

# Электропневматические модули СИТЕМА ЕРМ

## Технические характеристики

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# Technical Information TI-E10 Electropneumatic Module EPM

- ☑ Operation of clamping head independently of fixed pressure supply
- ☑ Electrical control of pneumatically actuated clamping heads



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## 1 Where do I find what?

Here you find a detailed description of the control, mounting, and performance testing:

- *Assembly instructions MA-E-11*

## 2 Purpose

The Electropneumatic Module EPM serves as interface between (electrical) power supply / control and pneumatic SITEMA clamping head.

The EPM can control all pneumatic SITEMA clamping heads which fulfill the technical requirements mentioned in this document (see *Technical data*).

The EPM can be used if no fixed pneumatic system is available and an electrical solution is needed.

For information about permissible volumes, see *Chapter 1.6 Technical data* [► 3].

## 3 Function

The EPM is actuated by a supply and switching voltage of 24 V.

The outlet pressure for actuating the pneumatic clamping head is controlled with a control signal (switching voltage) using the input command "apply pressure/release pressure".

If there is a power failure or if the input signal is switched off, the pressure is automatically released from the clamping head, and it enters the subsequent (operating) state.

The proper function of the EPM can be monitored with an output signal (error output) which has to be integrated into the machine control system.

Depending on the size of the connected clamping head, different cycle times can be achieved. The cycle times may not be below the minimum cycle times defined for a specific type, see *Chapter 1.6 Technical data* [► 3].

## 4 Design

The EPM consists of several components which produce an output pressure.

An oil-free compressor produces overpressure in an integrated pressure accumulator. A pressure control valve reduces the pressure to the required output pressure. An electromagnetic valve which can be controlled directly by the machine control controls the output pressure.

By applying a voltage of 24 V between input (switching voltage) and ground (supply voltage GND), the solenoid valve is actuated and the EPM output pressure is applied to the connected SITEMA clamping head.

If the switching voltage is switched off, the solenoid valve goes back to its initial state, and the connected clamping head is depressurized.

The EPM absorbs the air which it uses for compression through filters from its immediate environment.

## 5 Connection to the clamping head

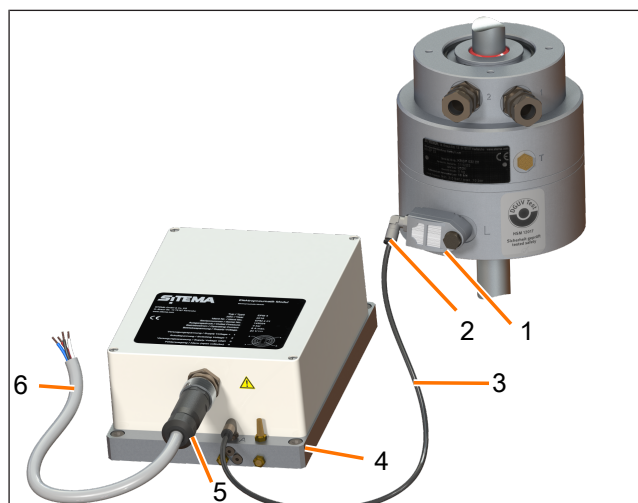


Fig. 1: Overview EPM with clamping head

- 1 Dump valve (in connection kit)
- 2 Quick-acting push-in fitting (in connection kit)
- 3 Pneumatic hose (in connection kit)
- 4 Electrical coupling (in scope of delivery)
- 5 Electrical connecting cable (not in scope of delivery)

### 5.1 Requirements

You need the following components to connect the EPM to a clamping head:

- Pneumatic hose: external diameter 4 mm, max. length 3 meter
- Hose connector: for example push-in fitting; to connect the pneumatic hose and clamping head or dump valve
- optional: dump valve, size: see connection thread of pressure port of clamping head

We recommend our ready for use connection kit (see Chapter 1.5.2 Connection kit ► 2]).

Here a schematic overview:

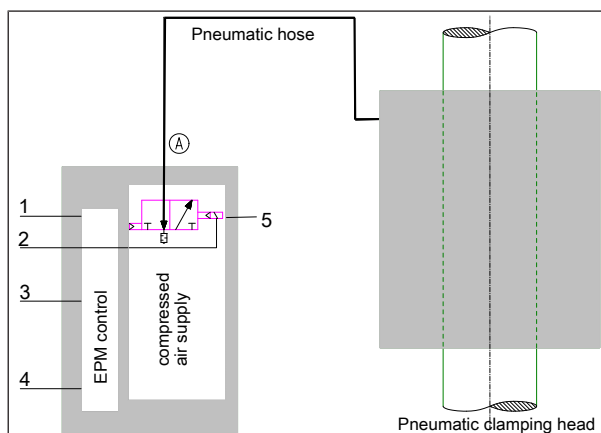


Fig. 2: Schematic overview

- 1 Supply voltage +
- 2 Switching voltage +
- 3 Supply voltage GND
- 4 Fault output (open collector)
- 5 Solenoid valve (N.C.)

### 5.2 Connection kit



Fig. 3: EPM connection kit

- 1 Pneumatic hose: external diameter 4 mm, max. length 3 meter
- 2 Dump valve with sealing ring
- 3 Quick-acting push-in fitting with sealing ring

The connection kit is available in 2 versions, one for each connection thread type of the pneumatic connection of the clamping head:

- Connection kit G1/8 (ID no.: EPM KIT G1/8)
- Connection kit G1/4 (ID no.: EPM KIT G1/4)

The orientation of the dump valve can be adapted to the particular installation situation.

The pneumatic hose in the connection kit (3 meter) can be shortened to the required length.

In addition to the kit, a T-joint is available. It enables the operation of two clamping heads. Please contact SITEMA for more information.

## Technical Information

### SITEMA Electropneumatic Module EPM

Interface between control unit and pneumatic clamping head

TI-E10-EN-1/2021

## 6 Technical data

	EPM 4	EPM 5
ID number (order number)	EPM 4 01	EPM 5 01
		EPM 4 and 5
Electrical supply		
Supply voltage, DC	24 V (± 10% tolerance)	
Peak current at compressor start up	8 A	
Continuous power input in standby	1 W	
Continuous power input with constantly running compressor	72 W	
Supply line protection with fine wire fuse	according to IEC 60127-2	
Input signal for applying pressure to the clamping head		
Switching voltage solenoid valve (N.C.)	24 V (± 10% tolerance)	
Supply voltage solenoid	20 mA	
Output signal		
Error output (open collector)	max. 2 W	
Connections: pneumatic and electrical		
pneumatic hose (external diameter)	4 mm	
Recommended wire diameters	1.5 mm <sup>2</sup>	
Weight	4 kg	

### Actuation /control of clamping head

	EPM 4	EPM 5
Maximum operating volume	220 cm <sup>3</sup>	150 cm <sup>3</sup>
EPM output pressure	4 bar	5 bar
Minimum cycle time	2.5 min	3 min

## 6.1 Dimensions

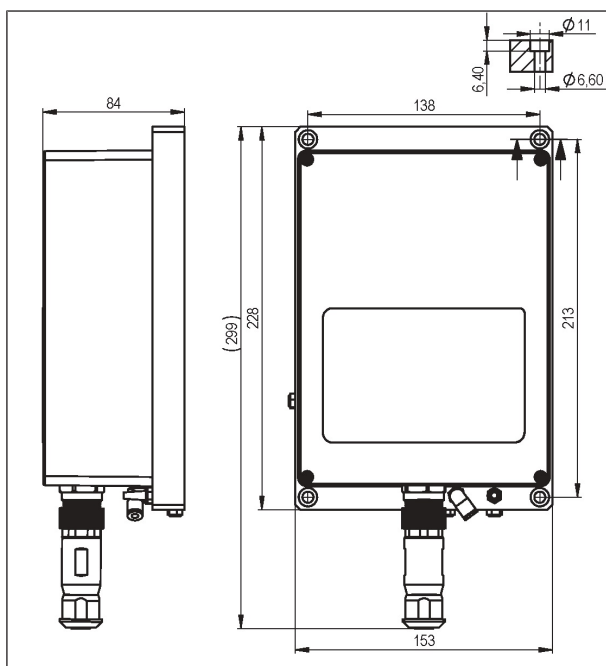


Fig. 4: Dimensions of EPM

The EPM is mounted directly to the machine frame using the bore holes (threads: M 6) in the corners of the base plate.

The EPM has to be positioned in such a way that the electrical coupling can be reached and removed at any time.

## 7 Power supply

For the operation of the EPM, a 24 V DC voltage is required. The maximum current may briefly reach 8 A.

The electrical supply and control unit needs to supply a DC voltage according to IEC 61010-1:2010 (chapters 6.3.1 and 6.3.2); the unit also needs to have a double separation / isolation from the power circuit according to IEC 61010-1:2010 (chapter 6.7).

For protecting the supply line from overload, a fuse according to IEC 60127-2 is needed: 5 x 20 mm T10AL, 250 V; or T10AH, 250 V.

A 4-core cable is to be used for the electrical connection (recommended wire diameter see *Technical data > Connections: pneumatic and electrical*). The standard scope of delivery comprises the electrical coupling shown in Fig. 5 with screw connections for the cable.

We deliver pre-assembled cables if requested.

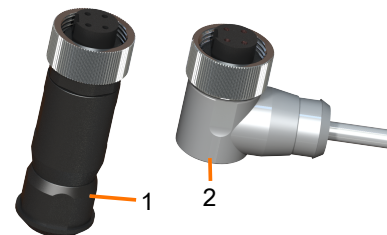


Fig. 5: Electrical coupling or pre-assembled cable

- 1 Electrical coupling (in scope of delivery)
- 2 Pre-assembled cable (optional accessory)

## 8 Actuation

The internal pressure regulation of the EPM maintains the pressure in the pressure accumulator. A temperature control at the compressor is a safety function to shut down the compressor in case of overheating and to activate the error output. This prevents damage to the compressor. After cooling down, the compressor is reactivated. In case of any other internal errors, the compressor is also deactivated and the error output activated.

As long as the error output is activated, no pressure is built up.

To ensure an error-free operation, only the input signal of the machine control acts on the solenoid valve which controls the SITEMA clamping head. All other controls of the EPM have no influence on the solenoid valve.

The status of the pressure outlet is not displayed. To monitor the pressure outlet, the signals of the clamping head's proximity switches can be used.

To ensure fast response times between EPM and clamping head, the pneumatic hose may not be longer than 3 m.

## 9 Operating conditions

	EPM 4 and 5
Minimum temperature	10 °C
Maximum temperature	40 °C
Max. humidity of intake air	60 %

The EPM is designed for operation in a dry and clean environment. Especially humidity entering the EPM can damage its components. Integrated air filters protect the pneumatic components from larger particles in the intake air.

The EPM has no feature to dry intake air. By design, condense water accumulates in the pressure accumulator. In an environment with high humidity, higher wear and a shorter service life of the integrated pneumatic components are to be expected.

If the condense water is drained in regular intervals from the pressure accumulator, the air humidity occasionally may exceed the maximum humidity value. In case of doubt, contact SITEMA.

The housing of the EPM consists of polycarbonate (PC).



*Protect the EPM from contact with brake fluids, cooling lubricants, thinners and other media, which can lead to reactions with the housing material.*

Please consult us in case of heavy dirt accumulation or high humidity in the intake air.

The EPM is not suitable for use in explosion-prone areas.

## 10 Risk assessment and RoHS

The EPM is to be selected and arranged according to the DIN EN ISO 12100:2010 risk assessment and additional applicable standards and regulations for the special case of application. This is the task of the machine manufacturer/operator.

Complies with the requirements of the directive 2011/65/EU (RoHS) and the delegated directive 2015/863.

## 11 Regular performance tests

The EPM must be subjected to performance tests at regular intervals.

## 12 Maintenance

If it cannot be guaranteed that the air humidity is steadily below 60 %, the condensate must be drained at regular intervals.

Further maintenance tasks are the regular checking of the valve functions and response times of the connected SITEMA clamping head.

To ensure correct functioning, only SITEMA is entitled to carry out repairs.

SITEMA cannot take any responsibility for repairs carried out by another party.

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