

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

S7-300

6ES7331-7RD00-0AB0

SM 331 INTRINSICALLY SAFE ANALOG INPUT

Used with the applicable SIMATIC S7-300 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation

SM 331; AI 4 x 0/4...20 mA, 6ES7331-7RD00-0AB0, as of product state 17

Product Information Leaflet

This product information document contains important information on **connecting signals from a hazardous area** to the SM 331; AI 4 x 0/4...20 mA.

Further Information

You will find more information on the module, the use of the DM 370 and explosion-proof isolating bar and the isolation of intrinsically safe and non-intrinsically safe cables in the Reference Manual S7-300, M7-300, ET 200M Automation Systems, I/O Modules with Intrinsically-Safe Signals (part of the documentation package with the order number 6ES7398-8RA00-8AA0).

Production Location

Siemens AG, 76181 Karlsruhe, Germany

Certification

ATEX  II 3 G (2) G Ex ec [ib Gb] IIC T4 Gc
II 3 G (2) D Ex ec [ib IIIC Db] IIC T4 Gc

IECEX Ex ec [ib Gb] IIC T4 Gc
Ex ec [ib IIIC Db] IIC T4 Gc

UKCA  DEKRA 21UKEX0100 X
Importer UK:
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Manchester M20 2UR

CCC  GB 3836.1-2010
(Explosive atmospheres - Part 1: Equipment - General requirements),
GB 3836.4-2010
(Explosive atmospheres - Part 4: Equipment protection by intrinsic safety "I")
GB 3836.8-2014
Explosive atmospheres - Part 8: Equipment protection by type of protection "n"
GB 12476.1-2013
(Electrical apparatus for use in the presence of combustible dust - Part 1: General requirements),
GB 12476.4-2010
(Electrical apparatus for use in the presence of combustible dust - Part 4: Protection by intrinsic safety "ID")

EAC Ex  2Ex nA [ib Gb] IIC T4 Gc X
[Ex ib Db] IIIC X

Note

Modules with the certification Ex ec [ib Gb] IIC T4 Gc, Ex ec [ib IIIC Db] IIC T4 Gc can only be used in SIMATIC S7-300/ET 200M automation systems belonging to equipment category 3. Intrinsically safe electrical equipment for zones 1, 2 and zones 21, 22 can be connected.

Maintenance

The analog module is maintenance-free. If a repair becomes necessary, the module must be sent to the production location. Repairs may only be performed by the manufacturer.

Installation

- The analog module must be installed outside the hazardous area in a suitable housing that complies with the IP 20 degree of protection in accordance with EN 60529.
- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1. The equipment shall be installed in a suitable enclosure that provides a degree of protection not less than IP54 in accordance with IEC 60079-7.
- If a temperature of > 70 °C is reached in the cable or at the cable entry of this housing under operating conditions, or if a temperature of > 80 °C can be reached at the junction of the conductors under operating conditions, the temperature-related properties of the cables must correspond to the temperatures actually measured.

Commissioning

- Once the analog module is installed, all the relevant isolation, connecting cables and connections must adhere to the conditions of Section 6.3 in accordance with EN 60079-11.
- During installation, the wire chamber (6ES7393-4AA00-0AA0) must be used

Supply lines with ferrules

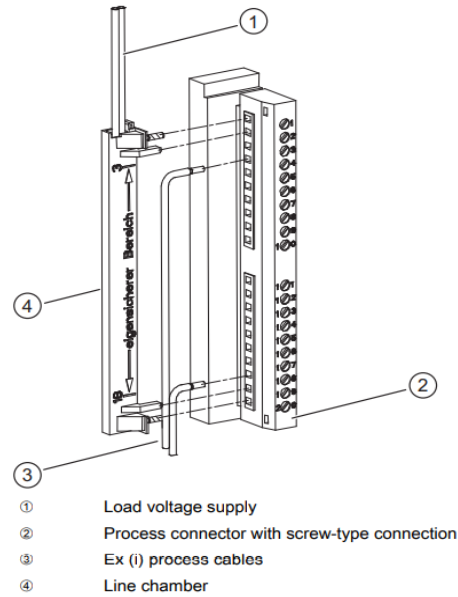
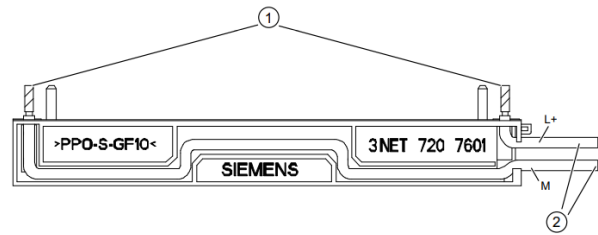


Figure 1-1 Connecting the LK 393 line chamber



- ① Wire end ferrule
② Diameter > 2 mm

Figure 1-2 Inserting the load voltage connection cables into the line chamber. Outer diameter of the cables > 2 mm (view from below)

It can also happen that the minimum thread length is not adhered to between the different modules (e.g. in mixed use of explosion-proof and standard modules). If the minimum thread length between conducting parts of explosion-proof and standard modules is less than 50 mm, the following options are available to you for adhering to the thread length between the modules:

1. Use the Ex isolating bar (6ES7 195-1KA00-0XA0) in connection with bus modules with an active backplane bus.
 2. If you do not use a bus module with an active backplane bus, you can also use the dummy module DM 370 (6ES7 370-0AA01-0AA0).
- To use the measurement inputs with the specified maximum values for connection to active sensors (with an external power supply), the unused measuring transducer outputs 3, 7, 12 and 16 on the front connector must be closed with appropriate plastic plugs.
 - In wiring the submodule, you must strictly separate the intrinsically safe lines from the non-intrinsically safe. They must be laid in separate cable ducts.
 - The analog module must be operated with safe functional extra-low voltage. This means that these modules may be subject to a voltage of no more than **Um ≤ 60 V (DC) or 30 V (AC)**, even in the event of an error.

All sources of voltage (e.g. internal 24 VDC load power supplies, external 24 VDC load power supplies, 5 VDC bus voltage) must be connected with each other electrically in such a way that, even if there are differences in potential, no voltage addition occurs at the different voltage sources and the error voltage **Um** is not exceeded.

Connection conditions for front connector:

Connectable cables	Front connector 20-pin
Solid cables	No
Flexible cables	
• Without ferrule	0.25 mm ² to 1.5 mm ²
• With ferrule	0.25 mm ² to 1.5 mm ²
Tightening torque	From 0.4 Nm to 0.8 Nm

Connecting the line chamber

1. Trim the cables of the L+ and M connections to the desired length, strip insulation and apply ferrules.
2. Insert the cable ends with the ferrules through the openings in the LK 393 line chamber until they are flush with the fastening pins.
3. Press the cables into the guide ducts of the LK 393 line chamber and route them upward (secure with hot-melt adhesive if necessary).
4. The line chamber pre-assembled in this way is now inserted in the terminals of the front connector.
5. Connect the ferrules of L+ and M to the terminals 1 and 20 and the fastening pins to terminals 2 and 19.