

Electronic Brake

Series : EB-901

Increased Productivity

No Wear & Tear

Available up to 150 kW

Controlled stopping of machine

Auto control by sensing standstill

INTRODUCTION

Periodic starting/stopping involved in a cyclic operation of machine tool, textile, SPM and other industrial machines constitutes to non-productive time element. Any reduction in this time, therefore amounts to direct increase in productivity. Conventional Electromagnetic clutch type brake suffers from wear & tear, uneven braking effect due to oil, dirt, moisture and other environmental conditions. Plugging (braking by reverse sequence current) does not permit control of braking torque or braking time and possibility of reverse rotation exists.

The electronic brake described here uses the principle of dynamic braking and helps to overcome all above drawbacks.

ADVANTAGES :

The Electronic brake has following main advantages

- No wear & tear.
- Total control adapted to existing machines.
- No mechanical coupling/fitting problem.
- Remote control through PLC circuits.

The electronic braking does not cause jerks, mechanical stresses or reversals thereby improving machine life. It is very useful for various applications like wood working machines, band saw, grinders, centrifuges, vibratory feeders and many other.



PRINCIPLE OF OPERATION :

The unit incorporates a half wave rectifier circuit to inject DC into stator winding. The DC voltage can be connected to either single winding / 2 windings or combination depending upon Star or Delta connection. The nature of braking torque generated is quite similar to starting torque of an induction motor as depicted in fig. 1. The D.C. braking operation takes place in a specific designed sequence.

A standard AC3 duty contactor is used to isolate the D.C. circuit during motor running. The contactor operation (Make/Break) is only at zero current level. The amount and duration of D.C. voltage is adjustable by a stepless control. Fig. 2 shows schematic arrangement for standard model.

Electronic Brake

CONSTRUCTION

The brake units are available in variety of enclosures to suit individual requirements.

- 1) IP 00 Enclosure : Generally the units are provided on a open base plate for mounting inside user's control panel. The dimensions will vary from model to model.
- 2) IP 30 Enclosure : Models EB 9011 and EB 9012 are provided in IP 30 enclosure suitable for mounting inside a panel.
- 3) IP 42 Enclosure : A M.S. fabricated enclosure to suit IP 42 grade of protection for stand-alone version. A DC ammeter is provided for display of current. An exhaust fan is provided for models above EB 9016.

OPERATION

The Electronic Brake senses withdrawal of AC supply to motor and injects the DC voltage after allowing some time (about 50-200 ms) for decaying the residual flux. The current depends upon winding resistance. The stopping time depends upon load inertia and speed. It is recommended to inject DC up to max. $2.5 \times \text{FLC}$. Any excess current adds only to heating and no further braking effect is achieved. The braking action is an open loop control and any positional control can not be achieved by using Electronic braking.

A special model of brake is available for injecting the DC voltage only till the motor comes to standstill. This model does not have a time setting knob and is very useful for machines having variable load inertia.

STANDARD SPECIFICATION

Supply voltage : 240 V/415 V, 50 Hz
 DC output voltage : 20-100 V DC
 Braking current : As per selection table
 Braking time : 1-10 sec
 Maximum ambient temp. : 55°C

ORDERING INFORMATION

- Σ Motor Rating in KW
- Σ Duty Cycle. (see selection table)
- Σ Supply Voltage for Brake
- Σ With/Without Braking Contactor.
- Σ Winding Resistance per phase (Rph.)

SPECIAL MODELS

Electronic Brake with following special features to suit various applications are also available.

- Σ Two level current setting for dual speed motors.
- Σ Built in zero speed detection.
- Σ External zero speed status control signal.

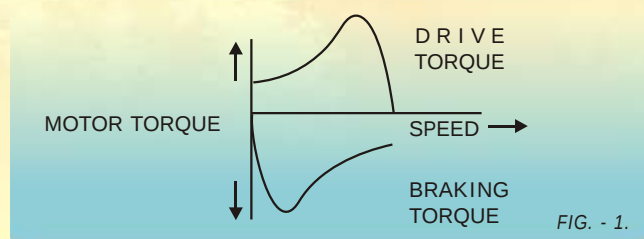
SELECTION TABLE

Type	Max. DC Braking Current *		Recommended Motor Rating KW **
	For 10% duty Cycle	For 30% duty Cycle	
EB 9011	10A	8A	Upto 1.5
EB 9012	20A	13A	Upto 3
EB 9013	25A	18A	Upto 5.5
EB 9014	35A	26A	Upto 7.5
EB 9015	45A	36A	Upto 11
EB 9016	65A	52A	Upto 15
EB 9017	125A	100A	Upto 30
EB 9018	175A	140A	Upto 45

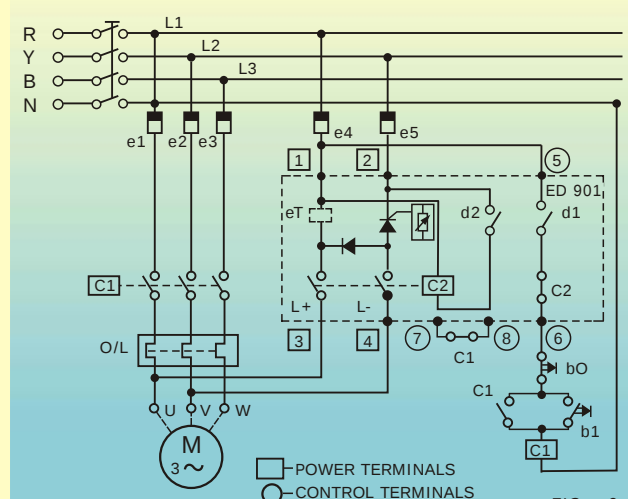
* This is the maximum permissible DC braking current that can be safely drawn from the unit. Care should be taken while adjusting the output voltage to ensure that current in excess of rated value does not circulate during braking operation.

** Motors Operating on 415V, 3ph, 50 Hz Supply.

BRAKING TORQUE



TYPICAL SCHEMATIC DIAGRAM



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