145		79	79
Insulation resistance	GΩ	> 2				
Characteristic impedance	Ω	-	-		86	120 ± 20

Type		1-KAB168	1-KAB175	1-KAB177	1-KAB165 <sup>1)</sup>	1-KAB173 <sup>2)</sup>
<b>Capacitance</b>	pF/m	25	≤ 82		68.4	≤ 100
<b>Shielding</b>		Braid made from tinned Cu wires, 0.1 mm in diameter, optical coverage 85% ± 5%	Braid made from bare Cu wires, 0.16 mm in diameter (optical coverage > 90%). Bare Cu drain wire, AWG 26/7, under braid.		Braid made from tinned Cu wires, 0.1 mm in diameter, optical coverage 85% ± 5%	Braid made from tinned Cu wires, 0.1 mm in diameter (optical coverage > 90%). Tinned Cu drain wire, AWG 28/19, under braid.
<b>Minimum bending radius</b>	mm	47 (59 when free)	26 (52 when free)		22 (66 when free)	35 (70 when free)
<b>Connector weight, approx.</b>	g	25	50	25	20	50
<b>Cable weight, approx.</b>	g/m	55	35	35	55	65
<b>Optional cable lengths</b>	m	5 / 20	3 / 6 / 12	3 / 6	3 / 6 / 12	3 / 6
<b>Material</b>						
Connector housing		TPU (injection-molded)	Stainless steel		TPU (injection-molded)	Stainless steel
Bolted connection		Zinc die-casting, nickel-plated	Stainless steel		Stainless steel	Stainless steel
Connector seal		NBR	FKM		FKM	FKM
Wire insulation		PP	Expanded polyolefin		PP	TPE
Cable sheath		PUR (halogen-free), black	Special PUR, black		PUR (halogen-free), black	TPE
<b>Resistance <sup>4)</sup></b>		Limited resistance to UV radiation, hydrolysis and microbes	High resistance to UV radiation, cooking oil, oily emulsions, grease, salt water, alkaline solutions, ozone and pressurized water (max. 10 bar) 99.9% reduction of test bacteria <sup>5)</sup>		High resistance to oil and chemicals	High resistance to UV radiation, machine oil, oily emulsions, grease, salt water, alkaline solutions, ozone and pressurized water (max. 10 bar)
<b>Cable end version</b>		-	Unterminated cable end		-	Unterminated cable end
<b>General information</b>		-	Gap-free construction, smooth connector surfaces, making it easy to clean		-	Gap-free construction, smooth connector surfaces, making it easy to clean

<sup>1)</sup> The cable is only suitable for startup, not for setting up CANopen and DeviceNet bus systems.



<sup>2)</sup> The cable is suitable for setting up CANopen and DeviceNet bus systems.

<sup>3)</sup> Only when plugged in.

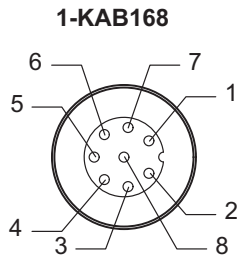
<sup>4)</sup> Resistance must be verified in each individual case.

<sup>5)</sup> According to JIS Z 2810.

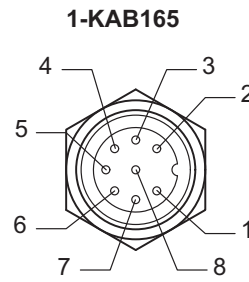
## SPECIFICATIONS FOR CONNECTOR PLUGS

Type		1-CON-S3003	1-CON-S3004
			
<b>Electrical data</b>			
Nominal (rated) voltage	V	30	
Nominal (rated) current	A	2	
Contact resistance	mΩ	< 5	
Insulation resistance	MΩ	> 100	
Overvoltage category		III	
<b>Mechanical data</b>			
Contact pin/socket material		CuSn/CuSn	
Contact surface material		Ni/Au	
Contact carrier material		PA 66	
Flammability rating to UL 94		V0	
Contamination level		3	
<b>Connection data</b>			
IP rating		IP67	
Outside diameter	mm	3.8 ... 8	
Connection cross-section min./max.	mm <sup>2</sup>	0.14 ... 0.34	
Connection cross-section of AWG min/max.		26 ... 22	
Ambient temperature (operation)	°C	-25 ... 85	

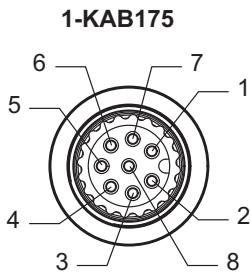
## ELECTRICAL CONNECTION FOR CABLES WITH CONNECTORS



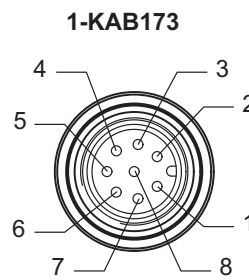
Pin assignment 1-KAB168 (M12 F)	
Terminal	Color
1	White
2	Brown
3	Green
4	Yellow
5	Gray
6	Pink
7	Blue
8	Red



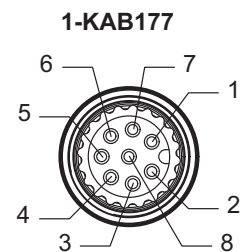
Pin assignment 1-KAB165 (M12 M)	
Terminal	Color
1	White
2	Brown
3	Green
4	Yellow
5	Gray
6	Pink
7	Blue
8	Red



Pin assignment 1-KAB175 and 1-KAB177 (M12 F)	
Terminal	Color
1	White
2	Not available
3	Green
4	Not available
5	Gray
6	Black
7	Blue
8	Red



Pin assignment 1-KAB173 (M12 M)	
Terminal	Color
1	White
2	Brown
3	Green
4	Yellow
5	Gray
6	Black
7	Blue
8	Red



## ELECTRICAL CONNECTION FOR CONNECTOR PLUGS

HBM load cell with fixed cable		Connector color code	
	White (signal +)		Blue/White
	Green <sup>1)</sup> (sense +)		Brown
	Blue (excitation +)		Blue
	Red (signal -)		Green
	Gray <sup>1)</sup> (sense -)		Green/White
	Black (excitation -)		Orange/White
-	-		Orange
-	-		Brown/White

<sup>1)</sup> Applies only to sensors and cables with 6 conductors; all conductors must be connected!

Note for small cable diameters between 3.8 mm and 5 mm:  
Supplied special accessory: 1x bushing and 1x heat-shrink tubing

## PRODUCT NUMBERS

Type	Ordering number
Connection cable with M12 F connector, 8-pin, TPU IP67, PUR cable sheath, 5 m long	1-KAB168-5
Connection cable with M12 F connector, 8-pin, TPU IP67, PUR cable sheath, 20 m long	1-KAB168-20
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 3 m long	1-KAB175-3-1
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 6 m long	1-KAB175-6-1
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 12 m long	1-KAB175-12-1
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 3 m long	1-KAB177-3-1
Connection cable with M12 F connector, 8-pin, stainless steel IP68/IP69K, hygiene design, 6 m long	1-KAB177-6-1
Connection cable with M12 M connector, 8-pin, TPU IP67, PUR cable sheath, 3 m long	1-KAB165-3
Connection cable with M12 M connector, 8-pin, TPU IP67, PUR cable sheath, 6 m long	1-KAB165-6
Connection cable with M12 M connector, 8-pin, TPU IP67, PUR cable sheath, 12 m long	1-KAB165-12
Connection cable with M12 M plug, 8-pin, stainless steel IP68/IP69K, TPE cable sheath, 3 m long	1-KAB173-3-1
Connection cable with M12 M plug, 8-pin, stainless steel IP68/IP69K, TPE cable sheath, 6 m long	1-KAB173-6-1
Connector plug for HBM transducer cable incl. shrink hose	1-CON-S3003
Connector plug for HBM transducer cable incl. shrink hose, angled	1-CON-S3004

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