

# Operating Manual

## Motor Spindle 4026 (HY)



DRIVE SYSTEMS

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## A 1.0 User Information

### A 1.1 Symbols Used

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#### Operating Manual / Unit

|   |   |
|---|---|
|  | Situations where failure to follow the instructions may lead to danger, damage to material or operating faults. |
|  | Important information for operator and engineer   |
|  | Information on disposal   |
|  | Close, screw in, fasten, etc.   |
|  | Open, release, loosen   |
|  | Direction of rotation   |
|  | CE mark (Communauté Européenne)   |

#### Packaging

|   |   |
|---|---|
|    | Fragile   |
|   | Keep dry  |
|  | Transport upright with the arrows pointing upwards. |
|  | Stacking restrictions                               |
|  | Temperature range                                   |
|  | Air pressure  |
|  | Humidity  |
|  | Quantity  |

### A 1.2 Important Information

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*The Operating Manual should be read by the user before starting up the unit for the first time in order to avoid incorrect operation and other damage. Duplication and distribution of the Operating Manual require SycoTec's prior consent.*

All specifications, information and properties of the product described in the Operating Manual correspond to the status on going to press.

Modifications and improvements to the product as a result of new technical developments are possible. This does not imply any right to retrofitting of existing units.

SycoTec assumes no responsibility for damage arising through:

- external influences (poor quality of the media or faulty installation)
- use of incorrect information
- improper use
- improperly performed repairs.

Repair and maintenance work - apart from the activities described in this Operating Manual - may be performed only by qualified technical staff.



- In the event of modifications by third parties, the licences become null and void.
- Use only SycoTec original parts.



**Disposal of equipment and accessories at the end of their service lives:**

On the basis of EC Directive 2002/96/EC on Waste Electrical and Electronic Equipment, we would like to point out that this product is not subject to this Directive but may be disposed of in Europe in special waste management centres.

### A 1.3 Safety Precautions

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Safe operation and protection of the unit are ensured only through proper use in accordance with the Operating Manual and using the tools approved for the purpose.

The following should also be observed:

- the tool manufacturer's instructions,
- the occupational safety regulations,
- the accident prevention regulations.



- Each time before switching on, check the set speed.
- Observe the permissible maximum speed and maximum contact pressure of the tools (according to tool manufacturer's instructions).
- Use safety spectacles when working with rotating tools.

In the event of an unsatisfactory condition of the unit or improper use, e.g.:

- unsuitable tools
- tool shanks not manufactured to DIN-ISO
- improper use or use not in accordance with purpose
- non-permissible speeds for tools used
- incorrect clamping of the tools in the chuck
- insufficient retaining force of the chuck (wear, contamination, failure to follow the product care instructions for the chuck system, etc.)
- different sizes of tool shank and chuck
- lack of regular cleaning of the chuck
- failure to follow the maintenance instructions
- failure to comply with the accident prevention regulations (e.g. failure to use safety spectacles, safety guards, handpiece racks etc.)
- Non-conformity with the EMC Guidelines regarding radiation from low frequency, radio frequency and microwaves (use screened cables)
- failure to take into account signs of wear and tear and damage
- tool shanks which have slipped out (potential danger = bending of the tool shanks)

there is a risk of injury and damage to material and unit, e.g. due to:

- bending of the tool shanks
- accidental withdrawal of the tools from the chuck
- eccentric rotation or shattering of tools, or
- catching and untwisting
- catapulting of material particles
- in order to prevent this, safety precautions must be incorporated into the unit.



Any claim under warranty shall be excluded if defects or the consequences thereof are due to manipulation or modifications to the product by the customer or by any third parties not authorized by SycoTec.



EMC analyses must be carried out and evaluated in conjunction with the inverter.

## A 1.4 Purpose and Applications

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The motor spindle is designed to be used in machines for drilling, milling, cutting and engraving.

Suitable for operation at 5.000 - 60.000 min<sup>1</sup>

## A 2.0 Scope of Supply - Accessories

### A 2.1 Scope of Supply

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|                             |                         |
|-----------------------------|-------------------------|
| Motor spindle 4026 (HY)     | Material no. 0.674.2160 |
| 2 Open-end wrenches (12 mm) | Material no. 0.411.1012 |
| Set of brushes              | Material no. 0.411.0190 |
| Operating Manual            | Material no. 0.488.5768 |



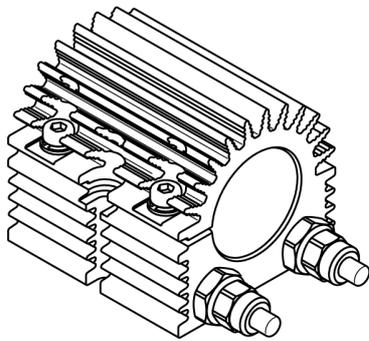
*Check to make sure delivery is complete.*

### A 2.2 Accessories

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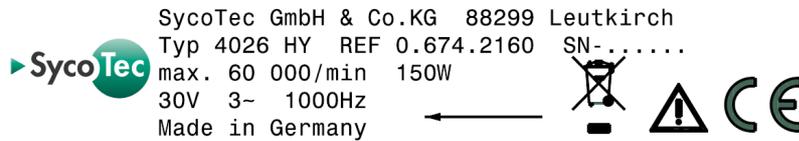
#### Accessories available on request:

Clamping bracket 4825/33 Material no. 1.001.6971



## A 3.0 Electrical Connection

Check that the available voltage and frequency agree with the data on the frequency inverter.



 See A 1.1 for symbols used.

Sycotec recommends operation with frequency inverter type e@syDrive 4424 (reduced output power) and frequency inverter type e@syDrive 4425.

-  When using another frequency inverter, ensure that the inverter output voltage to the network meets requirements in terms of "double insulation".
- 
  - Repair and maintenance work - apart from the activities described in this Operating Manual - may be performed only by qualified technical personnel.
  - Dangers from faults in the power supply, breaking of machine parts or other malfunctions, e.g.
    - unforeseen ejection
    - unexpected starting
    - unexpected slipping/over-revving
    - incorrect direction of rotation (chuck mechanism can loosen)must be prevented by appropriate safety features incorporated in the control unit (e.g. max. speed).
  - Before repair or maintenance work, disconnect the power supply plug from the control unit so that there is no power to the motor spindle.

## A 4.0 Installation and Commissioning

- It is recommended to use clamping bracket 4825/33 (Material no. 1.001.6971).  
Initial torque 1,5 Nm when clamping the motor spindle is to be maintained.
- Cooling air inlet and outlet must not be obstructed.
- No foreign bodies or lubricants may be sucked in with the cooling air.
- The motor spindle must not be flooded with coolant or lubricants.
- 
  - Motor spindles may only be mounted and operated in suitable receptacles and machines, according to the application possibilities of the motor spindles.
  - When mounting the motor spindle pay attention to a completely cylindrical seating.
- The motor spindle can be clamped along its whole casing length. Clamping over a large surface, and if possible in the middle of the motor spindle, is recommended.
- Ensure correct direction of rotation (see arrow on the rating plate).
- Operate the motor spindle only with a tool or c-lock pin fitted. It is essential not to subject the fitted tool to jolts or knocks.
- Use only tools free of imbalance.
-  Regulations for the prevention of accidents are to be observed!
- Permitted max. speed, forward feed and further specific instructions indicated by the manufacturer are to be observed.

## A 4.1 Operation

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- ⚠ *During commissioning and each time when operating the motor spindle, it is essential to observe the points mentioned in the section - A 1.3 Safety Precautions -!*
- ⚠ *Do not operate or lay down the motor spindle unless a tool or c-lock pin is clamped in the chuck.*

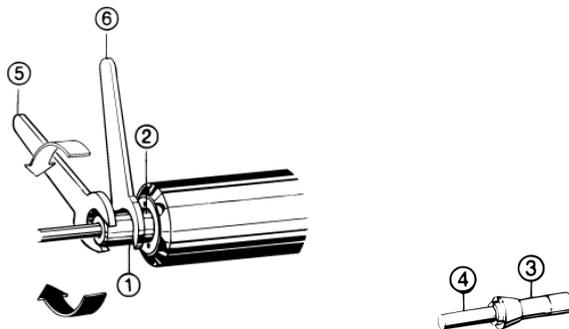
## A 5.0 Operation

- ⚠ *During commissioning and each time when operating the motor spindle, it is essential to observe the points mentioned in the section - A 1.3 Safety precautions -!*
- ⚠ *Tools and/or chucks must be changed **only when the motor spindle is at a complete stand-still.** Frequency converters must be secured against accidental switching on, for example by pressing the mains power switch to "OFF".*

### A 5.1 Inserting the Chuck

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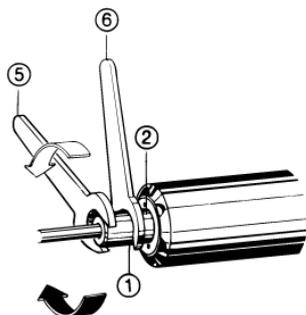
- Hold protective sleeve (2) with open-end wrench (6) and unscrew clamping nut (1) with open-end wrench (5) in the direction of the arrow ◀ and remove.
- Insert chuck (3) with tool or c-lock pin (4) into chuck holder.
- Screw up clamping nut (1) with open-end wrench (5) in the direction of the arrow ▶ while fixing tool or c-lock pin (4).



### A 5.2 Releasing the Chuck

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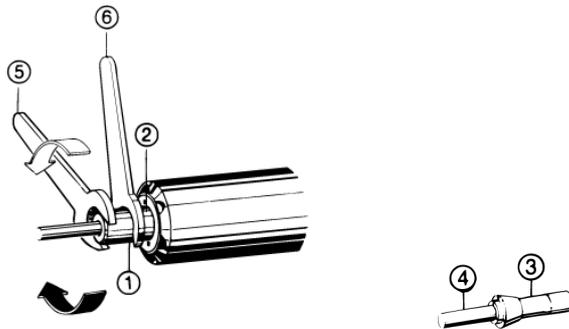
- Fix protective sleeve (2) with open-end wrench (6) and turn clamping nut (1) with open-end wrench (5) in the direction of the arrow ◀ until clamping nut (1) can be removed.
- Remove the chuck (3) so far used towards the front.



### A 5.3 Changing Tools

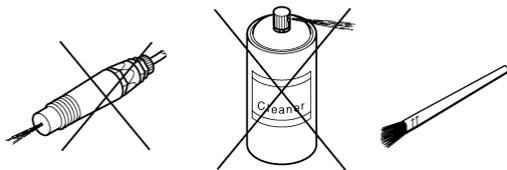
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- Fix protective sleeve (2) with open-end wrench (6) and unscrew clamping nut (1) with open-end wrench (5) in the direction of the arrow ◀ and remove until c-lock pin (4) or tool can be removed towards the front.
- Slide in new tool into chuck (3) as far as it will go. Screw up clamping nut (1) with open-end wrench (5) in the direction of the arrow ▶ and thereby secure the tool.



### A 6.0 Maintenance

- ⚠ *Repair and maintenance work - apart from the activities described in this Operating Manual - may be performed only by qualified technical personnel.*
- *Before repair or maintenance work, disconnect the power supply plug from the control unit so that there is no power to the unit.*
- ⚠ *On no account clean the motor spindle with ultrasound, steam jet, compressed air, or similar.*
- *Use the cleaning brush from the set of brushes.*
- *Under no circumstances should detergents (e.g. spray cleaner, grease solvents, etc.) get into the inside of the motor spindle.*
- *Use only original chucks.*

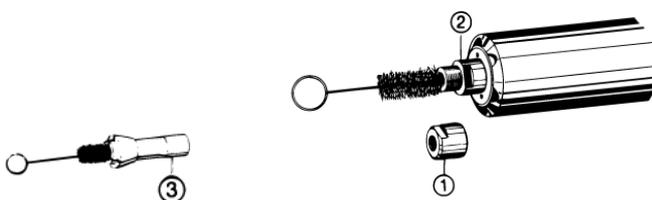


### A 6.1 Cleaning of Chuck and Motor Spindle

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**i** *Clean the chuck regularly.*

- Clean chuck holder and chuck (3) with brush or similar.
- Clean and apply a light film of oil to the threads of clamping nut (1) and protective sleeve (2).
- Re-insert the cleaned chuck (3) with tool or c-lock pin into the motor spindle (see A 5.1 - A 5.2).



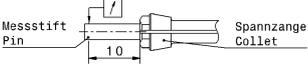
## A 7.0 Specifications



Further installation dimensions, with tolerances, are available on request from SycoTec.



Applicable Standards EN 60034-1 "Rotating Electrical Machines".

|  |   |
|--|---|
| Clamping diameter                            | 33 mm   |
| Motor system                                 | 3 phase asynchronous motor  |
| No load speed                                | 5.000 - 60.000 min <sup>-1</sup>  |
| Voltage                                      | 30 V 3~   |
| Current                                      | max. 8 A  |
| Torque                                       | max. 4,8 Ncm  |
| Frequency                                    | 83 - 1.000 Hz   |
| Output power                                 | S1: 69 W / max. 265 W   |
| Weight                                       | 0,7 kg  |
| Bearing system                               | 2 x Ceramic, 1 x Steel, lifetime lubrication  |
| Protection type                              | IP 20   |
| Motor protection                             | -   |
| Protection Class                             | III   |
| Installation categorie                       | Cat. II   |
| Pollution degree                             | P2  |
| Load direction                               | axial + radial  |
| Working position                             |    |
| Run-out in spindle cone                      | ≤ 0,005 mm  |
| Run-out with chuck                           | ≤ 0,03 mm   |
| Measuring point                              |  |
| Clamping range                               | Ø 0,5 mm - Ø 4,0 mm   |
| Tool change                                  | 2 Open-end wrenches (12 mm)   |
| Cooling system                               | Self-ventilation fan  |
| Protected against dirt and cooling lubricant | no  |
| Housing material                             | Stainless steel   |

### Ambient Conditions

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|                             |                                 |
|-----------------------------|---------------------------------|
| Permitted in interior rooms |                                 |
| Ambient temperature         | 5 °C - 40 °C / (41 °F - 104 °F) |
| Relative humidity           | max. 80 %                       |
| Max. altitude               | 2000 m                          |

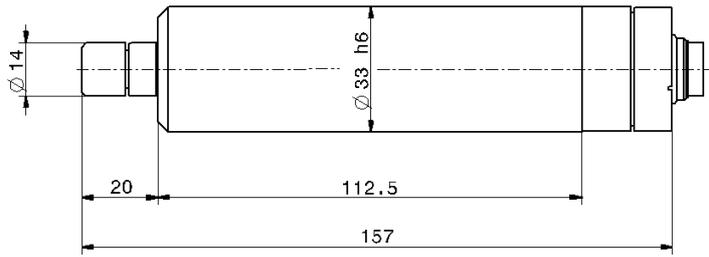
### Storage and Transport Conditions

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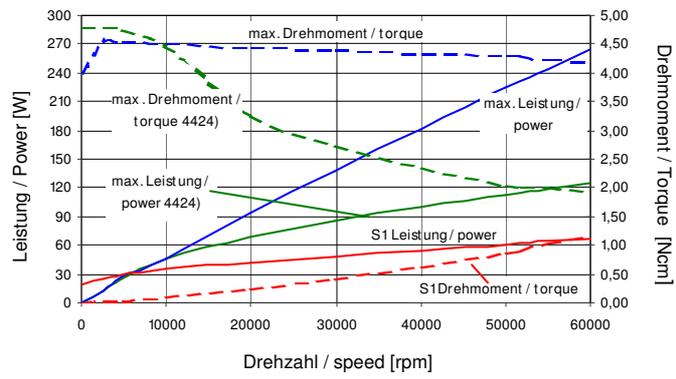
|                     |                                  |
|---------------------|----------------------------------|
| Ambient temperature | -30 °C - 70 °C (-22 °F - 158 °F) |
| Relative humidity   | 5 - 95 %                         |
| Air pressure        | 700 - 1060 hPa                   |
| Keep dry!           |                                  |

We reserve the right to make technical modifications.

## Dimensions



## Performance Diagram



## A 8.0 Requirements for Starting Up



Before initial operation and if the motor spindle has not been used for a long time, it **must be** started up according to the following requirements.

The temperature of the motor spindle must not exceed 40°C during start-up.

| Start-up cycle | Rotation speed preset<br>[1/min] | Operating time<br>[minutes]<br>Total time 159 minutes |
|----------------|----------------------------------|---|
| 1              | 5.000                            | 2   |
| 2              | 10.000                           | 8<br>Interval 20 s on / 60 s off                      |
| 3              | 20.000                           | 8<br>Interval 20 s on / 60 s off                      |
| 4              | 30.000                           | 8<br>Interval 20 s on / 60 s off                      |
| 5              | 0                                | 10  |
| 6              | 30.000                           | 8<br>Interval 20 s on / 60 s off                      |
| 7              | 40.000                           | 12<br>Interval 20 s on / 60 s off                     |
| 8              | 40.000                           | 20  |
| 9              | 50.000                           | 12<br>Interval 20 s on / 60 s off                     |
| 10             | 50.000                           | 20  |
| 11             | 0                                | 15  |
| 12             | 60.000                           | 8<br>Interval 20 s on / 60 s off                      |
| 13             | 60.000                           | 8<br>Interval 60 s on / 60 s off                      |
| 14             | 60.000                           | 20  |

## A 9.0 Chucks

### Chucks

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| <b>Standard sizes</b> | <b>Material no.</b> |
|-----------------------|---------------------|
| Ø 3,0 mm              | 0.674.2402          |
| Ø 3,175 mm (1/8")     | 0.674.2422          |
| Ø 4,0 mm              | 0.674.3132          |
| <b>Special sizes</b>  |                     |
| Ø 0,5 mm              | 0.674.2142          |
| Ø 0,6 mm              | 0.674.2152          |
| Ø 0,7 mm              | 0.674.2162          |
| Ø 0,8 mm              | 0.674.2172          |
| Ø 0,9 mm              | 0.674.2182          |
| Ø 1,0 mm              | 0.674.2192          |
| Ø 1,1 mm              | 0.674.2202          |
| Ø 1,2 mm              | 0.674.2212          |
| Ø 1,3 mm              | 0.674.2222          |
| Ø 1,5 mm              | 0.674.2242          |
| Ø 1,6 mm              | 0.674.2252          |
| Ø 1,8 mm              | 0.674.2272          |
| Ø 1,9 mm              | 0.674.2282          |
| Ø 2,0 mm              | 0.674.2292          |
| Ø 2,35 mm             | 0.674.2332          |
| Ø 2,5 mm              | 0.674.2352          |
| Ø 3,5 mm              | 0.674.2462          |

## A 10.0 Service and Repair

The motor spindle should only be repaired by SycoTec or a SycoTec authorised repair workshop.

Please contact SycoTec if you need repairs. ([www.sycotec.eu/DRIVE SYSTEMS/After Sales](http://www.sycotec.eu/DRIVE_SYSTEMS/After_Sales))

## **Warranty Conditions**

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Under current SycoTec delivery and payment conditions, SycoTec undertakes warranty for satisfactory function and freedom from faults in material and manufacture for a period of 12 months from the date of sale certified by the vendor.

In the event of justifiable complaints, SycoTec shall supply spare parts or carry out repairs free of charge under warranty. SycoTec accepts no liability for defects and their consequences which have arisen or could have arisen as a result of natural wear and tear, improper handling, cleaning or maintenance, non-compliance with the maintenance, operating or connecting instructions, corrosion, impurities in the air supply or chemical or electrical influences which are unusual or not admissible in accordance with SycoTec's standards. The warranty claims shall become null and void if defects or their consequences can be attributed to interventions in or modifications to the product. Warranty claims can only be validated if they are notified immediately in writing to SycoTec.

A copy invoice or delivery note clearly showing the manufacture number shall be attached if products are returned.

## **CE Declaration of Conformity**

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The CE Declaration of conformity may be requested or downloaded from [www.sycotec.eu](http://www.sycotec.eu).



0.488.5768 / 2010-11

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