

# Stepper Motors

6 mNm

Two phase, 24 steps per revolution

## Series AM1524

| Values at 20°C                                          | AM1524                                  | 0450 | 0250                                           | 0150 | 0075  |                    |
|---------------------------------------------------------|-----------------------------------------|------|------------------------------------------------|------|-------|--------------------|
| Nominal current per phase (both phases ON)              |                                         | 0,45 | 0,25                                           | 0,15 | 0,075 | A                  |
| Boosted current per phase (both phases ON)              |                                         | 0,9  | 0,5                                            | 0,3  | 0,15  | A                  |
| Nominal voltage per phase (both phases ON)              |                                         | 2    | 3,5                                            | 6    | 12    | V                  |
| Phase resistance                                        |                                         | 3,6  | 12,5                                           | 35   | 145   | Ω                  |
| Phase inductance (1 kHz)                                |                                         | 1,9  | 6,3                                            | 16,5 | 70,6  | mH                 |
| Holding torque (at nominal current in both phases)      |                                         | 6    | 6                                              | 6    | 6     | mNm                |
| Holding torque at boosted current                       |                                         | 10   | 10                                             | 10   | 10    | mNm                |
| Residual torque, typ.                                   |                                         | 0,51 | 0,51                                           | 0,51 | 0,51  | mNm                |
| Back-EMF amplitude                                      |                                         | 2,4  | 4,4                                            | 7,2  | 14,7  | V/k step/s         |
| Electrical time constant                                | 0,5                                     |      |                                                |      |       | ms                 |
| Rotor inertia                                           | 45·10 <sup>-9</sup>                     |      |                                                |      |       | kgm <sup>2</sup>   |
| Step angle (full step)                                  | 15                                      |      |                                                |      |       | °                  |
| Angular accuracy, typ.                                  | ±10                                     |      |                                                |      |       | %                  |
| Angular acceleration, max.                              | 222·10 <sup>3</sup>                     |      |                                                |      |       | rad/s <sup>2</sup> |
| Resonance frequency (at no load)                        | 60                                      |      |                                                |      |       | Hz                 |
| Thermal resistance                                      | 12,9 / 31,6                             |      |                                                |      |       | K/W                |
| Thermal time constant                                   | 6 / 350                                 |      |                                                |      |       | s                  |
| Operating temperature range                             | -35 ... +70                             |      |                                                |      |       | °C                 |
| Winding temperature, max.                               | +130                                    |      |                                                |      |       | °C                 |
| Shaft bearings <sup>1) 2)</sup>                         | sintered bearings<br>(Bearing code: SB) |      | ball bearings, preloaded<br>(Bearing code: 2R) |      |       |                    |
| Shaft load max.:                                        |                                         |      |                                                |      |       |                    |
| – with shaft diameter                                   | 1,5                                     |      | 1,5                                            |      |       | mm                 |
| – radial at 5 000 min <sup>-1</sup> (3 mm from bearing) | 0,5                                     |      | 6                                              |      |       | N                  |
| – axial at 5 000 min <sup>-1</sup>                      | 0,5                                     |      | 2                                              |      |       | N                  |
| – axial at standstill                                   | 0,5                                     |      | 17                                             |      |       | N                  |
| Shaft play:                                             |                                         |      |                                                |      |       |                    |
| – radial                                                | 0,015                                   |      | 0,012                                          |      |       | mm                 |
| – axial                                                 | 0,15                                    |      | 0                                              |      |       | mm                 |
| Housing material                                        | aluminium, black anodized               |      |                                                |      |       |                    |
| Mass                                                    | 12                                      |      |                                                |      |       | g                  |
| Magnet material                                         | NdFeB                                   |      |                                                |      |       |                    |

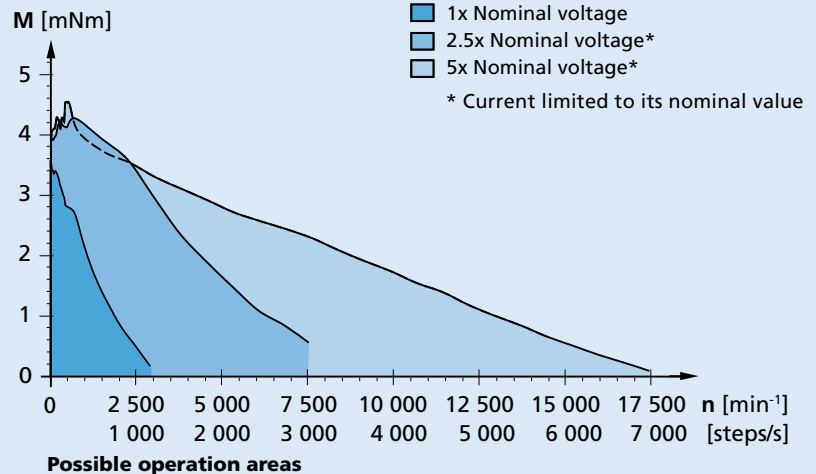
<sup>1)</sup> Special lubricant options available on request.

<sup>2)</sup> 2 preloaded ball bearings available on request for vacuum / low temperature (bearing code: RC).

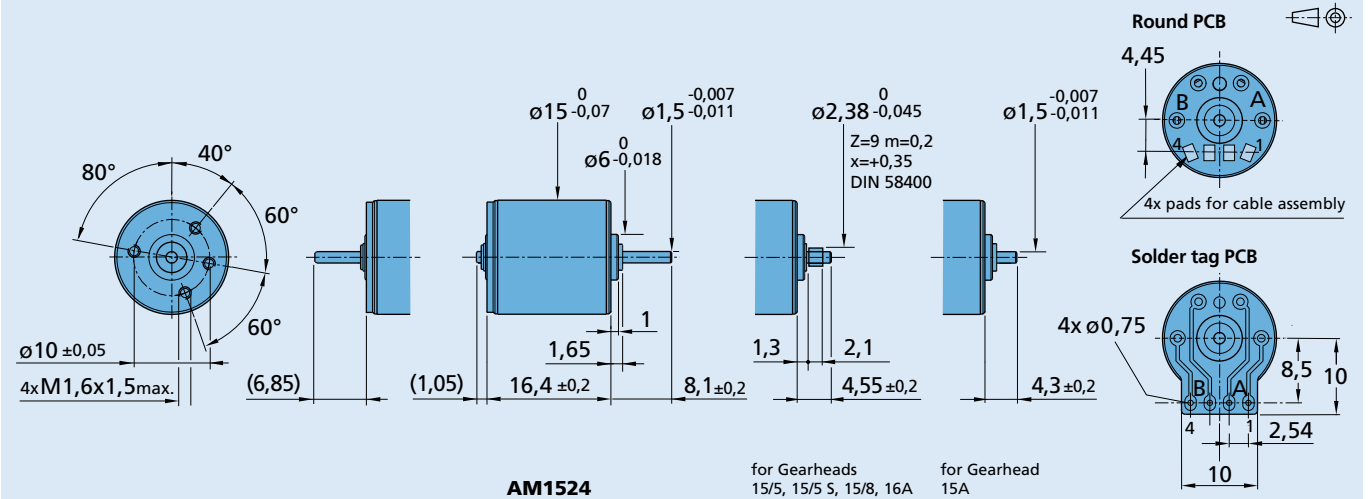
### Driver settings

Relevant for 2 phases ON only.  
On PWM drivers or chopper (current mode), the current is set to the nominal value and the supply voltage is typically 2.5 to 5x higher than the nominal voltage.

Curves measured with a load inertia of 50·10<sup>-9</sup> kgm<sup>2</sup>, in half-step mode for the "1 x nominal voltage" curve, in 1/4 micro-stepping mode for the other curves.



## Dimensional drawing



## Options and connection information

Example product designation: **AM15242R015055**

| Motor executions |              | PCB type       | Front shaft description                                                                                                                  | Connection |           |
|------------------|--------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
| front shaft      | double shaft |                |                                                                                                                                          | No.        | Function  |
| 55               | 54           | Round PCB      | Plain shaft, L=8,1 mm for gearheads 15/10, 16/7, 17/1 and lead screw M3                                                                  | 1          | Phase A + |
| 57               | 56           | Round PCB      | With pinion for gearheads 15/5, 15/5 S, 15/8 and 16A                                                                                     | 2          | Phase A - |
| 70               | 71           | Round PCB      | Plain shaft, L=4,3 mm for gearheads 15A                                                                                                  | 3          | Phase B + |
| 83               | 82           | Round PCB      | Plain shaft, for lead screw M2                                                                                                           | 4          | Phase B - |
| 05               | 04           | Solder tag PCB | Plain shaft, L=8,1 mm for gearheads 15/10, 16/7, 17/1 and lead screw M3                                                                  |            |           |
| 07               | 06           | Solder tag PCB | With pinion for gearheads 15/5, 15/5 S, 15/8 and 16A                                                                                     |            |           |
| 72               | 73           | Solder tag PCB | Plain shaft, L=4,3 mm for gearheads 15A                                                                                                  |            |           |
| 23               | 22           | Solder tag PCB | Plain shaft, for lead screw M2                                                                                                           |            |           |
| 09               | 08           | Solder tag PCB | With pinion for gearheads 16GPT, with encoder IEP3-4096 (an additional motor cable is mandatory)                                         |            |           |
| 59               | 58           | Round PCB      | With pinion for gearheads 16GPT, with encoder IEP3-4096 (an additional motor cable is mandatory)                                         |            |           |
|                  | 40           | Round PCB      | Plain shaft, for lead screw M2, with encoder IEP3-4096 (an additional motor cable is mandatory)                                          |            |           |
|                  | 41           | Round PCB      | Plain shaft, L=8,1 mm for gearheads 15/10, 16/7, 17/1 and lead screw M3, with encoder IEP3-4096 (an additional motor cable is mandatory) |            |           |
|                  | 42           | Round PCB      | With pinion for gearheads 15/5, 15/5 S, 15/8 and 16A, with encoder IEP3-4096 (an additional motor cable is mandatory)                    |            |           |
|                  | 43           | Round PCB      | Plain shaft, L=4,3 mm for gearheads 15A, with encoder IEP3-4096 (an additional motor cable is mandatory)                                 |            |           |
| <b>Option</b>    |              | Single leads   | PTFE single leads length 50/100/150/300 mm                                                                                               |            |           |
|                  |              | Connector      | PVC single leads length 50/100/150/300 mm or ETFE/PTFE single leads length 150 mm with connector Molex 51021-0400                        |            |           |

## Product combination

| Precision Gearheads / Lead Screws                                                                        | Encoders  | Drive Electronics      | Cables / Accessories                                                                                  |
|----------------------------------------------------------------------------------------------------------|-----------|------------------------|-------------------------------------------------------------------------------------------------------|
| 15A<br>15/5<br>15/5 S<br>15/8<br>15/10<br>16A<br>16GPT<br>16/7<br>17/1<br>M2 x 0,2 x L1<br>M3 x 0,5 x L1 | IEP3-4096 | MC 3602 B<br>MCST 3601 | Detailed cable options can be found in Application Note AN 010 to be downloaded on FAULHABER website. |