EUROMAP 73

Electrical Interface between Injection Moulding Machines and External Safety Devices

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(8 pages)

This recommendation was prepared by the Technical Commission of EUROMAP.

Supplier's data corrected (v. 1.0a).

List of plug suppliers removed (v. 1.1).
Please visit www.euromap.org/technical-issues/technical-recommendations for the current list.

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1 Scope and Application

This EUROMAP recommendation defines the connection between the injection moulding machine (IMM) and the external safety device, e.g. doors in fences around IMM, preventing access to the danger areas of the IMM with the possibility to reach into the area with high safety level specified in EN 201 "Plastics and rubber machines – Injection moulding machines – Safety requirements". This is intended to provide interchangeability. The interface is only used for the IMM, if other safety signals are necessary for other equipment, this falls under the responsibility of the user / integrator.

In addition, recommendations are given for signal voltage and current levels.

2 Description

The signals in both the injection moulding machine and the external safety device are given by contacts, e.g. contacts of relays or switches, semiconductors, etc. The contact making is either potential-free or related to a reference potential supplied to a contact of the plug mounted on the injection moulding machine (see Table 1). All signals which are not optional shall be supported by the injection moulding machine and external safety device.

2.1 Plug and socket outlets

The connection between the injection moulding machine and the external safety device is achieved by the plugs specified below. For the injection moulding machine (see Figure 2) and the external safety device (see Figure 1) the plug contacts should be capable of taking a minimum of 250 V and 10 A.

Arrangements of pins and sockets viewed from the mating side (opposite the wiring side)

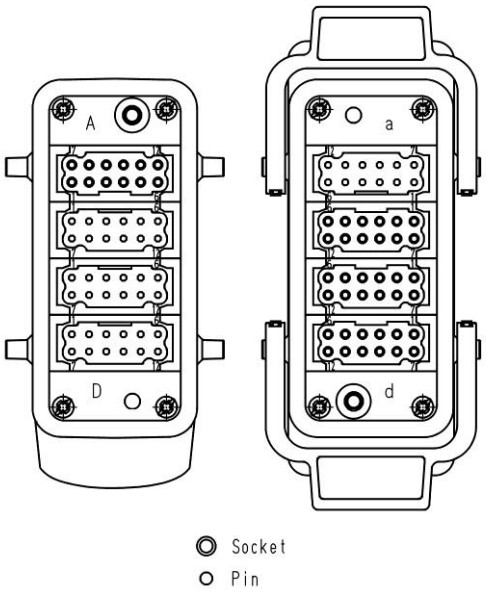


Figure 1: Plug on the external safety device

Figure 2: Plug on the injection moulding machine

2.2 Contact specification

2.2.1 Emergency stop, safety device

- The voltages of the signals must not exceed 50V DC or 250V AC.
- A current of at least 6 mA must be maintained during signalling.
- The maximum current is 6A.

2.2.2 Logical Signals

- These signals shall be in accordance with clause 3.3.1 of EN 61131-2, Table 9, Type 2 or with clause 3.3.3 of EN 61131-2,Table 11, max. 0,1 A unless otherwise specified.

2.2.3 Reference potential

-	Voltage	18 – 36V DC	
-	Overlayed ripple	max. 2,5Vpp	
-	Withstand against overvoltage	up to 60V	min. 10 ms
-	Current	max. 2A	

2.3 Plug contact assignment

Notes on the tables below:

- All signals are continuous signals unless otherwise noted.
- The signals are conducted from the signal source to the respective pin.

2.3.1 Table 1: Plug on the injection moulding machine (female)

Contact No.(female), see fig. 2	Contact name	Signal designation	Description
c1/c3 c2/c4	S1	External safety device closed	External safety device closed. Limit switch or safety switch is not actuated.
c5/c7 c6/c8	S2	External safety device closed	External safety device closed. Limit switch or safety switch is actuated.
c9/c11 c10/c12	S3	External safety device closed	External safety device closed. Limit switch or safety switch is not actuated.
d1		Supply from injection moulding machine	24V DC / 2A
d2		Supply from injection moulding machine	0V DC / 2A
d3/d4	S4	Acknowledgement	Signal of a manual switch or a safety circuit that all operators have left the protected area. Signal: Impulse, NO.
d5/d7	S0	Emergency stop of safety device channel 1	The switch contact must be open when the external safety device emergency stop is being actuated. The switch contact opening causes emergency stop of the injection moulding machine. The switch contact must be active when the safety device is inactive.
d6/d8	S0	Emergency stop of safety device channel 2	The switch contact must be open when the external safety device emergency stop is being actuated. The switch contact opening causes emergency stop of the injection moulding machine. The switch contact must be active when the safety device is inactive.
d9 **Optional**		Unlock external safety device lock	High signal to the external safety device to unlock the external safety device. Maximum load 1A / 24V DC
d10 **Optional**	S5	Monitoring external safety device lock	Contact is closed, if external safety device is closed and locked.
d11 **Optional**	S6	Request for external safety device opening	A request-signal for external safety device opening. Signal: Impulse, NO.
d12		Operation with external safety device	Low signal when the external safety device is inactive.
b1-b6		Spare	Reserved for future use of EUROMAP.
b7–b12		Spare	Not fixed by EUROMAP, manufacturer dependent.

NO: normally open
NC: normally closed

Note: S1,S2,S3 shall switch in a time period of ≤1s when the external safety device is closed (unclosed).

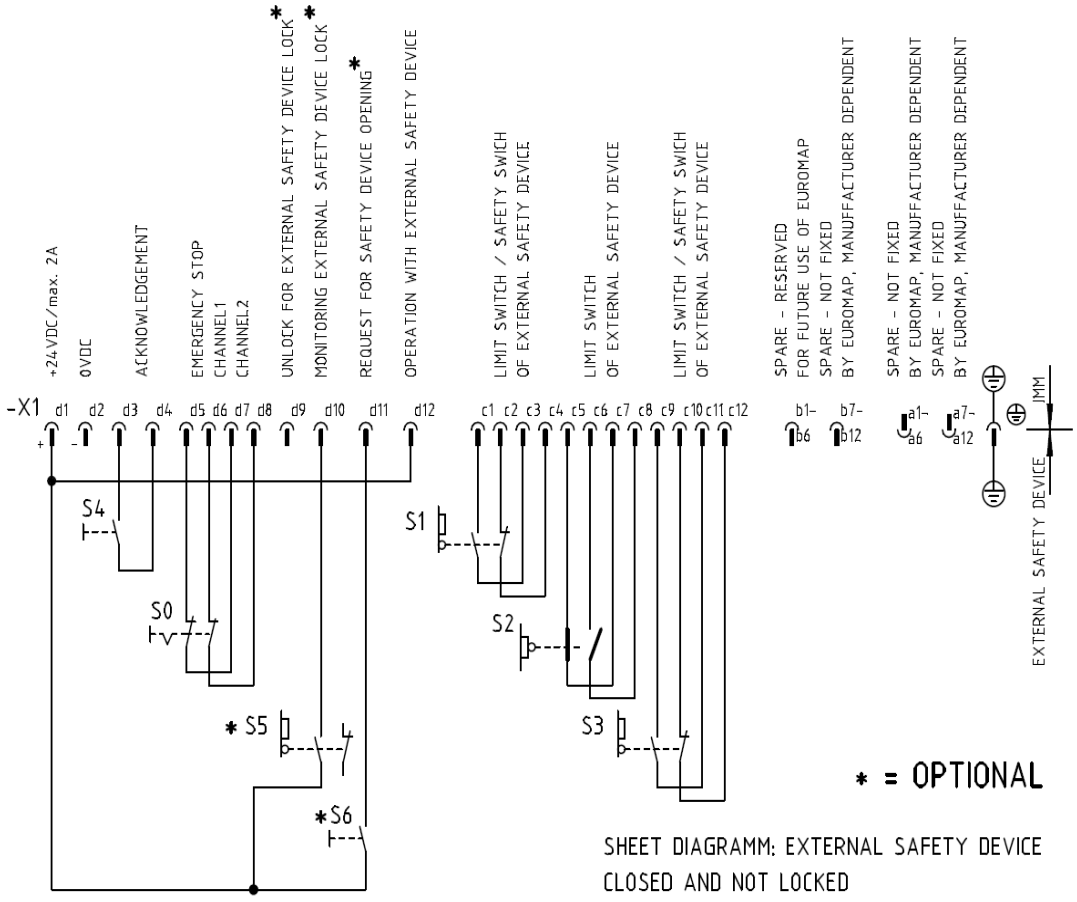
2.3.2 Table 2: Plug on the injection moulding machine (male)

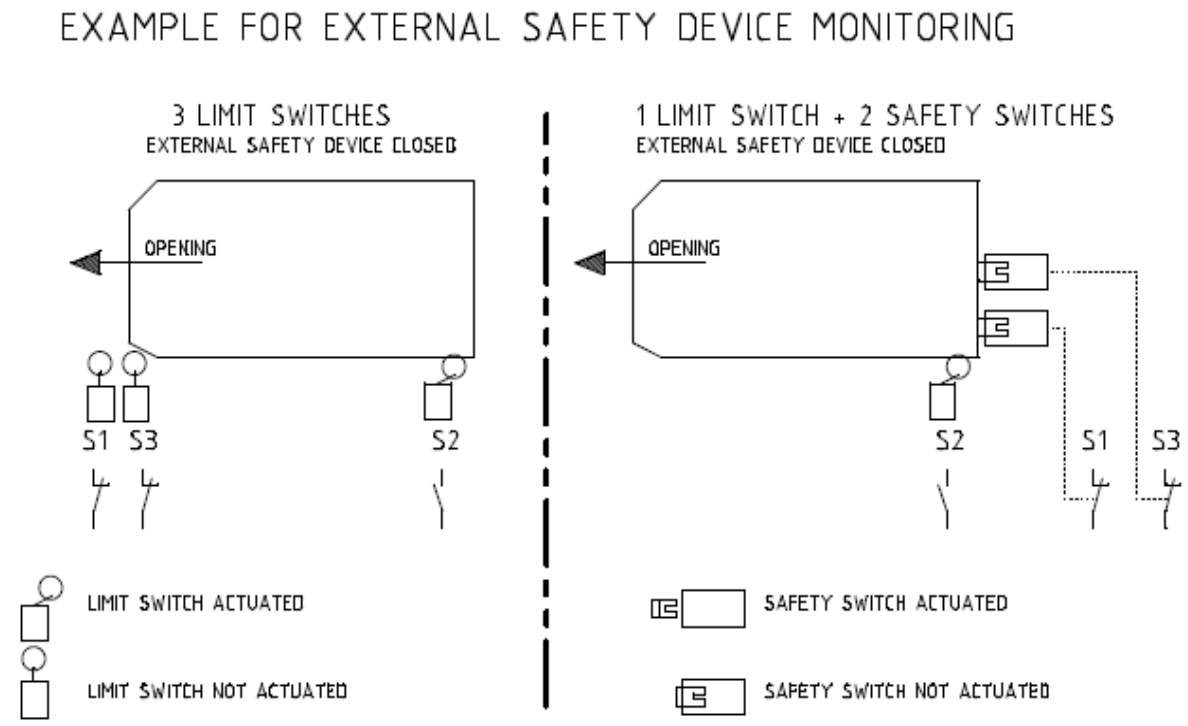
Contact No (male), see fig. 2	Contact name	Signal designation	Description
a1-a6		Spare	Reserved for future use of EUROMAP.
a7–a12		Spare	Not fixed by EUROMAP, manufacturer dependent.

2.4 Sources of supply

A list of plug suppliers is available for download on the EUROMAP website:
www.euromap.org/technical-issues/technical-recommendations

2.5 Schematic drawing of the interface





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