

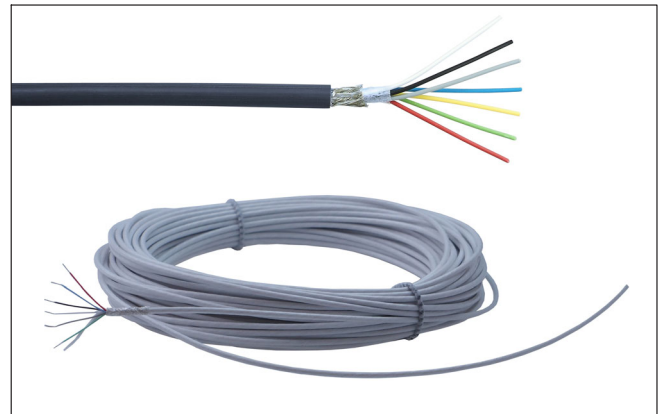
DATA SHEET

KAB-ML

Measuring leads by the meter

SPECIAL FEATURES

- Selection of approved types of leads
- Lead length available in six sizes
- Different materials and designs – suitable for the application



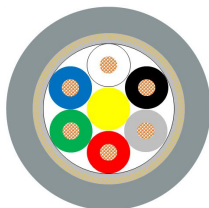
OVERVIEW OF THE LEADS



SCHEMATIC OVERVIEW AND SPECIFICATIONS

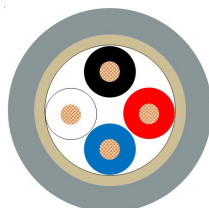
01 – Measuring lead

6 wires, 5.4 mm AD, PVC, gray,
4-3131.0071



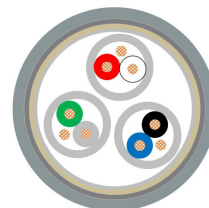
02 – Measuring lead

4 wires, 5.4 mm AD, PVC, gray,
4-3133.0002



03 – Measuring lead

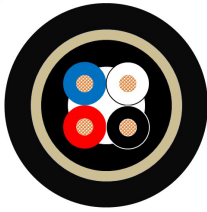
6 wires, 7.5 mm AD, PVC, gray,
4-3301.0071



Type			4-3131.0071	4-3133.0002	4-3301.0071
Measuring lead			01	02	03
Lead structure					
Number of wires		-	6	4	6
Outside diameter	D	mm	5.4 (-0.3)	5.4 (-0.3)	7.5 (±0.3)
Sheath color	-	-	gray	gray	gray
Stranding	-	-	6 wires around core filler	4 wires	6 wires, in pairs
Lead material	-	-	Copper wire (bare) 7 x Ø0.16 mm	Copper wire (bare) 7 x Ø0.175 mm	Copper wire (tin-coated) 18 x Ø0.10 mm
Lead cross-section	A	mm ²	0.14	0.17	0.14
Color code	-	-	gray, black, white, blue, green, red	blue, black, white, red	(white, red), (black, blue), (gray, green)
Inner shielding	-	-	No	No	Yes
Total shielding	-	-	Yes	Yes	Yes
Drain wire			Underneath the shield	-	For every pair
Materials					
Outer sheath	-	-	PVC	PVC	PVC
Inner sheath	-	-	PE	PE	PVC
Stranded insulation	-	-	Cellular PE	Cellular PE	PE-A
Electrical properties					
Max. capacity	C	pF/m	< 135	< 82	< 130
Conductor resistance	R	Ω/km	< 139	< 106	< 140
Ambient conditions					
Temperature range, fixed installation	T _{fv}	°C	-30 ... +85	-30 ... +85	-30 ... +70
Temperature range, flexible installation	T _{bv}	°C			-5 ... +50
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	5 x D	10 x D
Min. bending radius, flexible installation	r _{bv}	mm	10 x D	10 x D	
Further information					
Special features	-	-	Flame proofing test as per IEC 60332-2-2	-	Flame proofing test as per IEC 60332-2-2

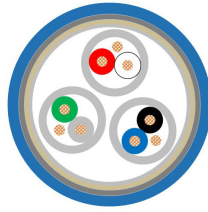
04 – Measuring lead

4 wires, 2.9 mm AD, PUR, black,
4-3301.0076



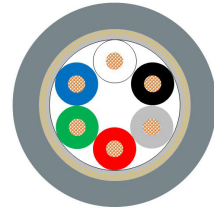
05 – Measuring lead

6 wires, 7.5 mm AD, PVC, blue,
4-3301.0082



06 – Measuring lead

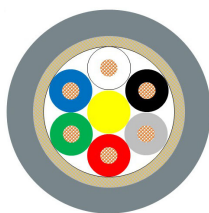
6 wires, 6.5 mm AD, silicone, gray,
4-3301.0108



Type			4-3301.0076	4-3301.0082	4-3301.0108
Measuring lead			04	05	06
Lead structure					
Number of wires		-	4	6	6
Outside diameter	D	mm	2.9 (±0.1)	7.5 (±0.3)	6.5 (±0.2)
Sheath color	-	-	black	blue	gray
Stranding	-	-	4 wires, stranded	6 wires, in pairs	6 wires, stranded
Lead material	-	-	Copper wire (bare) 40 x Ø0.05 mm	Copper wire (tin-coated) 18 x Ø0.10 mm	Copper wire (tin-coated) 14 x Ø0.15 mm
Lead cross-section	A	mm ²	0.08	0.14	0.25
Color code	-	-	black, white, blue, red	(white, red), (black, blue), (gray, green)	gray, black, white, blue, green, red
Inner shielding	-	-	No	Yes	No
Total shielding	-	-	Yes	Yes	Yes
Drain wire			-	For every pair	-
Materials					
Outer sheath	-	-	PUR	PVC	Silicone
Inner sheath	-	-	PVC	PVC	-
Stranded insulation	-	-	TPE-E	PE-A	Teflon
Electrical properties					
Max. capacity	C	pF/m	< 250	< 130	< 130
Conductor resistance	R	Ω/km	< 280	< 140	< 75
Ambient conditions					
Temperature range, fixed installation	T _{fv}	°C	-50 ... +80	-30 ... +70	-40 ... +180
Temperature range, flexible installation	T _{bv}	°C		-5 ... +50	-25 ... +180
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	10 x D	5 x D
Min. bending radius, flexible installation	r _{bv}	mm	10 x D		10 x D
Further information					
Special features	-	-	-	Flame proofing test as per IEC 60332-2-2	Flame proofing test as per IEC 60332-2-2

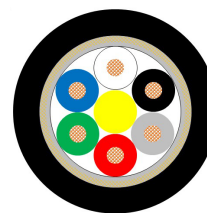
07 – Measuring lead

6 wires, 6.5 mm AD, TPE, gray,
4-3301.0115



08 – Measuring lead

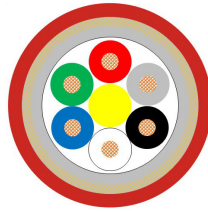
6 wires, 3.8 mm AD, TPE, black,
4-3301.0151



Type			4-3301.0115	4-3301.0151
Measuring lead			07	08
Lead structure				
Number of wires		-	6	6
Outside diameter	D	mm	6.5 (±0.25)	3.8 (±0.2)
Sheath color	-	-	gray	black
Stranding	-	-	6 wires around core filler	6 wires around core filler
Lead material	-	-	Copper wire (tin-coated) 19 x Ø0.127 mm	Copper wire (tin-coated) 19 x Ø0.1 mm
Lead cross-section	A	mm ²	0.25	0.15
Color code	-	-	gray, black, white, blue, green, red	gray, black, white, blue, green, red
Inner shielding	-	-	No	No
Total shielding	-	-	Yes	Yes
Drain wire			Underneath the shield	-
Materials				
Outer sheath	-	-	TPE-V	TPE-U
Inner sheath	-	-	-	-
Stranded insulation	-	-	TPE-E	PET
Electrical properties				
Max. capacity	C	pF/m	< 160	< 200
Conductor resistance	R	Ω/km	< 78	< 120
Ambient conditions				
Temperature range, fixed installation	T _{fv}	°C	-40 ... +80 (continuous) -50 ... +120 (short-term)	-50 ... +90 (20,000 h) -50 ... +125 (3000 h)
Temperature range, flexible installation	T _{bv}	°C		-25 ... +90 (20,000 h) -25 ... +115 (3000 h)
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	2 x D
Min. bending radius, flexible installation	r _{bv}	mm	10 x D	5 x D (flexible installation) 10 x D (continuously moving)
Further information				
Special features	-	-	Flame proofing test as per IEC 60332-2-2	Meets test requirements based on following specifications: 1) Drag chain: - 3 million cycles - Acceleration: 20 m/s ² - Speed: 4 m/s - Chain radius: 45 mm - Traverse path: 2 m 2) Torsion: - 3 million cycles - Two samples each, 1 m long and torsioned by 90° - Two samples each, 1 m long and torsioned by 180° Flame proofing test as per IEC 60332-2-2

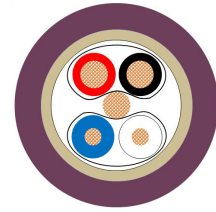
09 – Measuring lead

6 wires, 5.4 mm AD, TPE, orange,
4-3301.0152



10 – DeviceNet line

4 wires, 6.9 mm AD, FRNC, purple,
4-3301.0180

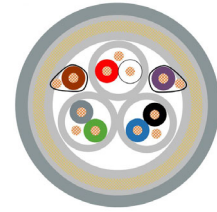


Type			4-3301.0152	4-3301.0180
Measuring lead/DeviceNet line			09	10
Lead structure				
Number of wires		-	6	4
Outside diameter	D	mm	5.4 (-0.3)	6.9 (±0.3)
Sheath color	-	-	blood orange	purple
Stranding	-	-	6 wires	4 wires, in pairs, around core filler
Lead material	-	-	Copper wire (tin-coated) 7 x Ø0.16 mm	Copper wire (tin-coated) 19 x Ø0.127 mm (data), 19 x Ø0.160 mm (power)
Lead cross-section	A	mm ²	0.14	0.24 (data), 0.38 (power)
Color code	-	-	gray, black, white, blue, green, red	(white, blue), (red, black)
Inner shielding	-	-	No	Yes
Total shielding	-	-	Yes	Yes
Drain wire			-	-
Materials				
Outer sheath	-	-	TPE-V	FRNC
Inner sheath	-	-	TPE-V	-
Stranded insulation	-	-	TPE-V	PE
Electrical properties				
Max. capacity	C	pF/m	< 105	-
Conductor resistance	R	Ω/km	< 140	-
Ambient conditions				
Temperature range, fixed installation	T _{fv}	°C	-40 ... +90 (continuous) -40 ... +120 (3000 h)	-25 ... +80
Temperature range, flexible installation	T _{bv}	°C	-	-
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	15 x D
Min. bending radius, flexible installation	r _{bv}	mm	10 x D	-
Further information				
Special features	-	-	Flame proofing test as per IEC 60332-2-2	DeviceNet bus lines based on CAN technology Data transfer rate: 125 kBit/s=500 m 250 kBit/s=250 m 500 kBit/s=100 m Moderate UV resistance Suitable for fixed installation Flame proofing test as per UL 1685, CSA FT4

11 – Measuring lead
24 wires, 10.5 mm AD,
Thermoplast, blue, 4-3301.0182



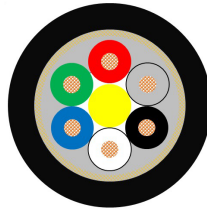
12 – Measuring lead
8 wires, 7.5 mm AD, PVC, gray,
4-3301.0183



Type			4-3301.0182	4-3301.0183
Measuring lead			11	12
Lead structure				
Number of wires		-	24	8
Outside diameter	D	mm	10.5 (±0.5)	7.5 (±0.3)
Sheath color	-	-	blue	gray
Stranding	-	-	24 wires, in pairs	6 wires, in pairs; 2 wires, individual
Lead material	-	-	Copper wire (tin-coated) 19 x Ø0.127 mm	Copper wire (tin-coated) 18 x Ø0.1 mm
Lead cross-section	A	mm ²	0.24	0.14
Color code	-	-	As per DIN 47100	(white, red), (black, blue), (gray, green), brown, purple
Inner shielding	-	-	No	Yes
Total shielding	-	-	Yes	Yes
Drain wire			Underneath the shield	For every inner shield
Materials				
Outer sheath	-	-	Thermoplast	PVC
Inner sheath	-	-	-	PVC
Stranded insulation	-	-	Thermoplast	PVC
Electrical properties				
Max. capacity	C	pF/m	< 100	< 130
Conductor resistance	R	Ω/km	< 80	< 276
Ambient conditions				
Temperature range, fixed installation	T _{fv}	°C	-30 ... +80	-30 ... +70
Temperature range, flexible installation	T _{bv}	°C	-10 ... +70	-5 ... +50
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	10 x D
Min. bending radius, flexible installation	r _{bv}	mm	15 x D	
Further information				
Special features	-	-	-	-

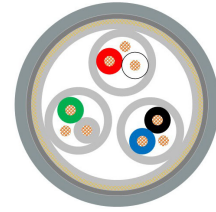
13 – Measuring lead

6 wires, 3.7 mm AD, PUR, black,
4-3301.0190



14 – Measuring lead

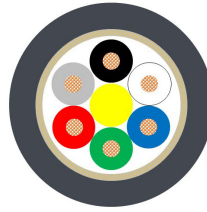
6 wires, 7.5 mm AD, TPE, gray,
4-3301.0199



Type			4-3301.0190	4-3301.0199
Measuring lead			13	14
Lead structure				
Number of wires		-	6	6
Outside diameter	D	mm	3.7 (±0.3)	7.5 (±0.3)
Sheath color	-	-	black	gray
Stranding	-	-	6 wires	6 wires, in pairs
Lead material	-	-	Copper wire (bare) 40 x Ø0.05 mm	Copper wire (tin-coated) 18 x Ø0.1 mm
Lead cross-section	A	mm ²	0.08	0.14
Color code	-	-	gray, black, white, blue, green, red	(white, red), (black, blue), (gray, green)
Inner shielding	-	-	No	Yes
Total shielding	-	-	Yes	Yes
Drain wire			-	For every pair
Materials				
Outer sheath	-	-	PUR	TPE-U
Inner sheath	-	-	PVC	TPE-U
Stranded insulation	-	-	TPE-E	PE-A
Electrical properties				
Max. capacity	C	pF/m	< 240	< 130
Conductor resistance	R	Ω/km	< 280	< 276
Ambient conditions				
Temperature range, fixed installation	T _{fv}	°C	-50 ... +80	-30 ... +70
Temperature range, flexible installation	T _{bv}	°C		-5 ... +50
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	10 x D
Min. bending radius, flexible installation	r _{bv}	mm	10 x D	
Further information				
Special features	-	-	-	Flame proofing test as per IEC 60332-2-2

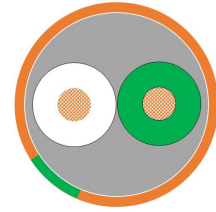
15 – Measuring lead

6 wires, 4.8 mm AD, TPE, gray,
4-3301.0228



16 – Thermo lead type K

2 wires, 3.05 mm AD, Teflon,
orange, 4-3301.0233



Type			4-3301.0228	4-3301.0233
Measuring lead/thermo lead			15	16
Lead structure				
Number of wires		-	6	2
Outside diameter	D	mm	4.8 (±0.2)	3.05 (±0.15)
Sheath color	-	-	gray	orange with green stripes
Stranding	-	-	6 wires around core filler	2 wires
Lead material	-	-	Copper wire (tin-coated) 7 x Ø0.16 mm	Copper wire (tin-coated) 7 x Ø0.2 mm
Lead cross-section	A	mm ²	0.14	0.22
Color code	-	-	gray, black, white, blue, green, red	white, green
Inner shielding	-	-	No	No
Total shielding	-	-	Yes	No
Drain wire			Underneath the shield	-
Materials				
Outer sheath	-	-	TPE	Teflon
Inner sheath	-	-	-	Elastosil
Stranded insulation	-	-	TPE	Teflon
Electrical properties				
Max. capacity	C	pF/m	< 130	-
Conductor resistance	R	Ω/km	< 141	-
Ambient conditions				
Temperature range, fixed installation	T _{fv}	°C	-40 ... +105	-
Temperature range, flexible installation	T _{bv}	°C	-25 ... +105	-50 ... +180
Min. bending radius, fixed installation	r _{fv}	mm	5 x D	-
Min. bending radius, flexible installation	r _{bv}	mm	10 x D	
Further information				
Special features	-	-	Flame proofing test as per IEC 60332-2-2	-

PRODUCT NUMBERS (OVERVIEW)

K-KAB-ML		
1	Code	Option 1: Version
	01	Measuring lead, 6 wires, 5.4 mm AD, PVC, gray, 4-3131.0071
	02	Measuring lead, 4 wires, 5.4 mm AD, PVC, gray, 4-3133.0002
	03	Measuring lead, 6 wires, 7.5 mm AD, PVC, gray, 4-3301.0071
	04	Measuring lead, 4 wires, 2.9 mm AD, PUR, black, 4-3301.0076
	05	Measuring lead, 6 wires, 7.5 mm AD, PVC, blue, 4-3301.0082
	06	Measuring lead, 6 wires, 6.5 mm AD, silicone, gray, 4-3301.0108
	07	Measuring lead, 6 wires, 6.5 mm AD, TPE, gray, 4-3301.0115
	08	Measuring lead, 6 wires, 3.8 mm AD, TPE, black, 4-3301.0151
	09	Measuring lead, 6 wires, 5.4 mm AD, TPE, orange, 4-3301.0152
	10	DeviceNet line, 4 wires, 6.9 mm AD, FRNC, purple, 4-3301.0180
	11	Measuring lead, 24 wires, 10.5 mm AD, Thermoplast, blue, 4-3301.0182
	12	Measuring lead, 8 wires, 7.5 mm AD, PVC, gray, 4-3301.0183
	13	Measuring lead, 6 wires, 3.7 mm AD, PUR, black, 4-3301.0190
	14	Measuring lead, 6 wires, 7.5 mm AD, TPE, gray, 4-3301.0199
	15	Measuring lead, 6 wires, 4.8 mm AD, TPE, gray, 4-3301.0228
16	Thermo lead type K, 2 wires, 3.05 mm AD, Teflon, orange, 4-3301.0233	
2	Code	Option 2: Length
	010	10 m, in plastic bag
	020	20 m, in plastic bag
	030	30 m, in plastic bag
	050	50 m, in plastic bag
	100	100 m, on a role
200	200 m, on a role	

Ordering example:

K-KAB-ML -

0	8
---	---

 -

0	2	0
---	---	---

1 2

Hottinger Brüel & Kjaer GmbH
 Im Tiefen See 45 · 64293 Darmstadt · Germany
 Tel. +49 6151 803-0 · Fax +49 6151 803-9100
 www.hbkworld.com · info@hbkworl.com

Subject to modifications. All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability.