

WA

Inductive Standard Displacement Transducers

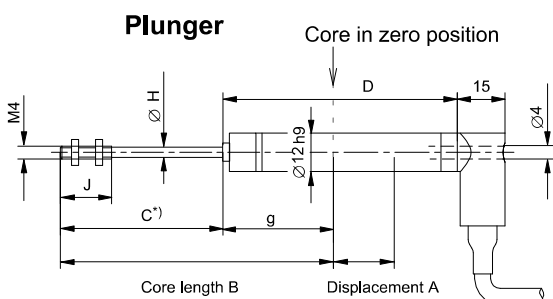
Special features

- Available as displacement probe or with detachable plunger
- Good thermal stability in the event of temperature gradients
- Space-saving, compact design
- Pressure-resistant transducer for measuring displacement in hydraulic cylinders
- Acceleration resistance ensures long service life
- Option: high temperature version up to 150°C, low temperature version up to -40°C
- Output signal of your choice: 80 mV/V, 0.5 - 10 V

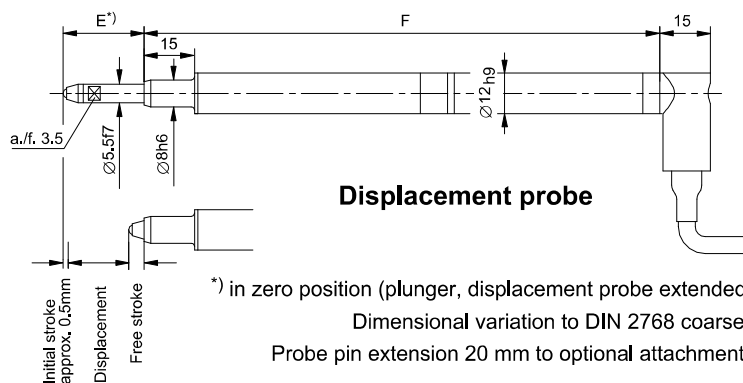
Data sheet



Dimensions (in mm; 1 mm = 0.0397 inches)



Fitted PVC cable, Ø6, optional length and termination



Measuring range	Plunger							Displacement probe		
	A	B	C	D	G	ØH	J	A	E	F
0...2 mm	2	75.5	40	69	35.5	1.2	15	2	14	130
0...10 mm	10	66	40	69	26 ± 0.5	3.7	16	10	14	130
0...20 mm	20	87	55	84	32 ± 0.5	3.7	16	20	24	170
0...50 mm	50	117	85	114	32 ± 0.5	3.7	16	50	54	230
0...100 mm	100	180	134	181.6	46 ± 1	3.7	16	100	104	372.6
0...200 mm	200	280	234	281.6	46 ± 1	3.7	16			
0...300 mm	300	380	334	381.6	46 ± 1	3.7	16			
0...500 mm	500	580	534	581.8	46 ± 1	3.7	16			

Specifications

Type		WA2	WA10	WA20	WA50	WA100	WA200	WA300	WA500	
Nominal displacement	mm	0...2	0...10	0...20	0...50	0...100	0...200	0...300	0...500	
Nominal sensitivity Nominal output signal at nominal displacement with output unloaded	mV/V	80								
Characteristic tolerance Deviation of sensitivity from nominal sensitivity	%	± 1								
Zero point tolerance with core in zero position	mV/V	± 1		± 8						
Linearity deviation Greatest deviation between start and end point (including hysteresis by reference to nominal sensitivity)	%	≤ ± 0.2 to ≤ ± 0.1								
Nominal temperature range	°C [°F]	-20...+80								
Operating temperature range Standard	°C [°F]	-25...+80 [-13...+176]								
Variant for high temperature	°C [°F]	-25...+150 [-13...+302]								
Variant for low temperature	°C [°F]	-40...+125 [-40...+257]								
Effect of temperature on zero signal in nominal temp. range per 10 K, by refer. to nominal sensitivity	%	< ± 0.1								
Effect of temperature on output signal in nominal temp. range per 10 K, by refer. to actual value	%	< ± 0.1								
Input resistance	Ω	100 ± 10 %		350 ± 10 %						
Output resistance	Ω	570 ± 10 %		680 ± 10 %						
Nominal excitation voltage	V _{rms}	2.5								
Operating range of the excitation voltage	V _{rms}	0.5...10								
Carrier frequency, Nominal range	KHz	4.8 ± 1 %								
Operating range	KHz	4.8 ± 8 %								
Weight of transducer body	g	54	56	57	68	104	147	190	276	
of plunger	g	4	6	7	9	13	20	28	42	
Impact resistance , test severity level to DIN IEC 68, Part 2-27; IEC 68-2-27-1987	-	1000								
Number of impacts (per direction)	-	1000								
Impact acceleration	m/s ²	650								
Impact duration	ms	3								
Impact form	-	Half sine wave								
Vibration resistance , test severity level to DIN IEC 68, Part 2-6, IEC 68-2-6-1982	-	5 to 65								
Frequency range	Hz	5 to 65								
Vibration acceleration	m/s ²	150								
Stress duration (per direction)	h	0.5								
Max. permissible plunger acceleration	m/s ²	2500								
	m/s ²	Probe version					Unfixed plunger version			
Service life, typically		10 million stress cycles					-			
Spring constant	N/mm	0.116				0.063		-		
Spring force in zero position (for 1mm initial stroke) approx.	N	2.4				2		-		
Spring force in final position (nom. displ.) appr.	N	2.7	3.6	4.7	8.2	8.3		-		
Max. permissible probe tip acceleration	m/s ²	170		140	95	45		-		
Probe tip cut-off frequency for 1 mm stroke appr.	Hz	60		55	45	30		-		
Probe tip cut-off frequency at nominal displacement	Hz	18		10	5	3		-		
Degree of protection acc. to EN 60 529 for transducer duct and core channel	-	IP67 (depending on connection piece)								
Max. permissible pressure (increasing load)	bar	350								
Overload limit (to VDI/VDE 2600, Sheet 4)	bar	450								
Destructive range (to VDI/VDE 2600, Sheet 4)	bar	> 500								

Specifications WA electronics

Type		WA2	WA10	WA20	WA50	WA100	WA200	WA300	WA500
Nominal displacement	mm	0...2	0...10	0...20	0...50	0...100	0...200	0...300	0...500
Nominal output span¹⁾	V	9.5 (0.5...10)							
Output span tolerance¹⁾	%	±0.5							
Linearity deviation¹⁾ Greatest deviation between start and end point (including hysteresis by reference to nominal sensitivity)	%	±0.2							
Nominal temperature range	°C	-20...+60							
Operating temperature range	°C	-20...+70							
Effect of temperature¹⁾ on zero signal in nominal temperature range per 10 K, by reference to nominal sensitivity	%	≤ ±0.2; typically ≤ ±0.15							
Effect of temperature¹⁾ on output signal in nominal temperature range per 10 K, by reference to actual value	%	≤ ±0.15; typically < ±0.10							
Supply voltage	V	15...30							
Dependence of the nominal (rated) output range from the supply voltage, typically (in the supply voltage range)	%	0.03							
Burden in the output	kΩ	≥10							
Current consumption	mA	45 (typically 26)							
Power consumption max.	W	1.5							
Cut-off frequency	Hz	520 filter 4th order, Butterworth							
Cable length between the transducer and the electronics	m	3...20							
Cable length between the electronics and the evaluator	m	3...50							

¹⁾ specified for the complete measuring chain

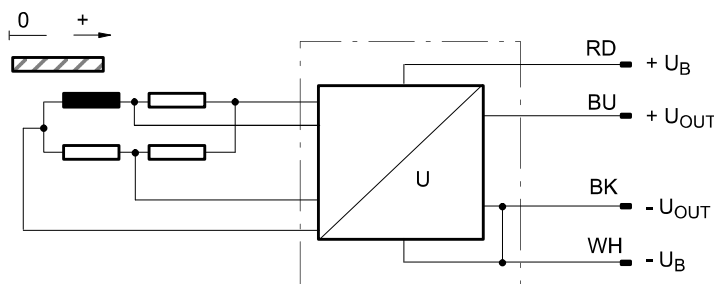
WA electronics



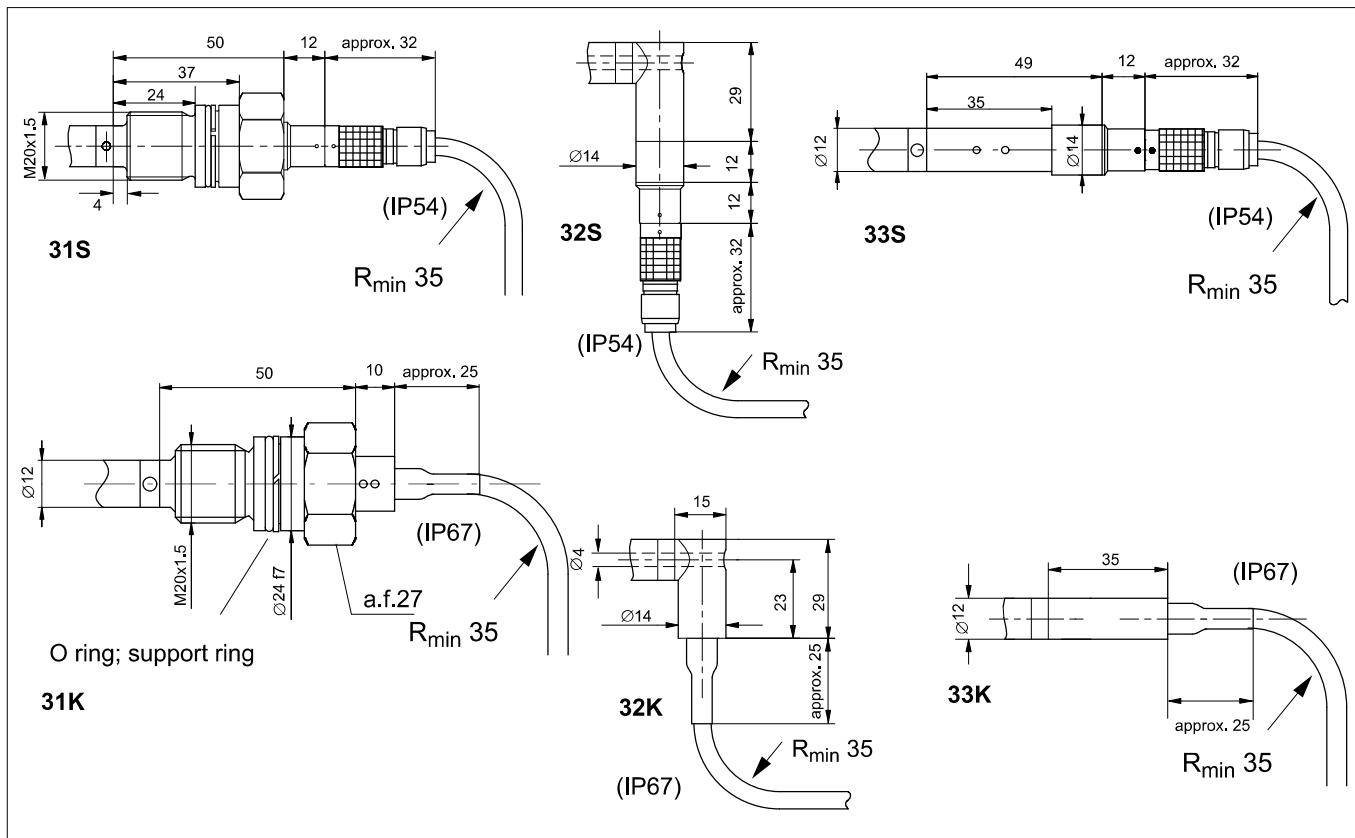
Dimensions WA electronics

Length: 102 mm
Width: 32 mm
Depth: 13.5 mm

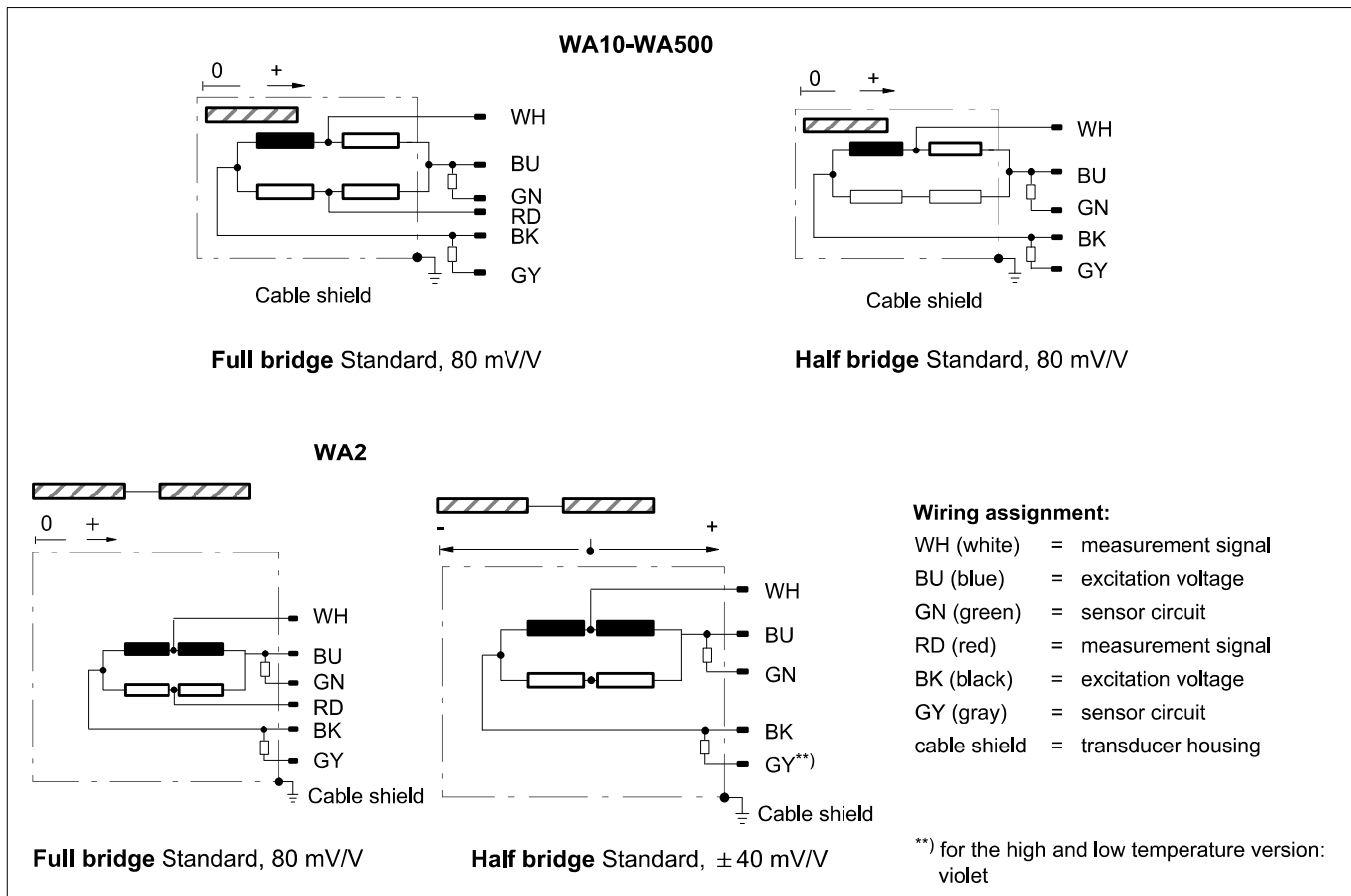
WA electronics cable assignment



Types of connection



Principle of measurement, wiring assignment

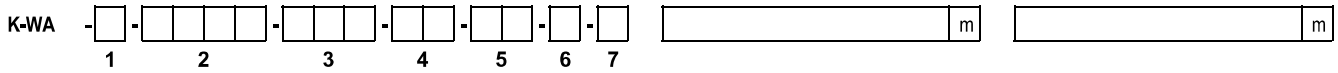


Options for WA

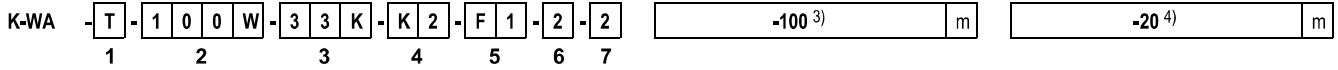
K-WA		Configurable displacement transducer WA		
1	Code	Option 1: Version		
	L	Detachable plunger, standard version		
	M	Detachable plunger, high temperature version up to max. 150°C		
	T	Displacement probe, standard version		
	U	Displacement probe, high temperature version up to max. 150 °C		
	X ¹⁾	Displacement probe, low temperature version for -40°C... 125°C		
2	Code	Option 2: Measuring range	Option = 1	
			T/U/X	L/M
	002W	2 mm	x	x
	010W	10 mm	x	x
	020W	20 mm	x	x
	050W	50 mm	x	x
	100W	100 mm	x	x
	200W	200 mm		x
	300W	300 mm		x
500W	500 mm		x	
3	Code	Option 3: Type of connection at the transducer		
	31K	Pressure-resistant, M20x1.5 + fixed cable, IP67		
	32K	90°, fixed cable, IP67		
	33K	0°, fixed cable, IP67		
	31S	Pressure-resistant, M20x1.5 + LEMO plug connection		
	32S	90°, LEMO male connector		
33S	0°, LEMO male connector			
4	Code	Option 4: Cable type; for option 1 = L / T	Option 3 =	
			__K	__S
	K1	Non-detachable PVC cable, length 3m	x	
	K2 ²⁾	Non-detachable PVC cable, length 3 m...300 m	x	
	S1	LEMO plug, PVC cable 3 m		x
	S2 ²⁾	LEMO plug, PVC cable 3 m...300 m		x
		Option 4: Cable type; for option 1 = M / U / X	Option 3 =	
			__K	__S
	K3	Non-detachable PTFE cable, max. 150 °C, length 3m	x	
	K4	Non-detachable PTFE cable, max. 150 °C, length 3 m ... 300 m	x	
S3	LEMO plug, PTFE cable, max. 150 °C, 3 m		x	
S4	LEMO plug, PTFE cable, max. 150 °C, 3 m ... 300 m		x	
5	Code	Option 5: Cable ends		
	D1	DB-15P male connector	with option 7 = 8 only	
	D2	DB-15P male connector with TEDS	with option 7 = 8 only	
	F1	Free ends		
	M1	MS 3106PEMV male connector	with option 7 = 8 only	
	M2	MS male connector with TEDS	with option 7 = 8 only	
	Q1	Sub-HD male connector	with option 7 = 8 only	
Q2	Sub-HD male connector with TEDS	with option 7 = 8 only		
6	Code	Option 6. Non-linearity		
	2	0.2%		
	1	0.1% not with option 2 = 010W / not with option 7 = 2		

7	Code	Option 7: Rated output
	8	80mV/V full bridge circuit for option 2 = 002W : can be connected as a full bridge or half bridge circuit ±40mV/V
	2	Output 0.5...10V 0.5 ... 10V WA electronics with option 5 = F1 PVC cable to the evaluator, length 3 m + option 6 = 2 (special cable length between the WA electronics and the evaluator: 3...50 m)

Ordering number



Example:



- 1) A reduced load-cycling capability is to be expected.
- 2) For option 7 = 2, the max. cable length at the transducer is 20 m
- 3) Special cable length at the transducer
- 4) Special cable length between the WA electronics and the evaluator

Devices can be supplied in the standard version from stock at short notice.

Scope of supply: displacement transducer, test record, 20 mm probe pin extension, operating manual

Standard displacement transducer WA

Version	Probe version	Plunger
Measuring range	Order no.	Order no.
0 ... 2 mm	1-WA/2MM-T	1-WA/2MM-L
0 ... 10 mm	1-WA/10MM-T	1-WA/10MM-L
0 ... 20 mm	1-WA/20MM-T	1-WA/20MM-L
0 ... 50 mm	1-WA/50MM-T	1-WA/50MM-L
0 ... 100 mm	1-WA/100MM-T	1-WA/100MM-L
0 ... 200 mm		1-WA/200MM-L
0 ... 300 mm		1-WA/300MM-L
0 ... 500 mm		1-WA/500MM-L

Accessories

Mounting set WS/ZB12

1. Fitting suggestion

WS/ZB12
2 mounting blocks with countersink Km4
DIN 74
1 mounting block with thread M4

2. Fitting suggestion

4 fillister-head screws M4x25, DIN 912
2 fillister-head screws M4x40, DIN 912

3. Fitting suggestion

1 hexagonal-head bolt spanner a.f.
3

Operating temperature range from -40 °C...+80 °C

Replacement parts

- PVC cable as cable type S1, 3 m, with Lemo connector (male) (2-9268.0675 for 80 mV/V)
- PVC cable as cable type S2, any length (max. 300 m, 2-9268.0676 for 80 mV/V; max. 20 m with Option 7, Code 2)
- PTFE cable as cable type S3, 3 m; with Lemo connector (male) (2-9268.0766 for 80 mV/V)
- PTFE cable such as cable type S4, any length (max. 20 m, 2-9268.0767 for 80 mV/V)
- Lemo connector, detachable (6-pin, 3-3312.0126 for 80 mV/V)
- Lemo jack, detachable (6-pin, 3-3312.0235 for 80 mV/V)
- Measurement insert with carbide ball (3-6061.0003)