

# Motor Brake Relay

Type BA 9034N  
ministop



Model BA 9034N

## Description

A compact general purpose DIN rail mounted motor brake relay with a self supplied auxiliary derived from the motor Voltage, suitable for asynchronous motors rated from 500W to 7.5kW (400V), 200W to 2kW (230V), or greater if optimum stopping time is not required. Braking current (IB) is adjustable via a potentiometer scaled 10-100% (2.5A to 25A), with a built in current limit which is scaled to the actual current % setting. Indication is via three LEDs which indicate power connected (green), fault indication (red) and DC current injection (yellow). The BA9034N incorporates automatic standstill monitoring and has an internal contactor which connects the DC output of the relay to the motor. The inter-lock contact X5-X6 is utilised to avoid motor restart while injecting DC braking current and a built in safety brake override timer will stop the braking cycle if standstill is not detected within the safety time. A n 11 sec safety time is standard with a 32 sec version available on request. Braking is normally initiated by a close - open - close free contact sequence at terminals X3 - X4 (NB: supply Voltage is present on these terminals), usually the opposite to the main motor contactor sequence. However if this contact fails to function, BA 9034N has a built in Voltage detection circuit which will automatically detect motor turn on and turn off and a braking cycle will be initiated (this detection system has a slower reaction time 1.5sec). For star delta applications, contact X7 and an interface relay IK8701.12 can be used for additional control of a star contactor during braking, see diagram 2 overleaf.

## Special Note

When monitoring the injected DC current we recommend the use of a **true RMS or moving iron instrument** to limit the injected current to no more than 2.8 x the motor rated current for delta connected motors or 2 x the motor current for star connected motors or 25A whichever is achieved first, low reading errors will often occur with other types of instrument.

## Application Circuit Diagram

### DOL

#### NB:

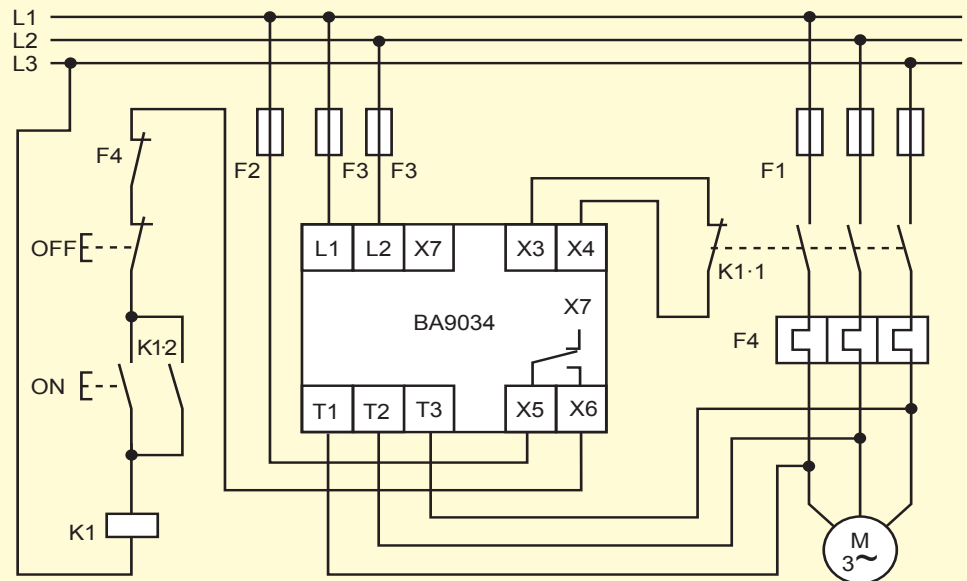
Fuses F3 to be superfast or ultrafast semi-conductor fuses rated at 32A. Coil of contactor K1 may be connected to (N) for 230V control circuits.

The wiring to the back emf detection circuit at terminal T3 should be protected either with a 1A fuse mounted as close as possible to the motor connection, or the wiring between terminal T3 and the motor must be wired with either double insulated cable or cable rated for protection via fuse F1.

Please note supply Voltage is present at terminals X3-X4.

#### For single phase applications

the motor is connected to T1 - T2, L & N are connected to L1 & L2 T3 is not connected.



Diag 1

## Braking Current Adjustment

Connect power to L1 - L2, (green LED on), set current pot (IB) to min (anti clockwise) and initiate a braking cycle via X3 - X4, (yellow LED (IB) on), slowly turn up the current pot until the motor starts to brake, then turn pot up further to a maximum of no more than 2.8 or 2 x the motor line current measured at terminal T2. Restart the motor and re initiate a braking cycle, if necessary re adjust until the desired stopping time is achieved. The yellow LED (IB) should turn off 1 -1.5sec after motor standstill has been detected. If standstill monitoring is not detected either adjust the current to achieve a stopping time of 7 to 9 sec and the safety timer will then turn off the brake current after 11sec or contact Dold Industries for further application advice. If the red LED (Error) flashes and contacts X5-X6 remain open, the unit has detected a fault, please see fault diagnosis overleaf. The red LED should not illuminate under normal operation, the fault can be reset by removing power at L1 - L2.

## Dimensions

Dimensions, Width 45mm, Height 73mm, Depth 122mm. Weight 600g

## Contact Information

### Dold Industries Ltd

11 Hamberts Road, Blackall Ind Est

South Woodham Ferrers

Essex, CM3 5UW

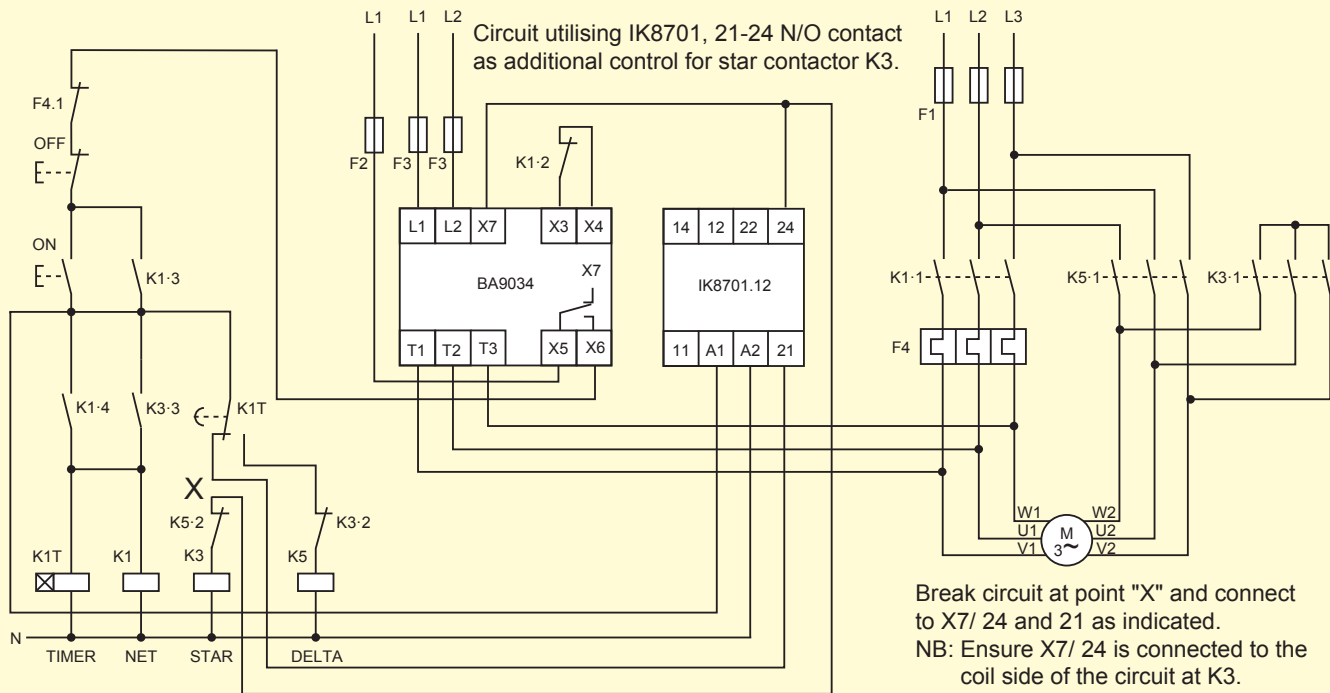
Sales / Technical Tel - 01245 324432

Fax - 01245 325570

email - admin@dold.co.uk website - www.dold.co.uk

## Application Circuit Diagram

### Star Delta



**NB:** The wiring to the back emf detection circuit at terminal T3 should be protected either with a 1A fuse mounted as close as possible to the motor connection, or the wiring between terminal T3 and the motor must be wired with either double insulated cable or cable rated for protection via fuse F1. Please note supply Voltage is present at X3-X4.

Fuses F3 to be superfast or ultrafast semi-conductor fuses rated at 32A.

Diag 2

| Indication  |  | Specifications             |  |
|---|--|----------------------------|--|
| <b>Green LED, (Run)</b>   | <b>(On)</b> Power connected  | Nominal Voltage            | 230V or 400Vac<br>(to be specified)                                      |
| <b>Yellow, LED, (IB)</b>  | <b>(On)</b> DC inj 11sec (Flashing 32sec)  | Voltage Tolerance          | 0.9 – 1.1Vn  |
| <b>Red LED, (Error)</b>   | <b>(Off)</b> System healthy  | Frequency                  | 50/60Hz +/- 1 Hz   |
| <b>Red LED, (Error)</b>   | <b>(On Flashing)</b> System fault.   | Burden                     | 5VA  |
| <b>Flashing x 1 pulse</b>   | <b>Incorrect mains frequency.</b>  | Braking Current (IB)       | 2.5 – 25A (10 -100%)<br>1 –10A, 5 – 32A (on request)                     |
| <b>Flashing x 2 pulses</b>  | <b>Set brake current is not achieved.</b><br><i>Brake current circuit broken.</i><br><i>Motor winding resistance too high.</i><br><i>Repair circuit or reduce braking current and allow longer braking time.</i> | Minimum On Time            | >2s for single phase connection  |
| <b>Flashing x 3 pulses</b>  | <b>Overtemperature of brake unit.</b><br><i>Duty cycle exceeded.</i><br><i>Reduce braking cycle time.</i>  | Standstill detection range | 5 – 25A  |
| <b>Flashing x 4 or 5 pulses</b>                                     | <b>System error</b><br><i>Return to manufacturer.</i>  | Braking Voltage (400V)     | 10 – 190V dc @ T1 - T2   |
| <b>Flashing x 6 pulses</b>  | <b>Motor Voltage not disconnected.</b><br><i>Contact manufacturer</i>  | Safety Time Delay          | 11sec max (32 sec on request)<br>option with 1 – 15sec timer             |
| <b>To reset Error fault (X5 - X6 open), cycle power to L1 - L2.</b> |  | Reaction Time              | 0.2 to 2 sec<br>motor back EMF dependant                                 |
|   |  | Stops Per Hour @ 25A       | 60 / Hr @ 5 sec duration   |
|   |  | Control Contact Ratings    | 400V (AC1) 3A  |
|   |  | Semiconductor Fuse rating  | less than 1250 A <sup>2</sup> / s  |
|   |  | Temperature Range          | 0 – +45°C  |
|   |  | Protection Class           | Case IP40 Terminals IP20   |
|   |  | Enclosure Material         | Thermoplastic Vo rating UL94   |
|   |  | Terminations               | 2 x 2.5mm <sup>2</sup> solid<br>2 x 1.5mm <sup>2</sup> stranded ferruled |
|   |  | Mounting                   | min 50mm from another brake unit   |

#### Information Required With Order

• Model type • Supply Voltage • Current •  
*Example: Motor Brake Module, BA9034N, 400V, 25A, 11sec*

**NB:** For single phase applications, the motor is connected to T1,T2, L & N are connected to L1 & L2 and T3 is not connected. The motor must run for a min of 2 sec for standstill monitoring to be reliably detected, in this mode the delay before braking is approx 1.5sec.