

## ПОТЕРИ ДАВЛЕНИЯ

Тепловая мощность [кВт] для  $\Delta T$ [K] для разности соответствующих температур [K]. ( $\Delta T$  = разница температур между прямым и обратным потоком) Пример:  $t$  прям 80.°C и  $t$  обр. 60°C => поэтому  $\Delta T$  20 K)

### Потери давления

| Тепловая мощность [кВт] для $\Delta T$ [K] для разности соответствующих температур [K] |      |      |      |      |      |      | Поток [l/sec] | Потери давления   | Напорные трубы PE-Xa SDR 11/ PN 6: d нар. x s [mm] |              |              |              |             |             |             |            |            |            |
|--|------|------|------|------|------|------|---------------|-------------------|--|--------------|--------------|--------------|-------------|-------------|-------------|------------|------------|------------|
| 5 K  | 10 K | 15 K | 20 K | 25 K | 30 K | 40 K |               |                   | Скорость потока                                    | 25 x 2.3     | 32 x 2.9     | 40 x 3.7     | 50 x 4.6    | 63 x 5.8    | 75 x 6.8    | 90 x 8.2   | 110 x 10.0 | 125 x 11.4 |
| 1  | 3    | 4    | 5    | 6    | 8    | 10   | 0.06          | [pa/m]<br>[m/sec] | 27<br>0.18   | 9<br>0.11    |              |              |             |             |             |            |            |            |
| 3  | 5    | 8    | 10   | 13   | 15   | 20   | 0.12          | [pa/m]<br>[m/sec] | 91<br>0.37   | 27<br>0.22   | 9<br>0.14    |              |             |             |             |            |            |            |
| 4  | 8    | 11   | 15   | 19   | 23   | 30   | 0.18          | [pa/m]<br>[m/sec] | 185<br>0.55  | 56<br>0.33   | 19<br>0.21   |              |             |             |             |            |            |            |
| 5  | 10   | 15   | 20   | 25   | 30   | 40   | 0.24          | [pa/m]<br>[m/sec] | 306<br>0.73  | 93<br>0.44   | 33<br>0.29   |              |             |             |             |            |            |            |
| 6  | 13   | 19   | 25   | 31   | 38   | 50   | 0.30          | [pa/m]<br>[m/sec] | 452<br>0.91  | 138<br>0.55  | 48<br>0.36   |              |             |             |             |            |            |            |
| 8  | 15   | 23   | 30   | 38   | 45   | 60   | 0.36          | [pa/m]<br>[m/sec] | 622<br>1.10  | 190<br>0.66  | 67<br>0.43   | 23<br>0.27   |             |             |             |            |            |            |
| 9  | 18   | 26   | 35   | 44   | 53   | 70   | 0.42          | [pa/m]<br>[m/sec] | 815<br>1.28  | 248<br>0.78  | 88<br>0.50   | 30<br>0.32   |             |             |             |            |            |            |
| 10   | 20   | 30   | 40   | 50   | 60   | 80   | 0.48          | [pa/m]<br>[m/sec] | 1030<br>1.46                                       | 314<br>0.89  | 111<br>0.57  | 38<br>0.37   | 12<br>0.23  |             |             |            |            |            |
| 11   | 23   | 34   | 45   | 56   | 68   | 90   | 0.54          | [pa/m]<br>[m/sec] | 1266<br>1.64                                       | 386<br>1.00  | 136<br>0.64  | 47<br>0.41   | 15<br>0.26  |             |             |            |            |            |
| 13   | 25   | 38   | 50   | 63   | 75   | 100  | 0.60          | [pa/m]<br>[m/sec] | 1522<br>1.83                                       | 464<br>1.11  | 164<br>0.72  | 56<br>0.46   | 18<br>0.29  |             |             |            |            |            |
| 14   | 28   | 41   | 55   | 69   | 83   | 110  | 0.66          | [pa/m]<br>[m/sec] | 1799<br>2.01                                       | 548<br>1.22  | 194<br>0.79  | 66<br>0.50   | 21<br>0.32  |             |             |            |            |            |
| 15   | 30   | 45   | 60   | 75   | 90   | 120  | 0.72          | [pa/m]<br>[m/sec] | 2095<br>2.19                                       | 639<br>1.33  | 226<br>0.86  | 77<br>0.55   | 25<br>0.34  |             |             |            |            |            |
| 16   | 33   | 49   | 65   | 81   | 98   | 130  | 0.78          | [pa/m]<br>[m/sec] | 2410<br>2.37                                       | 735<br>1.44  | 260<br>0.93  | 89<br>0.59   | 29<br>0.37  |             |             |            |            |            |
| 18   | 35   | 53   | 70   | 88   | 105  | 140  | 0.84          | [pa/m]<br>[m/sec] |  | 837<br>1.55  | 296<br>1.00  | 102<br>0.64  | 33<br>0.40  |             |             |            |            |            |
| 19   | 38   | 56   | 75   | 94   | 113  | 150  | 0.90          | [pa/m]<br>[m/sec] |  | 944<br>1.66  | 334<br>1.07  | 115<br>0.69  | 37<br>0.43  |             |             |            |            |            |
| 20   | 40   | 60   | 80   | 100  | 120  | 160  | 0.96          | [pa/m]<br>[m/sec] |  | 1057<br>1.77 | 374<br>1.14  | 128<br>0.73  | 42<br>0.46  | 18<br>0.32  |             |            |            |            |
| 21   | 43   | 64   | 85   | 106  | 128  | 170  | 1.02          | [pa/m]<br>[m/sec] |  | 1175<br>1.88 | 415<br>1.22  | 143<br>0.78  | 46<br>0.49  | 20<br>0.34  |             |            |            |            |
| 23   | 45   | 68   | 90   | 113  | 135  | 180  | 1.07          | [pa/m]<br>[m/sec] |  | 1299<br>1.99 | 459<br>1.29  | 158<br>0.82  | 51<br>0.51  | 23<br>0.36  |             |            |            |            |
| 25   | 50   | 75   | 100  | 125  | 150  | 200  | 1.19          | [pa/m]<br>[m/sec] |  | 1562<br>2.22 | 552<br>1.43  | 190<br>0.91  | 62<br>0.57  | 27<br>0.40  |             |            |            |            |
| 28   | 55   | 83   | 110  | 138  | 165  | 220  | 1.31          | [pa/m]<br>[m/sec] |  | 1846<br>2.44 | 653<br>1.57  | 225<br>1.01  | 73<br>0.63  | 32<br>0.44  |             |            |            |            |
| 30   | 60   | 90   | 120  | 150  | 180  | 240  | 1.43          | [pa/m]<br>[m/sec] |  | 2149<br>2.66 | 760<br>1.72  | 262<br>1.10  | 85<br>0.69  | 37<br>0.48  |             |            |            |            |
| 33   | 65   | 98   | 130  | 163  | 195  | 260  | 1.55          | [pa/m]<br>[m/sec] |  | 2472<br>2.88 | 874<br>1.86  | 301<br>1.19  | 98<br>0.74  | 43<br>0.52  |             |            |            |            |
| 35   | 70   | 105  | 140  | 175  | 210  | 280  | 1.67          | [pa/m]<br>[m/sec] |  |              | 995<br>2.00  | 343<br>1.28  | 112<br>0.80 | 49<br>0.56  |             |            |            |            |
| 38   | 75   | 113  | 150  | 188  | 225  | 300  | 1.79          | [pa/m]<br>[m/sec] |  |              | 1123<br>2.15 | 387<br>1.37  | 126<br>0.86 | 55<br>0.60  |             |            |            |            |
| 40   | 80   | 120  | 160  | 200  | 240  | 320  | 1.91          | [pa/m]<br>[m/sec] |  |              | 1258<br>2.29 | 433<br>1.46  | 142<br>0.91 | 62<br>0.65  | 26<br>0.45  |            |            |            |
| 43   | 85   | 128  | 170  | 213  | 255  | 340  | 2.03          | [pa/m]<br>[m/sec] |  |              | 1398<br>2.43 | 482<br>1.55  | 158<br>0.97 | 69<br>0.69  | 29<br>0.48  |            |            |            |
| 45   | 90   | 135  | 180  | 225  | 270  | 360  | 2.15          | [pa/m]<br>[m/sec] |  |              | 1546<br>2.57 | 533<br>1.64  | 174<br>1.03 | 76<br>0.73  | 32<br>0.51  |            |            |            |
| 50   | 100  | 150  | 200  | 250  | 300  | 400  | 2.39          | [pa/m]<br>[m/sec] |  |              | 1859<br>2.86 | 641<br>1.83  | 210<br>1.14 | 91<br>0.81  | 38<br>0.56  |            |            |            |
| 56   | 113  | 169  | 225  | 281  | 338  | 450  | 2.69          | [pa/m]<br>[m/sec] |  |              |              | 788<br>2.06  | 258<br>1.29 | 113<br>0.91 | 48<br>0.63  |            |            |            |
| 63   | 125  | 188  | 250  | 313  | 375  | 500  | 2.99          | [pa/m]<br>[m/sec] |  |              |              | 947<br>2.28  | 310<br>1.43 | 135<br>1.01 | 57<br>0.70  |            |            |            |
| 69   | 138  | 206  | 275  | 344  | 413  | 550  | 3.28          | [pa/m]<br>[m/sec] |  |              |              | 1120<br>2.52 | 367<br>1.57 | 161<br>1.11 | 68<br>0.77  |            |            |            |
| 75   | 150  | 225  | 300  | 375  | 450  | 600  | 3.58          | [pa/m]<br>[m/sec] |  |              |              |              | 427<br>1.71 | 186<br>1.21 | 79<br>0.84  | 30<br>0.56 |            |            |
| 81   | 163  | 244  | 325  | 406  | 488  | 650  | 3.88          | [pa/m]<br>[m/sec] |  |              |              |              | 497<br>1.85 | 217<br>1.31 | 92<br>0.91  | 35<br>0.61 |            |            |
| 88   | 175  | 263  | 350  | 438  | 525  | 700  | 4.18          | [pa/m]<br>[m/sec] |  |              |              |              | 567<br>2.00 | 248<br>1.41 | 105<br>0.98 | 40<br>0.66 | 22<br>0.51 |            |
| 94   | 188  | 281  | 375  | 469  | 563  | 750  | 4.48          | [pa/m]<br>[m/sec] |  |              |              |              | 636<br>2.14 | 278<br>1.51 | 117<br>1.05 | 45<br>0.70 | 25<br>0.55 |            |

## Потери давления

| Тепловая мощность [кВт] для ΔT[K] для разности соответствующих температур [K] |      |      |             |      |      |      | Поток<br>[l/sec] | Потери давления<br>Скорость потока | Тепловая мощность [кВт] для ΔT[K] для разности соответствующих температур [K] |             |             |             |              |                           |                           |                           |                           |
|---|------|------|-------------|------|------|------|------------------|------------------------------------|---|-------------|-------------|-------------|--------------|---------------------------|---------------------------|---------------------------|---------------------------|
| 5 K   | 10 K | 15 K | 20 K        | 25 K | 30 K | 40 K |                  |                                    | 25 x<br>2.3   | 32 x<br>2.9 | 40 x<br>3.7 | 50 x<br>4.6 | 63 x<br>5.8  | 75 x<br>6.8               | 90 x<br>8.2               | 110 x<br>10.0             | 125 x<br>11.4             |
| 100   | 200  | 300  | <b>400</b>  | 500  | 600  | 800  | <b>4.78</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             | 706<br>2.28  | <b>309</b><br><b>1.61</b> | <b>130</b><br><b>1.12</b> | <b>50</b><br><b>0.75</b>  | 28<br>0.58                |
| 106   | 213  | 319  | <b>425</b>  | 531  | 638  | 850  | <b>5.08</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             | 791<br>2.43  | <b>346</b><br><b>1.71</b> | <b>146</b><br><b>1.19</b> | <b>56</b><br><b>0.80</b>  | 32<br>0.62                |
| 113   | 225  | 338  | <b>450</b>  | 563  | 675  | 900  | <b>5.37</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             | 875<br>2.57  | 383<br>1.82               | <b>162</b><br><b>1.26</b> | <b>62</b><br><b>0.85</b>  | 35<br>0.66                |
| 119   | 238  | 356  | <b>475</b>  | 594  | 713  | 950  | <b>5.67</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             | 960<br>2.72  | 420<br>1.92               | <b>177</b><br><b>1.33</b> | <b>68</b><br><b>0.89</b>  | 38<br>0.69                |
| 125   | 250  | 375  | <b>500</b>  | 625  | 750  | 1000 | <b>5.97</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             | 1044<br>2.86 | 457<br>2.02               | <b>193</b><br><b>1.40</b> | <b>74</b><br><b>0.94</b>  | <b>42</b><br><b>0.73</b>  |
| 131   | 263  | 394  | <b>525</b>  | 656  | 788  | 1050 | <b>6.27</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 500<br>2.12               | <b>211</b><br><b>1.47</b> | <b>81</b><br><b>0.99</b>  | <b>46</b><br><b>0.76</b>  |
| 138   | 275  | 413  | <b>550</b>  | 688  | 825  | 1100 | <b>6.57</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 543<br>2.22               | <b>229</b><br><b>1.54</b> | <b>88</b><br><b>1.04</b>  | <b>49</b><br><b>0.80</b>  |
| 144   | 288  | 431  | <b>575</b>  | 719  | 863  | 1150 | <b>6.87</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 585<br>2.32               | <b>247</b><br><b>1.61</b> | <b>95</b><br><b>1.09</b>  | <b>53</b><br><b>0.84</b>  |
| 150   | 300  | 450  | <b>600</b>  | 750  | 900  | 1200 | <b>7.17</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 628<br>2.42               | <b>265</b><br><b>1.68</b> | <b>102</b><br><b>1.13</b> | <b>58</b><br><b>0.87</b>  |
| 156   | 313  | 469  | <b>625</b>  | 781  | 938  | 1250 | <b>7.46</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 677<br>2.52               | <b>286</b><br><b>1.75</b> | <b>110</b><br><b>1.18</b> | <b>62</b><br><b>0.91</b>  |
| 163   | 325  | 488  | <b>650</b>  | 813  | 975  | 1300 | <b>7.76</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 726<br>2.62               | <b>307</b><br><b>1.83</b> | <b>117</b><br><b>1.22</b> | <b>66</b><br><b>0.95</b>  |
| 169   | 338  | 506  | <b>675</b>  | 844  | 1013 | 1350 | <b>8.06</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 774<br>2.72               | <b>327</b><br><b>1.90</b> | <b>125</b><br><b>1.27</b> | <b>71</b><br><b>0.98</b>  |
| 175   | 350  | 525  | <b>700</b>  | 875  | 1050 | 1400 | <b>8.36</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 823<br>2.82               | <b>348</b><br><b>1.97</b> | <b>133</b><br><b>1.31</b> | <b>75</b><br><b>1.02</b>  |
| 181   | 363  | 544  | <b>725</b>  | 906  | 1088 | 1450 | <b>8.66</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 877<br>2.92               | 371<br>2.04               | <b>142</b><br><b>1.36</b> | <b>80</b><br><b>1.06</b>  |
| 188   | 375  | 563  | <b>750</b>  | 938  | 1125 | 1500 | <b>8.96</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 932<br>3.03               | 394<br>2.11               | <b>151</b><br><b>1.41</b> | <b>85</b><br><b>1.09</b>  |
| 194   | 388  | 581  | <b>775</b>  | 969  | 1163 | 1550 | <b>9.25</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 986<br>3.13               | 416<br>2.18               | <b>160</b><br><b>1.46</b> | <b>90</b><br><b>1.13</b>  |
| 200   | 400  | 600  | <b>800</b>  | 1000 | 1200 | 1600 | <b>9.55</b>      | [pa/m]<br>[m/sec]                  |   |             |             |             |              | 1040<br>3.23              | 439<br>2.25               | <b>169</b><br><b>1.50</b> | <b>95</b><br><b>1.16</b>  |
| 213   | 425  | 638  | <b>850</b>  | 1063 | 1275 | 1700 | <b>10.15</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           | 490<br>2.39               | <b>188</b><br><b>1.60</b> | <b>106</b><br><b>1.24</b> |
| 225   | 450  | 675  | <b>900</b>  | 1125 | 1350 | 1800 | <b>10.75</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           | 540<br>2.53               | <b>207</b><br><b>1.69</b> | <b>117</b><br><b>1.31</b> |
| 238   | 475  | 713  | <b>950</b>  | 1188 | 1425 | 1900 | <b>11.34</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           | 595<br>2.67               | <b>228</b><br><b>1.79</b> | <b>129</b><br><b>1.38</b> |
| 250   | 500  | 750  | <b>1000</b> | 1250 | 1500 | 2000 | <b>11.94</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           | 650<br>2.81               | <b>249</b><br><b>1.88</b> | <b>141</b><br><b>1.46</b> |
| 263   | 525  | 788  | <b>1050</b> | 1313 | 1575 | 2100 | <b>12.54</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           | <b>272</b><br><b>1.97</b> | <b>153</b><br><b>1.53</b> |
| 275   | 550  | 825  | <b>1100</b> | 1375 | 1650 | 2200 | <b>13.14</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           | <b>295</b><br><b>2.06</b> | <b>166</b><br><b>1.60</b> |
| 288   | 575  | 863  | <b>1150</b> | 1438 | 1725 | 2300 | <b>13.73</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           | <b>319</b><br><b>2.16</b> | <b>180</b><br><b>1.67</b> |
| 300   | 600  | 900  | <b>1200</b> | 1500 | 1800 | 2400 | <b>14.33</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           | <b>343</b><br><b>2.25</b> | <b>194</b><br><b>1.75</b> |
| 313   | 625  | 938  | <b>1250</b> | 1563 | 1875 | 2500 | <b>14.93</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           | <b>369</b><br><b>2.35</b> | <b>208</b><br><b>1.82</b> |
| 325   | 650  | 975  | <b>1300</b> | 1625 | 1950 | 2600 | <b>15.52</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           | <b>395</b><br><b>2.44</b> | <b>223</b><br><b>1.89</b> |
| 338   | 675  | 1013 | <b>1350</b> | 1688 | 2025 | 2700 | <b>16.12</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           | <b>238</b><br><b>1.97</b> |
| 350   | 700  | 1050 | <b>1400</b> | 1750 | 2100 | 2800 | <b>16.72</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           | <b>254</b><br><b>2.04</b> |
| 363   | 725  | 1088 | <b>1450</b> | 1813 | 2175 | 2900 | <b>17.32</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           | <b>270</b><br><b>2.11</b> |
| 375   | 750  | 1125 | <b>1500</b> | 1875 | 2250 | 3000 | <b>17.91</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           | <b>286</b><br><b>2.18</b> |
| 388   | 775  | 1163 | <b>1550</b> | 1938 | 2325 | 3100 | <b>18.51</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           |                           |
| 400   | 800  | 1200 | <b>1600</b> | 2000 | 2400 | 3200 | <b>19.11</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           |                           |
| 413   | 825  | 1238 | <b>1650</b> | 2063 | 2475 | 3300 | <b>19.70</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           |                           |
| 425   | 850  | 1275 | <b>1700</b> | 2125 | 2550 | 3400 | <b>20.30</b>     | [pa/m]<br>[m/sec]                  |   |             |             |             |              |                           |                           |                           |                           |