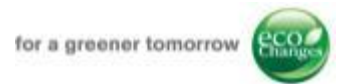


Product information



December 2010

Contact: Oliver Endres
+49(0)2102/486-9710

FFR-HEL-(H)-E DC-choke

Herewith we would like to inform you about the new compact DC-choke generation FFR-HEL-(H)-E.

Our new flexible and compact DC-choke is available for all 700series Inverter (1/3~200/ 3~400V) from 0,4 to 55kW. Above 55kW you will find the MT-HEL DC-chokes included as standard in the box.

For quick and easy installation, all chokes have standardised body sizes and isolated screw clamps.

The advantage of the potted versions is a smaller size. Each type becomes one size smaller than air cooled chokes,

because of the better heat dissipation caused by the polyurethane polyamide sealing. Picture 1: 18.5kW, 400V type



Energy saving advantages:

- By using this DC-choke the Inverter complies with EN 61000-3-12 Harmonic standard.
- Tests have shown that using a FFR-HEL-(H)-E DC-choke can shorten the energy consumption of the Mitsubishi Inverter by 34%.

The chokes have IP20 protection (400V: 0.4 to 37kW and 200V: 0.4 to 22kW; others have IP00) and they are produced according to UL- and RoHS-standard. Rated temperature is 50°C.

The FFR-HEL-(H)-E will be available from stock as standard product from January 2010.

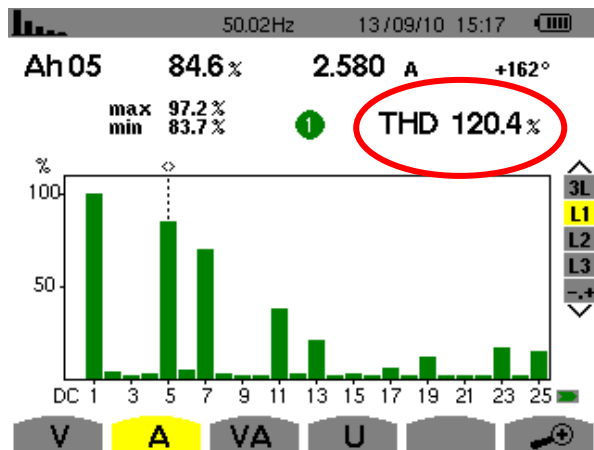
Find below the FFR-HEL types including list prices and article numbers:

| FFR-HEL-H (400V) | | |
|------------------|------------------|----------|
| Motor Power | Type | SAP Code |
| 0,4 kW | FFR-HEL-H0.4K-E | 238342 |
| 0,75 kW | FFR-HEL-H0.75K-E | 238343 |
| 1,5 kW | FFR-HEL-H1.5K-E | 238344 |
| 2,2 kW | FFR-HEL-H2.2K-E | 238345 |
| 3,7 kW | FFR-HEL-H3.7K-E | 238346 |
| 5,5 kW | FFR-HEL-H5.5K-E | 238347 |
| 7,5 kW | FFR-HEL-H7.5K-E | 238348 |
| 11 kW | FFR-HEL-H11K-E | 238349 |
| 15 kW | FFR-HEL-H15K-E | 238350 |
| 18,5 kW | FFR-HEL-H18.5K-E | 238351 |
| 22 kW | FFR-HEL-H22K-E | 238352 |
| 30 kW | FFR-HEL-H30K-E | 238353 |
| 37 kW | FFR-HEL-H37K-E | 238354 |
| 45 kW | FFR-HEL-H45K-E | 238355 |
| 55 kW | FFR-HEL-H55K-E | 238356 |

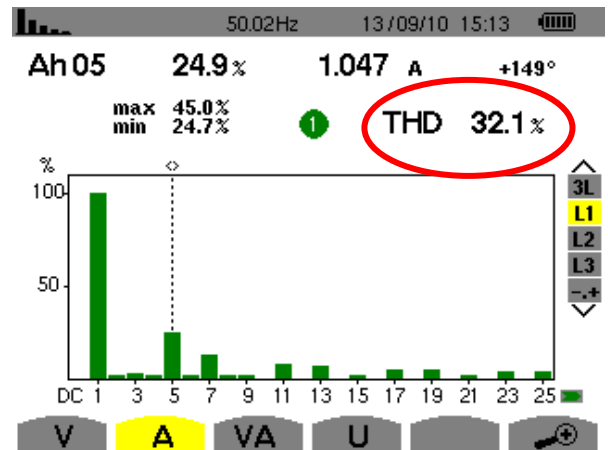
| FFR-HEL (1-/3-phase, 200V) | | |
|----------------------------|-----------------|----------|
| Motor Power | Type | SAP Code |
| 0,4 kW | FFR-HEL-0.4K-E | 238357 |
| 0,75 kW | FFR-HEL-0.75K-E | 238358 |
| 1,5 kW | FFR-HEL-1.5K-E | 238359 |
| 2,2 kW | FFR-HEL-2.2K-E | 238360 |
| 3,7 kW | FFR-HEL-3.7K-E | 238361 |
| 5,5 kW | FFR-HEL-5.5K-E | 238362 |
| 7,5 kW | FFR-HEL-7.5K-E | 238363 |
| 11 kW | FFR-HEL-11K-E | 238364 |
| 15 kW | FFR-HEL-15K-E | 238365 |
| 18,5 kW | FFR-HEL-18.5K-E | 238366 |
| 22 kW | FFR-HEL-22K-E | 238367 |
| 30 kW | FFR-HEL-30K-E | 238368 |
| 37 kW | FFR-HEL-37K-E | 238369 |
| 45 kW | FFR-HEL-45K-E | 238370 |
| 55 kW | FFR-HEL-55K-E | 238371 |

Performance benefits by using our new DC-choke: (left without choke; right with choke)

Total harmonic distortion (THDI):

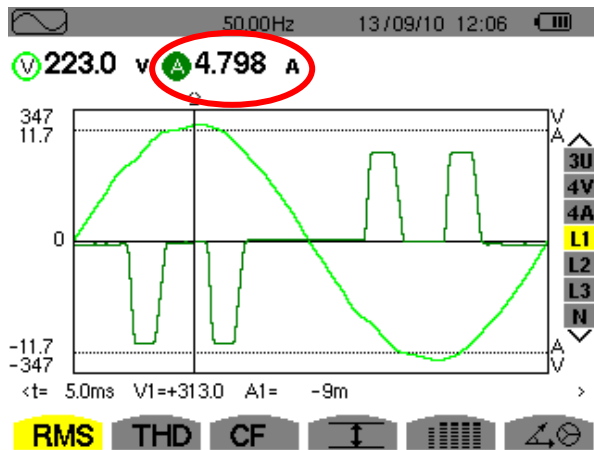


Picture 1: THDI without choke

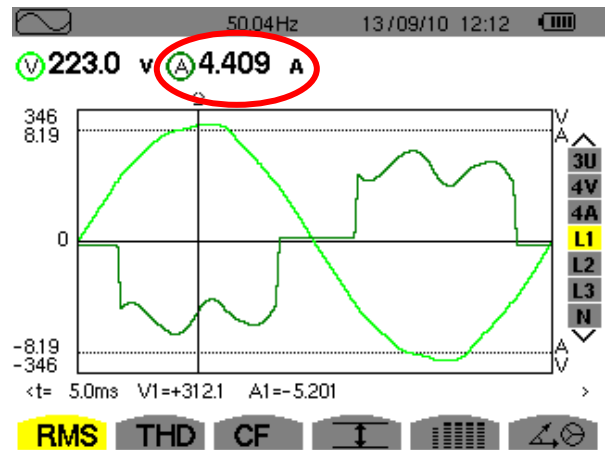


Picture 3: THDI with DC-choke

Input current wave form:



Picture 4: Input current without choke



Picture 5: Input current with DC-choke

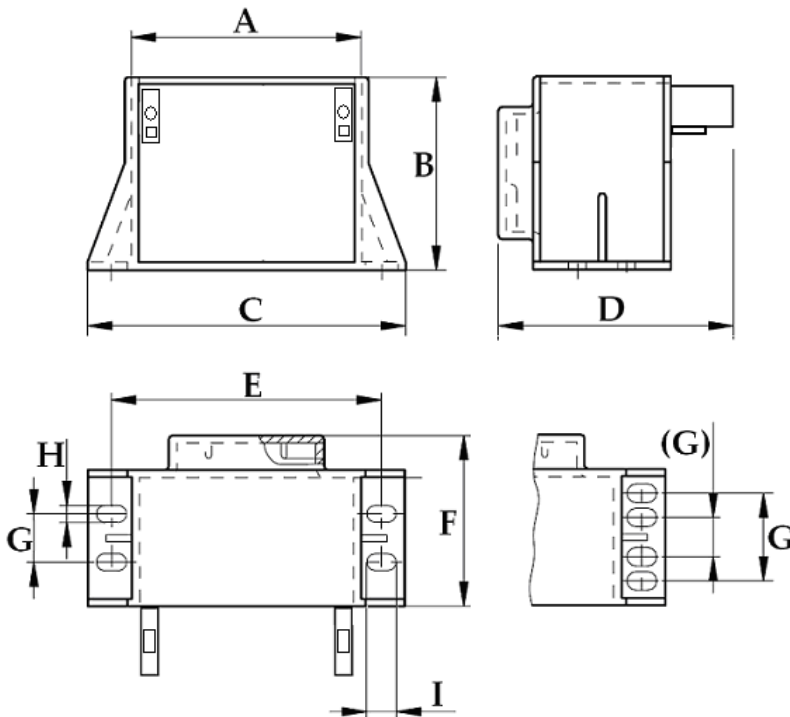
You can see the better harmonic performance and a smoothed DC-current wave form on a 2.2kW drive.

Documentation:

For further information see the summary of the [Measurement data](#) on Confidential Homepage.

Dimensions:

Drowned types (IP20):



Picture 6: DC-choke, drowned type

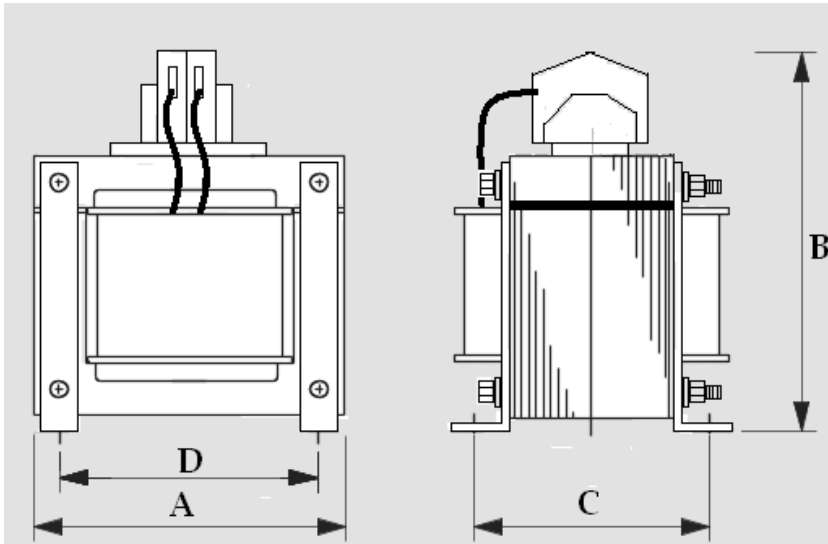
| Voltage type | DC-choke | A | B | C | D | E | F | G | H | I | Weight (kg) | Type of clamp |
|-----------------|------------------|-------|-------|-------|------|-------|-------|------|-----|------|-------------|---------------|
| 400V drowned | FFR-HEL-H0.4K-E | 51 | 43 | 75 | 60 | 62 | 38,6 | 12 | 3,5 | 6,7 | 0,35 | TK4 |
| | FFR-HEL-H0.75K-E | 63,5 | 53,5 | 88 | 70 | 75 | 48 | 13,5 | 5 | 9 | 0,6 | TK4 |
| | FFR-HEL-H1.5K-E | 63,5 | 53,5 | 88 | 70 | 75 | 48 | 13,5 | 5 | 9 | 0,61 | TK4 |
| | FFR-HEL-H2.2K-E | 82,5 | 71,5 | 112,5 | 81 | 97,5 | 59 | 32,5 | 5,2 | 10 | 1,2 | TK4 |
| | FFR-HEL-H3.7K-E | 82,5 | 71,5 | 112,5 | 81 | 97,5 | 59 | 32,5 | 5,2 | 10 | 1,2 | TK4 |
| | FFR-HEL-H5.5K-E | 89,2 | 74,7 | 120 | 85,5 | 102,5 | 63,8 | 32,5 | 5,5 | 10,2 | 1,5 | TK4 |
| | FFR-HEL-H7.5K-E | 89,2 | 74,7 | 120 | 100 | 102,5 | 77,8 | 45 | 5,5 | 10,2 | 2,2 | TK4 |
| | FFR-HEL-H11K-E | 101,5 | 85 | 133,2 | 112 | 115 | 84,6 | 50 | 5,5 | 10,2 | 3,1 | TK10 |
| | FFR-HEL-H15K-E | 101,5 | 85 | 133,2 | 112 | 115 | 84,6 | 50 | 5,5 | 10,2 | 3 | TK10 |
| | FFR-HEL-H18.5K-E | 101,5 | 85,2 | 133,2 | 128 | 115 | 98,5 | 64 | 5,5 | 10,2 | 4 | RK16 |
| | FFR-HEL-H22K-E | 127 | 106,8 | 172 | 166 | 150 | 108,5 | 65 | 8,5 | 8,5 | 5,3 | RK35 |
| FFR-HEL-H30K-E | 127 | 106,8 | 172 | 166 | 150 | 108,5 | 65 | 8,5 | 8,5 | 5,5 | RK35 | |
| FFR-HEL-H37K-E | 127 | 106,8 | 172 | 186 | 150 | 128,5 | 85 | 8,5 | 8,5 | 8 | RK35 | |

| Voltage type | DC-choke | A | B | C | D | E | F | G | H | I | Weight (kg) | Type of clamp |
|-----------------|-----------------|-------|-------|-------|------|-------|-------|------|-----|------|-------------|---------------|
| 200V drowned | FFR-HEL-0.4K-E | 63,5 | 53,5 | 88 | 70 | 75 | 48 | 13,5 | 5 | 9 | 0,6 | TK4 |
| | FFR-HEL-0.75K-E | 63,5 | 53,5 | 88 | 70 | 75 | 48 | 13,5 | 5 | 9 | 0,6 | TK4 |
| | FFR-HEL-1.5K-E | 82,5 | 71,5 | 112,5 | 81 | 97,5 | 59 | 32,5 | 5,2 | 10 | 1,2 | TK4 |
| | FFR-HEL-2.2K-E | 82,5 | 71,5 | 112,5 | 81 | 97,5 | 59 | 32,5 | 5,2 | 10 | 1,2 | TK4 |
| | FFR-HEL-3.7K-E | 89,2 | 74,7 | 120 | 85,5 | 102,5 | 63,8 | 32,5 | 5,5 | 10,2 | 1,5 | TK4 |
| | FFR-HEL-5.5K-E | 101,5 | 85 | 133,2 | 112 | 115 | 84,6 | 50 | 5,5 | 10,2 | 3,1 | TK10 |
| | FFR-HEL-7.5K-E | 101,5 | 85 | 133,2 | 112 | 115 | 84,6 | 50 | 5,5 | 10,2 | 3,1 | RK16 |
| | FFR-HEL-11K-E | 101,5 | 85 | 133,2 | 102 | 115 | 84,6 | 50 | 5,5 | 10,2 | 3,1 | RK16 |
| | FFR-HEL-15K-E | 101,5 | 85,2 | 133,2 | 156 | 115 | 98,5 | 64 | 5,5 | 10,2 | 4 | RK35 |
| | FFR-HEL-18.5K-E | 101,5 | 85,2 | 133,2 | 163 | 115 | 98,5 | 64 | 5,5 | 10,2 | 4 | RK50 |
| | FFR-HEL-22K-E | 127 | 106,8 | 172 | 144 | 150 | 108,5 | 65 | 8,5 | 8,5 | 5,5 | RK50 |

for a greener tomorrow



Open types (IP00):

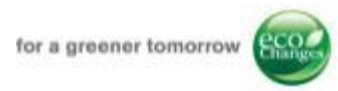
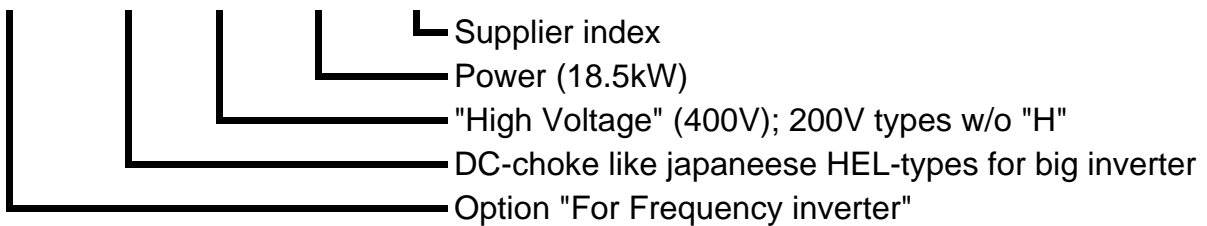


Picture 7: DC-choke, open type

| Voltage type | DC-choke | A | B | C | D | Weight (kg) | Type of clamp |
|--------------|----------------|-----|-----|-----|-----|-------------|---------------|
| 400V open | FFR-HEL-H45K-E | 150 | 202 | 114 | 125 | 11,3 | RK50 |
| | FFR-HEL-H55K-E | 150 | 212 | 134 | 125 | 14,4 | RK95 |

| Voltage type | DC-choke | A | B | C | D | Weight (kg) | Type of clamp |
|--------------|---------------|-----|-----|-----|-----|-------------|---------------|
| 200V open | FFR-HEL-30K-E | 150 | 237 | 94 | 125 | 8,2 | RK95 |
| | FFR-HEL-37K-E | 150 | 237 | 114 | 125 | 10,7 | RK95 |
| | FFR-HEL-45K-E | 150 | 237 | 114 | 125 | 10,7 | RK95 |
| | FFR-HEL-55K-E | 150 | 237 | 134 | 125 | 14,4 | RK95 |

FFR- HEL- H 18.5K- E



Inverter /// Inverter /// Inverter /// Inverter /// Inverter /// Inverter /// Inverter /// Inverter /// Inverter /// Inverter ///

| Motor power | DC-Choke | Art.Nr. | Size | L [mH] | I [A] | Type | Inverter | Art.Nr. |
|-------------|-----------------|---------|------------|--------|-------|----------------------------|--|--|
| 200V | | | | | | | | |
| 0,4k | FFR-HEL-0.4K-E | 238357 | EI 60/21 | 17 | 2,1 | drowned type IP20 | FR-D720-0.4K FR-D720S-025-EC FR-E720-0.4K FR-E720S-030-EC FR-A720-0.4k | 217401 214191 202362 217895 169745 |
| 0,75k | FFR-HEL-0.75K-E | 238358 | EI 60/21 | 9,7 | 3,6 | | FR-D720-0.75K FR-D720S-042-EC FR-E720-0.75K FR-E720S-050-EC FR-F720-0,75k FR-A720-0,75k | 217402 214192 202363 217896 194686 169746 |
| 1,5k | FFR-HEL-1.5K-E | 238359 | EI 78/27 | 4,3 | 7,3 | | FR-D720-1.5K FR-D720S-070-EC FR-E720-1.5K FR-E720S-080-EC FR-F720-1,5k FR-A720-1,5k | 217403 214193 202364 217897 194687 165014 |
| 2,2k | FFR-HEL-2.2K-E | 238360 | EI 78/27 | 3,1 | 10,5 | | FR-D720-2.2K FR-D720S-100-EC FR-E720-2.2K FR-E720S-110-EC FR-F720-2,2k FR-A720-2,2k | 217404 214194 202365 217898 194688 165015 |
| 3,7k | FFR-HEL-3.7K-E | 238361 | EI 84/29 | 1,77 | 17 | | FR-A720-3,7k FR-F720-3,7k FR-E720-3.7K FR-D720-3.7K | 165016 194689 202366 217415 |
| 5,5k | FFR-HEL-5.5K-E | 238362 | EI 96/45 | 1,25 | 25 | | FR-A720-5,5k FR-F720-5,5k FR-E720-5.5K FR-D720-5.5K | 165017 160810 202367 217416 |
| 7,5k | FFR-HEL-7.5K-E | 238363 | EI 96/45 | 0,77 | 34 | | FR-A720-7.5K FR-F720-7.5K FR-E720-7.5K FR-D720-7.5K | 169747 194690 202368 217417 |
| 11k | FFR-HEL-11K-E | 238364 | EI 96/45 | 0,6 | 48 | | FR-A720-11K FR-F720-11K FR-E720-11K | 169748 194691 202369 |
| 15k | FFR-HEL-15K-E | 238365 | EI 96/59 | 0,4 | 64,7 | | FR-A720-15K FR-F720-15K FR-E720-15K | 169749 194692 202370 |
| 18,5k | FFR-HEL-18.5K-E | 238366 | EI 96/59 | 0,35 | 80 | | FR-A720-18.5K FR-F720-18.5K | 169750 194693 |
| 22k | FFR-HEL-22K-E | 238367 | EI 120/53 | 0,3 | 95 | | FR-A720-22K FR-F720-22K | 169751 194714 |
| 30k | FFR-HEL-30K-E | 238368 | EI 150N/50 | 0,23 | 129 | | FR-A720-30K FR-F720-30K | 169752 194715 |
| 37k | FFR-HEL-37K-E | 238369 | EI 150N/70 | 0,2 | 158 | | FR-A720-37K FR-F720-37K | 169753 194716 |
| 45k | FFR-HEL-45K-E | 238370 | EI 150N/70 | 0,16 | 190 | | FR-A720-45K FR-F720-45K | 169754 194717 |
| 55k | FFR-HEL-55K-E | 238371 | EI 150N/90 | 0,13 | 233 | FR-A720-55K FR-F720-55K | 169755 194718 | |

| Motor power | DC-Choke | Art.Nr. | Size | L [mH] | I [A] | Type | Inverter | Art.Nr. |
|-------------|------------------|---------|------------|--------|-------|-------------------|--|--------------------------------------|
| 400V | | | | | | | | |
| 0.4k | FFR-HEL-H0.4K-E | 238342 | EI 48/16 | 88 | 0,9 | drowned type IP20 | FR-A740-00023-EC FR-E740-016-EC FR-D740-012-EC | 169826 211955 212414 |
| 0.75k | FFR-HEL-H0.75K-E | 238343 | EI 60/21 | 46,9 | 1,6 | | FR-A740-00038-EC FR-F740-00023-EC FR-E740-026-EC FR-D740-022-EC | 169797 156569 211956 212415 |
| 1.5k | FFR-HEL-H1.5K-E | 238344 | EI 60/21 | 20,5 | 3,1 | | FR-A740-00052-EC FR-F740-00038-EC FR-E740-040-EC FR-D740-036-EC | 169798 156570 211957 212416 |
| 2.2k | FFR-HEL-H2.2K-E | 238345 | EI78/27 | 14,2 | 4,4 | | FR-A740-00083-EC FR-F740-00052-EC FR-E740-060-EC FR-D740-050-EC | 169799 156571 211958 212417 |
| 3.7k | FFR-HEL-H3.7K-E | 238346 | EI 78/27 | 8,81 | 7,1 | | FR-A740-00126-EC FR-F740-00083-EC FR-E740-095-EC FR-D740-080-EC | 169800 156572 211959 212418 |
| 5.5k | FFR-HEL-H5.5K-E | 238347 | EI 84/29 | 4,74 | 10,5 | | FR-A740-00170-EC FR-F740-00126-EC FR-E740-120-EC FR-D740-120-EC | 169801 156573 211960 212419 |
| 7.5k | FFR-HEL-H7.5K-E | 238348 | EI 84/43 | 3,55 | 14 | | FR-A740-00250-EC FR-F740-00170-EC FR-E740-170-EC FR-D740-160-EC | 169802 156594 211961 212420 |
| 11k | FFR-HEL-H11K-E | 238349 | EI 96/45 | 2,58 | 20,5 | | FR-A740-00310-EC FR-F740-00250-EC FR-E740-230-EC | 169803 156595 211962 |
| 15k | FFR-HEL-H15K-E | 238350 | EI 96/45 | 1,97 | 27,5 | | FR-A740-00380-EC FR-F740-00310-EC FR-E740-300-EC | 169804 156596 211963 |
| 18.5k | FFR-HEL-H18.5K-E | 238351 | EI 96/59 | 1,76 | 34 | | FR-A740-00470-EC FR-F740-00380-EC | 169805 156597 |
| 22k | FFR-HEL-H22K-E | 238352 | EI 120/53 | 1,35 | 40,5 | | FR-A740-00620-EC FR-F740-00470-EC | 169806 156598 |
| 30k | FFR-HEL-H30K-E | 238353 | EI 120/53 | 1,06 | 55 | | FR-A740-00770-EC FR-F740-00620-EC | 169807 156599 |
| 37k | FFR-HEL-H37K-E | 238354 | EI 120/73 | 1 | 68 | | FR-A740-00930-EC FR-F740-00770-EC | 169808 156600 |
| 45k | FFR-HEL-H45K-E | 238355 | EI 150N/70 | 0,84 | 82 | | FR-A740-01160-EC FR-F740-00930-EC | 169809 156601 |
| 55k | FFR-HEL-H55K-E | 238356 | EI 150N/90 | 0,68 | 99 | | FR-A740-01800-EC FR-F740-01160-EC | 169810 156602 |