RTD and mA Input / Output Modules

REL52811 / REL52812 (VIO 12AA/AB)
REL52813 / REL52814 (VIO 12AC/AD)

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Schneider Electric

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1 Important information

1.1 Hazard categories and special symbols

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury or equipment damage.

Protective grounding

The user is responsible for compliance with all the existing international and national electrical codes concerning protective grounding of any device.

Please Note

Use the device's password protection feature to prevent untrained persons from interacting with this device.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Electrical equipment should be installed, operated, serviced, and maintained only by trained and qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

Failure to follow this instruction will result in death or serious injury.

1.2 Legal notice

Copyright

Disclaimer

No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this document. This document is not intended as an instruction manual for untrained persons. This document gives instructions on device installation, commissioning and operation. However, the manual cannot cover all conceivable circumstances or include detailed information on all topics. In the event of questions or specific problems, do not take any action without proper authorization. Contact Schneider Electric and request the necessary information.

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1.3 EU directive compliance

EMC compliance

CE 2014/30/EU

Compliance with the European Commission's EMC Directive. Product Specific Standard was used to establish conformity:

- EN 60255-26 2013

Product safety

CE 2014/35/EU

Compliance with the European Commission's Low Voltage Directive. Product Specific Safety Standard was used to establish conformity:

- EN 60255-27 2014

2 Features

- Measures as many as 12 RTD resistances
- Measuring accuracy ±0,3Ω
- Supported RTD types:
  - Pt100
  - Ni100
  - Ni120
  - Cu10
- Communications
  - REL52811 (VIO 12AA):
    - ST-type glass fiber (only TX)
    - RS-232
  - REL52812 (VIO 12AB):
    - RS-485
  - REL52813 (VIO 12AC) & REL52814 (VIO 12AD):
    - ST-type glass fiber (TX and RX)
    - RS-232
    - RS-485
- Supported External I/O protocols: *
  - RTD input (special protocol designed for VIO 12A)
  - Modbus RTU
- Steel plate case
- Assembly options:
  - 35 mm DIN-RAIL
  - Wall-mounted
  - Easergy P3 back panel
- Power supply:
  - REL52811 (VIO 12AA) & REL52812 (VIO 12AB): 24–230 Vac/dc, 50/60 Hz
  - REL52813 (VIO 12AC): 24 Vdc
  - REL52814 (VIO 12AD): 48–230 Vac/dc, 50/60 Hz
- Operating temperature: 0°C – +55°C

*** In Easergy P3 relays, the Modbus RTU and RTD input communications to VIO 12A (or other external I/O modules) are communally named External I/O protocols.**

3 Layout

3.1 REL52811 (VIO 12AA) RTD input module

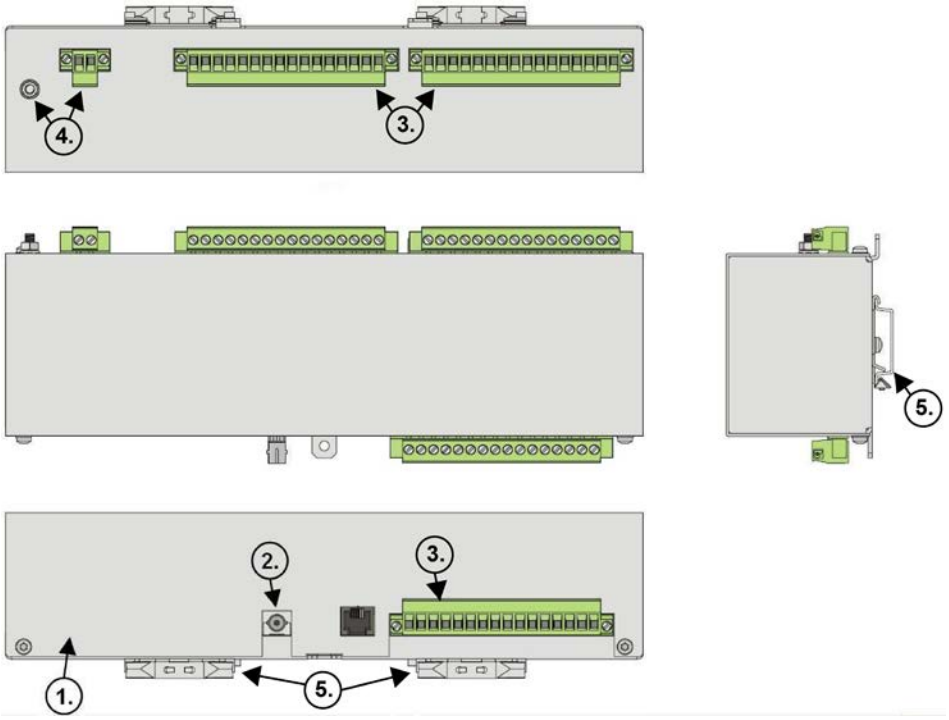


Figure 3-1 REL52811 (VIO 12AA) RTD input module layout

1. Metal enclosure
2. Glass fiber Tx communication
3. RTD inputs (12 channels, 3-wire connection + shield / channel)
4. Power connector and PE connection
5. DIN Rail mounting

3.2 REL52812 (VIO 12AB) RTD input module

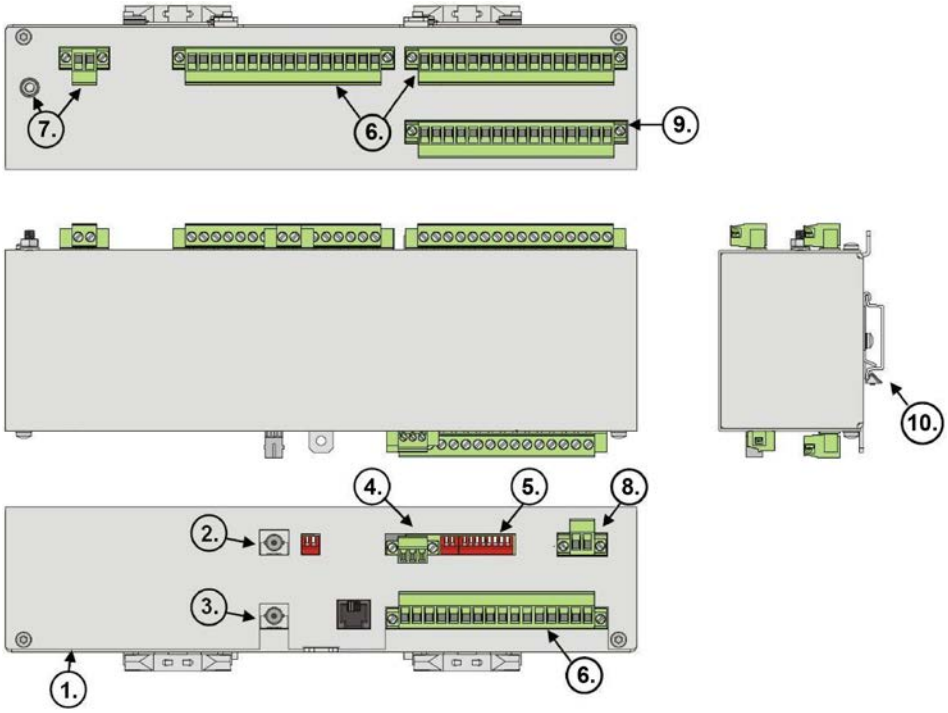


Figure 3-2 REL52812 (VIO 12AB) RTD input module layout

1. Metal enclosure
2. RS-485 communication (including Termination switch)
3. Address DIP Switch
4. RTD inputs (12 channels, 3-wire connection + shield / channel)
5. Power connector and PE connection
6. DIN Rail mounting

3.3 REL52813 and REL52814 (VIO 12AC/AD) RTD input and mA input/output modules

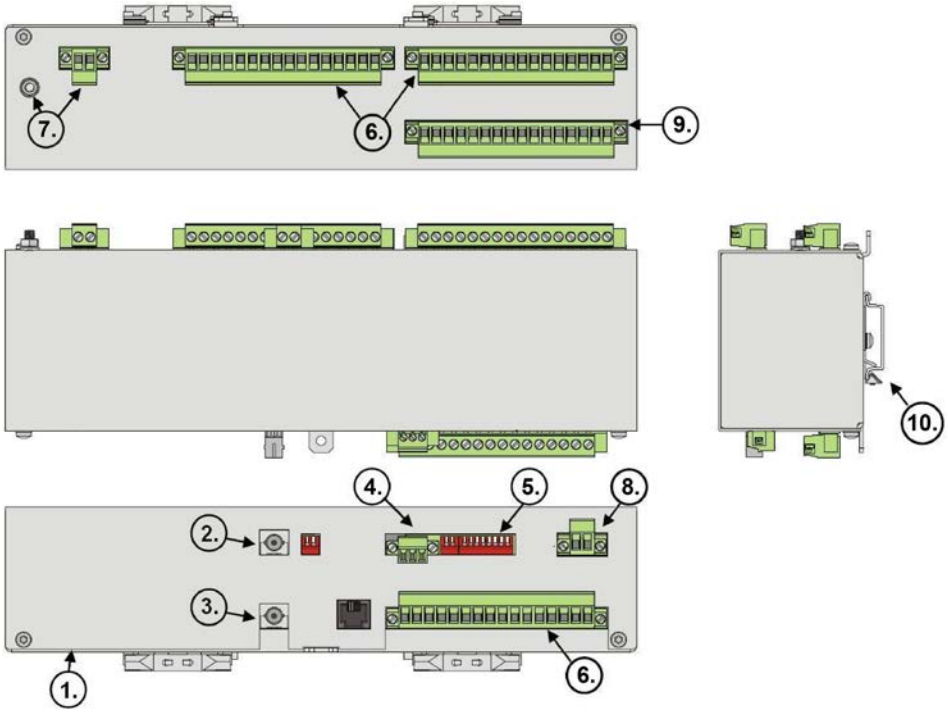


Figure 3-3 REL52813 / REL52814 (VIO 12AC/AD) RTD input module layout

1. Metal enclosure
2. Glass fiber Rx communication
3. Glass fiber Tx communication
4. RS-485 communication (including termination switch)
5. Address DIP switch
6. RTD inputs (12 channels, 3-wire connection + shield / channel)
7. Power connector and PE connection
8. PTC input (2-wire connection)
9. Four mA inputs / four mA outputs (2-wire connection /channel)
10. DIN Rail mounting

4 Operation

The RTD modules support two different External I/O protocols:

- RTD input (Figure 3-1)
- Modbus RTU (Figure 3-2).

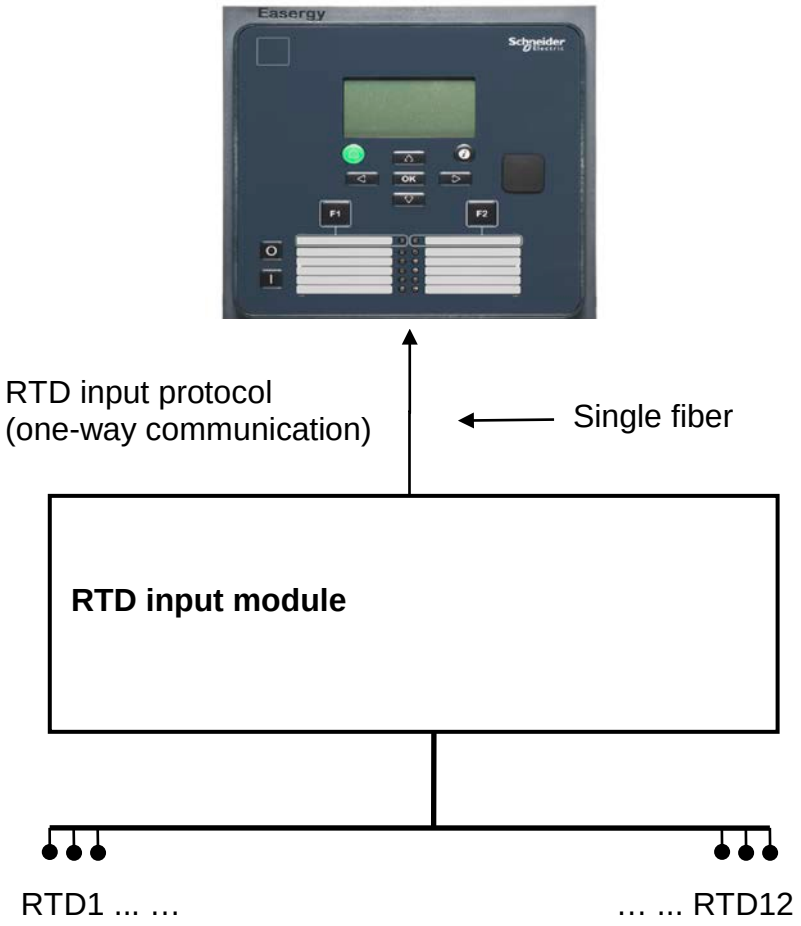


Figure 4-1 RTD input protocol operation principle

Function

Measure the resistances of RTD sensors and send results via RTD input protocol.

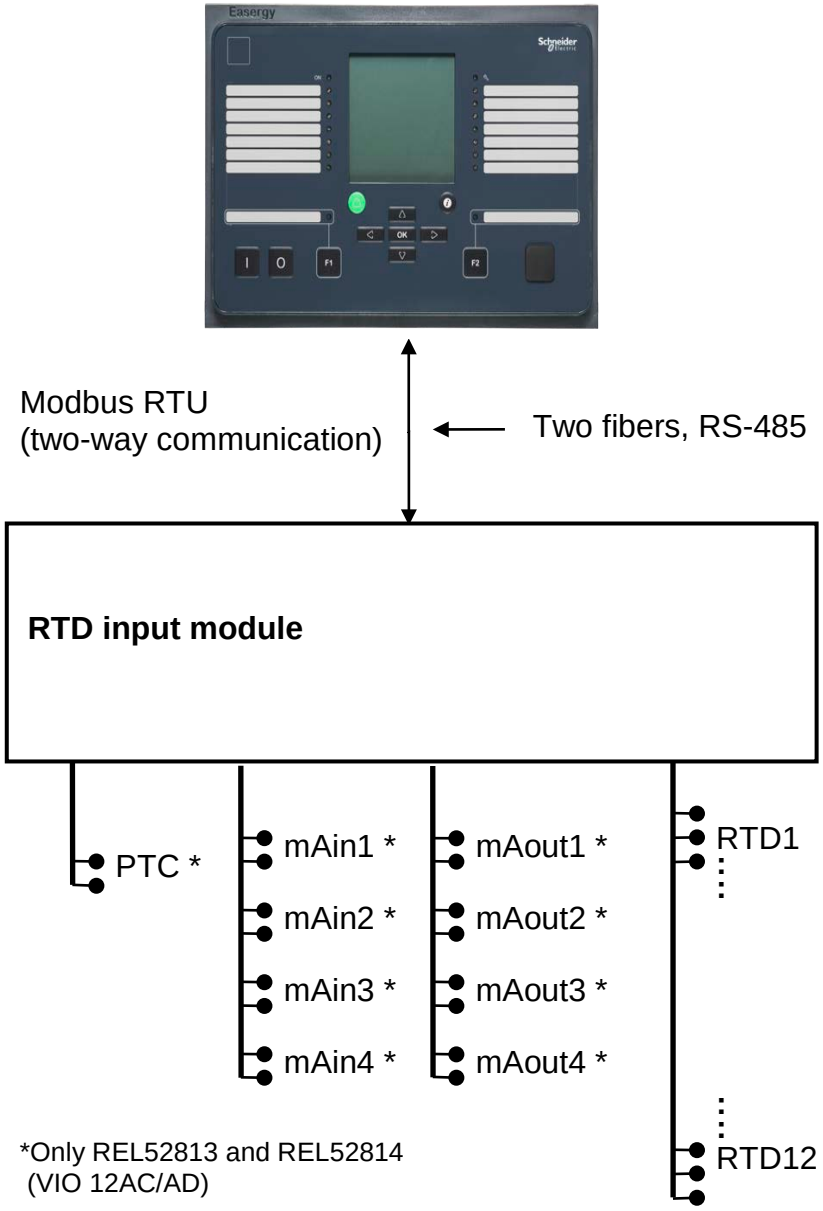


Figure 4-2 Modbus RTU operation principle

Function

- Measure the resistances of RTD sensors and send results via Modbus RTU.
- Measure analog inputs (mA and PTC) and send results via Modbus RTU. (Only REL52813 and REL52814 / VIO 12AC/AD).
- Provide analog outputs (mA). (Only REL52813 and REL52814 / VIO 12AC/AD)

Table 4-1 shows the resistances of supported RTDs in various temperatures.

Table 4-1*Supported RTDs*

Temperature (°C)	RTD type			
	Pt100	**Ni100**	**Ni120**	**Cu10**
300	212,02	-	439,44	-
200	175,84	223,20	303,46	16,78
100	138,50	161,80	200,64	12,90
90	134,70	154,90	191,64	12,51
80	130,89	148,30	182,84	12,12
70	127,07	141,70	174,25	11,74
60	123,24	135,30	165,90	11,35
50	119,40	129,10	157,74	10,97
40	115,54	123,00	149,79	10,58
30	111,67	117,10	142,06	10,19
20	107,79	111,20	134,52	9,81
10	103,90	105,60	127,17	9,42
0	100,00	100,00	120,00	9,04
-10	96,09	94,60	113,00	8,65
-20	92,16	89,30	106,15	8,26
-30	88,22	84,10	99,41	7,88
-40	84,27	79,10	92,76	7,49
-50	80,31	-	86,17	7,10

5 Application

This chapter describes the different ways to use the RTD modules and accessories with Easergy P3 relays.

Table 5-1 Communication interfaces from the Easergy P3 relay to VIO 12xx

Product	Relay interface	Cable	Communications adapter	VIO 12 type	Note
P3Ux	RS232	REL52825 (VX082)	REL52816 (VSE001 GG)	VIO 12AA VIO 12AC VIO 12AD (fiber interface)	Only Ethernet available, use optical cable with ST connector, 62.5 /125µm between VSE 001 and VIO
		REL52826 (VX083)	REL52820 (VSE002)	VIO 12AB VIO 12AC VIO 12AD (RS-485 interface)	Ethernet and serial protocols and IRIG-B available, use twisted pair between VSE002 and VIO
P3x3x	Fiber GG (slots 6 and 9)	Fiber optical with ST connector, 62.5 /125µm	-	VIO 12AA VIO 12 AC VIO 12 AD (fiber interface)	Fiber connected to the P3 directly
	RS-232 (slot 6 or 9)	REL52823 (VX067)	REL52816 (VSE001-GG)	VIO 12AA VIO 12 AC VIO 12 AD (fiber interface)	Use optical cable with ST connector, 62.5 /125µm between VSE 001 and VIO
			REL52820 (VSE002)	VIO 12 AB VIO 12 AC VIO 12 AD (RS-485)	Use twisted pair between VSE001 and VIO

Table 5-2 shows the accessories that are compatible with Easergy P3 relays.

Table 5-2 Accessories for Easergy P3 relays

Module / cable	Code	P3 Standard	P3 Advanced
Fiber optic module	REL52816 (VSE001-GGSE)	X	X
Fiber optic module	REL52819 (VSE001-PPSE)	X	X
RS-485 module	REL52820 (VSE002)	X	X
Cable	REL52825 (VX082)	X	

5.1 REL52811 (VIO 12AA)

Glass fiber application with Easergy P3 Standard

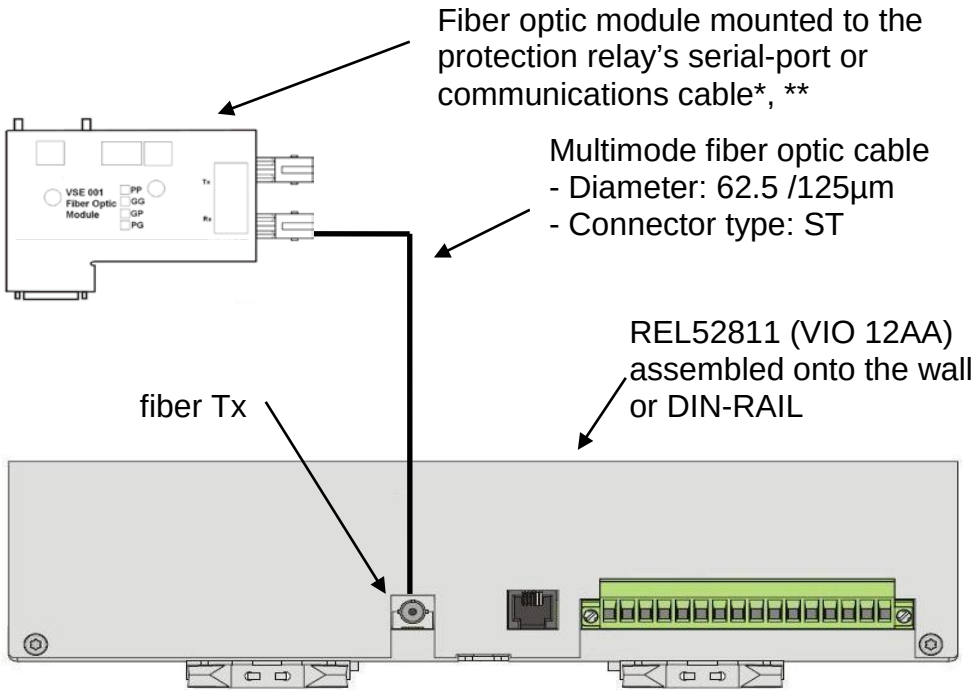


Figure 5-1 Glass fiber application, REL52811 (VIO12AA)

*** See Table 5-1 for compatible Easergy P3 relays and fiber optic modules.**
**** For detailed mounting instructions, see the user manual of the particular fiber optic module.**

Communication over glass fiber:

External I/O (RTD input): REL52811 (VIO 12AA) transmits RTD measurements to the relay.

5.2 REL52812 (VIO 12AB)

RS-485 application

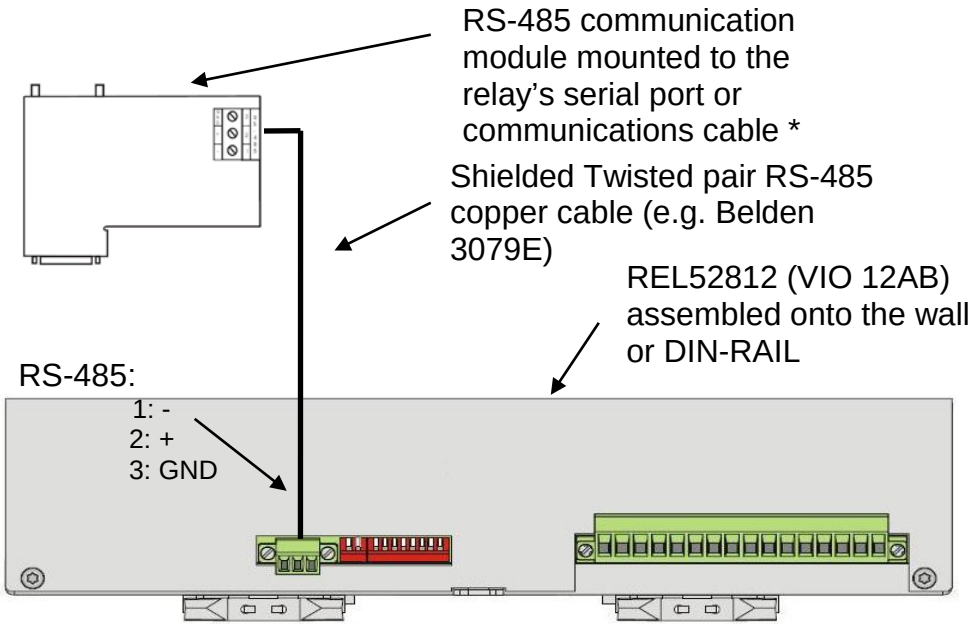


Figure 5-2 RS-485 application

*** For detailed connecting instructions, see the user manual of the particular RS-485 communication module.**

Communication over RS-485

- External I/O (Modbus RTU): the relay reads RTD measurements from REL52812.
- External I/O (RTD input): REL52812 (VIO 12AB) transmits RTD measurements to the relay.

5.3 REL52813 and REL52814 (VIO 12AC/AD)

Glass fiber application with Easergy P3 protection relays

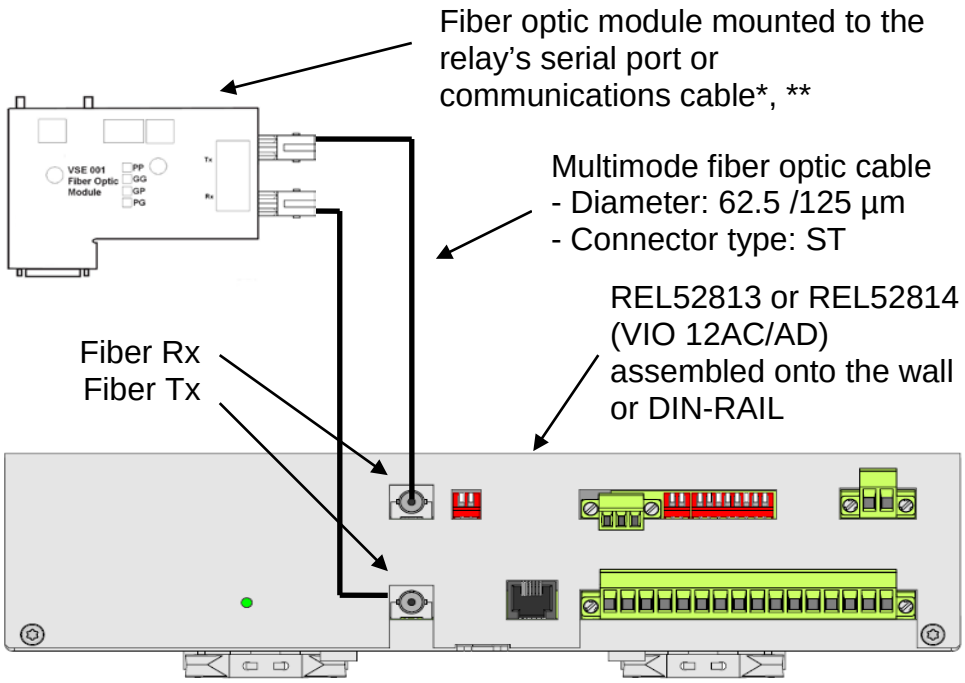


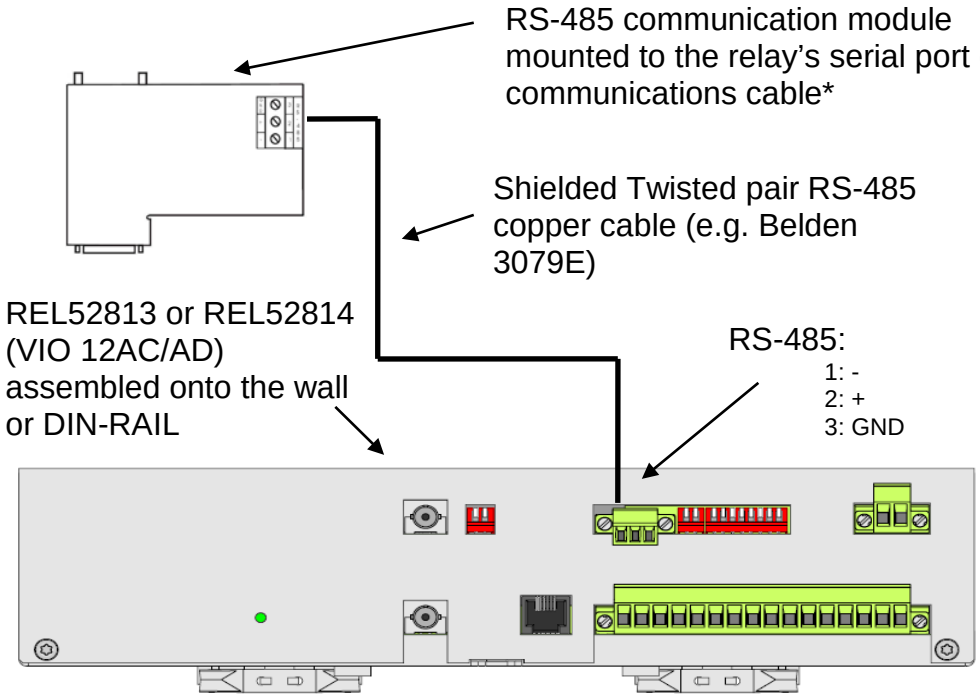
Figure 5-3 Glass fiber application

*** See Table 5-1 for compatible relays and fiber optic modules.**
**** For detailed mounting instructions, see the user manual of the particular fiber optic module.**

Communication over glass fiber

- External I/O (Modbus RTU): the relay reads RTD measurements from REL52813 / REL52814 (VIO 12AC/AD).
- External I/O (RTD input): REL52813 / REL52814 (VIO 12AC/AD) transmits RTD measurements to the relay.

RS-485 application



* **For detailed connecting instructions, see the user manual of the particular RS-485 communication module.**

Figure 5-4 RS-485 application

Communication over RS-485

- External I/O (Modbus RTU): the relay reads RTD measurements from REL52813 / REL52814 (VIO 12AC/AD).
- External I/O (RTD input): REL52813 / REL52814 (VIO 12AC/AD) transmits RTD measurements to the relay.

5.4 Communication settings

DIP switches functionality

The purpose of the DIP switches on the RTD input modules is to allow the user to set the proper communication settings required by the application.

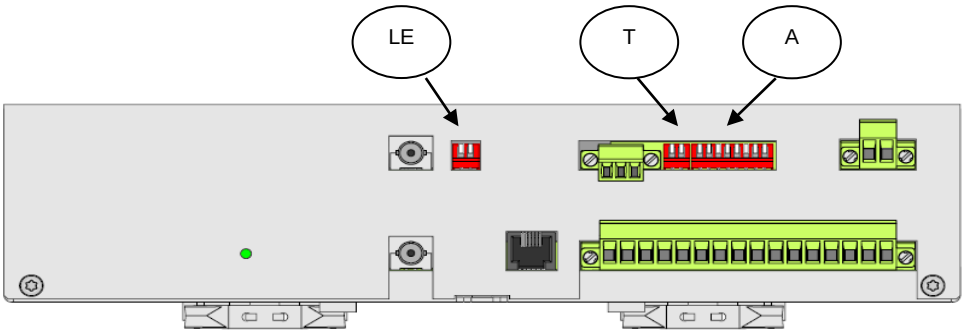


Figure 5-5 DIP switches

Table 5-3 DIP Switches in RTD input modules

	RTD input module		
Switch	**REL52811 (VIO12AA)**	**REL52812 (VIO 12AB)**	**REL52813/14 (VIO 12AC/AD)**
LE*			X
T		X	X
A		X	X

***) LE switch is divided into two parts, LE:1 and LE:2**

****) "X" stands for: available in the RTD input module.**

*****) The switch position is ON when the switch is turned DOWNWARDS.**

LE. Light - Echo Switch

LE:1. Light Switch

Position	Function : RTD module's optical fiber communication setup
ON	Light is on when there is no data being sent.
OFF	Light is off when there is no data being sent.

LE:2. Echo Switch

Position	Function: RTD module's optical fiber communication setup Application: Multi-slave chain / Ring topology setup
ON	The RTD module echoes the data received to the next device in the chain.
OFF	The RTD module does not echo to the next device in the chain.

T. Term. Switch (Termination Switch)

The termination switch is related only to the RS-485 interface, both switches must be ON or OFF at the same time.

Position	Function : Selection of the termination resistor of 120 ohms for the RS-485 interface.
ON	Resistor is selected
OFF	Resistor is not selected

NOTICE

The switch must be either ON or OFF at BOTH ENDS of thecommunication line.

Address Switch

The address switch is meant for selecting the slave address for the RTD module.

Position	Function : Assignment of slave address for the RTD module.
ON	Selected single address bit is set to 1.
OFF	Selected single address bit is set to 0.

The address switch has a total of 8 single switches. Their combination provides the user with an address space of 256 addresses (0-255). However, it is very important to notice that Modbus protocol's requirements restrict the use of addresses 0 and others larger than 247 (decimal base).

Example:
The address switch represents the RTD module's address in its binary notation.

	Address Switch							
OFF		■		■	■	■	■	■
ON	■		■					
	1	2	3	4	5	6	7	8

5 (decimal) = (Switch 8→1) 00000101 (binary)

NOTICE

RTD input protocol

By setting the RTD module's address to '0', it is possible to use the RTD input protocol to send RTD measurements to the relay.

When implementing the connection between the RTD module and the relay with RS-485 via the RTD input protocol, no other modules can be connected to the RS-485 bus.

NOTICE

mA outputs and inputs cannot be used via RTD input protocol.

6 Connections

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Only qualified personnel should operate this equipment. Such work should be performed only after reading this entire set of instructions and checking the technical characteristics of the device.
- Before connecting the devices, disconnect the supply voltage to the unit.
- Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow these instructions will result in death or serious injury.

6.1 RTDs

RTD connections are equal in all versions of the RTD module. Figure 5-1 shows the proper way to connect RTDs.

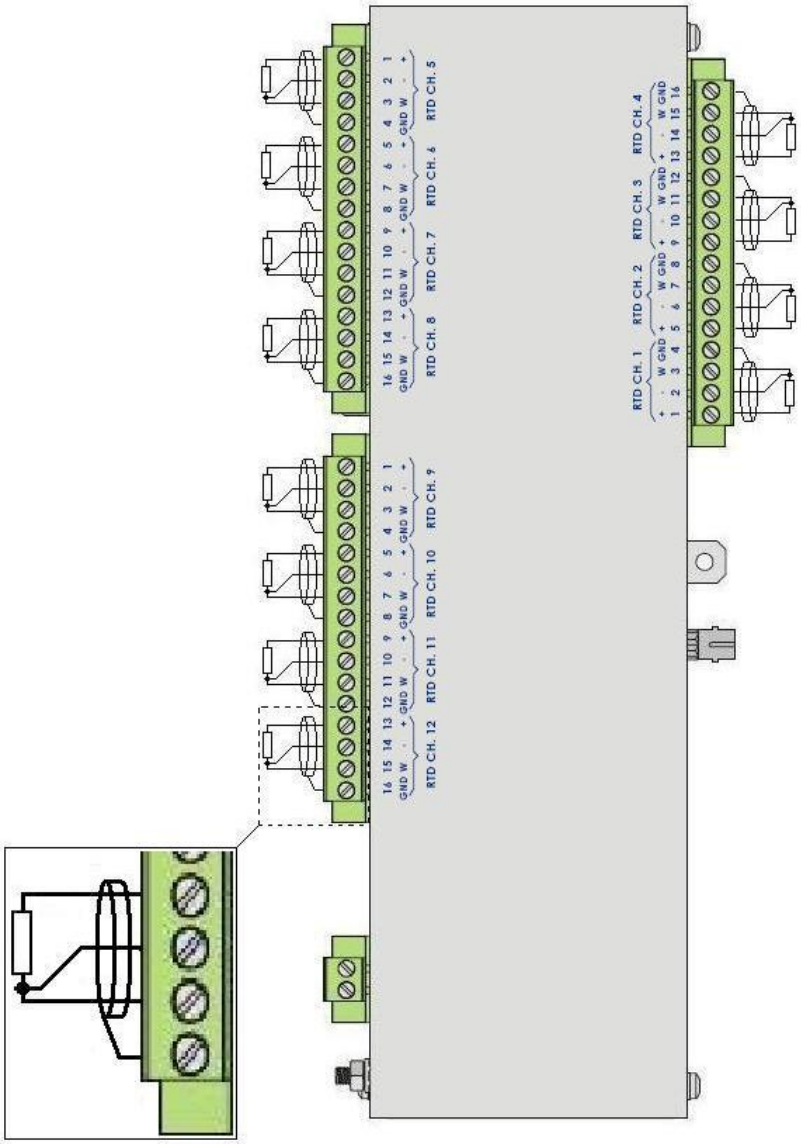


Figure 6-1 Connections of RTDs

Cable type:

Shielded non-paired control and instrumentation cable (for example Belden 8771)

6.2 mA inputs / outputs connections

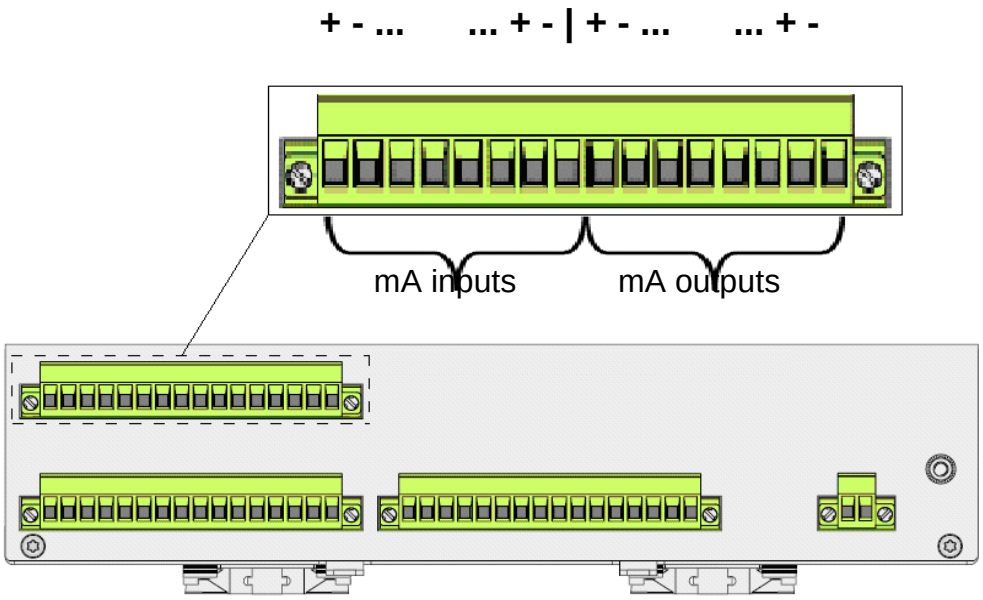


Figure 6-2 REL52813 / REL52814 (VIO 12AC/AD) mA input and mA output connection cables

Cable type

Shielded non-paired control and instrumentation cable (for example Belden 8771).

PTC connections

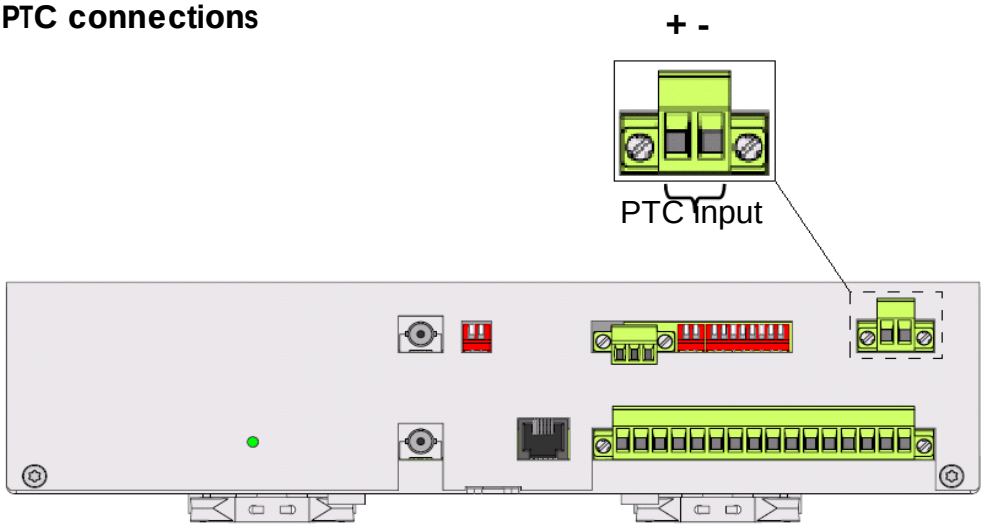


Figure 6-3 REL52813 / REL52814 (VIO 12AC/AD) PTC connection cables

Cable type

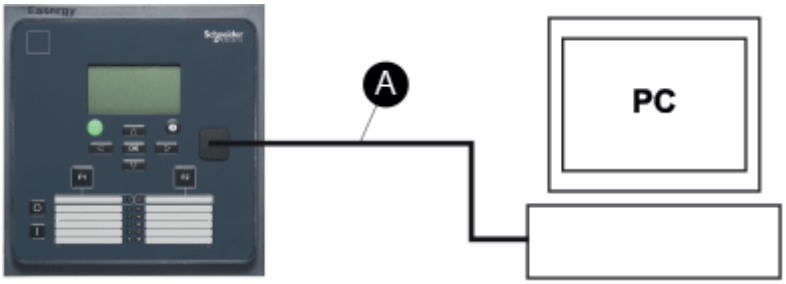
Shielded non-paired control and instrumentation cable (for example Belden 8771).

7 Configurations

This chapter describes the configurations required to correctly set up the relay and the RTD module using Easergy Pro.

7.1 Connecting the relay to Easergy Pro

1. Connect the USB cable (A) between the PC running Easergy Pro and the local port of the relay.
2. On the Easergy Pro toolbar, click the **ON** connection button. The **Login** pop-up window opens.
3. Select the right USB serial port and connection speed.
4. Click **Connect**. A new window showing the relay information opens.
5. Click the desired operating level: **User**, **Operator** or **Configurator**. The Easergy Pro main view opens.



A. USB cable REL52822 (VX052-3)

Figure 7-1 Connecting cable REL52822 to the relay's front port

For more information about communication between the relay and PC, see the relay's user manual of particular and Easergy Pro user manual.

7.2 Relay settings

All versions of the RTD module include support for both of the External I/O protocols (RTD input* and Modbus RTU). Settings to the relay must be done according to the protocol used.

*** Special protocol designed for REL52811 (VIO 12AA).**

7.2.1 Protocol configuration

In the **Protocol Configuration** setting view in Easergy Pro, select **External I/O** as the remote port protocol to one of the available

serial ports. The same port must be equipped with suitable hardware interface module to receive data from the module.

7.2.2 External I/O configuration

In the **External I/O Configuration** setting view, select the protocol to be used according to the connection method of the RTD module.

Table 7-1 External I/O Configuration

External I/O configuration	
External I/O Device Type	Other…
External I/O Protocol	ModBus
External I/O bit rate	9600 bps
Parity	Even

RTD module connection method: One-fiber cable

Table 7-2 External analog input settings

Parameter	**Value(s)**
External I/O Device Type	REL52811
External I/O Protocol *	RTD input
External I/O bit rate *	9600
Parity *	Even

NOTICE

*** After changing this parameter, the relay needs to be rebooted.**

RTD module connection method: RS-232, RS-485 or two-fiber cables

Table 7-3 External analog input settings

Parameter	**Value(s)**
External I/O Device Type **	REL52811, REL52812, REL52813
External I/O Protocol *	Modbus
External I/O bit rate *	9600
Parity *	Even

NOTICE

*** After changing this parameter the relay needs to be rebooted.**

RTD Inputs - Quick Setup

In the **RTD Inputs - Quick Setup** setting view, you can easily define the relay's most common RTD settings.

Table 7-4 RTD Inputs - Quick Setup parameters

Parameter	Value(s)
AI Enabled	On / Off
RTD Ch	Not editable
RTD Sensor Type	Other.., Pt100, Ni100, Ni120, Cu10
RTD Sensor Function	Off, WindingG, BearingG, Ambient, Other..
Alarm Limit *	User defined
Trip Limit *	User defined

*** Unit: Celsius**

7.2.3 External analog inputs

Settings

In the **External Analog Inputs** setting view, set the values for the parameters according to Table 7-5.

Table 7-5 External analog input settings

AI Enabled	AI Unit	AI Slave Address	AI Modbus Address	AI Register Type	AI Signed
On	C	1-247	See Table 4.2.2-3	HoldingR	Off

NOTICE

When External I/O-protocol selection is RTD input, the AI Slave Address, AI Modbus Address, AI Register Type and AI Signed can be left to their default values.

Scalings

Also in the external analog inputs menu, give proper values to parameters "AI Offset", "x1", "x2", "y1" and "y2". See Table 7-6 for proper values of the particular RTD.

Table 7-6 Scaling values for each supported RTD type

	AI Offset	X1	Y1	X2	Y2
Pt100	0	10000	0	13850	100
Ni100	0	10000	0	16180	100
Ni120	0	12000	0	20064	100
Cu10	0	904	0	1290	100

Registers

Table 7-7 RTD module external I/O registers

	Modbus register	Properties
RTD1's resistance	301	Read
RTD2's resistance	302	Read
RTD3's resistance	303	Read
RTD4's resistance	304	Read
RTD5's resistance	305	Read
RTD6's resistance	306	Read
RTD7's resistance	307	Read
RTD8's resistance	308	Read
RTD9's resistance	309	Read
RTD10's resistance	310	Read
RTD11's resistance	311	Read
RTD12's resistance	312	Read
mA-input 1 *	313	Read
mA-input 2 *	314	Read
mA-input 3 *	315	Read
mA-input 4 *	316	Read
PTC-resistance *	317	Read
mA-output 1 *	318	Read / Write
mA-output 2 *	319	Read / Write
mA-output 3 *	320	Read / Write
mA-output 4 *	321	Read / Write

*** Only in REL52813 and REL52814 (VIO 12AC/AD)**

7.2.4 External analog outputs

Settings

See Table 7-8 for explanations of the values that can be assigned to the parameters in the **External Analog Output** setting view.

Table 7-8 External Analog Outputs parameters

Parameter	Value	Explanation	Note
AO Enabled	ON	Analog output enabled	-
	OFF	Analog output not enabled	-
mA Output	Typical: 0-20	Analog output current	Unit: mA Depends on the values set for the parameters mA Min, mA Max, Linked Val. Min/Max and Modbus Min/Max parameters.
mA Min	See note	Minimum output current	Unit : mA Value: user defined. Depends on the values set for the parameters: Linked Val. Min and Min Modbus. Value set is related to ModBus Min by a ratio of 1:1000. Typical Value : 0 mA
mA Max	See note	Maximum output current	Unit: mA Value: user defined. Depends on the values set for the parameters: Linked Val. Max and Max Modbus. Value set is related to ModBus Max by a ratio of 1:1000. Typical Value : 20 mA or 25 mA (maximum)

Parameter	Value	Explanation	Note
AO Link	See note	Relay's or RTD module's analog input measurement.	This parameter directly linked to the mA output parameter.
Linked Val. Min	See note	AO Links Minimum Value	Value: User defined Allows scaling of the mA Output parameter
Linked Val. Max	See note	AO Links maximum value	Value: User defined Allows scaling of the mA Output parameter.
Ao Slave address	1-247	RTD module's modbus slave address	Value is restricted according to section 4.4 – Address Switch

Ao Modbus address	See note		Although there are 16 locations available, only 4 can be assigned (REL52814). Addresses are by default numbered from 1 to 16. However the address value must be set according the values in table 6.2.4-1. Meaning that: mA Output ←→ Ao ModBus A. ←→ 318 ←→ 319 ←→ 320 ←→ 321
Ao Register type	HoldingR	Holding register	Only available option.
ModBus Min	See note	Minimum value which is sent to the RTD module's ModBus register.	Typical value mA Min = 0 ModBus Min = 0
Modbus Max		Maximum value which is sent to the RTD module's ModBus	Typical value: mA Max = 20 → ModBus Max = 20000
AO Counter	0 …	Error counter for AO	It increments itself if either Ao Slave Address or Ao Register Address are not set correctly

7.2.5 Troubleshooting

If an RTD sensor is disconnected, Easergy Pro displays a value of -200ºC in the External Analog Inputs menus respective sensor channel.
If an RTD sensor is short circuited, Easergy Pro displays a value of -250ºC in the External Analog Inputs menus respective sensor channel.
In case of power failure or connection loss to the RTD module, when using RTD input protocol:

- Each sensor channel displays a value of -250ºC
- Timeout counter increases in the Protocol menu*

In case of power failure or connection loss to the RTD module, when using the Modbus RTU protocol:

- Each sensor channel value freezes
- AI error counter increases in the External analog inputs menu
- Timeout counter increases in the Protocol menu*

***If the application uses Remote- or Extension-communication port, an alarm can be generated using relay logic, for for example inverted Remote.comm signal can be used to drive a LED.**

7.3 REL52811 (VIO 12AA) settings

7.3.1 RTD input protocol

If the module is connected to the relay with the fiber optic cable, then the RTD input protocol is automatically used and no additional settings are needed for REL52811 (VIO 12AA).

7.3.2 Modbus RTU protocol

For the RTD module to use the Modbus RTU protocol in communication with the relay, the RDT module needs to be connected to the relay with an RS-232 cable. By using the RS-232 cable, the module’s address is automatically fixed to 1, baud rate to 9600 b/s and the parity is Even.

7.4 REL52812 (VIO 12AB) settings

7.4.1 Modbus RTU protocol

The REL52812 (VIO 12AB) module's address is set with DIP switches. The available address range is 1–247. If multiple REL52812 (VIO 12AB) modules (or other External I/O modules) are connected to the same RS-485 bus, then each module has to have a unique address. The termination must be on in the last module of the RS-485 bus structure. The baud rate is fixed to 9600 b/s, and the parity is Even.

7.4.2 RTD input protocol

By setting the REL52812 (VIO 12AB) module’s address to ‘0’, it is possible to send RTD measurements to the relay via the RTD input protocol.

NOTICE

When implementing the connection between REL52812 and a relay with RS-485 via the RTD input protocol, no other modules can be connected to the RS-485 bus.

7.5 REL52813 and REL52814 (VIO 12AC/AD) settings

7.5.1 Modbus RTU protocol

The REL52813 / REL52814 (VIO 12AC/AD) module's address is set with DIP switches. The available address range is 1–247. If RS-485 interface is used and there are multiple REL52813 / REL52814 modules (or other external I/O modules) connected to the same RS-485 bus, then each module has to have a unique address. The termination must be on in the last module of the RS-485 bus structure. The baud rate is fixed to 9600 b/s, and the parity is Even.

7.5.2 RTD input protocol

By setting the REL52813 / REL52814 (VIO 12AC/AD) module’s address to ‘0’ it is possible to send RTD measurements to the relay via RTD input protocol.

NOTICE

When implementing the connection between REL52813 / REL52814 and Easergy P3 relay with RS-485 via RTD input protocol it needs to be taken into consideration that no other modules can be connected to the RS-485 bus. mA outputs and inputs cannot be used via RTD input protocol.

8 Technical data

8.1 General

8.1.1 RTD inputs

	REL52811 (VIO 1212AA)	REL52812 (VIO 12AB)	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
RTD inputs	12			
RTD types	Pt100, Ni100, Ni120, Cu10			
Measuring range	1 – 400 Ω			
Measuring accuracy	±0,3 Ω			
Measuring resolution	0,10 Ω			
Measuring time	1s / all channels (1s mean value)			
RTD open-circuit detection	>450 Ω			
RTD short-circuit detection	<1 Ω			

8.1.2 mA inputs

	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
mA inputs	4	
Input range	0–25 mA	
Input accuracy	±1 %	
Input resolution	6 μA (12 bits)	
Input impedance	100 Ω	

8.1.3 mA outputs

	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
mA outputs	4	
Output range	0 – 25 mA	
Output accuracy	±1%	
Output resolution	6 μA (12-bits)	
Galvanic isolation	1000 V	
Max. Load / output	750 Ω	

8.1.4 PTC input

	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
PTC inputs	1	
Measuring accuracy	±10 % (< 10 kΩ)	

8.2 Connections

8.2.1 Measuring circuitry

	All RTD modules
Cable type	Shielded non-paired control and instrumentation cable (e.g. Belden 8771)
RTD measuring current	~1 mA
Maximum wire resistance	50 Ω per lead (corresponds to 2000 m at 0,75 mm^2 copper wire)
Terminal block **Maximum wire dimensions**	Phoenix MSTB or equivalent 2,5 mm^2 (13-14 AWG)

8.2.2 Auxiliary voltage

	REL52811 (VIO 12AA)	REL52812 (VIO 12AB)	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
Rated voltage	24–230 Vac/dc		24 Vdc	48–230 Vac/dc
Power consumption	< 1 W (normal conditions)			
Terminal block **Maximum wire dimensions**	Phoenix MSTB or equivalent 2,5 mm^2 (13–14 AWG)			
Power Led	In normal conditions, the LED is continuously lit. If the LED is blinking, contact Schneider Electric support.			

8.2.3 Glass fiber connection

	REL52811 (VIO 12AA)	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
Fiber type	Multimode fiber optic cable Ø 62,5 /125 µm		
Connector type	ST		
Maximum fiber length	2000 m		

8.2.4 RS-232 connection

Cable type	REL52811 (VIO 12AA)	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
Easergy P3 Standard	Standard REL52827 (VX084)		
Easergy P3 Advanced	Advanced REL52824 (VX072)		

8.2.5 RS-485 connection

	REL52812 (VIO 12AB)	REL52813 (VIO 12AC)	REL52814 (VIO 12AD)
Cable type	Shielded twisted pair RS-485 copper cable (for example Belden 3079E)		
Terminal block	Phoenix MC or equivalent		
Maximum cable length	1200 m		

8.3 Tests and environmental conditions

8.3.1 Disturbance tests

Emission (IEC / EN 61000-6-4) - Conducted (EN 55011 / CISPR 11) - Emitted (EN 55011 / CISPR 11)	 0.15 - 30 MHz 30 - 1 000 MHz
Immunity (IEC / EN 61000-6-2)	
- Static discharge (ESD)	EN 61000-4-2, class III
	6 kV contact discharge
	8 kV air discharge
- Fast transients (EFT)	EN 61000-4-4, class III
	2 kV, 5/50 ns
- Surge	EN 61000-4-5, class III
	1kV differential mode
	2kV common mode
- Conducted RF	IEC / EN 61000-4-6, Class III
	0,15 – 80 MHz, 10V / m
- Radiated RF	IEC / EN 61000-4-3, Class III
	80 – 2000 MHz, 10V /m
- Power frequency magnetic field	IEC / EN 61000-4-8
	100A / m, 50 / 60Hz
- Pulse magnetic field	IEC / EN 61000-4-9
	1000A / m, 1,2/50µs
- Voltage dips 7 interruptions	IEC / EN 61000-4-11

8.3.2 Test voltage

Voltage tests	IEC 61810-1
Dielectric voltage	2 kV 1 min
Impulse voltage	5 kV 1,2 / 50 µs

8.3.3 Environmental conditions

	All RTD modules
Operating temperature	0°C - +55°C

8.3.4 Casing

	All RTD modules
Degree of protection (IEC 60529)	IP20
Dimensions (W x H x D)	262,0 x 97,8 x 66,7 mm
Material	1 mm steel plate
Weight	About 1 kg

9 Construction and mounting

9.1 DIN-RAIL mounting

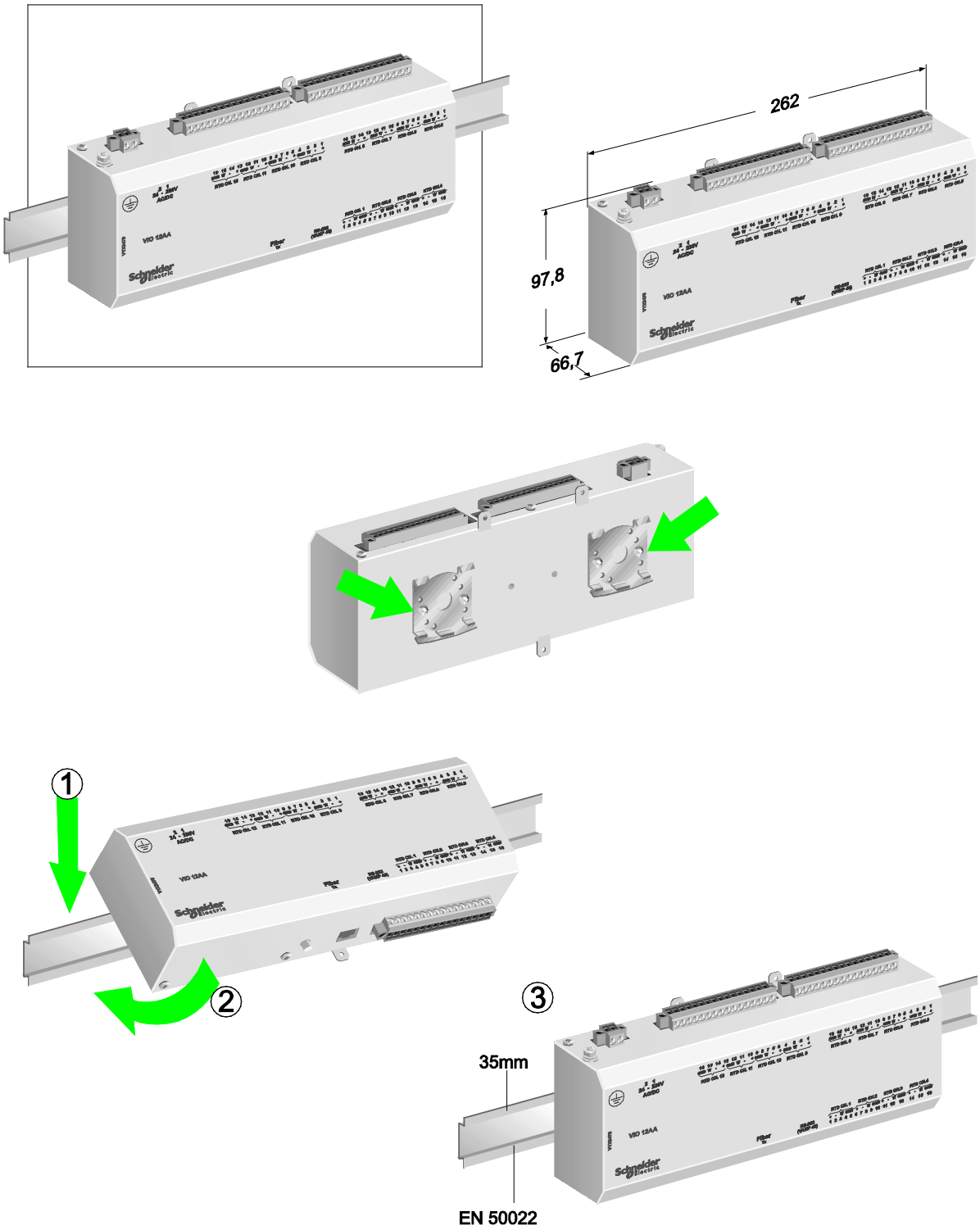
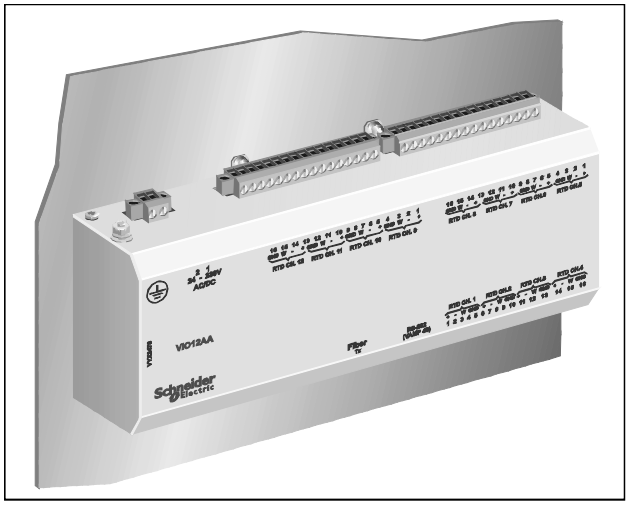
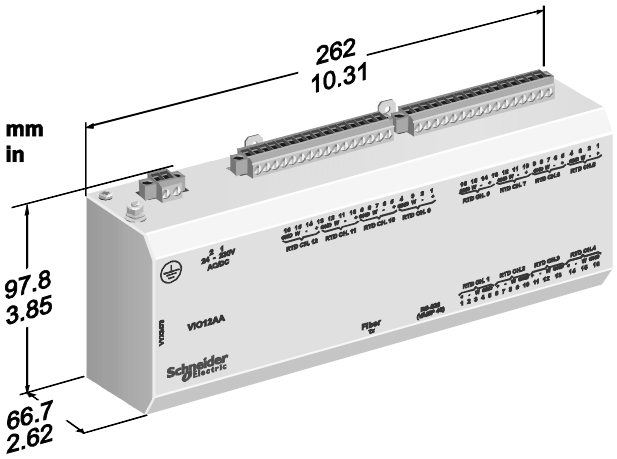
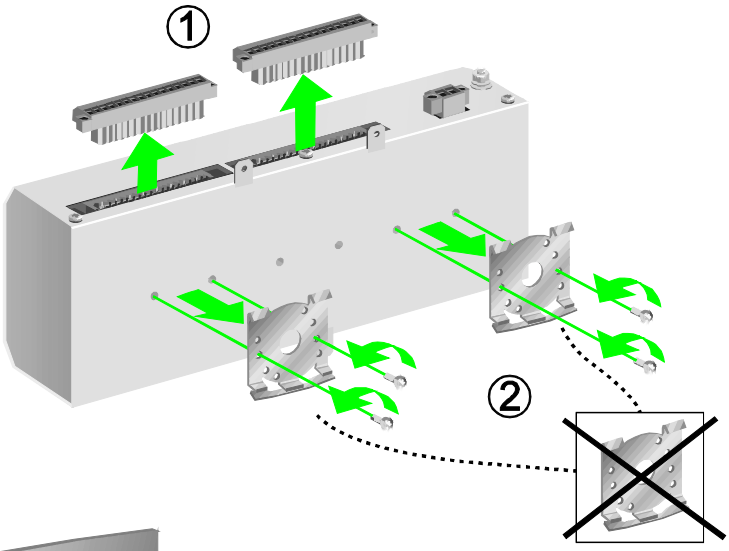


Figure 9-1 DIN-RAIL mounting

9.2 Wall mounting







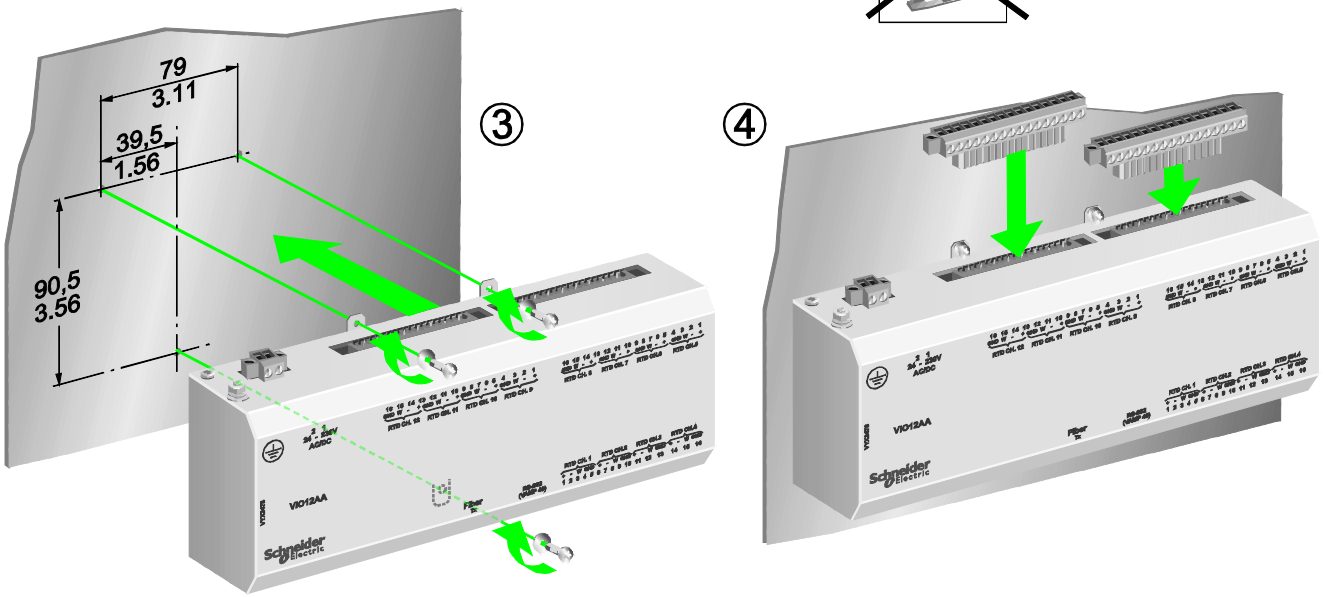


Figure 9-2 Wall mounting

9.3 Easergy P3 mounting

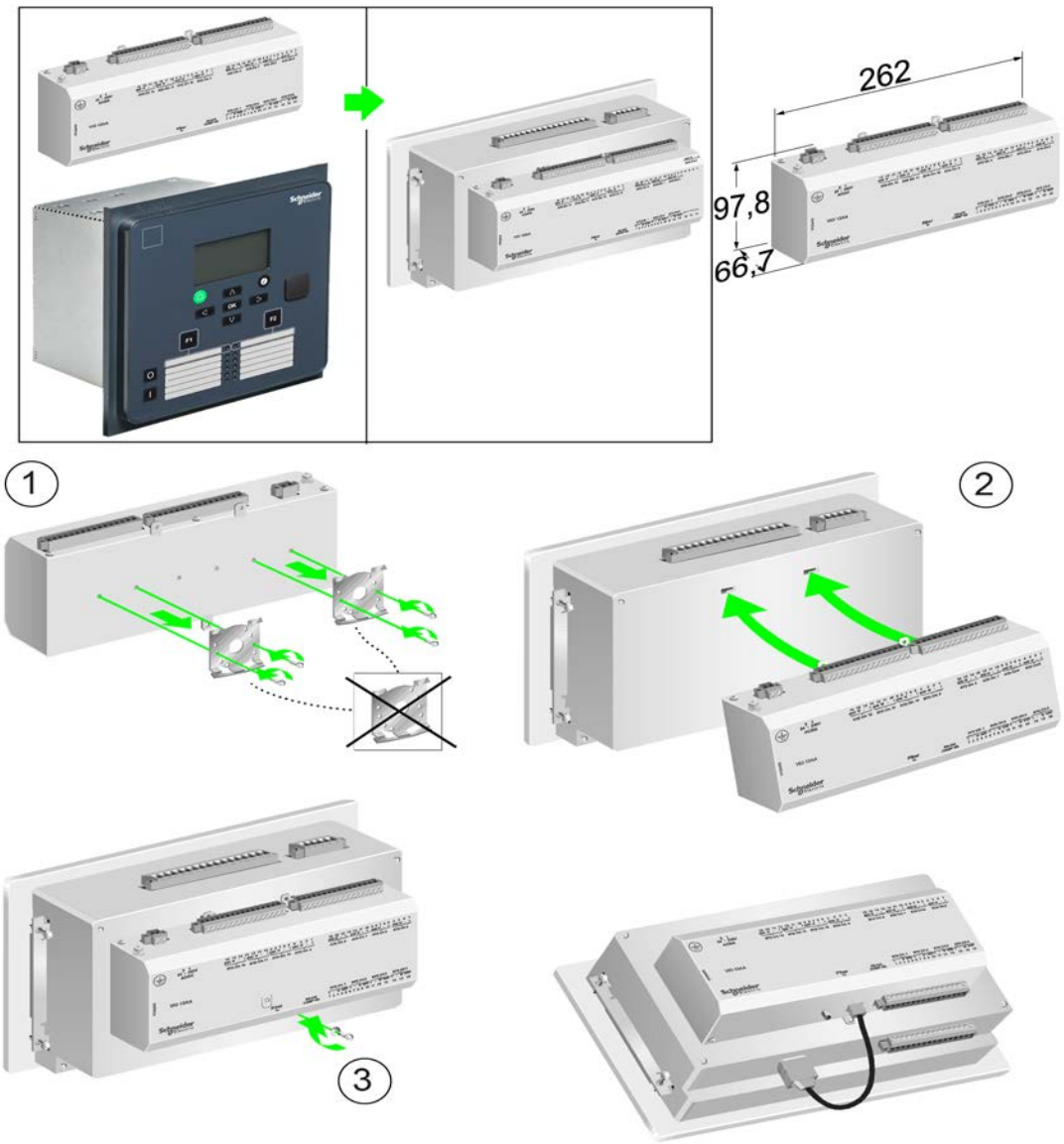


Figure 9-3 Easergy P3 mounting

10 Order information

When ordering, state the following information:

- Order code and type designation:
  - REL52811 (VIO 12AA)
  - REL52812 (VIO 12AB)
  - REL52813 (VIO 12AC)
  - REL52814 (VIO 12AD)
- Quantity

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