EM-28 DC-MOTOR CONTROL UNIT 12-24V 3A
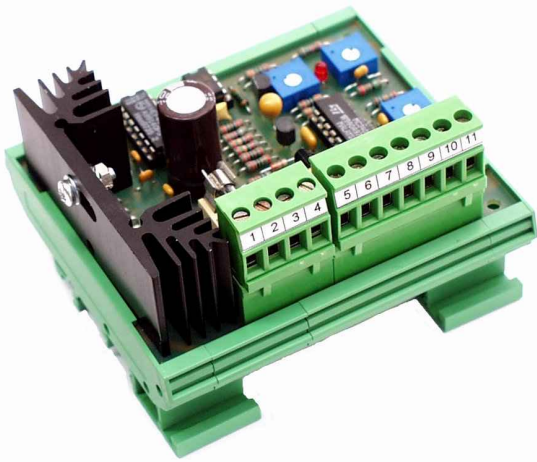
FEATURES:

- **4-quadrative operation**
- **Continuous / 2-step speed control**
- **Adjustable current limit**
- **Logic inputs for presettable speed**
- **RI-adjust for load compensation**
- **Selectable rundown mode, braking / flywheeling**
- **High efficiency**
- **Din-rail mountable**

EM-28 is designed for modern automation systems. Controls can be performed easily with relay- or open collector -outputs. Analog controls work with positive voltage. Usable motor can be permanent magnet motor with brushes in power range of 5 ... 60 W. Due to the advanced pulse control (PWM) the unit operates with high efficiency, low temperature losses and provides a high starting torque.

Loading of the motor can be compensated with inbuilt RI-adjustment. The current, or in other words, the torque of the motor can be controlled with I-trim or with external control. The operation of the current limit is indicated with red led. The 2 preselectable rotating speeds can be adjusted with 2 control level trims P3 and P4. Alternatively P4 is the max.level adjustment when the analog control is used. In braking the unit leads the energy to the internal resistor of the motor. Braking can be disabled.

TECHNICAL DATA:

Supply voltage	12...32 Vdc
Max. load	3A (RMS) mom 6A (5s)
Operating frequency	approx. 30 kHz
Control pot.meter	1 ... 10 kohm
Recommended fuse	max. 5A, slow
Voltage loss /V	0.5+0.7*Im
Input impedances	> 10 kohm. Pins 6-10
Analog controls	
Pin 8 speed	0 ... 5 V => 0 ... 25 V
Pin 6 current	0 ... 5 V => 0 ... 6 A
Digital controls	
Pin 7,9,10	"on" < 2 V / closed
	"off" > 4 V / open
Operating temp.	0...50 °C
Dimensions	87*72*32 mm
Weight	about 200 g

ADDTIONAL HEIGHT FOR RAIL MOUNT
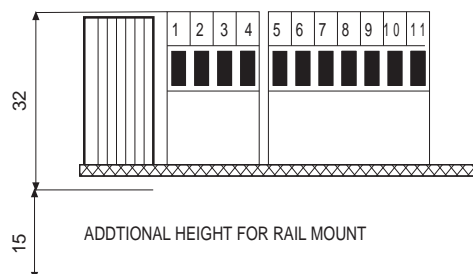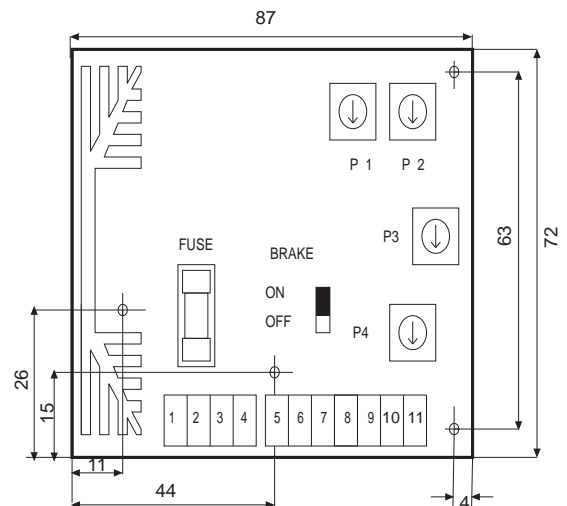
EM-28 OPERATING AND CONNECTION INSTRUCTIONS

INTRODUCTION
Always disconnect supply before making connections. Operating voltage must be filtered DC-voltage with less than 25 % ripple at full load.

ADJUSTMENTS
Set all trims to the middle position. With analog control the maximum running speed is set with trim P4. When using the 2-step speed adjustment set the "fast" speed on (pin 9). Adjust the running speed to desired value with trim P4. Then change to the "slow" speed on (pin 10) and adjust the running speed to desired value with trim P3.

The current limit adjustment is linear between 0 ... 6 A. The set value can be approximately determined from the position of the trim. When more precise adjustment is needed a current meter must be connected to motor circuit. The operation of the current limit is indicated with red led light. During the load compensation adjustment (P1) the load of the motor should be adjusted while observing the speed changes of the motor running speed. The compensation can be increased to point where the motor starts to twitch. Twitching is a sign of over compensation. The compensation adjustment has a slight effect on the running speed settings.
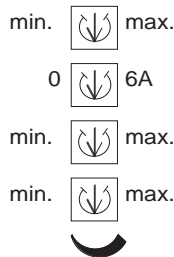
ADJUSTMENTS

P1 LOAD COMPENSATION   min. max.

P2 CURRENT LIMIT (IF NO EXT. CONTROL)   0 6A

P3 PRESETTABLE SPEED "SLOW"   min. max.

P4 PRESETTABLE SPEED "FAST"   min. max.
OR MAX. LEVEL LIMIT

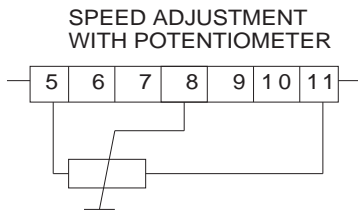CONNECTIONS

1 MOTOR - (MINUS)
2 SUPPLY VOLTAGE 12 ... 32 V
3 MOTOR + (PLUS)
4 SUPPLY VOLTAGE (GND)
5 CONTROL VOLTAGE 0V (GND)
6 CURRENT LIMIT INPUT
7 DIRECTION CHANGE
8 SPEED CONTROL INPUT
9 SELECTION OF PRESET SPEED (FAST)
10 SELECTION OF PRESET SPEED (SLOW)
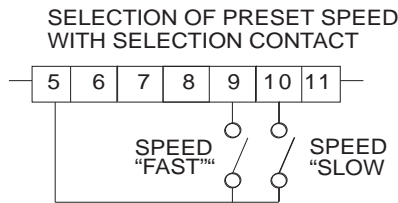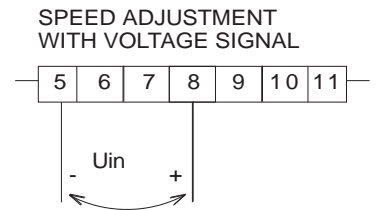11 +5.5 V REFERENCE OUTPUT MAX. 50 mA
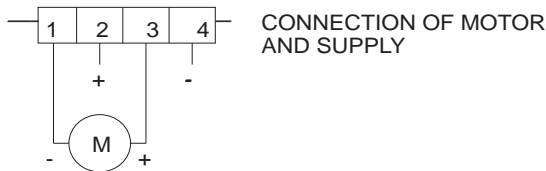
CONNECTION OF MOTOR AND SUPPLY

SPEED ADJUSTMENT
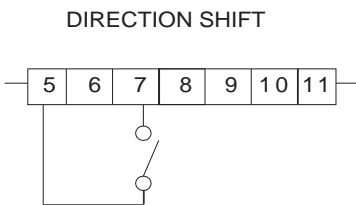WITH POTENTIOMETER

POT 1...10kohm
MAX. SET WITH TRIM P4

SELECTION OF PRESET SPEED
WITH SELECTION CONTACT

SPEED "FAST"   SPEED "SLOW"

"FAST" IS SET WITH TRIM P4
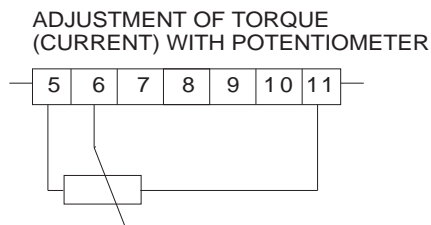"SLOW" IS SET WITH TRIM P3

SPEED ADJUSTMENT
WITH VOLTAGE SIGNAL
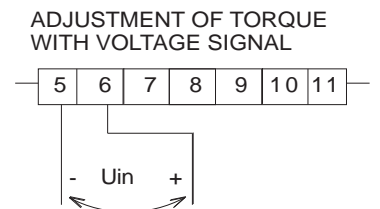
Uin

CONTROL 0 ... 5 V
MAX. SET WITH TRIM P4

DIRECTION SHIFT

"FORWARD" OPEN OR VOLTAGE > 4 V
"RESVERSE" CLOSE OR VOLTAGE < 2 V

ADJUSTMENT OF TORQUE
(CURRENT) WITH POTENTIOMETER

POTENTIOMETER 1...10 kohm
TRIM P2 TO POSITION MIN

ADJUSTMENT OF TORQUE
WITH VOLTAGE SIGNAL

Uin

CONTROL 0...5 V
TRIM P2 TO POSITION MIN.