

RefleX² Protection and Control

RefleX² - 203

Over current protection
Earth fault voltage protection
Communication (IEC 60870-5-103)



3 stage over current
2-stage EF voltage
Model 203

RefleX Over Current and Earth Fault Voltage Protection

Menu (setting group #1)

<p>In-service display</p>	<p>(See separate description of the sub-menu)</p>	<p>In-service display Press 'enter' to toggle displays</p>
<p>Trip records</p>	<p>(See separate description of the sub-menu 'Trip Records')</p>	<p>Press 'enter' to display recorded data After selecting a record use 'arrow up' or 'arrow down' to display additional information. Leave monitor by pressing 'Esc'.</p>
<p>Low current #1 I> 160/4A t> 1.5s Def.t CT 200/5A In5A</p>	<hr/> <hr/> <hr/>	<p>Low phase current Setting group # Primary/secondary current set value Delay Characteristic Primary/secondary CT Rated phase current</p>
<p>Med. current #1 I>> 800/20A t>> 0.5s Def.t CT 200/5A In5A</p>	<hr/> <hr/> <hr/>	<p>Medium phase current Setting group # Primary/secondary current set value Delay Characteristic Primary/secondary CT Rated phase current</p>
<p>High current #1 I>>> 1200/30A t>>> 0.05s Def.t CT 200/5A In5A</p>	<hr/> <hr/> <hr/>	<p>High phase current Setting group # Primary/secondary current set value Delay Characteristic Primary/secondary CT Rated phase current</p>
<p>Low EF volt. #1 Uo> 20V to> 2.5s Trip Off</p>	<hr/> <hr/> <hr/>	<p>Low EF voltage Setting group # Secondary low EF voltage set value Delay Trip On / Off</p>
<p>High EF volt. #1 Uo>> 60V to>> 0.5s Trip Off</p>	<hr/> <hr/> <hr/>	<p>High EF voltage Setting group # Secondary high EF voltage set value Delay Trip On / Off</p>
<p>Comm. IEC ON Config. Ring Address 1 Meas. value 1.2</p>	<hr/> <hr/> <hr/> <hr/>	<p>Configuration Comm. On/Off Relay address Star/Ring Value of measurand</p>
<p>YMD 2002-05-29 HMS 13:52:36 Password **** Freq. 50Hz</p>	<hr/> <hr/> <hr/> <hr/>	<p>Year - month - date. 24 hour clock Four-digit password Factory default: 1111 Rated power system frequency</p>

RefleX Over Current and Earth Fault Voltage Protection

Menu (setting group #2)

In-service display	(See separate description of the sub-menu)	In-service display Press 'enter' to toggle displays
Trip records	(See separate description of the sub-menu 'Trip Records')	Press 'enter' to display recorded data After selecting a record use 'arrow up' or 'arrow down' to display additional information. Leave monitor by pressing 'Esc'.
Low current #2 I> 160/4A t> 1.5s Def.t CT 200/5A In5A		Low phase current Setting group # Primary/secondary current set value Delay Characteristic Primary/secondary CT Rated phase current
Med. current #2 I>> 800/20A t>> 0.5s Def.t CT 200/5A In5A		Medium phase current Setting group # Primary/secondary current set value Delay Characteristic Primary/secondary CT Rated phase current
High current #2 I>>> 1200/30A t>>> 0.05s Def.t CT 200/5A In5A		High phase current Setting group # Primary/secondary current set value Delay Characteristic Primary/secondary CT Rated phase current
Low EF volt. #2 Uo> 20V to> 2.5s Trip Off		Low EF voltage Setting group # Secondary low EF voltage set value Delay Trip On / Off
High EF volt. #2 Uo>> 60V to>> 0.5s Trip Off		High EF voltage Setting group # Secondary high EF voltage set value Delay Trip On / Off
Comm. IEC ON Config. Star Address 45 Meas. value 1.2		Configuration Comm. On/Off Star/Ring Relay address Value of measurand
YMD 2002-05-29 HMS 13:52:36 Password **** Freq. 50Hz		Year - month - date. 24 hour clock Four-digit password Factory default: 1111 Rated power system frequency

RefleX Over Current and Earth Fault Voltage Protection

In-service displays

By commissioning of the relay the in-service display will show the primary phase currents.

Press 'enter' to switch between the different in-service displays

Chosen in-service display will automatically be default in-service display

In-service display

OC, DEF, Ph-Unb
IL1 124A
IL2 120A
IL3 123A

In service display

Primary current in phase 1

Primary current in phase 2

Primary current in phase 3

OC, EF
Uo 0V

Alternative in-service display

Secondary EF-voltage

RefleX Over Current and Earth Fault Voltage Protection

Trip records

After a relay trip the display showing date and time of the trip automatically appears.

Each trip is automatically assigned a separate serial number.

All displays show recordings subsequent to relay tripping. The last five recordings are always stored.

By using arrow up/arrow down the user may access all relevant information in the displays below.

Only trip records (displays) with active information is stored and/or displayed after a trip.

Trip records

This display is part of the main menu
After selecting a record use 'arrow up' or 'arrow down' to display additional information.
Leave trip records by pressing 'Esc'.

```
Trip 333
2002-12-24
12:13:14.123
Delay 0.05s
```

Header (in this case looking at trip no. 333)
Date of 'trip 333'
Time of 'trip 333'
Delay of 'trip 333'

```
Trip 333
I>  I>>  I>>>*
Uo> Uo>>
```

Trip indication (trip 333)
* indicates type of trip

```
Trip 333
IL1      1400A
IL2      1390A
IL3      1400A
```

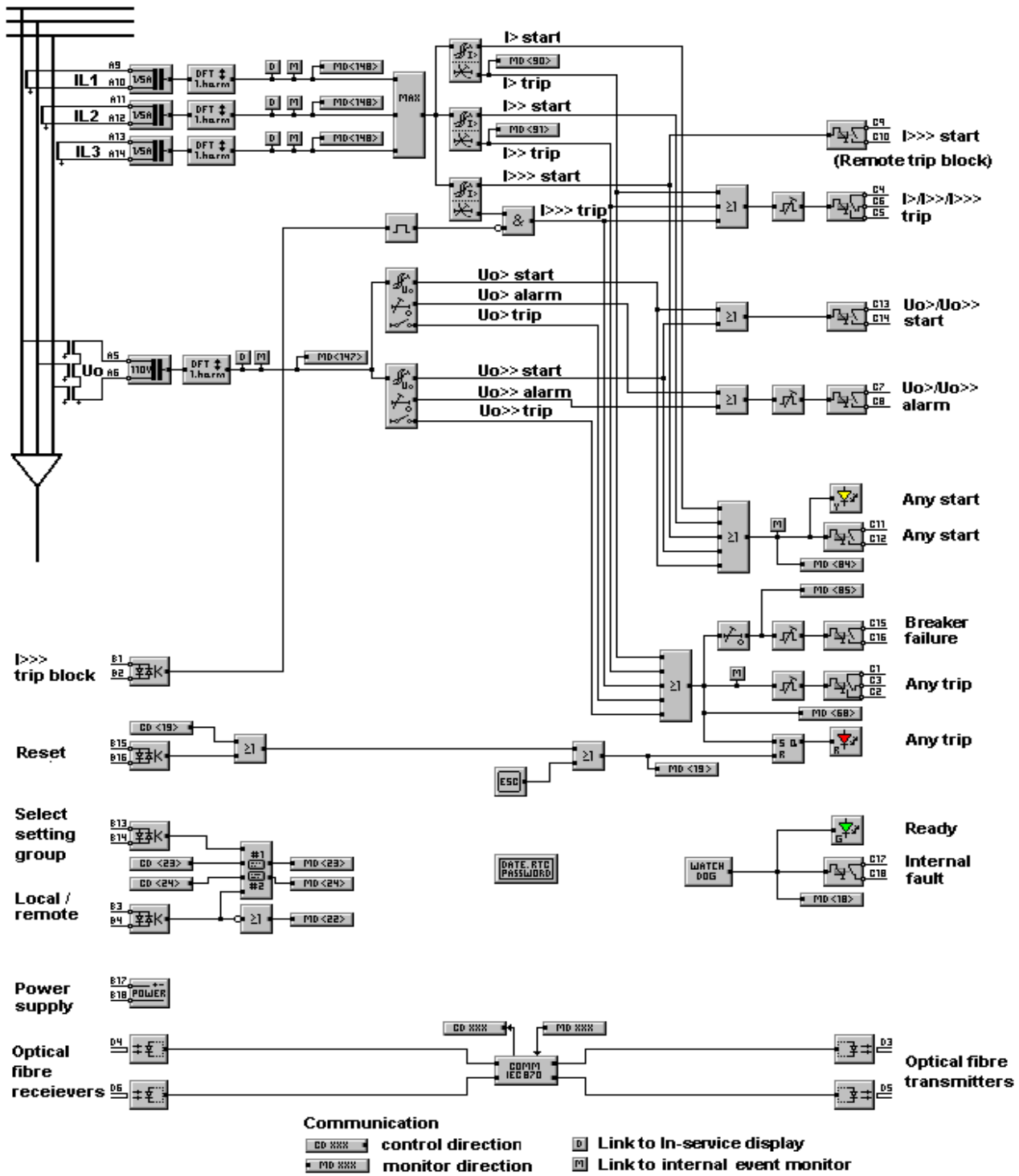
Trip 333
Primary phase current
Primary phase current
Primary phase current

```
Trip 333
Uo              0V
```

Earth fault (trip 333)
EF-voltage

Reflex Over Current and Earth Fault Voltage Protection

Logic diagram



RefleX Over Current and Earth Fault Voltage Protection

Technical data

Overcurrent protection

Measurement		Three phases
Current settings 1A rated input.	I>, I>>,I>>>	0.200 - 75.0 A and block
Current settings 5A rated input.	I>, I>>,I>>>	1.00 - 375 A and block
Time characteristics		NI, VI, EI, LTI and fasttid
Time multipliers for inverse time characteristics	k>,k>>,k>>>	0.10 - 1.20 and block
Definite time settings	t>,t>>,t>>>	0.01 - 9.99 s and block
Resetting ratio		>0.97
Harmonic measurement		1st harmonic

Earth fault protection (non-directional)

Single measurement (ground-fault voltage)		
Voltage settings	Uo>, Uo>>	1.00 - 170 V
Definite time settings	to>, to>>	0.00 - 9.99 s
Resetting ratio		>0.97
Harmonic measurement		1st harmonic

Breaker failure protection

Trip transfer delay (fixed value)		0.2 s
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Selection between two setting groups

Setting group #1 is active when 'low' input voltage is applied to Setting group #1 can also be selected by signal from comm.		Input B13-B14 <CD 23>
Setting group #2 is active when 'high' input voltage is applied to Setting group #2 can also be selected by signal from comm.		Input B13-B14 <CD 24>
Setting group is selected by communication when 'high' input voltage is applied to		Input B3-B4

System data

Factory default password		1111
Pulse-extension circuit on all trip outputs		0.2 s pulse
Pulse-extension circuit at blocking inputs		50 ms pulse
Rated frequency		50 / 60 Hz

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Technical data

Communication (IEC 60 870-5-103 protocol)

Optical fibre transmitters
Optical fibre receivers

Outputs D3, D5
Inputs D4, D6

	Type	Info.no	ASDU	Gi
Selection of standard information numbers in monitor direction (MDxxx)				
Protection inactive (internal fault)	160	18	1	x
LED-reset	160	19	1	-
Local parametersettings	160	22	1	x
Characteristic 1 (selected setting group)	160	23	1	x
Characteristic 2 (selected setting group)	160	24	1	x
General trip	160	68	2	-
General start	160	84	2	x
Breaker failure	160	85	2	-
Trip I>	160	90	2	-
Trip I>>	160	91	2	-
Measurands IN, VEN	160	147	3,1	-
Measurands IL1,2,3	160	148	9	-

Selection of standard information numbers in control direction (CDxxx)

Initiation of general interrogation	160	0	7	
Time Synchronization	160	0	6	
* LED-reset	160	19	20	
* Select setting group 1	160	23	20	
* Select setting group 2	160	24	20	

* Only available when remote mode is selected