MANUAL OF THE

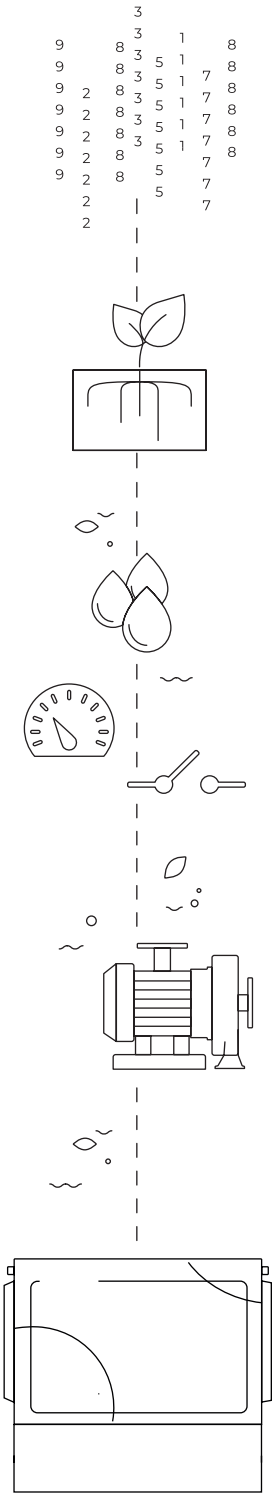
Expansión module 1

Sections in the manual:

- Description
- Dimensions
- Technical specifications
- Connection locations
- Connections
- Configuration
- Installation example

The Parameters and consultation sections of the expansion modules are detailed in the external module manual.

SISTEMES ELECTRÒNICS PROGRÉS



Hello!

Welcome to the expansion module 1 manual.

We are very grateful for the trust you have placed in us by expressing an interest in our products. This manual provides information about the features of the unit as well as its installation and use.

Who is this manual for?

This manual is intended for people who physically install the expansion module on the property or in the electrical panel. Shows the dimensions and how the different connection options must be wired.

Index

1 DESCRIPTION

Remote expansion module for the Agrónic 4500. It expands the number of outputs and inputs to perform quick-action controls or control of different heads.

It has the following features:

Expansion Module 8S 4ED 4EA

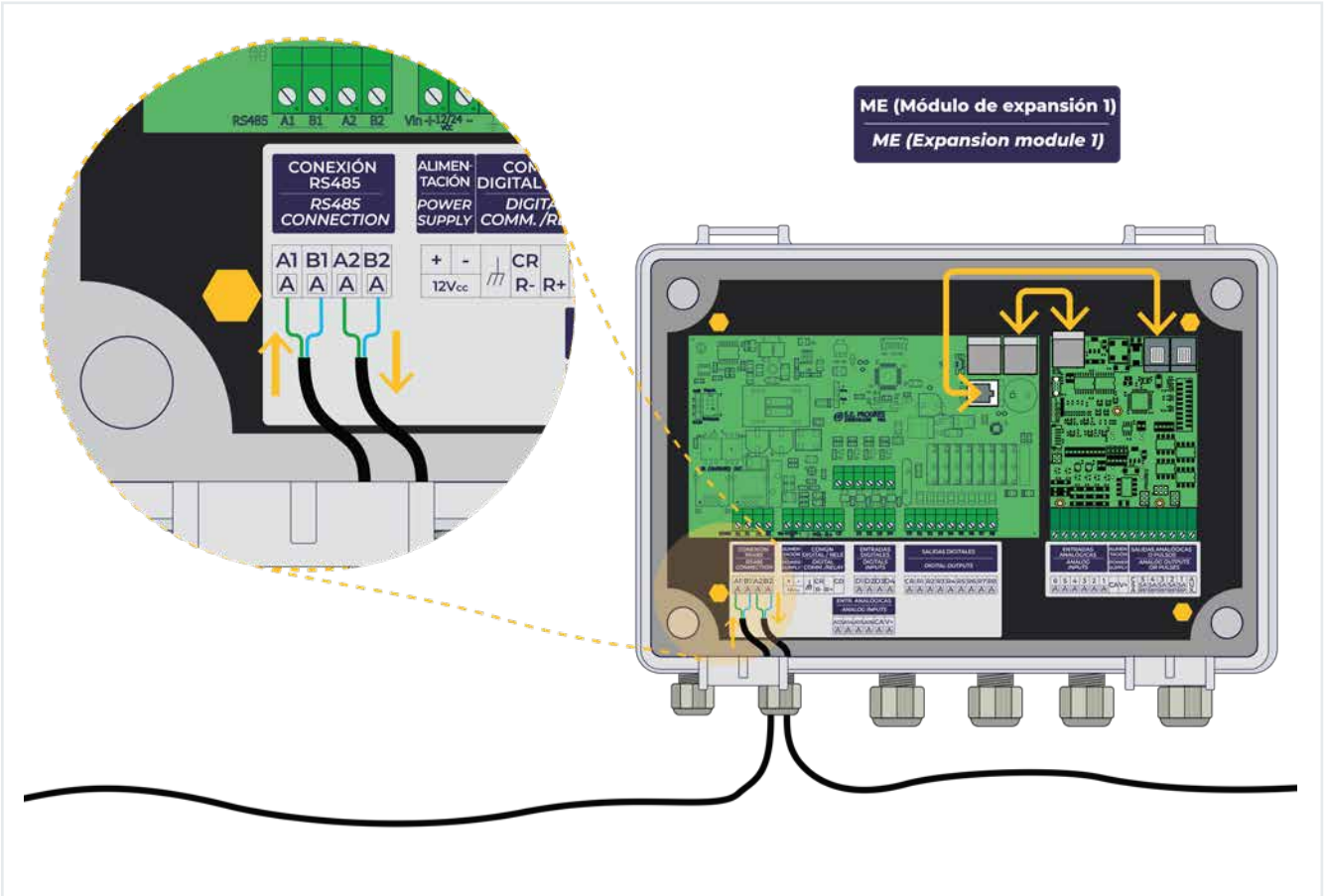
- 8 relay outputs
- 4 digital inputs
- 4 analog inputs (not isolated)
- 12 analog inputs (Isolated - option)
  - 10 4-20 mA analog inputs
  - 2 analog inputs 0-20 V
- 10 analog outputs of 4-20 mA or pulses (option)

The expansion modules communicate with the Agrónic 4500 through a single 0.5 mm section two-wire cable (RS-485).

Allows a maximum of 1200 meters cable distance from the controller to the last module. If more distance is needed, it is possible to install:

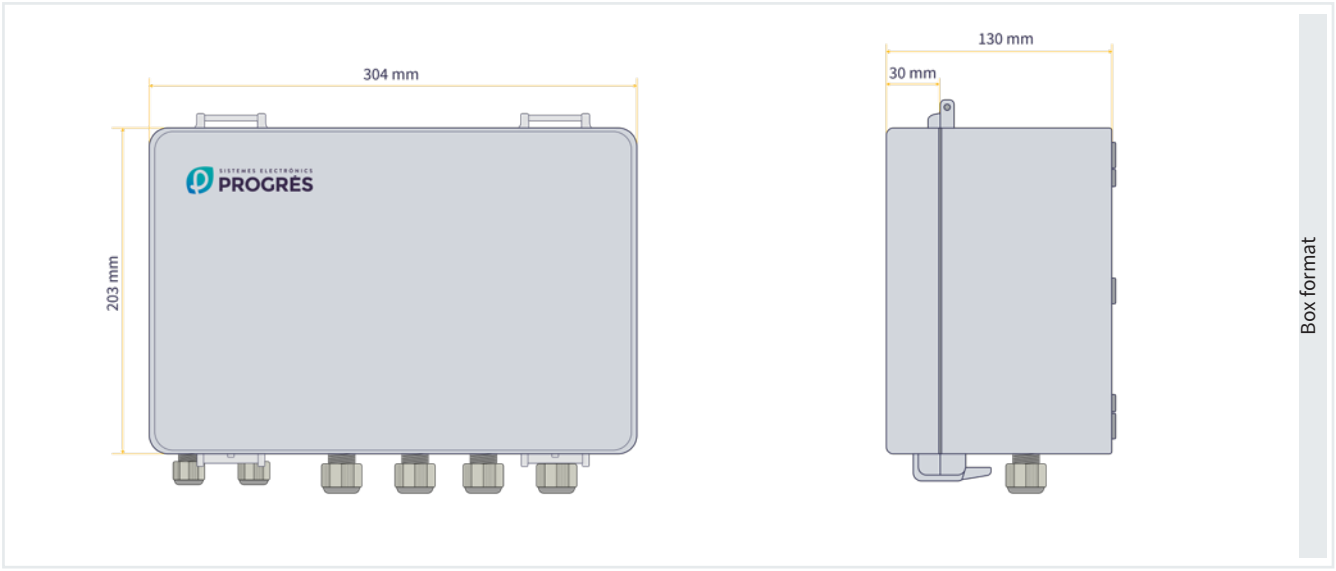
- An RS-485 repeater (06741220) that reaches an additional 1200 meters to the next device.
- A radio modem system between the Agrónic 4500 and the expansion module.

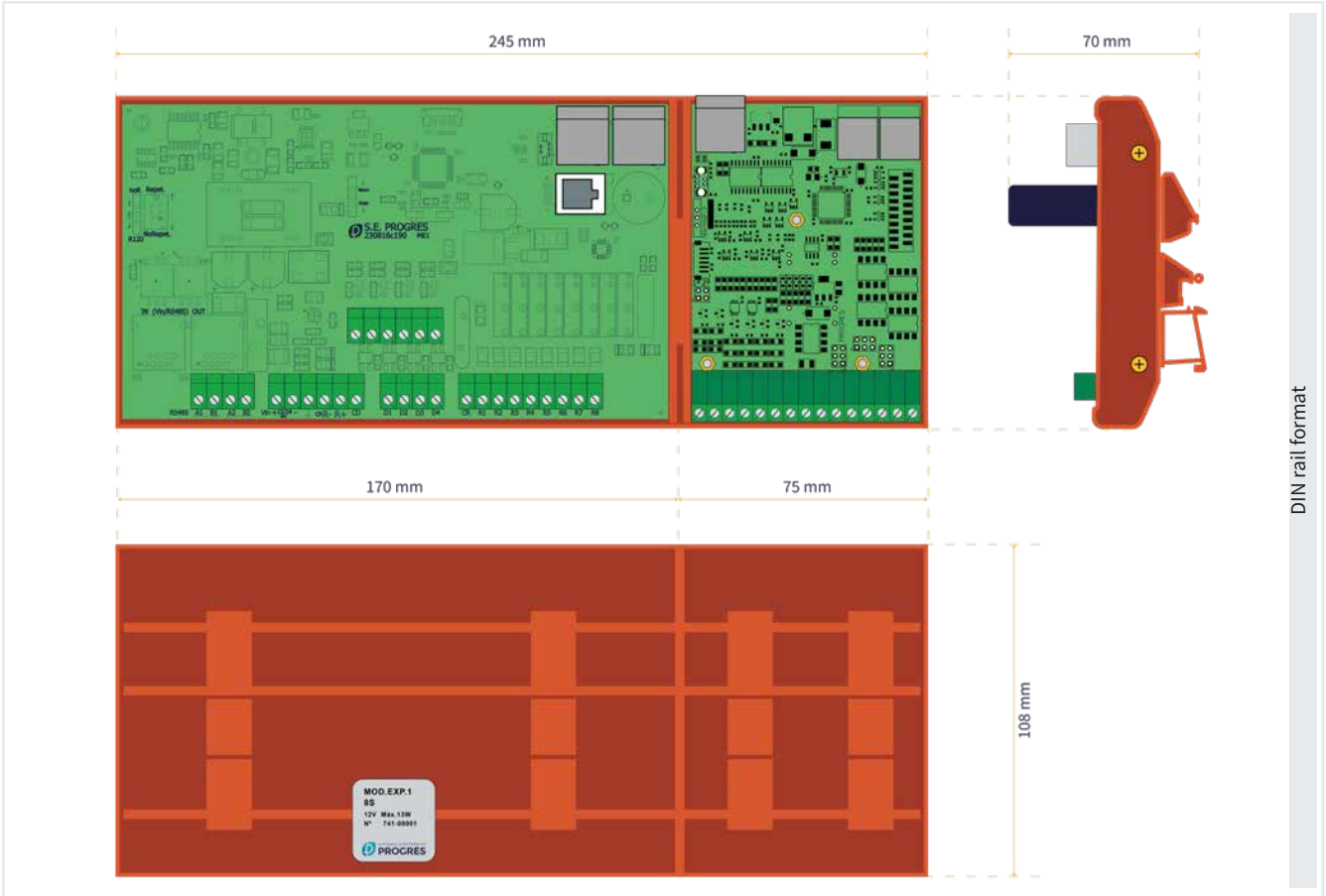
The Agrónic 4500 can have a maximum of 15 expansion modules connected.



Expansion module box

2 DIMENSIONS





Expansion module location

Install the expansion module at the correct height and position for good handling. Avoid direct sunlight, humidity, dust and vibrations as much as possible.

Avoid being close to elements that generate interference and may affect correct operation.

In the box format, the unit is housed in a hermetically-sealed box (IP65) with a transparent front cover for housing the connections.

To maintain the seal, the cover must always be closed and the cable glands included with the unit installed in the cable outputs.

3 TECHNICAL SPECIFICATIONS

General power supply		
Voltage		12 Vdc ±10%
Power consumption		Less than 12 W

Output power supply		
Voltage		From 12 to 24 Vdc or Vac (maximum 30 V)
Fuse	Input “R+”	Thermal (PTC) 3.0 Amp. at 25°C, auto-resettable

Outputs		
Digital	Number	8
	Type	By relay contact, with 24 Vac potential (external transformer).
	Limits	30 Vac / 30 Vdc, 1 Ampere, 50-60 Hz, CAT ll (per output)
Analog / Pulses (option)	Number	5 or 10
	Type	4-20 mA (galvanically isolated)
All outputs have double isolation in respect to the mains input.		

Inputs		
Digital sensors (base)	Number	4
	Type	Opto-coupled, operate at 12 or 24 Vdc or Vac
Analog sensors (base)	Number	4
	Type	4-20 mA
Analog sensors (option)	Number	5 or 10
	Type	4-20 mA (galvanically isolated)
	Number	1 or 2
	Type	0-20 V (galvanically isolated)

Environment	
Temperature	-5°C to 45°C
Humidity	< 85%
Altitude	2000 m
Pollution	Grade 2

Weight	
Box model	From 2 kg to 3 kg
DIN rail model	From 0.5 kg to 1 kg

Statement of compliance	
Complies with Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive 73/23/EEC for Product Safety Compliance. Compliance with the following specifications was demonstrated as indicated in the European Community Official Gazette.	CE

Symbols that may appear on the product							
	Protective ground terminal		Danger, risk of electric shock		Ground terminal		Double isolation

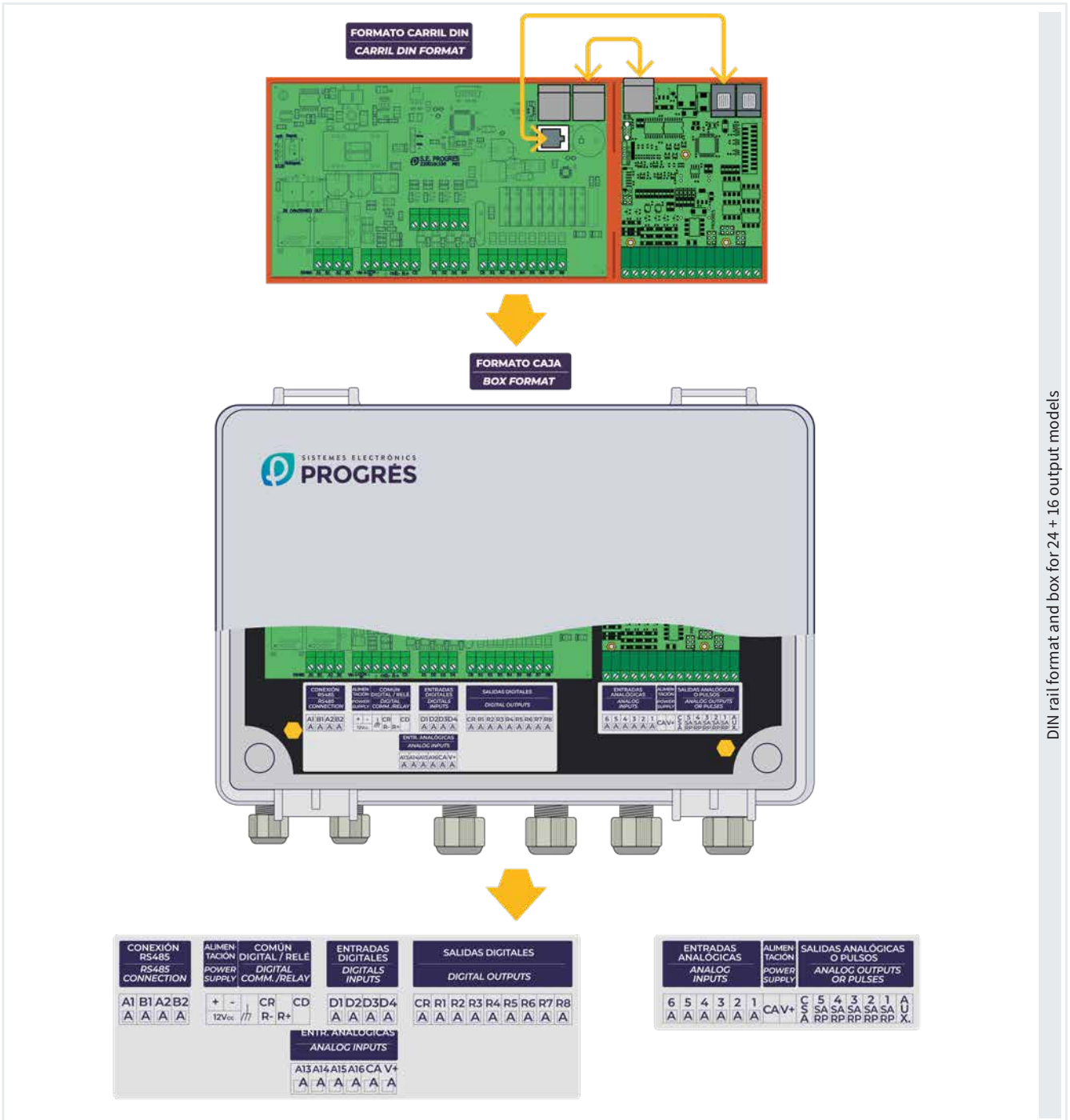
This symbol indicates that electronic devices should not be disposed of along with household waste at the end of their useful life. The product must be taken to the corresponding collection point for electric and electronic unit recycling and correctly processed pursuant to Spanish legislation.

4 CONNECTION LOCATIONS

4.1. BOX AND DIN RAIL FORMAT

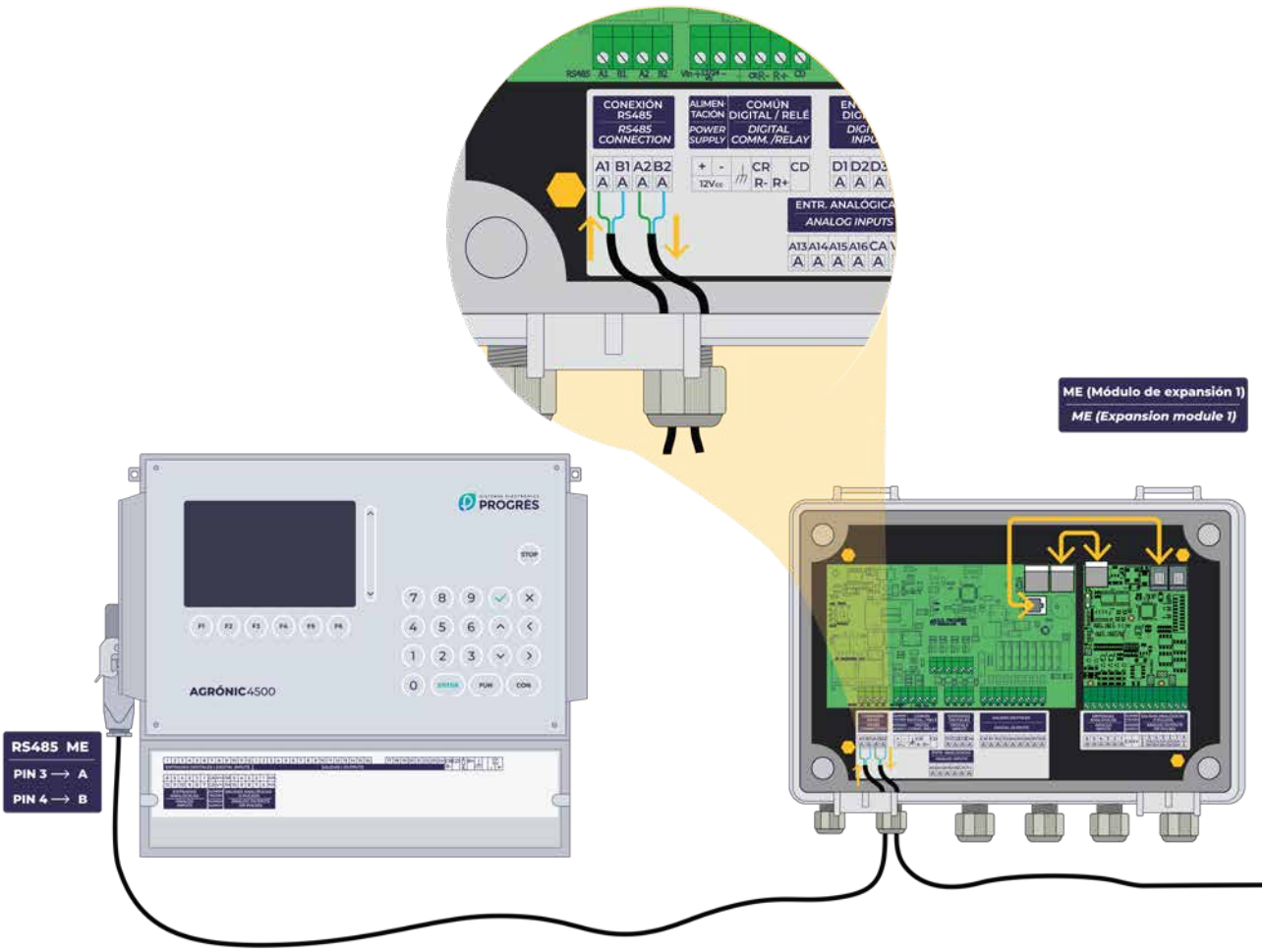
In the box format, to connect the unit, open the cover to access the connectors. To insert the cables, use the cable glands located on the front of the box.

In both formats it is recommended to connect the wires to the terminal using the terminal connectors that come with the unit. (The terminals accept cables of up to 2.5 mm^2 in diameter).



DIN rail format and box for 24 + 16 output models

Pins 3(A) and 4(B) of the connector marked “RS485 ME” are used to make the connection between the Agrónic 4500 and the expansion module.



Connection between the Agrónic 4500 and the ME 1

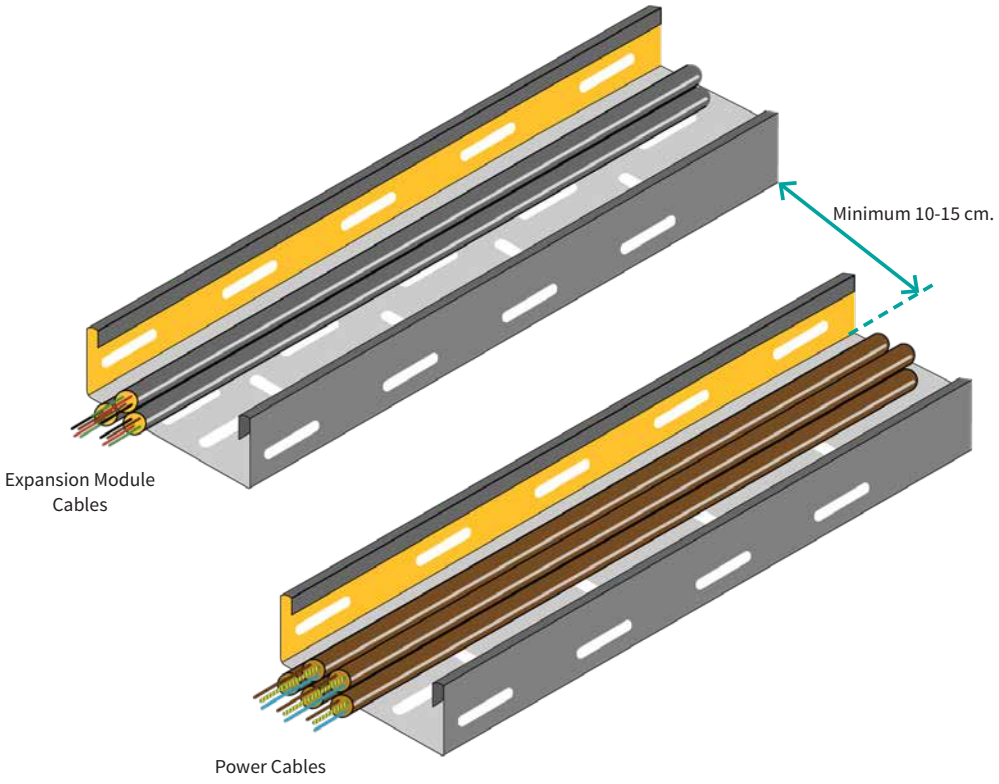
5 CONNECTIONS

The unit must be installed pursuant to the current regulations that apply to electrical installations. The unit will not be adequately protected if it is not used as specified in this manual.

All the connection terminals on the module can be plugged in, which allows for quick maintenance.

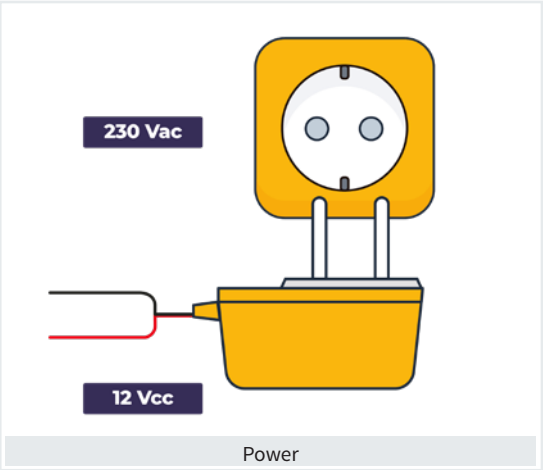
Some points to consider:

- Electromagnetic inteference must be minimized.
- The Expansion Module must be installed away from sources of interference such as frequency converters, motors, powers cables and alternating current cables (including the Monocable system).
- It is recommended to user separate tubes or rails for the communication and power lines.
- A distance of at least 15 cm must be maintained between the Expansion Module cables and the 230 Vac power cables.



Power lines and Expansion Module lines

5.1. CONNECTING THE POWER SUPPLY



Power

The power supply is 12 Vdc for all models.

Installations with a solar cell, generator set or diesel engine are connected to the 12 Vdc battery.

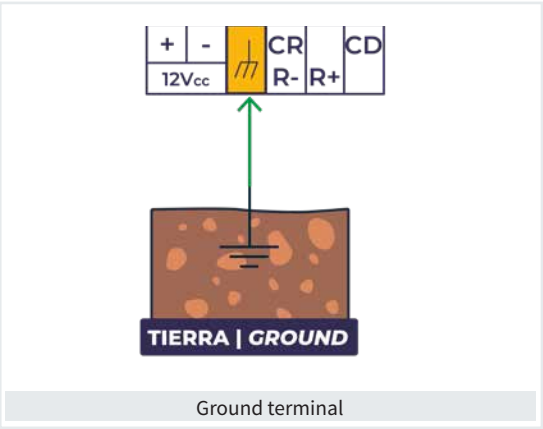
In 110 or 230 Vac systems, a 90-230 Vac / 12 Vdc (50-60 Hz) power supply is available as an accessory to connect the unit. The socket to which the power supply is connected must be easily accessible.

The power supply intake has an auto-resetting thermal fuse and is also protected against reversed polarity and power surges.

The installation must have a separate thermo-magnetic switch to protect the module. Its output is connected to the general power supply and the transformer that powers the output.

When the diesel engine is running, avoid disconnecting the battery as the alternator will raise the electrical tension considerably and damage the module.

5.2. CONNECTING THE GROUND CONNECTION



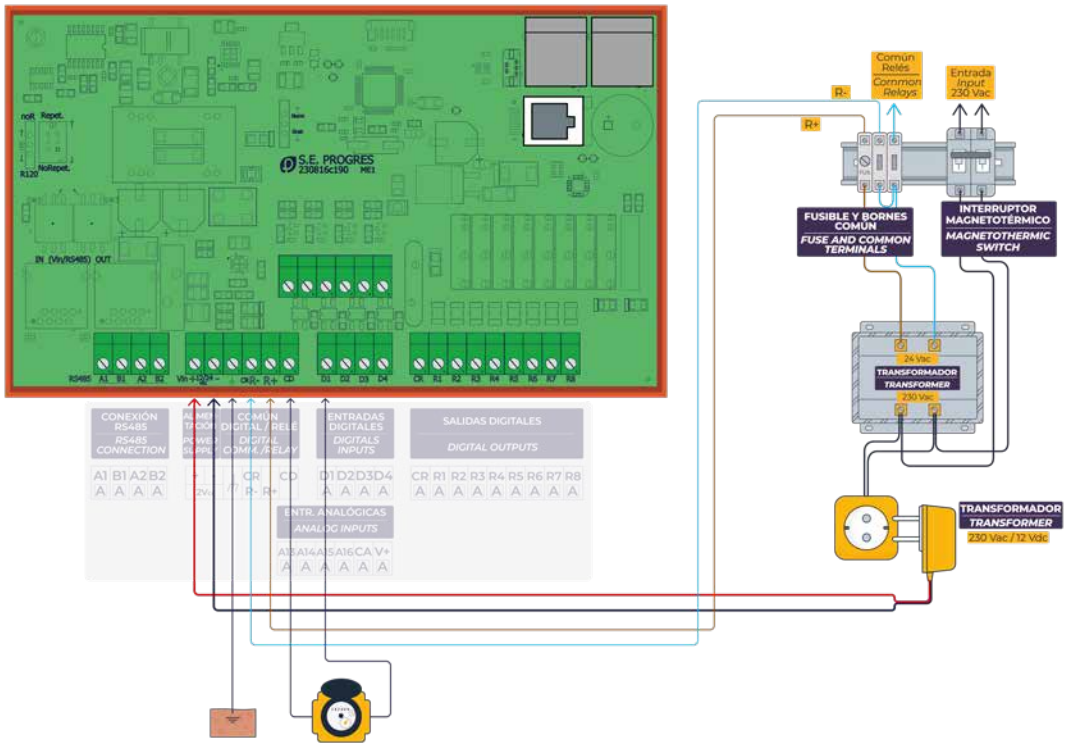
Ground terminal

The terminal used for the ground wires is located next to the power supply terminals; its function is to divert to the ground any possible electrical sparks generated by storms that can enter via the input and output cables. An arc sparkover in the internal gas discharger is produced with 90 volt or more.

It is extremely important to connect this socket independently for complete protection of the unit

The ground connection must be different and separate from the ground connection of drives or pumps.

5.3. CONNECTING DIGITAL INPUTS



Digital inputs

Both the digital inputs and the relay outputs are powered externally at 12 Vdc or 24 Vac.

The digital inputs are galvanically isolated by optocouplers from the rest of the circuit.

The contacts of the devices connected to the digital inputs must be voltage-free.

The unit has four digital inputs on the base, indicated as D1 to D4 and one common marked as CD.

5.4. CONNECTING THE OUTPUTS

All the outputs are operable at either 12 or 24 volt in alternating or continuous current (do not supply voltage higher than 30 volt).

To be operative at 24 Vac, an external transformer with a double-insulated 24 Vac output must be installed pursuant to UNE EN61010 standards.

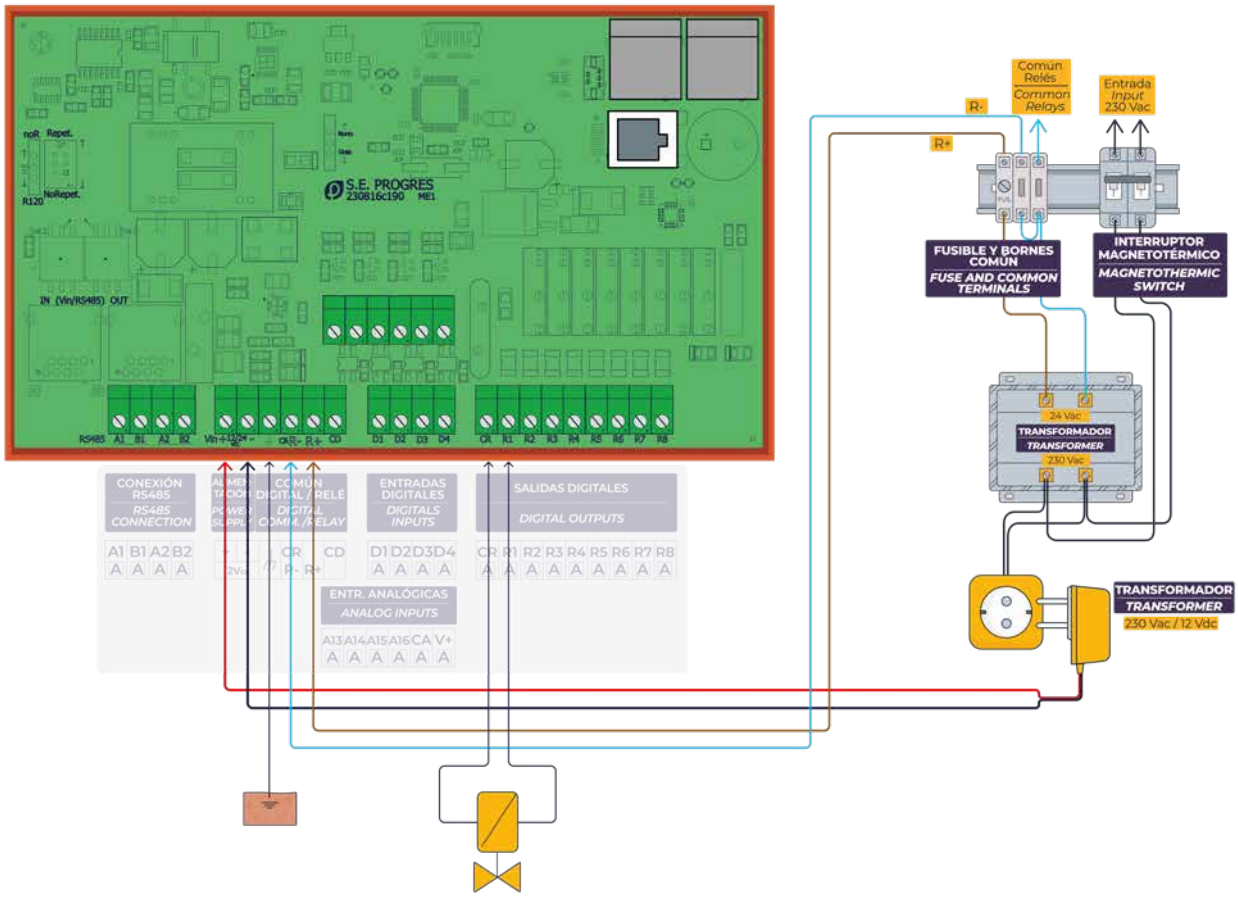
The power supply intake for the outputs is marked 'R+' and 'R-'.

The 'AUX' terminal corresponds to the 'R+' input passed through the power supply protection. It is used to connect auxiliary manual control elements and relay expansions.

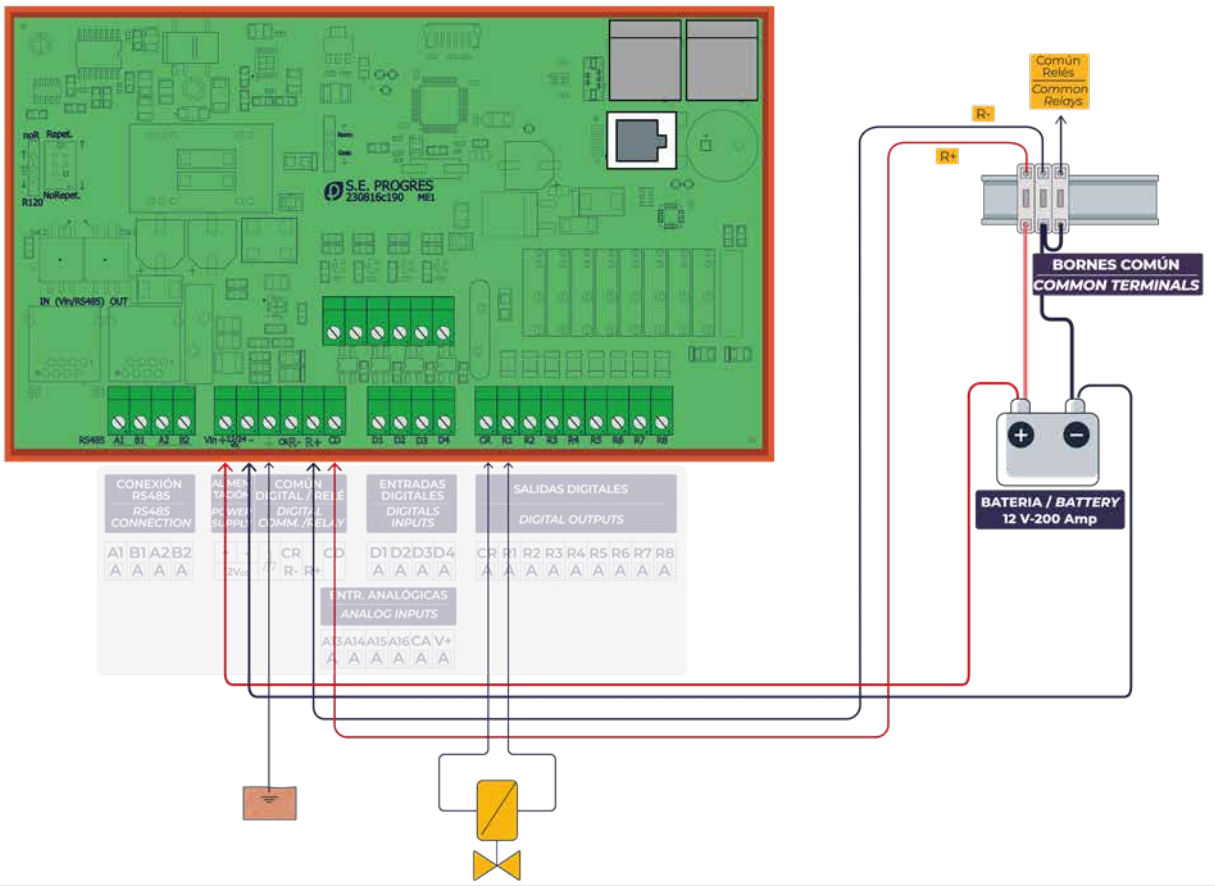
The solenoids on the solenoid valves, relays and contactors are connected between the 'CR' output common and the corresponding output between 'R1' and 'R8'.

The outputs are isolated from the internal circuitry by relays and protected by a varistor in each one.

The power supply to the outputs and sensors is protected by a self-reconfiguring thermal fuse. When there is a short circuit in one of the outputs, the fuse will automatically be tripped, limiting the output until the short circuit has terminated.



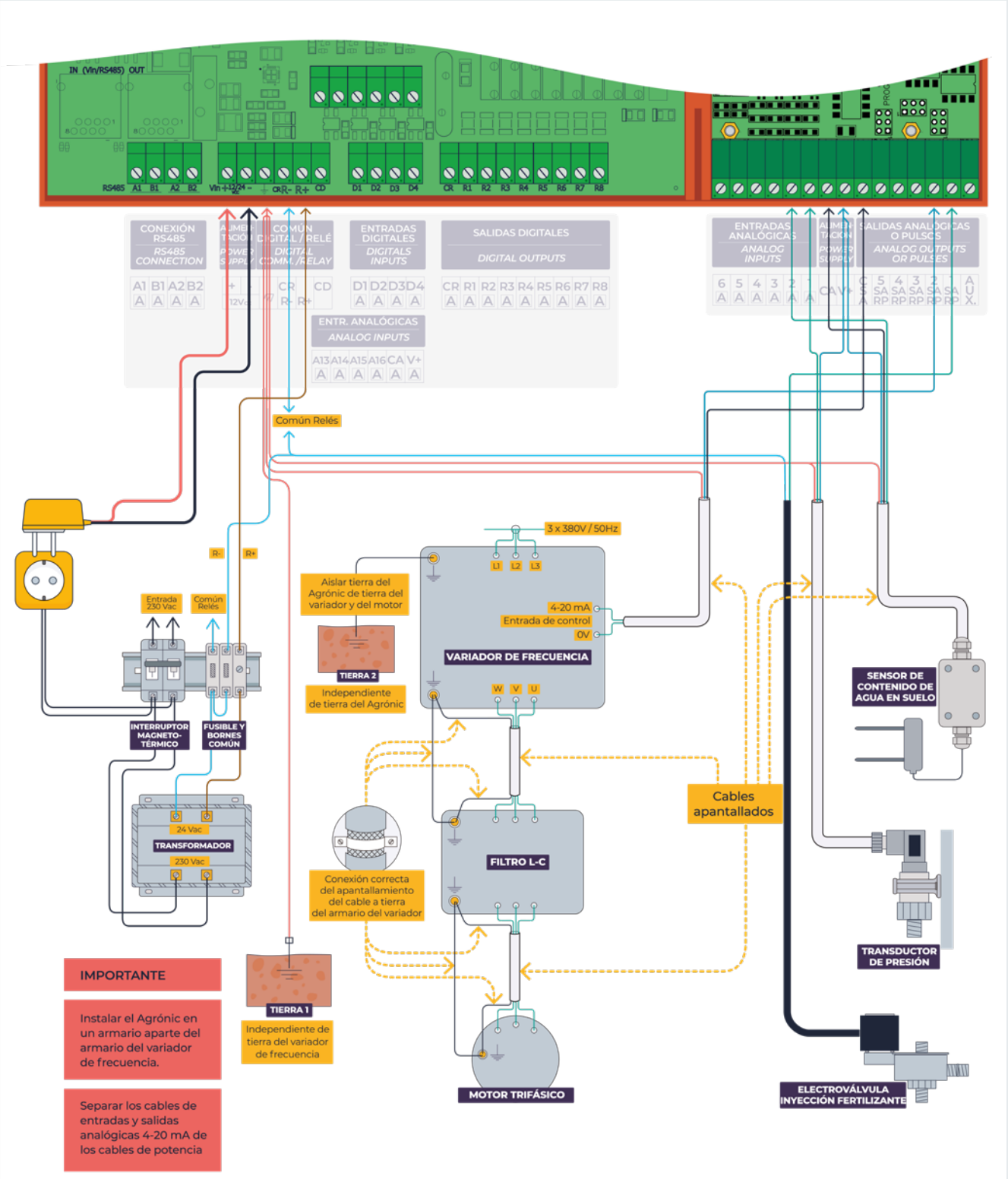
24 Vac outputs (220 Vac mains installation)



12 Vdc outputs (12 Vdc installation)

5.5. CONNECTING THE ANALOG INPUTS AND OUTPUTS

In installations where analog sensors or analog outputs need to be read for fertilization or pressure regulation, this option is required.



Connecting analog inputs and outputs

6 CONFIGURATION

6.1. CONFIGURING THE MODULE NUMBER

In each climate control installation carried out by Progrés, an initial configuration sheet is provided containing essential information about the expansion modules used in the system. This sheet includes, for each module:

- Serial number: This is a unique factory identifier number.
- RS485 adress: This is an indentifier that Progrés assigns internally to each expansion module using internal switches. This number allows one module to be differentiated from another within the system and is essential for establishing accurate communication with each of them.
- Module model: This is the module model which can be ME1 or ME2.
- Repeater: This details whether the module acts as a repeater or not.

This sheet is essential for:

- Correctly locating each module within the installation.
- Ensuring adequate communication between the modules ensuring that there is not a single module number repeated in the installation.

In case of doubts of future extensions to the systems, this sheet serves as a reference to correctly localte and configure the necessary module number.

To configure the number of a new module, see the following section ‘6.2 Configuring the module number’.

SISTEMES ELECTRÒNICS PROGRÉS

Installation configuration sheet

EXPANSION MODULES

Installation:		**Configuration date**:
Installer:		
Serial nº Agrónic: 74-		
Time between sendings:	**Tiempo Timeout**:	**Retries**:
IMPORTANT Check the correct installation of the cable and its correct polarizations (A, B).		

Equipment configuration	Serial Nº ME	Adress RS485	Model (ME1, ME2)	Repeater [YES/NO]	Observations
M 01					
M 02					
M 03					
M 04					
M 05					
M 06					
M 07					
M 08					
M 09					
M 10					
M 11					
M 12					
M 13					
M 14					
M 15					

6.2. CONFIGURING THE MODULE NUMBER

Each of the expansion modules connected to an Agrónic 4500 must be assigned a module number. This number is indicated by the two switches on the module plate (SW2 and SW3).

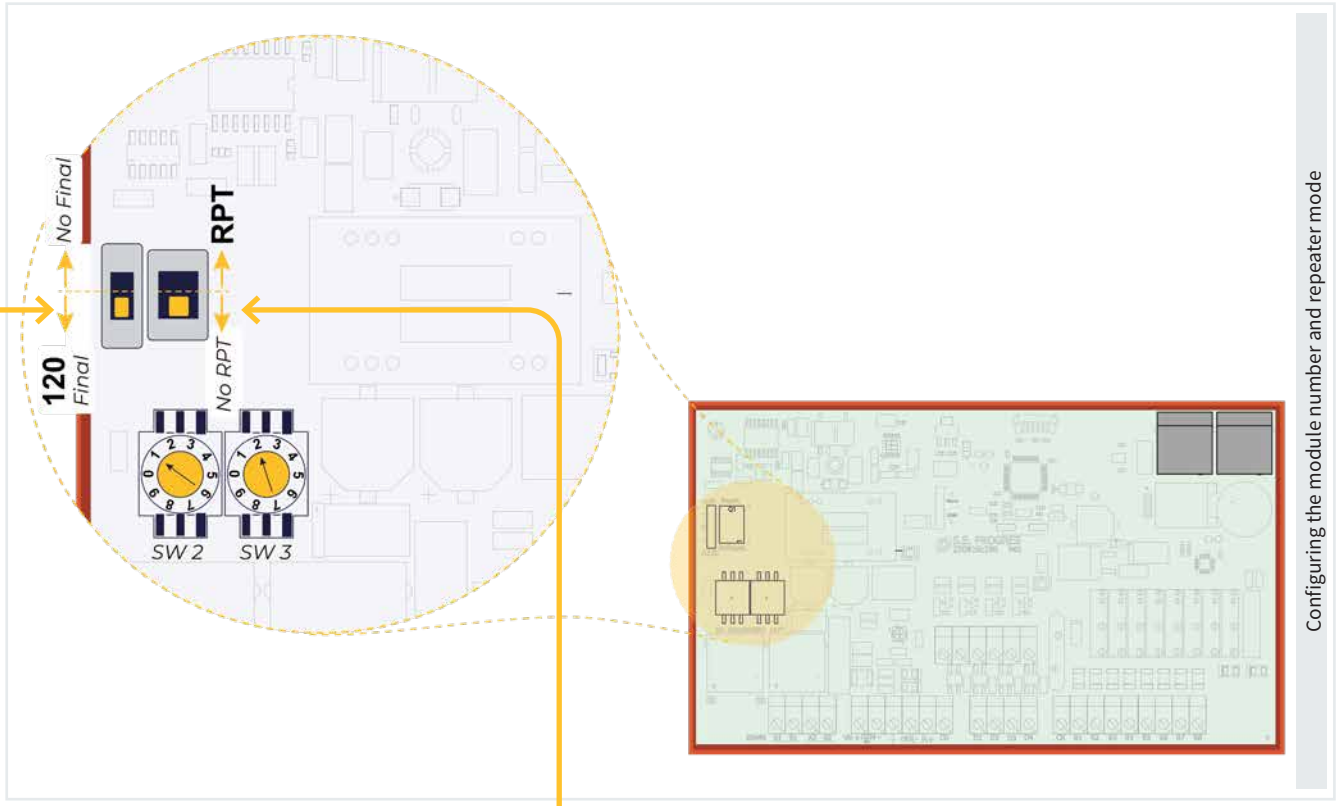
The switch (SW2) selects the tens while the second switch (SW3) selects the units.

In the Agrónic 4500 controller, this address must also be configured in the required module. To configure it, consult the manual '2418 Agrónic 4500 Manual - External modules' and go to:

'Function - Parameters - Installer - Communications - Expansion modules - Select module number.'

To check whether the expansion module is communicating, press 'Consult - Modules' (F4 key).

> **Importante**
>
> Modules are identified by a number assigned by switches SW2 and SW3. This number is completely independent of the module's serial number, as the two numbers are not related to each other.



The switch (RPT) is used to determine whether or not the module should repeat the signal to another module.

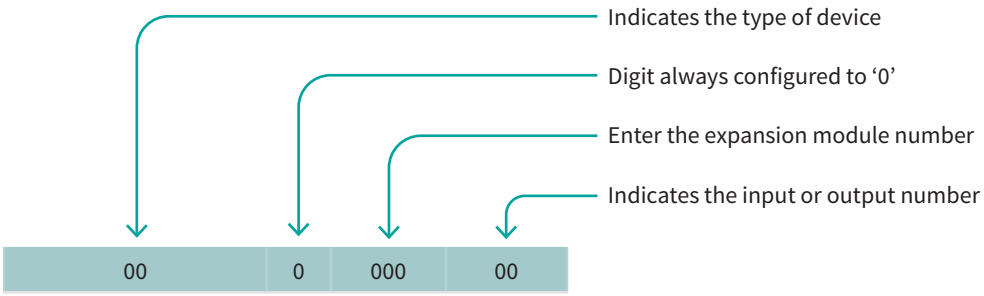
If the module is a repeater, install the plate in the indicated connector and position the switch upwards, otherwise position it downwards.

> **Example**
>
> SW2 : 1 SW3 : 2
>
> So the configured adress is 12 (10+2).

> **Important**
>
> If the expansion module is the last one in the line, it is essential to set the switch to position 120, as shown in the image. This configuration ensures the correct operation of the system.

6.3. CODING THE INPUTS AND OUTPUTS

The inputs and outputs are coded with 8 numbers for easy location.



Digital outputs				Description
11: Expansion modules	0	001 - 015	01 - 99	Expansion modules connected to the base of the Agrónic 4500

Digital inputs				Description
11: Expansion modules	0	001 - 015	01 - 12	Expansion modules connected to the base of the Agrónic 4500

Analog inputs				Description
11: Expansion modules	0	001 - 015	01 - 12	Expansion modules connected to the base of the Agrónic 4500

Analog/pulsed outputs				Description
11: Expansion modules	0	001 - 015	01 -10	Expansion modules connected to the base of the Agrónic 4500

Example

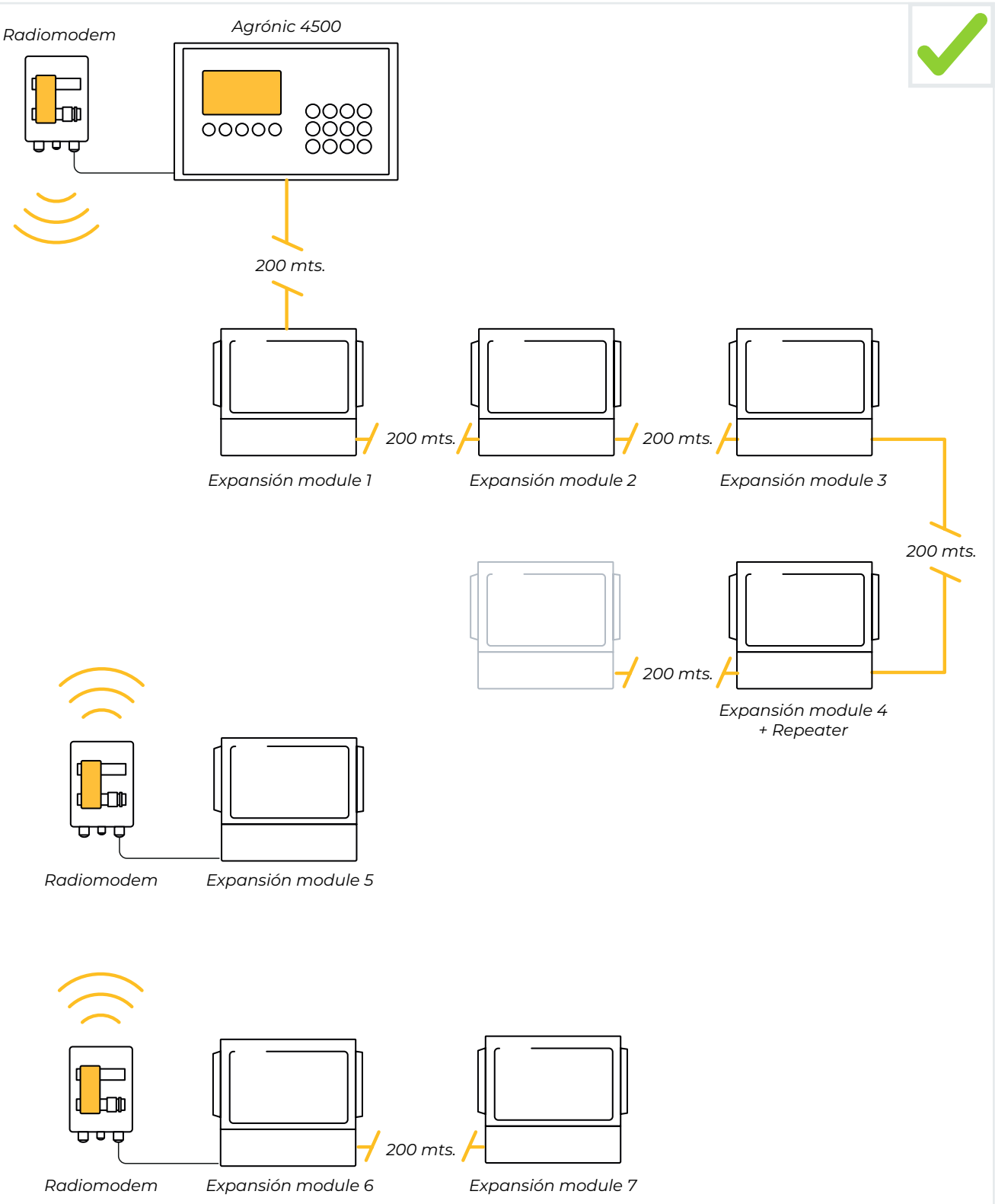
11000201 Analog/digital input/output 1 of module number 2 of external 'Expansion module'

7 EXAMPLE OF INSTALLATION DIAGRAM

7.1. RECOMMENDED TYPE OF INSTALLATION

Bellow is an example of a suitable installation to distribute and connect the different modules to the Agrónic 4500, and to make the connection in series, following the method known as 'Daisy Chain'.

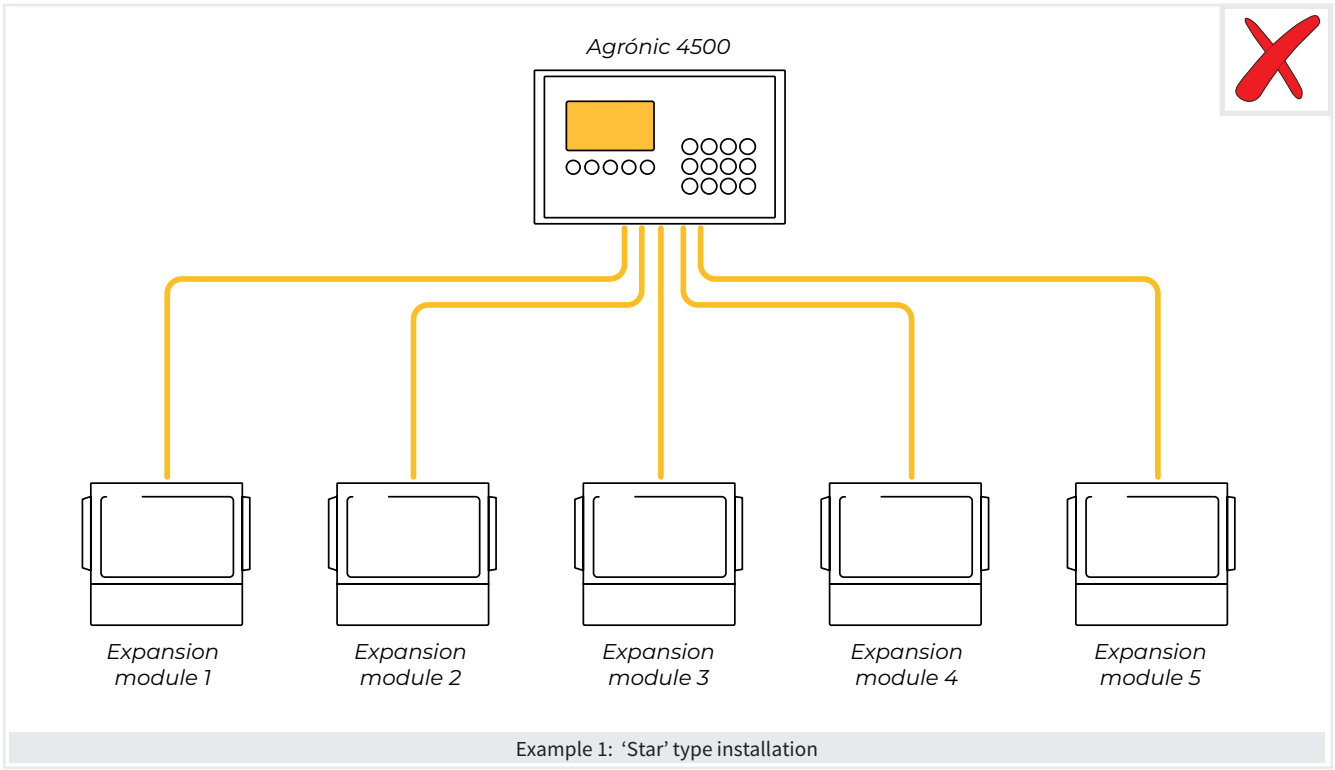
This type of connection guarantees efficient communication between the modules and the Agrónic 4500.



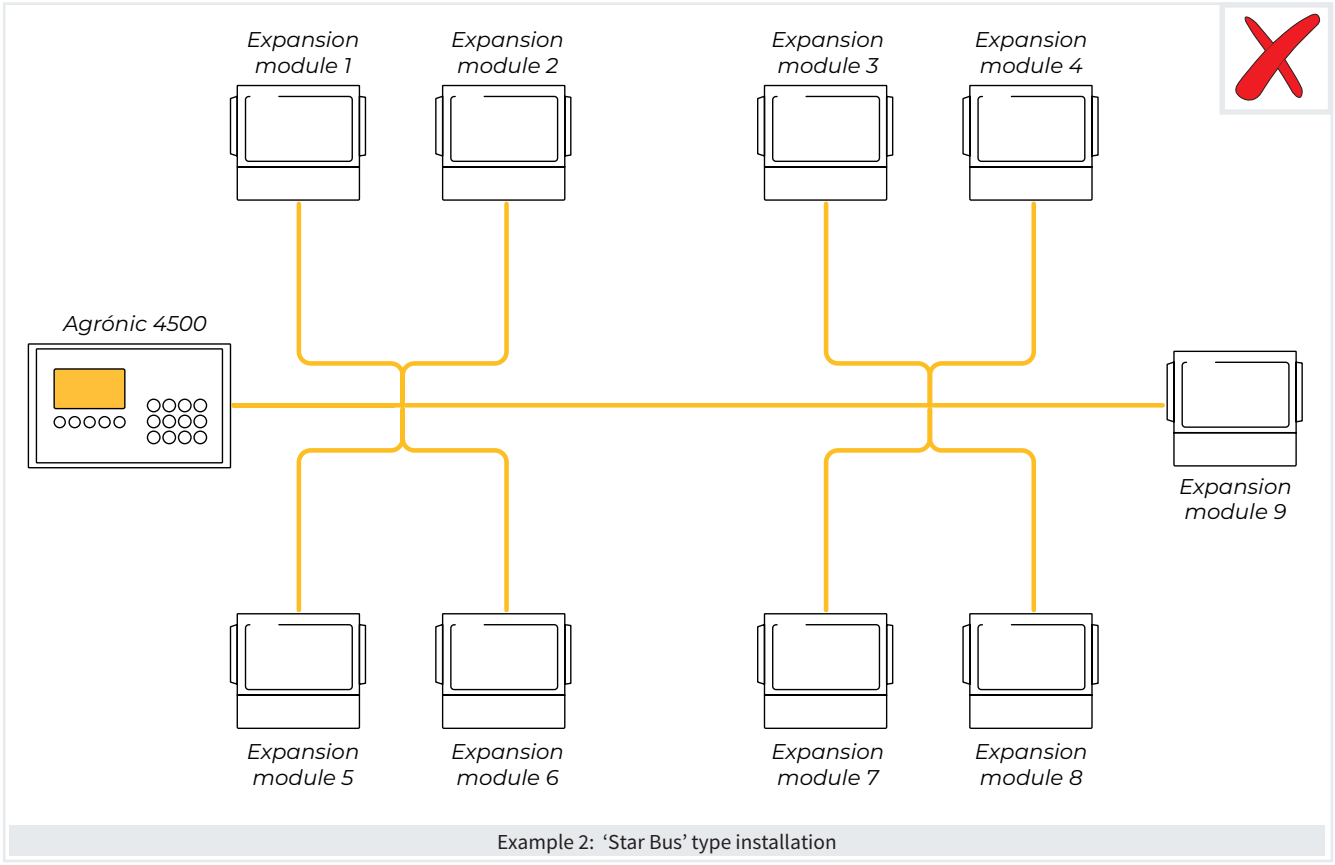
'Daisy Chain' type installation with Radio Link (Recommended type of installation)

7.2. TYPE OF INSTALLATION TO AVOID

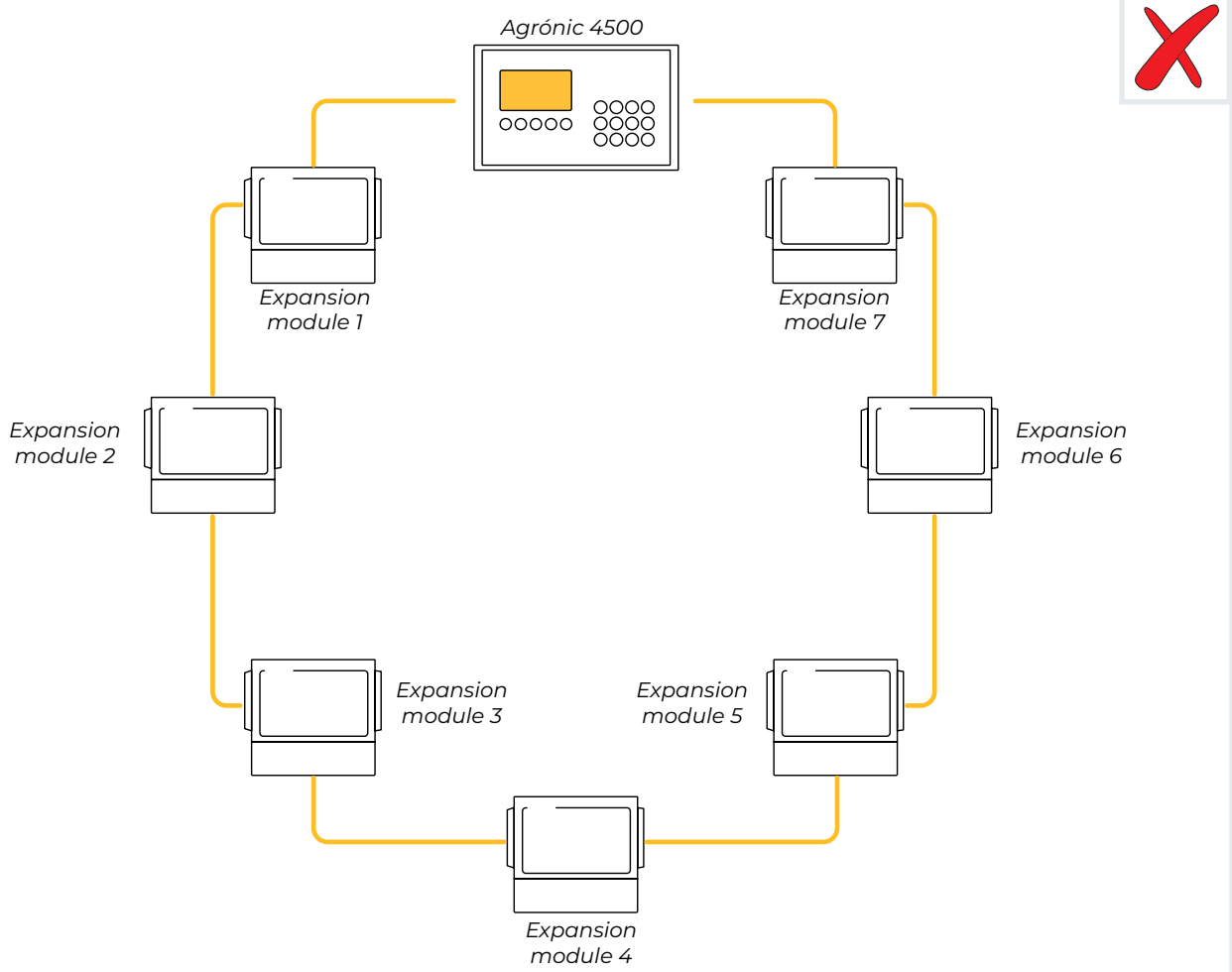
Below are 3 examples of typical installations that should not be done to avoid communication problems:



Example 1: 'Star' type installation



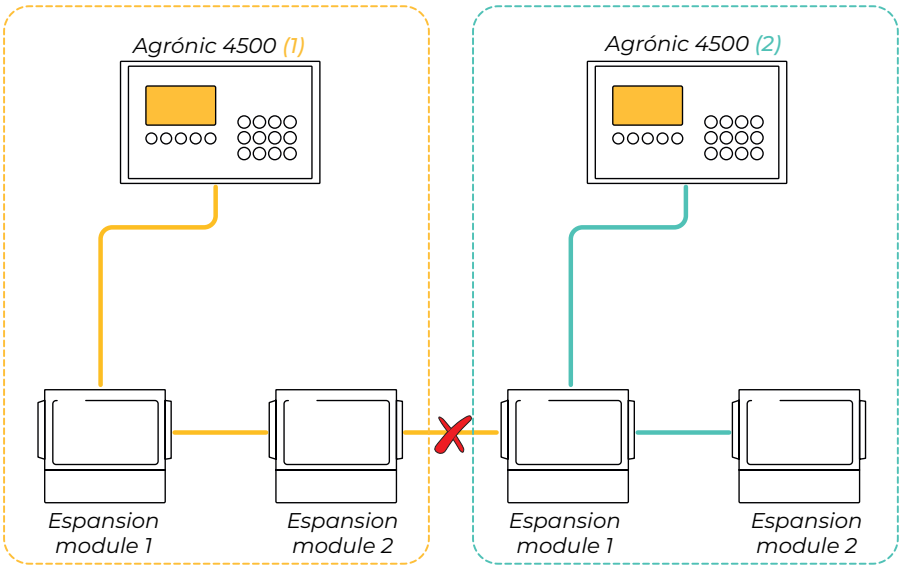
Example 2: 'Star Bus' type installation



Ejemplo 3: 'Ring' type installation

7.3. INDICATION IN INSTALLATIONS WITH MORE THAN 1 CONTROLLER

When two or more Agrónic 4500 controllers are used in the same installation, it is essential to pay attention to the cables that connect to their respective modules. The Bus lines of each controller must be kept separate and never mixed.



Installation with mixed cables

8 RECOMMMENDATIONS

Where to install the unit

- Install the unit at the correct height and position for good handling.
- Avoid direct sunlight, humidity, dust and vibrations as much as possible.
- Avoid being close to elements that generate interference and may affect correct operation.
- To maintain the tightness of the box format, always keep the lid closed and install cable glands on the cable outputs.

Installation with frequency drive

- The expansion module ground must be independent and separate the ground spike from the drive and the pump.
- Sensor cables must be shielded and installed separately from power cables.
- It is highly advisable to install the expansion module and the drive in different and separate cabinets.
- It is advisable to place a filter between the drive and the pump to reduce the harmonics of the output signal and thus comply with the CE marking regulations. The filter must be located near the converter, as well as using shielded cable (EMC).
- In installations that have a pressure transducer, it must be galvanically isolated from the pressure pipe, since interference can propagate through it. The transducer can be secured to the wall by means of an insulating support and connected to the pressure pipe by means of a microtube.
- In the expansion module, the consequences of incorrectly installing the drive can be random output activation, screen changes without touching the keyboard and incorrect probe readings, among others.
- See the manual '1406 Installations with Agrónics and frequency drives' available on the Progrés website.

Sensor and meter wiring

- Sensor and meter cables should never pass next to or parallel to cables with alternate power. There must be a minimum distance of 0.5 meters between them.

SPACE RESERVED FOR THE USER

Use this space to record information such as the parameters entered into the controller, drawings, program information, determining factors, alarms, etc.

Warranty

The expansion module complies with CE marking directives.
Products manufactured by Progrés have a two-year warranty against any manufacturing defect.
Compensation for direct and indirect damage caused by the use of the controllers is excluded from the warranty.

Sistemes Electrònics Progrés, S.A.
Polígon Industrial, C/ de la Coma, 2 | 25243 El Palau d'Anglesola | Lleida | Spain
Tel. 973 32 04 29 | info@progres.es | www.progres.es

R-2544