

DIN rail mounting temperature controller with current transformer input

D1 line

Installation manual • M.I. D1-2/04.05 • Cod. J30-658-1AD1 IE



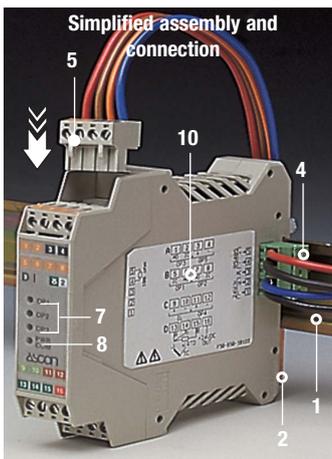
D1 line Installation manual

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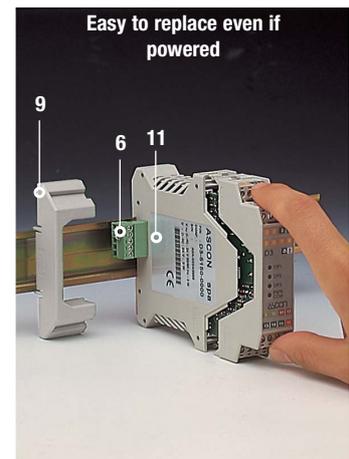
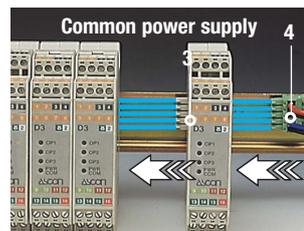


General description



- 1 DIN-rail, EN50022
- 2 Spring loaded slide for rail fastening
- 3 Side connector, build-in, to connect one instrument to another (up to 31)
- 4 5-pole male connector, with screw terminals, for power supply and serial communications bus
- 5 Four quick polarised connectors with 4 screw terminals for I/O

- 6 Female connector, with termination resistor for serial communications
- 7 Three Output status leds (red)
- 8 Green Status led:
 - ON: power on
 - flashing: serial communications in progress
- 9 Couple of connector protections
- 10 Wiring label
- 11 Model identification label



Model code

 Mod. **D1** **5B5D** - **EF00**
 Line Basic Accessories

The product code indicates the specific hardware configuration of the instrument, that can be modified by specialized engineers only.

 Line **D1**

OP1-OP2 outputs	B
Relay - Not fitted	0
Relay - Relay	1
SSR - Not fitted	3
SSR - SSR	5

Options	D
None	0
Current transformer (CT)	3

Special functions	E
Not fitted	0
Start-up + Timer	2

User manual	F
Italian/English (std)	0
French/English	1
German/English	2
Spanish/English	3

Notes on electric safety and electromagnetic compatibility

Please, read carefully these instructions before proceeding with the installation of the I/O module

Class II instrument, rear panel mounting.

This instrument has been designed in compliance with:

Regulations on electrical apparatus:
 according to regulations on the essential protection requirements in electrical apparatus EN 61010-1

Regulations on Electromagnetic Compatibility:
 according to:

- Regulations on RF emissions:
 - EN61000-6-3 residential environments,
 - EN61000-6-4 industrial environments;
- Regulation on RF immunity:
 - EN61000-6-2 industrial equipment and system.

It is important to understand that it's responsibility of the installer to ensure the compliance of the regulations on safety requirements and EMC.

This device has no user serviceable parts and requires special equipment and specialised engineers. Therefore, a repair can be hardly carried on directly by the user. For this purpose, the manufacturer provides technical assistance and the repair service for its Customers.

Please, contact your nearest Agent for further information. **All the information and warnings about safety and electromagnetic compatibility are marked with the  sign, at the side of the note.**

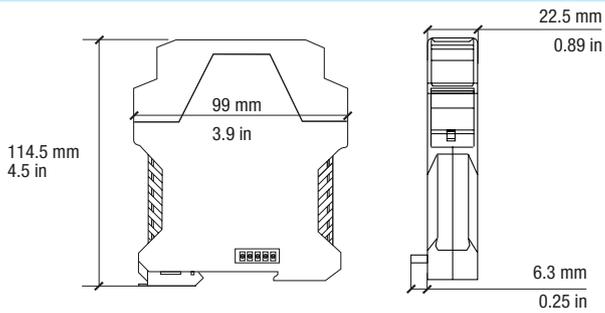
Installation kit

 Each set of interconnected controllers requires one model **AD3-KIT/BA.RT.PC.CD** kit:

Power supply and serial comm.s connector code AD3/BA		Couple of connector protections code AD3/PC	
Connector with termination resistor for serial comm.s code AD3/RT		CD Rom with configuration software tool code AD3/CD	

Installation

Dimensions

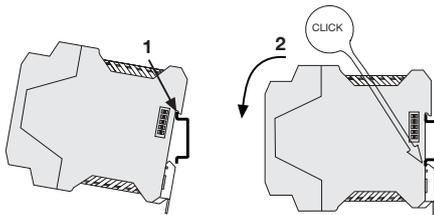


Environmental condition		CE	Suggestion
Operating conditions	Temperature 0...50 °C		
	Relative humidity 5...95% Rh non-condensing		
Special conditions	Temperature > 50 °C		Use forced ventilation
	> 95% RH		Warm up
	Conducting atmosphere		Use filter
Forbidden condition	Corrosive atmosphere	Explosive atmosphere	

Mounting on DIN rail (EN60022)

Mounting

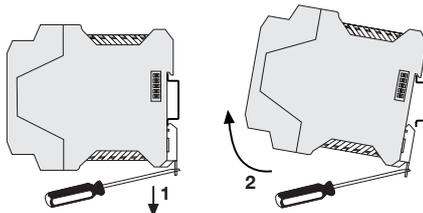
- clip the upper part of the instrument on the rail
- rotate the instrument downwards until the click



Disassembly

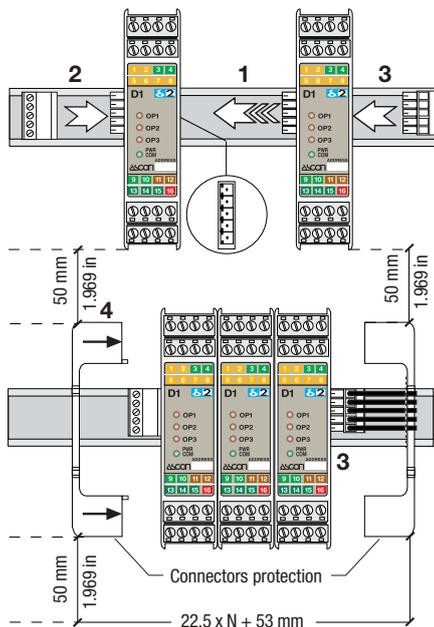
Switch the instrument off

- lower the spring slide by inserting a flat-blade screwdriver as indicated
- turn and lift the instrument upwards.

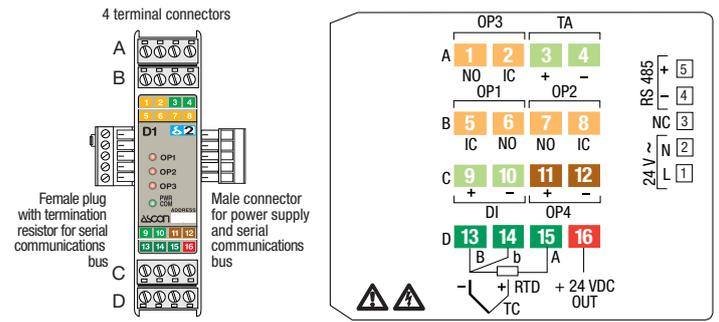


Mounting several instruments (up to 31) side by side

- After the mounting of instruments on the rail, put them side by side so that the male side connector fits into the corresponding female connector
- After mounting all the instruments side by side insert the female 5-pole connector with the termination resistor of the serial communications into the corresponding male connector
- Wire the 5-pole male power supply and serial communications connector and insert it in the corresponding female connector
- When assembled insert the connector protection on both sides



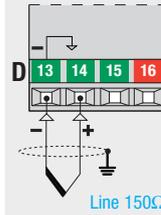
Terminal connectors and plugs



Features	Terminal plugs A-B-C-D	Power supply and communications connectors
Flexible cable section:	0.2...2.5 mm ² (AWG24...AWG12)	0.08...1.5 mm ² (AWG28...AWG16)
Stripped wire	7 mm...0.28 in	7 mm...0.28 in
Negative screwdriver	0.6 x 3.5 mm	0.4 x 2.5 mm
Tightening torque	0.5...0.6 Nm	0.4...0.5 Nm

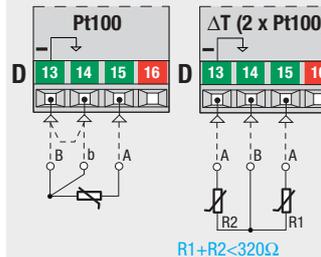
Input

PV control input: L-J-K-S-R-T-B-N-E-W thermocouple type



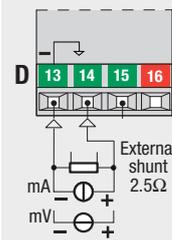
- Connect the wires with the polarity as shown
- Use always compensation cable of the correct type for the thermocouple used
- The shield, if present, must be connected to a proper earth.

PV control input: For Pt100 resistance thermometer - ΔT (2 x Pt100) special

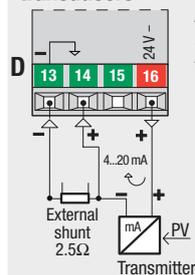


- If a 3 wires system is used, use always cables of the same section (1mm² min.) (maximum line resistance 20 Ω/line)
- When using a 2 wires system, use always cables of the same section (1.5mm² min.) and put a jumper between terminals 13 and 14
- ⚠ When the distance between the controller and the sensor is 15 m using a cable of 1.5 mm² section, produces an error on the measure of 1°C (1.8°F).

PV control input for mA, mV

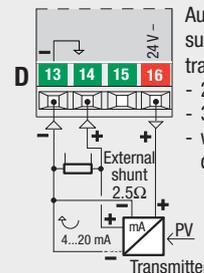


PV control input with 2 wires transducers



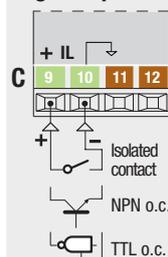
- Auxiliary power supply for external transmitter
- 24Vdc ±20%
 - 30mA max.
 - without short circuit protection

PV control input with 3 wires transducer



- Auxiliary power supply for external transmitter
- 24Vdc ±20%
 - 30mA max.
 - without short circuit protection

Digital input



- **ON**
The input is active when the logic state is ON, corresponding to the contact closed
- **OFF**
The input is inactive when the logic state is OFF, corresponding to the contact open

Precautions

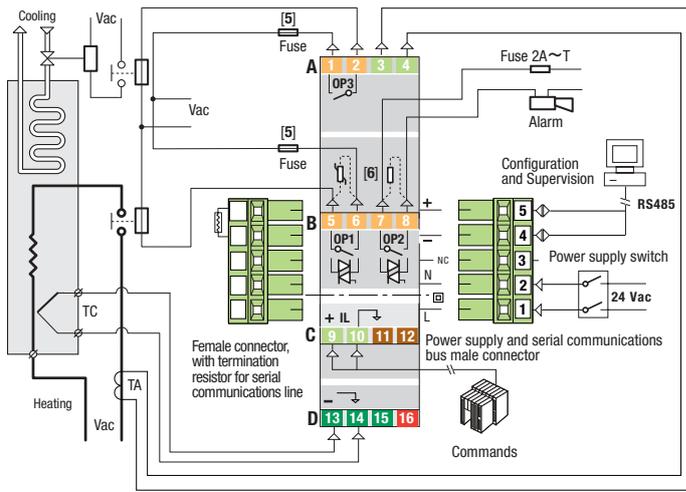
All the wiring must comply with the local regulations .

The supply wiring should be routed away from the power cables

Avoid to use electromagnetic contactors, power Relays and high power motors nearby.
Avoid power units nearby, especially if controlled in phase angle .

Keep the input low voltage sensor wires away from the power lines and the output cables.
If this is not achievable, use shielded cables on the sensor input, with the shield connected to earth

Example of wiring diagram (Heat/Cool control)



Notes

- 1 Make sure that the power supply voltage is the same indicated on the instrument.
- 2 Switch on the power supply only after that all the electrical connections have been completed.
- 3 In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument. The power supply switch shall be easily accessible from the operator.
- 4 The instrument is protected with a PTC fuse. In case of failure it is suggested to return the instrument to the manufacturer for repair.
- 5 To protect the instrument internal circuits use:
- 2 A~ T fuses for Relay outputs (4 A at 120Vac)
- 1 A~ T fuses for SSR outputs.
- 6 Relay contacts are already protected with varistors.

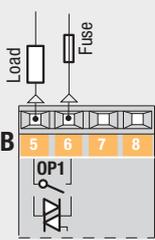
Only in case of 24 Vdc inductive loads, use model A51-065-30D7 varistors (on request).

OP1 - OP2 - OP3 - OP4 output

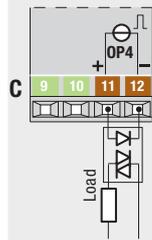
OP1-OP2-OP3-OP4 output characteristics

Output	Type	For resistive load or auxiliary circuit breaker
OP1 - OP2	Relay	SPST Relay N.O., 2A/250 Vca (4A/120Vac) External fuse 2A~T at 250Vac (4A~T at 120Vac)
OP1 - OP2	SSR	1A/250 Vac External fuse 1A~T
OP3	Relay	SPST Relay N.O., 2A/150Vac External fuse 2A~T at 150Vac
OP4	Digital	Not isolated: 0...5 Vdc, ±20% 30 mA max.

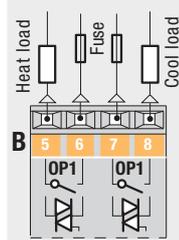
Single action Relay (SSR)



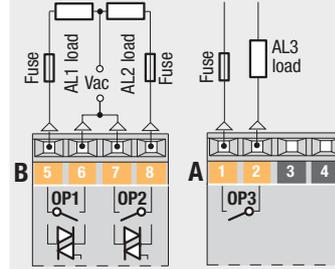
Single action SSR Drive



Double action Relay (SSR) / Relay (SSR)

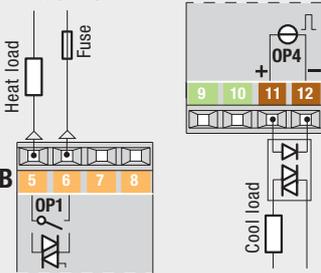


Alarm output

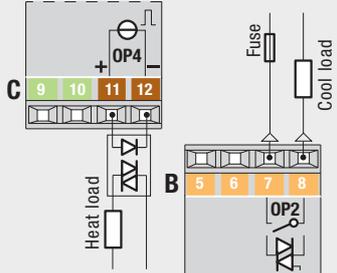


The relay/SSR output OP1, OP2 and OP3, can be used as alarm outputs only if they are not used as control outputs

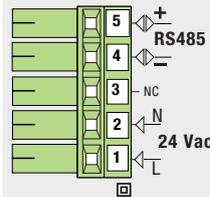
Double action Relay (SSR) / SSR Drive



Double action SSR Drive / Relay (SSR)



Power supply bus and serial communication RS485

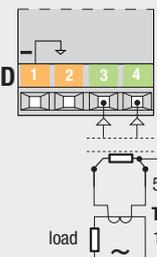


Power supply: Switching type with double insulation with incorporated PTC (fuse which can be reset).
Rated voltage: 24Vca (-25...+12%) 50/60 Hz; 24Vdc (-15...+25%).
Power consumption: 3 W max.
Protection: Incorporated PTC.

Serial communication: Passive and galvanically isolated interface 500Vca/1 min. Conforms to standard EIA RS 485, Modbus/Jbus protocol

Auxiliary input

For current transformer CT - Not isolated



For the measure of the load current

- Primary coil 10A...100A
- Secondary coil 50mA default 100mA S3 internal jumper selectable

5 Watt burden resistor
0.5Ω for 1A secondary transformer coil
0.1Ω for secondary transformer coil

