Digital Protection Relay

www.neopis.kr

EPIC - R510

Combined Digital Protection Relay
Storing & Management
- **Time Stamped Fault Information**
- **Operation Information**

Disturbance Recording
Software for convenient setting
International standard protocol
Sequence Config. of programmable Trip/Alarm

NEOPIS

Digital Protection Relay

The EPIC-R510 is a UNIT-type digital protective relay that enables the selective combination of various protection functions of all the voltage and current elements in order to monitor and protect the line fault, thereby realizing the compactness of the switchboard configuration. And those advanced functions are possible by high-speed operation by DSP.

On the other hand, it is also IED (Intelligent Electronic Device) providing high-function electronic switchboard solution that displays various measurement values and operation records of Event/Fault relays for each element, further enhancing customer convenience.

Main Features

Protection

Built-in composite relay functions

- Current elements : OCR, OCGR
- Voltage elements : OVR, UVR, OVGR, NSOVR
- Directional elements : DOCR, DGR, SGR
- Motor protection elements :
  THR, 51LR, 48ST, UCR, NSOCR
- Reclosing elements : 79

Metering

- Presision measurement functions
  - 3 Phase Current & Voltage, V_0, In

Recording

- Fault records(Max. 2048)
- Fault wave records(Max. 8, 160cycle)

Convenience

- Draw-Out type case
- Power supply of free voltage (AC/DC 110~220V)

Control and Monitoring

- Circuit Break Control (TRIP, OPEN, CLOSE)
  -DO1 : Trip(20A)
  -DO2 : Close(20A)
- Electrically isolated Input contacts(5ch)
- User programmable Alarm Outputs(6ch)
  -DO3 - DO8 : Alarm(10A)

Diagnosis Function

- TCS(Trip Coil Supervision)
- CCS(Close Coil Supervision)

Communication

- Front Interface Port provided
- Upper communication
  - RS-485 port
- Protocol
  - MODBUS RTU Protocol
  - DNP 3.0

Measurement

Items	Indication	Tolerance	Remark
3 Phase voltage	0~999.99[kV]	±0.5%	
V_0	0~999.99[V]	±1%	
3 Phase current	0~999.99[kA]	±0.5%	
In	0~999.99[A]	±0.1%	
Active Power	0~999.99[MW]	±0.5%	
Reactive Power	0~999.99[MVAR]	±0.5%	
Active Energy	0~999.99[MWH]	±1.0%	Import/Export Active Energy
Reactive Energy	0~999.99[MVAR]	±1.0%	Import/Export Reactive Energy
Power Factor	Lead/Lag0~100[%]	±0.5%	Instantaneous Power Factor
Frequency	45.0~65.0[A]	±1.0Hz	

Monitoring and Control

State Input

- Photo-isolated Binary Input of All-state inputs
- Monitoring of CB On/Off
- State input circuit
  - AC/DC 110 V

Output of Control

- Control of Trip and CB On/Off : 8port

Purpose of Use

- Relay operational Alarm
- Use as On/Off output

Recording

Fault Information Recording

Items	Management Data	Capacity
Fault information	Fault current, voltage, Phase angle, operational relay elements, type of fault, and time of fault	Latest 2048
Fault wave data	Time of fault, current/voltage wave of each phase	Latest 8 times (160cycle sample date/1 times)

Record of Operation Information

- Comprehensive history information storage management for IED's operation
- Backup up to 2048 event information
- Event items
  - CB On/Off Control(Local/Remote)
- Update setting value (Local/Remote)
  - CB operation information(ON, OFF, TRIP)
  - Alarm output Event
  - Contact input Event
  - Local/Remote Event
  - Fault occurrence Event
  - Diagnosis Event
  - Setting value change and initialization Event

Basic Specifications

◆ Rating

Rating	Frequency		50/60[Hz]
	Rated Current	CT	5 or 1[A]
		NCT	5 or 1[A]
	Rated Voltage	PT	110[V]
		GPT	190[V]
	Digital Output Contact	CB Control	20[A]:250V AC / 125V DC
		Alarm Signal	10[A]:125V AC / DC
	Digital Input Contact		AC/DC 110 V
	Control Power		AC/DC 110~220[V]
Temperation & Humiduty	Temperature	Operation	-10~55˚C
		Storage	-20~70˚C
	Humidity		Day average 30~80%
Test Environment	Insulation Resistence		IEC 60255-27
	Frequency Withstand Voltage		
	Lightening Impulse Withstand Voltage		
	Over Load		IEC 60255-27
	EMC	1MHz Burst	IEC 60255-26 IEC61000-4
		Electrostatic discharge	
		Fast transient	
		Surge	
		RF Interface	
	EMI		IEC 60255-26
	Vibration and Shock		IEC 60255-21

◆ Power Consumption and Weight

Items	Remark
Power consumption(No Load)	2.64 W
Weights(inside + outcase)kg	3.43 kg

EPIC-R510 Select Guide

특징		EPIC R510 Series						
		I	V	Z	Z-NG	M	M-NG	DG
Protection	OCR[50/51]	●		●	●	●	●	●
	OCGR[50N/51N]	●		●		●		●
	OVR[59]		●	●	●			●
	UVR[27]		●	●	●			●
	OVGR[64]		●	●	●		●	●
	NSOCR[46]	●		●	●	●	●	●
	NSOVR[47N]		●	●	●			●
	SGR[67G]				●		●	
	DOCR[67P]			○				
	DGR[67N]			○				
	OPR							○
	UPR							○
	OQR							○
	OFR							○
	UFR							○
	ROCOF							○
	THR[49]					●	●	
	UCR[37]					●	●	
	51LR					●	●	
	48					●	●	
	RECLOSE[79]	○		○	○			○
	50BF	○		○	○	○	○	○
	COLD Load Pickup	○		○	○	○	○	○
	Inrush Detection	○		○	○	○	○	○
	Trip Coil Supervisor	○	○	○	○	○	○	○
	Close Coil Supervisor	○	○	○	○	○	○	○
Monitoring & Metering	3ϕ Current	●		●	●	●	●	●
	3ϕ Voltage		●	●	●		V0 use	●
	Power (P, Q, S)			○	○			○
	Frequency			○	○			○
	Power Factor			○	○			○
	Import Energy			○	○			○
	Export Energy			○	○			○
	Self-Diagnosis	●	●	●	●	●	●	●
I/O	Digital Input	5	5	5	5	5	5	5
	Digital Output	8	8	8	8	8	8	8
	Logic Sequence	○	○	○	○	○	○	○
Recording	Operate Profile Event	● [1024]	● [1024]	● [1024]	● [1024]	● [1024]	● [1024]	● [1024]
	Fault Record Event	● [2048]	● [2048]	● [2048]	● [2048]	● [2048]	● [2048]	● [2048]
	Fault Wave	●	●	●	●	●	●	●
COMM	Media: RS485	●	●	●	●	●	●	●
	Media: USB	●	●	●	●	●	●	●
	Protocol: MODBUS	●	●	●	●	●	●	●
	Protocol: DNP 3.0	○	○	○	○	○	○	○
	Protocol: IEC 60870-5	○	○	○	○	○	○	○

● : Standard ○ : Option

EPIC-R510 I - Type

Relay Function	Type	Setting Items	Setting Range	Setting steps	
OCR (50/51)	Instantaneous1 I >>>	Pickup value	1.0 ~ 80.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 80.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Delayed I >	Pickup value	0.5 ~ 16.0 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
OCGR (50/51N)	Instantaneous1 I >>>	Pickup value	1.0 ~ 40.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 40.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Delayed I >	Pickup value	0.1 ~ 16.0 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
NSOCR (46)	Instantaneous I >>	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	40 ~ 100 mSec	10 mSec	
	Delayed I >	Pickup value	0.4 ~ 5.0 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
Reclosing	Seq. NO		1~4	1 Step	
	Prepare Time		0.05~200.00	0.01 Sec	
	Reclaim Time		0.01~350.00	0.01 Sec	
	Discriminationation Time		0.01~350.00	0.01 Sec	
	Reclosing T1		0.01~300.00	0.01 Sec	
	Reclosing T2		0.01~300.00	0.01 Sec	
	Reclosing T3		0.01~300.00	0.01 Sec	
	Reclosing T4		0.01~300.00	0.01 Sec	
50BF>	Operation time		0.03 ~ 2.0 Sec	0.1 Sec	
Cold Load Pickup	Pickup value		0.1 ~ 10.0 A	0.01 A	
	Block Time		0 ~ 1000 Sec	1 Sec	
	Reset time		0 ~ 1000 Sec	1 Sec	
	Block Relay		50, 51, 50N, 51N		
Inrush Detection	Pickup value (I2/If)		5 ~ 100 %	1.00 %	
	Pickup value		0.1 ~ 1.0A	0.1A	
	Block time		0.1 ~ 180.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		
CCSV (Close Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		

EPIC-R510 V - Type

Relay Function	Type	Setting Items	Setting Range	Setting steps	
OVR (59)	Delayed V >	Pickup value	100 ~ 150 %	1%	DT, NI
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	
UVR (27)	Delayed V <	Pickup value	10 ~ 100 %	1%	DT, NI
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	
OVGR (59GT)	Instantaneous V >>	Pickup value	5 ~ 80 %	1%	
		Operation time	50 ~ 1000 mSec	1 mSec	
	Delayed V >	Pickup value	5 ~ 40 %	1%	DT, NI
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	
NSOVR (47N)	Delayed V >	Pickup value	5 ~ 100 %	1%	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
50BF>		Operation time	0.03 ~ 2.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		
CCSV (Close Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		

AHEAD FOR LEADING
THE WORLD CLASS
PRODUCTS.

EPIC R510

EPIC-R510 Z - Type

Relay Function	Type	Setting Items	Setting Range	Setting steps	
OCR (50/51)	Instantaneous1 I >>>	Pickup value	1.0 ~ 80.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 80.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Delayed I >	Pickup value	0.5 ~ 16.0 A	0.1A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1Tm	
			0.1 ~ 50.0 Sec	0.1Sec	DT
OCGR (50/51N)	Instantaneous1 I >>>	Pickup value	1.0 ~ 40.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 40.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Delayed I >	Pickup value	0.1 ~ 16.0 A	0.1A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1Tm	
			0.1 ~ 50.0 Sec	0.1Sec	DT
OVR (59)	Delayed I >	Pickup value	100 ~ 150%	1%	DT,NI
		Operation time	0.1 ~ 50.0 Sec	0.1Sec	DT
			0.1 ~ 50.0 Tm	0.1Tm	
UVR (27)	Delayed I >	Pickup value	10 ~ 100 %	1%	DT,NI
		Operation time	0.1 ~ 50.0 Sec	0.1Sec	DT
			0.1 ~ 50.0 Tm	0.1Tm	
OVGR (59GT)	Instantaneous V >>	Pickup value	5 ~ 80 %	1 %	
		Operation time	50 ~ 1000 mSec	1 mSec	
	Delayed V >	Pickup value	5 ~ 40 %	1 %	DT,NI
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	
NSOVR (47N)	Delayed V >	Pickup value	5 ~ 100 %	1 %	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
NSOCR (46)	Instantaneous I >>	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	40 ~ 100 mSec	10 mSec	
	Delayed I >	Pickup value	0.4 ~ 5.0 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
DOCR (67G)	Reference Angle		0 ~ 60 °	1 °	
	Oepration Angle		60 ~ 90 °	1 °	
	Operation Voltage		1.0 ~ 10.0 V	1 V	
DOCGR (67N)	Reference Angle		0 ~ 60 °	1 °	
	Oepration Angle		60 ~ 90 °	1 °	
	Operation Voltage		1.0 ~ 10.0 V	1 V	
50BF>	Operation Time		0.03 ~ 2.0 Sec	0.1 Sec	
Cold Load Pickup	Pickup Value		0.1 ~ 10.0 A	0.01 A	
	Block Time		0 ~ 1000 Sec	1 Sec	
	Reset Time		0 ~ 1000 Sec	1 Sec	
	Block Relay		50, 51, 50N, 51N		
Inrush Detection	Pickup Value (I2/If)		5 ~ 100 %	1.00 %	
	Pickup Value		0.1 ~ 1.0A	0.1A	
	Block Time		0.1 ~ 180.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Instantaneous	Operation time	0.1 ~ 10.0 Sec	0.1 Sec	
		DI	DI 1 ~ 5	1	
CCSV (Close Coil SuperVision)	Instantaneous	Operation time	0.1 ~ 10.0 Sec	0.1 Sec	
		DI	DI 1 ~ 5	1	

EPIC-R510 Z_NG - Type

Relay Function	Type	Setting Items	Setting Range	Setting steps	
OCR (50/51)	Instantaneous1 I >>>	Pickup value	1.0 ~ 80.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 80.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Delayed I >	Pickup value	0.5 ~ 16.0 A	0.1A	
		Operation time	0.1 ~ 50.0 Tm	0.1Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1Sec	DT
OVR (59)	Delayed I >	Pickup value	100 ~ 150%	1%	
		Operation time	0.1 ~ 50.0 Sec	0.1Sec	DT
			0.1 ~ 50.0 Tm	0.1Tm	NI
UVR (27)	Delayed I >	Pickup value	10 ~ 100 %	1%	
		Operation time	0.1 ~ 50.0 Sec	0.1Sec	DT
			0.1 ~ 50.0 Tm	0.1Tm	NI
OVGR (59GT)	Instantaneous V >>	Pickup value	5 ~ 80 %	1 %	
		Operation time	50 ~ 1000 mSec	1 mSec	
	Delayed V >	Pickup value	5 ~ 40 %	1 %	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	NI
NSOVR (47N)	Delayed V >	Pickup value	5 ~ 100 %	1 %	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
NSOCR (46)	Instantaneous I >>	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	40 ~ 100 mSec	10 mSec	
	Delayed I >	Pickup value	0.4 ~ 5.0 A	0.1 A	
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1 Sec	DT
SGR (67G)	Reference Angle		0 ~ 90 °	1 °	
	Direction Angle		60 ~ 90 °	1 °	
	Operation Current		0.6 ~ 9.0 mA	0.1mA	
	Operation Voltage		5 ~ 160 V	1V	
	Operation Time		0.1 ~ 50.0 Sec	0.1 Sec	
50BF>	Operation Time		0.03 ~ 2.0 Sec	0.01 Sec	
Cold Load Pickup	Pickup Value		0.1 ~ 10.0 A	0.1 A	
	Block Time		0.1 ~ 180.0 Sec	0.1 Sec	
	Reset Time		0.1 ~ 180.0 Sec	0.1 Sec	
	Block Relay		50, 51, 50N, 51N		
Inrush Detection	Pickup Value		0.1 ~ 10.0 A	0.1 A	
	Pickup Value (I2/If)		5 ~ 100 %	1 %	
	Block Time		0.1 ~ 180.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Operation Time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		
CCSV (Close Coil SuperVision)	Operation Time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		

EPIC-R510 M - Type

Relay Function	Type	Setting Items	Setting Range	Setting steps	
OCR (50/51)	Instantaneous1 I >>>	Pickup value	1.0 ~ 80.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 80.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Delayed I >	Pickup value	0.5 ~ 16.0 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
OCGR (50/51N)	Instantaneous1 I >>>	Pickup value	1.0 ~ 40.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 40.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Delayed I >	Pickup value	0.1 ~ 16.0 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
NSOCR (46)	Instantaneous1 I >>	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	40 ~ 100 mSec	10 mSec	
	Delayed I >	Pickup value	0.4 ~ 50 A	0.1 A	DT, IEEE MI, VI, EI, IEC NI, VI, EI
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	
			0.1 ~ 50.0 Sec	0.1 Sec	DT
THR(49)	Delayed	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	Thermal time constant 0.5 ~ 60.0 min	0.5 min	
			Thermal time constant Cold 0.5 ~ 60.0 min	0.5 min	
UCR(37)	Instantaneous I<	Upper current value	0.2 ~ 5.0 A	0.1 A	
		Lower current value	1.0 ~ 5.0 A	0.1 A	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	
51LR	Delayed	Pickup value	1.0 ~ 50.0	0.2A	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	EI
		Start up	0.0 ~ 300.0 Sec	0.1 Sec	
48ST	Delayed	Pickup value	1.0~80	0.5 A	
		LR Amp	1.0~10.0	0.1 pu	
		Operation time	0.1~50.0	0.1 Sec	
50BF>	Operation time		0.03 ~ 2.0 Sec	0.1 Sec	
Cold Load Pickup	Pickup value		0.1 ~ 10.0 A	0.01 A	
	Block Time		0 ~ 1000 Sec	1 Sec	
	Reset time		0 ~ 1000 Sec	1 Sec	
	Block Relay		50, 51, 50N, 51N		
Inrush Detection	Pickup value (I2/If)		5 ~ 100 %	1.00 %	
	Pickup value		0.1 ~ 1.0A	0.1A	
	Block time		0.1 ~ 180.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5	1	
CCSV (Close Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5	1	

EPIC-R510 M_NG Type

Relay Function	Type	Setting Items	Setting Range	Setting steps	
OCR (50/51)	Instantaneous1 I >>>	Pickup value	1.0 ~ 80.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 80.0 A	1 A	
		Operation time	50 ~ 1000 mSec	10 mSec	
	Delayed I >	Pickup value	0.5 ~ 16.0 A	0.1 A	
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1 Sec	DT
NSOCR (46)	Instantaneous1 I >>>	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	40 ~ 100 mSec	10 mSec	
	Delayed I >	Pickup value	0.4 ~ 5.0 A	0.1 A	
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1 Sec	DT
OVGR (59GT)	Instantaneous1 V >>	Pickup value	5 ~ 80 %	1 %	
		Operation time	50 ~ 1000 mSec	1 mSec	
	Delayed V >	Pickup value	5 ~ 40 %	1 %	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	NI
THR(49)	Delayed	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	Thermal time constant 0.5 ~ 60.0 min	0.5 min	
			Thermal time constant Cold 0.5 ~ 60.0 min	0.5 min	
UCR(37)	Instantaneous I<	Upper current value	0.2 ~ 5.0 A	0.1 A	
		Lower current value	1.0 ~ 5.0 A	0.1 A	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	
51LR	Delayed	Pickup value	1.0 ~ 50.0	0.2A	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	EI
		Start up	YES or NO		
48ST	Delayed	Pickup value	1.0~80	0.5 A	
		LR Amp	1.0~10.0	0.1 pu	
	Operation time		0.1 ~ 50.0	0.1 Sec	
50BF>	Operation time		0.03 ~ 2.0 Sec	0.01 Sec	
Cold Load Pickup	Pickup value		0.1 ~ 10.0 A	0.1 A	
	Block Time		0.1 ~ 180.0 Sec	0.1 Sec	
	Reset time		0.1 ~ 180.0 Sec	0.1 Sec	
	Block Relay		50, 51, 50N, 51N		
Inrush Detection	Pickup value		0.1 ~ 10.0 A	0.1 A	
	Pickup value (I2/If)		5 ~ 100 %	1 %	
	Block Time		0.1 ~ 180.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		
CCSV (Close Coil SuperVision)	Operation time		0.1 ~ 10.0 Sec	0.1 Sec	
	DI		DI 1 ~ 5		
SGR (67G)	Reference Angle		0 ~ 90 °	1 °	
	Direction Angle		60 ~ 90 °	1 °	
	Operation Current		0.6 ~ 9.0 mA	0.1mA	
	Operation Voltage		5 ~ 160 V	1V	
	Operation time		0.1 ~ 50.0 Sec	0.1 Sec	

EPIC-R510 DG Type

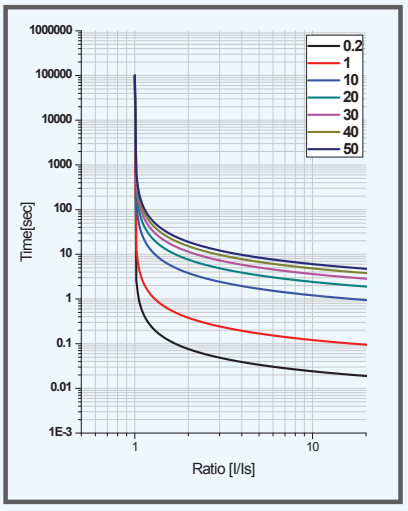
Relay Function	Type	Setting Items	Setting Range	Setting steps	
OCR (50/51)	Instantaneous1 I >>>	Pickup value	1.0 ~ 80.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 80.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Delayed I >	Pickup value	0.5 ~ 16.0 A	0.1A	
		Operation time	0.1 ~ 50.0 Tm	0.1Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1Sec	DT
OCGR (50/51N)	Instantaneous1 I >>>	Pickup value	1.0 ~ 40.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Instantaneous2 I >>	Pickup value	1.0 ~ 40.0 A	1A	
		Operation time	50 ~ 1000mSec	10mSec	
	Delayed I >	Pickup value	0.1 ~ 16.0 A	0.1A	
		Operation time	0.1 ~ 50.0 Tm	0.1Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1Sec	DT
OVR (59)	Delayed I >	Pickup value	100 ~ 150%	1%	
		Operation time	0.1 ~ 50.0 Sec	0.1Sec	DT
			0.1 ~ 50.0 Tm	0.1Tm	NI
UVR (27)	Delayed I >	Pickup value	10 ~ 100 %	1%	
		Operation time	0.1 ~ 50.0 Sec	0.1Sec	DT
			0.1 ~ 50.0 Tm	0.1Tm	NI
OVGR (59GT)	Instantaneous1 V >>	Pickup value	5 ~ 80 %	1 %	
		Operation time	50 ~ 1000 mSec	1 mSec	
	Delayed V >	Pickup value	5 ~ 40 %	1 %	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
			0.1 ~ 50.0 Tm	0.1 Tm	NI
NSOVR (47N)	Delayed V >	Pickup value	5 ~ 100 %	1 %	
		Operation time	0.1 ~ 50.0 Sec	0.1 Sec	DT
NSOCR (46)	Instantaneous1 I >>	Pickup value	0.5 ~ 12.0 A	0.1 A	
		Operation time	40 ~ 100 mSec	10 mSec	
	Delayed I >	Pickup value	0.4 ~ 5.0 A	0.1 A	
		Operation time	0.1 ~ 50.0 Tm	0.1 Tm	IEEE MI, VI, EI, IEC NI, VI, EI
			0.1 ~ 50.0 Sec	0.1 Sec	DT
OPR	Operation		Off/ Forward/ Reverse		
	Pickup value		15 ~ 2000 W	1 W	
	Operation time		0.1 ~ 180 Sec	0.01 Sec	
UPR	Operation		Off/ Forward/ Reverse		
	Pickup value		15 ~ 1500 W	1 W	
	Operation time		0.1 ~ 180 Sec	0.01 Sec	
OQR	Operation		Off/ Forward/ Reverse		
	Pickup value		15 ~ 1500 Var	1 Var	
	Operation time		0.1 ~ 180 Sec	0.01 Sec	
OFR	Pickup value		60 ~ 65 Hz	0.01 Hz	
	OFR Block		50 ~ 90 %	0.1 %	
	Operation time		0.1 ~ 60 Sec	0.01 Sec	
UFR	Pickup value		55 ~ 60 Hz	0.01 Hz	
	UFR Block		50 ~ 90 %	0.1 %	
	Operation time		0.1 ~ 60 Sec	0.01 Sec	

EPIC-R510 DG Type

Relay Function	Type / Setting Items	Setting Range	Setting steps	
ROCOF	Pickup value	0.1 ~ 2 Hz/s	0.01 Hz	
	ROCOF Block	50 ~ 90 %	0.1 %	
	Operation time	0.1 ~ 1 Sec	0.01 Sec	
50BF>	Operation time	0.03 ~ 2.0 Sec	0.01 Sec	
Cold Load Pickup	Pickup value	0.1 ~ 10.0 A	0.1 A	
	Block time	0.1 ~ 180.0 Sec	0.1 Sec	
	Reset time	0.1 ~ 180.0 Sec	0.1 Sec	
	Block Relay	50, 51, 50N, 51N		
Inrush Detection	Pickup value	0.1 ~ 10.0 A	0.1 A	
	Pickup value(I2/If)	5 ~ 100 %	1 %	
	Block time	0.1 ~ 180.0 Sec	0.1 Sec	
TCSV (Trip Coil SuperVision)	Operation time	0.1 ~ 10.0 Sec	0.1 Sec	
	DI	DI 1 ~ 5		
CCSV (Close Coil SuperVision)	Operation time	0.1 ~ 10.0 Sec	0.1 Sec	
	DI	DI 1 ~ 5		

Characteristic Curve

IEEE Moderately Inverse Protection characteristic curve

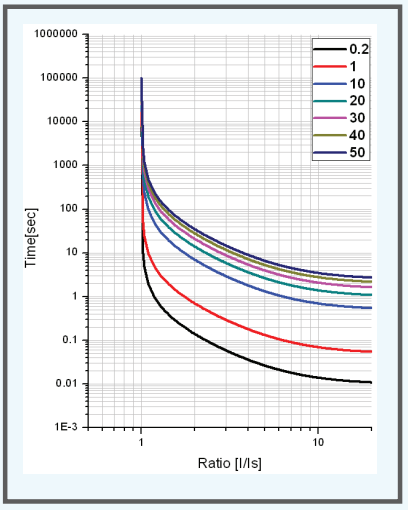


T: Operation time
I : Input current value
Is : Setting current value
Tm : Operation time multiplier

OCR(50/51)
OCGR(50/51N)
NSOCR(46)

$$T_{operate} = \left(\frac{0.0515}{(I/I_S)^{0.02} - 1} + 0.114 \right) \times \frac{T_m}{10}$$

IEEE Very Inverse(VI) Protection characteristic curve

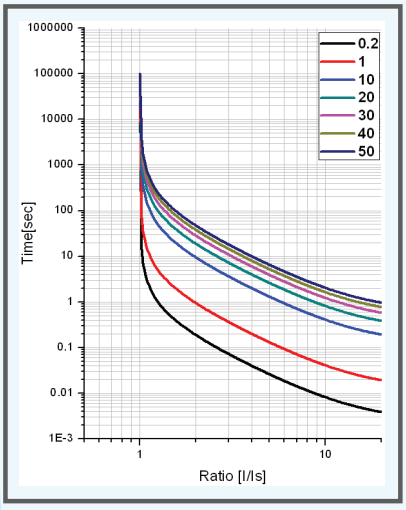


T: Operation time
I : Input current value
Is : Setting current value
Tm : Operation time multiplier

OCR(50/51)
OCGR(50/51N)
NSOCR(46)

$$T_{operate} = \left(\frac{19.61}{(I/I_S)^{2.00} - 1} + 0.491 \right) \times \frac{T_m}{10}$$

IEEE Extremely Inverse (EI) Protection characteristic curve

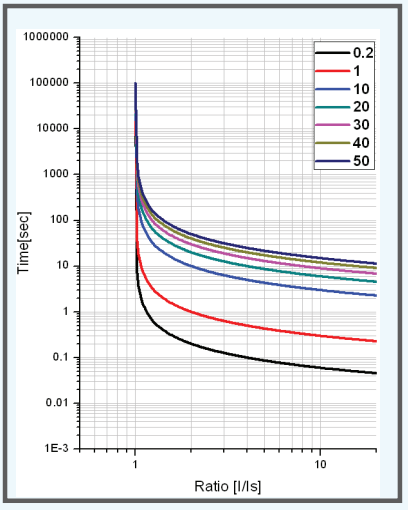


T: Operation time
I : Input current value
Is : Setting current value
Tm : Operation time multiplier

OCR(50/51)
OCGR(50/51N)
NSOCR(46)

$$T_{operate} = \left(\frac{28.2}{(I/I_S)^{2.00} - 1} + 0.1217 \right) \times \frac{T_m}{10}$$

IEC Inverse Delayed (NI) Protection characteristic curve



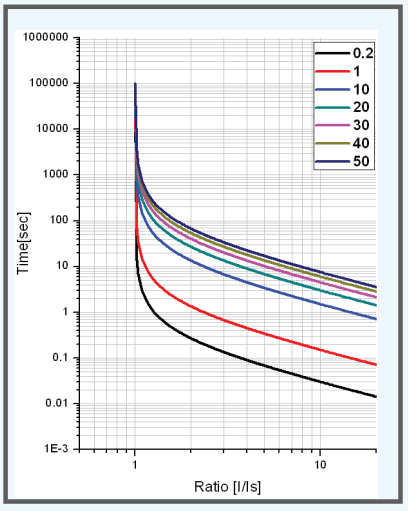
T: Operation time
I : Input current value
Is : Setting current value
Tm : Operation time multiplier

OCR(50/51)
OCGR(50/51N)
NSOCR(46)

$$T_{operate} = \left(\frac{0.14}{(I/I_S)^{0.02} - 1} \right) \times \frac{T_m}{10}$$

Characteristic Curve

IEC Very Inverse(VI) Protection characteristic curve

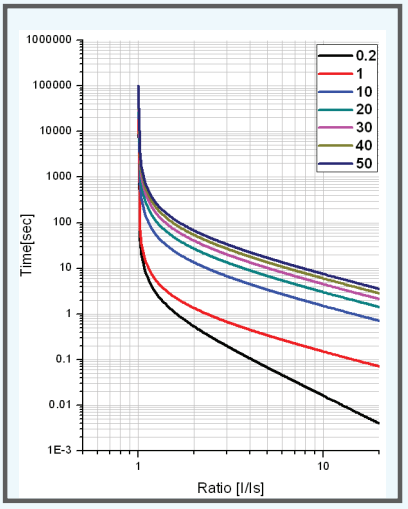


T: Operation time
I : Input current value
Is : Setting current value
Tm : Operation time multiplier

OCR(50/51)
OCGR(50/51N)
NSOCR(46)

$$T_{operate} = \left(\frac{13.5}{(I/I_S)^{1.00}-1}\right) X \frac{T_m}{10}$$

IEC Extremely Inverse (EI) Protection characteristic curve

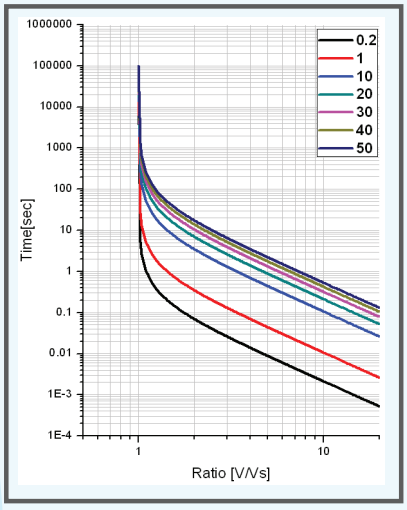


T: Operation time
I : Input current value
Is : Setting current value
Tm : Operation time multiplier

OCR(50/51)
OCGR(50/51N)
NSOCR(46)

$$T_{operate} = \left(\frac{80}{(I/I_S)^{2.00}-1}\right) X \frac{T_m}{10}$$

OVR Inverse Delayed (NI) Protection characteristic curve

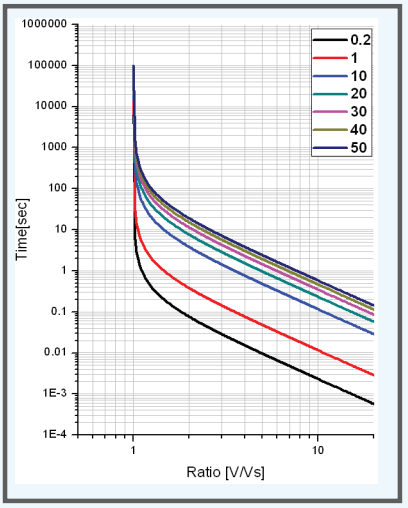


T: Operation time
V : Input voltage value
Vs : Setting voltage value
Tm : Operation time multiplier

OVR(59)

$$T_{operate} = \left(\frac{10.5}{(V/V_S)^{2.00}-1}\right) X \frac{T_m}{10}$$

OVGR Inverse Delayed (NI) Protection characteristic curve



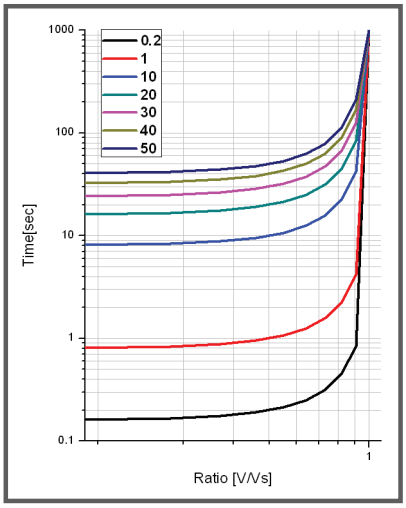
T: Operation time
V : Input voltage value
Vs : Setting voltage value
Tm : Operation time multiplier

OVGR(64)

$$T_{operate} = \left(\frac{11.5}{(V/V_S)^{2.00}-1}\right) X \frac{T_m}{10}$$

Characteristic Curve

UVR Inverse Delayed (NI) Protection characteristic curve

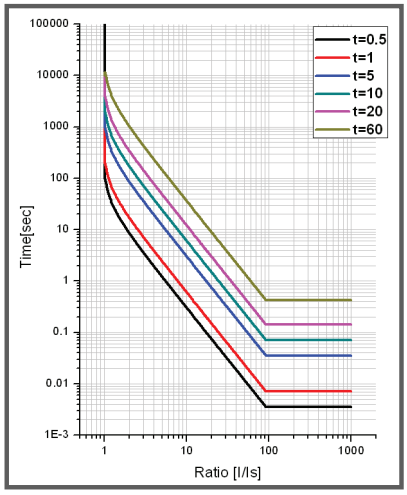


T: Operation time
V : Input voltage value
Vs : Setting voltage value
Tm : Operation time multiplier

UVR(64)

$$T_{operate} = \left(\frac{8.0}{1-(V/Vs)^{2.00}}\right) X \frac{T_m}{10}$$

Thermal Curve(Cold)

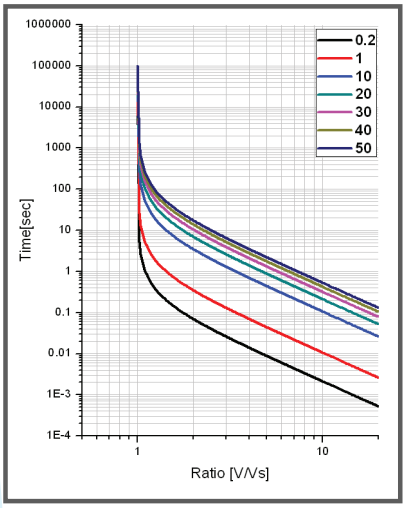


T: Operation time
Ip : Load current before fault
Ib : Rated load current
I : Fault current
k : Overload contant
τ : Thermal time constant
(t= 0.5~60M, when Ip=0, k=1, Ib=1)

Thermal Overload Relay

$$T = \tau \cdot \ln\left(\frac{I^2 - I_P^2}{I^2 - (k \cdot I_b)^2}\right)$$

Thermal Curve(Hot)

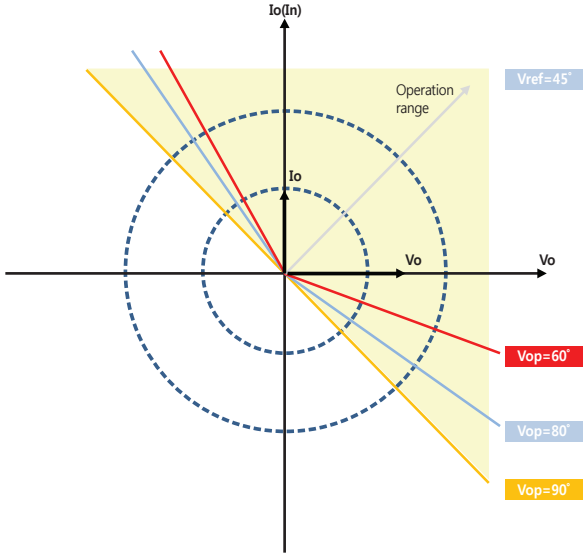


T: Operation time
Ip : Load current before fault
Ib : Rated load current
I : Fault current
k : Overload contant
τ : Thermal time constant
(t= 0.5~60M, When Ip^2=0.5, k=1, Ib=1)

Thermal Overload Relay

$$T = \tau \cdot \ln\left(\frac{I^2 - I_P^2}{I^2 - (k \cdot I_b)^2}\right)$$

Directional Relay



SGR(67G)
DOCR(67P),DGR(67N)

Terminal

I- Type and M-Type

01	Ia+	Ia-	02
03	Ib+	Ib-	04
05	Ic+	Ic-	06
07	In+	In-	08
09	DI 2	DI 1	10
11	DI 4	DI 3	12
13	DI 5	DI com	14
15	DO 1	DO 5	16
17	DO 2	DO 6	18
19	DO 3	DO 7	20
21	DO 4	DO 8	22
23	DO com1	DO com2	24
25	RS485+	PWR+	26
27	RS485-	PWR-	28

TB A

V-Type

01	Va+	Va-	02
03	Vb+	Vb-	04
05	Vc+	Vc-	06
07	V0+	V0-	08
09	DI 2	DI 1	10
11	DI 4	DI 3	12
13	DI 5	DI com	14
15	DO 1	DO 5	16
17	DO 2	DO 6	18
19	DO 3	DO 7	20
21	DO 4	DO 8	22
23	DO com1	DO com2	24
25	RS485+	PWR+	26
27	RS485-	PWR-	28

TB A

Terminal

Z- Type / DG Type

01	Ia+	Ia-	02
03	Ib+	Ib-	04
05	Ic+	Ic-	06
07	In+	In-	08
09	DI 2	DI 1	10
11	DI 4	DI 3	12
13	DI 5	DI com	14
15	DO 1	DO 5	16
17	DO 2	DO 6	18
19	DO 3	DO 7	20
21	DO 4	DO 8	22
23	DO com1	DO com2	24
25	RS485+	PWR+	26
27	RS485-	PWR-	28

TB A

Va+	31
Va-	32
Vb+	33
Vb+	34
Vc+	35
Vc-	36
V0+	37
V0-	38

TB B

Terminal

Z_NG Type

01	Ia+	Ia-	02
03	Ib+	Ib-	04
05	Ic+	Ic-	06
07	I0+	I0-	08
09	DI 2	DI 1	10
11	DI 4	DI 3	12
13	DI 5	DI com	14
15	DO 1	DO 5	16
17	DO 2	DO 6	18
19	DO 3	DO 7	20
21	DO 4	DO 8	22
23	DO com1	DO com2	24
25	RS485+	PWR+	26
27	RS485-	PWR-	28

TB A

Va+	31
Va-	32
Vb+	33
Vb+	34
Vc+	35
Vc-	36
V0+	37
V0-	38

TB B

Terminal

M_NG Type

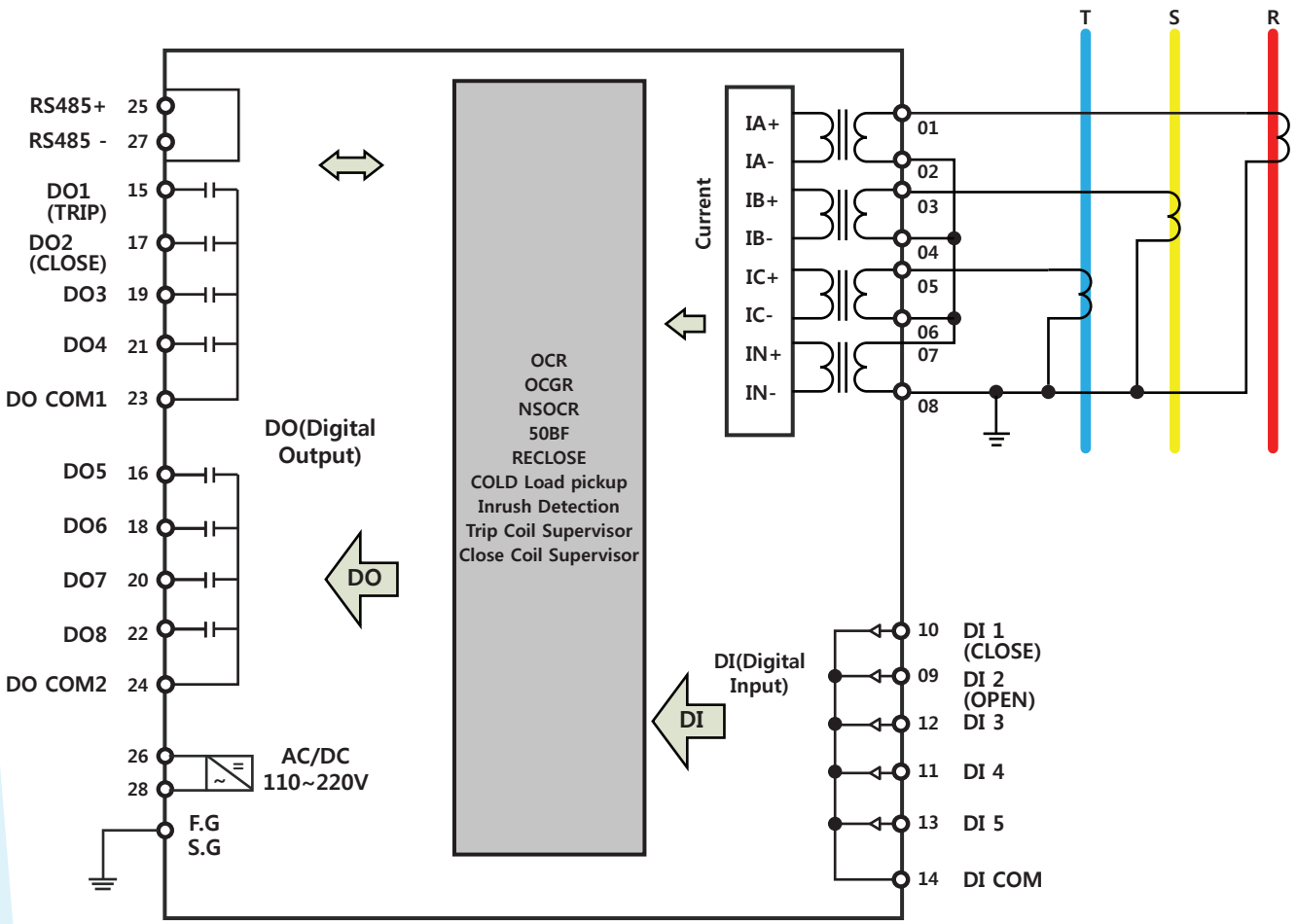
01	Ia+	Ia-	02
03	Ib+	Ib-	04
05	Ic+	Ic-	06
07	I0+	I0-	08
09	DI 2	DI 1	10
11	DI 4	DI 3	12
13	DI 5	DI com	14
15	DO 1	DO 5	16
17	DO 2	DO 6	18
19	DO 3	DO 7	20
21	DO 4	DO 8	22
23	DO com1	DO com2	24
25	RS485+	PWR+	26
27	RS485-	PWR-	28

TB A

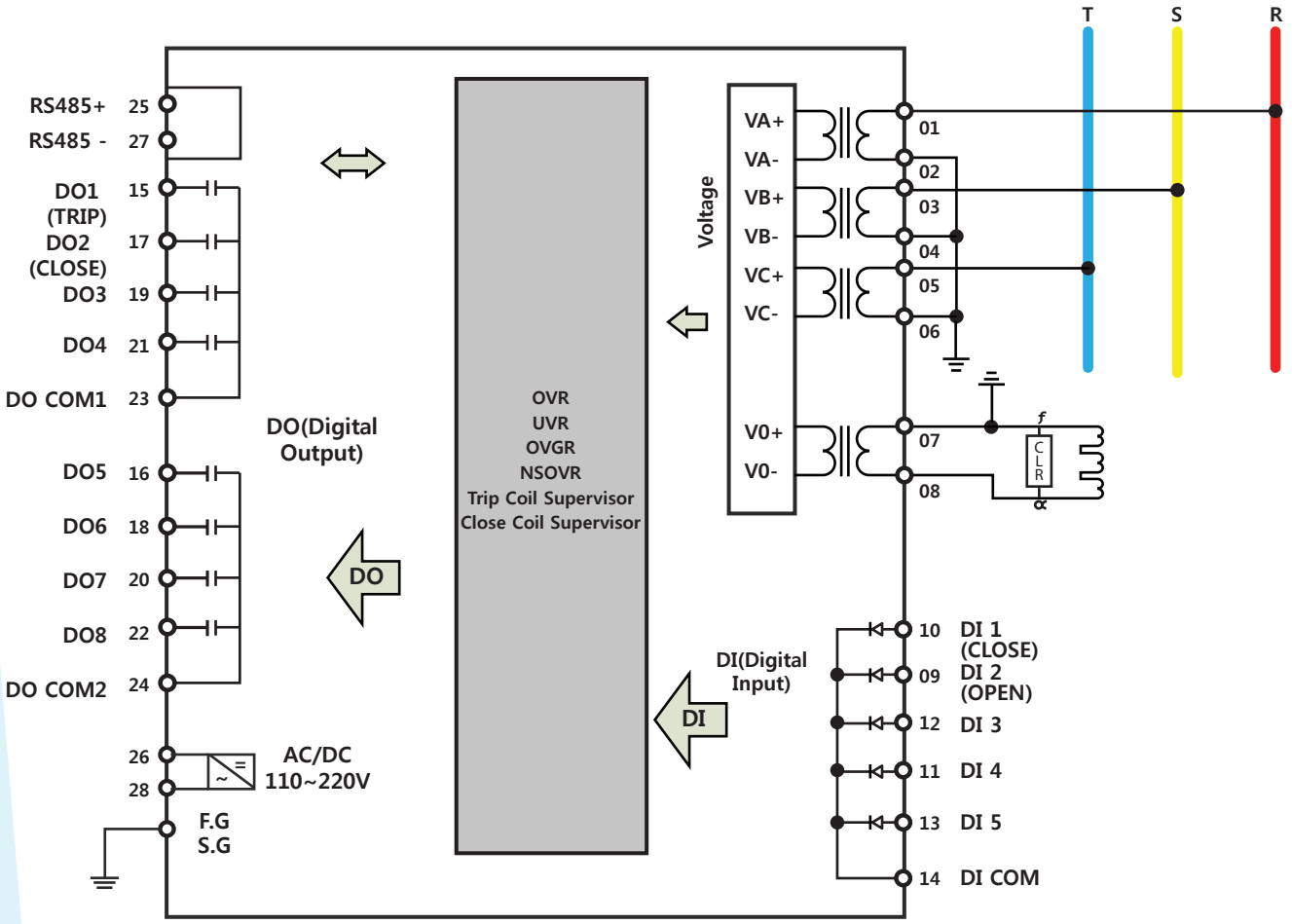
NC	31
NC	32
NC	33
NC	34
NC	35
NC	36
V0+	37
V0-	38

TB B

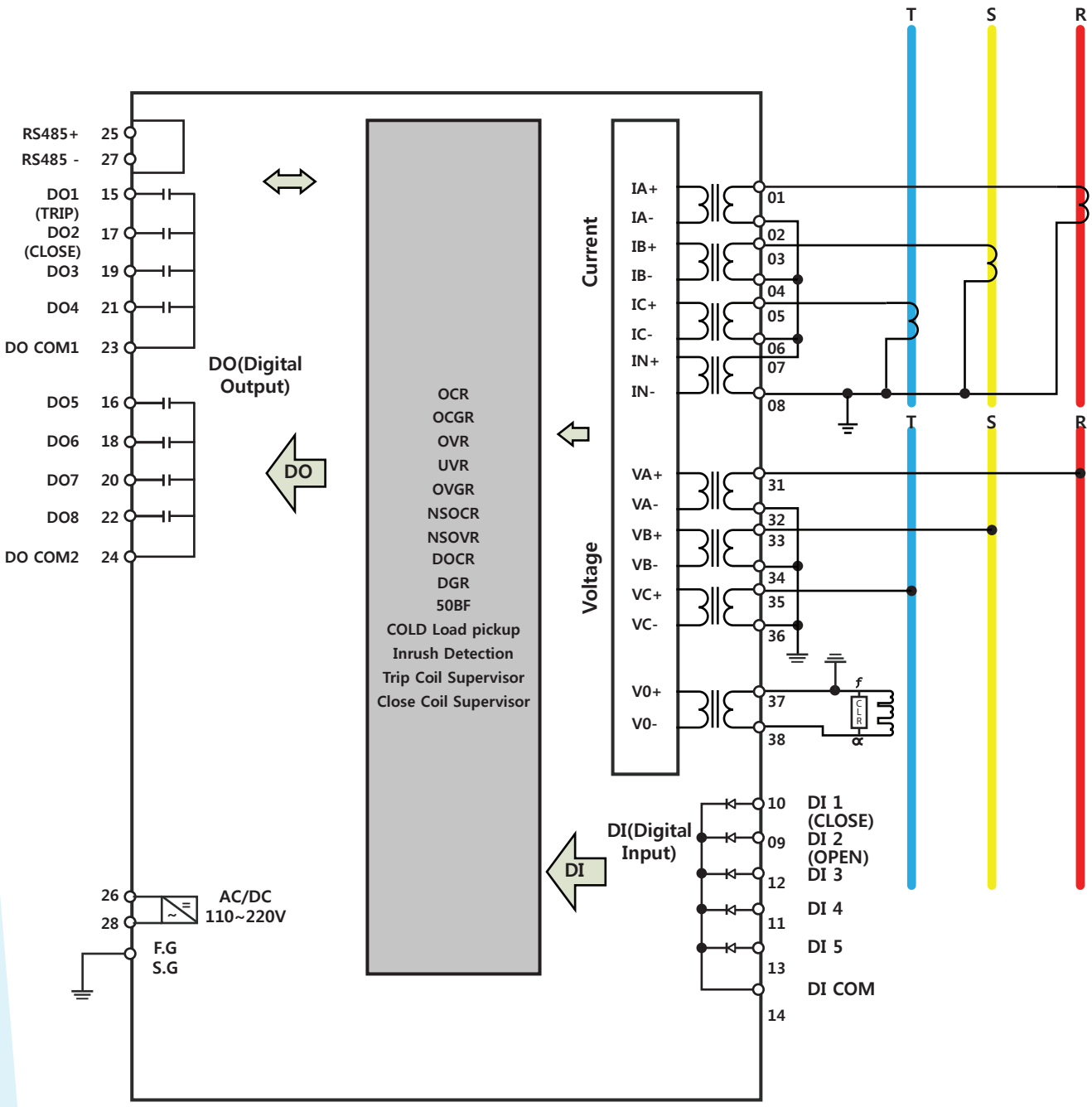
I-Type Wiring Diagram



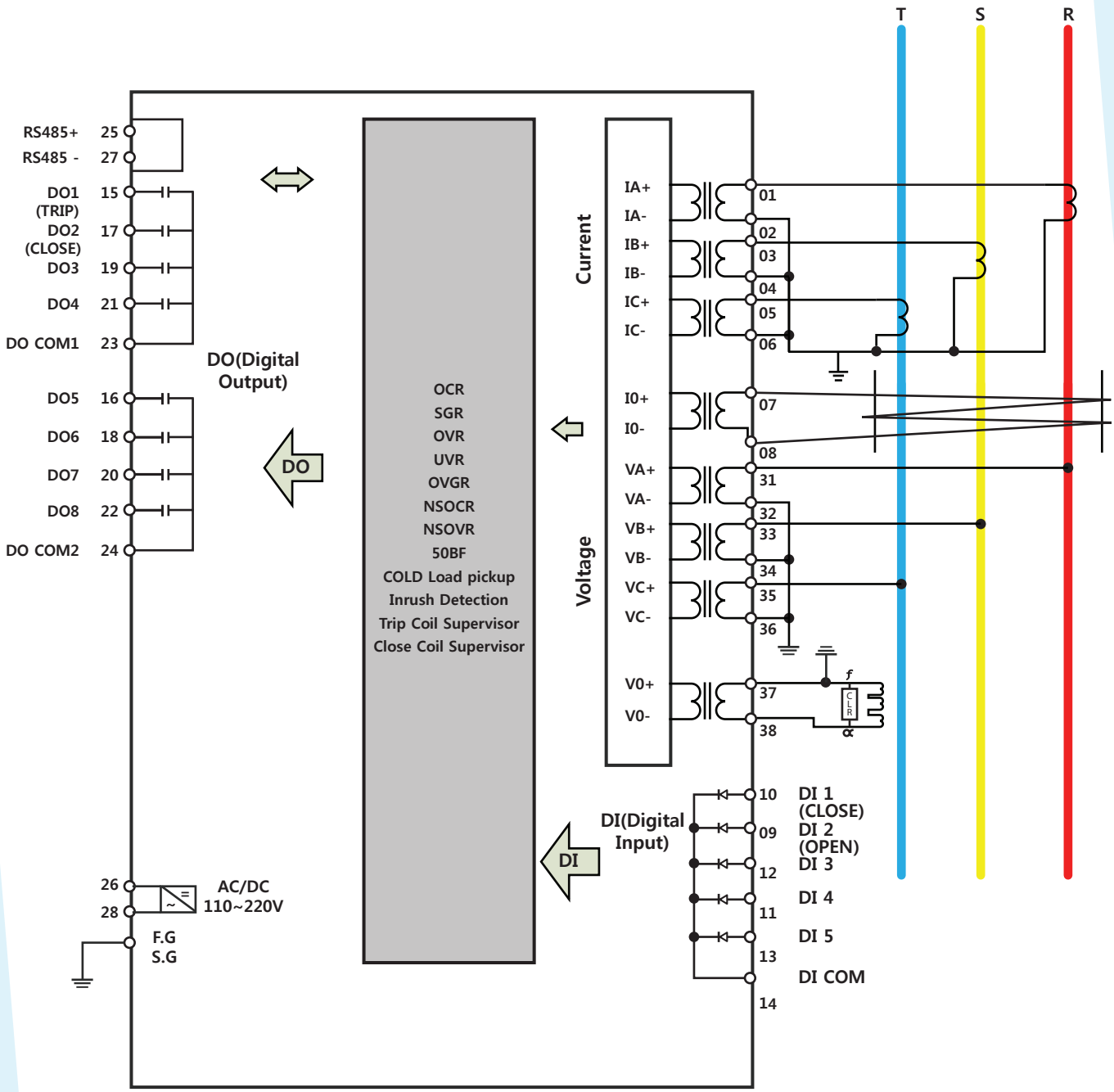
V-Type Wiring Diagram



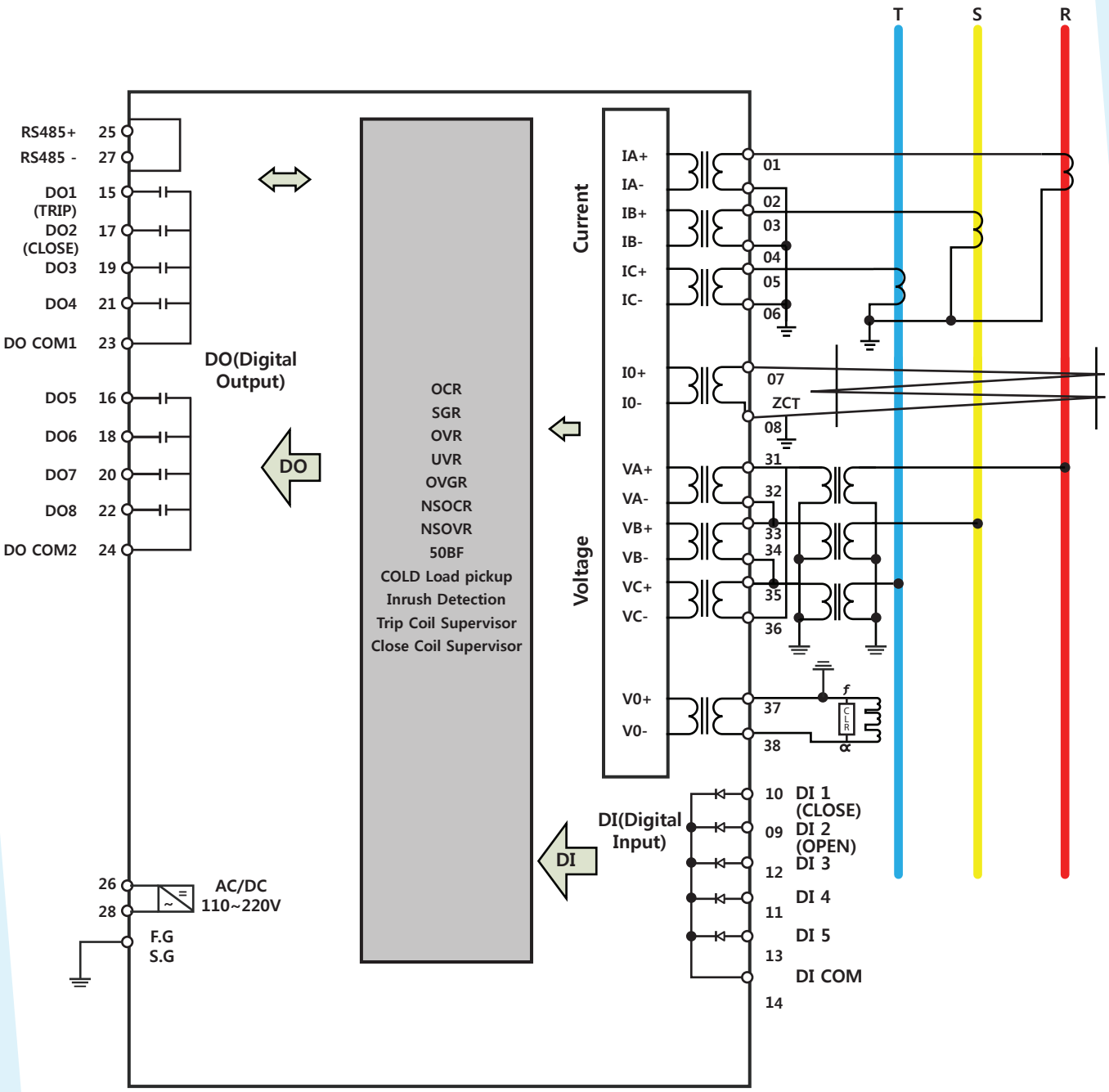
Z-Type / DG-Type Wiring Diagram



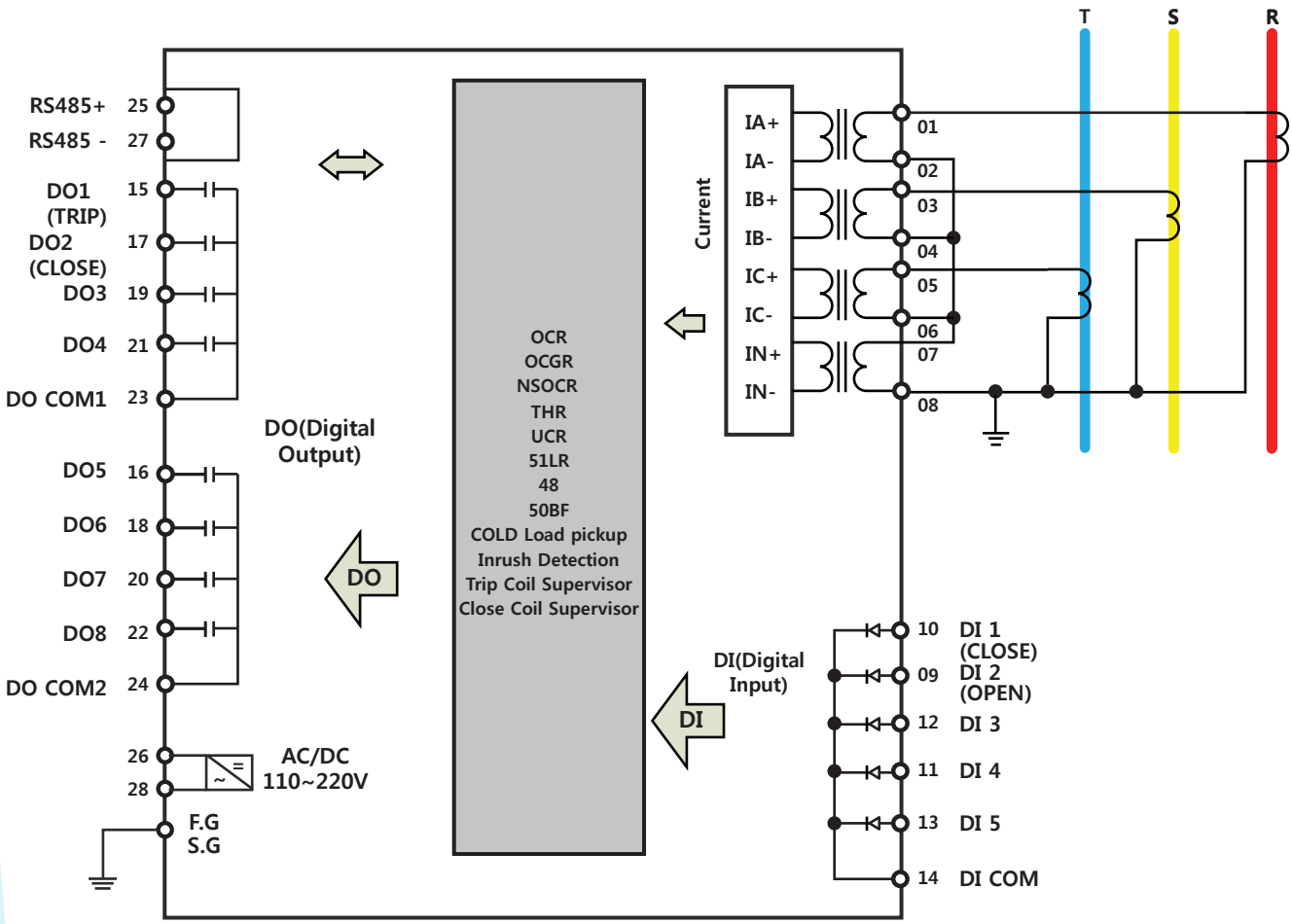
Z_NG- type(Wye) Wiring Diagram



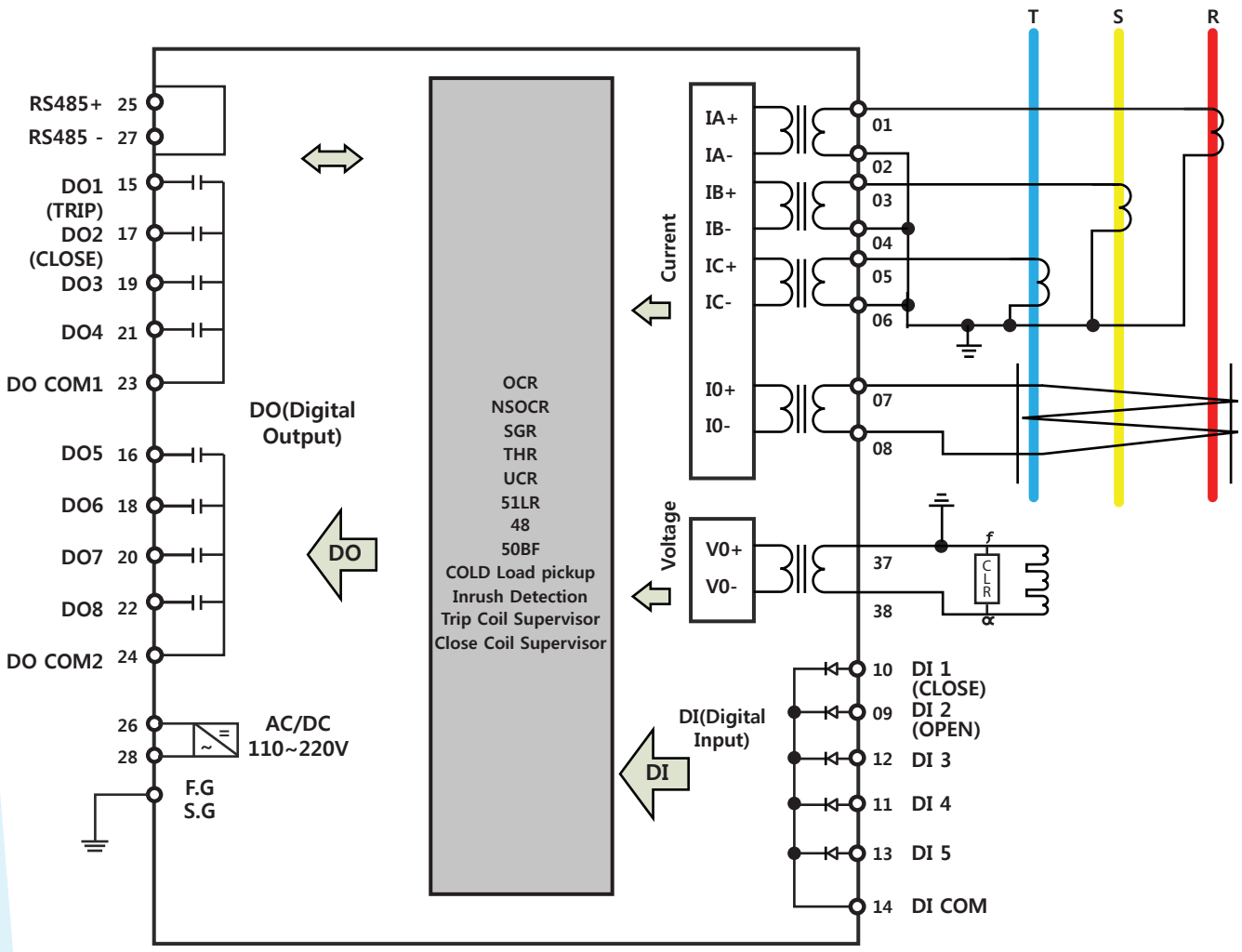
Z_NG- type (Delta) Wiring Diagram



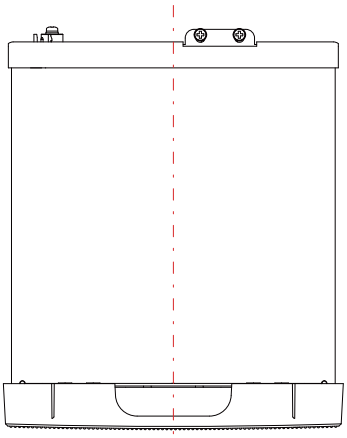
M-type Wiring Diagram

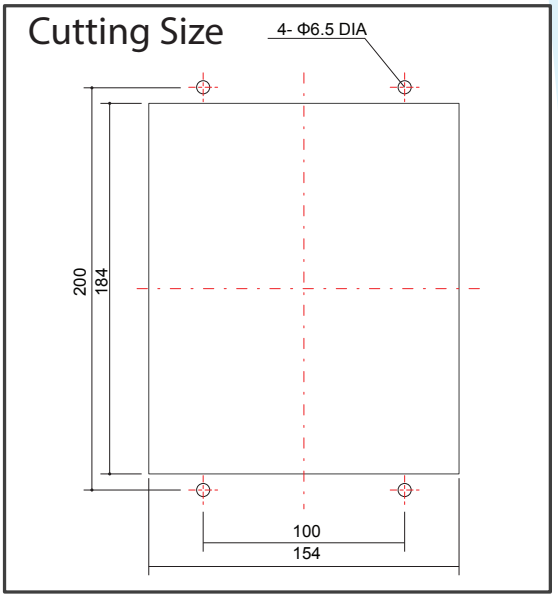


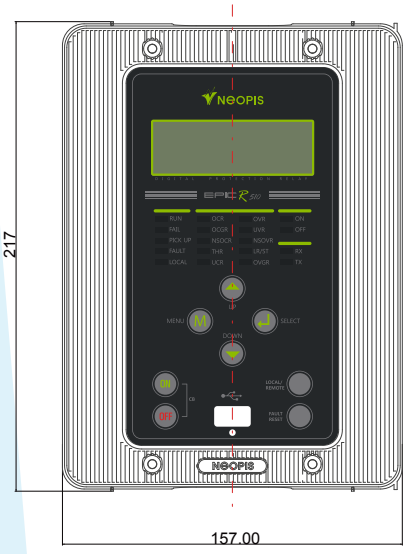
M_NG type Wiring Diagram

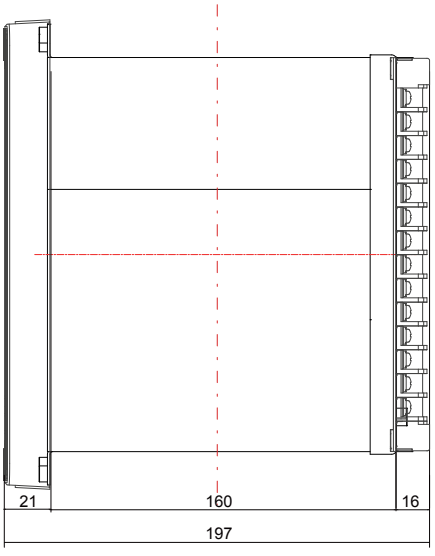


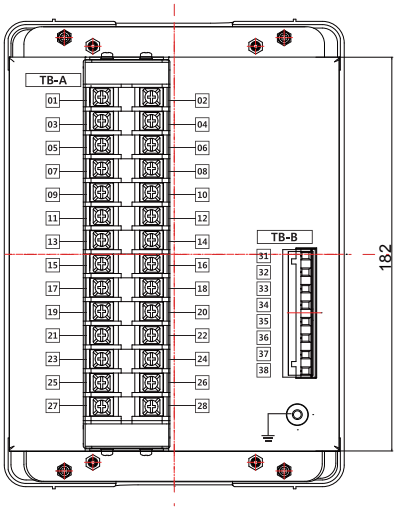
Drawing




Cutting Size
4- Φ6.5 DIA
200
184
100
154


NEOPIS
217
157.00


21
160
16
197


TB-A
TB-B
182

MAINTENANCE
Intelligent device and easy to operate and maintain

Protocol Interface& Monitoring

Access Control
Access control functions
Retrying to connect

Purchasing / Service Telephone Inquiries.

Tel : 031-427-8300 **Fax : 031-427-8302**

HOMEPAGE

http://www.neopis.kr

E-MAIL

neopis@neopis.kr

NEOPIS http://www.neopis.kr

NEO Bd. 47, Jeonpa-ro 24beon-gil, Manan-gu, Anyang-si, Gyeonggi-do, Republic of Korea 14086

E-mail : neopis@neopis.kr ***Tel :*** +82-31-427-8300 ***Fax :*** +82-31-427-8302