

Operating Manual Motor Spindle 4052

en



DRIVE SYSTEMS

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A 1.0 User Information

A 1.1 Symbols Used

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



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

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

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

Suitable for operation at 5.000 - 50.000 min⁻¹

A 2.0 Scope of Supply - Accessories

A 2.1 Scope of Supply

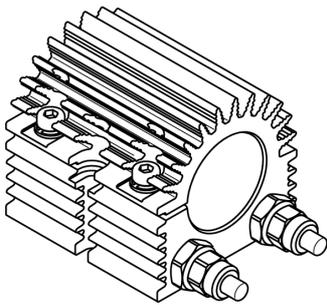
Motor spindle 4052	Material no. 0.674.3020
Spanner	Material no. 0.411.1242
Triangular wrench	Material no. 0.411.5192
Set of brushes	Material no. 0.411.0190
Operating Manual	Material no. 0.488.5829

 Check to make sure delivery is complete.

A 2.2 Accessories

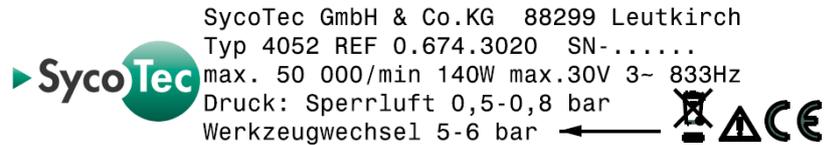
Accessories available on request:

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.



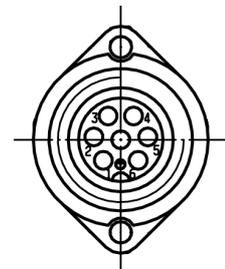
i See A 1.1 for symbols used.

Sycotec recommends operation with frequency inverter type e@syDrive 4425.

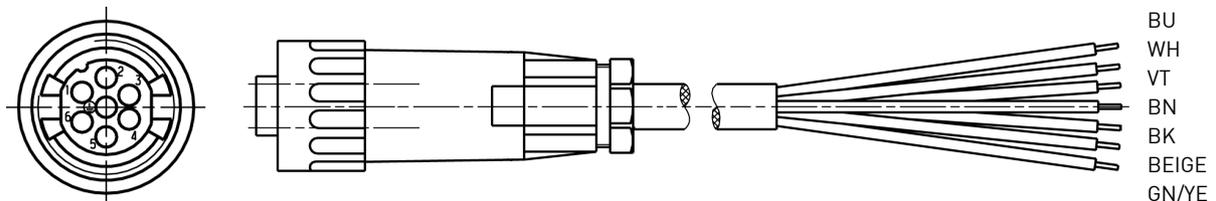
- !** When using another frequency inverter, ensure that the inverter output voltage to the network meets requirements in terms of "double insulation".
- !**
 - Repair and maintenance work - apart from the activities described in this Operating Manual - may be performed only by qualified technical personnel.
 - 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 3.1 Plug Connector for Motor Connecting Cable Allocation

Designation	Plug connector	Connecting cable
---	1	BU
Phase U	2	WH
---	3	VT
Phase V	4	BN
---	5	BK
Phase W	6	BEIGE
---	⏚	GN/YE



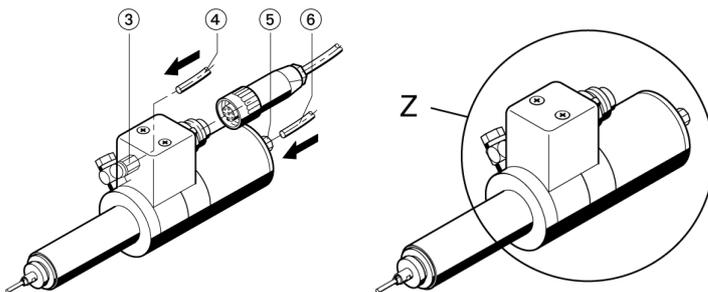
Fasten the connecting stranded wires to the frequency inverter terminals.



i Check the direction of rotation of the motor spindle (change two phases if necessary).

A 4.0 Installation and Commissioning

- Attach the sealing air hose (4), inner/outer diameter 4/6 mm, to the sealing air connector (3) in the direction of the arrow ◀, then secure.
- The sealing air connector must be pressurised before the tool cooling will be activated.
- The input of compressed air from min. 0,5 bar to max. 0,8 bar (min. 7 psi to max. 12 psi) must be dry and dust-free. It must not contain any foreign bodies or lubricants.
- When commencing operation of the motor spindle fit the compressed-air hose (6), inner/outer diameter 4/6 mm, in the direction of the arrow ◀ to the air connection nozzle (5) and connect up.
- The whole region of the cylinder (Z), as well as the compressed air and the electric connection must be protected against the penetration of dirt and water.



⚠ Use only compressed air free from dirt, water and oil!

- 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.
- The motor spindle is protected against spray water, but must not be plunged.
- Operation in any position between horizontal and vertical (tool pointing down) is possible, using cooling through the spindle support or an external cooling jacket.

⚠ • 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 over its whole casing length. It is recommended to clamp a large surface, and if possible in the middle of the motor spindle.
- Mind the 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 impacts.
- Use only tools free of unbalance.

⚠ 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

⚠ 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 -!

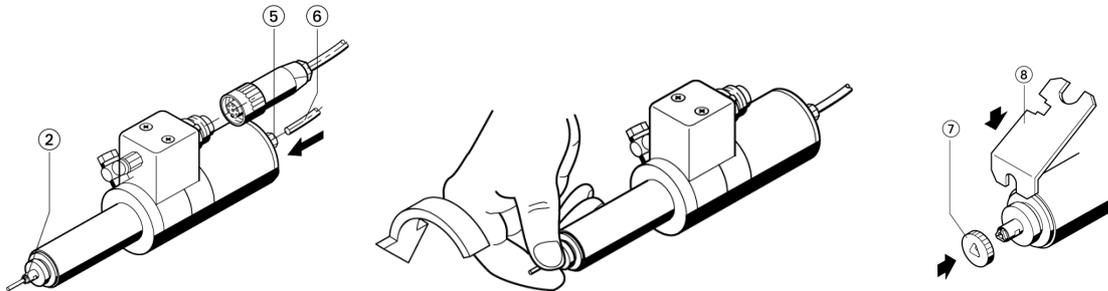
⚠ Do not operate or lay down the motor spindle unless a tool or c-lock pin is clamped in the chuck.

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 (pneumatically with compressed air of at least 5 bar and at most 6 bar or min. 71 psi and max. 85 psi) **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".*

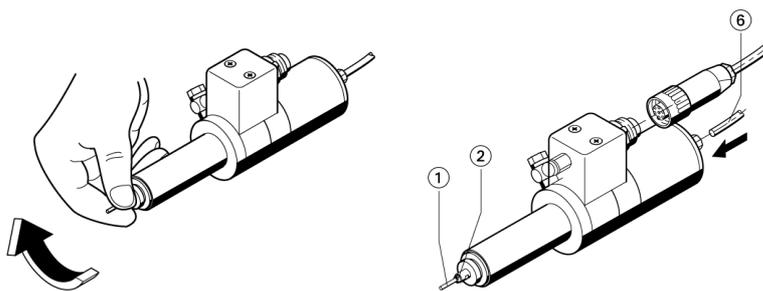
A 5.1 Releasing the Chuck

- To open the chuck (2) apply compressed air of at least 5 bar and at most 6 bar (min. 71 psi to max. 85 psi) to the motor spindle (see A 4.0). After the chuck has opened, turn it by hand in the direction of the arrow ◀ until the chuck (2) can be removed from the front.
- Exert pressure with spanner (8) and triangular wrench (7) only when the chuck is firmly applied.



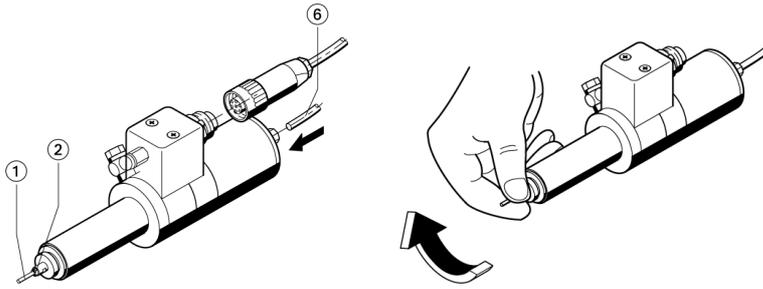
A 5.2 Inserting the Chuck

- Insert new chuck (2) with tool or c-lock pin (1) into the chuck holder.
- Tighten the chuck (2) with tool or c-lock pin (1) inserted by hand in the direction of the arrow ▶ up to the limit stop. To adjust the correct clamping path, the chuck is now turned back by 1/2 turn (loosen). Stop compressed air supply and allow the existing overpressure in the hose (6) to blow off.



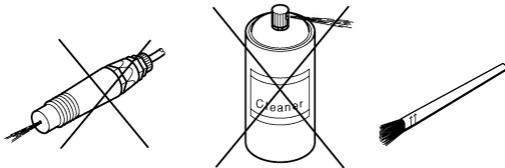
A 5.3 Changing Tools

- When changing the tool, allow compressed air of at least 5 bar and at most 6 bar (min. 71 psi to max. 85 psi) to flow in the motor spindle. After the chuck (2) has opened remove the so far used tool.
- A new tool must be inserted in the chuck up to the length of the stab and considering the specifications from the manufacturer. The tool itself must not touch the chuck. Stop compressed air supply and allow the existing overpressure in the hose (6) to blow off.



A 6.0 Maintenance

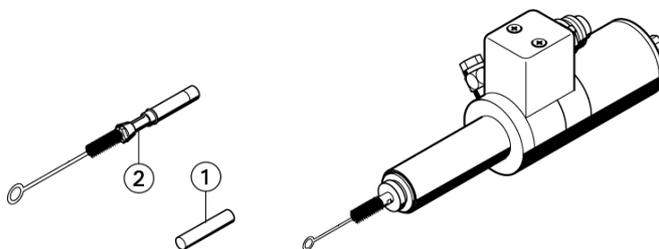
- ⚠ • *Repair and maintenance work - apart from the activities described in this Operating Manual - may be performed only by qualified technical personnel.*
- *Before repair or maintenance work, disconnect the power supply plug from the control unit so that there is no power to the unit.*
- ⚠ • *On no 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

i *Clean the chuck regularly.*

- Clean chuck holder and chuck (2) with brush or similar.
- Apply a light film of oil to the chuck thread.
- Re-insert the cleaned chuck (2) with tool or c-lock pin (1) 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
Speed range	5.000 - 50.000 min ⁻¹
Voltage	30 V 3~
Current	max. 8 A
Torque	max. 4,5 Ncm
Frequency	83 - 833 Hz
Output power	S1: 67 W / max. 225 W
Weight	2,1 kg
Bearing system	3 x Steel, lifetime lubrication
Protection category	IP 54
Motor protection	-
Protection Class	III
Installation category	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 1,0 - 4,0 mm (incl. 1/8")
Tool change	pneumatic 5 - 6 bar (71 - 85 psi) (hose Ø inner/outer 4/6 mm)
Cooling system	cooling via clamping bracket
Protected against dirt and cooling lubricant	Sealing air 0,5 - 0,8 bar (hose Ø inner/outer 4/6 mm)
Housing material	Stainless steel

Ambient Conditions

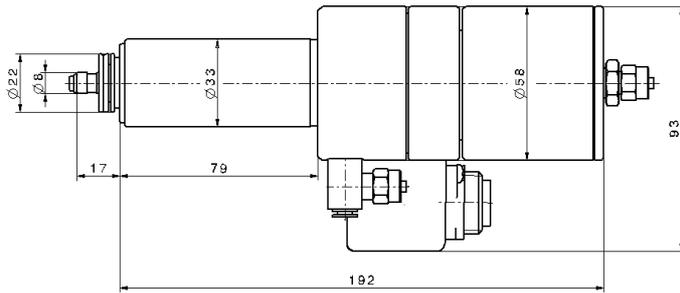
Permitted in interior rooms	
Ambient temperature	5 - 40 °C / (41 - 104 °F)
Relative humidity	max. 80 %
Max. altitude	2000 m

Storage and Transport Conditions

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

We reserve the right to make technical modifications.

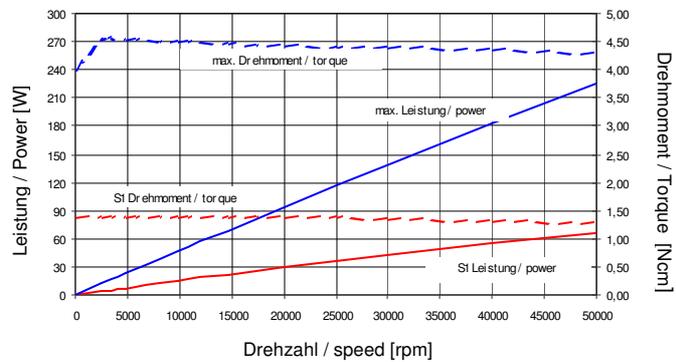
Dimensions



Performance Diagram

Clamping bracket 4825/33
- contains water cooling circulation:

Material no. 1.001.6971
Flow temperature 20 °C
Flow quantity 0,5 l/min



- These values are only correct for the installation described above.
- The thresholds provided by the manufacturer must be observed.

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 [1/min]	Operating time [minutes] Total time 130 minutes
1	5.000	2
2	10.000	8 Interval 20 s on / 60 s off
3	20.000	8 Interval 20 s on / 60 s off
4	30.000	8 Interval 20 s on / 60 s off
5	0	10
6	30.000	8 Interval 20 s on / 60 s off
7	40.000	12 Interval 20 s on / 60 s off
8	40.000	20
9	0	10
10	50.000	12 Interval 20 s on / 60 s off
11	50.000	12 Interval 60 s on / 60 s off
12	0	5
13	50.000	15

A 9.0 Chucks

Chucks

Standard sizes	Material no.
Ø 2,35 mm	0.674 2141
Ø 3,0 mm	0.674 2081
Ø 3,175 mm (1/8")	0.674 2091
Ø 4,0 mm	0.674 2201
Special sizes	
Ø 1,0 mm	0.674 3161
Ø 2,0 mm	0.674 2191

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

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

The CE Declaration of conformity may be requested or downloaded from www.sycotec.eu.

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(de = Original / en = translation / fr = traduction / es = traducción / it = traduzione)

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