

# SCHWARZBECK MESS - ELEKTRONIK

An der Klinge 29 D-69250 Schönau Tel.: 06228/1001 Fax.: (49)6228/1003

## Helmholtz-Spule HHS 5215-100 Helmholtz Coil HHS 5215-100



### Technische Daten:

|  |   |
|--|---|
| Windungszahl (pro Spule):  | 100                                       |
| Maximaler Spulenstrom:   | 20 A, 5 min.                              |
| Spulenstrom, nominell:   | 10 A continuous                           |
| Max. Magn. Feldstärke:   | ca. 2000 A/m<br>max. 5 min., dist. 0.6 m* |
| Magn. Nennfeldstärke:  | 842 A/m continuous                        |
| Spulenabstand für beste<br>Feldhomogenität:                        | 0.84 m*                                   |
| Magn. Feldstärke bei 1 A<br>Spulenstrom (Spulenfaktor):            | 84,2 A/m (Coil dist. 0.84 m*)             |
| Erforderlicher Strom für 100 A/m<br>bei bestmöglicher Homogenität: | 1.19 A (Coil dist. 0.84 m*)               |
| Außenabmessungen:  | 1.69 m x 1.60 m x 1.00 m                  |
| Mittlere elektrische Kantenlänge                                   | 1.533 m                                   |
| Max. Spulenabstand:  | 0.93 m*                                   |
| Nutzbarer Frequenzbereich:   | 0 - 6 kHz                                 |
| Induktivität (pro Spule):  | 52 mH                                     |
| Induktivität (Spulenpaar):   | 112 mH                                    |
| Wirkwiderstand (Spulenpaar):                                       | 9 Ω                                       |
| Resonanzfrequenz (Spulenpaar):                                     | > 20 kHz                                  |
| Gewicht:   | 53 kg                                     |

### Specifications:

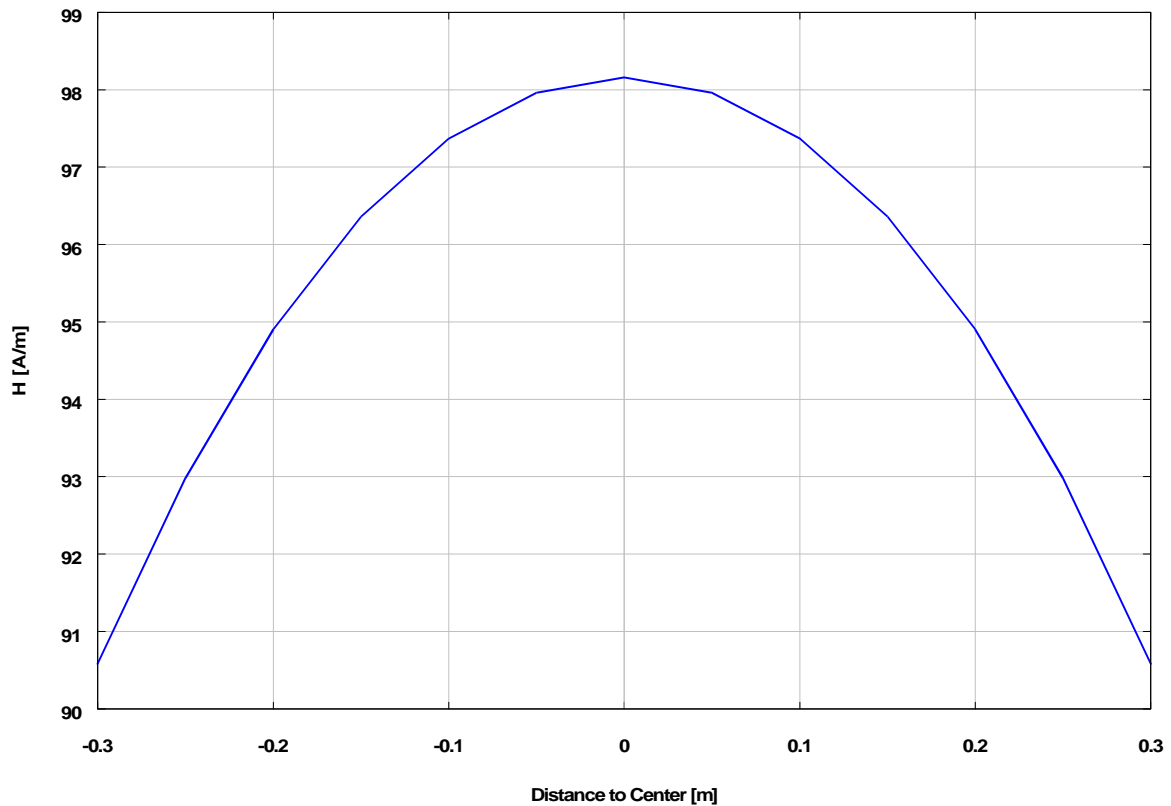
|  |   |
|--|---|
| Number of turns (per Coil):  | 100                                       |
| Maximum coil current:  | 20 A, 5 min.                              |
| Nominal coil current:  | 10 A continuous                           |
| Maximum magnetic field strength:                                     | ca. 2000 A/m<br>max. 5 min., dist. 0.6 m* |
| Nominal magnetic field strength:                                     | 842 A/m continuous                        |
| Coil Separation for best uniformity:                                 | 0.84 m*                                   |
| Magnetic field strength caused by<br>1 A coil current (coil factor): | 84,2 A/m (Coil dist. 0.84 m*)             |
| Current required for 100 A/m at<br>best possible homogeneity:        | 1.19 A (Coil dist. 0.84 m*)               |
| Outer mechanical dimensions:   | 1.69 m x 1.60 m x 1.00 m                  |
| Average electrical side length:                                      | 1.533 m                                   |
| Maximum coil separation:   | 0.93 m*                                   |
| Usable frequency range:  | 0 - 6 kHz                                 |
| Inductance (per coil):   | 52 mH                                     |
| Inductance (Pair of coils):  | 112 mH                                    |
| Resistance (Pair of coils):  | 9 Ω                                       |
| Resonant frequency (Pair of coils):                                  | > 20 kHz                                  |
| Weight:  | 53 kg                                     |

\* Gemessen von Spulenmitte zu Spulenmitte / Measured from coil center to coil center

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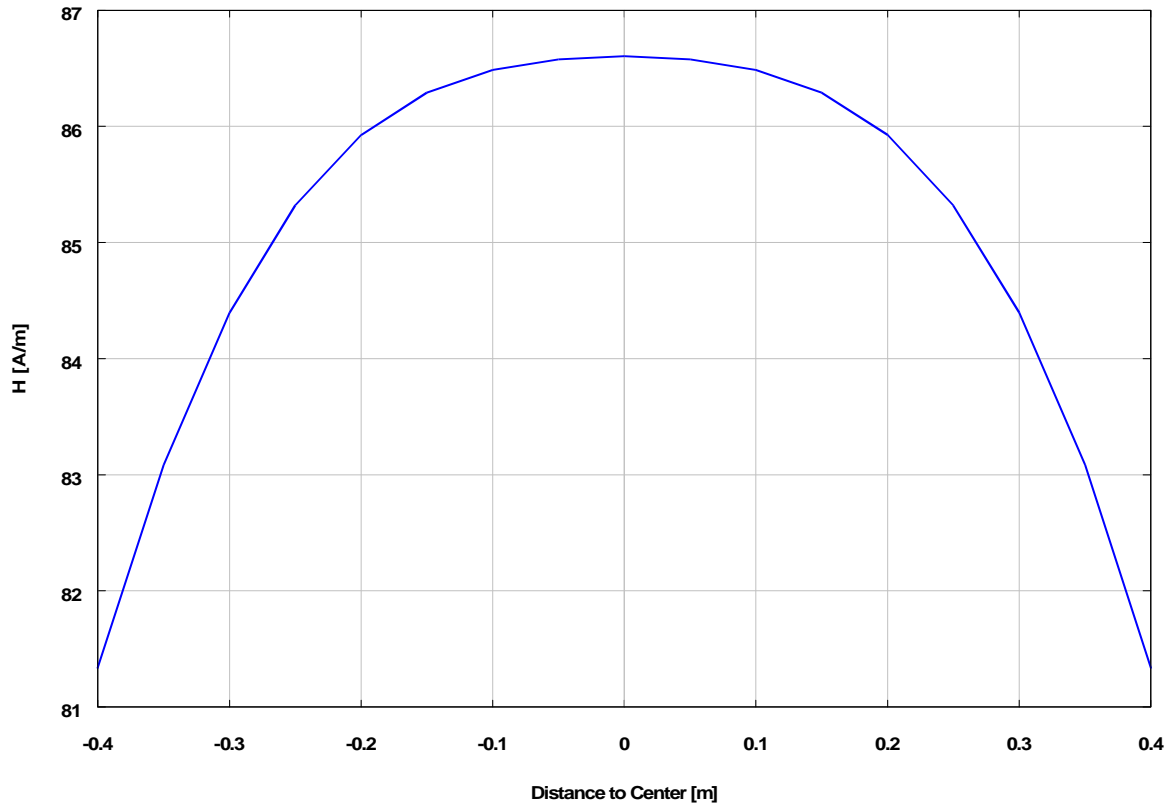


| HHS 5215-100   |         |         |           |            |            |              |
|--|---------|---------|-----------|------------|------------|--------------|
| Spulenabstand <i>Coil Distance</i> 0.6 m, I = 1 A                          |         |         |           |            |            |              |
| Längskomponente der magnetischen Feldstärke entlang der Spulenlängsachse   |         |         |           |            |            |              |
| <i>Magnet. Fieldstrength, longitudinal component along rotational axis</i> |         |         |           |            |            |              |
| Abstand zur Spulenmitte  | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dBµA/m] | H2[dBµA/m] | Hges[dBµA/m] |
| <i>Distance</i>  | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dBµA/m] | H2[dBµA/m] | Hges[dBµA/m] |
| -0.30<br>(Center Coil 2)   | 31,8606 | 58,7214 | 90,5820   | 150,07     | 155,38     | 159,14       |
| -0.25  | 34,5722 | 58,4105 | 92,9827   | 150,77     | 155,33     | 159,37       |
| -0.20  | 37,4094 | 57,4948 | 94,9042   | 151,46     | 155,19     | 159,55       |
| -0.15  | 40,3360 | 56,0224 | 96,3584   | 152,11     | 154,97     | 159,68       |
| -0.10  | 43,3019 | 54,0669 | 97,3688   | 152,73     | 154,66     | 159,77       |
| -0.05  | 46,8049 | 51,7193 | 97,9616   | 153,41     | 154,27     | 159,82       |
| -0.00<br>(Center Plane)  | 49,0784 | 49,0784 | 98,1568   | 153,82     | 153,82     | 159,84       |
| 0,05   | 51,7193 | 46,2423 | 97,9616   | 154,27     | 153,30     | 159,82       |
| 0,10   | 54,0669 | 43,3019 | 97,3688   | 154,66     | 152,73     | 159,77       |
| 0,15   | 56,0224 | 40,3360 | 96,3584   | 154,97     | 152,11     | 159,68       |
| 0,20   | 57,4948 | 37,4094 | 94,9042   | 155,19     | 151,46     | 159,55       |
| 0,25   | 58,4105 | 34,5722 | 92,9827   | 155,33     | 150,77     | 159,37       |
| 0.30<br>(Center Coil 1)  | 58,7214 | 31,8606 | 90,5820   | 155,38     | 150,07     | 159,14       |
| <b>Spulenabstand 0.6 m</b>   |         |         |           |            |            |              |
| <b><i>Coil Distance 0.6 m</i></b>  |         |         |           |            |            |              |

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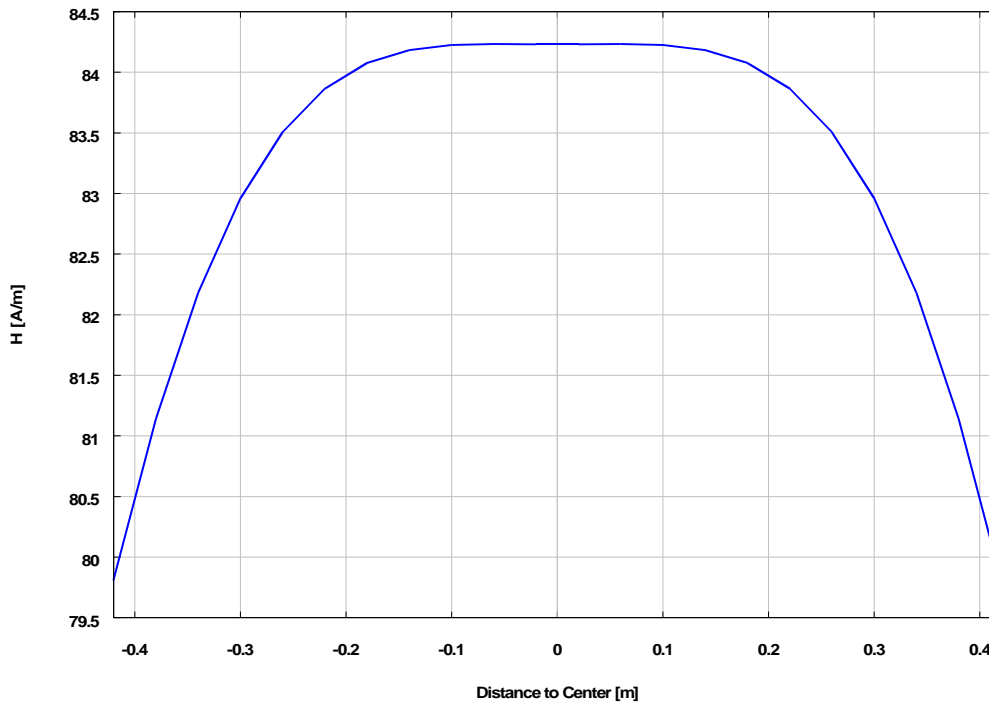


| HHS 5215-100<br>Spulenabstand <i>Coil Distance</i> 0.8 m, <i>I</i> = 1 A<br>Längskomponente der magnetischen Feldstärke entlang der Spulenlängsachse<br>Magnet. Fieldstrength, longitudinal component along rotational axis |         |         |           |            |            |              |
|---|---------|---------|-----------|------------|------------|--------------|
| Abstand zur Spulenmitte   | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dBµA/m] | H2[dBµA/m] | Hges[dBµA/m] |
| <i>Distance</i>   | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dBµA/m] | H2[dBµA/m] | Hges[dBµA/m] |
| -0.40<br>(Center Coil 2)  | 22,6180 | 58,7214 | 81,3393   | 147,09     | 155,38     | 158,21       |
| -0,35   | 24,6744 | 58,4105 | 83,0850   | 147,84     | 155,33     | 158,39       |
| -0,30   | 26,9015 | 57,4948 | 84,3963   | 148,60     | 155,19     | 158,53       |
| -0,25   | 29,2990 | 56,0224 | 85,3214   | 149,34     | 154,97     | 158,62       |
| -0,20   | 31,8606 | 54,0669 | 85,9275   | 150,07     | 154,66     | 158,68       |
| -0,15   | 34,5722 | 51,7193 | 86,2915   | 150,77     | 154,27     | 158,72       |
| -0,10   | 37,4094 | 49,0784 | 86,4878   | 151,46     | 153,82     | 158,74       |
| -0,05   | 40,3360 | 46,2423 | 86,5783   | 152,11     | 153,30     | 158,75       |
| 0.00<br>(Center Plane)  | 43,3019 | 43,3019 | 86,6038   | 152,73     | 152,73     | 158,75       |
| 0,05  | 46,2423 | 40,3360 | 86,5783   | 153,30     | 152,11     | 158,75       |
| 0,10  | 49,0784 | 37,4094 | 86,4878   | 153,82     | 151,46     | 158,74       |
| 0,15  | 51,7193 | 34,5722 | 86,2915   | 154,27     | 150,77     | 158,72       |
| 0,20  | 54,0669 | 31,8606 | 85,9275   | 154,66     | 150,07     | 158,68       |
| 0,25  | 56,0224 | 29,2990 | 85,3214   | 154,97     | 149,34     | 158,62       |
| 0,30  | 57,4948 | 26,9015 | 84,3963   | 155,19     | 148,60     | 158,53       |
| 0,35  | 58,4105 | 24,6744 | 83,0850   | 155,33     | 147,84     | 158,39       |
| 0.40<br>(Center Coil 1)   | 58,7214 | 22,6180 | 81,3393   | 155,38     | 147,09     | 158,21       |
| <b>Spulenabstand 0.8 m<br/>Coil Distance 0.8 m</b>  |         |         |           |            |            |              |

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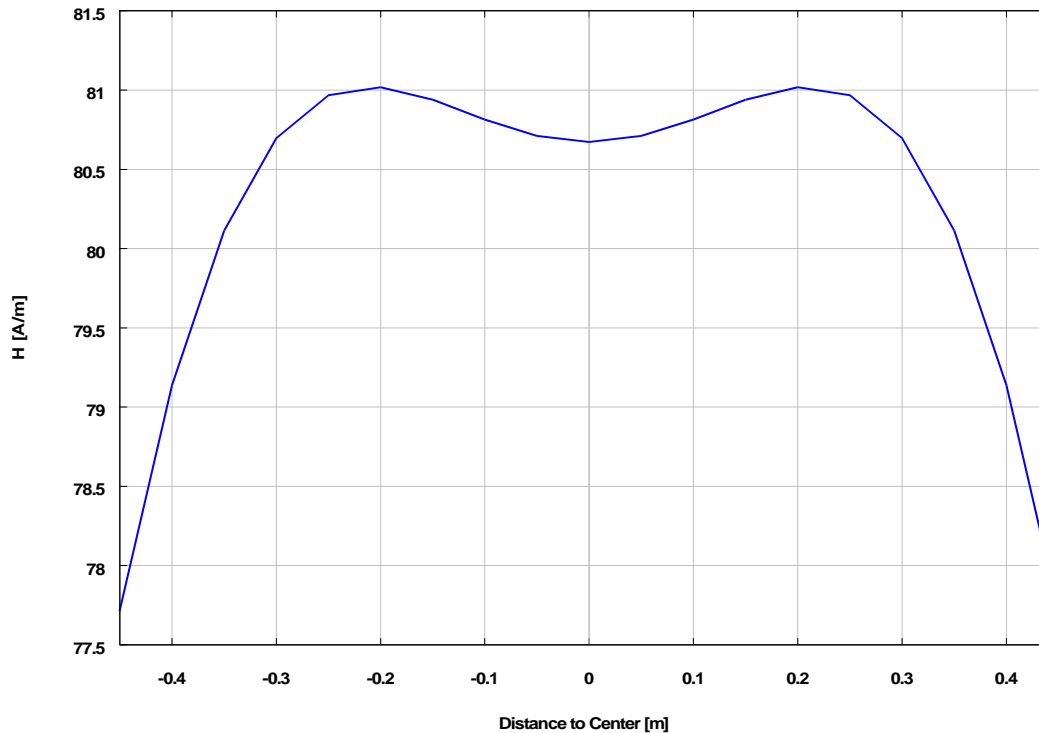


| HHS 5215-100   |         |         |           |                  |                  |                    |
|--|---------|---------|-----------|------------------|------------------|--------------------|
| Spulenabstand <i>Coil Distance</i> 0.84 m, $I = 1$ A                     |         |         |           |                  |                  |                    |
| Längskomponente der magnetischen Feldstärke entlang der Spulenlängsachse |         |         |           |                  |                  |                    |
| Magnet. Fieldstrength, longitudinal component along rotational axis      |         |         |           |                  |                  |                    |
| Abstand zur Spulenmitte  | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dB $\mu$ A/m] | H2[dB $\mu$ A/m] | Hges[dB $\mu$ A/m] |
| <i>Distance</i>  | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dB $\mu$ A/m] | H2[dB $\mu$ A/m] | Hges[dB $\mu$ A/m] |
| -0.42<br>(Center Coil 2)   | 21.0930 | 58.7214 | 79.8143   | 146.48           | 155.38           | 158.04             |
| -0.38  | 22.6180 | 58.5221 | 81.1401   | 147.09           | 155.35           | 158.18             |
| -0.34  | 24.2496 | 57.9313 | 82.1808   | 147.69           | 155.26           | 158.30             |
| -0.30  | 25.9901 | 56.9690 | 82.9591   | 148.30           | 155.11           | 158.38             |
| -0.26  | 27.8403 | 55.6672 | 83.5074   | 148.89           | 154.91           | 158.43             |
| -0.22  | 29.7985 | 54.0669 | 83.8654   | 149.48           | 154.66           | 158.47             |
| -0.18  | 31.8606 | 52.2155 | 84.0761   | 150.07           | 154.36           | 158.49             |
| -0.14  | 34.0189 | 50.1636 | 84.1824   | 150.63           | 154.01           | 158.50             |
| -0.10  | 36.2615 | 47.9621 | 84.2235   | 151.19           | 153.62           | 158.51             |
| -0.06  | 38.5718 | 45.6599 | 84.2317   | 151.73           | 153.19           | 158.51             |
| -0.02  | 40.9279 | 43.3019 | 84.2298   | 152.24           | 152.73           | 158.51             |
| 0.00<br>(Center Plane)   | 42.1146 | 42.1146 | 84.2293   | 152.49           | 152.49           | 158.51             |
| 0.02   | 43.3019 | 40.9279 | 84.2298   | 152.73           | 152.24           | 158.51             |
| 0.06   | 45.6598 | 38.5718 | 84.2317   | 153.19           | 151.73           | 158.51             |
| 0.10   | 47.9621 | 36.2615 | 84.2235   | 153.62           | 151.19           | 158.51             |
| 0.14   | 50.1636 | 34.0189 | 84.1824   | 154.01           | 150.63           | 158.50             |
| 0.18   | 52.2155 | 31.8606 | 84.0761   | 154.36           | 150.07           | 158.49             |
| 0.22   | 54.0669 | 29.7985 | 83.8654   | 154.66           | 149.48           | 158.47             |
| 0.26   | 55.6672 | 27.8403 | 83.5074   | 154.91           | 148.89           | 158.43             |
| 0.30   | 56.9690 | 25.9901 | 82.9591   | 155.11           | 148.30           | 158.38             |
| 0.34   | 57.9313 | 24.2496 | 82.1808   | 155.26           | 147.69           | 158.30             |
| 0.38   | 58.5221 | 22.6180 | 81.1401   | 155.35           | 147.09           | 158.18             |
| 0.42<br>(Center Coil 1)  | 58.7214 | 21.0930 | 79.8143   | 155.38           | 146.48           | 158.04             |
| <b>Spulenabstand 0.84 m</b>  |         |         |           |                  |                  |                    |
| <b>Coil Distance 0.84 m</b>  |         |         |           |                  |                  |                    |

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| HHS 5215-100   |         |         |           |                  |                  |                    |
|--|---------|---------|-----------|------------------|------------------|--------------------|
| Spulenabstand <i>Coil Distance</i> 0.9 m, $I = 1$ A                      |         |         |           |                  |                  |                    |
| Längskomponente der magnetischen Feldstärke entlang der Spulenlängsachse |         |         |           |                  |                  |                    |
| Magnet. Fieldstrength, longitudinal component along rotational axis      |         |         |           |                  |                  |                    |
| Abstand zur Spulenmitte  | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dB $\mu$ A/m] | H2[dB $\mu$ A/m] | Hges[dB $\mu$ A/m] |
| <i>Distance</i>  | H1[A/m] | H2[A/m] | Hges[A/m] | H1[dB $\mu$ A/m] | H2[dB $\mu$ A/m] | Hges[dB $\mu$ A/m] |
| -0.45<br>(Center Coil 2)   | 18.9973 | 58.7214 | 77.7187   | 145.57           | 155.38           | 157.81             |
| -0.40  | 20.7280 | 58.4105 | 79.1385   | 146.33           | 155.33           | 157.97             |
| -0.35  | 22.6180 | 57.4948 | 80.1128   | 147.09           | 155.19           | 158.07             |
| -0.30  | 24.6744 | 56.0224 | 80.6968   | 147.84           | 154.97           | 158.14             |
| -0.25  | 26.9015 | 54.0669 | 80.9684   | 148.60           | 154.66           | 158.17             |
| -0.20  | 29.2990 | 51.7193 | 81.0183   | 149.34           | 154.27           | 158.17             |
| -0.15  | 31.8606 | 49.0784 | 80.9390   | 150.07           | 153.82           | 158.16             |
| -0.10  | 34.5722 | 46.2423 | 80.8145   | 150.77           | 153.30           | 158.15             |
| -0.05  | 37.4094 | 43.3019 | 80.7113   | 151.46           | 152.73           | 158.14             |
| 0.00<br>(Center Plane)   | 40.3360 | 40.3360 | 80.6720   | 152.11           | 152.11           | 158.13             |
| 0.05   | 43.3019 | 37.4094 | 80.7113   | 152.73           | 151.46           | 158.14             |
| 0.10   | 46.2423 | 34.5722 | 80.8145   | 153.30           | 150.77           | 158.15             |
| 0.15   | 49.0784 | 31.8606 | 80.9390   | 153.82           | 150.07           | 158.16             |
| 0.20   | 51.7193 | 29.2990 | 81.0183   | 154.27           | 149.34           | 158.17             |
| 0.25   | 54.0669 | 26.9015 | 80.9684   | 154.66           | 148.60           | 158.17             |
| 0.30   | 56.0224 | 24.6744 | 80.6968   | 154.97           | 147.84           | 158.14             |
| 0.35   | 57.4948 | 22.6180 | 80.1128   | 155.19           | 147.09           | 158.07             |
| 0.40   | 58.4105 | 20.7280 | 79.1385   | 155.33           | 146.33           | 157.97             |
| 0.45<br>(Center Coil 1)  | 58.7214 | 18.9973 | 77.7187   | 155.38           | 145.57           | 157.81             |
| <b>Spulenabstand 0.9 m</b>   |         |         |           |                  |                  |                    |
| <b>Coil Distance 0.9 m</b>   |         |         |           |                  |                  |                    |