



Replacing guide for automatic burner control

ALBEN BC

- Replacing of ESA ESTRO burner control with ALBEN BC

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1. GENERALITY

1.1 INTRODUCTION

The purpose of this document is to describe the interconnection differences between ALBEN BC and ESTRO burner controls and highlight the changes required to the electrical circuits when using an ALBEN BC to replace an ESTRO in an existing system.

Considering of the ESTRO burner control functions, the ALBEN BC replacing unit will be composed by one ALBEN SAFE UNIT unit and if required one ALBEN AEM01 unit.

The ALBEN BC S have the same dimension of ESA ESTRO unit, then it is possible to maintain the ESTRO base, and just change the terminal block wiring.

ALBEN BC S IN THERMOSET CASE

- Same ESTRO box dimensions
- The base and the existing cables can be used and adjusted.

ALBEN BC D IN ALUMINIUM CASE

- Different box dimensions respect ESTRO
- If necessary, the existing cables must be replaced.



1.2 SPARE UNIT REQUIREMENT

ESTRO and ALBEN burner controls have inputs, outputs, and operating modes that can be configured to suit the application.

To obtain a replacement ALBEN suitable for your application, it is essential to provide the configuration of the installed devices.

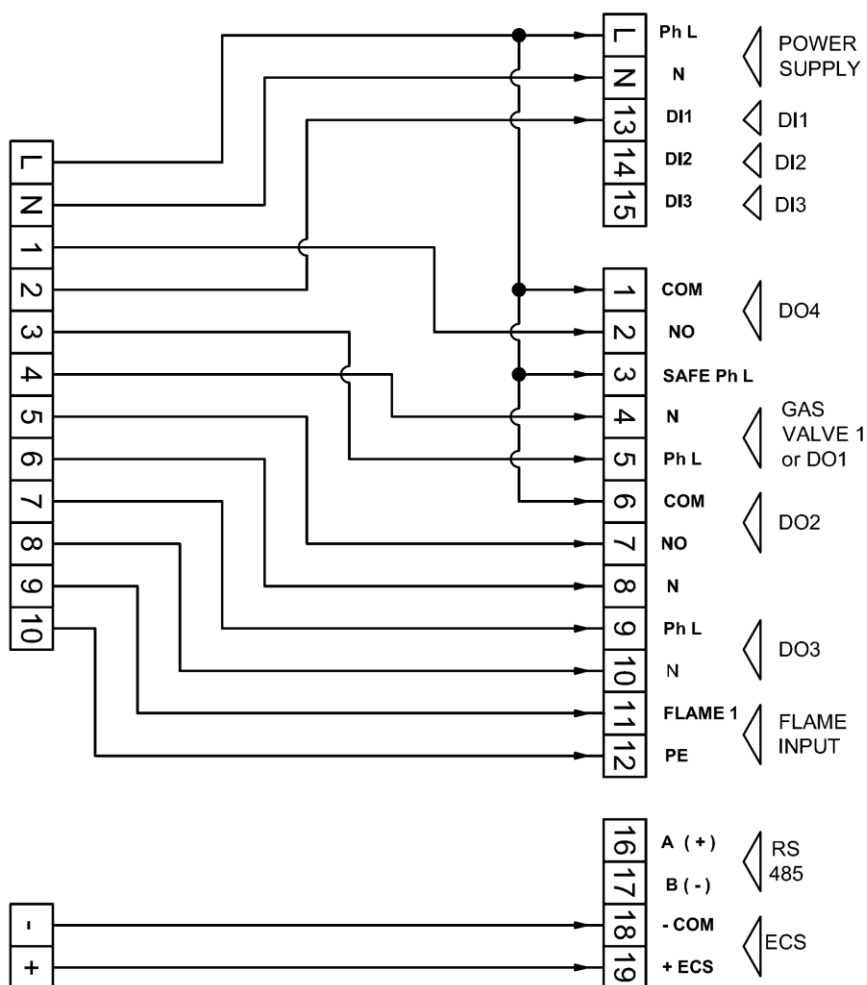
2. DEVICE REPLACEMENT

2.1 ESTRO A REPLACEMENT

The wiring change is described below.

ESA ESTRO A
MANUFACTURED
UNTIL 2026

ESA ALBEN BC
MANUFACTURED
FROM 2026



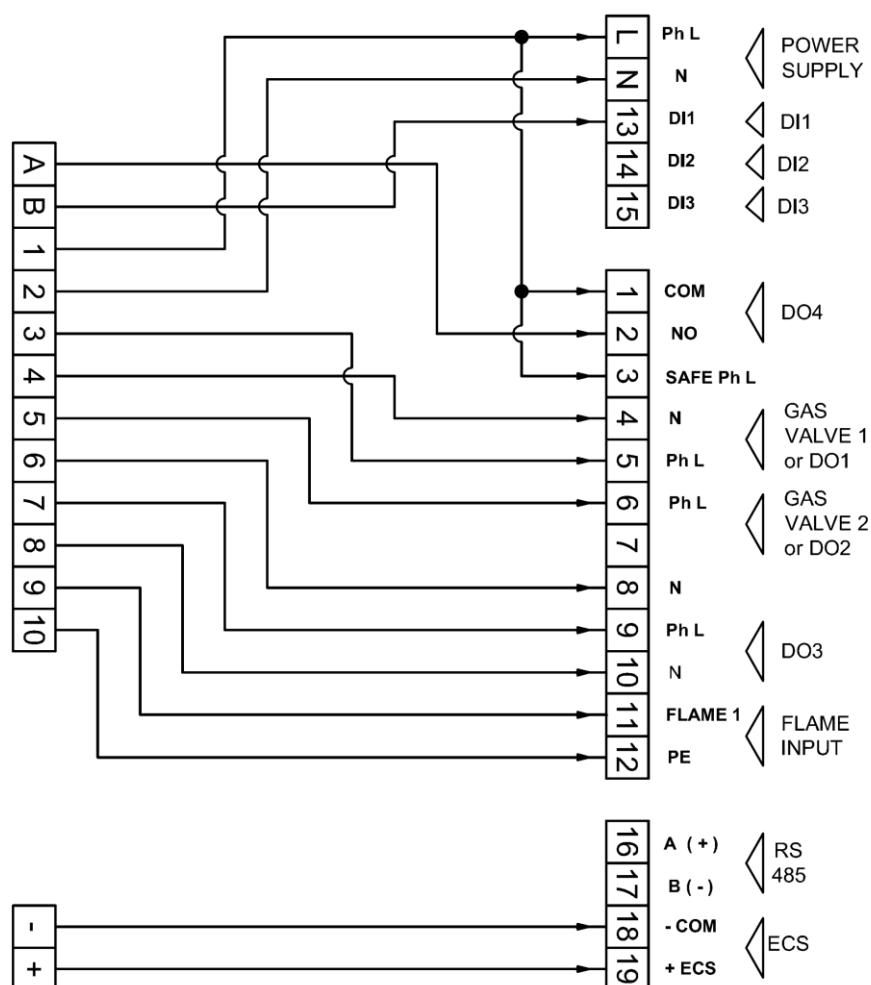
ATTENTION: ORDERING
CODE PARAMETER 02
MUST BE "C" OR "N"

2.2 ESTRO B REPLACEMENT

The wiring change is described below.

ESA ESTRO B
MANUFACTURED
UNTIL 2026

ESA ALBEN BC
MANUFACTURED
FROM 2026



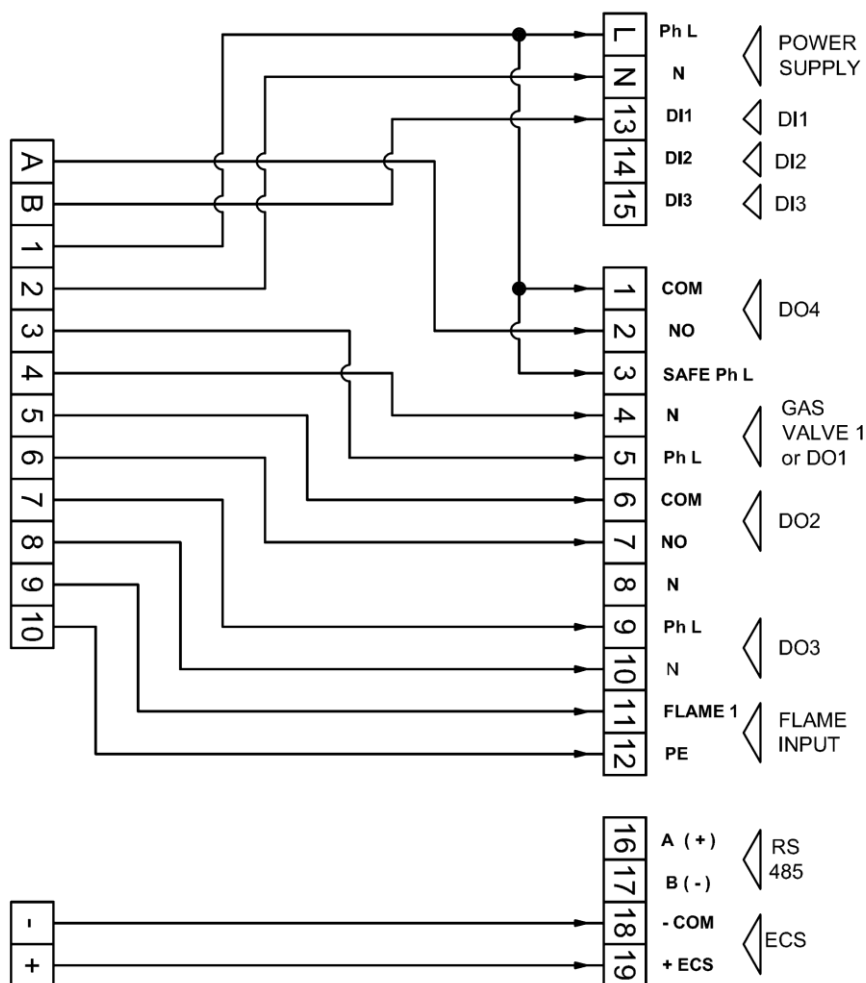
ATTENTION: ORDERING
CODE PARAMETER 02
MUST BE "B" OR "M"

2.3 ESTRO C REPLACEMENT

The wiring change is described below.

ESA ESTRO C
MANUFACTURED
UNTIL 2026

ESA ALBEN BC
MANUFACTURED
FROM 2026



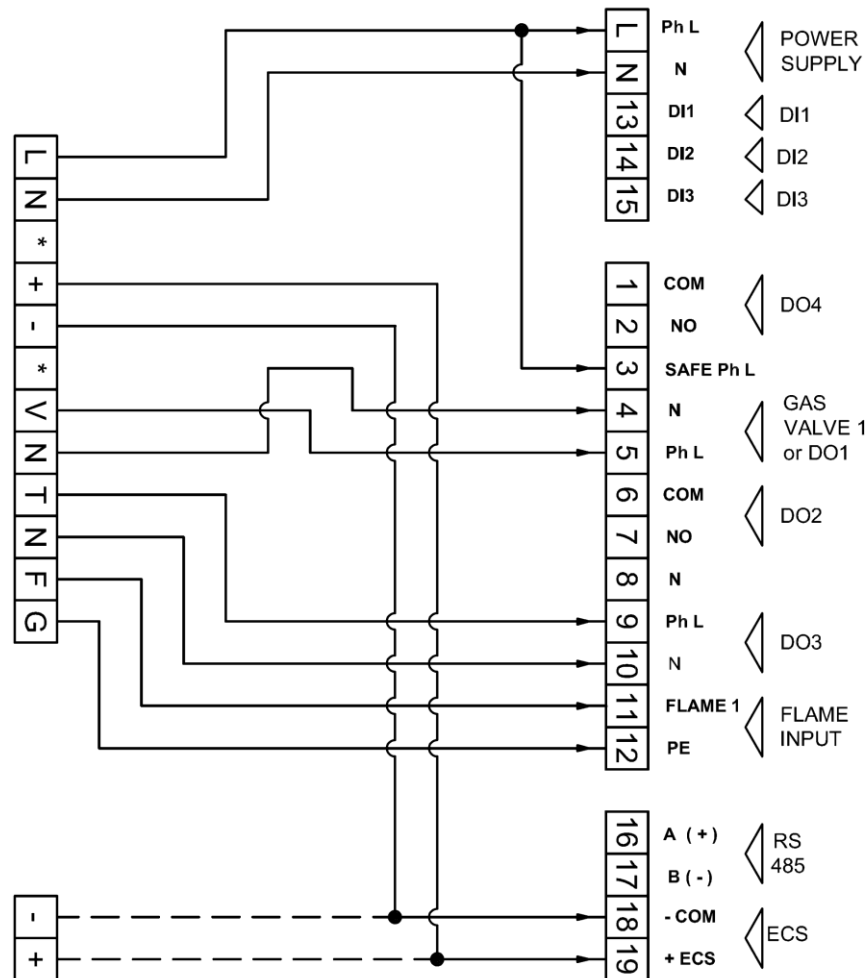
ATTENTION: ORDERING
CODE PARAMETER 02
MUST BE "C" OR "N"

2.4 ESTRO Q REPLACEMENT

The wiring change is described below.

ESA ESTRO Q
MANUFACTURED
UNTIL 2026

ESA ALBEN BC
MANUFACTURED
FROM 2026



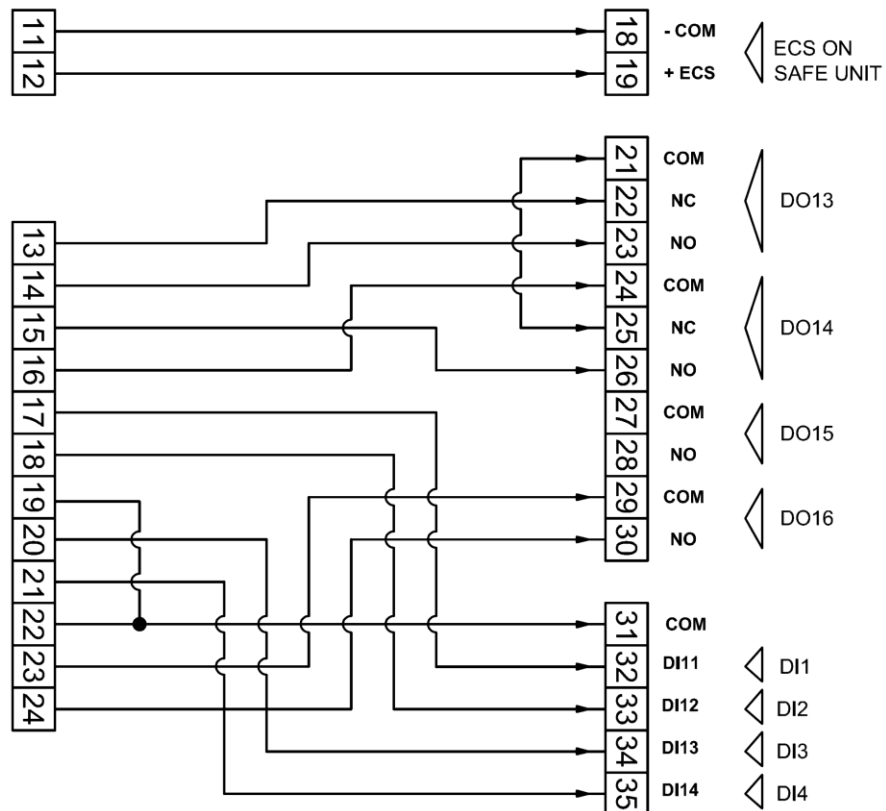
ATTENTION: ORDERING
CODE PARAMETER 02
MUST BE "C" OR "N"

2.5 ESTRO EXPANSION EXP2 REPLACEMENT

The wiring change is described below.

**ESA EXP2
MANUFACTURED
UNTIL 2026**

**ESA AEM01
MANUFACTURED
FROM 2026**

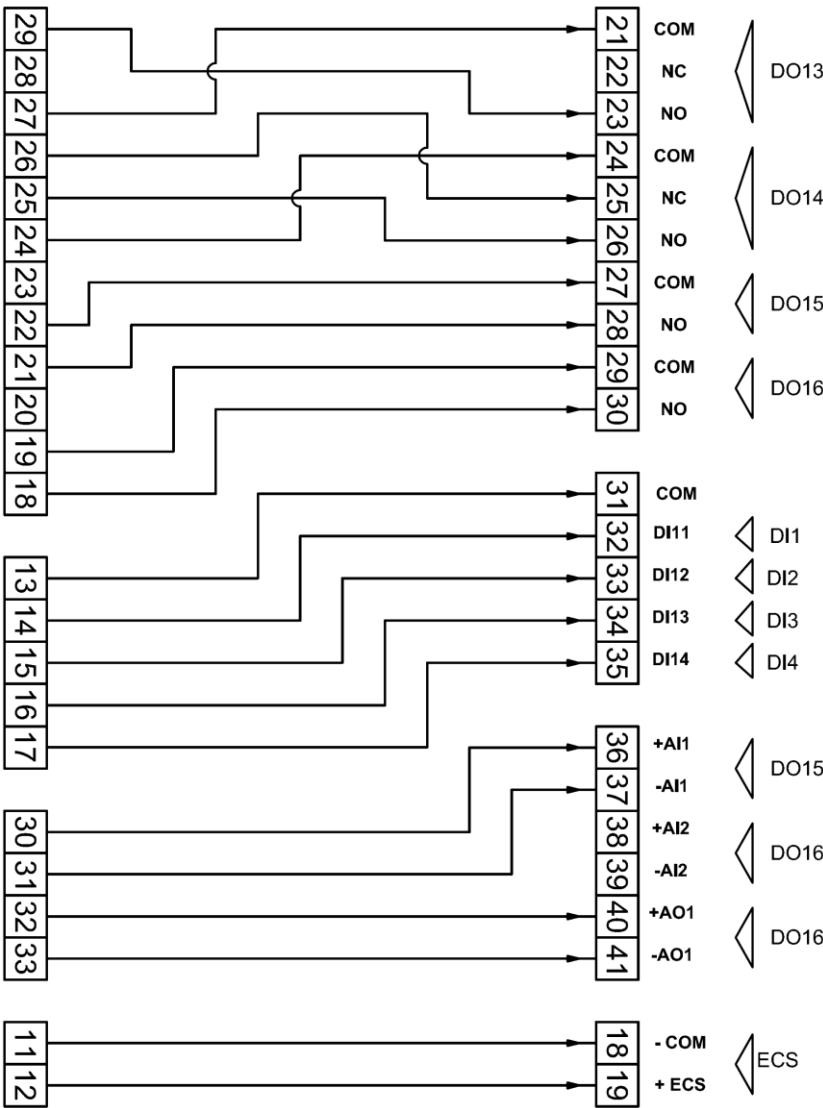


2.6 ESTRO EXPANSION EXP4 REPLACEMENT

The wiring change is described below.

ESA EXP4
MANUFACTURED
UNTIL 2026

ESA AEM01
MANUFACTURED
FROM 2026

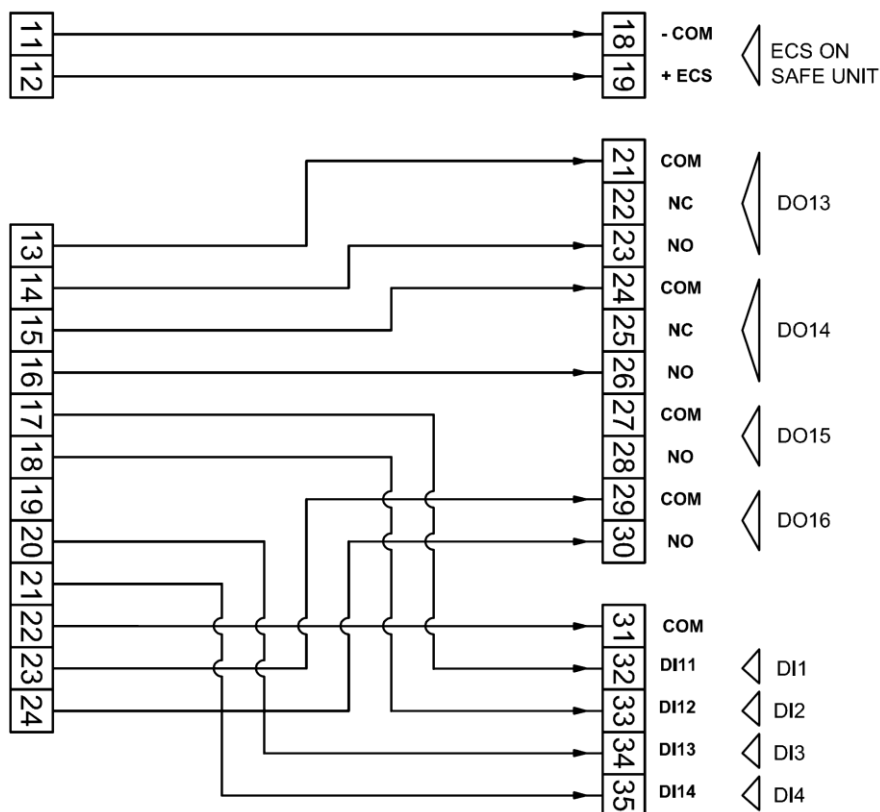


2.7 ESTRO EXPANSION EXP5 MODE 1 REPLACEMENT

The wiring change is described below.

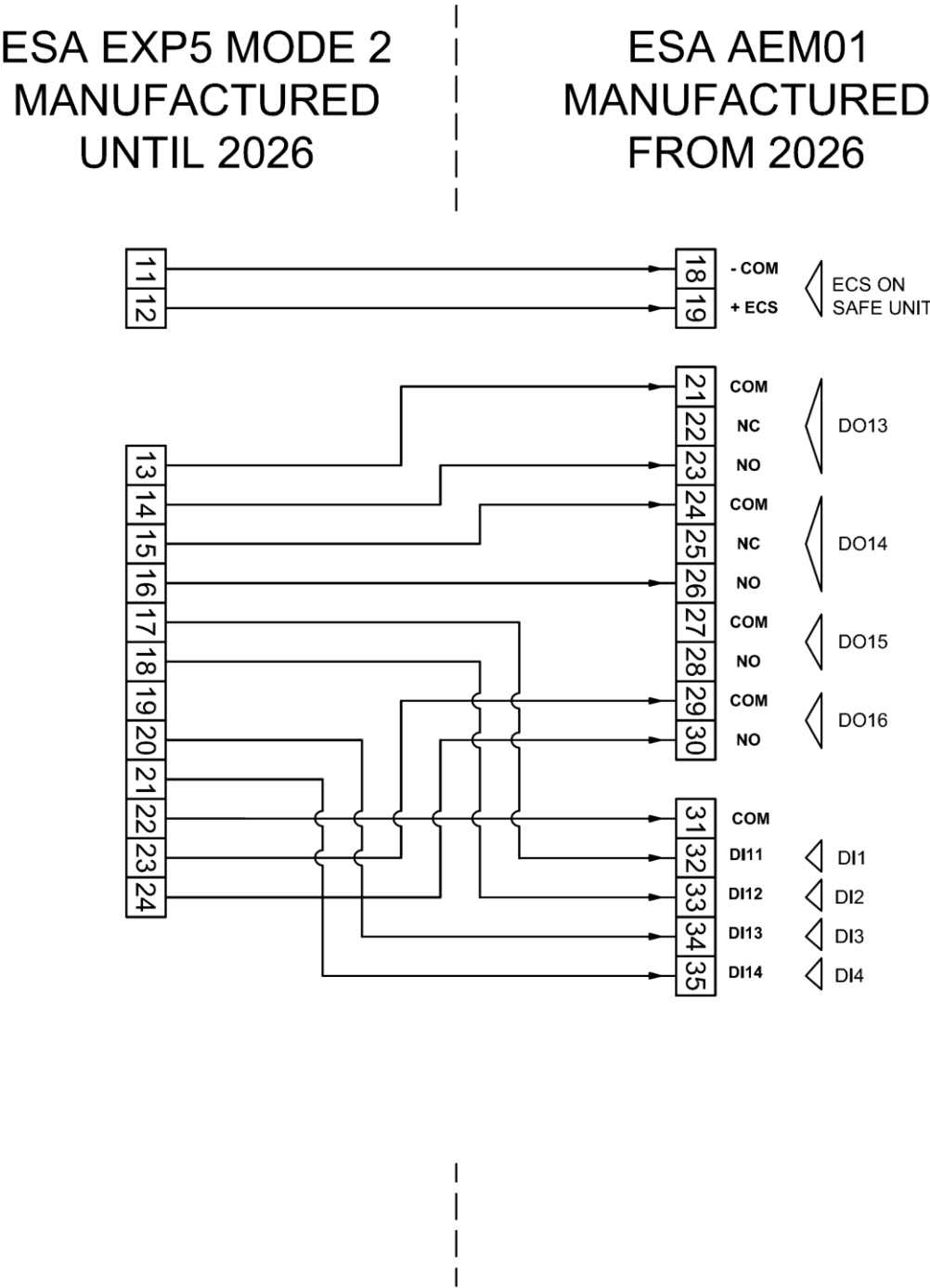
ESA EXP5 MODE 1
MANUFACTURED
UNTIL 2026

ESA AEM01
MANUFACTURED
FROM 2026



2.8 ESTRO EXPANSION EXP5 MODE 2 REPLACEMENT

The wiring change is described below.

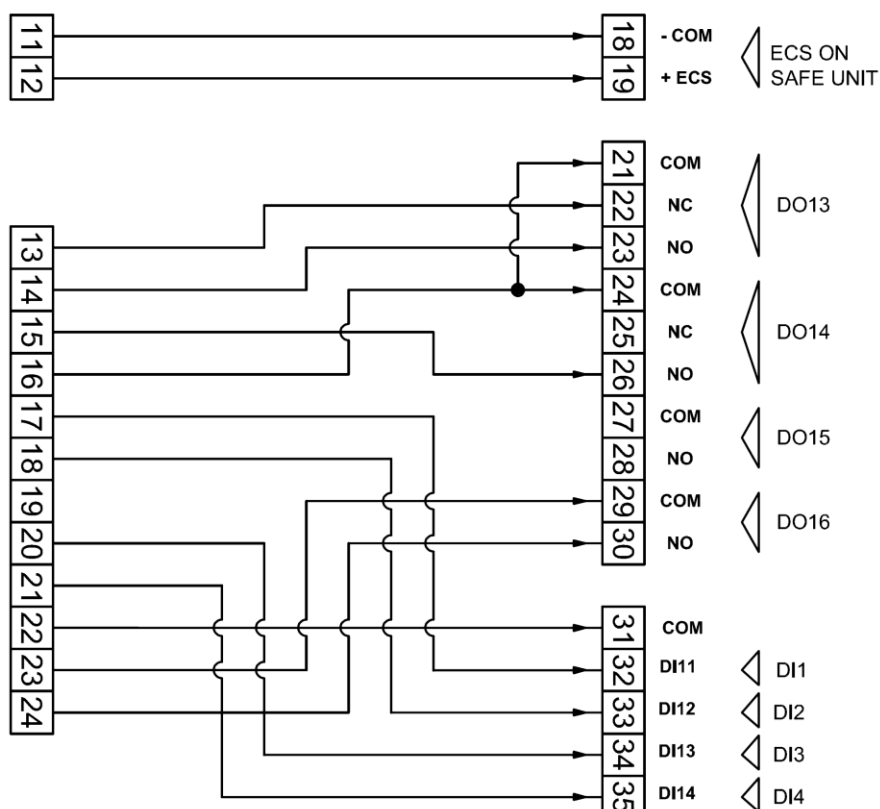


2.9 ESTRO EXPANSION EXP5 MODE 3 REPLACEMENT

The wiring change is described below.

ESA EXP5 MODE 3
MANUFACTURED
UNTIL 2026

ESA AEM01
MANUFACTURED
FROM 2026



2.10 DESIGN GUIDELINES



In the selection of configuration parameters analyze, in addition to the specific rule, any risks associated with certain modes of operation, choosing values which do not jeopardize the safety of the application. Before installing the unit, check that the configuration parameters conform to what has been defined.



ALBEN BC is designed for fixed installations and is meant to be electrically connected in a permanent and fixed manner. The reverse / neutral connection may compromise the security of the system. Do not use different phase between the various voltage inputs and do not apply voltages on the output or serial communication terminals.



The EMC emissions of the application must be checked following the incorporation of the final application of the burner control device. The EMC application requirement shall be tested after the incorporation of the burner control device into the final equipment.



Burner safety shut down, for unsafe application conditions (emergency, overheating, in correct pressure values etc), is guaranteed removing the relative digital input or removing the power for voltage output (terminal 3 and 53). The same recommendation is valid for instruments that are controlled by serial communication, where the ignition and shut down commands cannot be considered for safety but only for regulation control.



The input digital signal must be pulse-type and must not be present during the instrument's auto diagnosis when the input has the function for Reset/Stop, Only Reset and Only stop; whilst it must be stable when the input has other functions. The reset command is not accepted if the pulse duration is less than or greater than what has been specified.



In case of power supply interruption, the device restarts its program sequence from the beginning checking all interlocks. Refer to interlocks documentation in case they have to be reset.



ALBEN BC can activate the high temperature operation detecting the furnace temperature. As alternative the high temperature operation command can be connected to a digital input and the command must derive directly from the safety temperature detector (a part of the protection system according to the ISO EN13577-4). The high temperature operation guarantees indirect flame control, monitoring that the minimum combustion chamber temperature is enough to guarantee ignition of the fuel introduced. Refer to the specific application norm for the choice of these devices.



The power supply for the solenoid fuel valves must be derived only from dedicated outputs on the ALBEN BC. Control of the fuel solenoid valves by other not safety devices is not allowed (normal relay, not safety PLC...) that receive the command from the device.



When replacing the output protection fuse, the fuse must be fast acting and with a value that does not exceed the maximum permissible current. Otherwise, the not replaceable fuse blows to protect internal relays, so that the device does not work anymore.



After replacing the resettable fuse, before reconnecting the instrument to the application it is imperative to check the absence of internal damage. Check the insulation between the power supply phase terminal and the safety valve output phase terminals. Otherwise, the device must be sent to the manufacturer.



The HV ignition cable must not exceed a length of 2 meters (ideally 1 meter, maximum limit if an electronic transformer is used). The ignition transformer must be positioned near the burner.



Foreseen the noise filter connector for connecting the HV cable to the ignition electrode



For unirod detection systems use only specific ignition transformers, that allow operation for unirod ignition and detection. Make sure that ALBEN BC is connected correctly to the earth protection before ignition to avoid irreparable damage.



Avoid igniting the burner too close together. Consider a minimum time between one switch-on and the next equal to the sum of the prewash time and the first safety time, increased by at least 5 seconds. In any case, do not switch on more than 2 times in a period of 30 seconds.



ALBEN BC is a device that controls burner safety organs and functioning (a part of the protection system according to the ISO EN13577-4). It is not intended for burner regulation for which there are appropriate instruments.



If the supply system has a phase-phase type power or not earth-bonded, install an insulation transformer, connecting it to one end of the secondary winding referred to protection earth.



The safety change over output of AEM01 (DO5, DO6, DO13, DO14) can be used to control fuel valves or safety devices. In this case they must be fed by a safety voltage output of Safe Unit (DO1, DO2, DO9, DO10), and the total consumption of the connected loads cannot be higher than the maximum allowed for voltage output of Safe Unit.



Incorrect installation can cause damage to things or people, as well as altering the performance of the combustion system. ESA declines any responsibility in the event of incorrect installation of its products.



In case of malfunctioning ALBEN BC must be sent back to the manufacturer for repair. Any type of repair or alteration done by third parties causes the general guaranteed conditions to expire and compromises the device safety



For selecting the position of the HTO sensor in the application, the effect of exposing it to radiant heat directly from the flame is taken into account, see e.g. EN 746-2 or EN ISO 13577-2.



Record the configuration of the parameters set during the design phase or defined following system validation, in order to ensure their availability for any spare parts requests.

3. INSTALLATION



In case of failure to comply with the following warnings, the general warranty conditions and ESA is not responsible for any damage to things or people.



All the operations described in this chapter must be carried out by qualified technical personnel, in compliance with all the points indicated in this manual. The indications given in this document do not exempt the customer/user from compliance with the general and specific legal provisions.



Any modification or repair carried out by personnel not authorized by ESA.



The operator must wear suitable clothing and PPE in accordance with the legal requirements, respecting the general safety and risk prevention regulations.



The operation of the device is guaranteed only if the characteristics of the system (connections, type of power supply, operating temperatures, etc...) are compatible with the technical data of the product.



In case of malfunctions, follow the instructions in the paragraph "Troubleshooting" or contact customer service ESA.

3.1 ASSEMBLY



Combustion system components can reach high temperatures. Pay maximum attention to exposed hot parts.



Avoid placing ALBEN BC near intense magnetic or electric fields and in conditions of direct exposure to heat or combustion products, liquids, solvents or corrosive gases.



Do not limit in any way the area surrounding the instrument, but guarantee adequate space and ventilation to avoid overheating the device



The declared enclosure protection degree is guaranteed using specific cable glands or plugs with equal or higher protection degree value. Install cable glands or plugs as necessary to complete the wiring.



All reworkings of the enclosure box necessary for installation of the instrument must provide a minimum degree of protection of IP40. For systems used in open air, the minimum protection degree must be equal to IP54. The protection degree can also be guaranteed by the appliance in which the instrument is installed.

3.2 WIRING



The body of the burner and all the metal elements connected to it must be connected to the protective earth of the system with suitable conductors.



The connection cables must be positioned away from heat sources.



The ignition electrode connection cable must be specific for high voltage (hereinafter called HV) and unshielded. For positioning, sizing and other information on the HV cable, refer to the technical bulletin of the ignition transformer

-  The detection electrode connection cable must have a minimum section of 1mm² and must be suitable for the purpose. The use of an HV cable is recommended.
-  The UV sensor connection cable must have a minimum section of 1mm² and must be suitable for the purpose. For more information, please refer to the UV sensor technical datasheet.
-  The HV cable must be laid individually, away from power cables and not in metal ducts, ideally it should be left in free air.
-  The HV ignition cable must not exceed a length of 2 meters (ideally 1 meter, maximum limit if an electronic transformer is used). The ignition transformer must be positioned near the burner.
-  Use the noise filter connector for connecting the HV cable to the ignition electrode.
-  During wiring refer to the technical documentation, respecting polarity between phase and neutral.
-  The terminals for the electrical connections are screw-on type and can accept wires with sections from 0.5 to 2.5mm² and the choice of conductors and their location must be suitable for the application.
-  Adequately tighten the wires into the terminals to prevent malfunction or overheating which can lead to dangerous conditions. Numbering and the use of appropriate terminals on the conductors is recommended.
-  The laying out of the flame signal cables must be separated from power cables and other cables. The use of multi-core cables is not allowed, nor the use of shielded cables. The type of cables must ensure the minimum insulation required between the conductors.
-  Detection probes and any connectors must be isolated and made inaccessible using proper protection, so as to allow access only to qualified personnel.; if it is considered necessary, place warnings near the probes.
-  In applications with multiple burners, parallel connections between the outputs of the instruments are not allowed. If the system is controlled via communication lines, follow the specific wiring instructions.
-  The laying out of the communication lines must be separated from power lines, motor control (inverter) and network voltage.
-  For the ECS communication lines, use the specific ECS CABLE; alternatively, we recommend the use of busway systems taking into account a maximum length of the connecting cable between the busway and instrument of 1 m, both for communication and for the power supply. MULTIPOLAR nor SHIELDED cables are allowed.
-  Check the correct connection after installation. Before powering the instrument make sure that the voltage and frequency are correct; ensure that users do not have an absorption greater than the maximum capacity of the output contacts.

ESA contacts



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