

Cemented Wirewound Resistors with Lugs



FEATURES

- Complete welded construction
- Ceramic core
- Available in adjustable = "E" or non inductive design = "Ni"
- Lugs with various termination styles for soldering or bolt connection
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	VARIANT/ TERMINAL	POWER RATING $P_{40^{\circ}\text{C}}$ W	LIMITING VOLTAGE	RESISTANCE RANGE ⁽¹⁾ TCR -10 ppm/K to -80 ppm/K	RESISTANCE RANGE ⁽¹⁾ TCR 100 ppm/K to 180 ppm/K	TOLERANCE ± %
ZWS6	SL	6	$\sqrt{P \times R}$	0.82 to 5.1K	1.8 to 13K	10, 5
	E SL			2.7 to 5.1K	-	2
	Ni SL			0.82 to 130	1.8 to 4.7K	10, 5
				0.15 to 910	0.33 to 2.4K	10
				1 to 910	2 to 2.4K	5
ZWS8	SL, SS	8	$\sqrt{P \times R}$	0.68 to 7.5K	1.8 to 20K	10, 5
	E SL, E SS			3.3 to 7.5K	-	2
	Ni SL, Ni SS			0.62 to 200	1.8 to 6.8K	10, 5
				0.24 to 1.3K	0.56 to 3.6K	10
				1 to 1.3K	2 to 3.6K	5
ZWS12	SL, SS	12	$\sqrt{P \times R}$	0.62 to 10K	1.8 to 27K	10, 5
	E SL, E SS			3 to 10K	-	2
	Ni SL, Ni SS			0.56 to 270	1.8 to 9.1K	10, 5
				0.33 to 1.8K	0.75 to 5.1K	10
				1 to 1.8K	2 to 5.1K	5
ZWS15	SL, SS	15	$\sqrt{P \times R}$	0.68 to 12K	2.2 to 33K	10, 5
	E SL, E SS			2.2 to 12K	-	2
	Ni SL, Ni SS			0.68 to 330	2.2 to 11K	10, 5
				0.39 to 2.2K	0.82 to 6.2K	10
				1 to 2.2K	2.0 to 6.2K	5
ZWS20	SL, SS, SB, FST	20	$\sqrt{P \times R}$	0.62 to 16K	1.3 to 43K	10, 5
	E SL, E SS, E SB, E FST			2.7 to 16K	-	2
	Ni SL, Ni SS, Ni SB, Ni FST			0.62 to 430	1.3 to 15K	10, 5
				0.47 to 2.7K	1.1 to 8.2K	10
				1 to 2.7K	2 to 8.2K	5
ZWS35	SL, SS, SB, FST	35	$\sqrt{P \times R}$	1.1 to 30K	2.7 to 82K	10, 5
	E SL, E SS, E SB, E FST			1.3 to 30K	-	2
	Ni SL, Ni SS, Ni SB, Ni FST			1.1 to 750	2.7 to 27K	10, 5
				0.91 to 5.1K	2 to 15K	10, 5
ZWS50	SS, SSB, SB, FST	50	$\sqrt{P \times R}$	1.3 to 33K	3 to 91K	10, 5
	E SS, E SSB, E SB, E FST			2.2 to 33K	-	2
	Ni SS, Ni SSB, Ni SB, Ni FST			1.3 to 910	3 to 33K	10, 5
				1.1 to 6.2K	2.4 to 16K	10, 5



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ZWS100	SS, SSB, SB, FST	100	$\sqrt{P \times R}$	2.7 to 68K	6.2 to 200K	10, 5
	E SS, E SSB, E SB, E FST			2.7 to 1.8K	-	2
	Ni SS, Ni SSB, Ni SB, Ni FST			2.2 to 13K	4.7 to 33K	10, 5
ZWS150	SS, SSB, SB, FST	150	$\sqrt{P \times R}$	4.7 to 130K	11 to 360K	10, 5
	E SS, E SSB, E SB, E FST			4.7 to 3.3K	11 to 120K	2
	Ni SS, Ni SSB, Ni SB, Ni FST			3.9 to 22K	9.1 to 62K	10, 5
ZWS250	SS, SSB, SB, FST	250	$\sqrt{P \times R}$	8.2 to 220K	20 to 620K	10, 5
	E SS, E SSB, E SB, E FST			8.2 to 6.2K	-	2
	Ni SS, Ni SSB, Ni SB, Ni FST			6.8 to 39K	15 to 110K	10, 5
ZWS30/ 100	SS, SSB, SB, FST	75	$\sqrt{P \times R}$	2.4 to 62K	5.1 to 180K	10, 5
	E SS, E SSB, E SB, E FST			3 to 62K	-	2
	Ni SS, Ni SSB, Ni SB, Ni FST			2.4 to 1.6K	5.1 to 56K	10, 5
ZWS30/ 133	SS, SSB, SB, FST	110	$\sqrt{P \times R}$	3.3 to 91K	7.5 to 240K	10, 5
	E SS, E SSB, E SB, E FST			3.3 to 2.4K	-	2
	Ni SS, Ni SSB, Ni SB, Ni FST			2.7 to 16K	6.2 to 43K	10, 5

Notes

- For available "Mounting Accessories for Resistors", please see: www.vishay.com/doc?21015
- ⁽¹⁾ Resistance value to be selected for ± 10 % tolerance from E12 and for ± 5 % and ± 2 % from E24

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: ZWS006331001KLX000

Z	W	S	0	0	6	3	3	1	0	0	1	K	L	X	0	0	0
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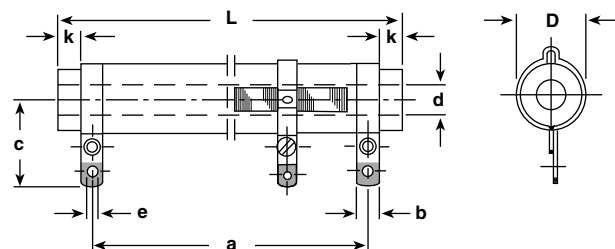
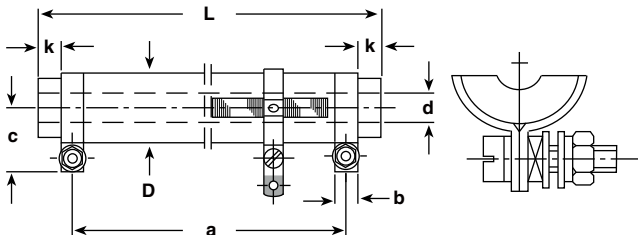
MODEL	VARIANT/ TERMINAL	TCR/MATERIAL	VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
ZWS006 = ZWS6 ZWS008 = ZWS8 ZWS012 = ZWS12 ZWS015 = ZWS15 ZWS020 = ZWS20 ZWS035 = ZWS35 ZWS050 = ZWS50 ZWS100 = ZWS100 ZWS150 = ZWS150 ZWS250 = ZWS250 ZWSN68 = ZWS6/30 ZWSN84 = ZWS30/100 ZWSN91 = ZWS30/133 ZWSN94 = ZWS30/145 ZWSN97 = ZWS30/235 ZWSN98 = ZWS50/165 ZWSOSM = ZWS10/30	3 = SL 4 = SS 5 = SB 6 = SSB 7 = FST 8 = E SL 9 = E SS A = E SB B = E SSB C = E FST I = GSCH Z = Value overflow (BV)	1 = -10 ... -80 ppm/K WM 50 Class 1 3 = 100 ... 180 ppm/K WM 110 Class 3 See also note (2)	3 digit value 1 digit multiplier MULTIPLIER 7 = 10^{-3} 8 = 10^{-2} 9 = 10^{-1} 0 = 10^0 1 = 10^1 2 = 10^2 3 = 10^3	G = ± 2.0 % J = ± 5.0 % K = ± 10.0 %	LX = Loose pack, without quantity	000 = Standard 3 digit code = Special or NI version ⁽²⁾

Product Description: ZWS6 SL 3 1K0 10 % LX

ZWS6	SL	3	1K0	10 %	LX
MODEL ⁽³⁾	VARIANT/ TERMINAL ⁽³⁾	TCR/MATERIAL ⁽³⁾	VALUE ⁽³⁾	TOLERANCE CODE ⁽³⁾	PACKAGING DESCRIPTION ⁽⁴⁾

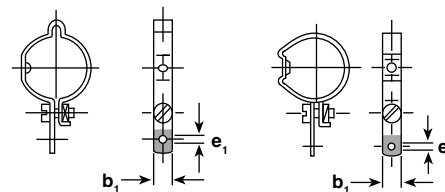
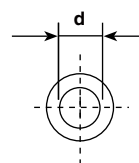
Notes

- ⁽²⁾ For special variants, special winding, or NI version, please contact: ww1resistors@vishay.com
- ⁽³⁾ See "Part Number" above
- ⁽⁴⁾ See "Packaging Code" above


DIMENSIONS
SL TERMINALS

SS TERMINALS

ADJUSTABLE LUGS

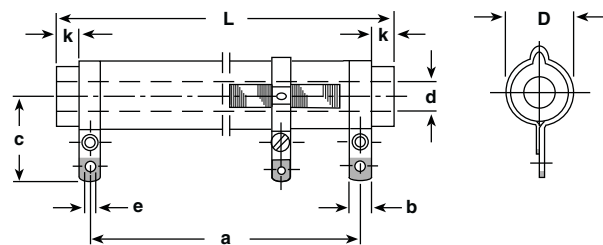
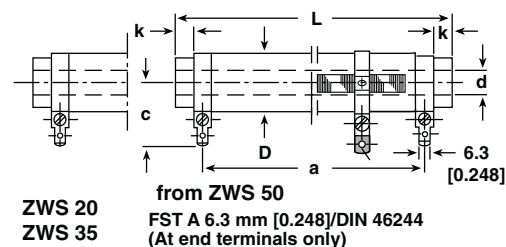
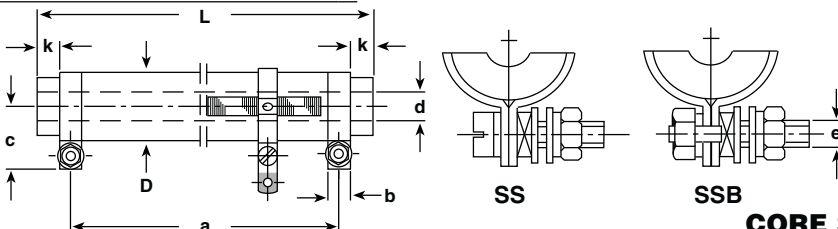
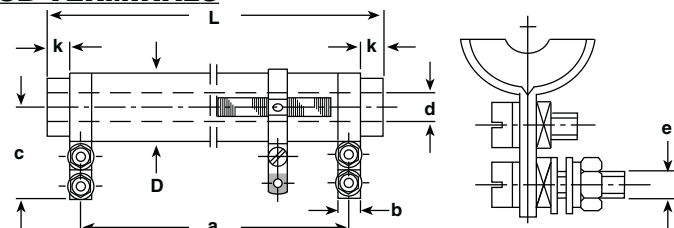
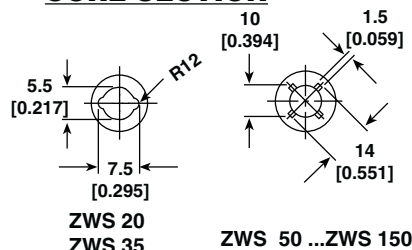
ZWS 6 E
ZWS 8 E

from ZWS 12 E

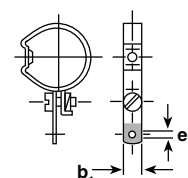

CORE SECTION


MODEL	DIMENSIONS in millimeters [inches]						
	ZWS 6 ZWS 6 E ZWS 6 Ni	ZWS 8 ZWS 8 E ZWS 8 Ni		ZWS 12 ZWS 12 E ZWS 12 Ni		ZWS 15 ZWS 15 E ZWS 15 Ni	
TERMINAL	SL	SL	SS	SL	SS	SL	SS
DIMENSION D	7.5 ± 0.5 [0.295 ± 0.020]	9.5 ± 0.5 [0.374 ± 0.020]		11.8 ± 0.8 [0.465 ± 0.031]		11.8 ± 0.8 [0.465 ± 0.031]	
L	45 ± 1.5 [1.772 ± 0.059]	50 ± 1.5 [1.969 ± 0.059]		55 ± 1.5 [2.165 ± 0.059]		62 ± 2 [2.441 ± 0.079]	
a	36 [1.417]	39 [1.535]	40 [1.575]	43 [1.693]	44 [1.732]	50 [1.969]	51 [2.008]
b	4 [0.157]	4 [0.157]	5 [0.197]	4 [0.157]	5 [0.197]	4 [0.157]	5 [0.197]
b ₁	4 [0.157]	4 [0.157]	4 [0.157]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]
c	15.5 [0.610]	18 [0.709]	10.5 [0.413]	19 [0.748]	11.5 [0.453]	19 [0.748]	11.5 [0.453]
d	2.6 [0.102]	3.5 [0.138]	3.5 [0.138]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]
e	1.5 [0.059]	2 [0.079]	M3 × 12	2 [0.079]	M3 × 12	2 [0.079]	M3 × 12
e ₁	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]
k	2.5 [0.098]	3.5 [0.138]	2.5 [0.098]	4 [0.157]	3 [0.118]	4 [0.157]	3 [0.118]
MASS (g)	5	6.5		11.5		12.5	

DIMENSIONS (continued)

SL TERMINALS

FST TERMINALS

SS AND SSB TERMINALS

SB TERMINALS

CORE SECTION

ADJUSTABLE LUGS

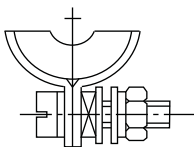
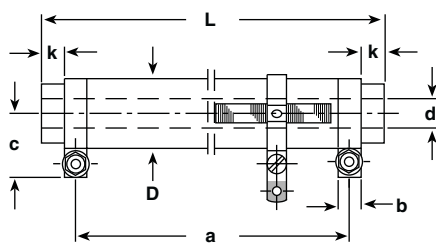
from ZWS 12 E



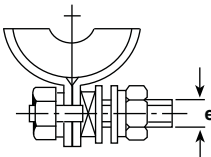
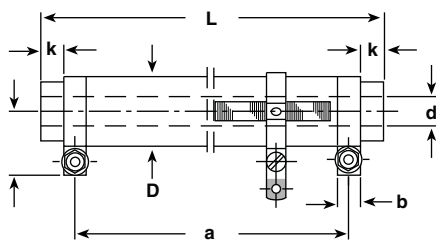
MODEL	DIMENSIONS in millimeters [inches]															
	ZWS 20 ZWS 20 E ZWS 20 Ni				ZWS 35 ZWS 35 E ZWS 35 Ni				ZWS 50 ZWS 50 E ZWS 50 Ni				ZWS 100 ZWS 100 E ZWS 100 Ni			
TERMINAL	SL	SS	SB	FST	SL	SS	SB	FST	SS	SSB	SB	FST	SS	SSB	SB	FST
DIMENSION D	14.8 ± 0.8 [0.583 ± 0.031]				14.8 ± 0.8 [0.583 ± 0.031]				22.3 ± 1.3 [0.878 ± 0.051]				22.3 ± 1.3 [0.878 ± 0.051]			
L	62 ± 2 [2.441 ± 0.079]				100 ± 2 [3.937 ± 0.079]				100 ± 2 [3.937 ± 0.079]				165 ± 2 [6.496 ± 0.079]			
a ± 2 [a ± 0.079]	50 [1.969]	51 [2.008]	51 [2.008]	48 [1.890]	86 [3.386]	87 [3.425]	87 [3.425]	84 [3.307]	71 [2.795]				136 [5.354]			
b	4 [0.157]	5 [0.197]	5 [0.197]	6.3 [0.248]	4 [0.157]	5 [0.197]	5 [0.197]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]
b ₁	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]
c	20.5 [0.807]	13 [0.512]	23 [0.906]	23.5 [0.925]	20.5 [0.807]	13 [0.512]	23 [0.906]	23.5 [0.925]	18.5 [0.728]	18.5 [0.728]	29.5 [1.161]	27 [1.063]	18.5 [0.728]	18.5 [0.728]	29.5 [1.161]	27 [1.063]
d	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]
e	2 [0.079]	M3 × 12	M3 × 12	-	2 [0.079]	M3 × 12	M3 × 12	-	M4 × 16	M4 × 18	M4 × 16	-	M4 × 16	M4 × 18	M4 × 16	-
e ₁	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]
k	4 [0.157]	3 [0.118]	3 [0.118]	3 [0.118]	5 [0.197]	4 [0.157]	4 [0.157]	4 [0.157]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]
MASS (g)	25				33				80				113			

DIMENSIONS (CONTINUED)

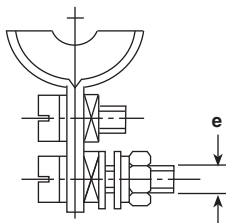
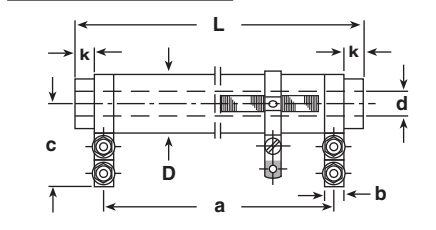
SS TERMINALS



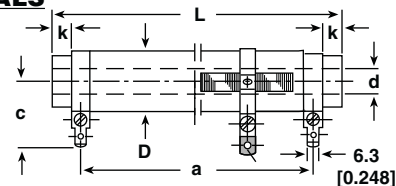
SSB TERMINALS



SB TERMINALS



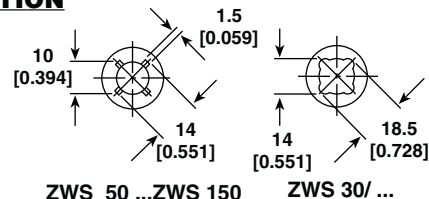
FST TERMINALS



from ZWS 50

FST A 6.3 mm [0.248]/DIN 46244
(At end terminals only)

CORE SECTION

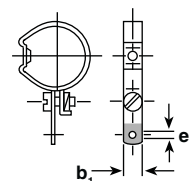


ZWS 50 ...ZWS 150

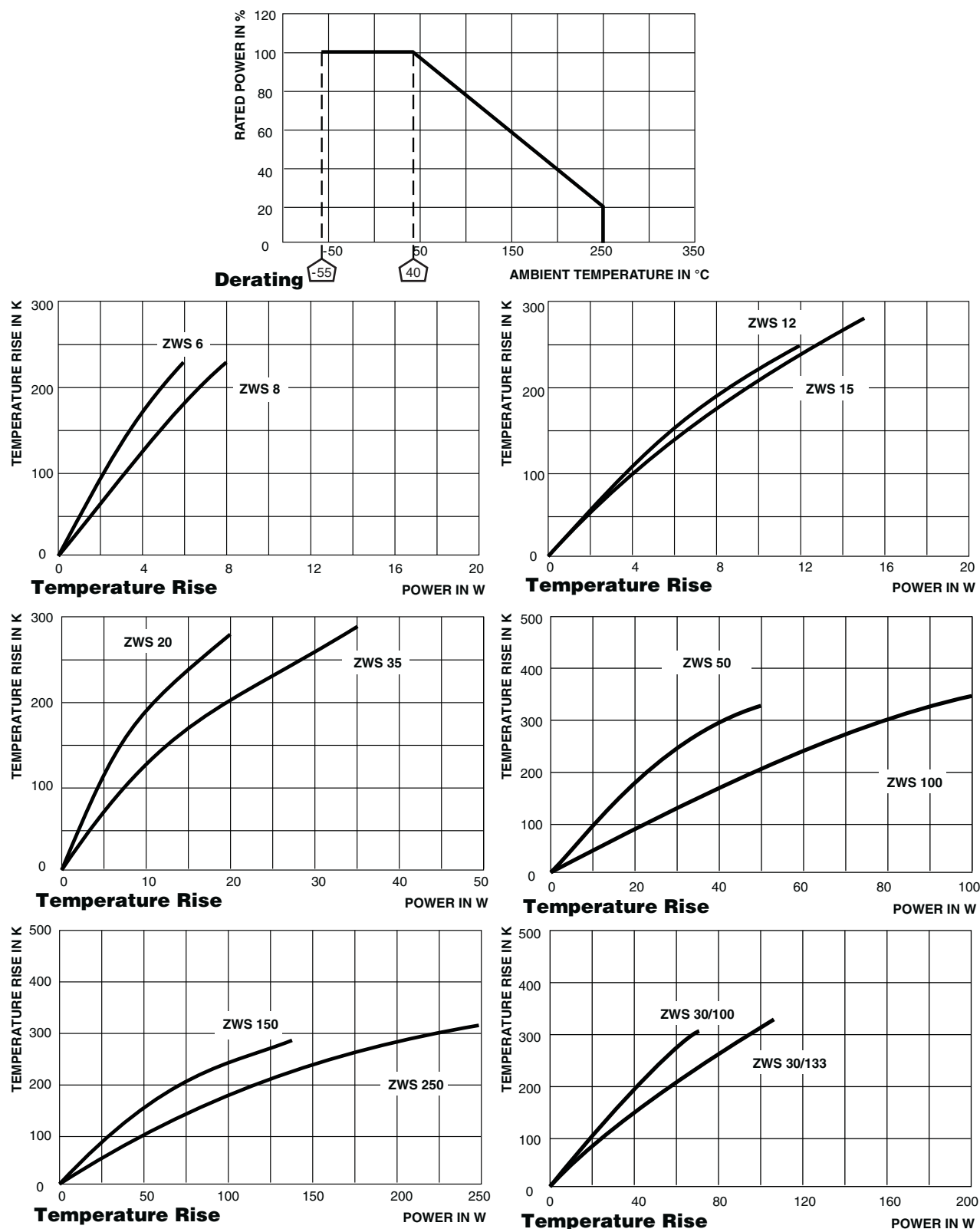
ZWS 30/ ...

ADJUSTABLE LUGS

from ZWS 12 E



MODEL	DIMENSIONS in millimeters [inches]															
	ZWS 150 ZWS 150 E ZWS 150 Ni				ZWS 250 ZWS 250 E ZWS 250 Ni				ZWS 30/100 ZWS 30/100 E ZWS 30/100 Ni				ZWS 30/133 ZWS 30/133 E ZWS 30/133 Ni			
TERMINAL	SS	SSB	SB	FST	SS	SSB	SB	FST	SS	SSB	SB	FST	SS	SSB	SB	FST
DIMENSION D	22.3 ± 1.3 [0.878 ± 0.051]				32.3 ± 1.5 [1.28 ± 0.059]				32.3 ± 1.5 [1.28 ± 0.059]				32.3 ± 1.5 [1.28 ± 0.059]			
L	265 ± 4 [10.433 ± 0.079]				330 ± 5 [12.992 ± 0.197]				100 ± 2.5 [3.937 ± 0.098]				133 ± 3 [5.236 ± 0.118]			
a	236 [9.291]				280 [11.024]				85 [3.346]				118 [4.646]			
b	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]
b ₁	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]
c	18.5 [0.728]	18.6 [0.732]	29.5 [1.161]	27 [1.063]	23.5 [0.925]	23.5 [0.925]	35 [1.378]	31.5 [1.24]	23.5 [0.925]	23.5 [0.925]	35 [1.378]	31.5 [1.24]	23.5 [0.925]	23.5 [0.925]	35 [1.378]	31.5 [1.24]
d	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	20 [0.787]	20 [0.787]	20 [0.787]	20 [0.787]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]
e	M4 × 16	M4 × 18	M4 × 16	-	M4 × 16	M4 × 18	M4 × 16	-	M4 × 16	M4 × 18	M4 × 16	-	M4 × 16	M4 × 18	M4 × 16	-
e ₁	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]
k	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]
MASS (g)	194				375				167				212			





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