# Technical Documentation

## THREE - PHASE TEFC INDUCTION CAGE MOTORS WITH BRAKE

WB09EN

ATB SEVER
Technology in Motion

# Vision

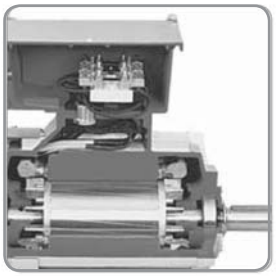
We set your ideas in motion. We do not merely manufacture motors, but instead turn the ambitious concepts of our customers into modern, innovative and reliable products, which are unique and point the way to the future. We bring our customers closer to their goals with reliability, creativity and flexibility.

## Business Units

Serial Motors

New Businesses

Home Appliances



Project Motors

**Mechanical protection: IP 54** **Voltage: 400 V, 50 Hz**

| Type | Output power $P_N$ kW | Rated speed $n_N$ $min^{-1}$ | Efficiency $\eta$ % | Power factor cos | Rated current $I_N$ A | Rated torque $M_N$ Nm | $I_1^*/I_N$ | $M_1^*/M_N$ | $M_b^*/M_N$ | $Mk_{max}$ Nm | $Z_o$ c/h | Moment of inertia J $kgm^2$ | Mass* kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRAKE MOTORS** | | | | | | | | | | | | | **3000 $min^{-1}$** |
| **1.KZK 71 A - 2** | Not in the production program | | | | | | | | | | | | |
| **1.KZK 71 B - 2** | | | | | | | | | | | | | |
| **1.KZK 80 A - 2** | | | | | | | | | | | | | |
| **1.KZK 80 B - 2** | | | | | | | | | | | | | |
| **1.KZK 90 S - 2** | | | | | | | | | | | | | |
| **1.KZK 90 L - 2** | | | | | | | | | | | | | |
| **2.KZK 100 L - 2** | | | | | | | | | | | | | |
| **2.KZK 112 M - 2** | | | | | | | | | | | | | |
| **1.KZK 132 Sk- 2** | | | | | | | | | | | | | |
| **1.KZK 132 S - 2** | | | | | | | | | | | | | |
| **1.KZK 160 Mk-2** | | | | | | | | | | | | | |
| **1.KZK 160 M - 2** | | | | | | | | | | | | | |
| **1.KZK 160 L - 2** | | | | | | | | | | | | | |
| **BRAKE MOTORS** | | | | | | | | | | | | | **1500 $min^{-1}$** |
| **1.KZK 71 A - 4** | Not in the production program | | | | | | | | | | | | |
| **1.KZK 71 B - 4** | | | | | | | | | | | | | |
| **1.KZK 80 A - 4** | | | | | | | | | | | | | |
| **1.KZK 80 B - 4** | | | | | | | | | | | | | |
| **1.KZK 90 S - 4** | | | | | | | | | | | | | |
| **1.KZK 90 L - 4** | | | | | | | | | | | | | |
| **2.KZK 100 L - 4** | | | | | | | | | | | | | |
| **2.KZK 100 Ld- 4** | | | | | | | | | | | | | |
| **2.KZK 112 M - 4** | | | | | | | | | | | | | |
| **1.KZK 132 S - 4** | | | | | | | | | | | | | |
| **1.KZK 132 M - 4** | | | | | | | | | | | | | |
| **1.KZK 160 M - 4** | | | | | | | | | | | | | |
| **1.KZK 160 L - 4** | | | | | | | | | | | | | |
| **1.KZK 180 M - 4** | | | | | | | | | | | | | |
| **1.KZK 180 L - 4** | | | | | | | | | | | | | |
| **1.KZK 200 L - 4** | 30 | 1470 | 90 | 0,84 | 57 | 195 | 7,5 | 2,9 | 2,8 | 200[1] 400[2] | 130 | 0,33 | 257 279 |
| **1.KZK 225 S - 4** | 37 | 1470 | 92 | 0,83 | 70 | 240 | 6,2 | 2,3 | 2,3 | 400 | 95 | 0,43 | 330 |
| **1.KZK 225 M - 4** | 45 | 1470 | 92 | 0,82 | 83 | 292 | 6,2 | 2,3 | 2,5 | 400 | 75 | 0,51 | 370 |

[1)] standard design [2)] on request

[*)] $I_1/I_N$ - Locked rotor current ratio, $M_1/M_N$ - Locked rotor torque ratio, $M_b/M_N$ - Break down torque ratio, **Mass** - For IM B3

**Mechanical protection: IP 54** **Voltage: 400 V, 50 Hz**

| Type | Output power $P_N$ kW | Rated speed $n_N$ $min^{-1}$ | Efficiency $\eta$ % | Power factor cos | Rated current $I_N$ A | Rated torque $M_N$ Nm | $I_1^*/I_N$ | $M_1^*/M_N$ | $M_b^*/M_N$ | $Mk_{max}$ Nm | $Z_o$ c/h | Moment of inertia J $kgm^2$ | Mass* kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRAKE MOTORS** | | | | | | | | | | | | | | **1000 $min^{-1}$** |
| **1.KZK 71 A - 6** | Not in the production program | | | | | | | | | | | | | |
| **1.KZK 71 B - 6** | | | | | | | | | | | | | | |
| **1.KZK 80 A - 6** | | | | | | | | | | | | | | |
| **1.KZK 80 B - 6** | | | | | | | | | | | | | | |
| **1.KZK 90 S - 6** | | | | | | | | | | | | | | |
| **1.KZK 90 L - 6** | | | | | | | | | | | | | | |
| **2.KZK 100 L - 6** | | | | | | | | | | | | | | |
| **2.KZK 112 M - 6** | | | | | | | | | | | | | | |
| **1.KZK 132 S - 6** | | | | | | | | | | | | | | |
| **1.KZK 132 Mk-6** | | | | | | | | | | | | | | |
| **1.KZK 132 M - 6** | | | | | | | | | | | | | | |
| **1.KZK 160 M - 6** | | | | | | | | | | | | | | |
| **1.KZK 160 L - 6** | | | | | | | | | | | | | | |
| **1.KZK 180 L - 6** | | | | | | | | | | | | | | |
| **1.KZK 200 Lk- 6** | 18,5 | 970 | 89 | 0,81 | 38 | 182 | 6,5 | 2 | 2,7 | 200[1] 400[2] | 210 | 0,28 | 232 | 254 |
| **1.KZK 200 L - 6** | 22 | 970 | 90 | 0,80 | 44 | 217 | 6,5 | 2 | 2,7 | 200[1] 400[2] | 190 | 0,33 | 257 | 279 |
| **1.KZK 225 M - 6** | 30 | 975 | 91 | 0,81 | 59 | 294 | 6,5 | 2 | 2,7 | 400 | 170 | 0,706 | 356 | |
| **BRAKE MOTORS** | | | | | | | | | | | | | | **750 $min^{-1}$** |
| **1.KZK 71 A - 8** | Not in the production program | | | | | | | | | | | | | |
| **1.KZK 71 B - 8** | | | | | | | | | | | | | | |
| **1.KZK 80 A - 8** | | | | | | | | | | | | | | |
| **1.KZK 80 B - 8** | | | | | | | | | | | | | | |
| **1.KZK 90 S - 8** | | | | | | | | | | | | | | |
| **1.KZK 90 L - 8** | | | | | | | | | | | | | | |
| **2.KZK 100 L - 8** | | | | | | | | | | | | | | |
| **2.KZK 100 Ld- 8** | | | | | | | | | | | | | | |
| **2.KZK 112 M - 8** | | | | | | | | | | | | | | |
| **1.KZK 132 S - 8** | | | | | | | | | | | | | | |
| **1.KZK 132 M - 8** | | | | | | | | | | | | | | |
| **1.KZK 160 Mk-8** | | | | | | | | | | | | | | |
| **1.KZK 160 M - 8** | | | | | | | | | | | | | | |
| **1.KZK 160 L - 8** | | | | | | | | | | | | | | |
| **1.KZK 180 L - 8** | | | | | | | | | | | | | | |
| **1.KZK 200 L - 8** | 15 | 725 | 87 | 0,70 | 36 | 199 | 5 | 1,8 | 2,2 | 200[1] 400[2] | 260 | 0,28 | 232 | 254 |
| **1.KZK 225 S - 8** | 18,5 | 735 | 88,5 | 0,75 | 41 | 240 | 4,8 | 1,7 | 2,2 | 400 | 240 | 0,53 | 295 | |
| **1.KZK 225 M - 8** | 22 | 735 | 89,5 | 0,75 | 48 | 286 | 4,8 | 1,6 | 2,3 | 400 | 210 | 0,62 | 356 | |

[1] standard design [2] on request

*) $I_1/I_N$ - Locked rotor current ratio, $M_1/M_N$ - Locked rotor torque ratio, $M_b/M_N$ - Break down torque ratio, **Mass** - For IM B3

**Mechanical protection: IP 54** **Voltage: 400 V, 50 Hz**

| Type | $P_N$ kW | | $n_N$ $min^{-1}$ | | $I_N$ A | | $I_1^*/I_N$ | | $M_b^*/M_N$ | | $Mk_{max}$ Nm | $Z_o^{**}$ c/h | J $kgm^2$ | Mass* kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | low speed | high speed | low speed | high speed | low speed | high speed | low speed | high speed | low speed | high speed | | | | |

**BREAK MOTORS DOUBLE SPEED - DAHLANDER WINDING △/YY** **1500/3000 $min^{-1}$**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.KZK 71 A - 4/2** | Not in the production program | | | | | | | | | | | | | | |
| **1.KZK 71 B - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 80 A - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 80 B - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 90 S - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 90 L - 4/2** | | | | | | | | | | | | | | | |
| **2.KZK 100 L - 4/2** | | | | | | | | | | | | | | | |
| **2.KZK 100 Ld- 4/2** | | | | | | | | | | | | | | | |
| **2.KZK 112 M - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 132 S - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 132 M - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 160 M - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 160 L - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 180 M - 4/2** | | | | | | | | | | | | | | | |
| **1.KZK 180 L - 4/2** | | | | | | | | | | | | | | | |

**) $Z_o$ -total permissible number of startings per hour at no load for both speeds (For 2p=2 je $Z_{02}$ 0,30 $Z_o$, for 2p=4 je $Z_{04}$ 0,70 $Z_o$)

**BREAK MOTORS DOUBLE SPEED - DAHLANDER WINDING △/YY** **750/1500 $min^{-1}$**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.KZK 80 A - 8/4** | Not in the production program | | | | | | | | | | | | | | |
| **1.KZK 80 B - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 90 S - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 90 L - 8/4** | | | | | | | | | | | | | | | |
| **2.KZK 100 L - 8/4** | | | | | | | | | | | | | | | |
| **2.KZK 100 Ld- 8/4** | | | | | | | | | | | | | | | |
| **2.KZK 112 M - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 132 S - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 132 M - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 160 Mk-8/4** | | | | | | | | | | | | | | | |
| **1.KZK 160 M - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 160 L - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 180 L - 8/4** | | | | | | | | | | | | | | | |
| **1.KZK 200 L - 8/4** | 15 | 20 | 730 | 1470 | 38 | 38 | 4,9 | 7,7 | 1,7 | 2,1 | 200[1] 400[2] | 340 | 0,28 | 232 | 254 |
| **1.KZK 225 S - 8/4** | 18 | 24 | 730 | 1470 | 41,5 | 47 | 4,3 | 6,6 | 1,4 | 2,2 | 400 | 300 | 0,53 | 295 | |
| **1.KZK 225 M - 8/4** | 22 | 28 | 730 | 1475 | 47 | 53 | 4,6 | 6,8 | 1,6 | 2,2 | 400 | 260 | 0,62 | 335 | |

**) $Z_o$ -total permissible number of startings per hour at no load for both speeds (For 2p=4 je $Z_{04}$ 0,40 $Z_o$, for 2p=8 je $Z_{08}$ 0,60 $Z_o$)

[1)] standard design [2)] on request

*) $\mathbf{I_1/I_N}$ - Locked rotor current ratio, $\mathbf{M_1/M_N}$ - Locked rotor torque ratio, $\mathbf{M_b/M_N}$ - Break down torque ratio, **Mass** - For IM B3

**Mechanical protection: IP 54**

**Voltage: 400 V, 50 Hz**

| tip motora | $P_N$ kW | | $n_N$ $min^{-1}$ | | $I_N$ A | | $I_1^*/I_N$ | | $M_b^*/M_N$ | | $Mk_{max}$ Nm | $Z_o^{**}$ c/h | J $kgm^2$ | Mass* kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | low speed | high speed | low speed | high speed | low speed | high speed | low speed | high speed | low speed | high speed | | | | | |
| **DOUBLE SPEED TWO SEPARATE WINDINGS Y/Y** | | | | | | | | | | | | | | **1000/1500 $min^{-1}$** | |
| **1.KZK 80 A - 6/4** | Not in the production program | | | | | | | | | | | | | | |
| **1.KZK 80 B - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 90 S - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 90 L - 6/4** | | | | | | | | | | | | | | | |
| **2.KZK 100 L - 6/4** | | | | | | | | | | | | | | | |
| **2.KZK 112 M - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 132 S - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 132 M - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 160 M - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 160 L - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 180 M - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 180 L - 6/4** | | | | | | | | | | | | | | | |
| **1.KZK 200 L - 6/4** | 13 | 19 | 980 | 1470 | 27,5 | 37 | 7,3 | 7,4 | 2,4 | 2,6 | 200[1] 400[2] | 190 | 0,33 | 257 | 279 |
| **1.KZK 225 S - 6/4** | 19 | 23 | 985 | 1480 | 48 | 47 | 6,4 | 7,6 | 2,7 | 2,6 | 400 | 150 | 0,43 | 330 | |
| **1.KZK 225 M - 6/4** | 23 | 27 | 985 | 1480 | 49 | 52 | 6,0 | 7 | 2,4 | 2,2 | 400 | 130 | 0,706 | 356 | |
| **DOUBLE SPEED TWO SEPARATE WINDINGS Y/Y** | | | | | | | | | | | | | | **750/1000 $min^{-1}$** | |
| **1.KZK 90 S - 8/6** | Not in the production program | | | | | | | | | | | | | | |
| **1.KZK 90 L - 8/6** | | | | | | | | | | | | | | | |
| **2.KZK 100 L - 8/6** | | | | | | | | | | | | | | | |
| **2.KZK 100 Ld- 8/6** | | | | | | | | | | | | | | | |
| **2.KZK 112 M - 8/6** | | | | | | | | | | | | | | | |
| **1.KZK 132 S - 8/6** | | | | | | | | | | | | | | | |
| **1.KZK 132 M - 8/6** | | | | | | | | | | | | | | | |
| **1.KZK 160 M - 8/6** | | | | | | | | | | | | | | | |
| **1.KZK 160 L - 8/6** | | | | | | | | | | | | | | | |
| **1.KZK 180 L - 8/6** | | | | | | | | | | | | | | | |
| **1.KZK 200 L - 8/6** | 10 | 13 | 730 | 975 | 25 | 27 | 4,9 | 5,5 | 1,5 | 1,5 | 200[1] 400[2] | 260 | 0,28 | 232 | 254 |
| **1.KZK 225 S - 8/6** | 13 | 16 | 735 | 980 | 28 | 32 | 5,3 | 6,3 | 2 | 1,7 | 400 | 210 | 0,53 | 295 | |
| **1.KZK 225 M - 8/6** | 17 | 22 | 735 | 980 | 37 | 45 | 5,3 | 5,8 | 1,9 | 1,5 | 400 | 190 | 0,62 | 335 | |
| **DOUBLE SPEED TWO SEPARATE WINDINGS Y/Y** | | | | | | | | | | | | | | **750/3000 $min^{-1}$** | |
| **1.KZK 80 A - 8/2** | Not in the production program | | | | | | | | | | | | | | |
| **1.KZK 80 B - 8/2** | | | | | | | | | | | | | | | |
| **1.KZK 90 S - 8/2** | | | | | | | | | | | | | | | |
| **1.KZK 90 L - 8/2** | | | | | | | | | | | | | | | |
| **2.KZK 100 L - 8/2** | | | | | | | | | | | | | | | |
| **2.KZK 100 Ld- 8/2** | | | | | | | | | | | | | | | |
| **2.KZK 112 M - 8/2** | | | | | | | | | | | | | | | |
| **1.KZK 132 S - 8/2** | | | | | | | | | | | | | | | |
| **1.KZK 132 Mk-8/2** | | | | | | | | | | | | | | | |
| **1.KZK 132 M - 8/2** | | | | | | | | | | | | | | | |
| **1.KZK 160 M - 8/2** | | | | | | | | | | | | | | | |
| **1.KZK 160 L - 8/2** | | | | | | | | | | | | | | | |

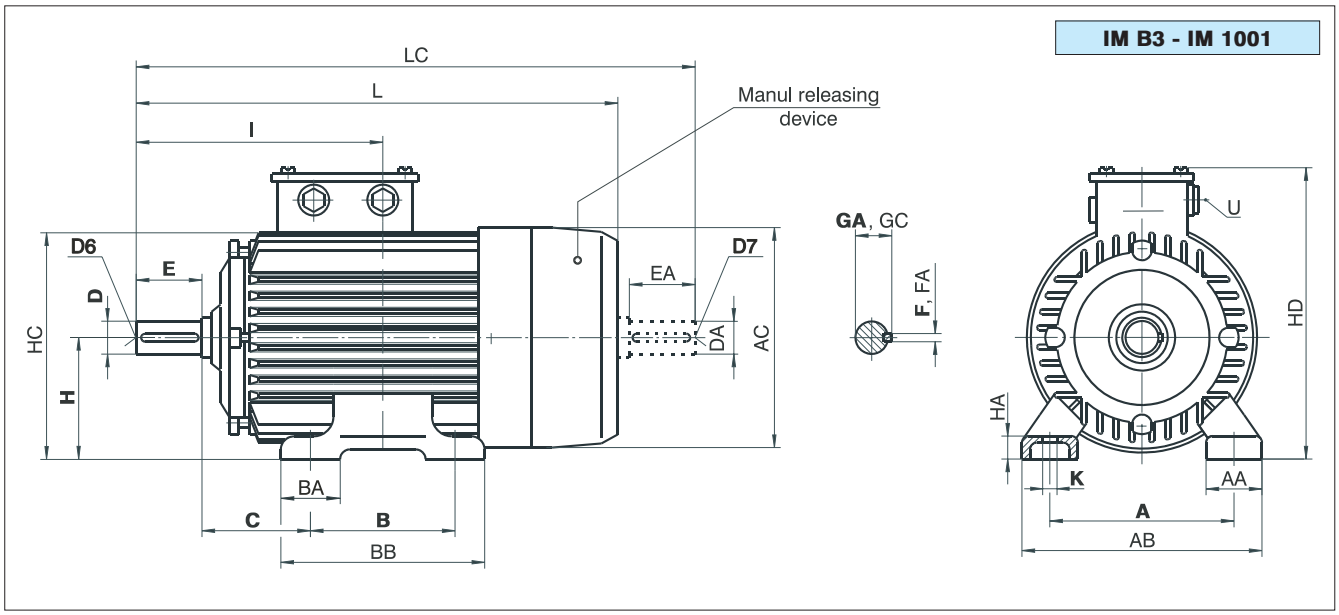
**) $Z_o$ -total permissible number of startings per hour at no load for both speeds (For 2p=4 je $Z_{04}$ 0,40 $Z_o$, for 2p=6 je $Z_{06}$ 0,60 $Z_o$)

**) $Z_o$ -total permissible number of startings per hour at no load for both speeds (For 2p=6 je $Z_{06}$ 0,40 $Z_o$, for 2p=8 je $Z_{08}$ 0,60 $Z_o$)

**) $Z_o$ -total permissible number of startings per hour at no load for both speeds (For 2p=2 je $Z_{02}$ 0,15 $Z_o$, for 2p=8 je $Z_{08}$ 0,85 $Z_o$)

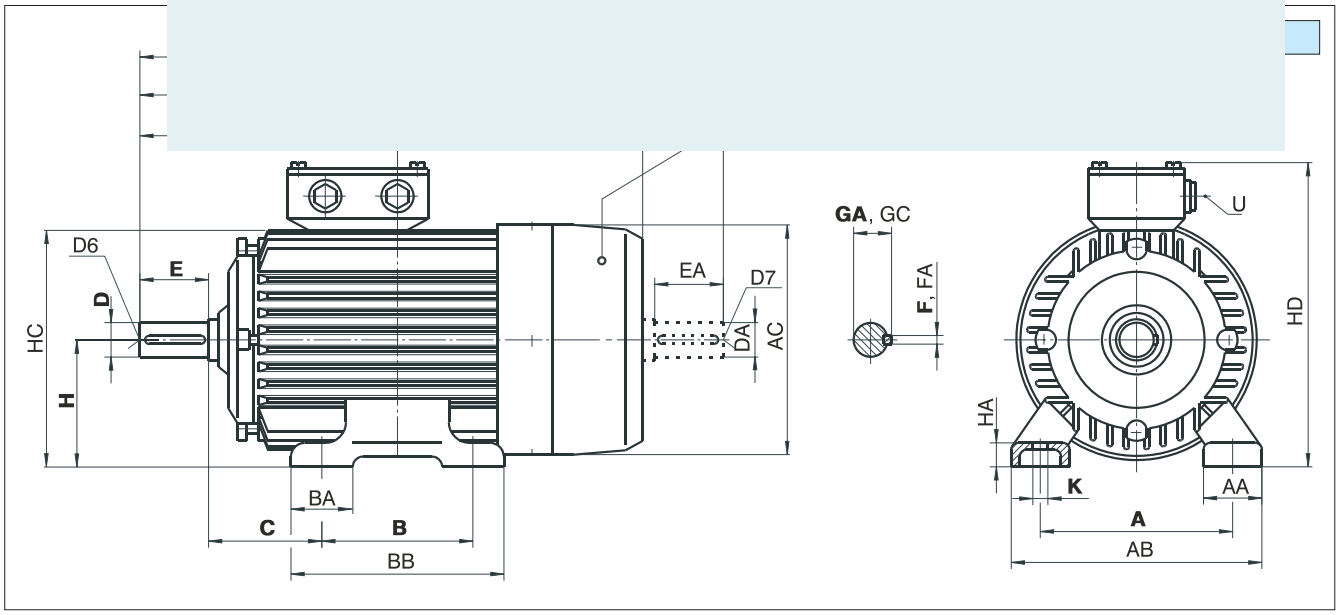
[1)] standard design [2)] on request

*) $\mathbf{I_1/I_N}$ - Locked rotor current ratio, $\mathbf{M_1/M_N}$ - Locked rotor torque ratio, $\mathbf{M_b/M_N}$ - Break down torque ratio, **Mass** - For IM B3




| Type | | Pole | A | AA | AB | AC | B | BA | BB | C | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | H | HA | HC | HD | I | K | L | LC | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.KZK 71 | | 2... 8 | **112** | 34 | 142 | 140 | **90** | 32 | 114 | **45** | **14** | 11 | M5 | M4 | **30** | 23 | **5** | 4 | **16** | 12,5 | **71** | 8 | 142 | 176 | 120 | **7** | 304 | 332 | AU 13,5 |
| 1.KZK 80 | | 2... 8 | **125** | 38 | 155 | 154 | **100** | 36 | 130 | **50** | **19** | 14 | M6 | M5 | **40** | 30 | **6** | 5 | **21,5** | 16 | **80** | 9 | 158 | 190 | 140 | **10** | 339 | 371 | AU 13,5 |
| 1.KZK 90 | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | L | | | | | | | | | | | | | | | | | | | | | | | | | | | | ,5 |

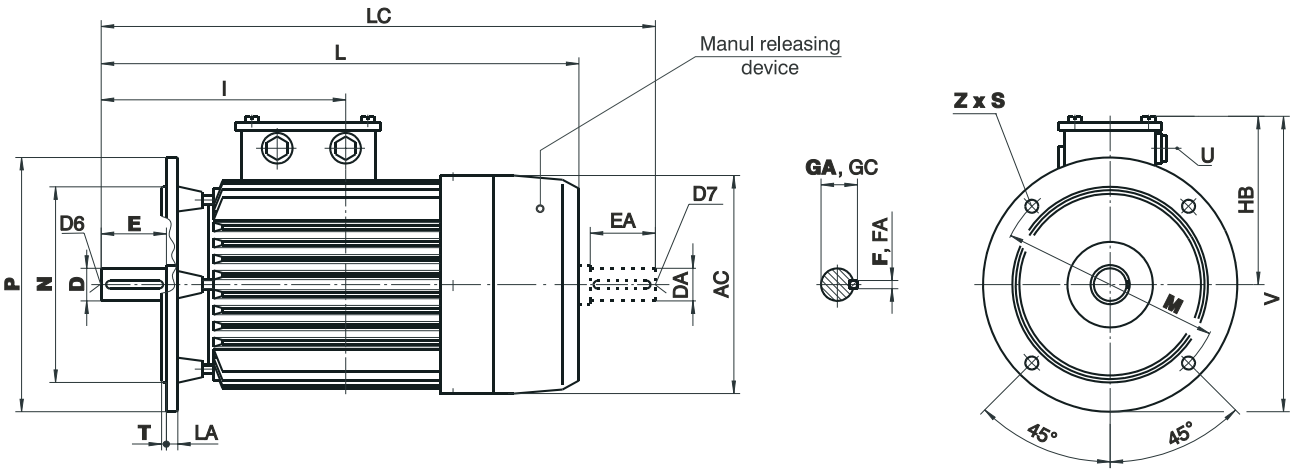
Not in the production program




| Type | | Pole | A | AA | AB | AC | B | BA | BB | C | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | H | HA | HC | HD | I | K | L | LC | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.KZK 100 | L | 2...8 | **160** | 44 | 204 | 193 | **140** | 50 | 175 | **63** | **28** | 24 | M10 | M8 | **60** | 50 | **8** | 8 | **31** | 27 | **100** | 14 | 194 | 257 | 193 | **12** | 466 | 520 | AU 16 |
| | Ld | 4; 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.KZK 112 | M | 2...8 | **190** | 46 | 236 | 216 | **140** | 50 | 175 | **70** | **28** | 24 | M10 | M8 | **60** | 50 | **8** | 8 | **31** | 27 | **112** | 16 | 218 | 281 | 200 | **12** | 494 | 548 | AU 16 |

The dimensions given in bold figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in milimetres.

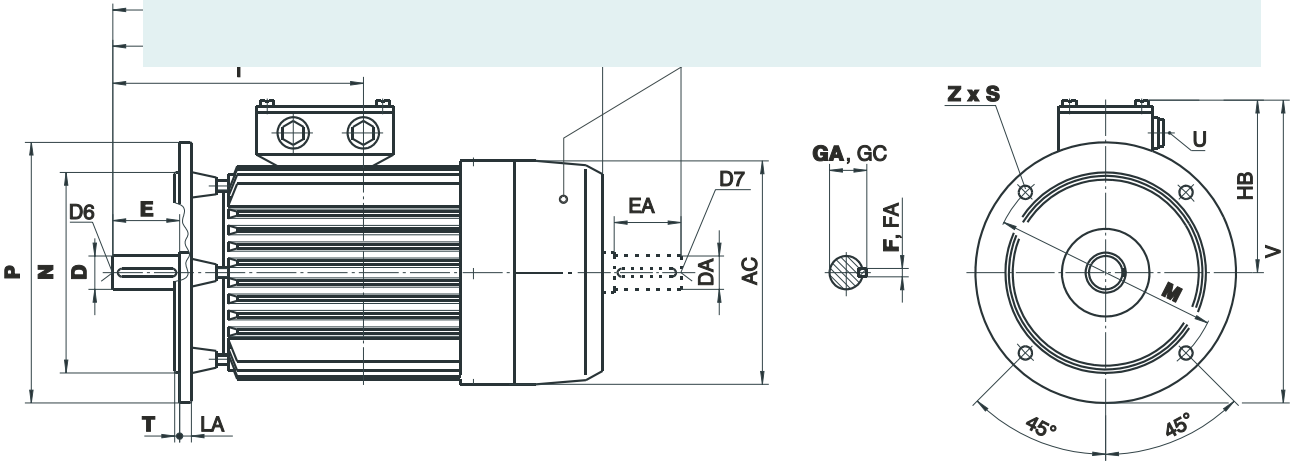
**IM B5, V1 - IM 3001, 3011**




| Type | | Pole | Flange | AC | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | HB | I | L | LA | LC | M | N | P | S | Z | T | V | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.KZK 71 | | 2...8 | FF-130 | 140 | **14** | 11 | M5 | M4 | **30** | 23 | **5** | 4 | **16** | 12,5 | 105 | 120 | 304 | 10 | 332 | **130** | **110** | **160** | **Ø10** | **4** | **3,5** | 185 | AU 13,5 |
| 1.KZK 80 | | 2...8 | FF-165 | 154 | **19** | 14 | M6 | M5 | **40** | 30 | **6** | 5 | **21,5** | 16 | 110 | 140 | 339 | 12 | 371 | **165** | **130** | **200** | **Ø12** | **4** | **3,5** | 210 | AU 13,5 |
| 1.KZK 90 | S | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | L | | | | | | | | | | | | | | | | | | | | | | | | | | 13,5 |

Not in the production program

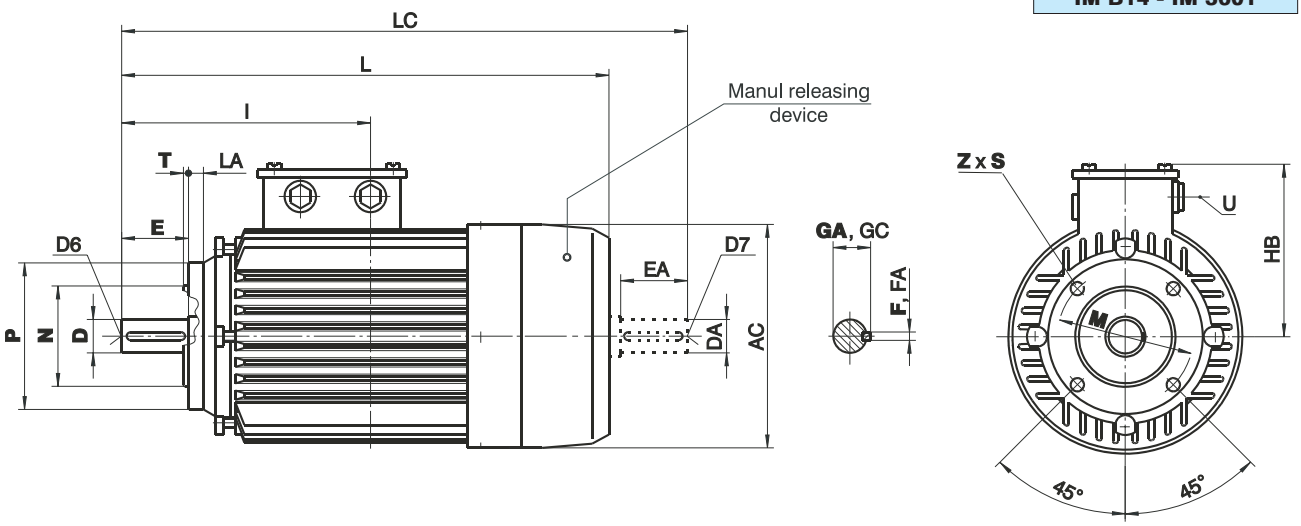
**11**




| Type | | Pole | Flange | AC | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | HB | I | L | LA | LC | M | N | P | S | Z | T | V | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.KZK 100 | L | 2...8 | FF 215 | 193 | **28** | 24 | M10 | M8 | **60** | 50 | **8** | 8 | **31** | 27 | 157 | 193 | 466 | 15 | 520 | **215** | **180** | **250** | **Ø15** | **4** | **4** | 282 | AU 16 |
| | Ld | 4; 8 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.KZK 112 | M | 2...8 | FF 215 | 216 | **28** | 24 | M10 | M8 | **60** | 50 | **8** | 8 | **31** | 27 | 169 | 200 | 494 | 16 | 548 | **215** | **180** | **250** | **Ø15** | **4** | **4** | 294 | AU 16 |

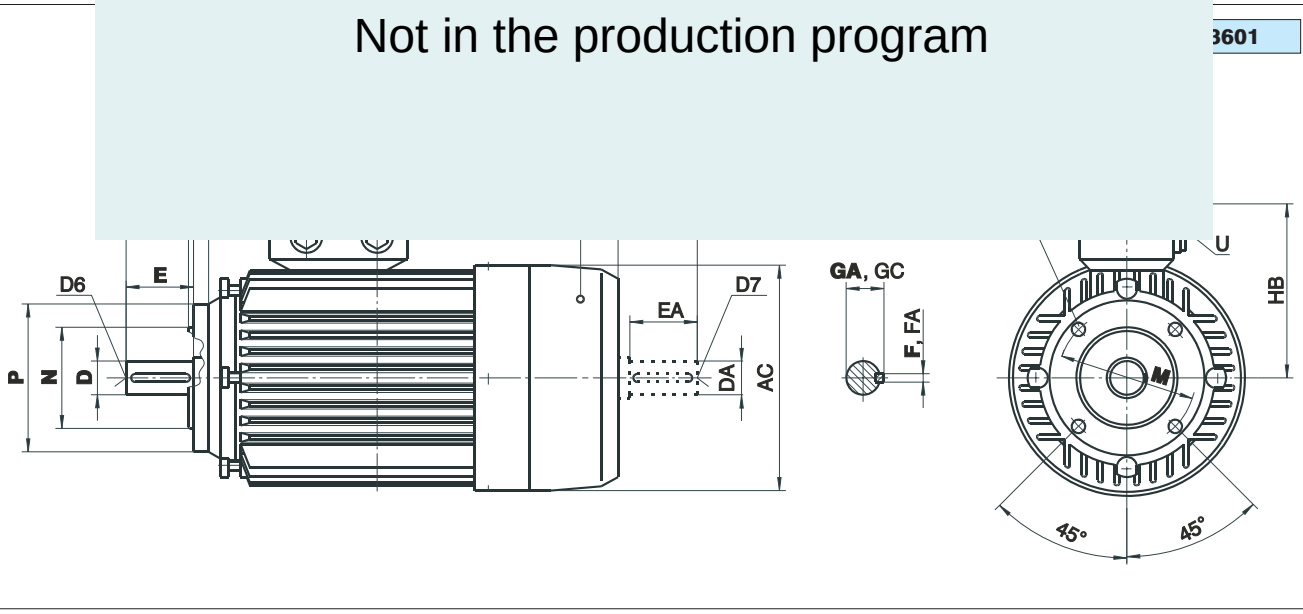
The dimensions given in bold figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in milimetres.

**IM B14 - IM 3601**



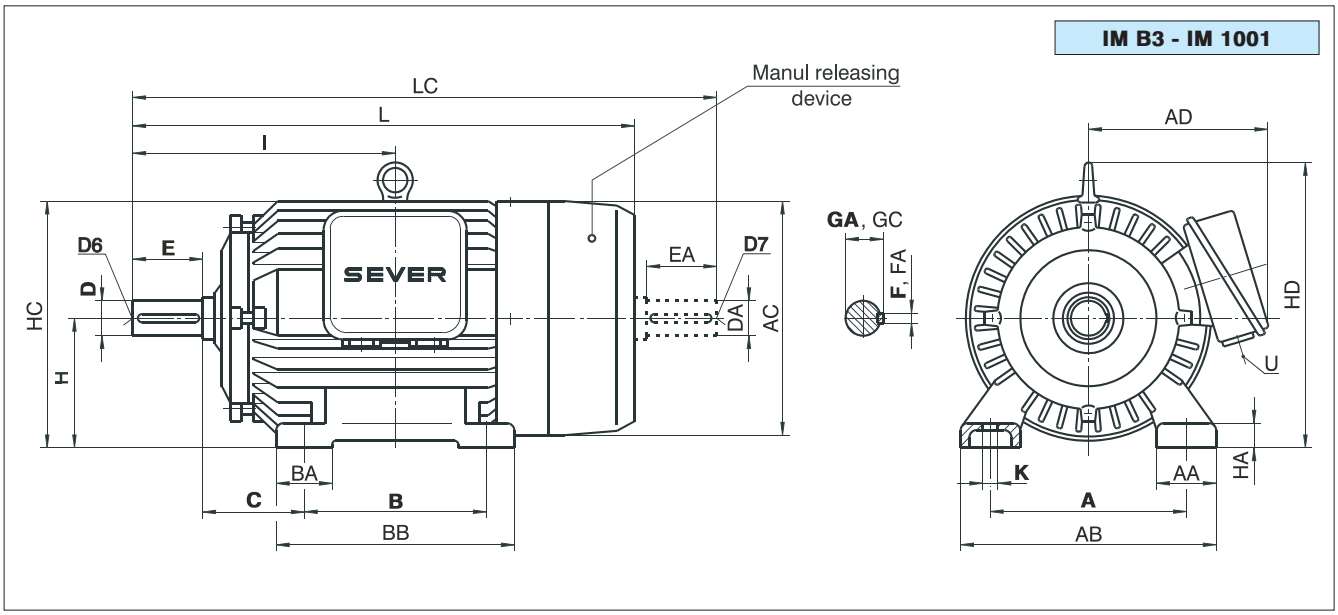

| Type | Pole | Flange | AC | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | HB | I | L | LA | LC | M | N | P | S | Z | T | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.KZK 71 | 2...8 | FT 85 | 140 | **14** | 11 | M5 | M4 | **30** | 23 | **5** | 4 | **16** | 12,5 | 105 | 120 | 304 | 8 | 332 | **85** | **70** | **105** | **M6** | **4** | **2,5** | AU 13,5 |
| | | FT 115 | | | | | | | | | | | | | | | 10 | | **115** | **95** | **140** | **M8** | | **3** | |
| 1.KZK 80 | 2...8 | FT 100 | 154 | **19** | 14 | M6 | M5 | **40** | 30 | **6** | 5 | **21,5** | 16 | 110 | 140 | 339 | 10 | 371 | **100** | **80** | **120** | **M6** | **4** | **3** | AU 13,5 |
| | | FT 130 | | | | | | | | | | | | | | | 12 | | **130** | **110** | **160** | **M8** | | **3,5** | |
| 1.KZK 90 | | FT 115 | | | | | | | | | | | | | | | | | **115** | **95** | **140** | | | **3,5** | AU 13,5 |

Not in the production program




| Type | Pole | Flange | AC | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | HB | I | L | LA | LC | M | N | P | S | Z | T | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.KZK 100 L | 2...8 | FT 130 | 193 | **28** | 24 | M10 | M8 | **60** | 50 | **8** | 8 | **31** | 27 | 157 | 193 | 466 | 10 | 520 | **130** | **110** | **160** | **M8** | **4** | **3,5** | AU 16 |
| | | FT 165 | | | | | | | | | | | | | | | 12 | | **165** | **130** | **200** | **M10** | | | |
| 2.KZK 100 Ld | 4; 8 | FT 130 | | | | | | | | | | | | | | | 10 | | **130** | **110** | **160** | **M8** | | | |
| | | FT 165 | | | | | | | | | | | | | | | 12 | | **165** | **130** | **200** | **M10** | | | |
| 2.KZK 112 M | 2...8 | FT 130 | 216 | **28** | 24 | M10 | M8 | **60** | 50 | **8** | 8 | **31** | 27 | 169 | 200 | 494 | 10 | 548 | **130** | **110** | **160** | **M8** | **4** | **3,5** | AU 16 |
| | | FT 165 | | | | | | | | | | | | | | | 12 | | **165** | **130** | **200** | **M10** | | | |

The dimensions given in bold figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in milimetres..

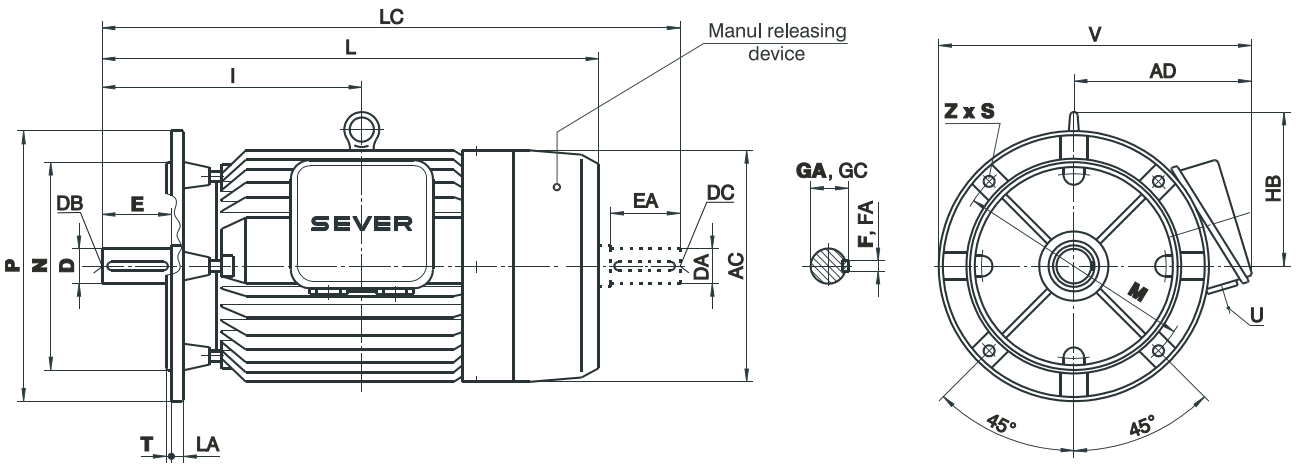



| Type | Pole | A | AA | AB | AC | AD | B | BA | BB | C | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | H | HA | HC | HD | I | K | L | LC | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.KZK 132 Sk | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 132 S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 132 Mk | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 132 M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 160 Mk | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 160 M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 160 L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 180 M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 180 L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 200 Lk | 4; 6; 8 | **318** | 80 | 398 | 369 | 299 | **305** | 95 | 375 | **133** | **55** | 38 | M20 | M12 | **110** | 80 | **16** | 10 | **59** | 41 | **200** | 30 | 387,5 | 440 | 395,5 | **18** | 926 | 1008 | AU 36 |
| 1.KZK 200 L | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 225 S | 4; 8 | **356** | 90 | 446 | 418 | 337 | **286** | 110 | 355 | **149** | **60** | 38 | M20 | M12 | **140** | 80 | **18** | 10 | **64** | 41 | **225** | 35 | 438 | 500 | 432 | **18** | 976 | 1060 | AU 36 |
| 1.KZK 225 M | 4; 6; 8 | | | | | | **311** | | 380 | | | | | | | | | | | | | | | | 444,5 | | 1001 | 1085 | |

Not in the production program

The dimensions given in bold figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in milimetres..

**IM B5, V1 - IM 3001, 3011**




| Type | | Pole | Flange | AC | AD | D | DA | D6 | D7 | E | EA | F | FA | GA | GC | HB | I | L | LA | LC | M | N | P | S | Z | T | V | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.KZK 132 | Sk | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | S | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Mk | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | M | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 160 | M | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Mk | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | L | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 180 | M | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | L | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 200 | Lk | 6 | FF 350 | 369 | 299 | **55** | 38 | M20 | M12 | **110** | 80 | **16** | 10 | **59** | 41 | 240 | 385,5 | 926 | 20 | 1008 | **350** | **300** | **400** | **Ø19** | **4** | **5** | 499 | AU 36 |
| | L | 4; 8 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.KZK 225 | S | 4; 8 | FF 400 | 418 | 337 | **60** | 38 | M20 | M20 | **140** | 80 | **18** | 10 | **64** | 41 | 275 | 432 | 976 | 20 | 1060 | **400** | **350** | **450** | **Ø18** | **8** | **5** | 537 | AU 36 |
| | M | 4; 6; 8 | | | | | | | | | | | | | | | 444,5 | 1001 | | 1085 | | | | | | | | |

The dimensions given in bold figures are obligatory according to the recommendation of IEC. All other technical data and dimensions during the future development of motors may undergo some changes and therefore they can be considered as obligatory after our confirmation only. All dimensions are given in milimetres.

## STANDARDS

Our three - phase TEFC induction cage motors satisfy the following standards:

IEC 60034-1 - Rating and performances;
IEC 60034-2 - Methods of determining efficiency;
IEC 60034-5 - Degree of mechanical protection;
IEC 60034-6 - Methods of cooling;
IEC 60034-7 CODE II - Mounting arrangements;
IEC 60034-8 - Terminal markings;
IEC 60034-9 - Noise limits;
IEC 60034-11 - Built - in thermal protection;
IEC 60034-12 - Starting performances;
IEC 60034-14 - Mechanical vibrations, limit values;
IEC 60034-17 - Converter fed induction motors;
IEC 60038 - Standard voltage;
IEC 60072-1 - Mounting dimensions;
IEC 60085 - Insulation material classification.

Our motors carry CE mark as a sign of a product conformity to the requirements of all applicably directives of European Union, especially concerning safety, life and health protection, environment protection and consumer protection:

Low Voltage Directive 73/23/EEC, modified by 93/68/EEC;
Electromagnetic compatibility Directive 89/336/EEC modified by 92/31 EEC
Machinery Directive 89/392/EEC modified by 91/368/EEC, 93/44/EEC and 93/68EEC.

Quality assurance system of SEVER motor factories is certified according to the international standard ISO9001.

## VOLTAGE AND FREQUENCY

The motors are produced for the rated supply voltage 3 x 400 V ±10%, 50Hz. This means that on a special request of the standards this motor can operate at supply voltages:

- 220/380 V ± 5%,
- 230/400 V ±10%,
- 240/415 V ± 5%.

Motors up to 1,5 kW are connected in star (Y), and above that in delta ( ) connection. On a special request the motors can be executed also for other voltages and winding connections unto 690 V.

These motors can operate at frequency of 60 Hz as well with suitable changes of electrical parameters.

## OUTPUT

The rated motor powers given in the performance data tables refer to continuous running duty. According to that the motors must be connected to the network of rated voltage and frequency, and the ambient temperature must not exceed 40°C. Motors for special operating conditions: temperature above 40°C, altitude above 1000 m, frequent starting or starting heavy flywheel masses are available on a special enquiry.

## SPEED

Data given in the schedules comply to the rated load at rated voltage and frequency.

## ELECTROMAGNETIC BRAKE

The coil of electromagnetic brake is supplied with d.c. from a rectifier During the normal operation the coil of electromagnetic brake suoolied with d.c. develops the magnetic field which attracts the pressing sheet made of feromagnetic material. Forces developod from a magnetic field are sufficient to overcome the springs of the brake. On this way the disc is released so that it can rotate with the rotor. Interruption of the power supply put the brake on. The magnetic field is interrupted and the forces of the springs impede the disc. Result of this action is the rapid motor breaking. If it is necessary the brake can be adjust to act if one of the line is broken. The motor are delivered with normal reaction time, but on the request they can be delivered with rapid reaction time. Every motor is provided with instruction and connection diagram. The rated voltage of the brake is stamped on the name plate of the motor. On special request other voltage can be provided for the coil. In such case please consult the factory. Braking disc is provided with braking sheets without asbestos.

## BRAKING TORQUE

The braking torques given in the schedules are maximum values. Standardly the braking torques are adjusted at maximum values. On special request these values can be reducedby removing two or four springs. So these values can be 75 or 50% of maximum values. On the request we produced also the motors with another values of braking torques. It is possible to achieve by using the special springs built in the brake.

## PERMISSIBLE NUMBER OF STARTINGS PER HOUR

The figures given in the Table 3 are the maximum numbers of the starts permissible in one hour without any load. These values are basis for calculation the permissible number of starts per hour for the following cases:

- Fly-mass of load;
- Resisting torque;
- For combined conditions of Fly-mass and resisting torque.

The permissilble numbers of startings per hour for these cases are given as a product of responsible factors and permissible number of startings at no load. The equations for calculation are given at the end of this paper.

## RELEASING DEVICE OF THE BRAKE

Standardly these motors are delivered with manual releasing device.

## MECHANICAL PROTECTION

Mechanical protection of the motor is IP54 according to the IEC 60034-5. Protection of terminal box is IP55 by which is disabled penetration of water jet.

## CONVERTER FED MOTORS

The motors are suitable for operation by electronic converters since the winding insulation of the motors endures certain voltage overloading. Generally, motors operated by converters have higher level of losses, vibrations and noise. So, during the motor operation performed from converter it is necessary to de-rate the motor, depending on speed range, torque-speed characteristics of the load, type of cooling and type of converter. Therefore when placing an order note that the motor will be operated by converter.

## MECHANICAL DESIGN AND MOUNTING ARRANGEMENTS

Some parts of the motor and the basic materials used in design are shown in the following table:

| Motor parts | Frame size (shaft height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 |
| Stator frame | Silumine | | | | | Cast iron | | | | |
| End shield B3 | Silumine | | | | | Cast iron | | | | |
| End shield B5 | Cast iron | | | | | | | | | |
| End shield B14 | Cast iron | | | | | Not available | | | | |
| Feet | Cast on | | Bolted | | | | Cast on | | | |
| Fan cover | Steel | | | | | | | | | |
| Fan | Polypropylene | | | | | | | | | Silumine |

The motors are designed for three basic mounting arrangements: IM B3 (IM 1001), IM B5 (IM 3001) and IM B14 (IM 3601) - only up to frame size 112. All mounting arrangements are in accordance with the IEC 60034-7.

## BEARINGS

Technical solution for bearing arrangement provides quiet and long - term motor operation. The bearing performances and dimensions can be shown in Table 1, page 13.

## LUBRICATION

The bearings for motor up to frame size 160 are lubricated for life and regreasing is not possible. With frame size 180-225 the bearings are lubricated by the motor manufacturer and cannot be relubricated without disassembling the motor end shields as it is indicated in Table 1, page 13. All data in the table refer to the ambient temperature up to 40 °C.
Standard used greases are lithium based.

## COOLING

The motors are surface cooled with their own fan, which is protected with special cover. All the motor up to frame size

200 have fans made of polypropylene. For all other frame size fans are made of aluminum alloy except for frame size 355 and 400 swich are made of steel.

## WINDING INSULATION

Stator and brake windings are manufactured in the class of insulation “F”. This system of insulation is suitable for temperature rise limit of 105 K above ambient temperature of 40 °C. Motor heating satisfies insulation in class “B” (80 K).

## TOLERANCES

All mechanical dimension of electric motors and their tolerances are in accordance with the IEC 60072-1 and are shown in the following table:

| Term | Design. | Dimension | Tolerance |
|---|---|---|---|
| **Shaft diameter** | **D, DA** | 28 mm<br>28 mm<br>50 mm | i6<br>k6<br>m6 |
| **Flange spigot diameter** | **N** | 450 mm | j6 |
| **Flange pitch diameter** | **M** | 200 mm<br>200 mm | 0.25 mm<br>0,50 mm |
| **Foot fixing dimension** | **A, B** | 250 mm<br>250 mm | 0.75 mm<br>1,00 mm |
| **Shaft height** | **H** | 250 mm | - 0,50 mm |

All electrical tolerances for rated values of the motor are in accordance with IEC 60034-1 and are shown in the following table:

| Term | Design. | Dimension | Tolerance |
|---|---|---|---|
| **Efficiency** | $\eta$ | $P_N$ 50 kW<br>$P_N$ 50 kW | - 0,15 (1- )<br>- 0,10 (1- ) |
| **Power factor** | $\cos\varphi$ | | $-\frac{1-\cos}{6}$, Min 0.02 Max 0.07 |
| **Slip** | **s** | $P_N$ 1 kW<br>$P_N$ 1 kW | 30 %<br>20 % |
| **Locked rotor current** | $I_1$ | | 20 % |
| **Locked rotor torque** | $M_1$ | | - 15 %<br>25 % |
| **Breakdown torque** | $M_b$ | | - 10 % |
| **Moment of inertia** | **J** | | 10 % |

## ROTOR AND SHAFT EXTENSION

The rotors are cage type, normally designed with one cylindrical shaft extension. On special request they can be designed also with two fee shaft extensions, with taper shaft extension and other special shaft extensions. The dimensions of free shaft extensions are in conformity with the recommendations of the publication IEC 60072 - 1, fifth edition. The central box of the shaft extension is given on dimension drawings. In order to keep load of bearings and of shaft extension within the allowed limits, there must be paid attention to the radial and axial forces and to the type of transmission from a motor to a working machine.

## MULTI SPEED MOTORS

Double speed motors with speed ratio 2:1 are produced with windings connected in D/YY. For another speed ratio the connections are Y/Y.

## TERMINAL BOX

In the terminal box it is located a rectifier.

Motors up to frame size 112 are designed with terminal box on the top. From frame size 132 to 225 (1.ZK) the motors are designed with right hand side terminal box, and left hand side position is available on request. Terminal markings are in accordance with the IEC 60034 - 8. The main terminal box data are shown in table 2, page 13.

## BALANCING AND VIBRATIONS

The rotors are balanced dynamically with half key on the drive shaft end, in quality which is in accordance with the requirements of the IEC 60034, part 14.

The limits of vibration severity are shown in the following table:

| Grade | Limits of vibration severity in $mms^{-1}$ (effective) for frame size H in mm | | |
|---|---|---|---|
| | Speed range $min^{-1}$ | Free suspension | |
| | | 71<H≤132 mm | 132<H≤225 mm |
| **N** | 600≤n≤3600 | 1,80 | 2,80 |
| **R** | 600≤n≤1800 | 0,71 | 1,12 |
| | 1800<n≤3600 | 1,12 | 1,80 |
| **S** | 600≤n≤1800 | 0,45 | 0,71 |
| | 1800<n≤3600 | 0,71 | 1,12 |

The motor with lower vibration severity grade “R” or “S” (special) are available on a special request.

## NOISE

The motors satisfy the noise level in accordance with the IEC 60034 - 9. The noise levels shown in the following table refer to a no-load motor at the indicated voltage, 50Hz, cooling type IC 411 and mechanical protection IP 54. Tolerance is + 3 dB (A).

| Noise levels dB (A) | | Frame size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 71 | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 |
| **2 pole** | **LpfA**[1] | 58 | 62 | 65 | 71 | 73 | 78 | 80 | 78 | 85 | 82 |
| | **LwA** [2] | 69 | 73 | 77 | 83 | 85 | 90 | 94 | 92 | 98 | 96 |
| **4 pole** | **LpfA** | 41 | 50 | 52 | 55 | 60 | 62 | 65 | 73 | 71 | 74 |
| | **LwA** | 52 | 61 | 64 | 67 | 72 | 74 | 78 | 87 | 84 | 88 |
| **6 pole** | **LpfA** | 39 | 46 | 51 | 59 | 58 | 71 | 66 | 61 | 67 | 72 |
| | **LwA** | 50 | 57 | 63 | 71 | 70 | 83 | 78 | 75 | 81 | 86 |
| **8 pole** | **LpfA** | 37 | 45 | 51 | 52 | 55 | 57 | 62 | 64 | 64 | 71 |
| | **LwA** | 48 | 56 | 63 | 64 | 67 | 69 | 74 | 77 | 77 | 86 |

**1) LpfA** - Sound pressure **, 2) LwA** - Sound power

## TORQUE CLASS

Motors of this catalogue and their characteristics of the starting torque are type "H", according to the IEC 60034-12. The motors are classified on the basis of torque class as follows: KR 10, KR 13 and KR 16. The motors of torque class KR 10 provide safe direct starting with torque load 100%, KR 13 with 130% and KR 16 with 160% of rated torque.

## OVERLOAD CAPACTIY

According to provisions of the JUS IEC 60034-1 motors can be overloaded, meaning that motors heated to on operating temperature can withstand current equal to 1.5 times the rated current for not less than 2 minutes. The same way, they can be overloaded by the torque 1.6 times the rated one for 15 seconds without stalling or abrupt in speed.

## HEATERS

On special request the motors can be equipped with heaters as a protection against condensed water. They could be exposed to danger of water condensation due to sudden and large changes of temperature during the motor stand still. During the motor operation the heaters must be switched off. The supply voltage and power of heating elements, which are fixed to the winding head are shown in the following table:

| Frame size H, mm | Supply voltage V | Heater's power $P_g$, W |
|---|---|---|
| **71-80** | 115 or 230 | 8 |
| **90-112** | | 25 |
| **132-160** | | 40 |
| **180-225** | | 80 |

## THERMAL PROTECTION

On a special request stator winding of the motor can be protected from overheating by using PTC thermistors according to the IEC 60034-11. In order to protect all the windings of the motor one PTC thermistor is embedded in each phase of the winding. The PTC thermistors are connected in series and two ends of such connection are led out in the terminal box. These two ends have to be connected to the control unit. Besides, the motors can be equipped with additional thermistors for alarm.

## FINISH PAINTING

Standard finish painting of the motors is performed by protective alkyd paint RAL 7001. For special climate conditions according to the IEC 60071-2-1 painting is performed by epoxy paint.

## PACKING

The motors of frame size 71 up to 132 are packed normally in cardboard boxes, while the motors of frame size 160 up to 225 are packed in wooden crates.

In order to prevent damaging of the bearing during the motor transportation, the motors of frame size 160 and above are delivered with fixed rotor.

## QNESTIONNAIRE

Please, answer the questions from the attached questionnaire as fully as possible, to enable offering of induction electric motors (page 15) and send it to the manufacturer.

### Bearings — Table 1

| Type | Drive end | Opposite end | | Grease | | Grease quantity | | Regreasing period, h | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insulation class | | | | Number of poles | | | |
| | | Horizontal design | Vertical design | B, F | H | g | $cm^3$ | 2 | 4 | 6 | 8,10,12 |
| 1.KZK 71 | 6203 2Z C3 | 6302 2RS C3 | | For life lubricated | | | | | | | |
| 1.KZK 80 | 6204 2Z C3 | 6204 2RS C3 | | | | | | | | | |
| 1.KZK 90 | 6205 2Z C3 | 6205 2RS C3 | | | | | | | | | |
| 2.KZK 100 | 6206 2Z C3 | 6206 2RS C3 | | | | | | | | | |
| 2.KZK 112 | 6206 2Z C3 | 6206 2RS C3 | | | | | | | | | |
| 1.KZK 132 | 6208 2Z C3 | 6208 2RS C3 | | | | | | | | | |
| 1.KZK 160 M, L | 6210 2Z C3 | 6210 2Z C3 | | | | | | | | | |
| 1.KZK 180 M, L | 6310 C3 | 6309 Z C3 | | Lithium based grease | Silicone based grease | Without regreasing device | | 10000 | 11500 | | |
| 1.KZK 200 L | 6312 C3 | 6311 C3 | | | | | | | 20000 | | |
| 1.KZK 225 M, S | 6313 C3 | 6311 C3 | | | | | | | | | |

### Terminal box — Table 2

| Type | Number of terminals | | Terminal stud thread | | Max. Permissible current A | | Number of entries | | Dimension of entries | | Max. Cable diameter mm | | Terminal box position |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | motor | ispravljač | motor | ispravljač | motor | ispravljač | motor | ispravljač | motor | ispravljač | motor | ispravljač | |
| 1.KZK 71 | 6[1] | - | M4 | M4 | 21 | - | 1 | 1 | AU 13,5 | č 9 | 13 | 12 | Top mounted only |
| 1.KZK 80 | | | | | | | | | | | | | |
| 1.KZK 90 | | | | | | | | | | | 16 | | Top mounted |
| 2.KZK 100 | | | | | | | | | AU 16 | | | | |
| 2.KZK 112 | | | | | | | | | | | | | |
| 1.KZK 132 | | | M5 | | 35 | | 2 | | AU 21 | | 21 | | Right hand side (left hand side on request) |
| 1.KZK 160 | | | M6 | | 60 | | | | AU 29 | č 11[1] | 30 | | |
| 1.KZK 180 | | | | | | | | | | | | | |
| 1.KZK 200 | | | M8 | | 100 | | | | AU 36 | | 38 | | |
| 1.KZK 225 | | | | | | | | | | | | | |

### Technical data for brakes — Table 3

| BRAKE TYPE | MOTOR TYPE | Max. braking torque $M_{k\ max}$ Nm | Reaction time $t_1$ sec | Switch off time D.C. terminals $t_2$ sec | Switch off time A.C. terminals $t_3$ sec | Input of the coil cold W | Input of the coil hot W |
|---|---|---|---|---|---|---|---|
| K- 70 | 1.KZK 71 | 5 | 0,08 | 0,02 | 0,06 | 28 | 21 |
| K- 80 | 1.KZK 80 | 10 | 0,1 | 0,025 | 0,07 | 40 | 32 |
| K- 90 | 1.KZK 90 | 20 | 0,15 | 0,04 | 0,08 | 51 | 43 |
| K-100 | 2.KZK 100 | 50 | 0,25 | 0,05 | 0,12 | 75 | 56 |
| | 2.KZK 112 | | | | | | |
| K-132 | 1.KZK 132 | 100 | 0,21 | 0,04 | 0,21 | 96 | 75 |
| K-160 | 1.KZK 160 | 200 | 0,3 | 0,06 | 0,25 | 130 | 100 |
| K-160 | 1.KZK 180 | 200 | 0,3 | 0,06 | 0,25 | 130 | 100 |
| K-180 | | 400 | 0,38 | | | | |
| K-160 | 1.KZK 200 | 200 | 0,38 | 0,06 | 0,48 | 130 | 100 |
| K-180 | | 400 | | | | | |
| K-180 | 1.KZK 225 | 400 | 0,38 | 0,06 | 0,48 | 130 | 100 |

[1] 12 terminals available on request for all types of frame size 90.

## Formulas for corection factors calculation

$Z = K_{dt}\ Z_0$

$K_{dt} = K_d\ K_1$

$K_d = \frac{J_m}{J_u}$

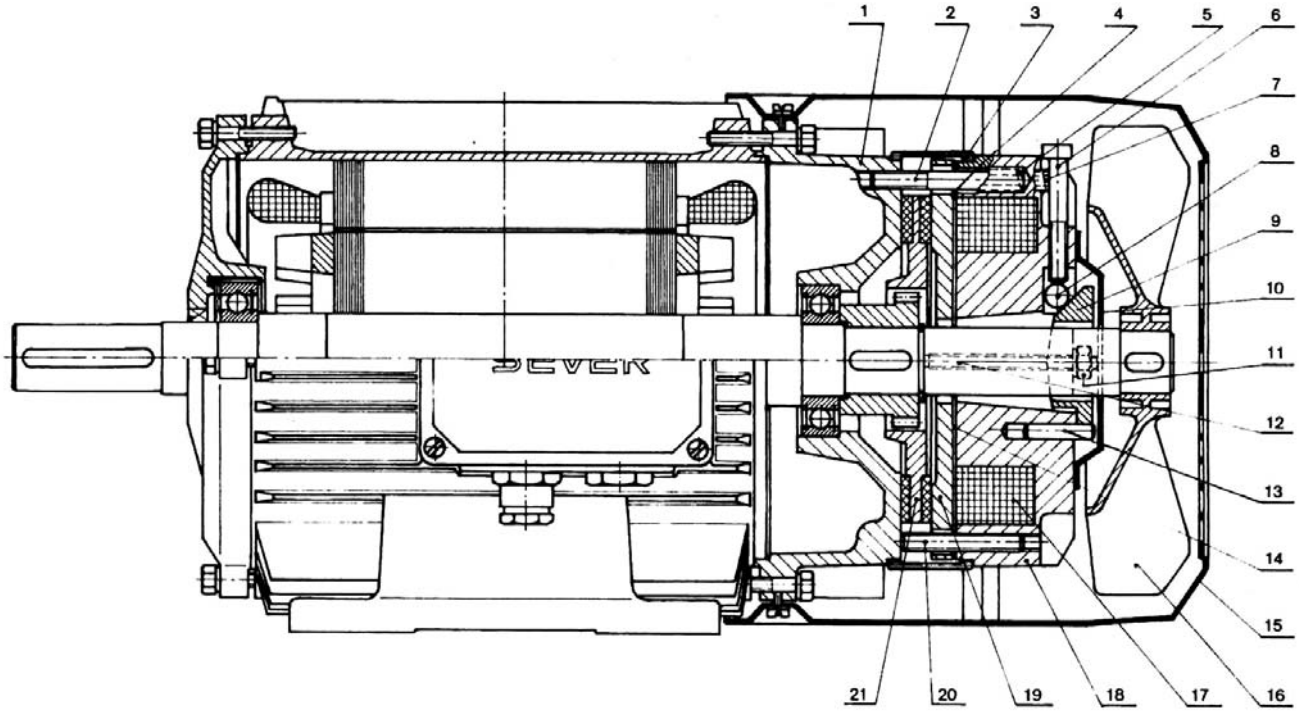
$J_u = J_m + J_d$

$K_1 = 1 - \frac{M_t}{\alpha M_n}$

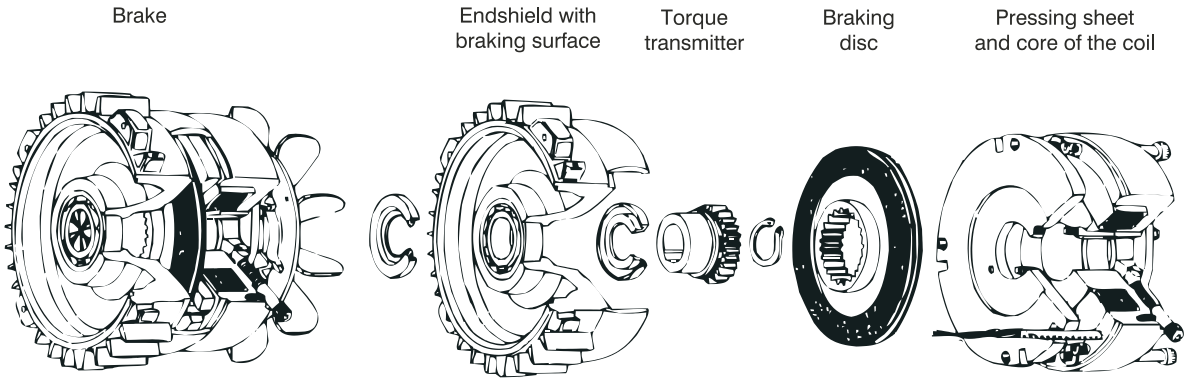
$t_k = \frac{J_u\ n}{9{,}55\ M_k}$ t2 ili t3

Z = Permissible number of startings
$Z_0$ = Permissible number of startings at no load
$K_{dt}$ = Total factor
$K_d$ = Fly-mass factor
$K_1$ = Load factor
$J_u$ = Total moment of inertia reduced on the motor speed
$J_m$ = Moment of inertia of the motor
$J_d$ = Moment of inertia of the load reduced on the motor speed
$M_t$ = Load torque
$M_N$ = Rated torque
$\alpha$ = Torque factor
for 2p=4 $\alpha$=2
for 2p=6 $\alpha$=1,8
for 2p=8 $\alpha$=1,5
$t_k$ = Braking time
$M_k$ = Braking torque
$t_1$, $t_2$, $t_3$ - The values given in the table 3

## ELECTROMOTOR WITH BRAKE TYPE: (2.) 1.KZK




1. Endshield with braking surface
2. Main screw
3. Protecting rubber
4. Distant washer
5. Spring of manual releasing device
6. Screw of manual releasing device
7. Braking spring
8. Roller of manual releasing device
9. Ring of manual releasing device
10. Cover
11. Screw nut for adjusting
12. Stud bolt
13. Limiter
14. Air gap
15. Fan cover
16. Fan
17. Coil
18. Core of the coil
19. Pressing screw
20. Distant screw
21. Braking disc



# QUESTIONNAIRE FOR THE OFFER OF ASYNCHRONOUS ELECTRIC MOTORS

ATB SEVER
Technology in Motion

Enquiry Number:

Customer: _____ ITEM: _____ Qty: _____

## A MOTOR DATA

1 Motor type: Three phase: Single phase:
2 Rotor type: Squirrel cage: Slip-ring:
3 Rated output: $P_N$= _____ kW
4 Rated voltage: $U_N$= _____ V Connect: Star Delta
5 Rated frequency: $f_N$= _____ Hz
6 Rated speed: $n_N$= _____ rpm
7 Insulation class: F ☐ B ☐
8 Duty type:

| | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|
| ED % | | | | | | | | | | |

starts /h _____ min _____ $J_{mot}$ _____ kgm$^2$
9 Standard: _____ IEC or _____
10 Cooling method: _____ IC
11 Mounting arrengement: IM
12 Protection degree: Motor IP: _____ Terminal box IP: _____
13 *Sense of rotation: Left Right Both
14 Motor brake: yes ☐ no ☐
Braking moment: _____ Nm
Brake voltage: _____ V/Hz _____ V,DC
15 No-load regime? (single phase motor) yes no
16 Rotor data: $U_{2c}$= _____ V $I_{2n}$= _____ A

## B DATA ABOUT THE DRIVEN MACHINE

1 Type:
2 Required power:
3 Required speed:
4 Load torque characteristic:
Constant: Squared _____ or _____

| Speed %: | 0 | 25 | 50 | 75 | 100 |
|---|---|---|---|---|---|
| Torque Nm: | | | | | |

5 Moment of inertia: J= _____ kgm$^2$
6 Running machine special data:

## C AMBIENT CONDITIONS

1 Ambient temperature: C
2 Relative humidity: %
3 Altitude (above sea level): m
4 Specific ambient conditions:

You are kindly requested to provide us with as much data as possible thus enabling us to offer satisfactorily

## D POWER TRANSMISSION AND STARTING CONDITIONS

1 Coupling type:
2 Starting:
3 Number of consecutive startings:
Hot state: Cold state:
_____ per hour _____ per hour
_____ per day _____ per day

## E ADDITIONAL REQUESTS FOR MOTOR EXECUTION

1 Overloading from: _____ % $P_N$
Duration: _____ min
2 Temperature rise: F ☐ B ☐
3 Request for: vibration level _____ mm/s
noise level _____ db
4 *Terminal box position:
left ☐ right ☐ On top ☐
5 Additional shaft loading sense
axial force radial force
6 Converter feed operation: yes ☐ no ☐
Converter type: _____
Manufacturer: _____
Speed range: from _____ to _____ rpm
7 Sensor category (mark in lower field):

| Taho gen. | Encoder | Absolute | Resolver |
|---|---|---|---|
| | | | |

Sensor Type: _____
8 Flange size: _____ mm
9 Second shaft end: yes ☐ no ☐
DA= _____ mm EA= _____ mm
10 Other requests and limits:

## F ADDITIONAL EQUIPMENT, SPARE PARTS AND DOCUMENTATION

1 Thermal protection: yes ☐ no ☐
Type: _____
2 Bearings thermometers yes ☐ no ☐
3 Anti-condesation heaters yes ☐ no ☐
4 Spare parts yes ☐ no ☐
5 Guarantee sheet yes ☐ no ☐
6 Language of instruction list:
7 Other requests for packing:

## H CUSTOMER

1 Company:
2 Adress:
3 City:
4 Country:
5 Person:
6 Telefon / Telefax:
7 e-mail:



* OBSERVED FROM DRIVE END

## ATB Group - a global player

a company of **A-TEC** INDUSTRIES AG





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