

SPECIFICATION  
Of  
**TEMPERATURE SENSOR**

PART NUMBER: **TT7-4.7KC3-4**

No. of pages: 4

customer part number:

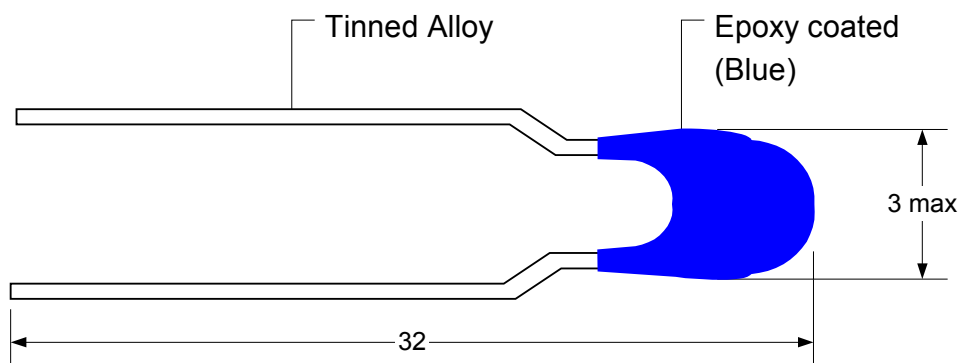
Date: **21.04.2008**

Revision: **02**

FEATURES:

|                              |                  |
|------------------------------|------------------|
| No-load resistance at 25°C   | 4 700 $\Omega$   |
| Resistance tolerance at 25°C | $\pm 1\%$        |
| Beta(25/85) Constant         | 3 977K $\pm 1\%$ |
| Operating temperature range  | -40°C ÷ 125°C    |
| <b>RoHS Compliant</b>        | <b>YES</b>       |

DRAWING:



UNITS: [mm]

# TEWA TEMPERATURE SENSORS

HIGH PRECISION NTC THERMISTORS AND TEMPERATURE SENSORS

**PART NUMBER: TT7-4.7KC3-4**

**R/T CHARACTERISTIC:**

| TEMP(C)   | MIN            | MEAN           | MAX            | R-TOL(MIN)  | R-TOL(MAX)  | T-TOL(MIN)  | T-TOL(MAX)  |
|-----------|----------------|----------------|----------------|-------------|-------------|-------------|-------------|
| -40       | <b>155,064</b> | <b>162,277</b> | <b>169,809</b> | <b>4,44</b> | <b>4,64</b> | <b>0,66</b> | <b>0,69</b> |
| -39       | 145,070        | 151,716        | 158,650        | 4,38        | 4,57        | 0,65        | 0,68        |
| -38       | 135,787        | 141,913        | 148,300        | 4,32        | 4,50        | 0,65        | 0,68        |
| -37       | 127,160        | 132,808        | 138,694        | 4,25        | 4,43        | 0,64        | 0,67        |
| -36       | 119,138        | 124,349        | 129,774        | 4,19        | 4,36        | 0,64        | 0,66        |
| -35       | <b>111,676</b> | <b>116,484</b> | <b>121,487</b> | <b>4,13</b> | <b>4,29</b> | <b>0,63</b> | <b>0,66</b> |
| -34       | 104,731        | 109,169        | 113,784        | 4,07        | 4,23        | 0,63        | 0,65        |
| -33       | 98,263         | 102,361        | 106,620        | 4,00        | 4,16        | 0,62        | 0,65        |
| -32       | 92,237         | 96,023         | 99,954         | 3,94        | 4,09        | 0,62        | 0,64        |
| -31       | 86,620         | 90,118         | 93,748         | 3,88        | 4,03        | 0,61        | 0,64        |
| -30       | <b>81,382</b>  | <b>84,615</b>  | <b>87,967</b>  | <b>3,82</b> | <b>3,96</b> | <b>0,61</b> | <b>0,63</b> |
| -29       | 76,494         | 79,483         | 82,581         | 3,76        | 3,90        | 0,60        | 0,62        |
| -28       | 71,932         | 74,696         | 77,559         | 3,70        | 3,83        | 0,60        | 0,62        |
| -27       | 67,671         | 70,228         | 72,875         | 3,64        | 3,77        | 0,59        | 0,61        |
| -26       | 63,690         | 66,056         | 68,503         | 3,58        | 3,70        | 0,59        | 0,61        |
| -25       | <b>59,968</b>  | <b>62,158</b>  | <b>64,422</b>  | <b>3,52</b> | <b>3,64</b> | <b>0,58</b> | <b>0,60</b> |
| -24       | 56,488         | 58,515         | 60,610         | 3,47        | 3,58        | 0,58        | 0,59        |
| -23       | 53,231         | 55,109         | 57,047         | 3,41        | 3,52        | 0,57        | 0,59        |
| -22       | 50,183         | 51,922         | 53,717         | 3,35        | 3,46        | 0,56        | 0,58        |
| -21       | 47,329         | 48,940         | 50,601         | 3,29        | 3,39        | 0,56        | 0,58        |
| -20       | <b>44,655</b>  | <b>46,148</b>  | <b>47,686</b>  | <b>3,24</b> | <b>3,33</b> | <b>0,55</b> | <b>0,57</b> |
| -19       | 42,149         | 43,533         | 44,958         | 3,18        | 3,27        | 0,55        | 0,56        |
| -18       | 39,799         | 41,082         | 42,402         | 3,12        | 3,21        | 0,54        | 0,56        |
| -17       | 37,594         | 38,784         | 40,007         | 3,07        | 3,15        | 0,53        | 0,55        |
| -16       | 35,526         | 36,629         | 37,763         | 3,01        | 3,10        | 0,53        | 0,54        |
| -15       | <b>33,584</b>  | <b>34,607</b>  | <b>35,658</b>  | <b>2,96</b> | <b>3,04</b> | <b>0,52</b> | <b>0,54</b> |
| -14       | 31,760         | 32,709         | 33,683         | 2,90        | 2,98        | 0,52        | 0,53        |
| -13       | 30,046         | 30,927         | 31,830         | 2,85        | 2,92        | 0,51        | 0,52        |
| -12       | 28,436         | 29,253         | 30,090         | 2,79        | 2,86        | 0,50        | 0,52        |
| -11       | 26,921         | 27,679         | 28,456         | 2,74        | 2,81        | 0,50        | 0,51        |
| -10       | <b>25,496</b>  | <b>26,200</b>  | <b>26,921</b>  | <b>2,69</b> | <b>2,75</b> | <b>0,49</b> | <b>0,50</b> |
| -9        | 24,156         | 24,809         | 25,477         | 2,63        | 2,69        | 0,48        | 0,50        |
| -8        | 22,894         | 23,500         | 24,120         | 2,58        | 2,64        | 0,48        | 0,49        |
| -7        | 21,705         | 22,268         | 22,843         | 2,53        | 2,58        | 0,47        | 0,48        |
| -6        | 20,585         | 21,108         | 21,642         | 2,48        | 2,53        | 0,46        | 0,47        |
| -5        | <b>19,530</b>  | <b>20,015</b>  | <b>20,510</b>  | <b>2,42</b> | <b>2,47</b> | <b>0,46</b> | <b>0,47</b> |
| -4        | 18,535         | 18,986         | 19,445         | 2,37        | 2,42        | 0,45        | 0,46        |
| -3        | 17,597         | 18,015         | 18,441         | 2,32        | 2,37        | 0,44        | 0,45        |
| -2        | 16,712         | 17,100         | 17,495         | 2,27        | 2,31        | 0,44        | 0,44        |
| -1        | 15,876         | 16,237         | 16,604         | 2,22        | 2,26        | 0,43        | 0,44        |
| <b>0</b>  | <b>15,088</b>  | <b>15,422</b>  | <b>15,763</b>  | <b>2,17</b> | <b>2,21</b> | <b>0,42</b> | <b>0,43</b> |
| 1         | 14,343         | 14,653         | 14,969         | 2,12        | 2,16        | 0,42        | 0,42        |
| 2         | 13,639         | 13,927         | 14,220         | 2,07        | 2,10        | 0,41        | 0,41        |
| 3         | 12,974         | 13,241         | 13,513         | 2,02        | 2,05        | 0,40        | 0,41        |
| 4         | 12,345         | 12,593         | 12,845         | 1,97        | 2,00        | 0,39        | 0,40        |
| <b>5</b>  | <b>11,750</b>  | <b>11,980</b>  | <b>12,214</b>  | <b>1,92</b> | <b>1,95</b> | <b>0,39</b> | <b>0,39</b> |
| 6         | 11,188         | 11,401         | 11,618         | 1,87        | 1,90        | 0,38        | 0,38        |
| 7         | 10,655         | 10,853         | 11,054         | 1,83        | 1,85        | 0,37        | 0,38        |
| 8         | 10,151         | 10,335         | 10,521         | 1,78        | 1,80        | 0,36        | 0,37        |
| 9         | 9,674          | 9,844          | 10,016         | 1,73        | 1,75        | 0,36        | 0,36        |
| <b>10</b> | <b>9,222</b>   | <b>9,380</b>   | <b>9,539</b>   | <b>1,68</b> | <b>1,70</b> | <b>0,35</b> | <b>0,35</b> |
| 11        | 8,793          | 8,940          | 9,087          | 1,63        | 1,65        | 0,34        | 0,34        |
| 12        | 8,387          | 8,523          | 8,659          | 1,59        | 1,60        | 0,33        | 0,34        |

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**R/T CHARACTERISTIC:**

| TEMP(C)   | MIN          | MEAN         | MAX          | R-TOL(MIN)  | R-TOL(MAX)  | T-TOL(MIN)  | T-TOL(MAX)  |
|-----------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|
| 13        | 8,002        | 8,128        | 8,254        | 1,54        | 1,55        | 0,33        | 0,33        |
| 14        | 7,637        | 7,753        | 7,870        | 1,49        | 1,51        | 0,32        | 0,32        |
| <b>15</b> | <b>7,291</b> | <b>7,398</b> | <b>7,506</b> | <b>1,45</b> | <b>1,46</b> | <b>0,31</b> | <b>0,31</b> |
| 16        | 6,962        | 7,061        | 7,161        | 1,40        | 1,41        | 0,30        | 0,30        |
| 17        | 6,650        | 6,742        | 6,834        | 1,36        | 1,36        | 0,29        | 0,30        |
| 18        | 6,354        | 6,438        | 6,523        | 1,31        | 1,32        | 0,29        | 0,29        |
| 19        | 6,072        | 6,150        | 6,228        | 1,27        | 1,27        | 0,28        | 0,28        |
| <b>20</b> | <b>5,805</b> | <b>5,877</b> | <b>5,949</b> | <b>1,22</b> | <b>1,23</b> | <b>0,27</b> | <b>0,27</b> |
| 21        | 5,551        | 5,617        | 5,683        | 1,18        | 1,18        | 0,26        | 0,26        |
| 22        | 5,309        | 5,370        | 5,431        | 1,13        | 1,13        | 0,25        | 0,25        |
| 23        | 5,079        | 5,135        | 5,191        | 1,09        | 1,09        | 0,24        | 0,24        |
| 24        | 4,861        | 4,912        | 4,963        | 1,04        | 1,04        | 0,24        | 0,24        |
| <b>25</b> | <b>4,653</b> | <b>4,700</b> | <b>4,747</b> | <b>1,00</b> | <b>1,00</b> | <b>0,23</b> | <b>0,23</b> |
| 26        | 4,451        | 4,498        | 4,545        | 1,04        | 1,04        | 0,24        | 0,24        |
| 27        | 4,259        | 4,306        | 4,353        | 1,09        | 1,09        | 0,25        | 0,25        |
| 28        | 4,077        | 4,123        | 4,170        | 1,13        | 1,13        | 0,26        | 0,26        |
| 29        | 3,903        | 3,949        | 3,996        | 1,17        | 1,18        | 0,27        | 0,27        |
| <b>30</b> | <b>3,738</b> | <b>3,783</b> | <b>3,830</b> | <b>1,21</b> | <b>1,22</b> | <b>0,28</b> | <b>0,29</b> |
| 31        | 3,580        | 3,626        | 3,671        | 1,26        | 1,26        | 0,30        | 0,30        |
| 32        | 3,430        | 3,475        | 3,520        | 1,30        | 1,31        | 0,31        | 0,31        |
| 33        | 3,287        | 3,332        | 3,377        | 1,34        | 1,35        | 0,32        | 0,32        |
| 34        | 3,151        | 3,195        | 3,239        | 1,38        | 1,39        | 0,33        | 0,33        |
| <b>35</b> | <b>3,021</b> | <b>3,065</b> | <b>3,109</b> | <b>1,42</b> | <b>1,43</b> | <b>0,34</b> | <b>0,34</b> |
| 36        | 2,897        | 2,940        | 2,984        | 1,46        | 1,47        | 0,35        | 0,36        |
| 37        | 2,779        | 2,822        | 2,865        | 1,50        | 1,52        | 0,37        | 0,37        |
| 38        | 2,667        | 2,709        | 2,751        | 1,54        | 1,56        | 0,38        | 0,38        |
| 39        | 2,559        | 2,601        | 2,642        | 1,58        | 1,60        | 0,39        | 0,39        |
| <b>40</b> | <b>2,457</b> | <b>2,497</b> | <b>2,538</b> | <b>1,62</b> | <b>1,64</b> | <b>0,40</b> | <b>0,41</b> |
| 41        | 2,359        | 2,399        | 2,439        | 1,66        | 1,68        | 0,41        | 0,42        |
| 42        | 2,266        | 2,305        | 2,344        | 1,70        | 1,72        | 0,43        | 0,43        |
| 43        | 2,176        | 2,215        | 2,254        | 1,74        | 1,76        | 0,44        | 0,44        |
| 44        | 2,091        | 2,129        | 2,167        | 1,78        | 1,80        | 0,45        | 0,46        |
| <b>45</b> | <b>2,010</b> | <b>2,047</b> | <b>2,085</b> | <b>1,82</b> | <b>1,84</b> | <b>0,46</b> | <b>0,47</b> |
| 46        | 1,932        | 1,968        | 2,005        | 1,86        | 1,88        | 0,48        | 0,48        |
| 47        | 1,857        | 1,893        | 1,930        | 1,90        | 1,92        | 0,49        | 0,50        |
| 48        | 1,786        | 1,821        | 1,857        | 1,93        | 1,96        | 0,50        | 0,51        |
| 49        | 1,718        | 1,753        | 1,788        | 1,97        | 2,00        | 0,51        | 0,52        |
| <b>50</b> | <b>1,653</b> | <b>1,687</b> | <b>1,721</b> | <b>2,01</b> | <b>2,04</b> | <b>0,53</b> | <b>0,53</b> |
| 51        | 1,591        | 1,624        | 1,658        | 2,05        | 2,08        | 0,54        | 0,55        |
| 52        | 1,531        | 1,564        | 1,597        | 2,08        | 2,12        | 0,55        | 0,56        |
| 53        | 1,474        | 1,506        | 1,538        | 2,12        | 2,16        | 0,57        | 0,57        |
| 54        | 1,419        | 1,451        | 1,482        | 2,16        | 2,19        | 0,58        | 0,59        |
| <b>55</b> | <b>1,367</b> | <b>1,398</b> | <b>1,429</b> | <b>2,19</b> | <b>2,23</b> | <b>0,59</b> | <b>0,60</b> |
| 56        | 1,317        | 1,347        | 1,377        | 2,23        | 2,27        | 0,60        | 0,62        |
| 57        | 1,269        | 1,298        | 1,328        | 2,27        | 2,31        | 0,62        | 0,63        |
| 58        | 1,223        | 1,252        | 1,281        | 2,30        | 2,35        | 0,63        | 0,64        |
| 59        | 1,179        | 1,207        | 1,236        | 2,34        | 2,38        | 0,64        | 0,66        |
| <b>60</b> | <b>1,136</b> | <b>1,164</b> | <b>1,192</b> | <b>2,37</b> | <b>2,42</b> | <b>0,66</b> | <b>0,67</b> |
| 61        | 1,096        | 1,123        | 1,150        | 2,41        | 2,46        | 0,67        | 0,68        |
| 62        | 1,057        | 1,083        | 1,110        | 2,44        | 2,49        | 0,68        | 0,70        |
| 63        | 1,020        | 1,045        | 1,072        | 2,48        | 2,53        | 0,70        | 0,71        |
| 64        | 0,984        | 1,009        | 1,035        | 2,51        | 2,57        | 0,71        | 0,73        |

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HIGH PRECISION NTC THERMISTORS AND TEMPERATURE SENSORS

PART NUMBER: **TT7-4.7KC3-4**

## R/T CHARACTERISTIC:

| TEMP(C)    | MIN          | MEAN         | MAX          | R-TOL(MIN)  | R-TOL(MAX)  | T-TOL(MIN)  | T-TOL(MAX)  |
|------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|
| <b>65</b>  | <b>0,949</b> | <b>0,974</b> | <b>1,000</b> | <b>2,55</b> | <b>2,60</b> | <b>0,72</b> | <b>0,74</b> |
| 66         | 0,916        | 0,941        | 0,965        | 2,58        | 2,64        | 0,74        | 0,76        |
| 67         | 0,885        | 0,908        | 0,933        | 2,61        | 2,67        | 0,75        | 0,77        |
| 68         | 0,854        | 0,878        | 0,901        | 2,65        | 2,71        | 0,77        | 0,78        |
| 69         | 0,825        | 0,848        | 0,871        | 2,68        | 2,74        | 0,78        | 0,80        |
| <b>70</b>  | <b>0,797</b> | <b>0,819</b> | <b>0,842</b> | <b>2,71</b> | <b>2,78</b> | <b>0,79</b> | <b>0,81</b> |
| 71         | 0,770        | 0,792        | 0,814        | 2,75        | 2,81        | 0,81        | 0,83        |
| 72         | 0,744        | 0,765        | 0,787        | 2,78        | 2,85        | 0,82        | 0,84        |
| 73         | 0,719        | 0,740        | 0,761        | 2,81        | 2,88        | 0,84        | 0,86        |
| 74         | 0,695        | 0,716        | 0,736        | 2,85        | 2,92        | 0,85        | 0,87        |
| <b>75</b>  | <b>0,672</b> | <b>0,692</b> | <b>0,713</b> | <b>2,88</b> | <b>2,95</b> | <b>0,86</b> | <b>0,89</b> |
| 76         | 0,650        | 0,670        | 0,690        | 2,91        | 2,99        | 0,88        | 0,90        |
| 77         | 0,629        | 0,648        | 0,667        | 2,94        | 3,02        | 0,89        | 0,92        |
| 78         | 0,608        | 0,627        | 0,646        | 2,97        | 3,06        | 0,91        | 0,93        |
| 79         | 0,588        | 0,607        | 0,625        | 3,01        | 3,09        | 0,92        | 0,95        |
| <b>80</b>  | <b>0,569</b> | <b>0,587</b> | <b>0,606</b> | <b>3,04</b> | <b>3,12</b> | <b>0,94</b> | <b>0,96</b> |
| 81         | 0,551        | 0,569        | 0,587        | 3,07        | 3,16        | 0,95        | 0,98        |
| 82         | 0,534        | 0,551        | 0,568        | 3,10        | 3,19        | 0,97        | 0,99        |
| 83         | 0,517        | 0,533        | 0,551        | 3,13        | 3,22        | 0,98        | 1,01        |
| 84         | 0,500        | 0,517        | 0,533        | 3,16        | 3,25        | 1,00        | 1,03        |
| <b>85</b>  | <b>0,485</b> | <b>0,501</b> | <b>0,517</b> | <b>3,19</b> | <b>3,29</b> | <b>1,01</b> | <b>1,04</b> |
| 86         | 0,469        | 0,485        | 0,501        | 3,22        | 3,32        | 1,03        | 1,06        |
| 87         | 0,455        | 0,470        | 0,486        | 3,25        | 3,35        | 1,04        | 1,07        |
| 88         | 0,441        | 0,456        | 0,471        | 3,28        | 3,38        | 1,06        | 1,09        |
| 89         | 0,427        | 0,442        | 0,457        | 3,31        | 3,42        | 1,07        | 1,11        |
| <b>90</b>  | <b>0,414</b> | <b>0,428</b> | <b>0,443</b> | <b>3,34</b> | <b>3,45</b> | <b>1,09</b> | <b>1,12</b> |
| 91         | 0,401        | 0,415        | 0,430        | 3,37        | 3,48        | 1,10        | 1,14        |
| 92         | 0,389        | 0,403        | 0,417        | 3,40        | 3,51        | 1,12        | 1,15        |
| 93         | 0,378        | 0,391        | 0,405        | 3,43        | 3,54        | 1,13        | 1,17        |
| 94         | 0,366        | 0,379        | 0,393        | 3,46        | 3,57        | 1,15        | 1,19        |
| <b>95</b>  | <b>0,355</b> | <b>0,368</b> | <b>0,381</b> | <b>3,49</b> | <b>3,61</b> | <b>1,17</b> | <b>1,20</b> |
| 96         | 0,345        | 0,357        | 0,370        | 3,52        | 3,64        | 1,18        | 1,22        |
| 97         | 0,335        | 0,347        | 0,360        | 3,55        | 3,67        | 1,20        | 1,24        |
| 98         | 0,325        | 0,337        | 0,349        | 3,58        | 3,70        | 1,21        | 1,25        |
| 99         | 0,315        | 0,327        | 0,339        | 3,60        | 3,73        | 1,23        | 1,27        |
| <b>100</b> | <b>0,306</b> | <b>0,318</b> | <b>0,329</b> | <b>3,63</b> | <b>3,76</b> | <b>1,25</b> | <b>1,29</b> |
| 101        | 0,297        | 0,308        | 0,320        | 3,66        | 3,79        | 1,26        | 1,31        |
| 102        | 0,289        | 0,300        | 0,311        | 3,69        | 3,82        | 1,28        | 1,32        |
| 103        | 0,280        | 0,291        | 0,302        | 3,72        | 3,85        | 1,29        | 1,34        |
| 104        | 0,272        | 0,283        | 0,294        | 3,74        | 3,88        | 1,31        | 1,36        |
| <b>105</b> | <b>0,265</b> | <b>0,275</b> | <b>0,286</b> | <b>3,77</b> | <b>3,91</b> | <b>1,33</b> | <b>1,38</b> |
| 106        | 0,257        | 0,267        | 0,278        | 3,80        | 3,94        | 1,34        | 1,39        |
| 107        | 0,250        | 0,260        | 0,270        | 3,83        | 3,97        | 1,36        | 1,41        |
| 108        | 0,243        | 0,253        | 0,263        | 3,85        | 4,00        | 1,38        | 1,43        |
| 109        | 0,236        | 0,246        | 0,256        | 3,88        | 4,02        | 1,39        | 1,45        |
| <b>110</b> | <b>0,230</b> | <b>0,239</b> | <b>0,249</b> | <b>3,91</b> | <b>4,05</b> | <b>1,41</b> | <b>1,46</b> |
| 111        | 0,223        | 0,232        | 0,242        | 3,93        | 4,08        | 1,43        | 1,48        |
| 112        | 0,217        | 0,226        | 0,235        | 3,96        | 4,11        | 1,44        | 1,50        |
| 113        | 0,211        | 0,220        | 0,229        | 3,98        | 4,14        | 1,46        | 1,52        |
| 114        | 0,206        | 0,214        | 0,223        | 4,01        | 4,17        | 1,48        | 1,54        |
| <b>115</b> | <b>0,200</b> | <b>0,208</b> | <b>0,217</b> | <b>4,04</b> | <b>4,20</b> | <b>1,50</b> | <b>1,56</b> |
| 116        | 0,195        | 0,203        | 0,212        | 4,06        | 4,22        | 1,51        | 1,57        |
| 117        | 0,190        | 0,198        | 0,206        | 4,09        | 4,25        | 1,53        | 1,59        |
| 118        | 0,184        | 0,192        | 0,201        | 4,11        | 4,28        | 1,55        | 1,61        |
| 119        | 0,180        | 0,187        | 0,195        | 4,14        | 4,31        | 1,57        | 1,63        |
| <b>120</b> | <b>0,175</b> | <b>0,182</b> | <b>0,190</b> | <b>4,16</b> | <b>4,34</b> | <b>1,58</b> | <b>1,65</b> |
| 121        | 0,170        | 0,178        | 0,186        | 4,19        | 4,36        | 1,60        | 1,67        |
| 122        | 0,166        | 0,173        | 0,181        | 4,21        | 4,39        | 1,62        | 1,69        |
| 123        | 0,162        | 0,169        | 0,176        | 4,24        | 4,42        | 1,64        | 1,71        |
| 124        | 0,157        | 0,164        | 0,172        | 4,26        | 4,44        | 1,66        | 1,73        |
| <b>125</b> | <b>0,153</b> | <b>0,160</b> | <b>0,167</b> | <b>4,29</b> | <b>4,47</b> | <b>1,67</b> | <b>1,74</b> |