



## MEASURING TRANSDUCERS FOR FREQUENCY

### F-MU

- General information** This operating manual is included with the equipment as standard. It contains the information required for correct usage. It is aimed at trained personnel and specialist staff who are familiar with the assembly, installation and commissioning of the product described here. If additional information is required, further details can be requested by the address given below.
- Conformity** This equipment conforms to the requirements of the Directive from the Council of the European Community on the harmonisation of the member states regarding electromagnetic compatibility, EMC Directive 2004/108/EC, as well as Low Voltage Directive 2006/95/EC.
- Application** The measuring transducers F-MU serve to convert a frequency into a load-independent direct-current and direct-voltage signal.
- Function** The frequency to be measured gets via a voltage transformer which serves for the galvanic separation over a filter to a microcontroller. The direct voltage gained in this way will be converted into an impressed direct current and an impressed direct voltage. Both outputs are no-load resistant and short-circuit proof. Any connection between both outputs will be inadmissible. The separated auxiliary voltage will be required for "live-zero" and in case of considerable fluctuations in the rated voltage as well as in frequency ranges starting from zero.

### Technical data

<b>Input</b>	Input quantity	frequency
	Rated values	partial range: 45-55 Hz, 48-52 Hz, 55-65 Hz, 360-440 Hz or 380-420 Hz complete range: 0-100 Hz, 0-500 Hz or 0-1000 Hz (separated aux.)
	Rated voltage	100 V, 110 V, 230 V, 400 V or 500 V +/- 20 % 2-50 V, 25-250 V or 75-690 V (separated aux.)
	Own consumption	2,5-5 VA, 1-1,5 VA in case of separated auxiliary voltage
	Overload permanent	1,2-fold
	Surge overload	2-fold, 1 sec.
<b>Output</b>	Output quantities	Load independent direct current and direct voltage
	Double-output	<b>0-20mA</b> /0-500 Ohm of load and <b>0-10V</b> max. load 10 mA or <b>4-20mA</b> /0-500 Ohm of load and <b>2-10V</b> max. load 10 mA (aux. required)
	Option	- <b>Frequency module</b> - a value of 0 – 5 Hz up to 0 – 10 kHz <ul style="list-style-type: none"> <li>o „Open-collector“ NPN, max. 30V 100 mA loadable, impulse/break 50/50 %</li> <li>o Square wave signal 5V, max. 10 mA loadable, impulse/break 50/50 %</li> </ul>
<b>Dynamic system behaviour</b>	Accuracy	+/- 0,5 %
	Temperature range	-15°C up to <u>+20°C up to +30°C</u> up to +55 °C
	Temperature influence	< 0,1 % at 10 K
	Influence of aux.	none
	Load influence	none
	External magnetic field influence	none (up to 400 A/m)
	Residual ripple	< 30 mV <sub>ss</sub>
	Response time	< 300 ms
	No-load voltage	max. 24 V
	Current limitation	max. 2-fold in case of saturation
	Testing voltage (working voltage up to 300V)	4 kV between input and output, input and aux., output and aux.
	Testing voltage (working voltage up to 600V)	4 kV between output and aux., 5,2 kV between input and output aux. 230 VAC and 110 VAC: 4 kV between input and aux. aux. 24 VDC, 6-30 V AC/DC and 36-265 V AC/DC: 5,2 kV between aux. and input
	<b>Adjustment</b>	After taking off the plexiglass cover it is possible to adjust with the potentiometer which is named "SPAN" the final value and with the potentiometer which is named "ZERO" the zero-point (only on partial range).



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**Regulations**

EMC	DIN EN 61326
Mechanical strength	DIN EN 61010 part 1
Electrical security	DIN EN 61010 part 1
	Housing all insulated, protection class II, at a working voltage up to 300V (network to neutral conductor) degree of pollution 2, overvoltage category CAT III at a working voltage up to 600V (network to neutral conductor) degree of pollution 2, overvoltage category CAT III
Accuracy, overload	DIN EN 60688
Separation	DIN EN 61010 part 1, 3,52 kV 50 Hz 10 sec. and 5,2 kV 50 Hz 10 sec.
Air gaps and creep distances	DIN EN 61010 part 1
System of protection	DIN EN 60529 housing IP30, terminals IP20
Connection	DIN 43807

**Auxiliary voltage**

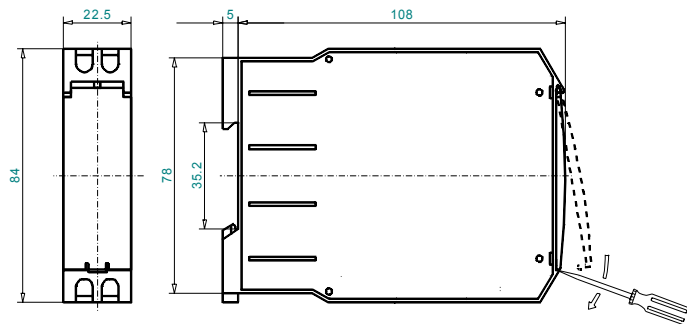
230 V AC  $\pm$  20 %, 45-65 Hz, 2,5 VA  
only required in case of "live zero", rated values up to 0... Hz, rated voltage > 500 V and fluctuating rated voltage  $\pm$  20 %

Option

- 110 V AC  $\pm$  20 %, 45-65 Hz, 2,5 VA
- 24 V DC, -15 % bis +25 %, 2 W, (EMC DIN EN 61326 class A)
- 6-30 V AC + DC or 36-265 V AC + DC, 2 VA, (EMC DIN EN 61326 class A)

**Weight** 190g

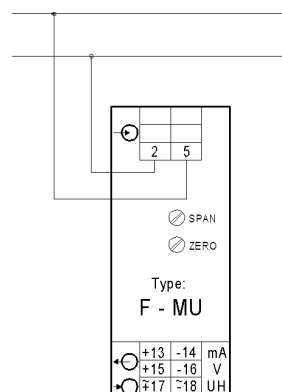
**Dimensions**



**Installation**

Attachement	snap-on mounting according to DIN EN 50 022
Electrical connection	threaded terminal end 4 mm <sup>2</sup> max.

**Connection**



Transducers with frequency module have no further outputs.  
At the clamps +13 and -14 the frequency output is available.

**Warning!** Before starting any work on or in a device, it must be disconnected from the mains or switched to a voltage-free state.

**Maintenance** The device is maintenance-free when used correctly.

**Caution!** Servicing or maintenance work must only be carried out by trained specialist personnel.



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