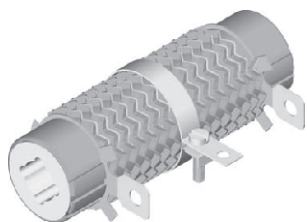


# Cemented Wirewound Resistors with Corrugated Ribbon



## FEATURES

- All welded construction
- Power rating up to 500 W
- Corrugated ribbon construction aids rapid cooling
- Available in adjustable design = "E"
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

| STANDARD ELECTRICAL SPECIFICATIONS |                                                  |                                                                                        |                                                                                      |                                                                                         |                      |
|------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------|
| MODEL                              | POWER<br>RATING<br>$P_{40^{\circ}\text{C}}$<br>W | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$<br>TCR + 650 ppm/K to + 750 ppm/K<br>WM 10 | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$<br>TCR - 10 ppm/K to - 80 ppm/K<br>WM 50 | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$<br>TCR + 100 ppm/K to + 180 ppm/K<br>WM 110 | TOLERANCE<br>$\pm$ % |
| ZBS 20/100<br>ZBS 20/100 E         | 50                                               | 0.13 to 0.51                                                                           | 0.56 to 2.2                                                                          | 1.3 to 6.2                                                                              | 10, 5                |
| ZBS 20/165<br>ZBS 20/165 E         | 100                                              | 0.27 to 1                                                                              | 1.1 to 4.7                                                                           | 2.4 to 12                                                                               | 10, 5                |
| ZBS 20/265<br>ZBS 20/265 E         | 150                                              | 0.47 to 1.8                                                                            | 2 to 7.5                                                                             | 4.3 to 22                                                                               | 10, 5                |
| ZBS 30/100<br>ZBS 30/100 E         | 75                                               | 0.1 to 0.43                                                                            | 0.47 to 3.3                                                                          | 1 to 8.2                                                                                | 10, 5                |
| ZBS 30/133<br>ZBS 30/133 E         | 110                                              | 0.15 to 0.62                                                                           | 0.68 to 5.1                                                                          | 1.5 to 12                                                                               | 10, 5                |
| ZBS 30/165<br>ZBS 30/165 E         | 150                                              | 0.2 to 0.91                                                                            | 1.0 to 6.8                                                                           | 2 to 16                                                                                 | 10, 5                |
| ZBS 30/215<br>ZBS 30/215 E         | 200                                              | 0.27 to 1.1                                                                            | 1.2 to 9.1                                                                           | 2.7 to 24                                                                               | 10, 5                |
| ZBS 30/265<br>ZBS 30/265 E         | 250                                              | 0.3 to 1.3                                                                             | 1.5 to 11                                                                            | 3.9 to 27                                                                               | 10, 5                |
| ZBS 30/330<br>ZBS 30/330 E         | 300                                              | 0.39 to 1.8                                                                            | 2 to 15                                                                              | 5.1 to 36                                                                               | 10, 5                |
| ZBS 45/370<br>ZBS 45/370 E         | 375                                              | 0.75 to 3                                                                              | 3.3 to 24                                                                            | 8.2 to 56                                                                               | 10, 5                |
| ZBS 60/370<br>ZBS 60/370 E         | 500                                              | 0.91 to 3.9                                                                            | 4.3 to 33                                                                            | 10 to 75                                                                                | 10, 5                |

## Notes

- For available "Mounting Accessories for Resistors", please see: [www.vishay.com/doc?221015](http://www.vishay.com/doc?221015)
- <sup>(1)</sup> Resistance value to be selected for  $\pm 10$  % tolerance from E12 and for  $\pm 5$  % from E24

## PART NUMBER AND PRODUCT DESCRIPTION

Part Number: ZBS202S01100KLX000

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z | B | S | 2 | 0 | 2 | S | 0 | 1 | 1 | 0 | 0 | K | L | X | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MODEL                                                                                                                                                                                                                                                                                                                                                                            | VARIANT/<br>TERMINAL                                                    | TCR/MATERIAL                                                                                                                                                                                                       | VALUE                                                                                                                                                      | TOLERANCE<br>CODE                         | PACKAGING<br>CODE                                 | SPECIAL                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------|
| <b>ZBS202S</b> = ZBS 20/100<br><b>ZBS204L</b> = ZBS 20/165<br><b>ZBS207D</b> = ZBS 20/265<br><b>ZBS302S</b> = ZBS 30/100<br><b>ZBS303P</b> = ZBS 30/133<br><b>ZBS304L</b> = ZBS 30/165<br><b>ZBS305Z</b> = ZBS 30/215<br><b>ZBS307D</b> = ZBS 30/265<br><b>ZBS308D</b> = ZBS 30/303<br><b>ZBS3096</b> = ZBS 30/330<br><b>ZBS45AA</b> = ZBS 45/370<br><b>ZBS60AA</b> = ZBS 60/370 | <b>0</b> = Neutral<br><b>1</b> = E<br><b>Z</b> = Value<br>overflow (BV) | <b>1</b> = - 10ppm/K to<br>- 80 ppm/K<br>WM 50<br>Class 1<br><b>3</b> = 100 ppm/K to<br>180 ppm/K<br>WM 110<br>Class 3<br><b>4</b> = 650 ppm/K to<br>750 ppm/K<br>WM 10<br>Class 1<br><br><b>See also note (1)</b> | <b>2 digit value</b><br><b>1 digit</b><br><b>multiplier</b><br><b>MULTIPLIER</b><br>8 = *10 <sup>-2</sup><br>9 = *10 <sup>-1</sup><br>0 = *10 <sup>0</sup> | <b>J</b> = ± 5.0 %<br><b>K</b> = ± 10.0 % | <b>LX</b> =<br>Loose pack,<br>without<br>quantity | <b>000</b> = Standard<br><b>3 digit code</b> =<br>Special <sup>(1)</sup> |

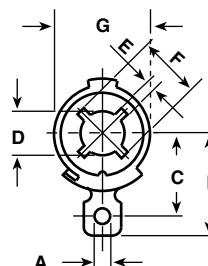
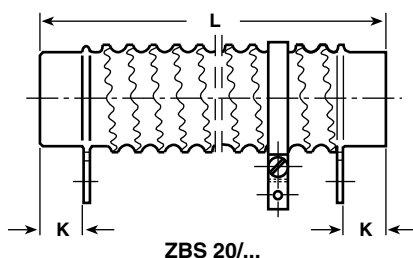
Product Description: ZBS 20/100 50 10R 10 % LX

|                      |                             |                      |                                  |                                         |
|----------------------|-----------------------------|----------------------|----------------------------------|-----------------------------------------|
| ZBS 20/100           | 50                          | 10R                  | 10 %                             | LX                                      |
| MODEL <sup>(2)</sup> | TCR/MATERIAL <sup>(2)</sup> | VALUE <sup>(2)</sup> | TOLERANCE<br>CODE <sup>(2)</sup> | PACKAGING<br>DESCRIPTION <sup>(3)</sup> |

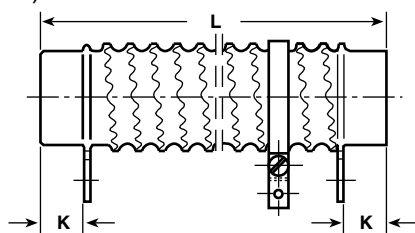
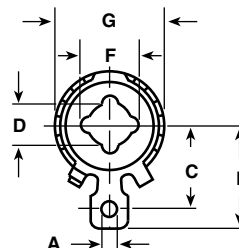
### Notes

- (1) For special variants or special winding, please contact: [ww1resistors@vishay.com](mailto:ww1resistors@vishay.com)  
(2) See "Part Number" above  
(3) See "Packaging Code" above

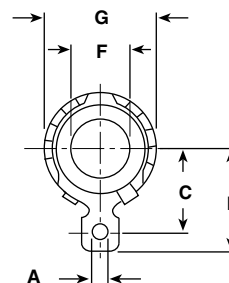
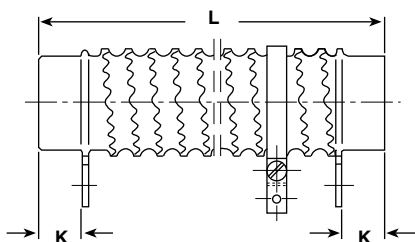
### DIMENSIONS



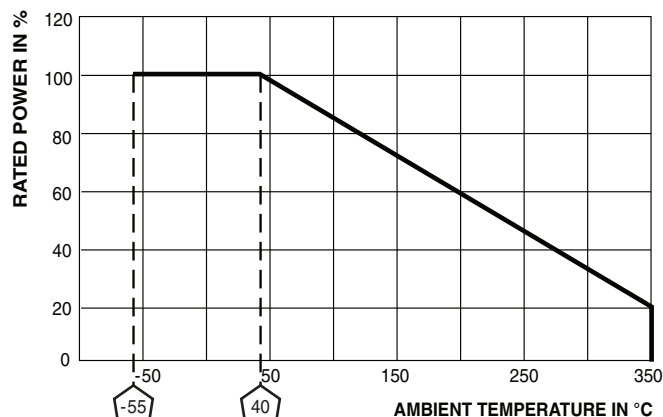
| MODEL                                    | DIMENSIONS in millimeters [inches] |               |                |                 |               |               |                |               |               |          |
|------------------------------------------|------------------------------------|---------------|----------------|-----------------|---------------|---------------|----------------|---------------|---------------|----------|
|                                          | L                                  | K             | A              | B               | C             | D             | E              | F             | G             | MASS (g) |
| <b>ZBS 20/100</b><br><b>ZBS 20/100 E</b> | 100 ± 2.5<br>[3.937 ± 0.098]       | 15<br>[0.591] | 4.2<br>[0.165] | 26.5<br>[1.043] | 22<br>[0.866] | 10<br>[0.394] | 1.5<br>[0.059] | 14<br>[0.551] | 24<br>[0.945] | 100      |
| <b>ZBS 20/165</b><br><b>ZBS 20/165 E</b> | 165 ± 4<br>[6.496 ± 0.157]         | 15<br>[0.591] | 4.2<br>[0.165] | 26.5<br>[1.043] | 22<br>[0.866] | 10<br>[0.394] | 1.5<br>[0.059] | 14<br>[0.551] | 24<br>[0.945] | 150      |
| <b>ZBS 20/265</b><br><b>ZBS 20/265 E</b> | 265 ± 6.6<br>[10.433 ± 0.260]      | 15<br>[0.591] | 4.2<br>[0.165] | 26.5<br>[1.043] | 22<br>[0.866] | 10<br>[0.394] | 1.5<br>[0.059] | 14<br>[0.551] | 24<br>[0.945] | 250      |

**DIMENSIONS** (continued)

**ZBS 30/...**


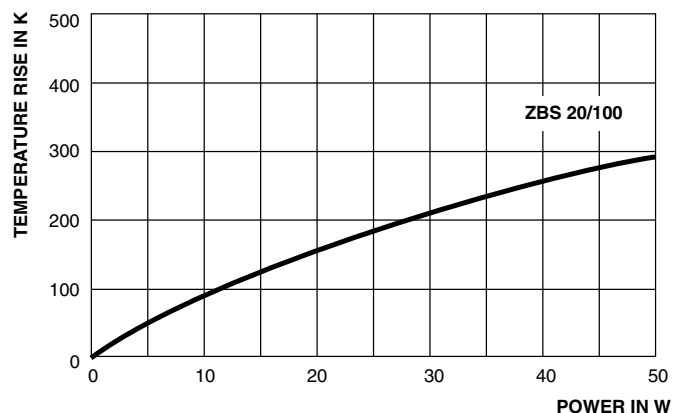
| MODEL                                    | DIMENSIONS in millimeters [inches] |               |                |               |               |               |                 |                           | MASS (g) |
|------------------------------------------|------------------------------------|---------------|----------------|---------------|---------------|---------------|-----------------|---------------------------|----------|
|                                          | L                                  | K             | A              | B             | C             | D             | F               | G                         |          |
| <b>ZBS 30/100</b><br><b>ZBS 30/100 E</b> | 100 ± 2.5<br>[3.937 ± 0.098]       | 15<br>[0.591] | 5.2<br>[0.205] | 34<br>[1.339] | 28<br>[1.102] | 14<br>[0.551] | 18.5<br>[0.728] | 37 ± 1<br>[1.457 ± 0.039] | 200      |
| <b>ZBS 30/133</b><br><b>ZBS 30/133 E</b> | 133 ± 3.3<br>[5.236 ± 0.130]       | 15<br>[0.591] | 5.2<br>[0.205] | 34<br>[1.339] | 28<br>[1.102] | 14<br>[0.551] | 18.5<br>[0.728] | 37 ± 1<br>[1.457 ± 0.039] | 250      |
| <b>ZBS 30/165</b><br><b>ZBS 30/165 E</b> | 165 ± 4<br>[6.496 ± 0.157]         | 15<br>[0.591] | 5.2<br>[0.205] | 34<br>[1.339] | 28<br>[1.102] | 14<br>[0.551] | 18.5<br>[0.728] | 37 ± 1<br>[1.457 ± 0.039] | 300      |
| <b>ZBS 30/215</b><br><b>ZBS 30/215 E</b> | 215 ± 5.4<br>[8.465 ± 0.213]       | 15<br>[0.591] | 5.2<br>[0.205] | 34<br>[1.339] | 28<br>[1.102] | 14<br>[0.551] | 18.5<br>[0.728] | 37 ± 1<br>[1.457 ± 0.039] | 400      |
| <b>ZBS 30/265</b><br><b>ZBS 30/265 E</b> | 265 ± 6.6<br>[10.433 ± 0.260]      | 15<br>[0.591] | 5.2<br>[0.205] | 34<br>[1.339] | 28<br>[1.102] | 14<br>[0.551] | 18.5<br>[0.728] | 37 ± 1<br>[1.457 ± 0.039] | 500      |
| <b>ZBS 30/330</b><br><b>ZBS 30/330 E</b> | 330 ± 8<br>[12.992 ± 0.315]        | 15<br>[0.591] | 5.2<br>[0.205] | 34<br>[1.339] | 28<br>[1.102] | 14<br>[0.551] | 18.5<br>[0.728] | 37 ± 1<br>[1.457 ± 0.039] | 600      |


**ZBS 45/370, ZBS 60/370**

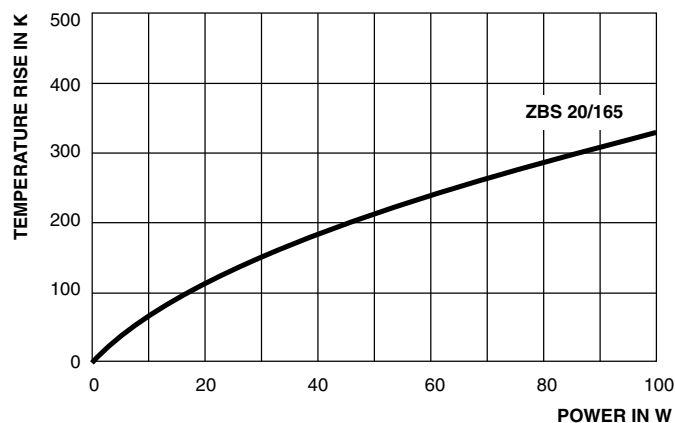
| MODEL                      | DIMENSIONS in millimeters [inches] |               |                |                 |                 |               |                           |          |
|----------------------------|------------------------------------|---------------|----------------|-----------------|-----------------|---------------|---------------------------|----------|
|                            | L                                  | K             | A              | B               | C               | F             | G                         | MASS (g) |
| ZBS 45/370<br>ZBS 45/370 E | 370 ± 9<br>[14.567 ± 0.354]        | 15<br>[0.591] | 5.2<br>[0.205] | 42.5<br>[1.673] | 37<br>[1.457]   | 30<br>[1.181] | 52 ± 1<br>[2.047 ± 0.039] | 1000     |
| ZBS 60/370<br>ZBS 60/370 E | 370 ± 9<br>[14.567 ± 0.354]        | 15<br>[0.591] | 5.2<br>[0.205] | 51.5<br>[2.028] | 45.5<br>[1.791] | 45<br>[1.772] | 67 ± 1<br>[2.638 ± 0.039] | 1200     |



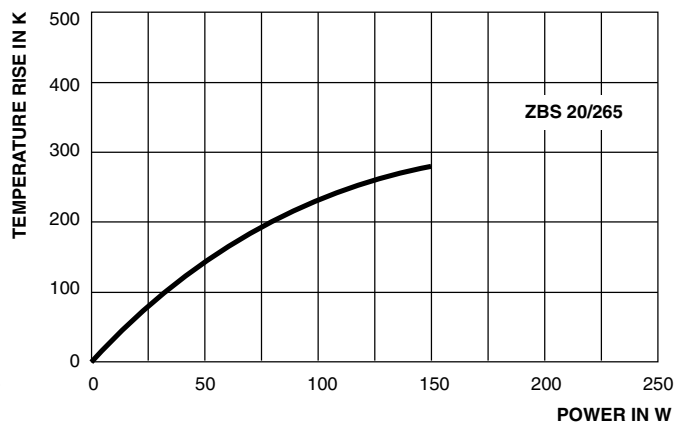
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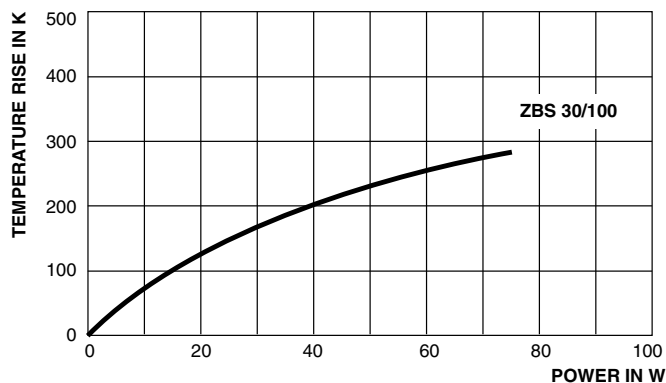
Temperature Rise



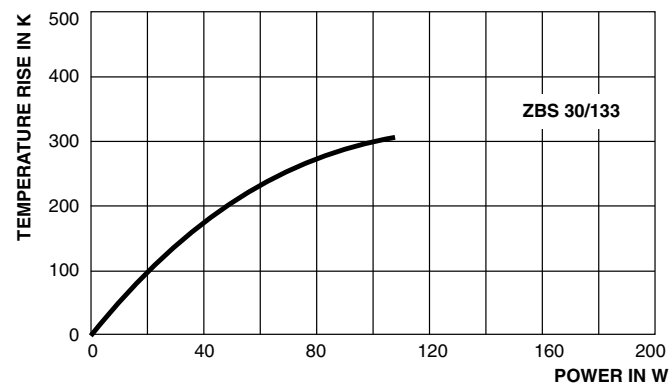
Temperature Rise



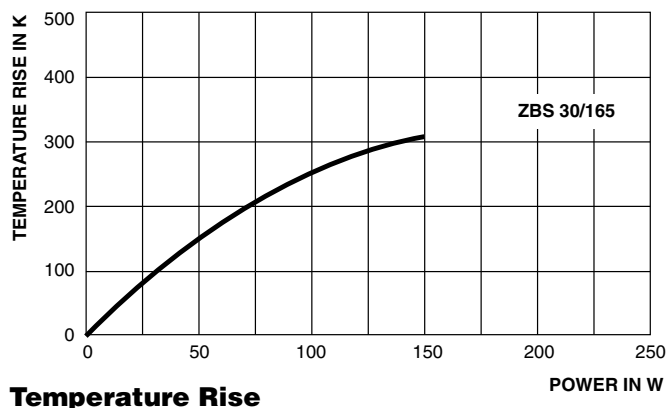
Temperature Rise



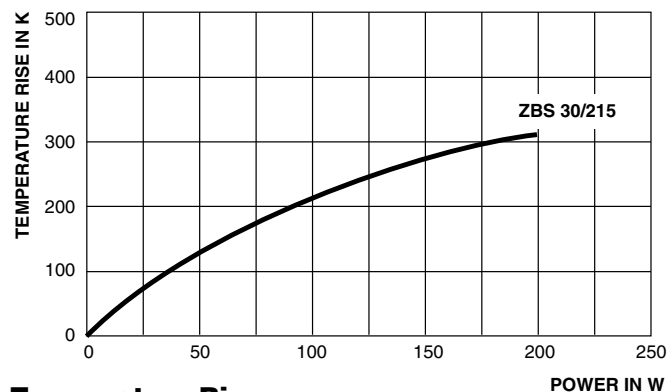
Temperature Rise



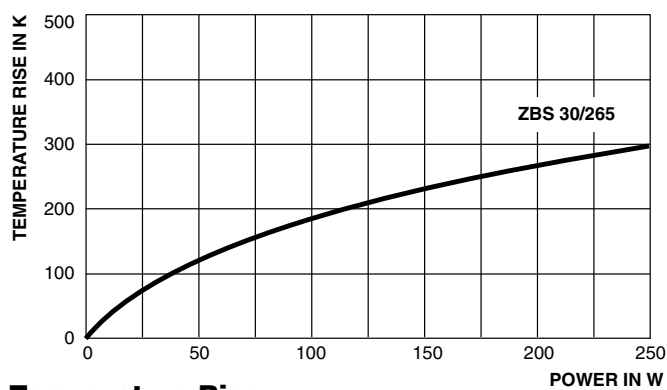
Temperature Rise



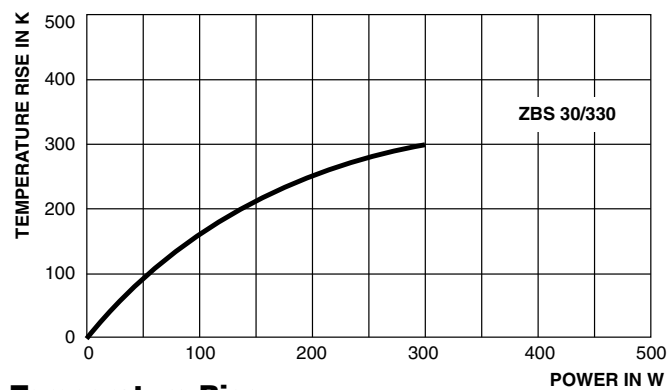
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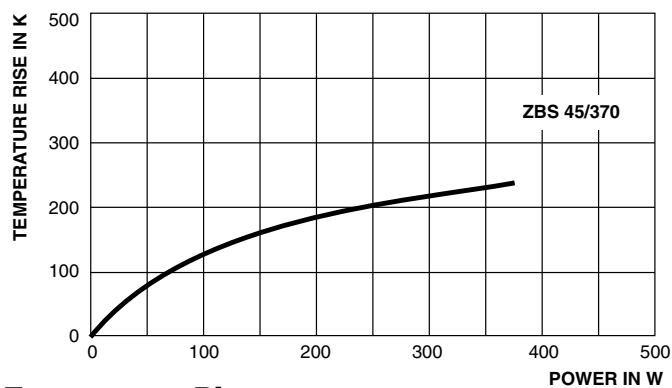
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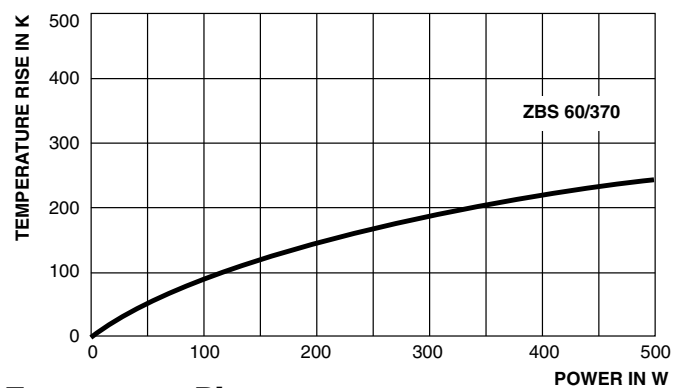
Temperature Rise



Temperature Rise



Temperature Rise



Temperature Rise



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