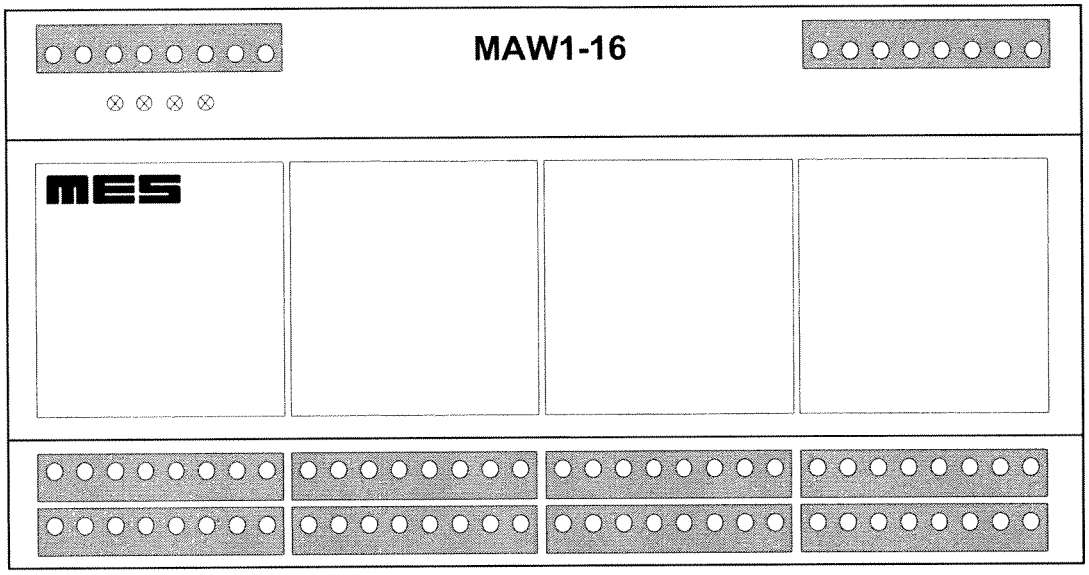
MULTIFUNKTIONALE ENERGIE SYSTEME

Measuring Transducer (Multiplexer) MAW1-16

Vision 04 31.10.2007



View 1

Measuring transducer

- measuring transducer with multiplexer
- 16 analogue inputs
- processing of 6 different measuring methods: PT100, PT1000, 0-20 mA, 20 mA active, 0-10 V, 0-50 mV
- 1 analogue measuring value output 0 – 10 VDC
- 4 digital address inputs
- LED indication for addressing
- compact design

1.0 SCOPE OF APPLICATION

The MAW1-16 is used for the transformation of time-uncritical analogue values.

For detection of 16 analogue measurements only **one** analogue input of an PLC-system is needed by pre-connection of one MAW1-16. Consequently it is possible by using eight MAW1-16, at one S5-95U with eight analogue onboard inputs and four digital outputs, to detect 128 measuring values. This measuring method represents an economical option in order to process a multitude number of measuring values.

2.0 METHOD OF OPERATION AND FUNCTION

The MAW1-16 can be equipped with up to four measuring modules. Each measuring module is able to process four channels of the equal measuring method. The different measuring modules are to be plugged on the basic pc-board. For the 0 – 10 V measurement there is no measuring module required. Coding jumpers are on the measuring modules and on the basic pc-board, which have to be plugged-in for the relevant application (point 2.1). Via four digital address inputs the 16 analogue inputs are scanned. The analogue input signals are transformed by the measuring transducer and passed-on to the SPC-system in form of 0 – 10 V in a cyclical manner. Addressing takes place by the SPC. The program, required for this action, belongs to the delivery scope of the MAW1-16. At selection of the analogue input pc-board of the SPC it must be observed that the coding time (read-in time) is faster than 10 ms. At present there are programs for following SPC-assemblies available:

make	SPC - type	analogue pcb	recommended inquiry time (ms)
Siemens	S5-95U	Onboard-inputs	100 – 500
	S5-115U	6ES5-466-3LA11	100 – 500
	S7-300	6ES7 331-7KB01-OAB0	approx. 100
VIPA		VIPA 465-HB41E	50-100
Schneider	A250	ADU 115	ca. 500

The shortest inquiry time of the MAW1-16 per input channel is ■10 ms, this results in an inquiry time of 160 ms for all 16 inputs. The inquiry time must be adapted to the workload and to the analogue-digital transformation times of the analogue input assembly of the relevant CPU. The CPU Simatic S5-95U requires therefore, inclusively of transformation into physical units (scaling), 7% of its computing power.

At the S5-95U with eight analogue Onboard-inputs, up to eight MAW1-16 can be triggered in parallel and consequently up to 128 analogue values covered.

For an additional MAW1-16 only one analogue input of the SPC is required. The maximum number of MAW1-16 units must be estimated constructively according to the SPC workload. The outputs on the terminal strip X20, terminal 11 to 14, are provided for passing-on of the address inputs to additional MAW1-16 units (view 4).

2.1 Coding

After removal of the cover the coding jumpers are accessible.

Four coding jumpers are arranged on the measuring modules 20 mA and 50 mV. These are to be removed in case a voltage-free four-wire measurement shall be connected (view 3).

In case of two-wire measurement coding jumpers are to be placed (view 3 and point 6).

The measurement 0 – 10 V does not require a measuring module. Therefore four coding jumpers are to be plugged in on the basic pc-board (view 2 and 3).

2.2 Commissioning

The MAW1-16 has to be connected according to the terminal allocation (view 3 and 4).

If there are only three or two connectors provided in the measuring heads of PT100-sensors, so nevertheless four-wire cables should be installed. The corresponding wires must be connected together in the relevant measuring head(view 5). By this means a comparable measurement accuracy like a PT100-4 is obtained.

The wires of the 50 mV-sensors should be connected to the MAW1-04 without intermediary terminals, in order to avoid voltage losses and measurement faults caused by this.

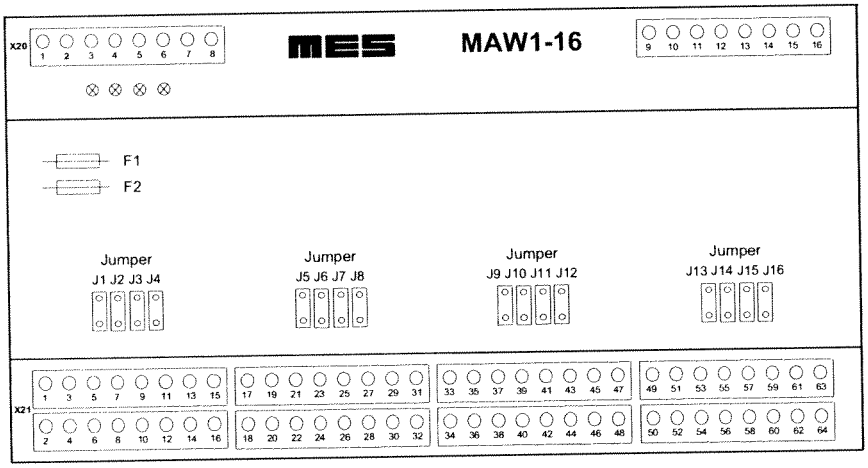
If this is impossible, so a comparing measuring point must be installed at the handing-over terminals from 0 – 50 mV-sensor wires to the copper wires. This measuring value has to be added to the other measuring values.

We recommend to install a shield terminal support at the measuring transducer inputs, for reception of the cable shields. By means of the spring-pressure terminals the shielded cables can be connected with little effort (view 6).

The shield terminal support can be additionally ordered as an accessory (Type: MAW1-SK16).

After connected auxiliary voltage the measuring transducer is ready for measurement. As soon as the SPC-system triggers the address inputs of the MAW1-16's unit, inquiry of the measuring points is beginning. This is signalled by the four LEDs.

4.0 CONNECTING DIAGRAM

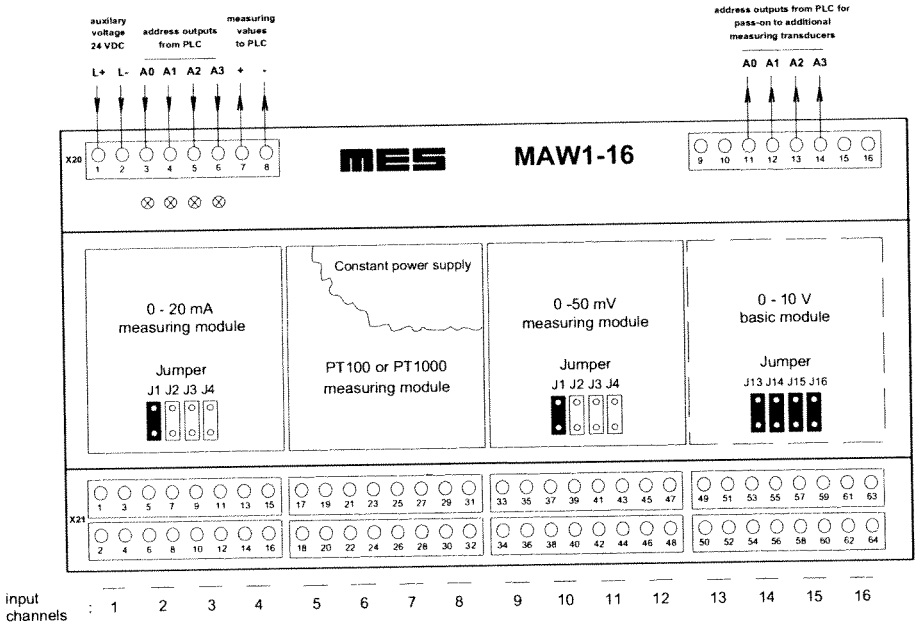


F1: Fuse for internal supply voltage, 2 amps, quick

F2: Fuse for active outputs, 2 amps, quick

At 0 - 10 V measuring inputs coding jumpers are to be plugged in.

View 2: Front view of basic module without measuring module



Each measuring channel is provided with a corresponding jumper.

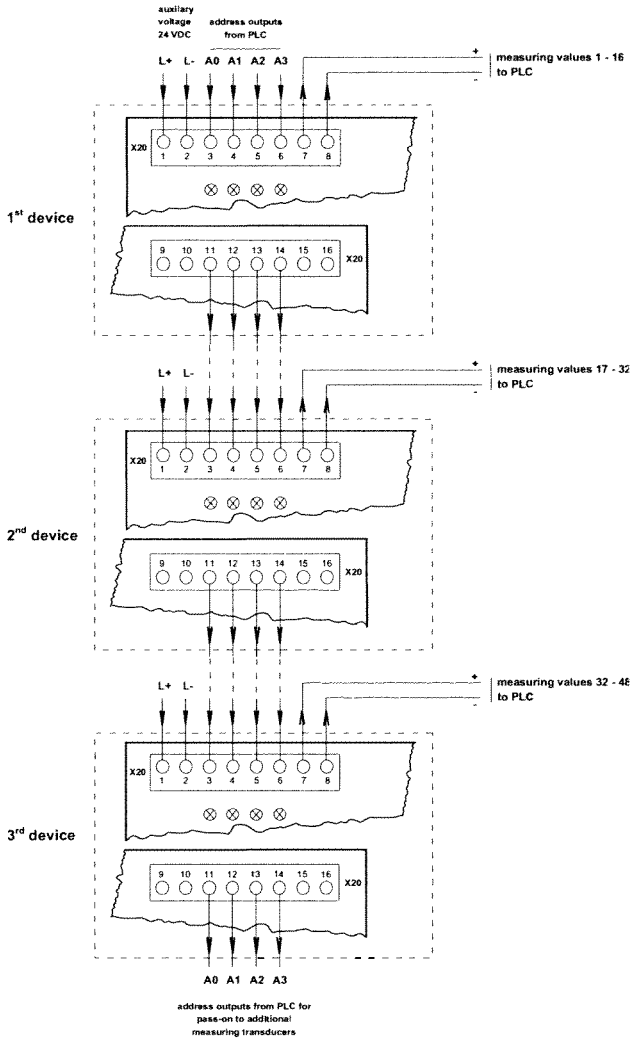
At the 0-20mA and 0-50mV inputs any coding is possible.

Jumper removed = voltage-free inputs

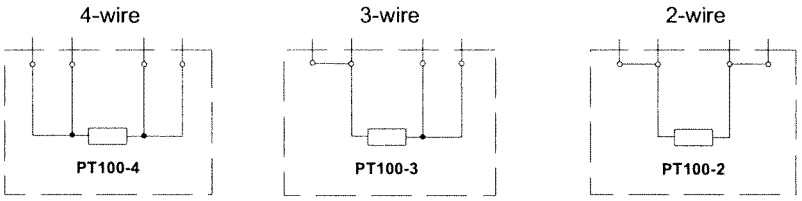
Jumper plugged-in = living voltage inputs

e.g. channel 1 and 9 gets the L- potential of DC supply, refer to connecting example E and G (point 6).

View 3: View with measuring modules

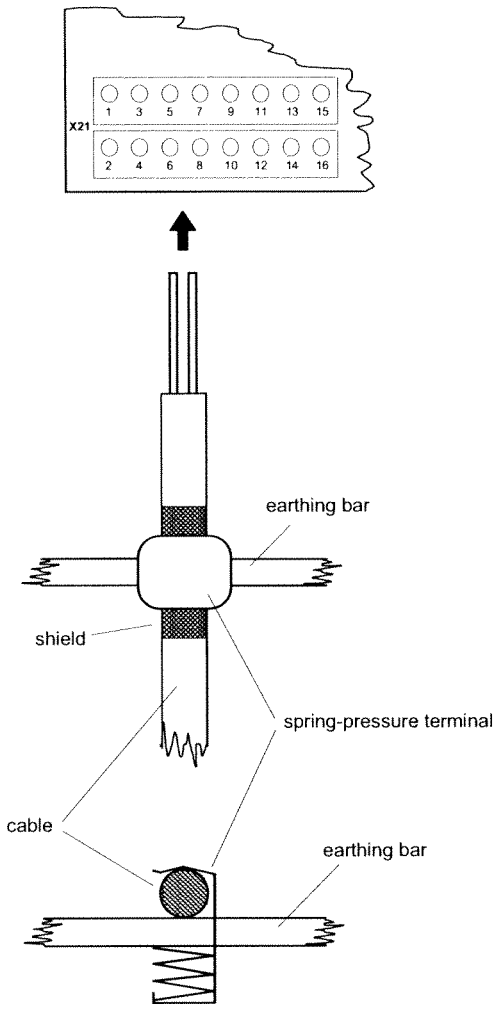


View 4: Connection example with several MAW1-16



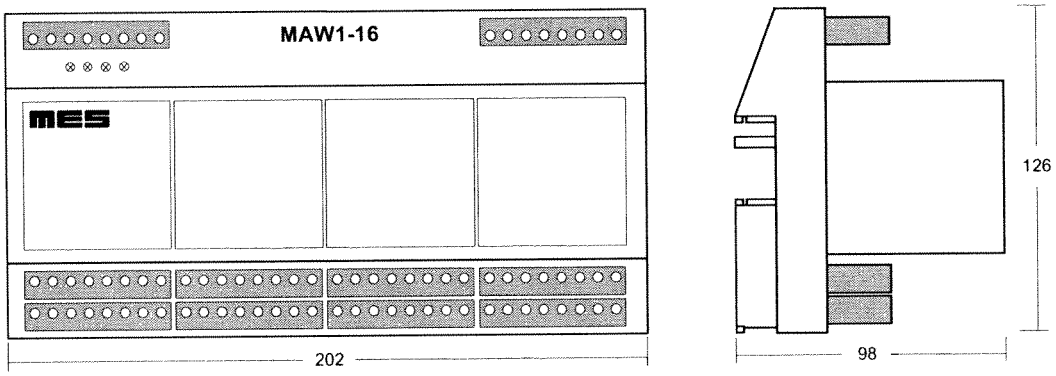
View 5: Connecting example for different PT100-sensors

4.1 Installation

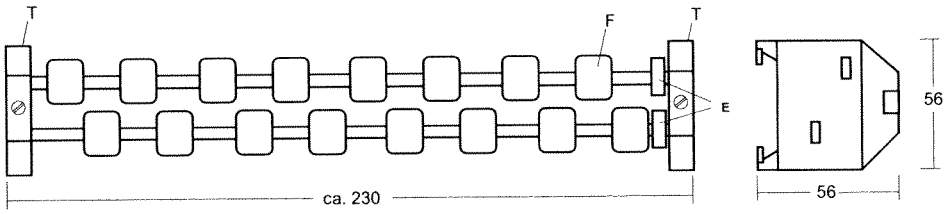


View 6: Connecting example for shield terminal

5.0 DIMENSIONS



View 7: Measuring module MAW1-16



E = earthing terminal, connection to switchboard earthing

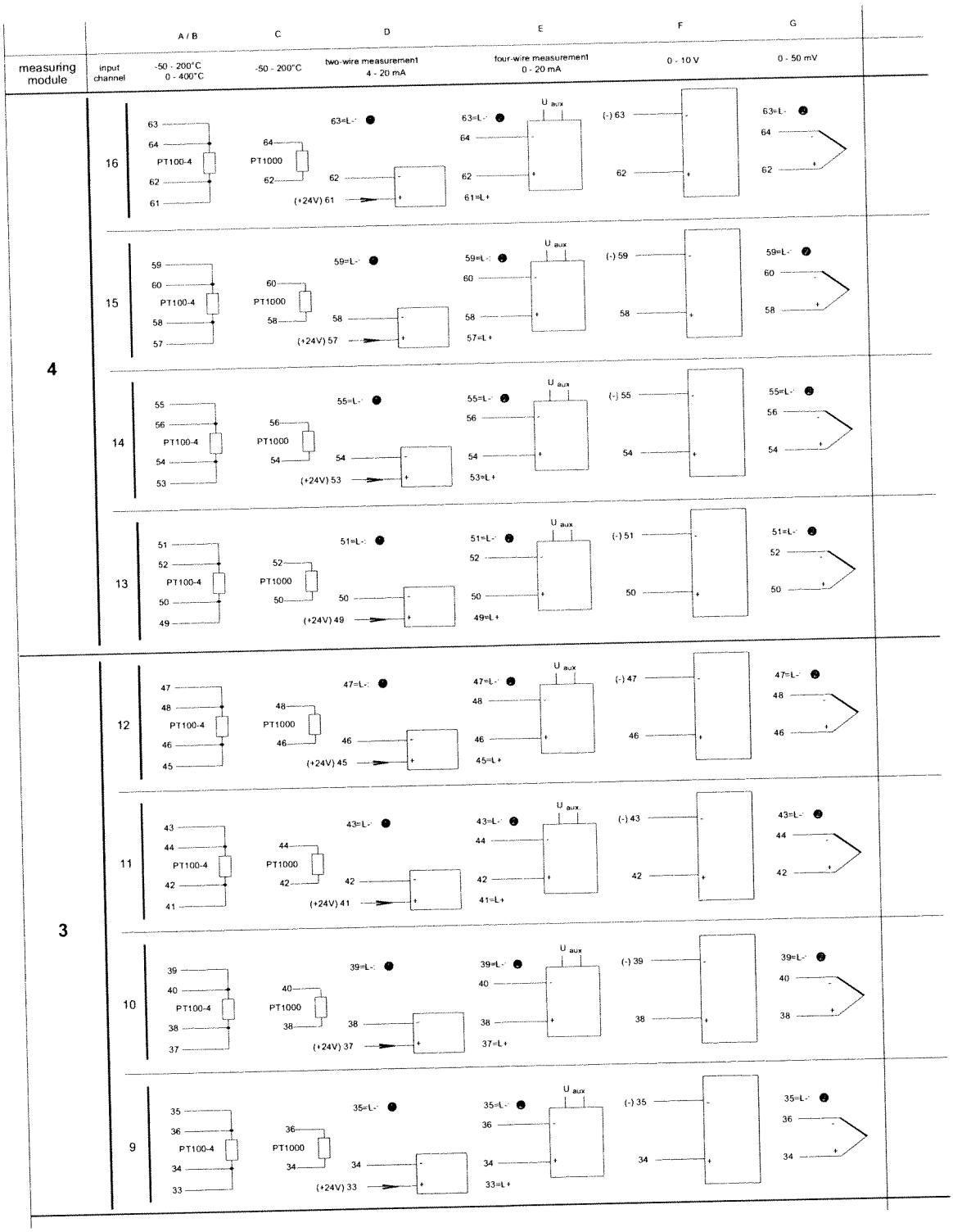
F = spring-pressure terminal

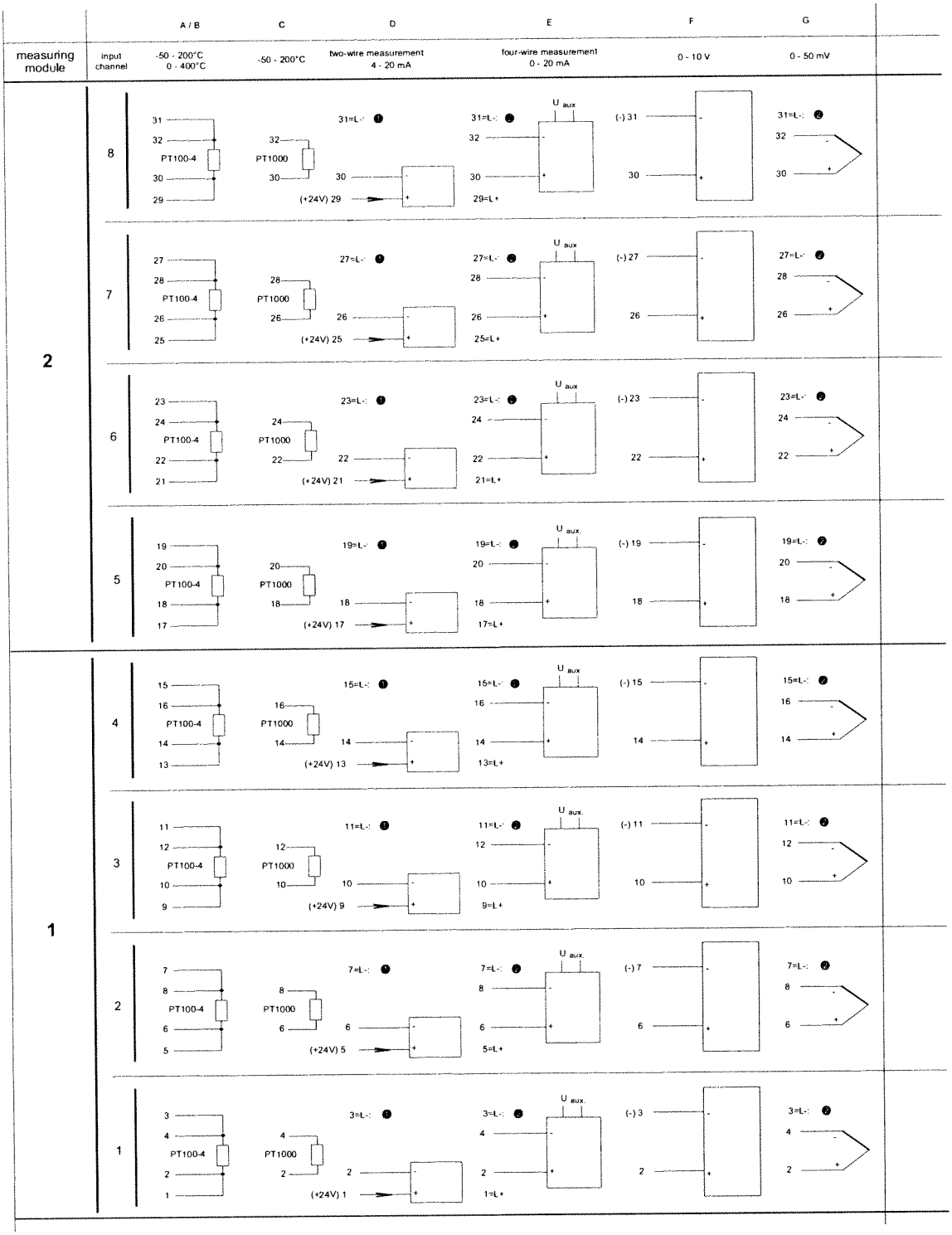
T = support for earthing bar

A connection must be established between earthing terminal "E" and switchboard earthing.

View 8: Shield terminal support MAW1-SK16

6.0 ALLOCATION OVERVIEW





❶: At these measuring inputs the jumpers have to put on the corresponding measuring modules. The negative potential is required for the measurement.

❷: At the stated measuring inputs the jumpers have to put on the corresponding measuring modules in case of living outputs. So the negative potentials are connected to L- potential.

U_{aux}: The auxiliary voltage may be taken as well from the terminals L- and L+.

7.0 TECHNICAL DATA

Auxiliary voltage	19 - 32 VDC
Input measurement	PT100 (-50 – 200 °C or 0 – 400°C), PT1000 (-50 – 200 °C), 0 – 20 mA, Burden 2.5 Ω 0 – 10 V, 0 – 50 mV, both input pc-boards high-resistant
Output voltage	0 - 10 VDC, living voltage, Burden >1 kΩ
Address inputs	24 VDC signal (opto de-coupled)
Inquiry time minimum	10 ms/ input
Inquiry time	dependent on workload of SPC-system
Digital inputs	24 VDC
Consumption	approx. 3 VA (24 VDC)

Software for

S5-95U	Onboard-inputs	
S5-115U	with analogue pc-board	6ES5-466-3LA11
S7-300	with analogue pc-board	6ES7 331-7KB01-OAB0
VIPA	with analogue pc-board	VIPA 465-HB41E
A250	with analogue pc-board	ADU 115

Test voltage	2.5 kV
Ambient temperature	0°C - 50°C
Casing	PVC and Polyamide
Dimensions	W202 x H126 x D98 mm
Mounting	on standard rail according DIN 50022
Degree of protection	IP 20
Weight	approx. 700 g
Mounting position	any
Regulations	VDE 0160 / EN 50178 VDE 0435 part 303 VDE 110 IEC 255-6

Subject to technical modification!

This device replaces our former type MAS16-1.

MES
MULTIFUNKTIONALE ENERGIE SYSTEME

Cargofresh AG
Business Unit Energy Systems
Brahmkoppel 4
D - 24558 Henstedt – Ulzburg
Tel. : + 49 4193 907 - 0
Fax : + 49 4193 907 – 201 distribution
E-mail : .@mes-energiesysteme.de
Internet : http://www.mes-energiesysteme.de