Intelligent Motor Protection Relay

MDB-201/301/501

GINRI®

We Are The FACTORY in Control&Protection Relays

Focus on Motor Protection ● Quickly Solve Your Troubles

The NEW MDB-501Z is a modular motor protection relay that provides integrated protection, metering and data logging functions for three-phase motors used in industrial environments.. The relay provides 10 protective functions by utilizing both current and voltage inputs.Current transformers are not required for currents up to 160 A.

Next Generation Relay with Communication Functionality for Motor Monitoring, Protection and Control

- Easyinstallationandmaintenanceforimprovedworkefficiency
- Savetimeandmaintenancecost
- Improvetheefficiencyandsafetyofproductionprocess
- Inunmannedmanagementsystem,saveenergythrough operationstatistics

> Application

Buildings
- Office,commercial,andresidentialbuildings, schools,hospitals

IndustrialFacilities
- Petrochemical,electronic,glass,steel, semiconductor,chemical,pharmaceutical, cement,paint,etc.

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

by Ginri Power Automation Co., Ltd.

Intelligent Motor Protection Relay

MDB-301

V2.2

■ Features

- Compact modular size
- Built-in LCD and keypad afford a precise,digital setting
- Three-phase monitoring of short-circuit, locked-rotor,overcurrent, undercurrent, phase loss, phase unbalance
- 1 or 2 phase monitoring of overvoltage, undervoltage
- Earth fault (should couple with ZCT)
- 1NO+1NC,separated output contacts
- 2 LEDs for status indication
- Fault recording with last 3 faults

☐ Ordering Information

MDB 301 Z /0.3-16A AC220V

- AC220V
- Power supply: AC220V,AC380V
- 0.3-16A
- Current Range: 0.3–16A (0.1–8kW) / 3–160A (1.5–80kW) / ✶10–999A (>80kW)
- Z
- Structure: Z:integrative, F:Separate
- 301
- Series: 301
- MDB
- Motor protection relay: MDB

✶ For 10–999A type,the relay should couple with external CT.
✶ ZCT for ground fault is optional,it should be purchased separately.
✶ The conntecting cable for MDB-301F is 1.5 meters by default.

☐ Function Data

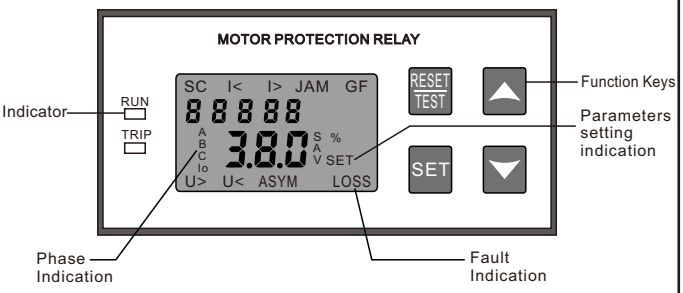
Functions	Condition & Setting range	Delay time
Overcurrent (I>,definite)	Condition : load current exceeds setting threshold. Setting range:0.3–16A,3–160A,10–999A.	0.5–60s
Overcurrent (I>,inverse)	Condition : load current exceeds setting threshold. Setting range:0.3–16A,3–160A,10–999A.	class 1-5 see TCC
Undercurrent (I<)	Condition : load current less than setting threshold. Setting range same as overcurrent, and the value must be less than overcurrent.	0.5–60s
Phase loss (PL)	current unbalance exceeds 50%.	2s
Current unbalance (ASYM)	current unbalance exceeds setting threshold. Setting range:10–50%。 *Unbalance factor (%) = (Imax phase - laverage) / laverage x 100%	5s
Start–up delay(dt)	When motor is starting,LCD will show a countdown. Overcurrent,undercurrent,lock-lotor,current unbalance are blocked during the start-up.	0–200s
Lock-rotor (JAM)	Load current exceeds setting threshold. Active only in motor running. Setting range:1.5–8 times of setting overcurrent.	3s
Short circuit (SC)	Load current exceeds 10 times of setting overcurrent.	≤50ms
Ground fault (GF)	Earth leakage current exceeds setting threshold. Setting range:30mA–2.5A. Should couple with a ZCT with CT ratio 5A/10mA.	1s
Overvoltage (U>)	Power voltage exceeds setting threshold。 Setting range:65–690V,hystersis 5%.	5s
Undervoltage (U<)	Power voltage less than setting threshold. Setting range:65–600V,hystersis 5%.	5s

☐ Inverse time-current characteristic curve(TCC)

✶ In/Is \ trip class / trip time(s)	0 (definite time)	1 (class 5)	2 (class 10A)	3 (class 10)	4 (class 20)	5 (class 30)
< 1.1	5s	not trip				
1.2		63	125	250	500	750
1.5		40	80	160	320	480
2.0		22	45	90	180	270
5.0		36	7.2	14	29	43
6.0		2.5	5	10	20	30
7.2		1.8	3.5	6.9	14	21

✶In-load current, Is-setting overcurrent

☐ Front Panel View



☐ Technical data

Model	MDB–301Z	MDB–301F
Structure	Integrative	Separate
Mounting	Panel mounting	Flush mounting
Measurement error	1%	
Rated supply voltage	AC220V,AC380V,50/60Hz	
Current setting	0.3-16A,3-160A,10-999A	
Time-current characteristic	Definite & inverse selectable	
Reset mode	Manual / Auto /power cycle	
Output type	1NO &1NC	
Contact capacity	5A 250VAC，3A 380VAC	
Power consumption	≤5VA	
Weight	600g	
Dimensions for MDB-301Z	90 x 70 x 106.5mm (H x W x D)	
Mounting hoze size for MDB-301F	90 x 46 mm (H x W)	

☐ Function keys

RESET TEST	Manual reset when the relay is tripped. Long press to self test trip.
SET	Press to query parameters. Long press to set parametes.
▲ ▼	Change setting value in setting mode. Long press to change quickly. Shift showing curren and voltage when motor running

☐ Current and voltage display

3 phase currents are displayed every 2 seconds in sequence. Press "≪" "≫" keys to shift showing 3 phase current, leakage current,power voltage.

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☐ Parameters setting guide

Setting mode is only available in standby status.Long press "SET" for 3s,It will get into parameter setting mode. " SET" LCD will light on. Press "SET" to shit to next parameter,press"∧" or "∨" to set up the values. Long press could accelerate increase or decrease.Press"RESET/TEST" to exit setting.
The relay will quit automatically if no operation for 30s.

Display	Parameters	Setting range	Default	Note
20 A SET	overcurrent threshold	0.3-16A 3–160A 10–999A	5A 20A 100A	
0 SET	inverse trip class	0-5	0	0 for definite
5.0 S SET	definite delay time of overcurrent	0.5-60.0s	5s	active when trip class is 0
OFF SET	undercurrent threshold	OFF,0.3–16A OFF,3–160A OFF,10–999A	OFF	OFF for disable
5.0 S SET	delay time of undercurrent	0.5-60.0s	5s	
dt 5.0 S SET	start-up delay time	0-200s	5s	LCD shows a countdown
JAM 5.0 SET	lock-rotor threshold	OFF,1.5-8	5	multiples of overcurrent, OFF for disable
20 % SET ASMY	current unbalance threshold	OFF,10-50%	20%	OFF for disable
GF OFF SET	ground fault threshold	65-690V,OFF	OFF	OFF for disable

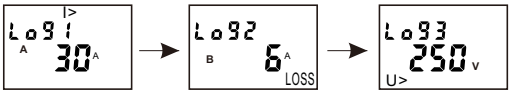
Display	Parameters	Setting range	Default	Note
OFF SET U>	overvoltage threshold	OFF,65-600V	OFF	OFF for disable
OFF SET U<	undervoltage threshold	OFF,0.03-2.5A	OFF	OFF for disable
Ct 20 SET	CT ratio	20-200	20	valid for 10-999A type, 20 means 100/5
rSt OFF SET	auto-reset time	OFF, 0.1-30 minutes	OFF	OFF for manual reset
rSn OFF SET	limit of auto-reset in 30 minutes	OFF,1-10	3	OFF for unlimited
dFLt no SET	restore to defaults	YES,NO	NO	
r2.2 SET	version			
End SET	exit	exit setting mode		

☐ Auto-reset

Auto reset is invalid for phase loss, stall, and short circuit. To prevent the motor from frequently starting, there is a limit of auto reset in 30 minutes. The count will be cleared by manual reset when the count reaches the limitation.

☐ Fault history check

Pressing "∨" more than 3sec, it displays the latest fault cause and the fault voltage. Press "SET" to check later fault continually.Press "∧" or "∨" to shift the display of current and voltage.The relay will exit automatically after Log3. The oldest fault record is over written when the number of fault to record exceeds three.The relay will quit automatically if no operation for 30s.



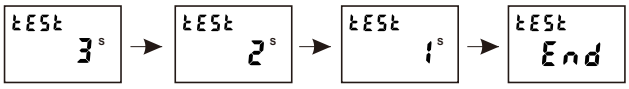
☐ Fault indication

When the relay is tripped. The cause and current of the trip is displayed and latched unitl the relay is reset.

Indication	Description	Indication	Description
SC	Short circuit fault indication	U>	Overvoltage fault indication
I<	Undercurrent fault indication	U<	Undervoltage fault indication
I>	Overcurrent fault indication	ASYM	Current unbalance fault indication
JAM	Lock-rotor fault indication	LOSS	Phase loss fault indication
GF	Gound fault indication		

☐ Self test trip

This function is disable when the motor is starting or running.Pressing "RESET/TEST" key more than 3s to active self test trip mode, all the output contacts will trip when 3s expires.The display shows "RESET/TEST" and countdown,when the test is done,the display shows "End".By pressing "RESET/TEST" to reset.Before 3s expires, pressing "RESET/TEST" blocks the test trip and return to the voltage display.The relay will quit self test trip mode and reset if no operation for 30s.



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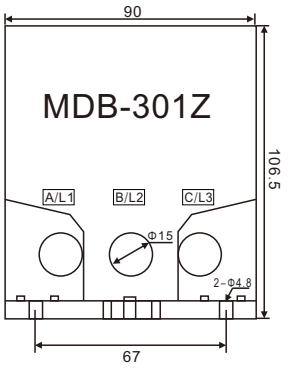
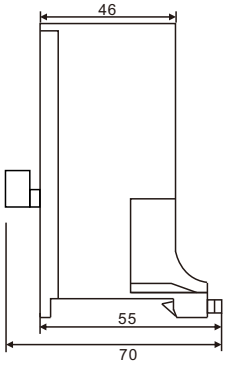
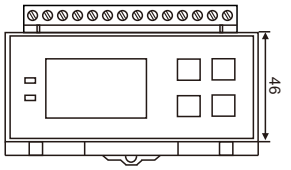
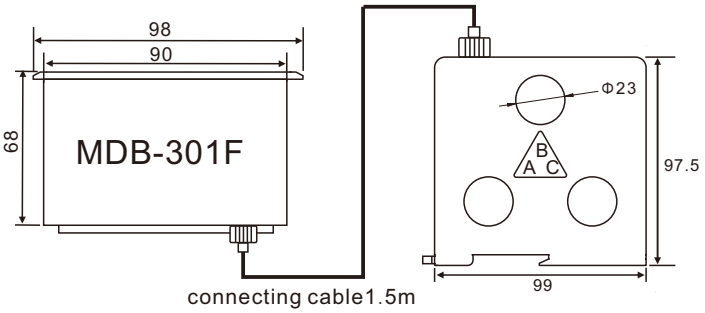
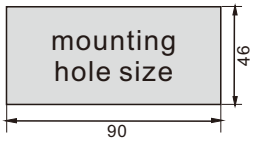
☐ Dimensions(mm)



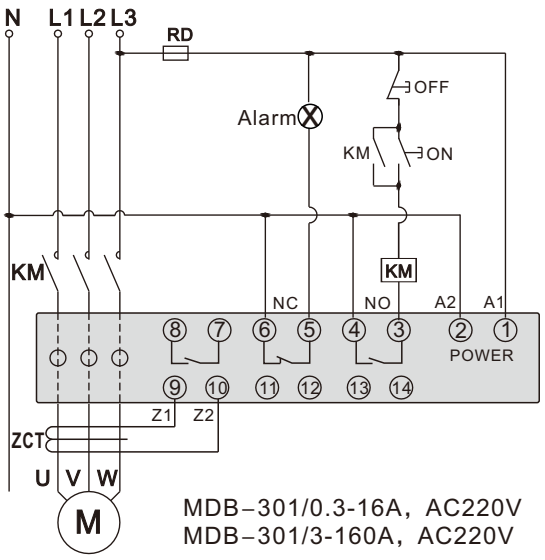




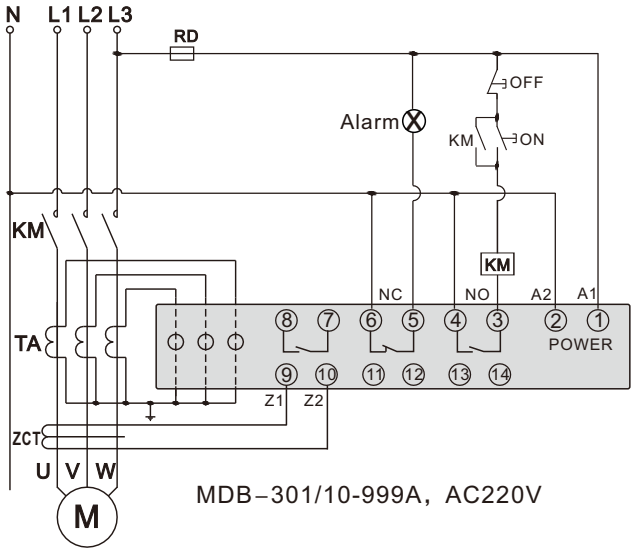




☐ Wiring Diagram

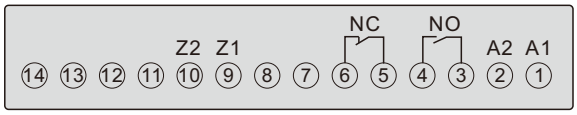


MDB–301/0.3-16A，AC220V
MDB–301/3-160A，AC220V



MDB–301/10-999A，AC220V

I/O Terminal layout



NOTE:
1.ALL the contacts position shown in 'Power off' condition.
Position is inverse when powered and under normal operation.
2.Z1–Z2 should couple with a ZCT with CT ratio 5A/10mA.
3.For 10–999A type,the relay should couple with external CT and set the CT ratio.

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