

Vario-Series • Square Panel Meters

For Frequency (Pointer-Type)



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



V-FZQS 96

Technical Data

Front Dimensions mm Type	48 x 48 FZQS 48 W	72 x 72 V-FZQS 72	96 x 96 V-FZQS 96
Scale Length mm	40	66	94
Accuracy Class	0.5	0.5	0.5
Weight approx. (kg)	0.08 ¹⁾	0.2	0.25
Operating Voltage	300 V	600 V	600 V
Test Voltage	3.5 kV	5.8 kV	5.8 kV
Front Housing-Panel Protection	IP 52	IP 52	IP 52
Fasteners (see next page)	leaf spring	screw clip S	screw clip S
Housing Material	polycarbonate	polycarbonate	polycarbonate
Interchangeable Scale	yes	yes	yes
Frequency Converter	separate	built in	built in

1) plus 0.2 kg (approx.) for separated frequency converter

Description

Analog panel meter with moving-coil movement and built in or separate frequency converter (see above)

Display

Scale Division Coarse-fine
Pointer Beam pointer with knife edge

Mechanical Design

Housing Material Polycarbonate, self-extinguishing and drip-proof per UL 94 V - 0 or sheet metal housing (see above).
Sheet metal housing for type V-FZQS 72 and V-FZQS 96 as option.

Replaceable Scales, glass windows and front frames
⇒ 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 Available as option

Reference Conditions

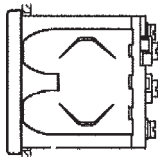
Reference Quantities	Reference Conditions
Ambient Temperature	23 °C ± 2 °C
Position of Use	control panel vertical ± 1°
Other	DIN EN 60 051

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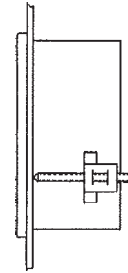


Leaf Spring



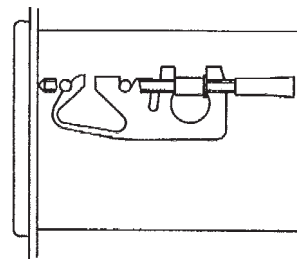
Control panel thickness 1 to 3 mm.
For size 48 x 48 mm, not available for Mauell-Grid.
Also available as option for sizes 72 x 72 and 96 x 96 mm.

Screw Clip S

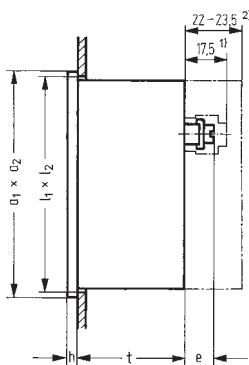


Control panel thickness 1 to 25 mm.
Special screw clamp M4 required for sizes 72 x 72 and 96 x 96 mm.
Also available as option for size 48 x 48 mm, not available for Mauell-Grid.

Fastener B DIN 43 835



Basic Dimensions



Control panel thickness 1 to 40 mm.
Screw clamp M4 as option for:
Sheet metal housings 72 x 72 and 96 x 96 mm with cone head rivets

Drawings to Scale (on request)

0101A258 for size 48 x 48 mm
0101A259 for sizes 72 x 72 and 96 x 96 mm
1325A10 for separated measuring converter
1402A32 for separated series resistance

Ordering Example

Panel meter for frequency (pointer-type), size 96 x 96 mm
90° Scale
Nominal Voltage 230 V, Class 0.5
Measuring Range 45 ... 50 ... 55 Hz

Dimensions for separated Measuring Converter

(for size 48 x 48 only)
120 x 63 x 88 (B/T/H)
Drawing to scale No. 1325 A 10 (on request)

Dimensions for separated Series Resistance

90 x 36 x 35.5 (L x B x H)
Drawing to scale No. 1402 A 32 (on request)

Type V-FZQS 96	Order No. 1604Z, IL323, EH619
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Front in mm	Nominal Dimensions		Cutout Dimensions	Installation Depth	Terminals M4 e
	a ₁ x a ₂	h			
48 x 48	48 x 48	5	45 ^{+0.6} x 45 ^{+0.6}	43.5	12.5
72 x 72	72 x 72	5	68 ^{+0.7} x 68 ^{+0.7}	43.5	12.5
96 x 96	96 x 96	5	92 ^{+0.8} x 92 ^{+0.8}	43.5	12.5

1) Single terminal cover

2) Overall terminal cover (22 mm for panel meters with front panel dimensions of 48 x 48 mm only)

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		Type Order No. →	FZQS 48 W ¹⁾ 1670Z	V-FZQS 72 ²⁾ 1601Z	V-FZQS 96 ²⁾ 1604Z
General Value Measuring		+ ↓ + ↓			
Nominal Voltage ³⁾	100–120 V	IL731			
	208–250 V	IL732			
	380–500 V	IL733			
Measuring Range	Class				
48 ... 50 ... 52 Hz ⁴⁾	0.5	EH623	+	+	+
58 ... 60 ... 62 Hz ⁴⁾	0.5	EH629	+	+	+
380 ... 400 ... 420 Hz ⁴⁾	0.5	EH674	+	+	+
45 ... 50 ... 55 Hz ⁵⁾	0.5	EH619	+	+	+
55 ... 60 ... 65 Hz ⁵⁾	0.5	EH626	+	+	+
90 ... 100 ... 110 Hz ⁵⁾	0.5	EH675	+	+	+
180 ... 200 ... 220 Hz ⁵⁾	0.5	EH635	+	+	+
270 ... 300 ... 330 Hz ⁵⁾	0.5	EH638	A	A	A
360 ... 400 ... 440 Hz ⁵⁾	0.5	EH642	+	A	+
15 ... 16.66 ... 18.4 Hz ⁵⁾	0.5	EH617	A	A	A
45 ... 50 ... 60 ... 65 Hz ⁵⁾	1	EH671	+	A	+
40 ... 50 ... 60 Hz ⁵⁾	1	EH618	A	A	A
For static Transducers					
Nominal Voltage	60 ... 150 ... 230 ... 300 V	IL734			
Measuring Range					
300 ... 500 ... 750 Hz	Class 1.5 for 150 ... 250 V Class 2.5 for < 150 ... 60 V and > 250 ... 300 V	EH641	-	-	A
600 ... 1000 ... 1400 Hz		EH646	-	-	A
1 ... 2 ... 3 kHz		EK601	-	-	A
1.8 ... 3 ... 4.2 kHz		EK603	-	-	A
2 ... 6 ... 10 kHz		EK609	-	-	A
6 ... 8 ... 10 kHz		EK608	-	-	A
Wide Range					
Nominal Voltage ³⁾	100–120 V	IL731			
	208–250 V	IL732			
	380–500 V	IL733			
Measuring Range	Class				
0/10 ... 100 Hz	1.5	EH611	-	-	A
0/10 ... 500 Hz	1.5	EH615	-	-	A
0/0.1 ... 1 kHz	1.5	EK110	-	-	A
0/0.1 ... 10 kHz	1.5	EK210	-	-	A

1) Separated measuring converter

2) For sheet metal housings with cone head rivets please see "Housing Variants"

3) Occuring voltage fluctuations up to ±20% of nominal voltage cause an additional error in indication that is less than half of the class error

4) 72 x 72 with nominal voltage > 120 V separated series resistance, 96 x 96 and 144 x 144 with nominal voltage > 230 V separated series resistance

5) 72 x 72 with nominal voltage 440 V separated series resistance

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Only one Identification No. with the same letter sequence may be chosen.

Order No. with Identification No. N (standard model) can be left out.

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

	Type Order No. ⇒	FZQS 48 W 1670Z	V-FZQS 72 1601Z	V-FZQS 96 1604Z
GENERAL VARIANTS				
Identification + ↓				
Position of Use				
Control panel vertical	LA1	N	N	N
Control panel horizontal	LA2	+	+	+
Other (Please specify angle between scale and horizontal)	LA999	A	A	A
Special Features				
Normal vibration and shock resistance	LN99	N	N	N
Vibration resis. 2.5 g, shock resis. 30 g	LN56	+ ¹⁾	+	+
Suitable for marine use with the following approvals:				
Germanischer Lloyd	LN2	A	A	A
Lloyd's Register of Shipping	LN3	-	+	+
SCALE VARIANTS				
Additional Imprint				
Second numbering (specify in clear text)	SK992	A	A	A
Inscription:				
Without additional inscription	SM99	N	N	N
Inscription ≤ 15 characters German	SM991	A	A	A
> 15 characters German	SM992	A	A	A
≤ 15 characters other language	SM993	A	A	A
> 15 characters other language	SM994	A	A	A
(Other language in Latin lettering, specify in clear text)				
Coloured mark red RAL 2002 (specify in clear text)	ST991	A	A	A
Coloured sectors yellow RAL 1021, green RAL 6018 or red RAL 2002 (specify in clear text)	SU991	A	A	A
Scale Characteristics				
Interchangeable scale	SA10	N	N	N
Screw mounted scale	SA11	A	A	A
Scale / Pointer Colours				
Scale white; imprint and pointer black	SG99	N	N	N
Scale black; imprint and pointer white	SG1	A ³⁾	A ³⁾	A ³⁾
Scale black; imprint and pointer yellow	SG2	A ³⁾	A ³⁾	A ³⁾
Scale black; imprint white, pointer yellow	SG3	A ³⁾	A ³⁾	A ³⁾

1) Available only in combination with screw clip S

2) Standard version without extra charge

3) Additional one-off costs for special scale printing on request

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HOUSING VARIANTS				
Identification + ↓				
Application				
Standard version	LB99	N	N	N
Tropic resistant	LB1	A	A	A
Protection				
According to list	LH99	N	N	N
Front housing-panel protection IP54, terminals IP00	LH21	A	A	A
Front Frame Colours				
Matt black	MA2	N	N	N
Matt grey RAL 7037	MA11	A	A	A
Matt stone grey RAL 7032	MA12	A	A	A
Matt light grey RAL 7035	MA14	A	A	A
Matt dark beige approx. RAL 1019	MA21	A	A	A
Intermediate Frame, Height 3 mm				
Without intermediate frame	MC99	N	N	N
Intermediate frame shiny black	MC1	A	A	A
Intermediate frame shiny grey RAL 7037	MC2	A	A	A
<i>Intermediate frame available only in combination with screw clip S or fastener B DIN 43 835</i>				
Glass Windows				
Standard version	MG99	N	N	N
Anti-glare glass	MG1	A	A	A
Housing				
Standard housing	ML99	N	N	N
Sheet metal housing with cone head rivets	ML4	-	A	A
Mounting				
2 leaf springs	MN2	N	+	+
4 leaf springs	MN1	A	A	A
Screw Clip S	MN14	A	N ¹⁾	N ¹⁾
Screw Clip G	MN13	-	-	-
Fastener B DIN 43835	MN11	-	A ²⁾	A ²⁾
Clip Subklew fastener (Screw Clip S without cone point)	MN32	A	A	A
Identification				
Without identification	MZ99	N	N	N
Identification on the back (specify in clear text)	MZ998	A	A	A
Contact Protection				
Without terminal cover	VB99	N	N	N
Overall terminal cover	VB2	A	A	A
Single terminal cover	VB1	+	+	+

1) Standard version without extra charge

2) Available only in combination with Order No. ML4 (sheet metal housing with cone head rivets)