

ESS MCA “Quickcheck” Standards List

Standard Motors

| Supplier | Motor | Current bipolar (A) | Holding torque (Nm) | Rotor inertia (kg/cm ²) | Flange size (mm) | NEMA | Shaft diameter | Price (EUR) |
|----------|-----------------------|---------------------|---------------------|-------------------------------------|------------------|------|----------------|-------------|
| Phytron | ZSS 33.200.1.2 | 1.2 | 0.075 | 0.018 | 32.0 | - | 4.00 | 198.00 |
| Phytron | ZSS 43.200.2.5 | 2.5 | 0.260 | 0.077 | 42.0 | - | 5.00 | 285.00 |
| McLennan | 23HT18C330 | 2.1 | 1.350 | 0.430 | 56.4 | 23 | 6.35 | 121.55 |
| McLennan | 34HT18C340 | 2.8 | 7.350 | 4.800 | 86.0 | 34 | 12.70 | 269.43 |
| Stoegra | SM 107.4.18 J6 | 6.0 | 17.000 | 16.000 | 108.0 | 42 | 15.87 | 1 028.65 |

Vacuum and Radiation Motors

| Supplier | Motor | Current (A) | Holding torque (Nm) | Rotor inertia (kg/cm ²) | Flange size (mm) | NEMA | Shaft diameter | Price (EUR) |
|----------|-----------------------|-------------|---------------------|-------------------------------------|------------------|------|----------------|-------------|
| Phytron | VSS 43.200.2.5 | 2.5 | 0.235 | 0.077 | 42.0 | - | 5.00 | 902.00 |
| Phytron | VSS 57.200.2.5 | 2.5 | 0.840 | 0.240 | 60.0 | 24 | 6.35 | 814.00 |
| Phytron | VSS 80.200.5 | 5.0 | 2.300 | 1.240 | 80.0 | - | 10.00 | 1 247.00 |
| Phytron | VSS 100.200.10 | 10.0 | 4.300 | 4.400 | 100.0 | - | 12.00 | 1 689.00 |

Encoders

Posital OCD-S101G-1416-B14V- PAL 16

Baumer BMMV 30S1G

Phytron ZSS/ZSH Series

Dimensions / Electrical and Mechanical Characteristics

| VSS/VSH Standard 200-steps 4 lead parallel ³⁾ | Electrical Characteristics | | | Mechanical Characteristics | | | | | | | Dimensions in mm | | | | | | | | | | | | | |
|--|--|---|--|----------------------------|-----|---------------------------------|--------------------|---------------|--------|--------|------------------|-------|------|-------|-----|-----|------|------------------|------------------|------|-----|------|------|------|
| | Current/ Phase I _N | Resistance/ Phase | Inductivity/ Phase | max. operating voltage | AWG | Holding torque ²⁾ | Detent torque | Rotor inertia | Loads | | Mass | A | B1 | D | E | F1 | F2 | G1 ⁴⁾ | G2 ⁴⁾ | K | L | M | N | |
| | | | | | | | | | axial | radial | | | | | | | | | | | | | | |
| A | Ω | mH | V _{DC} | | mNm | mNm | kg cm ² | N | N | kg | | | | | | | | | | | | | | |
| 19.200.0.6¹⁾ 19.200.1.2¹⁾ | 0.6 1.2 | 2.1 0.63 | 0.85 0.23 | | | 28 | 3.4 3.5 | 0.9 | 0.0009 | 3 | 3 | 0.05 | 19 | 26.5 | 1 | 2 | 7.5 | 6.5 | 2.5 | 2.5 | 19 | 10 | 16 | M2.5 |
| 20.200.0.6 20.200.1.2 | 0.6 1.2 | 3.45 0.95 | 1.1 0.4 | | | 28 | 8 | 1 | 0.002 | 3 | 3 | 0.075 | 19 | 43 | 1 | 2 | 7.5 | 6.5 | 2.5 | 2.5 | 19 | 10 | 16 | M2.5 |
| 25.200.0.6 25.200.1.2¹⁾ | 0.6 1.2 | 3.25 0.95 | 1.5 0.4 | | | 28 26 | 12 | 2 | 0.0025 | 5 | 5 | 0.08 | 25 | 31 | 1 | 2.5 | 9.5 | 8.5 | 3 | 3 | 25 | 14 | 21.5 | 2.2 |
| 26.200.0.6 26.200.1.2 | 0.6 1.2 | 5.85 1.7 | 3.2 1.0 | | | 28 26 | 28 | 1.9 | 0.006 | 5 | 5 | 0.13 | 25 | 47 | 1 | 2.5 | 9.5 | 8.5 | 3 | 3 | 25 | 14 | 21.5 | 2.2 |
| 32.200.0.6 32.200.1.2¹⁾ | 0.6 1.2 | 4.6 1.25 | 5.3 1.2 | | | 26 | 40 | 3 | 0.01 | 5 | 15 | 0.17 | 32 | 38.5 | 1 | 3 | 11 | 10 | 4 | 4 | 32 | 18 | 27 | 2.8 |
| 33.200.0.6 33.200.1.2¹⁾ | 0.6 1.2 | 7.5 1.9 | 9.3 2.2 | | | 26 | 68 | 3.3 | 0.018 | 5 | 15 | 0.26 | 32 | 57.5 | 1 | 3 | 11 | 10 | 4 | 4 | 32 | 18 | 27 | 2.8 |
| 42.200.1.2¹⁾ 42.200.2.5¹⁾ | 1.2 2.5 | 1.7 0.34 | 3 0.7 | | | 24 22 | 120 | 5 | 0.045 | 20 | 40 | 0.35 | 42 | 54 | 1 | 3 | 16 | 15 | 5 | 4 | 42 | 22 | 36 | 3.2 |
| 43.200.1.2¹⁾ 43.200.2.5 | 1.2 2.5 | 2.6 0.5 | 5.2 1.2 | | | 24 22 | 235 | 7 | 0.077 | 20 | 40 | 0.52 | 42 | 69 | 1 | 3 | 16 | 15 | 5 | 4 | 42 | 22 | 36 | 3.2 |
| 52.200.1.2 52.200.2.5 | 1.2 2.5 | 2.65 0.6 | 7 1.6 | | | 24 22 | 350 | 13 | 0.15 | 25 | 70 | 0.72 | 52 | 65 | 1.5 | 3.5 | 17.5 | 16 | 6 | 4 | 52 | 28 | 44 | 4.3 |
| 56.200.1.2 56.200.2.5 | 1.2 2.5 | 3.9 0.8 | 9.5 2.4 | | | 24 22 | 420 | 30 | 0.17 | 40 | 80 | 0.78 | 56.4 | 58.1 | 1.5 | 4.5 | 22 | 20.5 | 6.35 | 6.35 | 60 | 38.1 | 47.1 | 5.2 |
| 57.200.1.2 57.200.2.5¹⁾ | 1.2 2.5 | 3.9 0.8 | 11.6 2.9 | | | 24 22 | 840 | 50 | 0.24 | 40 | 80 | 0.99 | 56.4 | 74.1 | 1.5 | 4.5 | 22 | 20.5 | 6.35 | 6.35 | 60 | 38.1 | 47.1 | 5.2 |
| 80.200.5 | 5 | 0.4 | 2.3 | | | 18 | 2300 | 120 | 1.24 | 50 | 180 | 2.8 | 80 | 100 | 2 | 7.5 | 27 | 25 | 10 | 9 | 80 | 50 | 68 | 6.4 |
| 100.200.10 | 10 | 0.15 | 2.1 | | | 16 | 4300 | 140 | 4.4 | 70 | 300 | 5 | 100 | 125.5 | 2 | 8 | 32 | 30 | 12 | 12 | 100 | 60 | 86 | 6.4 |
| 126.200.10 | 10 | 0.23 | 3.9 | | | 16 | 13000 | 290 | 18.2 | 150 | 700 | 13.9 | 125 | 210 | 3 | 9.5 | 34 | 31 | 14 | 14 | 125 | 60 | 108 | 8.4 |

¹⁾ Preferred options: HV and UHVG in small quantities are available from stock

²⁾ Holding torque in bipolar mode with parallel windings, two phases on at rated current

³⁾ other step resolutions on demand (with different mechanical characteristics!)

⁴⁾ Shaft diameter tolerances: VSS 19 to 26: -0.005 to -0.009; from VSS 32: g5

All values given above refer to room temperature and atmospheric pressure.

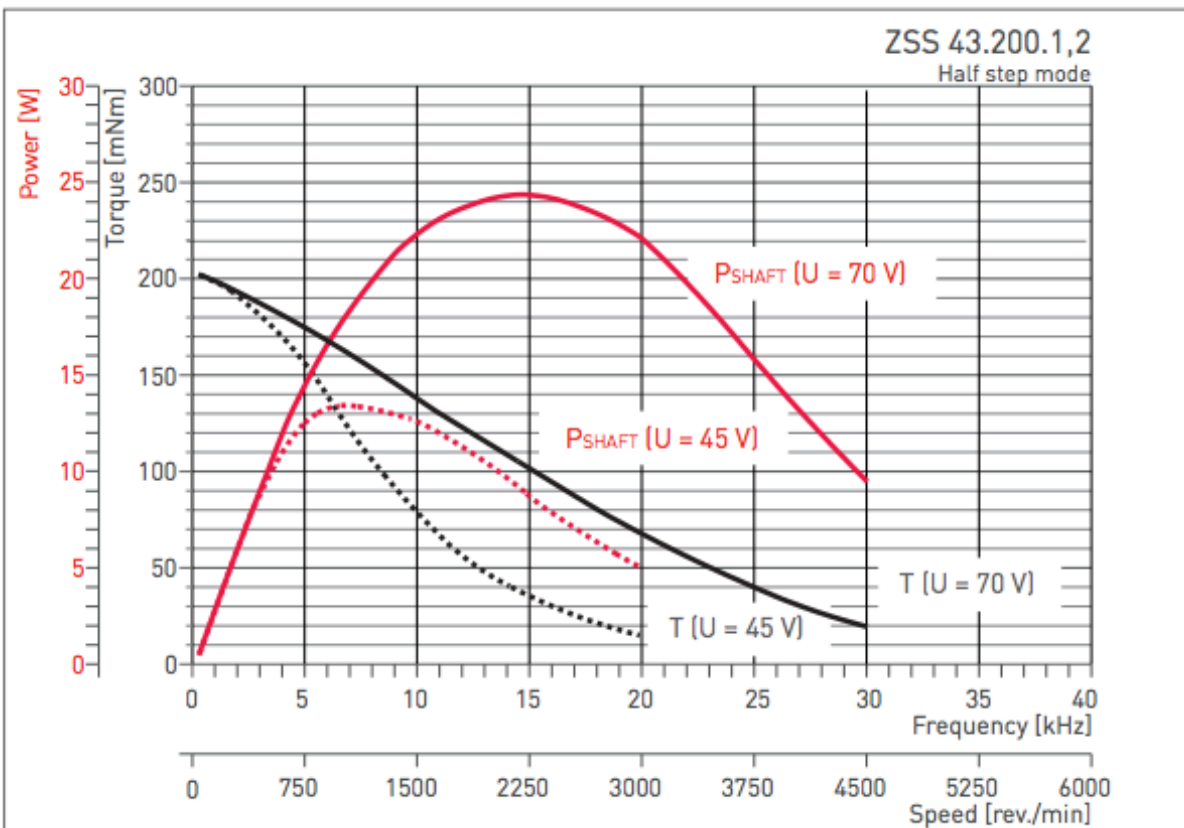
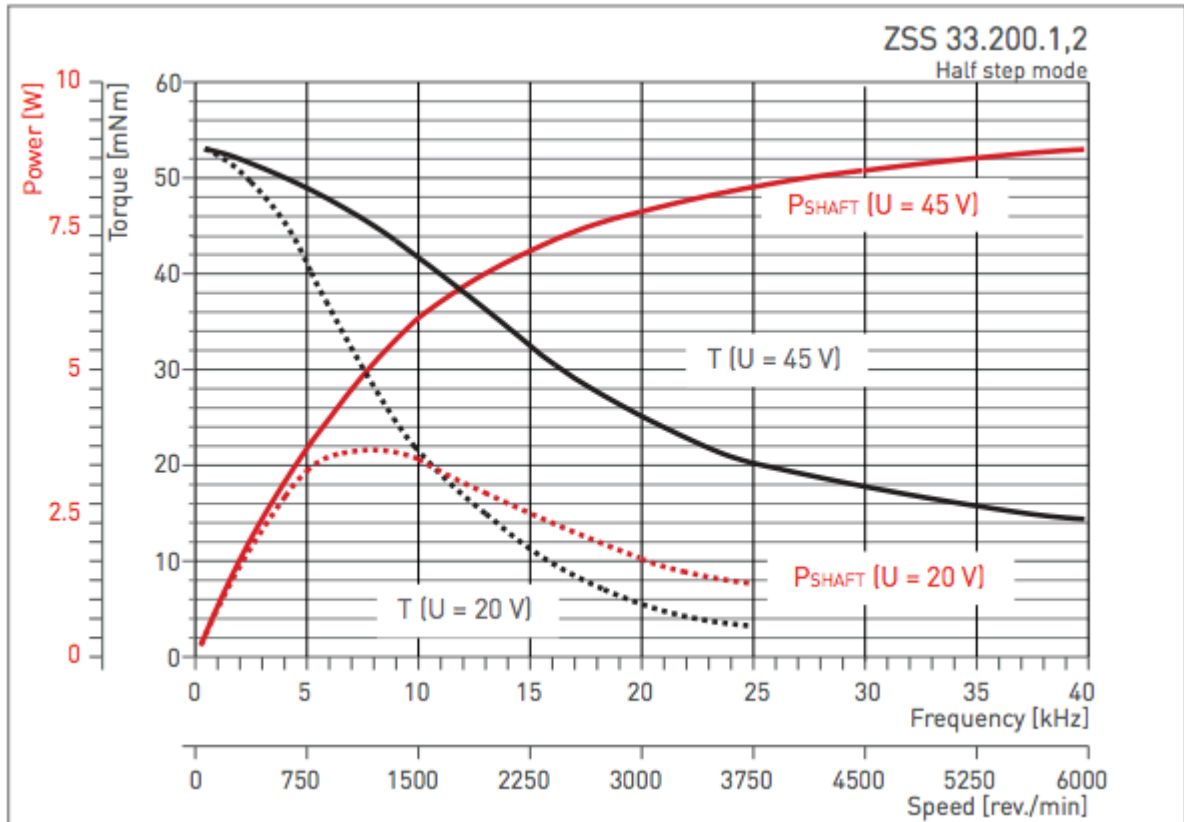
Gearboxes for use with ZSS/ZSH Series

Mechanical Characteristics

| Gear | Stepper motor | Gear backlash ¹⁾⁵⁾⁶⁾⁷⁾ | | | Rated torque ^{4) 6)8)} | | | Gear inertia | | | Radial load ²⁾ | Axial load | Efficiency at full load ³⁾ | | | reduction ratio i[:1] | | |
|----------|--------------------|-----------------------------------|----------|----------|---------------------------------|------------|------------|--------------------|-------|-------|---------------------------|------------|---------------------------------------|---|---|-----------------------|--|--|
| | | arc-min | | | Nm | | | kg cm ² | | | N | N | % | | | i[:1] | | |
| | | Stage | | | Stage | | | Stage | | | | | Stage | | | | | |
| | VSS/VSH | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | | | 1 | 2 | 3 | Stage1 | Stage 2 | Stage 3 |
| VGPL 16 | 19 20 | 20 | 35 | 50 | 0.1 | 0.3 | 0.5 | - | - | - | 30 | 10 | | | | 3 / 4 | 9 / 12 21 / 28 / 16 | 36 / 48 64 / 84 112 / 147 196 |
| VGPL 22 | 19 / 20 25 / 26 | 10 20 | 20 35 | 30 50 | 0.1 | 0.5 | 1.5 | 0.008 | 0.006 | 0.004 | 30 | 24 | | | | 4 / 5 | 16 / 20 28 / 35 | 64 / 80 112 / 140 196 / 245 |
| VGPL 26 | 25 26 | | | | 0.3 | 1 | 3 | 0.012 | 0.010 | 0.095 | 50 | 40 | | | | 3.5 / 4.33 | 12.25 / 18.78 26 / 33.22 | 81.37 / 112.67 143.96 / 199.33 |
| VGPL 32 | 32 33 | | | | 0.4 0.8 | 2 4 | 6 6 | 0.015 | 0.012 | 0.011 | 80 | 65 | | | | 4 / 4.5 5.2 | 12.08 / 16 18 / 20.8 25 / 29 32 / 36 41.6 | 64 / 72 / 81 100 / 130 144 / 200 225 / 256 288 |
| VGPL 42 | 42 43 | | | | 0.7 1.4 | 4 8 | 12 12 | 0.03 | 0.024 | 0.024 | 150 | 120 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 24 / 25 30 / 30.67 38.33 | 49 / 56 64 / 70 / 80 100 / 120 144 / 184 235.11 / 293.89 |
| VGPL 52 | 52 56 57 | | | | 1.5 3 | 10 15 | 30 30 | 0.06 | 0.055 | 0.05 | 250 | 200 | | | | 4 / 4.5 5.2 / 6.25 | 12.08 / 16 18 / 20.8 25 / 29 32 / 36 41.6 / 50 | 64 / 72 / 81 100 / 130 144 / 200 225 / 256 288 / 400 |
| VGPL 80 | 80 | | | | 3 6 | 15 30 | 38 38 | 0.12 | 0.08 | 0.075 | 400 | 320 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 / 24 25 / 30 30.67 / 38.33 46 | 49 / 56 / 64 70 / 80 / 100 120 / 144 / 184 235.11 / 293.89 |
| VGPL 105 | 80 100 | 6 20 | 12 35 | 15 50 | | | | | | | 800 | 640 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 24 / 25 30 / 30.67 38.33 | 49 / 56 64 / 70 / 80 100 / 120 144 / 184 235.11 / 293.89 |
| VGPL 105 | 126 | | | | 12 25 | 60 120 | 150 150 | 1 | 0.85 | 0.8 | | | | | | 3.5 / 4 | 12.25 / 14 16 / 20 24 / 30.67 | 49 / 56 64 / 70 / 80 100 / 120 144 / 184 235.11 |
| VGPL 120 | 126 | | | | 25 50 | 130 250 | 350 350 | 1.75 | 1.4 | 1.35 | 1500 | 1200 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 24 / 25 30 | 49 / 56 64 / 70 80 / 100 120 / 144 180 |

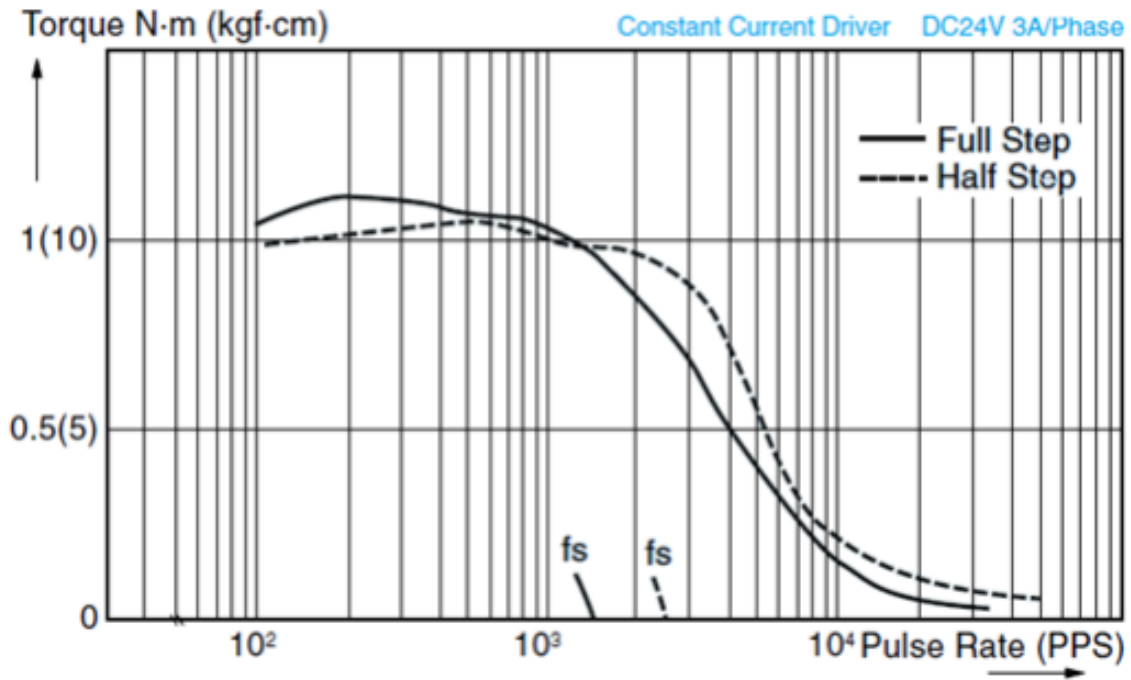
1) no load 2) center of the shaft 3) in grease-lubricated operation 4) continuous operation

5) applies to FV, HV, UHVG for type reduced backlash 6) applies to FV, HV, UHVG for type low backlash 7) applies to UHVS, UHVC type standard backlash 8) type standard backlash



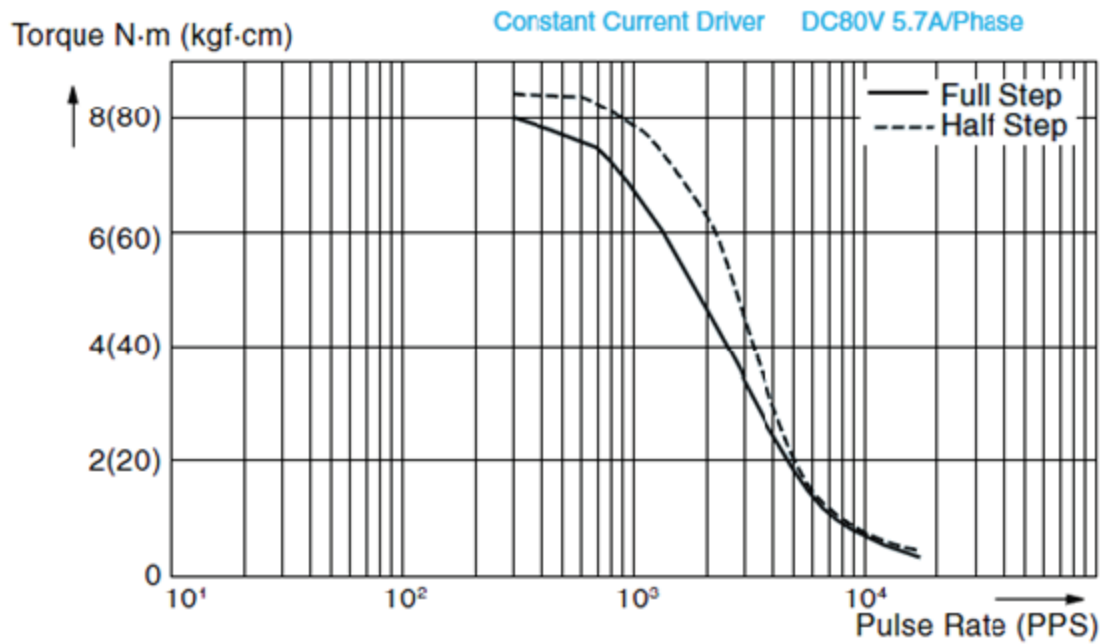
McLennan 23HT18C330 - Rotor Inertia = $0.43 \text{ kg} \cdot \text{cm}^2$

23HT18C330



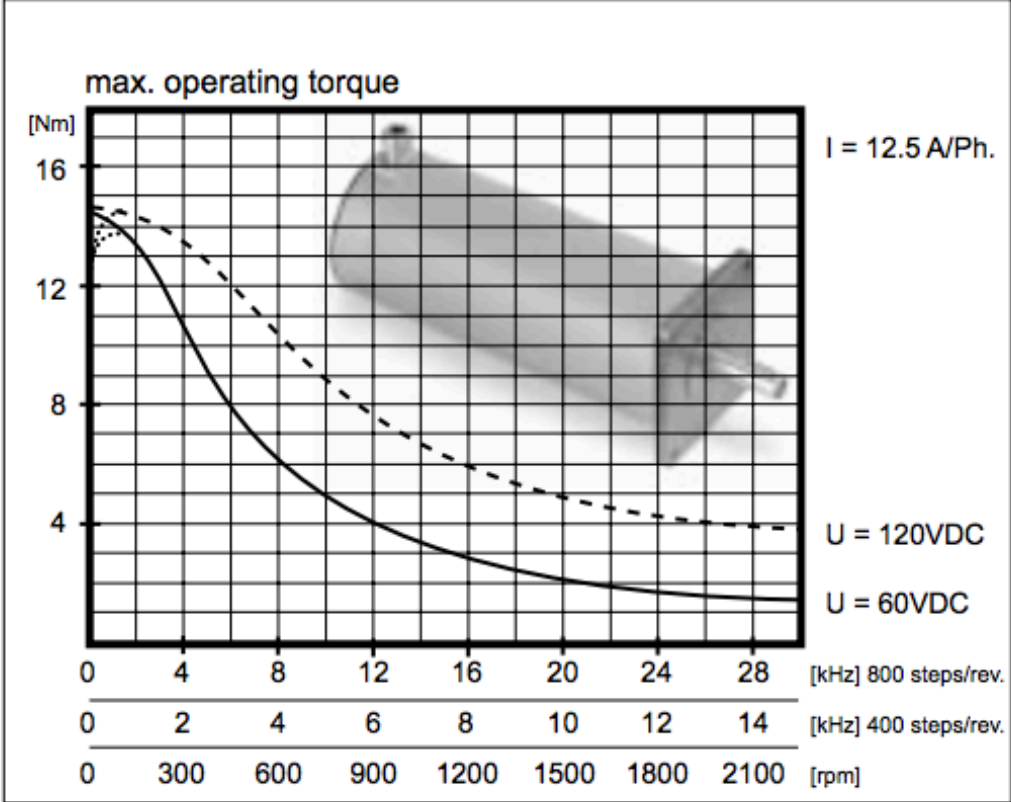
McLennan 34HT18C340 – Rotor Inertia = $4.8 \text{ kg} \cdot \text{cm}^2$

34HT18C340



Stögra SM107.4.18M12 (we specify SM107.4.18 J6) - Rotor Inertia = $16 \text{ kg} \cdot \text{cm}^2$

SM 107.4.18M12



Phyton VSS Series

Dimensions / Electrical and Mechanical Characteristics

| VSS/VSH Standard 200-steps 4 lead parallel ³⁾ | Electrical Characteristics | | | Mechanical Characteristics | | | | | | | Dimensions in mm | | | | | | | | | | | | |
|--|--|---|--|----------------------------|----------|---------------------------------|--------------------|---------------|-------|--------|------------------|------|-------|-----|-----|------|------|------------------|------------------|-----|------|------|------|
| | Current/ Phase I _N | Resistance/ Phase | Inductivity/ Phase | max. operating voltage | AWG | Holding torque ²⁾ | Detent torque | Rotor inertia | Loads | | Mass | A | B1 | D | E | F1 | F2 | G1 ⁴⁾ | G2 ⁴⁾ | K | L | M | N |
| | | | | | | | | | axial | radial | | | | | | | | | | | | | |
| A | Ω | mH | V _{DC} | | mNm | mNm | kg cm ² | N | N | kg | | | | | | | | | | | | | |
| 19.200.0.6¹⁾ 19.200.1.2¹⁾ | 0.6 1.2 | 2.1 0.63 | 0.85 0.23 | | 28 | 3.4 3.5 | 0.9 | 0.0009 | 3 | 3 | 0.05 | 19 | 26.5 | 1 | 2 | 7.5 | 6.5 | 2.5 | 2.5 | 19 | 10 | 16 | M2.5 |
| 20.200.0.6 20.200.1.2 | 0.6 1.2 | 3.45 0.95 | 1.1 0.4 | | 28 | 8 | 1 | 0.002 | 3 | 3 | 0.075 | 19 | 43 | 1 | 2 | 7.5 | 6.5 | 2.5 | 2.5 | 19 | 10 | 16 | M2.5 |
| 25.200.0.6 25.200.1.2¹⁾ | 0.6 1.2 | 3.25 0.95 | 1.5 0.4 | | 28 26 | 12 | 2 | 0.0025 | 5 | 5 | 0.08 | 25 | 31 | 1 | 2.5 | 9.5 | 8.5 | 3 | 3 | 25 | 14 | 21.5 | 2.2 |
| 26.200.0.6 26.200.1.2 | 0.6 1.2 | 5.85 1.7 | 3.2 1.0 | | 28 26 | 28 | 1.9 | 0.006 | 5 | 5 | 0.13 | 25 | 47 | 1 | 2.5 | 9.5 | 8.5 | 3 | 3 | 25 | 14 | 21.5 | 2.2 |
| 32.200.0.6 32.200.1.2¹⁾ | 0.6 1.2 | 4.6 1.25 | 5.3 1.2 | | 26 | 40 | 3 | 0.01 | 5 | 15 | 0.17 | 32 | 38.5 | 1 | 3 | 11 | 10 | 4 | 4 | 32 | 18 | 27 | 2.8 |
| 33.200.0.6 33.200.1.2¹⁾ | 0.6 1.2 | 7.5 1.9 | 9.3 2.2 | 70 | 26 | 68 | 3.3 | 0.018 | 5 | 15 | 0.26 | 32 | 57.5 | 1 | 3 | 11 | 10 | 4 | 4 | 32 | 18 | 27 | 2.8 |
| 42.200.1.2¹⁾ 42.200.2.5¹⁾ | 1.2 2.5 | 1.7 0.34 | 3 0.7 | | 24 22 | 120 | 5 | 0.045 | 20 | 40 | 0.35 | 42 | 54 | 1 | 3 | 16 | 15 | 5 | 4 | 42 | 22 | 36 | 3.2 |
| 43.200.1.2¹⁾ 43.200.2.5 | 1.2 2.5 | 2.6 0.5 | 5.2 1.2 | | 24 22 | 235 | 7 | 0.077 | 20 | 40 | 0.52 | 42 | 69 | 1 | 3 | 16 | 15 | 5 | 4 | 42 | 22 | 36 | 3.2 |
| 52.200.1.2 52.200.2.5 | 1.2 2.5 | 2.65 0.6 | 7 1.6 | | 24 22 | 350 | 13 | 0.15 | 25 | 70 | 0.72 | 52 | 65 | 1.5 | 3.5 | 17.5 | 16 | 6 | 4 | 52 | 28 | 44 | 4.3 |
| 56.200.1.2 56.200.2.5 | 1.2 2.5 | 3.9 0.8 | 9.5 2.4 | | 24 22 | 420 | 30 | 0.17 | 40 | 80 | 0.78 | 56.4 | 58.1 | 1.5 | 4.5 | 22 | 20.5 | 6.35 | 6.35 | 60 | 38.1 | 47.1 | 5.2 |
| 57.200.1.2 57.200.2.5¹⁾ | 1.2 2.5 | 3.9 0.8 | 11.6 2.9 | | 24 22 | 840 | 50 | 0.24 | 40 | 80 | 0.99 | 56.4 | 74.1 | 1.5 | 4.5 | 22 | 20.5 | 6.35 | 6.35 | 60 | 38.1 | 47.1 | 5.2 |
| 80.200.5 | 5 | 0.4 | 2.3 | | 18 | 2300 | 120 | 1.24 | 50 | 180 | 2.8 | 80 | 100 | 2 | 7.5 | 27 | 25 | 10 | 9 | 80 | 50 | 68 | 6.4 |
| 100.200.10 | 10 | 0.15 | 2.1 | 120 | 16 | 4300 | 140 | 4.4 | 70 | 300 | 5 | 100 | 125.5 | 2 | 8 | 32 | 30 | 12 | 12 | 100 | 60 | 86 | 6.4 |
| 126.200.10 | 10 | 0.23 | 3.9 | | 16 | 13000 | 290 | 18.2 | 150 | 700 | 13.9 | 125 | 210 | 3 | 9.5 | 34 | 31 | 14 | 14 | 125 | 60 | 108 | 8.4 |

¹⁾ Preferred options: HV and UHVG in small quantities are available from stock

²⁾ Holding torque in bipolar mode with parallel windings, two phases on at rated current

³⁾ other step resolutions on demand (with different mechanical characteristics!)

⁴⁾ Shaft diameter tolerances: VSS 19 to 26: -0.005 to -0.009; from VSS 32: g5

All values given above refer to room temperature and atmospheric pressure.

Gearboxes for use with Phytron VSS series of motors

| Mechanical Characteristics | | | | | | | | | | | | | | | | | | | |
|----------------------------|--------------------|-----------------------------------|----------|----------|--------------------------------|------------|------------|--------------------|-------|-------|---------------------------|------------|---------------------------------------|-----------------------|---|-----------------------|--|--|--|
| Gear | Stepper motor | Gear backlash ¹⁾⁵⁾⁶⁾⁷⁾ | | | Rated torque ⁴⁾⁶⁾⁸⁾ | | | Gear inertia | | | Radial load ²⁾ | Axial load | Efficiency at full load ³⁾ | reduction ratio i[:1] | | | | | |
| | | arc-min | | | Nm | | | kg cm ² | | | N | N | % | i[:1] | | | | | |
| | | Stage | | | Stage | | | Stage | | | | | Stage | | | | | | |
| | VSS/VSH | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | | | 1 | 2 | 3 | Stage 1 | Stage 2 | Stage 3 | |
| VGPL 16 | 19 20 | 20 | 35 | 50 | 0.1 | 0.3 | 0.5 | - | - | - | 30 | 10 | | | | 3 / 4 | 9 / 12 21 / 28 / 16 | 36 / 48 64 / 84 112 / 147 196 | |
| VGPL 22 | 19 / 20 25 / 26 | 10 20 | 20 35 | 30 50 | 0.1 | 0.5 | 1.5 | 0.008 | 0.006 | 0.004 | 30 | 24 | | | | 4 / 5 | 16 / 20 28 / 35 | 64 / 80 112 / 140 196 / 245 | |
| VGPL 26 | 25 26 | | | | 0.3 | 1 | 3 | 0.012 | 0.010 | 0.095 | 50 | 40 | | | | 3.5 / 4.33 | 12.25 / 18.78 26 / 33.22 | 81.37 / 112.67 143.96 / 199.33 | |
| VGPL 32 | 32 33 | 8 20 | 12 35 | 15 50 | 0.4 0.8 | 2 4 | 6 6 | 0.015 | 0.012 | 0.011 | 80 | 65 | | | | 4 / 4.5 5.2 | 12.08 / 16 18 / 20.8 25 / 29 32 / 36 41.6 | 64 / 72 / 81 100 / 130 144 / 200 225 / 256 288 | |
| VGPL 42 | 42 43 | | | | 0.7 1.4 | 4 8 | 12 12 | 0.03 | 0.024 | 0.024 | 150 | 120 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 24 / 25 30 / 30.67 38.33 | 49 / 56 64 / 70 / 80 100 / 120 144 / 184 235.11 / 293.89 | |
| VGPL 52 | 52 56 57 | 6 20 | 12 35 | 15 50 | 1.5 3 | 10 15 | 30 30 | 0.06 | 0.055 | 0.05 | 250 | 200 | | | | 4 / 4.5 5.2 / 6.25 | 12.08 / 16 18 / 20.8 25 / 29 32 / 36 41.6 / 50 | 64 / 72 / 81 100 / 130 144 / 200 225 / 256 288 / 400 | |
| VGPL 80 | 80 | | | | 3 6 | 15 30 | 38 38 | 0.12 | 0.08 | 0.075 | 400 | 320 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 / 24 25 / 30 30.67 / 38.33 46 | 49 / 56 / 64 70 / 80 / 100 120 / 144 / 184 235.11 / 293.89 | |
| VGPL 105 | 80 100 | 6 20 | 12 35 | 15 50 | 12 25 | 60 120 | 150 150 | 1 | 0.85 | 0.8 | 800 | 640 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 24 / 25 30 / 30.67 38.33 | 49 / 56 64 / 70 / 80 100 / 120 144 / 184 235.11 / 293.89 | |
| VGPL 105 | 126 | | | | 12 25 | 60 120 | 150 150 | 1 | 0.85 | 0.8 | 800 | 640 | | | | 3.5 / 4 | 12.25 / 14 16 / 20 24 / 30.67 | 49 / 56 64 / 70 / 80 100 / 120 144 / 184 235.11 | |
| VGPL 120 | 126 | | | | 25 50 | 130 250 | 350 350 | 1.75 | 1.4 | 1.35 | 1500 | 1200 | | | | 3.5 / 4 5 | 12.25 / 14 16 / 20 24 / 25 30 | 49 / 56 64 / 70 80 / 100 120 / 144 180 | |

¹⁾ no load ²⁾ center of the shaft ³⁾ in grease-lubricated operation ⁴⁾ continuous operation

⁵⁾ applies to FV, HV, UHVG for type reduced backlash ⁶⁾ applies to FV, HV, UHVG for type low backlash ⁷⁾ applies to UHVS, UHVC type standard backlash ⁸⁾ type standard backlash

