Smart relays

Zelio Logic

Your *advanced* solution !

Catalogue
January

04

a brand of Schneider Electric

Telemecanique

Contents

Zelio Logic smart relays

Zelio Logic smart relays
Compact and modular smart relays

Smart relay type	Compact smart relays			
				
Number of I/O	10	12	20	
Number of discrete inputs (of which analogue inputs)	6 (0)	8 (4)	12 (2)	12 (6)
Number of "relay" or "transistor" outputs	4	4	8	
Supply voltage	⎓ 24 V, ∿ 100...240 V	⎓ 12 V, ⎓ 24 V, ∿ 24 V, ∿ 100...240 V		
I/O extensions	No			
Modbus communication module ▲	No			
Clock	No	Yes	Depends on model	
Display and programming buttons	Depends on model			
Programming language LADDER / FBD	LADDER	LADDER / FBD *(1)*	LADDER	LADDER / FBD *(1)*
References	**SR2 ●101●●**	**SR2 ●121●●**	**SR2 B122BD**	**SR2 A201●●**	**SR2 B20●●● SR2 E201●●**
Pages	14	14	14	14	14

(1) FBD: Function Block Diagram
▲ Available: 1st quarter 2004.

Modular smart relays	
	
10	26
6 (4)	16 (6)
4	10
⎓ 24 V, ∿ 24 V, ∿ 100...240 V	
Yes (6, 10 or 14 I/O)	
Yes	
Yes	
Yes	
LADDER / FBD *(1)*	
SR3 B10●●●	**SR3 B26●●●**
15	15

(1) FBD: Function Block Diagram

Zelio Logic smart relays
Compact and modular smart relays

109446

SR2 B121BD

Presentation

Zelio Logic smart relays are designed for use in small automated systems. They are used in both industrial and commercial applications.

■ **For industry:**
□ automation of small finishing, production, assembly or packaging machines.
□ decentralised automation of ancillary equipment of large and medium-sized machines in the textile, plastics and materials processing sectors,
□ automated systems for agricultural machinery (irrigation, pumping, greenhouses, ...).

■ **For the commercial/building sectors:**
□ automation of barriers, roller shutters, access control,
□ automation of lighting installations,
□ automation of compressors and air conditioning systems.

Their compact size and ease of setting-up make them a competitive alternative to solutions based on cabled logic or specific cards.
Simple programming, ensured by the universal nature of LADDER and function block diagram FBD *(1)* languages, meets all automation requirements and also the needs of the electrician.
Compact smart relays are suitable for simple automated systems, up to 20 I/O.
If required, modular smart relays can be fitted with I/O extensions and a module for communication on the Modbus network, for greater performance and flexibility, from 10 to 40 I/O.

Programming

Programming can be carried out:
■ independently, using the buttons on the smart relay (ladder language),
■ on a PC, using "Zelio Soft" software.

When using a PC, programming can be carried out either in LADDER language, or in function block diagram language (FBD).

LCD display backlighting *(2)*

Backlighting of the display is programmable using “Zelio Soft” software and by direct action on the smart relay's 6 programming buttons.

Memory

The Zelio Logic smart relay has a backup memory which allows programs to be copied into another smart relay (examples: for building identical equipment, remote transmission of updates).
The memory also allows a backup copy of the program to be saved prior to exchanging the product.
When used with a smart relay without display or buttons, the copy of the program contained in the cartridge is automatically transferred into the smart relay at power-up.

Autonomy and backup

Autonomous operating time of the clock, ensured by a lithium battery, is 10 years.
Data backup (preset values and current values) is provided by an EEPROM Flash memory (10 years).

I/O extensions

Zelio Logic smart relays can, if necessary, take the following I/O extensions:
■ 6, 10 or 14 I/O, supplied with ⎓ 24 V via the smart relay,
■ 6, 10 or 14 I/O, supplied with ∿ 24 V via the smart relay,
■ 6, 10 or 14 I/O, supplied with ∿ 100... 240 V via the smart relay.

Communication module ▲

A module for communication on the Modbus network will be available for Zelio Logic modular smart relays. It is supplied with ⎓ 24 V via the smart relay.

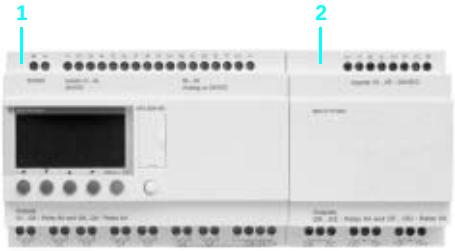
Communication interface ▲▲

The "communication" products in the Zelio Logic range include:
■ a communication interface connected between a smart relay and a modem,
■ analogue or GSM modems,
■ “Zelio Soft Com” software.

They are designed for monitoring or remote control of machines or installations which operate without personnel.
The communication interface, supplied with ⎓ 12/24 V, allows messages, telephone numbers and call conditions to be stored.

(1) FBD: Functional Block Diagram.
(2) LCD: Liquid Crystal Display

109458



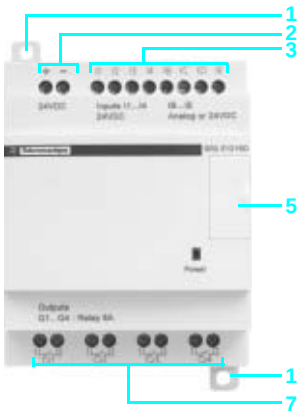
1 Modular smart relay (10 or 26 I/O)
2 I/O extension module (6,10 or 14 I/O)

▲ Available 1st quarter 2004.
▲▲ Available 2nd quarter 2004.

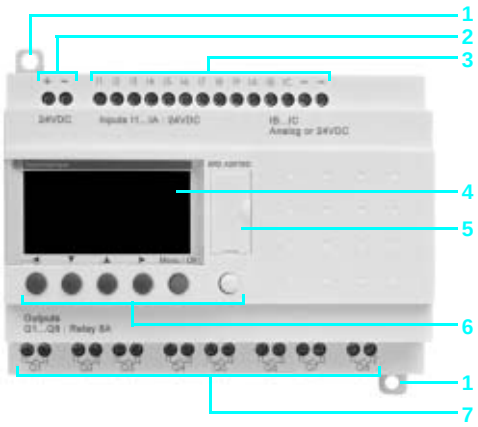
Zelio Logic smart relays
Compact and modular smart relays

Compact smart relays

Without display - 10, 12 and 20 I/O



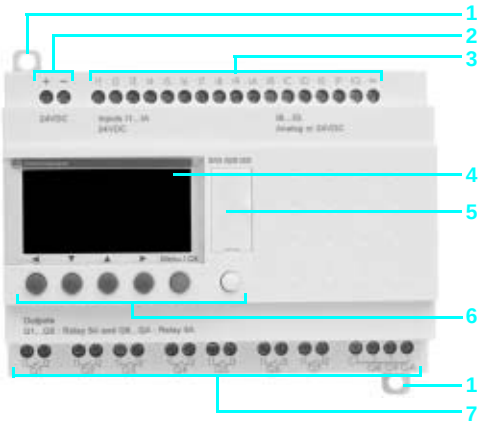
With display - 10, 12 and 20 I/O



Compact smart relays have the following on the front panel:
1 Two retractable fixing lugs
2 Two power supply terminals
3 Terminals for connection of the inputs
4 Backlit LCD display with 4 lines of 18 characters
5 Slot for a memory cartridge and connection to a PC
6 6 buttons for programming and parameter entry
7 Terminals for connection of the outputs

Modular smart relays

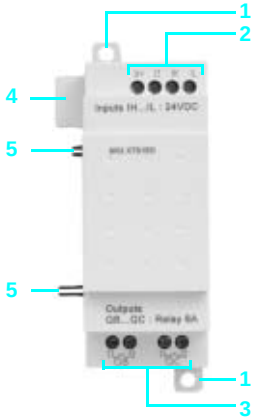
10 and 26 I/O



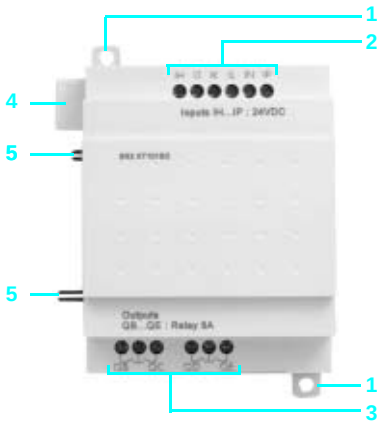
Modular smart relays have the following on the front panel:
1 Two retractable fixing lugs
2 Two power supply terminals
3 Terminals for connection of the inputs
4 Backlit LCD display with 4 lines of 18 characters
5 Slot for a memory cartridge and connection to a PC
6 6 buttons for programming and parameter entry
7 Terminals for connection of the outputs

I/O extension modules

6 I/O



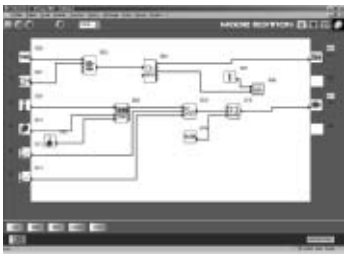
10 and 14 I/O



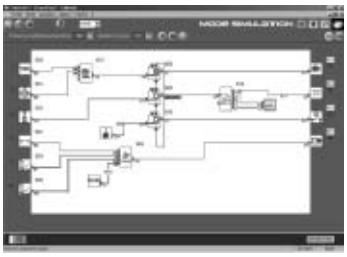
I/O extension modules have the following on the front panel:
1 Two retractable fixing lugs
2 Terminals for connection of the inputs
3 Terminals for connection of the outputs
4 A connector for connection to the smart relay (powered by the smart relay)
5 Locating pegs

Zelio Logic smart relays
Compact and modular smart relays
“Zelio Soft for PC” programming software

Programming in LADDER language



Programming in FBD language



"Simulation" mode

"Monitoring" window

“Zelio Soft for PC” (version 2.0)

“Zelio Soft” software allows:
- programming in LADDER language or in function block diagram language (FBD),
- simulation, monitoring and supervision,
- uploading and downloading of programs,
- output of personalised files,
- automatic compiling of programs,
- on-line help.

Coherence test and application languages

“Zelio Soft” software monitors applications by means of its coherence test function. An indicator turns red at the slightest input error. The problem can be located by simply clicking the mouse.
"Zelio Soft" software allows switching, at any time, to any of the 6 application languages (English, French, German, Spanish, Italian, Portuguese), and editing of the application file in the selected language.

Inputting messages for display on Zelio Logic

"Zelio Soft" software allows Text function blocks to be configured, which can then be displayed on all smart relays which have a display.

Program testing

2 test modes are provided: simulation and monitoring.

“Zelio Soft” **simulation** mode allows all the programs to be tested, without the smart relay, i.e.:
- enable discrete inputs,
- display the status of outputs,
- vary the voltage of the analogue inputs,
- enable the programming buttons,
- simulate the application in real time or in accelerated time,
- dynamically display (in red) the various active elements of the program.

“Zelio Soft” **monitoring** mode makes it possible to test the program executed by the smart relay, i.e.:
- display the program "on line",
- force inputs, outputs, control relays and current values of the function blocks,
- adjust the time,
- change from STOP mode to RUN mode and vice versa.

In simulation or monitoring mode, the monitoring window allows the status of the smart relay I/O to be displayed within your application environment (diagram or image).

Zelio Logic smart relays
Compact and modular smart relays
“Zelio Soft” programming software

LADDER language

Definition


Text function block


Timer


Up/down counter


Fast counter


Analogue comparator


Clock


Control relay


Counter comparator


LCD backlighting


Summer/Winter time switching


Output coil

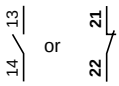
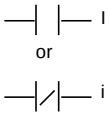
LADDER language allows a LADDER program to be written with elementary functions, elementary function blocks and derived function blocks, as well as with contacts, coils and variables.
The contacts, coils and variables can be annotated. Text can be placed freely within the graphic.

■ **Control scheme input modes**
“Zelio input” mode enables users who have directly programmed the Zelio smart relay to find the same user interface, even when using the software for the first time.
“Free input” mode, which is more intuitive, is very user-friendly and incorporates many additional features.
With LADDER programming language, two alternative types of symbol can be used :
- LADDER symbols,
- electrical symbols.

"Free input" mode also allows the creation of mnemonics and notes associated with with each line of the program.
Instant switching from one input mode to the other is possible at any time, by clicking the mouse.
Up to 120 control scheme lines can be programmed, with 5 contacts and 1 coil per program line.

■ **Functions:**
- 16 time delay function blocks; parameters of 11 different types can be set for each of these (1/10th second to 9999 hours),
- 16 up/down counter function blocks from 0 to 32767,
- 1 fast counter (1 kHz),
- 16 text function blocks,
- 16 analogue comparator function blocks,
- 8 clock function blocks, each with 4 channels,
- 28 control relays,
- 8 counter comparators,
- automatic Summer/Winter time switching,
- variety of coil functions, latching (Set/Reset), impulse relay, contactor
- LCD screen with programmable backlighting.

Functions

Function	Electrical scheme	LADDER language	Notes
Contact			I corresponds to the real state of the contact connected to the input of the smart relay. i corresponds to the inverse state of the contact connected to the input of the smart relay.
Standard coil			The coil is energised when the contacts to which it is connected are closed.
Latch coil (Set)			The coil is energised when the contacts to which it is connected are closed. It remains tripped when the contacts re-open.
Unlatch coil (Reset)			The coil is de-energised when the contacts to which it is connected are closed. It remains inactive when the contacts re-open.

Function block diagram language (FBD) *(1)*

Definition

FBD language allows graphical programming based on the use of predefined function blocks.
This language provides the use of 23 pre-programmed functions for counting, time delay, timing, definition of switching threshold (temperature regulation for example), generation of impulses, time programming, multiplexing, display, etc.

Pre-programmed functions

Zelio Logic smart relays provide a high processing capacity, up to 200 function blocks, including 23 pre-programmed functions:

TIMER AC
Timer. Function A/C
ON-delay and OFF delay

TIMER BH
Timer. Function BH.
(Adjustable pulsed signal)

TIMER BW
Timer - Function BW
(pulse on rising/falling edge)

TIMER Li
Pulse generator
ON-delay, OFF delay

BISTABLE
Impulse relay function

SET- RESET
Bistable latching - Priority assigned either to SET or RESET function

BOOLEAN
Allows logic equations to be created between connected inputs

CAM
Cam programmer

PRESET COUNT
Up/down counter

UP DOWN COUNT
Up/down counter with external preset

PRESET H-METER
Hour counter
(hour, minute preset)

TIME PROG
Time programmer,
weekly and annual

GAIN
Allows conversion of an analogue value by change of scale and offset.

TRIGGER
Defines an activation zone with hysteresis.

MUX
Multiplexing functions on 2 analogue values

COMP IN ZONE
Zone comparison
(Min. ⩽ Value ⩽ Max.)

ADD/SUB
Add and/or subtract function

MUL/DIV
Multiply and/or divide function

DISPLAY
Display of digital and analogue data, date, time, messages for Human-Machine interface.

COMPARE
Comparison of 2 analogue values using the operands =, >, <, ⩽, ⩾.

STATUS
Access to smart relay status

ARCHIVE
Storage of 2 values simultaneously

SPEED COUNT
Fast counting up to 1 kHz

SFC functions *(2)* (GRAFCET)

RESET-INIT
Reinitialisable step

INIT STEP
Initial step

STEP
SFC step

DIV-OR 2
Divergence to OR

CONV-OR 2
Convergence to OR

DIV-AND 2
Divergence to AND

CONV-AND 2
Convergence to AND

Logic functions

AND
AND function

OR
OR function

NAND
NOT AND function

NOR
NOT OR function

XOR
Exclusive OR function

NOT
NOT function

(1) Functional Block Diagram.
(2) Sequential Function Chart.

Zelio Logic smart relays
Compact and modular smart relays

Environment characteristics

Product certifications			UL, CSA, GL, C-TICK
Conformity with the low voltage directive	Conforming to 73/23/EEC		EN 61131-2 (open equipment)
Conformity with the EMC directive	Conforming to 89/336/EEC		EN 61131-2 (Zone B) EN 61000-6-2, EN 61000-6-3 and EN 61000-6-4
Degree of protection	Conforming to IEC 60529		IP 20
Overvoltage category	Conforming to IEC 60664-1		3
Degree of pollution	Conforming to IEC/EN 61131-2		2
Ambient air temperature around the device	Operation	**°C**	-20... +55 (+40 in enclosure), conforming to IEC 60068-2-1 and IEC 60068-2-2
	Storage	**°C**	-40... +70
Maximum relative humidity			95 % without condensation or dripping water
Maximum operating altitude	Operation	**m**	2000
	Transport	**m**	3048
Mechanical resistance	Immunity to vibrations		IEC 60068-2-6, test Fc
	Immunity to mechanical shock		IEC 60068-2-27, test Ea
Resistance to electrostatic discharge	Immunity to electrostatic discharge		IEC 61000-4-2, level 3
Resistance to HF interference (Immunity)	Immunity to electromagnetic radiated fields		IEC 61000-4-3, level 3
	Immunity to fast transients in bursts		IEC 61000-4-4, level 3
	Immunity to shock waves		IEC 61000-4-5
	Radio frequency in common mode		IEC 61000-4-6, level 3
	Voltage dips and breaks (⏦)		IEC 61000-4-11
	Immunity to damped oscillation wave		IEC 61000-4-12
Conducted and radiated emissions	Conforming to EN 55022/11 (Group 1)		Class B
Connection to screw terminals (Tightened using Ø 3.5 screwdriver)	Flexible cable with cable end	**mm²**	1 conductor: 0.25...2.5, cable: AWG 24... AWG14 2 conductors: 0.25...0.75, cable: AWG 24... AWG18
	Semi-solid cable	**mm²**	1 conductor: 0.2...2.5, cable: AWG 25... AWG14
	Solid cable	**mm²**	1 conductor: 0.2...2.5, cable: AWG 25... AWG14 2 conductors: 0.2...1.5, cable: AWG 24... AWG16
	Tightening torque	**N.m**	0.5

⎓ 12 V supply characteristics

Smart relay type			**SR2 B121JD**	**SR2 B201JD**
Primary	Nominal voltage	**V**	12	12
Voltage limits	Including ripple	**V**	10.4…14.4	10.4…14.4
Nominal input current		**mA**	120	200
Nominal input current with extensions		**mA**	144	250
Power dissipated		**W**	1.5	2.5
Micro-breaks	Permissible duration	**ms**	⩽ 1 (repeated 20 times)	
Protection			Against polarity inversion	

⎓ 24 V supply characteristics

Smart relay type			**SR2 ●1●1BD**	**SR2 ●1●2BD**	**SR2 ●2●1BD**	**SR2 ●2●2BD**	**SR3 B101BD**	**SR3 B102BD**	**SR3 B261BD**	**SR3 B262BD**
Primary	Nominal voltage	**V**	24	24	24	24	24	24	24	24
Voltage limits	Including ripple	**V**	19.2…30	19.2…30	19.2…30	19.2…30	19.2…30	19.2…30	19.2…30	19.2…30
Nominal input current		**mA**	100	100	100	100	100	50	190	70
Nominal input current with extensions		**mA**	–	–	–	–	100	160	300	180
Power dissipated		**W**	3	3	6	3	3	4	6	5
Power dissipated with extensions		**W**	–	–	–	–	8	8	10	10
Micro-breaks	Permissible duration	**ms**	⩽ 1 (repeated 20 times)							
Protection			Against polarity inversion							

⏦ 24 V supply characteristics

Smart relay type			**SR2●1●1B**	**SR2●2●1B**	**SR3 B101B**	**SR3 B261B**
Primary	Nominal voltage	**V**	24	24	24	24
Voltage limits		**V**	20.4…28.8	20.4…28.8	20.4…28.8	20.4…28.8
Nominal frequency		**Hz**	50-60	50-60	50-60	50-60
Nominal input current		**mA**	145	233	160	280
Nominal input current with extensions		**mA**	–	–	280	415
Power dissipated		**VA**	4	6	4	7.5
Power dissipated with extensions		**VA**	–	–	7,5	10
Micro-breaks	Permissible duration	**ms**	⩽ 10 (repeated 20 times)			
rms insulation voltage		**V**	1780 (50-60 Hz)			

∿ 100...240 V supply characteristics

Smart relay type				SR2 ●101FU	SR2 ●121FU	SR2 ●201FU	SR3 B101FU	SR3 B261FU
Primary	Nominal voltage		**V**	100…240	100…240	100…240	100…240	100…240
Voltage limits			**V**	85…264	85…264	85…264	85…264	85…264
Nominal input current			**mA**	80/30	80/30	100/50	80/30	100/50
Nominal input current with extensions			**mA**	–	–	–	80/40	80/60
Power dissipated			**VA**	7	7	11	7	12
Power dissipated with extensions			**VA**	–	–	–	12	17
Micro-breaks	Permissible duration		**ms**	10	10	10	10	10
rms insulation voltage			**V**	1780	1780	1780	1780	1780

Processing characteristics

Smart relay type				SR2/SR3
Number of control scheme lines	With LADDER programming			120
Number of function blocks	With FBD programming			Up to 200
Cycle time			**ms**	10...50
Response time			**ms**	20
Back-up time (in the event of power failure)	Day/time			10 years (lithium battery) at 25 °C
	Program and settings			10 years (EEPROM memory)
Program memory checking				At each power-up
Clock drift				12 min/year (0 to 55 °C) 6 sec/month (at 25 °C and calibration)
Timer block accuracy				1 % ± 2 of the cycle time

Discrete ⎓ 24 V input characteristics

Smart relay type				SR2/SR3
Connection				Screw terminal block
Nominal value of inputs	Voltage		**V**	24
	Current		**mA**	4
Input switching limit values	At state 1	Voltage	**V**	≥ 15
		Current	**mA**	≥ 2.20
	At state 0	Voltage	**V**	≤ 5
		Current	**mA**	< 0.75
Input impedance at state 1			**KΩ**	7.4
Configurable response time	State 0 to 1		**ms**	0.2
	State 1 to 0		**ms**	0.3
Conformity to IEC 61131-2				Type 1
Sensor compatibility	3-wire			Yes PNP
	2-wire			No
Input type				Resistive
Isolation	Between supply and inputs			None
	Between inputs			None
Maximum counting frequency			**kHz**	1
Protection	Against inversion of terminals			Control instructions not executed

Discrete ∿ 100...240 V input characteristics

Smart relay type				SR2/SR3
Connection				Screw terminal block
Nominal value of inputs	Voltage		**V**	100... 240
	Current		**mA**	0.6
	Frequency		**Hz**	47... 63
Input switching limit values	At state 1	Voltage	**V**	≥ 79
		Current	**mA**	> 0.1750
	At state 0	Voltage	**V**	≤ 40
		Current	**mA**	< 0.05
Input impedance at state 1			**KΩ**	350
Configurable response time	State 0 to 1 (50/60 Hz)		**ms**	50
	State 1 to 0 (50/60 Hz)		**ms**	50
Isolation	Between supply and inputs			None
	Between inputs			None
Protection	Against inversion of terminals			Control instructions not executed

Integral analogue input characteristics

Smart relay type				SR2/SR3
Analogue inputs	Input range		**V**	0...10 or 0...24
	Input impedance		**KΩ**	12
	Maximum non destructive voltage		**V**	30
	Value of LSB			39 mV, 4 mA
	Input type			Common mode
Conversion	Resolution			8 bit
	Conversion time			Smart relay cycle time
	Precision	at 25 °C		± 5 %
		at 55 °C		± 6.2 %
	Repeat accuracy	at 55 °C		± 2 %
Isolation	Between analogue channel and supply			None
Cabling distance			**m**	10 maximum, with screened cable (sensor not isolated)
Protection	Against inversion of terminals			Control instructions not executed

Relay output characteristics

Smart relay type				SR2 ●●●/ SR3 B101●●	SR3 B261●●, SR3 XT141●●
Operating limit values			**V**	⎓ 5...150. ∿ 24...250	⎓ 5...150. ∿ 24...250
Contact type				N/O	N/O
Thermal current			**A**	8	8 outputs: 8 A 2 outputs: 5 A
Electrical durability for 500 000 operating cycles	Utilisation category	DC-12	**V**	24	24
			A	1.5	1.5
		DC-13	**V**	24 (L/R = 10 ms)	24 (L/R = 10 ms)
			A	0.6	0.6
		AC-12	**V**	230	230
			A	1.5	1.5
		AC-15	**V**	230	230
			A	0.9	0.9
Minimum switching capacity	At minimum voltage of 12 V		**mA**	10	10
Low power switching reliability of contact				12 V - 10 mA	12 V - 10 mA
Maximum operating rate	No-load		**Hz**	10	10
	At Ie (operational current)		**Hz**	0.1	0.1
Mechanical life	In millions of operating cycles			10	10
Rated impulse withstand voltage	Conforming to IEC 60947-1 and 60664-1		**kV**	4	4
Response time	Trip		**ms**	10	10
	Reset		**ms**	5	5
Built-in protection	Short-circuit			None	
	Against overvoltage and overload			None	

Transistor output characteristics

Smart relay type			SR2/SR3
Operating limit values		**V**	19.2...30
Load	Nominal voltage	**V**	⎓ 24
	Nominal current	**A**	0.5
	Maximum current	**A**	0.625 at 30 V
Drop out voltage	At state 1	**V**	⩽ 2 for I = 0.5 A
Response time	Trip	**ms**	⩽ 1
	Reset	**ms**	⩽ 1
Built-in protection	Against overload and short-circuits		Yes
	Against overvoltage *(1)*		Yes
	Against inversions of power supply		Yes

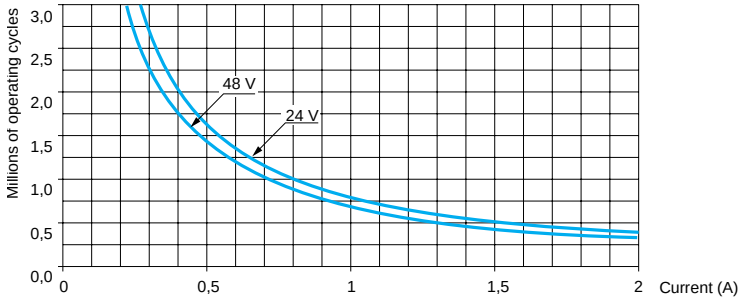
(1) If there is no volt-free contact between the relay output and the load.

Electrical durability of relay outputs

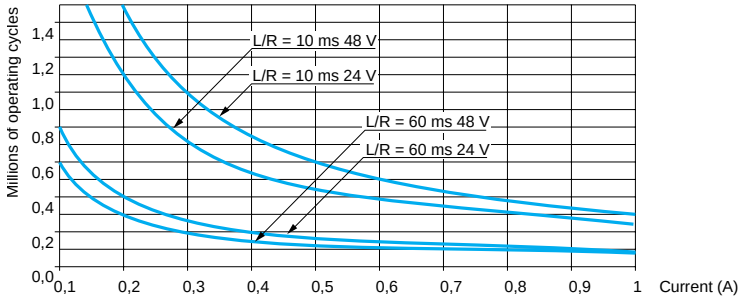
(in millions of operating cycles, conforming to IEC 60947-5-1)

d.c. loads

DC-12 *(1)*



DC-13 *(2)*



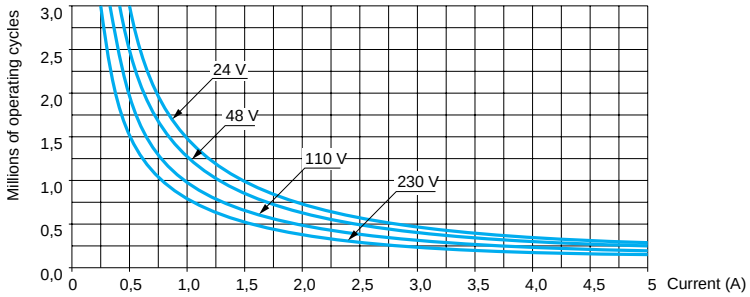
(1) DC-12: switching resistive loads and photo-coupler isolated solid state loads, L/R ≤ 1ms.
(2) DC-13: switching electromagnets, L/R ≤ 2 x (Ue x Ie) in ms, Ue: Rated operational voltage, Ie: rated operational current (with protection diode on load, use the DC-12 curves and apply a coefficient of 0.9 to the millions of operating cycles value).

Electrical durability of relay outputs (continued)

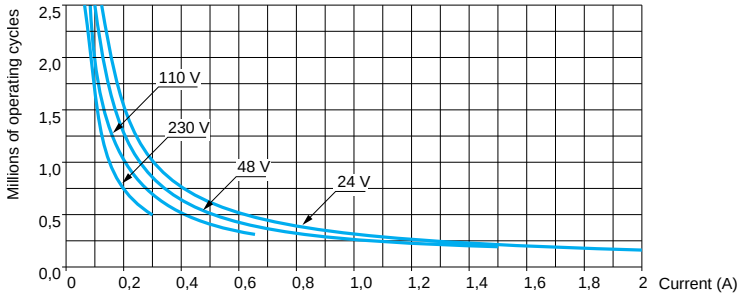
(in millions of operating cycles, conforming to IEC 60947-5-1)

a.c. loads

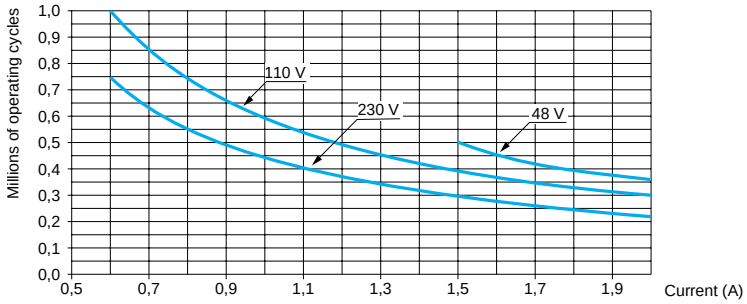
AC-12 *(1)*



AC-14 *(2)*



AC-15 *(3)*



(1) AC-12: switching resistive loads and photo-coupler isolated solid state loads, cos ≥ 0.9.
(2) AC-14: switching small electromagnetic loads whose power drawn with the electromagnet closed is ≤ 72 VA, making: cos = 0.3, breaking: cos = 0.3.
(3) AC-15: switching electromagnetic loads whose power drawn with the electromagnet closed is > 72 VA, making: cos = 0.7, breaking: cos = 0.4.

Zelio Logic smart relays
Compact smart relays

109440

SR2 A201BD

109442

SR2 E121BD

510345

SR2 PACK●●●

Compact smart relays with display

Number of I/O	Discrete inputs	Of which 0-10 V analogue inputs	Relay outputs	Transistor outputs	Clock	Reference	Weight kg
Supply ⎓ 12 V							
12	8	4	4	0	Yes	**SR2 B121JD**	0.250
20	12	6	8	0	Yes	**SR2 B201JD**	0.250
Supply ⎓ 24 V							
10	6	0	4	0	No	**SR2 A101BD** *(1)*	0.250
12	8	4	4	0	Yes	**SR2 B121BD**	0.250
	8	4	0	4	Yes	**SR2 B122BD**	0.220
20	12	2	8	0	No	**SR2 A201BD** *(1)*	0.380
	12	6	8	0	Yes	**SR2 B201BD**	0.380
	12	6	0	8	Yes	**SR2 B202BD**	0.280
Supply ∿ 24 V							
12	8	0	4	0	Yes	**SR2 B121B**	0.250
20	12	0	8	0	Yes	**SR2 B201B**	0.380
Supply ∿ 100...240 V							
10	6	0	4	0	No	**SR2 A101FU** *(1)*	0.250
12	8	0	4	0	Yes	**SR2 B121FU**	0.250
20	12	0	8	0	No	**SR2 A201FU** *(1)*	0.380
	12	0	8	0	Yes	**SR2 B201FU**	0.380

Compact smart relays without display

Number of I/O	Discrete inputs	Of which 0-10 V analogue inputs	Relay outputs	Transistor outputs	Clock	Reference	Weight kg
Supply ⎓ 24 V							
10	6	0	4	0	No	**SR2 D101BD** *(1)*	0.220
12	8	4	4	0	Yes	**SR2 E121BD**	0.220
20	12	2	8	0	No	**SR2 D201BD** *(1)*	0.350
	12	6	8	0	Yes	**SR2 E201BD**	0.350
Supply ∿ 24 V							
12	8	0	4	0	Yes	**SR2 E121B**	0.220
20	12	0	8	0	Yes	**SR2 E201B**	0.350
Supply ∿ 100...240 V							
10	6	0	4	0	No	**SR2 D101FU** *(1)*	0.220
12	8	0	4	0	Yes	**SR2 E121FU**	0.220
20	12	0	8	0	No	**SR2 D201FU** *(1)*	0.350
	12	0	8	0	Yes	**SR2 E201FU**	0.350

Compact "discovery" packs

Number of I/O	Pack contents	Reference	Weight kg
Supply ⎓ 24 V			
12	An **SR2 B121BD** compact smart relay with display, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR2 PACKBD**	0.700
20	An **SR2 B201BD** compact smart relay with display, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR2 PACK2BD**	0.850
Supply ∿ 100...240 V			
12	An **SR2 B121FU** compact smart relay with display, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR2 PACKFU**	0.700
20	An **SR2 B201FU** compact smart relay with display, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR2 PACK2FU**	0.850

(1) Programming on smart relay in LADDER language only.

Zelio Logic smart relays
Modular smart relays

109442

SR3 B101BD

109363

SR3 XT61BD

109369

SR3 XT141BD

Modular smart relays with display

Number of I/O	Discrete inputs	Of which 0-10 V analogue inputs	Relay outputs	Transistor outputs	Clock	Reference	Weight kg
Supply ⎓ 24 V							
10	6	4	4	0	Yes	**SR3 B101BD**	0.250
	6	4	0	4	Yes	**SR3 B102BD**	0.220
26	16	6	10 *(1)*	0	Yes	**SR3 B261BD**	0.400
	16	6	0	10	Yes	**SR3 B262BD**	0.300
Supply ∿ 24 V							
10	6	0	4	0	Yes	**SR3 B101B**	0.250
26	16	0	10 *(1)*	0	Yes	**SR3 B261B**	0.400
Supply ∿ 100-240 V							
10	6	0	4	0	Yes	**SR3 B101FU**	0.250
26	16	0	10 *(1)*	0	Yes	**SR3 B261FU**	0.400

I/O extension modules *(2)*

Number of I/O	Discrete inputs	Relay outputs	Reference	Weight kg
Supply ⎓ 24 V (for smart relays SR3 B●●●BD)				
6	4	2	**SR3 XT61BD**	0.125
10	6	4	**SR3 XT101BD**	0.200
14	8	6	**SR3 XT141BD**	0.220
Supply ∿ 24 V (for smart relays SR3 B●●●B)				
6	4	2	**SR3 XT61B**	0.125
10	6	4	**SR3 XT101B**	0.200
14	8	6	**SR3 XT141B**	0.220
Supply ∿ 100-240 V (for smart relays SR3 B●●●FU)				
6	4	2	**SR3 XT61FU**	0.125
10	6	4	**SR3 XT101FU**	0.200
14	8	6	**SR3 XT141FU**	0.220

Communication module *(2)*

For use on	Supply voltage	Reference	Weight kg
Modbus network	⎓ 24 V	**SR3 MBU01BD** ▲	0.300

Modular "discovery" packs

Number of I/O	Pack contents	Reference	Weight kg
Supply ⎓ 24 V			
10	An **SR3 B101BD** modular smart relay, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR3 PACKBD**	0.700
26	An **SR3 B261BD** modular smart relay, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR3 PACK2BD**	0.850
Supply ∿ 100...240 V			
10	An **SR3 B101FU** modular smart relay, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR3 PACKFU**	0.700
26	An **SR3 B261FU** modular smart relay with display, a connecting cable and “Zelio Soft” programming software supplied on CD-Rom.	**SR3 PACK2FU**	0.850

(1) Including 8 outputs at maximum current of 8 A and 2 outputs at maximum current of 5 A.
(2) Power supply to the I/O extension and communication modules is via the modular smart relays

Note: *The smart relay and its associated extensions must have an identical voltage.*

▲ Available: 1st quarter of 2004.

Zelio Logic smart relays
Compact and modular smart relays
Separate components

510352

SR2 SFT01

"Zelio Soft" software for PC

Description	Reference	Weight kg
"Zelio Soft" for PC multi-language programming software supplied on CD-Rom *(1)*, compatible with Windows 95, 98, NT, 2000, XP and ME.	**SR2 SFT01**	0.200
Connecting cable between the PC (SUB-D, 9-way connector) and the smart relay, length: 3 m	**SR2 CBL01**	0.150
Interface for USB port (for use with cable **SR2 CBL01**), length: 1.8 m	**SR2 CBL06**	0.350

Back-up memory

Description	Reference	Weight kg
EEPROM back-up memory	**SR2 MEM01**	0.010

Communication interface

Description	Supply	Reference	Weight kg
Communication interface	⎓ 12/24 V	**SR2 COM01** ▲	0.140

109369

SR2 MEM01

510353

SR2 COM01

Converters for Optimum Pt100 probes *(2)*

Supply voltage ⎓ 24 V (20 %, not isolated)

Type	Temperature range °C	Temperature range °F	Output signal	Reference	Weight kg
Pt100 2-wire, 3-wire and 4-wire	- 40...40	- 40...104	0...10 V or 4...20 mA	**RMP T13BD**	0.116
	- 100...100	- 148...212	0...10 V or 4...20 mA	**RMP T23BD**	0.116
	0... 100	32... 212	0...10 V or 4...20 mA	**RMP T33BD**	0.116
	0... 250	32... 482	0...10 V or 4...20 mA	**RMP T53BD**	0.116
	0... 500	32...932	0...10 V or 4...20 mA	**RMP T73BD**	0.116

Power supplies *(3)*

Input voltage	Nominal output voltage	Nominal output current	Reference	Weight kg
∿ 100...240 V (47...63 Hz)	⎓ 12 V	1.9 A	**ABL 7RM1202**	0.180
	⎓ 24 V	1.4 A	**ABL 7RM2401**	0.182

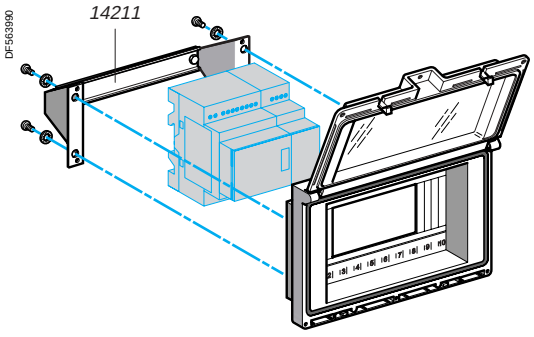
510354

ABL 7RM1202

Mounting accessories *(4)*

Description	Reference	Weight kg
Dust and damp-proof enclosure for mounting through a door with split blanking cover arrangement, fitted with an IP 55 dust and damp-proof window with hinged flap. Mounting capacity: - 1 or 2 SR2 modules with 10 or 12 I/O, or - 1 SR2 module with 20 I/O, or - 1 SR3 module with 10 I/O + 1 I/O extension module (6 or 10 or 14 I/O, or - 1 SR3 module with 26 I/O + 1 I/O extension module 6 I/O.	**14210**	0.350
Fixing bracket and symmetrical mounting rail for mounting enclosure **14210** through a door panel.	**14211**	0.210

DF563990



14210

Documentation

Description	Language	Reference	Weight kg
User's manual for direct programming on the smart relay	English	**SR2 MAN01EN**	0.100
	French	**SR2 MAN01FR**	0.100
	German	**SR2 MAN01DE**	0.100
	Spanish	**SR2 MAN01ES**	0.100
	Italian	**SR2 MAN01IT**	0.100
	Portuguese	**SR2 MAN01P0**	0.100

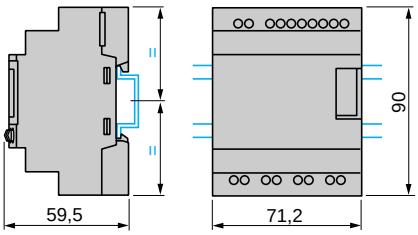
(1) CD-Rom containing "Zelio Soft" software, an application library, a self-training manual, installation instructions and a user's manual.
(2) See pages 20 to 25
(3) See pages 26 to 29
(4) Products marketed under the Merlin Gerin brand.

▲ Available: 2nd quarter of 2004.

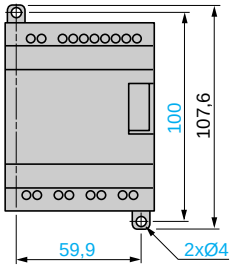
Compact and modular smart relays

SR2 A101BD, SR2 D101FU, SR3 B101BD and SR3 B101FU (10 I/O)
SR2 B121JD, SR2 B12●BD, SR2 B121B, SR2 A101FU, SR2 B121FU, SR2 D101BD, SR2 E121BD, SR2 E121B, SR2 E121FU (12 I/O)

Mounting on 35 mm ⊓ rail

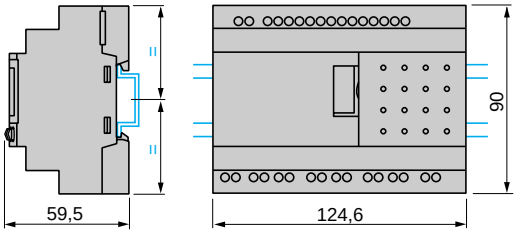


Screw fixing (retractable lugs)

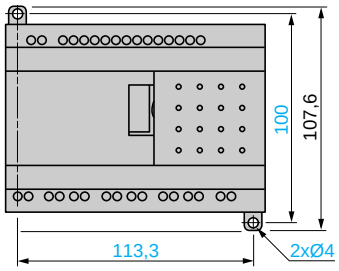


SR2 B201JD, SR2 A201BD, SR2 B20●BD, SR2 B201B, SR2 A201FU, SR2 B201FU, SR2 D201BD, SR2 E201BD, SR2 E201B, SR2 D201FU and SR2 E201FU (20 I/O)
SR3 B26●BD and SR3 B261FU (26 I/O)

Mounting on 35 mm ⊓ rail



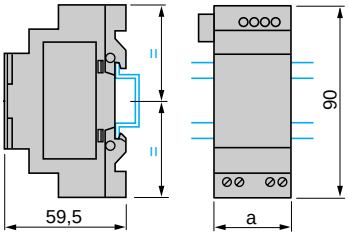
Screw fixing (retractable lugs)



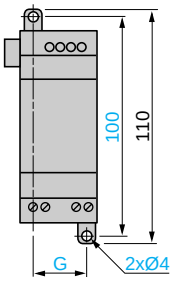
I/O extension modules

SR3 XT61●● (6 I/O), SR3 XT101●● and SR3 XT141●● (10 and 14 I/O)

Mounting on 35 mm ⊓ rail



Screw fixing (retractable lugs)

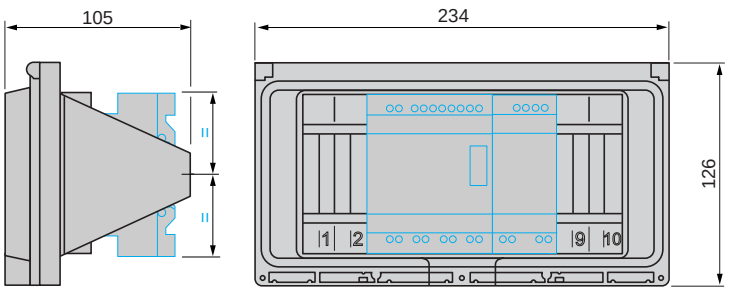


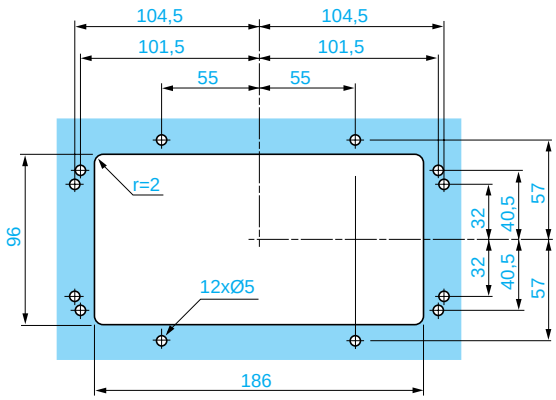
SR3	a	G
XT61●●	35,5	25
XT101●●	72	60
XT141●●	72	60

Enclosure + fixing bracket

14210 and 14211

Cut-out

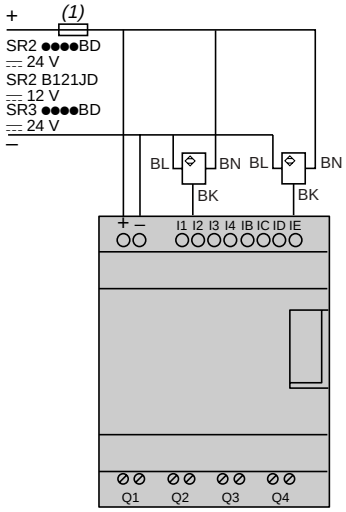




Input connections

3-wire sensors

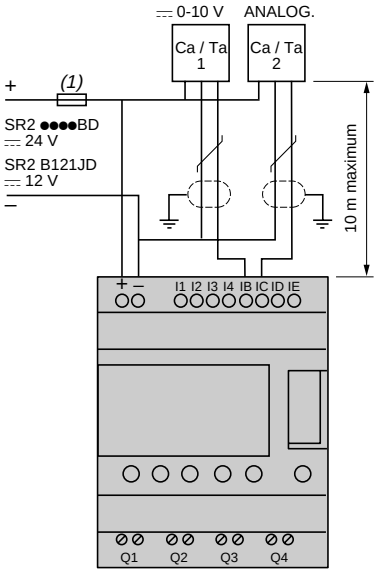
SR2 ●●●●BD, SR2 B121JD and SR3 ●●●●BD



(1) 1 A quick-blow fuse or circuit-breaker.

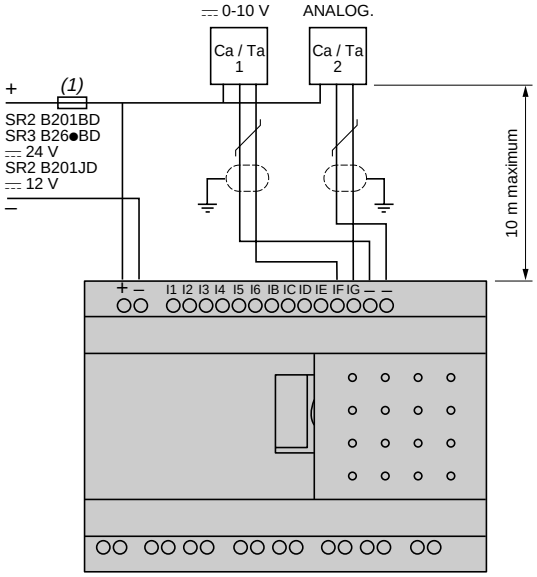
Analogue inputs

SR2 B12●BD, SR2 B121JD and SR3 B10●BD



(1) 1 A quick-blow fuse or circuit-breaker.

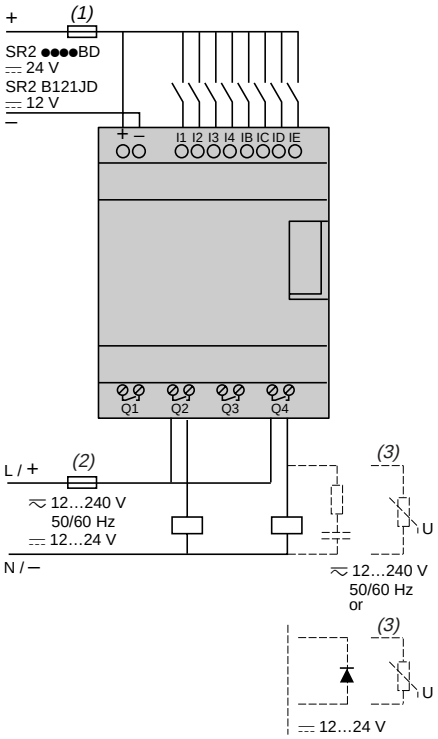
SR2 B201BD, SR3 B26●BD and SR2 B201JD



(1) 1 A quick-blow fuse or circuit-breaker.

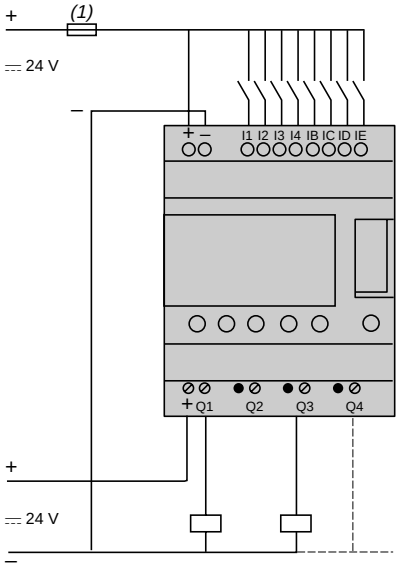
Connection of smart relays on ⎓ supply

SR2 ●●●●BD, SR2 B121JD, SR2 ●201BD and SR3 B10●●●



(1) 1 A quick-blow fuse or circuit-breaker.
(2) Fuse or circuit-breaker.
(3) Inductive load.

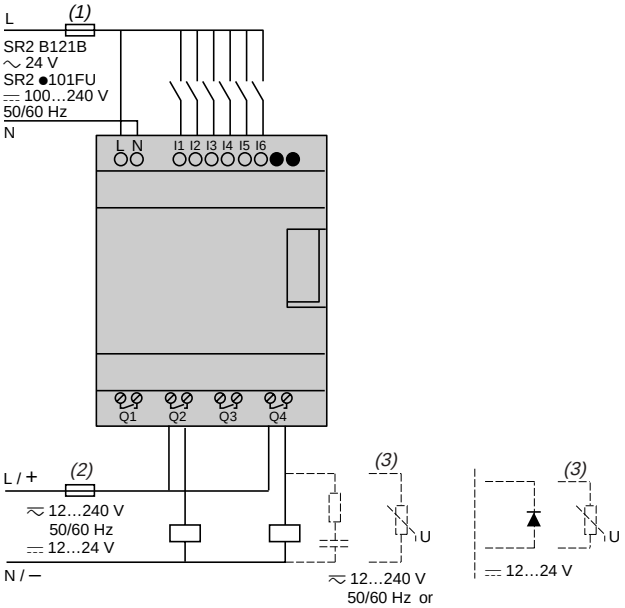
SR2 B122BD and SR2 B202BD, SR3 B102BD and SR3 B262BD



(1) 1 A quick-blow fuse or circuit-breaker.

Connection of smart relays on ∿ supply

SR2 B●●●B, SR2 A1●1FU, SR2 ●201FU, SR3 B●●B and SR3 B●●●FU



(1) 1 A quick-blow fuse or circuit-breaker.
(2) Fuse or circuit-breaker.
(3) Inductive load.

Analogue interfaces
Zelio Analog
Converters for thermocouples and Pt100 probes
Voltage/current converters

The Zelio Analog range of converters is designed to convert signals emitted by sensors or electrical measurements into standard electrical signals which are compatible with automation platforms, controllers (thermal processes, speed, …). They also allow the connection distance between a sensor and the measurement acquisition device to be increased: for example between a thermocouple and a programmable controller.
Conforming to IEC standards, UL and CSA certified, these converters are suitable for universal use.

Measurement signals for thermocouples and Pt100 probes
The voltages induced by thermocouples vary between 10 and 80 µV/°C, Pt100 probes (100 ohms at 0 °C) produce about 0.5 mV/°C, with measurement currents of 1 mA. Depending on the sensor, the signal to be measured ranges from a few µV (thermocouple) to 250 and 700 mV for a Pt100 probe.
It is therefore difficult to transmit these low level signals over long electric lines without encountering problems of interference, signal reduction or errors.
Connecting Zelio Analog converters close to the sensors resolves these problems :
- 4-20 mA current loops transmitted over a long distance are less sensitive to interference than low level voltage signals from sensors,
- signal reductions during transmission (resistance) of voltages do not occur,
- the cables used to connect the converters to process equipment (programmable controllers) are standard cables, which are more cost effective than extension cables or compensation cables suitable for low level signals for Pt100 probes or thermocouples.

Presentation

The Zelio Analog range

The Zelio Analog range has been developed both to take account of the most common applications and to ensure great simplicity of installation:
- pre-set input and output scales, requiring no adjustment
- outputs protected against reverse polarity, overvoltage and short-circuits
- ⎓ 24 V power supply
- sealable protective cover
- rail mounting and screw fixing onto mounting plate
- LED indicator on the front panel
- input and output selector switches on the front panel
- output with fallback value if no input signal is present (due to failure of a sensor, for example).

The Zelio Analog converter range is divided into four families:
- Converters for J and K type thermocouples: **RMT J/K**
- Converters for Universal Pt100 probes: **RMP T●0**
- Converters for Optimum Pt100 probes: **RMP T●3**
- Universal voltage/current converters: **RMC**.

108999

RMT J40BD

108997

RMT K90BD

Converters for J and K type thermocouples

Thermocouples, which consist of two metals with different thermo-electric characteristics, produce a voltage that varies according to temperature. This voltage is transmitted to the Zelio Analog converter which converts it to a standard signal. Converters for thermocouples have cold junction compensation to allow detection of measurement errors induced by the connection to the device itself.

Converters for J and K type thermocouples have :
- for inputs, a pre-set temperature range, depending on the model:
  - Type J: 0...150 °C, 0...300 °C, 0...600 °C
  - Type K: 0...600 °C, 0...1200 °C.
- for outputs, a switchable signal:
  - 0...10 V, 0... 20 mA, 4... 20 mA.

Characteristics : pages 22 and 23
References : page 24
Dimensions : page 25
Schemes : page 25

Analogue interfaces
Zelio Analog
Converters for thermocouples and Pt100 probes
Voltage/current converters

109000

RMP T70BD

Converters for Universal Pt100 probes

Pt100 probes with platinum resistor are electrical conductors whose resistance varies according to the temperature.
This ohmic resistance is transmitted to the Zelio Analog converter which converts it to a standard signal.
Converters for Universal Pt100 probes have:
■ for inputs, a pre-set temperature range, depending on the model:
□ - 100...100 °C,
□ - 40...40 °C,
□ 0...100 °C,
□ 0...250 °C,
□ 0...500 °C.
■ for outputs, a switchable signal:
□ 0... 10 V, 0... 20 mA, 4... 20 mA.
The products in the Universal Pt100 family allow wiring of Pt100 probes in 2, 3 and 4-wire mode.

Converters for Optimum Pt100 probes

Derived from the above family, these converters have:
■ for inputs, a pre-set temperature range identical to that of converters for Universal Pt100 probes.
■ for outputs:
□ a 0... 10V signal dedicated to Zelio Logic analogue inputs.
They allow Pt100 probes to be wired in 2, 3 and 4-wire mode.

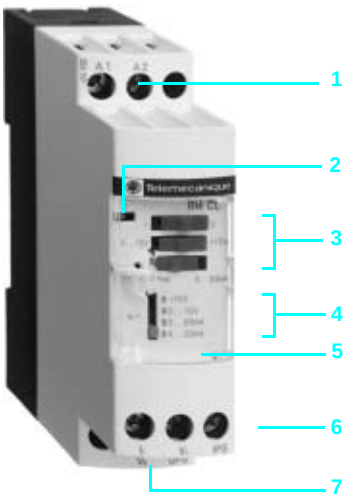
109002

RMC A61BD

Universal voltage/current converters

This family of converters allows the adaptation of electrical values (voltage/current).
Four products are available:
■ a cost effective converter which will convert a 0...10 V signal to a 4...20mA signal or vice versa.
■ a Universal voltage/current converter allowing the most common signals. They have:
□ for inputs, a voltage/current range:
- 0...10 V, ± 10 V, 0...20 mA, 4...20 mA.
□ for outputs, a switchable voltage/current range:
- 0...10 V, ± 10 V, 0...20 mA, 4...20 mA.
■ two Universal voltage/current converters which allow conversion of electrical power signals, both a.c. and d.c.
They have the following, depending on the model:
□ **for voltage inputs**, a range of 0 to 500 V (~ or ⎓)
□ for outputs, a switchable voltage/current range:
- 0...10 V, 0...20 mA, 4...20 mA.
□ **for current inputs**, a range of 0 to 15 A (~ or ⎓)
□ for outputs, a voltage/current range:
- 0...10 V, 0...20 mA, 4...20 mA.

108998



RMC L55BD

Description

Zelio Analog converters have the following on their front panel, depending on the model:
1 Two terminals for ⎓ 24 V supply connection
2 A 'Power ON' LED
3 Three input selector switches (depending on model)
4 An output selector switch (depending on model)
5 A sealable protective cover
6 A screw terminal block for inputs
7 A screw terminal block for outputs.

Characteristics : pages 22 and 23
References : page 24
Dimensions : page 25
Schemes : page 25

Analogue interfaces
Zelio Analog
Converters for thermocouples and Pt100 probes
Voltage/current converters

Environment characteristics

Converter types			RMT J/K●●●●●, RMP ●●●●●, RMC●●●●●
Conforming to standards			IEC 947-1, IEC 584-1 (IEC 751, DIN 43760 for RMP●●●●)
Approvals			UL, CSA, GL, CE
Degree of protection			
	Housing		IP 50
	Terminal block		IP 20
Flame resistance		**°C**	850 conforming to UL, IEC 695-2-1
Shock resistance			50 gn/11ms conforming to IEC 68-2-27
Vibration resistance			5 gn (10...100 Hz) conforming to IEC 68-2-6
Immunity to EMC			
	Resistance to electrostatic discharge	**kV**	Level 3: 8 (air), 6 (contact) conforming to IEC 1000-4-2
	Immunity to fast transient currents	**kV**	On the power supply: 2; on the input-output: 1 conforming to IEC 1004-4
	Surge withstand	**kV**	0.5 - waves 1.2/50µs; 0.5 J conforming to IEC 1000-4-5
Disturbance			
	Radiated/conducted		CISPR11 and CISPR22 Group1- Class B
Insulation voltage		**kV**	2
Ambient air temperature around the device			
	Storage	**°C**	- 40...85 (- 40...185 °F)
	Operation	**°C**	Mounted side-by-side: 0...50 (32...122 °F); 2 cm spacing: 0...60 (32...140 °F)
Degree of pollution			2 conforming to IEC 60 664-1
Mounting			35 mm DIN rail, clip-on or fixed on mounting plate
Connection		**mm²**	2 x1.5 or 1 x 2.5 cable
Tightening torque		**Nm**	0.6...1.1

Specific characteristics

Types of converter for thermocouples			RMT J40BD	RMT J60BD	RMT J80BD	RMT K80BD	RMT K90BD
Input types	Thermocouple type, to IEC 584		J (Fe-CuNi)			K (Ni-CrNi)	
	Temperature range	**°C**	0...150	0...300	0...600	0...600	0...1200
		°F	32...302	32...572	32...1112	12...1112	32...2192
Analogue output switchable to voltage or current							
Voltage	Range	**V**	0...10				
	Minimum impedance of load	**kΩ**	100				
Current	Range	**mA**	0...20; 4...20				
	Maximum impedance of load	Ω	500				
Built-in protection			Reverse polarity, overvoltage (± 30 V) and short-circuit				
Safety feature	Output state when no inputs are wired or when input wire broken		Output predetermined according to type of output selected: voltage = - 13 V current = 0 mA				
Supply							
Voltage	Rated	⎓ **V**	24 ± 20 %, non isolated				
Maximum current consumption	For voltage output	**mA**	40				
	For current output	**mA**	60				
Built-in protection			Reverse polarity				
Signalling			Green LED (power on)				
Measurements							
Accuracy	At 20 °C	**%**	± 1 of the full scale value				
Repeatability error	At 20 °C	**%**	± 0.25 of the full scale value				
	At 60 °C	**%**	± 0.8 of the full scale value				
Temperature coefficient		**ppm/°C**	200 (0.02 %)				
Cold junction compensation			Built-in, cold junction measurement: 0 to 60 °C (0...140 °F)				

Presentation : pages 20 and 21
References : page 24
Dimensions : page 25
Schemes : page 25

Analogue interfaces
Zelio Analog
Converters for thermocouples and Pt100 probes
Voltage/current converters

Specific characteristics (continued)

Types of converter for Pt100 probes			RMP T10/13BD	RMP T20/23BD	RMP T30/33BD	RMP T50/53BD	RMP T70/73BD
Input types	Probe type		Pt100 - IEC 751; DIN 43760 (2, 3, 4-wire)				
	Temperature range	**°C**	- 40...40	- 100...100	0...100	0...250	0...500
		°F	- 40...104	- 148...212	32...212	32...482	32...932
Analogue output							
Output selection			0...10 V/0...20 mA, 4...20 mA switchable for RMP T●0BD				
			0...10 V or 4...20 mA for RMP T●3BD				
Voltage	Minimum impedance of load	**kΩ**	100				
Current	Maximum impedance of load	**Ω**	500				
Built-in protection			Reverse polarity, overvoltage (± 30 V) and short-circuit				
Safety feature	Output state when no inputs are wired or when input wire broken		Output predetermined according to type of output selected: voltage = - 13 V current = 0 mA				
Supply							
Voltage	Rated	**⎓ V**	24 ± 20 %, non isolated				
Maximum current consumption	For voltage output	**mA**	40				
	For current output	**mA**	60				
Built-in protection			Reverse polarity				
Signalling			Green LED (power on)				
Measurements							
Accuracy	At 20 °C	**%**	± 0.5 of the full scale value (3, 4-wire connection) ± 1 of the full scale value (2-wire connection)				
Repeatability error	At 20 °C	**%**	± 0.2 of the full scale value				
	At 60 °C	**%**	± 0.6 of the full scale value				
Temperature coefficient		**ppm/°C**	150 (0.015 %)				
Connection in 2-wire mode							
	Maximum resistance of cable	**mΩ**	200				

Types of voltage/current converters			RMC N22BD	RMC L55BD	RMC V60BD	RMC A61BD
Input types	Voltage	**V**	⎓ 0...10	⎓ 0...10, ±10	0...50; 0...300; 0...500 ⎓ or ∿ 50/60 Hz	–
	Current	**mA**	4...20	0...20; 4...20	–	–
		A	–	–	–	0...1.5; 0...5; 0...15 ⎓ or ∿ 50/60 Hz
Analogue output						
Output selection			By cabling	Switchable	Switchable	By cabling
Voltage	Range	**V**	0...10	0...10; ± 10	0...10	0...10
	Minimum impedance of load	**kΩ**	100			
Current	Range	**mA**	4...20	0...20; 4...20	0...20; 4...20	0...20; 4...20
	Maximum impedance of load	**Ω**	500			
Built-in protection			Reverse polarity, overvoltage (± 30 V) and short-circuit			
Safety	Output state when no inputs are wired or when input wire broken		Output predetermined according to type of output selected: voltage: - 2.5 V current: 6 mA	voltage: - 10…+ 10 V = -10 V 0…+ 10 V = 0 V current: 0…20 mA = 0 mA 4…20 mA = 4 mA	voltage: 0 V current: 0…20 mA = 0 mA 4…20 mA = 4 mA	
Supply						
Voltage	Rated	**V**	⎓ 24 ± 20 % non isolated	⎓ 24 ± 20 % isolated (1.5 kV)		
Maximum current consumption	For voltage output	**mA**	40	70		
	For current output	**mA**	60	90		
Built-in protection			Reverse polarity			
Signalling			Green LED (power on)			
Measurements						
Accuracy	At 20 °C	**%**	± 1 of the full scale value		± 5 of the full scale value	
Repeatability error	At 20 °C	**%**	± 0.2 of the full scale value			
	At 60 °C	**%**	± 0.6 of the full scale value			
Temperature coefficient		**ppm/°C**	200 (0.02 %)			0...1.5 A: 500 (0.05 %) 0...5 A: 1000 (0.1 %) 0..0.15 A: 2000 (0.2 %)

Presentation : pages 20 and 21 | References : page 24 | Dimensions : page 25 | Schemes : page 25

Analogue interfaces

Zelio Analog

Converters for thermocouples and Pt100 probes
Voltage/current converters

RMT J40BD

RMT K90BD

Converters for J and K type thermocouples

Supply voltage ⎓ 24 V ± 20 %, non isolated

Type	Temperature range °C	Temperature range °F	Switchable output signal	Reference	Weight kg
Type J	0…150	32…302	0…10 V, 0…20 mA, 4…20 mA	**RMT J40BD**	0.120
	0…300	32…572	0…10 V, 0…20 mA, 4…20 mA	**RMT J60BD**	0.120
	0…600	32…1112	0…10 V, 0…20 mA, 4…20 mA	**RMT J80BD**	0.120
Type K	0…600	32…1112	0…10 V, 0…20 mA, 4…20 mA	**RMT K80BD**	0.120
	0…1200	32…2192	0…10 V, 0…20 mA, 4…20 mA	**RMT K90BD**	0.120

RMP T70BD

Converters for Universal Pt100 probes

Supply voltage ⎓ 24 V ± 20 %, non isolated

Type	Temperature range °C	Temperature range °F	Switchable output signal	Reference	Weight kg
Pt100 2-wire, 3-wire and 4-wire	- 40…40	- 40…104	0…10 V, 0…20 mA, 4…20 mA	**RMP T10BD**	0.120
	- 100…100	- 148…212	0…10 V, 0…20 mA, 4…20 mA	**RMP T20BD**	0.120
	0…100	32…212	0…10 V, 0…20 mA, 4…20 mA	**RMP T30BD**	0.120
	0…250	32…482	0…10 V, 0…20 mA, 4…20 mA	**RMP T50BD**	0.120
	0…500	32…932	0…10 V, 0…20 mA, 4…20 mA	**RMP T70BD**	0.120

RMP T13BD

Converters for Optimum Pt100 probes *(1)*

Supply voltage ⎓ 24 V ± 20 %, non isolated

Type	Temperature range °C	Temperature range °F	Output signal	Reference	Weight kg
Pt100 2-wire, 3-wire and 4-wire	- 40…40	- 40…104	0…10 V or 4…20 mA	**RMP T13BD**	0.120
	- 100…100	- 148…212	0…10 V or 4…20 mA	**RMP T23BD**	0.120
	0…100	32…212	0…10 V or 4…20 mA	**RMP T33BD**	0.120
	0…250	32…482	0…10 V or 4…20 mA	**RMP T53BD**	0.120
	0…500	32…932	0…10 V or 4…20 mA	**RMP T73BD**	0.120

RMC N22BD

Universal voltage/current converters

Supply voltage ⎓ 24 V ± 20 %, non isolated

Input signal	Output signal	Reference	Weight kg
0…10 V or 4…20 mA	0…10 V or 4…20 mA	**RMC N22BD**	0.120

Supply voltage ⎓ 24 V ± 20 %, isolated

Input signal	Output signal	Reference	Weight kg
0…10 V, ± 10 V, 0…20 mA, 4…20 mA	Switchable: 0…10 V, ± 10 V, 0…20 mA, 4…20 mA	**RMC L55BD**	0.120
0…50 V, 0…300 V, 0…500 V ⎓ or ∿ 50/60 Hz	Switchable: 0…10 V, 0...20 mA, 4…20 mA	**RMC V60BD**	0.150
0…1.5 A, 0…5 A, 0…15 A ⎓ or ∿ 50/60 Hz	0…10 V or 0...20 mA or 4…20 mA	**RMC A61BD**	0.150

RMC L55BD

RMC A61BD

Connection accessories

Description	Type	Sold in lots of	Unit reference	Weight kg
Terminal blocks for connection of protective earth conductor	Screw	100	**AB1 RRTP435U**	0.025
	Spring	100	**AB1 RRTP435U2**	0.015

(1) Converters dedicated to Zelio Logic smart relays.

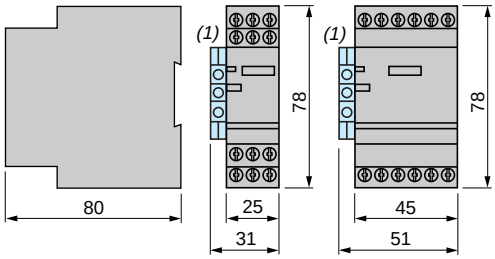
Presentation : pages 20 and 21
Characteristics : pages 22 and 23
Dimensions : page 25
Schemes : page 25

Analogue interfaces
Zelio Analog
Converters for thermocouples and Pt100 probes
Voltage/current converters

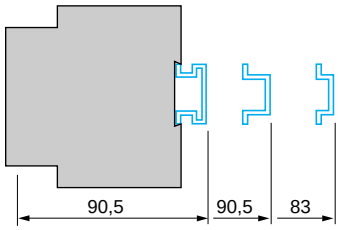
Dimensions, mounting

RMT ●●●●●/RMP ●●●●●/RMC ●●●●●

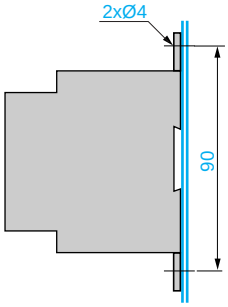
RMT ●●●●●●RMC A61BD
RMP ●●●●●●
RMC ●●●●●●



Mounting on rails **AM1 ●●●●●**



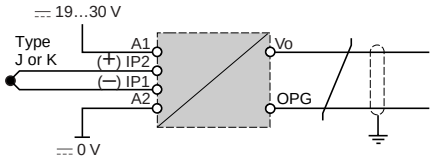
Panel mounting



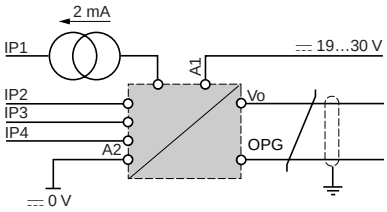
*(1) Terminal block **AB1 RRTP435U** or **AB1 RRTP435U2**.*

Schemes

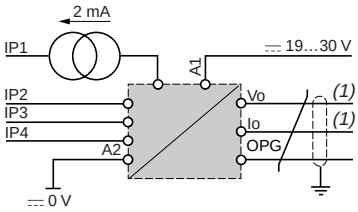
RMT J●●●●, RMT K●●●●



RMP T●0BD



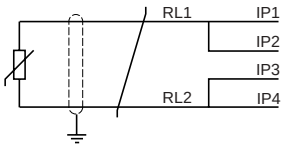
RMP T●3BD



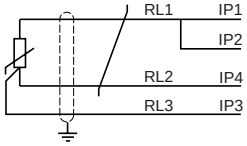
(1) Use one output only.

Input connections on RMP T●●●●●

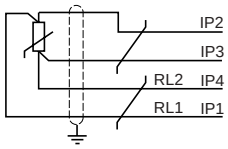
2-wire type
RL1 + RL2 ≤ 200 mΩ



3-wire type
RL1 = RL2 = RL3
RL1 + RL2 ≤ 200 Ω

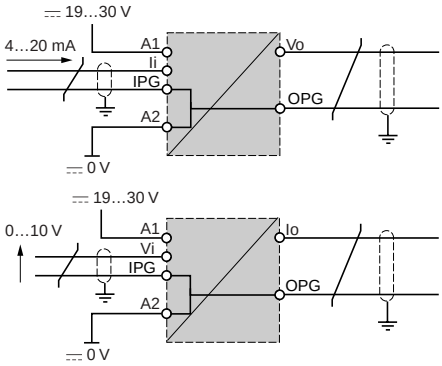


4-wire type
RL1 + RL2 ≤ 200 Ω

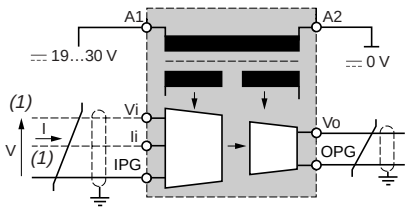


RMC ●●●●●

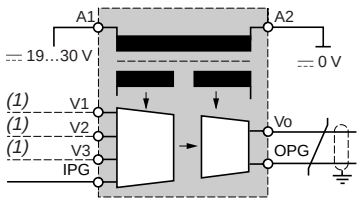
RMC N22BD



RMC L55BD



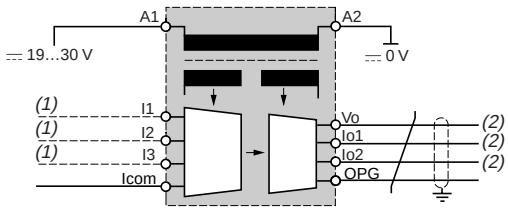
RMC V60BD



(1) Use one input only.

(1) Use one input only.

RMC A61BD



(1) Use one input only.
(2) Use one output only.

Presentation : pages 20 and 21
Characteristics : pages 22 and 23
References : page 24

Power supplies and transformers
Power supply for d.c. control circuits
Phaseo modular regulated power supplies

ABL 7RM modular switch mode power supplies

The ABL 7RM range of power supplies is designed to provide the d.c. voltage necessary for the control circuits of control system equipment. Comprising 2 products, this range meets the needs encountered in industrial, commercial and residential applications. These single-phase, modular, electronic switch mode power supplies provide a quality of output current which is suitable for the loads supplied and compatible with the Zelio Logic range, making them ideal partners. Clear guidelines are given on selecting the upstream protection devices which are often used with them, and thus a comprehensive solution is provided which can be used in total safety.

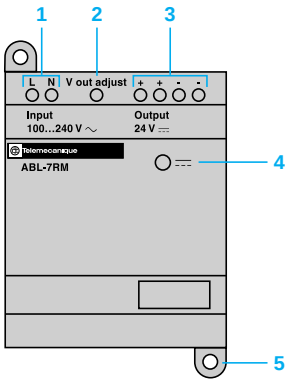
These switch mode power supplies are totally electronic and regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies, which offer:
- very compact size,
- integrated overload, short-circuit, overvoltage and undervoltage protection,
- a very wide range of permissible input voltages, without any adjustment,
- a high degree of output voltage stability,
- good performance,
- considerably reduced weight,
- a modular format allowing integration into panels.

Phaseo power supplies are single-phase. They deliver a voltage which is precise to 3 %, whatever the load and whatever the type of mains supply, within a range of 85 to 264 V for single-phase. Conforming to IEC standards and UL and CSA certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.
All the products are fitted with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs.
These power supplies are designed for direct mounting on 35 and 75 mm ⊔ rails, or on a mounting plate by means of retractable fixing lugs.

These power supplies are single-phase and two references are available:

- ABL 7RM2401 (24 V ⎓/1.3 A).
- ABL 7RM1202 (12 V ⎓/1.9 A).

Description



1 2.5 mm² screw terminal for connection of the incoming a.c. supply voltage.
2 Output voltage adjustment potentiometer.
3 2.5 mm² screw terminal for connection of the output voltage.
4 LED indicating presence of the d.c. output voltage.
5 Retractable fixing lugs.

Characteristics : page 27
References : page 29
Dimensions : page 29

Power supplies and transformers

Power supply for d.c. control circuits
Phaseo modular regulated power supplies

Technical characteristics

Type of power supply			**ABL 7RM1202**	**ABL 7RM2401**
Approvals			UL - CSA - TÜV	
Conforming to standards	Safety		IEC/EN 60950 - IEC/EN 61131-2/A11	
	EMC		EN 50081-1, IEC 61000-6-2 (EN 50082-2)	
Input circuit				
LED indication			No	No
Input voltage	Rated values	**V**	∿ 100…240	∿ 100…240
	Permissible values	**V**	∿ 85…264	∿ 85…264
	Permissible frequencies	**Hz**	47…63	47…63
	Efficiency at nominal load		> 80%	> 80%
	Current consumption	**A**	0.5 (100 V)/0.3 (240 V)	0.6 (100 V)/0.4 (240 V)
	Current at switch-on	**A**	< 20	< 20
	Power factor		0.6	0.6
Output circuit				
LED indication			Green LED	Green LED
Nominal output voltage		**V**	⎓ 12	⎓ 24
Nominal output current		**A**	1.9	1.3
Precision	Output voltage		Adjustable 100 to 120 %	
	Line and load regulation		± 4 %	± 3 %
	Residual ripple - interference	**mV**	200	250
Micro-breaks	Holding time for I max and Ue min	**ms**	> 10	> 10
Protection	Short-circuit		Permanent/Thermal protection	
	Overcurrent, cold state		< 1.7 In	< 1.6 In
	Undervoltage	**V**	< 10.5	< 19
Operating characteristics				
Connections	Input	**mm²**	1 x 2.5 or 2 x 1.5 screw terminals	
	Output	**mm²**	1 x 2.5 or 2 x 1.5 screw terminals	
Environment	Storage temperature	**°C**	-25 to +70	
	Operating temperature	**°C**	-25 to +55	
	Maximum relative humidity		95 %	
	Degree of protection		IP2x	
	Vibrations		EN 61131-2, IEC 68-2-6 test Fc	
Operating position			Vertical	
MTBF			Not available	
Connections	Series		No	
	Parallel		Yes (same references)	
Dielectric strength	Input/output		3000 V∿/50 Hz/1 min	
Protection class conforming to VDE 0106 1			Class II without PE	
Input fuse incorporated			Yes (not interchangeable)	
Emissions	Conducted/radiated		EN 50081-1 (generic standard), EN 55011, EN 55022 Cl:B	
Immunity	Electrostatic discharge		EN 61000-6-2 (generic standard), EN 61000-4-2 (4 kV contact/8 kV air)	
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)	
	Conducted interference		EN 61000-4-4 level 3 (2 kV), EN 61000-4-6 (10 V)	
	Mains interference		EN 61000-4-11	

Presentation : page 26
References : page 29
Dimensions : page 29

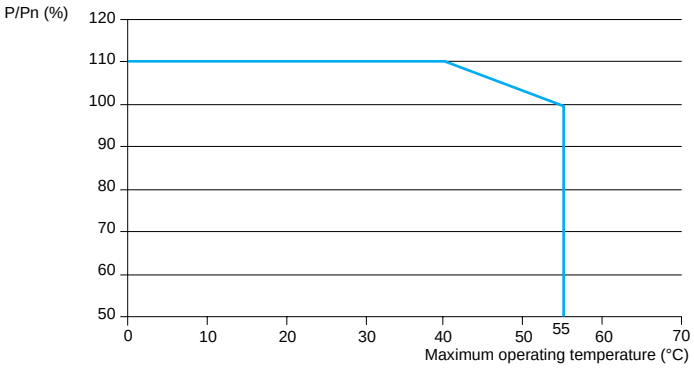
Power supplies and transformers
Power supply for d.c. control circuits
Phaseo modular regulated power supplies

Output characteristics

Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced. Conversely, a power supply can deliver more than its rated power if the ambient temperature remains well below the nominal operating temperature.

The maximum ambient temperature for Phaseo power supplies is 55 °C. Below this temperature, uprating is possible up to 110 % of the nominal power.
The graph below shows the power (in relation to the nominal power) which the power supply can deliver continuously, according to the ambient temperature.



Selection

Upstream protection of power supplies

Mains supply	∿ 115 V single-phase			∿ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-breaker		Gg fuse	Thermal-magnetic circuit-breaker		Gg fuse
Single-pole	GB2 CB●●	-	-	-	-	-
2-pole	GB2 DB●●	C60N	-	GB2 DB●●	C60N	-
ABL 7RM2401	GB2 CB/DB06	MG24516 *(1)* 24184	1 A	GB2 CB/DB07	MG24517 *(1)* 24185	1 A
ABL 7RM1202	GB2 CB/DB06	MG24516 *(1)* 24184	1 A	GB2 CB/DB07	MG17453 *(1)* 24185	1 A

(1) UL certified circuit-breaker

Presentation : page 26
References : page 29
Dimensions : page 29

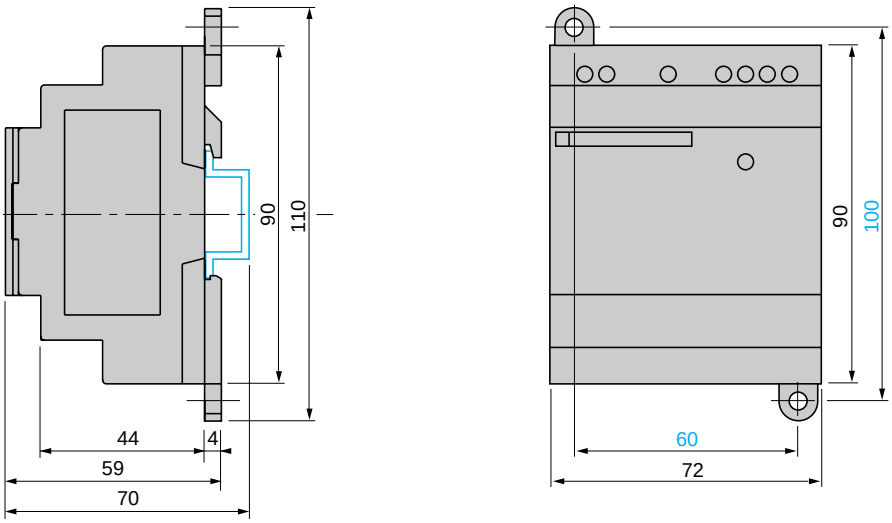
Power supplies and transformers
Power supply for d.c. control circuits
Phaseo modular regulated power supplies

ABL 7RM modular regulated switch mode power supplies

Mains input voltage 47…63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Reference	Weight
V	⎓ V	W	A			kg
100…240 single-phase wide range	12	22	1.9	auto	**ABL 7RM1202**	0.180
	24	30	1.3	auto	**ABL 7RM2401**	0.182

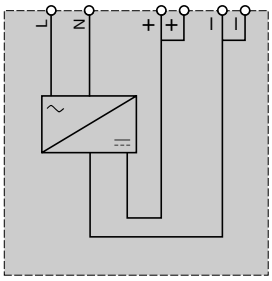
Dimensions

ABL 7RM●●●● power supply



Scheme

ABL 7RM●●●●



Presentation : page 26
Characteristics : page 27

Schneider Electric worldwide

Up-dated: 28-07-2003

Afghanistan	Contacts are assured by	**Schneider Electric India**		
Albania	Contacts are assured by	**Schneider Electric Austria**		
Algeria	■ Schneider Electric	voie A Lot C22 Zone industrielle Rouiba - Alger	Tel. : +213 21 92 97 02 à 09 Fax : +213 21 92 97 00 à 01	
Andorra	Contacts are assured by	**Schneider Electric France**		
Angola	Contacts are assured by	**Schneider Electric South Africa**		
Anguilla	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Antartica	Contacts are assured by	**Schneider Electric Brazil**		
Antigua & Barbuda	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Argentina	■ Schneider Argentina	Viamonte 2850 - 1678 Caseros (provincia Buenos Aires)	Tel.: +54 1 716 88 88 Fax: +54 1 716 88 33	**www.schneider-electric.com.ar**
Armenia	Contacts are assured by	**Schneider Electric Russian Fed.**		
Aruba	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Australia	■ Schneider Electric (Australia) Pty. Limited	2 Solent Circuit Norwest Business Park Baulkham Hill _ NSW 2153	Tel.: +61 298 51 28 00 Fax: +61 296 29 83 40	**www.schneider.com.au**
Austria	■ Schneider Austria Ges.m.b.H.	Birostrasse 11 1239 Wien	Tel.: +431 610 540 Fax: +431 610 54 54	**www.schneider-electric.at**
Azerbaijan	Contacts are assured by	**Schneider Electric Russian Fed.**		
Bahamas	■ Schneider Electric	Union Village PO Box 3901 - Nassau	Tel. : +1 242 327 42 91 Fax : +1 242 327 42 91	**www.squared.com**
Bahrain	■ Schneider Electric	Floor 1 - Juma Building Abu Horaira Avenue PO Box 355 - 304 Manama	Tel.: +97 322 7897 Fax: +97 321 8313	
Bangladesh	Contacts are assured by	**Schneider Electric India**		
Barbados	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Belarus	■ Schneider Electric Industries SA	Prospect Macherova 5, of. 202 220004 Minsk	Tel. : +375 172 23 75 50 Fax : +375 172 23 97 61	
Belgium	■ Schneider Electric nv/sa	Dieweg 3 B - 1180 Brussels	Tel.: +3223737711 Fax: +3223753858	**www.schneider-electric.be**
Belize	Contacts are assured by	**Schneider Electric USA**		
Benin	Contacts are assured by	**Schneider Electric Ivory Coast**		
Bermuda	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Bhutan	Contacts are assured by	**Schneider Electric India**		
Bolivia	Contacts are assured by	**Schneider Electric Chile**		
Bosnia and Herzegovina	Contacts are assured by	**Schneider Electric Croatia**		
Botswana	Contacts are assured by	**Schneider Electric South Africa**		
Bouvet island	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Brazil	■ Schneider Electric Brazil Ltda.	Avenida Das Nações Unidas 23223 Jurubatuba - CEP 04795-907 São Paulo-SP	Tel.: +55 55 24 52 33 Fax: +55 55 22 51 34	**www.schneider-electric.com.br**
Brunei (Darussalam)	Contacts are assured by	**Schneider Electric Singapore**		
Bulgaria	■ Schneider Electric	Expo 2000, Boulevard Vaptzarov 1407 Sofiav	Tel.: +3592 919 42 Fax: +3592 962 44 39	**www.schneiderelectric.bg**
Burkina Faso	Contacts are assured by	**Schneider Electric Ivory Coast**		
Burundi	Contacts are assured by	**Schneider Electric Kenya**		
Cambodia	Contacts are assured by	**Schneider Electric Viet Nam**		
Cameroon	■ Schneider Electric Cameroon	166, rue de l'Hôtel de Ville BP12087 - Douala	Tel.: +237 343 38 84 Fax: +237 343 11 94	
Canada	■ Schneider Canada	19, Waterman Avenue M4 B1Y2 Toronto - Ontario	Tel.: +1 416 752 8020 Fax: +1 416 752 4203	**www.schneider-electric.ca**
Cape Verde	Contacts are assured by	**Schneider Electric Senegal**		
Caribee	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Cayman islands	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Central African Republic	Contacts are assured by	**Schneider Electric Cameroon**		
Chad	Contacts are assured by	**Schneider Electric Cameroon**		
Chile	■ Schneider Electric Chile S.A.	Avda. Pdte Ed. Frei Montalva, 6001-31 Conchali - Santiago	Tel.: +56 2 444 3000 Fax: +56 2 423 9335	**www.schneider-electric.co.cl**
China	■ Schneider Beijing	Landmark bldg-Room 1801 8 North Dong Sanhuan Rd Chaoyang District 100004 Beijing	Tel.: +86 10 65 90 69 07 Fax: +86 10 65 90 00 13	**www.schneider-electric.com.cn**

Schneider Electric worldwide

Up-dated: 28-07-2003

Christmas island	Contacts are assured by	**Schneider Electric Australia**		
Cocos (Keeling) islands	Contacts are assured by	**Schneider Electric Australia**		
Colombia	■ Schneider Electric de Colombia S.A.	Calle 45A #102-48 Bogota DC	Tel.: +57 1 426 97 00 Fax: +57 1 426 97 40	
Comoros	Contacts are assured by	**Schneider Electric la Reunion**		
Congo	Contacts are assured by	**Schneider Electric Cameroon**		
Cook islands	Contacts are assured by	**Schneider Electric Australia**		
Costa Rica	■ Schneider Centroamérica Ltda.	1.5 kmts oeste de la Embajada Americana, Pavas, San José, Costa Rica C.A. Apartado: 4123-1000 San Jose	Tel.: +506 232-60-55 Fax: +506 232-04-26	**www.schneider-ca.com**
Croatia	■ Schneider Electric SA	Fallerovo Setaliste 22 HR - 10000 Zagreb	Tel.: +385 1 367 100 Fax: +385 1 367 111	
Cuba	■ Schneider Electric	Bureau de Liaison de La Havane Calle 36- N°306-Apto1 Entre 3ra y 5ta Avenida Miramar Playa Habana	Tel.: +53 724 15 59 Fax: +53 724 12 17	
Cyprus	■ Schneider Electric Cyprus	28 General Timayia Avenue Kyriakos Building, Block #A301 Larnaca 6046	Tel.: +00357 248 12646 Fax: +00357 246 37382	
Czech Republic	■ Schneider Electric CZ, s.r.o.	Thámova 13 Praha 8 - 186 00	Tel.: +420 2 810 88 111 Fax: +420 2 24 81 08 49	**www.schneider-electric.cz**
Democratic Rep. of Congo	Contacts are assured by	**Schneider Electric Cameroon**		
Denmark	■ Schneider Electric A/S	Baltorpbakken 14 DK-2750 Ballerup	Tel.: +45 44 73 78 88 Fax: +45 44 68 5255	**www.schneider-electric.dk**
Djibouti	Contacts are assured by	**Schneider Electric Egypt**		
Dominican Republic	■ Schneider Electric	Calle Jacinto Manon Esq. Federico Geraldino Edificio D' Roca Plaza Suite 402, Ens. Paraiso - Santo Domingo	Tel.: +1 809 334 66 63 Fax: +1 809 334 66 68	
Ecuador	■ Schneider Electric Ecuador SA	Av.Republica del Salvador 1082 y Nac Edificio Mansion Blanca-Quito	Tel. : +593 2 224 42 42 Fax : +593 2 224 42 94	
Egypt	■ Schneider Electric Egypt sae	68, El Tayaran Street Nasr City, 11371 - Cairo	Tel.: +20 24 01 01 19 Fax: +20 24 01 66 87	**www.schneider.com.eg**
El Salvador	Contacts are assured by	**Schneider Electric USA**		
Equatorial Guinea	Contacts are assured by	**Schneider Electric Cameroon**		
Eritrea	Contacts are assured by	**Schneider Electric Egypt**		
Estonia	■ Lexel Electric	Ehitajate tee 110 EE 12618 Talinn	Tel. : +372 650 97 00 Fax : +372 650 97 22	
Ethiopia	Contacts are assured by	**Schneider Electric Egypt**		
Falkland islands	Contacts are assured by	**Schneider Electric Brazil**		
Faroe islands	Contacts are assured by	**Schneider Electric Australia**		
Fiji	Contacts are assured by	**Schneider Electric Australia**		
Finland	■ Schneider Electric Oy	Sinimäentie 14 02630 Espoo	Tel. : +358 9 527 000 Fax : +358 9 5270 0376	**www.schneider-electric.fi**
France	■ Schneider Electric SA	5, rue Nadar 92500 Rueil Malmaison	Tel.: +33 (0)1 41 29 82 00 Fax: +33 (0)1 47 51 80 20	**www.schneider-electric.fr**
French Polynesia	Contacts are assured by	**Schneider Electric Australia**		
French West Indies	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Gabon	Contacts are assured by	**Schneider Electric Cameroon**		
Gambia	Contacts are assured by	**Schneider Electric Senegal**		
Georgia	Contacts are assured by	**Schneider Electric Russian Fed.**		
Germany	■ Schneider Electric GmbH	Gothaer Straße 29 D-40880 Ratingen	Tel.: +49210 240 40 Fax: +492 10 240 49 256	**www.schneiderelectric.de**
Ghana	■ Schneider Electric Ghana	PMB Kia 3rd Floor Opeibea House Airport Commercial Center Liberation road - Accra	Tel. : +233 21 70 11 687 Fax : +233 21 77 96 22	
Gilbraltar	Contacts are assured by	**Schneider Electric Spain**		
Greece	■ Schneider Electric AE	14th km - RN Athens-Lamia GR - 14564 Kifissia	Tel.: +302 106 29 52 00 Fax: +302 106 29 52 10	**www.schneider-electric.com.gr**
Greenland	Contacts are assured by	**Schneider Electric United States**		
Grenada	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Guadeloupe	Contacts are assured by	**Schneider Electric Martinique**		
Guam	Contacts are assured by	**Schneider Electric Australia**		

Schneider Electric worldwide

Up-dated: 28-07-2003

Guatemala	Contacts are assured by	**Schneider Electric United States**		
Guinea-Bissau	Contacts are assured by	**Schneider Electric Sénégal**		
Guinea	Contacts are assured by	**Schneider Electric Ivory Coast**		
Guyana	Contacts are assured by	**Schneider Electric United States**		
Haiti	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Heard & Mac Donald isl.	Contacts are assured by	**Schneider Electric Australia**		
Honduras	Contacts are assured by	**Schneider Electric United States**		
Hong Kong	■ Schneider Electric (Hong Kong) Ltd	Room 3108-28, 31th Floor, Sun Hung Kai Centre, 30 Harbour Road, Wanchai	Tel.: +852 25 65 06 21 Fax: +852 28 11 10 29	
Hungary	■ Schneider Electric Hungária Villamossági Rt.	Fehérvári út 108 – 112 H-1116 Budapest	Tel.: +36 1 382 26-06 Fax: +36 1 206 1429	**www.schneider-electric.hu**
Iceland	Contacts are assured by	**Schneider Electric Denmark**		
India	■ Schneider Electric India	Max House, 1 Dr Jha Marg, Okhla 110 020 New Dehli	Tel. : +91 11 631 85 84 Tel. : +91 11 631 71 61	**www.schneiderelectric-in.com**
Indonesia	■ P.T. Schneider Indonesia	Ventura Building 7th Floor Jalan R.A. Kartini Kav.26 Cilandak - 12430 Jakarta	Tel.: +62 +21 750 44 06 Fax: +62 +21 750 44 15/ 16	**www.schneider-electric.co.id**
Iran (Islamic Republic of)	■ Telemecanique Iran	1047 Avenue VALI ASSR P.O. Box 15875-3547 15116 Teheran	Tel.: +98 218 71 01 42 Fax: +98 218 71 81 87	
Irak	■ Schneider Electric Industries SA	38050 Grenoble Cedex 9	Tel.: +33 04 76 60 54 27 Fax: +33 04 76 60 56 60	
Ireland	■ Schneider Electric Ireland	Maynooth Road Cellbridge - Co. Kildare	Tel.: +353+0 1 6012200 Fax: +353+0 1 6012201	**www.schneiderelectric.ie**
Italy	■ Schneider Electric S.p.A.	Centro Direzionale Colleoni Palazzo Sirio - Viale Colleoni, 7 20041 Agrate Brianza (Mi)	Tel.: +39 39 655 8111 Fax: +39 39 605 6237	**www.schneiderelectric.it**
Ivory Coast	■ Schneider Electric Afrique de l'Ouest	Rue Pierre et Marie Curie 18 BP 2027 Abidjan 18	Tel.: +225 21 75 00 10 Fax: +225 21 75 00 30	
Jamaica	■ Schneider Electric	Shop#5, Plaza Dunrobin 30 Dunrobin Avenue - Kingstown	Tel. : +1876 755 41 27 Tel. : +931 87 74	
Japan	■ Schneider Electric Japan Ltd	Torigoe F. Bldg 1-8-2, Torigoe Taito-Ku - 111-0054 Tokyo	Tel.: +81 358 35 35 81 Fax: +81 358 35 35 85	**www.schneider-electric.co.jp**
Jordan	■ Schneider Electric Industr. Jordan	Jordan University Street Abu Al Haj Commercial Complex 2nd Floor - Office # 202 - Amman	Tel.: 962 65 16 78 87 Fax: 962 65 16 79 1	
Kazakstan	■ Schneider Electric Kazakhstan Liaison Office	Prospekt Abaia 157 off 9 480009 Almaty	Tel. : +7 327 250 93 88 Tel. : +7 327 250 63 70	
Kenya	■ Schneider East Africa	Power Technics Complex Monbasa Road - PO Box 46345 Nairobi	Tel. : +254 2.824.156 Fax : +254 2.824.157	
Kiribati	Contacts are assured by	**Schneider Electric Australia**		
Korea	■ Schneider Electric Korea Ltd	3Floor, Cheil Bldg., 94-46, 7-Ka Youngdeungpodong, Youngdeungpo-ku 150-037 Seoul	Tel. : +82 2 2630 9700 Fax : +82 2 2630 9800	**www.csinfo.co.kr/schneider/**
Kurdistan	Contacts are assured by	**Schneider Electric Russian Fed.**		
Kuwait	■ Schneider Electric Kuwait	Al Gaas Tower - Sharq 2nd Floor PO Box 20092 - 13 061 Safat	Tel.: +965 240 75 46 Fax: +965 240 75 06	
Kyrgyz Republic	Contacts are assured by	**Schneider Electric Russian Fed.**		
Laos	Contacts are assured by	**Schneider Electric Thailand**		
Latvia	■ Lexel Electric	60A A.Deglava str. LV1035 Riga	Tel. : +371 780 23 74/75 Fax : +371 754 62 80	
Lebanon	■ Schneider Electric Liban	Tabaris, Avenue Charles Malek Immeuble Ashada, 8 P.O. Box 166223 - Beyrouth	Tel. : +961 1 20 46 20 Tel. : +961 1 20 31 19	
Lesotho	Contacts are assured by	**Schneider Electric South Africa**		
Liberia	Contacts are assured by	**Schneider Electric Ghana**		
Libya	Contacts are assured by	**Schneider Electric Tunisia**		
Liechtenstein	Contacts are assured by	**Schneider Electric Switzerland**		
Lithuania	■ Lexel Electric	44, Verkiu str. LT-2012 Vilnius	Tel. : +370 278 59 59/61 Fax : +370 278 59 60	
Loro Sae	Contacts are assured by	**Schneider Electric Australia**		
Luxembourg	■ Schneider Electric Industrie SAS	Agence de Metz 1, Rue Graham Bell - BP n° 35190 57075 Metz cedex 3 - France	Tel.: 33 03 87 39 06 03 Fax: 33 03 87 74 25 96	**www.schneider-electric.fr**

Schneider Electric worldwide

Up-dated: 28-07-2003

Macau	Contacts are assured by	**Schneider Electric China**		
Macedonia	Contacts are assured by	**Schneider Electric Bulgaria**		
Madagascar	Contacts are assured by	**Schneider Electric la Reunion**		
Malawi	Contacts are assured by	**Schneider Electric South Africa**		
Malaysia	■ Schneider Electric (Malaysia) Sdn Bhd	No.11 Jalan U1/19, Seksyen U1 Hicom-Glenmarie Industrial Park 40150 Shah Alam Selangor Darul Ehsan	Tel. : (603) 7883 6333 Fax : (603) 7883 6188	**www.schneider-electric.com.my**
Maldives	Contacts are assured by	**Schneider Electric Reunion**		
Mali	Contacts are assured by	**Schneider Electric Senegal**		
Malta	Contacts are assured by	**Schneider Electric Tunisia**		
Marshall islands	Contacts are assured by	**Schneider Electric Australia**		
Martinique	■ Schneider Electric	Schneider Electric Immeuble Cottrell - ZI de la Lézarde 97232 Le Lamentin	Tel.: +05 96 51 06 00 Fax: +05 96 51 11 26	
Mauritania	Contacts are assured by	**Schneider Electric Senegal**		
Mauritius	■ Schneider Electric	Route côtière Calodyne - Mauritius	Tel.: 230 282 18 83 Fax: 230 282 18 84	
Mayotte	Contacts are assured by	**Schneider Electric Reunion**		
Mexico	■ Groupe Schneider Mexico	Calz. Rojo Gomez N° 1121-A Col. Guadalupe del Moral México, D.F. - C.P. 09300	Tel.: +525 686 30 00 Fax: +525 686 24 09	**www.schneider-electric.com.mx**
Micronesia	Contacts are assured by	**Schneider Electric Australia**		
Moldova	Contacts are assured by	**Schneider Electric Romania**		
Monaco	Contacts are assured by	**Schneider Electric France**		
Mongolia	Contacts are assured by	**Schneider Electric Russian Fed.**		
Montserrat	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Morocco	■ Schneider Electric Morocco	26, rue Ibnou Khalikane Quartier Palmiers 20100 Casablanca	Tel.: +212 299 08 48 to 57 Fax: +212 299 08 67 and 69	**www.schneider.co.ma**
Mozambique	Contacts are assured by	**Schneider Electric South Africa**		
Myanmar	Contacts are assured by	**Schneider Electric Singapore**		
Namibia	Contacts are assured by	**Schneider Electric South Africa**		
Nauru	Contacts are assured by	**Schneider Electric Australia**		
Nepal	Contacts are assured by	**Schneider Electric India**		
Netherlands	■ Schneider Electric BV	Waarderweg 40 - Postbus 836 2003 RV Haarlem	Tel.: +31 23 512 4124 Fax: +31 23 512 4100	**www.schneider-electric.nl**
Netherlands Antilles	Contacts are assured by	**Schneider Electric Dominican Rep.**		
New Caledonia	Contacts are assured by	**Schneider Electric Australia**		
New Zealand	■ Schneider Electric (NZ) Ltd	14 Charann Place Avondale P.O. Box 15355 - New Lynn Auckland	Tel. : +64 9 829 04 90 Fax : +64 9 829 04 91	**www.schneider-electric.co.nz**
Nicaragua	Contacts are assured by	**Schneider Electric United States**		
Niger	Contacts are assured by	**Schneider Electric Ivory Coast**		
Nigeria	■ Schneider Electric Nigeria Limited	Biro plaza - 8th Floor - Plot 634 Abeyemo Alakija Street Victoria Islan - Lagos	Tel. : +234 1 2702973 Fax : +234 1 2702976	
Niue	Contacts are assured by	**Schneider Electric Australia**		
Norfolk island	Contacts are assured by	**Schneider Electric Australia**		
North Korea	Contacts are assured by	**Schneider Electric China**		
Northern Mariana islands	Contacts are assured by	**Schneider Electric Australia**		
Norway	■ Schneider Electric Norge A/S	Solgaard Skog 2 Postboks 128 - 1501 Moss	Tel.: +47 6924 9700 Fax: +47 6925 7871	**www.schneider-electric.no**
Oman	■ Schneider Electric CA	c/o Arab Development Co PO Box 439 - 113 Muscat	Tel.: +968 77 163 64 Fax: +968 77 104 49	
Pakistan	■ Schneider Electric Pakistan	43-L, 2nd floor, M.M. Alam Road, Gulberg II - Lahore	Tel.: +92 42 5754471 à 73 Fax: +92 42 5754474	
Palau	Contacts are assured by	**Schneider Electric Australia**		
Panama	Contacts are assured by	**Schneider Electric United States**		
Papua New Guinea	Contacts are assured by	**Schneider Electric Australia**		
Paraguay	Contacts are assured by	**Schneider Electric Uruguay**		

Schneider Electric worldwide

Up-dated: 28-07-2003

Peru	■ Schneider Electric Peru S.A.	Los Telares n°231 Urb. Vulcano, Ate Lima 03	Tel.: +511 348 44 11 Fax: +511 348 05 23	**www.schneider-electric.com.pe**
Philippines	■ Schneider Electric Philippines, Inc	5th Floor, ALCO Building 391 Sen, Gil Puyat Avenue Makati 1209	Tel. : +632 896 6063 Fax : +632 896 7229	
Pitcairn	Contacts are assured by	**Schneider Electric Australia**		
Poland	■ Schneider Electric Polska Sp.zo.o.	ul. Lubinowa 4a 03-878 - Warszawa	Tel.: +48 22 511 8 200 Fax: +48 22 511 8 210	**www.schneider-electric.pl**
Portugal	■ Schneider Electric Portugal	Av.do Forte, 3 Edificio Suécia II, Piso 3-A CP 2028 Carnaxide 2795 Linda-A-Velha	Tel.: +351 21 416 5800 Fax: +351 21 416 5857	**www.schneiderelectric.pt**
Puerto Rico	Contacts are assured by	**Schneider Electric United States**		
Qatar	■ Schneider Electric Qatar Branch	c/o Khalifa BinFahred Al Thani Trad.and Co - P.O. Box 4484 Doha	Tel.: +97 4424358 Fax: +97 4424358	
Reunion	■ Schneider Electric	Immeuble Futura, 190, rue des 2 canons BP 646 - 97497 Sainte Clothilde	Tel.: +262 28 14 28 Fax: +262 28 39 37	
Romania	■ Schneider Electric	Bd Ficusului n°42 Apimondia, Corp.A, et.1, Sector 1 Bucuresti	Tel.: +401 203 06 50 Fax: +401 232 15 98	**www.schneider-electric.ro**
Russian Federation	■ Schneider Electric ZAO	Enisseyskaya 37 129 281 Moscow	Tel.: +7095 797 40 00 Fax: +7095 797 40 03	**www.schneider-electric.ru**
Rwanda	Contacts are assured by	**Schneider Electric Kenya**		
Samoa	Contacts are assured by	**Schneider Electric Australia**		
San Marino	Contacts are assured by	**Schneider Electric Italy**		
Sandwich & Georgia island	Contacts are assured by	**Schneider Electric Australia**		
Sao Tome & Principe	Contacts are assured by	**Schneider Electric Senegal**		
Saudi Arabia	■ Schneider Electric	Second Industrial City P.O. Box 89249 - 11682 Riyadh	Tel.: +966 1 265 1515 Fax: +966 1 265 1860	
Senegal	■ Schneider Electric Sénégal	BP 15952 - Dakar-Fann Rond point N'Gor - Dakar	Tel.: +221 820 68 05 Fax: +221 820 58 50	
Seychelles	Contacts are assured by	**Schneider Electric Reunion**		
Sierra Leone	Contacts are assured by	**Schneider Electric Ghana**		
Singapore	■ Schneider Electric Singapore Pte Ltd	10 Ang Mo Kio Street 65 #02-17/20 TechPoint Singapore 569059	Tel.: +65 484 78 77 Fax: +65 484 78 00	**www.schneider-electric.com.sg**
Slovak Republic	■ Schneider Electric Slovakia spol s.r.o.	Borekova 10 SK-821 06 Bratislava	Tel. : +02 45 52 40 10 and 40 30 Fax : +02 45 52 40 00	**www.schneider-electric.sk**
Slovenia	■ Schneider Electric, d.o.o.	Dunasjka 47 1000 Ljubljana	Tel. : +386 1 23 63 555 Fax : +386 1 23 63 559	**www.schneider-electric.si**
Solomon islands	Contacts are assured by	**Schneider Electric Australia**		
Somalia	Contacts are assured by	**Schneider Electric Egypt**		
South Africa	■ Schneider Electric South Africa (PTY) Ltd	Private Bag X139 Halfway House 1685 - Midrand.	Tel.: +27 11 254 6400 Fax: +27 11 315 8830	**www.schneider-electric.co.za**
Spain	■ Schneider Electric España, S.A.	Pl. Dr. Letamendi, 5-7 08007 Barcelona	Tel.: +34 93 484 3100 Fax: +34 93 484 3308	**www.schneiderelectric.es**
Sri Lanka	■ Schneider Electric Industries SA	Liaison office SRI Lanka Level 3B Valiant towers 46/7 Nawam Mawatha-Colombo 2	Tel. : +94 77 48 54 89	**www.schneiderelectric-in.com**
St Helena	Contacts are assured by	**Schneider Electric Italy**		
St Kitts & Nevis	Contacts are assured by	**Schneider Electric Dominican Rep.**		
St Lucia	Contacts are assured by	**Schneider Electric Dominican Rep.**		
St Pierre et Miquelon	Contacts are assured by	**Schneider Electric Dominican Rep.**		
St Vincent & Grenadines	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Sudan	Contacts are assured by	**Schneider Electric Egypt**		
Suriname	Contacts are assured by	**Schneider Electric United States**		
Svalbard & Jan Mayen isl.	Contacts are assured by	**Schneider Electric Denmark**		
Swaziland	Contacts are assured by	**Schneider Electric South Africa**		
Sweden	■ Schneider Electric AB	Djupdalsvägen 17/19 19129 Sollentuna	Tel.: +46 8 623 84 00 Fax: +46 8 623 84 85	**www.schneider-electric.se**
Switzerland	■ Schneider Electric (Switzerland) S.A.	Schermenwaldstrasse 11 CH - 3063 Ittigen	Tel.: +41 31 917 3333 Fax: +41 31 917 3355	**www.schneider-electric.ch**

Schneider Electric worldwide

Up-dated: 28-07-2003

Syrian Arab Republic	■ Schneider Electric Syria	Elba Street - Malki Gheibeh and Qassas bldg, 1st floor PO Box 33876-Damascus	Tel. : +963 11 37 49 88 00 Fax : +963 11 37 17 55 9	
Taiwan, Republic of China	■ Schneider Electric Taiwan Co Ltd	2FI., N°37, Ji-Hu Road, Nei-Hu Dist., Taipei 114	Tel. : +886 2 8751 6388 Fax : +886 2 8751 6389	**www.schneider-electric.com.tw**
Tajikistan	Contacts are assured by	**Schneider Electric Russian Fed.**		
Tanzania, United Rep. of	Contacts are assured by	**Schneider Electric Kenya**		
Thailand	■ Schneider (Thailand) Ltd	20th Floor Richmond Building 75 Sukhumvit 26 Road, Klongtoey Bangkok 10110	Tel.: +662 204 9888 Fax: +662 204 9816	**www.schneider-electric.co.th**
Togo	Contacts are assured by	**Schneider Electric Ivory Coast**		
Tokelau	Contacts are assured by	**Schneider Electric Australia**		
Tonga	Contacts are assured by	**Schneider Electric Australia**		
Trinidad & Tobago	■ Schneider Electric	6, 1st Street West Ext. Beaulieu Avenue Trincity Trinidad West Indies	Tel.: 1868 640 42 04 Fax: 1868 640 42 04	
Tunisia	■ Schneider Electric Tunisia	Rue du Lac Oubeira 1053 Les Berges du Lac - Tunis	Tel.: +216 71 960 477 Fax: +216 71 960 342	
Turkey	■ Schneider Elektrik Sanayi Ve Ticaret A.S.	Tütüncü Mehmet Efendi Cad. N°:110 Kat 1-2 - 81080 Göztepe – Istanbul	Tel.: +90 21 63 86 95 70 Fax: +90 21 63 86 38 75	**www.schneiderelectric.com.tr**
Turkmenistan	■ Schneider Electric Turkmenistan Liaison Office	rue Neitralny Turkmenistan 28, off.326/327 74 000 Achgabad	Tel. : +993 12 46 29 52 Fax : +993 12 46 29 52	
Turks & Caicos islands	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Tuvalu	Contacts are assured by	**Schneider Electric Australia**		
Uganda	Contacts are assured by	**Schneider Electric Kenya**		
Ukraine	■ Schneider Electric	Rue Krechtchalik 2 252601 Kiev	Tel.: +380 44 462 04 25 Fax: +380 44 462 04 24	**www.schneider-electric.com.ua**
United Arab Emirates	■ Schneider Electric Abu Dhabi	PO Box 29580 Office Floor 2/Lulu Street Al Marina Plaza Tower Abu Dhabi	Tel.: +9712 6 339444 Fax: +9712 6 316606	
United Kingdom	■ Schneider Electric Ltd	Braywick House East Windsor Road - Maidenhead Berkshire SL6 1 DN	Tel.: +44 (0)1 628 508 500 Fax: +44 (0)1 628 508 508	**www.schneider.co.uk**
United States	■ Schneider Electric	North American Division 1415 Roselle Road Palatine - IL 60067	Tel.: +1 847 397 2600 Fax: +1 847 925 7500	**www.squared.com**
Uruguay	■ Schneider Electric Uruguay S.A.	Ramon Masini 3190 Montevideo	Tel. : +59 82 707 2392 Fax : +59 82 707 2184	
Uzbekistan	Contacts are assured by	**Schneider Electric Russian Fed.**		
Vanuatu	Contacts are assured by	**Schneider Electric Australia**		
Vatican city St./Holy See	Contacts are assured by	**Schneider Electric Italy**		
Venezuela	■ Schneider Mg SD TE, S.A	Calle 162/ Piso 2 Edificio Centro Cynamid La Urbina, 1070 - 75319 Caracas	Tel.: +58 2 241 13 44 Fax: +58 2 243 60 09	**www.schneider-electric.com.ve**
Viet Nam	■ R.R.O. of Schneider Electric Industries S.A.S. in Viet Nam	Unit 2.9, 2nd Floor, e-Town Building 364 Cong Hoa Street Tan Binh District - Ho Chi Minh City	Tel.: +84 8 8103 103 Fax: +84 8 8120 477	
Virgin islands	Contacts are assured by	**Schneider Electric Dominican Rep.**		
Wallis & Futuna islands	Contacts are assured by	**Schneider Electric Australia**		
Western Sahara	Contacts are assured by	**Schneider Electric Morocco**		
Yemen	Contacts are assured by	**Schneider Electric U.A.E.**		
Yugoslavia	■ Schneider Electric Jugoslavija d.o.o.	Ratarski put 27d 11186 Belgrade	Tel.: +381 11 192 414 Fax: +381 11 107 125	
Zambia	■ Schneider Zambia	Zambia Office c/o Matipi Craft Center Building Plot 1036 - Accra Road PO Box 22792 - Kitwe	Tel.: +260 222 22 52 Fax: +260 222 83 89	
Zimbabwe	■ Schneider Electric	Zimbabwe Liaison Office 75A Second Street (corner Livingstone Avenue) Harare	Tel.: +263 4 707 179/180 Fax: +263 4 707 176	

Schneider Electric Industries SAS

Headquarters

89, bd Franklin Roosevelt
F - 92506 Rueil Malmaison Cedex

http://www.schneider-electric.com

Production : Schneider Electric Industries
Photos : Schneider Electric Industries
Printed by :

DIA3ED2031108EN

ART. 070261

January 2004