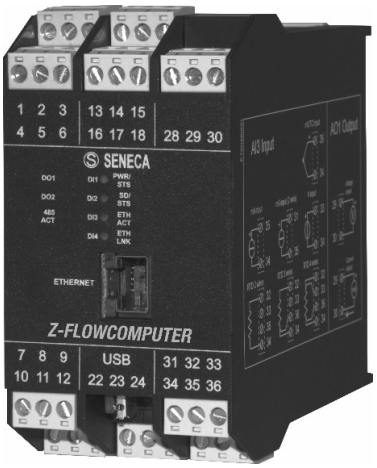
EN

INSTALLATION MANUAL
Z-FLOWCOMPUTER / Z-FLOWCOMPUTER-B

Computer for the calculation of flow and energy of liquids, gases and steam

CONTENTS:



Manufacturer

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PRELIMINARY WARNINGS

The full content of this manual must be read before performing any operation. The module must only be used by qualified electricians. Specific documentation is available from: www.seneca.it/products/z-flowcomputer

The module must be repaired and damaged parts replaced by the Manufacturer. The product is sensitive to electrostatic discharges. Take appropriate measures during all operations.

The warranty is null and void in the event the module or devices supplied by the Manufacturer, necessary for its correct operation, are improperly used or tampered with and, in any case, if the instructions contained in this manual were not followed.

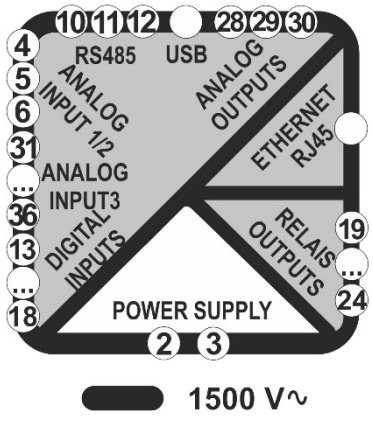
PRELIMINARY USE INSTRUCTIONS

Obstructing ventilation slots with any object is prohibited.
Installing the module next to devices that generate heat is prohibited.

GENERAL FEATURES

- Computer for the calculation of flow and energy of liquids, gases and steam
- Calculation rules: IAPWS IF-97, AGA8 GROSS METHOD, AGA8-92DC (ISO 12213-2), SGERG88 (ISO 12213-3), Redlich-Kwong (RK) and Redlich-Kwong-Soave (RKS) equations .
- CPU ARM 32 bit
- Ethernet 100Mbps port
- Side micro USB port, No. 1 RS485 terminal port
- Slot for micro SD card, 32 Gb max.
- 1500 V∿ power insulation compared with the remaining low voltage circuits.
- Module dockable to IEC EN 60715 omega-shaped guide. Pull-out terminals, section 2.5mm^2
- Rechargeable backup batteries for internal UPS.

TECHNICAL SPECIFICTIONS

Insulation 1500 V∿	*Standards*	
	The instrument complies with the following standards:	
	CE	**EN61000-6-4** (electromagnetic emission, industrial environment) **EN61000-6-2** (electromagnetic immunity, industrial environment) **EN61010-1** (safety).
		SUPPLEMENTARY NOTES ON USE: A 1 A, delayed fuse must be installed in series on the power connection, near the module.

Communication ports	
RS485 terminal: 10, 11, 12	Baud rate 115200 baud max
Ethernet	Fast Ethernet 100 Mbps Communication port: front with RJ45 connector Connection maximum distance 100m
Side USB	Plug-in: Micro USB

Digital input (pulsed Q flow measurement)
Input type: PNP / Absorbed current: 3mA Voltage and internal power supply: 12V / 20mA / Maximum frequency: 250 Hz.

Analogue inputs 1 and 2 Voltage/Current (A1 Q flow measurement, A2 Pressure P measurement / Temperature T)
Number of channels: 2 / Input type: configurable mA or V / Resolution: 16 bit Voltage input: 0 – 30 V / precision 0.1% of Full Scale Current input: 0 – 20 mA / precision 0.1% of Full Scale / Input protection: 30 V / 25 mA / Max voltage drop: 1.2 V

Universal analogue input 3 (Temperature measurement T)
Type: V / mA 2 wires passive / mA 4 wires active / RTD 2 wires / RTD 3 wires / RTD 4 wires Resolution: 15 bit / Sampling: 20ms (50Hz rejection) INPUT TYPE: voltage 0 – 10 V / Input impedance: 120kΩ current: 0 – 20 mA / Input protection: 30 V / 25 mA / Max voltage drop: 1.2 V resistance thermometer (RTD): PT100 / 500 / 1000 / NI100 connection with 2 / 3 / 4 wires with burnout detection.

Analogue output
Type: configurable V – mA / Resolution: 14 bit / Width-limited signal. Voltage output: 0 – 10 V (minimum load resistance = 1kΩ), Current output (active):0 – 20 mA (maximum load resistance 600Ω), Precision: 0.1% / Thermal stability: 0.01%/°K / Linearity error: 0.01% / EMI < 1%.

Digital outputs
Number of channels: 2 / Type: SPDT free contact relay / Voltage: 30 V∿ / 30 V⎓ / Current: 2 A.

Power supply	
Voltage	10 – 40 V⎓; 19 – 28 V∿ 50 – 60 Hz
Absorption	Max.: 5 W @ 24V∿
Internal batteries	2xAAA NiMH

Environmental conditions	
Temperature	-10 – +40°C (limit with UPS recharge battery) -10 – +50°C (limit without UPS recharge battery)
Humidity	30 – 90% to 40°C non condensing
Altitude	up to 2000 m above sea level
Storage temperature	-20 – +45°C (< 6 months)
Protection rating	IP20

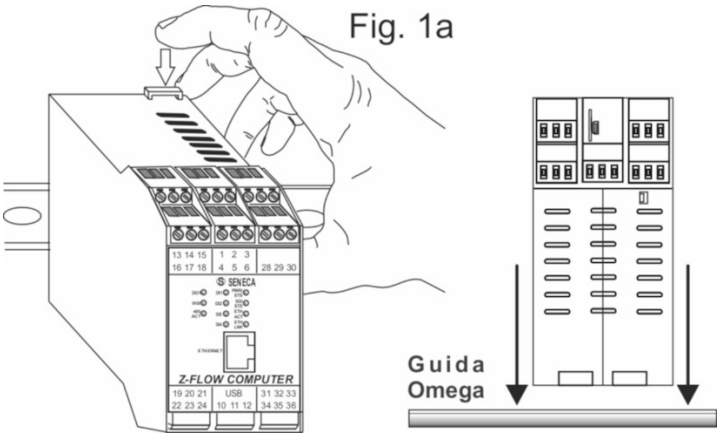
Connections
3-way removable screw terminals, pitch 5 mm
RJ45 and micro USB
Micro SD card slot

Overall dimensions / Case	
Dimensions/Weight	L: 100 mm; H: 112 mm; W: 52.5 mm / 315 gr.
Case	PA6, black

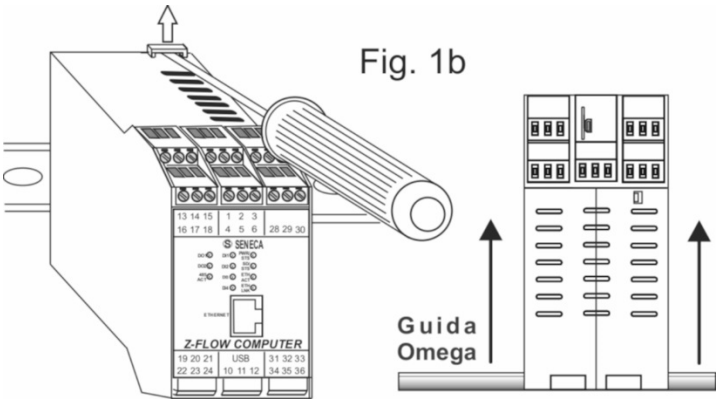
INSTALLATION RULES

The module has been designed for vertical installation on an IEC EN 60715 omega guide. For optimal operation and long working life, adequate ventilation must be provided. Avoid positioning cable ducts or other objects so that they obstruct the ventilation slots. Avoid mounting modules over equipment generating heat. Installation in the bottom part of the distribution board is recommended.

OMEGA IEC EN 60715 guide installation and removal.

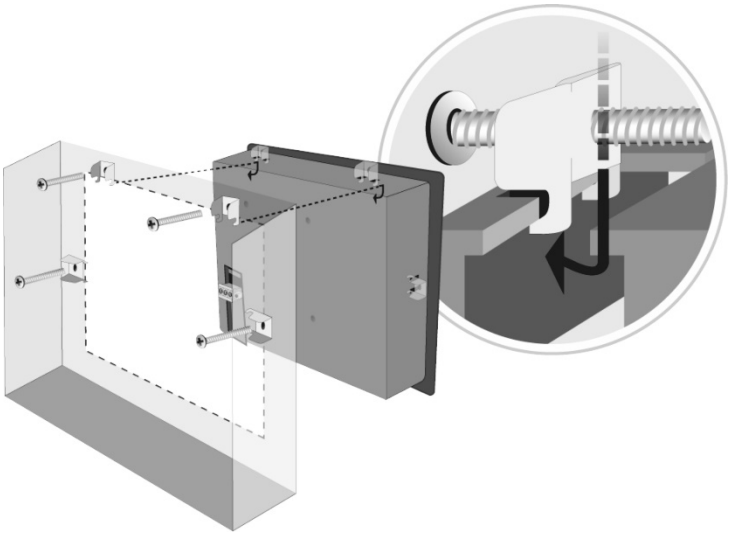


Insertion onto the IEC EN 60715 guide:
1) Move the four hooks on the back of the module outwards as illustrated in fig. 1b.
2) Rest the module on the OMEGA guide.
3) To secure the module to the OMEGA guide, tighten the four hooks on the side of the IDC10 rear connector as shown in fig. 1a.



Removal from the IEC EN 60715 guide:
As shown in figure 1b:
1) Move outwards the four hooks on the side of the module, with the help of a screwdriver.
2) Extract the module from the guide.

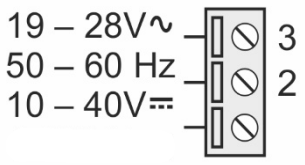
Installation of the display panel (not present in the Z-FLOWCOMPUTER-B version)



Make a rectangular hole with the following dimensions:
W=119 mm x H=93 mm.
Insert the panel into the hole.
Secure the panel as shown in the figure using all the screws and fixing brackets supplied.
Be careful not to drop the panel while fixing it, so as not to damage it.

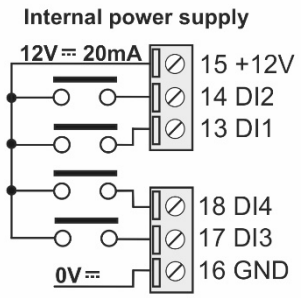
ELECTRICAL CONNECTIONS

Z-FLOWCOMPUTER module power supply

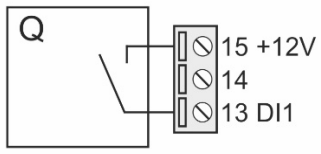


The power supply must be connected to terminals 2 and 3. The supply voltage must be between 10 and 40V⎓ (any polarity), or between 19 and 28 V∿.
The upper limits must not be exceeded in order to avoid serious damage to the module.
The power supply source must be protected from any malfunctions of the module through appropriately sized safety fuse.
Important: On first start-up, the module must be supplied without any interruptions for at least 72 hours to charge the internal batteries.

Z-FLOWCOMPUTER Digital input 1 (pulsed flow measurement)

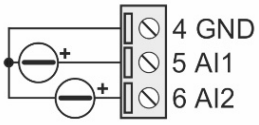


Digital input 1 can be connected to a Q flow,
V Volume or digital mass/weight sensor with pulse output.

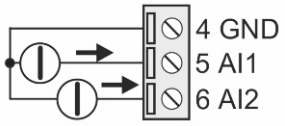


Z-FLOWCOMPUTER analog outputs 1 and 2

Voltage

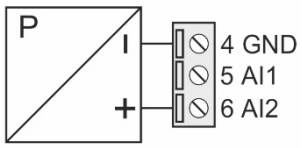


Current



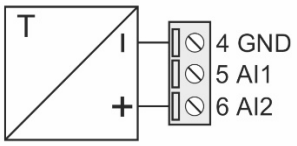
The Z-FLOWCOMPUTER module has two voltage or current configurables analog inputs.
Input 1 is used for Q flow measurements.
Input 2 is used for P pressure or T1 temperature measurements.
The figures show some sensor connection examples.

Pressure sensor



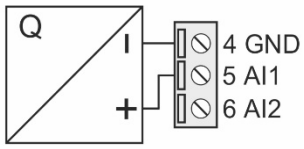
4 – 20 mA

Temperature1 sensor



0 – 10 V

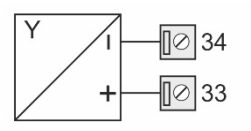
Flow sensor



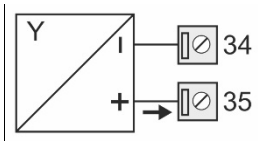
0 – 20 mA

Z-FLOWCOMPUTER universal analog input 3

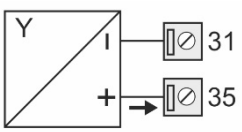
The Z-FLOWCOMPUTER module has a universal analogue input to be used for temperature measurements T2. The figures show the connection modes and sensor types that can be connected to this input.
Active input means that Z-FLOWCOMPUTER supplies the current loop.
Passive input means that the sensor supplies the current loop.



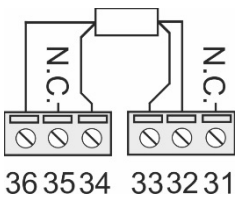
Transducer
0 – 10 V



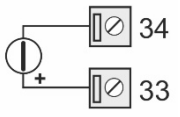
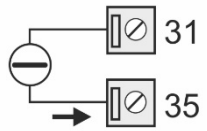
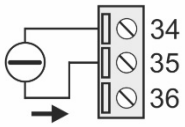
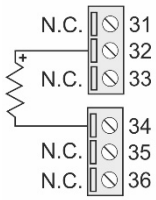
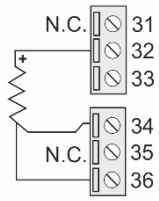
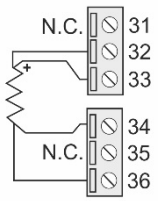
Transducer
0 – 20 mA passive (2 wires)

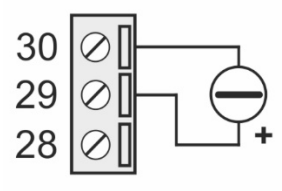
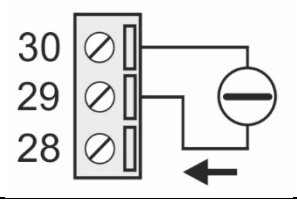


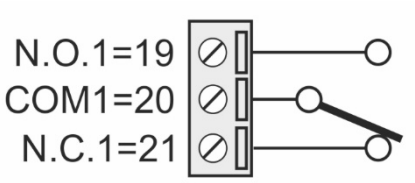
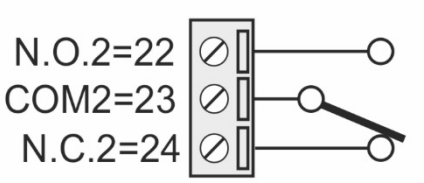
Transducer
4 – 20 mA active (4 wires)



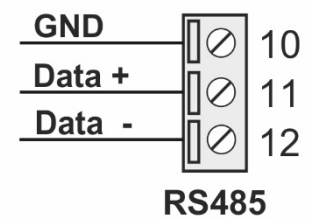
4 wires RTC

Input V	*Input mA active 4 wires*	*Input mA passive 2 wires*	*RTD input 2 wires*	*RTD input 3 wires*	*RTD input 4 wires*
					

Analog output (V)	*Analog output (mA)*	*Configurable output*
		The Z-FLOWCOMPUTER has an analog output that can be configured for either voltage or current. The figures show the connections.

Digital output 1	*Digital output 2*	*Outputs with free contacts*
		The Z-FLOWCOMPUTER has two digital outputs with free contacts. The figures show the internal relay contacts available.

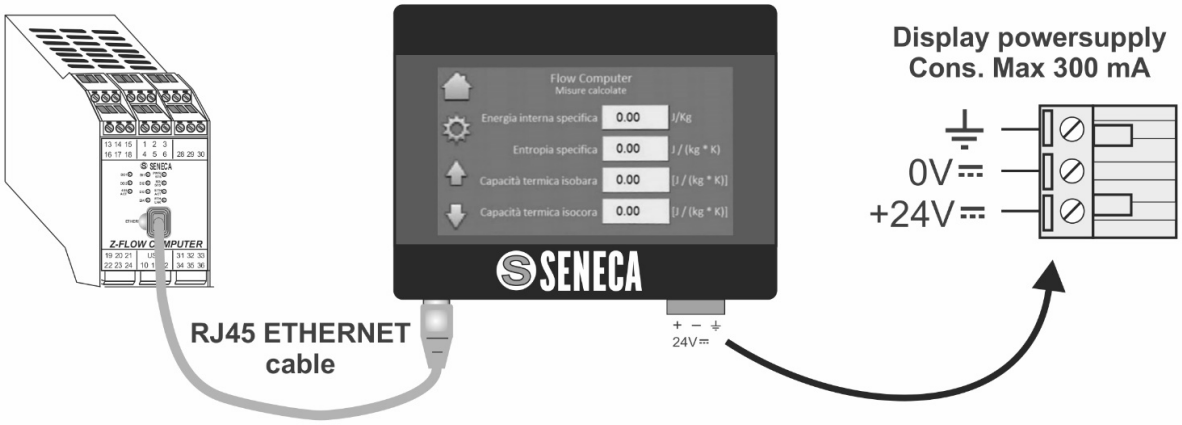
Connection of the RS485 port



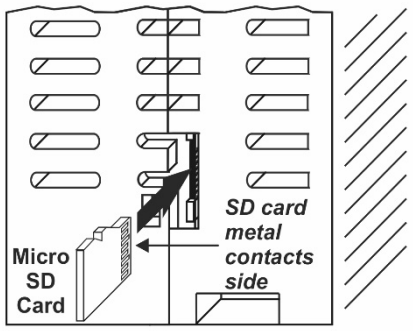
The RS485 port of the Z-FLOWCOMPUTER can be connected as shown in the figure.

Connection RJ45 ETHERNET - HMI display (not present in the Z-FLOWCOMPUTER-B version)

The RJ45 ETHERNET cable for the connection of the HMI display panel supplied with the Z-FLOWCOMPUTER module must be connected as shown in the figure. For further information, refer to the installation manual of the Visual3 display.

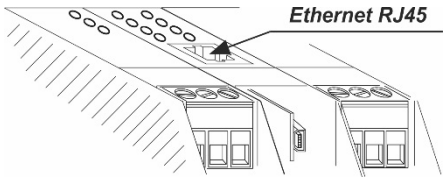


Micro SD card slot



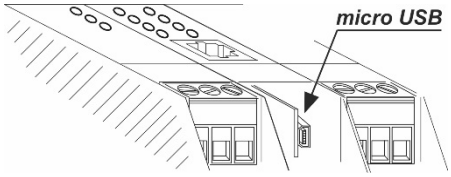
The Z-FLOWCOMPUTER has a micro SD card slot on the side of the case.
Before insert the SD card in the matching slot, make sure the metal contacts are facing right (with reference to the side figure).**NOTA BENE:**
For the Z-FLOWCOMPUTER to working properly the micro SD card **must be inserted**.

RJ45 Ethernet port (on front)



Z-FLOWCOMPUTER has an Ethernet port with RJ45 connector on the front of the module, for display connection and/or for TCP-IP communications.
For further information, refer to the USER MANUAL.

USB micro port (side)



Z-FLOWCOMPUTER has a serial USB micro port.
This port allows module connection to a computer in order to configure it.
For further information, refer to the USER MANUAL.

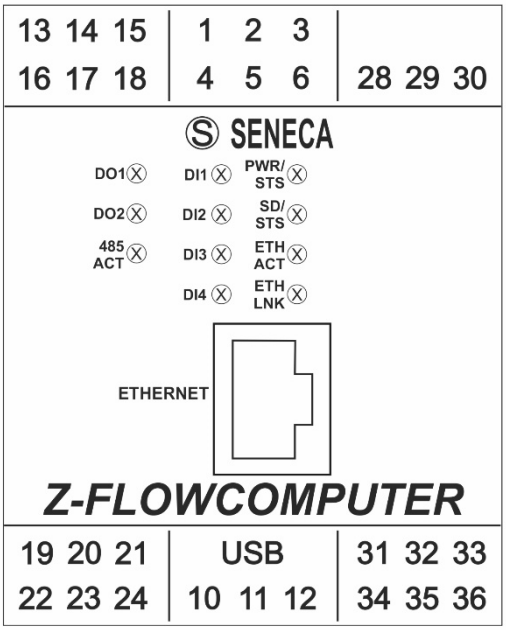
LED INDICATIONS ON THE FRONTAL PANEL

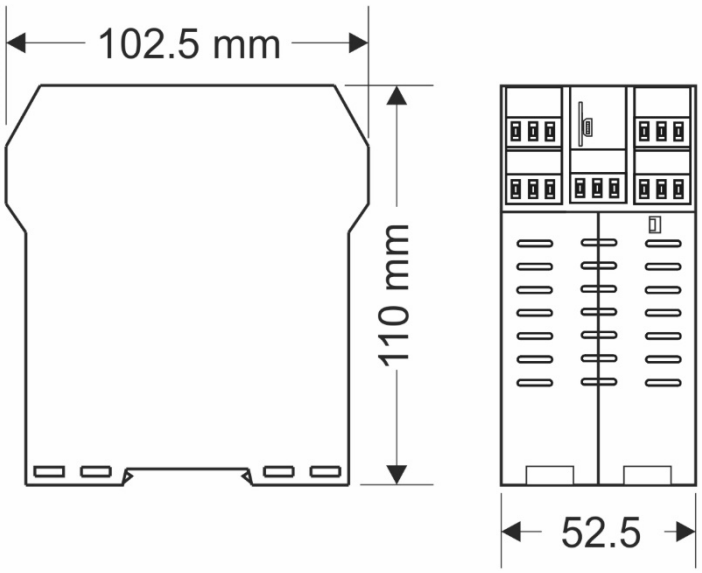
LED	*STATUS*	*LED meaning*
PWR/STS Green	ON	The device is supplied correctly
SD/STS Red	Flashing	Access to micro SD card
ETH ACT Yellow	Flashing	Packet transit on Ethernet port
ETH LNK Green	Flashing	Connection on RJ45 activated
DI1 Red	ON	Digital input 1 PNP closed at + 12V
DI1 Red	OFF	Digital input 1 PNP open
DI2 Red	ON	Digital input 1 PNP closed at + 12V
DI2 Red	OFF	Digital input 2 PNP open
DI3 Red	ON	Digital input 3 PNP closed at + 12V
DI3 Red	OFF	Digital input 3 PNP open
DI4 Red	ON	Digital input 4 PNP closed at + 12V
DI4 Red	OFF	Digital input 4 PNP open
DO1 Red	ON	Digital output 1, relay energised
DO1 Red	OFF	Digital output 1, relay deenergised
DO2 Red	ON	Digital output 2, relay energised
DO2 Red	OFF	Digital output 2, relay deenergised
485 ACT Red	Flashing	Reading on internal I/O card

ACCESSORIES

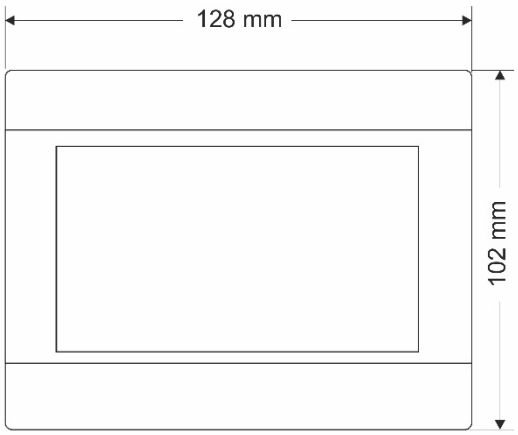
CODE	**DESCRIPTION**
CS-DB9F-TIP_V	RS485 connection cable
CE-RJ45-RJ45-R	ETHERNET connection cable

FRONT PANEL / MODULE LAYOUT





MONITOR SIZE (not present in the Z-FLOWCOMPUTER-B version)



For the configuration, use the **EASY FLOWCOMPUTER** software available for download, at:
www.seneca.it/products/z-flowcomputer
For further information on the product, refer to the USER MANUAL available for download, at:
www.seneca.it/products/z-flowcomputer

DECOMMISSIONING AND DISPOSAL

Electrical and electronic waste disposal (applicable in the European Union and other countries with recycling). The symbol on the product or packaging indicates that the product cannot be discarded as domestic waste. It should be taken to an authorised recycling centre for electrical and electronic waste. Ensuring that the product is suitably discarded will avoid potential negative impacts on the environment and human health, that could be caused by non compliant product disposal. Material recycling will contribute to the preservation of natural resources. To receive further information, please contact your local waste disposal service centre or product dealer.