SycoTec Dental motors

Installation Instructions

EN

Type:
All SLM dental motors variants
All SycoDrill dental motors variants

www.sycotec.eu

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1 User Information

Symbol used

⚠WARNING	Indicates a hazardous situation that can lead to serious injury or death
⚠CAUTION	Indicates a hazardous situation that can lead to property damage or minor to moderate injury
NOTICE	Important information

Important information

NOTICE

- ▶ All in the operating manual of the dental motor given information have to be mind.

⚠CAUTION

- ▶ After long times (week-end, holidays, vacation) and before every treatment the drive system have to be purged at least 20 seconds. This have to be done with the connected dental treatment unit.

The technical specifications, illustrations and dimensions contained in these instructions are given only as a guide. They may not be the subject of any claim. The manufacturer reserves the right to make technical improvements to its equipment, without amending these instructions. For all additional information, please contact SycoTec.

Target group

This document is for installer and user.

Safety check (STK) in according to EN 62353

For this medical unit are following safety checks (STK) determined:

- The dental motor must be common checked with the dental treatment unit.
  The check interval must be < 24 month.

Checks for:

- Motor or hose damaged on the outside.
- If exist operator manual.
- Leakage current in according to EN (IEC) 60601-1.

All results of the safety check must be documented in the medical device book

If defects that present a danger to patients, employees or third parties are identified during safety inspections, the device should not be used until the defects have been rectified through professional technical servicing.

Safety precautions

⚠WARNING

Electrical shock with incorrectly connection of a third-party system to the medical device.

- ▶ **When installing and operating the dental motor with treatment equipment and devices from other manufacturers, observe the provisions in "Protection against electrical shock," "Leakage current," and "Non-grounding the application part" in accordance with DIN EN IEC 60601-1.**

Intended use - purpose:

This dental motor is:

- Only intended for dental treatment. Any other type of use or alteration to the product is impermissible and can be hazardous.
- A dental motor according to relevant national statutory regulations.
- A low-voltage electric dental motor in accordance with DIN EN ISO 14457 use of dental straight and contra angles (according ISO 3964 short).
- Not approved for use in areas with an increased risk of explosion.

According to these provisions, the dental motor is only to be used by an experienced user for the described application in accordance with:

- The applicable health and safety regulations,
- The applicable accident prevention regulations,
- And this operating manual.

1 User Information

According to these regulations, the user is required to:

- Use only equipment which is free of faults and works properly,
- Use only the equipment for the proper purpose,
- Protect himself, the patient and third parties from danger,
- Avoid contamination from the product.

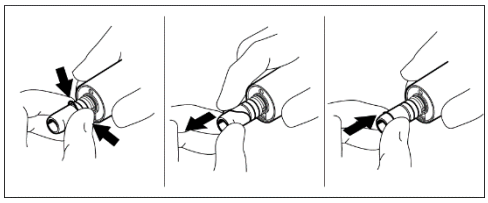
This dental motor is intended for following applications:

- **Indications:**
  Dental motor with position sensor: use for prophylaxis, preparation and endodontic treatment in dentistry.
  Dental motor without position sensor: use for prophylaxis and preparation treatment in dentistry.
- **Contra indications:** currently none known
- **Adverse effects:** currently none known

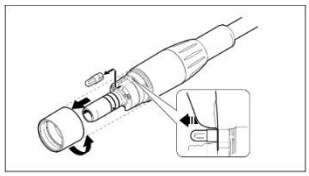
2 Maintenance

Check for malfunctions

Fault:	**Troubleshooting:**
The medical product gets excessively hot when running without a load	➔ Check the amount of cooling air
O-ring missing on the supply hose	➔ Replace the O-ring
O-ring missing on the coupling	➔ Replace the O-ring



Fault:	**Troubleshooting:**
The dental motor has no lighting:	
– Dental motor SLM: LED defective	➔ Send back to the manufacturer
– Dental motor SycoDrill: Bulb defective	➔ Replace bulb
Lighting control not activated	➔ Check on the dental treatment unit



3 Installation and Commissioning

Instructions for installation of the dental motor

NOTICE

- ► The dental motor is only intended for installation in dental treatment units.
- ► Follow all terms and specifications of the operating manual.
- ► When installing and mounting to dental treatment units observe the provisions of national regulations and law.
- ► The safety inspection of the motor in accordance to DIN EN IEC 60601-1 and DIN EN IEC 60601-1-2 have to implement in conjunction with the dental treatment units.
- ► Use only the dental motor with a control unit with current limiter approved by the manufacturer.

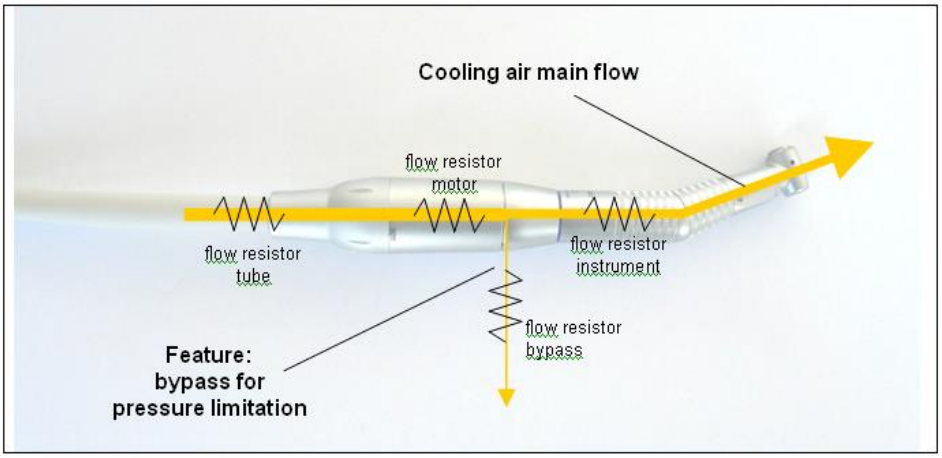
Damage caused by contaminated and moist cooling air

⚠CAUTION

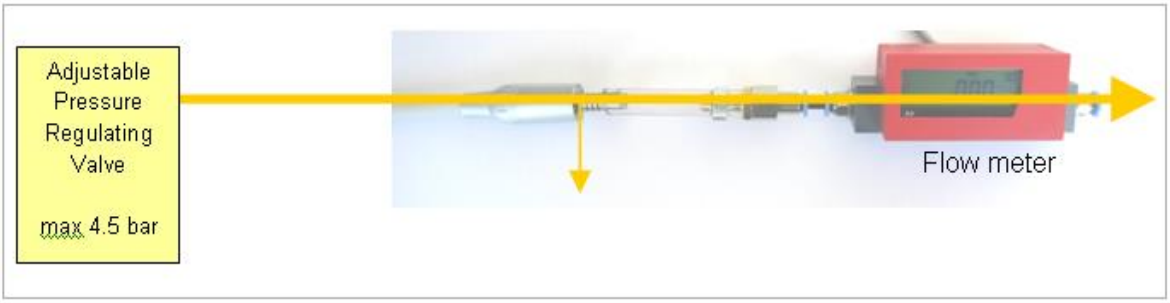
- ► Contaminated and moist cooling air can cause malfunctions and premature bearing wear.
  In general, ensure that a dry, clean and uncontaminated supply of cooling air is provided in accordance with DIN EN ISO 7494-2.

Cooling air

Equivalent circuit diagram



How to set up cooling air pressure and flow using adjustable pressure regulating valve

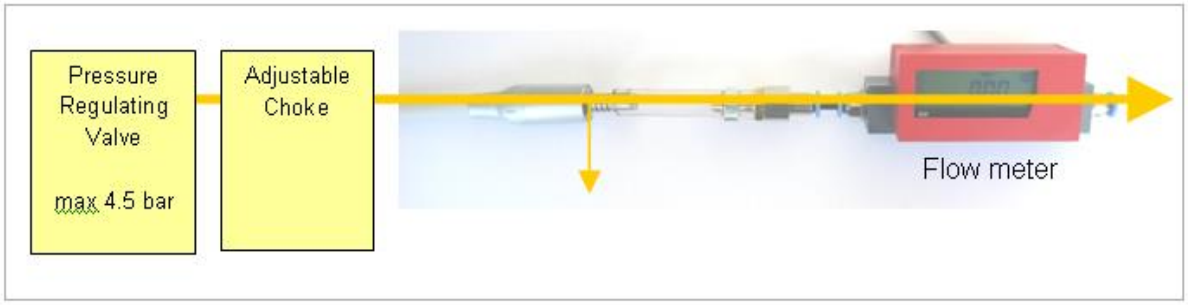


– Connect flow meter to SLM instrument coupler
– Change instrument air flow by setting pressure regulating valve

Instrument flow must be between 5.0 and 7.0 l/min@STP
We recommend 6.0 l/min@STP

3 Installation and Commissioning

How to set up cooling air pressure and flow using adjustable choke



– Air pressure regulating valve must not set higher than 4.5 bar
– Connect flow meter to ISO 3964 instrument coupler
– Change instrument air flow by setting the adjustable choke

Instrument flow must be between 5.0 and 7.0 standard liter/minute.
We recommend 6.0 standard liter/minute

Spray air

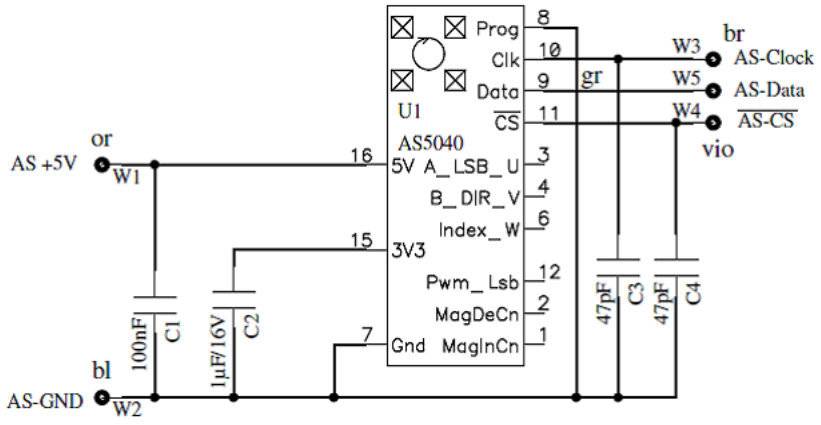
Spray air pressure must be set between 1.0 and 2.5 bar.
Measuring point: supply side tube.

Spray water

Spray water pressure must be set between 0.8 and 2.0 bar.
Measuring point: supply side tube.

Supply tube

Sensor (dental motor with position sensor only)

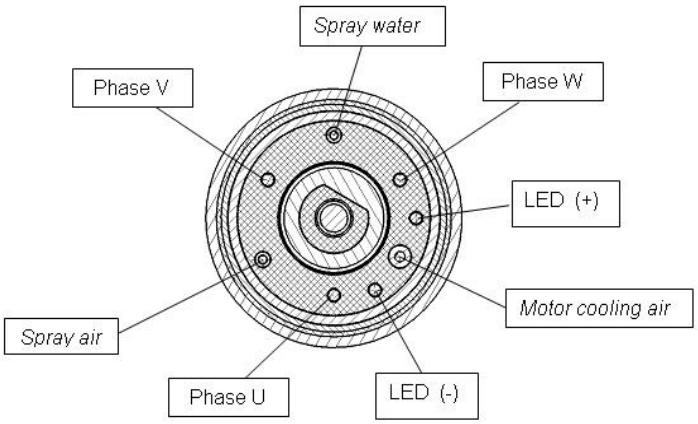


Sensor AS5040 wire assignment	
AS +5V	orange
AS GND	blue
AS Clock	brown
AS Data	grey
AS CS	violet

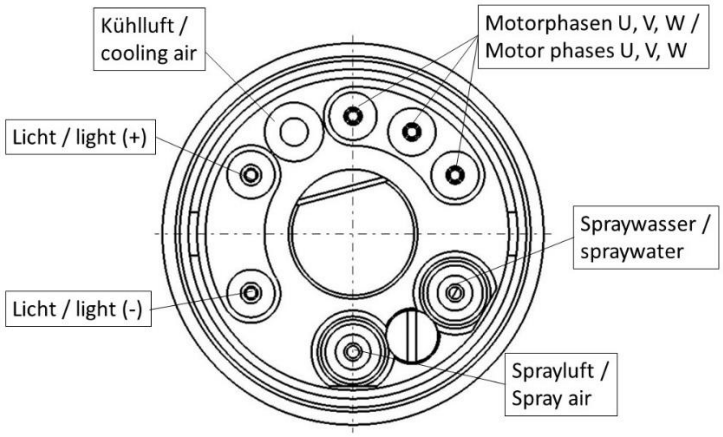
3 Installation and Commissioning

Connection plug motor

Dental motor SLM



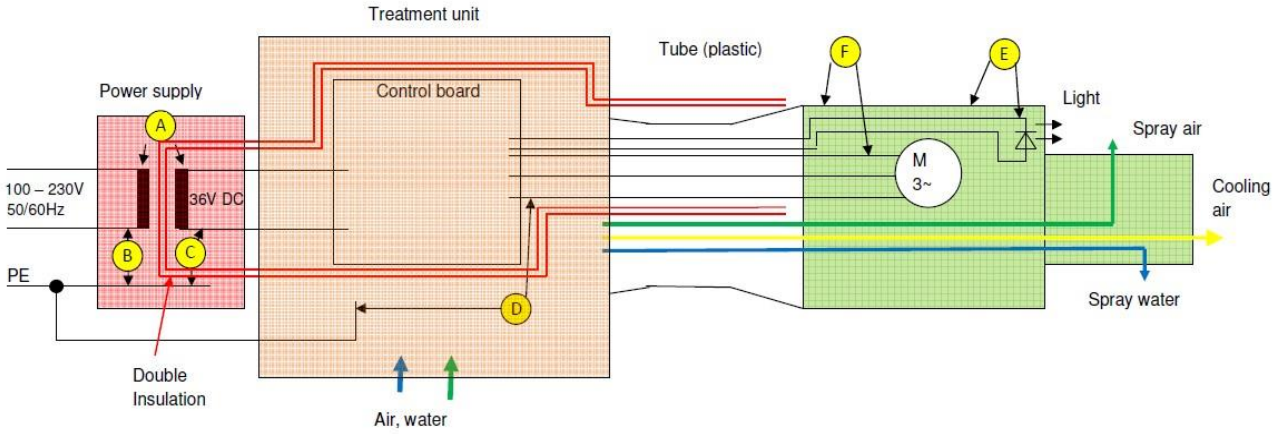
Dental motor SycoDrill



Assignment	
Phase U	yellow 0.5 mm²
Phase V	red 0.5 mm²
Phase W	black 0.5 mm²
LED +	white 0.25 mm²
LED -	black 0.25 mm²
Motor cooling air	yellow
Spray water	green
Spray air	blue

3 Installation and Commissioning

Insulation diagram



Insulation diagram		
A	DI	Primary - secondary
B	BI	Primary - protective earth
C	DI	Secondary - protective earth
D	DI	Secondary - protective earth
E	FI	Electrical motor LED – motor cover
F	FI	Electrical motor phases – motor cover

(BI = basic insulation / DI = double insulation / FI = functional insulation (approved with 500 V AC))

⚠WARNING

► Use only a double insulated and medical approved power supply without earth connection!

4 Specifications

Electrical data

Nominal voltage		22.0 V
Max. speed		40,000 rpm
Generator voltage at 40,000 rpm		
	SLM emf	15,6 V
	SycoDrill emf	12,9 V
Torque constant:	SLM	0,64 cm/A
	SycoDrill	0,53 cm/A
Max. torque:	SLM	3.5 Ncm
	SycoDrill	3.0 Ncm
Resistance Ph-Ph:	SLM	1.30 Ohm
	SycoDrill	1.45 Ohm
Operating times (cooling air 10 standard liter/min)		Maximum continuous duration not exceeding 40°C on surface of motor at ambient temperature 20°C
0.6 Ncm		without limit
1.0 Ncm		180 s
2.0 Ncm		40 s
3.0 Ncm		15 s
3.5 Ncm		10 s

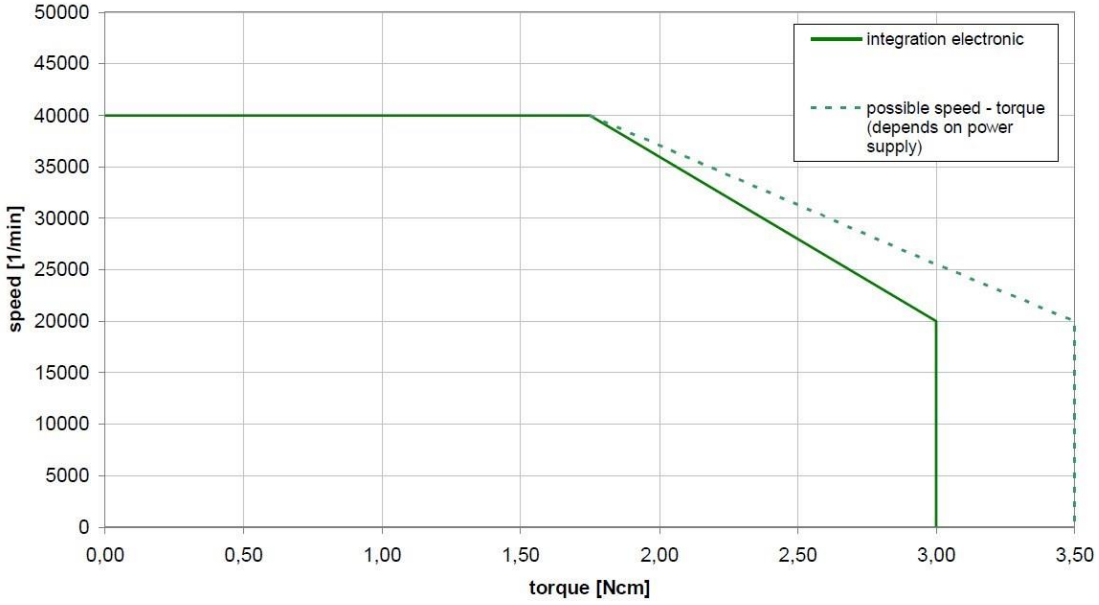
Ambient conditions

Location	Permitted in interior rooms (integrated in a dental treatment unit)
Ambient temperature	10 – 35°C (50 – 95°F)
Relative humidity	30 – 75%
Max. altitude	2,000 m

Storage and transport conditions

Ambient temperature	Transport: -30 – 70°C (-22 – 158°F) Storage: 0 – 40°C (32 – 104°F)
Relative air humidity	15 – 93%
Air pressure	700 – 1,060 hPa

Speed / torque diagram



(DE = original)