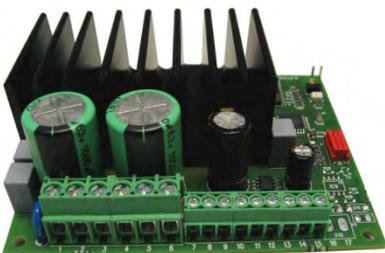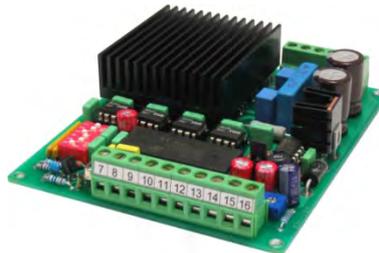# MOTION TECHNOLOGIES PTY LTD

TECHNICAL SPECIFICATIONS

ELECTROMEN STEPPER MOTOR CONTROLLERS

SUMMARY

Continuous Current limit (amps)	Volts	Model #	Page
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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
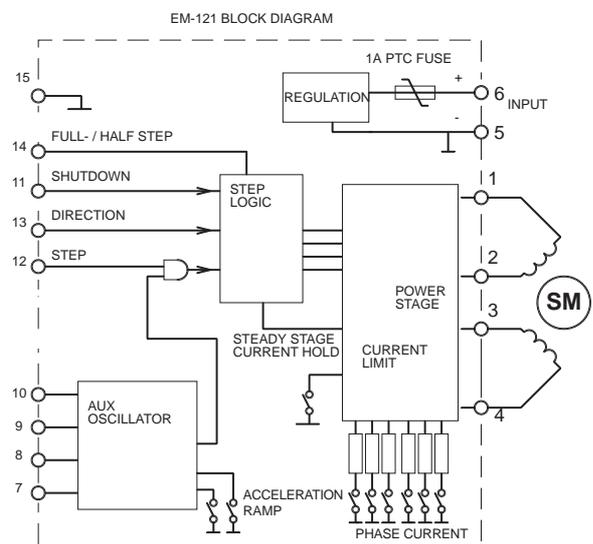
OPERATING INSTRUCTIONS EM-121

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
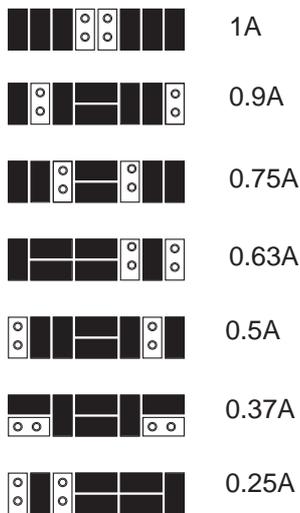SHUTDOWN:
- switch on or 0V
CHOOSING AUXILIARY OSCILLATOR
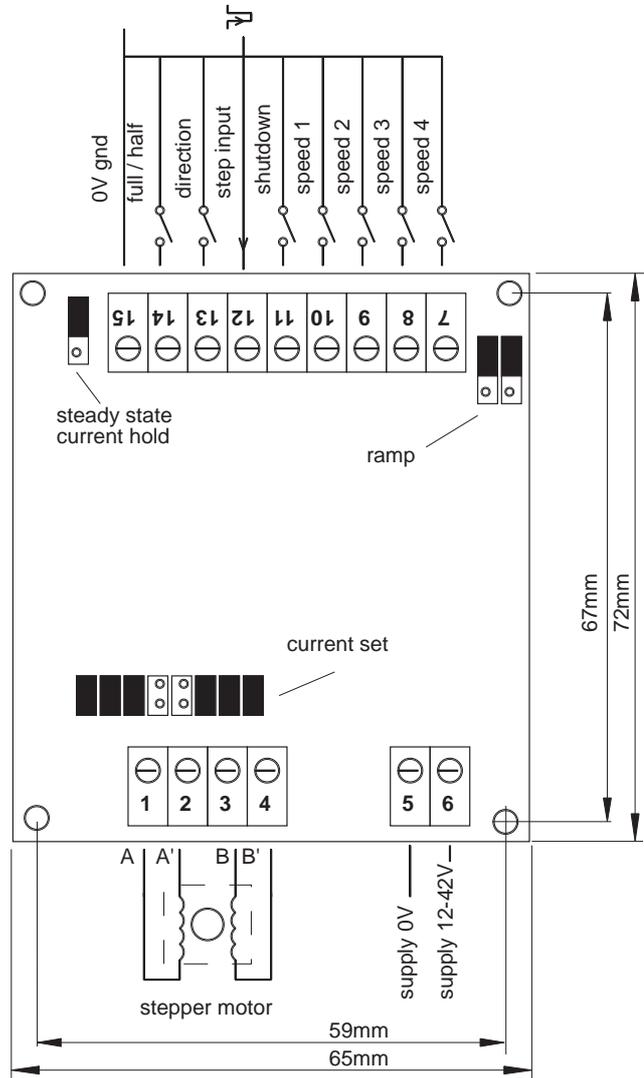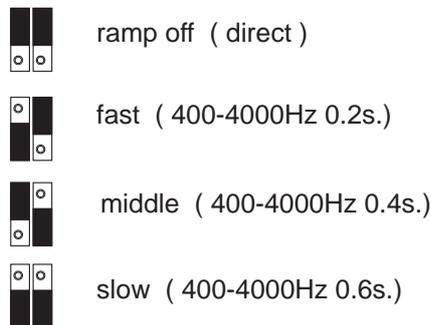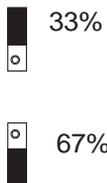FREQUENCIES:
- activate with switch on or 0V

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%

steady state current hold

ramp

current set

67mm
72mm

1 2 3 4   5 6

A A' B B'

stepper motor

supply 0V
supply 12-42V

59mm
65mm

0V gnd
full / half
direction
step input
shutdown
speed 1
speed 2
speed 3
speed 4

15 14 13 12 11 10 9 8 7

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	✕	✕	✕	✕
3500		✕	✕	✕
3000	✕		✕	✕
2500			✕	✕
2000	✕	✕		✕
1500		✕		✕
1000	✕			✕
800				✕
600	✕	✕	✕	
400		✕	✕	
300	✕		✕	
200			✕	
100	✕	✕		
50		✕		
20	✕			
stop				

EM-318 STEPPER MOTOR DRIVER 3A 12-24V
microstepping and presettable function inputs

FEATURES

- **Bibolar chopper**
- **1, 1/2 , 1/4.....1/64 steps**
- **Four preset function inputs**
- **PNP or TTL control**
- **Quiet run current control**
- **Acceleration / deceleration ramps**
- **DIN-rail base mountable**

EM-318 is a bipolar-chopper type microstepping steppermotor controller. The bipolar operation principle suits most stepper motors and provides the best torque. The microstepping function also enables great performance at low rpm. The stepping and current regulation has been synchronized, giving a smooth and quiet operation. There are 7 different stepping options to choose from, ranging from full- to 1/64-step operation. This provides various possibilities for different speed applications.

The controller has its own auxiliary oscillator, which can be used for pre-set speed driving. The pre-set speeds can be activated by using 4 digital function inputs. The oscillator features an acceleration ramp function, which allows frequencies to be altered flexibly. The motor will also start up reliably even to higher frequencies and it is possible to shift to the desired velocity with out pace drop. The auxiliary oscillator incorporates an indexing part, which offers the possibility of running presettable operational sequences. These secuences can be activated with the 4 digital inputs. The sequence is a movement with selected speed, direction and distance (as steps).   All the inputs are activated with positive logic commands. So the commands and functions are activated by connecting the input to a positive voltage. Control can also be done with TTL-logic level commands.

All of the controller settings are made digitally, using the separate setting device, EM-236 Interface Unit. With this device the settings are easily copied to an other or even to multiple controllers.

Operating voltage	12-35Vdc
Idle current	n. 20mA
Current settings	0.1 -3A (step 0.1A)
Auxliary oscillator	50-10000Hz
Frequency accuracy	typ. 0.5%
Ramp adjust	0.1-5s (0 to 10000Hz)
Control level	"on" when Uin 4 -30V
	"off" when Uin 0-1V or open
Max. step freq.	15kHz
Operating temp.	0-50℃
Dimensions	87x72.5x25mm
Weight	100g

CONTROL INPUT CONFIGURATION

All control inputs

47kohm (step in = 22kohm)

10kohm

EM-318 BLOCK DIAGRAM

CONNECTIONS

Operating voltage 12-35Vdc, ripple smaller than 20%.
The card has no internal fuse. The use of an external
fuse is recommended. Incorrect supply polarity can
damage the controller. All control inputs work with
positive control 4-30V. Inputs can be controlled with
PLC or TTL signals. 5V auxiliary output (terminal 7)
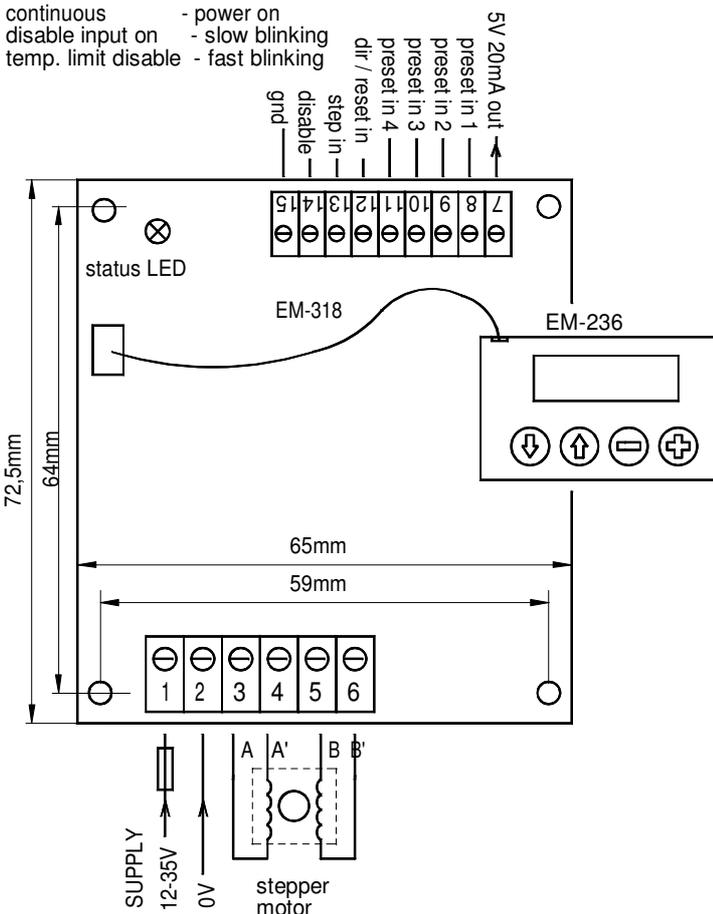can source max. 20mA.

CONTROL -inputs

STEP IN is the input for stepping pulses. One steps is done with
the positive edge of the input pulse.
DIR/STOP/RESET input is normally used to choose the rotational
direction. If preset functions are used (terminal 8 to 11) this input
can act as a stop input, and if preset sequence is used it will also
reset the sequence counter. This input is triggered with up going
pulse edge.
DISABLE will shut down power stage and hold it disabled, this
input has the highest priority. But it will not reset a sequence.
So it is recommended to stop and reset functions before releasing
disable to avoid any possible uncontrolled startup.
PRESET IN 1-4 are presettable function inputs. These are used to
activate chosen preset function. Function parameters include speed,
direction, and distance in steps.
If stepping distance is chosen to be zero, the drive will be continued
as long as input is selected or STOP is activated. In other words
the function works as preset speed driving.

PARAMETER SETTING

The card settings are made with a EM-236 Interface Unit
or Ementool Lite PC soft-ware and EM-268 USB-dongle.
EM-236 is connected to a red connector on the card.
At first it will display the cards type and program version.
Answering yes for LOAD and EDIT alternative the cards
parameters are retrieved and displayed as a list that can be
browsed with the arrow keys. Adjustment is done with +/- keys.
The adjusted parameters are saved by pressing the SAVE
key for about 2 seconds. After this, a notification will appear
that that the new values has been SEND and SAVED.
By choosing the MONITOR function, you can monitor the
cards operation.

Status LED codes

continuous	- power on
disable input on	- slow blinking
temp. limit disable	- fast blinking

PARAMETER EFFECT

1. The stepping mode determines how much motor
moves when card receives a step pulse. The most
precise results are achieved with so called
micro-stepping (partial step) setting and the highest
possible resolution is 1/64-motor step agains one
incoming step pulse.
2. Ramp setting is common for acceleration- and
deceleration. Ramp is in use with preset functions.
3. The current drop function limits the current to the
set percentace during the rest-stage. This reduces
the amount of the heat that motor has to dissipate.
Notice. Lower values than 100% can reduce
precision in micro-stepping driving.
4. Phase current limiting during the drive.
5. and 6. are not in use.
7.-22. These are to determine preset functions which
are activated with PRESET IN # inputs. There are
four preset functions available to be determined.
7.-10. Parameters to select the preset direction.
11.-14. Parameters to set the stepping frequency = speed
15.-22. Parameters for stepping amount = distance.

For example: Par.15 set to 393 and Par.16 set to 41 will
result in 41393 steps total when terminal 8 (preset in 1) is
activated.
Notice.
The movement is in ratio to the used stepping mode.
With 1/64 mode the movement is smallest, that is:
41393/64 = 646 + 49/64 full steps

MONITORABLE VALUES

1. last activated preset function
2. sequence step down counter to zero
3. Step counter. Reset with a new sequence.

PARAMETERS of EM-318 prog 1.2
default values in brackets.

1. Stepping mode (0-6) [2]
  0 = full step
  1 = half step
  2 = quarter step
  3 = 1/8 step
  4 = 1/16 step
  5 = 1/32 step
  6 = 1/64 step
2. Ramp time 0.1-5s (1-50) [10]
3. Current 1s after stop (1-4) [4]
  1. 100% (= normal)
  2. 50% (reduced)
  3. 25% (reduced)
  4. 0% (current disabled)
4. Phase current 0.1-3A (1-30) [10]
5. not in use (0-1)
6. not in use (0-1)

  Preset run directions
7. preset 1. 0=fwd 1=rev [0]
8. preset 2. 0=fwd 1=rev [1]
9. preset 3. 0=fwd 1=rev [0]
10.preset 4. 0=fwd 1=rev [1]

  Preset run frequencies
11. preset 1. 50-10000Hz (5-1000) [30]
12. preset 2. 50-10000Hz (5-1000) [30]
13. preset 3. 50-10000Hz (5-1000) [100]
14. preset 4. 50-10000Hz (5-1000) [100]

  Index run counting values 0-1000000 step
  Setting 0= continuous run
15. preset 1. 0-999 (0-999) [0]
16. preset 1. 0-1000 x 10^3 (0-1000) [0]
17. preset 2. 0-999 (0-999) [0]
18. preset 2. 0-1000 x 10^3 (0-1000) [0]
19. preset 3. 0-999 (0-999) [0]
20. preset 3. 0-1000 x 10^3 (0-1000) [0]
21. preset 4. 0-999 (0-999) [0]
22. preset 4. 0-1000 x 10^3 (0-1000) [0]

23. min start freq. 50-10000Hz (5-1000) [10]

EM-136 STEPPER MOTOR MICROSTEPPING CONTROLLER UNIT 12-45V 0.5-4A

FEATURES:

- Bipolar chopper
- Wide supply voltage range
- Full-, half-, quarter-, and 1/8-step operation
- 8-programmable phase currents
- Auxiliary oscillator
- Acceleration- and braking ramp
- Self recovery fuse
- Very high efficiency
- Low heat dissipation
- Rail mounting base available

EM-136 is bipolar-chopper type stepper motor controller. Bipolar operation suits most stepper motors and provides the best torque. The microstepping feature gives high performance also at low rpm. The power stage is mosfet-type so it runs with very high efficiency.

There are four stepping modes: full, half, quarter and 1/8. Desired mode is set with two control inputs. The phase current (current limit) can be set in eight different levels using dip-switches.
A wide phase current set range makes it possible to use the device with several different motors.

The controller features an auxiliary oscillator, which has 7 preprogrammed frequencies. The frequency is set with three control inputs. Auxililary oscillator in EM-136 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. The acceleration ramp time is set with a trim.

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

The power state of EM-136 has self recovery fuse that protects the controller from over current and reversed input voltage polarity.

TECHNICAL DATA:

Operating voltage	12-45Vdc
Idle current	approx. 25mA (enable "0")
Current set	0.5; 1,0; 1.5; 2.0;
	2.5; 3.0; 3,5 and 4.0A
Voltage loss	1V when Im=1A
Fuse	4A self recovery.
Aux. osc. freq.	200, 500, 1000, 2000 Hz
	3000, 5000, 8000 Hz
Ramp speed	0,2...3s (0...8000 Hz)
Aux. freq. precision	better than 0,5%
Digital control	"on" when Uin 4 -30V
	"off" when Uin 0-1V
Step freq.	max. 15 kHz
Operating temp.	0-50°C
Dimensions	87x73x35mm
Weight	approx. 90g

EM-136 BLOCK DIAGRAM
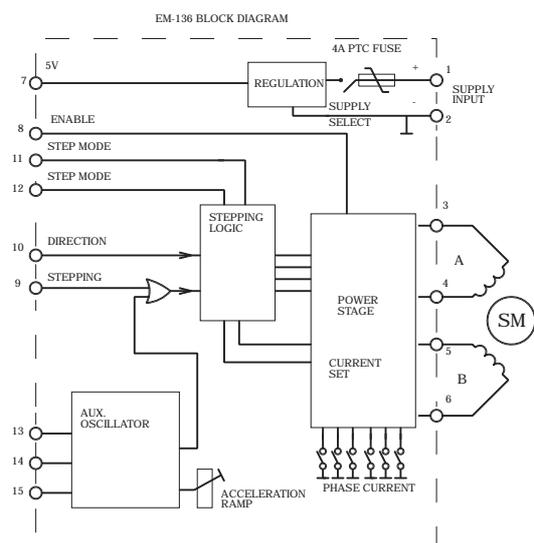
EM-136 WIRING AND INSTALLATION

Supply voltage 12-45Vdc, ripple less than 20%
Make sure that the current feed capability of the
voltage source is adequate for the application.
The undervoltage situation can cause undesired
effects for the function.

The phase current is set with PHASE CURRENT
switch (see the table below). Notice that the motor
do not always need the nominal phase current. Often
the motor works better with lower than the nominal
current. Find the best current for your application,
but do not exceed the nominal current of the motor.

Control inputs are activated using switches or
voltage signal. Driver has a positive control logic
5...30V = "on" , 0-1V or OPEN = "off"

There are four stepping modes : full, half, 1/4 and 1/8.
The full-step is good for higher speeds. The 1/8-step
gives best resolution on positioning use, and also the
smoothest run on low speeds. Stepping mode is
selected with STEP MODE inputs A & B (look at table
below).

If used with external stepping frequency source,
connect frequency signal to STEP PULSE input.
Incoming pulse level should be 4-30V, frequency
max.15kHz and minimum pulse lenght 25us.
Internal stepping source (aux. oscillator) is set
with AUX. OSC. inputs 1,2 and 3 (see the table).
Aux. oscillator includes also the acceleration RAMP.
It gives a smooth start towards the selected frequency.
The ramp time can be adjusted from 0.2 to 3sec.
The AUX. OSC. frequencies and the RAMP time are
based on 20MHz crystal frecuency. The chrystal can
be changed to be anything between 4...20MHz.
The AUX. OSC. frequencies and ramp time are changed
in the same proportion.

ENABLE has the highest priority.
NOTE. If ENABLE input is "off" the output stage is
turned off, (output current is off) and also the AUX. OSC
is reset. So every time when the ENABLE input is turned
"on" the AUX. OSC. starts with the acceleration ramp.

DIRECTION input is used to change the rotating direction.
Direction change does not include the RAMP function in
it self. But if it is used with the ENABLE input the
ramp and the smooth direction change can be achieved.

STEP MODE SET

full step: input A and B "off"
half step: input A "on", B "off"
1/4 step: input A "off", B"on"
1/8 step: input A and B "on"

PHASE CURRENT SET

0.5A all "off"
1.0A 1 and 4 "on", others "off"
1.5A 2 and 5 "on", others "off"
2.0A 1,2,4,5 "on", others "off"
2.5A 3 and 6 "on", others "off"
3.0A 1,3,4,6 "on", others "off"
3.5A 2,3,5,6 "on", others "off"
4.0A all "on"

AUX. OSCILLATOR FREQ.
(with 20MHz crystal)

stop   all aux. osc. input "off"
200Hz   in1 "on", others "off"
500Hz   in2 "on", others "off"
1000Hz in1,2 "on", others "off"
2000Hz in3 "on", others "off"
3000Hz in1,3 "on", others "off"
5000Hz in2,3 "on", others "off"
8000Hz all aux. osc. input "on"

EM-186-72 STEPPER MOTOR MICROSTEPPING CONTROLLER UNIT 20-80V 0.8-5A
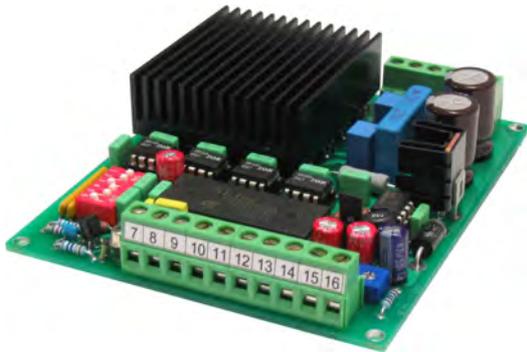
FEATURES:

- Bipolar chopper
- Wide supply voltage range
- Full-, half-, quarter-, and 1/8-step operation
- 8-programmable phase currents
- Auxiliary oscillator
- Acceleration- and braking ramp
- Power reduction
- Very high efficiency
- Low heat dissipation
- Rail mounting base available

EM-186-72 is bipolar-chopper type stepper motor controller. Bipolar operation suits most stepper motors and provides the best torque. The microstepping feature gives high performance also at low rpm. The power stage is mosfet-type so it runs with very high efficiency.

There are four stepping modes: full, half, quarter and eighth. Desired mode is set with two control inputs. The phase current (current limit) can be set in eight different levels using dip-switches.
A wide phase current set range makes it possible to use the device with several different motors. Automatic power reduction will drop phase current when stepping pulses stop coming.

The controller features an auxiliary oscillator, which has 7 preprogrammed frequencies. The frequency is set with three control inputs. Auxililary oscillator in EM-186-72 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. The acceleration ramp time is set with a trim.

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

TECHNICAL DATA:

Operating voltage	20-80Vdc
Idle current	approx. 25mA (enable "0")
Current set	0,8; 1,4; 2; 2,6
	3,2; 3,8; 4,4; 5,0A
Voltage loss	1V when Im=1A
Aux. osc. freq.	200, 500, 1000, 2000 Hz
	3000, 5000, 8000 Hz
Ramp speed	0,2...3s (0...8000 Hz)
Aux. freq. precision	better than 0,5%
Digital control	"on" when Uin 4 -30V
	"off" when Uin 0-1V or open
Stepping options	1,1/2,1/4,1/8 step
Power reduction	-70%
Power reduction delay	100ms from last pulse
Step freq.	max. 15 kHz
Operating temp.	0-50°C
Dimensions	90x107x30mm
Weight	approx. 180g

EM-186 BLOCK DIAGRAM
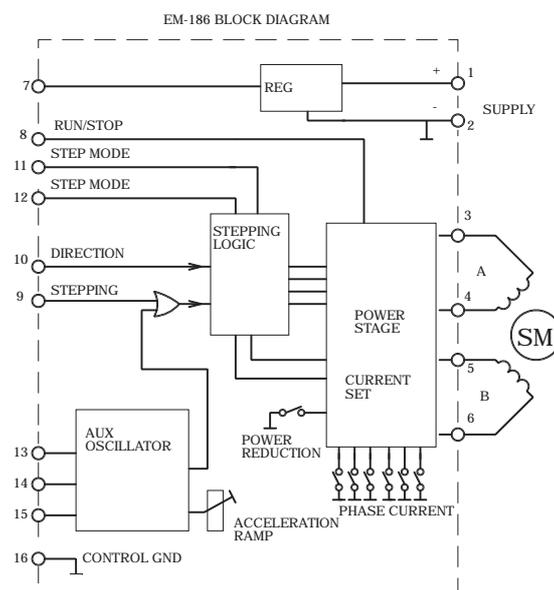
EM-186-72 WIRING AND INSTALLATION

Supply voltage 20-80Vdc, ripple less than 20%
Make sure that the current feed capability of the
voltage source is adequate for the application.
The undervoltage situation can cause undesired
effects for the function.

The phase current is set with PHASE CURRENT
switch (see the table below). Notice that the motor
do not always need the nominal phase current. Often
the motor works better with lower than the nominal
current. Find the best current for your application,
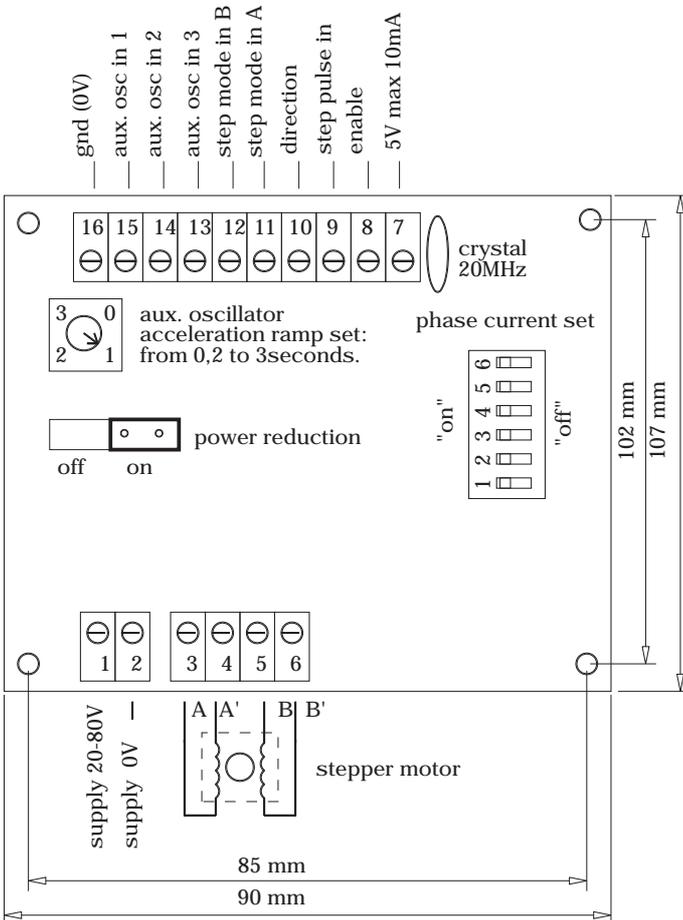but do not exceed the nominal current of the motor.

Control inputs are activated using switches or
voltage signal. Driver has a positive control logic
5...30V = "on" , 0-1V or OPEN = "off"

There are four stepping modes : full, half, 1/4 and 1/8.
The full-step is good for higher speeds. The 1/8-step
gives best resolution on positioning use, and also the
smoothest run on low speeds. Stepping mode is
selected with STEP MODE inputs A & B (look at table
below).

If used with external stepping frequency source,
connect frequency signal to STEP PULSE input.
Incoming pulse level should be 4-30V, frequency
max.15kHz and minimum pulse lenght 25us.
Internal stepping source (aux. oscillator) is set
with AUX. OSC. inputs 1,2 and 3 (see the table).
Aux. oscillator includes also the acceleration RAMP.
It gives a smooth start towards the selected frequency.
The ramp time can be adjusted from 0.2 to 3sec.
The AUX. OSC. frequencies and the RAMP time are
based on 20MHz crystal frecuency. The chrystal can
be changed to be anything between 4...20MHz.
The AUX. OSC. frequencies and ramp time are changed
in the same proportion.

ENABLE has the highest priority.
NOTE. If ENABLE input is "off" the output stage is
turned off, (output current is off) and also the AUX. OSC
is reset. So every time when the ENABLE input is turned
"on" the AUX. OSC. starts with the acceleration ramp.

DIRECTION input is used to change the rotating direction.
Direction change does not include the RAMP function in
it self. But if it is used with the ENABLE input the
ramp and the smooth direction change can be achieved.

STEP MODE SET

full step: input A and B "off"
half step: input A "on", B "off"
1/4 step: input A "off", B"on"
1/8 step: input A and B "on"

PHASE CURRENT SET

0.8A all "off"
1.4A 1 and 4 "on", others "off"
2.0A 2 and 5 "on", others "off"
2.6A 1,2,4,5 "on", others "off"
3.2A 3 and 6 "on", others "off"
3.8A 1,3,4,6 "on", others "off"
4.2A 2,3,5,6 "on", others "off"
5.0A all "on"

AUX. OSCILLATOR FREQ.
(with 20MHz crystal)

stop   all aux. osc. input "off"
200Hz   in1 "on", others "off"
500Hz   in2 "on", others "off"
1000Hz in1,2 "on", others "off"
2000Hz in3 "on", others "off"
3000Hz in1,3 "on", others "off"
5000Hz in2,3 "on", others "off"
8000Hz all aux. osc. input "on"

EM-314 STEPPER MOTOR DRIVER 6A 12-24V
microstepping and presettable function inputs

FEATURES

- **Bibolar chopper**
- **1, 1/2 , 1/4.....1/64 steps**
- **Four preset function inputs**
- **PNP or TTL control**
- **Quiet run current control**
- **Acceleration / deceleration ramps**
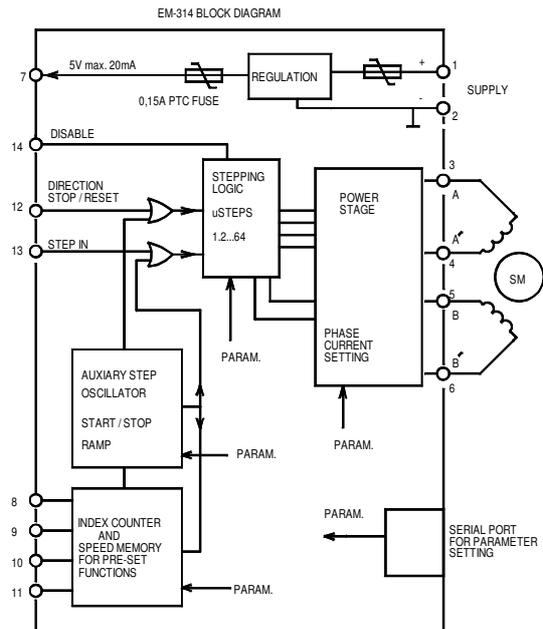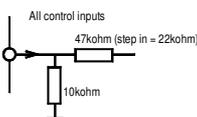- **DIN-rail base mountable**

EM-314 is a bipolar-chopper type microstepping steppermotor controller. The bipolar operation principle suits most stepper motors and provides the best torque. The microstepping function also enables great performance at low rpm. The stepping and current regulation has been synchronized, giving a smooth and quiet operation. There are 7 different stepping options to choose from, ranging from full- to 1/64-step operation. This provides various possibilities for different speed applications.

The controller has its own auxiliary oscillator, which can be used for pre-set speed driving. The pre-set speeds can be activated by using 4 digital function inputs. The oscillator features an acceleration ramp function, which allows frequencies to be altered flexibly. The motor will also start up reliably even to higher frequencies and it is possible to shift to the desired velocity with out pace drop. The auxiliary oscillator incorporates an indexing part, which offers the possibility of running presettable operational sequences. These secuences can be activated with the 4 digital inputs. The sequence is a movement with selected speed, direction and distance (as steps).   All the inputs are activated with positive logic commands. So the commands and functions are activated by connecting the input to a positive voltage. Control can also be done with TTL-logic level commands.

All of the controller settings are made digitally, using the separate setting device, EM-236 Interface Unit. With this device the settings are easily copied to an other or even to multiple controllers.

Operating voltage	12-35Vdc
Idle current	n. 20mA
Current settings	0.1 -6A (step 0.1A)
Auxliary oscillator	50-10000Hz
Frequency accuracy	typ. 0.5%
Ramp adjust	0.1-5s (0 to 10000Hz)
Control level	"on" when Uin 4 -30V
	"off" when Uin 0-1V or open
Max. step freq.	15kHz
Operating temp.	0-50°C
Dimensions	87x72.5x25mm
Weight	100g

CONTROL INPUT CONFIGURATION

All control inputs

47kohm (step in = 22kohm)

10kohm

EM-314 BLOCK DIAGRAM

CONNECTIONS

Operating voltage 12-35Vdc, ripple smaller than 20%.
The card has no internal fuse. The use of an external
fuse is recommended. Incorrect supply polarity can
damage the controller. All control inputs work with
positive control 4-30V. Inputs can be controlled with
PLC or TTL signals. 5V auxiliary output (terminal 7)
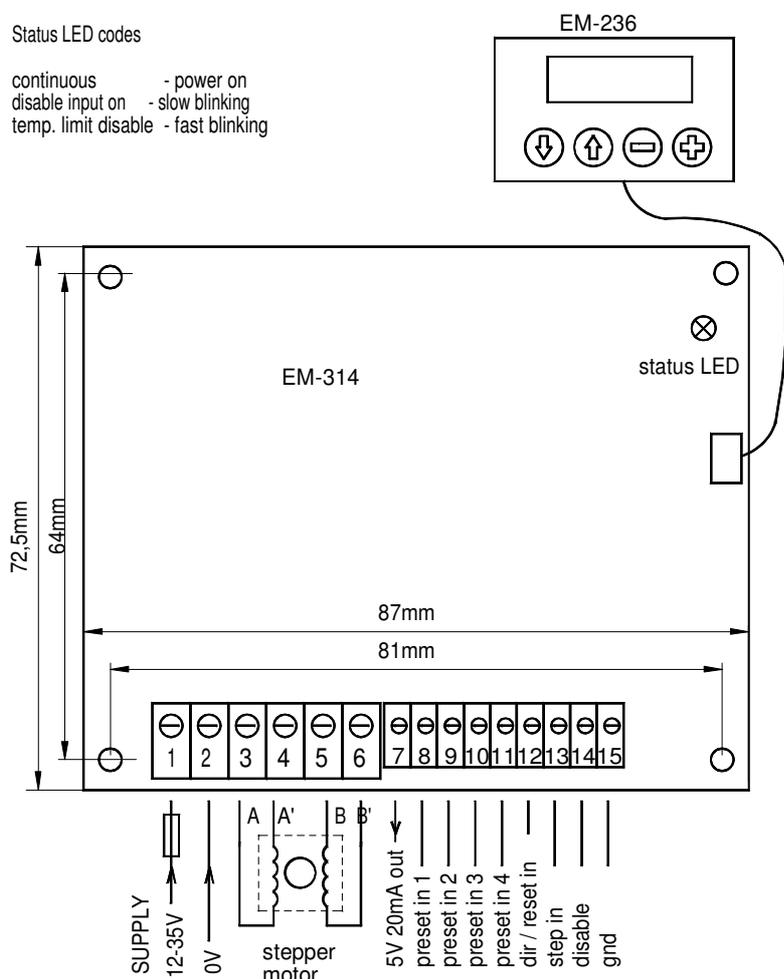can source max. 20mA.

CONTROL -inputs

STEP IN is the input for stepping pulses. One steps is done with
the positive edge of the input pulse.
DIR/STOP/RESET input is normally used to choose the rotational
direction. If preset functions are used (terminal 8 to 11) this input
can act as a stop input, and if preset sequence is used it will also
reset the sequence counter. This input is triggered with up going
pulse edge.
DISABLE will shut down power stage and hold it disabled, this
input has the highest priority. But it will not reset a sequence.
So it is recommended to stop and reset functions before releasing
disable to avoid any possible uncontrolled startup.
PRESET IN 1-4 are presettable function inputs. These are used to
activate chosen preset function. Function parameters include speed,
direction, and distance in steps.
If stepping distance is chosen to be zero, the drive will be continued
as long as input is selected or STOP is activated. In other words
the function works as preset speed driving.

PARAMETER SETTING

The card settings are made with a EM-236 Interface Unit
or Ementool Lite PC soft-ware and EM-268 USB-dongle.
EM-236 is connected to a red connector on the card.
At first it will display the cards type and program version.
Answering yes for LOAD and EDIT alternative the cards
parameters are retrieved and displayed as a list that can be
browsed with the arrow keys. Adjustment is done with +/- keys.
The adjusted parameters are saved by pressing the SAVE
key for about 2 seconds. After this, a notification will appear
that that the new values has been SEND and SAVED.
By choosing the MONITOR function, you can monitor the
cards operation.

Status LED codes

continuous   - power on
disable input on - slow blinking
temp. limit disable - fast blinking

PARAMETER EFFECT

1.The stepping mode determines how much motor
moves when card receives a step pulse. The most
precise results are achieved with so called
micro-stepping (partial step) setting and the highest
possible resolution is 1/64-motor step agains one
incoming step pulse.
2.Ramp setting is common for acceleration- and
deceleration. Ramp is in use with preset functions.
3.The current drop function limits the current to the
set percentace during the rest-stage. This reduces
the amount of the heat that motor has to dissipate.
Notice. Lower values than 100% can reduce
precision in micro-stepping driving.
4. Phase current limiting during the drive.
5. and 6. are not in use.
7.-22. These are to determine preset functions which
are activated with PRESET IN # inputs. There are
four preset functions available to be determined.
7.-10. Parameters to select the preset direction.
11.-14. Parameters to set the stepping frequency = speed
15.-22. Parameters for stepping amount = distance.

For example: Par.15 set to 393 and Par.16 set to 41 will
result in 41393 steps total when terminal 8 (preset in 1) is
activated.
Notice.
The movement is in ratio to the used stepping mode.
With 1/64 mode the movement is smallest, that is:
41393/64 = 646 + 49/64 full steps

MONITORABLE VALUES

1. last activated preset function
2. sequence step down counter to zero
3. Step counter. Reset with a new sequence.

PARAMETERS of EM-314 prog 1.2
default values in brackets.

1. Stepping mode (0-6) [2]
   0 = full step
   1 = half step
   2 = quarter step
   3 = 1/8 step
   4 = 1/16 step
   5 = 1/32 step
   6 = 1/64 step
2. Ramp time 0.1-5s (1-50) [10]
3. Current 1s after stop (1-4) [4]
   1. 100% (= normal)
   2. 50% (reduced)
   3. 25% (reduced)
   4. 0% (current disabled)
4. Phase current 0.1-6A (1-60) [10]
5. not in use (0-1)
6. not in use (0-1)

   Preset run directions
7. preset 1. 0=fwd 1=rev [0]
8. preset 2. 0=fwd 1=rev [1]
9. preset 3. 0=fwd 1=rev [0]
10.preset 4. 0=fwd 1=rev [1]

   Preset run frequencies
11. preset 1. 50-10000Hz (5-1000) [30]
12. preset 2. 50-10000Hz (5-1000) [30]
13. preset 3. 50-10000Hz (5-1000) [100]
14. preset 4. 50-10000Hz (5-1000) [100]

   Index run counting values 0-1000000 step
   Setting 0= continuous run
15. preset 1. 0-999 (0-999) [0]
16. preset 1. 0-1000 x 10^3 (0-1000) [0]
17. preset 2. 0-999 (0-999) [0]
18. preset 2. 0-1000 x 10^3 (0-1000) [0]
19. preset 3. 0-999 (0-999) [0]
20. preset 3. 0-1000 x 10^3 (0-1000) [0]
21. preset 4. 0-999 (0-999) [0]
22. preset 4. 0-1000 x 10^3 (0-1000) [0]

23. min start freq. 50-10000Hz (5-1000) [10]

EM-236

EM-314

status LED

72,5mm
64mm
87mm
81mm

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

A A' B B'

SUPPLY
12-35V
0V
stepper
motor
5V 20mA out
preset in 1
preset in 2
preset in 3
preset in 4
dir / reset in
step in
disable
gnd