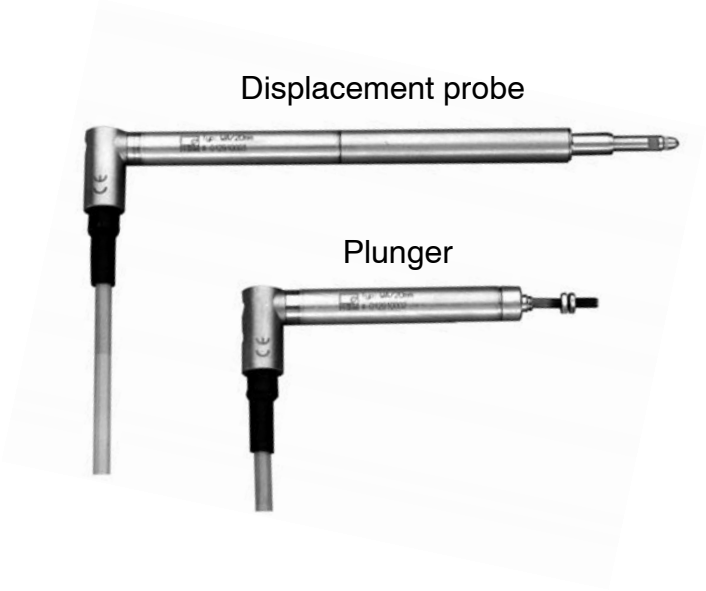
Data Sheet

WA

Inductive Standard Displacement Transducers

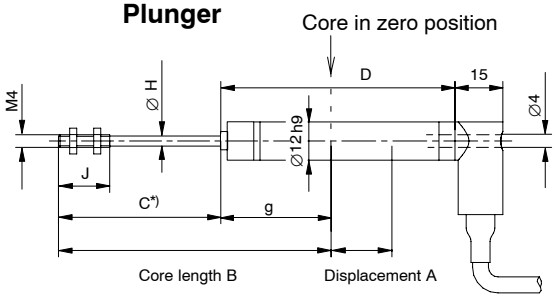


Special features

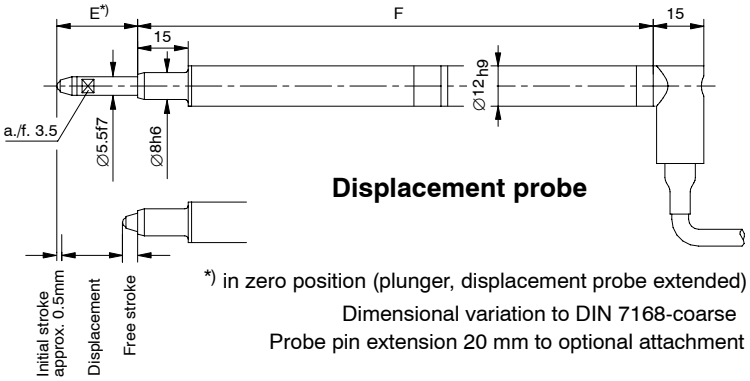
- **Displacement probe and transducer with detachable plunger**
- **Good thermal stability in the event of temperature gradients**
- **Space-saving, compact design**
- **Pressure-resistant transducer for measuring displacement in hydraulic cylinders**
- **Acceleration resistance ensures long service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

Dimensions (in mm; 1 mm= 0.0397 inches)

Plunger



Fitted PVC cable, ∅6, optional length and termination



*) in zero position (plunger, displacement probe extended)
Dimensional variation to DIN 7168-coarse
Probe pin extension 20 mm to optional attachment

	Plunger							Displacement probe		
Measuring range	**A**	**B**	**C**	**D**	**G**	**∅H**	**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 ± 10	3.7	16	100	104	372.6
0...200 mm	200	280	234	281.6	46 ± 10	3.7	16			
0...300 mm	300	380	334	381.6	46 ± 10	3.7	16			
0...500 mm	500	580	534	581.8	46 ± 10	3.7	16			

Specifications

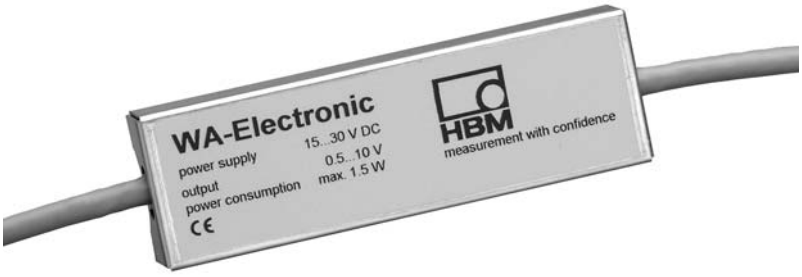
Type		WA2	WA10	WA20	WA50	WA100	WA200	WA300	WA500
Nominal displacement	mm	0...2	0...10	0...20	0...50	0...100	0...200	0...300	0...500
Nominal sensitivity									
Nominal output signal at nominal displacement with output unloaded	mV/V	80							
Characteristic tolerance									
Deviation of sensitivity 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]	-30...+80 [-22...+176]							
Variant for high temperature	°C [°F]	-40...+150 [-40...+302]							
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
Surface materials	-	rust-resistant							
Impact resistance, test severity level to DIN IEC 68, Part 2-27; IEC 68-2-27-1987									
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									
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.) apprx.	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

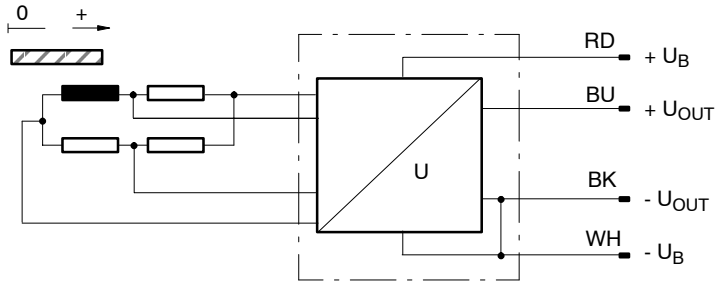
WA electronics



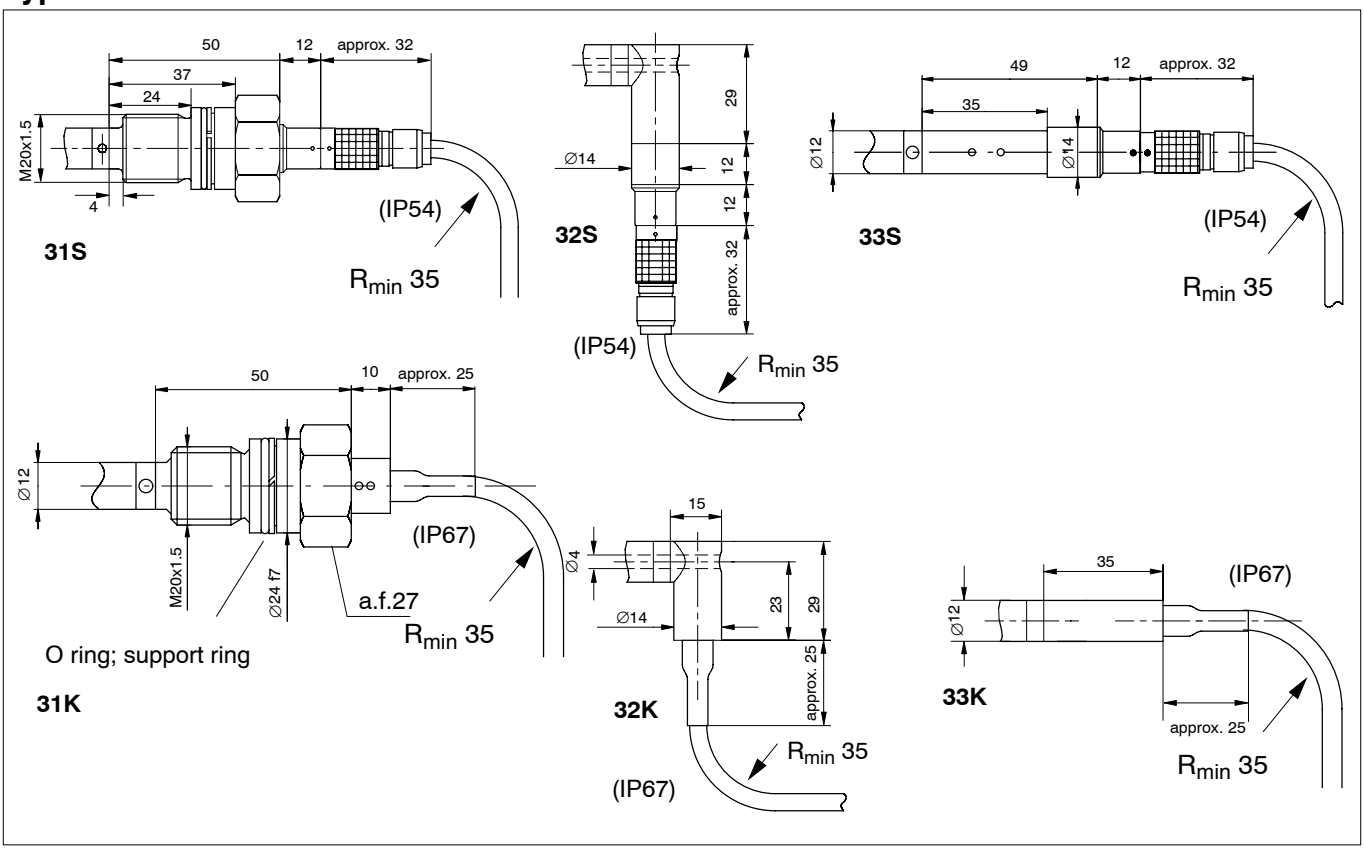
Dimensions WA electronics

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

WA electronics cable assignment

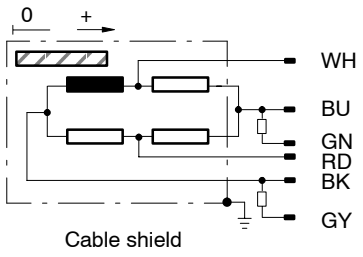


Types of connection

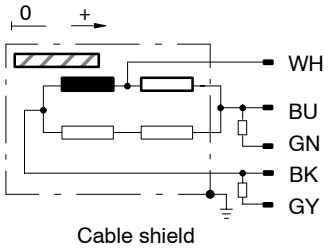


Principle of measurement, wiring assignment

WA10-WA500

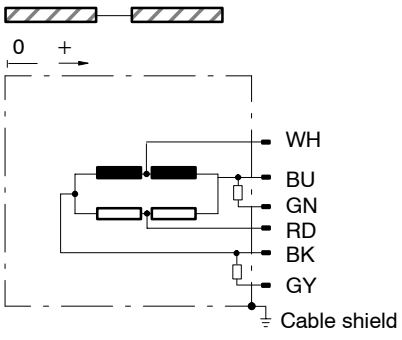


Full bridge Standard, 80 mV/V

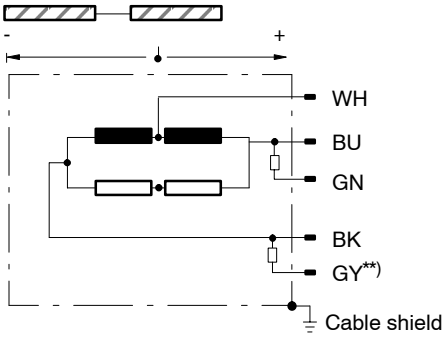


Half bridge Standard, 80 mV/V

WA2



Full bridge Standard, 80 mV/V



Half bridge Standard, ±40 mV/V

Wiring assignment:

WH (white)	=	measurement signal
BU (blue)	=	excitation voltage
GN (green)	=	sensor circuit
RD (red)	=	measurement signal
BK (black)	=	excitation voltage
GY (gray)	=	sensor circuit
cable shield	=	transducer housing

**) for the high temperature version: violet

Options for WA

Code	Option 1: version	Code	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

		Option 1	
Code	**Option 2: measuring range [mm]**	**T / U**	**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)**
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[6)]
M1[5)]	Connector MS 3106PEMV
LB[4)]	For HBM-MGC AP801 S6 (4-pin Lemo connector)

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]-[L][B] - [2] - [2] - [0][2][0] m - [5][0] m

Customized **transducer** cable length

Customized cable length **between WA electronics and evaluation device**

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

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

1) Customized transducer cable length
- with Option 7 / Code 2: 3...20 m

2) For the WA2: ±40 mV/V

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

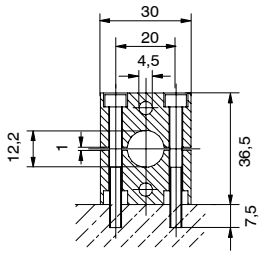
4) Only in connection with Option 7 Code 2; electronics

5) Not with Option 7, Code 2

6) Only with option 4, Code K

Mounting

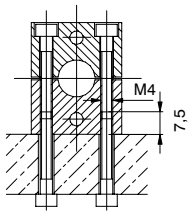
1. Fitting suggestion



WS/ZB12

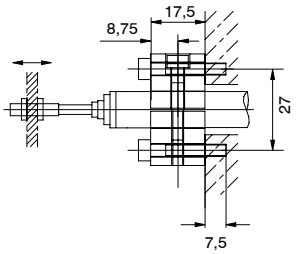
2 mounting blocks with countersink Km4 DIN 74
1 mounting block with thread M4

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 ºC...+80 ºC

Accessories:

Mounting set WS/ZB12

Replacement parts:

PVC cable such as cable type S1, 3 m, with Lemo connector (male)
(2-9268.0675 for 80mV/V / 2-9268.0580 for 10 mV/V)

PVC cable such as cable type S2, any length
(max. 300 m, 2-9268.0676 for 80 mV/V / max. 20 m, 2-9268.0588 for 10 mV/V)

PTFE cable such as cable type S3, 3 m; with Lemo connector (male)
(2-9268.0766 for 80 mV/V; 2-9268.0768 for 10 mV/V)

PTFE cable such as cable type S4, any length, max. 20 m
(2-9268.0767 for 80 mV/V; 2-9268.0769 for 10 mV/V)

Measurement insert with carbide ball (3-6061.0003)

Lemo connector, detachable (6-pin, 3-3312.0126 for 80 mV/V / 8-pin, 3-3312.0139 for 10 mV/V)

Lemo jack, detachable (6-pin, 3-3312.0235 for 80 mV/V / 8-pin, 3-3312.0140 for 10 mV/V)

Hottinger Baldwin Messtechnik GmbH

Im Tiefen See 45, D-64293 Darmstadt, Germany
Tel.: +49 6151 803-0 Fax: +49 6151 803 9100
Email: support@hbm.com Internet: www.hbm.com