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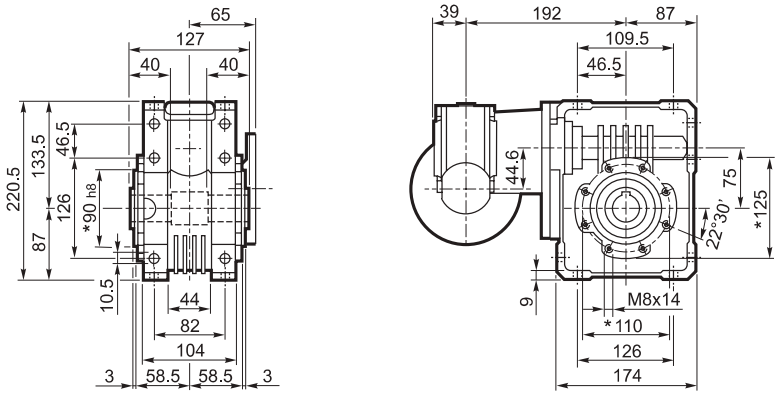
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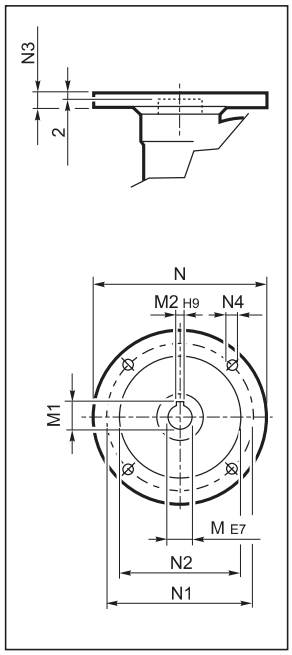
Find the *Bonfiglioli W63UP71B14* at our website: *Click HERE*

# VF/W 44/75...P (IEC)

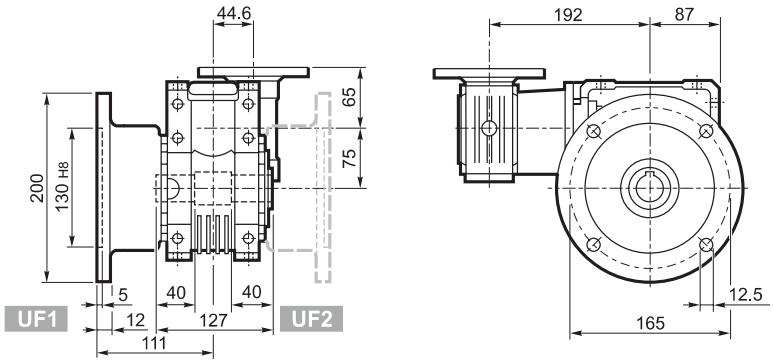
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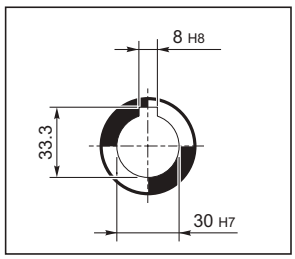

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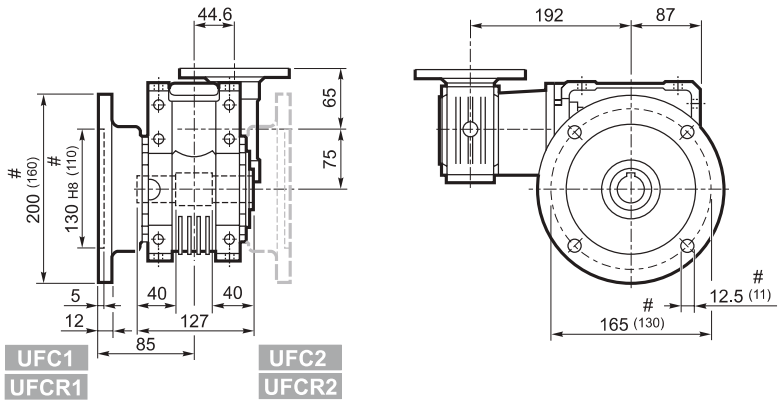

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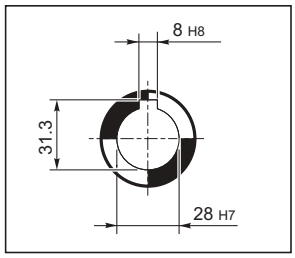

**STANDARD OUTPUT**




**UFC_**
**UFCR_#**




**ON REQUEST OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF/W 44/75** | **P63 B5** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10 | 9.5 | 12.5 |
| **VF/W 44/75** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | 9.5 | |
| **VF/W 44/75** | **P63 B14** | 11 | 12.8 | 4 | 90 | 75 | 60 | 8 | 5.5 | |
| **VF/W 44/75** | **P71 B14** | 14 | 16.3 | 5 | 105 | 85 | 70 | 10 | 7 | |

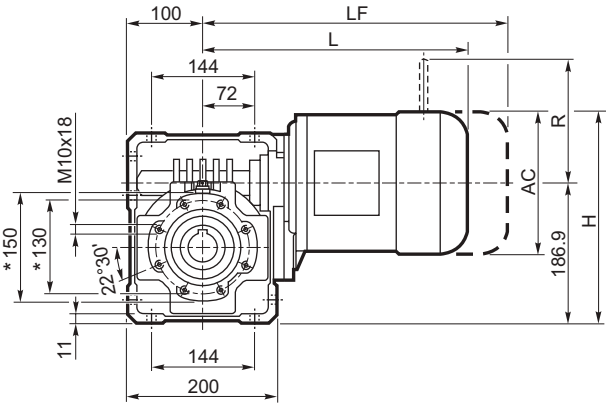
* On both sides  # Reduced flange

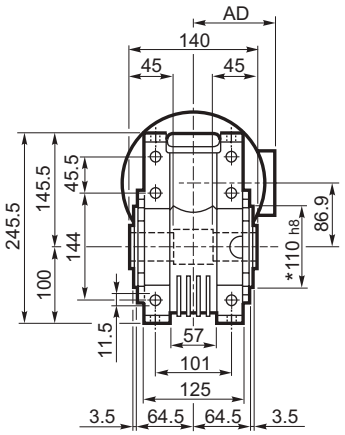



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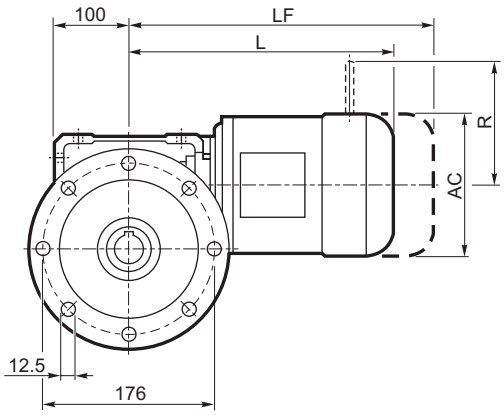
# W 86...M

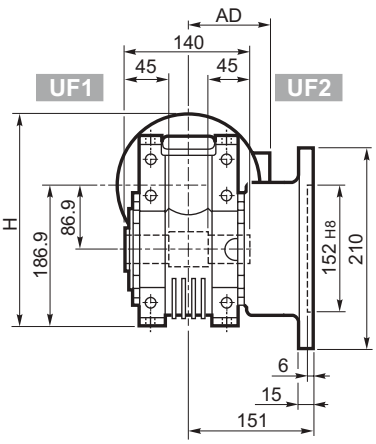
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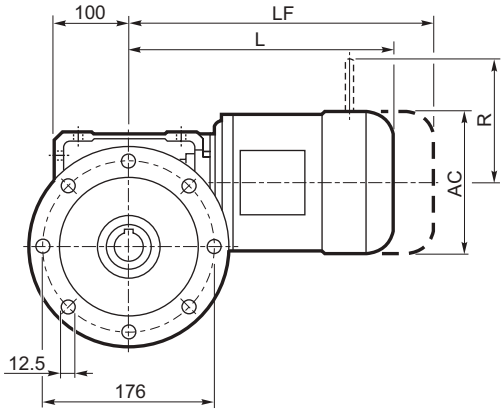



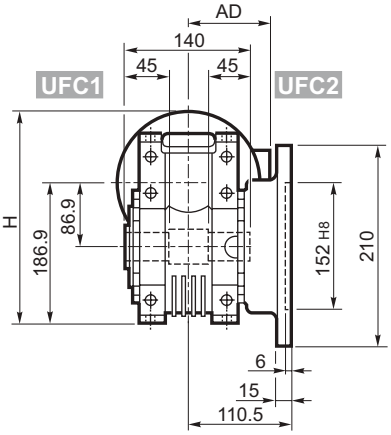

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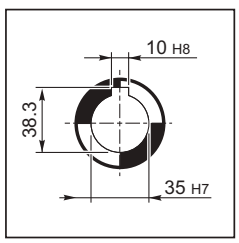

**UFC_**




| | | | M_ | | | | | M...FD M...FA | | M...FD | | M...FA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AC | H | L | AD | Kg | LF | Kg | R | AD | R | AD |
| **W 86** | **S1** | **M1** | 138 | 256 | 324 | 108 | 20.1 | 385 | 22.3 | 103 | 135 | 124 | 108 |
| **W 86** | **S2** | **M2S** | 156 | 265 | 349 | 119 | 22.6 | 425 | 25.7 | 129 | 146 | 134 | 119 |
| **W 86** | **S3** | **M3S** | 193 | 283.5 | 392 | 142 | 29.7 | 488 | 35 | 160 | 158 | 160 | 142 |
| **W 86** | **S3** | **M3L** | 193 | 283.5 | 424 | 142 | 33 | 515 | 36 | 160 | 158 | 160 | 142 |

**OUTPUT**



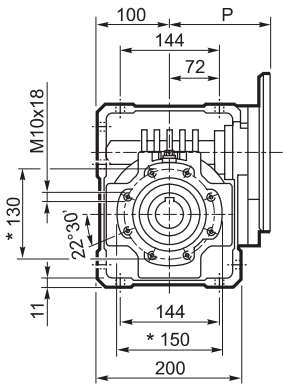

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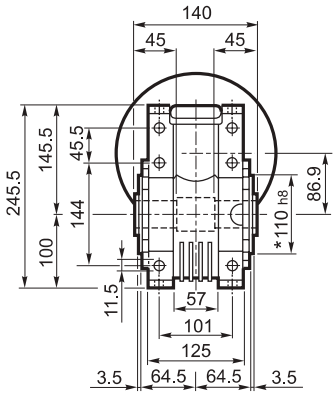


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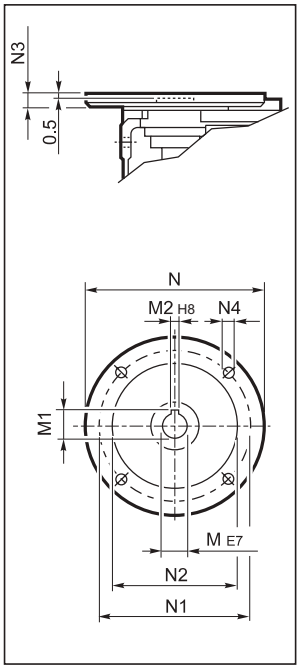
# W 86...P (IEC)

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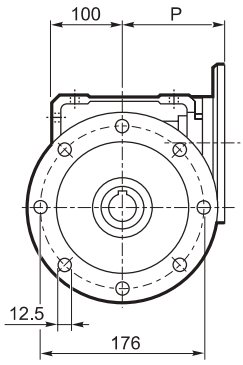


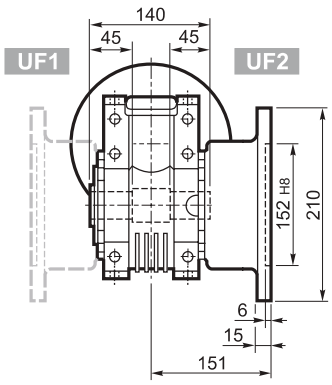




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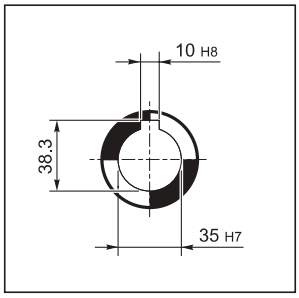



**UF_**

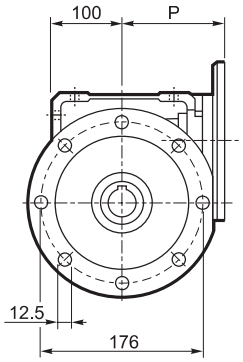


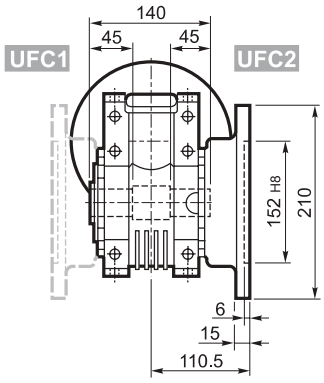




**OUTPUT**




**UFC_**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **W 86** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 128 | 13.6 |
| **W 86** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 128 | 13.8 |
| **W 86** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 128 | 13.7 |
| **W 86** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 12.5 | 136 | 13.8 |
| **W 86** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 12.5 | 136 | 13.8 |
| **W 86** | **P80 B14** | 19 | 21.8 | 6 | 120 | 100 | 80 | 7.5 | 6.5 | 128 | 13.5 |
| **W 86** | **P90 B14** | 24 | 27.3 | 8 | 140 | 115 | 95 | 7.5 | 8.5 | 128 | 13.5 |
| **W 86** | **P100 B14** | 28 | 31.3 | 8 | 160 | 130 | 110 | 10 | 8.5 | 136 | 13.6 |
| **W 86** | **P112 B14** | 28 | 31.3 | 8 | 160 | 130 | 110 | 10 | 8.5 | 136 | 13.6 |

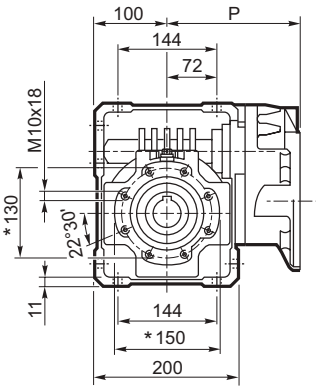
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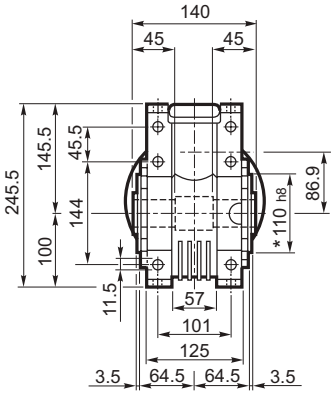


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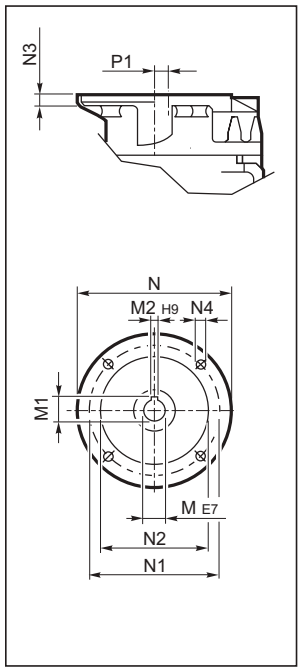
# WR 86...P (IEC)

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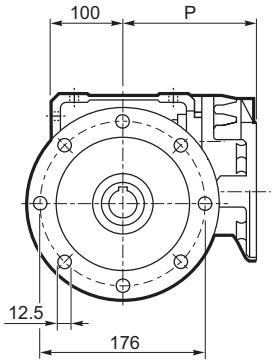


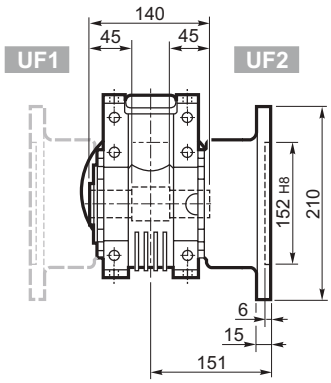




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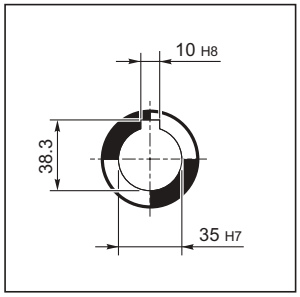



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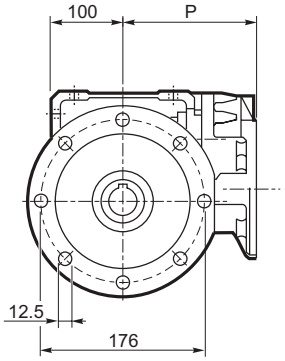


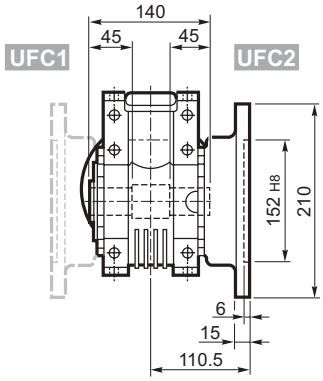




**OUTPUT**




**UFC_**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | P1 | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **WR 86** | **P63 B5** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10 | M8x10 | 168 | 35.4 | 14.3 |
| **WR 86** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | M8x10 | 168 | 35.4 | 14.4 |
| **WR 86** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 | 15.2 |
| **WR 86** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 | 15.3 |

* On both sides

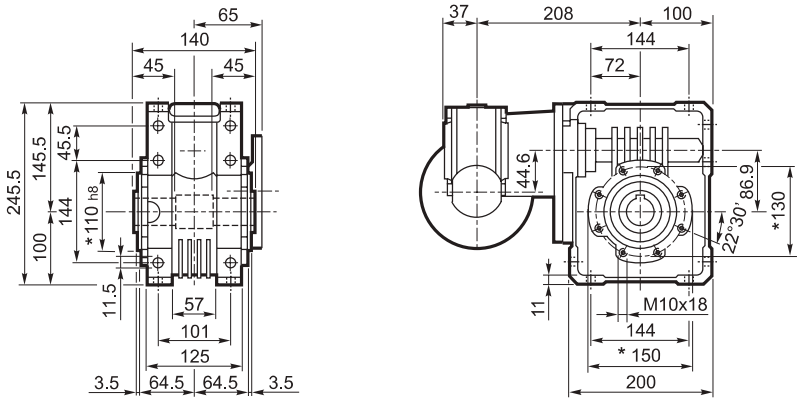


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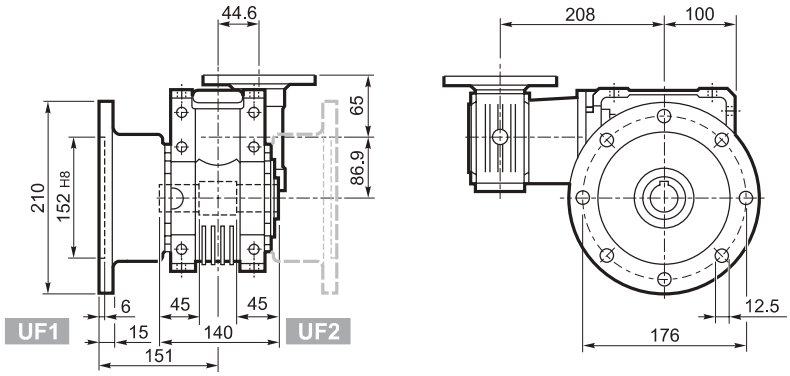
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# VF/W 44/86... P (IEC)

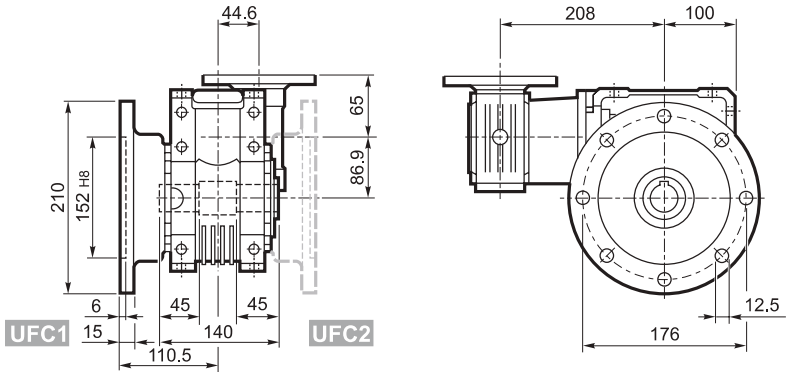
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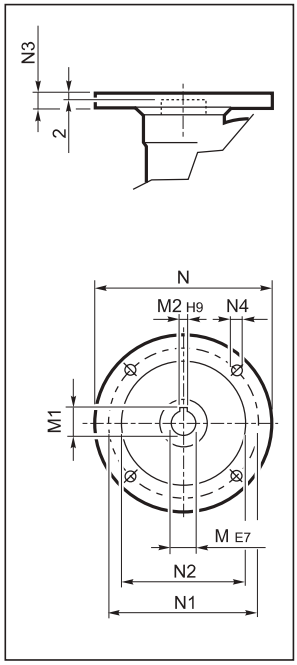

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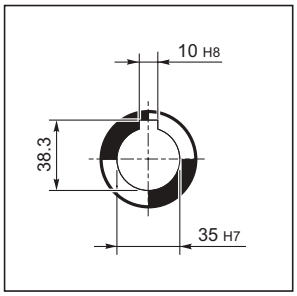

**UFC_**




**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF/W 44/86** | **P63 B5** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10 | 9.5 | 16.6 |
| **VF/W 44/86** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | 9.5 | |
| **VF/W 44/86** | **P63 B14** | 11 | 12.8 | 4 | 90 | 75 | 60 | 8 | 5.5 | |
| **VF/W 44/86** | **P71 B14** | 14 | 16.3 | 5 | 105 | 85 | 70 | 10 | 7 | |

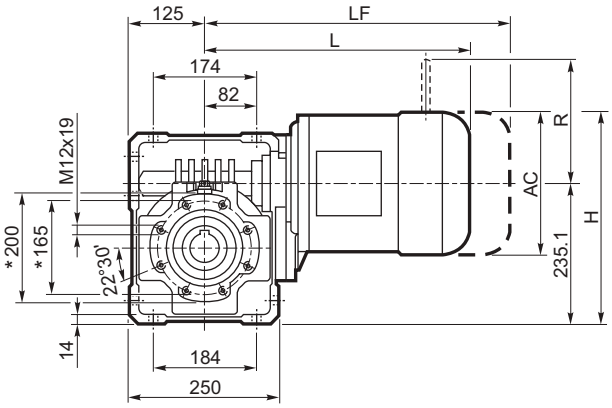
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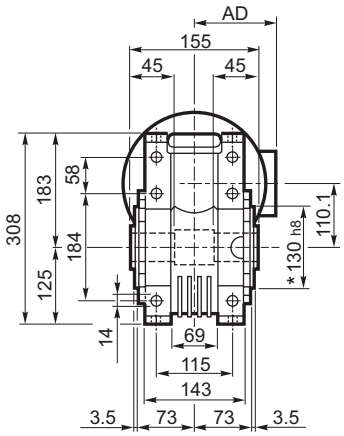



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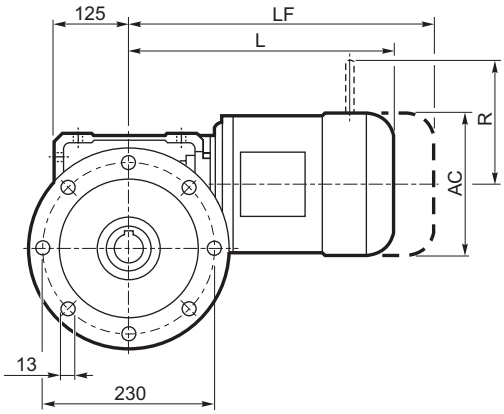
# W 110...M

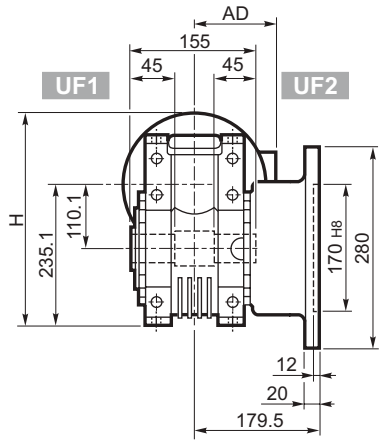
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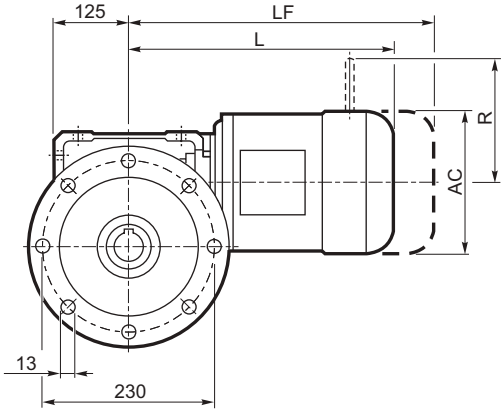



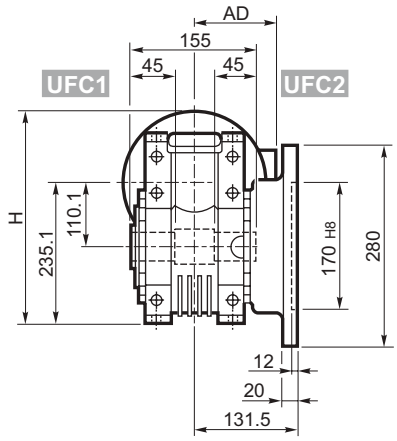

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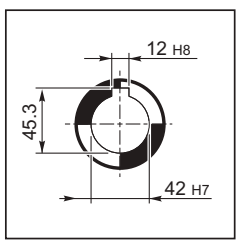

**UFC_**




| | | | M_ | | | | | M...FD M...FA | | M...FD | | M...FA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AC | H | L | AD | Kg | LF | Kg | R | AD | R | AD |
| **W 110** | **S2** | **M2S** | 156 | 313 | 364 | 119 | 38 | 440 | 41 | 129 | 146 | 134 | 119 |
| **W 110** | **S3** | **M3S** | 193 | 332 | 407 | 142 | 46 | 503 | 50 | 160 | 158 | 160 | 142 |
| **W 110** | **S3** | **M3L** | 193 | 332 | 439 | 142 | 48 | 530 | 53 | 160 | 158 | 160 | 142 |

**OUTPUT**



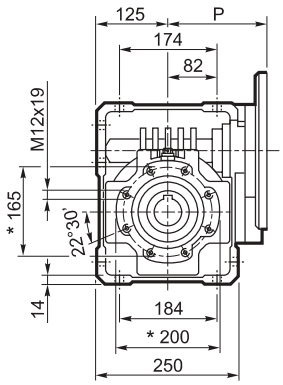

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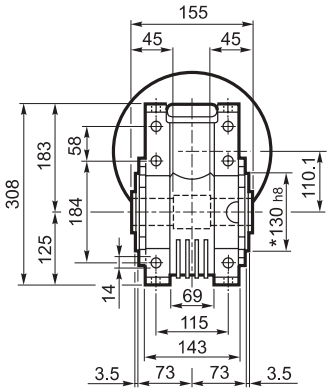


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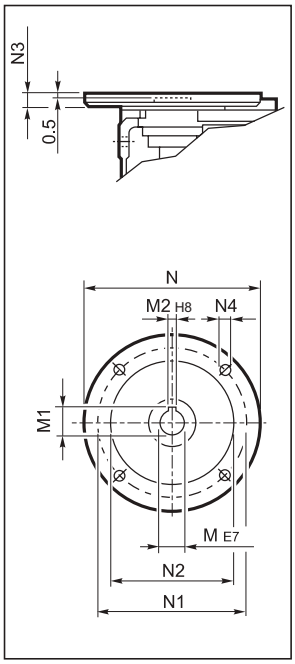
# W 110...P (IEC)

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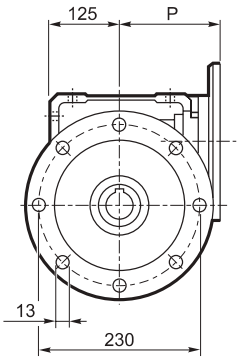


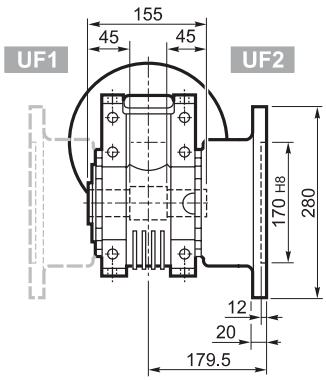




**INPUT**

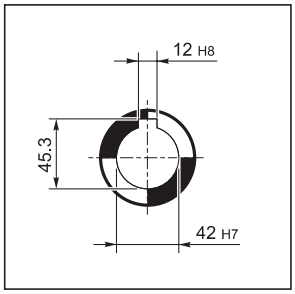



**UF_**

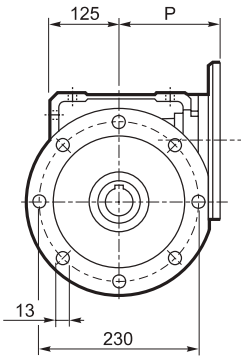


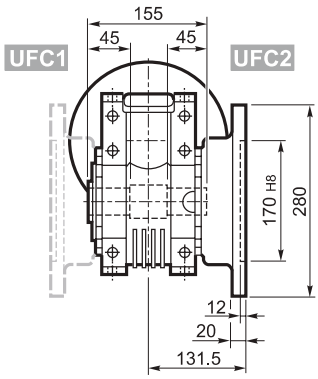




**OUTPUT**




**UFC_**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **W 110** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | — | M10x12 | 143 | 28 |
| **W 110** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | — | M10x12 | 143 | 28 |
| **W 110** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 13 | 151 | 29 |
| **W 110** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 13 | 151 | 29 |
| **W 110** | **P132 B5** | 38 | 41.3 | 10 | 300 | 265 | 230 | 16 | 14 | 226 | 31 |
| **W 110** | **P80 B14** | 19 | 21.8 | 6 | 120 | 100 | 80 | 7.5 | 7 | 143 | 27.5 |
| **W 110** | **P90 B14** | 24 | 27.3 | 8 | 140 | 115 | 95 | 6.5 | 9 | 143 | 27.5 |
| **W 110** | **P100 B14** | 28 | 31.3 | 8 | 160 | 130 | 110 | 13 | 9 | 151 | 27 |
| **W 110** | **P112 B14** | 28 | 31.3 | 8 | 160 | 130 | 110 | 13 | 9 | 151 | 27 |

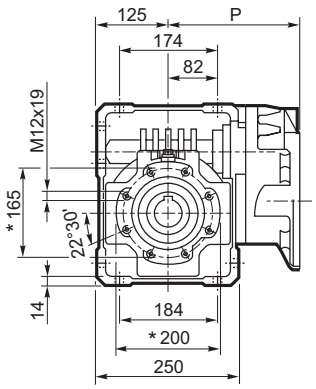
* On both sides

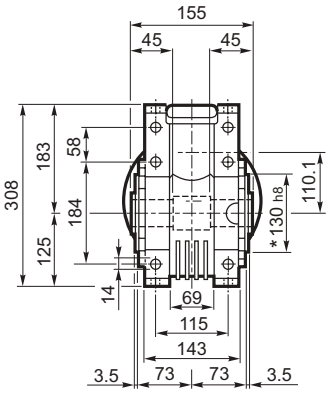


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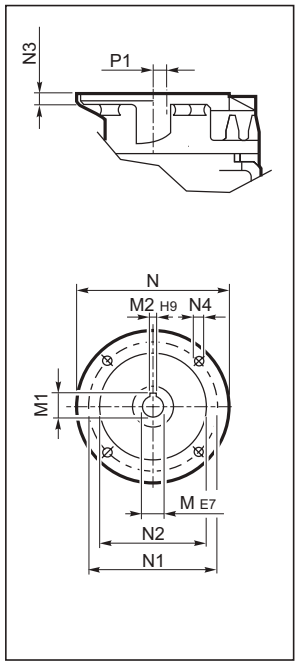
# WR 110...P (IEC)

**U**

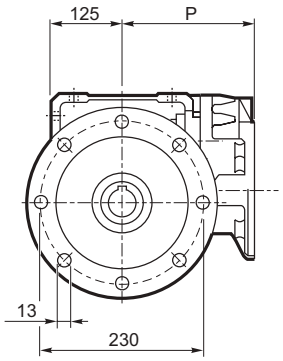


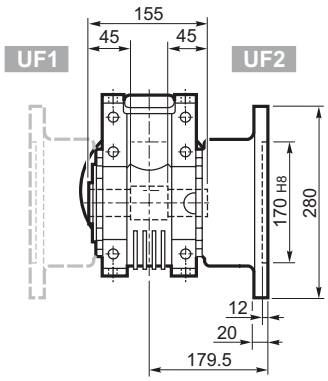




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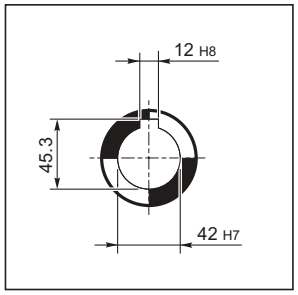



**UF_**

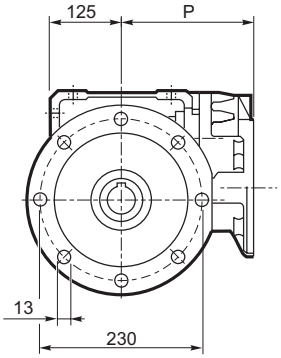


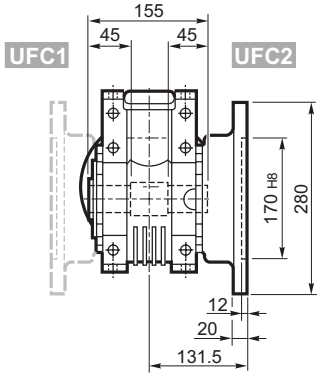




**OUTPUT**




**UFC_**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | P1 | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **WR 110** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | M8x14 | 185 | 58.6 | 30.5 |
| **WR 110** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | 14 | M10x15 | 204 | 21.1 | 31 |
| **WR 110** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 14 | M10x15 | 204 | 21.1 | 31 |
| **WR 110** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 14 | M12x13 | 213 | 21.1 | 32 |
| **WR 110** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 14 | M12x13 | 213 | 21.1 | 32 |

* On both sides

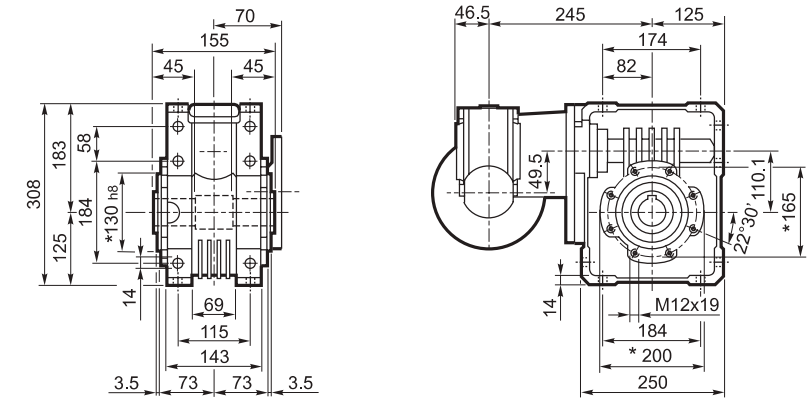


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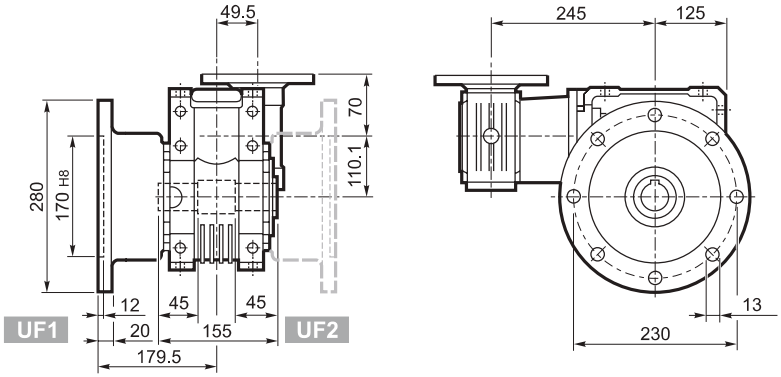
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# VF/W 49/110...P (IEC)

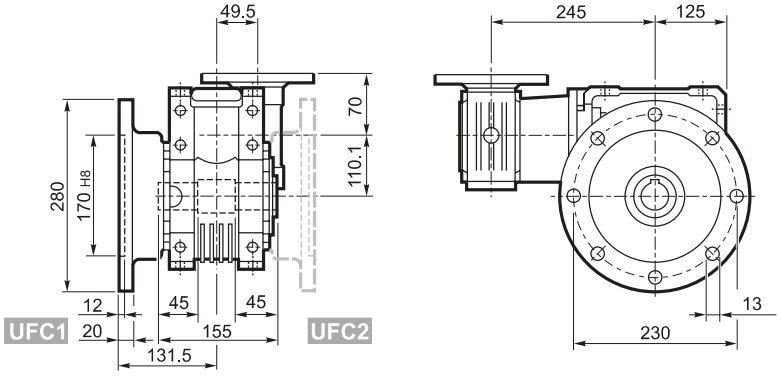
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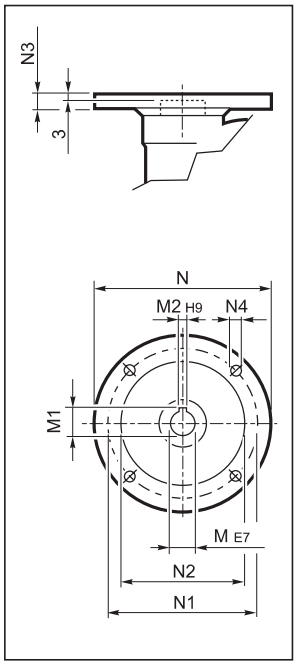

**UF_**



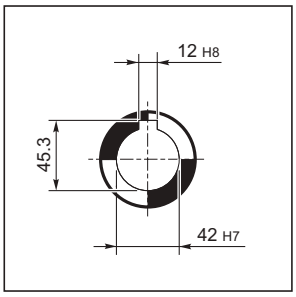

**UFC_**




**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF/W 49/110** | **P63 B5** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10.5 | 9.5 | 33 |
| **VF/W 49/110** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10.5 | 9.5 | |
| **VF/W 49/110** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | 10 | 11.5 | |
| **VF/W 49/110** | **P63 B14** | 11 | 12.8 | 4 | 90 | 75 | 60 | 7 | 6 | |
| **VF/W 49/110** | **P71 B14** | 14 | 16.3 | 5 | 105 | 85 | 70 | 10.5 | 6.5 | |
| **VF/W 49/110** | **P80 B14** | 19 | 21.8 | 6 | 120 | 100 | 80 | 10 | 7 | |

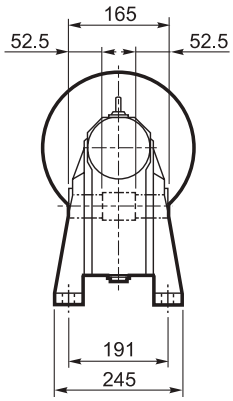
* On both sides

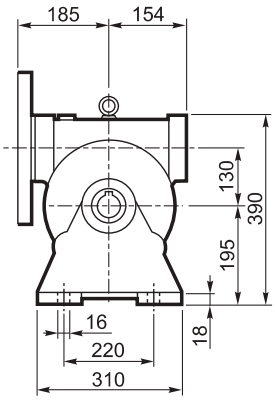



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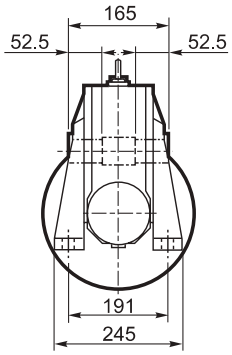
# VF 130...P (IEC)

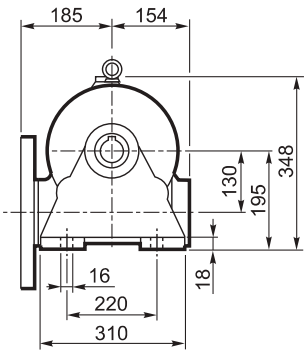
**A**



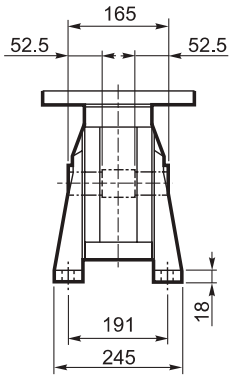



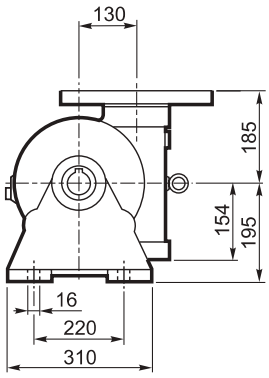

**N**



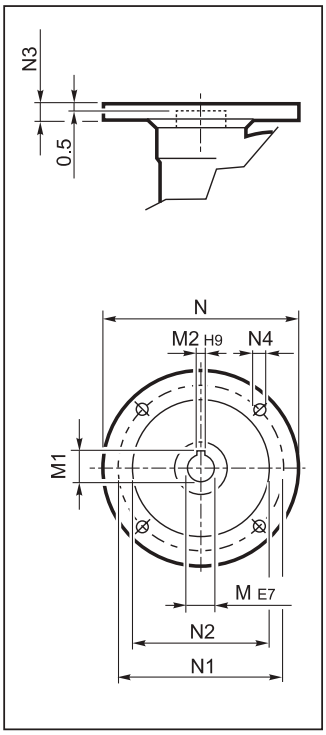




**V**

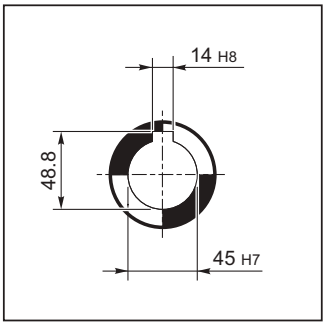



**INPUT**




**OUTPUT**



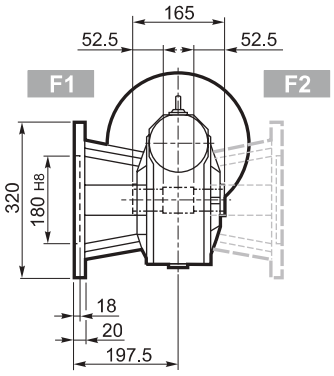


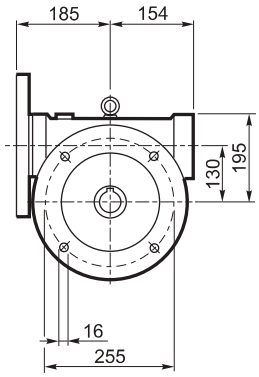

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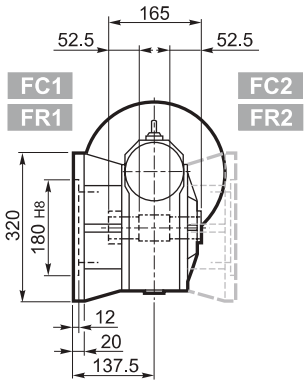
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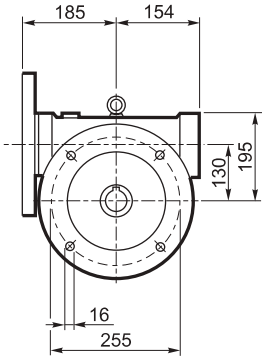
**F_**



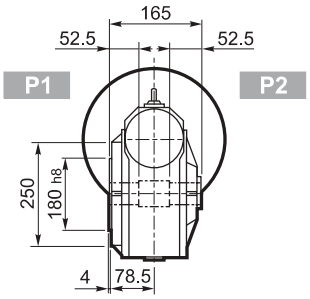



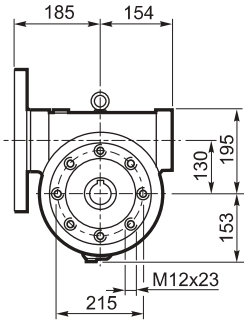

**FC_**
**FR_**



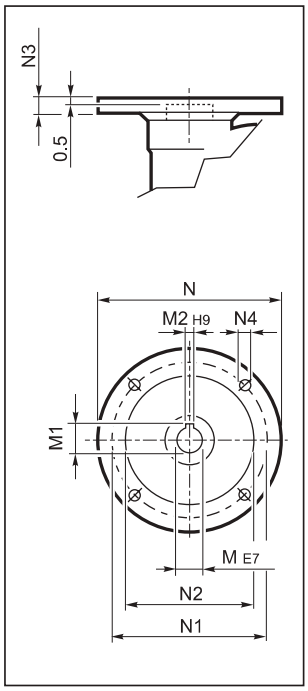




**P_**

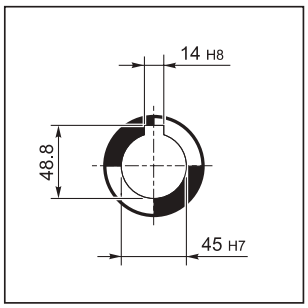



**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF130** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 17 | 11 | 49 |
| **VF130** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 17 | 13 | |
| **VF130** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 17 | 13 | |
| **VF130** | **P132 B5** | 38 | 40.1# | 10 | 300 | 265 | 230 | 17 | 13 | |

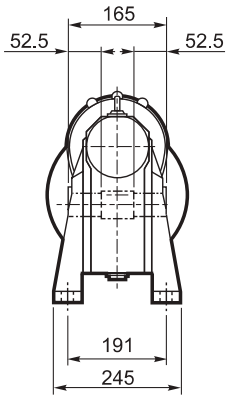
# Lowered key

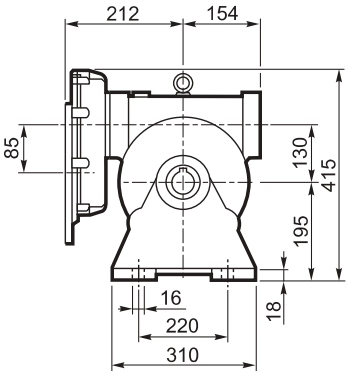



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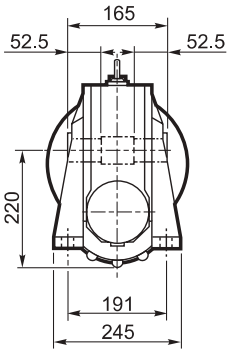
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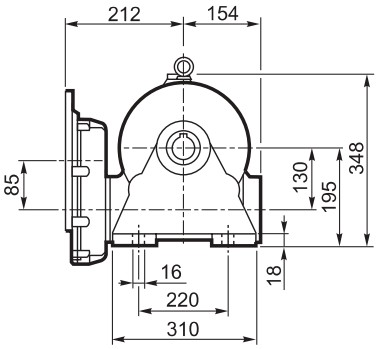
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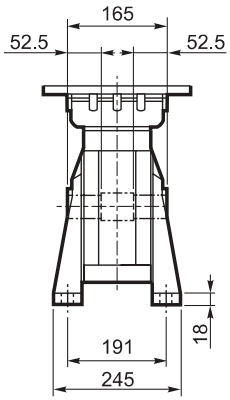



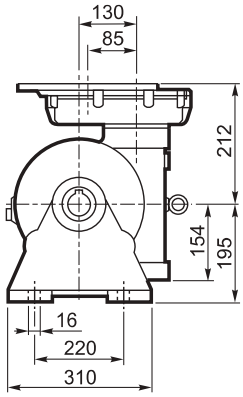

**N**



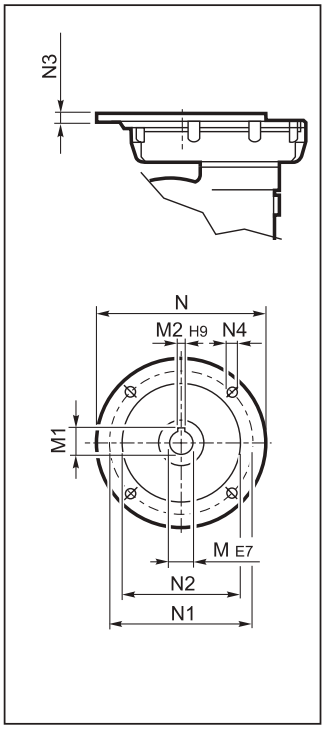




**V**

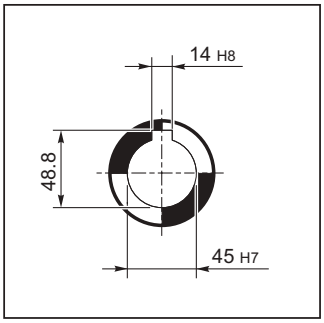



**INPUT**




**OUTPUT**

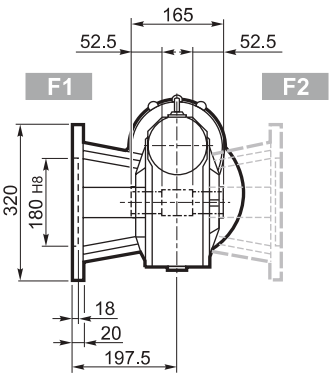


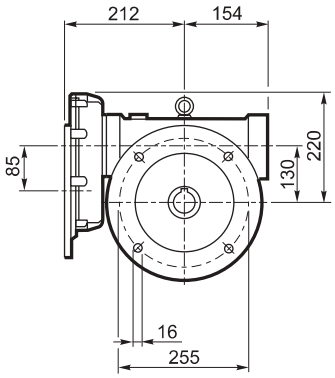



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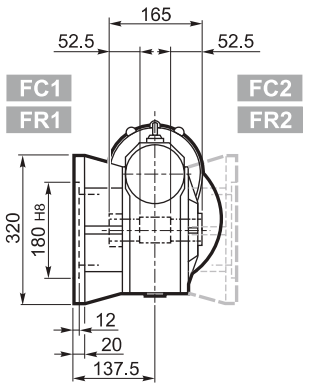
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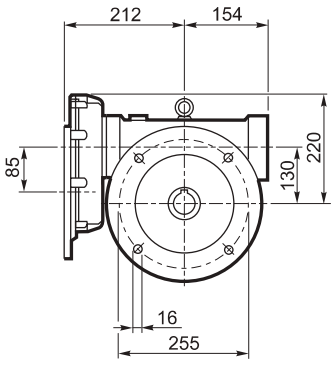
**F_**



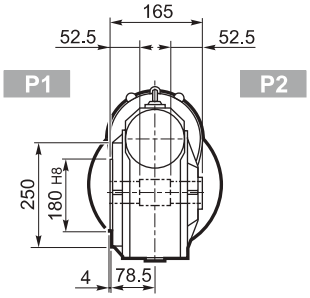



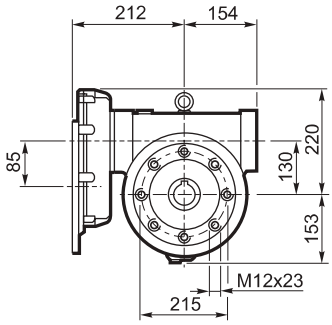

**FC_**
**FR_**



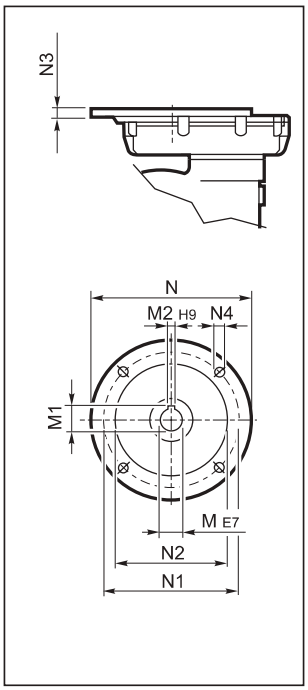




**P_**

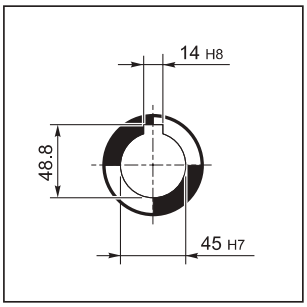



**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VFR 130** | **P80 B5** | 19 K6 | 21.8 | 6 | 200 | 165 | 130 | 12 | M10x25 | 57 |
| **VFR 130** | **P90 B5** | 24 K6 | 27.3 | 8 | 200 | 165 | 130 | 12 | M10x25 | |
| **VFR 130** | **P100 B5** | 28 J6 | 29.1# | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 130** | **P112 B5** | 28 J6 | 29.1# | 8 | 250 | 215 | 180 | 13 | M12x35 | |

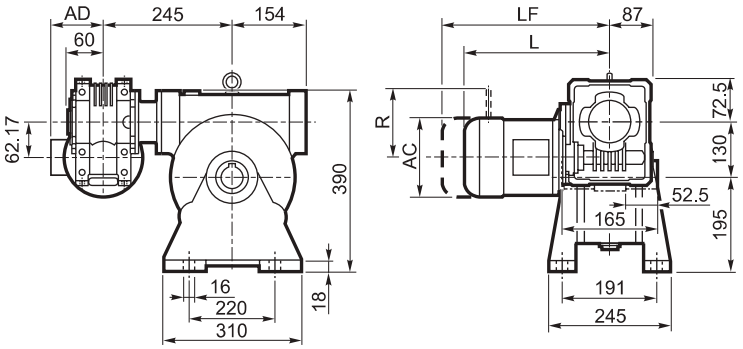
# Lowered key



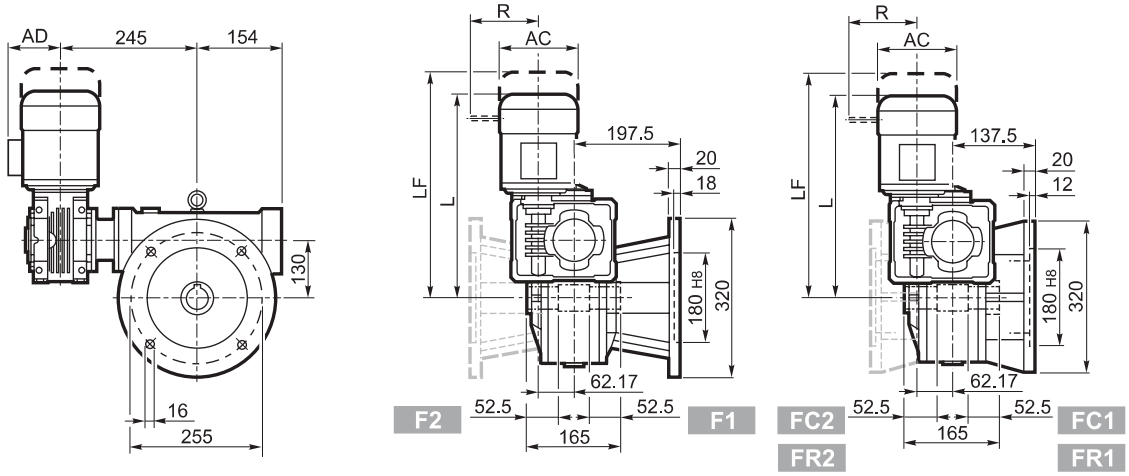
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# W/VF 63/130...M

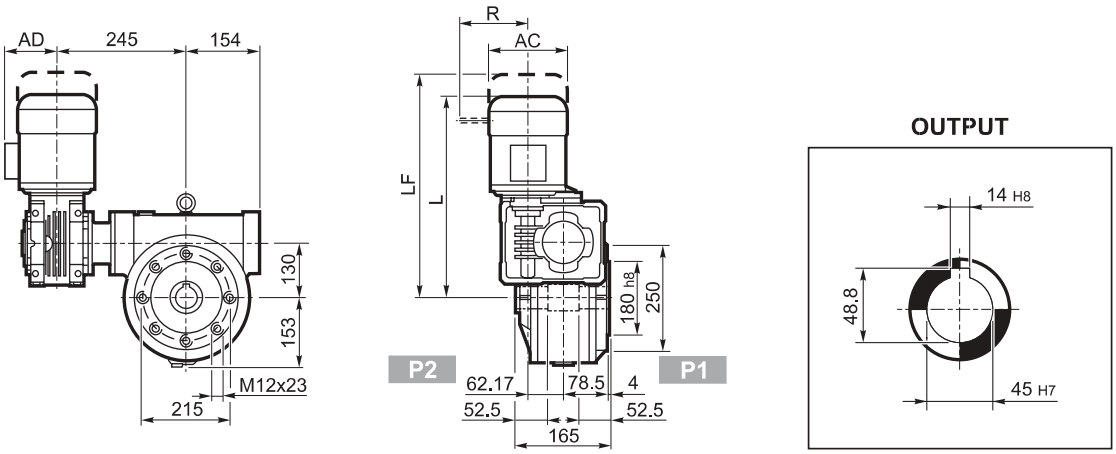
**A**




**F_**
**FC_**
**FR_**




**P_**




| | | | M_ | | | | M...FD M...FA | | M...FD | | M...FA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AC | L | AD | Kg | LF | Kg | R | AD | R | AD |
| **W/VF 63/130** | **S1** | **M1** | 138 | 419 | 108 | 63 | 480 | 65 | 103 | 135 | 124 | 108 |
| **W/VF 63/130** | **S2** | **M2S** | 156 | 447 | 119 | 68 | 523 | 71 | 129 | 146 | 134 | 119 |

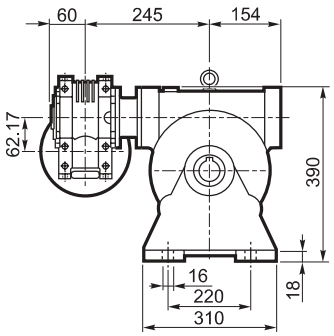


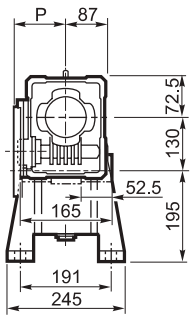
Bonfiglioli Riduttori

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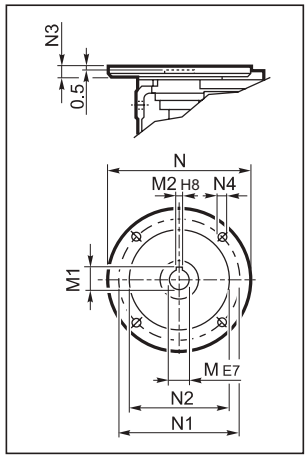
# W/VF 63/130...P (IEC)

**A**

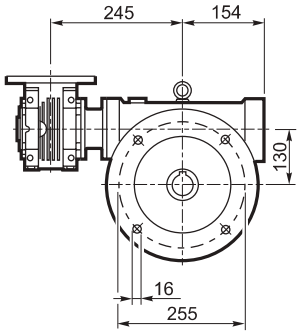


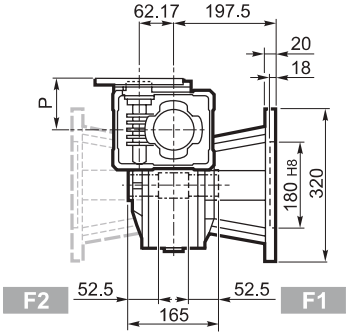



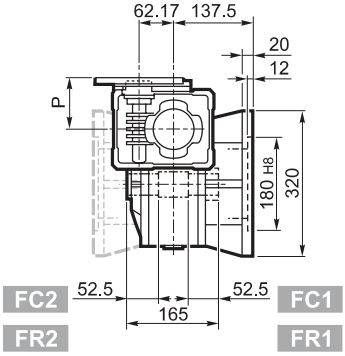

**INPUT**



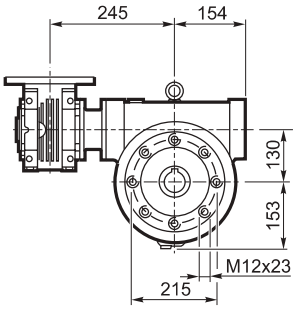

**F_**
**FC_**
**FR_**

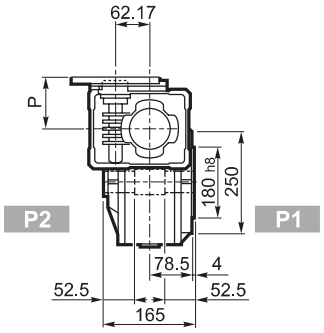


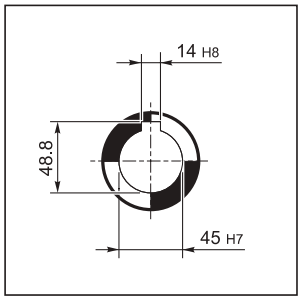




**P_**




**OUTPUT**



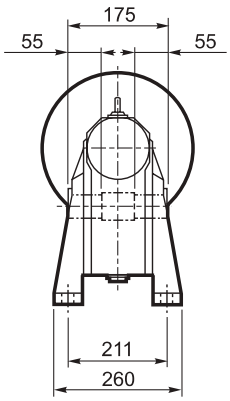

| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **W/VF 63/130** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 95 | 57 |
| **W/VF 63/130** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 102 | |
| **W/VF 63/130** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 102 | |
| **W/VF 63/130** | **P71 B14** | 14 | 16.3 | 5 | 105 | 85 | 70 | 11 | 6.5 | 95 | |
| **W/VF 63/130** | **P80 B14** | 19 | 21.8 | 6 | 120 | 100 | 80 | 11 | 6.5 | 102 | |
| **W/VF 63/130** | **P90 B14** | 24 | 27.3 | 8 | 140 | 115 | 95 | 11 | 8.5 | 102 | |

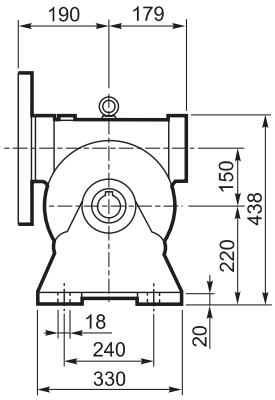


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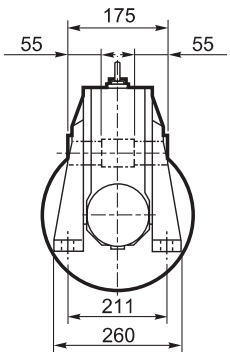
# VF 150...P (IEC)

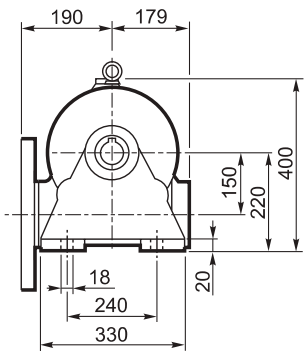
**A**



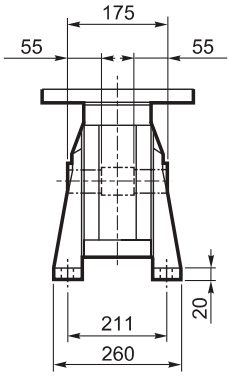



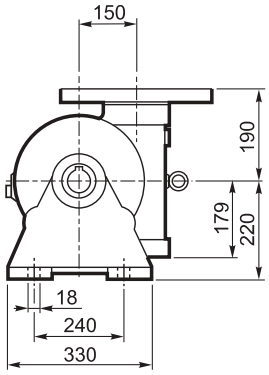

**N**



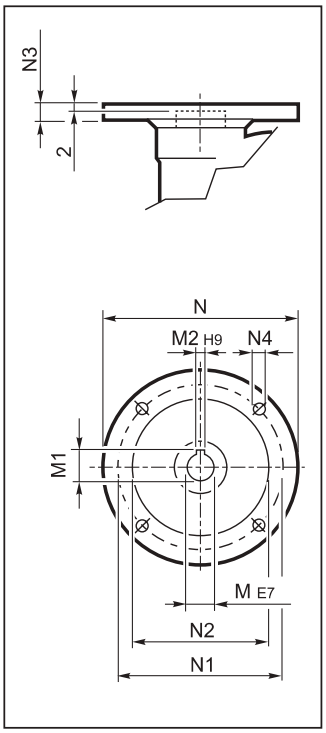




**V**

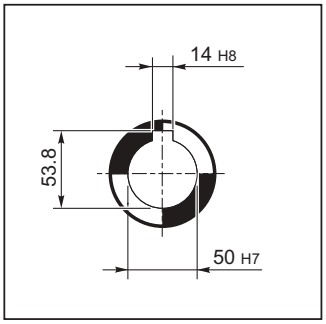



**INPUT**




**OUTPUT**

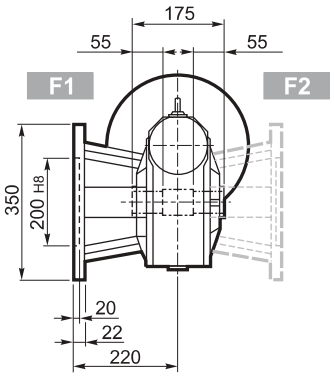


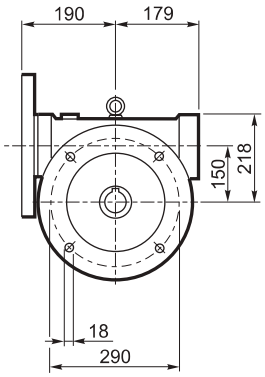



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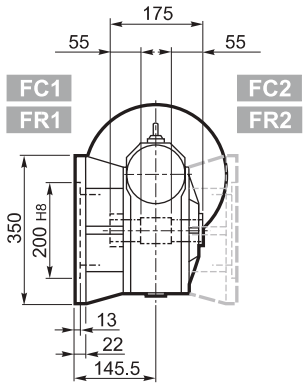
# VF 150...P (IEC)

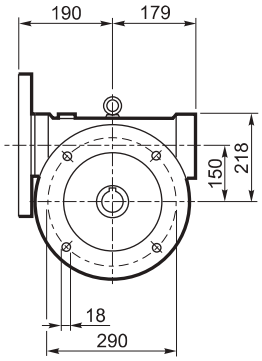
**F_**



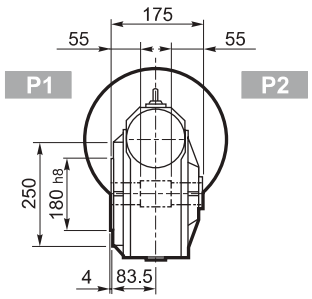



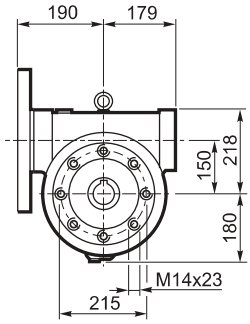

**FC_**
**FR_**



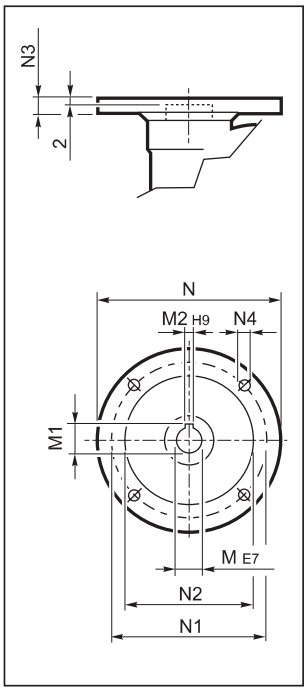




**P_**

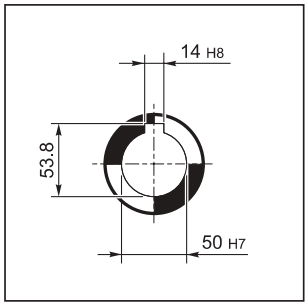



**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF 150** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 11 | 13 | 60 |
| **VF 150** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 11 | 13 | |
| **VF 150** | **P132 B5** | 38 | 41.3 | 10 | 300 | 265 | 230 | 16 | 13 | |
| **VF 150** | **P160 B5** | 42 | 44.6# | 12 | 350 | 300 | 250 | 18 | 18 | |

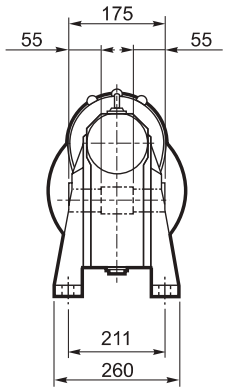
# Lowered key

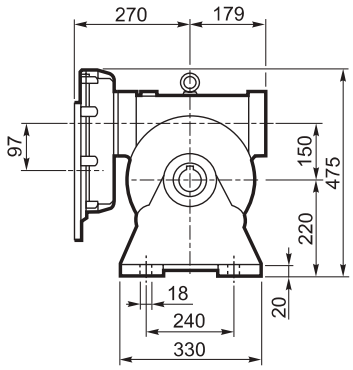



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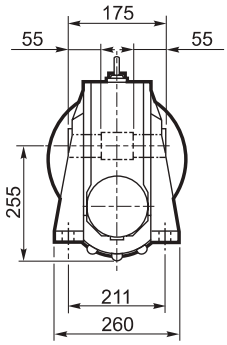
# VFR 150...P (IEC)

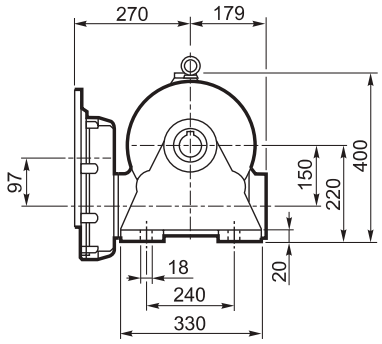
**A**



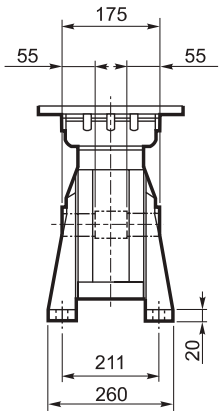



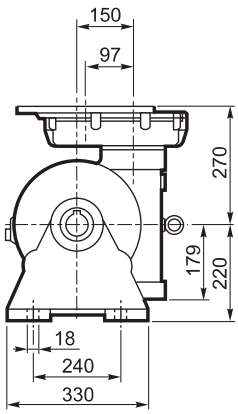

**N**



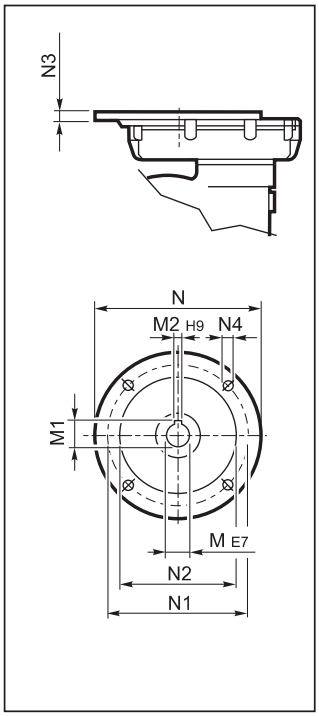




**V**

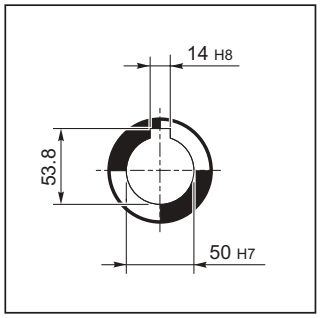



**INPUT**




**OUTPUT**



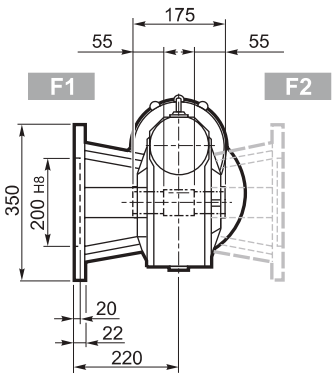


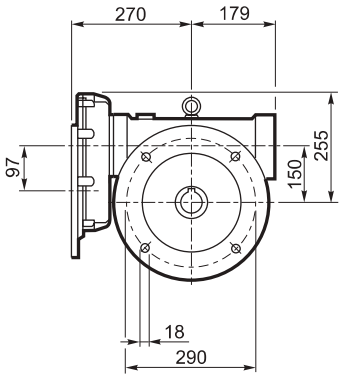

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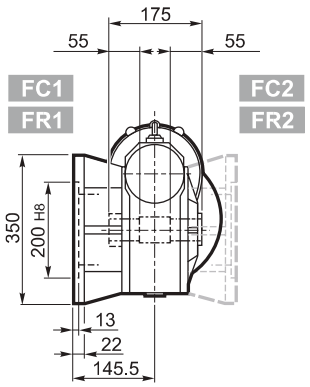
# VFR 150...P (IEC)

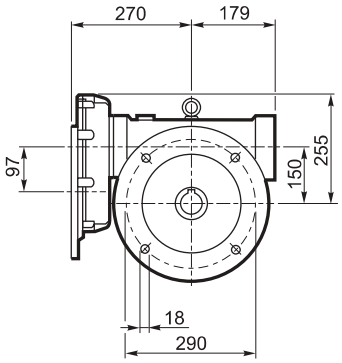
**F_**



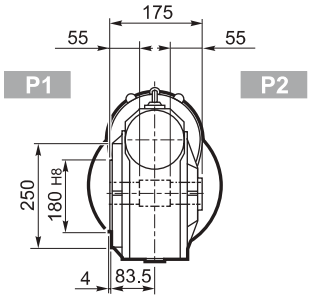



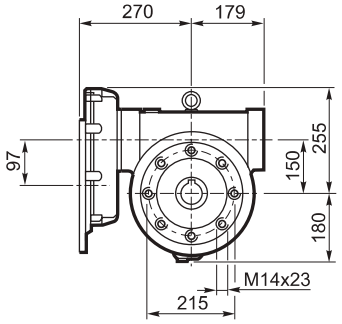

**FC_**
**FR_**



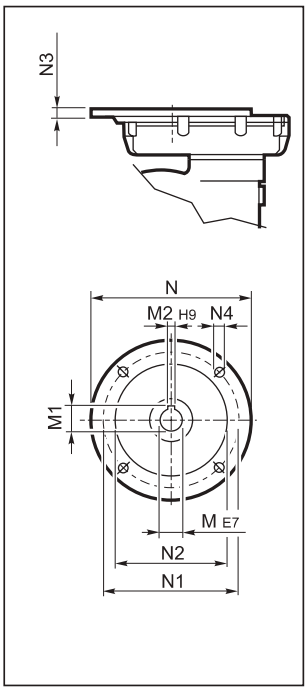




**P_**

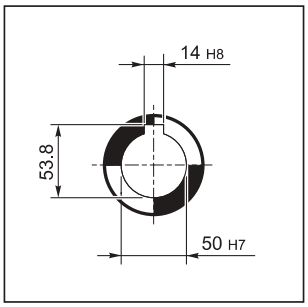



**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VFR 150** | **P90 B5** | 24 K6 | 27.3 | 8 | 200 | 165 | 130 | 13 | M10x25 | 71 |
| **VFR 150** | **P100 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 150** | **P112 B5** | 28 J6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 150** | **P132 B5** | 38 J6 | 39.6# | 10 | 300 | 265 | 230 | 13 | M12x35 | |

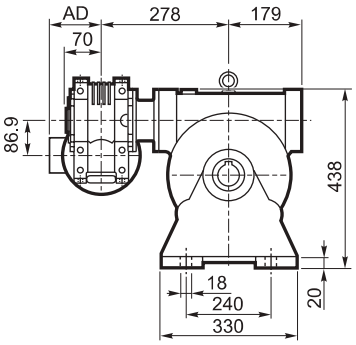
# Lowered key

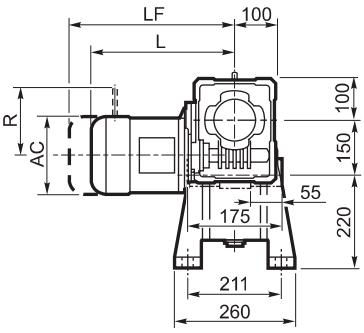


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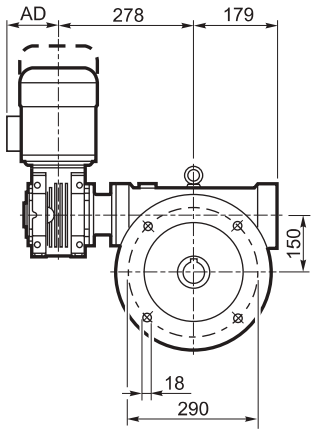
# W/VF 86/150...M

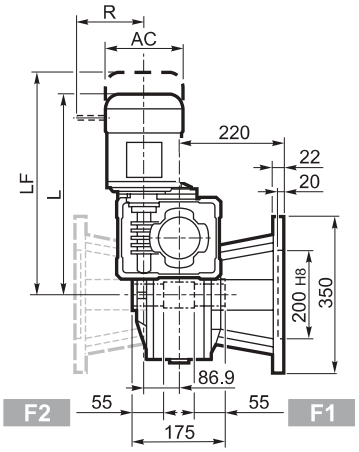
**A**

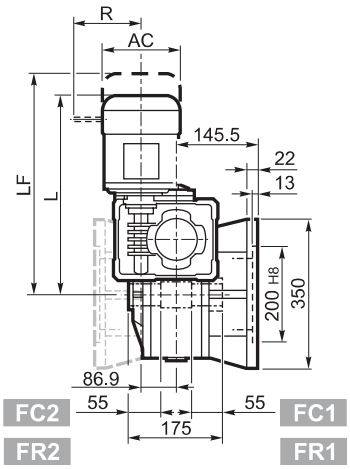


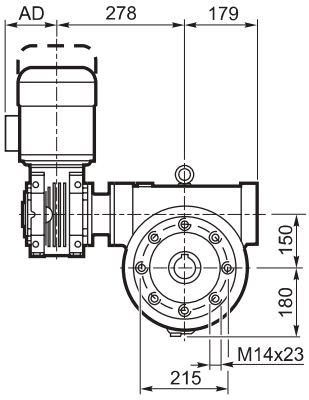

**F_**
**FC_**
**FR_**

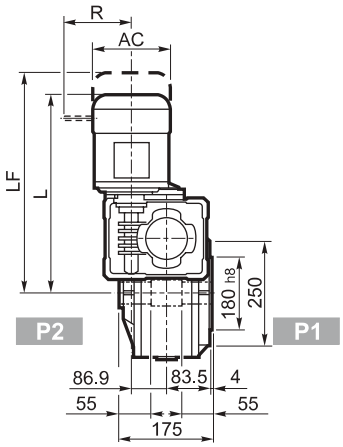


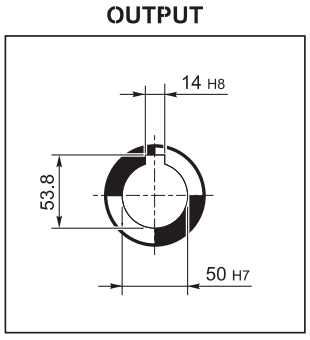




**P_**




| | | | M_ | | | | M...FD M...FA | | M...FD | | M...FA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AC | L | AD | Kg | LF | Kg | R | AD | R | AD |
| **W/VF 86/150** | **S1** | **M1** | 138 | 474 | 108 | 82 | 385 | 84 | 103 | 135 | 124 | 108 |
| **W/VF 86/150** | **S2** | **M2S** | 156 | 499 | 119 | 86 | 425 | 89 | 129 | 146 | 134 | 119 |
| **W/VF 86/150** | **S3** | **M3S** | 193 | 542 | 142 | 91 | 488 | 97 | 160 | 158 | 160 | 142 |
| **W/VF 86/150** | **S3** | **M3L** | 193 | 574 | 142 | 99 | 515 | 104 | 160 | 158 | 160 | 142 |

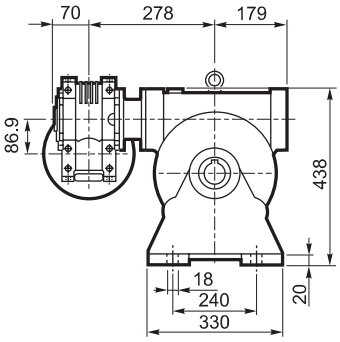


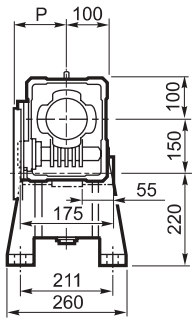
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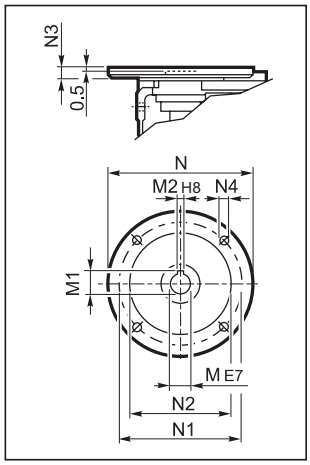
# W/VF 86/150...P (IEC)

**A**

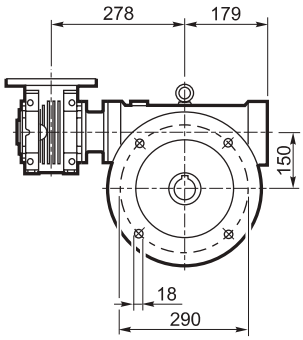


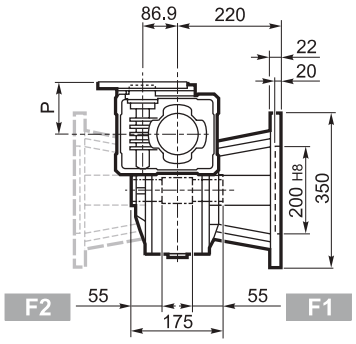



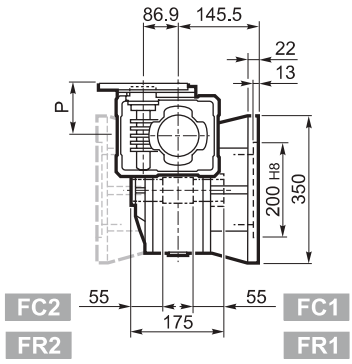

**INPUT**



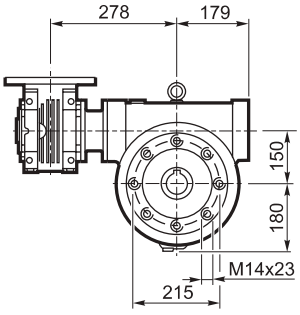

**F_**
**FC_**
**FR_**

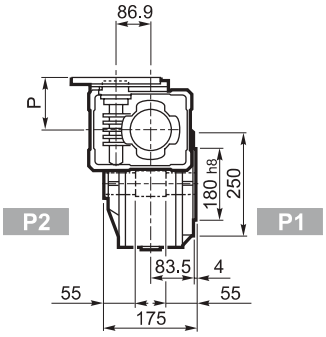


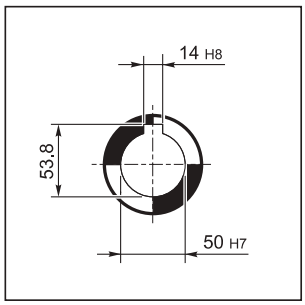




**P_**




**OUTPUT**



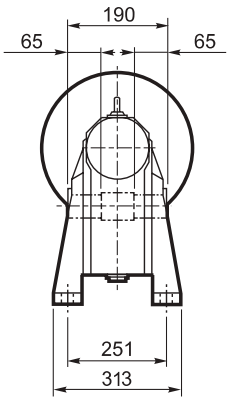

| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **W/VF 86/150** | **P71 B5** | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 128 | |
| **W/VF 86/150** | **P80 B5** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 128 | |
| **W/VF 86/150** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 128 | |
| **W/VF 86/150** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 12.5 | 136 | |
| **W/VF 86/150** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 12.5 | 136 | 75 |
| **W/VF 86/150** | **P80 B14** | 19 | 21.8 | 6 | 120 | 100 | 80 | 7.5 | 6.5 | 128 | |
| **W/VF 86/150** | **P90 B14** | 24 | 27.3 | 8 | 140 | 115 | 95 | 7.5 | 8.5 | 128 | |
| **W/VF 86/150** | **P100 B14** | 28 | 31.3 | 8 | 160 | 130 | 110 | 10 | 8.5 | 136 | |
| **W/VF 86/150** | **P112 B14** | 28 | 31.3 | 8 | 160 | 130 | 110 | 10 | 8.5 | 136 | |

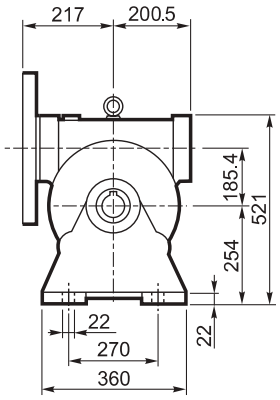



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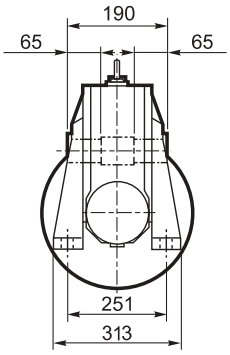
# VF 185...P (IEC)

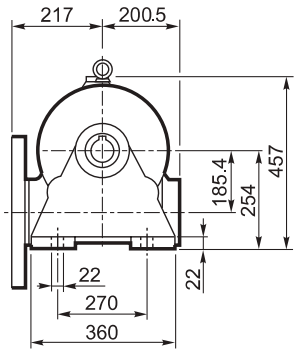
**A**



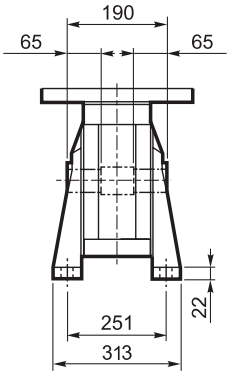



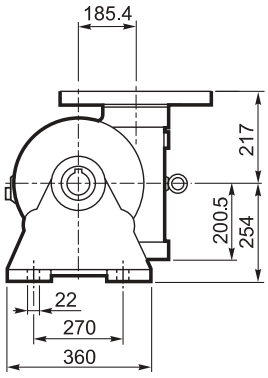

**N**



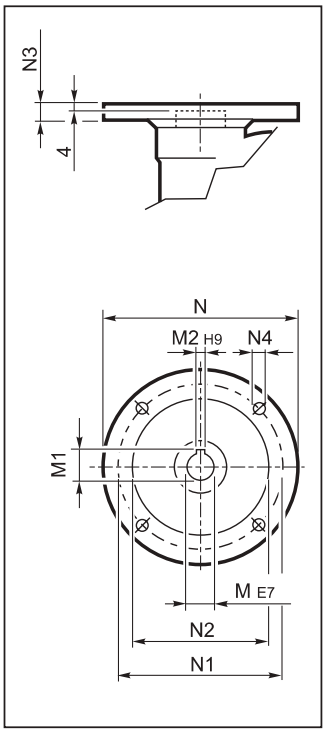




**V**

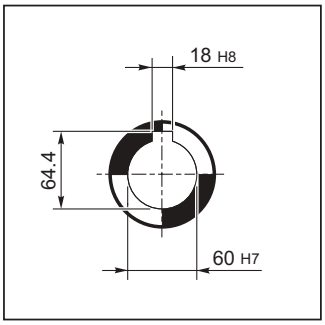



**INPUT**




**OUTPUT**

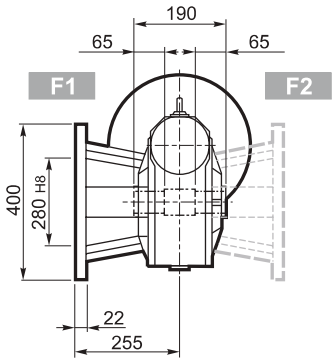


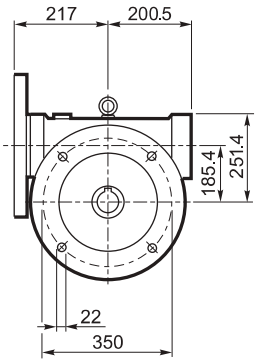



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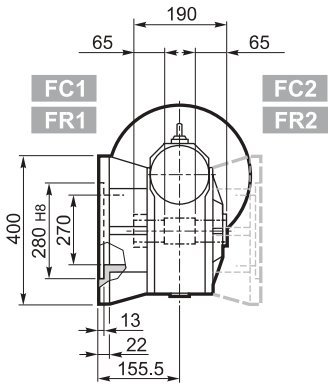
# VF 185...P (IEC)

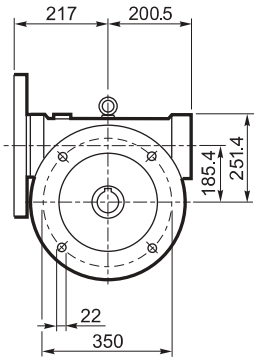
**F_**



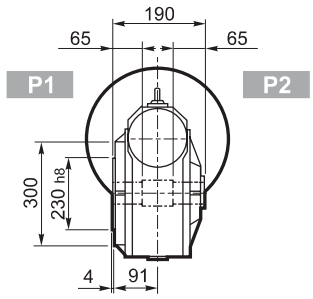



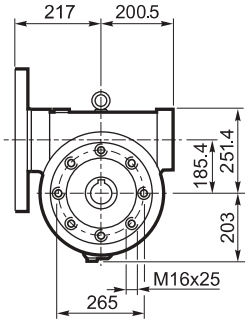

**FC_**
**FR_**



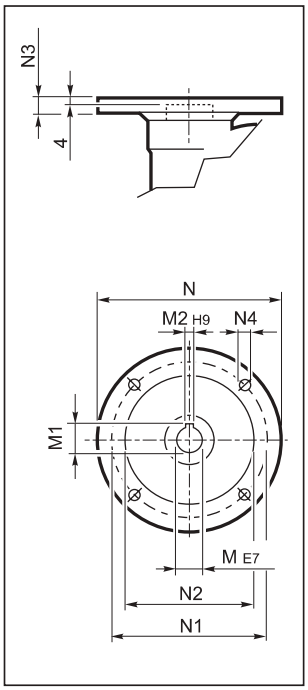




**P_**

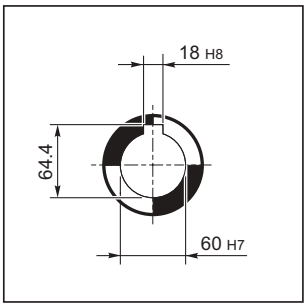



**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF 185** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 16 | 13 | 94 |
| **VF 185** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 16 | 13 | |
| **VF 185** | **P132 B5** | 38 | 41.3 | 10 | 300 | 265 | 230 | 16 | 13 | |
| **VF 185** | **P160 B5** | 42 | 45.3 | 12 | 350 | 300 | 250 | 18 | 18 | |
| **VF 185** | **P180 B5** | 48 | 51.2# | 14 | 350 | 300 | 250 | 18 | 18 | |

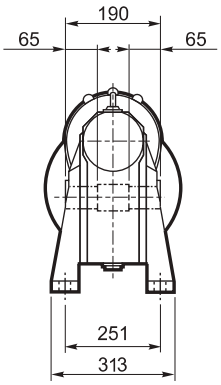
# Lowered key

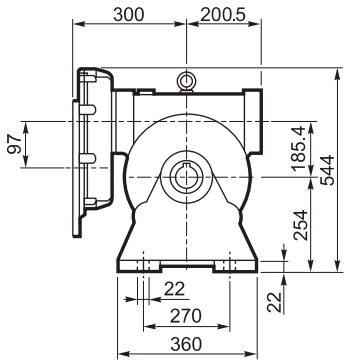


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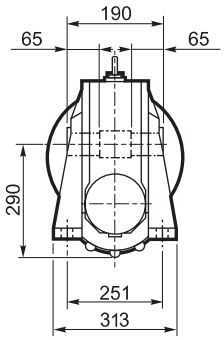
# VFR 185...P (IEC)

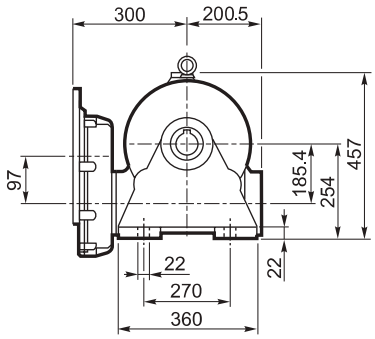
**A**



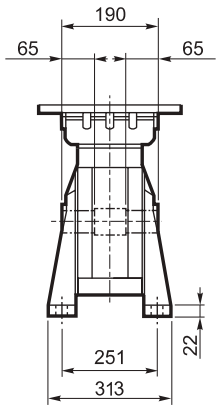



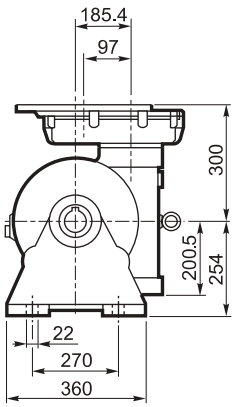

**N**



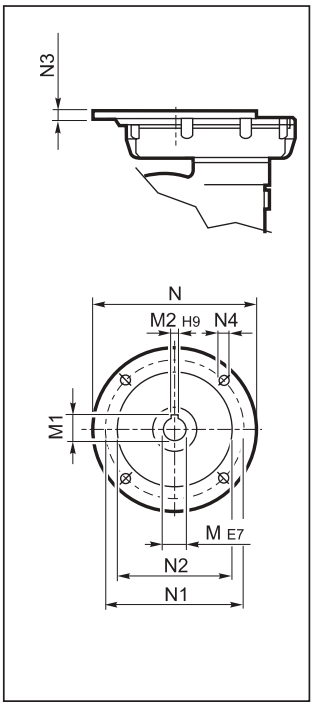




**V**

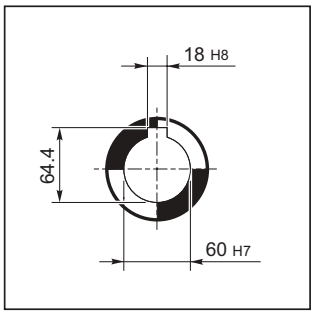



**INPUT**




**OUTPUT**



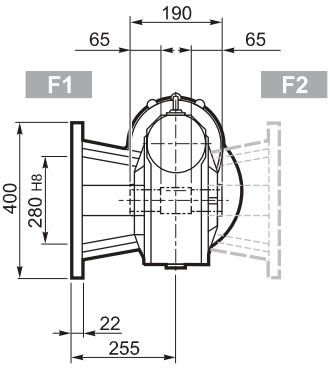


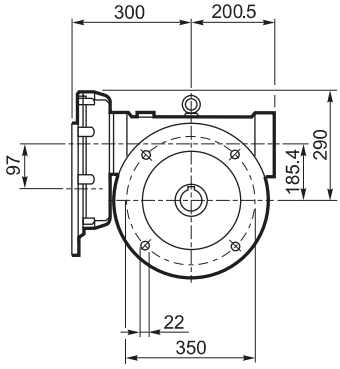

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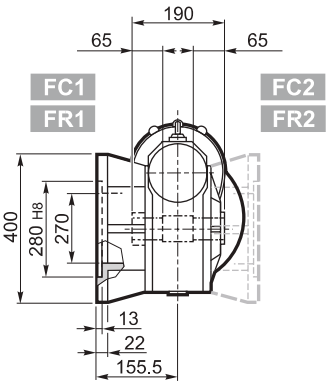
# VFR 185...P (IEC)

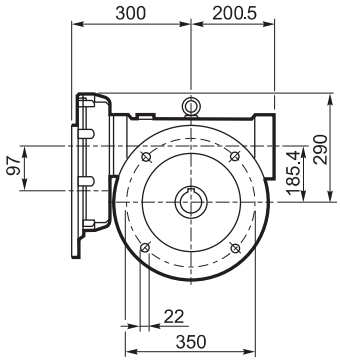
**F_**



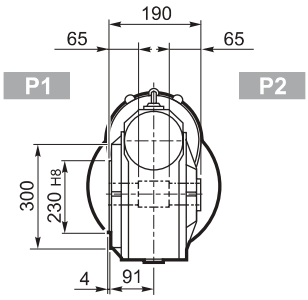



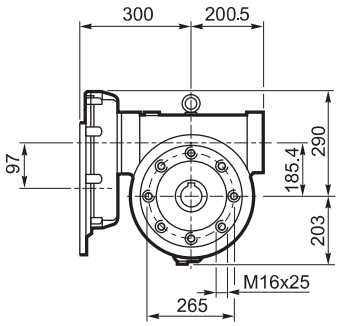

**FC_**
**FR_**



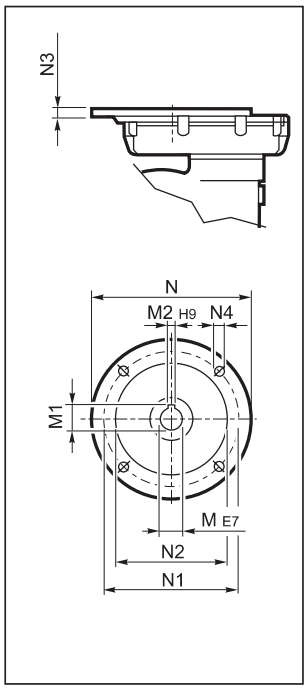




**P_**

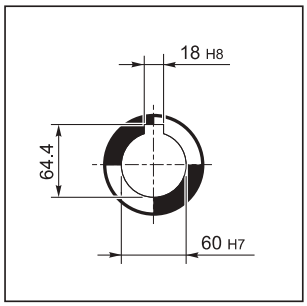



**INPUT**




**OUTPUT**




| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VFR 185** | **P90 B5** | 24 K6 | 27.3 | 8 | 200 | 165 | 130 | 13 | M10x25 | 110 |
| **VFR 185** | **P100 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 185** | **P112 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 185** | **P132 B5** | 38 J6 | 39.6# | 10 | 300 | 265 | 230 | 13 | M12x35 | |

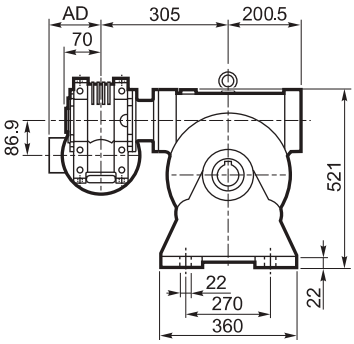
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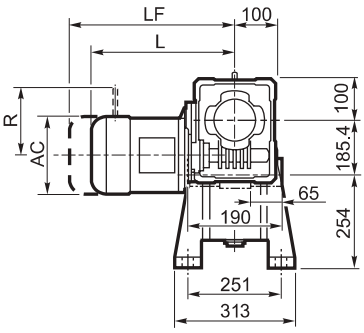


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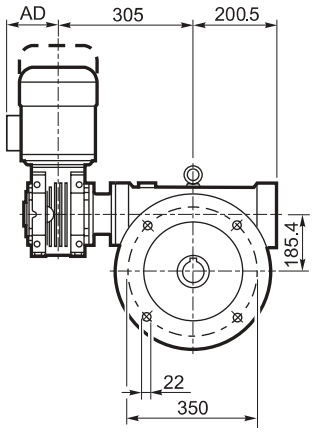
# W/VF 86/185...M

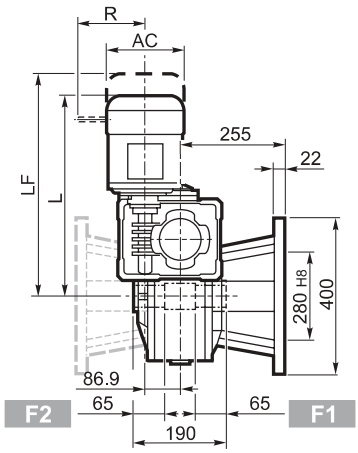
**A**

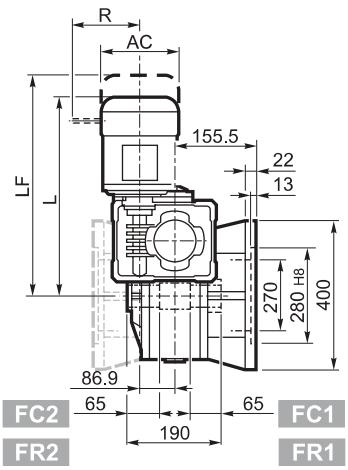


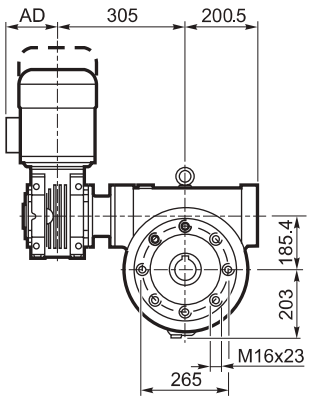

**F_**
**FC_**
**FR_**

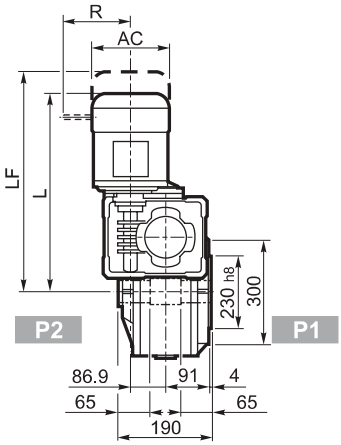


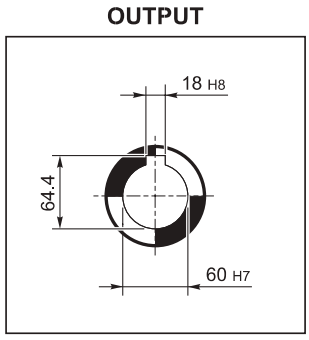




**P_**




| | | | M_ | | | | M...FD M...FA | | M...FD | | M...FA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AC | L | AD | Kg | LF | Kg | R | AD | R | AD |
| **W/VF 86/185** | **S1** | **M1** | 138 | 509 | 108 | 116 | 570 | 118 | 103 | 135 | 124 | 108 |
| **W/VF 86/185** | **S2** | **M2S** | 156 | 534 | 119 | 120 | 610 | 123 | 129 | 146 | 134 | 119 |
| **W/VF 86/185** | **S3** | **M3S** | 193 | 577 | 142 | 125 | 673 | 131 | 160 | 158 | 160 | 142 |
| **W/VF 86/185** | **S3** | **M3L** | 193 | 609 | 142 | 133 | 700 | 138 | 160 | 158 | 160 | 142 |

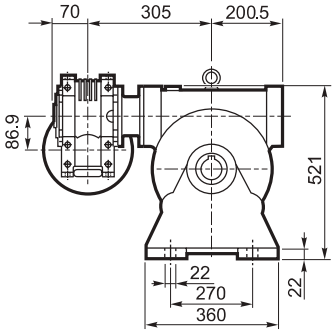


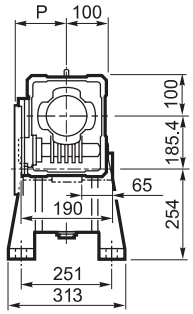
Bonfiglioli Riduttori

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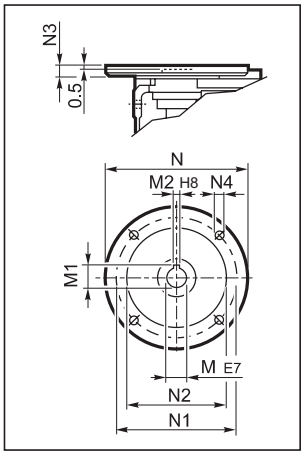
# W/VF 86/185...P (IEC)

**A**

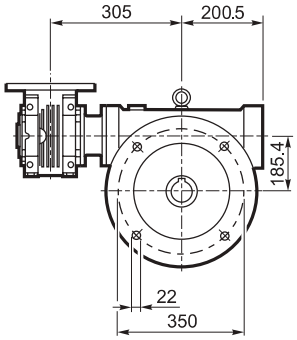


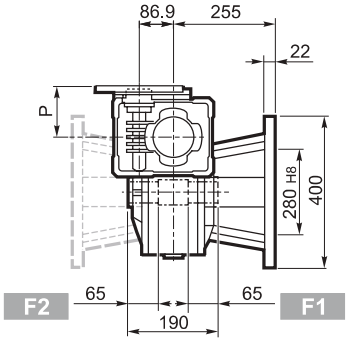



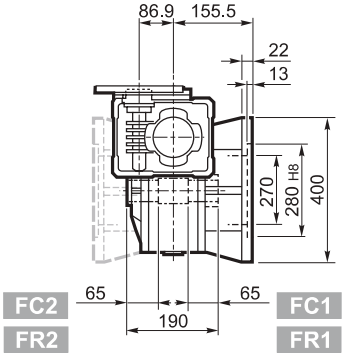

**INPUT**



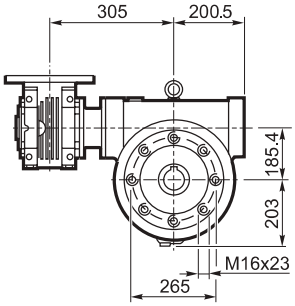

**F_**
**FC_**
**FR_**

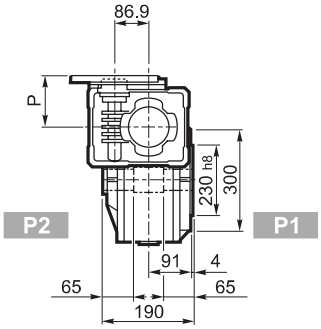


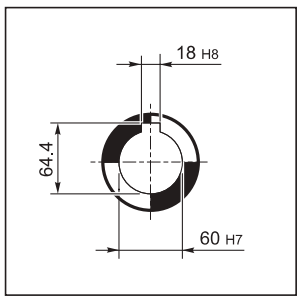




**P_**




**OUTPUT**



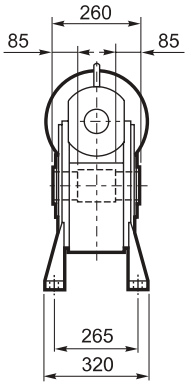

| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W/VF 86/185 | P71 B5 | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 128 | |
| W/VF 86/185 | P80 B5 | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 128 | |
| W/VF 86/185 | P90 B5 | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 128 | |
| W/VF 86/185 | P100 B5 | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 12.5 | 136 | |
| W/VF 86/185 | P112 B5 | 28 | 31.3 | 8 | 250 | 215 | 180 | 13 | 12.5 | 136 | 109 |
| W/VF 86/185 | P80 B14 | 19 | 21.8 | 6 | 120 | 100 | 80 | 7.5 | 6.5 | 128 | |
| W/VF 86/185 | P90 B14 | 24 | 27.3 | 8 | 140 | 115 | 95 | 7.5 | 8.5 | 128 | |
| W/VF 86/185 | P100 B14 | 28 | 31.3 | 8 | 160 | 130 | 110 | 10 | 8.5 | 136 | |
| W/VF 86/185 | P112 B14 | 28 | 31.3 | 8 | 160 | 130 | 110 | 10 | 8.5 | 136 | |

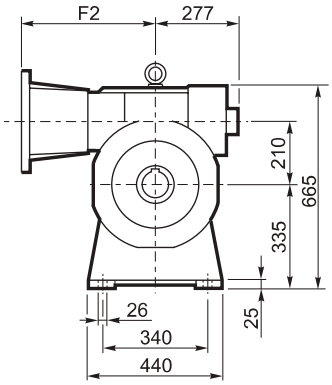


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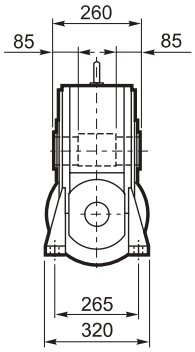
# VF 210...P (IEC)

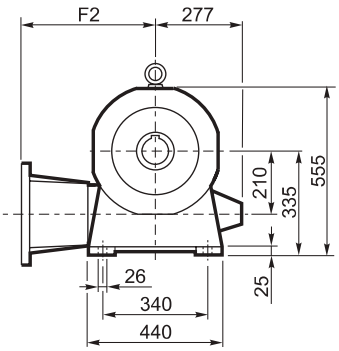
**A**



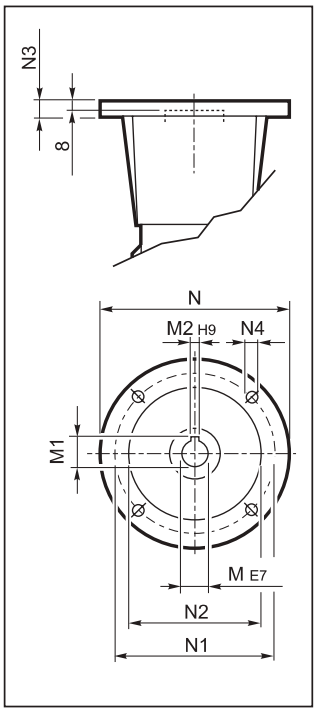




**N**

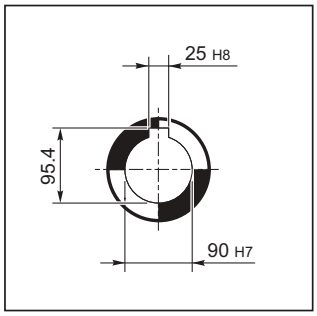



**INPUT**




**OUTPUT**

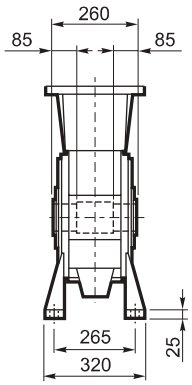


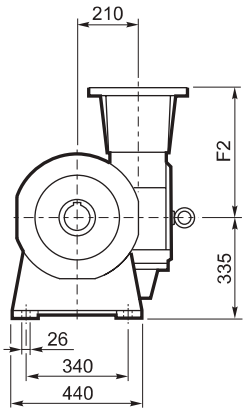



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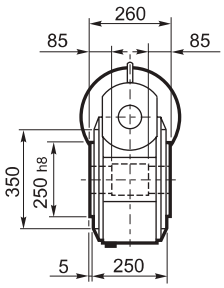
# VF 210...P (IEC)

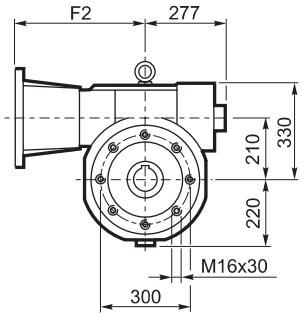
**V**



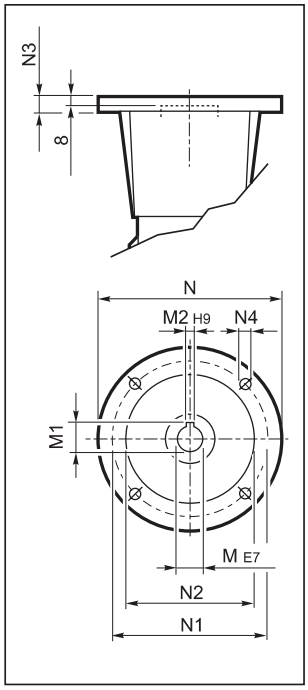




**P**

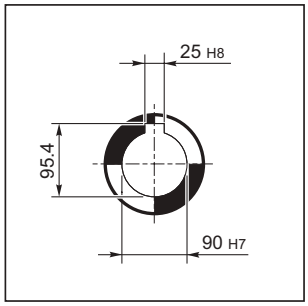



**INPUT**




**OUTPUT**




Fan cooling as standard on versions A and P.
P(IEC) arrangements come complete with gear coupling enclosed in the bell housing.

| | | F2 | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF 210** | **P132 B5** | 485 | 38 | 41.3 | 10 | 300 | 265 | 230 | 25 | M12 | 210 |
| **VF 210** | **P160 B5** | 460 | 42 | 45.3 | 12 | 350 | 300 | 250 | 22 | 18 | |
| **VF 210** | **P180 B5** | 460 | 48 | 51.8 | 14 | 350 | 300 | 250 | 22 | 18 | |
| **VF 210** | **P200 B5** | 485 | 55 | 59.3 | 16 | 400 | 350 | 300 | 25 | M16 | |
| **VF 210** | **P225 B5** | 490 | 60 | 64.4 | 18 | 450 | 400 | 350 | 22 | 18 # | |

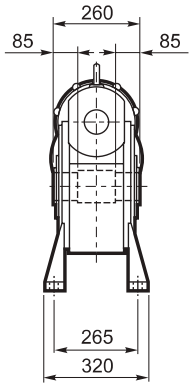
# N° 8 holes at 45°

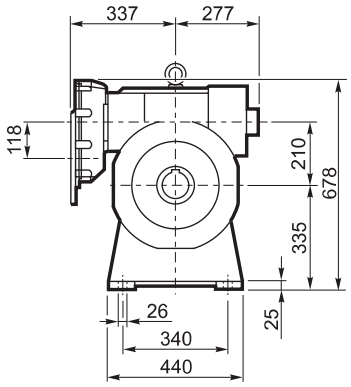


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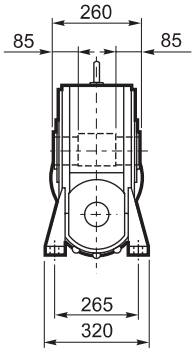
# VFR 210...P (IEC)

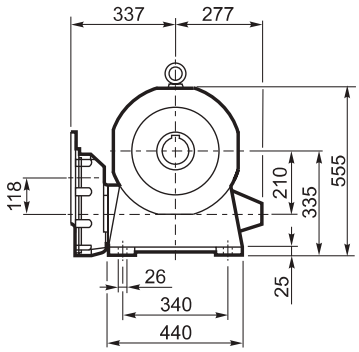
**A**



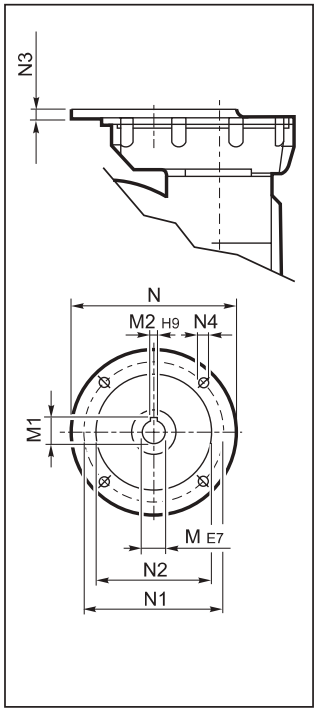




**N**

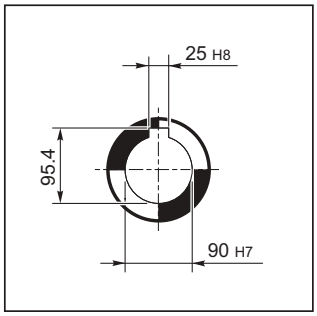



**INPUT**




**OUTPUT**

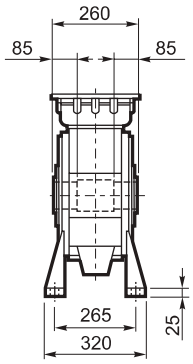


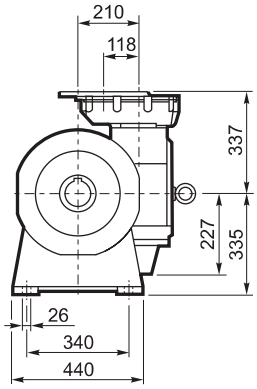



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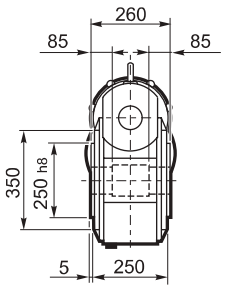
# VFR 210...P (IEC)

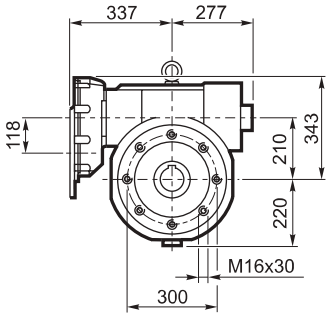
**V**



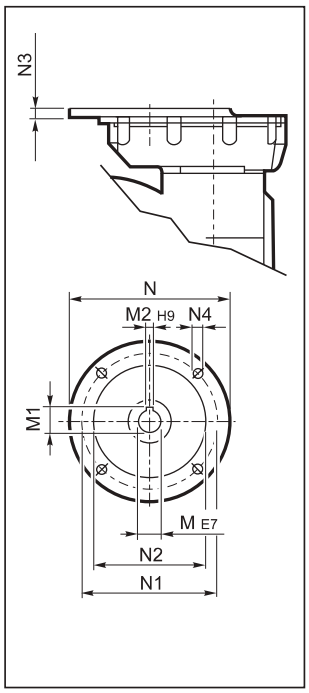




**P**

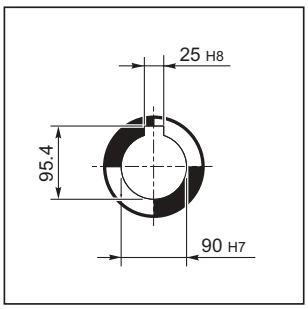



**INPUT**




**OUTPUT**




Fan cooling as standard on versions A and P.

| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VFR 210** | **P100 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | 185 |
| **VFR 210** | **P112 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 210** | **P132 B5** | 38 J6 | 41.3 | 10 | 300 | 265 | 230 | 13 | M12x35 | |
| **VFR 210** | **P160 B5** | 42 J6 | 44.3# | 12 | 350 | 300 | 250 | 18 | M16x60 | |

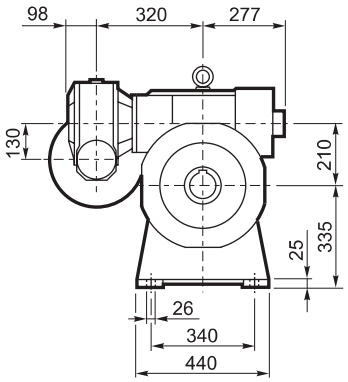
# Lowered key

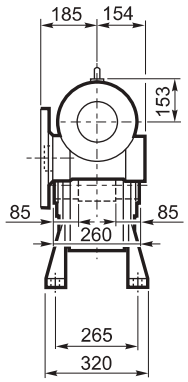


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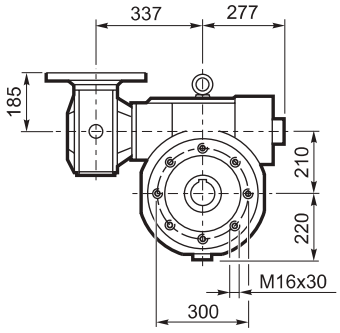
# VF/VF 130/210...P (IEC)

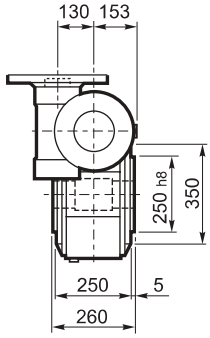
**A**



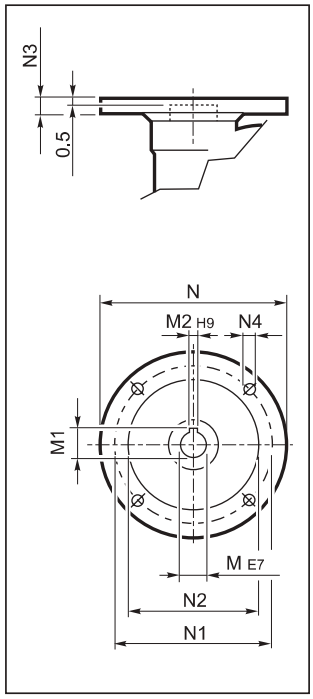




**P**

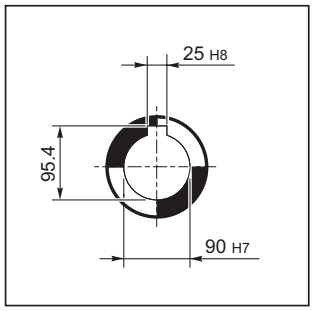



**INPUT**




**OUTPUT**



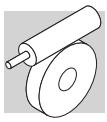

Fan cooling as standard on versions A and P.

| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF/VF 130/210** | **P90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 17 | 11 | 225 |
| **VF/VF 130/210** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 17 | 13 | |
| **VF/VF 130/210** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 17 | 13 | |
| **VF/VF 130/210** | **P132 B5** | 38 | 40.1# | 10 | 300 | 265 | 230 | 17 | 13 | |

# Lowered key



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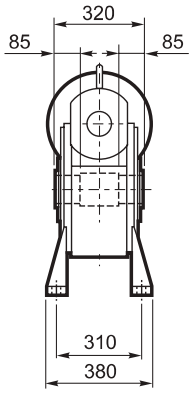


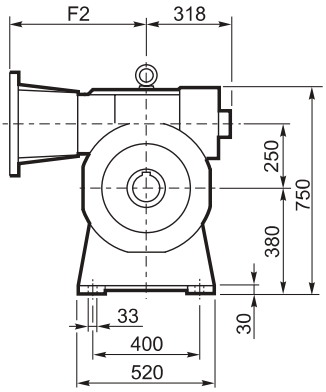


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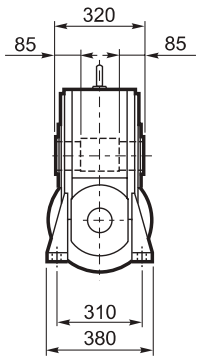
# VF 250...P (IEC)

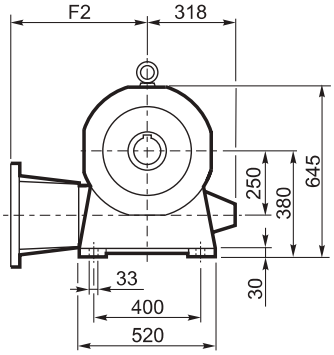
**A**



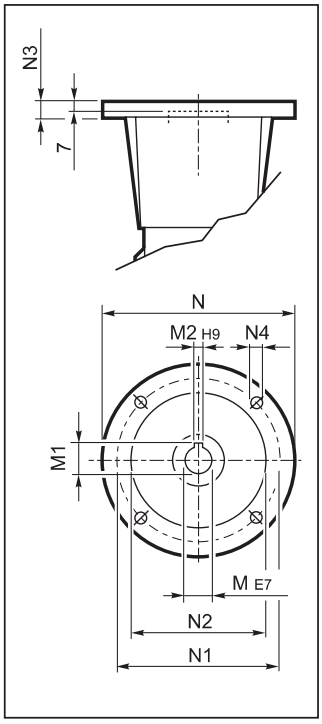




**N**

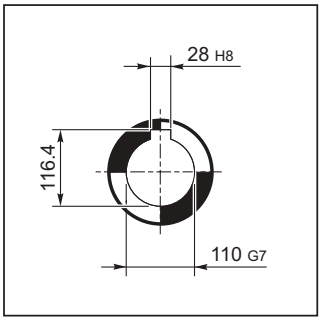



**INPUT**




**OUTPUT**

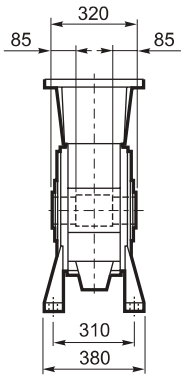


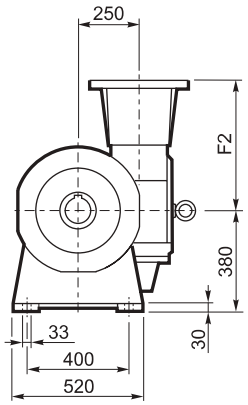



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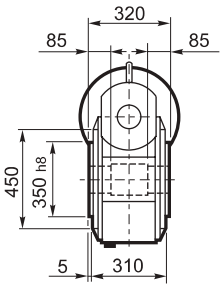
# VF 250...P (IEC)

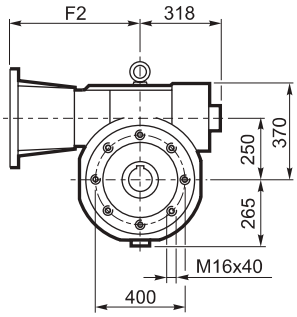
**V**



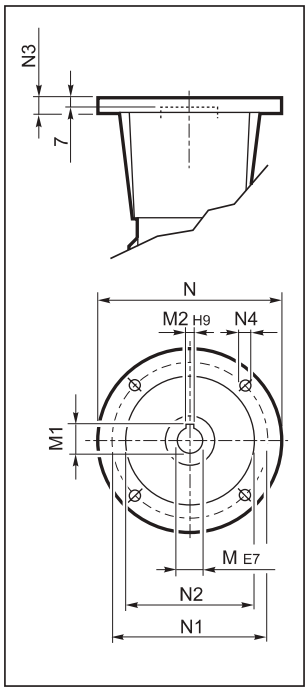




**P**

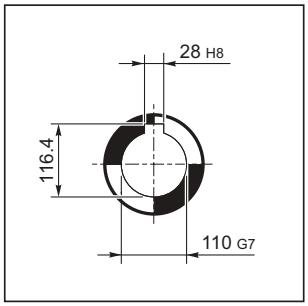



**INPUT**




**OUTPUT**




Fan cooling as standard on versions A and P.
P(IEC) arrangements come complete with gear coupling enclosed in the bell housing.

| | | F2 | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF 250** | **P132 B5** | 531 | 38 | 41.3 | 10 | 300 | 265 | 230 | 25 | M12 | 310 |
| **VF 250** | **P160 B5** | 506 | 42 | 45.3 | 12 | 350 | 300 | 250 | 22 | 18 | |
| **VF 250** | **P180 B5** | 506 | 48 | 51.8 | 14 | 350 | 300 | 250 | 22 | 18 | |
| **VF 250** | **P200 B5** | 531 | 55 | 59.3 | 16 | 400 | 350 | 300 | 25 | M16 | |
| **VF 250** | **P225 B5** | 536 | 60 | 64.4 | 18 | 450 | 400 | 350 | 22 | 18# | |

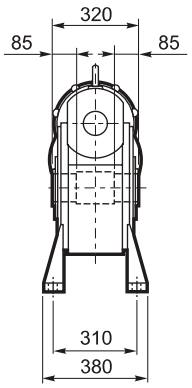
# N° 8 holes at 45°

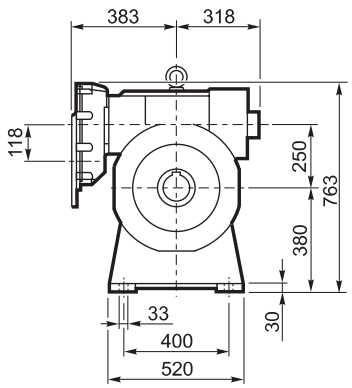


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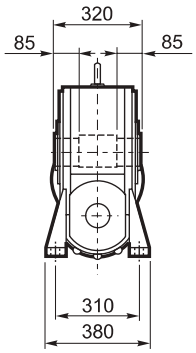
# VFR 250...P (IEC)

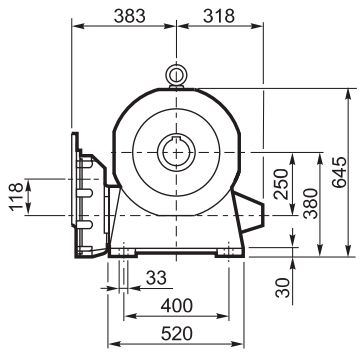
**A**



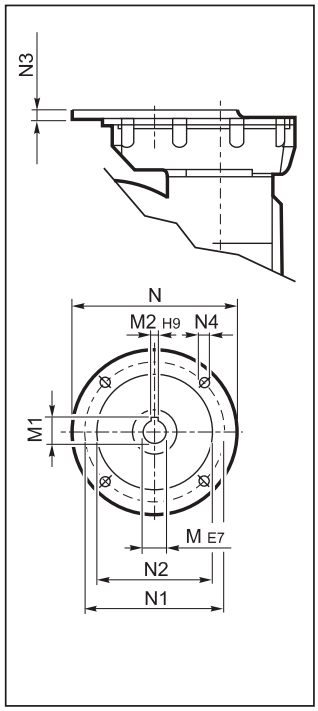




**N**

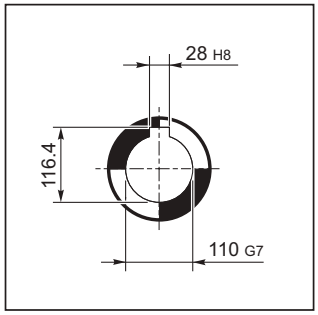



**INPUT**




**OUTPUT**

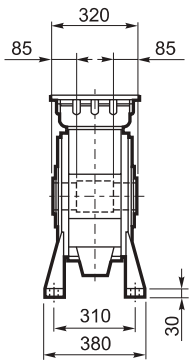


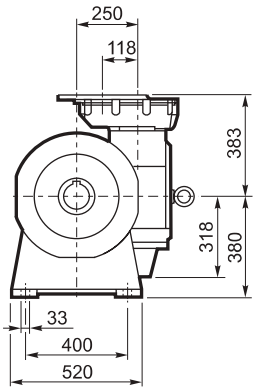



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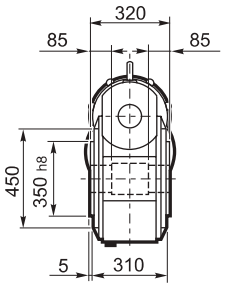
# VFR 250...P (IEC)

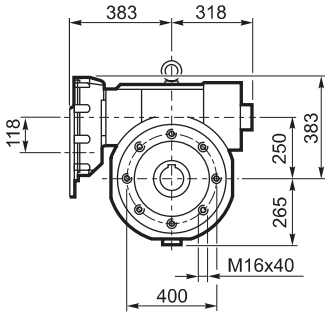
**V**



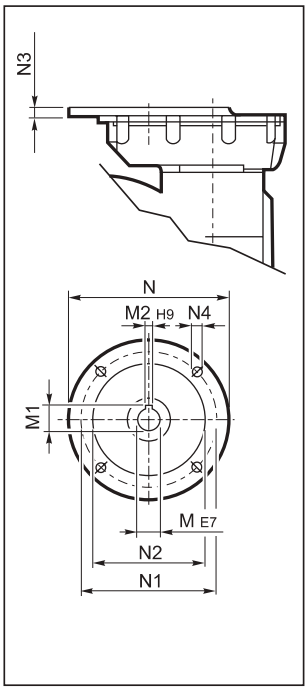




**P**

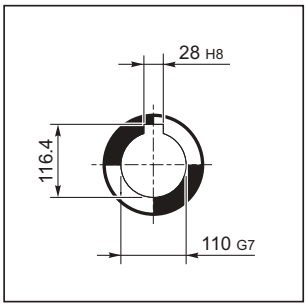



**INPUT**




**OUTPUT**




Fan cooling as standard on versions A and P.

| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VFR 250** | **P100 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | 295 |
| **VFR 250** | **P112 B5** | 28 K6 | 31.3 | 8 | 250 | 215 | 180 | 13 | M12x35 | |
| **VFR 250** | **P132 B5** | 38 J6 | 41.3 | 10 | 300 | 265 | 230 | 13 | M12x35 | |
| **VFR 250** | **P160 B5** | 42 J6 | 44.3# | 12 | 350 | 300 | 250 | 18 | M16x60 | |

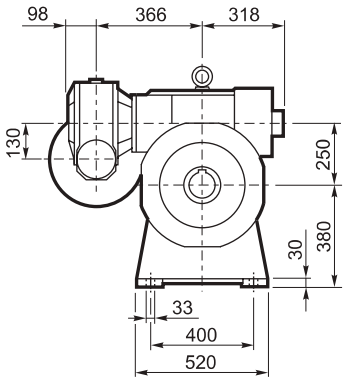
# Lowered key

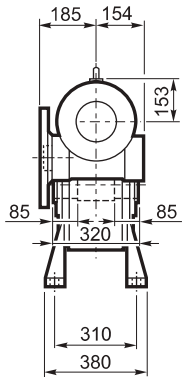


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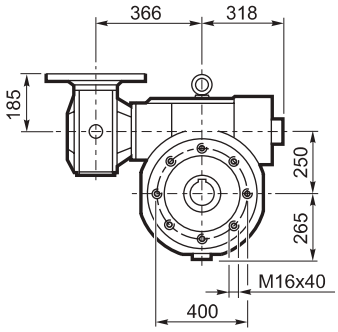
# VF/VF 130/250...P (IEC)

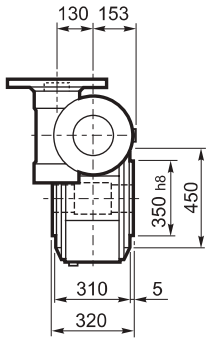
**A**



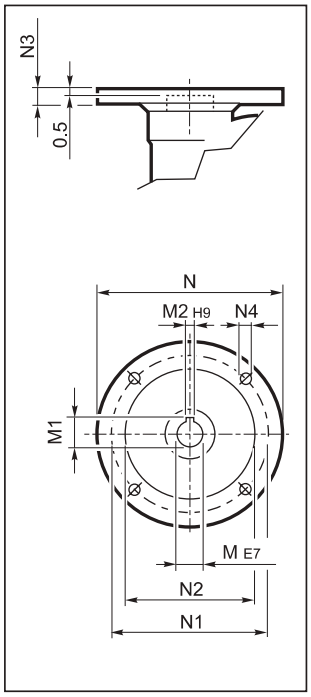




**P**

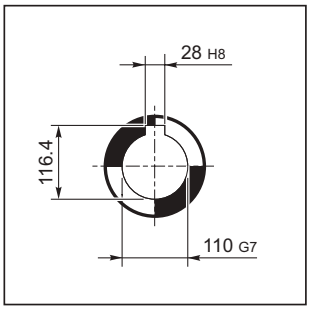



**INPUT**




**OUTPUT**




Fan cooling as standard on versions A and P.

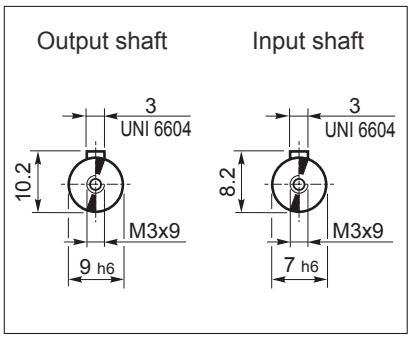
| | | M | M1 | M2 | N | N1 | N2 | N3 | N4 | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **VF/VF 130/250** | **P 90 B5** | 24 | 27.3 | 8 | 200 | 165 | 130 | 17 | 11 | 325 |
| **VF/VF 130/250** | **P100 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 17 | 13 | |
| **VF/VF 130/250** | **P112 B5** | 28 | 31.3 | 8 | 250 | 215 | 180 | 17 | 13 | |
| **VF/VF 130/250** | **P132 B5** | 38 | 40.1# | 10 | 300 | 265 | 230 | 17 | 13 | |

# Lowered key

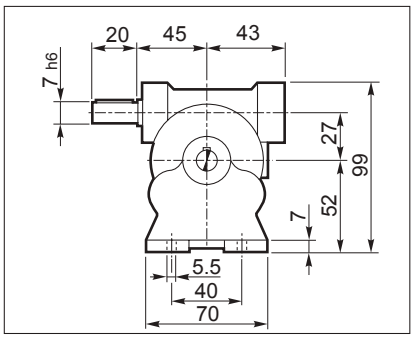


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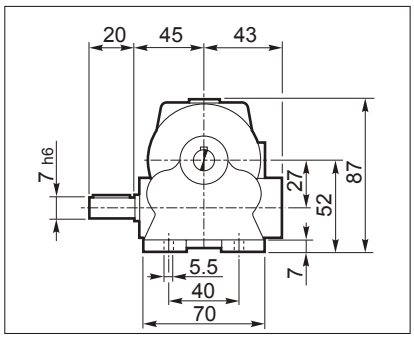
# VF 27...HS



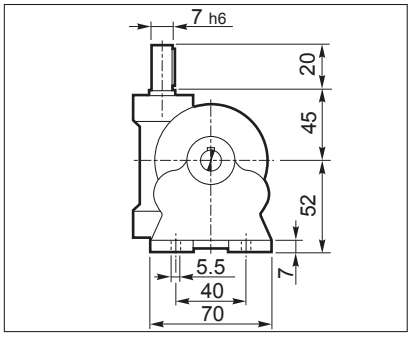

## VF 27_A..HS



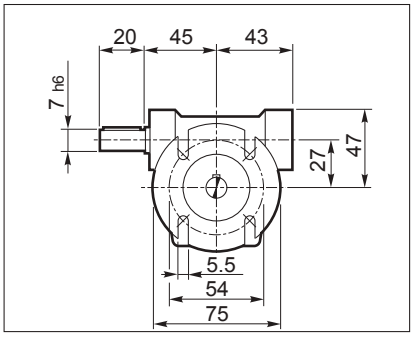

## VF 27_N..HS



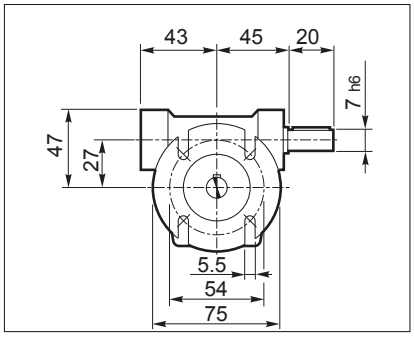

## VF 27_V..HS




## VF 27_F1..HS




## VF 27_F2..HS




| | Kg |
|---|---|
| **VF 27_HS** | 0.73 |

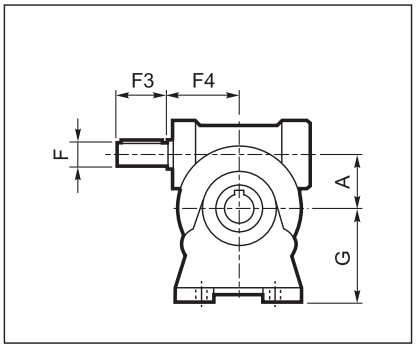
Dimensions common to the other configurations can be found at page 111.



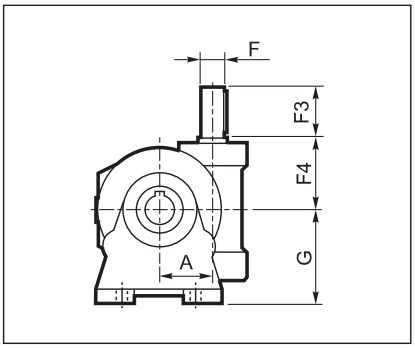
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# VF...HS - W..HS

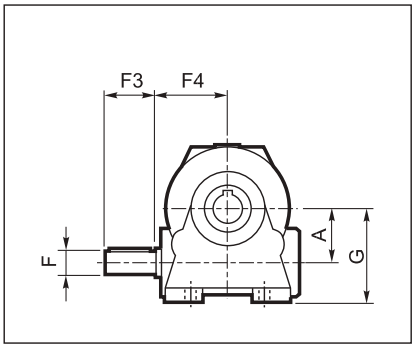
### VF_A..HS



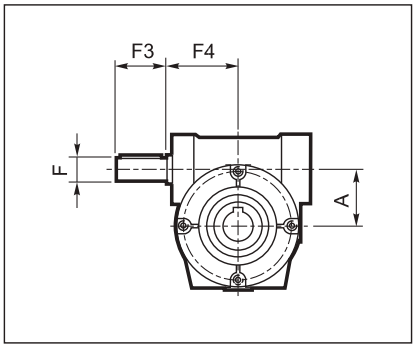

### VF_V..HS



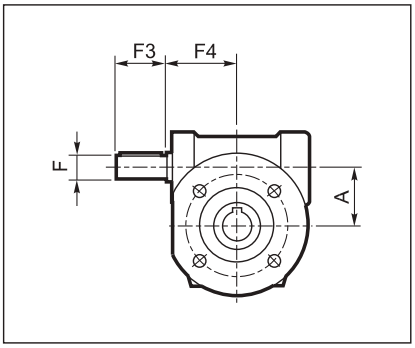

### VF_N..HS



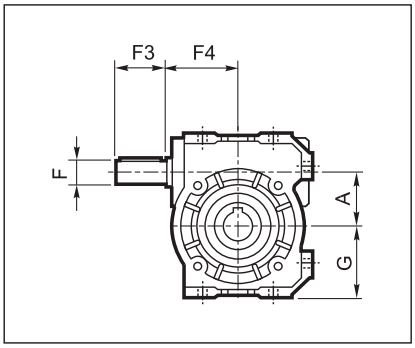

### VF_P..HS



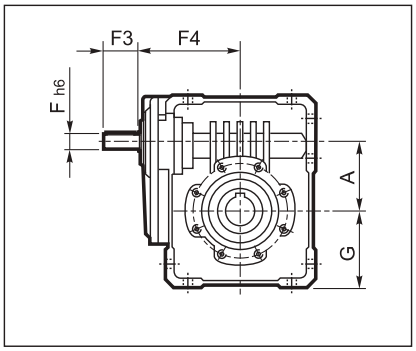

### VF_FA/FC/FR/F..HS



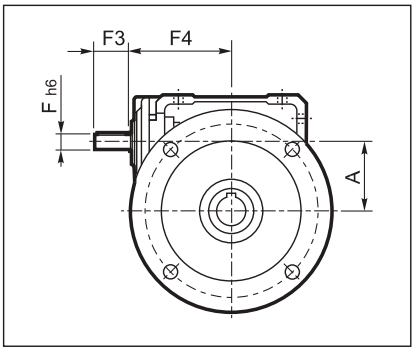

### VF_U..HS

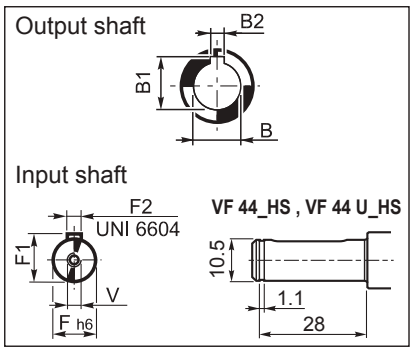



### W_U..HS




### W_UF/UFC/UFCR..HS




| | A | B | B1 | B2 | F | F1 | F2 | F3 | F4 | G | V | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF 30_HS** | 30 | 14 H7 | 16.3 | 5 | 9 | 10.2 | 3 | 20 | 50 | 55 | — | 1.1 |
| **VF 30 U HS** | | | | | | | | | | 47 | | |
| **VF 44_HS** | 44.6 | 18 H7 | 20.8 | 6 | 11 | 12.5 | 4 | 30 | 54 | 72 | — | 2.0 |
| **VF 44 U HS** | | | | | | | | | | 55 | | |
| **VF 49_HS** | 49.5 | 25 H7 | 28.3 | 8 | 16 | 18 | 5 | 40 | 65 | 82 | M6x16 | 3.0 |
| **VF 49 U HS** | | | | | | | | | | 64.5 | | |
| **W 63_HS** | 62.17 | 25 H7 | 28.3 | 8 | 18 | 20.5 | 6 | 40 | 110.5 | 72.5 | M6x16 | 6.4 |
| **W 75_HS** | 75 | 30(28) H7 | 33.3(31.3) | 8 | 19 | 21.5 | 6 | 40 | 128 | 87 | M6x16 | 10.0 |
| **W 86_HS** | 86.9 | 35 H7 | 38.3 | 10 | 25 | 28 | 8 | 50 | 144 | 100 | M8x19 | 14.1 |
| **W 110_HS** | 110.1 | 42 H7 | 45.3 | 12 | 25 | 28 | 8 | 60 | 168 | 125 | M8x19 | 27 |
| **VF 130_HS** | 130 | 45 H7 | 48.8 | 14 | 30 | 33 | 8 | 60 | 160 | 195 | M8x20 | 49 |
| **VF 150_HS** | 150 | 50 H7 | 53.8 | 14 | 35 | 38 | 10 | 65 | 185 | 220 | M8x20 | 60 |
| **VF 185_HS** | 185.4 | 60 H7 | 64.4 | 18 | 40 | 43 | 12 | 70 | 214.5 | 254 | M8x20 | 94 |
| **VF 210_HS** | 210 | 90 H7 | 95.4 | 25 | 48 | 51.5 | 14 | 110 | 230 | 335 | M16x40 | 175 |
| **VF 250_HS** | 250 | 110 G7 | 116.4 | 28 | 55 | 59 | 16 | 110 | 274 | 380 | M16x40 | 275 |

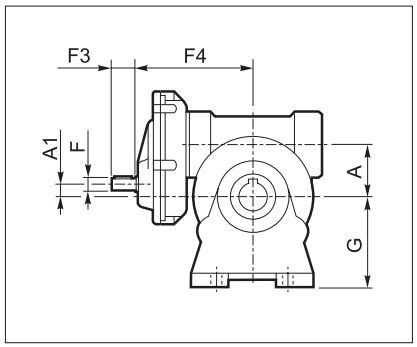
Dimensions common to the other configurations can be found from page 112 to 167.



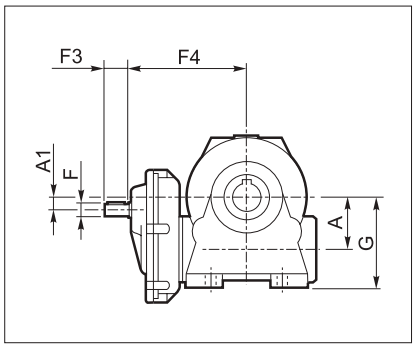
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# VFR...HS - WR...HS

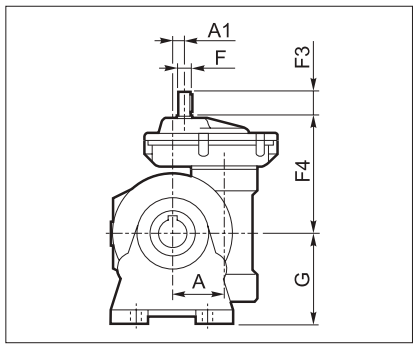
**VFR_A..HS**



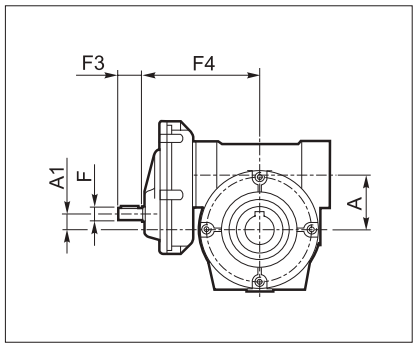

**VFR_N..HS**



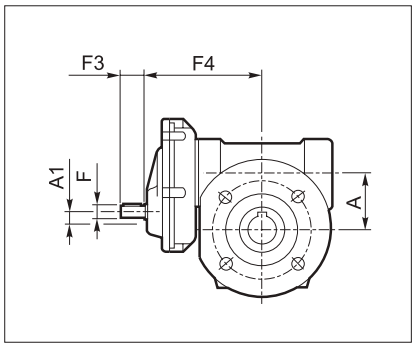

**VFR_V..HS**



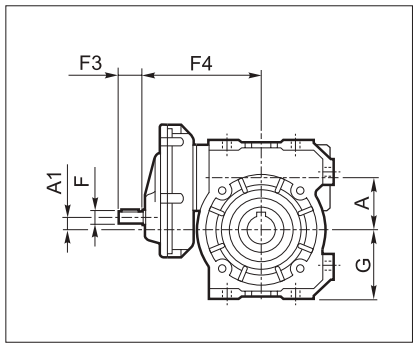

**VFR_P..HS**



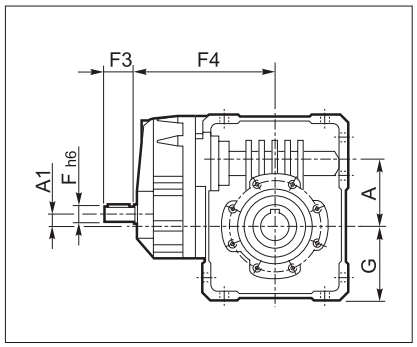

**VFR_FA/FC/FR/F..HS**



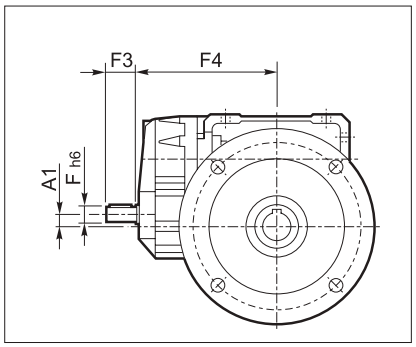

**VFR_U..HS**

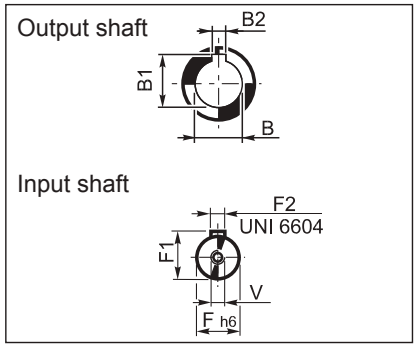



**WR_U..HS**




**WR_UF/UFC/UFCR..HS**




| | A | A1 | B | B1 | B2 | F | F1 | F2 | F3 | F4 | G | V | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VFR 49_HS** | 49.5 | 10 | 25 H7 | 28.3 | 8 | 11 | 12.5 | 4 | 23 | 110 | 82 | M4x10 | 5 |
| **VFR 49 U HS** | | | | | | | | | | | 64.5 | | |
| **WR 63_HS** | 62.17 | 11.42 | 25 H7 | 28.3 | 8 | 14 | 16 | 5 | 30 | 138 | 72.5 | M5x12.5 | 7.1 |
| **WR 75_HS** | 75 | 11 | 30(28) H7 | 33.3(31.3) | 8 | 19 | 21.5 | 6 | 40 | 162 | 87 | M6x16 | 11.1 |
| **WR 86_HS** | 86.9 | 22.9 | 35 H7 | 38.3 | 10 | 19 | 21.5 | 6 | 40 | 178 | 100 | M6x16 | 14.7 |
| **WR 110_HS** | 110.1 | 21.1 | 42 H7 | 45.3 | 12 | 24 | 27 | 8 | 50 | 201 | 125 | M8x19 | 34 |
| **VFR 130_HS** | 130 | 45 | 45 H7 | 48.8 | 14 | 24 | 27 | 8 | 50 | 228 | 195 | M8x20 | 57 |
| **VFR 150_HS** | 150 | 53 | 50 H7 | 53.8 | 14 | 28 | 31 | 8 | 60 | 280 | 220 | M8x20 | 71 |
| **VFR 185_HS** | 185.4 | 88.4 | 60 H7 | 64.4 | 18 | 28 | 31 | 8 | 60 | 310 | 254 | M8x20 | 110 |
| **VFR 210_HS** | 210 | 92 | 90 H7 | 95.4 | 25 | 38 | 41 | 10 | 80 | 335 | 335 | M10x25 | 185 |
| **VFR 250_HS** | 250 | 132 | 110 G7 | 116.4 | 28 | 38 | 41 | 10 | 80 | 383 | 380 | M10x25 | 295 |

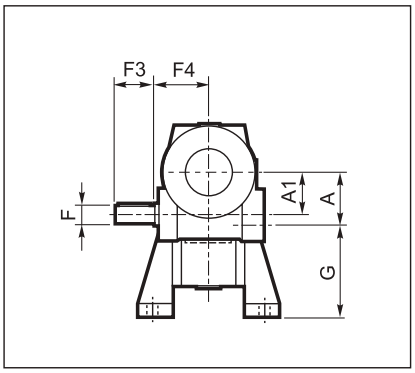
Dimensions common to the other configurations can be found from page 116 to 169.

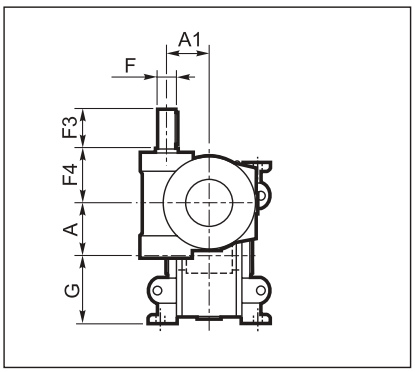


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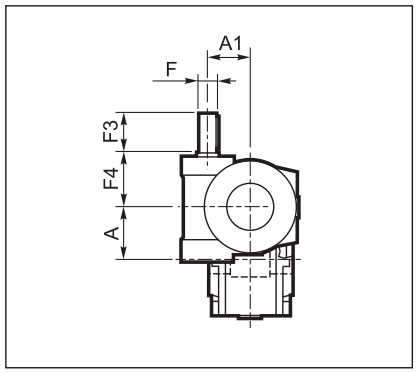
# VF/VF...HS - VF/W...HS - W/VF...HS

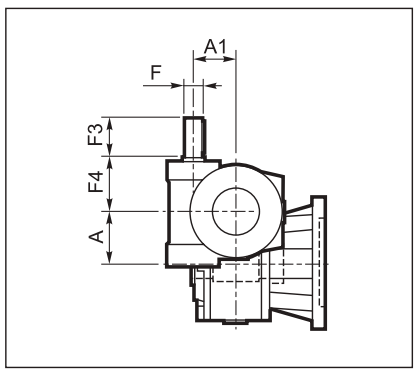
**VF/VF_A..HS**
**W/VF_A..HS**



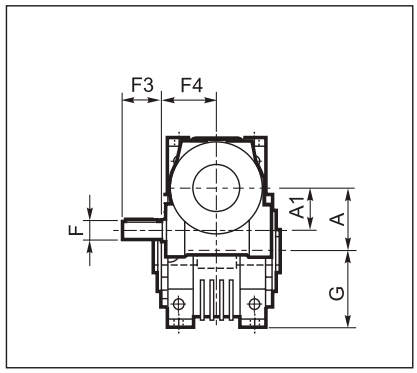



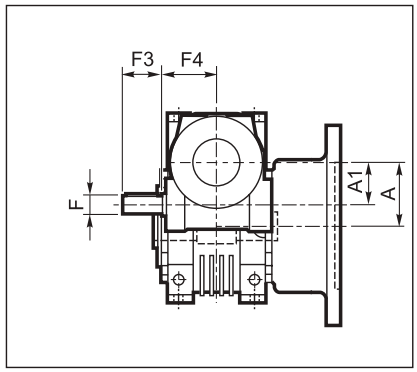

**VF/VF_P..HS**
**W/VF_P..HS**



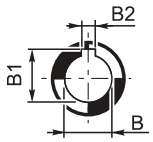




**VF/VF_P..HS**
**W/VF_P..HS**

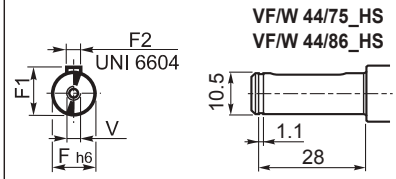



Output shaft




Input shaft




| | A | A1 | B | B1 | B2 | F | F1 | F2 | F3 | F4 | G | V | Kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF/VF 30/44_HS** | 44.6 | 30 | 18 H7 | 20.8 | 6 | 9 | 10.2 | 3 | 20 | 50 | 72 | — | 3.5 |
| **VF/VF 30/44 U HS** | | | | | | | | | | | 55 | | |
| **VF/VF 30/49_HS** | 49.5 | 30 | 25 H7 | 28.3 | 8 | 9 | 10.2 | 3 | 20 | 50 | 82 | — | 4.5 |
| **VF/VF 30/49 U HS** | | | | | | | | | | | 64.5 | | |
| **VF/W 30/63_HS** | 62.17 | 30 | 25 H7 | 28.3 | 8 | 9 | 10.2 | 3 | 20 | 50 | 100 | — | 7.5 |
| **VF/W 44/75_HS** | 75 | 44.6 | 30 (28) H7 | 33.3 (31.3) | 8 | 11 | 12.5 | 4 | 30 | 54 | 115 | — | 16.1 |
| **VF/W 44/86_HS** | 86.9 | 44.6 | 35 H7 | 38.3 | 10 | 11 | 12.5 | 4 | 30 | 54 | 142 | — | 42 |
| **VF/W 49/110_HS** | 110.0 | 49.5 | 42 H7 | 45.3 | 12 | 16 | 18 | 5 | 40 | 65 | 170 | M6x16 | 46 |
| **W/VF 63/130_HS** | 130 | 62.17 | 45 H7 | 48.8 | 14 | 18 | 20.5 | 6 | 40 | 110.5 | 72.5 | M6x16 | 74 |
| **W/VF 86/150_HS** | 150 | 86.9 | 50 H7 | 53.8 | 14 | 25 | 28 | 8 | 50 | 144 | 100 | M8x19 | 108 |
| **W/VF 86/185_HS** | 185.4 | 86.9 | 60 H7 | 64.4 | 18 | 25 | 28 | 8 | 50 | 144 | 100 | M8x19 | 109 |
| **VF/VF 130/210_HS** | 210 | 130 | 90 H7 | 95.4 | 25 | 30 | 33 | 8 | 60 | 160 | 335 | M8 | 225 |
| **VF/VF 130/250_HS** | 250 | 130 | 110 G7 | 116.4 | 28 | 30 | 33 | 8 | 60 | 160 | 380 | M8 | 325 |

Dimensions common to the other configurations can be found from page 118 to 170.

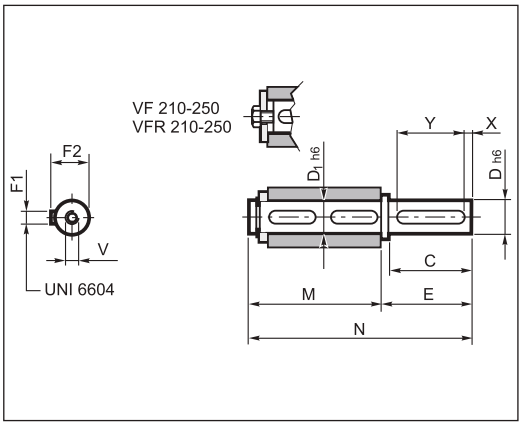


Bonfiglioli Riduttori

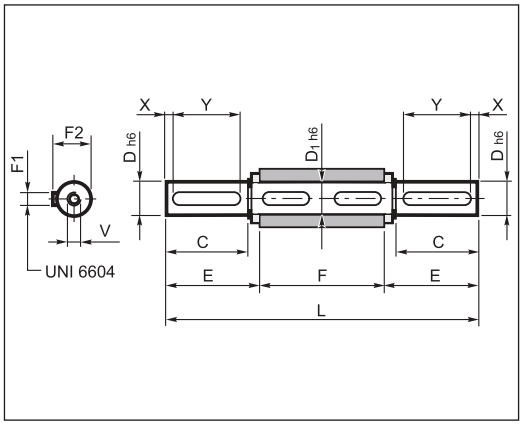
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## 28 ACCESSORIES

### 28.1 Plug-in output shaft



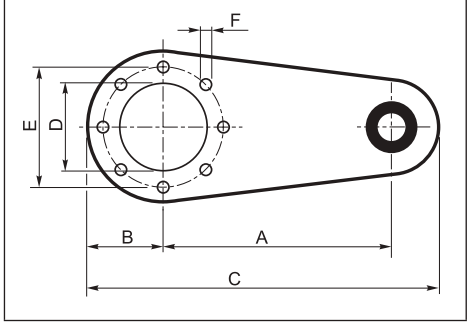

| | | C | D | D1 | E | F1 | F2 | M | N | V | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VF | 30 | 30 | 14 | 14 | 35 | 5 | 16 | 61 | 96 | M5x13 | 5 | 20 |
| VFR | 44 | 40 | 18 | 18 | 45 | 6 | 20.5 | 70 | 115 | M6x16 | 5 | 30 |
| VF/VF | 49 | 60 | 25 | 25 | 65 | 8 | 28 | 89 | 154 | M8x19 | 5 | 50 |
| | 63 | 60 | 25 | 25 | 65 | 8 | 28 | 127 | 192 | M8x19 | 5 | 50 |
| W | 75_D28 | 60 | 28 | 30 | 65 | 8 | 31 | 134 | 199 | M8x20 | 5 | 50 |
| WR | 75_D30 | 60 | 30 | 30 | 65 | 8 | 33 | 134 | 199 | M10x22 | 5 | 50 |
| VF/W | 86 | 60 | 35 | 35 | 65 | 10 | 38 | 149 | 214 | M10x22 | 5 | 50 |
| | 110 | 75 | 42 | 42 | 80 | 12 | 45 | 164 | 244 | M12x28 | 7.5 | 60 |
| | 130 | 80 | 45 | 45 | 85 | 14 | 48.5 | 176 | 261 | M12x32 | 5 | 70 |
| VF | 150 | 85 | 50 | 50 | 93 | 14 | 53.5 | 185 | 278 | M16x40 | 7.5 | 70 |
| VFR | 185 | 100 | 60 | 60 | 110 | 18 | 64 | 200 | 310 | M16x40 | 10 | 80 |
| W/VF | 210 | 130 | 90 | 90 | 140 | 25 | 95 | 255 | 395 | M20x50 | 5 | 120 |
| | 250 | 165 | 110 | 110 | 175 | 28 | 116 | 315 | 490 | M24x64 | 15 | 140 |



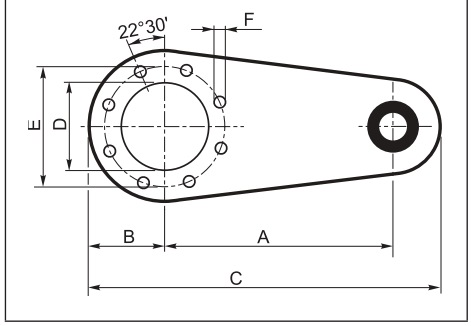

| | | C | D | D1 | E | F | F1 | F2 | L | V | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VF | 30 | 30 | 14 | 14 | 32.5 | 55 | 5 | 16 | 120 | M5x13 | 5 | 20 |
| VFR | 44 | 40 | 18 | 18 | 42.7 | 64 | 6 | 20.5 | 149.4 | M6x16 | 5 | 30 |
| VF/VF | 49 | 60 | 25 | 25 | 63.2 | 82 | 8 | 28 | 208.4 | M8x19 | 5 | 50 |
| | 63 | 60 | 25 | 25 | 63.2 | 120 | 8 | 28 | 246.4 | M8x19 | 5 | 50 |
| W | 75_D28 | 60 | 28 | 30 | 64 | 127 | 8 | 31 | 255 | M8x20 | 5 | 50 |
| WR | 75_D30 | 60 | 30 | 30 | 64 | 127 | 8 | 33 | 255 | M10x22 | 5 | 50 |
| VF/W | 86 | 60 | 35 | 35 | 64 | 140 | 10 | 38 | 268 | M10x22 | 5 | 50 |
| | 110 | 75 | 42 | 42 | 79.3 | 155 | 12 | 45 | 313.5 | M12x28 | 7.5 | 60 |
| | 130 | 80 | 45 | 45 | 84.7 | 165 | 14 | 48.5 | 334.5 | M12x32 | 5 | 70 |
| VF | 150 | 85 | 50 | 50 | 90 | 175 | 14 | 53.5 | 355 | M16x40 | 7.5 | 70 |
| VFR | 185 | 100 | 60 | 60 | 105 | 190 | 18 | 64 | 400 | M16x40 | 10 | 80 |
| W/VF | 210 | 130 | 90 | 90 | 140 | 260 | 25 | 95 | 540 | M20x50 | 5 | 120 |
| | 250 | 165 | 110 | 110 | 175 | 320 | 28 | 116 | 670 | M24x64 | 15 | 140 |

### 28.2 Torque arm

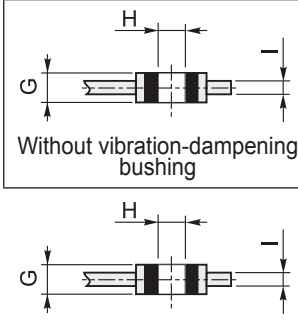
**VF**




**W**




**VF 30 - VF 44 - VF 49**

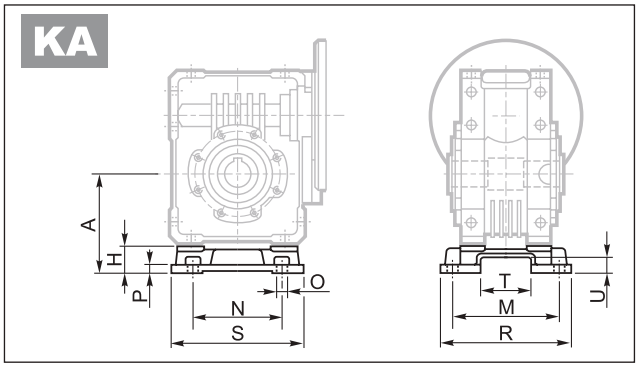


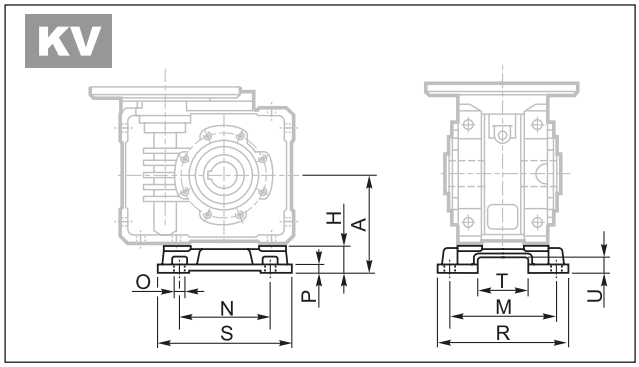

| | | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|---|
| VF VFR VF/VF | 30 | 100 | 40 | 157.5 | 50 | 65 | 7 | 14 | 8 | 4 |
| | 44 | 100 | 40 | 157.5 | 50 | 65 | 7 | 14 | 8 | 4 |
| | 49 | 100 | 55 | 172.5 | 68 | 94 | 7 | 14 | 8 | 4 |
| W WR VF/W | 63 | 150 | 55 | 233 | 75 | 90 | 9 | 20 | 10 | 6 |
| | 75 | 200 | 63 | 300 | 90 | 110 | 9 | 25 | 20 | 6 |
| | 86 | 200 | 80 | 318 | 110 | 130 | 11 | 25 | 20 | 6 |
| | 110 | 250 | 100 | 388 | 130 | 165 | 13 | 25 | 20 | 6 |
| VF VFR W/VF | 130 | 300 | 125 | 470 | 180 | 215 | 13 | 30 | 25 | 6 |
| | 150 | 300 | 125 | 470 | 180 | 215 | 15 | 30 | 25 | 6 |
| | 185 | 350 | 150 | 545 | 230 | 265 | 17 | 30 | 25 | 6 |
| | 210 | 350 | 175 | 625 | 250 | 300 | 19 | 60 | 50 | 8 |
| | 250 | 400 | 225 | 725 | 350 | 400 | 19 | 60 | 50 | 10 |



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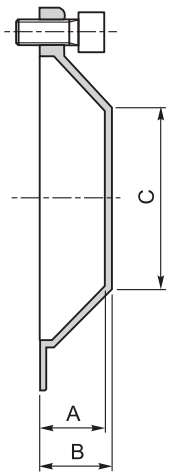
## 28.3 VF-interchangeable foot kits KA, KV




| | A | H | M | N | O | P | R | S | T | U |
|---|---|---|---|---|---|---|---|---|---|---|
| **W 63 - WR 63** | 100 | 27.5 | 111 | 95 | 11 | 8 | 135 | 145 | 56.5 | 15.5 |
| **W 75 - WR 75** | 115 | 28 | 115 | 120 | 11 | 9 | 139 | 174 | 56.5 | 15.5 |
| **W 86 - WR 86** | 142 | 42 | 146 | 140 | 11 | 11 | 170 | 200 | 69 | 20 |
| **W 110 - WR 110** | 170 | 45 | 181 | 200 | 13 | 14 | 210 | 250 | 69 | 20 |

## 28.4 Safety cover



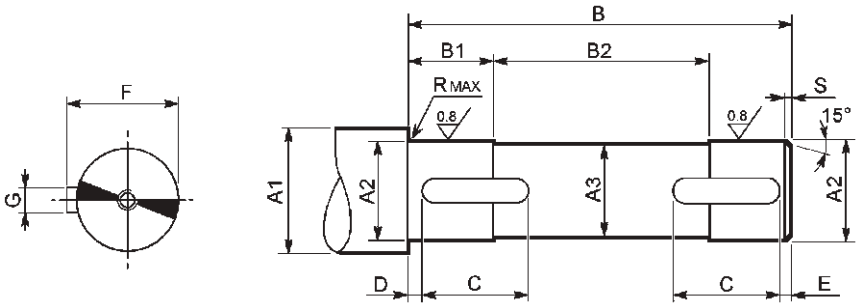

| | A | B | C |
|---|---|---|---|
| **W 63 - WR 63** | 26.5 | 29 | Ø35 |
| **W 75 - WR 75** | 24.5 | 27 | Ø54 |
| **W 86 - WR 86** | 26.5 | 29 | Ø71 |
| **W 110 - WR110** | 27.5 | 30 | Ø89 |

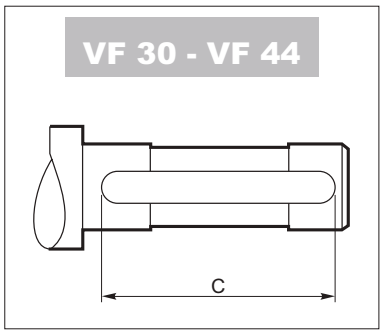


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## 29 CUSTOMER'S SHAFT

Pivot of driven equipment should be made from high grade alloy steel.
Table below shows recommended dimensions for the Customer to consider when designing mating shaft. A device such as that illustrated below should also be installed to secure the shaft axially. Take care to verify and dimension the various components to suit the needs of the application.




| | A1 | A2 | A3 | B | B1 | B2 | C | D | E | F | G | R | S | UNI 6604 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF 30** | ≥ 19 | 14 f7 | 13 | 53 | 18.5 | 16 | 40 | 6.5 | 6.5 | 16 | 5 h9 | 0.5 | 1.5 | 5x5x40 A |
| **VF 44** | ≥ 23 | 18 f7 | 17 | 62 | 22.5 | 17 | 50 | 6 | 6 | 20.5 | 6 h9 | 0.5 | 1.5 | 6x6x50 A |
| **VF 49** | ≥ 30 | 25 f7 | 24 | 80 | 20.5 | 39 | 20 | 2 | 2 | 28 | 8 h9 | 1 | 1.5 | 8x7x20 A |
| **W 63** | ≥ 30 | 25 f7 | 24 | 118 | 38 | 42 | 35 | 2 | 2 | 28 | 8 h9 | 1 | 1.5 | 8x7x35 A |
| **W 75** | ≥ 35 | 28 f7 | 27 | 125 | 38 | 49 | 40 | 2 | 2 | 31 | 8 h9 | 1 | 1.5 | 8x7x40 A |
| | ≥ 35 | 30 f7 | 29 | 125 | 38 | 49 | 40 | 2 | 2 | 33 | 8 h9 | 1 | 1.5 | 8x7x40 A |
| **W 86** | ≥ 42 | 35 f7 | 34 | 138 | 43 | 52 | 40 | 2 | 2 | 38 | 10 h9 | 1.5 | 1.5 | 10x8x40 A |
| **W 110** | ≥ 48 | 42 f7 | 41 | 153 | 43 | 67 | 50 | 2 | 2 | 45 | 12 h9 | 1.5 | 2 | 12x8x50 A |
| **VF 130** | ≥ 52 | 45 f7 | 44 | 163 | 50.5 | 62 | 60 | 2.5 | 2.5 | 49.5 | 14 h9 | 2.5 | 2 | 14x9x60 A |
| **VF 150** | ≥ 57 | 50 f7 | 49 | 173 | 53 | 67 | 70 | 2.5 | 2.5 | 53.5 | 14 h9 | 2.5 | 2 | 14x9x70 A |
| **VF 185** | ≥ 68 | 60 f7 | 59 | 188 | 63 | 62 | 80 | 2.5 | 2.5 | 64 | 18 h9 | 2.5 | 2 | 18x11x80 A |
| **VF 210** | ≥ 99 | 90 f7 | 89 | 258 | 83 | 92 | 80 | 3 | 3 | 95 | 25 h9 | 2.5 | 2.5 | 25x14x80 A |
| **VF 250** | ≥ 121 | 110 h7 | 109 | 318 | 83 | 152 | 80 | 3 | 3 | 116 | 28 h9 | 2.5 | 2.5 | 28x16x80 A |


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## 30 TORQUE LIMITER

### 30.1 Description

The friction-based torque limiter, available for wormgears type **VF44 - VF49** and **W63…W110**, is designed to protect the transmission from accidental overloads which could damage the drive elements. Against conventional external torque limiters, this versatile solution lends the following advantages:

• unchanged external dimensions against standard same model standard units
• maintenance-free, as the system is permanently lubed
• slip torque can be easily adjusted by means of a simple manual operation from the outside of the gearbox
• slipping, even if continuous, does not create any damage or wear to the mechanical parts, since slipping parts are constantly separated by an oil film.

**We advise against installing this device to lifting equipment.**

### 30.2 Operating principle

The torque limiter basically consists of a double tapered clutch with active surfaces machined on (bronze) worm wheel and hub of output shaft (nodular cast iron GS400/12). Bore of output shaft allows shaft mounting of gear unit onto driven machine.
Active surfaces of the torque limiter are pressed against each other by thrust generated by adequately proportioned spring washers. Transmissible torque is proportional to axial force applied by the springs and adjustment of torque setting is easily conducted manually through an external ring nut.

### 30.3 Protection of the machine from overloads

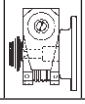
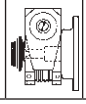
The torque limiter, properly adjusted in function of the torque necessary for the driven equipment, protects all mechanical components of the transmission avoiding any damage due to overloads.

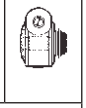
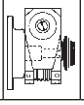
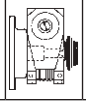
### 30.4 Reversing of a self-locking unit

In some applications it may be desired to rotate the output shaft while machine is not operating. Such a situation is not always possible with high-ratio self-locking worm gears. Using the torque limiter it is possible to conduct such operation untightening the ring nut.

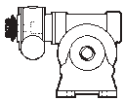

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## 30.5 VF…L, W…L

| L1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | A | V | U | F1 FC1 FR1 FA1 | F2 FC2 FR2 FA2** | P1 P2 |
| VF VF/VF* |  |  |  |  |  |  ** ⛀ VF 49 |  |
| | U | UF1 UFC1 | UF2 UFC2 | UFCR1 | UFCR2 | | |
| W VF/W* |  |  | ⛀ |  | ⛀ | | |

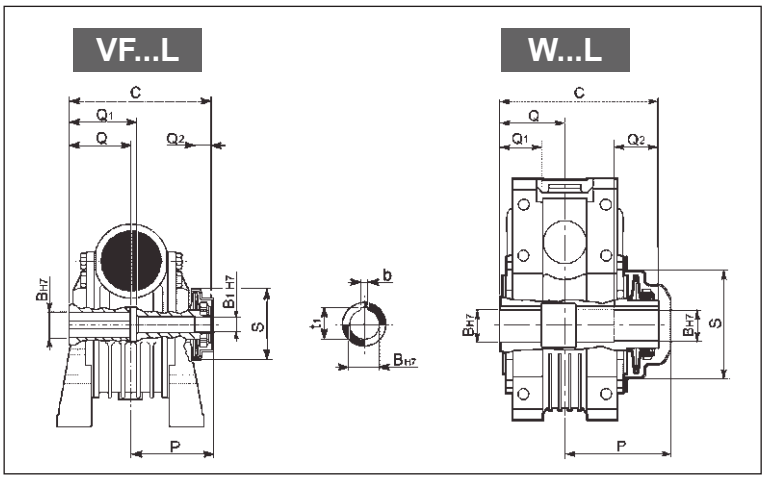
| L2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | A | V | U | F1 FC1 FR1 FA1** | F2 FC2 FR2 FA2 | P1 P2 |
| VF VF/VF* |  |  |  |  |  ** ⛀ VF 49 |  |  |
| | U | UF1 UFC1 | UF2 UFC2 | UFCR1 | UFCR2 | | |
| W VF/W* |  | ⛀ |  | ⛀ |  | | |

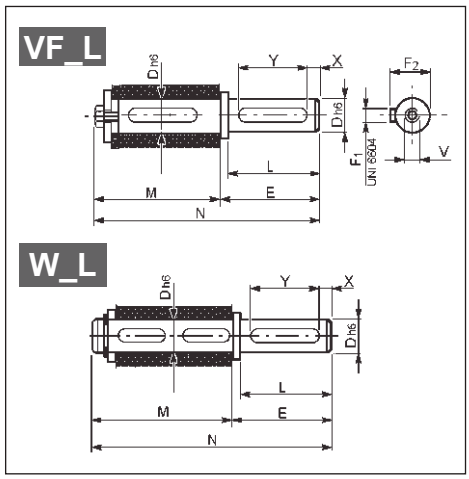
* On double worm gear units the torque limiter is fitted on 2nd reducer (larger size) for the L1 or L2 configurations. Same is fitted on 1st reducer (smaller) when the LF configuration is specified.

| LF | | | |
|---|---|---|---|
|  | | | |
| **VF/W** | 44/75 | 44/86 | 49/110 |
| **W/VF** | 63/130 | 86/150 | 86/185 |

Unless otherwise specified VF…L gear units are supplied with ring nut on the left hand side (L1), viewing from the electric motor and gearbox in the B3 mounting position.

## 30.6 Dimensions




| | Torque limiter | | | | | | | | | | Single output shaft | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C | Q | Q1 | Q2 | P | S | B H7 | B1 H7 | t1 | b | L | D h6 | E | F1 | F2 | M | N | V | X | Y |
| **VF 44L** | 79 | 32 | 32 | 12 | 48 | 42.5 | 18 | 11 | 20.8 | 6 | 40 | 18 | 45 | 6 | 20.5 | 86 | 131 | M6x16 | 5 | 30 |
| **VF 49L** | 105 | 41 | 51 | 15 | 63.5 | 66.5 | 25 | 14 | 28.3 | 8 | 60 | 25 | 65 | 8 | 28 | 114.5 | 179.5 | M8x19 | 5 | 40 |
| **W 63L** | 145 | 60 | 40 | 40 | 100 | 77 | 25 | - | 28.3 | 8 | 60 | 25 | 65 | 8 | 28 | 152 | 217 | M8x19 | 5 | 50 |
| **W 75L_D30** | 154.5 | 63.5 | 40 | 40 | 104 | 100 | 30 | - | 33.3 | 8 | 60 | 30 | 65 | 8 | 33 | 161.5 | 226.5 | M10x22 | 5 | 50 |
| **W 86L** | 170 | 70 | 50 | 45 | 113 | 119 | 35 | - | 38.3 | 10 | 60 | 35 | 65 | 10 | 38 | 179 | 244 | M10x22 | 5 | 50 |
| **W 110L** | 191 | 77.5 | 55 | 45 | 133 | 134 | 42 | - | 45.3 | 12 | 75 | 42 | 80 | 12 | 45 | 200 | 280 | M12x28 | 7.5 | 60 |



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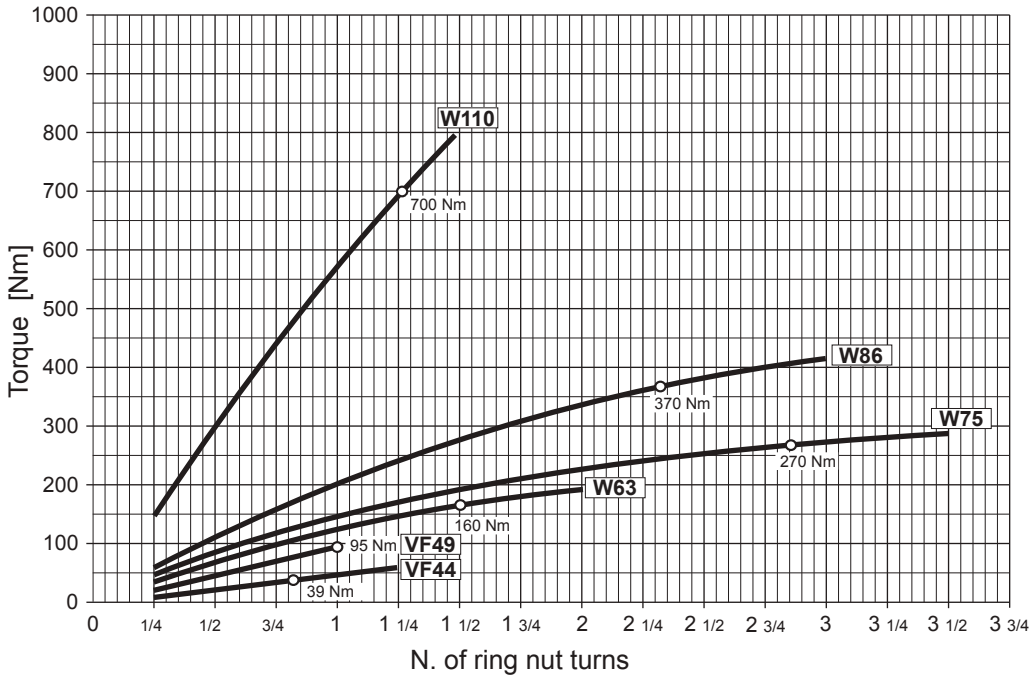
## 30.7 Slip torque setting

A preliminary slip torque setting is conducted at the factory. Reference is made to torque rating $Mn_2$ [$n_1$=1400] of the captioned VF or W gear unit.
Here below the operations performed at the factory for the initial adjustment are listed. Same steps, with the exception of step (2), must be followed when a different torque setting is required.

1. Ring nut is tightened until spring washers are sufficiently loaded that manual rotation is hardly possible.

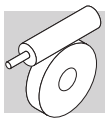
2. By means of an engraver marks are made, in identical (angular) position, on both the ring nut and the hollow shaft.
Setting will then be referred to as the zero-point for the consequent slip torque adjustment, through turning of the ring nut.

3. Ring nut is then turned of the number of turns, or fraction of, corresponding to nominal torque rating $Mn_2$ of the captioned gear unit. In this case the diagram shown here under refers as to the proportion between number of turns and transmissible torque. Same diagram comes handy for customised torque adjustments, should these be required with time.






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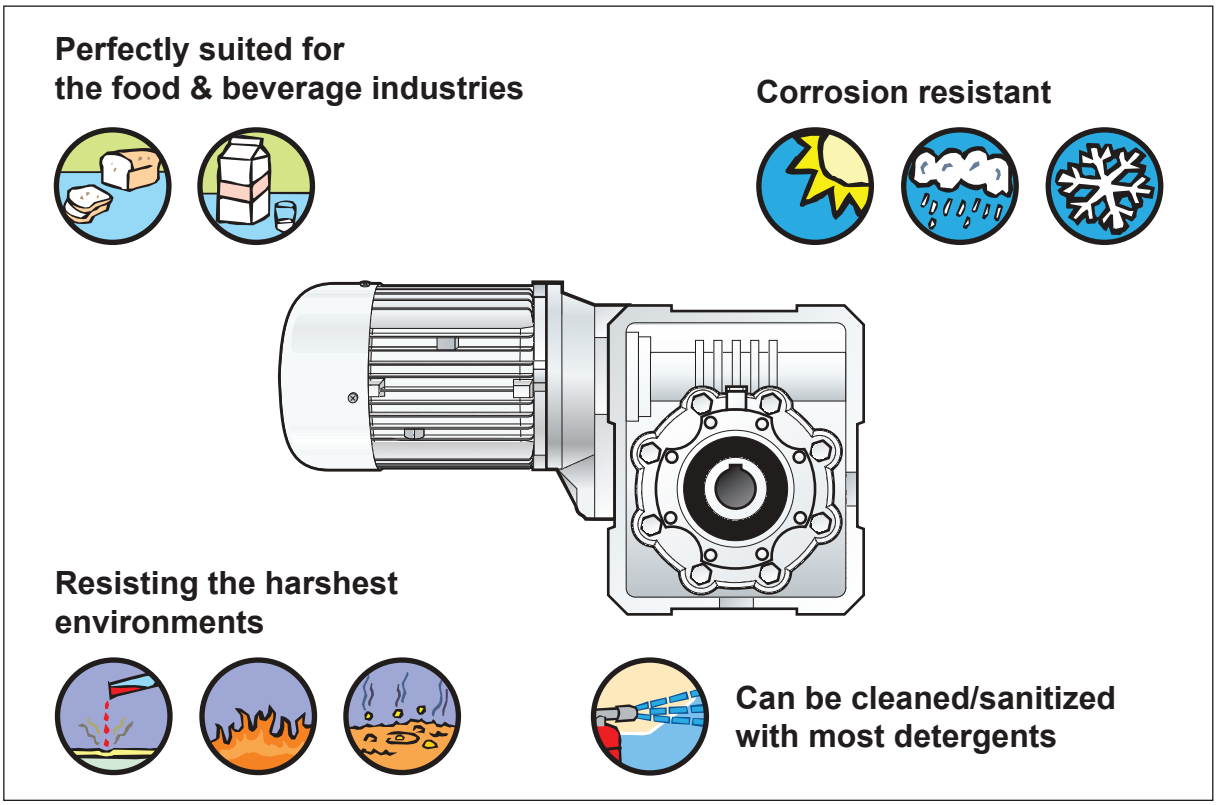


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# VF-EP / W-EP - GEARBOXES AND GEARMOTORS FOR CORROSIVE AND ASEPTIC ENVIRONMENTS

## 31 MAIN BENEFITS OF THE EP (Enhanced Protection) SERIES FOR THE FOOD AND BEVERAGE INDUSTRIES

All companies involved in the food and beverage industry today have the choice of a newly designed range of products perfectly suiting their hygiene and corrosion-resistant specifications, which are not normally available among standard products.
With the utmost attention being given to oil tightness and wash down of the gearmotor's exterior surfaces, this allows the unit to be installed in the close proximity of the food process, without the need of screening by cabinets or guards.
The epoxy coating, with a total thickness of ca. 200 µm, provides superior abrasion and corrosion resistance properties. The complete unit in fact, whether gearmotor or gearbox only, is first coated with a two-part epoxy primer layer, followed by a highly resistant two part epoxy finish coating, which is lead-and chrome-free. The material is registred by NSF and FDA for the food-processing and pharmaceutical industries, for incidental food contact , and besides resisting the corrosion of most acid and alkaline substances, is also well suited against most chemical detergents commonly used in the industry. As per the Norm ISO 9223, the epoxy coating provided is suitable for the most aggressive environments, top classified C5 in the corrosivity scale.
Three colours are available for the finish, identified through the RAL code numbers RAL 9010 (white), 5010 (blue) e 9006 (light grey).
The **_EP** product can be further tailored to specific requirements through various options and mounting accessories.
Frame sizes available: 44 (excepted VFR style), 49, 63, 75, 86. Motor availability: 0,12 through 4 kW, both compact type and IEC – standard 2, 4 and 6 poles.






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### ARRANGEMENT FOR THE GEAR UNIT

① The speed reducer is fully sealed to minimise contamination of the environment.

② Stainless steel output shaft - AISI 316.

③ Stainless steel nameplate and bolts.

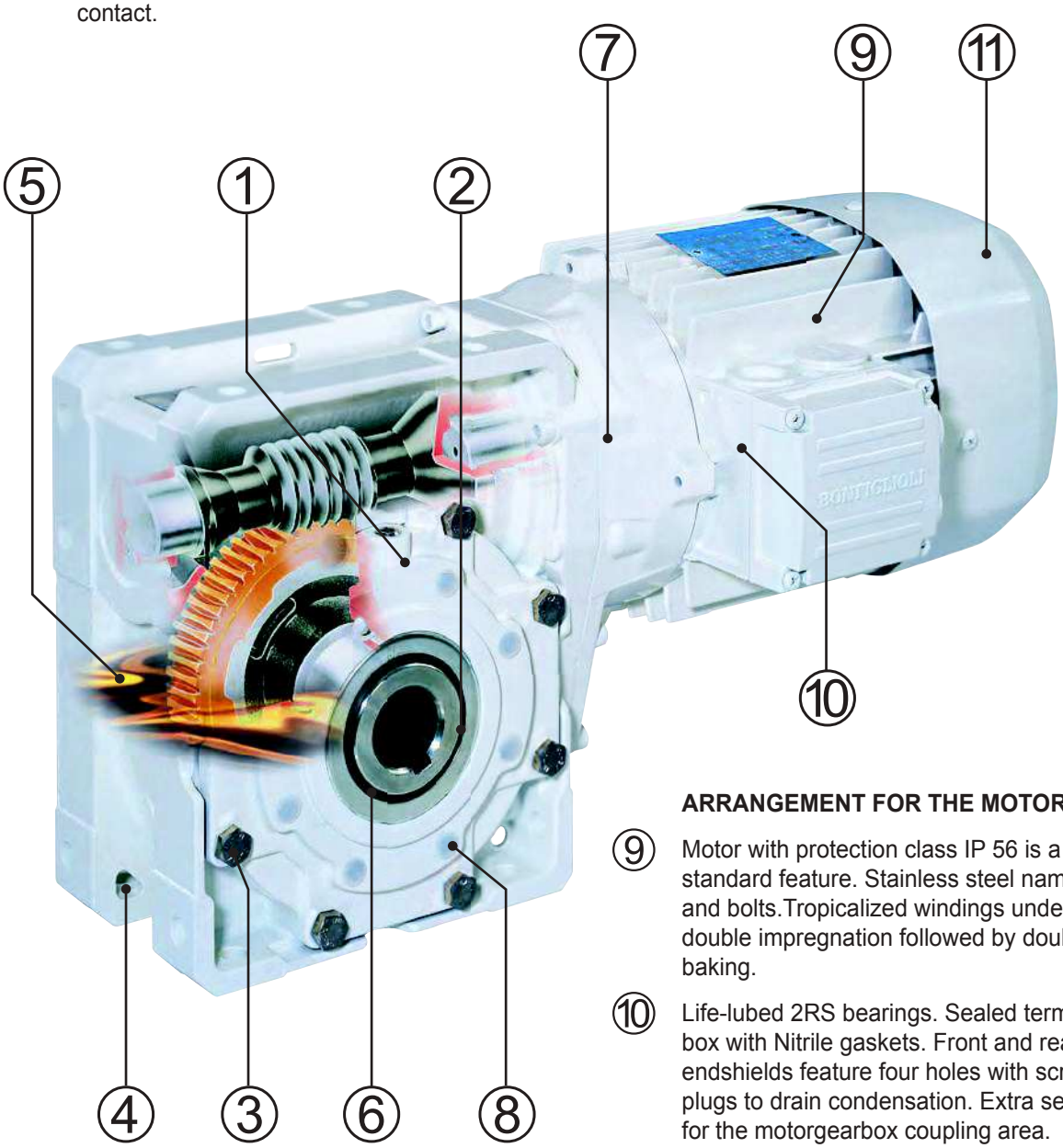
④ Through holes facilitate discharge of water after wash-down.

⑤ In option is available lubricant UH1-class synthetic oil registred by NSF for the food-processing and pharmaceutical industries . In compliance with FDA for incidental food contact.

⑥ Oil seals loaded with stainless steel inner spring. Availabilty of washdown duty double lip oil seals with stainless steel frame.

⑦ Exterior surfaces are primed and paint finished with a two-part epoxy coating, FDA and NSF approved (depending on color choice) for incidental food contact.

⑧ Button plugs for unused mounting holes.




### ARRANGEMENT FOR THE MOTOR

⑨ Motor with protection class IP 56 is a standard feature. Stainless steel nameplate and bolts.Tropicalized windings undergo double impregnation followed by double baking.

⑩ Life-lubed 2RS bearings. Sealed terminal box with Nitrile gaskets. Front and rear endshields feature four holes with screw plugs to drain condensation. Extra sealing for the motorgearbox coupling area.

⑪ Chemically inert fan.



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## 32 DESIGNATION

GEAR UNIT

**W-EP — 63 U 30 P90 B14 B3 RAL9010 ....**

OPTIONS

PAINTING

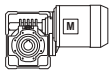
| | |
|---|---|
| **NP** unpainted | |
| **RAL9010** | |
| **RAL5010** | |
| **RAL9006** (not in compliance with FDA and NSF) | |

MOUNTING POSITION

| | |
|---|---|
| VF-EP 44<br>VF-EP 49 | **B3** |
| W-EP 63<br>W-EP 75<br>W-EP 86 | **B3** (default), **B6**, **B7**, **B8**, **V5**, **V6** |

MOTOR MOUNTING
**B5, B14** (IEC standard)

INPUT CONFIGURATION

| | VF-EP | VF-EP R | W-EP | W-EP R |
|---|---|---|---|---|
| **P(IEC)** |  P63...P80 |  P63 |  P71...P112 |  P63...P90 |
| **S_** | ⛔ | ⛔ |  S1...S3 | ⛔ |

GEAR RATIO

VERSION

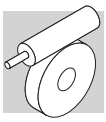
GEAR FRAME SIZE
VF-EP: **44, 49**
W-EP: **63, 75, 86**

**—** (blank)
**R** (helical-worm gear unit ⛔ VF-EP 44)

GEAR TYPE
**VF-EP**
**W-EP**



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MOTOR

**BN-EP 80B 4 B14** 230/400-50 CLF .... **RAL9010** ....

OPTIONS

PAINTING

| | |
|---|---|
| **NP** unpainted | |
| **RAL9010** | |
| **RAL5010** | |
| **RAL9006** (not in compliance with FDA and NSF) | |

TERMINAL BOX POSITION
**W** (default), **N**, **E**, **S**

INSULATION CLASS
**CL F** standard
**CL H** option

VOLTAGE-FREQUENCY

VERSION
**—** (integral motor)
**B5, B14** (IEC motor)

POLE NUMBER
**2**, **4**, **6**,

MOTOR SIZE
**1SC ... 3LC** (integral motors)
**63 ... 112** (IEC motors)

MOTOR TYPE
**M-EP** = 3-phase integral
**BN-EP** = 3-phase IEC



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## 33 GEARBOX OPTIONS

**PX**
Wash down duty oil seals for the output shaft. The particular oil seals, offered as an option, make the gearmotor suitable for arduous environments where frequent washdowns occur, often with high-pressure hot water, together with sanitizing agents. The stainless steel screen and the low friction PTFE double lip design provide an extended life and improved sealing function even under extreme conditions with the presence of aggressive media.

**PV**
Fluoro elastomer rings on output shaft. Stainless steel loading spring.

**UH**1
Food grade synthetic lubricant. The gearbox is factory filled with “long life” lubricant, approved for incidental food contact and registered as UH1 by the NSF for the food and pharma industry, it also satisfy the FDA 21 CFR Sec. 178.3570 norms.
It’s polyglycol-based synthetic nature, not only extends the application range from temperatures of –25 °C to +150 °C, but does not require periodical oil change thus, with the absence of contamination, the gearbox is virtually maintenance-free.

**CERTIFICATES**

**AC - Certificate of compliance**
The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

**CC - Inspection certificate**
The document entails checking on order compliance, the visual inspection of external conditions and of mating dimensions. Checking on main functional parameters in unloaded conditions is also performed along with oil seal proofing, both in static and in running conditions. Units inspected are sampled within the shipping batch and marked individually.

## 34 MOTOR OPTIONS

**The available options for BN-EP and M-EP motors are: D3, E3, K1, H1, NH1, RC, RV, ACM, CC, CUS, S2, S3, S9.**

**For more detailed information please consult the Electric Motor section in this book.**



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## 35 OTHERS INFORMATION ABOUT GEARBOX AND GEARMOTOR

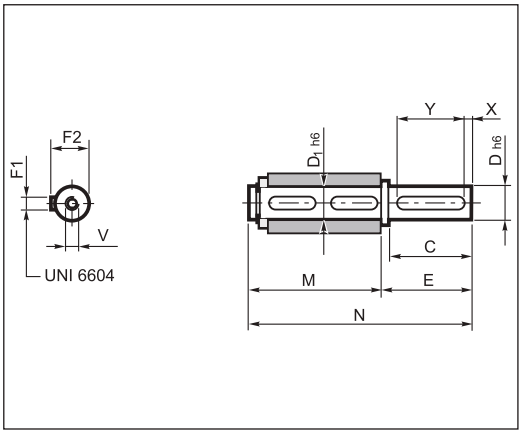
Mounting positions, technical data, motor availability,moments of inertia and dimensions of **VF-EP** e **W-EP** series don't change among equivalent **VF** and **W** product series. In the same way, information about **M-EP** and **BN-EP** motors don't change among equivalent **M** and **BN** product series. All of these information can be obtained in the related chapters of this catalogue.

## 36 THE ACCESSORIES FOR THE _EP SERIES

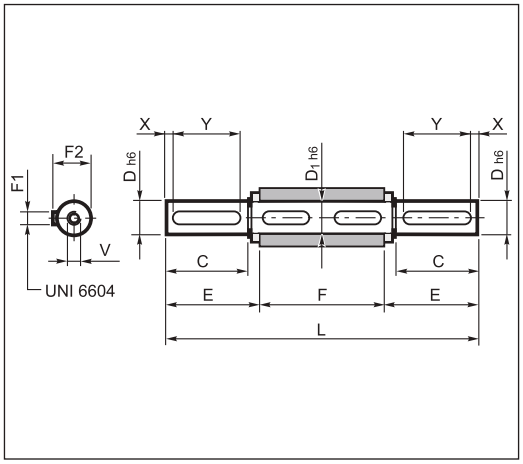
Depending on the mounting pattern, the gearbox can be complemented with the following pieces of equipment:

- AISI 316 stainless steel plug-in solid shaft, both single and double projection
- epoxy paint coated torque arm (specify RAL_)
- safety cover for the unused hollow shaft area – plastic type for W63, W75 and W86 units, metal type nitrile coated for VF 44 and VF 49, with stainless steel fasteners. IP 56 protection achieved after assembling.

### 36.1 Plug-in output shaft




| | C | D | D1 | E | F1 | F2 | M | N | V | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF-EP 44** | 40 | 18 | 18 | 45 | 6 | 20.5 | 70 | 115 | M6x16 | 5 | 30 |
| **VF-EP 49**<br>**VF-EP R 49** | 60 | 25 | 25 | 65 | 8 | 28 | 89 | 154 | M8x19 | 5 | 50 |
| **W-EP 63**<br>**W-EP R 63** | 60 | 25 | 25 | 65 | 8 | 28 | 127 | 192 | M8x19 | 5 | 50 |
| **W-EP 75**<br>**W-EP R 75** | 60 | 30 | 30 | 65 | 8 | 33 | 134 | 199 | M10x22 | 5 | 50 |
| **W-EP 86**<br>**W-EP R 86** | 60 | 35 | 35 | 65 | 10 | 38 | 149 | 214 | M10x22 | 5 | 50 |



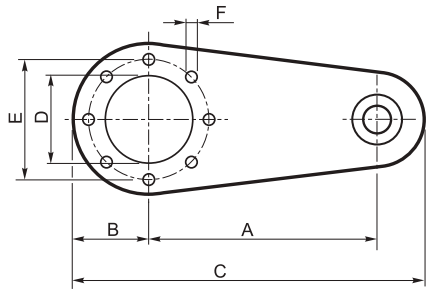

| | C | D | D1 | E | F | F1 | F2 | L | V | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **VF-EP 44** | 40 | 18 | 18 | 42.7 | 64 | 6 | 20.5 | 149.4 | M6x16 | 5 | 30 |
| **VF-EP 49**<br>**VF-EP R 49** | 60 | 25 | 25 | 63.2 | 82 | 8 | 28 | 208.4 | M8x19 | 5 | 50 |
| **W-EP 63**<br>**W-EP R 63** | 60 | 25 | 25 | 63.2 | 120 | 8 | 28 | 246.4 | M8x19 | 5 | 50 |
| **W-EP 75**<br>**W-EP R 75** | 60 | 30 | 30 | 64 | 127 | 8 | 33 | 255 | M10x22 | 5 | 50 |
| **W-EP 86**<br>**W-EP R 86** | 60 | 35 | 35 | 64 | 140 | 10 | 38 | 268 | M10x22 | 5 | 50 |



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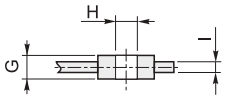
## 36.2 Torque arm

**VF-EP 44 ; VF-EP 49**

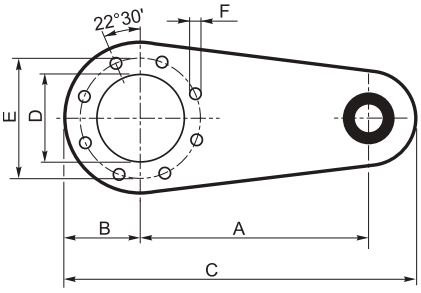



Painting:
**NP** (unpainted)
**RAL 9010**
**RAL 5010**
**RAL 9006**

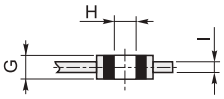
Without vibration-dampening bushing




**W-EP 63 ; W-EP 75 ; W-EP 86**



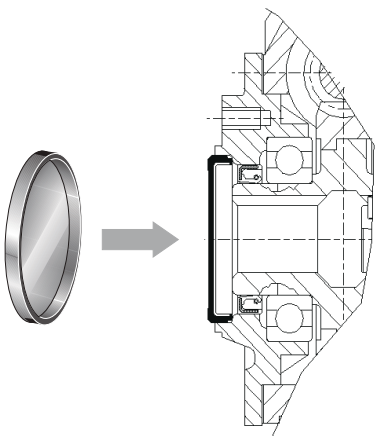

Painting:
**NP** (unpainted)
**RAL 9010**
**RAL 5010**
**RAL 9006**



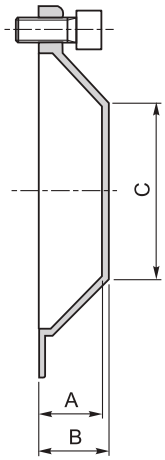

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| **VF-EP 44** | 100 | 40 | 157.5 | 50 | 65 | 7 | 14 | 8 | 4 |
| **VF-EP 49**<br>**VF-EP R 49** | 100 | 55 | 172.5 | 68 | 94 | 7 | 14 | 8 | 4 |
| **W-EP 63**<br>**W-EP R 63** | 150 | 55 | 233 | 75 | 90 | 9 | 20 | 10 | 6 |
| **W-EP 75**<br>**W-EP R 75** | 200 | 63 | 300 | 90 | 110 | 9 | 25 | 20 | 6 |
| **W-EP 86**<br>**W-EP R 86** | 200 | 80 | 318 | 110 | 130 | 11 | 25 | 20 | 6 |

## 36.3 Safety cover

**VF-EP 44 ; VF-EP 49**



**W-EP 63 ; W-EP 75 ; W-EP 86**




| | A | B | C |
|---|---|---|---|
| **W-EP 63 P** | 26.5 | 29 | Ø35 |
| **W-EP 75 P** | 24.5 | 27 | Ø54 |
| **W-EP 86 P** | 26.5 | 29 | Ø71 |



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# RVS LIMIT-STOP DEVICE

## 37 GENERAL INFORMATION

The limit-stop device type RVS has been designed to fit Bonfiglioli Riduttori worm gearmotors to operate:

- Green house windows and shades
- Remote-controlled gates
- Hopper frame windows
- Dosing devices for the livestock  farming industry
- Butterfly valves

Worm gearmotors equipped with the RVS limit switch device are suitable for linear and rotary intermittent duty applications requiring accurate and repetitive positioning.
For the applications listed above, typically light duty, worm gear-motors should only be selected from relevant selection charts, given at paragraph 40.
The drive selection will then comply with both the application duty and the max. peripheral speed constraints of the limit-switch device.
**The configuration is complete when the limit-switch device RVS is flanged onto the gearmotor through the relevant assembly kit (see next page).**
Configuration kits are available for worm gears type VF 49, W 63, W 75, and W 86 only.
Please note that **RVS** devices will only fit F-flanged VF 49 and FC-flanged W worm gears.
**RVS** mounting side is opposite to flange.

### 37.1 Technical features

The working principle of the limit-stop device is based on the differential movement of two pairs of wheels – each equipped with a cam – and the relative operation of precision micro-switches that stop and reverse motion through relays (to be fitted by the installer).
Travel end positions, normally the open and closed positions of application frame, are easily set using a common Allen key after gearmotor installation.
Once adjusted, the unit will retain its settings over time for guaranteed motion repeatability.
In its basic version, the **RVS** limit-stop unit comes with a pair of approx. 1-m long cables. Internal wiring is made at the factory.
The RVS unit is available in the following variants:

**RVS ME:** the limit switch features a 6-stud terminal box for external wiring of cables wiring of cables to main relais.

**RVS DM:** features a double set of micro-switches, connected in series, for absolute reliability where applicable regional standards or regulations call for a redundant design.



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**RVS ME DM:** features the combination of the two options described above.

Regardless to the variant the RVS limit switch device offers the following features:
- Extremely quite operation
- Space efficiency
- Ease of installation and setting
- Overall protection IP55
- Adjustment range within a maximum of 43 revolutions of drive shaft.

## 38 ORDERING CODES

Determine which device or variant best suits the specific application and locate the part number in the table below:

| RVS | RVS ME | RVS DM | RVS ME DM |
|---|---|---|---|
|  cod. 193312025 |  cod. 193312026 |  cod. 193312027 |  cod. 193312028 |

Select also the part number of the specific configuration kit for the speed reducer the limit-stop device is to be installed to:

| | | | |
|---|---|---|---|
|  | | | |
| cod. 192860001 | cod. 192860002 | cod. 192860003 | cod. 192860004 |
|  |  |  |  |
| VF 49 F - VFR 49 F | W 63 UFC - WR 63 UFC | W 75 UFC - WR 75 UFC | W 86 UFC - WR 86 UFC |



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## 39 DESIGNATION

Ordering code for RVS acceptable **VF** and **W** gear units.

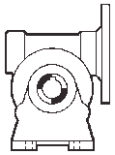
**W R 75 UFC1 D30 240 P71 B5 B3** ....

OPTIONS

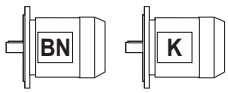
MOUNTING POSITION
**B3** (default), **B6, B7, B8, V5, V6**

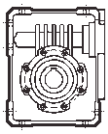
IEC MOTOR MOUNTING
**B5**
**B14**

INPUT TYPE
VF: **P** (IEC)
W: **S_, P** (IEC)



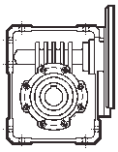
**P63, P71**



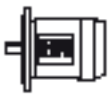



**S1 ... S3**





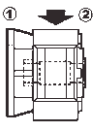
**P63 ... P90**



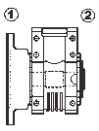
GEAR RATIO

SHAFT BORE
**D30** (W75 alone)

VERSION
VF: **F**
W: **UFC**




**F (1, 2)**




**UFC (1, 2)**

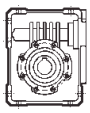
FRAME SIZE
VF: **49**
W: **63, 75, 86**

HELICAL REDUCTION
**/**
**R**

GEAR TYPE



**VF**



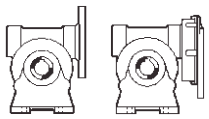
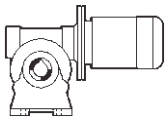
**W**



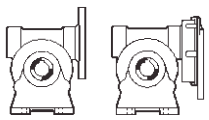
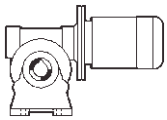
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## 40 GEARMOTOR SELECTION

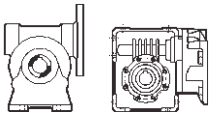
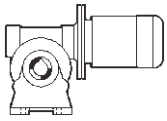
### 0.12 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i |  IEC | | |  | | |
|---|---|---|---|---|---|---|---|---|
| **4.7** | 98 | 300 | **VFR 49_300** | **P63** | **BN63A4** | | | |
| **5.8** | 89 | 240 | **VFR 49_240** | **P63** | **BN63A4** | | | |
| **6.7** | 83 | 210 | **VFR 49_210** | **P63** | **BN63A4** | | | |
| **7.8** | 76 | 180 | **VFR 49_180** | **P63** | **BN63A4** | | | |
| **10.4** | 64 | 135 | **VFR 49_135** | **P63** | **BN63A4** | | | |
| **14.0** | 41 | 100 | **VF 49_100** | **P63** | **BN63A4** | **VF 49_100** | **P63** | **K63A4** |
| **17.5** | 37 | 80 | **VF 49_80** | **P63** | **BN63A4** | **VF 49_80** | **P63** | **K63A4** |
| **20.0** | 34 | 70 | **VF 49_70** | **P63** | **BN63A4** | **VF 49_70** | **P63** | **K63A4** |
| **23.3** | 31 | 60 | **VF 49_60** | **P63** | **BN63A4** | **VF 49_60** | **P63** | **K63A4** |

### 0.18 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i |  IEC | | |  | | |
|---|---|---|---|---|---|---|---|---|
| **7.8** | 112 | 180 | **VFR 49_180** | **P63** | **BN63B4** | | | |
| **10.4** | 95 | 135 | **VFR 49_135** | **P63** | **BN63B4** | | | |
| **14.0** | 61 | 100 | **VF 49_100** | **P63** | **BN63B4** | | | |
| **17.5** | 54 | 80 | **VF 49_80** | **P63** | **BN63B4** | **VF 49_80** | **P63** | **K63B4** |
| **20.0** | 49 | 70 | **VF 49_70** | **P63** | **BN63B4** | **VF 49_70** | **P63** | **K63B4** |
| **23.3** | 45 | 60 | **VF 49_60** | **P63** | **BN63B4** | **VF 49_60** | **P63** | **K63B4** |

### 0.25 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i |  IEC | | |  | | |
|---|---|---|---|---|---|---|---|---|
| **4.7** | 214 | 300 | **WR 63_300** | **P71** | **BN71A4** | | | |
| **5.8** | 192 | 240 | **WR 63_240** | **P71** | **BN71A4** | | | |
| **7.3** | 170 | 192 | **WR 63_192** | **P71** | **BN71A4** | | | |
| **10.4** | 136 | 135 | **WR 63_135** | **P71** | **BN71A4** | | | |
| **12.3** | 121 | 114 | **WR 63_114** | **P71** | **BN71A4** | | | |
| **14.0** | 82 | 100 | **VF 49_100** | **P71** | **BN71A4** | | | |
| **17.5** | 72 | 80 | **VF 49_80** | **P71** | **BN71A4** | | | |
| **20.0** | 66 | 70 | **VF 49_70** | **P71** | **BN71A4** | | | |
| **23.3** | 61 | 60 | **VF 49_60** | **P71** | **BN71A4** | **VF 49_60** | **P71** | **K71A4** |



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## 0.37 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i | | IEC | | | | |
|---|---|---|---|---|---|---|---|---|
| **4.7** | 382 | 300 | **WR 86_300** | **P71** | **BN71B4** | | | |
| **5.8** | 306 | 240 | **WR 75_240** | **P71** | **BN71B4** | | | |
| **7.3** | 290 | 192 | **WR 86_192** | **P71** | **BN71B4** | | | |
| **7.8** | 257 | 180 | **WR 75_180** | **P71** | **BN71B4** | | | |
| **9.3** | 226 | 150 | **WR 75_150** | **P71** | **BN71B4** | | | |
| **10.4** | 204 | 135 | **WR 63_135** | **P71** | **BN71B4** | | | |
| **12.3** | 181 | 114 | **WR 63_114** | **P71** | **BN71B4** | | | |
| **14.0** | 133 | 100 | **W 63_100** | **P71** | **BN71B4** | **W 63_100** | **S1** | **M1SD4** |
| **17.5** | 108 | 80 | **VF 49_80** | **P71** | **BN71B4** | | | |
| **20.0** | 98.3 | 70 | **VF 49_70** | **P71** | **BN71B4** | | | |
| **23.3** | 90.5 | 60 | **VF 49_60** | **P71** | **BN71B4** | | | |

## 0.55 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i | | IEC | | | | |
|---|---|---|---|---|---|---|---|---|
| **4.7** | 559 | 300 | **WR 86_300** | **P80** | **BN80A4** | | | |
| **5.8** | 483 | 240 | **WR 86_240** | **P80** | **BN80A4** | | | |
| **7.3** | 423 | 192 | **WR 86_192** | **P80** | **BN80A4** | | | |
| **7.8** | 376 | 180 | **WR 75_180** | **P80** | **BN80A4** | | | |
| **8.3** | 383 | 168 | **WR 86_168** | **P80** | **BN80A4** | | | |
| **9.3** | 331 | 150 | **WR 75_150** | **P80** | **BN80A4** | | | |
| **10.1** | 330 | 138 | **WR 86_138** | **P80** | **BN80A4** | | | |
| **11.7** | 287 | 120 | **WR 75_120** | **P80** | **BN80A4** | | | |
| **14.0** | 194 | 100 | **W 63_100** | **P80** | **BN80A4** | **W 63_100** | **S1** | **M1LA4** |
| **17.5** | 170 | 80 | **W 63_80** | **P80** | **BN80A4** | **W 63_80** | **S1** | **M1LA4** |
| **21.9** | 148 | 64 | **W 63_64** | **P80** | **BN80A4** | **W 63_64** | **S1** | **M1LA4** |
| **23.3** | 148 | 60 | **W 75_60** | **P80** | **BN80A4** | **W 75_60** | **S1** | **M1LA4** |

## 0.75 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i | | IEC | | | | |
|---|---|---|---|---|---|---|---|---|
| **7.3** | 568 | 192 | **WR 86_192** | **P80** | **BN80B4** | | | |
| **8.3** | 514 | 168 | **WR 86_168** | **P80** | **BN80B4** | | | |
| **9.3** | 444 | 150 | **WR 75_150** | **P80** | **BN80B4** | | | |
| **10.1** | 443 | 138 | **WR 86_138** | **P80** | **BN80B4** | | | |
| **11.7** | 386 | 120 | **WR 75_120** | **P80** | **BN80B4** | | | |
| **14.0** | 281 | 100 | **W 75_100** | **P80** | **BN80B4** | **W 75_100** | **S2** | **M2SA4** |
| **17.5** | 241 | 80 | **W 75_80** | **P80** | **BN80B4** | **W 75_80** | **S2** | **M2SA4** |
| **21.9** | 199 | 64 | **W 63_64** | **P80** | **BN80B4** | **W 63_64** | **S2** | **M2SA4** |
| **23.3** | 199 | 60 | **W 75_60** | **P80** | **BN80B4** | **W 75_60** | **S2** | **M2SA4** |



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## 1.1 kW

| $n_2$ min$^{-1}$ | $M_2$ Nm | i | | IEC | | | | |
|---|---|---|---|---|---|---|---|---|
| **10.1** | 652 | 138 | **WR 86_138** | **P90** | **BN90S4** | | | |
| **11.7** | 594 | 120 | **WR 86_120** | **P90** | **BN90S4** | | | |
| **14.0** | 443 | 100 | **W 86_100** | **P90** | **BN90S4** | **W 86_100** | **S2** | **M2SB4** |
| **17.5** | 384 | 80 | **W 86_80** | **P90** | **BN90S4** | **W 86_80** | **S2** | **M2SB4** |
| **21.9** | 326 | 64 | **W 86_64** | **P90** | **BN90S4** | **W 86_60** | **S2** | **M2SB4** |

## 1.5 kW

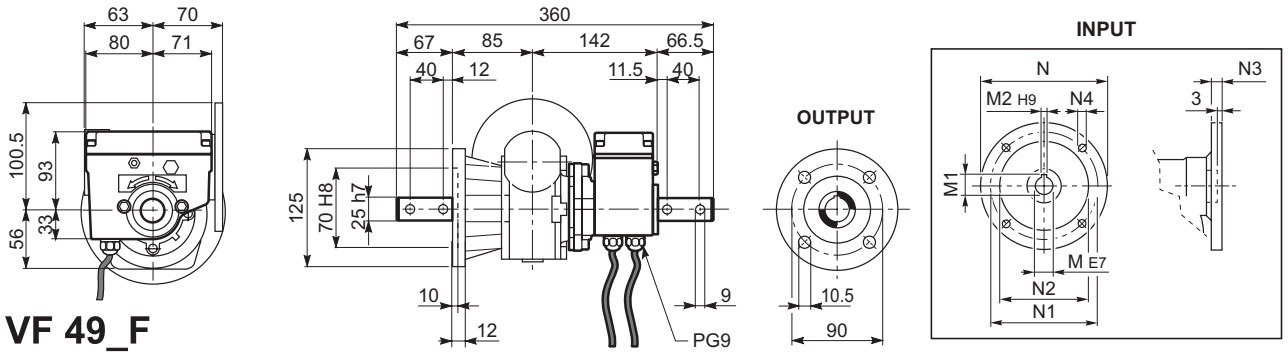
| $n_2$ min$^{-1}$ | $M_2$ Nm | i | | IEC | | | | |
|---|---|---|---|---|---|---|---|---|
| **11.7** | 816 | 120 | **WR 86_120** | **P90** | **BN90LA4** | | | |
| **17.5** | 527 | 80 | **W 86_80** | **P90** | **BN90LA4** | **W 86_80** | **S3** | **M3SA4** |
| **21.9** | 448 | 64 | **W 86_64** | **P90** | **BN90LA4** | **W 86_60** | **S3** | **M3SA4** |



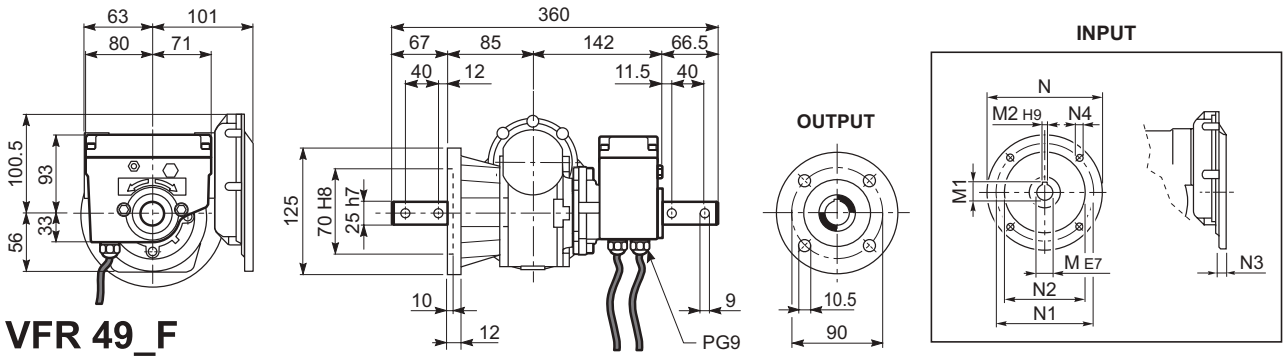
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## 41 DIMENSIONS

# VF 49_F - VFR 49_F




VF 49_F



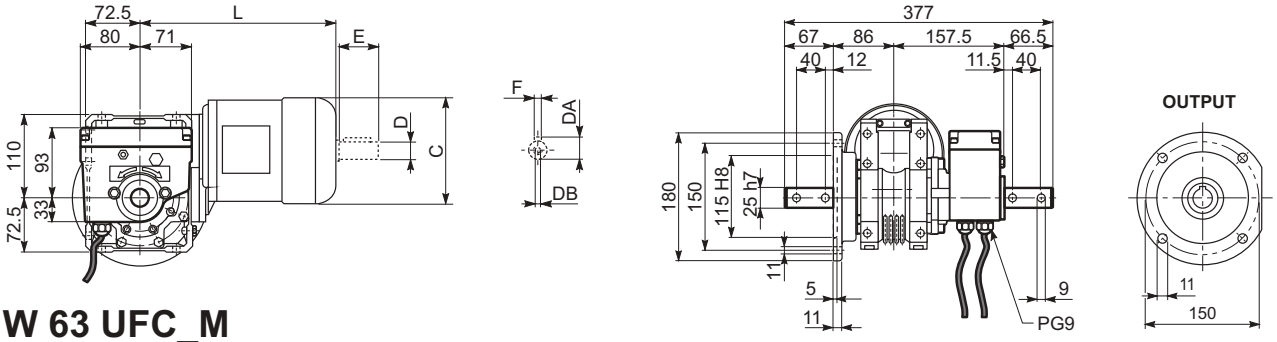

VFR 49_F

| | M | M1 | M2 | N | N1 | N2 | N3 | N4 |
|---|---|---|---|---|---|---|---|---|
| **VF 49_P 63** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10.5 | 9.5 |
| **VF 49_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10.5 | 9.5 |
| **VFR 49_P 63** | 11 | 12.8 | 4 | 140 | 115 | 95 | 11 | M8x19 |



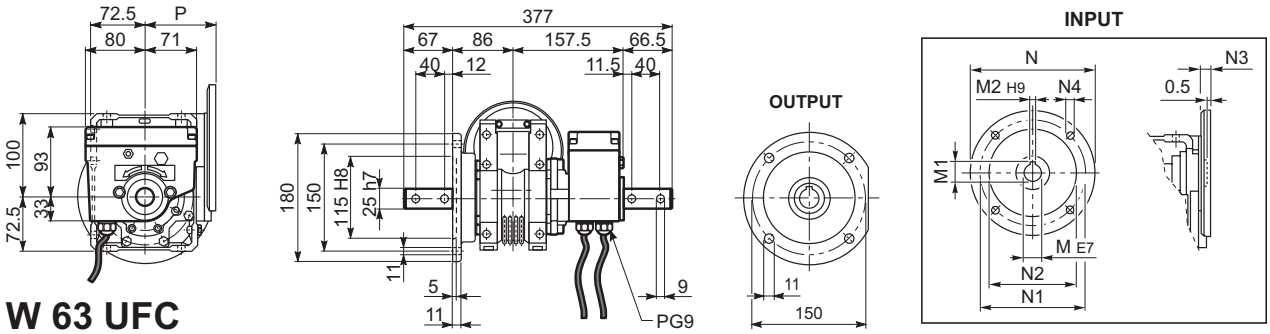
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# W 63 UFC_M - W 63 UFC - WR 63 UFC

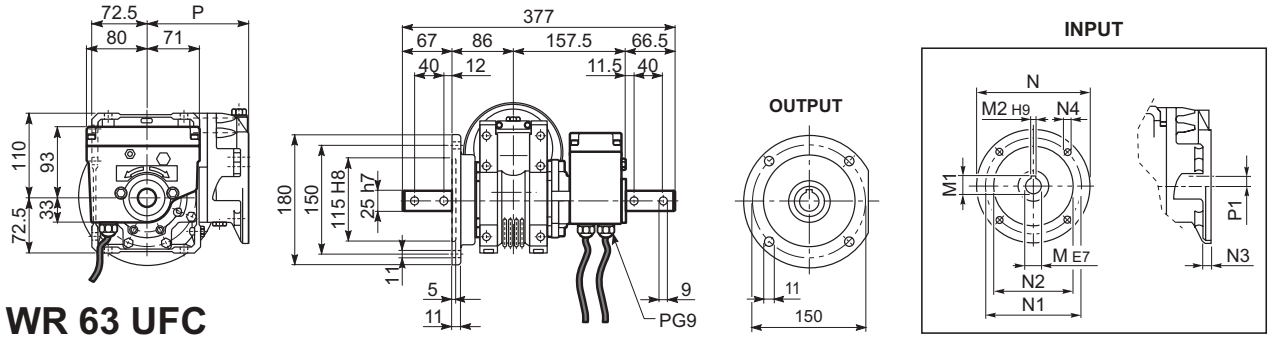



## W 63 UFC_M

| | C | D | DA | DB | E | F | L |
|---|---|---|---|---|---|---|---|
| **W 63_S1 M1L** | 138 | 14 | 16 | M5 | 30 | 5 | 289 |
| **W 63_S2 M2S** | 156 | 19 | 21.5 | M6 | 40 | 6 | 317 |




## W 63 UFC




## WR 63 UFC

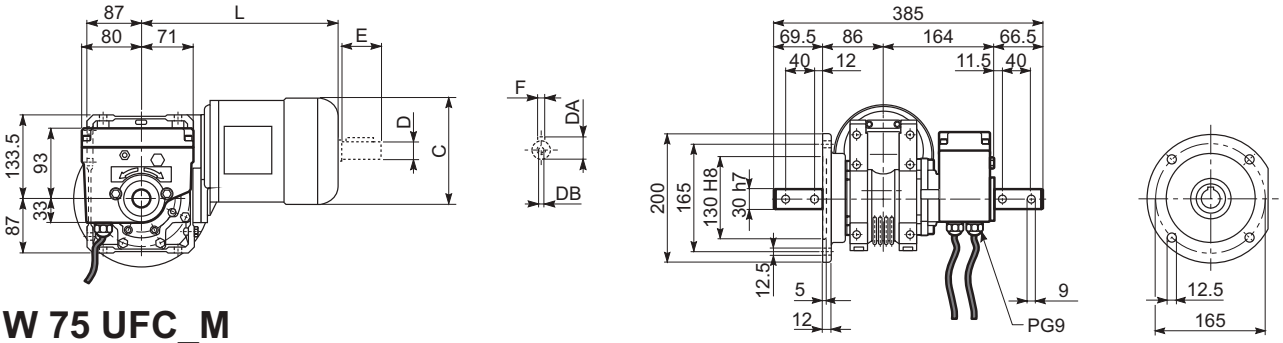
| | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | P1 |
|---|---|---|---|---|---|---|---|---|---|---|
| **W 63_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 95 | - |
| **W 63_P 80** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 102 | - |
| **W 63_P 90** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 102 | - |
| **WR 63_P 63** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10 | M8x10 | 133.5 | 11.42 |
| **WR 63_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | M8x10 | 133.5 | 11.42 |



Bonfiglioli Riduttori

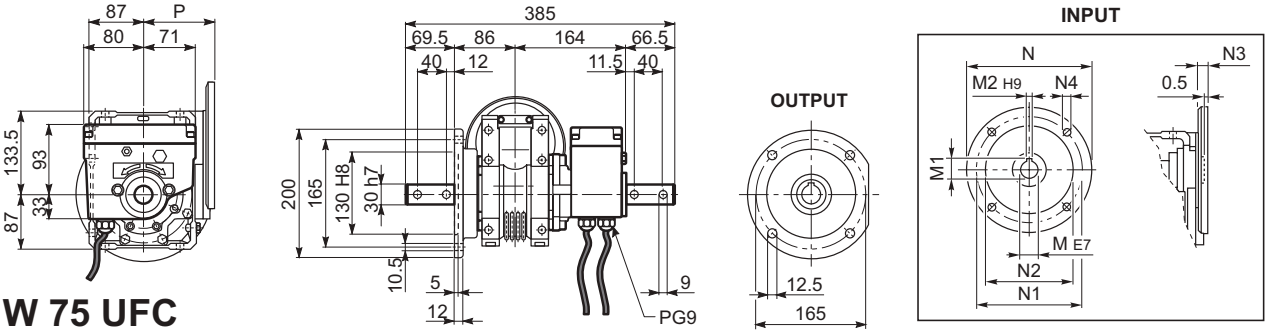
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# W 75 UFC_M - W 75 UFC - WR 75 UFC

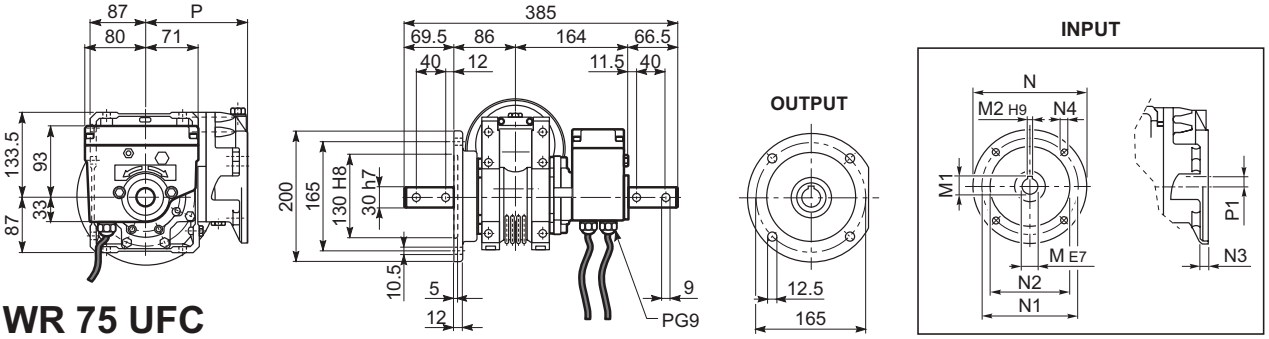



## W 75 UFC_M

| | C | D | DA | DB | E | F | L |
|---|---|---|---|---|---|---|---|
| **W 75_S1 M1L** | 138 | 14 | 16 | M5 | 30 | 5 | 308 |
| **W 75_S2 M2S** | 156 | 19 | 21.5 | M6 | 40 | 6 | 333 |
| **W 75_S3 M3S** | 193 | 28 | 31 | M10 | 60 | 8 | 376 |
| **W 75_S3 M3L** | 193 | 28 | 31 | M10 | 60 | 8 | 408 |




## W 75 UFC



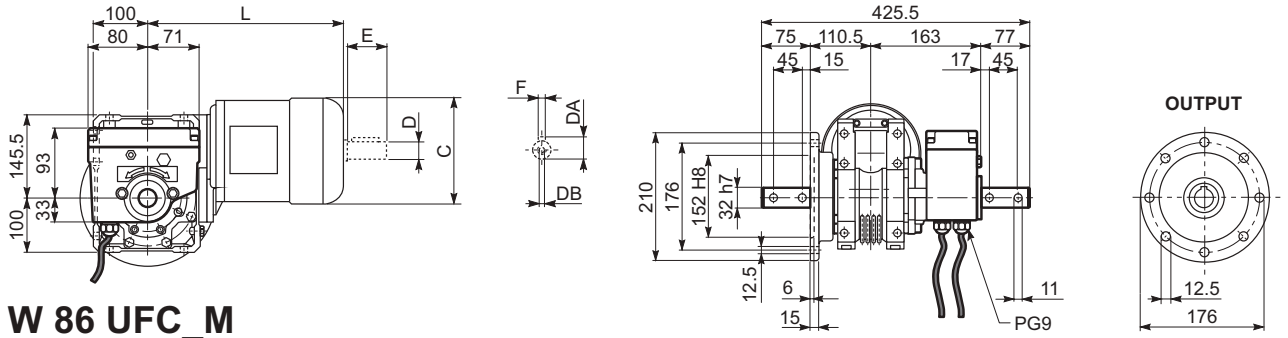

## WR 75 UFC

| | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | P1 |
|---|---|---|---|---|---|---|---|---|---|---|
| **W 75_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 112 | - |
| **W 75_P 80** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 112 | - |
| **W 75_P 90** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 112 | - |
| **WR 75_P 63** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10 | M8x10 | 152 | 23.53 |
| **WR 75_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | M8x10 | 152 | 23.53 |
| **WR 75_P 80** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | M10x13 | 163.5 | 11 |
| **WR 75_P 90** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | M10x13 | 163.5 | 11 |



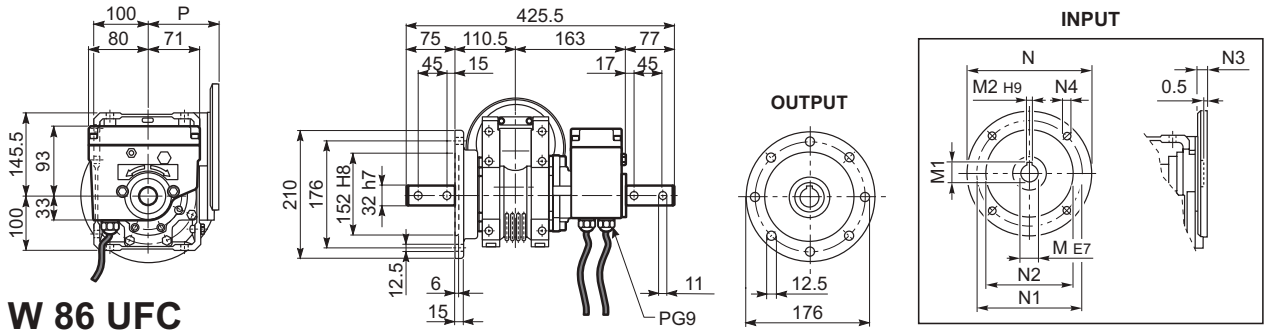
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# W 86 UFC_M - W 86 UFC - WR 86 UFC

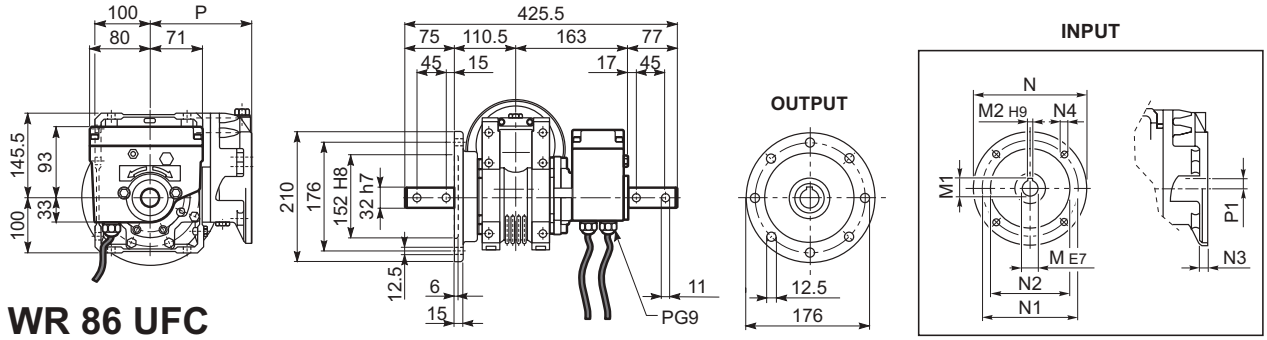



## W 86 UFC_M

| | C | D | DA | DB | E | F | L |
|---|---|---|---|---|---|---|---|
| **W 86_S1 M1L** | 138 | 14 | 16 | M5 | 30 | 5 | 324 |
| **W 86_S2 M2S** | 156 | 19 | 21.5 | M6 | 40 | 6 | 349 |
| **W 86_S3 M3S** | 193 | 28 | 31 | M10 | 60 | 8 | 392 |
| **W 86_S3 M3L** | 193 | 28 | 31 | M10 | 60 | 8 | 424 |




## W 86 UFC




## WR 86 UFC

| | M | M1 | M2 | N | N1 | N2 | N3 | N4 | P | P1 |
|---|---|---|---|---|---|---|---|---|---|---|
| **W 86_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 11 | 9 | 128 | - |
| **W 86_P 80** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | 11.5 | 128 | - |
| **W 86_P 90** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | 11.5 | 128 | - |
| **WR 86_P 63** | 11 | 12.8 | 4 | 140 | 115 | 95 | 10 | M8x10 | 168 | 35.4 |
| **WR 86_P 71** | 14 | 16.3 | 5 | 160 | 130 | 110 | 10 | M8x10 | 168 | 35.4 |
| **WR 86_P 80** | 19 | 21.8 | 6 | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 |
| **WR 86_P 90** | 24 | 27.3 | 8 | 200 | 165 | 130 | 12 | M10x13 | 179.5 | 22.9 |

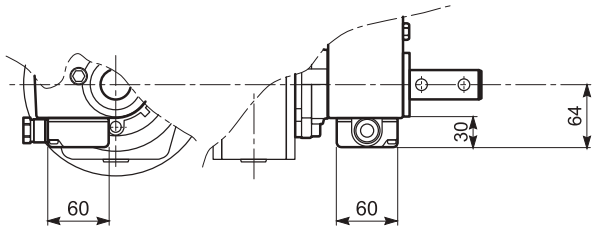


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## 42 OPTIONS

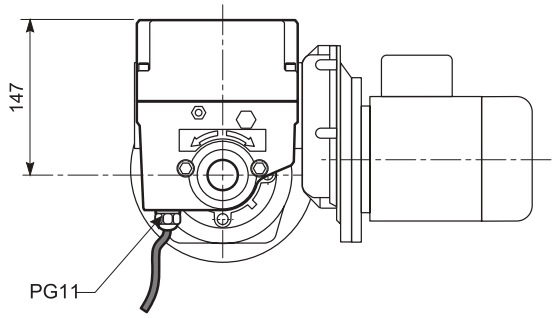
### Limit switch modifications

**ME**




Version with terminal box

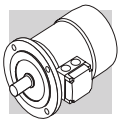
**DM**




Four microswitch version



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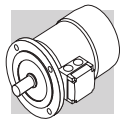
## M1 SYMBOLS AND UNITS OF MEASUREMENT

| Symbols | Units of Measure | Description |
|---|---|---|
| $\cos\varphi$ | – | Power factor |
| $\eta$ | – | Efficiency |
| $f_m$ | – | Power adjusting factor |
| I | – | Cyclic duration factor |
| $I_N$ | [A] | Rated current |
| $I_S$ | [A] | Locked rotor current |
| $J_C$ | [Kgm$^2$] | Load moment of inertia |
| $J_M$ | [Kgm$^2$] | Moment of inertia |
| $K_c$ | – | Torque factor |
| $K_d$ | – | Load factor |
| $K_J$ | – | Inertia factor |
| $M_A$ | [Nm] | Mean breakaway torque |
| $M_B$ | [Nm] | Brake torque |
| $M_N$ | [Nm] | Rated torque |
| $M_L$ | [Nm] | Counter-torque during acceleration |
| $M_S$ | [Nm] | Starting torque |

| Symbols | Units of Measure | Description |
|---|---|---|
| n | [min$^{-1}$] | Rated speed |
| $P_B$ | [W] | Power drawn by the brake at 20°C |
| $P_n$ | [kW] | Motor rated power |
| $P_r$ | [kW] | Required power |
| $t_1$ | [ms] | Brake response time with one-way rectifier |
| $t_{1s}$ | [ms] | Brake response time with electronic-controlled rectifier |
| $t_2$ | [ms] | Brake reaction time with a.c. disconnect |
| $t_{2c}$ | [ms] | Brake reaction time with a.c. and d.c. disconnect |
| $t_a$ | [°C] | Ambient temperature |
| $t_f$ | [min] | Work time at constant load |
| $t_r$ | [min] | Rest time |
| W | [J] | Braking work between service interval |
| $W_{max}$ | [J] | Maximum brake work for each braking |
| Z | [1/h] | Permissible starting frequency, loaded |
| $Z_0$ | [1/h] | Max. permissible unloaded starting frequency (I = 50%) |



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## M2 GENERAL CHARACTERISTICS

### M2.1 Production range

The asynchronous three-phase electric motors of BONFIGLIOLI RIDUTTORI's production, are available in basic designs IMB5 and IMB14 and derived versions, with the following polarities: 2, 4, 6, 2/4, 2/6, 2/8, 2/12.
The technical characteristics of compact motors, M type, are also supplied in this manual.

### M2.2 Standards

The motors described in this catalogue are manufactured to the applicable standards shown in the following table.

(F 1)

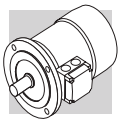
| Title | CEI | IEC |
|---|---|---|
| General requirements for rotating electrical machines | **CEI EN 60034-1** | **IEC 60034-1** |
| Terminal markings and direction of rotation of rotating machines | **CEI 2-8** | **IEC 60034-8** |
| Methods of cooling for electrical machines | **CEI EN 60034-6** | **IEC 60034-6** |
| Dimensions and output ratings for rotating electrical machines | **EN 50347** | **IEC 60072** |
| Classification of degree of protection provided by enclosures for rotating machines | **CEI EN 60034-5** | **IEC 60034-5** |
| Noise limits | **CEI EN 60034-9** | **IEC 60034-9** |
| Classification of type of construction and mounting arrangements | **CEI EN 60034-7** | **IEC 60034-7** |
| Rated voltage for low voltage mains power | **CEI 8-6** | **IEC 60038** |
| Vibration level of electric machines | **CEI EN 60034-14** | **IEC 60034-14** |

The motors also comply with foreign standards adapted to IEC 60034-1 as shown here below.

(F 2)

| | |
|---|---|
| **DIN VDE 0530** | Germany |
| **BS5000 / BS4999** | Great Britain |
| **AS 1359** | Australia |
| **NBNC 51 - 101** | Belgium |
| **NEK - IEC 34** | Norway |
| **NF C 51** | France |
| **OEVE M 10** | Austria |
| **SEV 3009** | Switzerland |
| **NEN 3173** | Netherlands |
| **SS 426 01 01** | Sweden |


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## M2.3 Motors for USA and Canada

**CUS**

BN motors are available in NEMA Design C configuration (concerning electrical characteristics), in compliance with CSA (Canadian standard) C22.2 No. 100 and UL (Underwriters Laboratory) UL 1004-1. By specifying the option CUS the name plate is marked with both symbols shown here below.

C US

The CUS option does not apply to servo-ventilated motors.
US power mains voltages and the corresponding rated voltages to be specified for the motor are indicated in the following table:

(F 3)

| Frequency | Mains voltage | $V_{mot}$ |
|---|---|---|
| 60 Hz | 208 V | **200 V** |
| | 240 V | **230 V** |
| | 480 V | **460 V** |
| | 600 V | **575 V** |

CUS option is applicable onto 50 Hz operating motors as well.

Motors with voltage in ratio 2 (e.g. 230/460-60; 220/440-60) feature, as standard, a 9-stud terminal board. For same executions, as well as for 575V-60H tions, as well as for 575V-60Hz supply, the nominal rating is coincident with the correspondent 50Hz rating.
For DC brake motors type BN/M_FD, the rectifier is connected to a single-phase 230 VAC supply voltage in the motor terminal box.
**Brake power supply** for brake motors is as follows:

(F 4)

| **BN_FD M_FD** |
|---|
| Wired to terminal box 1~230V a.c. |

| **BN_FA M_FA** | | Specify |
|---|---|---|
| Separate power supply | 230V Δ | 230SA |
| Separate power supply | 460V Y | 460SA |



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## M2.4 China Compulsory Certification

CCC

Electric motors destined for sale in the People's Republic of China have to be certified under the CCC (China Compulsory Certification) system. BN motors of up to 7 Nm in rated torque are available with CCC certification and a special nameplate bearing the mark shown below:

CCC option is not currently available for servo - ventilated motors.

## M2.5 Directives 2006/95/EC (LVD) and 2004/108/EC (EMC)

BN and M motors meet the requirements of Directives 2006/95/EC (Low Voltage Directive) and 2004/108/EC (Electromagnetic Compatibility Directive) and their name plates bear the CE mark.
As for the EMC Directive, construction is in accordance with standards CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.
Motors with FD brakes, when fitted with the suitable capacitive filter at rectifier input (option **CF**), meet the emission limits required by Standard EN 61000-6-3:2007 "Electromagnetic compatibility - Generic Emission Standard - Part 6-3 Residential, commercial and light industrial environment".
Motors also meet the requirements of standard CEI EN 60204-1 "Electrical equipment of machines".
The responsibility for final product safety and compliance with applicable directives rests with the manufacturer or the assembler who incorporate the motors as component parts.

## M2.6 Tolerances

As per the Norms applicable the tolerances here below apply to the following quantities.

(F 5)

| | |
|---|---|
| -0.15 (1 - η)  P ≤ 50kW | Efficiency |
| -(1 - cosφ)/6  min  0.02  max  0.07 | Power factor |
| ±20% * | Slip |
| +20% | Locked rotor current |
| -15%  +25% | Locked rotor torque |
| -10% | Max. torque |

* ± 30% for motors with Pn < 1 kW



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## M3 MECHANICAL FEATURES

### M3.1 Versions

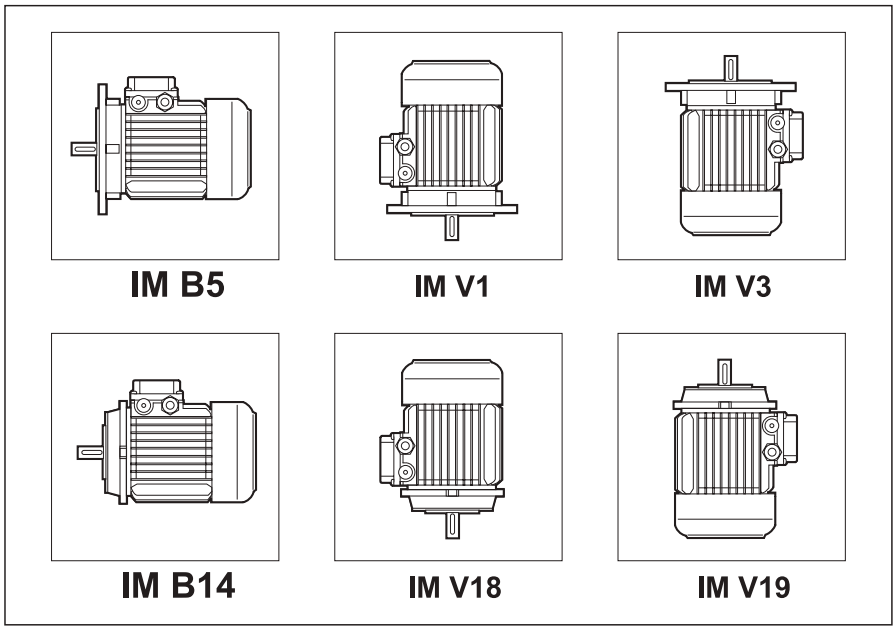
EC-normalised BN motors are available in the design versions indicated in table (F6) as per Standards CEI EN 60034-14.

Mounting versions are:

**IM B5** (basic)
IM V1, IM V3 (derived)
**IM B14** (basic)
IM V18, IM V19 (derived)

IM B5 design motors can be installed in positions IM V1 and IM V3; IM B14 design motors can be installed in positions IM V18 and IM V19.
In such cases, the basic design IM B5 or IM B14 is indicated on the motor name plate.
In design versions with a vertically located motor and shaft downwards, it is recommended to request the drip cover (always necessary for brake motors). This facility, included in the option list should be specified when ordering as it does not come as a standard device

(F 6)

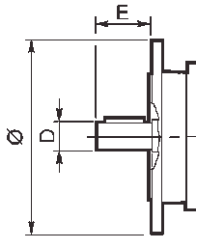



Flange output motors are also available with reduced coupling dimensions, as indicated in the table below - executions **B5R, B14R**. Their use in combination with gearboxes must be however coherent with the maximum installable power on gearboxes themselves (see chapters “Motors availability”). In case this condition is not met need to contact the Technical Service for the checking of the combination.



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(F 7)




| | BN 71 | BN 80 | BN 90 | BN 100 | BN 112 | BN 132 |
|---|---|---|---|---|---|---|
| | DxE - Ø | | | | | |
| **B5R** (1) | 11x23 - 140 | 14x30 - 160 | 19x40 - 200 | 24x50 - 200 | 24x50 - 200 | 28x60 - 250 |
| **B14R** (2) | 11x23 - 90 | 14x30 - 105 | 19x40 - 120 | 24x50 - 140 | — | — |

(1) flange with through holes
(2) flange with threaded holes

## M3.2 Degree of protection

**IP..**

The following chart provides an overview of the degrees of protection available.
In addition to the degree of protection specified when ordering, motors to be installed outdoors require protection against direct sunlight and also – when they are to be installed vertically down – a drip cover to prevent the ingress of water and solid particles (option **RC**).

(F 8)

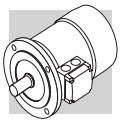
|  |  | IP 54 | IP 55 | IP 56 |
|---|---|---|---|---|
| **BN** | **M** | ⛔ | standard |  |
| **BN_FD**<br>**BN_FA** | **M_FD**<br>**M_FA** | standard |  | ⛔ |

## M3.3 Cooling

The motors are externally ventilated (IC 411 to CEI EN 60034-6) and are equipped with a plastic fan working in both directions.
The motors must be installed allowing sufficient space between fan cowl and the nearest wall to ensure free air intake and allow access for maintenance purposes on motor and brake, if supplied.
Independent, forced air ventilation (IC 416) can be supplied on request (option U1).
This solution enables to increase
the motor duty factor when driven by an inverter and operating at reduced speed.



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## M3.4 Direction of rotation

Rotation is possible in both directions. If terminals U1, V1, and W1 are connected to line phases L1,L2 and L3, clockwise rotation (looking from drive end) is obtained. For counterclockwise rotation, switch two phases.

## M3.5 Noise

Noise levels, measured using the method prescribed by ISO 1680 Standards, are within the maximum levels specified by Standards CEI EN 60034-9.

## M3.6 Vibrations and balancing

Rotor shafts are balanced with half key fitted and fall within the vibration class N, as per Standard CEI EN 60034-14.
If a further reduced noise level is required improved balancing carequired improved balancing can be optionally requested (class B).
Table below shows the value for the vibration velocity for standard (A) and improved (B) balancing.

(F 9)

| Vibration class | Angular velocity<br>n [$min^{-1}$] | Limits of the vibration velocity<br>[mm/s]<br>**BN 56 ≤ H ≤ BN 200**<br>**M05 ≤ H ≤ M5** |
|---|---|---|
| **A** | 600 < n < 3600 | 1.6 |
| **B** | 600 < n < 3600 | 0.70 |

Values refer to measures with freely suspended motor in unloaded conditions.

## M3.7 Terminal box

Terminal board features 6 studs for eyelet terminal connection (9 studs execution for US voltage “Dual Voltage”).
A ground terminal is also supplied for earthing of the equipment.
Terminals number and type are shown in the following table.
For brake power supply, please read par. M6 (brake FD), M7 (brake FA).
Brakemotors house the a.c./d.c. rectifier (factory pre-wired) inside the terminal box.
Wiring instructions are provided either in the box or in the user manual.



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(F 10)

|  |  | No. of terminals | Terminal threads | Wire max cross section area mm$^2$ |
|---|---|---|---|---|
| **BN 56 ... BN 71** | **M05, M1** | 6 | M4 | 2.5 |
| **BN 80, BN 90** | **M2** | 6 | M4 | 2.5 |
| **BN 100 ... BN 112** | **M3** | 6 | M5 | 6 |
| **BN 132 ... BN 160MR** | **M4** | 6 | M5 | 6 |
| **BN 160M ... BN 180M** | **M5** | 6 | M6 | 16 |
| **BN 180L ... BN 200L** | **–** | 6 | M8 | 25 |
| **BN 63 ... BN 160MR** | **M05 ... M4** | 9 | M4 | 6 |
| **BN 160M ... BN 200L** | **M5** | 9 | M6 | 16 |

## M3.8 Cable entry

The holes used to bring cables to terminal boxes use metric threads in accordance with standard EN 50262 as indicated in the table here after.

(F 11)

|  |  | Cable entry | Max. cable diameter allowed [mm] |
|---|---|---|---|
| **BN 63** | **M05** | 2 x M20 x 1.5 | 13 |
| **BN 71** | **M1** | 2 x M25 x 1.5 | 17 |
| **BN 80 - BN 90** | **M2** | 2 x M25 x 1.5 | 17 |
| **BN 100** | **M3** | 2 x M32 x 1.5 | 21 |
| | | 2 x M25 x 1.5 | 17 |
| **BN 112** | **—** | 2 x M32 x 1.5 | 21 |
| | | 2 x M25 x 1.5 | 17 |
| **BN 132...BN 160MR** | **M4** | 4 x M32 x 1.5 | 21 |
| **BN 160M...BN 200L** | **M5** | 2 x M40 x 1.5 | 28 |

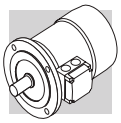
## M3.9 Bearings

Life lubricated preloaded radial ball bearings are used, types are shown in the chart here under.
Calculated endurance lifetime $L_{10h}$, as per ISO 281, in unloaded condition, exceeds 40000 hrs.
**DE** = drive end
**NDE** = non drive end

(F 12)

|  | **DE** | **NDE** | |
|---|---|---|---|
| | **M, M_FD, M_FA** | **M** | **M_FD, M_FA** |
| **M05** | 6004 2Z C3 | 6201 2Z C3 | 6201 2RS C3 |
| **M1** | 6004 2Z C3 | 6202 2Z C3 | 6202 2RS C3 |
| **M2** | 6007 2Z C3 | 6204 2Z C3 | 6204 2RS C3 |
| **M3** | 6207 2Z C3 | 6206 2Z C3 | 6206 2RS C3 |
| **M4** | 6309 2Z C3 | 6308 2Z C3 | 6308 2RS C3 |
| **M5** | 6309 2Z C3 | 6309 2Z C3 | 6309 2RS C3 |


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(F 13)

|  | DE | NDE | |
|---|---|---|---|
| | BN, BN_FD BN_FA | BN | BN_FD BN_FA |
| **BN 56** | 6201 2Z C3 | 6201 2Z C3 | – |
| **BN 63** | 6201 2Z C3 | 6201 2Z C3 | 6201 2RS C3 |
| **BN 71** | 6202 2Z C3 | 6202 2Z C3 | 6202 2RS C3 |
| **BN 80** | 6204 2Z C3 | 6204 2Z C3 | 6204 2RS C3 |
| **BN 90** | 6205 2Z C3 | 6205 2Z C3 | 6305 2RS C3 |
| **BN 100** | 6206 2Z C3 | 6206 2Z C3 | 6206 2RS C3 |
| **BN 112** | 6306 2Z C3 | 6306 2Z C3 | 6306 2RS C3 |
| **BN 132** | 6308 2Z C3 | 6308 2Z C3 | 6308 2RS C3 |
| **BN 160MR** | 6309 2Z C3 | 6308 2Z C3 | 6308 2RS C3 |
| **BN 160M/L** | 6309 2Z C3 | 6309 2Z C3 | 6309 2RS C3 |
| **BN 180M** | 6310 2Z C3 | 6309 2Z C3 | 6309 2RS C3 |
| **BN 180L** | 6310 2Z C3 | 6310 2Z C3 | 6310 2RS C3 |
| **BN 200L** | 6312 2Z C3 | 6310 2Z C3 | 6310 2RS C3 |

## M4 ELECTRICAL CHARACTERISTICS

### M4.1 Voltage

Single speed motors are provided in standard execution either for nominal voltage 230 / 400 V Δ/Y, 50 Hz, or 400 / 690 V Δ/Y, 50 Hz, with a voltage tolerance of ± 10%, according to what is specified on the below table.
On all the motors BN and M, for which the voltage / frequency configuration is not included on the below table, the voltage tolerance is reduced down to ± 5%.
For the operation out of the tolerance boundaries, the temperature may exceed by 10 K the limit provided by the adopted insulation class.
The motors are suitable for operation on distribution European grid with voltage complying with the pubblication IEC 60038.

(F 14)

| |  |  | $V_{mot}$ ± 10 % 3 ~ | Configuation |
|---|---|---|---|---|
| **IE1** | **BN 56 ... BN 132** | **M0 ... M4** | 230 / 400 V - Δ/Y - 50 Hz | Standard |
| | | | 400 / 690 V - Δ/Y - 50 Hz | On request at no extra charge |
| | | | 460 V Y - 60 Hz | Standard |
| | **BN 160 ... 200** | **M5** | 400 / 690 V - Δ/Y - 50 Hz | Standard |
| | | | 460 V Δ - 60 Hz | Standard |

[1] 4 pole motor only

The only rated voltage for motors type 50Hz and all double speed motors is 400V.
Applicable tolerances as per CEI EN 60034-1.

The table below shows the wiring options available.



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(F 15)

| Pole |  | Wiring options |
|---|---|---|
| 2 | **BN 63 ... BN 200** | Δ / Y (²) |
| 4 | **BN 56 ... BN 200** | |
| 6 | **BN 63 ... BN 200** | |
| 8 | **BN 71 ... BN 132** | |
| 2/4 | **BN 63 ... BN 132** | Δ / YY (Dahlander) |
| 2/6 | **BN 71 ... BN 132** | Y / Y (Two windings) |
| 2/8 | **BN 71 ... BN 132** | |
| 2/12 | **BN 80 ... BN 132** | |
| 4/6 | **BN 71 ... BN 132** | |
| 4/8 | **BN 80 ... BN 132** | Δ / YY (Dahlander) |

(²) Motors with voltage in ratio 2 (ex. 230/460 - 60) will be equipped with a 9 pin terminal box with winding connection either Δ Δ/ Δ or YY / Y (except 6 pole BN 63 Δ / Y)

## M4.2 Frequency

Rated output power BN / M for 60 Hz operation is shown in the following diagram.

(F 16)

|  |  | $P_n$ [kW] | | | |
|---|---|---|---|---|---|
| | | **2P** | **4P** | **6P** | **8P (*)** |
| **BN 56A** | **–** | – | 0.07 | – | – |
| **BN 56B** | **M0B** | – | 0.10 | – | – |
| **BN 63A** | **M05A** | 0.21 | 0.14 | 0.10 | – |
| **BN 63B** | **M05B** | 0.30 | 0.21 | 0.14 | – |
| **BN 63C** | **M05C** | 0.45 | 0.30 | – | – |
| **BN 71A** | **M05C** | 0.45 | 0.30 | 0.21 | 0.10 |
| **BN 71B** | **M05SD** | 0.65 | 0.45 | 0.30 | 0.14 |
| **BN 71C** | **M1LA** | 0.90 | 0.65 | 0.45 | – |
| **BN 80A** | | 0.90 | 0.65 | 0.45 | 0.21 |
| **BN 80B** | **M2SA** | 1.30 | 0.90 | 0.65 | 0.30 |
| **BN 80C** | | 1.80 | 1.3 | 0.90 | – |
| **BN 90S** | **M2SB** | – | 1.3 | 0.90 | 0.45 |
| **BN 90SA** | | 1.8 | – | – | – |
| **BN 90SB** | **–** | 2.2 | – | – | – |
| **BN 90L** | **M3SA** | 2.5 | – | 1.3 | 0.65 |
| **BN 90LA** | | – | 1.8 | – | – |
| **BN 90LB** | **–** | – | 2.2 | – | – |

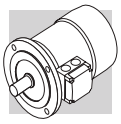
|  |  | $P_n$ [kW] | | | |
|---|---|---|---|---|---|
| | | **2P** | **4P** | **6P** | **8P (*)** |
| **BN 100L** | **M3LA** | 3.5 | – | – | – |
| **BN 100LA** | | – | 2.5 | 1.8 | 0.85 |
| **BN 100LB** | **M3LB** | 4.7 | 3.5 | 2.2 | 1.3 |
| **BN 112M** | | 4.7 | 4.7 | 2.5 | 1.8 |
| **–** | **M3LC** | – | 4.7 | 2.5 | – |
| **BN 132S** | **M4SA** | – | 6.5 | 3.5 | 2.5 |
| **BN 132SA** | | 6.5 | – | – | – |
| **BN 132SB** | **M4SB** | 8.7 | – | – | – |
| **BN 132M** | **M4LA** | 11 | – | – | 3.5 |
| **BN 132MA** | | – | 8.7 | 4.6 | – |
| **BN 132MB** | **M4LB** | – | 11 | 6.5 | – |
| **BN 160MR** | **M4LC** | 12.5 | 12.5 | – | – |
| **BN 160MB** | **M5SB** | 17.5 | –– | – | – |
| **BN 160M** | **M5SA** | – | – | 8.6 | – |
| **BN 160L** | **M5S** | 21.5 | 17.5 | 12.6 | – |
| **BN 180M** | **M5LA** | 24.5 | 21.5 | – | – |
| **BN 180L** | **–** | – | 25.3 | 17.5 | – |
| **BN 200L** | **–** | – | 34 | – | – |
| **BN 200LA** | **–** | 34 | – | 22 | – |

(*) Excluded M_ motors

Double speed BN / M motors supplied at 60 Hz will have an increase of nominal power, referred to 50 Hz, equal to 15%. If a nominal power rating, equal to the normalised nominal power rating at 50 Hz, was requested to be on a nameplate of a motor meant to be voltage supplied at 60 Hz, the PN option shall be specified on the motor designation. Motors normally designed for a 50 Hz frequency may be used on a 60 Hz operating grid, but the related data shall be updated according to the following table.



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Motors designated for 50 Hz operation show on the nameplate also the values for 60 Hz operation (excluding motors in CUS execution and brake motors). See the following table.

(F 17)

| **50 Hz** | **60 Hz** | | | |
|---|---|---|---|---|
| **V** - 50 Hz | **V** - 60 Hz | **Pn** - 60 Hz | $\mathbf{M_n}$, $\mathbf{M_a/M_n}$ - 60 Hz | **n** [min$^{-1}$] - 60 Hz |
| **230/400 Δ/Y** | 220 - 240 Δ | 1 | 0.83 | 1.2 |
| | 380 - 415 Y | | | |
| **400/690 Δ/Y** | 380 - 415 Δ | | | |
| **230/400 Δ/Y** | 265 - 280 Δ | 1.15 | 1 | 1.2 |
| | 440 - 480 Y | | | |
| **400/690 Δ/Y** | 440 - 480 Δ | | | |

## M4.3 Ambient temperature

Catalogue rating values are calculated for 50 Hz operation and for standard ambient conditions (temperature 40 °C; elevation <1000 m a.s.l.) as per the CEI EN 60034-1 Standards.
The motors can be used within the 40 - 60 °C temperature range with rated power output adjusted by factors given in the following charts.

(F 18)

| Ambient temperature (°C) | 40° | 45° | 50° | 55° | 60° |
|---|---|---|---|---|---|
| Permitted power as a % of rated power | 100% | 95% | 90% | 85% | 80% |

Should a derating factor higher than 15% apply please consult factory.

## M4.4 Insulation class

### CL F

Bonfiglioli motors use class **F** insulating materials (enamelled wire, insulators, impregnation resins) as compare to the standard motor.

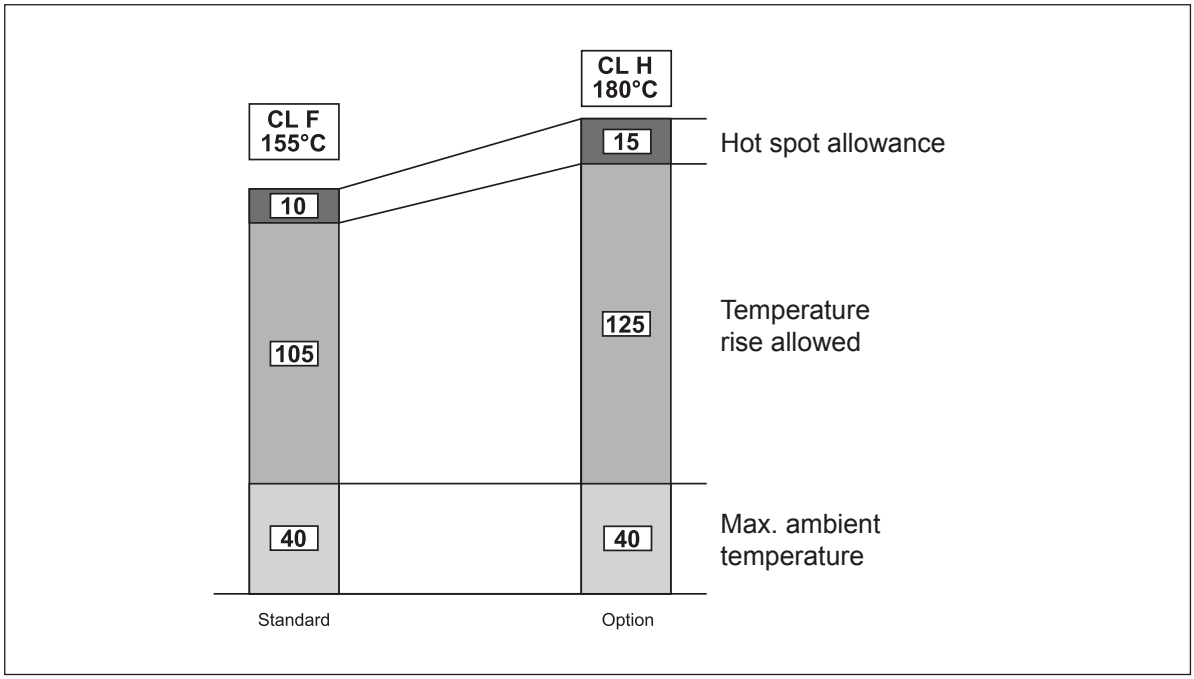
### CL H

Motors manufactured in insulation class **H** are available at request.
In standard motors, stator windings over temperature normally stays below the 80 K limit corresponding to class B over temperature.
A careful selection of insulating components makes the motors compatible with tropical climates and normal vibration.
For applications involving the presence of aggressive chemicals or high humidity, contact Bonfiglioli Engineering for assistance with product selection.
Not available for motors in compliance with CSA e UL standards (CUS option).



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(F 19)




## M4.5 Type of duty

Unless otherwise specified, catalogue motor power refers to continuous duty S1.
Any operating conditions other than S1 duty must be identified in accordance with duty cycle definitions laid down in standards CEI EN 60034-1.
For duty cycles S2 and S3, the power increase co-efficient reported in the following table may be used. Please note that the table provided below applies to single-speed motors.
As an alternative to S1 continuous duty, one of the following values can be specified at the product configuration stage: S2, S3 or S9. The motor nameplate will be marked with an increased power rating to suit the type of duty, and with specific electrical data and a duty type of S2-30 min, S3-70% or S9 respectively.
For further details, contact Bonfiglioli's Technical Service.
Please contact Bonfiglioli Engineering for the power increase coefficients applicable to switch-pole motors.

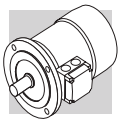
(F 20)

| | **Duty** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **S2** | | | **S3 *** | | | **S4 - S9** |
| | Cycle duration (min) | | | Cyclic duration factor ( I ) | | | |
| | **10** | **30 (*)** | **60** | **25%** | **40%** | **70% (*)** | Consult factory |
| $f_m$ | 1.35 | 1.15 | 1.05 | 1.25 | 1.15 | 1.1 | |

* Cycle duration must, in any event, be equal to or less than 10 minutes; if this time is exceeded, please contact our Technical Service.
(*) Default values from options.



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### M4.5.1 Cyclic duration factor:

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \qquad (23)$$

$t_f$ = work time under constant load
$t_r$ = rest time

### M4.5.2 Limited duration duty S2

This type of duty is characterized by operation at constant load for a limited time, which is shorter than the time required to reach thermal equilibrium, followed by a rest period of sufficient duration to restore ambient temperature in the motor.

### M4.5.3 Periodical intermittent duty S3:

This type of duty is characterized by a sequence of identical operation cycles, each including a constant load operation period and a rest period.
For this type of duty, the starting current does not significantly influence overtemperature.

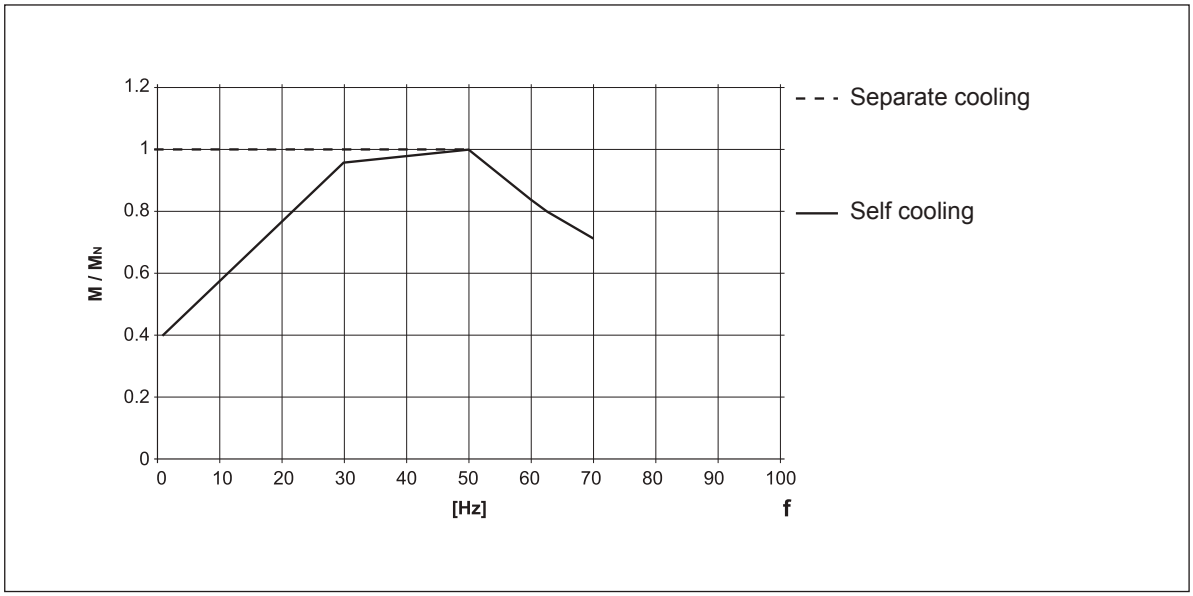
## M4.6 Inverter-controlled motors

The electric motors of series BN and M may be used in combination with PWM inverters with rated voltage at transformer input up to 500 V.Standard motors use a phase insulating system with separators, class 2 enamelled wire and class H impregnation resins (1600V peak-to-peak voltage pulse capacity and rise edge $t_s$ > 0.1µs at motor terminals). Typical torque/speed curves referred to S1 duty for motors with base frequency fb = 50 Hz is are reported in the table below.
Because ventilation is somewhat impaired in operation at lower frequencies (about 30 Hz), standard motors with incorporated fan (IC411) require adequate torque derating or - alternately - the addition of a separate supply fan cooling.
Above base frequency, upon reaching the maximum output voltage of the inverter, the motor enters a steady-power field of operation, and shaft torque drops with ratio ($f/f_b$).
As motor maximum torque decreases with $(f/f_b)^2$, the allowed overloading must be reduced progressively.



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(F 21)




The following table reports the mechanical speed limit for motors operating above rated frequency:

(F 22)

|  |  | **n** [min$^{-1}$] | | |
|---|---|---|---|---|
| | | **2p** | **4p** | **6p** |
| **≤ BN 112** | **M05…M3** | 5200 | 4000 | 3000 |
| **≥ BN 132** | **M4, M5** | 4500 | 4000 | 3000 |

Above rated speed, motors generate increased mechanical vibration and fan noise. Class B rotor balancing is highly recommended in these applications. Installing a separate supply fan cooling may also be advisable.

Remote-controlled fan and brake (if fitted) must always be connected direct to mains power supply.

## M4.7 Permissible starts per hour, Z

The rating charts of brakemotors lend the permitted number of starts $Z_0$, based on 50% intermittence and for unloaded operation.
The catalogue value represents the maximum number of starts per hour for the motor without exceeding the rated temperature for the insulation class F.
To give a practical example for an application characterized by inertia $J_c$, drawing power $P_r$ and requiring mean torque at start-up $M_L$ the actual number of starts per hour for the motor can be calculated approximately through the following equation:



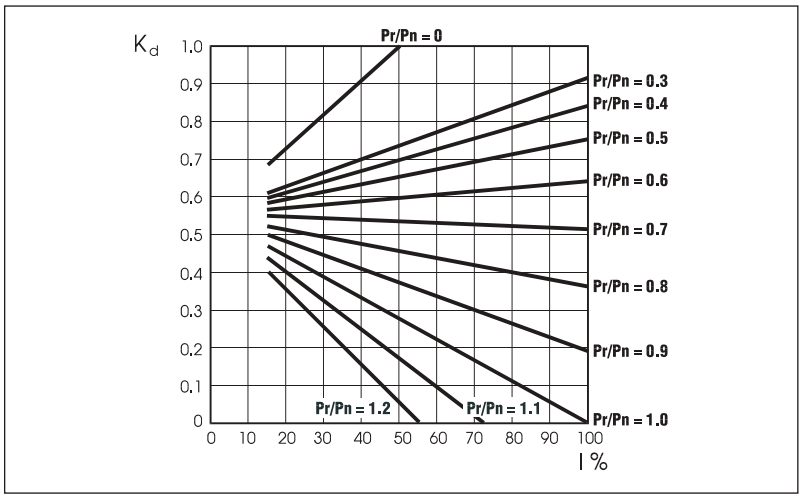
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$$Z = \frac{Z_0 \cdot K_c \cdot K_d}{K_J} \qquad (24)$$

where:

| | |
|---|---|
| $K_J = \frac{J_m + J_c}{J_m}$ | inertia factor |
| $K_c = \frac{M_a - M_L}{M_a}$ | torque factor |
| $K_d =$ | load factor see table (F23) |

(F 23)




If actual starts per hour is within permitted value (Z) it may be worth checking that braking work is compatible with brake (thermal) capacity $W_{max}$ also given in tables (F30), (F38) and dependent on the number of switches (c/h).



Bonfiglioli Riduttori

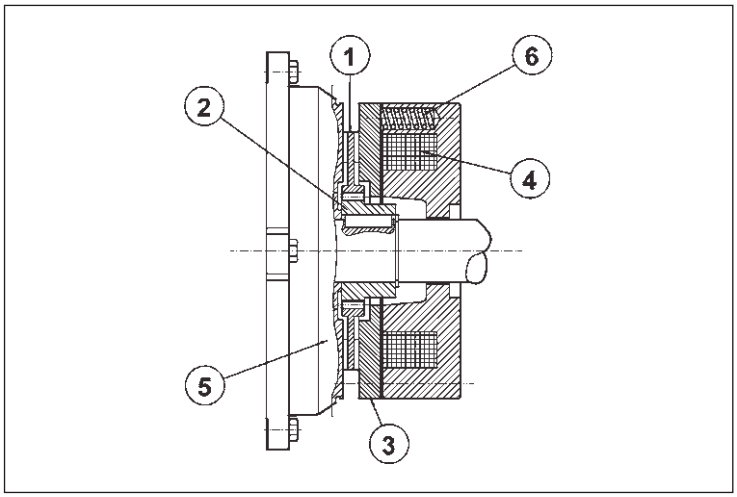
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## M5 ASYNCHRONOUS BRAKE MOTORS

### M5.1 Operation

Versions with incorporated brake use spring-applied DC (FD option) or AC (FA options) brakes.
All brakes are designed to provide fail-safe operation, meaning that they are applied by spring-action in the event of power failure.

(F 24)




Key:
① brake disc
② disc carrier
③ pressure plate
④ brake coil
⑤ motor rear shield
⑥ brake springs

When voltage is interrupted, pressure springs push the armature plate against the brake disc. The disc becomes trapped between the armature plate and motor shield and stops the shaft from rotation. When the coil is energized, a magnetic field strong enough to overcome spring action attracts the armature plate, so that the brake disc – which is integral with the motor shaft – is released.

### M5.2 Most significant features

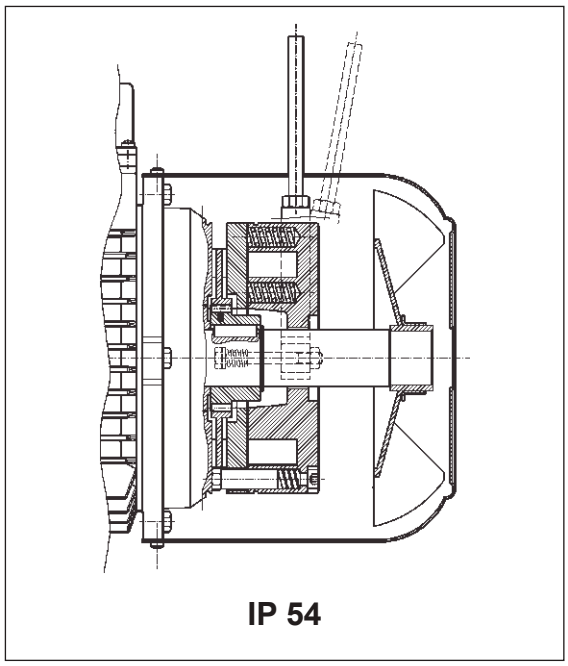
- High braking torques (normally $M_b \approx 2$ Mn), braking torque adjustment.
- Steel brake disc with double friction lining (low-wear, asbestos-free lining).
- Hexagonal seat on motor shaft fan end (N.D.E.) for manual rotation (not compatible with options PS, RC, TC, U1, U2, EN1, EN2, EN3, EN4, EN5, EN6).
- Manual release lever (options **R** and **RM** for BN/M_FD; option **R** for BN/M_FA).
- Corrosion-proof treatment on all brake surfaces.
- Insulation class F.


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## M6 DC BRAKE MOTORS TYPE BN_FD and M_FD

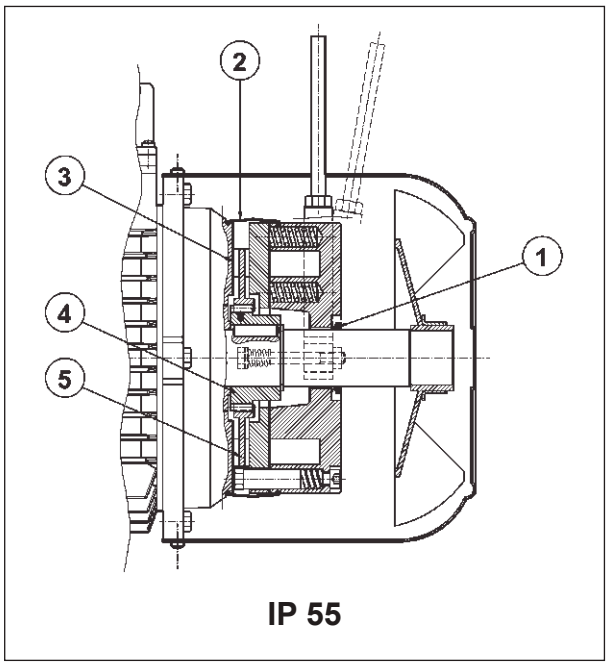
**Frame sizes**: BN 63 … BN 200L / M05 ... M5

(F 25)



IP 54

(F 26)




IP 55

**Direct current** toroidal-coil electromagnetic brake bolted onto motor shield. Preloading springs provide axial positioning of magnet body.
Brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration device.
Brake torque factory setting is indicated in the corresponding motor rating charts. Braking torque may be modified by changing the type and/or number of springs.
At request, motors may be equipped with manual release lever with automatic return (**R**) or system for holding brake in the released position (**RM**).
See variant at paragraph “BRAKE RELEASE SYSTEMS” for available release lever locations.
FD brakes ensure excellent dynamic performance with low noise. DC brake operating characteristics may be optimized to meet application requirements by choosing from the various rectifier/power supply and wiring connection options available.
**For applications involving lifting and/or high hourly energy dissipation, contact Bonfiglioli’s Technical Service.**

### M6.1 Degree of protection

Standard protection class is IP54.
Brake motor FD is also available in protection class **IP55**, which mandates the following variants:

① V-ring at N.D.E. of motor shaft
② dust and water-proof rubber boot
③ stainless steel ring placed between motor shieldand brake disc
④ stainless steel hub
⑤ stainless steel brake disc

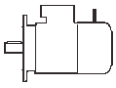


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## M6.2 FD brake power supply

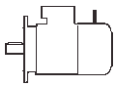
A rectifier accommodated inside the terminal box feeds the DC brake coil. Wiring connection across rectifier and brake coil is performed at the factory. On all single-pole motors, rectifier is connected to the motor terminal board. Rectifier standard power supply voltage VB is as indicated in the following table, regardless of mains frequency:

(F 27)

| **2, 4, 6 P** | | | | | **1 speed** |
|---|---|---|---|---|---|
|  |  | **BN_FD / M_FD** $V_{mot}$ ± 10% 3 ~ | $V_B$ ± 10% 1 ~ | brake connected to terminal board power supply | separate power supply |
| **BN 63…BN 132** | **M05...M4LB** | 230/400 V – 50 Hz | 230 V | standard | specify **$V_B$ SA** o **$V_B$ SD** |
| **BN 160…BN 200** | **M4LC...M5** | 400/690 V – 50 Hz | 400 V | standard | specify **$V_B$ SA** o **$V_B$ SD** |

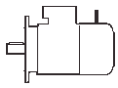
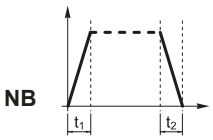
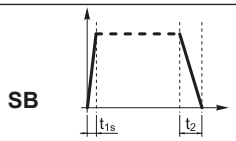
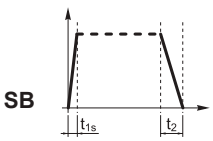
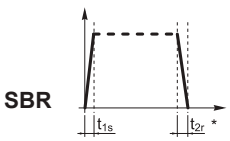
Switch-pole motors feature a separate power supply line for the brake with rectifier input voltage $V_B$ as indicated in the table below:

(F 28)

| **2/4, 2/6, 2/8, 2/12, 4/6, 4/8 P** | | | | | **2 speed** |
|---|---|---|---|---|---|
|  |  | **BN_FD / M_FD** $V_{mot}$ ± 10% 3 ~ | $V_B$ ± 10% 1 ~ | brake connected to terminal board power supply | separate power supply |
| **BN 63…BN 132** | **M05...M4LB** | 400 V – 50 Hz | 230 V | ⛔ | specify **$V_B$ SA** o **$V_B$ SD** |

The diode half-wave rectifier (VDC ≈ 0,45 x VAC) is available in versions **NB, SB, NBR** e **SBR**, as detailed in the table below:

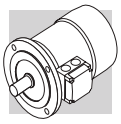
(F 29)

|  |  | brake | standard | at request |
|---|---|---|---|---|
| **BN 63** | **M05** | **FD 02** |  |  |
| **BN 71** | **M1** | **FD 03**<br>**FD 53** | | |
| **BN 80** | **M2** | **FD 04** | | |
| **BN 90S** | **—** | **FD 14** | | |
| **BN 90L** | **—** | **FD 05** | | |
| **BN 100** | **M3** | **FD 15** | | |
| **—** | | **FD 55** |  |  |
| **BN 112** | **—** | **FD 06S** | | |
| **BN 132 - BN 160MR** | **M4** | **FD 56**<br>**FD 06**<br>**FD 07** | | |
| **BN 160L - BN 180M** | **M5** | **FD 08** | | |
| **BN 180L - BN 200M** | **—** | **FD 09** | | |

(*) $t_{2c} < t_{2r} < t_2$



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Rectifier **SB** with electronic energizing control over-energizes the electromagnet upon power-up to cut brake release response time and then switches to normal half-wave operation once the brake has been released.

Use of the **SB** rectifier is mandatory in the event of:
- high number of operations per hour
- reduced brake release response time
- brake is exposed to extreme thermal stress

Rectifiers **NBR** or **SBR** are available for applications requiring quick brake intervention (braking condition reinstatement) response.
These rectifiers complement the **NB** and **SB** types as their electronic circuit incorporates a static switch that de-energizes the brake quickly in the event voltage is missing.
This arrangement ensures short brake release response time with no need for additional external wiring and contacts.
Optimum performance of rectifiers **NBR** and **SBR** is achieved with separate brake power supply.
**Versions available: 230Vac ±10%, 400Vac ± 10%, 50/60 Hz (with power supply); 100Vdc ±10%, 180Vdc ± 10% (with SD option).**

## M6.3 FD brake technical specifications

The table below reports the technical specifications of DC brakes FD.

(F 30)

| Brake | Brake torque $M_b$ [Nm] springs | | | Release | | Braking | | $W_{max}$ per brake operation [ J ] | | | W | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $t_1$ | $t_{1\,s}$ | $t_2$ | $t_{2c}$ | | | | | |
| | 6 | 4 | 2 | [ms] | [ms] | [ms] | [ms] | 10 s/h | 100 s/h | 1000 s/h | [MJ] | [W] |
| **FD02** | – | 3.5 | 1.75 | 30 | 15 | 80 | 9 | 4500 | 1400 | 180 | 15 | 17 |
| **FD03** | 5 | 3.5 | 1.75 | 50 | 20 | 100 | 12 | 7000 | 1900 | 230 | 25 | 24 |
| **FD53** | 7.5 | 5 | 2.5 | 60 | 30 | 100 | 12 | | | | | |
| **FD04** | 15 | 10 | 5 | 80 | 35 | 140 | 15 | 10000 | 3100 | 350 | 30 | 33 |
| **FD14** | | | | | | | | | | | | |
| **FD05** | 40 | 26 | 13 | 130 | 65 | 170 | 20 | 18000 | 4500 | 500 | 50 | 45 |
| **FD15** | 40 | 26 | 13 | 130 | 65 | 170 | 20 | | | | | |
| **FD55** | 55 | 37 | 18 | – | 65 | 170 | 20 | | | | | |
| **FD06S** | 60 | 40 | 20 | – | 80 | 220 | 25 | 20000 | 4800 | 550 | 70 | 55 |
| **FD56** | – | 75 | 37 | – | 90 | 250 | 20 | 29000 | 7400 | 800 | 80 | 65 |
| **FD06** | | 100 | 50 | | 100 | 250 | 20 | | | | | |
| **FD07** | 150 | 100 | 50 | – | 120 | 200 | 25 | 40000 | 9300 | 1000 | 130 | 65 |
| **FD08*** | 250 | 200 | 170 | – | 140 | 350 | 30 | 60000 | 14000 | 1500 | 230 | 100 |
| **FD09**** | 400 | 300 | 200 | – | 200 | 450 | 40 | 70000 | 15000 | 1700 | 230 | 120 |

* brake torque values obtained with 9, 7 and 6 springs, respectively

** brake torque values obtained with 12, 9 and 6 springs, respectively

$t_1$ = brake release time with half-wave rectifier
$t_{1s}$ = brake release time with over-energizing rectifier
$t_2$ = brake engagement time with AC line interruption and separate power supply
$t_{2c}$ = brake engagement time with AC and DC line interruption – Values for t1, t1s, t2, t2c indicated in the tab. (F30) are referred to brake set at maximum torque, medium air gap and rated voltage
$W_{max}$ = max energy per brake operation
W = braking energy between two successive air gap adjustments
$P_b$ = brake power absorption at 20 °C
$M_b$ = static braking torque (±15%)
s/h = starts per hour



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**The brake pad wear depends on the operating/ambient conditions (temperature, humidity, angular speed, specifica pressure); Therefore the declared wear rate must be considered as indicative.**

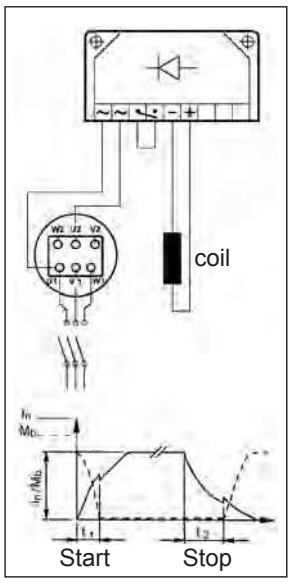
## M6.4 FD brake connections

On standard single-pole motors, the rectifier is connected to the motor terminal board at the factory. For switch-pole motors and where a separate brake power supply is required, connection to rectifier must comply with brake voltage VB stated in motor name plate.
**Because the load is of the inductive type, brake control and DC line interruption must use contacts from the usage class AC-3 to IEC 60947-4-1.**

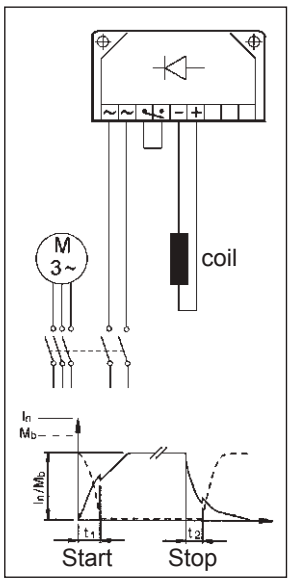
Table (F31) – Brake power supply from motor terminals and AC line interruption
Delayed stop time $t_2$ and function of motor time constants.
Mandatory when soft-start/stops are required.
Table (F32) – Brake coil with separate power supply and AC line interruption
Normal stop time independent of motor.
Achieved stop times $t_2$ are indicated in the table (F30).
Table (F33) – Brake coil power supply from motor terminals and AC/DC line interruption.
Quick stop with operation times $t_{2c}$ as per table (F30).
Table (F34) – Brake coil with separate power supply and AC/DC line interruption.
Stop time decreases by values $t_{2c}$ indicated in the table (F30).

The brake may be voltage supplied directly from the motor terminal box (from tab. F31 to tab. F34) only if the nominal voltage of the brake is the same as the smaller voltage of the motor.

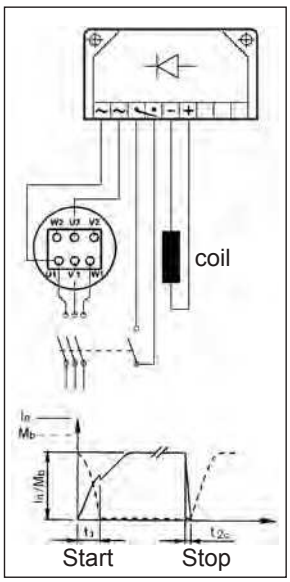
(F 31)



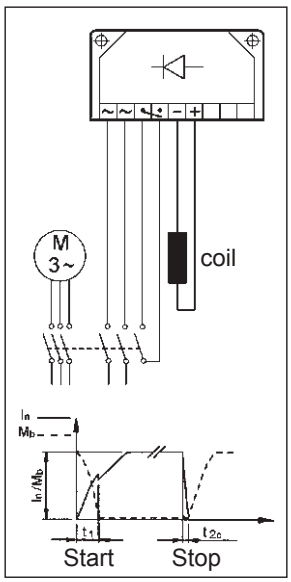

(F 32)




(F 33)




(F 34)



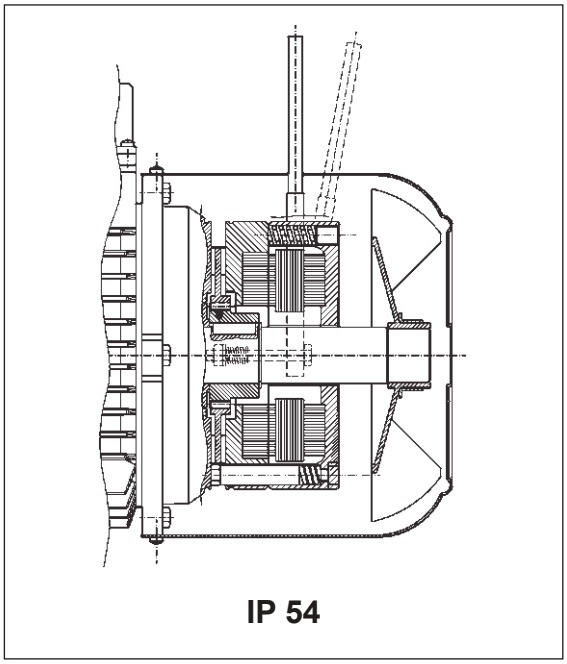



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## M7 AC BRAKE MOTORS TYPE BN_FA and M_FA

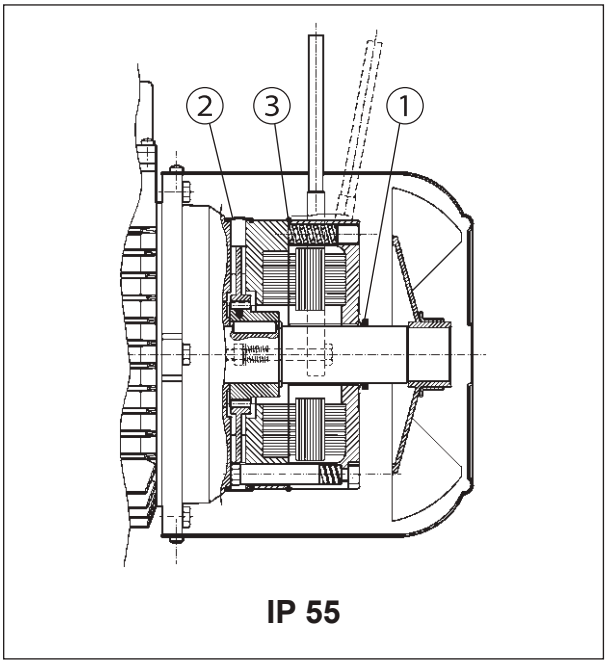
**Frame sizes**: BN 63 … BN 180M / M05 ... M5

(F 35)



**IP 54**

(F 36)




**IP 55**

Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield. Preloading springs provide axial positioning of magnet body.
Steel brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration device.
Brake torque factory setting is indicated in the corresponding motor rating charts.
Spring preloading screws provide stepless braking torque adjustment.
Torque adjustment range is 30% $M_{bMAX} < M_b < M_{bMAX}$ (where $M_{bMAX}$ is maximum braking torque as shown in tab. (F38).
Thanks to their high dynamic characteristics, FA brakes are ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.
Motors may be equipped with manual release lever with automatic return (**R**) at request. See variant at paragraph “BRAKE RELEASE SYSTEMS” for available release lever locations.
**For applications involving lifting and/or high hourly energy dissipation, contact Bonfiglioli’s Technical Service.**

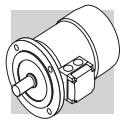
### M7.1 Degree of protection

Standard protection class is IP54.
Brake motor FA is also available in protection class **IP55**, which mandates the following variants:

① V-ring at N.D.E. of motor shaft
② dust and water-proof rubber boot
③ O-ring



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## M7.2 FA brake power supply

In single speed motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.
Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory. The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

(F 37)

| | BN 63…BN 132 | BN 160…BN 180 |
|---|---|---|
| **single-pole motor** | **M05...M4LB** | **M4LC...M5** |
| | 230Δ / 400Y V ±10% – 50 Hz | 400Δ/ 690Y V ±10% – 50 Hz |
| | 265Δ / 460Y ±10% - 60 Hz | 460Y – 60 Hz |

| | BN 63…BN 132 |
|---|---|
| **switch-pole motors** (separate power supply line) | **M05...M4** |
| | 230Δ / 400Y V ±10% – 50 Hz |
| | 460Y - 60 Hz |

Unless otherwise specified, standard brake power supply is 230Δ /400Y V - 50 Hz.

Special voltages in the 24…690 V, 50-60 Hz range are available at request.

## M7.3 Technical specifications of FA brakes

(F 38)

| Brake | Brake torque $M_b$ [Nm] | Release $t_1$ [ms] | Braking $t_2$ [ms] | $W_{max}$ [ J ] | | | W [MJ] | P [VA] |
|---|---|---|---|---|---|---|---|---|
| | | | | **10 s/h** | **100 s/h** | **1000 s/h** | | |
| **FA 02** | 3.5 | 4 | 20 | 4500 | 1400 | 180 | 15 | 60 |
| **FA 03** | 7.5 | 4 | 40 | 7000 | 1900 | 230 | 25 | 80 |
| **FA 04** | 15 | 6 | 60 | 10000 | 3100 | 350 | 30 | 110 |
| **FA 14** | | | | | | | | |
| **FA 05** | 40 | 8 | 90 | 18000 | 4500 | 500 | 50 | 250 |
| **FA 15** | | | | | | | | |
| **FA 06S** | 60 | 16 | 120 | 20000 | 4800 | 550 | 70 | 470 |
| **FA 06** | 75 | 16 | 140 | 29000 | 7400 | 800 | 80 | 550 |
| **FA 07** | 150 | 16 | 180 | 40000 | 9300 | 1000 | 130 | 600 |
| **FA 08** | 250 | 20 | 200 | 60000 | 14000 | 1500 | 230 | 1200 |

$M_b$ = max static braking torque (±15%)
$t_1$ = brake release time
$t_2$ = brake engagement time
$W_{max}$ = max energy per brake operation (brake thermal capacity)
W = braking energy between two successive air gap adjustments
$P_b$ = power drawn by brake at 20° (50 Hz)
s/h = starts per hour

NOTE
Values $t_1$ and $t_2$ in the table refer to a brake set at rated torque, medium air gap and rated voltage.



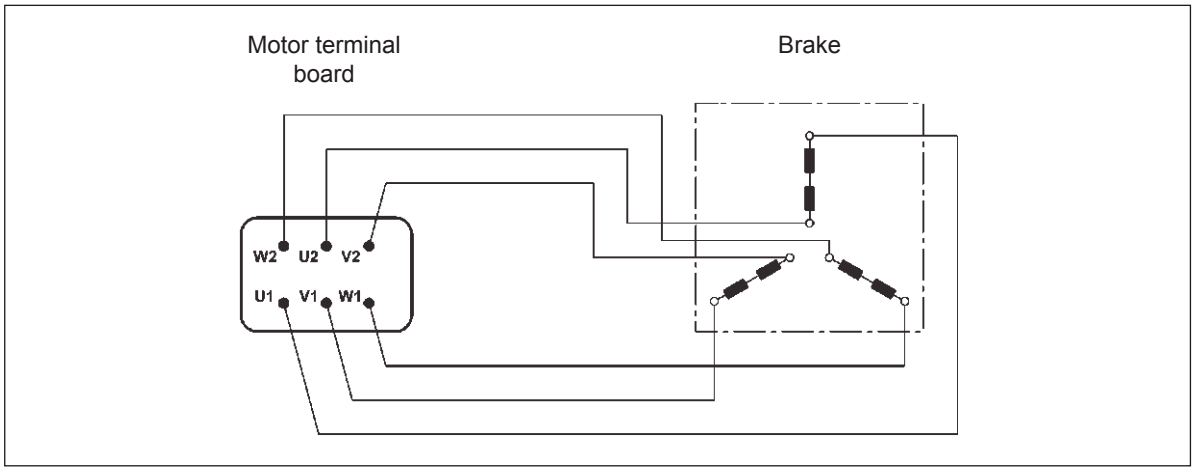
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**The brake pad wear depends on the operating/ambient conditions (temperature, humidity, angular speed, specifica pressure); Therefore the declared wear rate must be considered as indicative.**

## M7.4 FA brake connections

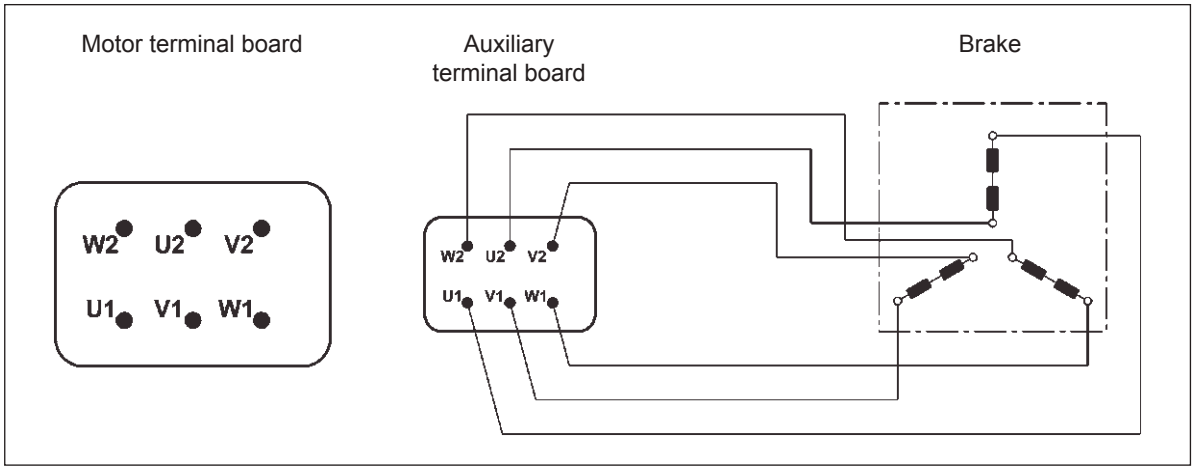
The diagram below shows the wiring when brake is connected directly to same power supply of the motor:

(F 39)




Switch-pole motors and, at request, single-pole motors with separate power supply are equipped with an auxiliary terminal board with 6 terminals for brake connection.
In this version, motors feature a larger terminal box. See diagram below:

(F 40)





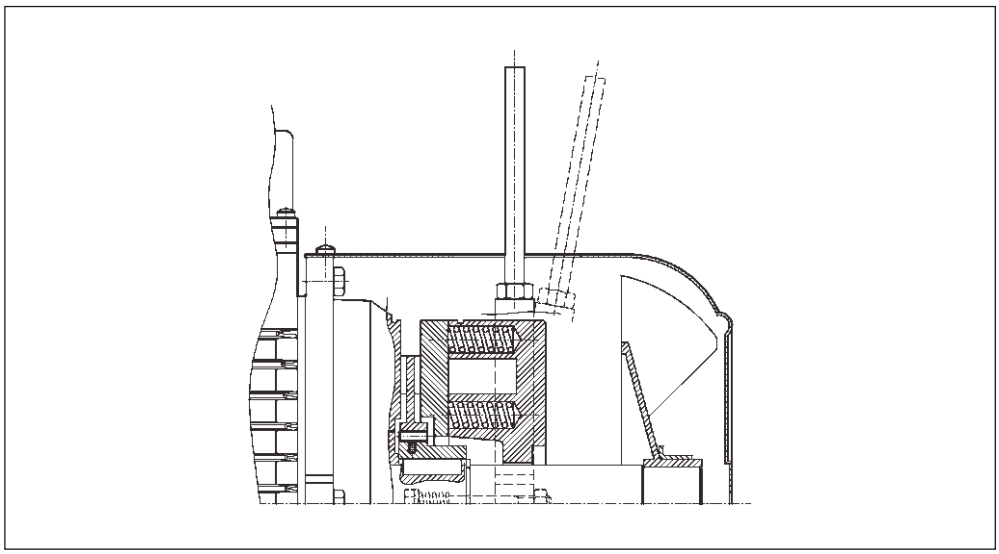

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## M8 BRAKE RELEASE SYSTEMS

Spring-applied brakes type FD and FA may be equipped with optional manual release devices. These are typically used for manually releasing the brake before servicing any machine or plant parts operated by the motor.

**R**

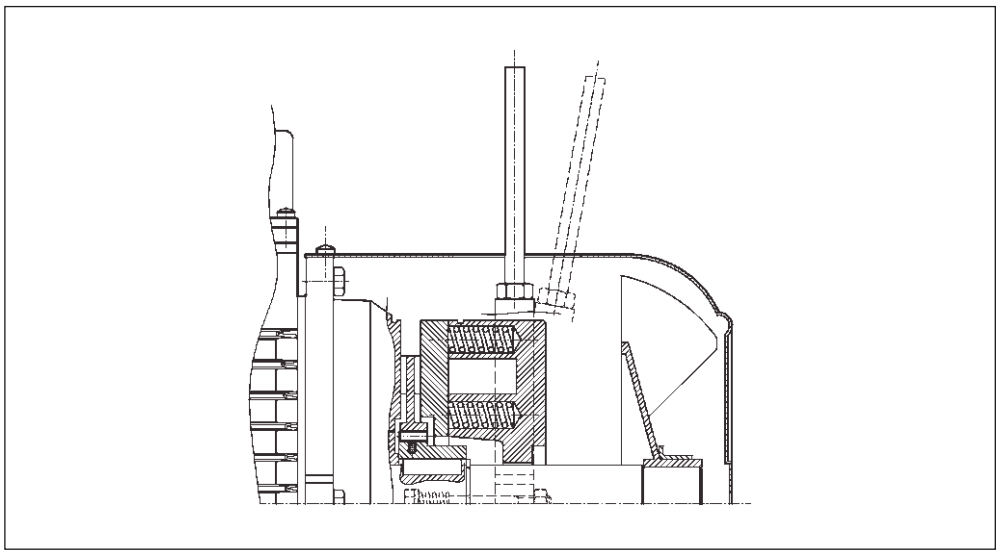
(F 41)



A return spring brings the release lever back in the original position.

**RM**

(F 42)



On motors type BN_FD, if the option RM is specified, the release device may be locked in the ”release” position by tightening the lever until its end becomes engaged with a brake housing projection. The availability for the various disengagement devices is charted here below:



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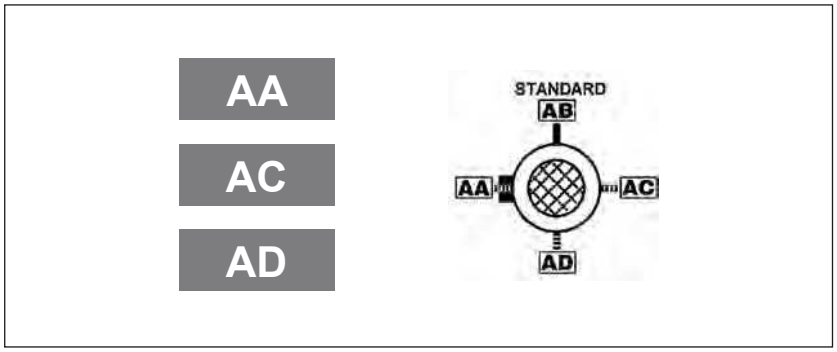
(F 43)

| | R | RM |
|---|---|---|
| BN_FD | BN 63...BN 200 | 2p 63A2 ≤ H ≤ 132M2<br>4p 63A4 ≤ H ≤ 132MA4<br>6p 63A6 ≤ H ≤ 132MA6 |
| M_FD | M 05...M 5 | M 05...M 4LA |
| BN_FA | BN 63...BN 180M | ⛔ |
| M_FA | M 05...M 5 | |

## M8.1 Release lever orientation

Unless otherwise specified, the release lever is located 90° away from the terminal box – identified by letters [**AB**] in the diagram below – in a clockwise direction on both options **R** and **RM**. Alternative lever positions [**AA**], [**AC**] and [**AD**] are also possible when the corresponding option is specified:

(F 44)




## M8.2 Fly-wheel data (F1)

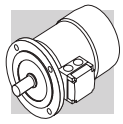
The table below shows values of weight and inertia of flywheel (option F1). Overall dimensions of motors remain unchanged.

(F 45)

| Main data for flywheel of motore type: BN_FD, M_FD | | | |
|---|---|---|---|
|  |  | **Fly-wheel weight** [Kg] | **Fly-wheel inertia** [Kgm$^2$] |
| **BN 63** | **M05** | 0.69 | 0.00063 |
| **BN 71** | **M1** | 1.13 | 0.00135 |
| **BN 80** | **M2** | 1.67 | 0.00270 |
| **BN 90 S - BN 90 L** | **–** | 2.51 | 0.00530 |
| **BN 100** | **M3** | 3.48 | 0.00840 |
| **BN 112** | **–** | 4.82 | 0.01483 |
| **BN 132 S - BN 132 M** | **M4** | 6.19 | 0.02580 |



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## M9 OPTIONS

### M9.1 Thermal protective devices

n addition to the standard protection provided by the magneto-thermal device, motors can be supplied with built-in thermal probes to protect the winding against overheating caused, by insufficient ventilation or by an intermittent duty.
This additional protection should always be specified for servoven- tilated motors (IC416).

### M9.2 Capacitive filter

**CF**

An optional capacitive filter is available for DC brake motors type BN_FD only. When the suitable capacitive filter is installed upstream of the rectifier (option CF), motors comply with the emission limits required by standard EN61000-6-3:2007“ Electromagnetic Compatibility – Generic Emission Standard – Part 6-3: Residential, commercial and light industrial environment”.

### M9.3 Thermistors

**E3**

These are semi-conductors having rapid resistance variation when they are close to the rated switch off temperature (150 °C).
Variations of the R = f(T) characteristic are specified under DIN 44081, IEC 34-11 Standards.
Positive temperature coefficient thermistors are normally used (also known as PTC “cold conductor resistors”).
Thermistors cannot control relays directly and must be connected to a suitable disconnect device.
Thus protected, three PTCs connected in series are installed in the winding, the terminals of which are located on the auxiliary terminal-board.

**K1**

The design characteristics of this sub-group of PTC thermistors allow them to be used as positive temperature coefficient sensors with variable resistance.
Functioning temperature range: 0°C ... +260°C.
Thermistors cannot control relays directly and must be connected to a suitable disconnect device.
Terminals (polarised) for 1 x KTY 84-130 are provided on an auxiliary terminal strip.

### M9.4 Bimetallic thermostates

**D3**

These types of protective devices house a bimetal disk. When the rated switch off temperature (150 °C) is reached, the disk switches the contacts from their initial rest position.
As temperature falls, the disk and the contacts automatically return to rest position.
Three bimetallic thermostates connected in series are usually employed, with normally closed contacts. The terminals are located on an auxiliary terminal-board.



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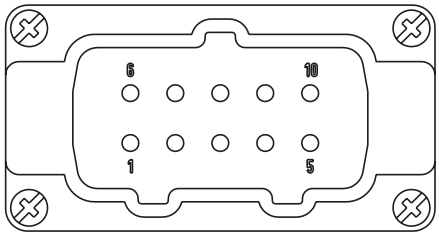
## M9.5 Plug connector

# CON

Three types of connectors (CON 1, CON 2, CON 3) are provided; they can be mounted in two different positions: right side of terminal box cover (C1D, C2D, C3D); left side of terminal box cover (C1S, C2S, C3S).
The option CON is applicable to single speed BN and M motors (2, 4, 6, 8 poles), and it is not applicable to switch-pole motors. More details about the motor sizes are available in the next table.
The connectors CON 1 / CON 2 are available for BN and M motors without brake and for BN and M brakemotors equipped with DC brake type FD, for the motor sizes listed below.
**The male connector (with pins) is mounted on the motor, the female connector is not provided. With CON option, the winding connection is always Y.**
With option U1 “forced ventilation”, the fan unit supply is available inside the separate terminal box fixed to fan cover.
With options EN1...EN6, the encoder connection is made by a cable not connected to the motor plug connector.
The CON option is not applicable to brakemotors equipped with AC brake type FA. The CON option is not available when at least one of the next options are selected: the U2, CUS, IC.

### Specifications

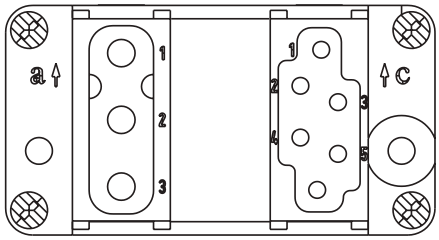
(F 46)

| Option | **CON 1** |
|---|---|
| Motor size | **BN63…BN112 / M05...M3** |
| Connector view |  |
| Type of connector | Harting Han 10ES |
| Housing | Han EMC 10B with 2 levers |
| Numbers of pins - nominal current | 10 x 16A |
| Voltage | 500 Vac |
| Contact connection | Screw terminals |

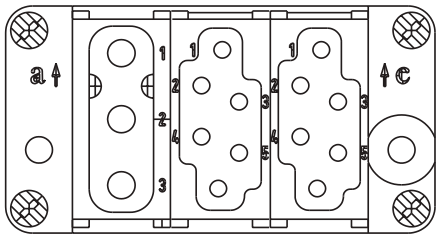


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(F 47)

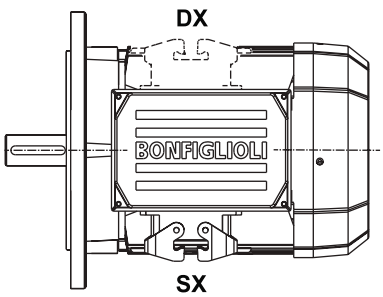
| Option | CON 2 |
|---|---|
| Motor size | **BN63…BN132M / M05...M4L** |
| Connector view |  |
| Type of connector | Harting Han Modular |
| Housing | Han EMC 10B with 2 levers |
| Module type | Module C + Empty module + Module E |
| Numbers of pins - nominal current | 3 x 36A / 6 x 16A |
| Voltage | 500 Vac |
| Contact connection | Crimping contacts |

(F 48)

| Option | CON 3 |
|---|---|
| Motor size | **BN63…BN132M / M05...M4L** |
| Connector view |  |
| Type of connector | Harting Han Modular |
| Housing | Han EMC 10B with 2 levers |
| Module type | Module C + Module E + Module E |
| Numbers of pins - nominal current | 3 x 36A / 6 + 6 x 16A |
| Voltage | 500 Vac |
| Contact connection | Crimping contacts |

(F 49)

**Connector orientation**

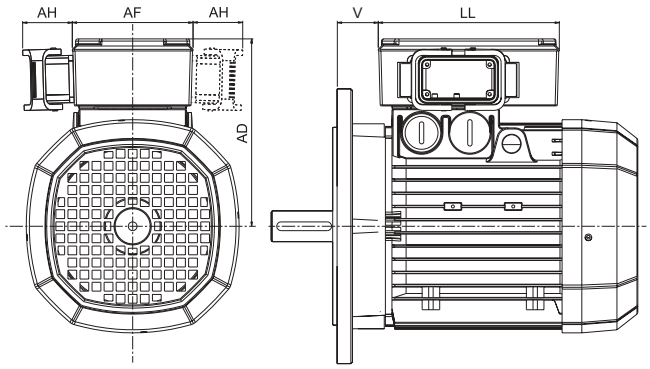





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(F 50)

**Motors without brake dimensions**

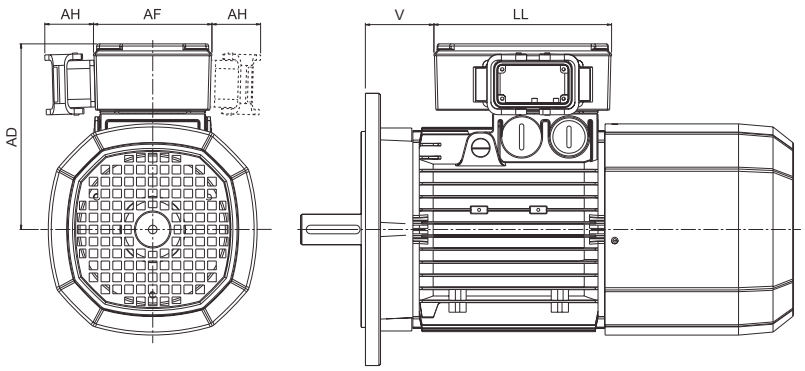



| | | AD (mm) | AF (mm) | AH (mm) | LL (mm) | V(*) (mm) |
|---|---|---|---|---|---|---|
| **BN63** | **M05** | 136 | 110 | 45 | 165 | 4.5 |
| **BN71** | **M1** | 149 | 110 | 45 | 165 | 15.5 |
| **BN80** | **M2** | 160 | 110 | 45 | 165 | 16.5 |
| **BN90** | **—** | 162 | 110 | 45 | 165 | 31.5 |
| **BN100** | **M3** | 171 | 110 | 45 | 165 | 37.5 |
| **BN112** | **—** | 186 | 110 | 45 | 165 | 39 |
| **BN132** | **M4** | 210 | 140 | 45 | 188 | 45.5 |
| **BN160MR** | **—** | 210 | 140 | 45 | 188 | 161 |

(*) Dimension valid only for motors BN.

(F 51)

**Motors with FD brake dimensions**




| | | AD (mm) | AF (mm) | AH (mm) | LL (mm) | V(*) (mm) |
|---|---|---|---|---|---|---|
| **BN63** | **M05** | 136 | 110 | 45 | 165 | 4.5 |
| **BN71** | **M1** | 149 | 110 | 45 | 165 | 1.5 |
| **BN80** | **M2** | 160 | 110 | 45 | 165 | 18.5 |
| **BN90** | **—** | 162 | 110 | 45 | 165 | 39.5 |
| **BN100** | **M3** | 171 | 110 | 45 | 165 | 63.5 |
| **BN112** | **—** | 186 | 110 | 45 | 165 | 75 |
| **BN132** | **M4** | 210 | 140 | 45 | 188 | 122 |
| **BN160MR** | **—** | 210 | 140 | 45 | 188 | 161 |

(*) Dimension valid only for motors BN.



Bonfiglioli Riduttori

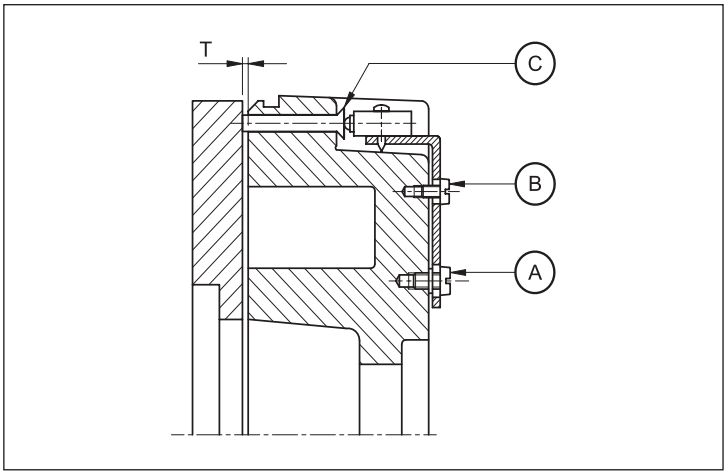
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## M9.6 Control of brake operation

**MSW**

The microswitch can be set in order to obtain from it a signal related to the attraction/release of anchor plate, or it can be set in order to give feedback when the air gap reaches the maximum value.
**MSW option is available for brakes FD03...FD09.**
The microswitch is provided with three lead wires (NC, NO, COM). The next figure shown the main components of the brake equipped with microswitch.

(F 52)




A: Plate fixing screws
B: Setting screws
C: Actuator control pin

## M9.7 Additional cable entry for brakemotors

**IC**

The terminal box cover of brakemotors BN63...BN160MR / M05...M4 is provided with two additional cable entry M16 x 1.5 (one cable entry per side).
The terminal box cover of brakemotors BN160...BN200 / M5 is provided with an additional cable entry M16 x 1.5 next to the cable entry used for the brake.

## M9.8 Anti-condensation heaters

**H1** **NH1**

Where an application involves high humidity or extreme temperature fluctuation, motors may be equipped with an anti-condensate heater.
A single-phase power supply is available in the auxiliary terminal board inside the main terminal box.
Values for the absorbed power are listed here below:


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(F 53)

|  |  | H1<br>1~ 230V ± 10%<br>P [W] | NH1<br>1~ 115V ± 10%<br>P [W] |
|---|---|---|---|
| **BN 56...BN 80** | **M0...M2** | 10 | 10 |
| **BN 90...BN 160MR** | **M3 - M4** | 25 | 25 |
| **BN 160M...BN 180M** | **M5** | 50 | 50 |
| **BN 180L...BN 200L** | **—** | | |

**Warning!**
**Always remove power supply to the anti-condensante hea- ter before operating the motor.**

## M9.9 Tropicalization

**TP**

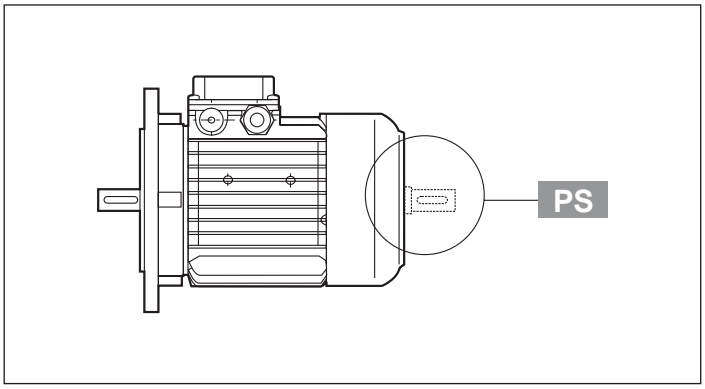
When option **TP** is specified, motor windings receive additional protection for operation in high humidity and temperature conditions.

## M9.10 Second shaft extension

**PS**

This option is not compatible with variants RC, TC, U1, U2, EN1, EN2, EN3, EN4, EN5, EN6.
For shaft dimensions please see motor dimensions tables.

(F 54)




## M9.11 Backstop device

**AL** **AR**

For applications where backdriving must be avoided, motors equipped with an anti run-back device can be used (available for the M series only). While allowing rotation in the direction required, this device operates instantaneously in case of a power failure, preventing the shaft from running back. The anti run-back device is life lubricated with special grease for this specific application. When ordering, customers should indicate the required rotation direction, AL or AR.
Never use the anti run-back device to prevent reverse rotation caused by faulty electrical connection. Table (F55) shows rated and maximum locking torques for the anti run-back devices. A diagram of the device can be seen in Table (F56). Overall dimensis are same as the corresponding brake motor. The direction of free rotation is described in the “MOTOR OPTIONS” section of specifically dedicated sections to gear units.

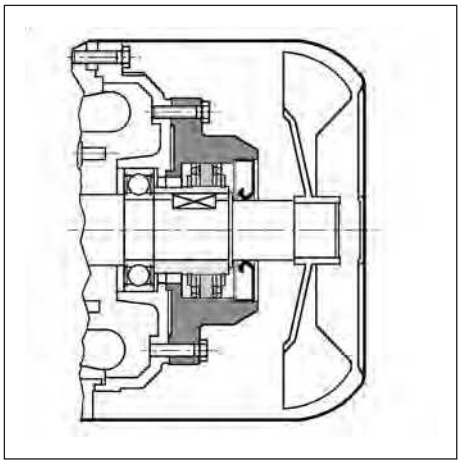


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(F 55)

| | Rated locking torque [Nm] | Max. locking torque [Nm] | Release speed [min$^{-1}$] |
|---|---|---|---|
| **M1** | 6 | 10 | 750 |
| **M2** | 16 | 27 | 650 |
| **M3** | 54 | 92 | 520 |
| **M4** | 110 | 205 | 430 |

(F 56)



## M9.12 Ventilation

Motors are cooled through outer air blow (IC 411 according to CEI EN 60034-6) and are equipped with a plastic radial fan, which operates in both directions.
Ensure that fan cover is installed at a suitable distance from the closest wall so to allow air circulation and servicing of motor and brake, if fitted.
On request, motors can be supplied with independently power-supplied forced ventilation system starting from BN 71 or M1 size.
Motor is cooled by an axial fan with independent power supply and fitted on the fan cover (IC 416 cooling system).
This version is used in case of motor driven by inverter so that steady torque operation is possible even at low speed or when high starting frequencies are needed.
Brake all motors with rear shaft projection (PS option) are excluded.

(F 57)

| Power supply | | | | | |
|---|---|---|---|---|---|
| | | **V a.c. ± 10%** | **Hz** | **P** [W] | **I** [A] |
| **BN 71** | **M1** | 1~ 230 | 50 / 60 | 22 | 0.12 |
| **BN 80** | **M2** | | | 22 | 0.12 |
| **BN 90** | **—** | | | 40 | 0.30 |
| **BN 100 (*)** | **M3** | | | 50 | 0.25 |
| **BN 112** | **—** | 3~ 230 Δ / 400Y | | 50 | 0.26 / 0.15 |
| **BN 132S** | **M4S** | | | 110 | 0.38 / 0.22 |
| **BN 132M...BN 160MR** | **M4L** | | | | |
| **BN 160...BN 180M** | **M5** | | 50 | 180 | 1.25 / 0.72 |

This variant has two different models, called **U1** and **U2**, having the same longitudinal size. Longer side of fan cover (**DL**) is specified for both models in the table below. Overall dimension can be reckoned from motor size table.

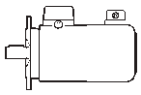

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(F 58)

| Extra length for servoventilated motors | | | |
|---|---|---|---|
|  |  | $\Delta L_1$ | $\Delta L_2$ |
| **BN 71** | **M1** | 93 | 32 |
| **BN 80** | **M2** | 127 | 55 |
| **BN 90** | **—** | 131 | 48 |
| **BN 100** | **M3** | 119 | 28 |
| **BN 112** | **—** | 130 | 31 |
| **BN 132S** | **M4S** | 161 | 51 |
| **BN 132M** | **M4L** | 161 | 51 |

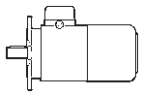
$\Delta L_1$ = extra length to LB value of corresponding standard motor
$\Delta L_2$ = extra length to LB value of corresponding brake motor

## U1



Fan wiring terminals are housed in a separate terminal box.
In brake motors of size BN 71...BN 160MR, M1...M4L, with **U1** model, the release lever cannot be positioned to AA.
The option is not applicable to motors compliant with the CSA and UL norms (option CUS).

## U2



Fan terminals are wired in the motor terminal box.
The **U2** option does not apply to motors BN 160 through BN 200L, M5, with the only exception of motor BN 160MR for which the option is available instead and to motors with option CUS (ompliant to norms CSA and UL).

(F 59)

|  |  | **V a.c.** ±10% | **Hz** | **P** [W] | **I** [A] |
|---|---|---|---|---|---|
| **BN 71** | **M1** | 1 ~ 230 | 50 / 60 | 22 | 0.12 |
| **BN 80** | **M2** | | | 22 | 0.12 |
| **BN 90** | **–** | | | 40 | 0.30 |
| **BN 100** | **M3** | 3 ~ 230Δ / 400Y | | 40 | 0.26 / 0.09 |
| **BN 112** | **–** | | | 50 | 0.26 / 0.15 |
| **BN 132 ... BN 160MR** | **M4L** | | | 110 | 0.38 / 0.22 |

### M9.13 Rain canopy

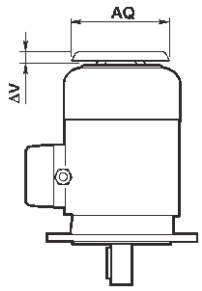
## RC

The rain canopy protects the motor from dripping and avoids the ingress of solid bodies. It is recommended when motor is installed in a vertical position with the shaft downwards.
Relevant dimensions are indicated in the table below.
The drip cover is not compatible with variants PS, EN1, EN2, EN3, EN4, EN5, EN6.



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(F 60)

| | | AQ | ΔV | |
|---|---|---|---|---|
| **BN 63** | **M05** | 118 | 24 |  |
| **BN 71** | **M1** | 134 | 27 | |
| **BN 80** | **M2** | 152 | 25 | |
| **BN 90** | **—** | 168 | 30 | |
| **BN 100** | **M3** | 190 | 28 | |
| **BN 112** | **—** | 211 | 32 | |
| **BN 132...BN 160MR** | **M4** | 254 | 32 | |
| **BN 160M...BN 180M** | **M5** | 302 | 36 | |
| **BN 180L...BN 200L** | **—** | 340 | 36 | |



## M9.14 Textile canopy

**TC**

Option TC is a cover variant for textile industry environments, where lint may obstruct the fan grid and prevent a regular flow of cooling air.
This option is not compatible with variants EN1, EN2, EN3, EN4, EN5, EN6.
Overall dimensions are the same as drip cover type RC.

## M9.15 Feedback units

Motors may be combined with six different types of encoders to achieve feedback circuits.
Configurations with double-extended shaft (PS) and rain canopy (RC, TC) are not compatible with encoder installation.

**EN1**

Incremental encoder, $V_{IN}$ = 5 V, line-driver output RS 422.

**EN2**

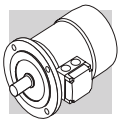
Incremental encoder, $V_{IN}$ = 10-30 V, line-driver output RS 422.

**EN3**

Incremental encoder, $V_{IN}$ = 12-30 V, push-pull output 12-30 V



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## EN4

Encoder sin/cos, $V_{IN}$ = 4.5-5.5 V, output Sinus 0.5$V_{PP}$.

## EN5

Absolute encoder singleturn, HIPERFACE® interface, $V_{IN}$ = 7-12 V.

## EN6

Absolute encoder multiturn, HIPERFACE® interface, $V_{IN}$ = 7-12 V.

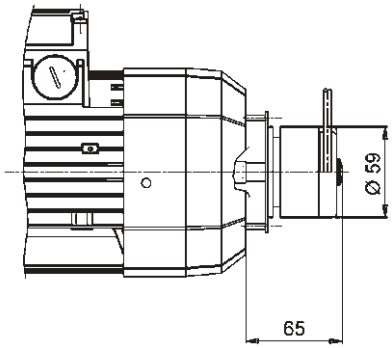
(F 61)

| | EN1 | EN2 | EN3 | EN4 | EN5 | EN6 |
|---|---|---|---|---|---|---|
| Interface | TTL/RS 422 | TTL/RS 422 | HTL/push-pull | Sinus 0.5 VPP | HIPERFACE® | HIPERFACE® |
| Power supply voltage [V] | 4...6 | 10...30 | 12...30 | 4.4...5.5 | 7...12 | 7...12 |
| Output voltage [V] | 5 | 5 | 12...30 | — | — | — |
| No-load operating current [mA] | 120 | 100 | 100 | 40 | 80 | 80 |
| No. of pulses per revolution | 1024 | | | | | |
| Steps per revolution | — | — | — | — | 15 bit | 15 bit |
| Revolutions | — | — | — | — | — | 12 bit |
| No. of signals | 6 (A, B, Z + inverted signals) | | | 6 (cos-, cos+, sin-, sin+, Z, $\overline{Z}$) | — | — |
| Max. output frequency [kHz] | 600 | | | 200 | | |
| Max. speed [$min^{-1}$] | 6000 (9000 $min^{-1}$ for 10 s ) | | | | | |
| Working temperature range [°C] | -30 ... +100 | | | | | |
| Protection class | IP 65 | | | | | |

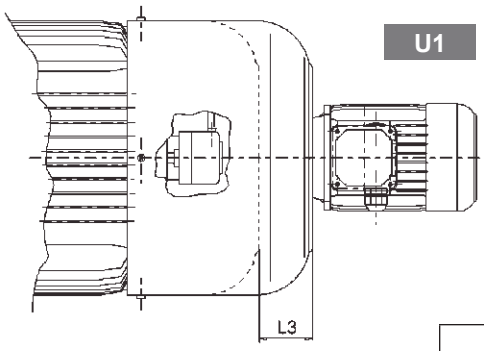


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(F 63)

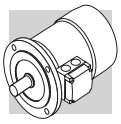
| EN1, EN2, EN3, EN4, EN5, EN6 | |
|---|---|
|  | |
| **BN 63...BN 200L** | **M05...M5** |
| **BN 63_FD...BN 200L_FD** | **M05_FD...M5_FD** |
| **BN 63_FA...BN 200L_FA** | **M05_FA...M5_FA** |

(F 62)

| EN_ + U1 | | |
|---|---|---|
|  | | |
| | | **L3** |
| **BN 160M...BN 180M** | **M5** | 72 |
| **BN 180L...BN 200L** | **-** | 82 |
| **BN 160M_FD...BN 180M_FD** | **M5_FD** | 35 |
| **BN 180L_FD...BN 200L_FD** | **-** | 41 |

If the encoder device (option EN_) is specified on motors BN71...BN160MR / M1...M4, along with the independent fan cooling (options U1, U2), the extra length of motor is coincident with that of the correspondent U1 and U2 execution.


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## M9.16 Surface protection

**C_**

When no specific protection class is requested, the painted (ferrous) surfaces of motors are protected to at least corrosivity class C2 (UNI EN ISO 12944-2). For improved resistance to atmospheric corrosion, motors can be delivered with C3 and C4 surface protection.

| SURFACE PROTECTION | Typical environments | Maximum surface temperature | Corrosivity class according to UNI EN ISO 12944-2 |
|---|---|---|---|
| **C3** | Urban and industrial environments with up to 100% relative humidity (medium air pollution) | 120°C | C3 |
| **C4** | Industrial areas, coastal areas, chemical plant, with up to 100% relative humidity (high air pollution) | 120°C | C4 |

Motors with optional protection to class C3 or C4 are available in a choice of colours. If no specific colour is requested (see the “PAINTING” option) motors are finished in RAL 7042.
Motors can also be supplied with surface protection for corrosivity class C5 according to UNI EN ISO 12944-2. Contact our Technical Service for further details.

## M9.17 Painting

**RAL_**

Gearboxes with optional protection to class C3 or C4 are available in the colours listed in the following table.

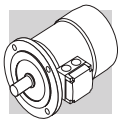
| PAINTING | Colour | RAL number |
|---|---|---|
| **RAL7042*** | Traffic Grey A | 7042 |
| **RAL5010** | Gentian Blue | 5010 |
| **RAL9005** | Jet Black | 9005 |
| **RAL9006** | White Aluminium | 9006 |
| **RAL9010** | Pure White | 9010 |

* Gearboxes are supplied in this standard colour if no other colour is specified.

NOTE – “PAINTING” options can only be specified in conjunction with “SURFACE PROTECTION” options.



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## M9.18 Certificates

### ACM

**Certificate of compliance of motors**

The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

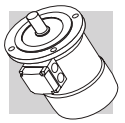
### CC

**Inspection certificate**

The document entails checking on order compliance, the visual inspection of external conditions and instrumental testing of the electrical characteristics in unloaded conditions. Units inspected are sampled within the shipping batch and marked individually.



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## 2P — 3000 min$^{-1}$ - S1 — 50 Hz

| | | | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ | | n | $M_n$ | IE1 | η (100%) | η (75%) | η (50%) | cosφ | In 400V | Is / In | Ms / Mn | Ma / Mn | $J_m$ x $10^{-4}$ | IM B5 | Mod | Mb | $Z_o$ 1/h | | $J_m$ x $10^{-4}$ | IM B5 | Mod | Mb | $Z_o$ 1/h | $J_m$ x $10^{-4}$ | IM B5 |
| kW | | min$^{-1}$ | Nm | | % | % | % | | A | | | | kgm$^2$ | Kg | | Nm | NB | SB | kgm$^2$ | Kg | | Nm | | kgm$^2$ | Kg |
| 0.18 | BN 63A 2 | 2730 | 0.63 | ○ | 59.9 | 56.9 | 51.9 | 0.77 | 0.56 | 3.0 | 2.1 | 2.0 | 2.0 | 3.5 | FD 02 | 1.75 | 3900 | 4800 | 2.6 | 5.2 | FA 02 | 1.75 | 4800 | 2.6 | 5.0 |
| 0.25 | BN 63B 2 | 2740 | 0.87 | ○ | 66.0 | 64.8 | 64.8 | 0.76 | 0.72 | 3.3 | 2.3 | 2.3 | 2.3 | 3.9 | FD 02 | 1.75 | 3900 | 4800 | 3.0 | 5.6 | FA 02 | 1.75 | 4800 | 3.0 | 5.4 |
| 0.37 | BN 63C 2 | 2800 | 1.26 | ○ | 69.1 | 66.8 | 66.8 | 0.78 | 0.99 | 3.9 | 2.6 | 2.6 | 3.3 | 5.1 | FD 02 | 3.5 | 3600 | 4500 | 3.9 | 6.8 | FA 02 | 3.5 | 4500 | 3.9 | 6.6 |
| 0.37 | BN 71A 2 | 2820 | 1.25 | ○ | 73.8 | 73.0 | 70.6 | 0.76 | 0.95 | 4.8 | 2.8 | 2.6 | 3.5 | 5.4 | FD 03 | 3.5 | 3000 | 4100 | 4.6 | 8.1 | FA 03 | 3.5 | 4200 | 4.6 | 7.8 |
| 0.55 | BN 71B 2 | 2820 | 1.86 | ○ | 76.0 | 75.8 | 74.8 | 0.76 | 1.37 | 5.0 | 2.9 | 2.8 | 4.1 | 6.2 | FD 03 | 5 | 2900 | 4200 | 5.3 | 8.9 | FA 03 | 5 | 4200 | 5.3 | 8.6 |
| 0.75 | BN 71C 2 | 2810 | 2.6 | ○ | 76.6 | 76.2 | 76.2 | 0.76 | 1.86 | 5.1 | 3.1 | 2.8 | 5.0 | 7.3 | FD 03 | 5 | 1900 | 3300 | 6.1 | 10.0 | FA 03 | 5 | 3600 | 6.1 | 9.7 |
| 0.75 | BN 80A 2 | 2810 | 2.6 | • | 76.2 | 75.5 | 68.3 | 0.81 | 1.75 | 4.8 | 2.6 | 2.2 | 7.8 | 8.6 | FD 04 | 5 | 1700 | 3200 | 9.4 | 12.5 | FA 04 | 5 | 3200 | 9.4 | 12.4 |
| 1.1 | BN 80B 2 | 2800 | 3.8 | • | 76.4 | 76.2 | 75.0 | 0.81 | 2.57 | 4.8 | 2.8 | 2.4 | 9.0 | 9.5 | FD 04 | 10 | 1500 | 3000 | 10.6 | 13.4 | FA 04 | 10 | 3000 | 10.6 | 13.3 |
| 1.5 | BN 80C 2 | 2800 | 5.1 | • | 79.1 | 79.5 | 77.2 | 0.81 | 3.4 | 4.9 | 2.7 | 2.4 | 11.4 | 11.3 | FD 04 | 15 | 1300 | 2600 | 13.0 | 15.2 | FA 04 | 15 | 2600 | 13.0 | 15.1 |
| 1.5 | BN 90SA 2 | 2870 | 5.0 | • | 82.0 | 81.5 | 78.1 | 0.80 | 3.4 | 5.9 | 2.7 | 2.6 | 12.5 | 12.3 | FD 14 | 15 | 900 | 2200 | 14.1 | 16.5 | FA 14 | 15 | 2200 | 14.1 | 16.4 |
| 1.85 | BN 90SB 2 | 2880 | 6.1 | • | 82.5 | 82.0 | 75.4 | 0.80 | 4.0 | 6.2 | 2.9 | 2.6 | 16.7 | 14 | FD 14 | 15 | 900 | 2200 | 18.3 | 18.2 | FA 14 | 15 | 2200 | 18.3 | 18.1 |
| 2.2 | BN 90L 2 | 2880 | 7.3 | • | 82.7 | 82.1 | 80.8 | 0.80 | 4.8 | 6.3 | 2.9 | 2.7 | 16.7 | 14 | FD 05 | 26 | 900 | 2200 | 21 | 20 | FA 05 | 26 | 2200 | 21 | 20.7 |
| 3 | BN 100L 2 | 2860 | 10.0 | • | 81.5 | 81.3 | 77.4 | 0.79 | 6.7 | 5.6 | 2.6 | 2.2 | 31 | 20 | FD 15 | 26 | 700 | 1600 | 35 | 26 | FA 15 | 26 | 1600 | 35 | 27 |
| 4 | BN 100LB 2 | 2870 | 13.3 | • | 83.1 | 83.0 | 77.8 | 0.80 | 8.7 | 5.8 | 2.7 | 2.5 | 39 | 23 | FD 15 | 40 | 450 | 900 | 43 | 29 | FA 15 | 40 | 1000 | 43 | 30 |
| 4 | BN 112M 2 | 2900 | 13.2 | • | 85.5 | 84.5 | 83.0 | 0.82 | 8.2 | 6.9 | 3.0 | 2.9 | 57 | 28 | FD 06S | 40 | — | 950 | 66 | 39 | FA 06S | 40 | 950 | 66 | 40 |
| 5.5 | BN 132SA 2 | 2890 | 18.2 | • | 84.7 | 84.5 | 81.2 | 0.84 | 11.2 | 5.9 | 2.6 | 2.2 | 101 | 35 | FD 06 | 50 | — | 600 | 112 | 48 | FA 06 | 50 | 600 | 112 | 49 |
| 7.5 | BN 132SB 2 | 2900 | 25 | • | 86.5 | 86.3 | 84.4 | 0.85 | 14.7 | 6.4 | 2.6 | 2.2 | 145 | 42 | FD 06 | 50 | — | 550 | 154 | 55 | FA 06 | 50 | 550 | 154 | 56 |
| 9.2 | BN 132M 2 | 2930 | 30 | • | 87.0 | 86.5 | 83.6 | 0.86 | 17.7 | 6.7 | 2.8 | 2.3 | 178 | 53 | FD 56 | 75 | — | 430 | 189 | 66 | FA 06 | 75 | 430 | 189 | 67 |
| 11 | BN 160MR 2 | 2920 | 36 | • | 87.6 | 87.0 | 86.0 | 0.88 | 20.6 | 6.9 | 2.9 | 2.5 | 210 | 65 | | | | | | | | | | | |
| 15 | BN 160MB 2 | 2930 | 49 | • | 89.6 | 89.4 | 88.0 | 0.86 | 28.1 | 7.1 | 2.6 | 2.3 | 340 | 84 | | | | | | | | | | | |
| 18.5 | BN 160L 2 | 2930 | 60 | • | 90.4 | 90.1 | 89.0 | 0.86 | 34 | 7.6 | 2.7 | 2.3 | 420 | 97 | | | | | | | | | | | |
| 22 | BN 180M 2 | 2930 | 72 | • | 89.9 | 89.7 | 89.5 | 0.88 | 40 | 7.8 | 2.6 | 2.4 | 490 | 109 | | | | | | | | | | | |
| 30 | BN 200LA 2 | 2930 | 98 | • | 90.7 | 90.1 | 87.6 | 0.89 | 54 | 7.8 | 2.7 | 2.9 | 770 | 140 | | | | | | | | | | | |

○ = n.a. • = IE1

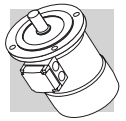


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## 4P — 1500 min$^{-1}$ - S1 — 50 Hz

| | | | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | IE1 | η (100%) % | η (75%) % | η (50%) % | cosφ | In 400V A | Is / In | Ms / Mn | Ma / Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.06 | BN 56A | 4 | 1340 | 0.43 | ○ | 46.8 | 44.2 | 41.3 | 0.65 | 0.28 | 2.6 | 2.3 | 2.0 | 1.5 | 3.1 | | | | | | | | | | | |
| 0.09 | BN 56B | 4 | 1350 | 0.64 | ○ | 51.7 | 47.6 | 42.9 | 0.60 | 0.42 | 2.6 | 2.5 | 2.4 | 1.5 | 3.1 | | | | | | | | | | | |
| 0.12 | BN 63A | 4 | 1350 | 0.85 | ○ | 59.8 | 56.2 | 47.0 | 0.62 | 0.47 | 2.6 | 1.9 | 1.8 | 2.0 | 3.5 | FD 02 | 1.75 | 10000 | 13000 | 2.6 | 5.2 | FA 02 | 1.75 | 13000 | 2.6 | 5.0 |
| 0.18 | BN 63B | 4 | 1320 | 1.30 | ○ | 54.8 | 52.9 | 52.5 | 0.67 | 0.71 | 2.6 | 2.2 | 2.0 | 2.3 | 3.9 | FD 02 | 3.5 | 10000 | 13000 | 3.0 | 5.6 | FA 02 | 3.5 | 13000 | 3.0 | 5.4 |
| 0.25 | BN 63C | 4 | 1340 | 1.78 | ○ | 65.3 | 65.0 | 57.9 | 0.69 | 0.80 | 2.7 | 2.1 | 1.9 | 3.3 | 5.1 | FD 02 | 3.5 | 7800 | 10000 | 3.9 | 6.8 | FA 02 | 3.5 | 10000 | 3.9 | 6.6 |
| 0.25 | BN 71A | 4 | 1380 | 1.73 | ○ | 63.7 | 62.2 | 59.1 | 0.73 | 0.78 | 3.3 | 1.9 | 1.7 | 5.8 | 5.1 | FD 03 | 3.5 | 7700 | 11000 | 6.9 | 7.8 | FA 03 | 3.5 | 11000 | 6.9 | 7.5 |
| 0.37 | BN 71B | 4 | 1370 | 2.6 | ○ | 66.8 | 66.7 | 63.0 | 0.76 | 1.05 | 3.7 | 2.0 | 1.9 | 6.9 | 5.9 | FD 03 | 5 | 6000 | 9400 | 8.0 | 8.6 | FA 03 | 5.0 | 9400 | 8.0 | 8.3 |
| 0.55 | BN 71C | 4 | 1380 | 3.8 | ○ | 69.0 | 68.9 | 68.8 | 0.74 | 1.55 | 4.1 | 2.3 | 2.3 | 9.1 | 7.3 | FD 53 | 7.5 | 4300 | 8700 | 10.2 | 10.0 | FA 03 | 7.5 | 8700 | 10.2 | 9.7 |
| 0.55 | BN 80A | 4 | 1390 | 3.8 | ○ | 72.0 | 71.3 | 69.7 | 0.77 | 1.43 | 4.1 | 2.3 | 2.0 | 15 | 8.2 | FD 04 | 10 | 4100 | 8000 | 16.6 | 12.1 | FA 04 | 10 | 8000 | 16.6 | 12.0 |
| 0.75 | BN 80B | 4 | 1400 | 5.1 | • | 75.0 | 74.5 | 69.3 | 0.78 | 1.85 | 4.9 | 2.7 | 2.5 | 20 | 9.9 | FD 04 | 15 | 4100 | 7800 | 22 | 13.8 | FA 04 | 15 | 7800 | 22 | 13.7 |
| 1.1 | BN 80C | 4 | 1400 | 7.5 | • | 75.5 | 76.2 | 70.4 | 0.78 | 2.7 | 5.1 | 2.8 | 2.5 | 25 | 11.3 | FD 04 | 15 | 2600 | 5300 | 27 | 15.2 | FA 04 | 15 | 5300 | 27 | 15.1 |
| 1.1 | BN 90S | 4 | 1390 | 7.6 | • | 76.5 | 76.2 | 72.2 | 0.77 | 2.70 | 4.6 | 2.6 | 2.2 | 21 | 12.2 | FD 14 | 15 | 4800 | 8000 | 23 | 16.4 | FA 14 | 15 | 8000 | 23 | 16.3 |
| 1.5 | BN 90LA | 4 | 1410 | 10.2 | • | 78.7 | 78.5 | 74.9 | 0.77 | 3.6 | 5.3 | 2.8 | 2.4 | 28 | 13.6 | FD 05 | 26 | 3400 | 6000 | 32 | 19.6 | FA 05 | 26 | 6000 | 32 | 20.3 |
| 1.85 | BN 90LB | 4 | 1390 | 12.7 | • | 78.6 | 78.9 | 77.2 | 0.79 | 4.3 | 5.1 | 2.8 | 2.6 | 30 | 15.1 | FD 05 | 26 | 3200 | 5900 | 34 | 21.1 | FA 05 | 26 | 5900 | 34 | 21.8 |
| 2.2 | BN 100LA | 4 | 1410 | 14.9 | • | 81.1 | 81.4 | 79.9 | 0.75 | 5.2 | 4.5 | 2.2 | 2.0 | 40 | 18 | FD 15 | 40 | 2600 | 4700 | 44 | 25 | FA 15 | 40 | 4700 | 44 | 25 |
| 3 | BN 100LB | 4 | 1410 | 20 | • | 82.6 | 83.8 | 83.7 | 0.77 | 6.8 | 5.0 | 2.3 | 2.2 | 54 | 22 | FD 15 | 40 | 2400 | 4400 | 58 | 28 | FA 15 | 40 | 4400 | 58 | 29 |
| 4 | BN 112M | 4 | 1430 | 27 | • | 84.4 | 84.2 | 81.6 | 0.81 | 8.4 | 5.6 | 2.7 | 2.5 | 98 | 30 | FD 06S | 60 | — | 1400 | 107 | 40 | FA 06S | 60 | 2100 | 107 | 42 |
| 5.5 | BN 132S | 4 | 1440 | 36 | • | 84.7 | 84.8 | 82.5 | 0.81 | 11.6 | 5.5 | 2.3 | 2.2 | 213 | 44 | FD 56 | 75 | — | 1050 | 223 | 57 | FA 06 | 75 | 1200 | 223 | 58 |
| 7.5 | BN 132MA | 4 | 1440 | 50 | • | 86.0 | 86.3 | 85.3 | 0.81 | 15.5 | 5.7 | 2.5 | 2.4 | 270 | 53 | FD 06 | 100 | — | 950 | 280 | 66 | FA 07 | 100 | 1000 | 280 | 71 |
| 9.2 | BN 132MB | 4 | 1440 | 61 | • | 88.4 | 88.6 | 87.5 | 0.81 | 18.8 | 5.9 | 2.7 | 2.5 | 319 | 59 | FD 07 | 150 | — | 900 | 342 | 75 | FA 07 | 150 | 900 | 342 | 77 |
| 11 | BN 160MR | 4 | 1440 | 73 | • | 87.6 | 87.8 | 86.0 | 0.81 | 22.4 | 6.0 | 2.7 | 2.5 | 360 | 70 | FD 07 | 150 | — | 850 | 382 | 86 | FA 07 | 150 | 850 | 382 | 88 |
| 15 | BN 160L | 4 | 1460 | 98 | • | 88.7 | 88.5 | 88.4 | 0.81 | 30 | 6.0 | 2.3 | 2.1 | 650 | 99 | FD 08 | 200 | — | 750 | 725 | 129 | FA 08 | 200 | 750 | 710 | 128 |
| 18.5 | BN 180M | 4 | 1460 | 121 | • | 89.3 | 89.5 | 89.2 | 0.81 | 37 | 6.2 | 2.6 | 2.5 | 790 | 115 | FD 08 | 250 | — | 700 | 865 | 145 | FA 08 | 250 | 700 | 850 | 144 |
| 22 | BN 180L | 4 | 1460 | 144 | • | 89.9 | 90.0 | 90.0 | 0.80 | 44 | 6.4 | 2.5 | 2.5 | 1250 | 135 | FD 09 | 300 | — | 400 | 1450 | 175 | | | | | |
| 30 | BN 200L | 4 | 1460 | 196 | • | 91.4 | 91.7 | 91.0 | 0.80 | 59 | 7.1 | 2.7 | 2.8 | 1650 | 157 | FD 09 | 400 | — | 300 | 1850 | 197 | | | | | |

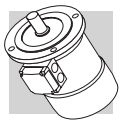
○ = n.a. • = IE1





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## 6P — 1000 min$^{-1}$ - S1 — 50 Hz



| | | | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | n min$^{-1}$ | $M_n$ Nm | IE1 | η (100%) % | η (75%) % | η (50%) % | cosφ | In 400V A | Is / In | Ms / Mn | Ma / Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.09 | **BN 63A 6** | 880 | 0.98 | ○ | 41.0 | 41.0 | 32.9 | 0.53 | 0.60 | 2.1 | 2.1 | 1.8 | 3.4 | 4.6 | **FD 02** | 3.5 | 9000 | 14000 | 4.0 | 6.3 | **FA 02** | 3.5 | 14000 | 4.0 | 6.1 |
| 0.12 | **BN 63B 6** | 870 | 1.32 | ○ | 45.0 | 44.0 | 41.8 | 0.60 | 0.64 | 2.1 | 1.9 | 1.7 | 3.7 | 4.9 | **FD 02** | 3.5 | 9000 | 14000 | 4.3 | 6.6 | **FA 02** | 3.5 | 14000 | 4.3 | 6.4 |
| 0.18 | **BN 71A 6** | 900 | 1.91 | ○ | 55.0 | 55.5 | 51.0 | 0.69 | 0.68 | 2.6 | 1.9 | 1.7 | 8.4 | 5.5 | **FD 03** | 5 | 8100 | 13500 | 9.5 | 8.2 | **FA 03** | 5.0 | 13500 | 9.5 | 7.9 |
| 0.25 | **BN 71B 6** | 900 | 2.70 | ○ | 62.0 | 58.5 | 51.4 | 0.71 | 0.82 | 2.6 | 1.9 | 1.7 | 10.9 | 6.7 | **FD 03** | 5 | 7800 | 13000 | 12 | 9.4 | **FA 03** | 5.0 | 13000 | 12 | 9.1 |
| 0.37 | **BN 71C 6** | 910 | 3.9 | ○ | 66.0 | 60.0 | 53.3 | 0.69 | 1.17 | 3.0 | 2.4 | 2.0 | 12.9 | 7.7 | **FD 53** | 7.5 | 5100 | 9500 | 14 | 10.4 | **FA 03** | 7.5 | 9500 | 14 | 10.1 |
| 0.37 | **BN 80A 6** | 910 | 3.9 | ○ | 68.0 | 67.4 | 63.3 | 0.68 | 1.15 | 3.2 | 2.2 | 2.0 | 21 | 9.9 | **FD 04** | 10 | 5200 | 8500 | 23 | 13.8 | **FA 04** | 10 | 8500 | 23 | 13.7 |
| 0.55 | **BN 80B 6** | 920 | 5.7 | ○ | 70.0 | 69.8 | 64.3 | 0.68 | 1.67 | 3.9 | 2.6 | 2.2 | 25 | 11.3 | **FD 04** | 15 | 4800 | 7200 | 27 | 15.2 | **FA 04** | 15 | 7200 | 27 | 15.1 |
| 0.75 | **BN 80C 6** | 920 | 7.8 | • | 70.0 | 70.0 | 64.4 | 0.65 | 2.38 | 3.8 | 2.5 | 2.2 | 28 | 12.2 | **FD 04** | 15 | 3400 | 6400 | 30 | 16.1 | **FA 04** | 15 | 6400 | 30 | 16.0 |
| 0.75 | **BN 90S 6** | 920 | 7.8 | • | 70.0 | 69.0 | 64.2 | 0.68 | 2.27 | 3.8 | 2.4 | 2.2 | 26 | 12.6 | **FD 14** | 15 | 3400 | 6500 | 28 | 16.8 | **FA 14** | 15 | 6500 | 28 | 16.7 |
| 1.1 | **BN 90L 6** | 920 | 11.4 | • | 72.9 | 72.6 | 69.1 | 0.69 | 3.2 | 3.9 | 2.3 | 2.0 | 33 | 15 | **FD 05** | 26 | 2700 | 5000 | 37 | 21 | **FA 05** | 26 | 5000 | 37 | 22 |
| 1.5 | **BN 100LA 6** | 940 | 15.2 | • | 75.2 | 74.2 | 70.3 | 0.72 | 4.0 | 4.1 | 2.1 | 2.0 | 82 | 22 | **FD 15** | 40 | 1900 | 4100 | 86 | 28 | **FA 15** | 40 | 4100 | 86 | 29 |
| 1.85 | **BN 100LB 6** | 930 | 19.0 | • | 76.6 | 72.8 | 62.6 | 0.73 | 4.8 | 4.6 | 2.1 | 2.0 | 95 | 24 | **FD 15** | 40 | 1700 | 3600 | 99 | 30 | **FA 15** | 40 | 3600 | 99 | 31 |
| 2.2 | **BN 112M 6** | 940 | 22 | • | 78.5 | 79.0 | 76.5 | 0.73 | 5.5 | 4.8 | 2.2 | 2.0 | 168 | 32 | **FD 06S** | 60 | — | 2100 | 177 | 42 | **FA 06S** | 60 | 2100 | 177 | 44 |
| 3 | **BN 132S 6** | 940 | 30 | • | 79.7 | 77.0 | 75.1 | 0.76 | 7.1 | 5.1 | 1.9 | 1.8 | 216 | 36 | **FD 56** | 75 | — | 1400 | 226 | 49 | **FA 06** | 75 | 1400 | 226 | 50 |
| 4 | **BN 132MA 6** | 950 | 40 | • | 81.4 | 81.5 | 79.5 | 0.77 | 9.2 | 5.5 | 2.0 | 1.8 | 295 | 45 | **FD 06** | 100 | — | 1200 | 305 | 58 | **FA 07** | 100 | 1200 | 318 | 63 |
| 5.5 | **BN 132MB 6** | 945 | 56 | • | 83.1 | 80.9 | 79.1 | 0.78 | 12.2 | 6.1 | 2.1 | 1.9 | 383 | 56 | **FD 07** | 150 | — | 1050 | 406 | 72 | **FA 07** | 150 | 1050 | 406 | 74 |
| 7.5 | **BN 160M 6** | 955 | 75 | • | 85.0 | 85.0 | 84.8 | 0.81 | 15.7 | 5.9 | 2.2 | 2.0 | 740 | 83 | **FD 08** | 170 | — | 900 | 815 | 112 | **FA 08** | 170 | 900 | 815 | 113 |
| 11 | **BN 160L 6** | 960 | 109 | • | 86.4 | 86.5 | 85.9 | 0.81 | 22.7 | 6.6 | 2.5 | 2.3 | 970 | 103 | **FD 08** | 200 | — | 800 | 1045 | 133 | **FA 08** | 200 | 800 | 1045 | 133 |
| 15 | **BN 180L 6** | 970 | 148 | • | 87.7 | 88.0 | 87.3 | 0.82 | 30 | 6.2 | 2.0 | 2.4 | 1550 | 130 | **FD 09** | 300 | — | 600 | 1750 | 170 | | | | | |
| 18.5 | **BN 200LA 6** | 960 | 184 | • | 88.6 | 88.0 | 87.3 | 0.81 | 37 | 5.9 | 2.0 | 2.3 | 1700 | 145 | **FD 09** | 400 | — | 450 | 1900 | 185 | | | | | |

○ = n.a. • = IE1

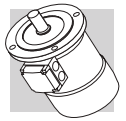


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| 8P | 750 min$^{-1}$ - S1 | 50 Hz |
|---|---|---|

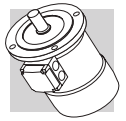
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.09 | **BN 71A** | **8** | 680 | 1.26 | 47 | 0.59 | 0.47 | 2.3 | 2.4 | 2.3 | 10.9 | 6.7 | **FD 03** | 3.5 | 9000 | 16000 | 12.0 | 9.4 | **FA 03** | 3.5 | 16000 | 12.0 | 9.1 |
| 0.12 | **BN 71B** | **8** | 680 | 1.69 | 51 | 0.59 | 0.58 | 2.1 | 2.3 | 2.2 | 12.9 | 7.7 | **FD 03** | 5.0 | 9000 | 16000 | 14.0 | 10.4 | **FA 03** | 5.0 | 16000 | 14.0 | 10.1 |
| 0.18 | **BN 80A** | **8** | 690 | 2.49 | 51 | 0.60 | 0.85 | 2.4 | 2.2 | 2.2 | 15 | 8.2 | **FD 04** | 5.0 | 6500 | 11000 | 16.6 | 12.1 | **FA 04** | 5.0 | 11000 | 16.6 | 12.0 |
| 0.25 | **BN 80B** | **8** | 680 | 3.51 | 54 | 0.63 | 1.06 | 2.4 | 2.0 | 1.9 | 20 | 9.9 | **FD 04** | 10.0 | 6000 | 10000 | 22 | 13.8 | **FA 04** | 10.0 | 10000 | 23 | 13.7 |
| 0.37 | **BN 90S** | **8** | 675 | 5.2 | 58 | 0.60 | 1.53 | 2.6 | 2.3 | 2.1 | 26 | 12.6 | **FD 14** | 15.0 | 4800 | 7500 | 28 | 16.8 | **FA 14** | 15.0 | 7500 | 28 | 16.7 |
| 0.55 | **BN 90L** | **8** | 670 | 7.8 | 62 | 0.60 | 2.13 | 2.6 | 2.2 | 2.0 | 33 | 15 | **FD 05** | 26 | 4000 | 6400 | 37 | 21 | **FA 05** | 26 | 6400 | 37 | 22 |
| 0.75 | **BN 100LA** | **8** | 700 | 10.2 | 68 | 0.63 | 2.53 | 3.4 | 1.9 | 1.7 | 82 | 22 | **FD 15** | 26 | 2800 | 4800 | 86 | 28 | **FA 15** | 26 | 4800 | 86 | 29 |
| 1.1 | **BN 100LB** | **8** | 700 | 15.0 | 68 | 0.64 | 3.65 | 3.2 | 1.7 | 1.7 | 95 | 24 | **FD 15** | 40 | 2500 | 4000 | 99 | 30 | **FA 15** | 40 | 4000 | 99 | 31 |
| 1.5 | **BN 112M** | **8** | 710 | 20.2 | 71 | 0.66 | 4.6 | 3.7 | 1.8 | 1.9 | 168 | 32 | **FD 06S** | 60 | — | 3000 | 177 | 42 | **FA 06S** | 60 | 3000 | 177 | 44 |
| 2.2 | **BN 132S** | **8** | 710 | 29.6 | 75 | 0.66 | 6.4 | 3.8 | 1.8 | 2.0 | 295 | 45 | **FD 56** | 75 | — | 2300 | 305 | 58 | **FA 06** | 75 | 2300 | 305 | 56 |
| 3 | **BN 132MA** | **8** | 710 | 40.4 | 76 | 0.69 | 8.3 | 3.9 | 1.6 | 1.8 | 370 | 53 | **FD 06** | 100 | — | 1900 | 394 | 69 | **FA 07** | 100 | 1900 | 406 | 74 |





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## 2/4P — 3000/1500 min$^{-1}$ - S1 — 50 Hz



| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.20 | **BN 63B** | **2** | 2700 | 0.71 | 55 | 0.82 | 0.64 | 3.5 | 2.1 | 1.9 | 2.9 | 4.4 | **FD 02** | 3.5 | 2200 | 2600 | 3.5 | 6.1 | **FA 02** | 3.5 | 2600 | 3.5 | 5.9 |
| 0.15 | | **4** | 1350 | 1.06 | 49 | 0.67 | 0.66 | 2.6 | 1.8 | 1.7 | | | | | 4000 | 5100 | | | | | 5100 | | |
| 0.28 | **BN 71A** | **2** | 2700 | 0.99 | 56 | 0.82 | 0.88 | 2.9 | 1.9 | 1.7 | 4.7 | 4.4 | **FD 03** | 3.5 | 2100 | 2400 | 5.8 | 7.1 | **FA 03** | 3.5 | 2400 | 5.8 | 6.8 |
| 0.20 | | **4** | 1370 | 1.39 | 59 | 0.72 | 0.68 | 3.1 | 1.8 | 1.7 | | | | | 3800 | 4800 | | | | | 4800 | | |
| 0.37 | **BN 71B** | **2** | 2740 | 1.29 | 56 | 0.82 | 1.16 | 3.5 | 1.8 | 1.8 | 5.8 | 5.1 | **FD 03** | 5.0 | 1400 | 2100 | 6.9 | 7.8 | **FA 03** | 5.0 | 2100 | 6.9 | 7.5 |
| 0.25 | | **4** | 1390 | 1.72 | 60 | 0.73 | 0.82 | 3.3 | 2.0 | 1.9 | | | | | 2900 | 4200 | | | | | 4200 | | |
| 0.45 | **BN 71C** | **2** | 2780 | 1.55 | 63 | 0.85 | 1.21 | 3.8 | 1.8 | 1.8 | 6.9 | 5.9 | **FD 03** | 5.0 | 1400 | 2100 | 8.0 | 8.6 | **FA 03** | 5.0 | 2100 | 8.0 | 8.3 |
| 0.30 | | **4** | 1400 | 2.0 | 63 | 0.73 | 0.94 | 3.6 | 2.0 | 1.9 | | | | | 2900 | 4200 | | | | | 4200 | | |
| 0.55 | **BN 80A** | **2** | 2800 | 1.9 | 63 | 0.85 | 1.48 | 3.9 | 1.7 | 1.7 | 15 | 8.2 | **FD 04** | 5.0 | 1600 | 2300 | 17 | 12.1 | **FA 04** | 5.0 | 2300 | 16.6 | 12.0 |
| 0.37 | | **4** | 1400 | 2.5 | 67 | 0.79 | 1.01 | 4.1 | 1.8 | 1.9 | | | | | 3000 | 4000 | | | | | 4000 | | |
| 0.75 | **BN 80B** | **2** | 2780 | 2.6 | 65 | 0.85 | 1.96 | 3.8 | 1.9 | 1.8 | 20 | 9.9 | **FD 04** | 10 | 1400 | 1600 | 22 | 13.8 | **FA 04** | 10 | 1600 | 22 | 13.7 |
| 0.55 | | **4** | 1400 | 3.8 | 68 | 0.81 | 1.44 | 3.9 | 1.7 | 1.7 | | | | | 2700 | 3600 | | | | | 3600 | | |
| 1.1 | **BN 90S** | **2** | 2790 | 3.8 | 71 | 0.82 | 2.73 | 4.7 | 2.3 | 2.0 | 21 | 12.2 | **FD 14** | 10 | 1500 | 1600 | 23 | 16.4 | **FA 14** | 10 | 1600 | 23 | 16.3 |
| 0.75 | | **4** | 1390 | 5.2 | 66 | 0.79 | 2.08 | 4.6 | 2.4 | 2.2 | | | | | 2300 | 2800 | | | | | 2800 | | |
| 1.5 | **BN 90L** | **2** | 2780 | 5.2 | 70 | 0.85 | 3.64 | 4.5 | 2.4 | 2.1 | 28 | 14.0 | **FD 05** | 26 | 1050 | 1200 | 32 | 20 | **FA 05** | 26 | 1200 | 32 | 21 |
| 1.1 | | **4** | 1390 | 7.6 | 73 | 0.81 | 2.69 | 4.7 | 2.5 | 2.2 | | | | | 1600 | 2000 | | | | | 2000 | | |
| 2.2 | **BN 100LA** | **2** | 2800 | 7.5 | 72 | 0.85 | 5.2 | 4.5 | 2.0 | 1.9 | 40 | 18.3 | **FD 15** | 26 | 600 | 900 | 44 | 25 | **FA 15** | 26 | 900 | 44 | 25 |
| 1.5 | | **4** | 1410 | 10.2 | 73 | 0.79 | 3.8 | 4.7 | 2.0 | 2.0 | | | | | 1300 | 2300 | | | | | 2300 | | |
| 3.5 | **BN 100LB** | **2** | 2850 | 11.7 | 80 | 0.84 | 7.5 | 5.4 | 2.2 | 2.1 | 61 | 25 | **FD 15** | 40 | 500 | 900 | 65 | 31 | **FA 15** | 40 | 900 | 65 | 32 |
| 2.5 | | **4** | 1420 | 16.8 | 82 | 0.80 | 5.5 | 5.2 | 2.2 | 2.2 | | | | | 1000 | 2100 | | | | | 2100 | | |
| 4 | **BN 112M** | **2** | 2880 | 13.3 | 79 | 0.83 | 8.8 | 6.1 | 2.4 | 2.0 | 98 | 30 | **FD 06S** | 60 | — | 700 | 107 | 40 | **FA 06S** | 60 | 700 | 107 | 42 |
| 3.3 | | **4** | 1420 | 22.2 | 80 | 0.80 | 7.4 | 5.1 | 2.1 | 2.0 | | | | | — | 1200 | | | | | 1200 | | |
| 5.5 | **BN 132S** | **2** | 2890 | 18.2 | 80 | 0.87 | 11.4 | 5.9 | 2.4 | 2.0 | 213 | 44 | **FD 56** | 75 | — | 350 | 223 | 57 | **FA 06** | 75 | 350 | 223 | 58 |
| 4.4 | | **4** | 1440 | 29 | 82 | 0.84 | 9.2 | 5.3 | 2.2 | 2.0 | | | | | — | 900 | | | | | 900 | | |
| 7.5 | **BN 132MA** | **2** | 2900 | 25 | 82 | 0.87 | 15.2 | 6.5 | 2.4 | 2.0 | 270 | 53 | **FD 06** | 100 | — | 350 | 280 | 66 | **FA 07** | 100 | 350 | 293 | 71 |
| 6 | | **4** | 1430 | 40 | 84 | 0.85 | 12.1 | 5.8 | 2.3 | 2.1 | | | | | — | 900 | | | | | 900 | | |
| 9.2 | **BN 132MB** | **2** | 2920 | 30 | 83 | 0.86 | 18.6 | 6.0 | 2.6 | 2.2 | 319 | 59 | **FD 07** | 150 | — | 300 | 342 | 75 | **FA 07** | 150 | 300 | 342 | 77 |
| 7.3 | | **4** | 1440 | 48 | 85 | 0.85 | 14.6 | 5.5 | 2.3 | 2.1 | | | | | — | 800 | | | | | 800 | | |

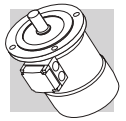


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## 2/6P — 3000/1000 min$^{-1}$ - S3 60/40% — 50 Hz

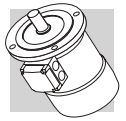
| | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.25 | **BN 71A** | **2** | 2850 | 0.84 | 60 | 0.82 | 0.73 | 4.3 | 1.9 | 1.8 | 6.9 | 5.9 | **FD 03** | 1.75 | 1500 | 1700 | 8.0 | 8.6 | **FA 03** | 2.5 | 1700 | 8.0 | 8.3 |
| 0.08 | | **6** | 910 | 0.84 | 43 | 0.70 | 0.38 | 2.1 | 1.4 | 1.5 | | | | | 10000 | 13000 | | | | | 13000 | | |
| 0.37 | **BN 71B** | **2** | 2880 | 1.23 | 62 | 0.80 | 1.08 | 4.4 | 1.9 | 1.8 | 9.1 | 7.3 | **FD 03** | 3.5 | 1000 | 1300 | 10.2 | 10.0 | **FA 03** | 3.5 | 1300 | 10.2 | 9.7 |
| 0.12 | | **6** | 900 | 1.27 | 44 | 0.73 | 0.54 | 2.4 | 1.4 | 1.5 | | | | | 9000 | 11000 | | | | | 11000 | | |
| 0.55 | **BN 80A** | **2** | 2800 | 1.88 | 63 | 0.86 | 1.47 | 4.5 | 1.9 | 1.7 | 20 | 9.9 | **FD 04** | 5.0 | 1500 | 1800 | 22 | 13.8 | **FA 04** | 5.0 | 1800 | 22 | 13.7 |
| 0.18 | | **6** | 930 | 1.85 | 52 | 0.65 | 0.77 | 3.3 | 2.0 | 1.9 | | | | | 4100 | 6300 | | | | | 6300 | | |
| 0.75 | **BN 80B** | **2** | 2800 | 2.6 | 66 | 0.87 | 1.89 | 4.3 | 1.8 | 1.6 | 25 | 11.3 | **FD 04** | 5.0 | 1700 | 1900 | 27 | 15.2 | **FA 04** | 5.0 | 1900 | 27 | 15.1 |
| 0.25 | | **6** | 930 | 2.6 | 54 | 0.67 | 1.00 | 3.2 | 1.7 | 1.8 | | | | | 3800 | 6000 | | | | | 6000 | | |
| 1.10 | **BN 90L** | **2** | 2860 | 3.7 | 67 | 0.84 | 2.82 | 4.7 | 2.1 | 1.9 | 28 | 14.0 | **FD 05** | 13 | 1400 | 1600 | 32 | 20 | **FA 05** | 13 | 1600 | 32 | 21 |
| 0.37 | | **6** | 920 | 3.8 | 59 | 0.71 | 1.27 | 3.3 | 1.6 | 1.6 | | | | | 3400 | 5200 | | | | | 5200 | | |
| 1.5 | **BN 100LA** | **2** | 2880 | 5 | 73 | 0.84 | 3.53 | 5.1 | 1.9 | 2.0 | 40 | 18.3 | **FD 15** | 13 | 1000 | 1200 | 44 | 24 | **FA 15** | 13 | 1200 | 44 | 25 |
| 0.55 | | **6** | 940 | 5.6 | 64 | 0.67 | 1.85 | 3.5 | 1.7 | 1.8 | | | | | 2900 | 4000 | | | | | 4000 | | |
| 2.2 | **BN 100LB** | **2** | 2900 | 7.2 | 77 | 0.85 | 4.9 | 5.9 | 2.0 | 2.0 | 61 | 25 | **FD 15** | 26 | 700 | 900 | 65 | 31 | **FA 15** | 26 | 900 | 65 | 32 |
| 0.75 | | **6** | 950 | 7.5 | 67 | 0.64 | 2.5 | 3.3 | 1.9 | 1.8 | | | | | 2100 | 3000 | | | | | 3000 | | |
| 3 | **BN 112M** | **2** | 2900 | 9.9 | 78 | 0.87 | 6.4 | 6.3 | 2.0 | 2.1 | 98 | 30 | **FD 06S** | 40 | — | 1000 | 107 | 40 | **FA 06S** | 40 | 1000 | 107 | 32 |
| 1.1 | | **6** | 950 | 11.1 | 72 | 0.64 | 3.4 | 3.9 | 1.8 | 1.8 | | | | | — | 2600 | | | | | 2600 | | |
| 4.5 | **BN 132S** | **2** | 2910 | 14.8 | 78 | 0.84 | 9.9 | 5.8 | 1.9 | 1.8 | 213 | 44 | **FD 56** | 37 | — | 500 | 223 | 57 | **FA 06** | 37 | 500 | 223 | 58 |
| 1.5 | | **6** | 960 | 14.9 | 74 | 0.67 | 4.4 | 4.2 | 1.9 | 2.0 | | | | | — | 2100 | | | | | 2100 | | |
| 5.5 | **BN 132M** | **2** | 2920 | 18.0 | 78 | 0.87 | 11.7 | 6.2 | 2.1 | 1.9 | 270 | 53 | **FD 56** | 50 | — | 400 | 280 | 66 | **FA 06** | 50 | 400 | 280 | 67 |
| 2.2 | | **6** | 960 | 22 | 77 | 0.71 | 5.8 | 4.3 | 2.1 | 2.0 | | | | | — | 1900 | | | | | 1900 | | |





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## 2/8P — 3000/750 min$^{-1}$ - S3 60/40% — 50 Hz



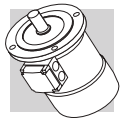
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.25 | **BN 71A** | **2** | 2790 | 0.86 | 61 | 0.87 | 0.68 | 3.9 | 1.8 | 1.9 | 10.9 | 6.7 | **FD 03** | 1.75 | 1300 | 1400 | 12 | 9.4 | **FA 03** | 2.5 | 1400 | 12 | 9.1 |
| 0.06 | | **8** | 680 | 0.84 | 31 | 0.61 | 0.46 | 2.0 | 1.8 | 1.9 | | | | | 10000 | 13000 | | | | | 13000 | | |
| 0.37 | **BN 71B** | **2** | 2800 | 1.26 | 63 | 0.86 | 0.99 | 3.9 | 1.8 | 1.9 | 12.9 | 7.7 | **FD 03** | 3.5 | 1200 | 1300 | 14 | 10.4 | **FA 03** | 3.5 | 1300 | 14 | 10.1 |
| 0.09 | | **8** | 670 | 1.28 | 34 | 0.75 | 0.51 | 1.8 | 1.4 | 1.5 | | | | | 9500 | 13000 | | | | | 13000 | | |
| 0.55 | **BN 80A** | **2** | 2830 | 1.86 | 66 | 0.86 | 1.40 | 4.4 | 2.1 | 2.0 | 20 | 9.9 | **FD 04** | 5.0 | 1500 | 1800 | 22 | 13.8 | **FA 04** | 5.0 | 1800 | 22 | 13.7 |
| 0.13 | | **8** | 690 | 1.80 | 41 | 0.64 | 0.72 | 2.3 | 1.6 | 1.7 | | | | | 5600 | 8000 | | | | | 8000 | | |
| 0.75 | **BN 80B** | **2** | 2800 | 2.6 | 68 | 0.88 | 1.81 | 4.6 | 2.1 | 2.0 | 25 | 11.3 | **FD 04** | 10 | 1700 | 1900 | 27 | 15.2 | **FA 04** | 10 | 1900 | 27 | 15.1 |
| 0.18 | | **8** | 690 | 2.5 | 43 | 0.66 | 0.92 | 2.3 | 1.6 | 1.7 | | | | | 4800 | 7300 | | | | | 7300 | | |
| 1.10 | **BN 90L** | **2** | 2830 | 3.7 | 63 | 0.84 | 3.00 | 4.5 | 2.1 | 1.9 | 28 | 14.0 | **FD 05** | 13 | 1400 | 1600 | 32 | 20 | **FA 05** | 13 | 1600 | 32 | 21 |
| 0.28 | | **8** | 690 | 3.9 | 48 | 0.63 | 1.34 | 2.4 | 1.8 | 1.9 | | | | | 3400 | 5100 | | | | | 5100 | | |
| 1.5 | **BN 100LA** | **2** | 2880 | 5.0 | 69 | 0.85 | 3.69 | 4.7 | 1.9 | 1.8 | 40 | 18.3 | **FD 15** | 13 | 1000 | 1200 | 44 | 25 | **FA 15** | 13 | 1200 | 44 | 25 |
| 0.37 | | **8** | 690 | 5.1 | 46 | 0.63 | 1.84 | 2.1 | 1.6 | 1.6 | | | | | 3300 | 5000 | | | | | 5000 | | |
| 2.4 | **BN 100LB** | **2** | 2900 | 7.9 | 75 | 0.82 | 5.6 | 5.4 | 2.1 | 2.0 | 61 | 25 | **FD 15** | 26 | 550 | 700 | 65 | 31 | **FA 15** | 26 | 700 | 65 | 32 |
| 0.55 | | **8** | 700 | 7.5 | 54 | 0.58 | 2.5 | 2.6 | 1.8 | 1.8 | | | | | 2000 | 3500 | | | | | 3500 | | |
| 3 | **BN 112M** | **2** | 2900 | 9.9 | 76 | 0.87 | 6.5 | 6.3 | 2.1 | 1.9 | 98 | 30 | **FD 06S** | 40 | — | 900 | 107 | 40 | **FA 06S** | 40 | 900 | 107 | 42 |
| 0.75 | | **8** | 690 | 10.4 | 60 | 0.65 | 2.8 | 2.5 | 1.6 | 1.6 | | | | | — | 2900 | | | | | 2900 | | |
| 4 | **BN 132S** | **2** | 2870 | 13.3 | 73 | 0.84 | 9.4 | 5.6 | 2.3 | 2.4 | 213 | 44 | **FD 56** | 37 | — | 500 | 223 | 57 | **FA 06** | 37 | 500 | 223 | 58 |
| 1 | | **8** | 690 | 13.8 | 66 | 0.62 | 3.5 | 2.9 | 1.9 | 1.8 | | | | | — | 3500 | | | | | 3500 | | |
| 5.5 | **BN 132M** | **2** | 2870 | 18.3 | 75 | 0.84 | 12.6 | 6.1 | 2.4 | 2.5 | 270 | 53 | **FD 06** | 50 | — | 400 | 280 | 66 | **FA 06** | 50 | 400 | 280 | 67 |
| 1.5 | | **8** | 690 | 21 | 68 | 0.63 | 5.1 | 2.9 | 1.9 | 1.9 | | | | | — | 2400 | | | | | 2400 | | |



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## 2/12P — 3000/500 min$^{-1}$ - S3 60/40% — 50 Hz

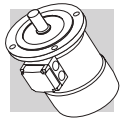
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.55 | **BN 80B** | **2** | 2820 | 1.86 | 64 | 0.89 | 1.39 | 4.2 | 1.6 | 1.7 | 25 | 11.3 | **FD 04** | 5.0 | 1000 | 1300 | 27 | 15.2 | **FA 04** | 5.0 | 1300 | 27 | 15.1 |
| 0.09 | | **12** | 430 | 2.0 | 30 | 0.63 | 0.69 | 1.8 | 1.9 | 1.8 | | | | | 8000 | 12000 | | | | | 12000 | | |
| 0.75 | **BN 90L** | **2** | 2790 | 2.6 | 56 | 0.89 | 2.17 | 4.2 | 1.8 | 1.7 | 26 | 12.6 | **FD 05** | 13 | 1000 | 1150 | 30 | 18.6 | **FA 05** | 13 | 1150 | 30 | 19.3 |
| 0.12 | | **12** | 430 | 2.7 | 26 | 0.63 | 1.06 | 1.7 | 1.4 | 1.6 | | | | | 4600 | 6300 | | | | | 6300 | | |
| 1.10 | **BN 100LA** | **2** | 2850 | 3.7 | 65 | 0.85 | 2.87 | 4.5 | 1.6 | 1.8 | 40 | 18.3 | **FD 15** | 13 | 700 | 900 | 44 | 25 | **FA 15** | 13 | 900 | 44 | 25 |
| 0.18 | | **12** | 430 | 4.0 | 26 | 0.54 | 1.85 | 1.5 | 1.3 | 1.5 | | | | | 4000 | 6000 | | | | | 6000 | | |
| 1.5 | **BN 100LB** | **2** | 2900 | 4.9 | 67 | 0.86 | 3.76 | 5.6 | 1.9 | 1.9 | 54 | 22 | **FD 15** | 13 | 700 | 900 | 58 | 28 | **FA 15** | 13 | 900 | 58 | 29 |
| 0.25 | | **12** | 440 | 5.4 | 36 | 0.46 | 2.18 | 1.8 | 1.7 | 1.8 | | | | | 3800 | 5000 | | | | | 5000 | | |
| 2 | **BN 112M** | **2** | 2900 | 6.6 | 74 | 0.88 | 4.43 | 6.5 | 2.1 | 2.0 | 98 | 30 | **FD 06S** | 20 | — | 800 | 107 | 40 | **FA 06S** | 20 | 800 | 107 | 42 |
| 0.3 | | **12** | 460 | 6.2 | 46 | 0.43 | 2.19 | 2.0 | 2.1 | 2.0 | | | | | — | 3400 | | | | | 3400 | | |
| 3 | **BN 132S** | **2** | 2920 | 9.8 | 74 | 0.87 | 6.7 | 6.8 | 2.3 | 1.9 | 213 | 44 | **FD 56** | 37 | — | 450 | 223 | 57 | **FA 06** | 37 | 450 | 223 | 58 |
| 0.5 | | **12** | 470 | 10.2 | 51 | 0.43 | 3.3 | 2.0 | 1.7 | 1.6 | | | | | — | 3000 | | | | | 3000 | | |
| 4 | **BN 132M** | **2** | 2920 | 13.1 | 75 | 0.89 | 8.6 | 5.9 | 2.4 | 2.3 | 270 | 53 | **FD 56** | 37 | — | 400 | 280 | 66 | **FA 06** | 37 | 400 | 280 | 67 |
| 0.7 | | **12** | 460 | 14.5 | 53 | 0.44 | 4.3 | 1.9 | 1.7 | 1.6 | | | | | — | 2800 | | | | | 2800 | | |





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## 4/6P — 1500/1000 min$^{-1}$ - S1 — 50 Hz



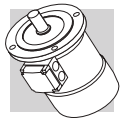
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.22 | **BN 71B** | **4** | 1410 | 1.5 | 64 | 0.74 | 0.67 | 3.9 | 1.8 | 1.9 | 9.1 | 7.3 | **FD 03** | 3.5 | 2500 | 3500 | 10.2 | 10.0 | **FA 03** | 3.5 | 3500 | 10.2 | 9.7 |
| 0.13 | | **6** | 920 | 1.4 | 43 | 0.67 | 0.65 | 2.3 | 1.6 | 1.7 | | | | | 5000 | 9000 | | | | | 9000 | | |
| 0.30 | **BN 80A** | **4** | 1410 | 2.0 | 61 | 0.82 | 0.87 | 3.5 | 1.3 | 1.5 | 15 | 8.2 | **FD 04** | 5.0 | 2500 | 3100 | 16.6 | 12.1 | **FA 04** | 5.0 | 3100 | 16.6 | 12.0 |
| 0.20 | | **6** | 930 | 2.1 | 54 | 0.66 | 0.81 | 3.2 | 1.9 | 2.0 | | | | | 4000 | 6000 | | | | | 6000 | | |
| 0.40 | **BN 80B** | **4** | 1430 | 2.7 | 63 | 0.75 | 1.22 | 3.9 | 1.8 | 1.8 | 20 | 9.9 | **FD 04** | 10 | 1800 | 2300 | 22 | 13.8 | **FA 04** | 10 | 2300 | 22 | 13.7 |
| 0.26 | | **6** | 930 | 2.7 | 55 | 0.70 | 0.97 | 2.7 | 1.5 | 1.6 | | | | | 3600 | 5500 | | | | | 5500 | | |
| 0.55 | **BN 90S** | **4** | 1420 | 3.7 | 70 | 0.78 | 1.45 | 4.5 | 2.0 | 1.9 | 21 | 12.2 | **FD 14** | 10 | 1500 | 2100 | 23 | 16.1 | **FA 14** | 10 | 2100 | 23 | 16.3 |
| 0.33 | | **6** | 930 | 3.4 | 62 | 0.70 | 1.10 | 3.7 | 2.3 | 2.0 | | | | | 2500 | 4100 | | | | | 4100 | | |
| 0.75 | **BN 90L** | **4** | 1420 | 5.0 | 74 | 0.78 | 1.88 | 4.3 | 1.9 | 1.8 | 28 | 14 | **FD 05** | 13 | 1400 | 2000 | 32 | 20 | **FA 05** | 13 | 2000 | 32 | 21 |
| 0.45 | | **6** | 920 | 4.7 | 66 | 0.71 | 1.39 | 3.3 | 2.0 | 1.9 | | | | | 2300 | 3600 | | | | | 3600 | | |
| 1.1 | **BN 100LA** | **4** | 1450 | 7.2 | 74 | 0.79 | 2.72 | 5.0 | 1.7 | 1.9 | 82 | 22 | **FD 15** | 26 | 1400 | 2000 | 86 | 28 | **FA 15** | 26 | 2000 | 86 | 29 |
| 0.8 | | **6** | 950 | 8.0 | 65 | 0.69 | 2.57 | 4.1 | 1.9 | 2.1 | | | | | 2100 | 3300 | | | | | 3300 | | |
| 1.5 | **BN 100LB** | **4** | 1450 | 9.9 | 75 | 0.79 | 3.65 | 5.1 | 1.7 | 1.9 | 95 | 25 | **FD 15** | 26 | 1300 | 1800 | 99 | 31 | **FA 15** | 26 | 1800 | 99 | 32 |
| 1.1 | | **6** | 950 | 11.1 | 72 | 0.68 | 3.24 | 4.3 | 2.0 | 2.1 | | | | | 2000 | 3000 | | | | | 3000 | | |
| 2.3 | **BN 112M** | **4** | 1450 | 15.2 | 75 | 0.78 | 5.7 | 5.2 | 1.8 | 1.9 | 168 | 32 | **FD 06S** | 40 | — | 1600 | 177 | 42 | **FA 06S** | 40 | 1600 | 177 | 44 |
| 1.5 | | **6** | 960 | 14.9 | 73 | 0.72 | 4.1 | 4.9 | 2.0 | 2.0 | | | | | — | 2400 | | | | | 2400 | | |
| 3.1 | **BN 132S** | **4** | 1460 | 20 | 83 | 0.83 | 6.5 | 5.9 | 2.1 | 2.0 | 213 | 44 | **FD 56** | 37 | — | 1200 | 223 | 57 | **FA 06** | 37 | 1200 | 223 | 58 |
| 2 | | **6** | 960 | 20 | 77 | 0.75 | 4.9 | 4.5 | 2.1 | 2.1 | | | | | — | 1900 | | | | | 1900 | | |
| 4.2 | **BN 132MA** | **4** | 1460 | 27 | 84 | 0.82 | 8.8 | 5.9 | 2.1 | 2.2 | 270 | 53 | **FD 06** | 50 | — | 900 | 280 | 66 | **FA 06** | 50 | 900 | 280 | 67 |
| 2.6 | | **6** | 960 | 26 | 79 | 0.72 | 6.6 | 4.3 | 2.0 | 2.0 | | | | | — | 1500 | | | | | 1500 | | |



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## 4/8P — 1500/750 min$^{-1}$ - S1 — 50 Hz

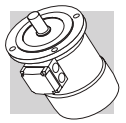
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.37 | **BN 80A** | **4** | 1400 | 2.5 | 63 | 0.82 | 1.03 | 3.3 | 1.4 | 1.4 | 15 | 8.2 | **FD 04** | 10 | 2300 | 3500 | 16.6 | 12.1 | **FA 04** | 10 | 3500 | 16.6 | 12.0 |
| 0.18 | | **8** | 690 | 2.5 | 44 | 0.60 | 0.98 | 2.2 | 1.5 | 1.6 | | | | | 4500 | 7000 | | | | | 7000 | | |
| 0.55 | **BN 80B** | **4** | 1390 | 3.8 | 65 | 0.86 | 1.42 | 3.8 | 1.7 | 1.6 | 20 | 9.9 | **FD 04** | 10 | 2200 | 2900 | 22 | 13.8 | **FA 04** | 10 | 2900 | 22 | 13.7 |
| 0.30 | | **8** | 670 | 4.3 | 49 | 0.65 | 1.36 | 2.3 | 1.7 | 1.8 | | | | | 4200 | 6500 | | | | | 6500 | | |
| 0.65 | **BN 90S** | **4** | 1390 | 4.5 | 73 | 0.85 | 1.51 | 4.0 | 1.9 | 1.9 | 28 | 13.6 | **FD 14** | 15 | 2300 | 2800 | 30 | 17.8 | **FA 14** | 15 | 2800 | 30 | 17.7 |
| 0.35 | | **8** | 690 | 4.8 | 49 | 0.57 | 1.81 | 2.5 | 2.1 | 2.2 | | | | | 3500 | 6000 | | | | | 6000 | | |
| 0.9 | **BN 90L** | **4** | 1370 | 6.3 | 73 | 0.87 | 2.05 | 3.8 | 1.8 | 1.8 | 30 | 15.1 | **FD 05** | 26 | 1700 | 2100 | 34 | 21 | **FA 05** | 26 | 2100 | 34 | 22 |
| 0.5 | | **8** | 670 | 7.1 | 57 | 0.62 | 2.04 | 2.4 | 2.1 | 2.0 | | | | | 2500 | 4200 | | | | | 4200 | | |
| 1.30 | **BN 100LA** | **4** | 1420 | 8.7 | 72 | 0.83 | 3.14 | 4.3 | 1.7 | 1.8 | 82 | 22 | **FD 15** | 40 | 1300 | 1700 | 86 | 28 | **FA 15** | 40 | 1700 | 86 | 29 |
| 0.70 | | **8** | 700 | 9.6 | 58 | 0.64 | 2.72 | 2.8 | 1.8 | 1.8 | | | | | 2000 | 3400 | | | | | 3400 | | |
| 1.8 | **BN 100LB** | **4** | 1420 | 12.1 | 69 | 0.87 | 4.3 | 4.2 | 1.6 | 1.7 | 95 | 25 | **FD 15** | 40 | 1200 | 1700 | 99 | 31 | **FA 15** | 40 | 1700 | 99 | 32 |
| 0.9 | | **8** | 700 | 12.3 | 62 | 0.63 | 3.3 | 3.2 | 1.7 | 1.8 | | | | | 1600 | 2600 | | | | | 2600 | | |
| 2.2 | **BN 112M** | **4** | 1440 | 14.6 | 77 | 0.85 | 4.9 | 5.3 | 1.8 | 1.8 | 168 | 32 | **FD 06S** | 60 | — | 1200 | 177 | 42 | **FA 06S** | 60 | 1200 | 177 | 43 |
| 1.2 | | **8** | 710 | 16.1 | 70 | 0.63 | 3.9 | 3.3 | 1.9 | 1.8 | | | | | — | 2000 | | | | | 2000 | | |
| 3.6 | **BN 132S** | **4** | 1440 | 24 | 80 | 0.82 | 7.9 | 6.5 | 2.1 | 1.9 | 295 | 45 | **FD 56** | 75 | — | 1000 | 305 | 58 | **FA 06** | 75 | 1000 | 305 | 59 |
| 1.8 | | **8** | 720 | 24 | 72 | 0.55 | 6.6 | 4.6 | 1.9 | 2.0 | | | | | — | 1400 | | | | | 1400 | | |
| 4.6 | **BN 132M** | **4** | 1450 | 30 | 81 | 0.83 | 9.9 | 6.5 | 2.2 | 1.9 | 383 | 56 | **FD 06** | 100 | — | 1000 | 393 | 69 | **FA 07** | 100 | 1000 | 406 | 74 |
| 2.3 | | **8** | 720 | 31 | 73 | 0.54 | 8.4 | 4.4 | 2.3 | 2.0 | | | | | — | 1300 | | | | | 1300 | | |





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## 2P — 3000 min$^{-1}$ - S1 — 50 Hz



| | | | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | n min$^{-1}$ | $M_n$ Nm | IE1 | η (100%) % | η (75%) % | η (50%) % | cosφ | In 400V A | Is / In | Ms / Mn | Ma / Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.18 | **M 05A** | **2** | 2730 | 0.63 | ○ | 59.9 | 56.9 | 51.9 | 0.77 | 0.56 | 3.0 | 2.1 | 2.0 | 2.0 | 3.2 | **FD 02** | 1.75 | 3900 | 4800 | 2.6 | 4.9 | **FA 02** | 1.75 | 4800 | 2.6 | 4.7 |
| 0.25 | **M 05B** | **2** | 2740 | 0.87 | ○ | 66.0 | 64.8 | 64.8 | 0.76 | 0.72 | 3.3 | 2.3 | 2.3 | 2.3 | 3.6 | **FD 02** | 1.75 | 3900 | 4800 | 3.0 | 5.3 | **FA 02** | 1.75 | 4800 | 3.0 | 5.1 |
| 0.37 | **M 05C** | **2** | 2800 | 1.26 | ○ | 69.1 | 66.8 | 66.8 | 0.78 | 0.99 | 3.9 | 2.6 | 2.6 | 3.3 | 4.8 | **FD 02** | 3.5 | 3600 | 4500 | 3.9 | 6.5 | **FA 02** | 3.5 | 4500 | 3.9 | 6.3 |
| 0.55 | **M 1SD** | **2** | 2820 | 1.86 | ○ | 76.0 | 75.8 | 74.8 | 0.76 | 1.37 | 5.0 | 2.9 | 2.8 | 4.1 | 5.8 | **FD 03** | 5 | 2900 | 4200 | 5.3 | 8.5 | **FA 03** | 5 | 4200 | 5.3 | 8.2 |
| 0.75 | **M 1LA** | **2** | 2810 | 2.6 | ○ | 76.6 | 76.2 | 76.2 | 0.76 | 1.86 | 5.1 | 3.1 | 2.8 | 5.0 | 6.9 | **FD 03** | 5 | 1900 | 3300 | 6.1 | 9.6 | **FA 03** | 5 | 3300 | 6.1 | 9.3 |
| 1.1 | **M 2SA** | **2** | 2800 | 3.8 | • | 76.4 | 76.2 | 75.0 | 0.81 | 2.57 | 4.8 | 2.8 | 2.4 | 9.0 | 8.8 | **FD 04** | 10 | 1500 | 3000 | 10.6 | 11.9 | **FA 04** | 10 | 3000 | 10.6 | 12.6 |
| 1.5 | **M 2SB** | **2** | 2800 | 5.1 | • | 79.1 | 79.5 | 77.2 | 0.81 | 3.4 | 4.9 | 2.7 | 2.4 | 11.4 | 10.6 | **FD 04** | 15 | 1300 | 2600 | 13.0 | 9.9 | **FA 04** | 15 | 2600 | 13.0 | 14.4 |
| 2.2 | **M 3SA** | **2** | 2880 | 7.3 | • | 82.7 | 82.1 | 81.0 | 0.80 | 4.8 | 6.3 | 2.9 | 2.7 | 24 | 15.5 | **FD 15** | 26 | 1100 | 2400 | 28 | 22 | **FA 15** | 26 | 2400 | 28 | 23 |
| 3 | **M 3LA** | **2** | 2860 | 10.0 | • | 81.5 | 81.3 | 77.4 | 0.79 | 6.7 | 5.6 | 2.6 | 2.2 | 31 | 18.7 | **FD 15** | 26 | 700 | 1600 | 35 | 25 | **FA 15** | 26 | 1600 | 35 | 26 |
| 4 | **M 3LB** | **2** | 2870 | 13.3 | • | 83.1 | 83.0 | 77.8 | 0.80 | 8.7 | 5.8 | 2.7 | 2.5 | 39 | 22 | **FD 15** | 40 | 450 | 900 | 43 | 28 | **FA 15** | 40 | 900 | 43 | 29 |
| 5.5 | **M 4SA** | **2** | 2890 | 18.2 | • | 84.7 | 84.5 | 81.2 | 0.84 | 11.2 | 5.9 | 2.6 | 2.2 | 101 | 33 | **FD 06** | 50 | — | 600 | 112 | 46 | **FA 06** | 50 | 600 | 112 | 47 |
| 7.5 | **M 4SB** | **2** | 2900 | 25 | • | 86.5 | 86.3 | 84.4 | 0.85 | 14.7 | 6.4 | 2.6 | 2.2 | 145 | 40 | **FD 06** | 50 | — | 550 | 154 | 53 | **FA 06** | 50 | 550 | 154 | 54 |
| 9.2 | **M 4LA** | **2** | 2930 | 30 | • | 87.0 | 86.5 | 83.6 | 0.86 | 17.7 | 6.7 | 2.8 | 2.3 | 178 | 51 | **FD 56** | 75 | — | 430 | 189 | 64 | **FA 06** | 75 | 430 | 189 | 65 |
| 11 | **M 4LC** | **2** | 2920 | 36 | • | 87.6 | 87.0 | 86.0 | 0.88 | 20.6 | 6.9 | 2.9 | 2.5 | 210 | 60 | | | | | | | | | | | |
| 15 | **M 5SB** | **2** | 2930 | 49 | • | 89.6 | 89.4 | 88.0 | 0.86 | 28.1 | 7.1 | 2.6 | 2.3 | 340 | 70 | | | | | | | | | | | |
| 18.5 | **M 5SC** | **2** | 2930 | 60 | • | 90.4 | 90.1 | 89.0 | 0.86 | 34 | 7.6 | 2.7 | 2.3 | 420 | 83 | | | | | | | | | | | |
| 22 | **M 5LA** | **2** | 2930 | 72 | • | 89.9 | 89.7 | 89.5 | 0.88 | 40 | 7.8 | 2.6 | 2.4 | 490 | 95 | | | | | | | | | | | |

○ = n.a. • = IE1

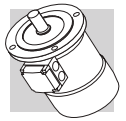


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## 4P — 1500 min$^{-1}$ - S1 — 50 Hz

| | | | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | n min$^{-1}$ | $M_n$ Nm | IE1 | η (100%) % | η (75%) % | η (50%) % | cosφ | In 400V A | Is / In | Ms / Mn | Ma / Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.09 | M 0B 4 | 1350 | 0.64 | ○ | 51.7 | 47.6 | 42.9 | 0.60 | 0.42 | 2.6 | 2.5 | 2.4 | 1.5 | 2.9 | | | | | | | | | | | |
| 0.12 | M 05A 4 | 1350 | 0.85 | ○ | 59.8 | 56.2 | 47.0 | 0.62 | 0.47 | 2.6 | 1.9 | 1.8 | 2.0 | 3.2 | FD 02 | 1.75 | 10000 | 13000 | 2.6 | 4.9 | FA 02 | 1.75 | 13000 | 2.6 | 4.7 |
| 0.18 | M 05B 4 | 1320 | 1.30 | ○ | 54.8 | 52.9 | 52.5 | 0.67 | 0.71 | 2.6 | 2.2 | 2.0 | 2.3 | 3.6 | FD 02 | 3.5 | 10000 | 13000 | 3.0 | 5.3 | FA 02 | 3.5 | 13000 | 3.0 | 5.1 |
| 0.25 | M 05C 4 | 1340 | 1.78 | ○ | 65.3 | 65.0 | 57.9 | 0.69 | 0.80 | 2.7 | 2.1 | 1.9 | 3.3 | 4.8 | FD 02 | 3.5 | 7800 | 10000 | 3.9 | 6.5 | FA 02 | 3.5 | 10000 | 3.9 | 6.3 |
| 0.37 | M 1SD 4 | 1370 | 2.6 | ○ | 66.8 | 66.7 | 63.0 | 0.76 | 1.05 | 3.7 | 2.0 | 1.9 | 6.9 | 5.5 | FD 03 | 5 | 6000 | 9400 | 8.0 | 8.2 | FA 03 | 5 | 9400 | 8.0 | 7.9 |
| 0.55 | M 1LA 4 | 1380 | 3.8 | ○ | 69.0 | 68.9 | 68.8 | 0.74 | 1.55 | 4.1 | 2.3 | 2.3 | 9.1 | 6.9 | FD 53 | 7.5 | 4300 | 8700 | 10.2 | 9.6 | FA 03 | 7.5 | 8700 | 10.2 | 9.3 |
| 0.75 | M 2SA 4 | 1400 | 5.1 | • | 75.0 | 74.5 | 69.3 | 0.78 | 1.85 | 4.9 | 2.7 | 2.5 | 20 | 9.2 | FD 04 | 15 | 4100 | 7800 | 22 | 13.1 | FA 04 | 15 | 7800 | 22 | 13.0 |
| 1.1 | M 2SB 4 | 1400 | 7.5 | • | 76.4 | 76.2 | 70.4 | 0.78 | 2.66 | 5.1 | 2.8 | 2.5 | 25 | 10.6 | FD 04 | 15 | 2600 | 5300 | 27 | 14.5 | FA 04 | 15 | 5300 | 27 | 14.4 |
| 1.5 | M 3SA 4 | 1410 | 10.2 | • | 79.6 | 80.5 | 79.3 | 0.77 | 3.5 | 4.6 | 2.1 | 2.1 | 34 | 15.5 | FD 15 | 26 | 2800 | 4900 | 38 | 22 | FA 15 | 26 | 4900 | 38 | 23 |
| 2.2 | M 3LA 4 | 1410 | 14.9 | • | 81.1 | 81.4 | 79.9 | 0.75 | 5.2 | 4.5 | 2.2 | 2.0 | 40 | 17 | FD 15 | 40 | 2600 | 4700 | 44 | 24 | FA 15 | 40 | 4700 | 44 | 24 |
| 3 | M 3LB 4 | 1410 | 20 | • | 82.6 | 83.8 | 83.7 | 0.77 | 6.8 | 5.0 | 2.3 | 2.2 | 54 | 21 | FD 15 | 40 | 2400 | 4400 | 58 | 27 | FA 15 | 40 | 4400 | 58 | 28 |
| 4 | M 3LC 4 | 1400 | 27 | ○ | 82.7 | 83.1 | 80.5 | 0.78 | 9.0 | 4.7 | 2.3 | 2.2 | 61 | 23 | FD 55 | 55 | — | 1300 | 65 | 29 | FA 15 | 40 | 1300 | 65 | 30 |
| 5.5 | M 4SA 4 | 1440 | 36 | • | 84.7 | 84.8 | 82.5 | 0.81 | 11.6 | 5.5 | 2.3 | 2.2 | 213 | 42 | FD 56 | 75 | — | 1050 | 223 | 55 | FA 06 | 75 | 1050 | 223 | 56 |
| 7.5 | M 4LA 4 | 1440 | 50 | • | 86.0 | 86.3 | 85.3 | 0.81 | 15.5 | 5.7 | 2.5 | 2.4 | 270 | 51 | FD 06 | 100 | — | 950 | 280 | 64 | FA 07 | 100 | 950 | 280 | 65 |
| 9.2 | M 4LB 4 | 1440 | 61 | • | 88.4 | 88.6 | 87.5 | 0.81 | 18.8 | 5.9 | 2.7 | 2.5 | 319 | 57 | FD 07 | 150 | — | 900 | 342 | 73 | FA 07 | 150 | 900 | 342 | 75 |
| 11 | M 4LC 4 | 1440 | 73 | • | 87.6 | 87.8 | 86.0 | 0.81 | 22.4 | 6.0 | 2.7 | 2.5 | 360 | 65 | FD 07 | 150 | — | 850 | 382 | 81 | FA 07 | 150 | 850 | 382 | 83 |
| 15 | M 5SB 4 | 1460 | 98 | • | 88.7 | 88.5 | 88.4 | 0.81 | 30.1 | 6.0 | 2.3 | 2.1 | 650 | 85 | FD 08 | 200 | — | 750 | 725 | 115 | FA 08 | 200 | 750 | 710 | 114 |
| 18.5 | M 5LA 4 | 1460 | 121 | • | 89.3 | 89.5 | 89.2 | 0.81 | 37 | 6.2 | 2.6 | 2.5 | 790 | 101 | FD 08 | 250 | — | 700 | 865 | 131 | FA 08 | 250 | 700 | 850 | 130 |

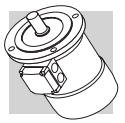
○ = n.a. • = IE1





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## 6P — 1000 min$^{-1}$ - S1 — 50 Hz



| | | | | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | IE1 | η (100%) % | η (75%) % | η (50%) % | cosφ | In 400V A | Is / In | Ms / Mn | Ma / Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.09 | M 05A | 6 | 880 | 0.98 | ○ | 41.0 | 41.0 | 32.9 | 0.53 | 0.60 | 2.1 | 2.1 | 1.8 | 3.4 | 4.3 | FD 02 | 3.5 | 9000 | 14000 | 4.0 | 6.0 | FA 02 | 3.5 | 14000 | 4.0 | 5.8 |
| 0.12 | M 05B | 6 | 870 | 1.32 | ○ | 45.0 | 44.0 | 41.8 | 0.60 | 0.64 | 2.1 | 1.9 | 1.7 | 3.7 | 4.6 | FD 02 | 3.5 | 9000 | 14000 | 4.3 | 6.3 | FA 02 | 3.5 | 14000 | 4.3 | 6.1 |
| 0.18 | M 1SC | 6 | 900 | 1.91 | ○ | 55.0 | 55.5 | 51.0 | 0.69 | 0.68 | 2.6 | 1.9 | 1.7 | 8.4 | 5.1 | FD 03 | 5 | 8100 | 13500 | 9.5 | 7.8 | FA 03 | 5 | 13500 | 9.5 | 7.5 |
| 0.25 | M 1SD | 6 | 900 | 2.7 | ○ | 62.0 | 58.5 | 51.4 | 0.71 | 0.82 | 2.6 | 1.9 | 1.7 | 10.9 | 6.3 | FD 03 | 5 | 7800 | 13000 | 12 | 9.0 | FA 03 | 5 | 13000 | 12 | 8.7 |
| 0.37 | M 1LA | 6 | 910 | 3.9 | ○ | 66.0 | 60.0 | 53.3 | 0.69 | 1.17 | 3.0 | 2.4 | 2.0 | 12.9 | 7.3 | FD 53 | 7.5 | 5100 | 9500 | 14 | 10.0 | FA 03 | 7.5 | 9500 | 14 | 9.7 |
| 0.55 | M 2SA | 6 | 920 | 5.7 | ○ | 70.0 | 69.8 | 64.3 | 0.68 | 1.67 | 3.9 | 2.6 | 2.2 | 25 | 10.6 | FD 04 | 15 | 4800 | 7200 | 27 | 14.5 | FA 04 | 15 | 7200 | 27 | 14.4 |
| 0.75 | M 2SB | 6 | 920 | 7.8 | • | 70.0 | 70.0 | 64.4 | 0.65 | 2.38 | 3.8 | 2.5 | 2.2 | 28 | 11.5 | FD 04 | 15 | 3400 | 6400 | 30 | 15.4 | FA 04 | 15 | 6400 | 30 | 15.3 |
| 1.1 | M 3SA | 6 | 920 | 11.4 | • | 75.0 | 74.0 | 72.0 | 0.72 | 2.9 | 4.3 | 2.0 | 1.8 | 33 | 17 | FD 15 | 26 | 2700 | 5000 | 37 | 23 | FA 15 | 26 | 5000 | 37 | 24 |
| 1.5 | M 3LA | 6 | 940 | 15.2 | • | 75.2 | 74.2 | 70.3 | 0.72 | 4.0 | 4.1 | 2.1 | 2.0 | 82 | 21 | FD 15 | 40 | 1900 | 4100 | 86 | 27 | FA 15 | 40 | 4100 | 86 | 28 |
| 1.85 | M 3LB | 6 | 930 | 19.0 | • | 76.6 | 72.8 | 62.6 | 0.73 | 4.8 | 4.6 | 2.1 | 2.0 | 95 | 23 | FD 15 | 40 | 1700 | 3600 | 99 | 29 | FA 15 | 40 | 3600 | 99 | 30 |
| 2.2 | M 3LC | 6 | 930 | 23 | • | 77.7 | 76.8 | 72.4 | 0.71 | 5.8 | 4.7 | 2.3 | 2.1 | 95 | 23 | FD 55 | 55 | — | 1900 | 99 | 29 | FA 15 | 55 | 1900 | 99 | 30 |
| 3 | M 4SA | 6 | 940 | 30 | • | 79.7 | 77.0 | 75.1 | 0.76 | 7.1 | 5.1 | 1.9 | 1.8 | 216 | 34 | FD 56 | 75 | — | 1400 | 226 | 47 | FA 06 | 75 | 1400 | 226 | 48 |
| 4 | M 4LA | 6 | 950 | 40 | • | 81.4 | 81.5 | 79.5 | 0.77 | 9.2 | 5.5 | 2.0 | 1.8 | 295 | 43 | FD 06 | 100 | — | 1200 | 305 | 56 | FA 07 | 100 | 1200 | 305 | 57 |
| 5.5 | M 4LB | 6 | 945 | 56 | • | 83.1 | 80.9 | 79.1 | 0.78 | 12.2 | 6.1 | 2.1 | 1.9 | 383 | 54 | FD 07 | 150 | — | 1050 | 406 | 70 | FA 07 | 150 | 1050 | 406 | 72 |
| 7.5 | M 5SA | 6 | 955 | 75 | • | 85.0 | 85.0 | 84.8 | 0.81 | 15.7 | 5.9 | 2.2 | 2.0 | 740 | 69 | FD 08 | 170 | — | 900 | 815 | 98 | FA 08 | 170 | 900 | 800 | 98 |
| 11 | M 5SB | 6 | 960 | 109 | • | 86.4 | 86.5 | 85.9 | 0.81 | 22.7 | 6.6 | 2.5 | 2.3 | 970 | 89 | FD 08 | 200 | — | 800 | 1045 | 119 | FA 08 | 200 | 800 | 1030 | 118 |

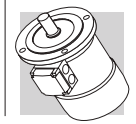
○ = n.a. • = IE1



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## 2/4P — 3000/1500 min$^{-1}$ - S1 — 50 Hz

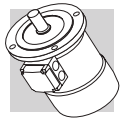
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.20 | M 05A | 2 | 2700 | 0.71 | 55 | 0.82 | 0.64 | 3.5 | 2.1 | 1.9 | 2.9 | 4.1 | FD 02 | 3.5 | 2200 | 2600 | 3.5 | 5.8 | FA 02 | 3.5 | 2600 | 3.5 | 5.6 |
| 0.15 | | 4 | 1350 | 1.06 | 49 | 0.67 | 0.66 | 2.6 | 1.8 | 1.7 | | | | | 4000 | 5100 | | | | | 5100 | | |
| 0.28 | M 1SB | 2 | 2700 | 0.99 | 56 | 0.82 | 0.88 | 2.9 | 1.9 | 1.7 | 4.7 | 4.0 | FD 03 | 3.5 | 2100 | 2400 | 5.8 | 6.7 | FA 03 | 3.5 | 2400 | 5.8 | 6.4 |
| 0.20 | | 4 | 1370 | 1.39 | 59 | 0.68 | 1.02 | 3.1 | 1.8 | 1.7 | | | | | 3800 | 4800 | | | | | 4800 | | |
| 0.37 | M 1SC | 2 | 2740 | 1.29 | 56 | 0.82 | 1.16 | 3.5 | 1.8 | 1.8 | 5.8 | 4.7 | FD 03 | 5 | 1400 | 2100 | 6.9 | 7.4 | FA 03 | 5 | 2100 | 6.9 | 7.1 |
| 0.25 | | 4 | 1390 | 1.72 | 60 | 0.73 | 0.82 | 3.3 | 2.0 | 1.9 | | | | | 2900 | 4200 | | | | | 4200 | | |
| 0.45 | M 1SD | 2 | 2780 | 1.55 | 63 | 0.85 | 1.21 | 3.8 | 1.8 | 1.8 | 6.9 | 5.5 | FD 03 | 5 | 1400 | 2100 | 8.0 | 8.2 | FA 03 | 5 | 2100 | 8.0 | 7.9 |
| 0.30 | | 4 | 1400 | 2.0 | 63 | 0.74 | 0.93 | 3.8 | 2.1 | 1.9 | | | | | 2900 | 4200 | | | | | 4200 | | |
| 0.55 | M 1LA | 2 | 2800 | 1.9 | 73 | 0.79 | 1.38 | 4.2 | 2.0 | 1.8 | 9.1 | 6.9 | FD 03 | 5 | 1600 | 2200 | 10.2 | 9.6 | FA 03 | 5 | 2200 | 10.2 | 9.3 |
| 0.37 | | 4 | 1400 | 2.5 | 68 | 0.72 | 1.09 | 3.9 | 2.2 | 2.0 | | | | | 3300 | 4600 | | | | | 4600 | | |
| 0.75 | M 2SA | 2 | 2780 | 2.6 | 65 | 0.85 | 1.96 | 3.8 | 1.9 | 1.8 | 20 | 9.2 | FD 04 | 10 | 1400 | 1600 | 22 | 13.1 | FA 04 | 10 | 1600 | 22 | 13.0 |
| 0.55 | | 4 | 1400 | 3.8 | 68 | 0.81 | 1.44 | 3.9 | 1.7 | 1.7 | | | | | 2700 | 3600 | | | | | 3600 | | |
| 1.1 | M 2SB | 2 | 2730 | 3.9 | 65 | 0.86 | 2.84 | 3.9 | 2.0 | 1.9 | 25 | 10.7 | FD 04 | 10 | 1200 | 1500 | 27 | 14.5 | FA 04 | 10 | 1500 | 27 | 14.5 |
| 0.75 | | 4 | 1410 | 5.1 | 75 | 0.81 | 1.78 | 4.5 | 2.1 | 2.0 | | | | | 2300 | 3100 | | | | | 3100 | | |
| 1.5 | M 3SA | 2 | 2830 | 5.1 | 74 | 0.83 | 3.5 | 4.7 | 2.1 | 2.0 | 34 | 15.5 | FD 15 | 26 | 700 | 1000 | 38 | 22 | FA 15 | 26 | 1000 | 38 | 23 |
| 1.1 | | 4 | 1420 | 7.4 | 77 | 0.78 | 2.6 | 4.3 | 2.1 | 2.0 | | | | | 1600 | 2600 | | | | | 2600 | | |
| 2.2 | M 3LA | 2 | 2800 | 7.5 | 72 | 0.85 | 5.2 | 4.5 | 2.0 | 1.9 | 40 | 17 | FD 15 | 26 | 600 | 900 | 44 | 24 | FA 15 | 26 | 900 | 44 | 24 |
| 1.5 | | 4 | 1410 | 10.2 | 73 | 0.79 | 3.8 | 4.7 | 2.0 | 2.0 | | | | | 1300 | 2300 | | | | | 2300 | | |
| 3.5 | M 3LB | 2 | 2850 | 11.7 | 80 | 0.84 | 7.5 | 5.4 | 2.2 | 2.1 | 61 | 23 | FD 15 | 40 | 500 | 900 | 65 | 29 | FA 15 | 40 | 900 | 65 | 30 |
| 2.5 | | 4 | 1420 | 16.8 | 82 | 0.80 | 5.5 | 5.2 | 2.2 | 2.2 | | | | | 1000 | 2100 | | | | | 2100 | | |
| 4.8 | M 4 SA | 2 | 2900 | 15.8 | 81 | 0.88 | 9.7 | 6.0 | 2.0 | 1.9 | 213 | 42 | FD 06 | 50 | — | 400 | 233 | 55 | FA 06 | 50 | 400 | 233 | 56 |
| 3.8 | | 4 | 1430 | 25.4 | 81 | 0.84 | 8.1 | 5.2 | 2.1 | 2.1 | | | | | — | 950 | | | | | 950 | | |
| 5.5 | M 4SB | 2 | 2890 | 18.2 | 80 | 0.87 | 11.4 | 5.9 | 2.4 | 2.0 | 213 | 42 | FD 56 | 75 | — | 350 | 223 | 55 | FA 06 | 75 | 350 | 223 | 56 |
| 4.4 | | 4 | 1440 | 29 | 82 | 0.84 | 9.2 | 5.3 | 2.2 | 2.0 | | | | | — | 900 | | | | | 900 | | |
| 7.5 | M 4LA | 2 | 2900 | 25 | 82 | 0.87 | 15.2 | 6.5 | 2.4 | 2.0 | 270 | 51 | FD 06 | 100 | — | 350 | 280 | 64 | FA 07 | 100 | 350 | 280 | 65 |
| 6 | | 4 | 1430 | 40 | 84 | 0.85 | 12.1 | 5.8 | 2.3 | 2.1 | | | | | — | 950 | | | | | 950 | | |
| 9.2 | M 4LB | 2 | 2920 | 30 | 83 | 0.86 | 18.6 | 6.0 | 2.6 | 2.2 | 319 | 57 | FD 07 | 150 | — | 300 | 342 | 73 | FA 07 | 150 | 300 | 342 | 75 |
| 7.3 | | 4 | 1440 | 48 | 85 | 0.85 | 14.6 | 5.5 | 2.3 | 2.1 | | | | | — | 800 | | | | | 800 | | |





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## 2/6P — 3000/1000 min$^{-1}$ - S3 60/40% — 50 Hz



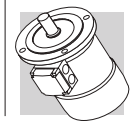
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.25 | **M 1SA** | **2** | 2850 | 0.84 | 60 | 0.82 | 0.73 | 4.3 | 1.9 | 1.8 | 6.9 | 5.5 | **FD 03** | 1.75 | 1500 | 1700 | 8.0 | 8.2 | **FA 03** | 1.75 | 1700 | 8.0 | 7.9 |
| 0.08 | | **6** | 910 | 0.84 | 43 | 0.70 | 0.38 | 2.1 | 1.4 | 1.5 | | | | | 10000 | 13000 | | | | | 13000 | | |
| 0.37 | **M 1LA** | **2** | 2880 | 1.23 | 62 | 0.80 | 1.08 | 4.4 | 1.9 | 1.8 | 9.1 | 6.9 | **FD 03** | 3.5 | 1000 | 1300 | 10.2 | 9.6 | **FA 03** | 3.5 | 1300 | 10.2 | 9.3 |
| 0.12 | | **6** | 900 | 1.27 | 44 | 0.73 | 0.54 | 2.4 | 1.4 | 1.5 | | | | | 9000 | 11000 | | | | | 11000 | | |
| 0.55 | **M 2SA** | **2** | 2800 | 1.88 | 63 | 0.86 | 1.47 | 4.5 | 1.9 | 1.7 | 20 | 9.2 | **FD 04** | 5 | 1500 | 1800 | 22 | 13.1 | **FA 04** | 5 | 1800 | 22 | 13.0 |
| 0.18 | | **6** | 930 | 1.85 | 52 | 0.65 | 0.77 | 3.3 | 2.0 | 1.9 | | | | | 4100 | 6300 | | | | | 6300 | | |
| 0.75 | **M 2SB** | **2** | 2800 | 2.6 | 66 | 0.87 | 1.89 | 4.3 | 1.8 | 1.6 | 25 | 10.6 | **FD 04** | 5 | 1700 | 1900 | 27 | 14.5 | **FA 04** | 5 | 1900 | 27 | 14.4 |
| 0.25 | | **6** | 930 | 2.6 | 54 | 0.67 | 1.00 | 3.2 | 1.7 | 1.8 | | | | | 3800 | 6000 | | | | | 6000 | | |
| 1.1 | **M 3SA** | **2** | 2870 | 3.7 | 71 | 0.82 | 2.73 | 4.9 | 1.8 | 1.9 | 34 | 15.5 | **FD 15** | 13 | 1000 | 1300 | 38 | 22 | **FA 15** | 13 | 1300 | 38 | 23 |
| 0.37 | | **6** | 930 | 3.8 | 63 | 0.70 | 1.21 | 3.1 | 1.5 | 1.8 | | | | | 3500 | 5000 | | | | | 5000 | | |
| 1.5 | **M 3LA** | **2** | 2880 | 5.0 | 73 | 0.84 | 3.53 | 5.1 | 1.9 | 2.0 | 40 | 17 | **FD 15** | 13 | 1000 | 1200 | 44 | 24 | **FA 15** | 13 | 1200 | 44 | 24 |
| 0.55 | | **6** | 940 | 5.6 | 64 | 0.67 | 1.85 | 3.5 | 1.7 | 1.8 | | | | | 2900 | 4000 | | | | | 4000 | | |
| 2.2 | **M 3LB** | **2** | 2900 | 7.2 | 77 | 0.85 | 4.9 | 5.9 | 2.0 | 2.0 | 61 | 23 | **FD 15** | 26 | 700 | 900 | 65 | 29 | **FA 15** | 26 | 900 | 65 | 30 |
| 0.75 | | **6** | 950 | 7.5 | 67 | 0.64 | 2.5 | 3.3 | 1.9 | 1.8 | | | | | 2100 | 3000 | | | | | 3000 | | |
| 3 | **M 4SA** | **2** | 2910 | 9.9 | 74 | 0.88 | 6.6 | 5.6 | 2.0 | 2.1 | 170 | 36 | **FD 56** | 37 | — | 600 | 182 | 48 | **FA 06** | 37 | 600 | 182 | 50 |
| 1.1 | | **6** | 960 | 10.9 | 73 | 0.68 | 3.2 | 4.5 | 2.2 | 2.0 | | | | | — | 2200 | | | | | 2200 | | |
| 4.5 | **M 4SB** | **2** | 2910 | 14.8 | 78 | 0.84 | 9.9 | 5.8 | 1.9 | 1.8 | 213 | 42 | **FD 56** | 37 | — | 500 | 223 | 55 | **FA 06** | 37 | 500 | 223 | 56 |
| 1.5 | | **6** | 960 | 14.9 | 74 | 0.67 | 4.4 | 4.2 | 1.9 | 2.0 | | | | | — | 2100 | | | | | 2100 | | |
| 5.5 | **M 4LA** | **2** | 2920 | 18.0 | 78 | 0.87 | 11.7 | 6.2 | 2.1 | 1.9 | 270 | 51 | **FD 06** | 50 | — | 400 | 280 | 64 | **FA 06** | 50 | 400 | 280 | 65 |
| 2.2 | | **6** | 960 | 22 | 77 | 0.71 | 5.8 | 4.3 | 2.1 | 2.0 | | | | | — | 1900 | | | | | 1900 | | |



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## 2/8P — 3000/750 min$^{-1}$ - S3 60/40% — 50 Hz

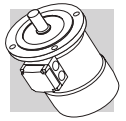
| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x $10^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.37 | **M 1LA** | **2** | 2800 | 1.26 | 63 | 0.86 | 0.99 | 3.9 | 1.8 | 1.9 | 12.9 | 7.3 | **FD 03** | 3.5 | 1200 | 1300 | 14 | 10.0 | **FA 03** | 3.5 | 1300 | 14 | 9.7 |
| 0.09 | | **8** | 670 | 1.28 | 34 | 0.75 | 0.51 | 1.8 | 1.4 | 1.5 | | | | | 9500 | 13000 | | | | | 13000 | | |
| 0.55 | **M 2SA** | **2** | 2830 | 1.86 | 66 | 0.86 | 1.40 | 4.4 | 2.1 | 2.0 | 20 | 9.2 | **FD 04** | 5 | 1500 | 1800 | 22 | 13.1 | **FA 04** | 5 | 1800 | 22 | 13.0 |
| 0.13 | | **8** | 690 | 1.80 | 41 | 0.64 | 0.72 | 2.3 | 1.6 | 1.7 | | | | | 5600 | 8000 | | | | | 8000 | | |
| 0.75 | **M 2SB** | **2** | 2800 | 2.6 | 68 | 0.88 | 1.81 | 4.6 | 2.1 | 2.0 | 25 | 10.6 | **FD 04** | 10 | 1700 | 1900 | 27 | 14.5 | **FA 04** | 10 | 1900 | 27 | 14.4 |
| 0.18 | | **8** | 690 | 2.5 | 43 | 0.66 | 0.92 | 2.3 | 1.6 | 1.7 | | | | | 4800 | 7300 | | | | | 7300 | | |
| 1.1 | **M 3SA** | **2** | 2870 | 3.7 | 69 | 0.84 | 2.74 | 4.6 | 1.8 | 1.7 | 34 | 15.5 | **FD 15** | 13 | 1000 | 1300 | 38 | 22 | **FA 15** | 13 | 1300 | 38 | 23 |
| 0.28 | | **8** | 690 | 3.9 | 44 | 0.56 | 1.64 | 2.3 | 1.4 | 1.7 | | | | | 3400 | 5000 | | | | | 5000 | | |
| 1.5 | **M 3LA** | **2** | 2880 | 5.0 | 69 | 0.85 | 3.69 | 4.7 | 1.9 | 1.8 | 40 | 17 | **FD 15** | 13 | 1000 | 1200 | 44 | 24 | **FA 15** | 13 | 1200 | 44 | 24 |
| 0.37 | | **8** | 690 | 5.1 | 46 | 0.63 | 1.84 | 2.1 | 1.6 | 1.6 | | | | | 3300 | 5000 | | | | | 5000 | | |
| 2.4 | **M 3LB** | **2** | 2900 | 7.9 | 75 | 0.82 | 5.6 | 5.4 | 2.1 | 2.0 | 61 | 23 | **FD 15** | 26 | 550 | 700 | 65 | 29 | **FA 15** | 26 | 700 | 65 | 30 |
| 0.55 | | **8** | 700 | 7.5 | 54 | 0.58 | 2.5 | 2.6 | 1.8 | 1.8 | | | | | 2000 | 3500 | | | | | 3500 | | |
| 3 | **M 4SA** | **2** | 2920 | 9.8 | 72 | 0.85 | 7.1 | 5.6 | 2.0 | 1.8 | 162 | 36 | **FD 56** | 37 | — | 600 | 182 | 48 | **FA 06** | 37 | 600 | 182 | 50 |
| 0.75 | | **8** | 710 | 10.1 | 61 | 0.64 | 2.8 | 3.0 | 1.7 | 1.8 | | | | | — | 3400 | | | | | 3400 | | |
| 4 | **M 4SB** | **2** | 2870 | 13.3 | 73 | 0.84 | 9.4 | 5.6 | 2.3 | 2.4 | 213 | 42 | **FD 56** | 37 | — | 500 | 223 | 55 | **FA 06** | 37 | 500 | 223 | 56 |
| 1 | | **8** | 690 | 13.8 | 66 | 0.62 | 3.5 | 2.9 | 1.9 | 1.8 | | | | | — | 3500 | | | | | 3500 | | |
| 5.5 | **M 4LA** | **2** | 2870 | 18.3 | 75 | 0.84 | 12.6 | 6.1 | 2.4 | 2.5 | 270 | 51 | **FD 06** | 50 | — | 400 | 280 | 64 | **FA 06** | 50 | 400 | 280 | 65 |
| 1.5 | | **8** | 690 | 21 | 68 | 0.63 | 5.1 | 2.9 | 1.9 | 1.9 | | | | | — | 2400 | | | | | 2400 | | |





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## 2/12P — 3000/500 min$^{-1}$ - S3 60/40% — 50 Hz

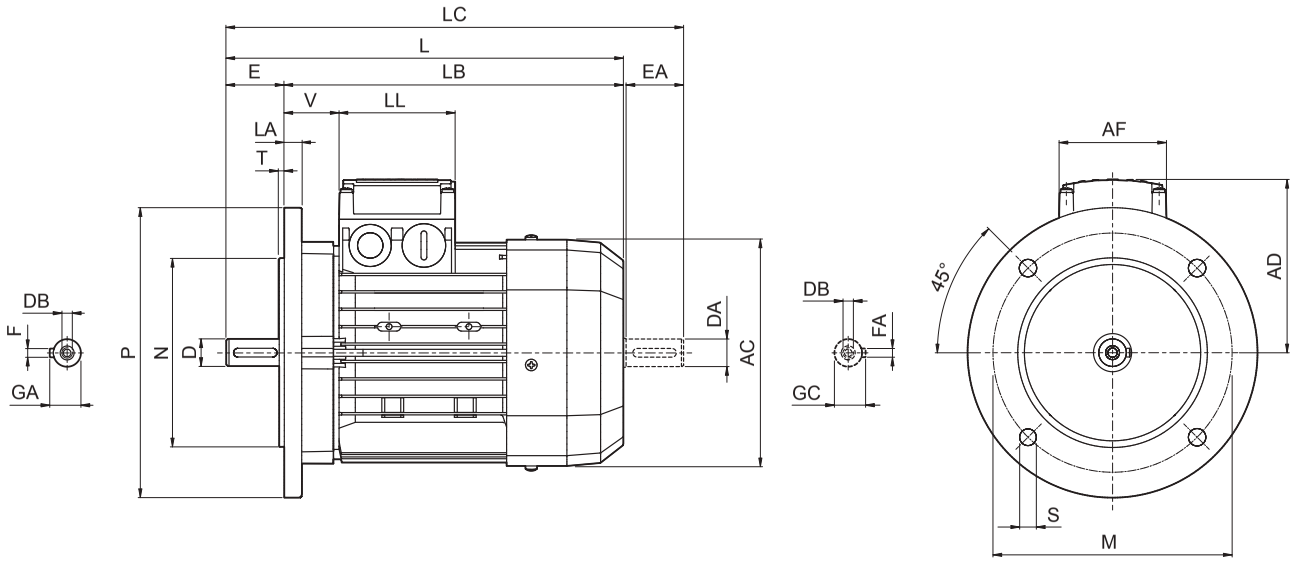


| | | | | | | | | | | | | | d.c. brake | | | | | | a.c. brake | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | FD | | | | | | FA | | | | |
| $P_n$ kW | | | n min$^{-1}$ | $M_n$ Nm | η % | cosφ | In 400V A | Is/In | Ms/Mn | Ma/Mn | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h NB | $Z_o$ 1/h SB | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg | Mod | Mb Nm | $Z_o$ 1/h | $J_m$ x 10$^{-4}$ kgm$^2$ | IM B5 Kg |
| 0.55 | **M 2SA** | **2** | 2820 | 1.86 | 64 | 0.89 | 1.39 | 4.2 | 1.6 | 1.7 | 25 | 10.6 | **FD 04** | 5 | 1000 | 1300 | 27 | 14.5 | **FA 04** | 5 | 1300 | 27 | 14.4 |
| 0.09 | | **12** | 430 | 2.0 | 30 | 0.63 | 0.69 | 1.8 | 1.9 | 1.8 | | | | | 8000 | 12000 | | | | | 12000 | | |
| 0.75 | **M 3SA** | **2** | 2900 | 2.5 | 65 | 0.81 | 2.06 | 5.2 | 1.9 | 2.1 | 34 | 15.5 | **FD 15** | 13 | 700 | 900 | 38 | 22 | **FA 15** | 13 | 900 | 38 | 23 |
| 0.12 | | **12** | 460 | 2.5 | 33 | 0.43 | 1.22 | 1.9 | 1.3 | 1.6 | | | | | 5000 | 7000 | | | | | 7000 | | |
| 1.1 | **M 3LA** | **2** | 2850 | 3.7 | 65 | 0.85 | 2.87 | 4.5 | 1.6 | 1.8 | 40 | 17 | **FD 15** | 13 | 700 | 900 | 44 | 24 | **FA 15** | 13 | 900 | 44 | 24 |
| 0.18 | | **12** | 430 | 4.0 | 26 | 0.54 | 1.85 | 1.5 | 1.3 | 1.5 | | | | | 4000 | 6000 | | | | | 6000 | | |
| 1.5 | **M 3LB** | **2** | 2900 | 4.9 | 67 | 0.86 | 3.76 | 5.6 | 1.9 | 1.9 | 54 | 21 | **FD 15** | 13 | 700 | 900 | 58 | 27 | **FA 15** | 13 | 900 | 58 | 28 |
| 0.25 | | **12** | 440 | 5.4 | 36 | 0.46 | 2.18 | 1.8 | 1.7 | 1.8 | | | | | 3800 | 5000 | | | | | 5000 | | |
| 2 | **M 3LC** | **2** | 2850 | 6.7 | 70 | 0.84 | 4.9 | 4.9 | 1.8 | 1.7 | 61 | 23 | **FD 55** | 18 | — | 700 | 65 | 29 | **FA 15** | 18 | 700 | 65 | 30 |
| 0.3 | | **12** | 450 | 6.4 | 38 | 0.47 | 2.4 | 1.7 | 1.6 | 1.7 | | | | | — | 3500 | | | | | 3500 | | |
| 3 | **M 4SA** | **2** | 2920 | 9.8 | 74 | 0.87 | 6.7 | 6.8 | 2.3 | 1.9 | 213 | 42 | **FD 56** | 37 | — | 450 | 223 | 55 | **FA 06** | 37 | 450 | 223 | 56 |
| 0.5 | | **12** | 470 | 10.2 | 51 | 0.43 | 3.3 | 2.0 | 1.7 | 1.6 | | | | | — | 3000 | | | | | 3000 | | |
| 4 | **M 4LA** | **2** | 2920 | 13.1 | 75 | 0.89 | 8.6 | 5.9 | 2.4 | 2.3 | 270 | 51 | **FD 56** | 37 | — | 400 | 280 | 64 | **FA 06** | 37 | 400 | 280 | 65 |
| 0.7 | | **12** | 460 | 14.5 | 53 | 0.44 | 4.3 | 1.9 | 1.7 | 1.6 | | | | | — | 2800 | | | | | 2800 | | |



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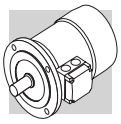
## BN - IM B5



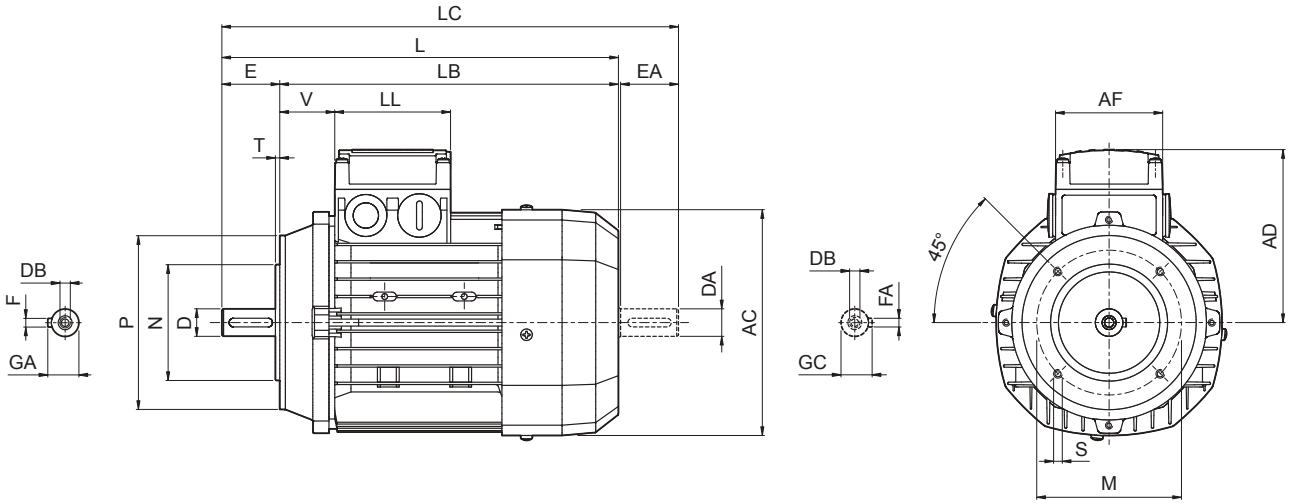

| | Shaft | | | | | Flange | | | | | | Motor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D<br>DA | E<br>EA | DB | GA<br>GC | F<br>FA | M | N | P | S | T | LA | AC | L | LB | LC | AD | AF | LL | V |
| **BN 56** | 9 | 20 | M3 | 10.2 | 3 | 100 | 80 | 120 | 7 | 3 | 8 | 110 | 185 | 165 | 207 | 91 | 74 | 80 | 34 |
| **BN 63** | 11 | 23 | M4 | 12.5 | 4 | 115 | 95 | 140 | 9.5 | | 10 | 121 | 207 | 184 | 232 | 95 | | | 26 |
| **BN 71** | 14 | 30 | M5 | 16 | 5 | 130 | 110 | 160 | | 3.5 | | 138 | 249 | 219 | 281 | 108 | | | 37 |
| **BN 80** | 19 | 40 | M6 | 21.5 | 6 | 165 | 130 | 200 | 11.5 | | 11.5 | 156 | 274 | 234 | 315 | 119 | | | 38 |
| **BN 90** | 24 | 50 | M8 | 27 | 8 | | | | | | | 176 | 326 | 276 | 378 | 133 | 98 | 98 | 44 |
| **BN 100** | 28 | 60 | M10 | 31 | | 215 | 180 | 250 | 14 | 4 | 14 | 195 | 367 | 307 | 429 | 142 | | | 50 |
| **BN 112** | | | | | | | | | | | 15 | 219 | 385 | 325 | 448 | 157 | | | 52 |
| **BN 132** | 38 | 80 | M12 | 41 | 10 | 265 | 230 | 300 | | | 20 | 258 | 493 | 413 | 576 | 193 | 118 | 118 | 58 |
| **BN 160 MR** | 42<br>38 (1) | 110<br>80 (1) | M16<br>M12 (1) | 45<br>41 (1) | 12<br>10 (1) | 300 | 250 | 350 | 18.5 | 5 | 15 | | 562 | 452 | 645 | | | | 218 |
| **BN 160 M** | | | | | | | | | | | | 310 | 596 | 486 | 680 | 245 | 187 | 187 | 51 |
| **BN 160 L** | | | | | | | | | | | | | | | | | | | |
| **BN 180 M** | 48<br>38 (1) | 110<br>110 (1) | M16<br>M12 (1) | 51.5<br>41 (1) | 14<br>10 (1) | | | | | | | 310 | 640 | 530 | 724 | | | | |
| **BN 180 L** | 48<br>42 (1) | | M16<br>M16 (1) | 51.5<br>45 (1) | 14<br>12 (1) | | | | | | 18 | 348 | 708 | 598 | 823 | 261 | | | 52 |
| **BN 200 L** | 55<br>42 (1) | | M20<br>M16 (1) | 59<br>45 (1) | 16<br>12 (1) | 350 | 300 | 400 | | | | | 722 | 612 | 837 | | | | 66 |

NOTE:
1) These values refer to the rear shaft end.

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# BN - IM B14



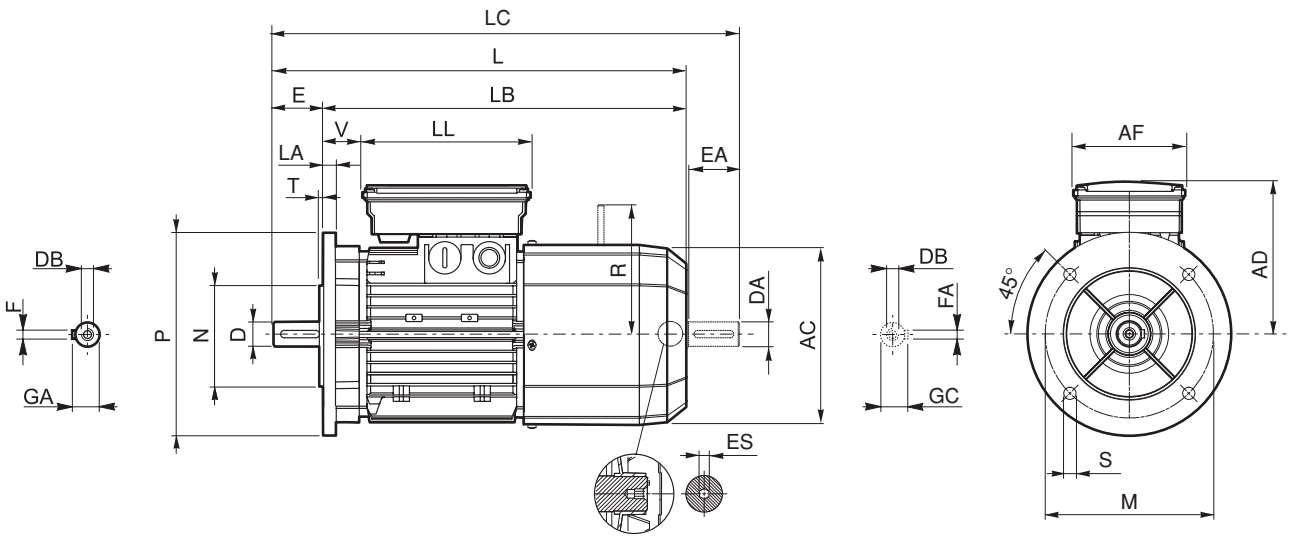

| | Shaft | | | | | Flange | | | | | Motor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **D DA** | **E EA** | **DB** | **GA GC** | **F FA** | **M** | **N** | **P** | **S** | **T** | **AC** | **L** | **LB** | **LC** | **AD** | **AF** | **LL** | **V** |
| **BN 56** | 9 | 20 | M3 | 10.2 | 3 | 65 | 50 | 80 | M5 | 2.5 | 110 | 185 | 165 | 207 | 91 | 74 | 80 | 34 |
| **BN 63** | 11 | 23 | M4 | 12.5 | 4 | 75 | 60 | 90 | | | 121 | 207 | 184 | 232 | 95 | | | 26 |
| **BN 71** | 14 | 30 | M5 | 16 | 5 | 85 | 70 | 105 | M6 | | 138 | 249 | 219 | 281 | 108 | | | 37 |
| **BN 80** | 19 | 40 | M6 | 21.5 | 6 | 100 | 80 | 120 | | 3 | 156 | 274 | 234 | 315 | 119 | | | 38 |
| **BN 90** | 24 | 50 | M8 | 27 | 8 | 115 | 95 | 140 | M8 | | 176 | 326 | 276 | 378 | 133 | 98 | 98 | 44 |
| **BN 100** | 28 | 60 | M10 | 31 | | 130 | 110 | 160 | | 3.5 | 195 | 367 | 307 | 429 | 142 | | | 50 |
| **BN 112** | | | | | | | | | | | 219 | 385 | 325 | 448 | 157 | | | 52 |
| **BN 132** | 38 | 80 | M12 | 41 | 10 | 165 | 130 | 200 | M10 | 4 | 258 | 493 | 413 | 576 | 193 | 118 | 118 | 58 |



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# BN_FD ; IM B5



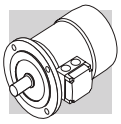

| | Shaft | | | | | Flange | | | | | | Motor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D<br>DA | E<br>EA | DB | GA<br>GC | F<br>FA | M | N | P | S | T | LA | AC | L | LB | LC | AD | AF | LL | V | R | ES |
| **BN 63** | 11 | 23 | M4 | 12.5 | 4 | 115 | 95 | 140 | 9.5 | 3 | 10 | 121 | 272 | 249 | 297 | 122 | 98 | 133 | 14 | 96 | 5 |
| **BN 71** | 14 | 30 | M5 | 16 | 5 | 130 | 110 | 160 | 9.5 | 3.5 | | 138 | 310 | 280 | 342 | 135 | | | 25 | 103 | |
| **BN 80** | 19 | 40 | M6 | 21.5 | 6 | 165 | 130 | 200 | 11.5 | | 11.5 | 156 | 346 | 306 | 388 | 146 | | | 41 | 129 | |
| **BN 90 S** | 24 | 50 | M8 | 27 | 8 | | | | | | | 176 | 409 | 359 | 461 | 149 | 110 | 165 | 39 | | 6 |
| **BN 90 L** | | | | | | | | | | | | | | | | 146 | | | | 160 | |
| **BN 100** | 28 | 60 | M10 | 31 | | 215 | 180 | 250 | 14 | 4 | 14 | 195 | 458 | 398 | 521 | 158 | | 165 | 62 | | |
| **BN 112** | | | | | | | | | | | 15 | 219 | 484 | 424 | 547 | 173 | | 165 | 73 | 199 | |
| **BN 132** | 38 | 80 | M12 | 41 | 10 | 265 | 230 | 300 | | | 20 | 258 | 603 | 523 | 686 | 210 | 140 | 188 | 46 | 204 (2) | |
| **BN 160 MR** | 42<br>38 (1) | 110<br>80 (1) | M16<br>M12 (1) | 45<br>41 (1) | 12<br>10 (1) | 300 | 250 | 350 | 18.5 | 5 | 15 | | 672 | 562 | 755 | | | | 161 | 226 | |
| **BN 160 M** | | | | | | | | | | | | 310 | 736 | 626 | 820 | 245 | 187 | 187 | 51 | 266 | — |
| **BN 160 L** | 42<br>38 (1) | 110<br>80 (1) | M16<br>M12 (1) | 45<br>41 (1) | 12<br>10 (1) | | | | | | | | 780 | 670 | 864 | | | | | | |
| **BN 180 M** | 48<br>38 (1) | | | 51.5<br>41 (1) | 14<br>10 (1) | | | | | | | | 866 | 756 | 981 | 261 | | | 52 | 305 | |
| **BN 180 L** | 48<br>42 (1) | 110<br>110 (1) | M16<br>M16 (1) | 51.5<br>45 (1) | 14<br>12 (1) | | | | | | 18 | 348 | 878 | 768 | 993 | | | | 64 | | |
| **BN 200 L** | 55<br>42 (1) | | M20<br>M16 (1) | 59<br>45 (1) | 16<br>12 (1) | 350 | 300 | 400 | 18.5 | | | | | | | | | | | | |

NOTE:
1) These values refer to the rear shaft end.
2) For FD07 brake value R=226.

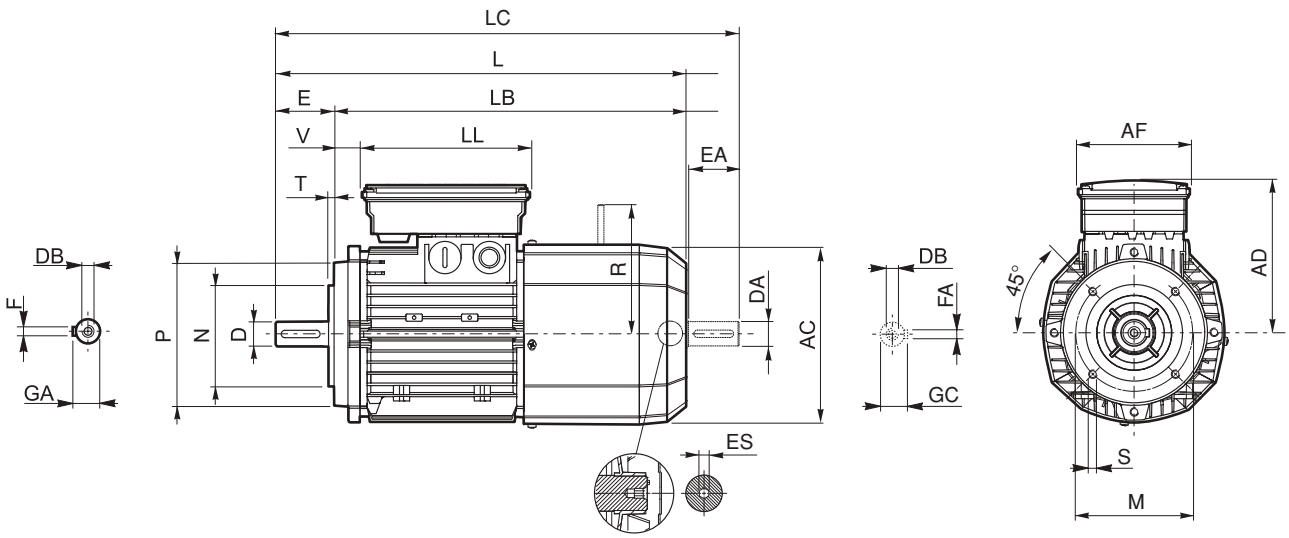
ES hexagon is not supplied with PS option.



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# BN_FD ; IM B14




| | Shaft | | | | | Flange | | | | | Motor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D DA | E EA | DB | GA GC | F FA | M | N | P | S | T | AC | L | LB | LC | AD | AF | LL | V | R | ES |
| **BN 63** | 11 | 23 | M4 | 12.5 | 4 | 75 | 60 | 90 | M5 | 2.5 | 121 | 272 | 249 | 297 | 122 | 98 | 133 | 14 | 96 | 5 |
| **BN 71** | 14 | 30 | M5 | 16 | 5 | 85 | 70 | 105 | M6 | | 138 | 310 | 280 | 342 | 135 | | | 25 | 103 | |
| **BN 80** | 19 | 40 | M6 | 21.5 | 6 | 100 | 80 | 120 | | 3 | 156 | 346 | 306 | 388 | 146 | | | 41 | 129 | |
| **BN 90 S** | 24 | 50 | M8 | 27 | 8 | 115 | 95 | 140 | M8 | | 176 | 409 | 359 | 461 | 149 | 110 | 165 | 39 | 129 | 6 |
| **BN 90 L** | | | | | | | | | | | | | | | 146 | | | | 160 | |
| **BN 100** | 28 | 60 | M10 | 31 | | 130 | 110 | 160 | | 3.5 | 195 | 458 | 398 | 521 | 158 | | | 62 | | |
| **BN 112** | | | | | | | | | | | 219 | 484 | 424 | 547 | 173 | | | 73 | 199 | |
| **BN 132** | 38 | 80 | M12 | 41 | 10 | 165 | 130 | 200 | M10 | 4 | 258 | 603 | 523 | 686 | 210 | 140 | 188 | 46 | 204 (1) | |

NOTE:
1) For FD07 brake value R=226.

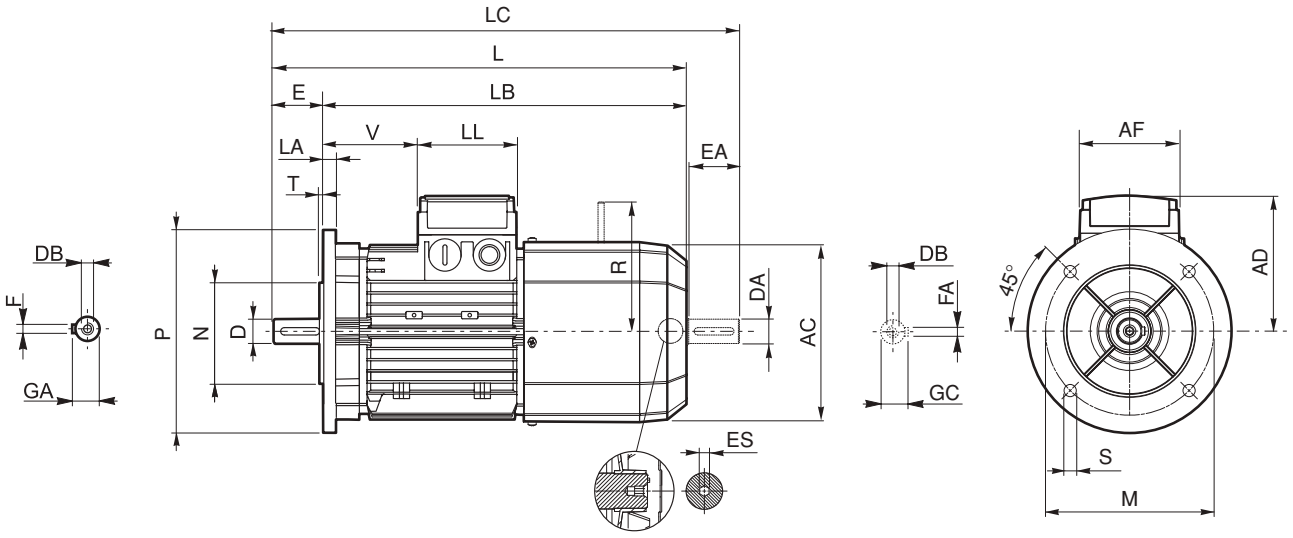
ES hexagon is not supplied with PS option.



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# BN_FA - IM B5




| | Shaft | | | | | Flange | | | | | | Motor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D<br>DA | E<br>EA | DB | GA<br>GC | F<br>FA | M | N | P | S | T | LA | AC | L | LB | LC | AD | AF | LL | V | R | ES |
| **BN 63** | 11 | 23 | M4 | 12.5 | 4 | 115 | 95 | 140 | 9.5 | 3 | 10 | 121 | 272 | 249 | 297 | 95 | 74 | 80 | 26 | 116 | 5 |
| **BN 71** | 14 | 30 | M5 | 16 | 5 | 130 | 110 | 160 | | 3.5 | 11.5 | 138 | 310 | 280 | 342 | 108 | | | 68 | 124 | |
| **BN 80** | 19 | 40 | M6 | 21.5 | 6 | 165 | 130 | 200 | 11.5 | | | 156 | 346 | 306 | 388 | 119 | | | 83 | 134 | |
| **BN 90** | 24 | 50 | M8 | 27 | 8 | | | | | | | 176 | 409 | 359 | 461 | 133 | 98 | 98 | 95 | 160 | 6 |
| **BN 100** | 28 | 60 | M10 | 31 | | 215 | 180 | 250 | 14 | 4 | 14 | 195 | 458 | 398 | 521 | 142 | | | 119 | | |
| **BN 112** | | | | | | | | | | | 15 | 219 | 484 | 424 | 547 | 157 | | | 128 | 198 | |
| **BN 132** | 38 | 80 | M12 | 41 | 10 | 265 | 230 | 300 | | | 20 | 258 | 603 | 523 | 686 | 210 | 140 | 188 | 46 | 200 (2) | |
| **BN 160 MR** | 42<br>38 (1) | 110<br>80 (1) | M16<br>M12 (1) | 45<br>41 (1) | 12<br>10 (1) | 300 | 250 | 350 | 18.5 | 5 | 15 | | 672 | 562 | 755 | 193 | 118 | 118 | 218 | 217 | |
| **BN 160 M** | | | | | | | | | | | | 310 | 736 | 626 | 820 | 245 | 187 | 187 | 51 | 247 | — |
| **BN 160 L** | | | | | | | | | | | | | | | | | | | | | |
| **BN 180 M** | | | | 51.5<br>41 (1) | 14<br>10 (1) | | | | | | | | 780 | 670 | 864 | | | | | | |

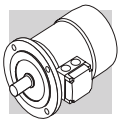
NOTE:
1) These values refer to the rear shaft end.
2) For FA07 brake value R=217.

Dimensions AD, AF, LL and V, relevant to terminal box of motors BN…FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN…FD motors

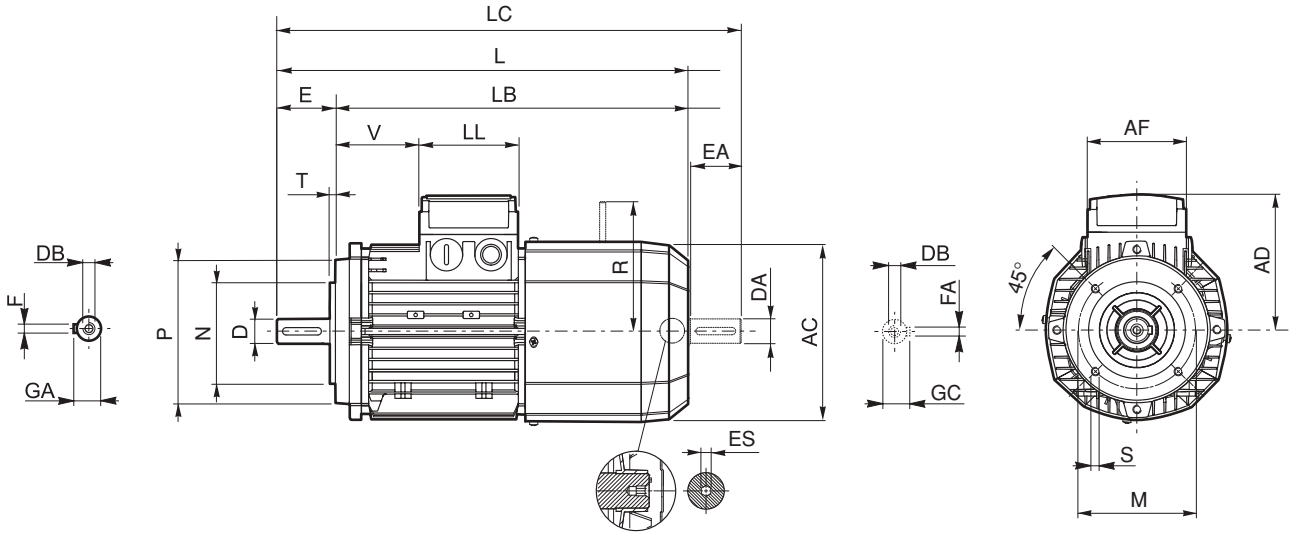
ES hexagon is not supplied with PS option.



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# BN_FA - IM B14




| | Shaft | | | | | Flange | | | | | Motor | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D DA | E EA | DB | GA GC | F FA | M | N | P | S | T | AC | L | LB | LC | AD | AF | LL | V | R | ES |
| **BN 63** | 11 | 23 | M4 | 12.5 | 4 | 75 | 60 | 90 | M5 | 2.5 | 121 | 272 | 249 | 119 | 95 | 74 | 80 | 26 | 116 | 5 |
| **BN 71** | 14 | 30 | M5 | 16 | 5 | 85 | 70 | 105 | M6 | | 138 | 310 | 280 | 342 | 108 | | | 68 | 124 | |
| **BN 80** | 19 | 40 | M6 | 21.5 | 6 | 100 | 80 | 120 | | 3 | 156 | 346 | 306 | 388 | 119 | | | 83 | 134 | |
| **BN 90** | 24 | 50 | M8 | 27 | 8 | 115 | 95 | 140 | M8 | | 176 | 409 | 359 | 461 | 133 | 98 | 98 | 95 | 160 | 6 |
| **BN 100** | 28 | 60 | M10 | 31 | | 130 | 110 | 160 | | 3.5 | 195 | 458 | 398 | 521 | 142 | | | 119 | | |
| **BN 112** | | | | | | | | | | | 219 | 484 | 424 | 547 | 157 | | | 128 | 198 | |
| **BN 132** | 38 | 80 | M12 | 41 | 10 | 165 | 130 | 200 | M10 | 4 | 258 | 603 | 523 | 686 | 210 | 140 | 188 | 46 | 200 (1) | |

NOTE:
1) For FA07 brake value R=217.

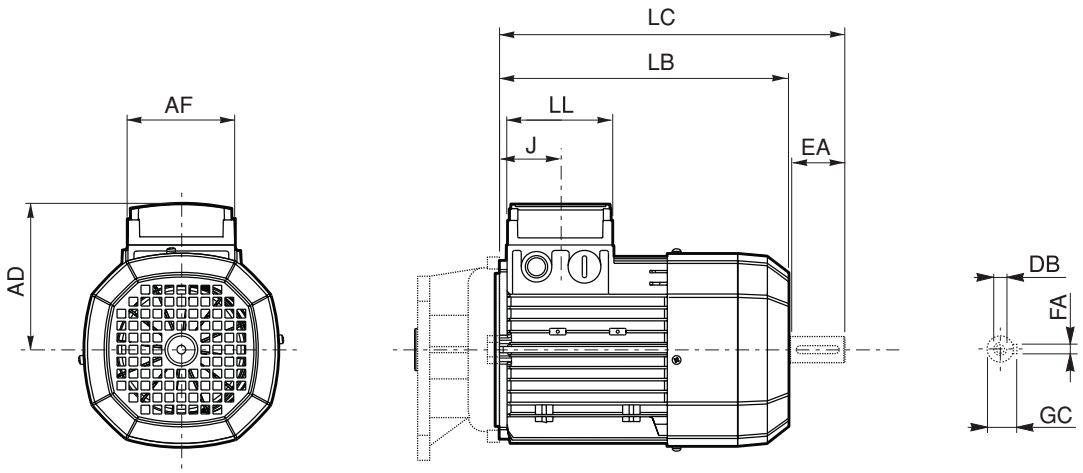
Dimensions AD, AF, LL and V, relevant to terminal box of motors BN…FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN…FD motors

ES hexagon is not supplied with PS option.



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# M

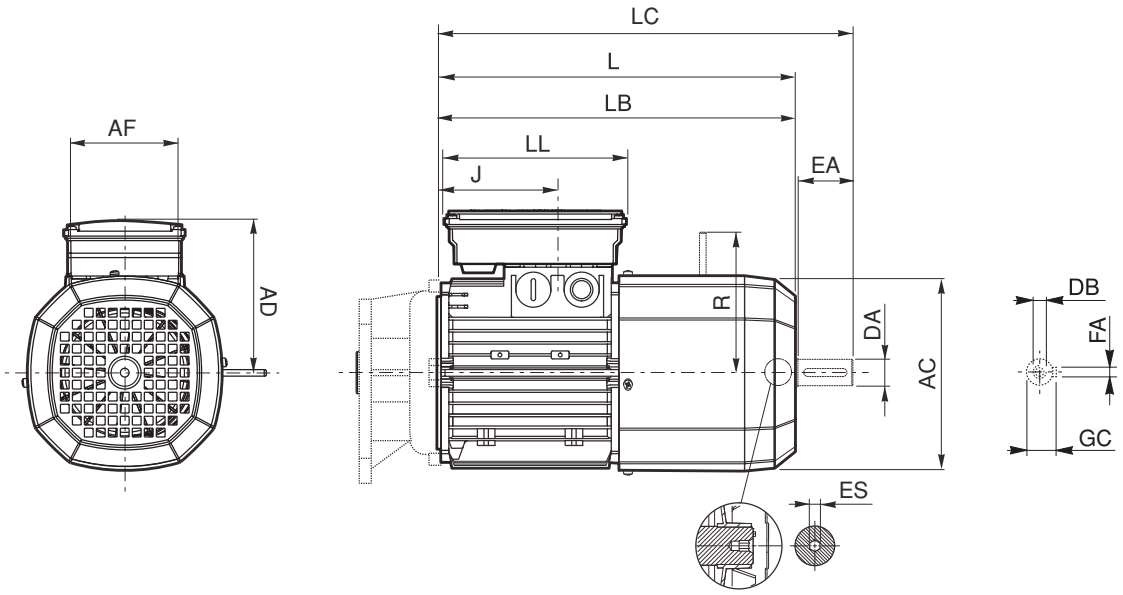



| | Rear shaft end | | | | | Motor | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DA** | **EA** | **DB** | **FA** | **GC** | **AC** | **LB** | **LC** | **AF** | **LL** | **J** | **AD** |
| **M 0** | 9 | 20 | M3 | 3 | 10.2 | 110 | 133 | 155 | 74 | 80 | 42 | 91 |
| **M 05** | 11 | 23 | M4 | 4 | 12.5 | 121 | 165 | 191 | | | 48 | 95 |
| **M 1** | 14 | 30 | M5 | 5 | 16 | 138 | 187 | 219 | | | 45 | 108 |
| **M 2 S** | 19 | 40 | M6 | 6 | 21.5 | 156 | 202 | 245 | | | 44 | 119 |
| **M 3 S** | 28 | 60 | M10 | 8 | 31 | 195 | 230 | 293 | 98 | 98 | 53.5 | 142 |
| **M 3 L** | | | | | | | 262 | 325 | | | | |
| **M 4** | 38 | 80 | M12 | 10 | 41 | 258 | 361 | 444 | 118 | 118 | 64.5 | 193 |
| **M 4 LC** | | | | | | | 396 | 479 | | | | |
| **M 5 S** | | | | | | 310 | 418 | 502 | 187 | 187 | 77 | 245 |
| **M 5 L** | | | | | | | 462 | 546 | | | | |



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# M_FD




| | Rear shaft end | | | | | Motor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DA** | **EA** | **DB** | **FA** | **GC** | **AC** | **LB** | **LC** | **AF** | **LL** | **J** | **AD** | **R** | **ES** |
| **M 05** | 11 | 23 | M4 | 4 | 12.5 | 121 | 231 | 256 | 98 | 133 | 48 | 122 | 96 | 5 |
| **M 1** | 14 | 30 | M5 | 5 | 16 | 138 | 248 | 280 | | | 73 | 135 | 103 | |
| **M 2 S** | 19 | 40 | M6 | 6 | 21.5 | 156 | 272 | 314 | | | 88 | 146 | 129 | |
| **M 3 S** | 28 | 60 | M10 | 8 | 31 | 195 | 326 | 389 | 110 | 165 | 124.5 | 158 | 160 | 6 |
| **M 3 L** | | | | | | | 353 | 416 | | | | | | |
| **M 4** | 38 | 80 | M12 | 10 | 41 | 258 | 470 | 553 | 140 | 188 | 185.5 | 210 | 204 (1) | |
| **M 4 LC** | | | | | | | 495 | 578 | | | 64.5 | | 226 | |
| **M 5 S** | | | | | | 310 | 558 | 642 | 187 | 187 | 77 | 245 | 266 | — |
| **M 5 L** | | | | | | | 602 | 686 | | | | | | |

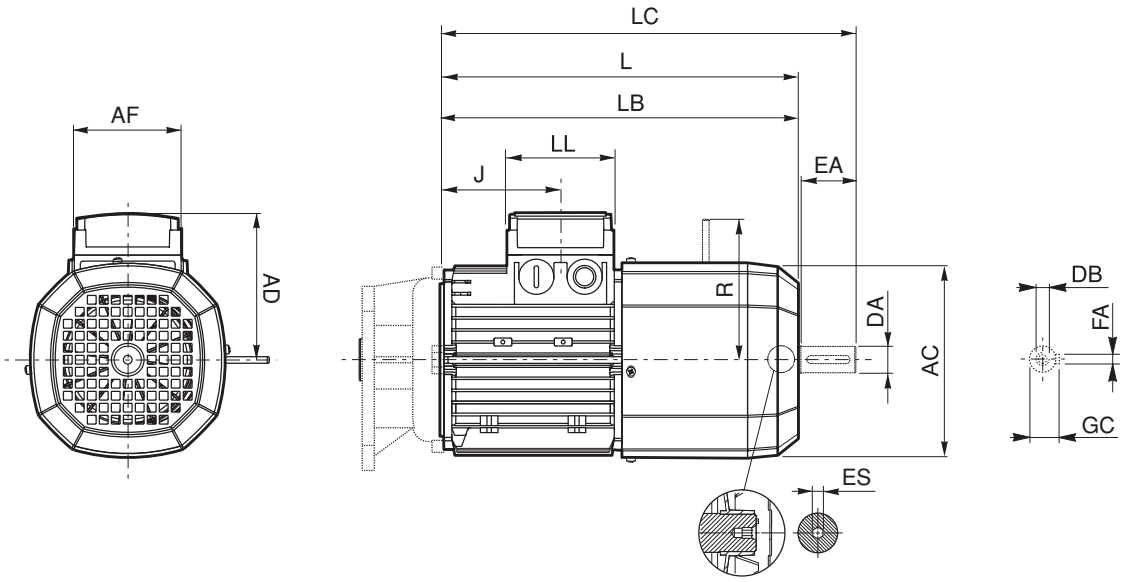
NOTE:
1) For FD07 brake value R=226.

ES hexagon is not supplied with PS option.



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# M_FA




| | Rear shaft end | | | | | Motor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **DA** | **EA** | **DB** | **FA** | **GC** | **AC** | **LB** | **LC** | **AF** | **LL** | **J** | **AD** | **R** | **ES** |
| **M 05** | 11 | 23 | M4 | 4 | 12.5 | 121 | 231 | 256 | 74 | 80 | 48 | 95 | 116 | 5 |
| **M 1** | 14 | 30 | M5 | 5 | 16 | 138 | 248 | 280 | | | 73 | 108 | 124 | |
| **M 2 S** | 19 | 40 | M6 | 6 | 21.5 | 156 | 272 | 314 | | | 88 | 119 | 134 | |
| **M 3 S** | 28 | 60 | M10 | 8 | 31 | 195 | 326 | 389 | 98 | 98 | 124.5 | 142 | 160 | 6 |
| **M 3 L** | | | | | | | 353 | 416 | | | | | | |
| **M 4** | 38 | 80 | M14 | 10 | 41 | 258 | 470 | 553 | 140 | 188 | 185.5 | 210 | 200 (1) | |
| **M 4 LC** | | | | | | | 495 | 578 | | | 64.5 | | 217 | |
| **M 5 S** | | | M12 | | | 310 | 558 | 642 | 187 | 187 | 77 | 245 | 247 | — |
| **M 5 L** | | | | | | | 602 | 686 | | | | | | |

NOTE:
1) For FA07 brake value R=217.

Dimensions AD, AF, LL and V, relevant to terminal box of motors M…FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size M…FD motors

ES hexagon is not supplied with PS option.



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## INDEX OF REVISIONS

| BR_CAT_VFW_STD_ENG_R06_0 | |
|---|---|
| | **Description** |
| 6, 11 | Added “Allowed temperature limits” and “Lubrication” chapters. |

2016 09 30

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