

WA

Inductive Standard Displacement Transducers

Displacement probe

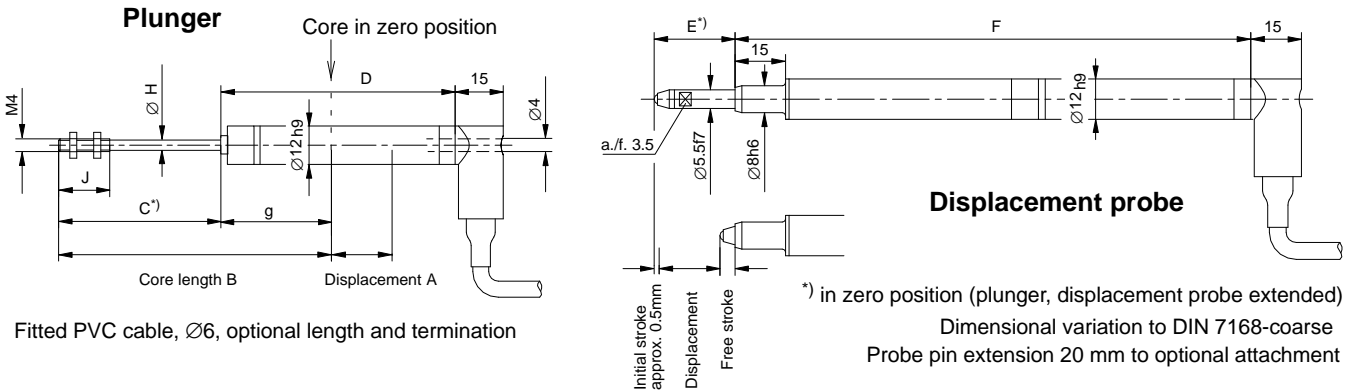


Plunger

Special features

- Displacement probe and transducer 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

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)		650								
Impact acceleration	m/s ²	3								
Impact duration	ms	Half sine wave								
Impact form										
Vibration resistance , test severity level to DIN IEC 68, Part 2-6, IEC 68-2-6-1982		5 to 65								
Frequency range	Hz	150								
Vibration acceleration	m/s ²	0.5								
Stress duration (per direction)	h									
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 span ¹⁾	V	9.5 (0.5...10)							
Output span tolerance ¹⁾	%	± 0.5							
Linearity deviation ¹⁾ 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 temperature ¹⁾ on zero signal in nominal temperature range per 10 K, by reference to nominal sensitivity	%	≤ ± 0.15; typically < ± 0.10							
Effect of temperature ¹⁾ 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

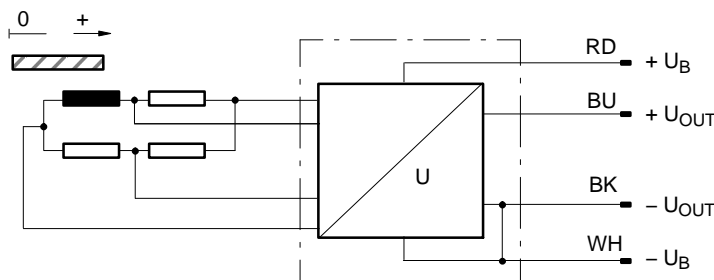
WA electronics



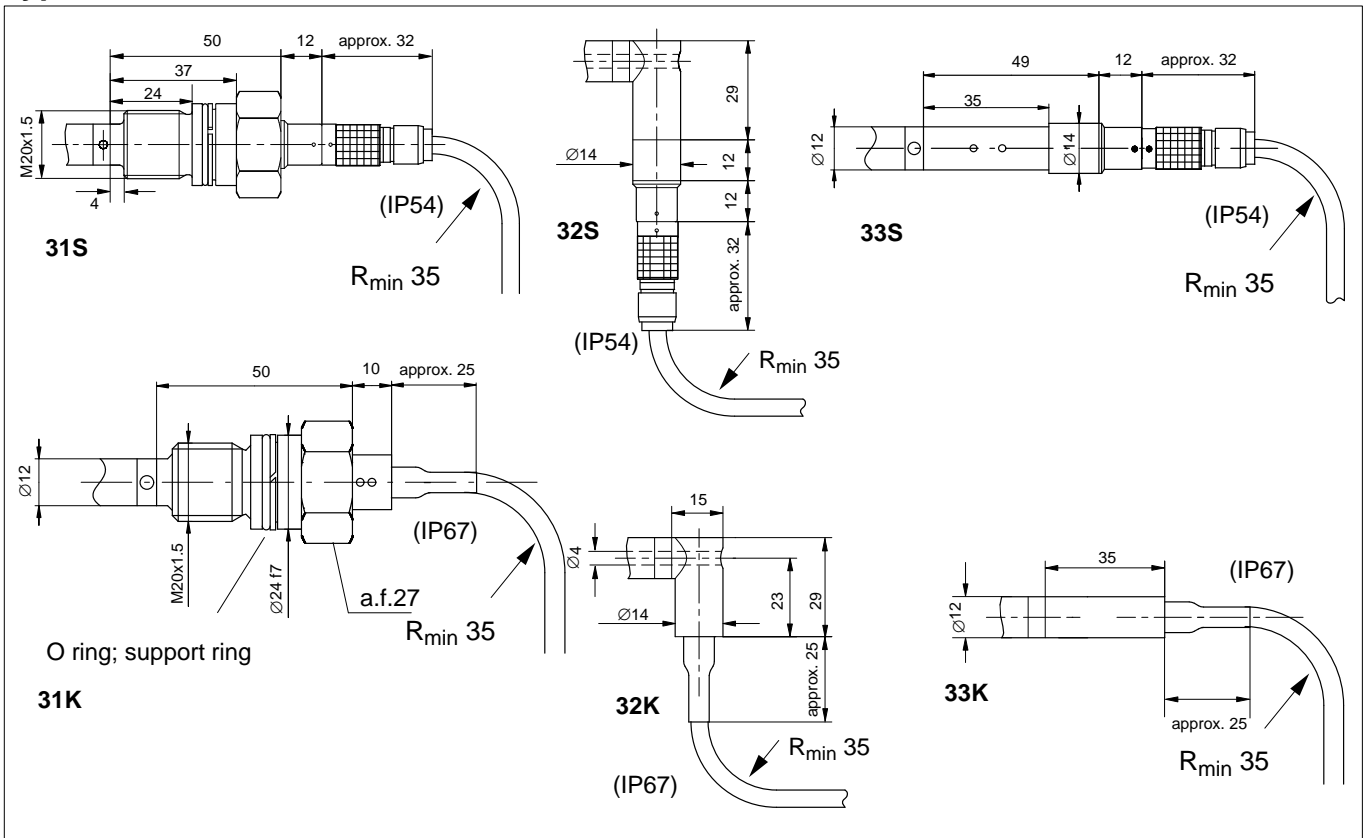
Dimensions WA electronics

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

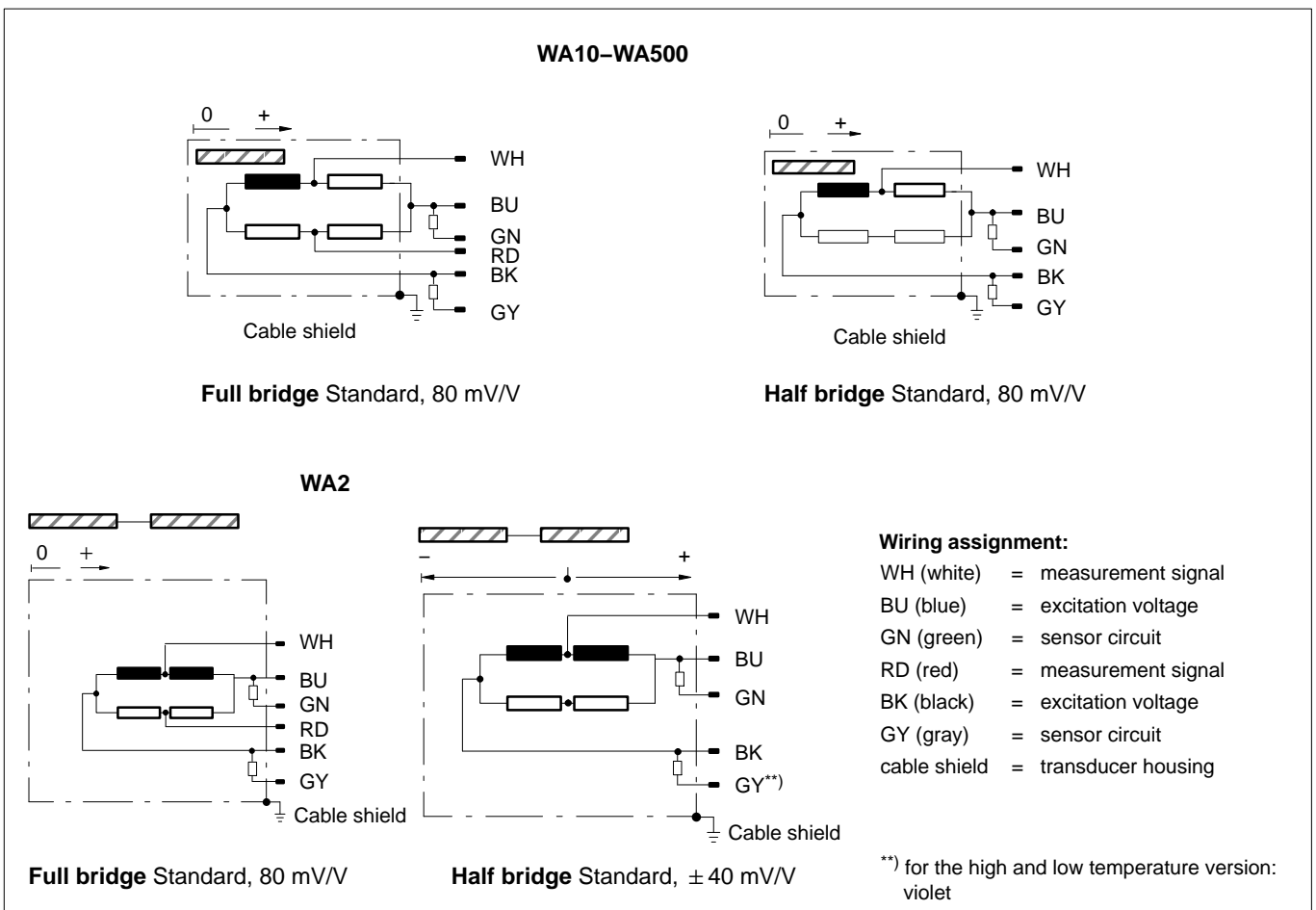
WA electronics cable assignment



Types of connection



Principle of measurement, wiring assignment



Options for WA

Code	Option 1: version	Option 1: version	Option 1: version
L	Plunger, standard version	M	Plunger, high temperature version up to 150 °C
T	Displacement probe, standard version	U	Displacement probe, high temperature version up to 150 °C
		X	Displacement probe, low temperature version up to -40°C ⁶⁾

Code	Option 2: measuring range [mm]	Option 1	
		T / U / X	L / M
002W	0...2	x	x
010W	0...10	x	x
020W	0...20	x	x
050W	0...50	x	x
100W	0...100	x	x
200W	0...200		x
300W	0...300		x
500W	0...500		x

Code	Option 3: type of connection
31K	M20x1.5; pressure resistant, fitted cable with straight output, IP67 (cable type K1, K2, K3, K4)
32K	Fitted cable, 90°, IP67 (cable type K1, K2, K3, K4)
33K	Fitted cable with straight output, IP67 (cable type K1, K2, K3, K4)
31S	M20x1.5; Lemo connector, IP54 (cable type S1, S2, S3, S4)
32S	Lemo connector, 90°, IP54 (cable type S1, S2, S3, S4)
33S	Lemo connector, straight IP54 (cable type S1, S2, S3, S4)

Code	Option 4: standard version (only with Option 1 - Code L,T)
K1	Fitted PVC cable; 3 m long
K2 ¹⁾	Fitted PVC cable; length as required, (>3 ... 300 m)
S1	Lemo connector, PVC cable; length 3 m
S2 ¹⁾	Lemo connector, PVC cable; length as required, (>3 ... 300 m)
Code	Option 4: high temperature version (only with Opt.1 - Code M,U) low temperature version (only with Opt.1 - Code X)
K3	PTFE cable, fitted, 3 m, max. 150 °C
K4 ¹⁾	PTFE cable, fitted, max. 150 °C, length as required, (>3 ... 20 m)
S3	Lemo connector, cable, 3 m, max. 150 °C
S4	Lemo connector, cable, max. 150 °C, length as required, (>3 ... 20 m)

Code	Option 5: termination
F1	Unterminated
D1 ⁵⁾	Connector DB-15P
D2 ⁵⁾	15-pin D connector wit integrated TEDS ⁴⁾
M1 ⁵⁾	Connector MS 3106PEMV

Code	Option 6: Linearity deviation
2	0.2 %
1 ⁵⁾	0.1 %

Code	Option 7: Sensitivity
8	80 mV/V, full bridge, half bridge ²⁾
2	0.5 – 10 V ³⁾ WA electronics, PVC cable to the evaluation device, 3 m

Order no.:

K-WA- [] - [] [] [] - [] [] [] - [] [] [] - [] [] [] - [] [] [] - [] [] [] - [] [] [] m - [] [] [] m

Typical order no.

K-WA- [T] - [0] [5] [0] [W] - [3] [2] [K] - [K] [2] - [F] [1] - [2] - [2] - [0] [2] [0] m - [5] [0] m

Devices with [] are rapidly available from stock in standard version at no extra charge.

Customized
transducer
cable length

Customized cable length
between WA electronics
and evaluation device

Components supplied: displacement transducer, test report, probe pin extension 20mm, Operating Manual

¹⁾ Customized transducer cable length

³⁾ Customized cable length between WA electronics and evaluation device; 3...50 m

⁵⁾ Not with Option 7, Code 2 not with option 2, Code 010W

²⁾ For the WA2: ± 40 mV/V

⁴⁾ Only with option 4, Code K

⁶⁾ A reduced load cycle capability has to be expected

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

2. Fitting suggestion

3. Fitting suggestion

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

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

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)

Modifications reserved.

All details describe our products in general form only. They are not to be understood as express warranty and do not constitute any liability whatsoever.

Hottinger Baldwin Messtechnik GmbH

Im Tiefen See 45 · 64293 Darmstadt · Germany
 Tel. +49 6151 803-0 · Fax: +49 6151 803-9100
 Email: info@hbm.com · www.hbm.com

measure and predict with confidence

