

## Digital Motor Protection Relays MDB-A/MDB-B/MDB-C

### Features

- Compact modular size with integrative structure
- Built-in LCD and keypad afford a precise, digital setting
- Three-phase monitoring of locked-rotor, overcurrent, undercurrent, phase loss, phase unbalance
- Adjustable reset mode: automatic reset or manual reset
- Adjustable power-on delay
- 1 C/O output contact
- Fault latch



### Protective Functions

- Locked-rotor
- Overcurrent
- Undercurrent
- Phase loss
- Phase unbalance

### Applications

- Pumps
- Fans
- Refrigeration Units
- Blowers
- Motors
- Compressors
- Lifts, Elevators
- Cranes
- Mining excavators and conveyors

### Ordering Information

MDB — □ / □  
1 2 3

1. Basic Model
2. Function code:  
A: 1-50A, Overcurrent(Def), phase loss  
B: 1-30A, locked-rotor, overcurrent(Def/Inv), undercurrent, phase loss, phase unbalance  
C: 3-100A, locked-rotor, overcurrent(Def/Inv), undercurrent, phase loss, phase unbalance
3. Power supply: 220VAC, 380VAC

### Technical data

Rated supply voltage	220VAC, 380VAC, 50/60Hz
Operating voltage range	+10/-15% max. of the rated voltage
Operating current range	MDB-A: 1-50A, MDB-B: 1-30A, MDB-C: 3-100A
Protective functions	MDB-A: overcurrent(Def), phase loss, MDB-B&C: locked-rotor, overcurrent(Def/Inv), undercurrent, phase loss, phase unbalance,
Indicators	LCD indicating current, operation status
Output type	1 C/O
Contact capacity	3A 440VAC/24VDC (resistive load)
Degree of protection	IP 20
Working conditions	-25°C~65°C, ≤85%RH, non-condensing
Mechanical durability	1000000 cycles
Dielectric strength	>2kVAC 1min
Weight	680g
Dimensions (H x W x D)	70X55X98mm
Mounting	screw fixing

### Function Data

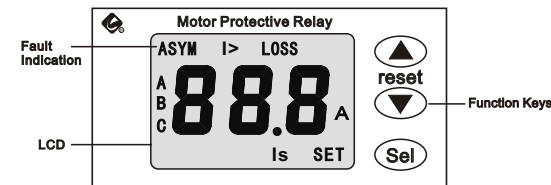
Functions	Condition & Setting range	Delay time
Overcurrent (I>)	Condition : load current(I <sub>n</sub> ) exceeds setting current (I <sub>s</sub> ), i.e., I <sub>n</sub> ≥ I <sub>s</sub> . MDB-A: 1-50A, MDB-B: 1-30A, MDB-C: 3-100A	*Def: 0.1~60s Inv: 1~5
Undercurrent (LSL)	Condition : load current(I <sub>n</sub> ) exceeds setting current (I <sub>uc</sub> ), i.e., I <sub>n</sub> ≤ I <sub>uc</sub> . Setting range: 0~80% I <sub>s</sub>	0.1~60s adjustable
Lock-rotor (bLc)	Condition : I <sub>n</sub> ≥ Lock-rotor current setting (I <sub>r</sub> ). Active once motor starting. Setting range: 1.5 I <sub>s</sub> ~ 10 I <sub>s</sub>	0.1~60s adjustable
Current unbalance (ASYM)	Condition : current unbalance ≥ setting unbalance(un) Setting range: 1%~50% *Unbalance factor (%) = (I <sub>max</sub> phase - I <sub>average</sub> ) / I <sub>average</sub> x 100%	0.1~60s adjustable
Phase loss (LOSS)	Condition : max unbalance is more than 50% among 3 phase current. Enable or disable : selectable	0.1~60s adjustable

\*Def means definite time 0.2-30s adjustable. Inv means inverse time, provided 5 curves, the Time-current characteristic curve refers to table as below.

Inverse time-current characteristic curve table

Curve No. Action time(s) I <sub>n</sub> /I <sub>s</sub>	Curve No.					
	0	1	2	3	4	5
≥ 1.1	def	930	1861	2791	3721	4651
≥ 1.2		296	593	889	1185	1482
≥ 1.5		87	174	261	349	436
≥ 2.0		35	69	104	138	173
≥ 5.0		4.2	8.4	13	17	21
≥ 6.0		2.9	5.7	8.6	12	14
≥ 7.0		2.1	4.2	6.3	8.4	10

### Front Panel View



- ▲ → Increasing setting value.  
Hand reset the relay when the relay trips.
- ▼ → Decreasing setting value.  
Hand reset the relay when the relay trips.
- Ⓢ → Quickly setting overcurrent value.  
& Shifting the display of three phase current.
- Is → Overcurrent quickly setting indication (refer to page 7)
- SET → Setting menu indication

※ When working normally, LCD shows the three phase average current, press "Sel" button to show the A, B, C three phase current.

Fault Indication	Description
ASYM	Current unbalance fault indication
I>	Overcurrent fault indication
LOSS	Phase loss fault indication
• LSL	Undercurrent fault indication
• bLc	Lock-rotor fault indication

※ When the fault happens, LCD will show corresponding fault indication by flickering, the relay will disconnect and lock the fault current. (the real current is 0 as the motor is off power.) The fault is latched until the relay is reset.  
※ LSL and bLc are showing in the middle of LCD.

### Parameter Setting Method

Press the keys as the following sequence "▲▼▲▼▲▼▲▼". (Note: the interval should be less than 1 second) It will get into parameter setting mode. "SET" will be lit on LCD. Press "▲" or "▼" to choose LCD CODE, press "Sel" to access setting, use "▲" and "▼" to set up the values and press "Sel" to return to the show of LCD CODE. Long press "▲" or "▼" could accelerate increase or decrease.

LCD CODE *1	Parameters	Setting range	Default
F11	overcurrent threshold(Is)	MDB-A:1.0-50.0A MDB-B:1.0-30.0A MDB-C:3.0-100A	10A
F12	inverse curve no.	0-5	0
F13 *2	definite delay time of overcurrent	0.1-60.0s	3s
F14	undercurrent threshold	0-80%	20%
F15 *3	delay time of undercurrent	0.1-60.0s, OFF	OFF
F16 *4	lock-rotor current threshold	(1.5-10.0)*Is	5*Is
F17	delay time of lock-rotor	0.1-60.0s, OFF	5s
F18	start-up delay time	0-60.0s	0s
F21	current unbalance threshold	1-50%	20%

Following next page...

### Parameter Setting Method

(Continued)

LCD CODE	Parameters	Setting range	Default
F22	delay time of unbalance	0.1-60.0s, OFF	5s
F23	delay time of phase loss	0.1-60.0s, OFF	2s
F51 *5	limit of auto-reset number	0-10 times, UNL	0
F52	auto-reset time	0.1-99.9 minutes	15min
F53 *6	limit of continuous fault time	0.1-999 minutes	60min
F61	power-on delay	0-999s	0s
F90-92	kept by the factory	----	----
End	exit	----	----

#### Note:

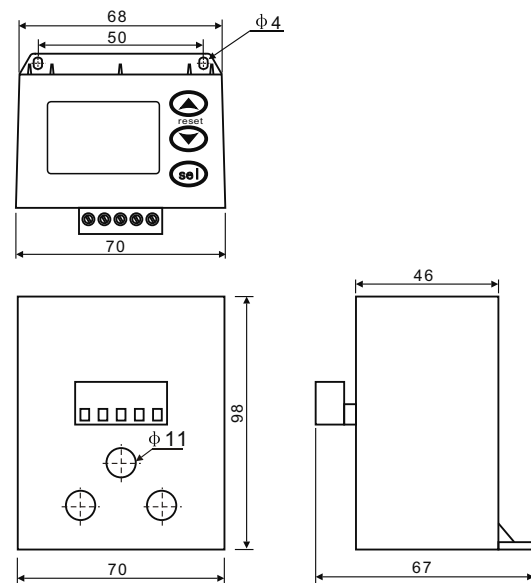
- MDB-A is only with F11, F13, F23.
- Definite delay time is only available when F12=0.
- OFF means disable the function.
- Lock-rotor detection is active once motor starting.
- UNL means unlimited times.
- If F53=60min, auto reset mode will be interrupted when auto reset count reaches the limit number (F51) during 60min, after press "▲" or "▼" to hand reset and the auto-reset count will be cleared.
- The relay will quit setting mode automatically if no operation for 30s.

### Quick Setting For Overcurrent

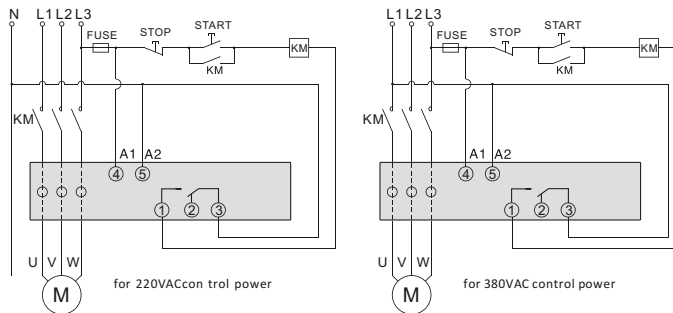
Press "Sel" for 2s to enter quick setting for overcurrent, use "▲" or "▼" to change the set value, press "Sel" to exit. It has the same effect for setting F11.



### Dimensions (mm)



### Wiring Diagram



Relay contact position shown in 'Power off' condition

**GENERAL SAFETY**  
POTENTIALLY HAZARDOUS VOLTAGES ARE PRESENT AT THE TERMINALS OF THE RELAYS.  
ALL ELECTRICAL POWER SHOULD BE REMOVED WHEN CONNECTING OR DISCONNECTING WIRING.  
THIS DEVICE SHOULD BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL.



#### Ginri Power Automation Co., Ltd.

Kaichuang Road 337, Baitawang Industrial Zone,  
North Baixiang, Yueqing, Zhejiang, China  
Tel: +86-577-57198185 Fax: +86-577-62982268  
E-mail: info@ginri.com http: www.ginri.com