

Stepping motor control amplifier board series SE ... E50 V12 und SE ... E50 V14

- control of 2-phase stepping motors
- compatible with STÖGRA standard amplifier boards series SE ... E50
- supply voltage - nominal voltage : 24 VDC till 240 VDC
- phase current range 0 A / ph. - 12 A / ph.
- integrated control of the motor load angle
 - in function with STÖGRA E50 encoder (50 impulses per channel and revolution) at the motor
 - (- also available as SE ... E200 V11/3 for E200 encoder (200 impulse per channel and revolution))
- all connections and signals via 31 pol. connector - H/F form
- protection against shortcircuit, overtemperature, and undervoltage
- via solder-bridges adjustable step angles: 400 , 500 , 800 and 1000 steps per revolution
- EMV according to EN 500082-2 and EN 55011 class B
- available with TTL- or SPS input signal level

Dimensions

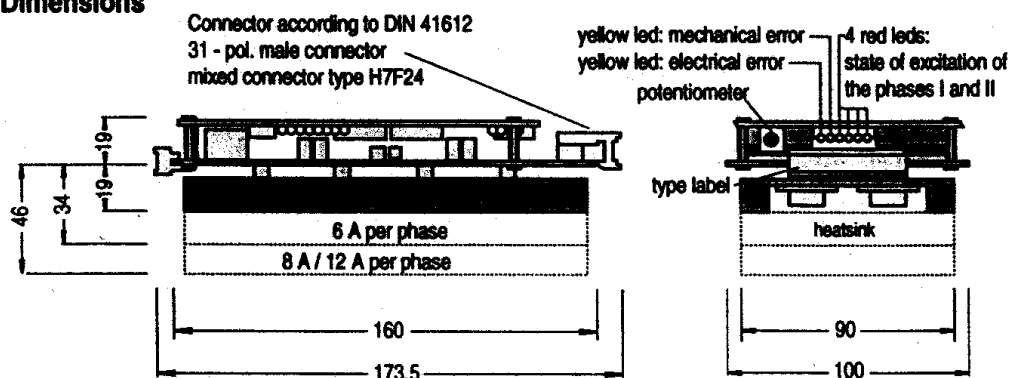


fig.1: Dimension

Selectable adjustments

all adjustments can be made via (marked) solder-bridges on the backside of the logic board.

marker	signification	standard adjustment
R	open: automatic current-reduction 50% at standstill closed: no current-reduction	open
W0,W1	step angle adjustment (see table below)	open
M	open: a mechanical error will be put out closed: a mechanical error will be ignored.	open
F	intern function - must be open	open
L-H	L open, H closed: input signals HIGH - active (the rising edge of the pulse-signal is significant) L closed, H open: input signals LOW - active (the falling edge of the pulse-signal is significant)	H closed L open

! Attention : Do not close L and H ! (shortcircuit !)

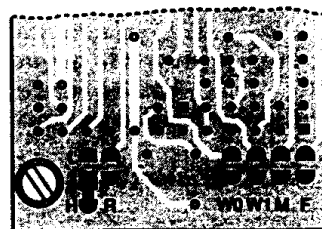


fig.2: selectable adjustments

Automatic current reduction (marker »R« open)

The total phase current - adjustable via potentiometer - is set for nominal operation. If marker "R" is open, then the phase current will be reduced by 50% at standstill of the motor. The first arriving pulse increases the phase current again to the adjusted nominal value. By activated Reset input, the current reduction will be not activated.

Step angle adjustments

via marker W0 and W1

X = marker closed

0 = marker open

W1	W0	steps per revolution
0	0	800
0	X	400
X	0	1000
X	X	500

Current adjustment

Ex factory the amplifier board is set to the nominal current. The motor phase current may be changed. For changing the phase current the Reset-signal has to be set. Then only LED "0" is active (see fig. 3) !

At measuring point B against point GND there can be measured a voltage which is proportional to the phase current.

300 mV correspond to the nominal current of the amplifier board. Meaning that at a amplifier board type SE 400.04.60 E50 V14 the phase current is set to 4A/Ph., if the voltmeter shows 300mV. 225mV correspond to 3A/Ph. An exception are amplifier boards with a nominal current of 8A/Ph. - see table below. The phase current can be adjusted via the potentiometer on the board's frontside.

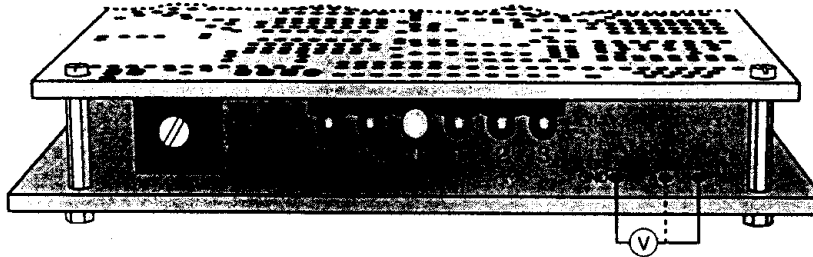


fig.3:
current-
adjustment
and condition
indication

nominal current		1 A/Ph. SE 400.01.24 E50 V14	4 A/Ph. SE 400.04.85 E50 V12	6 A/Ph. SE 500.06.85 E50 V12	12 A/Ph. SE 800.12.120 E50 V14	8A/Ph. SE 1000.08.120 E50 V14		
ⓧ	measured voltage	set phase current				measured voltage		
	%	[A/Ph]	[A/Ph]	[A/Ph]	[A/Ph]	[A/Ph]	[A/Ph]	
	375 mV	1,25	5	7,5	15	333 mV	125%	10
	300 mV	1	4	6	12	267 mV	100%	8
	225 mV	0,75	3	4,5	9	200 mV	75%	6
	150 mV	0,50	2	3	6	133 mV	50%	4
	max. adjustable current in ampere / phase (+ 5%)		1.4	5.6	8.4	14.5	11.2	

Input - and Outputsignals

-**Boost** increases the phase current by 20%.

-**Disable** switches the phase current off.

-**Reset** sets the unit in initial position - phase zero. A pulse signal is ignored and errors are reset.

-**Direction** controls the motor direction - signal from system control.

-**Pulse** - with every pulse the motor will do one step.

-**Step angle** divides the step resolution by two- 1000 (800) to 500 (400) steps/revolution. Input is always low-active.
- works only with open marker W0.

-**Change Direction** turns the motor direction - Coordination between the motor direction and the signal **Direction**
- The signal is always low-active

-**electrical error (/Ready signal)** is put out in case of undervoltage, shortcircuit or overtemperature.

At non-error-condition the Relais contact is closed - the unit is ready (Ready signal).

-**mechanical error** indicates lost steps of the stepping motor (load angle > 3,6°).

At non-error-condition the Relais contact is closed.

-**phase zero** indicates the electrical zero-position (every 7,2° - mechanically)

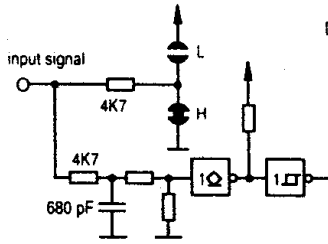
Input signals

rising time max.: 1 μ s , falling time max.: 1 μ s , frequency Pulse max.: 45 KHz

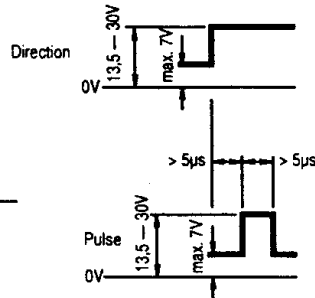
series E50 V12 / V14

Input circuit

e.g.: HIGH - Aktiv



Input signals V11 / SPS



Input signals V13 / TTL

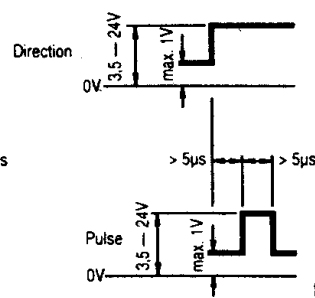


fig. 4: circuits / Inputs

Output signals

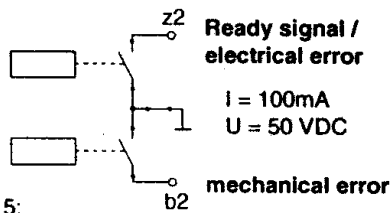


fig. 5:
Output signals

Ready signal

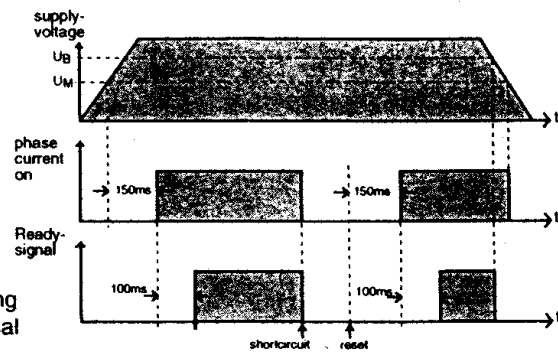


fig. 6: Timing
Ready signal

Supply voltage

Maximum allowed supply voltage: Nominal voltage of power amplifier card plus 15% (mains fluctuations !)

The nominal output voltage of the power pack unit (= supply voltage of power amplifier card) may not be higher than the nominal supply voltage of the power amplifier card.

E.g.: Calculation of a power pack unit for a SE 800.06.120 E50 V12 :

$$\text{Output voltage of power pack} = 120 \text{ VDC (and not (!) } 138 \text{ VDC} = 120 \text{ VDC} + 15\%)$$

working range - supply voltage (see Ready signal fig.6)

(Nominal-) supply voltage power amplifier card [VDC]	U_B [VDC]	U_M [VDC]
24	18	16
60	43	32
85	43	32
120	50	38
240	120	100

U_B and U_M +/- 5%

Specifications

Protection of the device

protection IP 00 (DIN 530)

protection against shortcircuit (in the motor phases), over-temperature and undervoltage

weight

nominal current | 1 A/Ph | 4 A/Ph | 6 A/Ph | 8 A/Ph | 12 A/Ph
weight | 0,2 Kg | 0,52 Kg | 0,77 Kg | 1,1 Kg | 1,1 Kg

Ambient conditions

Ambient temperature : 0°C to 50°C

max. heat sink temperature : 85°C

forced draft : necessary for power amplifier cards with nominal current 8A and 12A

Noise immunity

by correct installation :

according to EN50082-2 :

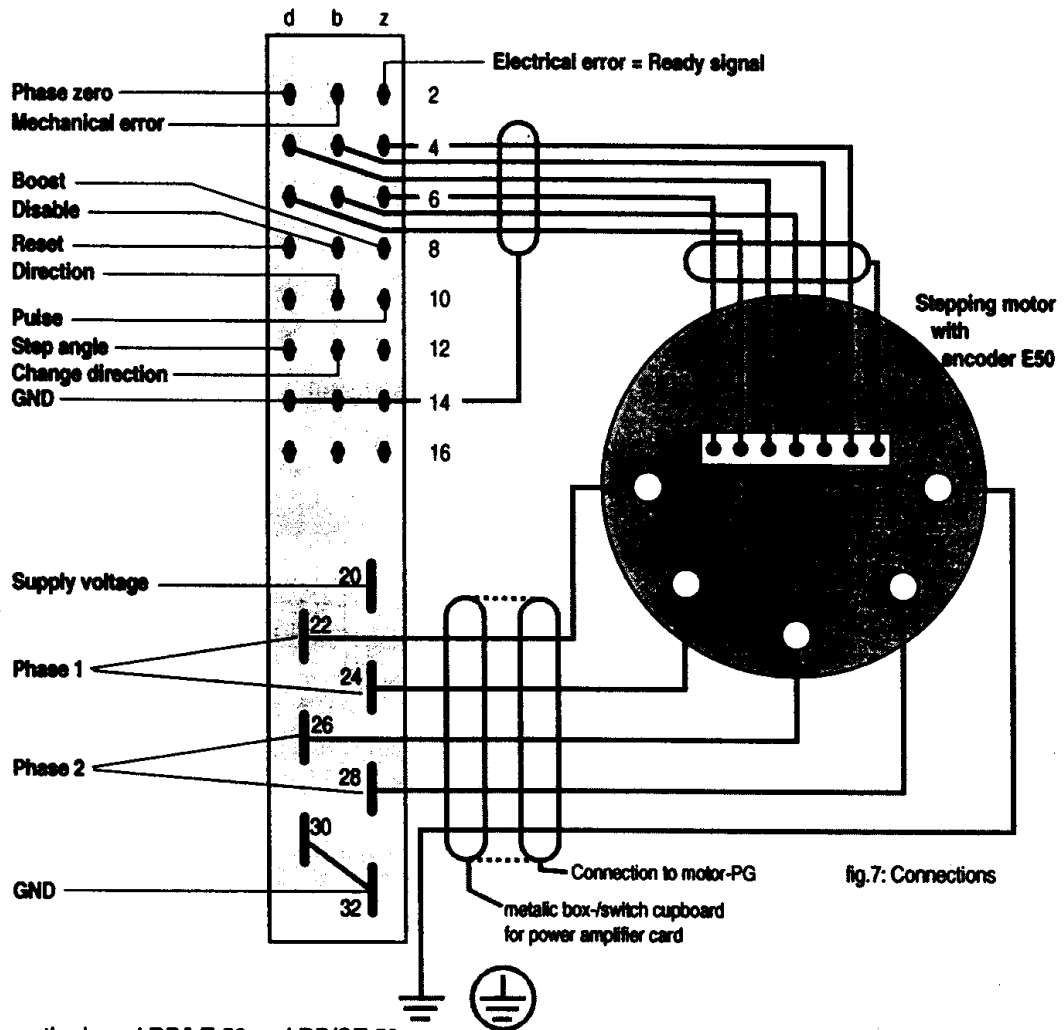
- at V14 (TTL-level) the signal inputs are not immune against fast transients (burst)

Noise radiation

by correct installation and shielding
or/and filtering of the lines and signals
according to EN55011 class B

Connections

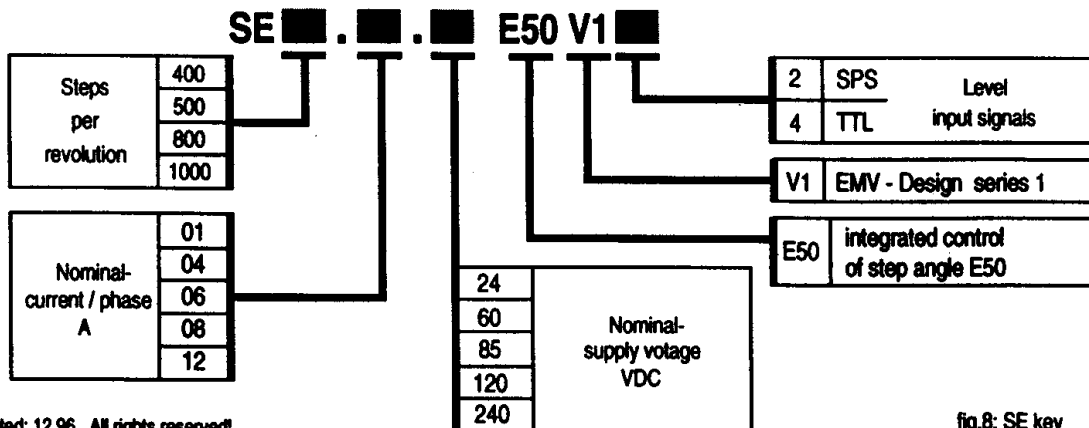
series E50 V12 / V14



works with motherboard RP/LE 50 and RP/CE 50

Non used inputs may stay open, there is no need to connect to an external potential

Available types: Example: SE 800.06.120 E50 V12



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