

DATA SHEET

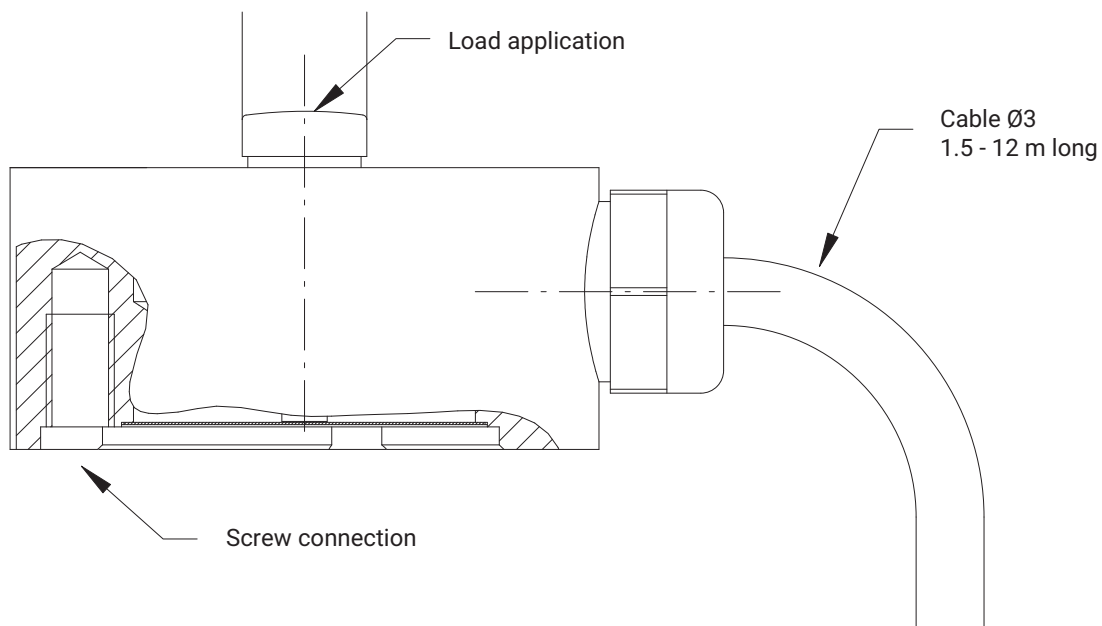
C9C Force Transducer

SPECIAL FEATURES

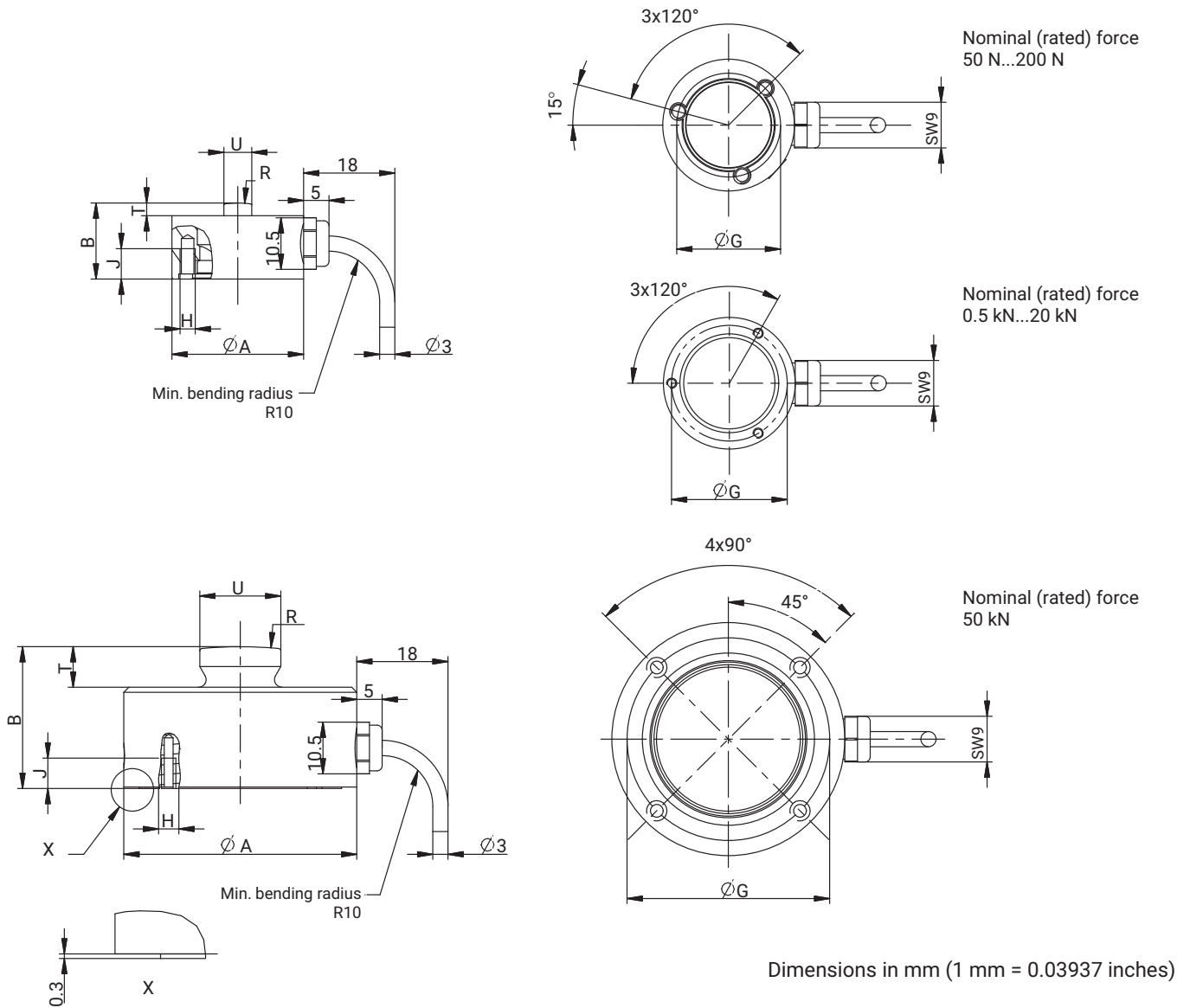
- Compact design compressive force transducer
- Accuracy class 0.2
- Nominal (rated) forces 50 N... 50 kN
- Available on request as a measurement chain with permanently connected inline amplifier.
Output signals: mA, V or IO-Link
- Configurable with different cable lengths, plug assembly and TEDS on request
- Stainless, protection class IP67
- High rigidity, ideally suited for dynamic measurement tasks
- Cable suitable for drag chains



PRINCIPLE OF THE C9C FORCE TRANSDUCER

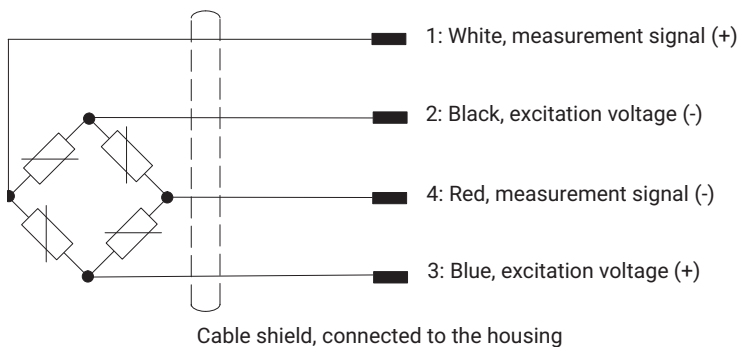


DIMENSIONS OF C9C

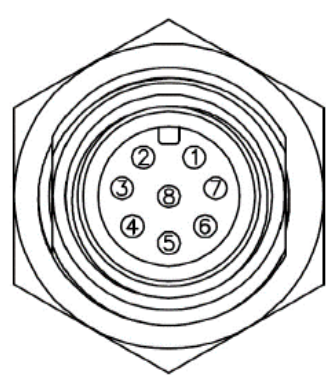


Nominal (rated) force of C9C	A _{0.1}	B	G _{+/0.1}	H	J	R	T	U _{0.1}	X
	[mm]								
50 N - 200 N	26	15	20.5	3 x M3	6	20	2.5	5.5	10.5
0.5 kN - 20 kN	26	13	22.75	3 x M2	3.5	40	1	8	10.5
50 kN	46	28	40	4 x M4	6	80	8	16	10.5

Wiring diagram of C9C without inline amplifier



VA1, VA2 INLINE AMPLIFIER WIRING DIAGRAM



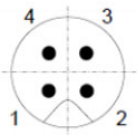
Pin	Version VA 1 (voltage output)	Version VA 2 (current output)	KAB168 connection cable wire assignment
1	Supply voltage 0 V (GND)		White
2	Not in use		Brown
3	Zero control input		Green
4	Not in use		Yellow
5	Output signal 0 ... 10 V	Output signal 4 ... 20 mA	Gray
6	Output signal 0 V	Not in use	Pink
7	Not in use		Blue
8	Voltage supply -19 ... +30 V		Red

Accessory	Ordering number
KAB168-5, PUR connection cable with M12 plug and free ends, 5 m long. Not suitable for use with the IO-Link interface.	1-KAB168-5
KAB168-20, PUR connection cable with M12 plug and free ends, 20 m long. Not suitable for use with the IO-Link interface.	1-KAB168-20

PIN ASSIGNMENT OF VAIO INLINE AMPLIFIER

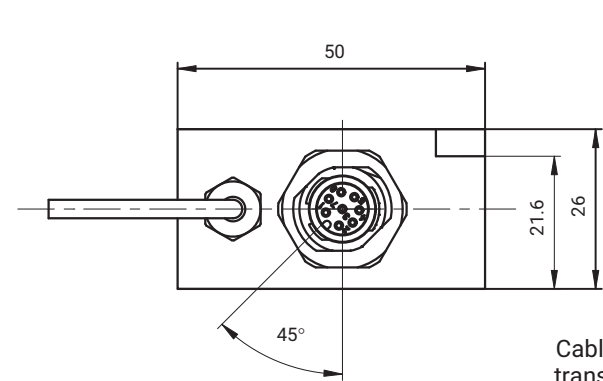
PIN	U9/C9 plug assignment
1	Supply voltage +
2	Digital output (DI/DO pin function)
3	Supply voltage -, reference potential
4	IO-Link data (C/Q), switchover to the digital output (SIO mode) possible

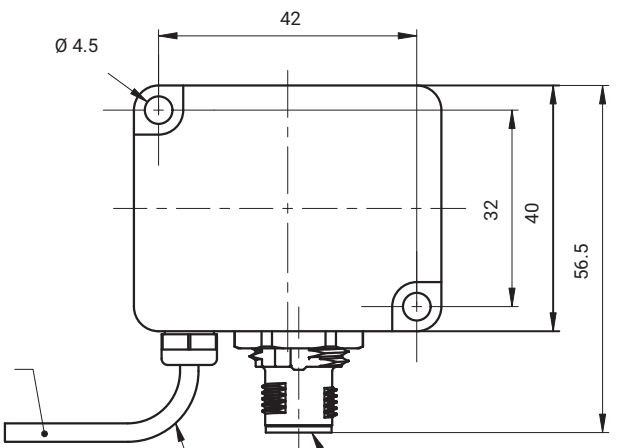
Class A



Male (device)

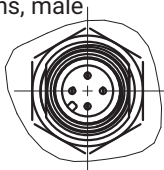
DIMENSIONS OF VA1, VA2, VAIO INLINE AMPLIFIERS





Cable length to transducer: Ø 3

Plug with VAIO option:
M12, A-coded, 4 pins, male



Bending radius: min. R10

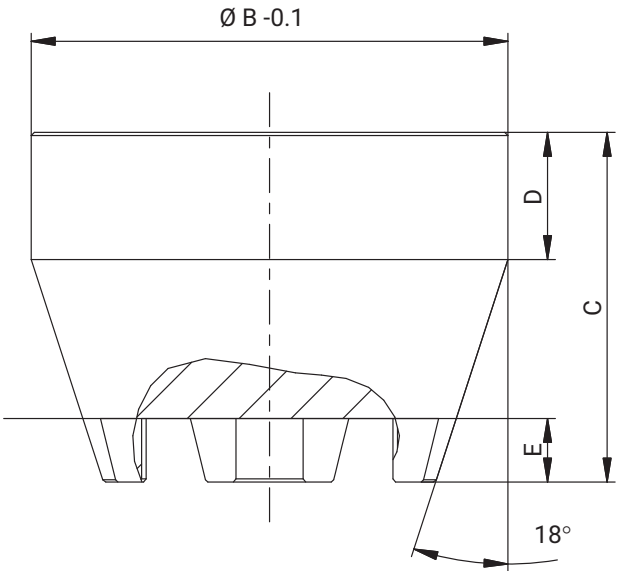
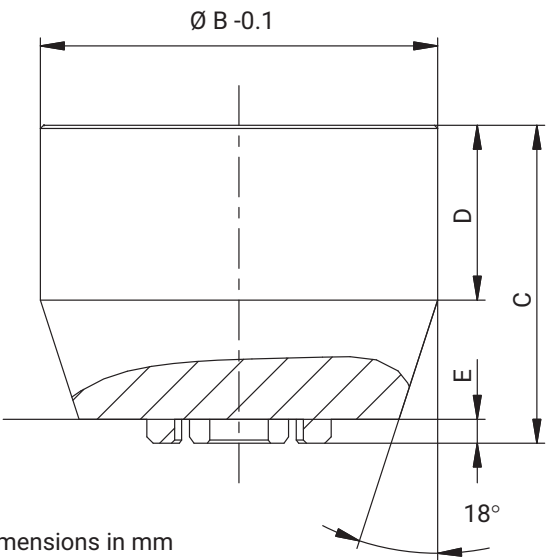
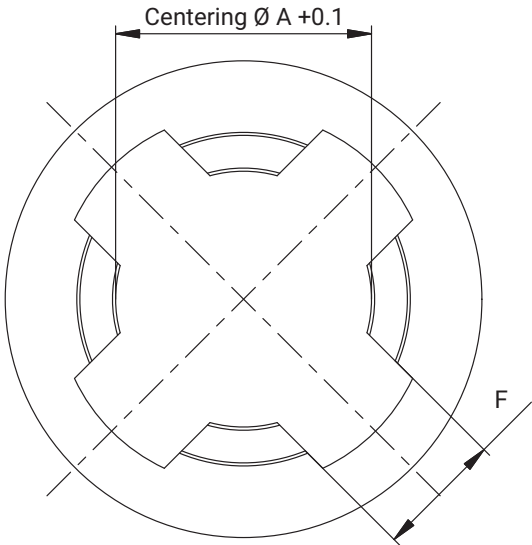
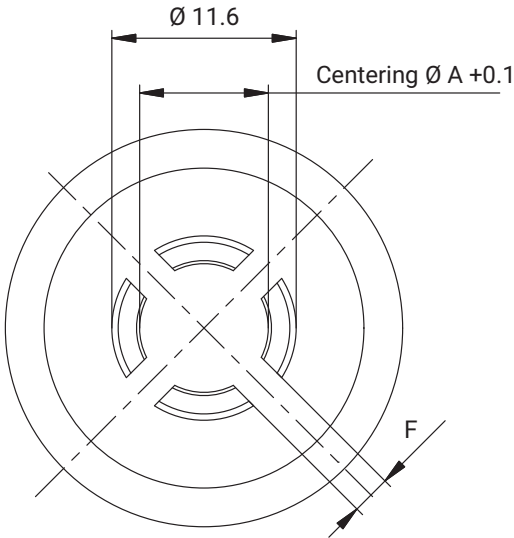
Plug:
Voltage VA1/current VA2
M12, A-coded, 8 pins, male
IO-Link VAIO
M12, A-coded, 4 pins, male

Dimensions in mm

DIMENSIONS OF EDO9

Nominal (rated) force 0.5...20 kN

Nominal (rated) force
50 kN



Dimensions in mm

EDO9 Ordering number	Force range	$\varnothing A$	$\varnothing B$	C	D	E	F
		[mm]					
1-EDO9/20kN	0.5 ... 20 kN	8.1	25	20	11	1.5	2.5
1-EDO9/50kN	From 50 kN	16.1	30	22	8	4	8

SPECIFICATIONS FOR C9C

Nominal (rated) force	F _{nom}	N	50	100	200								
		kN				0.5	1	2	5	10	20	50	
Accuracy													
Accuracy class			0.2										
Relative reproducibility and repeatability errors in unchanged mounting position	b _{rg}	%	< 0.2										
Relative reversibility error	v	%	< 0.2										
Non-linearity	d _{lin}	%	< 0.2										
Relative creep	d _{crf+E}	%	< 0.2			< 0.1							
Temperature coefficient of sensitivity													
In the nominal (rated) temperature range	TC _S	%/10K	< 0.2										
In the operating temperature range	TC _S	%/10K	< 0.50										
Temperature coefficient of zero signal													
In the nominal (rated) temperature range	TC ₀	%/10K	< 0.2										
In the operating temperature range	TC ₀	%/10K	< 0.50										
Rated electrical output													
Nominal (rated) output	C _{nom}	mV/V	1										
Tolerance range of zero signal	d _{s,0}	mV/V	± 0.2										
Sensitivity error	d _c	%	< 1										
Input resistance	R _e	Ω	250 - 400			300 - 450							
Output resistance	R _a	Ω	200 - 400			100 - 450							
Insulation resistance	R _{Iso}	Ω	> 1*10 ⁹										
Operating range of the excitation voltage	B _{u,gt}	V	0.5....12										
Reference excitation voltage	U _{ref}	V	5										
Connection			4-wire circuit										
Temperature													
Reference temperature	t _{ref}	°C	23										
Nominal temperature range	B _{t,nom}	°C	-10...+70										
Operating temperature range	B _{t,g}	°C	-30...+85										
Storage temperature range	B _{t,S}	°C	-30...+85										
Characteristic mechanical quantities													
Max. operating force	F _G	% of F _{nom}	200			120							
Force limit	F _L	% of F _{nom}	> 200			> 150							
Breaking force	F _B	% of F _{nom}	> 400										
Permissible eccentricity when loaded with nominal (rated) force	e _g	mm	2.6	2.5	2.5	3.5	2.6	3.2	1.8	2.0	0.8	2.5	
Nominal (rated) displacement ±15%	S _{nom}	mm	0.009			0.015	0.019	0.020	0.025	0.040	0.055	0.075	
Natural frequency	f _G	kHz	7.3	10	15.7	3.5	5	7	13	15.1	20	12	
Permissible oscillation stress	F _{rb}	% of F _{nom}	80										70
Maximum impact load to IEC 60068-2-6													
Number			1000										
Duration		ms	3										
Acceleration		m/s ²	1000										
Vibrational stress as per IEC 60068-2-27													
Frequency range		Hz	5 ... 65										

Nominal (rated) force	F _{nom}	N	50	100	200							
		kN				0.5	1	2	5	10	20	50
Duration		min	30									
Acceleration		m/s ²	150									
General information												
Degree of protection as per EN 60529			IP67									
Spring element material			Steel									
Measuring point protection			Hermetically welded									
Cable			Four-wire circuit, PUR insulation									
Cable length	m		1.5 m; 3 m; 5 m; 6 m; 7 m; 12 m									
Weight	g		55			65						260

SPECIFICATIONS OF VA1, VA2 INLINE AMPLIFIERS

Module type		VA1	VA2
Accuracy			
Accuracy class	%	0.15	
Effect of temperature on amplification	%	0.10	
Relative linearity error	%	0.01	
Effect of temperature on zero point	%	0.15	
Rated electrical output			
Output signal		0 ... 10 V	4 ... 20 mA
Nominal (rated) output		10 V	16 mA
Sensitivity tolerance		± 0.1 V	± 0.16 mA
Zero signal		0 V	4 mA
Output signal range		-0.3 ... 11 V	3 ... 21 mA
Cut-off frequency (-3 dB)	kHz	2	
Supply voltage	V	19 ... 30	
Nominal (rated) voltage	V	24	
Maximum current consumption	mA	15	30
Temperature			
Nominal temperature range	°C	-10...+50	
Operating temperature range	°C	-20...+60	
Storage temperature range	°C	-25...+85	
Reference temperature	°C	23	
Maximum impact load to IEC 60068-2-6			
Number		1000	
Duration	ms	3	
Acceleration	m/s ²	1000	
Vibrational stress as per IEC 60068-2-27			
Frequency range	Hz	5 ... 65	
Duration	min	30	
Acceleration	m/s ²	150	
General information			
Housing material		Aluminum	
Weight without cable	g	125	
Max. cable length for supply voltage/output signal	m	30	
Degree of protection as per EN 60529		IP67	

SPECIFICATIONS OF INLINE AMPLIFIER VAIO

Module type		VAIO
Accuracy		
Accuracy class		0.01
Effect of temperature on amplification	%/10K	0.01
Effect of temperature on zero point	%/10K	0.01
Rated electrical output		
Output signal; interface		COM3, to IO-Link standard, class A
Min. cycle (max. output rate)	ms	0.9
Sample rate (internal)	S/s	40000
Cut-off frequency (-3 dB)	kHz	4
Reference supply voltage	V	24
Supply voltage range	V	19 - 30
Max. power consumption	mW	3200
Noise	ppm of nominal force	With Bessel filter 1 Hz: 25 With Bessel filter 10 Hz: 63 With Bessel filter 100 Hz: 195 With Bessel filter 200 Hz: 275 Without filter: 3020
Filter		
Low-pass filter		Freely adjustable cut-off frequency, Bessel or Butterworth characteristic, 6th order
Device functions		
Limit value switches		2 limit value switches. Invertible, freely adjustable hysteresis. Output via process data or digital output
Digital IO		According to IO-Link Smart Sensor Profile, 1 permanently available digital output, 1 output can be set to data output, then no measurement possible
Lag indicator function		Yes
Peak value memory		Yes
Peak-to-peak memory		Yes
Warning functions		Warning on exceeding nominal (rated) force/maximum operating force; Nominal (rated) temperature/maximum operating force
Temperature		
Nominal temperature range	°C	-10 ... +50
Operating temperature range	°C	-10 ... +60
Storage temperature range	°C	-25 ... +85
Reference temperature	°C	23
Maximum impact load to IEC 60068-2-6		
Number		1000
Duration	ms	3
Acceleration	m/s ²	1000
Maximum vibrational stress to IEC 60068-2-27		
Frequency range	Hz	5 ... 65
Duration	min	30
Acceleration	m/s ²	150

VERSIONS AND ORDERING NUMBERS

Code	Measuring range	Ordering number
050 N	50 N	1-C9C/50N
100 N	100 N	1-C9C/100N
200 N	200 N	1-C9C/200N
00K5	0.5 kN	1-C9C/0.5kN
01K0	1 kN	1-C9C/1kN
02K0	2 kN	1-C9C/2kN
05K0	5 kN	1-C9C/5kN
10K0	10 kN	1-C9C/10kN
20K0	20 kN	1-C9C/20kN
50K0	50 kN	1-C9C/50kN

The ordering numbers shown in gray are preferred types. They can be delivered rapidly.

All preferred types with 1.5 m cable, open ends, without TEDS and without firmware.

The ordering number for the preferred types is 1-C9C...

The ordering number for customer-specific designs is K-C9C...

The ordering number example **K-C9C-05K0-03m0-VAIO-S-I002** below is a: C9C, nominal force 5 kN with 3 m cable, inline amplifier with IO-Link output

Nominal (rated) force	Cable length	Electrical connection	Transducer identification	FW version
50 N 050N	1.5 m 01m5	Free ends Y	With TEDS chip T	No firmware N
100 N 100N	3 m 03m0	15-pin Sub-D connector F	Without TEDS chip S	IO 1.2.6 I001
200 N 200N	5 m 05m0	Male connector MS3106PEMV N		IO .2.0.0 I002
0,5 kN 00K5	6 m 06m0	15-pin Sub-HD connector Q		
1 kN 01K0	7 m 07m0	With inline amplifier 0 .. 10 V VA1		
2 kN 02K0	12 m 12m0	With inline amplifier 4 .. 20 mA VA2		
5 kN 05K0		With IO-Link inline amplifier VAIO		
10 kN 10K0				
20 kN 20K0				
50 kN 50K0				

K-C9C-	05K0-	03m0-	VAIO-	S-	I002
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All cable lengths can be combined with all plugs.

TEDS can only be ordered in conjunction with a plug option. It is not possible to combine TEDS and free cable ends.

Versions with inline amplifiers (VA1, VA2 and VAIO) can only be combined with cable lengths of 1.5 m and 3 m; TEDS is not available for these measurement chains.

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