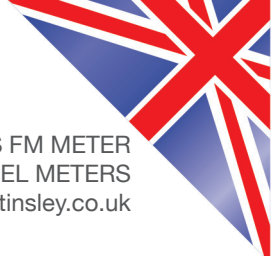




sifam tinsley
PRECISION INSTRUMENTATION

SIGMA SERIES FM METER
ANALOGUE PANEL METERS
www.sifamtinsley.co.uk



DATASHEET

Issue 1



Multifunction Meters

Transducers & Isolators

Temperature Controllers

Converters & Recorders

Digital Panel Meters

Current Transformers

kWh Energy Meters

Analogue Panel Meters

Shunts

Digital Multimeters

Protection Relays

Synchroscope Series

Power Supplies

Test & Measurement

SIGMA SERIES FM METER ANALOGUE PANEL METER

SUBJECT TO CHANGE WITHOUT NOTICE

This datasheet superseded all previous versions – please keep for future reference

Features

- Linear Scale
- Glass filled polycarbonate Lousing.
- Knife edge pointer.
- Easily replicable glass and bezel.

ANALOGUE POINTER FREQUENCY METER



Application

The pointer type frequency meters, FM 48/ 72 / 96 / 144 housed in moulded polycarbonate cases are suitable for the measurement of frequencies in the range of 45 to 450 Hz.

For maximum accuracy, the essential measuring range is obtained by suppressing the unwanted frequency span.

These instruments offer several advantages in switchboard and Generating Set Panels. Number of meters can be mounted in a Panel Cut out (Mosaic mounting). Front glass, Bezel & Dial can be easily replaced.

Functional Principle

Frequencies are measured with a built in electronic transducer & moving coil indicator. Moving coil movement has pivots of very high hardness. Movement is suspended between spring loaded saphire jewels. Movement is properly shielded & critically damped by eddy currents induced in coil former.

Mechanical Data

Case details	Moulded square case suitable for mounting in Control Switchgear panels. Machinery consoles.
Case material	Polycarbonate, flame retardant and drip proof as per UL 94 V-0.
Front facia	Glass
Colour of bezel	Black
Position of use	Vertical
Panel fixing	Mounting Clamps
Mounting	Stackable in a single cutout
Panel thickness	< 25 mm
Terminals	Hexagon studs, M4 screws And wire clamps E3

Electrical Data

Measured quantity	Frequency
Input quantity	Alternatingv voltage in sine waveform
Overload capacity	(acc. to IS : 1248 / IEC 51)
Continuously	1.2 times rated voltage
Short duration	2 times rated voltage, 0.5 sec : 9 overloads 2 times rated voltage, 5 sec : 1 overload
Enclosure code	IP 52 case
(IEC 529)	IP 00 for terminals without back cover IP 20 for terminals with back cover
Insulation class	Group A according to VDE 0110
Rated insulation voltage	660V
Proof voltage	2KV
Installation catagory	300V CAT III
Insulation resistance	50 Mohm at 500V d.c
Power consumption	< 7VA

Standard Measuring Ranges

Frequency Range	45.....50.....55 Hz 45.....55.....65 Hz 55.....60.....65 Hz 360...400...440 Hz 380...400...420 Hz
Rated input voltage	57.7 V 63.5V 100 V 110 V 115 V 120 V 127V 208 V 220 V 230 V 240 V 289 V 380 V 400 V 415 V 440 V 500 V

Non-Standard ranges available on request.

Scale and Pointer

Pointer	Knife - edge pointer
Pointer deflection	0...900
Scale characteristics	linear
Scale Division	Coarse - fine
Scale length	FM 48 FM 72 FM 96 FM144 41mm 63 mm 97mm 146mm

Accuracy at Reference Conditions

Accuracy class	0.5 according to IS: 1248 (IEC 51/ DIN EN 60051)
Reference Conditions	
Ambient temperature	23°C +2°C
Position of use	Nominal position $\pm 1^\circ$
Input	Rated Value of measured quantity
Other conditions	IS : 1248 (IEC 51/ DIN EN 60051)
Preheating time	≥ 3 min
Nominal range of use	
Ambient temperature	0...50°C
Position of use	Nominal position ± 5
External magnetic field	At 0.4 kA/m
Voltage	Rated Voltage $\pm 15\%$

Environmental Conditions

Climatic suitability	Climate category II as per IS : 1248(climatic class 3 according to VDE/VDI 3540)
Operating temperature	- 10... + 55°C
Storage temperature	- 25... + 65°C
Relative humidity	< 75% annual average, noncondensing
Shock resistance	15g for pulse duration 11 ms n
Vibration resistance	10-55-10Hz for ampli. 0.15mm (1.5 g at 50Hz)
Pollution degree	2

Applicable Standards

Nominal case and cutout dimensions for indicating Electrical instruments	IS 2419 DIN IEC 61554
Scale and pointer for electrical measuring instruments	IS 1248 DIN 43802
Connections and Terminal markings for panel meters	IS 1248 DIN 43807
Terminal bolts / leads	DIN 46200/46282
Clamp straps for connections	DIN 46282
Safety requirements and protective measures for Electrical indicating.	IS 9249 DIN 40050
Instruments and their accessories	VDE 0110, VDE 0410, IEC 529, IEC 1010
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IS 1248, IEC51/DINEN60051 DIN 43701
Environmental conditions	IS 1248, IS: 9000, VDE / VDI 3540
Front frames for indicating measuring instruments Principle dimensions	DIN 43718
UL Combustibility Class	UL 94 V-0
Technical conditions of delivery for electrical instruments	DIN 43701
Mechanical strength (Free fall test, vibration test)	IS 1248 / IEC 51 IS 9000, VDE 0411, IEC 61010

Comply with following European directives: 2004 / 108 / EC (EMC directive), 2006/ 9 5 /EC (low voltage directive) & amendment 93/68/EEC, For CE Marking.

Options

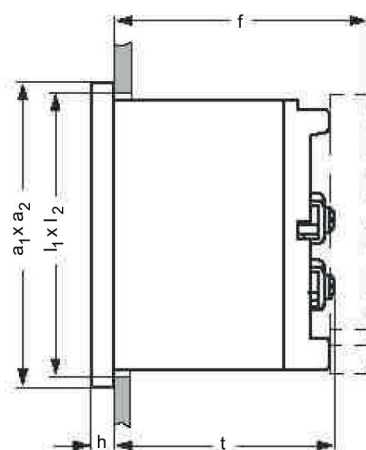
Case	
Front facia	Antiglare glass
Colour of bezel	Red, Yellow, Blue, White
Red index pointer	Front adjustable on site
Position of use	on request 0° ... 180°
Dial	
Blank dial	With initial and end values marked
Special markings	Numbering / Lettering
Division dials	Basic divisions without numbering
Colour markings/bands	Red or green

Accessories

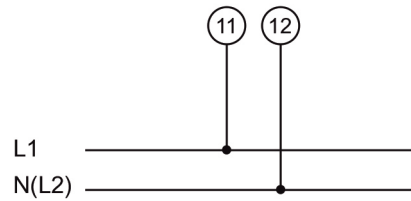
Safety Terminal Protection

Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers).

Dimensions



Front in mm	Nominal Dimensions, mm		Cutout, mm $l_1 \times l_2$	Installation Depth Inc. Terminal (t), mm	Installation Depth Inc. Full back Cover (f), mm
	$a_1 \times a_2$	h			
48 x 48	48 x 48	5.5	$45^{+0.6} \times 45^{+0.6}$	54	62.5
72 x 72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	54	62.5
96 x 96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	54	62.5
144 x 144	144 x 144	5.5	$138^{+1} \times 138^{+1}$	54	62.5

Connections**Safety Precautions**

- 1) Instruments with damaged bezel or glasses must be disconnected from the mains.
- 2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non - insulated connector wires are used.
- 3) The back cover must be snapped into place after connector wires have been clamped for protection against accidental contact.
- 4) Bezel, Scale and Glass may only be replaced under voltage free conditions.
- 5) Instruments to be used in grounded panel.

Specifications are subject to change without notice.

Ordering Information

Ordering Example	Type (1)	Type (2)	Input..(3)	Accuracy (5)	Front Facia (6)	Ingress protection (7)	Cover (8)	Scale/dial Type (9)	Scale/dial Background (10)	
Code	ZQ74	46	24	3	N	1	C	A	W	0ST
Description	72x72mm	45-55-65Hz	200-250VAC	0.5	Normal glass	IP52	with Back cover	Standard Aluminium	White	Sifam Tinsley

Type (1)		Frequency Range (2)		Input Voltage(3)		Accuracy (5)		Front facia (6)		Ingress protection (7)		Cover (8)		Scale/dial Type (9)		Scale/dial Background (10)		0ST
ZQ44	48x48mm	46	45-55-65Hz	23	380-440V	1	Class - 1.5	N	Normal glass	1	IP 52 case	C	With Back cover	P	Standard Plastic	B	Black background	Sifam Tinsley
ZQ74	72x72mm	56	55-60-65Hz	24	200-250V	2	Class - 1.0	A	Antiglare glass	2	IP 54 for term	B	Without Back cover	A	Standard Aluminium	W	White background	
ZQ94	96x96mm	45	45-50-55Hz	25	100-130V	3	Class 0.5	P	Plastic front Facia	3	IP 65 for term			R	Aluminium with Colour mark	X		
ZQ14	144x144m	34	360-400-440Hz	26	100-125V			R	Normal glass with red pointer					D	Aluminium with Dual Scale			
		36	35-50-65Hz	27	110-130V									I	Illumination dial			
		38	380-400-420Hz	28	208-277V									C	Aluminium with colour bands			
		47	47-50-53Hz	29	110-125V									X	Without Dial			
		2A	340-400-460Hz	30	380-500V									B	Blank Scale			
		2B	48-50-52Hz	31	220-440V									L	Blank Scale with logo			
		2C	46-50-54Hz	32	240-440V													
		2D	25-60Hz	33	240-415V													
		2E	50-60-70Hz	34	460-600V													
		2F	57-60-63Hz	35	100-120V													
		2G	55-66Hz	36	220-250V													

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