EM-121 STEPPER MOTOR CONTROLLER 40V 1A

FEATURES

- **Bipolar chopper**
- **Wide operating voltage range**
- **Full and half step operation**
- **7-settable phase currents**
- **Auxiliary oscillator**
- **Acceleration ramp, 3-speed**
- **Self recovery fuse**
- **Rail mounting base fittable**

EM-121 is bipolar-chopper type stepper motor controller. Bipolar operation suits most stepper motors and provides the best torque. Phase current is set to desired level using chopping type current limit.

The phase current (current limit) can be set in seven different levels using jumpers. A wide phase current set range makes it possible to use the device with several different motors. EM-M121 also utilizes steady state current hold, in other words when the motor is stopped the controller decreases phase current, this feature reduces both the motor and controller thermal loss. Two steady state current hold modes are settable.

The controller features an auxiliary oscillator, which has fifteen preprogrammed frequencies. The frequency is set with four control inputs. Auxililary oscillator in EM-121 has also an acceleration ramp feature, which can be used to change frequencies flexibly, so that the motor will start up reliably even at high frequencies. There are three acceleration ramp intervals, that can also be bypassed.

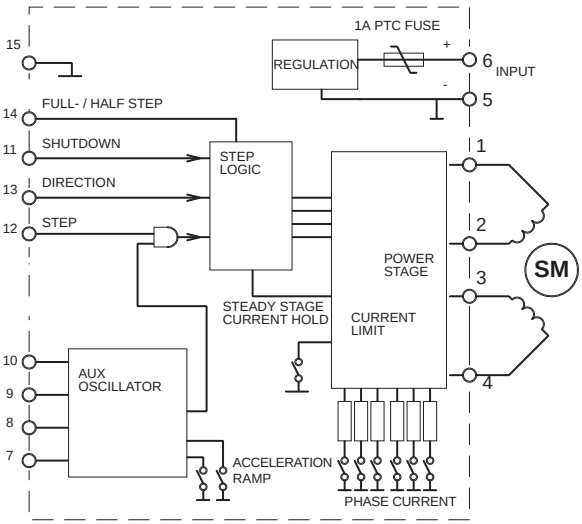
The inputs operate with so called negative logic, in other words the inputs are activated with connecting the input to ground, the inputs also work with TTL-logic level control.

The power state of EM-121 has thermal protection for overload, the device has also self recovery fuse that protects the controller from over current and reversed input voltage polarity.

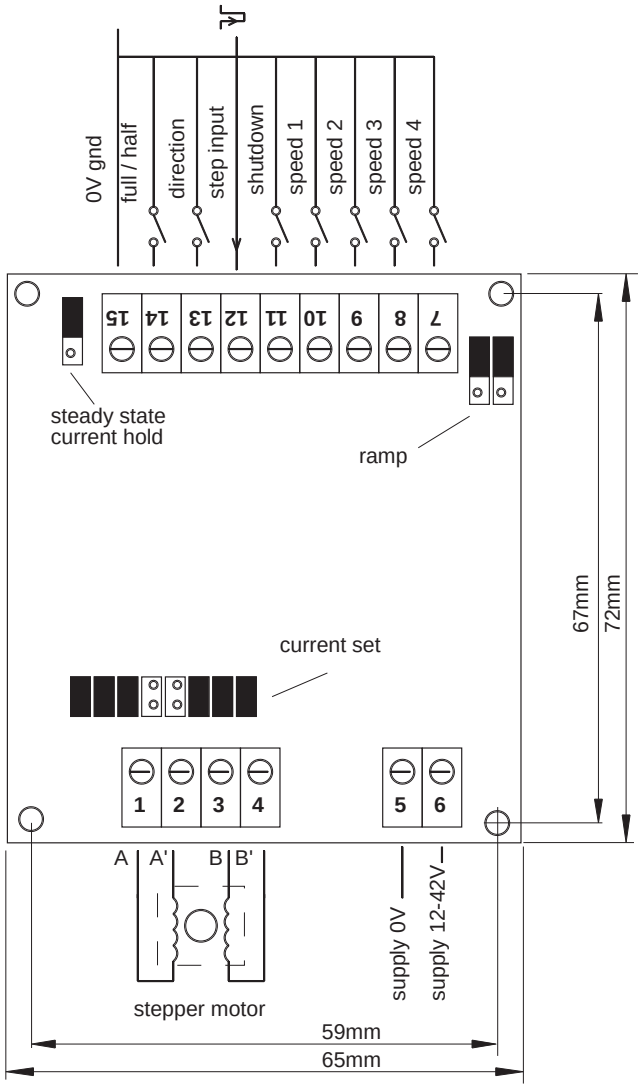
TECHNICAL DATA:

Operating voltage	12-40Vdc
Idle current	approx. 40mA / (20mA shutdown "0")
Current set	0.25; 0.37; 0.5; 0.63; 0.75; 0.9; and 1.0A
Steady state I hold	approx. 35 or 67% of current set
Voltage loss	3V when Im=1A
Fuse	1A self recovery.
Aux. osc. freq.	20, 50, 100, 200, 300 Hz 400, 600, 800, 1000 Hz 1.5; 2; 2.5; 3; 3.5; 4 kHz
Freq. precision	typ. 1%
Digital control	"off" when Uin 4 -30V or open "on" when Uin 0-1V
Step freq.	max. 9kHz
Operating temp.	0-50°C
Dimensions	67x75x25mm
Weight	approx. 100g

EM-121 BLOCK DIAGRAM



OPERATING INSTRUCTIONS EM-121



Supply voltage 12-40Vdc filtered.

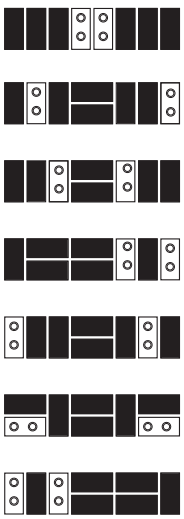
Control inputs are activated using switches, or 0-5V voltage signals, or NPN-open collector outputs.

Current, steady state current hold and ramp are set with jumpers

STEP:
- full step switch on or 0V
  half step switch off or 5V
DIRECTION:
- Forward switch on or 0V
  Backwards switch off or 5V
STEP-INPUT:
- TTL or 0-5V pulse, trigs with falling edge
SHUTDOWN:
- switch on or 0V
CHOOSING AUXILIARY OSCILLATOR FREQUENCIES:
- activate with switch on or 0V

CURRENT SET

Phase current setting map



1A
0.9A
0.75A
0.63A
0.5A
0.37A
0.25A

STEADY STATE CURRENT HOLD
When the motor is not run the current set changes to current hold. Steady state current hold is set either to 33% or 67%

33%

67%

AUXILIARY OSCILLATOR
The aux. oscillator produces preprogrammed frequencies, the frequencies are set with four digital inputs. The aux. oscillator also features ramp, that can be used to change frequencies flexible, with better motor start up. Small frequencies change directly, but frequencies above 400 Hz change with slope.
CAUTION! Aux. oscillator cannot be used with pulse input at the same time.

ramp off (direct)

fast (400-4000Hz 0.2s.)

middle (400-4000Hz 0.4s.)

slow (400-4000Hz 0.6s.)

switches

freq./Hz	1	2	3	4
4000	X	X	X	X
3500		X	X	X
3000	X		X	X
2500			X	X
2000	X	X		X
1500		X		X
1000	X			X
800				X
600	X	X	X	
400		X	X	
300	X		X	
200			X	
100	X	X		
50		X		
20	X			
stop				

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