

# Wirewound Resistors, Industrial High Power, Vitreous Tubular



**"CS" Type 1 Collars**

## FEATURES

- 95 W to 800 W at 25 °C
- NF C 93-214
- RB 25 x 168, RB 30 x 250
- Rugged construction for use in severe environmental conditions
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

The RWST vitreous wirewound high power resistors are known for their excellent reliability which has developed out of the Vishay Sfernice experience over several decades in the field of high current applications.

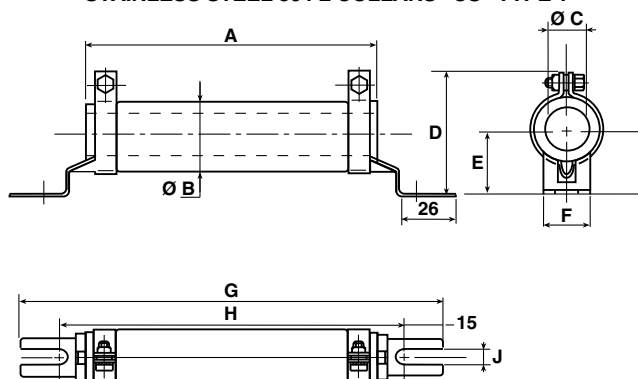
Extremely severe conditions of use are encountered in electrical traction including repeated overloads. To withstand such conditions the new RWST model is extremely rugged and is manufactured to a very carefully monitored process using the best materials.

NF F 16101, 10/1988 and 16102, 04/1992: Not applicable (our parts are made of metallic and refractory materials).

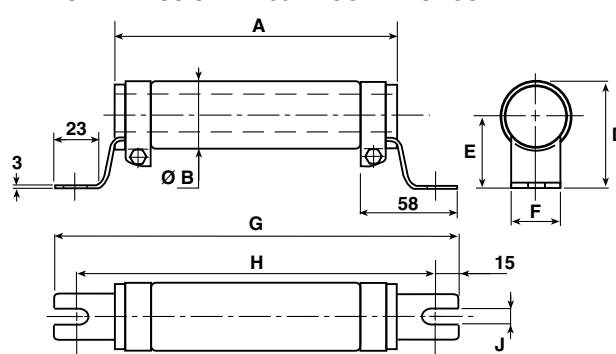
NF C 93-214. Performances according to NF C 93-214.

## DIMENSIONS in millimeters

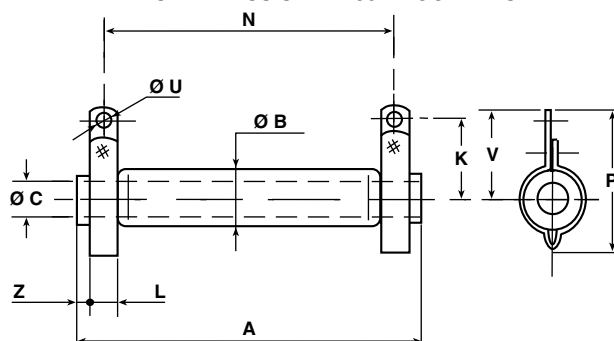
### STAINLESS STEEL 304 L COLLARS "CS" TYPE 1



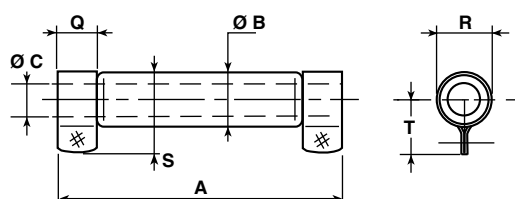
### STAINLESS STEEL 304 L COLLARS "CS" TYPE 2



### WELDED STAINLESS STEEL 304 L COLLARS "AN"



### WELDED STAINLESS STEEL 304 L BAND "B"



**DIMENSIONS** in millimeters

| SERIES           | CONNECTIONS    | A ± 2   | Ø B<br>MAX. | Ø C<br>MIN.     | D                   | E         | F<br>± 0.5 | G<br>- 4<br>+ 0 | H<br>- 4<br>+ 0 | J<br>± 0.5 | K                                           | L<br>+ 0.5<br>+ 0 |
|------------------|----------------|---------|-------------|-----------------|---------------------|-----------|------------|-----------------|-----------------|------------|---------------------------------------------|-------------------|
| RWST<br>25 x 138 | AN-B CS type 1 | 138     | 28          | 12              | 50 ± 1.5            | 27 ± 1    | 24         | 199             | 169             | 6.5        | 28.5 ± 1                                    | 9                 |
| RWST<br>25 x 168 | AN-B CS type 1 | 168     | 28          | 12              | 50 ± 1.5            | 27 ± 1    | 24         | 229             | 199             | 6.5        | 28.5 ± 1                                    | 9                 |
| RWST<br>30 x 250 | AN-B CS type 1 | 250     | 33          | 17              | 60 ± 1.5            | 30 ± 1    | 25         | 317             | 287             | 9          | 31 ± 1                                      | 13                |
| RWST<br>40 x 370 | AN CS type 2   | 370     | 45          | 22              | 69 max.             | 45 ± 1.5  | 30         | 432             | 405             | 9          | 45 ± 1.5                                    | 18                |
| RWST<br>50 x 373 | AN CS type 2   | 373     | 53          | 27.1            | 80 max.             | 51 ± 1.5  | 30         | 432             | 405             | 9          | 51 ± 1.5                                    | 18                |
| SERIES           | CONNECTIONS    | N ± 2   | P           | Q<br>- 0<br>+ 5 | R<br>- 0.3<br>+ 0.9 | S<br>MAX. | T ± 1      | Ø U             | V               | Z          | AVERAGE UNIT<br>WEIGHT IN g<br>(CS collars) |                   |
| RWST<br>25 x 138 | AN-B CS type 1 | 117 ± 2 | 51.5 ± 1.5  | 15              | 26                  | 38.5      | 23.5       | 5.7             | 33.5 ± 1        | 6          | 225                                         |                   |
| RWST<br>25 x 168 | AN-B CS type 1 | 147 ± 2 | 50 ± 1.5    | 15              | 26                  | 38.5      | 23.5       | 5.7             | 33.5 ± 1        | 6          | 250                                         |                   |
| RWST<br>30 x 250 | AN-B CS type 1 | 227 ± 2 | 55 ± 1.5    | 18              | 31                  | 43.5      | 26         | 5.7             | 36 ± 1          | 5          | 445                                         |                   |
| RWST<br>40 x 370 | AN CS type 2   | 332 ± 3 | 81.5 max.   | -               | -                   | -         | -          | 9.2             | 57 ± 1.5        | 10         | 1400                                        |                   |
| RWST<br>50 x 373 | AN CS type 2   | 332 ± 3 | 92.5 max.   | -               | -                   | -         | -          | 9.2             | 63 ± 1.5        | 11.5       | 2200                                        |                   |

**STANDARD ELECTRICAL SPECIFICATIONS**

| MODEL         | SIZE  | RESISTANCE<br>RANGE<br>Ω | RATED POWER<br>P <sub>25 °C</sub><br>W | TOLERANCE<br>± % |
|---------------|-------|--------------------------|----------------------------------------|------------------|
| RWST 25 x 138 | 25138 | 2.7 to 82K               | 95                                     | 5                |
| RWST 25 x 168 | 25168 | 2.7 to 100K              | 160                                    | 5                |
| RWST 30 x 250 | 30250 | 4.7 to 220K              | 280                                    | 5                |
| RWST 40 x 370 | 40370 | 8.2 to 360K              | 500                                    | 5                |
| RWST 50 x 373 | 50373 | 12 to 390K               | 700                                    | 5                |

**MECHANICAL SPECIFICATIONS**

|                       |                       |
|-----------------------|-----------------------|
| Mechanical Protection | Vitreous enamel       |
| Resistive Element     | Ni-Cr wire            |
| Connections           | CS supporting collars |
| AN Collar or B        | on request            |
| Average Unit Weight   | 225 g to 2200 g       |

**ENVIRONMENTAL SPECIFICATIONS**

|                   |                            |
|-------------------|----------------------------|
| Temperature Range | -55 °C +450 °C             |
| Climatic Category | -55 °C / +200 °C / 56 days |

**TECHNICAL SPECIFICATIONS**

|                                  |                                                       |
|----------------------------------|-------------------------------------------------------|
| Resistance Range                 | 2.7 Ω to 430 kΩ<br>(E12, E24 preferred series values) |
| Resistance Tolerance<br>Standard | ± 5 %                                                 |
| Power Rating                     | 95 W to 800 W at 25 °C                                |
| Temperature Coefficient          | 75 ppm/°C (typical)                                   |
| Shelf Life                       | 0.1 % year (typical)                                  |

**PERFORMANCE**

| TESTS                      | CONDITIONS                                                                            | REQUIREMENTS                                  | TYPICAL VALUES AND DRIFTS |     |
|----------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------|-----|
| Short Time Overload        | 10 P <sub>r</sub> during 5 s<br>Voltage limited at < 5000 V                           | 2 % or 0.05 Ω                                 | 0.5 %                     |     |
| Climatic Sequence          | -55 °C, +200 °C                                                                       | 2 % or 0.05 Ω<br>Insulation resistance 100 MΩ | 0.5 %                     |     |
| Humidity<br>(Steady State) | 56 days<br>95 % relative humidity                                                     | 3 % or 0.05 Ω<br>Insulation resistance 100 MΩ | 0.5 %                     |     |
| Thermal Shock              | Load at 100 % P <sub>r</sub> followed by cold<br>temperature exposure at -55 °C / 15' | 2 % or 0.05 Ω                                 | 0.5 %                     |     |
| Shock                      | Severity 50 A<br>9 shocks/each side                                                   | 1 % or 0.05 Ω                                 | 0.25 %                    |     |
| Vibration                  | Severity 55B                                                                          | 1 % or 0.05 Ω                                 | 0.25 %                    |     |
| Terminal Strength          | AN<br>B<br>Traction 40 Ncm<br>Torque 60 Ncm                                           | 1 % or 0.05 Ω                                 | 0.5 %                     |     |
| Load Life                  | 90' / 30' cycle<br>1000 h at P <sub>r</sub> 25 °C                                     | 5 %                                           | 1000 h                    | 1 % |
|                            |                                                                                       |                                               | 5000 h                    | 2 % |

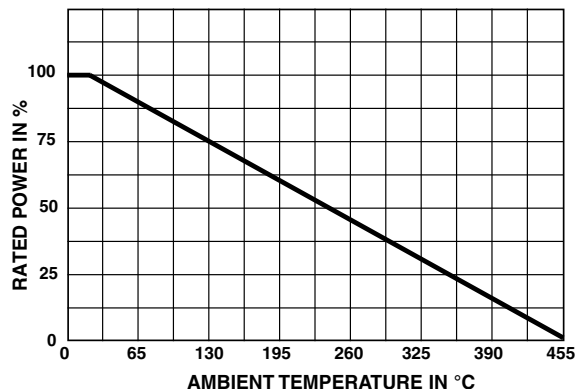
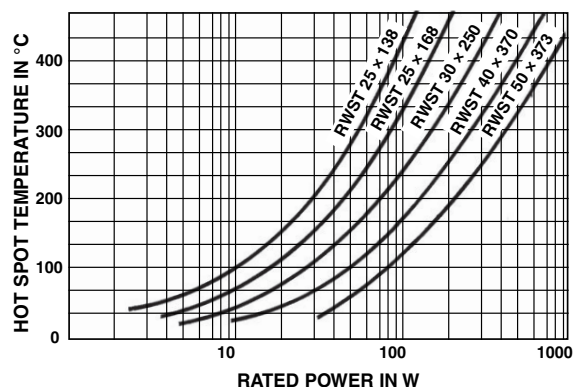
**SPECIAL FEATURES**

| RWST STYLE                    | 25 x 138       | 25 x 168        | 30 x 250        | 40 x 370        | 50 x 373       |
|-------------------------------|----------------|-----------------|-----------------|-----------------|----------------|
| Designation NF C 93-214       | -              | RB 25 x 168     | RB 30 x 250     | -               | -              |
| Maximum Power Rating at 25 °C | 110 W          | 180 W           | 320 W           | 600 W           | 800 W          |
| Ohmic Range (E12, E24 series) | 2.7 Ω to 82 kΩ | 2.7 Ω to 100 kΩ | 4.7 Ω to 220 kΩ | 8.2 Ω to 360 kΩ | 12 Ω to 430 kΩ |
| Limiting Element Voltage      | 1400 V         | 1900 V          | 3000 V          | 4500 V          | 5000 V         |
| Critical Resistance           | 18 kΩ          | 20 kΩ           | 30 kΩ           | 36 kΩ           | 30 kΩ          |

**NON INDUCTIVE WINDING**

For high frequencies, low self induction resistors are available with special windings. RWSTNI designation.

| MODEL AND STYLE             | RWSTNI<br>25 x 138 | RWSTNI<br>25 x 168 | RWSTNI<br>30 x 250 | RWSTNI<br>40 x 370 | RWSTNI<br>50 x 373 |
|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Ohmic Range<br>(E12 series) | 22 Ω<br>2.5 kΩ     | 22 Ω<br>4 kΩ       | 120 Ω<br>6.8 kΩ    | 120 Ω<br>8.2 kΩ    | 150 Ω<br>8.2 kΩ    |

**POWER RATING****TEMPERATURE RISE****MARKING**

Vishay Sfernice trademark, model, style, nominal resistance (in Ω), tolerance (in %), manufacturing date.

**PACKAGING**

Box: Fixed quantity depending on size and connections

**ORDERING INFORMATION**

| RWST  | 25 x 138 |                       |                | B           | 56U                                                                             | ± 5 %     | B06       | e              |
|-------|----------|-----------------------|----------------|-------------|---------------------------------------------------------------------------------|-----------|-----------|----------------|
| MODEL | STYLE    | NON-INDUCTIVE WINDING | SPECIAL DESIGN | CONNECTIONS | OHMIC VALUE                                                                     | TOLERANCE | PACKAGING | LEAD (Pb)-FREE |
|       |          | Optional              | Optional       |             | Custom items are subject to extra-charge and min. order. Please see price list. |           |           |                |

**GLOBAL PART NUMBER INFORMATION**

|              |   |                                                          |   |                                         |   |                           |   |                                                                                                                                                                                                                                       |   |  |   |   |           |   |                                                             |   |                                       |   |  |  |  |
|--------------|---|----------------------------------------------------------|---|-----------------------------------------|---|---------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|---|---|-----------|---|-------------------------------------------------------------|---|---------------------------------------|---|--|--|--|
| R            | W | S                                                        | T | 2                                       | 5 | 1                         | 6 | 8                                                                                                                                                                                                                                     | C |  | 4 | 7 | 0         | 0 | J                                                           | B | 0                                     | 4 |  |  |  |
| GLOBAL MODEL |   | SIZE                                                     |   | LEADS                                   |   | OPTION                    |   | OHMIC VALUE                                                                                                                                                                                                                           |   |  |   |   | TOLERANCE |   | PACKAGING                                                   |   | SPECIAL                               |   |  |  |  |
| RWST         |   | 25 x 138<br>25 x 168<br>30 x 250<br>40 x 370<br>50 x 373 |   | A = AN<br>B = B<br>C = CS<br>F = faston |   | N = non inductive winding |   | The first three digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point.<br><b>4700</b> = 470 Ω<br><b>48R8</b> = 48.7 Ω<br><b>R010</b> = 0.01 Ω<br><b>R470</b> = 0.47 Ω |   |  |   |   | J = 5.0 % |   | Box:<br>BO1<br>BO2<br>BO2NA<br>BO4<br>BO4NA<br>BO6<br>BO6NA |   | As applicable.<br>Example: <b>BA7</b> |   |  |  |  |

**RELATED DOCUMENTS****APPLICATION NOTES**

Packaging Information

[www.vishay.com/doc?50033](http://www.vishay.com/doc?50033)



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.