

**BASIC CHARACTERISTICS**

- 8 differential analog channels for connection of sensing units or actuators, each has galvanic isolated feeder 14/24V DC, 20mA in addition
- 2 differential channels for connection of passive actuators
- Each feeder with protection against permanent short-circuit and overload signaling
- Each channel with overvoltage protection against overvoltage over 200V DC and filter for limitation of HF interference influence.
- It conforms to EMC requirements acc. to ČSN EN 61000-6-2 ed.3 and ČSN EN 61000-6-4 ed.2
- Mounting onto DIN bar

**DESCRIPTION**

MD417 is module intended for direct connection of signals among technology sensors and actuators and boards DV457, DV467, DV477 of the system ZAT-2000 MP. Mutually galvanic separated power supplies could be used for various methods of feeding the signal parts of connected elements. Overvoltage protections in the module together with filters protect board inputs against induced overvoltage pulses and displaced overvoltages.

Standardize cable K81 (K101) is intended for connection between board and module. Channels 1 - 8 have power sources for sensors brought out also through transil to terminals X1 5b, 8b, 11b, 14b, 17b, 20b, 23b, 26b, where voltage is approx. by 10 V lower. Signals of technological side are connected through WAGO terminal box to the module. Eight channels is also equipped with mutually galvanic separated feeders 24V DC, 20mA that enable e.g. passive current outputs feeding.

All module channels are equipped with overvoltage protections combined with filtering circuits that protect DV457 inputs against overvoltage higher than 200V.

Power supplies 24V DC, 20mA are equipped with protection against permanent short-circuit at output and signal overload status by lighting relevant red LED. Green LED signals voltage at power supply output. Power supply outputs are protected against damage by pulse overvoltage. Feeding of these sources +24V DC is connected to terminals 1a 1b, 0V to terminals 2a 2b in terminal box X1. Terminals -U have sources' negative poles, terminals UR have sources' positive poles with voltage 14V, terminals +U have sources' positive poles with voltage +24V.

## TECHNICAL PARAMETERS

Parameter	Conditions	Min.	Type	Max.	Units
Maximum working voltage of signal terminal against ground fault	leakage max. 5 $\mu$ A	170			V
Maximum pulse current to signal terminal	pulse 8/20 $\mu$ s			15	A
Residual voltage behind overvoltage protection	pulse 8/20 $\mu$ s, 15A			400	V
Serial resistance added to signal loop			2x18		$\Omega$
Feeding voltage		21,6	24	26,4	V
Consumption	$I_{OUT} = 8 \times 0$ mA		70	80	mA
	$I_{OUT} = 8 \times 20$ mA		350	430	mA
Module power	$I_{OUT} = 8 \times 20$ mA		8,5	10,4	W
Supply output voltage	$I_{OUT} = 0 \div 20$ mA	23		33	V DC
Supply short-circuit current				35	mA
Overload indication		22			mA
Dielectric strength (supply output / all parts)	1 min.		1000		V DC
Operational temperature range		-5		+70	$^{\circ}$ C
Inlet conductors' section		0,08		2,5	mm <sup>2</sup>
Output conductors' section		0,08		0,5	mm <sup>2</sup>
Weight			0,25		kg
Dimension	Height, Width, Depth	106x178x47			mm

## APPLICATION PRINCIPLES

When connecting system parts, observe the regulations for leading communication cables and connection of sensors to communication cables. All signal lines must have as minimum the shielding of cable core and possibly shielding of conductor pairs. The shielding of cables must always be connected to grounding system, whereas the following principles must be observed:

1. Shielding connection to grounding system must not be ordinarily done in more remote points, since the shielding would create loops to lead

the induced currents or stray currents. Shielding connection to grounding system is possibly done in point of communication cables concentration at entry to metallic marshalling cabinets.

2. These cabinets must be connected to grounding system with copper ropes, whose cross section is given by maximum energy of disturbances at given location, while the minimum is 65 mm<sup>2</sup>. Leading of these ropes to grounding system must be direct in maximum extent and without bends creating parasite inductive loops.

3. If one could not avoid galvanic connection between sensor frame and sensor signal terminals, the cable shielding is to be connected to sensor frame. This frame must be connected to grounding system in the same manner as in case of marshalling cabinets.
4. Grounding system for connection of signal conductors must have star topology, or possibly combined with local lattice topology.

In terminal box, modules MD417 have terminals intended for signal cables

shielding connection. If cable shielding is connected to grounding system at input to the cabinet, this shielding is to be connected to. If module terminals have connected less than 2 inlet signal cables' shielding, ground the module through connection of its terminals 3a, 3b to grounding system (usually by short conductor 2,5mm<sup>2</sup> to its supporting DIN bar).

Modules MD417 are to be located to the closest positions to racks with boards DV457, maximum admissible cable K81 (K101) length is limited to 12m.

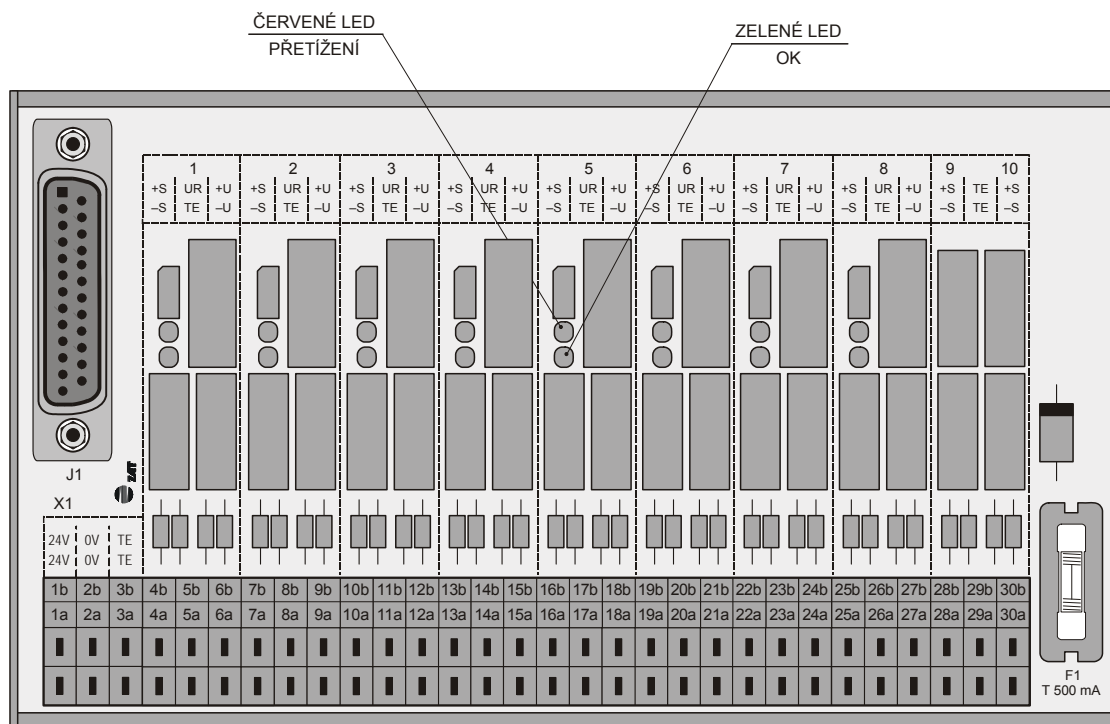


Fig.1 Module MD417

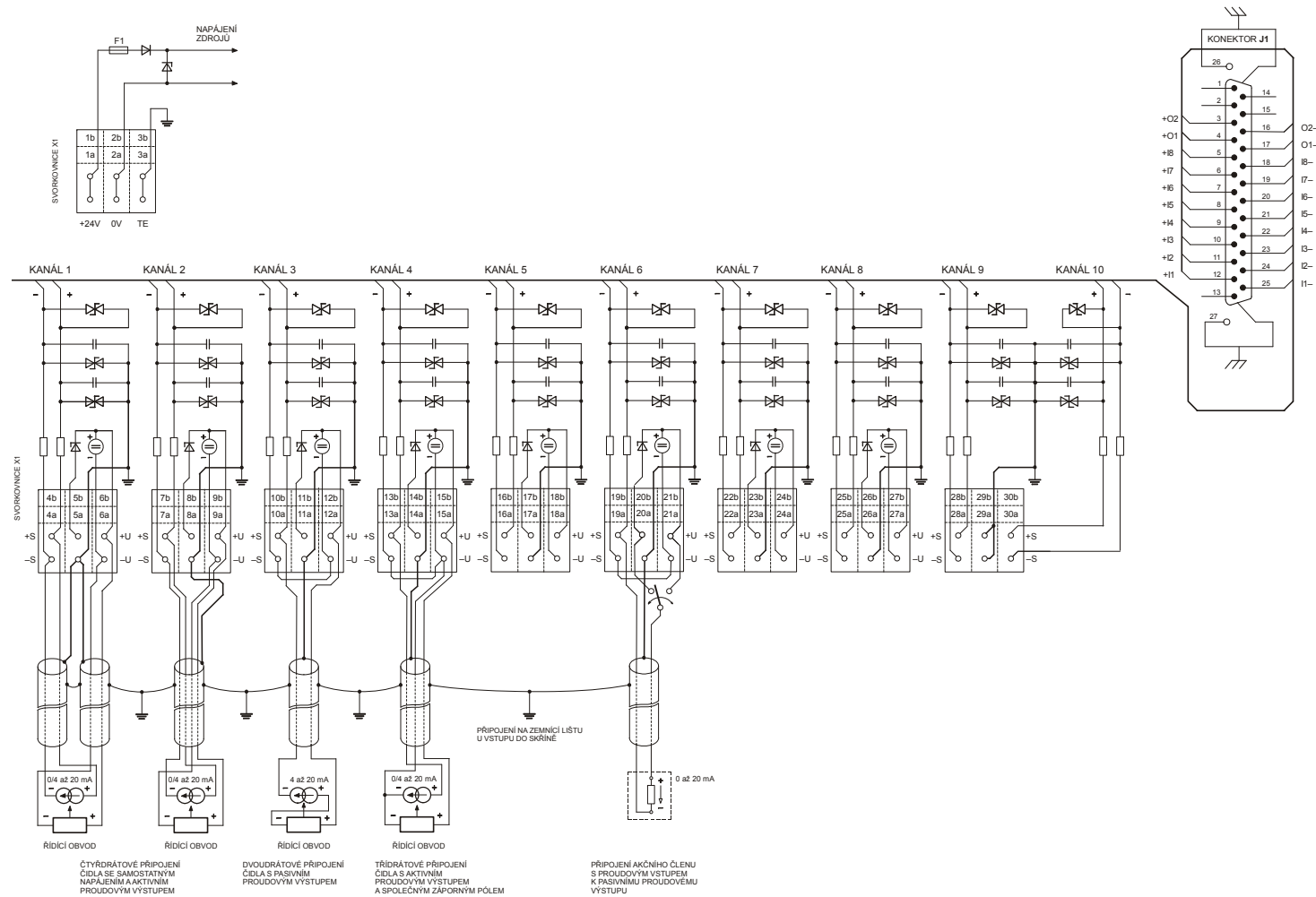


Fig.2 Module MD417 wiring diagram