DPR-1000

Digital Protection Relay

DPR-1000 is the digital protective relay which is intended for monitoring and protecting the faults on the feeder of distribution system, especially for the medium-voltage motors.

- 11 protective function for the medium-voltage motors
- Compact type protective relay with built-in various add functions
- Remote control & Monitoring of circuit breaker
- MODBUS, DNP3.0 / RS-485 communication

Contents :

Digital Protective Relays

Feeder/Motor protection relay

DPR-1000 is the digital protective relay which is intended for monitoring and protecting the faults on the feeder of distribution system, especially for the medium-voltage motors.

- 11 protective function for the medium-voltage motors
- Compact type protective relay with built-in various add functions
- Remote control & Monitoring of circuit breaker
- MODBUS, DNP3.0 / RS-485 communication

Function

Protection & Control

- Overcurrent (50/51P), Overcurrent ground (50/51N)
- Thermal (49), Negative sequence overcurrent (46)
- Selective ground (67G), Directional ground (67N)
- Under current (37), Stall & locked rotor (48/51LR)
- Starts per hour (66)
- Lock-out (86)
- 2 analog inputs (Thermistor)
- 5 digital outputs
- 3 digital inputs

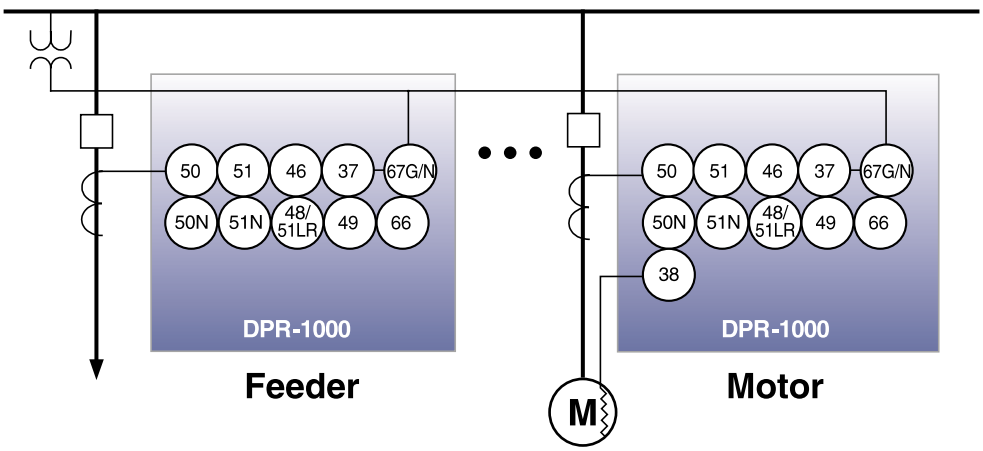
Monitoring & Metering

- I, Io, I2, Vo
- Temperature (2 ch.)
- Starting current, starting time, full load current, thermal, etc.
- Event triggered wave recording: 15 Traces (Ir, Is, It, Io, Vo, AI1, AI2, DI/DO, etc.)

User Interface

- 20 × 4 Character LCD
- DNP3.0, Modbus/RS-485
- PC interface software (GIPAM manager)

Block diagram



Rating

Type			Specification
Wiring			3P3W, 3P4W
Input	Frequency		60Hz
	Voltage	GPT	190, 190 / $\sqrt{3}$
	Current	CT	5A
		ZCT	1.5mA
	Control voltage		AC/DC: 110V
	Power consumption		Steady: below 30W Operating: below 70W
	Burden	PT	0.5VA
		CT	1.0VA
	Digital Input		Digital Input: AC/DC 110V
Output	For trip		AC 250V 16A/DC 30V 16A Resistive Load AC 2500VA, DC 300W
	For alarm		AC 250V 5A/DC 30V 5A Resistive Load AC 750VA, DC 90W
Insulation resistance			Over DC 500V 100㏁
Insulation voltage			AC 2kV (1kV)/for 1 min
Impulse voltage			AC 5kV (3kV) Over 1.2 × 50㎲
Overload Withstand	Current circuit		3 In for 3 hours 20 In for 2 seconds
	Voltage circuit		1.15Vn for 3 hours
Fast transient disturbance			Power Input 4kV Other Input 2kV (Analog Input 1kV)
ESD (Electrostatic Discharge)			Air 8kV Contact 6kV
Operation temperature			-10°C ~ 55°C
Storage temperature			-25°C ~ 70°C
Humidity			Average 30% ~ 80%
Altitude			1000m and below
Others			Non-impact place Non-air pollution palce
Standard			IEC 60255, IEC 61000-4, KEMC 1120
Dimension (W × H × D)			120 × 245 × 185 (mm)
Weight			3.4kg

Protection functions

Protective function	Operating part	Setting & Operating time	Remark
OCR (50/51)	Instantaneous high set	Setting: OFF, 0.5~20.0/0.1In	Below 40ms
	Instantaneous low set	Setting: OFF, 0.5~20.0/0.1In Operating time: 0.05~60.0/0.01s	Definite
	Time delay	Setting: OFF, 0.1~4.0/0.02In Operating time: 0.05~1.20/0.01 (Inverse)	Curves SI, VI, EI, LI
OCGR (50/51N)	Instantaneous	Setting: OFF, 0.1~8.0/0.02In Operating time: 0.05~300.0/0.01s	Definite
	Time delay	Setting: OFF, 0.02~2.0/0.01In Operating time: 0.05~1.20/0.01 (Inverse) 0.05~60.0/0.01s (Definite)	Curves DT, SI, VI, EI, LI
NSOCR (46)	Time delay high set	Setting: OFF, 0.1~1.0/0.02In Operating time: 0.08~60.0/0.01s	Definite
	Time delay low set	Setting: OFF, 0.1~1.0/0.01In Operating time: 0.05~1.00/0.01(Inverse) 0.08~60.0/0.01s(Definite)	Curves DT, SI, VI, EI, LI
DGR (67N)	Time delay	Io Setting: 0.02~2.0/0.01Ion Vo Setting: 11~80/1V RCA Setting: 0~90/1° Operating time: 0.05~10.00/0.01s	Grounded system Definite
SGR (67G)	Time delay	Io Setting: 0.9~6.0/0.01mA Vo Setting: 11~80/1V RCA Setting: 0~90/1° Operating time: 0.05~10.00/0.01s	Isolated system Definite
THERMAL (49)	Time delay	Setting: OFF, 50~100/1% (τh, τc)	Motor Config.
STALL/ LOCK (48/51LR)	Time delay (Stall)	Setting: 0.50~10.00/0.01 (FLC × SVC. × O/L)	Motor Config.
	Time delay (Lock)	Operating time: 0.05~300.0/0.01s(Definite) 0.05~1.20/0.01(Inverse)	Motor Config.
UCR (37)	Time delay	Setting: 0.1~0.9/0.02In Operating time: 0.05~300.0/0.01s	Definite
NCH (66)	-	Starts number: OFF, 1~5 times/1 Base time: 10~60min/1min Time between starts block: 1~60min/1min Operating time: 10~80%/1%	Notching
RTD (38)	Time delay	Setting: OFF, 20~180/1°C Operating time: below 50ms	Definite

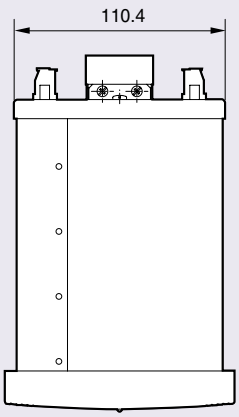
Motor protection

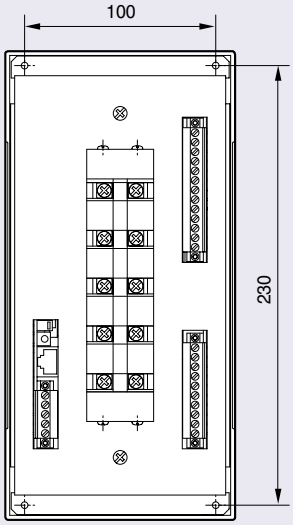
Motor factor	Setting & Operating time	Remark
STALL/ START TIME	Tss (Stall operating time): 0.05~300.00/0.01s Ts (Motor starting time): 1.0~300.0/0.1s	-
FLC/LRC	FLC: 0.20~2.00/0.01In LRC: 0.50~10.00/0.01FLC	FLC: STALL Setting LRC: LOCK Setting
SERVICE FACTOR	SVC: 1.00~1.20/0.05	-
THR CONST	Thermal const.(Heat): 2.0~60.0/0.5min Thermal const.(Cool): 2.0~60.0/0.5min Overload Const. (O/L): 0.80~1.20/0.05	THR (49) Setting
OCGR BLOCK TIME	B/T : 0.00~60.00/0.01s	Operating delay time

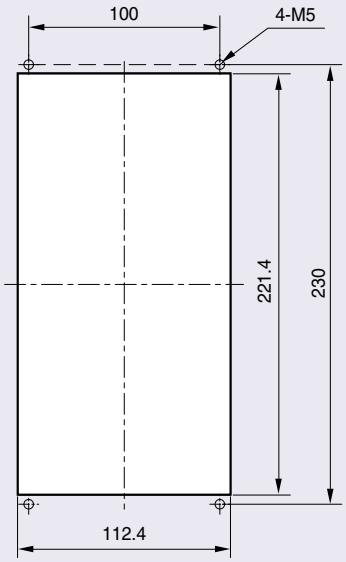
Measurement

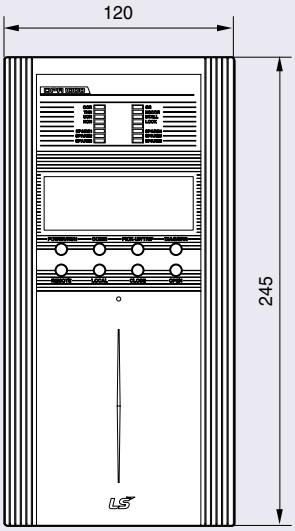
Item	Display range	Remark
Line / Load current	0.000A ~ 999.99kA (CT^{pri})	Start current (CT^{sec}) : 0.050A
Starting current (Is_avg, Is_peak)	0.000A ~ 999.99kA (CT^{pri})	Start current (CT^{sec}) : 0.050A
Starting time (Ts_avg, Ts_peak)	0.000sec ~ 4294967.296sec	-
%FLC, %FLCavg, %FLCpeak	0.000% ~ 999.99%	Start %FLC: 5.000%
Io, Io max	0.000A ~ 999.99kA (CT^{pri}) 0.000A ~ 200.00mA (ZCT^{pri})	Start current (CT^{sec}/ZCT^{sec}) : 0.050A/0.15mA
Vo, Vo max	0.000V ~ 999.99kV (PT^{pri})	Start voltage (PT^{pri}): 2.2V
I_2	0.000A ~ 999.9kA (CT^{pri})	Start current (CT^{sec}): 0.050A
%Q, %Qavg, %Qpeak	0.000% ~ 150.0%	Start capacity: 5.000%
TD Input (4~20mA DC)	0 ~ 20mA DC	

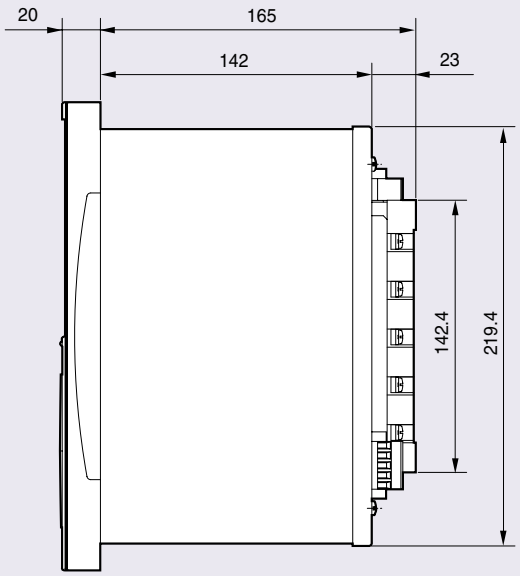
Dimension


110.4


100
230


100
4-M5
221.4
230
112.4


120
245


20
165
142
23
142.4
219.4

DPR-1000

FN	RS	D	AI	60Hz

Protection usage	
FN	Feeder, Motor/NCT
FZ	Feeder, Motor/ZCT

Communication	
RS	RS-485
-	Without comm.

Protocol	
M	MODBUS

Analog Input	
AI	4~20mA
-	Without AI

Frequency
60Hz
50Hz