

Technical Information TI-E10. 1

Electropneumatic Module

EPM 10

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



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1 Purpose

The Electropneumatic Module EPM acts as an interface between an electrical power supply and a pneumatic SITEMA clamping head. The EPM can be used if no local pneumatic system is available and if a pneumatic clamping head needs to be actuated.

The EPM also allows the control of several clamping heads at the same time.

Condition for the operation is, that the permitted duty cycle must be observed.

2 Design

The following components of the EPM work together to generate the required outlet pressure:

- Oil-free compressor: draws in air from the environment.

The compressor draws in air from the immediate environment and produces compressed air.

In adverse environmental conditions we recommend an optional external air filter. For more information, contact SITEMA.

- Pressure control valve/outlet pressure: reduces the pressure to the required outlet pressure.
- Solenoid valve: is controlled directly by the machine control and activates the outlet pressure.

3 Function

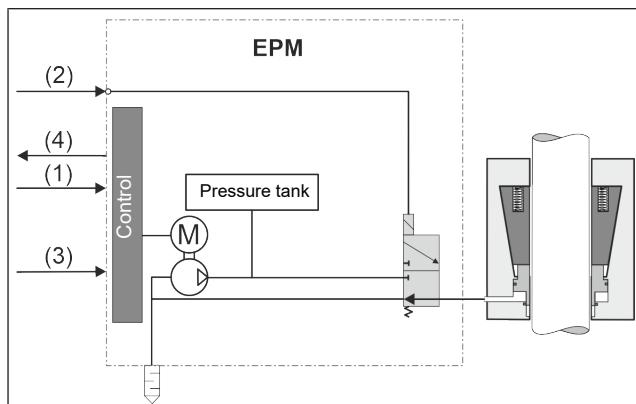


Fig. 1: Schematic representation of functioning

Pin assignment	(1)	Input supply voltage
	(2)	Input switching voltage
	(3)	Supply voltage GND
	(4)	Error output

The EPM is operated with a supply voltage and switching voltage of 24 V.

If voltage is applied between the *switching voltage* input (2) and the *supply voltage GND* input (3), the solenoid valve is activated. The solenoid valve activates the outlet pressure to open the clamping of the connected clamping head and to keep it open.

If the *switching voltage* is turned off, the pressure is released from the clamping head and its clamping closes.

The error output (open collector) (4) of the EPM monitors its correct functioning. This monitoring feature can be integrated into the machine control.

IMPORTANT: The admissible duty cycle described in the technical data must be observed.

4 Operating conditions

Permissible ambient temperatures	+10 °C to + 40 °C
Recommended humidity	less than 60 %

Table 1: Operating conditions

The EPM has been designed for indoor use and operation in a dry and clean workshop.

The housing of the EPM consists of polycarbonate (PC) which is not resistant against brake fluids, cooling lubricants, and thinners. Avoid contact to the above mentioned fluids.

Please get back to us if you plan to operate the EPM in an environment with lots of dirt and/or high humidity.

4.1 Operation at high humidity conditions

The EPM has no feature to dry intake air.

If the EPM is operated at high humidity conditions, condensate can accumulate in the pressure accumulator in the EPM. This can lead to an increase of wear and tear and to a shorter service life of the integrated pneumatic components.

i If the EPM is operated at high humidity conditions, regular checks for condensate must be carried out. If condensate accumulates, it has to be drained in regular intervals.

5 Connection to the clamping head

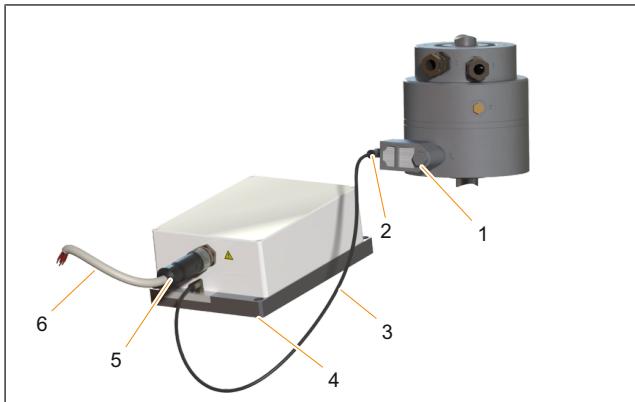


Fig. 2: EPM with clamping head

1	Dump valve (in connection kit)
2	Quick connector (in connection kit)
3	Pneumatic hose (in connection kit)
4	Base plate
5	Electrical connector (in scope of delivery)
6	Electrical cable (not in scope of delivery)

i The solenoid valve acts as a 3/2-way valve, N.C. (normally closed). Its position is recovered electromagnetically as well as self-intensifying through the compressed air on the valve.

Only with an overpressure of 0.2 to 0.7 bar, the valve closes reliably. Therefore, the EPM may only be started if a clamping head is connected. Only in this condition the overpressure reliably closes the solenoid valve.

If the EPM is turned on for the first time and if no clamping head is connected, it can happen that the valve is not closed and air escapes.

5.1 Requirements

For connecting the EPM with a clamping head, we recommend to use the connection kit from SITEMA (see Chapter 5.2 Connection kit [► 2]).

Without the connection kit, you need the following parts:

- 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 components: dump valve, size: see connection thread of pressure port of clamping head

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.

6 Power supply

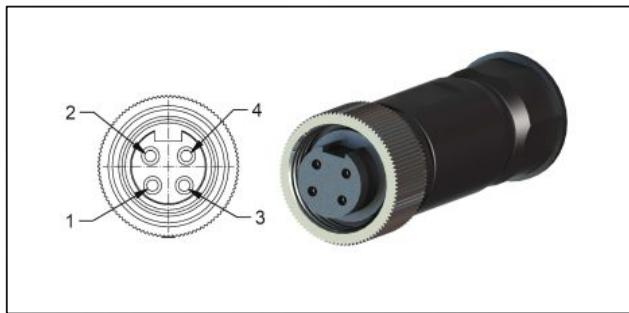


Fig. 4: Electrical connector with pin assignment

For the electrical connection, a 4-core cable should be used (recommended wire cross-sections 1.5 mm²). The standard scope of delivery includes the electrical connector shown above with screw connections for the cables to be connected.

A DC voltage of 24 V is required for the operation of the EPM. 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.

7 Actuation

The internal pressure regulation of the EPM maintains the pressure in the pressure accumulator. The compressor has a temperature control. It serves as safety function to activate the error output and to shut down the compressor in case of overheating. This prevents damaging 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.

Only the signal of the *switching voltage* input activates the solenoid valve which actuates the clamping head. All other controls of the EPM have no influence on the solenoid valve. This enables the error-free functioning of the EPM.

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

8 Risk assessment and RoHS

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

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

9 Regular performance tests

At regular intervals, a performance test must be carried out on the EPM together with the connected clamping head. A performance test is appropriate especially after installation, cleaning, maintenance or any use that does not correspond to the intended use.

10 Maintenance and repairs

Apart from the regular performance tests with the connected clamping head, if condensate builds up, it has to be drained at regular intervals.

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

To ensure the correct functioning, repairs may be carried out exclusively by SITEMA. SITEMA will not take any responsibility for repairs carried out by another party.

11 Further information

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

- *Assembly instructions MA-E-11.1.*

12 Accessories and spare parts

The following accessories and spare parts are available from SITEMA:

- Connection kit (for connection to clamping head, see *Chapter 5.2 Connection kit* [▶ 2])
- Electrical connector (electrical connection)
- T-joint (connection of 2 clamping heads)
- External air filter (for use in adverse environmental conditions)

13 Technical data

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

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

The opening for draining condensate water is located on the bottom of the EPM. Mount the EPM horizontally, if possible, and make sure that the opening for draining condensate is easily accessible; or alternatively make sure that the EPM can be easily removed and reinstalled.

Dimensions

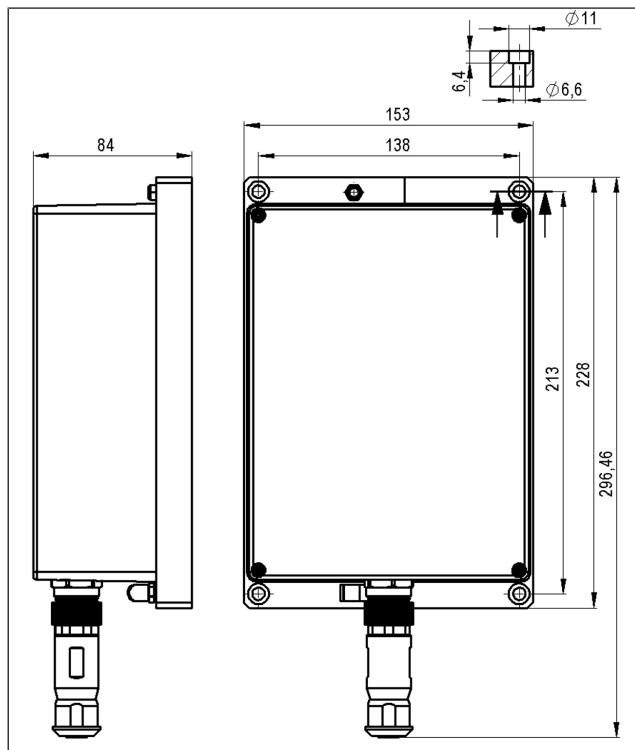


Fig. 5: Dimensions of EPM

Type	EPM 10
ID number (order number)	EPM 10
Actuation / control of clamping head	
EPM outlet pressure	5 bar
Duty cycle	25% S3 TC = 1 min TC = time of one load cycle, according to the standard IEC 60034-1
Electrical supply	
Supply voltage, DC	24 V (tolerance: $\pm 10\%$)
Peak current at compressor start-up	8 A
Continuous power input in standby	1 W
Average power consumption with compressor running	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 (tolerance: $\pm 10\%$)
Supply voltage solenoid	20 mA
Output signal	
Error output	OC (open collector) 360 Ω , max. 2 W
Connections: pneumatic and electrical	
Pneumatic hose (external diameter)	4 mm
Recommended wire diameters for electrical connection	1.5 mm ²
Weight	4 kg
Requirement for electrical connection and control	

Subject to modification without prior notice