

## Linear Stepper Motor Power Stage with Variable Current Profile

### The SINCOS Power Stage

SINCOS is a linear stepper motor power stage particularly developed for applications which require very high step resolution, such as: measuring tables, machine tools, graphic instruments, etc. SINCOS is specially recommended for applications where chopping is not acceptable.

The linear power stage SINCOS is able to control stepper motors nearly without noise voltages.

SINCOS is the power stage for extreme requirements (e.g. measuring applications), where sensible measurements could be disturbed by perturbing radiation.

EMC trouble has not to be expected because of the fully linear design.

### Step Resolution / Current Profile

Six step resolutions from full step up to 1/20 step and four different current profiles are selectable by setting switches. So you can always choose an adapted operating mode for each motor type and application.

For external programming of step resolution and current profile the SELECT A, B, C, D inputs can be used.

Conventional full step



Conventional half step



Half step triangular



1/4 to 1/20 step sine-shaped



1/4 to 1/20 step triangular



1/4 to 1/20 step trapezoidal



### Technical Information

- Linear power stage for two-phase stepper motors, with 4, 6 or 8 leads
- Maximum phase current:  
2.5 A (with cooling)  
1.5 A (without cooling)
- Drive and stop current continuously adjustable from 0 to 100%
- Selectable phase current profiles: sine-shaped, triangular or trapezoidal
- Supply voltages:  
+20 V<sub>DC</sub> and -20 V<sub>DC</sub>
- Step resolution selectable from full step to 1/20 step
- Inputs: TTL and open collector Control pulses, Motor direction, Motor stop, Motor current OFF, Select, Reset
- Output: Overtemperature
- Mounting in 19"/3 U plug-in rack

### Control elements

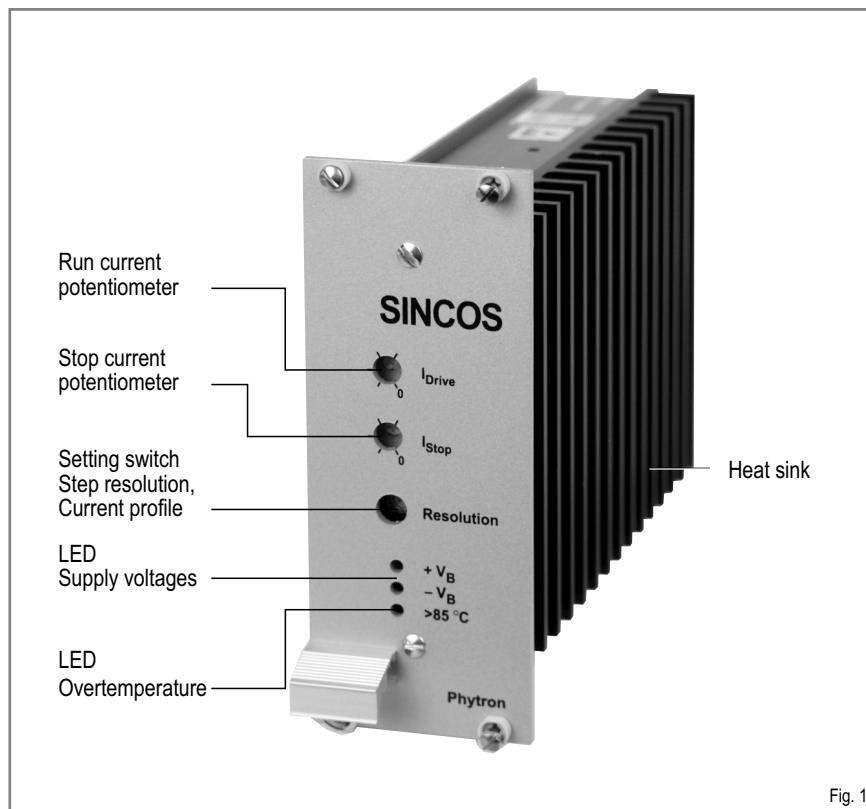


Fig. 1

## Dimensions

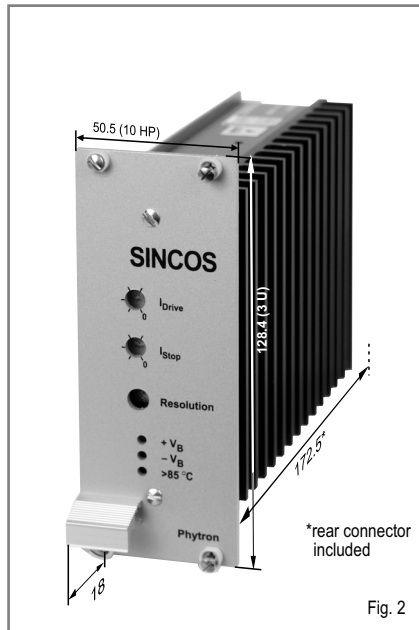


Fig. 2

## Stepper Motor

Two-phase stepper motor,  
wired as 4, 6 oder 8 lead motor

Max. phase current:  
2.5 A (with cooling), 1.5 A (without cooling)

Min. motor phase inductance: 0.5 mH

## Supply Voltages

The SINCOS unit requires a dual supply  
unit with  $-8$  to  $-21$  V<sub>DC</sub> and  $+8$  to  $+21$  V<sub>DC</sub>.

The voltage setting depends on the desired  
drive frequency.

Reducing the supply voltage will also reduce  
losses and heat sink temperature.

## Accessories

- Front panel (10 HP) with handle
- NTS 10 power supply unit
- NBS SINCOS power supply kit
- Mating connector

## Inputs

The inputs include internal pull-up resistors and  
are designed for open collector control signals.

**Control pulses:** maximum control pulse  
frequency 200 kHz  
minimum pulse width 2.5  $\mu$ s

**Motor direction:** The motor rotates contrary to  
the selected preferential direction with the  
falling edge of the control pulse signal.

**Motor Stop:** This signal stops the motor  
independently of the control pulse signal.

**Reset:** This signal resets the internal counter  
and the overtemperature error message.

**Motor current OFF:** This signal switches the  
motor current off independently of other input  
signals.

**Select A,B,C,D:** Via four external data lines,  
step resolution and current profiles can be set  
instead of using the selection switch.

## Input wiring

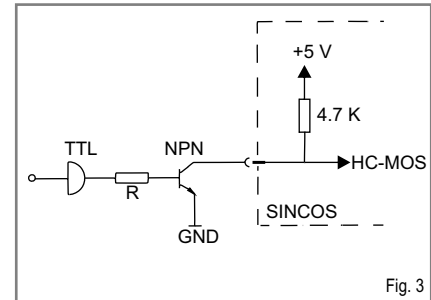


Fig. 3

## Overtemperature Output

The output is switched when the temperature  
monitoring circuit is activated:

Open collector output  
Max. admissible load:  $I_{max} = 100$  mA,  
 $U_{max} = 45$  V,  $P_{max} = 0.3$  W

## Pin Assignment

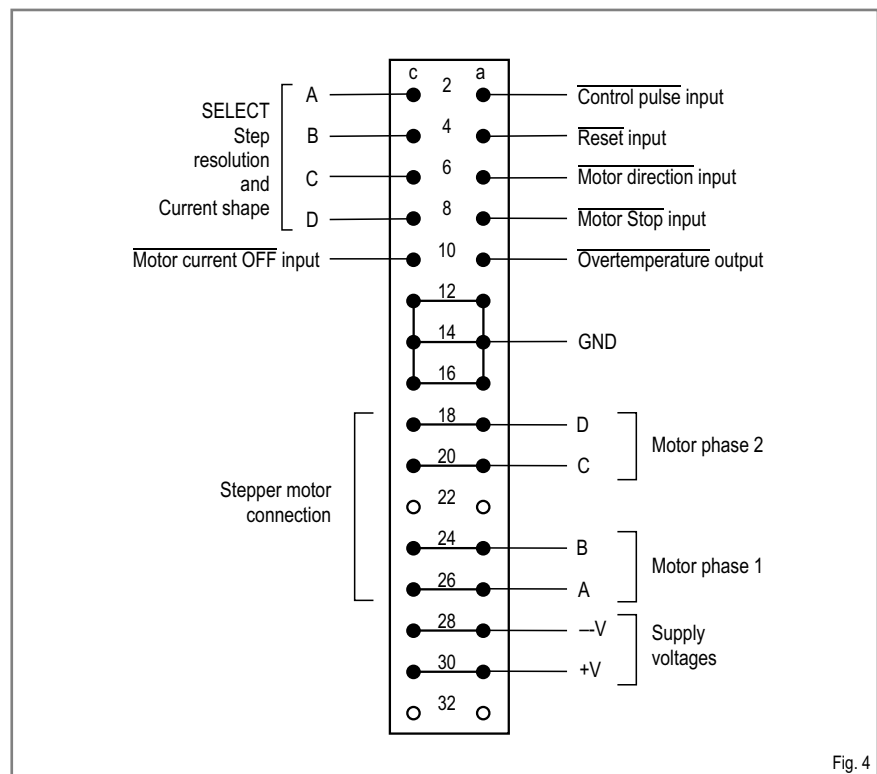


Fig. 4

## Ordering Code: SINCOS

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