

# Vario-Series • Square Panel Meters

For Power Factor



Moving-coil movement with power factor converter, 90° scale  
Narrow front frame per DIN 43 718, matt black

## Technical Data

Front Dimensions Type	96 x 96 mm V-LF 96
Scale Length mm	94
Accuracy Class	1.5
Max. Weight (standard version.), kg	0.54
Power Consumption approx. Current Path	1.0 VA
Voltage Path	3.0 VA
Operating Voltage:	Outer to neutral conductor
	3-Phase-3-Wire-System
	3-Phase-4-Wire-System
	≤ 300 V
	≤ 500 V
	≤ 277/480 V
Test Voltage	3.5 kV
Front Housing-Panel Protection	IP 52



V-LF 96

## Description

Analog panel meter with core-magnet moving-coil movement and built in power factor converter. The power factor converter determines the phase angle between current and voltage.  $\cos \varphi$  is displayed at the moving-coil movement.

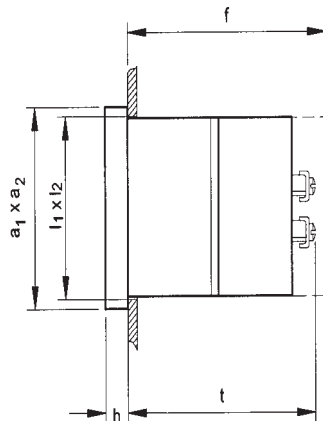
## Display

Measuring Range	CAP 0.5 ... 1 ... 0.5 IND
Scale Division	Coarse-fine
Pointer	Beam pointer with knife edge

## Mechanical Design

Housing Material	Polycarbonate, self-extinguishing and drip-proof per UL94V-0 or sheet metal housing as option
Mounting Fasteners	Standard: Screw clip S. Options: see next page
Replaceable	Scales, front frames and glass windows ⇒ May only be replaced under voltage free conditions!
Terminals	M4 screw terminals with self-lifting terminal clips. Screws can be turned with cross-head or standard screw drivers.
Contact Protection	Finger-safe full cover included

## Basic Dimensions



Front in mm	Nom. Dimensions. mm		Cutout Dimensions. mm $l_1 \times l_2$	Installation Depth incl. Terminals M4 mm t	Installation Depth incl. Full cover. mm f
	$a_1 \times a_2$	h			
96 x 96	96 x 96	5	$92^{+0.8} \times 92^{+0.8}$	124 (60 projected)	133

## Reference Conditions

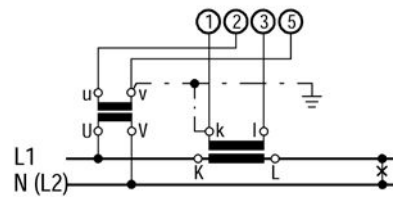
Reference Quantities	Reference Conditions
Ambient Temperature	23 °C ± 2°C
Position of Use	control panel vertical ± 1°
Frequency	50 Hz ± 0.1 Hz
Current Component	95 ... 100% of rated value
Voltage Component	98 ... 102% of rated value
Waveshape	sine, distortion factor ≤ 1%
Warm-Up Time	≥ 5 min.
Other	DIN EN 60051

## Nominal Range of Use Limits

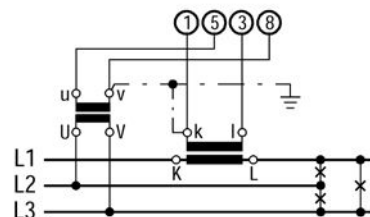
Frequency	45 Hz ... 65 Hz 49 Hz ... 51 Hz for Order No.: AB21
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## Schematic Diagrams

### Single Phase Alternating Current



### 3-Phase 3-Wire, Balanced Load



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### Please note when ordering:

Only one Order No. with the same letter sequence may be chosen. Order No. with Identification N (standard model) can be left out.

An entry with "...“ in the Order No. column means that the Order No. must be supplemented with written text.

'N' = Standard Version · 'A' = Extra Charge · '+' = Available without extra Charge · '-' = Not available

		Type Order No. + ↓	⇒ + ↓	V-LF 96 1129H
<b>System Type / Power Type</b>	<b>Nominal Voltage</b>			
Single Phase Alternating Current		AB21		+
	100 ... 110 V AC		IL710	+
	220 ... 230 V AC		IL726	+
3-Wire-System, Balanced Load		AB22		+
	100 ... 110 V AC		IL710	+
	380 V AC		IL338	+
	400 ... 500 V AC		IL341	+
<b>Current Path Terminal</b>	at transformer sec.: 1 A	BE10		+
	at transformer sec.: 5 A	BE11		+
<b>Position of Use</b>	standard			N
	0 ... 45 degrees from horizontal (bonded glass)	LA11		A
	46 ... 89 degrees from horizontal (bonded glass)	LA12		A
	91 ... 135 degrees from horizontal	LA13		A
<b>Application</b>	standard			N
	conditionally tropic resistant, climatic category 3	LB4		A
<b>Protection</b>	standard			N
	front panel: IP 54, terminals IP00	LH21		A
<b>Resistance to Vibration/ Marine Application</b>	standard			N
	vibration resistance 2.5 g; shock resistance 30 g	LN56		A
	Germanischer Lloyd	LN8		A
<b>Front Frame</b>	matt balck			N
	matt grey, RAL 7037	MA11		A
<b>Glass Window</b>	standard			N
	anti-glare	MG1		A
	anti-glare, with red adjustable set pointer	MG98		A
<b>Housing and Fasteners</b>	standard			N
	sheet metal housing with type S screw clip	ML7		A
	sheet metal housing with type B screw clip	ML8		A
	polycarbonate housing with 2 leaf springs	ML9		A
	polycarbonate housing with 4 leaf springs	ML11		A
	polycarbonate housing with Subklew fasteners	ML10		A
<b>Identification</b>	none			N
	on the back: ...	MZ998...		A
<b>Scale Inscription (Latin lettering)</b>	none			N
	≤ 22 characters, 1 line: ...	SM902...		A
	≤ 37 characters, 2 lines: 1 <sup>st</sup> line (15 characters): ...			
	2 <sup>nd</sup> line (22 characters): ...	SM911...		A
<b>Red Marker (RAL 2002)</b>	none			N
	red marker at: ...	ST981...		A

### Ordering Example

Panel meter for power factor  
3-Wire-System, balanced load,  
Connection to transformer sec. 5 A, 500 V

Type	Order No.
V-LF 96	1129H, AB22, BE11, IL341