

Stepping motor control amplifier board series SE...V1 and SE...E50 V1

General notes

- Q Control of 2-phase-stepping motors
- Q Compatible with STÖGRA and Zebotronics standard amplifier boards series SE ..., SE ... E50, SE ... E50 D..
- Q Supply voltage - nominal voltage : 24 VDC to 240 VDC
- Q Phase current range 0 A/phase - 14,5 A/phase
- Q Boards SE ... E50 V1.. with integrated load angle control
 - together with Zebotronics E50 encoder (50 impulses per channel and revolution) at the motor
 - (also available SE ... E200 V1.. for HP H200 encoder - 200 impulse per channel and revolution)
- Q Protection against shortcircuit, overtemperature and undervoltage
- Q Via solder bridges adjustable step angles: 200, 400 , 500 , 800 and 1000 steps per revolution
- Q EMC according to EN55011 class B and EN50082-2

Versions - connector system and signal level of the inputs

- Q SE ... E50 V11 : Encoder connections via 9 pole D-Sub, all other signals and connections via 32 pole male connector (DIN 41612 type D) and SPS(PLC)-input signal level
- Q SE ... E50 V13 : Encoder connections via 9 pole D-Sub , all other signals and connections via 32 pole male connector (DIN 41612 type D) and TTL-input signal level
- Q SE ... V11 : All signals and connections via 32 pole male connector (DIN 41612 type D) and SPS(PLC)-input signal level
- Q SE ... V13 : All signals and connections via 32 pole male connector (DIN 41612 type D) and TTL-input signal level

Dimensions

SE 400.04.85 V13

SE 400.04.85.E50 V13

SE 400.01.85 V13

SE 400.02.24 V13

SE 400.08.120 V13

SE 400.12.120 V13

Dimensions series SE... V11/13

Selectable adjustments

All adjustments can be made via (marked) solder bridges on the rear side of the logic board.



selectable adjustments series SE ...V1.. / SE ... E50 V1..

marker	denotes
R	open: automatic current reduction 50% standstill closed: no current reduction
W0,W1	step angle adjustment (see table below)
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) ! Attention: Don't close L and H ! (short circuit!)

Step angle adjustments

X = marker closed
0 = marker open

		SE 400... V1.	SE 200... V1.
W1	W0	steps/rev.	steps/rev.
0	0	800	200
0	X	400	400
X	0	1000	-
X	X	500	-

Automatic current reduction

(marker »R« open)

The phase current - adjustable via potentiometer- is set for nominal operation. If marker »R« is open, the phase current will be reduced by 50% at standstill of the motor. The first pulse increases the phase current again to the adjusted nominal value. At active Reset input, the current reduction will be disabled.

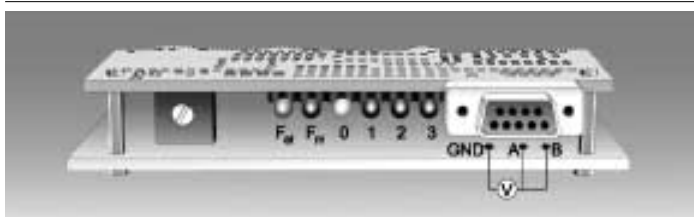
Stepping motor control amplifier board series SE...V1 and SE...E50 V1

Supply voltage (working range)

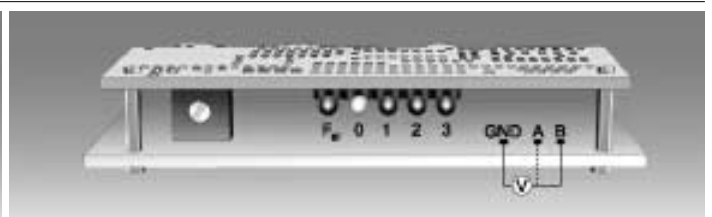
(Nominal) supply voltage [VDC]	Working range [VDC]	U_B [VDC] (motor enabled)	U_M [VDC] (motor current ON)	U_B and U_M $\pm 5\%$
24	20 - 36	18	16	
60 u. 85	50 - 85	43	32	
120	60 - 120	50	38	
240	130 - 240	120	100	

Current adjustment

Ex factory the amplifier board is set to nominal current. Via the potentiometer at the board frontside the phase current can be adjusted (the board must be in Reset state -> input signal Reset is set or power-ON Reset -> only LED "0" is lightning (see figure below). The voltage between measuring point B and point GND is proportional to the phase current (see table below)



SE ... E50 V11 and SE ... E50 V13



SE ... V11 and SE ... V13

measured voltage ⓧ %	Nominal phase current Typ	adjusted phase current					measured voltage [A/Ph]	
		1 A/Ph. SE ...01...	2 A/Ph. SE ...02...	4 A/Ph. SE ...04...	6 A/Ph. SE ...06...	12 A/Ph. SE ...12...	8 A/Ph. SE ...08...	
300 mV	100%	1	2	4	6	12	267 mV	8
150 mV	50%	0,75	1	2	3	6	133 mV	4
max. adjustable current		1.4	2.8	5.6	8.4	14.5	11.2	

Output signals

SE ... [E50] V11 and SE ... [E50] V13 :

Ready signal: Indication of an electrical error or a mechanical error (at SE...E50 V..).

In non error state the relay contact is closed.

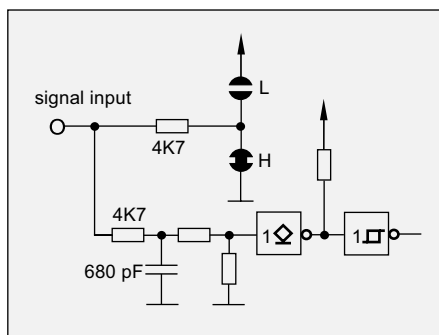


Output circuit SE...V11 / SE...V13 and SE...E50 V11 / SE...E50 V13

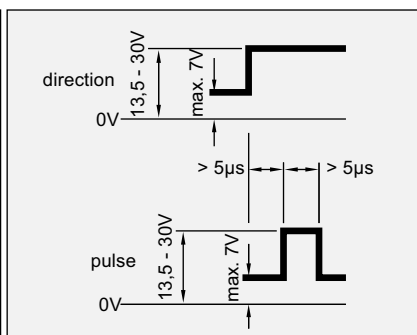
Input signals

- Boost:** Increases the phase current by 20%.
- Disable:** Switches off the phase current.
- Reset:** Sets the unit in zero position - phase zero. A pulse signal is ignored and errors are reset.
- Direction:** Controls the motor direction.
- Pulse:** With every pulse the motor will execute one step.
- Step angle:** Divides the step resolution by two from 1000 or 800 to 500 or 400 steps per revolution. The input is always LOW-active - works only with open marker W0.

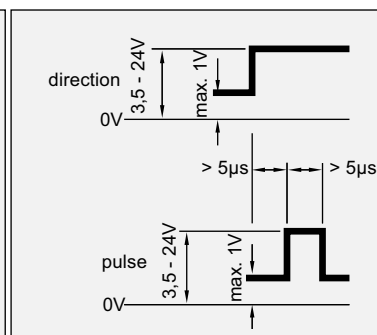
Input signals e.g.: HIGH-active



Input signals SPS - V11



Input signals TTL - V13



Specification of other input signals is as »direction«

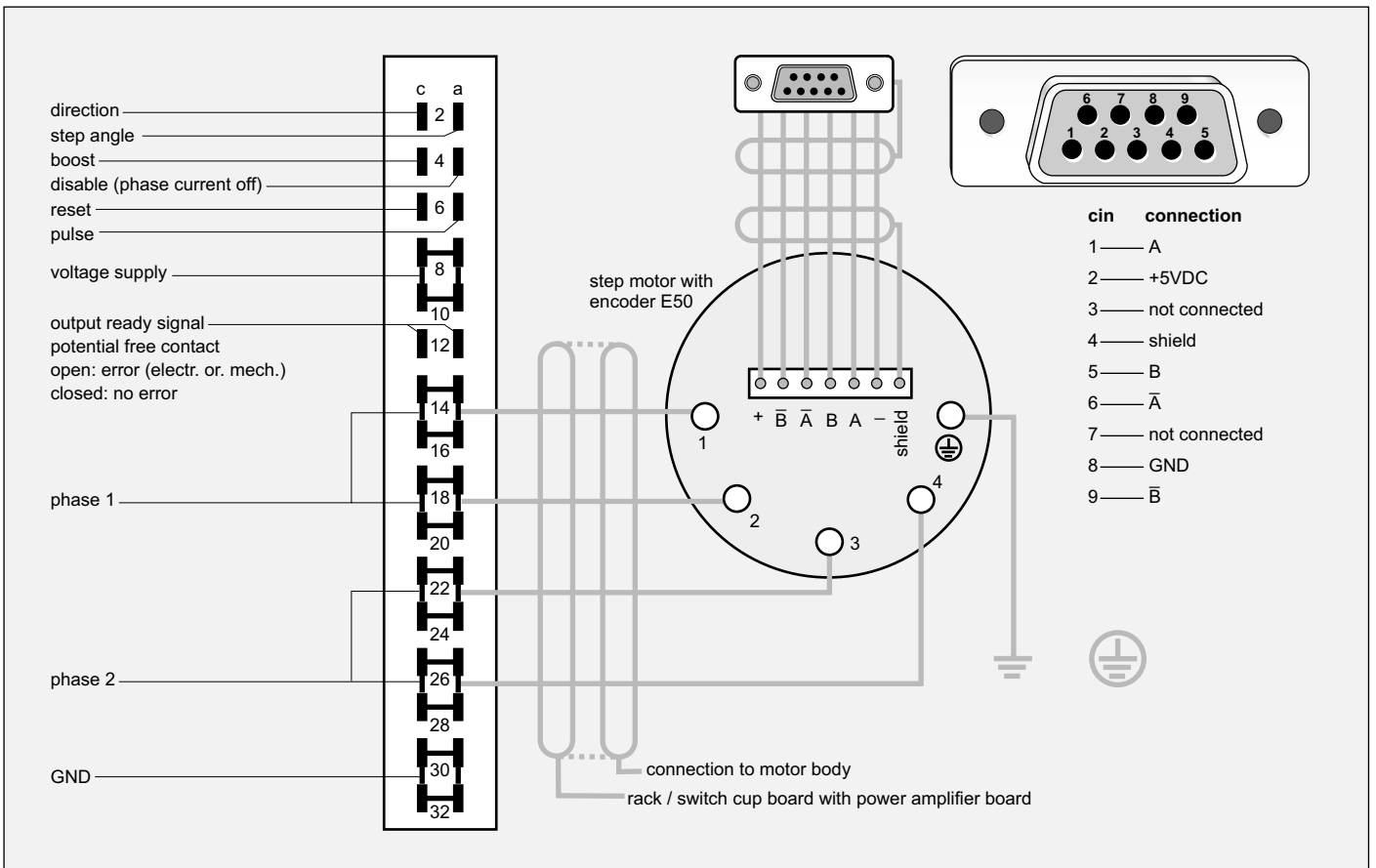
signal rise time max.: $1\mu\text{s}$, signal fall time max.: $1\mu\text{s}$, frequency pulse max.: **45 KHz**

Stepping motor control amplifier board series SE...V1 and SE...E50 V1

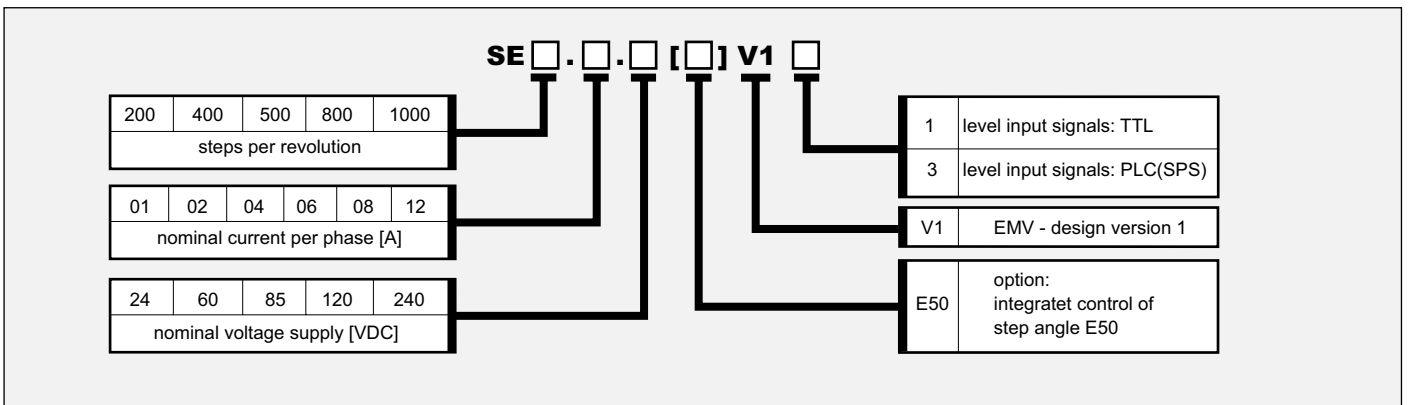
Technical specifications

Protection of the device Protection IP 00 Protection against shortcircuit, overtemperature and undervoltage	Noise immunity In case of correct installation: according to EN50082-2: - at V13 (TTL-level) the signal inputs are not immune to fast transients (burst)														
Weight <table border="1"> <tr> <td>Nominal current</td> <td>1 A/Ph</td> <td>2 A/Ph</td> <td>4 A/Ph</td> <td>6 A/Ph</td> <td>8 A/Ph</td> <td>12 A/Ph</td> </tr> <tr> <td>Weight</td> <td>0,2 Kg</td> <td>0,2 Kg</td> <td>0,52 Kg</td> <td>0,77 Kg</td> <td>1,1 Kg</td> <td>1,1 Kg</td> </tr> </table>	Nominal current	1 A/Ph	2 A/Ph	4 A/Ph	6 A/Ph	8 A/Ph	12 A/Ph	Weight	0,2 Kg	0,2 Kg	0,52 Kg	0,77 Kg	1,1 Kg	1,1 Kg	Noise radiation In case of correct installation and shielding or/and filtering of the lines and signals according to EN55011 class B
Nominal current	1 A/Ph	2 A/Ph	4 A/Ph	6 A/Ph	8 A/Ph	12 A/Ph									
Weight	0,2 Kg	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 : for amplifier boards with nominal current 8A and 12A															

Connections



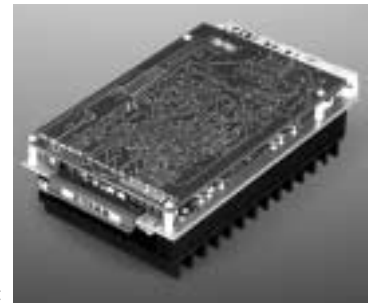
Available versions: Example: SE 800.06.120 E50 V14 or SE 1000.04.85 V13



Limitation in possible combinations 01 A only with 24 VDC and 85 VDC , 02 A only with 24 VDC , 240 VDC only with 08 A and 12 A

Series SE P05 - Microstep

- Q Step resolution adjustable from 200 to 12800 steps / rev. and externally switchable
- Q Excellent truth micro stepping over the entire velocity range
- Q Electrically and mechanically compatible to standard amplifier (SE 11... , SE... , SE...V13..)
- Q Shortcircuit, overtemperature and undervoltage protected
- Q Voltage range from 24 VDC to 240 VDC
- Q Current range from 0 A / Ph. to 14,5 A / Ph.
- Q Constant torques for all pre-selected resolutions



SE P05 Mikroschritt

Step angle adjustment on the board

Different step angles can be selected via the markings C0, C1, C2 and C3. With the input »step angle« (Pin a2) the step angle can be switched externally between two values (marker »W« must be open!). During motion, switching the step angle is possible within the motor start-stop-frequency (when changing simultaneously the pulse frequency and step angle - at any frequency).

steps / revolution Resolution switchable externally - PIN a2		marker for step angle selection X = marker closed, else = marker open			
not active	active	C3	C2	C1	C0
2000	200	X	X	X	X
	400	X	X	X	
2500	500	X	X		X
3200	800	X	X		
4000	400	X		X	X
	800	X		X	
	1000	X			X
5000	500	X			
	1000		X	X	X
8000	800		X	X	
	2000		X		X
10000	400		X		
	1000			X	X
	2000			X	
12800	800				X
	1600				

There are available more step angles ! Please ask at our sales office.

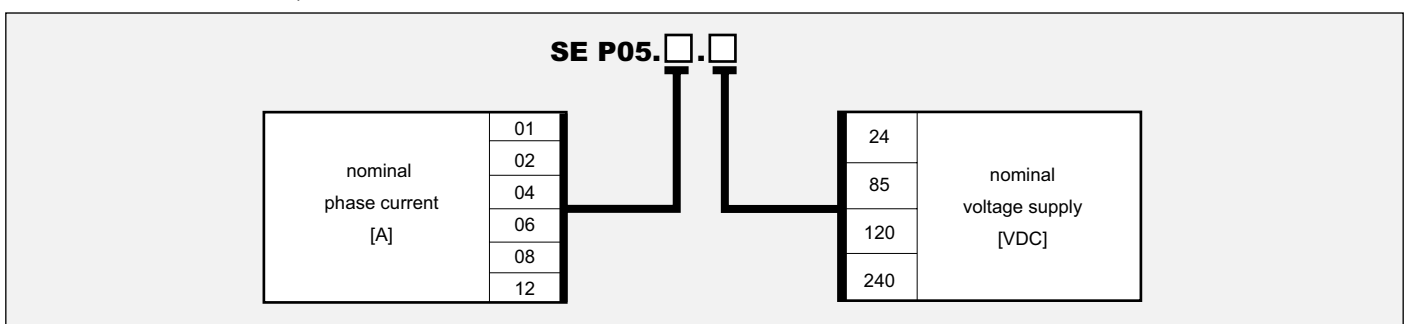
Adjustments via solder bridges on the rearside of the control board:

marking	denotes
S0	Phase current characteristics
C0 - C3	selection of step angle (see table above)
S0, C4	internal functions
W	activates row »Pin a2 active« of above step angle table Pin a2 (external switching of step angle) is deactivated
SPS	open: "TTL"- input level closed: "SPS"- input level (PLC signal level)
R	automatic current reduction (see SE...V1... page 6)
L	open : Signale High-Aktiv - geschlossen Signale : Low-Aktiv

Sonstige Daten :
Abmasse,
Eingangssignale,
Ausgangssignale,
Stromeinstellung,
Versorgungsspannung,
Technische Daten
wie SE ... V11/V13

selectable adjustments

Available versions: (e.g.: SE P05.06.85)



Limitation in possible combinations 01 A only with 24 VDC and 85 VDC , 02 A only with 24 VDC , 240 VDC only with 08 A and 12 A