

Introduction

Digital motor protection relay is used to prevent damage to the electrical motor, such as internal faults in the motor, overcurrent fault, Single phasing, Earth fault, Bearing failure fault, High Winding temperature, Short circuit, etc.

Also external conditions when connecting to the power grid or during use have to be detected and abnormal conditions must be prevented. Additionally, the protection relay prevents the disturbance to spread back into the grid.



Protection functions

IEEE / ANSI C37.2	PROTECTION FUNCTIONS
48	Max. Start Time
49, 51	Overload
51	Increased safety motors overload
51R	Over Current Level 1 - Jam
47	Phase loss
46	Current imbalance
50G/N, 51G/N	Ground fault
50	Over Current Level 2 - Short
32L	Under Power
38	Over temperature
59	Over voltage
27	Undervoltage
81U/81O	Abnormal frequency
55	Lead / Lag PF / Low Power Factor
74	Welded Contactor
86 or 94	External fault
	Data logging
	Wave capture

Start working mode

- Protection Only
- Panel control start/stop
- Forward and reverse start
- Wye-Delta Transition
- Autotransformer Closed Transition
- Two-Winding

Not all models have above protect function and working mode, please refer to ordering information.

Technical characteristics

Electrical parameters	
Auxiliary Power	85-265Vac/dc
Power consumption	<4 VA
Insulation resistance	>100MΩ
Relays	5A/250VAC, 5A/30VDC (NO contact)
Motor rated voltage	AC220V / AC380V / AC660V
Motor rated current	0.5-200A use internal CT
Leakage current sensor ⁽¹⁾	0-1A
Impulse withstand voltage	4 kV
Measuring accuracy:	
Current	± 0.5% @ 10~120% Ie
Voltage	± 0.5% @ 10~150% Ue
Frequency	± 0.1% @ 45~65Hz
Power factor	± 1% @ 0.0~1.0
Power	± 1% @ 0~500 kW
Leakage current	± 1% @ 10~100% Ir
Temperature	± 1% @ 0.1~30 K
Analog Output	± 1% (4 ~ 20mA)
External port:	
Comm port ⁽²⁾	RS485 MODBUS-RTU Optional Profibus-DP
Digital input	Regular 7DI, max 11 DI ⁽³⁾
Digital output	Regular 2DO, max 6DO ⁽⁴⁾
Analog Output	Optional 1AO
Working environment:	
Working temperature	-10C ~ +55°C
Storage temperature	-30C ~ +70°C
Relative humidity	< 93% RH
Elevation	Less than 3000 m
Electrical test:	
Standard reference	IEC 60947-1 IEC 60947-4
Electrostatic discharge	Severity: level III
Severity	Severity: level III
Surge	Severities: level III
Voltage Characteristics	Between two of the power / input / output between AC2kV/1min

- (1) leakage sensor is optional accessories.
 (2) PR 260 have independent communication module, please refer ordering information.
 (3) PR 260 have independent I/O module, optional active contact node(220Vac/dc or 110Vdc). Other models use passive contact node, relay body provide 15Vdc loop power.
 (4) PR 260 have independent I/O module, DO trip functions can free to configuration.

PR 200

Motor protection Relay

Description

PR200 motor protector is an all-in-one solution designed to continuously monitor 3-phase power lines for abnormal conditions. It can use with motors of any size or type.

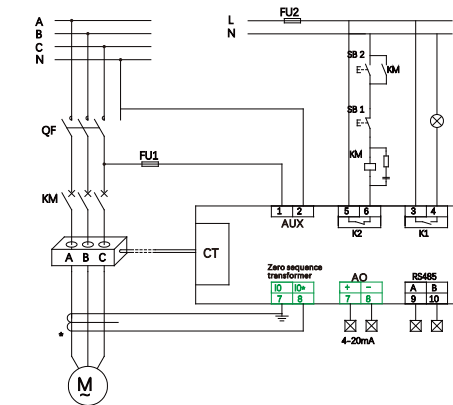
When the PR200 sense the motor runs into the preset abnormal alarm value, PR200 will automatically trigger the release switch to shut down the circuit. Option RS485 communication port can upload the monitor data and alarm status to remote control system.

Features

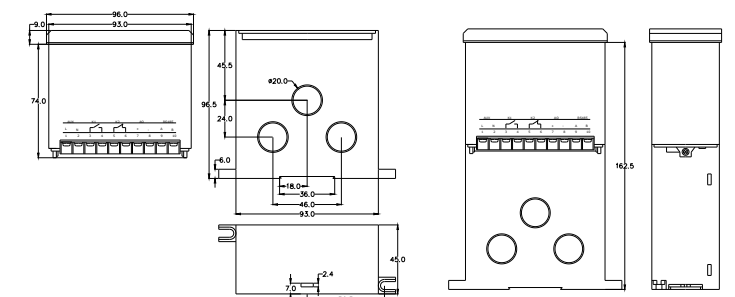
- Low cost electronic design relay, can replace a variety of single function protection relays.
- Suit for Motor under 0.66KV.
- Build in 3P CT for current sampling, suit for current under 200A.
- 2 digital outputs for external control loops.
- Optional RS-485 network communications.
- Optional earth leakage sensor or analog output.



Wiring diagrams



Installation Dimensions



Split installation

Panel mounting installation

PR 240

Split motor protect relay

Description

PR 240 is an excellent choice for telemetry applications for Motor monitoring, metering, and control. Its small size, low cost and remote HMI options make the relay a perfect option for power distribution systems for such uses as end-of-line monitoring and power metering.

It offers low-voltage motor protection in virtually all applications, including pumping, air-based, chiller, and bulk-material applications. It can be configured as full range of medium-voltage, three-phase induction and synchronous motors protect relay.

Features

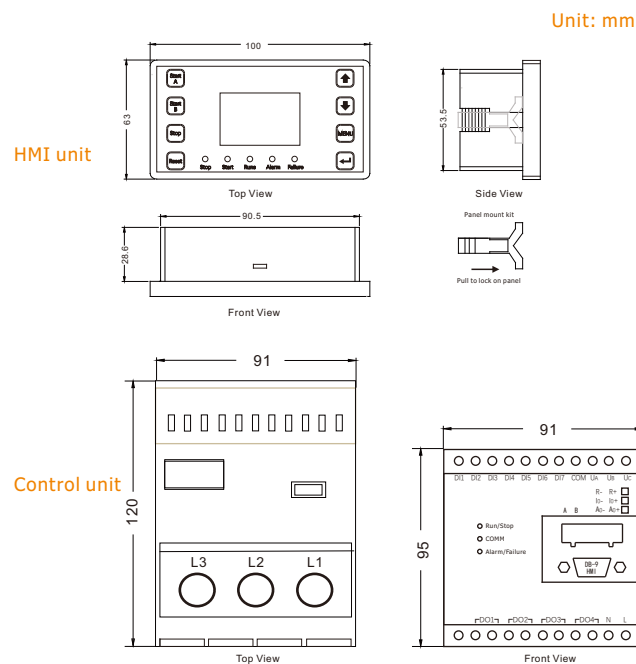
- Panel mounting HMI unit and Din-rail mounting control unit.
- Suit for Motor under 0.66KV and any current range.
- HMI unit provide 3-phase current voltage monitors, Power Measurement.
- Control unit build in 200A CT, out of range use ../5A CT connect.
- Abundant protection modes can be freely selected to alarm or trip.
- Can selected a variety of startup modes for different wiring application.
- RS-485 network communications.
- 4 digital outputs, and 7 digital inputs.
- Optional 1 programmable analog output.



Technical characteristics

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74	Welded Contactor

Installation Dimensions



PR 260

Modular motor management

Description

PR 260 is modular design motor management device, accommodate more I/O modules. Flexible arrangement of motor control modes and state sensing. monitors voltage, current, and temperature to provide a comprehensive package of 22 protective functions. with integrated protection, motor control, metering, and data-logging functions.

This system is typically used to provide protection for three-phase low- and medium-voltage, medium to high-horsepower induction motors.

Features

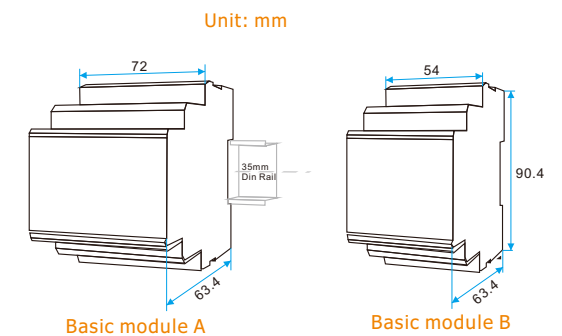
- Panel mounting HMI unit and Din-rail mounting control module.
- Suit for Motor under 0.66KV and any current range.
- HMI unit provide 3-phase current voltage monitors, Power Measurement.
- Control unit use ../5A CT connect.
- Abundant protection modes can be freely selected to alarm or trip.
- Can selected a variety of startup modes for different wiring application.
- 100 lists Waveform capture function, easy to trace back the fault.
- RS-485 network communications.
- 4 digital outputs, and 7 digital inputs.
- Optional 2 programmable analog output.
- Extra optional Modular:
 - PR-26C extra 2* RS485 or 2* Profibus-DP port;
 - PR-265 extra programmable 11*DI and 6*DO.
- Accept customized extra function module.



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	Data logging
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Installation Dimensions



PR 260	Acquisition module	B+A
PR 265	I/O Unit	A
PR 26C	Comm Unit	B

Ordering Information

Products code	IEEE / ANSI C37.2	PR201	PR202	PR203	PR240	PR260	PR265	PR26C
PROTECTION FUNCTION								
Max. Start Time	48	●	●	●	●	●	-	-
Overload	49, 51	●	●	●	●	●	-	-
Increased safety motors overload	51	-	-	-	●	●	-	-
Over Current - Jam in starting	51R	●	●	●	●	●	-	-
Over Current - Jam in running	51R	-	●	●	●	●	-	-
Phase loss	47	●	●	●	●	●	-	-
Current imbalance	46	●	●	●	●	●	-	-
Over voltage	59	-	●	●	●	●	-	-
Undervoltage	27	-	●	●	●	●	-	-
Under Power	32L	-	●	●	●	●	-	-
Ground fault	50G/N, 51G/N	-	○	○	●	●	-	-
Over Current - Short	50	-	-	-	●	●	-	-
Over temperature	38	-	-	-	○	○	-	-
Abnormal frequency	81U/81O	-	-	-	●	●	-	-
Lead / Lag PF / Low Power Factor	55	-	-	-	●	●	-	-
Welded Contactor	74	-	-	-	●	●	-	-
External fault	86 or 94	-	-	-	-	●	-	-
Internal failure	3	-	-	-	-	●	-	-
Restart		-	-	-	●	●	-	-
START MODE								
Protection Only		●	●	●	●	●	-	-
Panel control start/stop		-	-	●	●	●	-	-
Forward and reverse start		-	-	●	●	●	-	-
Wye-Delta Transition		-	-	●	●	●	-	-
Autotransformer Closed Transition		-	-	-	●	●	-	-
Two-Winding		-	-	●	●	●	-	-
METERING FUNCTION								
Three phase amp		●	●	●	●	●	-	-
Voltage		-	●	●	●	●	-	-
Frequency, Power factory, Power		-	-	●	●	●	-	-
Wh, Varh		-	-	●	●	●	-	-
leakage current, unbalance rate		-	-	-	○	●	-	-
thermal capacity, thermal resistance		-	-	-	○	●	-	-
OTHER								
Digital Output		2	2	3	4	4	2	-
Digital Input		-	-	6	7	7	4 or 11	-
Analog Output		-	1	-	1	1	1	-
RS485 COMM, MODBUS-RTU		-	●	●	●	●	-	2
Profibus-DP		-	-	-	○	○	-	2
SOE		-	10	10	99	99	-	-
Record Statistics		-	-	-	●	●	-	-
Wave capture		-	-	-	-	●	-	-
Display		LED	LED	LCD	LCD	LCD	-	-

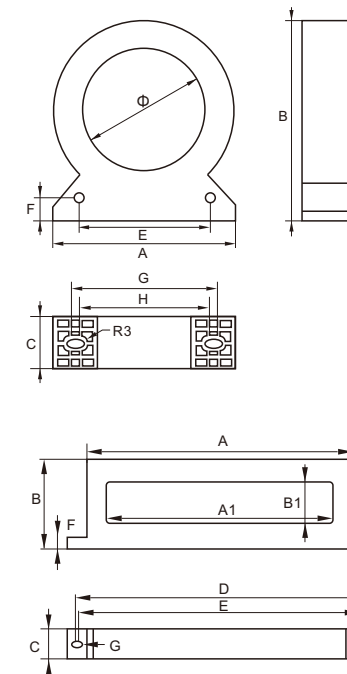
CT selection table

Motor rated Power kW	Rated current A	CT range
0.06	0.22	10A
0.12	0.42	
0.37	1	
0.55	1.5	
0.75	2	
1.1	2.5	
2.2	5	
3	6.5	
5.5	11	
7.5	14.8	
11	21	100A
15	28.5	
18.5	35	
22	42	
30	57	
37	69	
45	81	
55	100	

Motor rated Power kW	Rated current A	CT range
75	135	500/5 external CT
90	165	
110	200	
132	240	
160	285	
200	352	
220	420	
250	480	

Notes:
 1. For more than 100A circuit, must use external 500/5A CT.
 2. CT secondary protection rate must 10A model.
 For example: 75kW motor rated current is 135A,
 Ie of the motor protection relay setting 135/100=1.35A

Accessories selection



Zero sequence transformer: Through Cable

Current Range	Size(mm)								
	φ	A	B	C	D	E	F	G	H
16-100A	45	77	85	24	38	54	9	64	54
100-250A	80	112	122	28	56	80	14	89	80
250-400A	100	131	136	24	66	96	14	108	107
400-800A	150	200	209	28	100	145	16.5	184	177

Zero sequence transformer: Through Busbar

Current Range	Size(mm)								
	A1	B1	A	B	C	D	E	F	G
0-63A	100	20	133	50	16	144	140	3	2
0-100A	100	25	133	60	24	154	143	9	2.5
0-225A	140	32	172	72	24	189	184	9	2.5
0-250A	180	32	212	72	24	229	224	9	2.5
0-400A	220	45	254	86	24	269	264	11	2.5
0-630A	260	45	294	86	24	309	304	11	2.5
0-1600A	300	45	334	86	24	349	344	11	2.5
0-4000A	420	45	454	86	24	469	464	11	2.5