2012-Z-GCA

Analogue Panel Meters

Analogue Panel Meters

Ziegler

Redefine Innovative Metering

ANALOG PANEL METERS & ACCESSORIES

SECTION INDEX

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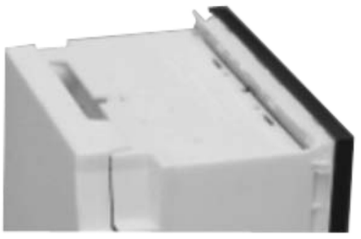
ZIEGLER ANALOGUE PANEL METERS

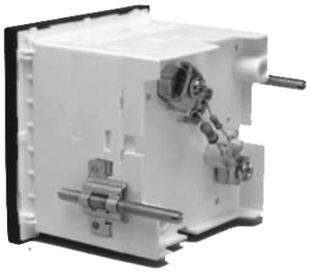
ROBUST CASE WITH CLASSIC FINISH

Ziegler Meters are housed in a Robust case made of glass filled Polycarbonate. This case is self extinguishing and non-drip which conforms to international regulations UL 94 V-0, resulting in no danger to the equipment below meters, since no burnt plastic material falls on some other equipment. This light weight material falls on some other equipment. This light weight material has very high mechanical strength and flame retardant properties



MOUNTING

Mounting is possible through S type screw clamps which can be mounted on any two opposite sides of the meter either left and right or top and bottom. All fastners are resistant to excessive vibration and shock. The “S” type screw clamp supplied as standard equipment is suitable for control panel of thickness
25mm

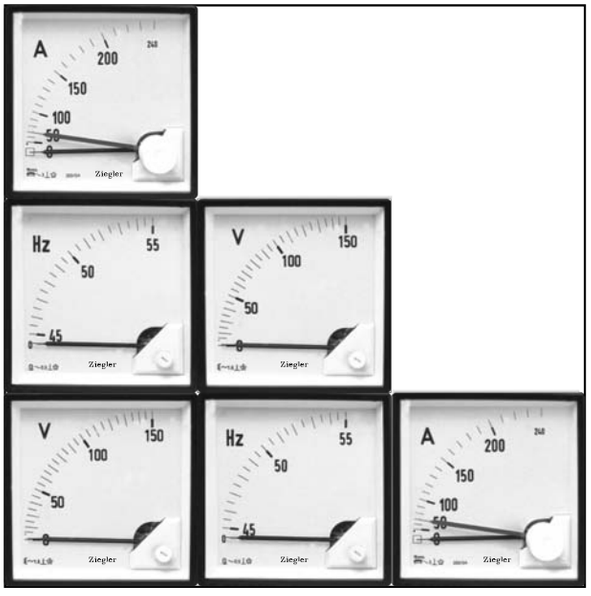


LEAF SPRING

As optional, Ziegler can supply an easy mounting lesf spring. This is saving time in installation as they snap into the panel very easily & speedily. It can be as front mounting into various grid systems. The instruments are suitable for mounting in control panels, switchboards and machine consoles even up to wall thickness of 25mm. Design facilitate for mounting meters in vertical and horizontal rows in a single cut-out.

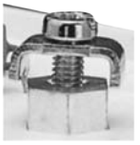
CONVENIENT HOUSING FOR EASY MOUNTING

Housing design is so convenient that the installation is possible in various grid systems. The instrument is suitable for mounting in Control Panel, Switch Boards and machine consoles even up to a wall thickness of 25mm. Design facilitates for mounting meters in vertical and horizontal rows in a single cut-out. Optically an easy mounting leaf spring is also available for thickness of 1mm panel.



SELF LIFTING TERMINAL CLAMPS

The terminal screws are connected to the terminal clamps. Whenever we unscrew, the terminal clamp gets lifted along with the terminal screw. This simplifies clamping of connector/wires.



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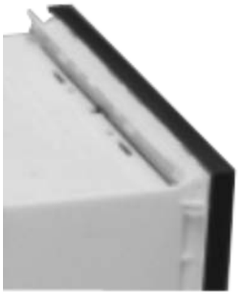
INTERCHANGEABLE SCALES

Scale replacement is quick and simple with no loss of accuracy and without tools. Interchangeable scale facility minimizes the carrying cost of inventory substantially. It also helps in reducing the lead times. A permanently fixed click fit window need only be opened for changing the scale.



SURFACE MOUNTING TECHNOLOGY (SMT)

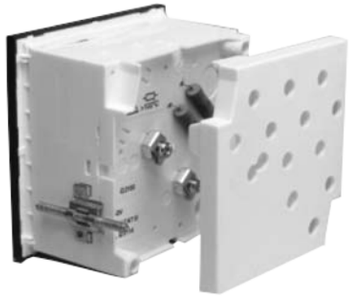
The built in Transducer forming a single unit meter. This is used for power, frequency and power factor measurements. Built in transducer PCB's with SMT manufacturing ensures quality and reliability of the products.

CONVENIENCE FEATURES

Bezels and front glass can be replaced easily. Material used for face plate is float glass. Optionally Anti-glare glass faceplate and transparent polycarbonate face plate are also available. Specially designed back cover eliminates risk of contact with live parts. Terminal protection cover conform to IP 20 as per IEC 529 (DIN 40050). The holes on the back cover facilitate to check the voltage without removing it.

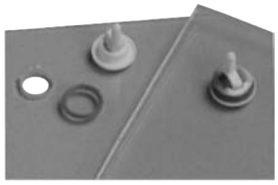
STANDARD IP20 (BACK COVER)

All Ziegler meters are supplied with click fit backcover. Specially designed back cover eliminates risk of contact with live parts. Terminal protection with back cover to IP 20 as per IEC 529. The holes on the backcover facilitate to check the voltage without removing it.



IP 52 PROTECTION

Ziegler meters conform to IP 52 protection as per IEC 529. The O-Ring incorporation in Zero Knob ensures protection from fine dust particles and water.



OPTIONAL IP54 & IP65

The Ip54 & Ip65 protection for the meter to meter will be provided on request. The Ip65 kit can be ordered separately and be added on site on the meters.

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Moving Iron Panel Mount Analog Meters With Interchangeable Scales

DE 48
DE 72
DE 96
DE 144

For Voltage-AC Voltmeter
For Current-AC Ammeter
with TRUE EFFECTIVE VALUE

Available in both AC, Current & Voltage type, they come in standard size of 48x48, 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE	
Ammeters	2 times nominal current
Voltmeters for use on voltage transformers	1.2 times nominal voltage
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs	
Panel thickness	40mm	
Terminals	Voltmeter& Ammeter 30A	HEX STUD M4 screws and wire clamp
	Voltmeter& Ammeter >30A	Threaded studs M6 with nuts
	Voltmeter& Ammeter >60A	Threaded studs M8 with nuts
Pointer	Knife-edge pointer	
Pointer deflection	0-90°	
Scale characteristics	Nearly linear above10% of nominal full scale value	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :		
Voltmeter	< 4.5 VA	
Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Accuracy class	1.5 according to IEC 60051	

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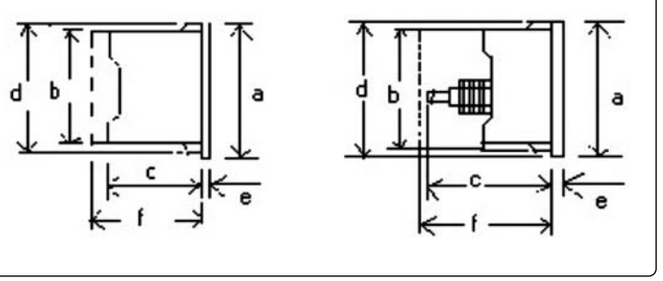
TECHNICAL SPECIFICATIONS:

Model	Unit	DE 48	DE 72	DE 96	DE 144
Front Facia	mm	48x48	72x72	96x96	144x144
Approximate weight	kg	0.10	0.16	0.20	0.40
AC Ammeter CT operated	A	1A, 5A			
AC Ammeter Direct measurement	A	100mA-60A	100mA-100A		
AC Voltmeter	V	6V-600V	6V-750V		
Rated insulation voltage	V	660V	1000V		
Proof voltage	V	2kV	3kV		

OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage/current			
Short duration Voltmeter		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.			
Ammeter	5sec	10 times (200A max.)	10 times		
	1sec	------	40 times (250 A max.)		
Scale length	mm	41	63	97	146

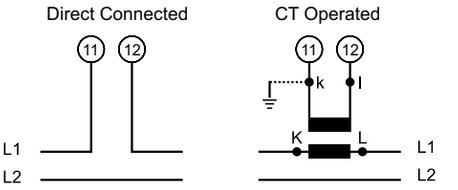


Dimensions (in mm)		DE 48	DE 72	DE 96	DE 144
Bezel	a	48	72	96	144
Case	b	43.5	66	90	136
Depth	c (<30A)	53	53	53	53
	(>30A)	62	62	62	62
	(>60A)	67	67	67	67
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth with back cover	f[xx]	64	64	64	64
	(30-60A)	70	70	70	70

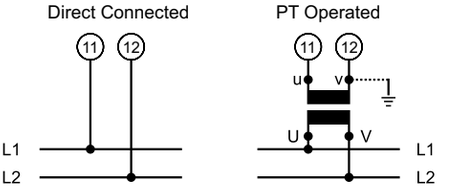
[xx] f=75mm, for DE 48 I > 30 A

CONNECTION DIAGRAMS:

AC Ammeter



AC Voltmeter



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	Over Range	Scale	Options

ORDER EXAMPLE

DE	72	Ammeter	100/5A	x 2	100A	with back cover

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Redefine Innovative Metering

Moving Coil Panel Mount Analog Meters With Interchangeable Scales

DS 48
DS 72
DS 96
DS 144

For Voltage-DC Voltmeter
For Current-DC Ammeter

Available in both DC, Current & Voltage type, they come in standard size of 48x48, 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE:	
Ammeters	2 times nominal current
Voltmeters for use on voltage transformers	1.2 times nominal voltage
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs	
Panel thickness	40mm	
Terminals	Voltmeter& Ammeter 6A	HEX STUD M4 screws and wire clamp
	Ammeter 6A	Threaded studs M6 with nuts
	Ammeter >60A	Threaded studs M8 with nuts
Pointer	Knife-edge pointer	
Pointer deflection	0-90°	
Scale characteristics	Nearly linear above 10% of nominal full scale value	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :		
Voltmeter	< 4.5 VA	
Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Accuracy class	1.5 according to IEC 60051	

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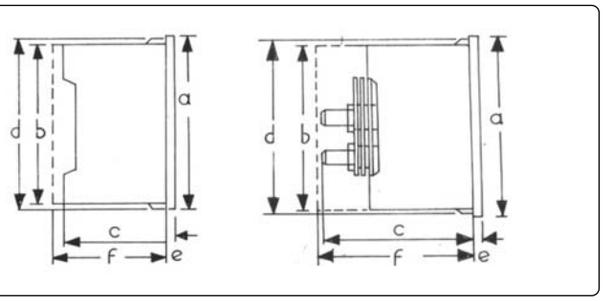
TECHNICAL SPECIFICATIONS:

Model	Unit	DS 48	DS 72	DS 96	DS 144
Front Facia	mm	48x48	72x72	96x96	144x144
Approximate weight	kg	0.13	0.18	0.22	0.43
DC Ammeter Direct measurement	A	15µA-60A	15µA-100A		40µA-100A
DC Voltmeter	V	15mV-600V			
Rated insulation voltage	V	660V	1000V		
Proof voltage	V	2kV	3kV		

OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage/current			
Short duration Voltmeter		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.			
Ammeter	5sec	10 times (200A max.)	10 times		
	1sec	------	40 times (250 A max.)		
Scale length	mm	41	63	97	146

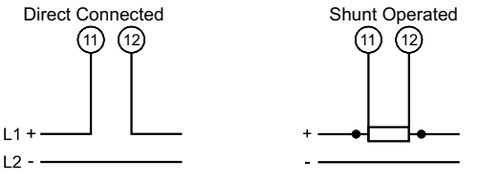


Dimensions (in mm)		DS 48	DS 72	DS 96	DS 144
Bezel	a	48	72	96	144
Case	b	43.5	66	90	136
Depth	c (<6)	53	53	53	53
	(6-60A)	68	68	68	68
	(>60A)	78	78	78	78
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth without back cover	f[xx]	64	64	64	64
Depth with back cover	(6-60A)	70	70	70	70

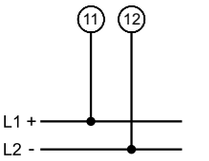
[xx] f=75mm, for DS 48 I > 6 A

CONNECTION DIAGRAMS:

DC Ammeter



DC Voltmeter



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

DS	96	Ammeter	100/75mV	$100A_{DC}$	with red mark at $80A_{DC}$

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Redefine Innovative Metering

The Moving Coil, Rectifier Analogue Meter DG 48,72,96,144mm, for the measurement of AC, Current & Voltage

DG 48 DG 72 DG 96 DG 144	For Voltage-AC Voltmeter For Current-AC Ammeter with built-in rectifier

Available in both AC, Current & Voltage type, they come in standard size of 48x48, 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE:	
Ammeters	2 times nominal current
Voltmeters for use on voltage transformers	1.2 times nominal voltage
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs	
Panel thickness	40mm	
Terminals	Voltmeter& Ammeter <6A	HEX STUD M4 screws and wire clamp
	Ammeter 6A	Threaded studs M6 with nuts
Pointer	Knife-edge pointer	
Pointer deflection	0-90°	
Scale characteristics	Nearly linear above 10% of nominal full scale value	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :		
Voltmeter	< 4.5 VA	
Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Accuracy class	1.5 according to IEC 60051	

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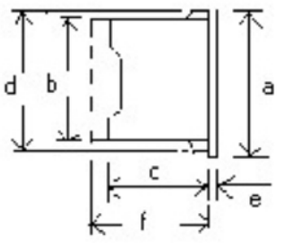
Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	DG 48	DG 72	DG 96	DG 144
Front Facia	mm	48x48	72x72	96x96	144x144
Approximate weight	kg	0.13	0.18	0.22	0.43
AC Ammeter CT operated	A	1A, 5A	1A, 5A	1A, 5A	1A, 5A
AC Ammeter Direct measurement	A	10µA-10A			
AC Voltmeter	V	6V-600V			
Rated insulation voltage	V	660V	1000V		
Proof voltage	V	2kV	3kV		

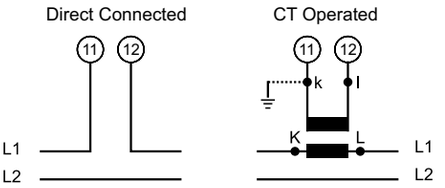
OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage/current			
Short duration Voltmeter		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.			
Ammeter	5sec	10 times (200A max.)	10 times		
	1sec	------	40 times (250 A max.)		
Scale length	mm	38	61	97	146



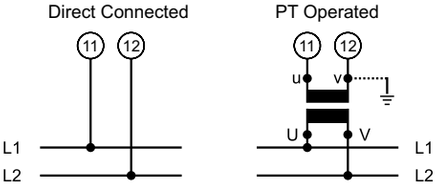
Dimensions (in mm)		DG 48	DG 72	DG 96	DG 144
Bezel	a	48	72	96	144
Case	b	43.5	66	90	136
Depth	c (<6)	53	53	53	53
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth with back cover	f	64	64	64	64

CONNECTION DIAGRAMS:

AC Ammeter



AC Voltmeter



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

DG	72	Voltmeter	500V	500V	with back cover

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Redefine Innovative Metering

Analogue Pointer type Frequency meter

FM 48 FM 72 FM 96 FM 144	For measuring frequency

Pointer type frequency meter measure frequencies in the range of 45Hz-450Hz. For maximizing the accuracy, the essential measuring range is obtained by suppressing the unwanted frequency span. They come in standard size of 48x48, 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps, Leaf springs
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp
Pointer	Knife-edge pointer
Pointer deflection	0-90°
Scale characteristics	Linear
Scale divisions	Coarse & fine
POWER CONSUMPTION :	
Frequency meter	7 VA
Accuracy class	0.5 according to IEC 60051

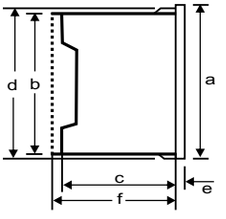
Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	FM 48	FM 72	FM 96	FM 144
Front Facia	mm	48x48	72x72	96x96	144x144
Approximate weight	kg	0.15	0.21	0.28	0.49
Measuring range	Hz	45...50...55 Hz 48...50...52 Hz 45...55...65 Hz 55...60...65 Hz 58...60...62 Hz 180...200...220 Hz 360...400...440 Hz		Rated input voltage 57.7V-440V (please specify the required voltage while ordering)	
Rated insulation voltage	V	660V			
Proof voltage	V	2kV			

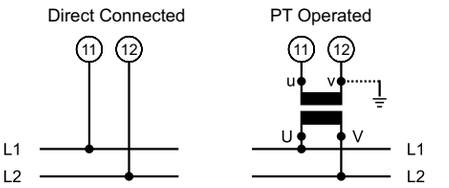
OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage			
Short duration Voltmeter		2 x rated voltage max. 5sec.			
Scale length	mm	41	63	97	146



Dimensions (in mm)		FM 48	FM 72	FM 96	FM 144
Bezel	a	48	72	96	144
Case	b	43.5	66	90	136
Depth	c	53	53	53	53
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth with back cover	f	64	64	64	64

CONNECTION DIAGRAMS:

FREQUENCY METER



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Input Voltage	Scale	Options

ORDER EXAMPLE

FM	96	Frequency meter	230V	55Hz...60Hz...65Hz	with back cover

Ziegler

Redefine Innovative Metering

Moving Coil Panel Mount Analogue Power Factor Meters with Built -in Transducer

LF 72 LF 96 LF 144	Analogue power factor meter with Angle adjuster for monitoring changing power factor.

Power factor meter consist moving coil indicator with built-in SMD transducer to indicate power factor values in Single phase and Three phase systems. They come in standard size of 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Electro Magnetic Compatibility (EMC)	EN 50081-2, EN 50082-2, EN 55011/CISPR 11. EN 60555-2/IEC 555-2 EN 61000-4-4/IEC 1000-4-4 EN 61000-4-2/IEC 1000-4-2 EN 61000-4-5/IEC 1000-4-5, ENV 50140
Insulation class	Group A according to VDE 0110
Installation category	CAT III 300 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp
Pointer	Knife-edge pointer
Pointer deflection	0-90°
Scale characteristics	Non linear
Scale divisions	Coarse & fine
POWER CONSUMPTION :	
Voltage path	3.0 VA
Current path	1.0 VA
Accuracy class	1.5 according to IEC 60051

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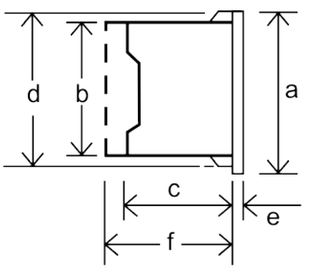
Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	LF 72	LF 96	LF 144
Front Facia	mm	72x72	96x96	144x144
Approximate weight	kg	0.55	0.60	0.80
Rated current	A	1A, 5A		
AC Voltage range	V	57.5V-500V (Please specify the voltage range and system type while ordering)		
Measuring ranges	Cosφ	Cap 0.5 - 1 - 0.5 ind Cap 0.8 - 1 - 0.3 ind Cap 0.8 - 1 - 0.8 ind		
Rated insulation voltage	V	660V		
Proof voltage	V	2kV		
OVERLOAD CAPACITY :				
Continuous		1.2 x rated voltage/current		
Short duration		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.		
Scale length	mm	63	97	146



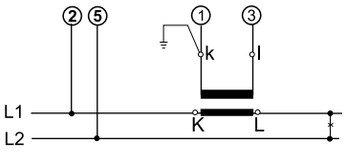
Dimensions (in mm)		LF 72	LF 96	LF 144
Bezel	a	72	96	144
Case	b	66	90	136
Depth	c	53	53	53
	d	67.5	91.5	137.5
	e	5.5	5.5	5.5
Cutout Size		$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth with back cover	f	64	64	64

SYSTEM TYPES:

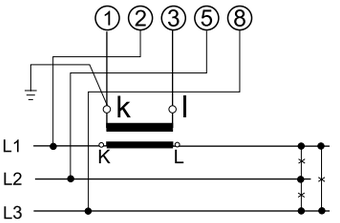
Type	Active Power
Single phase system	D1C
3 phase 3 wire system (balanced load)	E1C
3 phase 4 wire system (balanced load)	V1C
3 phase 3 wire system (unbalanced load)	D2C
3 phase 4 wire system (unbalanced load)	V3C

CONNECTION DIAGRAMS:

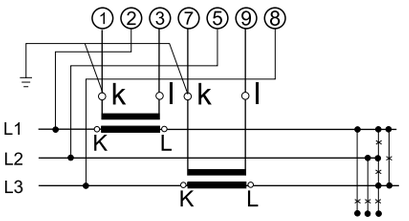
SINGLE PHASE SYSTEM



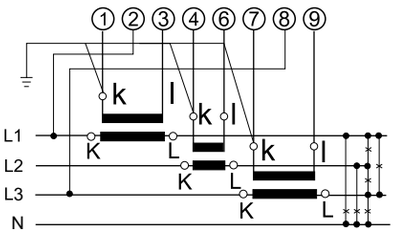
3 PHASE 3 WIRE SYSTEM (BALANCED LOAD)



3 PHASE 3 WIRE SYSTEM (UNBALANCED LOAD)



3 PHASE 4 WIRE SYSTEM (UNBALANCED LOAD)



Type	Size	Measured Qty	System type	Measuring Range/Input	Scale	Options

LF	96	Power Factor	Single Phase	500V/5A	cap 0.5... 1...0.5 ind	with back cover

Ziegler

Redefine Innovative Metering

Moving coil panel mount analogue Watt meters with built-in transducer

LM 96 LM 144	Analogue watt meters for, Single phase Three phase balance load 3 or 4 wire Three phase unbalanced load 3 or 4 wire

Analogue watt meters, available in 96x96 & 144x144mm, are suitable to indicate export and import, active and reactive power on sinusoidal and non-sinusoidal current. These instruments use built-in transducers manufactured with SMD technology, offering reliable and accurate performance.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Electro Magnetic Compatibility (EMC)	EN 50081-2, EN 50082-2, EN 55011/CISPR 11. EN 60555-2/IEC 555-2 EN 61000-4-4/IEC 1000-4-4 EN 61000-4-2/IEC 1000-4-2 EN 61000-4-5/IEC 1000-4-5, ENV 50140
Insulation class	Group A according to VDE 0110
Installation category	CAT III 300 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate / transparent (on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Nominal position ±1°
Panel Fixing (mountable in a single cutout)	Metal side clamps
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp E3
Pointer	Knife-edge pointer
Pointer deflection	0-90°
Scale characteristics	Linear
Scale divisions	Coarse & fine
POWER CONSUMPTION :	
Current	0.2VA
Voltage path	E1W, D1W, D1B, V1W, V1B : 3.0VA E1B : 3.5VA D2W, D2B : 3.4VA V3W : 3.9VA V3B : 4.3VA
Accuracy class	1.5 according to IEC 60051
Input	Full power value Pw / Pb
Feasibility factor	Lambda = Pw / Ps or Pb / Ps

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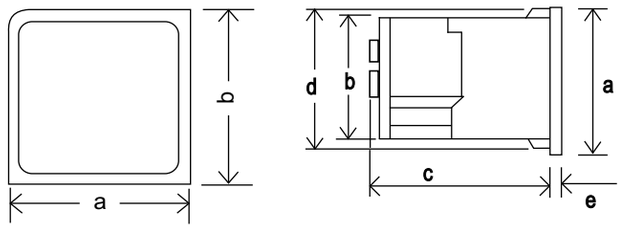
Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	LM 96	LM 144
Front Facia	mm	96x96	144x144
Approximate weight	kg	0.65-0.9	0.9-1.1
AC Wattmeter CT operated	A	1A, 5A	1A, 5A
AC wattmeter rated voltage	V	for single phase (E1W, E1B) : 57.7,63.5,100,110,127,220,289,380 for three phase (D1W, D1B, D2W, D2B, V1W, V1B, V3W, V3B) : 100, 110, 220, 240, 380, 415, 500	
Rated insulation voltage	V	660V	
Proof voltage	V	2kV	
OVERLOAD CAPACITY :			
Continuous		1.2 x rated voltage/current	
Short duration Voltage path		2 x rated voltage, 5sec. max. 10 x rated current, 5 sec. max.	
Response time	sec	4sec. max.	
Scale length	mm	97	146



Dimensions (in mm)		LM 96	LM 144
Bezel	a	96	144
Case	b	90	136
Depth	c	106	106
	d	91.5	137.5
	e	5.5	5.5
Cutout Size		$92^{+0.8}$	138^{+1}
Depth with back cover	f	64	64

SYSTEM TYPES:

Type	Active Power	Reactive Power
Single phase system	E1W	E1B
3 phase 3 wire system (balanced load)	D1W	D1B
3 phase 4 wire system (balanced load)	V1W	V1B
3 phase 3 wire system (unbalanced load)	D2W	D2B
3 phase 4 wire system (unbalanced load)	V3W	V3B

SELECTION OF MEASURING RANGE :

Apparant power Ps is calculated from primary ratings of current transformer and voltage transformer.

In single phase network, $Ps = V \cdot I$

where V = voltage between phase and neutral & I = line current.

In three phase network, $Ps = \sqrt{3}\, V \cdot I$

where V = voltage between two phase & I = line current.

Full scale value i.e range of the instrument (Pw = active power, Pb = reactive power) must be selected in such a way that the same remain between 0.5 times and 1.2 times the value of apparent power Ps.

Thus feasibility factor "Lambda" should be between 0.5 and 1.2

where "Lambda" = Pw/Ps or Pb/Ps

Full scale values shall preferably be selected from standard series according to DIN 43701, 1-1.2-1.5-2-2.5-3-4-5-6-7.5-8 and their decadic / decimal multiples.

ORDERING INFORMATION

Please specify ordering information as given below,

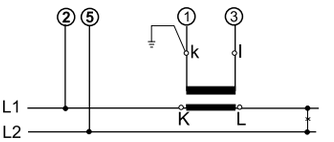
Type	Size	Measured Qty	System type	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

LM	144	Active Power	3 phase 3 wire balanced load	380V/5A	1900W	with back cover

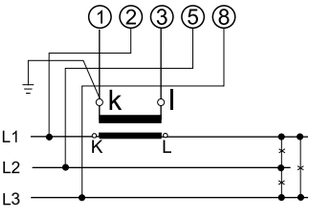
CONNECTION DIAGRAMS:

- **SINGLE PHASE SYSTEM :**

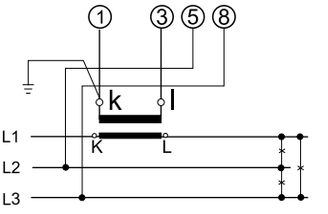


Active Power / Reactive Power

- **3 PHASE 3 WIRE SYSTEM (BALANCED LOAD) :**

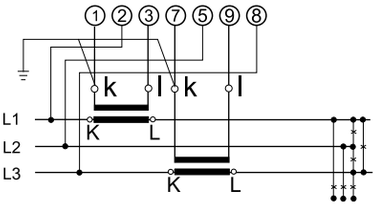


Active Power



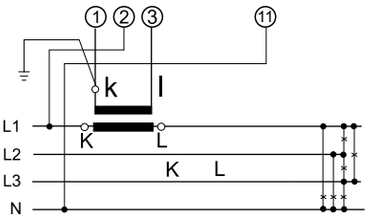
Reactive Power

- **3 PHASE 3 WIRE SYSTEM (UNBALANCED LOAD) :**

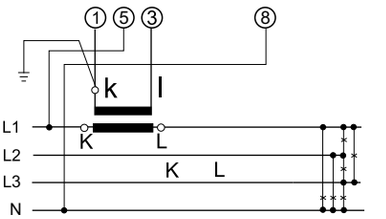


Active Power / Reactive Power

- **3 PHASE 4 WIRE SYSTEM (BALANCED LOAD) :**

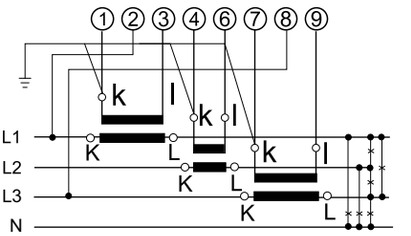


Active Power

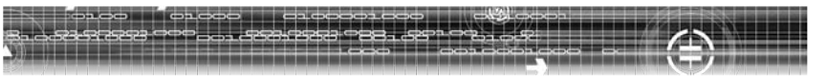


Reactive Power

- **3 PHASE 4 WIRE SYSTEM (UNBALANCED LOAD) :**



Active Power / Reactive Power



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Redefine Innovative Metering

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Redefine Innovative Metering

Analogue Maximum Demand Ammeter with Bimetallic Movement

BM/EB	48	BM-Bimetallic Movement MDI meter
BM/EB	72	EB-Bimetallic Movement MDI meter combined with Moving Iron Ammeter
BM/EB	96	

The MDI meter indicates maximum demand of the system with thermal movement, deflecting proportional to the current time integral. The indicating system drives the red slave pointer which indicates the maximum value until it is reset manually by the resetting knob.
If it is required to measure instantaneous current then EB type instrument serves the purpose.
They come in standard size of 72x72, 96x96

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 40 (standard)
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE:	
Ammeters	2 times rated current
Bimetallic Ammeters	1.2 times rated current
Insulation class	Group A according to VDE 0110
Installation category	CAT III 300 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps, Leaf springs	
Panel thickness	40mm	
Terminals	HEX STUD M4 screws and wire clamp E3	
Pointer	Knife-edge pointer	
Pointer deflection	0-90°	
Scale characteristics	Bimetallic-Quadratic Moving iron-nearly linear	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :	BM 72/96	EB 72/96
1A rated current	< 1.6 VA	< 2.5 VA
5A rated current	< 2.5 VA	< 3.4 VA
Accuracy class	3(Bimetallic movement-referred to slave pointer) 1.5 (moving iron movement) according to IEC 60051	
Response time	Approx. 1sec. (moving iron)	
Thermal time delay	15 minutes 8 min/20min/30min. on request	

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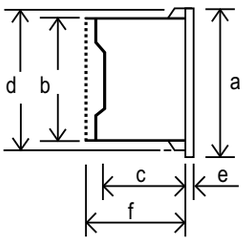
Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:


Model	Unit	BM 48	BM 72	BM 96	EB 48	EB 72	EB 96
Front Facia	mm	48x48	72x72	96x96	48x48	72x72	96x96
Approximate weight	kg	0.20	0.22	0.26	0.20	0.26	0.30
Measuring range	A	1A, 5A					
Rated insulation voltage	V	1000V					
Proof voltage	V	3kV					

OVERLOAD CAPACITY :

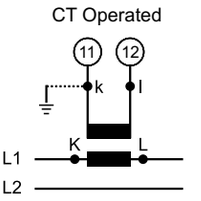
Continuous	1.2 x rated current						
Short duration	10 x rated current , 1sec. max.						
Scale length Bimetallic	mm	41	61	52	35	97	71
Moving Iron	mm	—	—	61	41	—	97



Dimensions (in mm)		BM 48	BM 72	BM 96	EB 48	EB 72	EB 96
Bezel	a	48	72	96	48	72	96
Case	b	43.5	66	90	43.5	66	90
Depth	c	53	53	53	53	53	53
	d	67.5	67.5	91.5	67.5	67.5	91.5
	e	5.5	5.5	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$
Depth with back cover	f	64	64	64	64	64	64

CONNECTION DIAGRAMS:

MDI AMMETER



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	RS Time	Scale	Options

ORDER EXAMPLE

BM	96	MDI Ammeter	300/5A	15min.	300A (x 1.2)	with back cover

Ziegler

Redefine Innovative Metering

2 IN 1 Pointer Type Analogue Panel Meters

DE/2 96	For measuring AC voltage & current
DS/2 96	For measuring DC voltage & current
FM/2 96	For measuring frequency

2 in 1 pointer type analogue panel meter come in 96mm x 96mm size. These measure frequency, AC and DC voltage and current depending upon the application. These combine 2 measuring systems independent of each other.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Electro Magnetic Compatibility (EMC)	EN 50081-2, EN 50082-2, EN 55011/CISPR 11. EN 60555-2/IEC 555-2 EN 61000-4-4/IEC 1000-4-4 EN 61000-4-2/IEC 1000-4-2 EN 61000-4-5/IEC 1000-4-5, ENV 50140
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

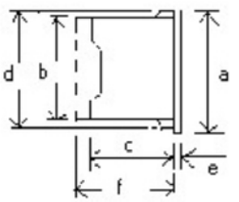
Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antique Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs	
Panel thickness	40mm	
Terminals	AC Voltmeter, Frequency meter & AC Ammeter 30A & DC Ammeter <6A	HEX STUD M4 screws and wire clamp
	AC Ammeter >30A DC Ammeter 6A	Threaded studs M6 with nuts
	Ammeter >60A	Threaded studs M8 with nuts
Pointer	Knife-edge pointer	
Pointer deflection	0-90°	
Scale characteristics	AC moving iron-Nearly linear DC moving coil & frequency-linear	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :		
AC Voltmeter	< 4.5 VA	
AC Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Frequency meter	7 VA	
DC Voltmeter	< 4.5 VA	
DC Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Accuracy class	1.5 (for ammeter & voltmeter) 0.5 for frequency meter according to IEC 60051	

Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	DE/2 96	DS/2 96	FM/2 96
Front Facia	mm	96x96	96x96	96x96
Approximate weight	kg	0.20	0.26	0.28
Measuring range		100mA-100A 6V-750V	15µA-100A 15mV-600V	45...50...55 Hz 48...50...52 Hz 45...55...65 Hz 55...60...65 Hz 58...60...62 Hz 180...200...220 Hz 360...400...440 Hz Rated input voltage 57.7V-440V
Rated insulation voltage	V	1000V		660V
Proof voltage	V	3kV		2kV
OVERLOAD CAPACITY :				
Continuous		1.2 x rated voltage		
Short duration Voltmeter		2 x rated voltage max. 5sec.		
Scale length	mm	54	54	54



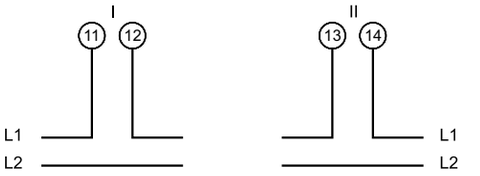
For AC Voltmeters, Ammeters & Frequency meters upto 30A
For DC Voltmeters & Ammeters <6A

Dimensions (in mm)		DE/2 96	DS/2 96	FM/2 96
Bezel	a	96	96	96
Case	b	90	90	90
Depth	c	53	53	53
	d	91.5	91.5	91.5
	e	5.5	5.5	5.5
Cutout Size		$92^{+0.8}$	$92^{+0.8}$	$92^{+0.8}$
Depth with back cover	f	64	64	64

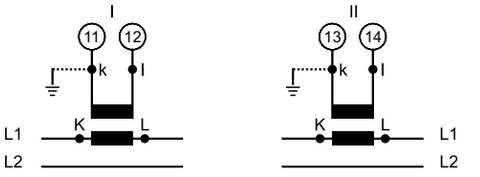
CONNECTION DIAGRAMS:

AC / DC AMMETER

Direct Connected

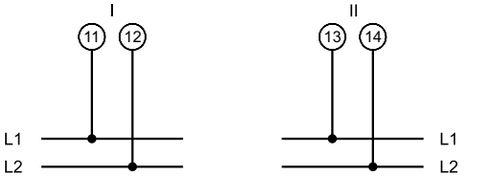


CT Operated

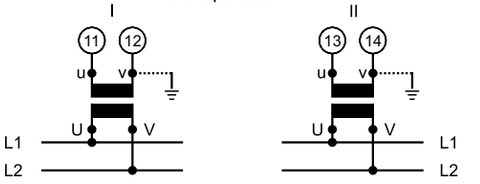


AC / DC VOLTMETER / FREQUENCY METER

Direct Connected



PT Operated



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	Over Range	Scale	Options

ORDER EXAMPLE

DE/2	96	2 in 1 Voltmeter	415V	----	415V	with back cover

Ziegler

Redefine Innovative Metering

Moving Coil Panel Mount Analog Meters With Interchangeable Scales

DSL 48
DSL 72
DSL 96
DSL 144

For Voltage-DC Voltmeter
For Current-DC Ammeter

Available in both DC Current & Voltage type, they come in standard size of 48x48, 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE:	
Ammeters	2 times nominal current
Voltmeters for use on voltage transformers	1.2 times nominal voltage
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs	
Panel thickness	40mm	
Terminals	Voltmeter& Ammeter 6A	HEX STUD M4 screws and wire clamp
	Ammeter 6A	Threaded studs M6 with nuts
	Ammeter >60A	Threaded studs M8 with nuts
Pointer	Knife-edge pointer	
Pointer deflection	0-240°	
Scale characteristics	Nearly linear above 10% of nominal full scale value	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :		
Voltmeter	< 4.5 VA	
Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Accuracy class	1.5 according to IEC 60051	

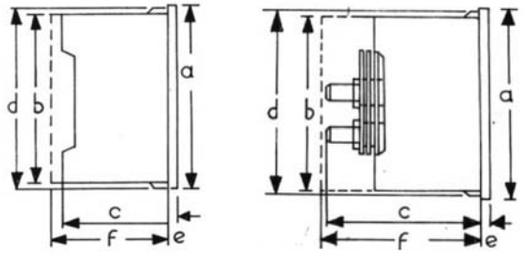
Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	DSL 48	DSL 72	DSL 96	DSL 144
Front Facia	mm	48x48	72x72	96x96	144x144
Approximate weight	kg	0.13	0.25	0.30	0.43
DC Ammeter Direct measurement	A	100µA-100A	50µA-30A	50µA-100A	
DC Voltmeter	V	60mV-600V			
Rated insulation voltage	V	660V			
Proof voltage	V	3kV			

OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage/current			
Short duration Voltmeter		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.			
Ammeter	5sec	10 times (200A max.)	10 times		
	1sec	------	40 times (250 A max.)		
Scale length	mm	70	106	142	230

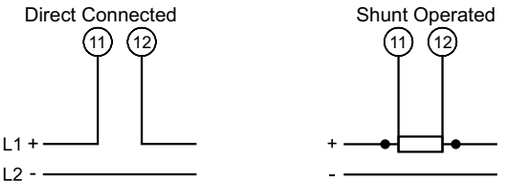


Dimensions (in mm)		DSL 48	DSL 72	DSL 96	DSL 144
Bezel	a	48	72	96	144
Case	b	43.5	66	90	136
Depth	c (<6)	53	53	53	53
	(6-60A)	68	68	68	68
	(>60A)	78	78	78	78
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth without back cover	f^{xx}	64	64	64	64
Depth with back cover	(6-60A)	70	70	70	70

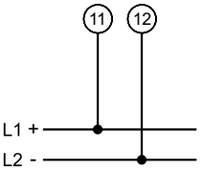
^{xx} f=75mm, for DSL 48 I > 6 A

CONNECTION DIAGRAMS:

DC AMMETER



DC VOLTMETER



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

DSL	72	Voltmeter	300V	$300V_{DC}$	with back cover

Ziegler

Redefine Innovative Metering

The moving coil, rectifier analogue meter DGL 48, 72, 96,144mm, for the measurement of AC, Current & Voltage

DGL 48 DGL 72 DGL 96 DGL 144	For Voltage-AC Voltmeter For Current-AC Ammeter with built-in rectifier

Available in both AC, Current & Voltage type, they come in standard size of 48x48, 72x72, 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE:	
Ammeters	2 times nominal current
Voltmeters for use on voltage transformers	1.2 times nominal voltage
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

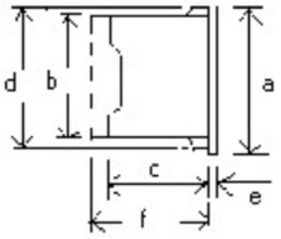
Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black Red/Yellow/Blue/White (on request)	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs	
Panel thickness	40mm	
Terminals	Voltmeter& Ammeter <6A	HEX STUD M4 screws and wire clamp
	Ammeter 6A	Threaded studs M6 with nuts
Pointer	Knife-edge pointer	
Pointer deflection	0-240°	
Scale characteristics	Nearly linear above 10% of nominal full scale value	
Scale divisions	Coarse & fine	
POWER CONSUMPTION :		
Voltmeter	< 4.5 VA	
Ammeter	<15A - < 0.5 VA >15A - <0.8 VA	
Accuracy class	1.5 according to IEC 60051	

Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

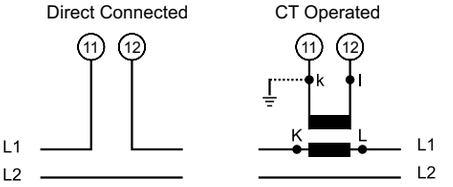
Model	Unit	DGL 48	DGL 72	DGL 96	DGL 144
Front Facia	mm	48x48	72x72	96x96	144x144
Approximate weight	kg	0.13	0.25	0.30	0.43
AC Ammeter CT operated	A	1A, 5A			
AC Ammeter Direct measurement	A	100mA-10A			
AC Voltmeter	V	6V-600V			
Rated insulation voltage	V	660V			
Proof voltage	V	3kV			
OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage/current			
Short duration Voltmeter		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.			
Ammeter	5sec	10 times (200A max.)	10 times		
	1sec	------	40 times (250 A max.)		
Scale length	mm	70	106	142	230



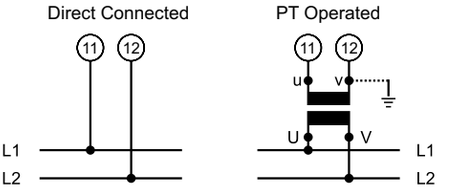
Dimensions (in mm)		DGL 48	DGL 72	DGL 96	DGL 144
Bezel	a	48	72	96	144
Case	b	43.5	66	90	136
Depth	c (<6)	53	53	53	53
	d	44.5	67.5	91.5	137.5
	e	5.5	5.5	5.5	5.5
Cutout Size		$45^{+0.6}$	$68^{+0.7}$	$92^{+0.8}$	138^{+1}
Depth with back cover	f^{xx}	64	64	64	64

CONNECTION DIAGRAMS:

AC AMMETER



AC VOLTMETER



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input		Scale	Options

ORDER EXAMPLE

DGL	48	Voltmeter	500V		500V	with back cover

Ziegler

Redefine Innovative Metering

Analogue Pointer type Frequency meter

FML 96 FML 144	For measuring frequency

Pointer type frequency meter measure frequencies in the range of 45Hz-450Hz. For maximizing the accuracy, the essential measuring range is obtained by suppressing the unwanted frequency span. They come in standard size of 96x96 & 144x144mm

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

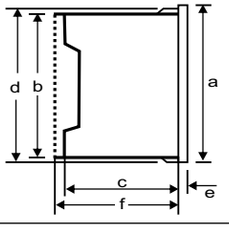
Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps, Leaf springs
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp
Pointer	Knife-edge pointer
Pointer deflection	0-240°
Scale characteristics	Linear
Scale divisions	Coarse & fine
POWER CONSUMPTION :	
Frequency meter	7 VA
Accuracy class	0.5 according to IEC 60051

Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

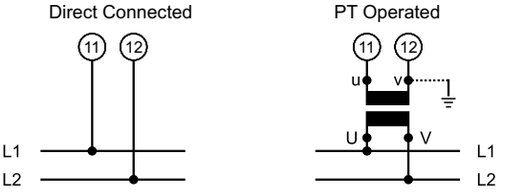
Model	Unit	FML 96	FML 144
Front Facia	mm	96x96	144x144
Approximate weight	kg	0.45	0.60
Measuring range	Hz	45...50...55 Hz 48...50...52 Hz 45...55...65 Hz 55...60...65 Hz 58...60...62 Hz 180...200...220 Hz 360...400...440 Hz	Rated input voltage 57.7V-500V (please specify the required voltage while ordering)
Rated insulation voltage	V	660V	
Proof voltage	V	2kV	
OVERLOAD CAPACITY :			
Continuous		1.2 x rated voltage	
Short duration Voltmeter		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.	
Scale length	mm	142	230



Dimensions (in mm)		FML 96	FML 144
Bezel	a	96	144
Case	b	90	136
Depth	c	53	53
	d	91.5	137.5
	e	5.5	5.5
Cutout Size		$92^{+0.8}$	138^{+1}
Depth with back cover	f	64	64

CONNECTION DIAGRAMS:

FREQUENCY METER



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Input Voltage	Scale	Options

ORDER EXAMPLE

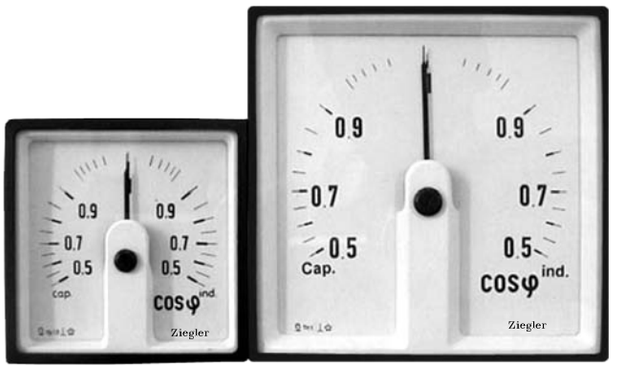
FML	96	Frequency meter	230V	55Hz...60Hz...65Hz	with back cover

Ziegler

Redefine Innovative Metering

Moving coil panel mount analogue power factor meters with built -in transducer phase.

LFL 96 LFL 144	Analogue power factor meter with Angle adjuster for monitoring changing power factor.



Power factor meter consist moving coil indicator with built-in SMD transducer to indicate power factor values in Single phase and Three phase systems. They come in standard size of 96x96 & 144x144mm

GENERAL FEATURES:

Applicable Standards	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Electro Magnetic Compatibility (EMC)	EN 50081-2, EN 50082-2, EN 55011/CISPR 11. EN 60555-2/IEC 555-2 EN 61000-4-4/IEC 1000-4-4 EN 61000-4-2/IEC 1000-4-2 EN 61000-4-5/IEC 1000-4-5, ENV 50140
Insulation class	Group A according to VDE 0110
Installation category	CAT III 300 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

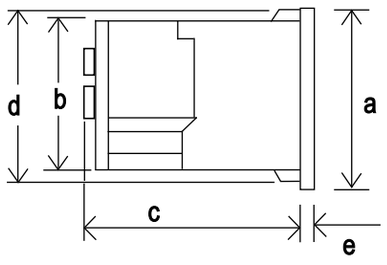
Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps leaf springs
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp
Pointer	Knife-edge pointer
Pointer deflection	0-240°
Scale characteristics	Non linear
Scale divisions	Coarse & fine
Power Consumption :	
Voltage path	3.5 VA
Current path	1.0 VA
Accuracy class	1.5 according to IEC 60051

Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit			LFL 96	LFL 144
Front Facia	mm			96x96	144x144
Approximate weight	kg			0.68	0.80
Rated current	A		1A, 5A		
AC Voltage range	V	57.5V-500V (Please specify the voltage range and system type while ordering)			
Measuring ranges	Cosφ	Cap 0.5 - 1 - 0.5 ind Cap 0.8 - 1 - 0.3 ind Cap 0.8 - 1 - 0.8 ind			
Rated insulation voltage	V		660V		
Proof voltage	V		2kV		
OVERLOAD CAPACITY :					
Continuous		1.2 x rated voltage/current			
Short duration		2 x rated voltage, 5sec. max. 10 x rated current, 5sec. max.			
Scale length	mm			142	230



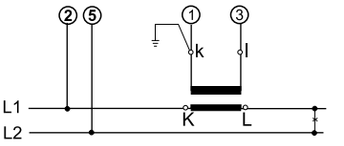
Dimensions (in mm)				LFL 96	LFL 144
Bezel	a			96	144
Case	b			90	136
Depth	c			106	106
	d			$91.5^{+0.8}$	137.5
	e			5.5	5.5
Cutout Size				92	$138^{+0.1}$
Depth with back cover	f			64	64

System types:

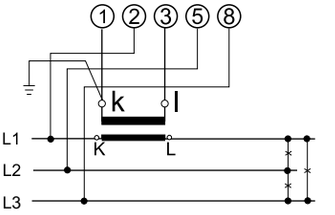
Type	Active Power
Single phase system	E
3 phase 3 wire system (balanced load)	D

CONNECTION DIAGRAMS:

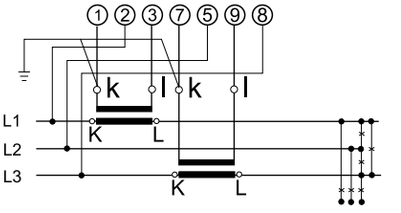
SINGLE PHASE SYSTEM



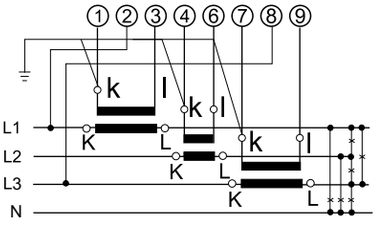
3 PHASE 3 WIRE SYSTEM (BALANCED LOAD)



3 PHASE 3 WIRE SYSTEM (UNBALANCED LOAD)



3 PHASE 4 WIRE SYSTEM (UNBALANCED LOAD)



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	System type	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

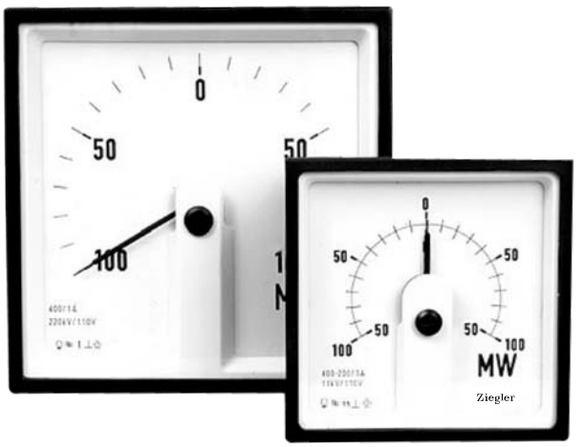
LFL	96	Power Factor	Single Phase	500V/5A	cap 0.5... 1...0.5 ind	with back cover

Ziegler

Redefine Innovative Metering

Moving coil panel mount analogue Watt meters with built-in transducer

	Analogue watt meters for,
LML 96	Single phase
LML 144	Three phase balance load 3 or 4 wire
	Three phase unbalanced load 3 or 4 wire



Analogue watt meters, available in 96x96 & 144x144mm, are suitable to indicate export and import, active and reactive power on sinusoidal and non-sinusoidal current. These instruments use built-in transducers manufactured with SMD technology, offering reliable and accurate performance.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Electro Magnetic Compatibility (EMC)	EN 50081-2, EN 50082-2, EN 55011/CISPR 11. EN 60555-2/IEC 555-2 EN 61000-4-4/IEC 1000-4-4 EN 61000-4-2/IEC 1000-4-2 EN 61000-4-5/IEC 1000-4-5, ENV 50140
Insulation class	Group A according to VDE 0110
Installation category	CAT III 300 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate / transparent (on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Nominal position ±1°
Panel Fixing (mountable in a single cutout)	Metal side clamps
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp E3
Pointer	Knife-edge pointer
Pointer deflection	0-240°
Scale characteristics	Linear
Scale divisions	Coarse & fine
POWER CONSUMPTION :	
Current	0.2VA
Voltage path	E1W, D1W, D1B, V1W, V1B : 3.0VA E1B : 3.5VA D2W, D2B : 3.4VA V3W : 3.9VA V3B : 4.3VA
Accuracy class	1.5 according to IEC 60051
Input	Full power value Pw / Pb
Feasibility factor	Lambda = Pw / Ps or Pb / Ps

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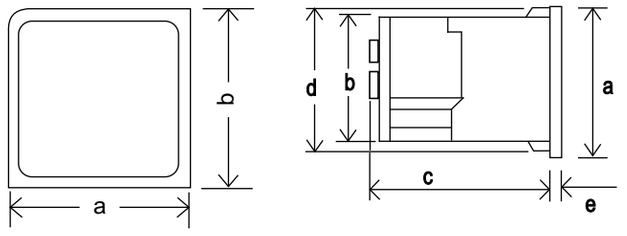
Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	LML 96	LML 144
Front Facia	mm	96x96	144x144
Approximate weight	kg	0.73-0.98	0.9-1.2
AC Wattmeter CT operated	A	1A, 5A	1A, 5A
AC wattmeter rated voltage	V	for single phase (E1W, E1B) : 57.7,63.5,100,110,127,220,289,380 for three phase (D1W, D1B, D2W, D2B, V1W, V1B, V3W, V3B) : 100, 110, 220, 240, 380, 415, 500	
Rated insulation voltage	V	660V	
Proof voltage	V	2kV	
OVERLOAD CAPACITY :			
Continuous		1.2 x rated voltage/current	
Short duration Voltage path		2 x rated voltage, 5sec. max. 10 x rated current, 5 sec. max.	
Response time	sec	4sec. max.	
Scale length	mm	142	230



Dimensions (in mm)		LML 96	LML 144
Bezel	a	96	144
Case	b	90	136
Depth	c	106	106
	d	91.5	137.5
	e	5.5	5.5
Cutout Size		$92^{+0.8}$	138^{+1}
Depth with back cover	f	64	64

SYSTEM TYPES:

Type	Active Power	Reactive Power
Single phase system	E1W	E1B
3 phase 3 wire system (balanced load)	D1W	D1B
3 phase 4 wire system (balanced load)	V1W	V1B
3 phase 3 wire system (unbalanced load)	D2W	D2B
3 phase 4 wire system (unbalanced load)	V3W	V3B

SELECTION OF MEASURING RANGE :

Apparant power Ps is calculated from primary ratings of current transformer and voltage transformer.

In single phase network, $Ps = V \cdot I$

where V = voltage between phase and neutral & I = line current.

In three phase network, $Ps = \sqrt{3}\, V \cdot I$

where V = voltage between two phase & I = line current.

Full scale value i.e range of the instrument (Pw = active power, Pb = reactive power) must be selected in such a way that the same remain between 0.5 times and 1.2 times the value of apparent power Ps.

Thus feasibility factor "Lambda" should be between 0.5 and 1.2

where "Lambda" = Pw/Ps or Pb/Ps

Full scale values shall preferably be selected from standard series according to DIN 43701, 1-1.2-1.5-2-2.5-3-4-5-6-7.5-8 and their decadic / decimal multiples.

ORDERING INFORMATION

Please specify ordering information as given below,

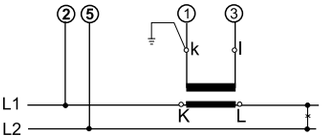
Type	Size	Measured Qty	System type	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

LML	96	Active Power	3 phase 3 wire balanced load	380V/5A	1900W	with back cover

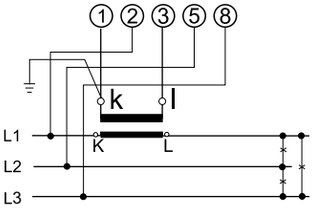
CONNECTION DIAGRAMS:

- **SINGLE PHASE SYSTEM :**

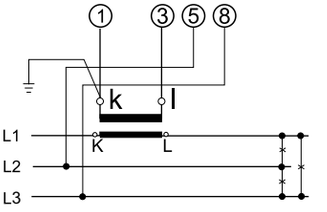


Active Power / Reactive Power

- **3 PHASE 3 WIRE SYSTEM (BALANCED LOAD) :**

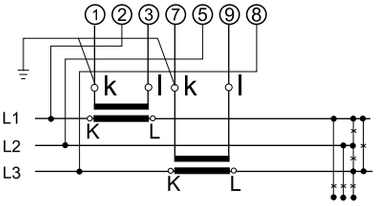


Active Power



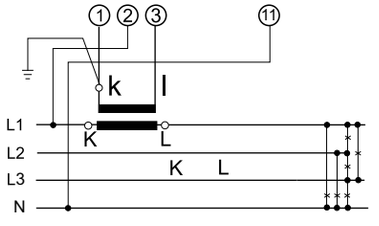
Reactive Power

- **3 PHASE 3 WIRE SYSTEM (UNBALANCED LOAD) :**

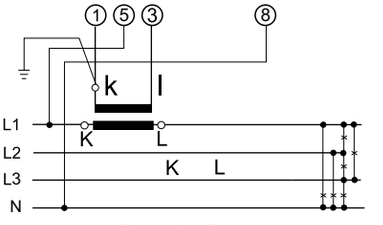


Active Power / Reactive Power

- **3 PHASE 4 WIRE SYSTEM (BALANCED LOAD) :**

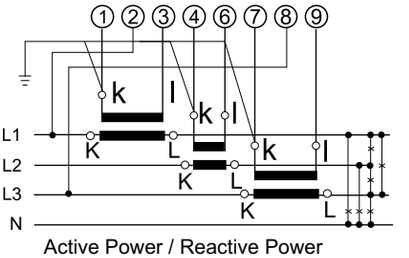


Active Power

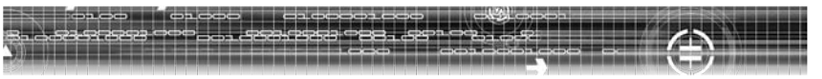


Reactive Power

- **3 PHASE 4 WIRE SYSTEM (UNBALANCED LOAD) :**



Active Power / Reactive Power



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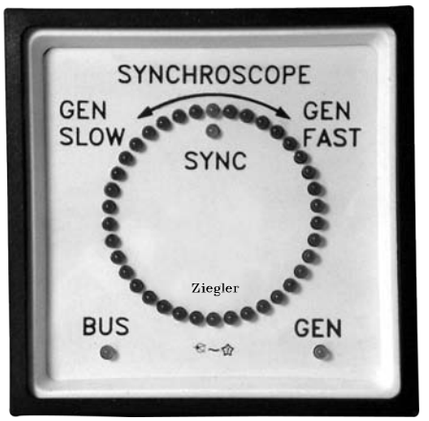
LED Type Electronic Synchroscope

SQ 96	Electronic LED type Synchroscope for synchronizing application



The Electronic Synchroscope is designed to provide an illuminated indication of actual phase difference between the BUS voltage (reference voltage) & the GENERATOR Voltage (incoming voltage)

It denotes the actual frequency difference corresponding to the inverse of time taken for 1 rotation of the illuminated vector spot. When 2 alternators are paralleled, it is necessary that,

1) Frequency must be equal.
2) Phase must be same.

Synchroscope is, hence used to indicate the phase and frequency difference between 2 AC alternators.

Applicable Standards

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
OVER RANGE:	
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles	
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0	
Front Facia	Glass glare Antiglare Glass (on request) Polycarbonate/transparent(on request)	
Color of Bezel	Black/Red/Yellow/Blue/White (on request)	
Color of LED's	Red/Orange/Yellow	
Position of use	Vertical	
Panel Fixing (mountable in a single cutout)	Swivel screws	
Panel thickness	40mm	
Terminals	Voltmeter& Ammeter <6A	HEX STUD M4 screws and wire clamp
	Ammeter 6A	Threaded studs M6 with nuts
POWER CONSUMPTION :		
Sychroscope	< 6 VA max.	

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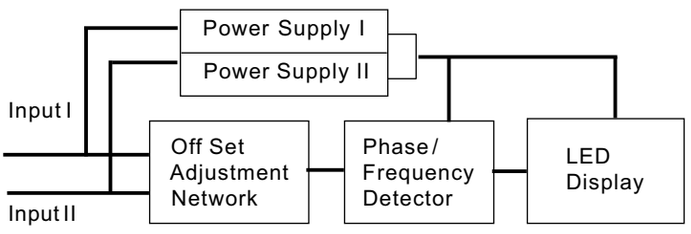
Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	Unit	SQ
Front Facia	mm	96X96
Approximate weight	kg	0.60
Measuring quantity		Frequency & Phase difference
Measuring range	Hz	35-70Hz
Pull in/drop out frequency	Hz	±9Hz
Rated insulation voltage	V	660V
Proof voltage	V	2kV
Dimensions (in mm)		SQ 96
Bezel a		96
Case b		90
Depth c (<6)		104
d		91.5
e		5.5
Cutout Size		$92^{+0.8}$
Depth with back cover f		64

FUNCTIONAL PRINCIPLE:



The Bus & Gen inputs are fed to the Frequency & Phase detection network. The output duty cycle of the network corresponds to the frequency difference between Bus & Generator Voltage. The detector network also determines the actual phase difference.

DESCRIPTION

The rotation of the vector spot is with reference to the bus voltage.

If the vector spot LED turns clockwise,it indicates the GENERATOR frequency is greater than the BUS frequency. It means the speed of the generator must be reduced by the operator.

If the spot LED turns anticlockwise,the GENERATOR frequency is less than BUS frequency.In this case speed of the generator must be increased.

If 'T' is the time taken for one rotation, the frequency difference can be calculated as 1/ T = A f

Example: Let the bus frequency be 50 Hz.The vector spot takes 10 Sec. for one rotation,clockwise.

1/10 = 0.1 Hz.

The frequency difference = 0.1Hz. Hence we can infer that GENERATOR frequency is 50.1 Hz.

If the Frequency & Phase of BUS signal matches with those of GENERATOR signal,the two green led's at 12 o'clock position glow.

If the Frequency matches & Phase does not, then one red led corresponding to the phase difference will glow.

FAVORABLE CONDITION FOR" SWITCHING IN" THE GENERATOR:

1.Ensure that the frequency difference between two inputs is within the requirements of user as follows:

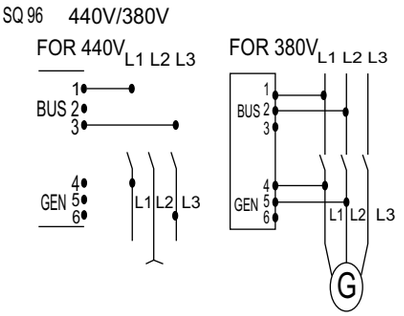
Measure time taken for 1 complete rotation of the vector spot in SECOND(T).

The frequency difference will be Af = 1/T(Hz)

2.Provided the frequency difference is within acceptable limits,wait till the SYNC mark LED s(two green LED s at 12 o'clock position)glow.

At this instant , it is safe to CONNECT the GENERATOR to BUS.

CONNECTIONS DIAGRAM :



TYPE	TERMINAL	
BUS	1-3	1-2
GEN	4-6	4-5
SQ - 96	440 V	380 V
	240 V	220 V
	480 V	415 V
	110 V	100 V
	127 V	120 V

ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Measuring Range/Input	Options

ORDER EXAMPLE

SQ	96	Frequency & Phase difference	415V/50Hz	with back cover

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Redefine Innovative Metering

Moving Iron Panel Mount Analog Meters With Interchangeable Scales & built-in selector switch

EQ 72 SWT
EQ 96 SWT

For Voltage-AC Voltmeter with selector switch
For Current-AC Ammeter with selector switch
with TRUE EFFECTIVE VALUE
in 3 phase systems

Available in both AC Current & Voltage type, they come in standard size of 72x72, 96x96mm

Selector Switch Position	System & Instrument Type
L1, L2, L3, OFF	3 Phase Ammeter
L1L2, L2L3, L3L1, OFF	3 Phase 3 Wire Voltmeter
L1L2, L2L3, L3L1 L1N, L2N, L3N	3 Phase 4 Wire Voltmeter
L1L2, L2L3, L3L1 L1N, L2N, L3N OFF	

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
OVER RANGE:	
Ammeters	2 times nominal current
Voltmeters for use on voltage transformers	1.2 times nominal voltage
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Swivel screws
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp E3
Pointer	Knife-edge pointer
Pointer deflection	0-90°
Scale characteristics	Nearly linear above10% of nominal full scale value
Scale divisions	Coarse & fine
POWER CONSUMPTION :	
Voltmeter	< 3.5 VA
Ammeter	1 VA
Accuracy class	1.5 according to IEC 60051

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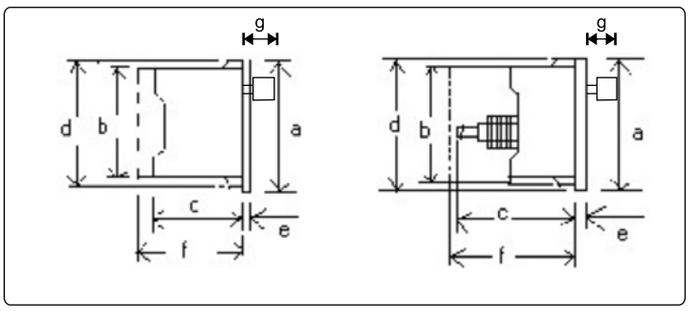
TECHNICAL SPECIFICATIONS:

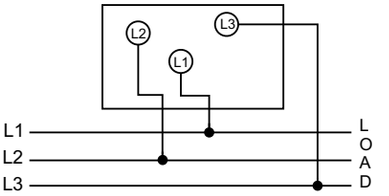
Model	Unit	EQ 72	EQ 96
Front Facia	mm	72x72	96x96
Approximate weight	kg	0.19	0.23
AC Ammeter	A	1A, 5A	
AC Voltmeter	V	110V, 120V, 132V, 150V, 200V, 250V, 300V, 400V, 500V, 600V	
Rated insulation voltage	V	1000V	
Proof voltage	V	3kV	
OVERLOAD CAPACITY :			
Continuous		1.2 x rated voltage/current	
Short duration Voltmeter		2 x rated voltage max. 1000V upto max. 5sec.	
Ammeter	5sec	10 times	
	1sec	40 times (250 A max.)	
Scale length	mm	61	97



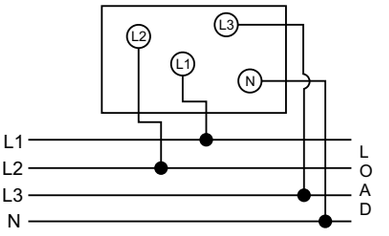
Dimensions (in mm)		EQ 72 SWT	EQ 96 SWT
Bezel	a	72	96
Case	b	66	90
Depth	c	53	53
	d	67.5	91.5
	e	5.5	5.5
Cutout Size		$68^{+0.7}$	$92^{+0.8}$
Depth with back cover	f	64	64
	g	13	13

CONNECTION DIAGRAMS:

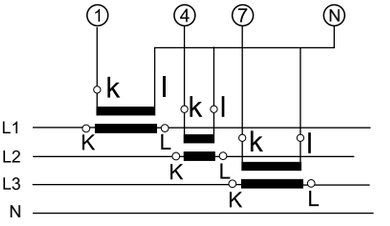
AC VOLTMETERS 3 PHASE 3 WIRE



AC VOLTMETERS 3 PHASE 4 WIRE



AC AMMETERS 3 PHASE 4 WIRE



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	System Type	Measuring Range/Input	Scale	Options

ORDER EXAMPLE

EQ	72	Voltmeter	3 Phase 3 Wire	250V	250V	with back cover

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Redefine Innovative Metering

Vibrating REED Type Frequency Meter

FQ 72 FQ 96	For measuring frequency of Generators and Power Suppliers

The vibrating REED Type Frequency Meters are used measuring frequency of gensets, generator sets in the span of rated frequencies 50Hz or 60Hz. They come in 72x72mm & 96x96mm DIN Quadratic sizes.

Movement :
Vibrating REED Movement with 13nos. If REEDs mounted in HORIZONTAL ARRANGEMENT. Each REED is tuned to a different value in the frequency span.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Scale and pointer for electrical measuring instruments	DIN 43802
Nominal case and cutout dimensions for indicating Electrical instruments	DIN 43700 DIN 16257
Connections and Terminal markings for panel meters	DIN 43807
Terminal bolts / leads.	DIN 46200/46282
Principle Dimensions & Front frames for indicating measuring instruments	DIN 43718
Safety requirements and protective measures for Electrical indicating. instruments and their accessories.	DIN 40050/8-70, VDE 0110/ 11-72 VDE 0410/ 10-76 IEC 529 , IEC 1010
Enclosure code	IP 52 (standard) IP 65(on req.) IP 54 (on request) casings
UL combustibility class	UL 94 V-0
Compliance with European Directives	89/336/EEC (EMC directive) 73/23/EEC (low voltage directive) & amendment 93/68/EEC, for CE Marking
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50MΩ at 500 V DC

FACT SHEET:

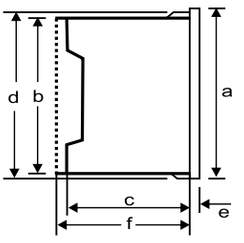
Casing Details	Moulded square case suitable for mounting in control / switchgear panels, Machinery consoles
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass Antiglare Glass (on request) Polycarbonate/transparent(on request)
Color of Bezel	Black Red/Yellow/Blue/White (on request)
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps, Leaf springs
Panel thickness	40mm
Terminals	HEX STUD M4 screws and wire clamp E3
No. of REEDs	13
REED Arrangement	Horizontal
Scale divisions	Coarse & fine
Accuracy class	0.5 according to IEC 60051

Ziegler

Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

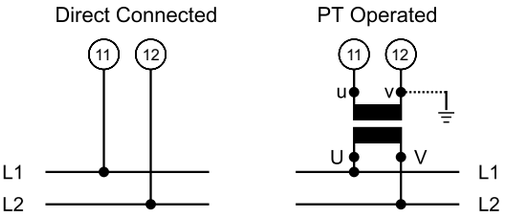
Model	Unit	FQ 72	FQ 96
Front Facia	mm	72x72	96x96
Approximate weight	kg	0.30	0.40
Measuring range	Hz	45...50...55 Hz 47...50...53 Hz 44...50...56 Hz 57...60...63 Hz 54...60...66 Hz	Resolution: ½ Hz ½ Hz 1 Hz ½ Hz 1 Hz
Rated voltage		100V 110V 230V 400V 500V 600V	Approx. power consumption 0.4VA 0.5VA 1VA 1.5VA <3VA <3VA
Rated insulation voltage	V	660V	
Proof voltage	V	2kV	
OVERLOAD CAPACITY :			
Continuous		1.2 x rated voltage	
Short duration		2 x rated voltage max. 5sec.	



Dimensions (in mm)		FQ 72	FQ 96
Bezel	a	72	96
Case	b	66	90
Depth	c	53	53
	d	67.5	91.5
	e	5.5	5.5
Cutout Size		$68^{+0.7}$	$92^{+0.8}$
Depth with back cover	f	64	64

CONNECTION DIAGRAMS:

Frequency meter



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Measured Qty	Input Voltage	Scale	Options

ORDER EXAMPLE

FQ	72	Frequency	230V	45...50...55 Hz	with back cover

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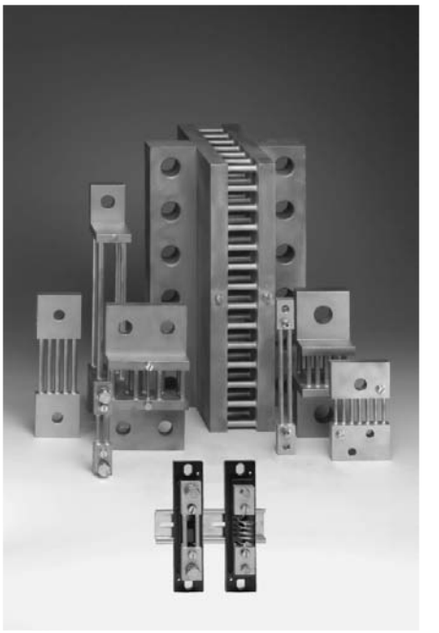
DC Shunts for High current on DC circuits



50mV
60mV
75mV
150mV

For measuring High Value current connection on DC circuits on 0.5 and 1 class.

DC shunts convert high value current in DC circuits into proportional voltage drop (50mV/60mV/75mV/150mV) which can be connected of DC voltmeters to measure the high value current.
They come in three forms as described below,

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Shunts	DIN 73703
Mounting rails	DIN EN 50022-35
Enclosure code	IP 00
OVER RANGE:	
Shunt	1.2 times nominal current
Insulation class	Group A according to VDE 0110
Installation category	CAT III 600 V (IEC 61010)
Insulation Resistance	>50M? at 500 V DC

FACT SHEET:

Form A	Insulating base mounted shunts clamping to DIN mounting rail or wall mounting (upto 30A) without insulating base (31...150A)
Form B	L-profile end blocks
Resistance bars	Manganin
End blocks Form A	High conductivity brass
Form B/C	High conductivity brass / copper
Base material	Polycarbonate, black
POWER CONSUMPTION :	
Voltmeter	< 4.5 VA
Ammeter	<15A - < 0.5 VA >15A - <0.8 VA
Accuracy class	Class 1, 0.5, 0.2

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Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

DIN 43703 standard   

Model		Form A	Form B	Form C
Voltage drop	mV	50mV, 60mV, 75mV, 150mV	50mV, 60mV, 75mV, 150mV	50mV, 60mV, 75mV, 150mV
MEASURING RANGE	In	1,2,4,5,6 10,15,20,25,30,40 50,60,80,100 or 150	200; 250; 300; 400; 500; 600; 750; 800; 1000; 1200; 1500; 2000 or 2500	1200; 1500; 2000 or 2500 3000 or 4000

Approximate weight (Kg)							
In	1...30A	31...150A	200...250A	400...600A	1000A	1500A	2500A
50/60mV	0.12	0.13	0.61	0.85	1.45	1.96	2.90
75mV	0.12	0.16	0.61	1	1.90	3	3.10
150mV	0.15	0.23	0.68	1.16	2.15	3.15	5.20

Voltage drop mV	Rated current A	Exec.according to figure	a	b	c	d	e	f	No. of screws	Hexagonal screw DIN 933-5-8
50/60 mV	1...30A	A	90	70	20	-	-	-	2 x 1	M5x12
	31...150A	A	110	80	20	-	-	-	2 x 1	M8x16
	200...250A	B	155	105	30	30	15	-	2 x 1	M12x40
	400...600A	B	155	105	30	30	20	-	2 x 1	M16x45
	1000A	B	175	115	60	30	30	-	2 x 1	M20x50
	1500A	B	175	115	90	30	21	48	2 x 2	M16x45
	2500A	C	175	115	120	30	30	60	2 x 2	M20x50
75mV	200...250A	B	165	125	30	30	15	-	2 x 1	M12x40
	400...600A	B	165	125	40	30	20	-	2 x 1	M16x45
	1000A	B	185	135	60	30	30	-	2 x 1	M20x50
	1500A	B	185	135	90	30	21	-	2 x 2	M16x45
	2500A	C	185	135	120	30	30	-	2 x 2	M20x50
150mV	200...250A	B	270	230	30	50	15	-	2 x 1	M12x40
	400...600A	B	270	230	40	50	20	-	2 x 1	M16x45
	1000A	B	290	240	70	60	35	-	2 x 1	M20x50
	1500A	C	290	240	90	60	21	-	2 x 2	M16x45
	2500A	C	290	240	120	60	30	-	2 x 2	M20x50

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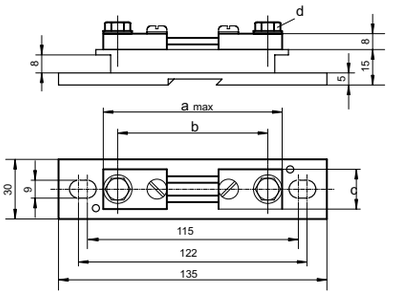
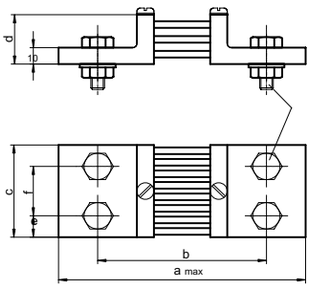
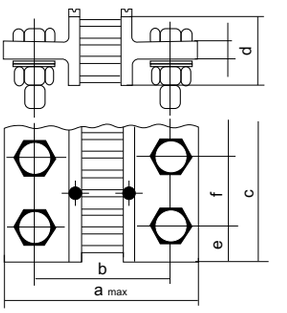
Form A with insulating base



Form B



Form C



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Voltage Drop	Rated Current	Accuracy	Insulating Base

ORDER EXAMPLE

Shunt	75mV	500A	Class 1	NA

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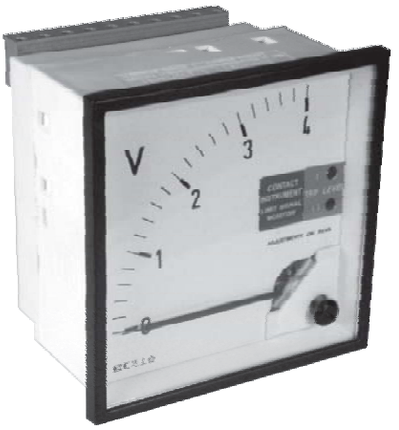
Analog Meters with Moving-Iron Movement with contacts

EQC 96

Available in both AC, Current & Voltage type, they come in standard size of 96x96mm



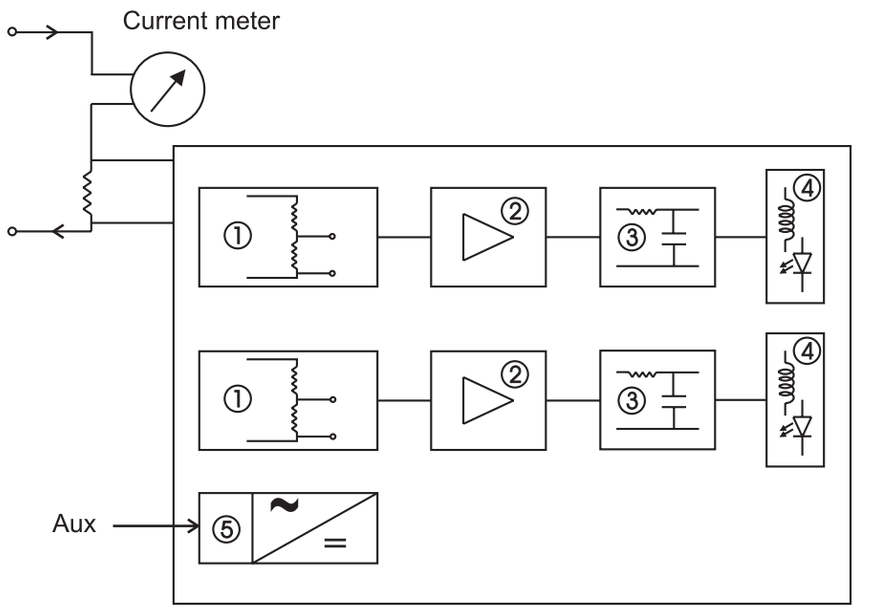
GENERAL FEATURES:

APPLICABLE STANDARDS	
Nominal case and cutout dimensions for indicating Electrical instruments	IEC 61554
Scale and pointer for electrical measuring instruments	DIN 43802
Safety requirements and protective measures for electrical indicating. instruments and their accessories.	DIN 40050 / 8-70, VDE 0110 / 11-72 VDE 0410 / 10-76 IEC 529, IEC 1010
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories.	IEC 51 / DIN EN 60051 DIN 43701
Environmental conditions	VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions	DIN 43718
Enclosure code	IP 52 case
UL Combustibility Class	UL 94 V-0
Insulation class	Group A according to VDE 0110
Rated insulation voltage	1000 V
Proof voltage	EQC 96 : 2KV
Installation category	300 V CAT III (IEC 1010)
Insulation resistance	> 50 Mohm at 500 V d.c
Voltmeters	2 times rated voltage
Ammeter	
5 s max.	10 times (200 A max.) : 10 overloads
1 s max.	-- 40 times (250 A max.)
Relay contact rating	10A @ 250VAC
Time delay	0 - 30 Sec. ± 3 Sec.
Set accuracy	± 5 %
Trip Setting	0 - 100%
Set accuracy	± 5 %
Hysterisys	2% of the scale

FACT SHEET:

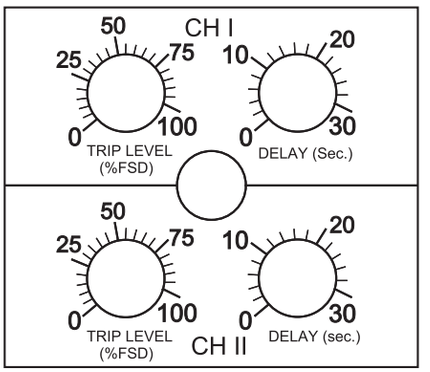
Case details	Moulded square case suitable for mounting in Control / Switchgear panels, Machinery consoles.
Case material	Glass filled polycarbonate, flame retardant and drip proof as per UL 94 V-0.
Front facia	Glass
Colour of bezel	Black
Position of use	Vertical
Panel fixing	Mounting Clamps
Mounting	Stackable in a single cutout
Panel thickness	≤ 25 mm
Terminals	Plug and play terminal blocks
Pointer	Knife - edge pointer
Pointer deflection	$0...90^{0}$
Scale characteristics	Near Linear above 10% of nominal full Scale value
Scale division	Coarse - fine
Scale length	EQC 96 97mm
Over range	
Ammeters	2 times nominal current
Voltmeters for use on	1.2 times nominal voltage
Voltage transformer	
Scale Interchangeability	Interchangeable
Power consumption	
Ammeter < 15 A	< 1 VA
Ammeter > 15 A	< 1.5 VA
Voltmeter	< 4.5 VA
Accuracy class	1.5 according to IS : 1248 (IEC 51/ DIN EN 60051)

Schematic Diagram



① Attenuator
② Comparator
③ Delay Circuit
④ Trip Circuit
⑤ Power Supply

Trip level and delay settings



	CH-I	CH-II
Trip level setting	0 - 100%	0 - 100%
Delay setting	0 - 30 sec	0 - 30 sec

Relay and LED status

Cascade I mode :

	Relay I	LED I	Relay II	LED II
Healthy condition	ON	OFF	ON	OFF
Trip condition	OFF	ON	OFF	ON

Note : Trip condition will occur after the set delay.

Cascade II mode :

	Relay I	LED I	Relay II	LED II
Healthy condition	OFF	OFF	OFF	OFF
Trip condition	ON	ON	ON	ON

Note : Trip condition will occur after the set delay.

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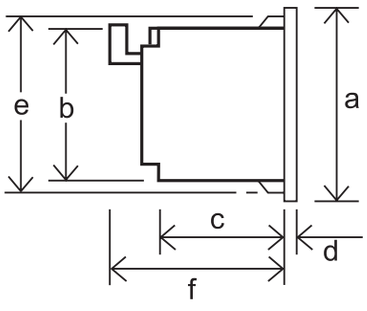
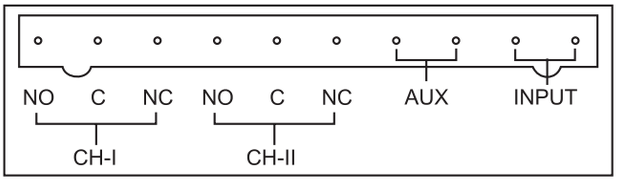
TECHNICAL SPECIFICATIONS:

Model	Unit	EQC 96
Front Facia	mm	96x96
Approximate weight	kg	0.450
AC Ammeter CT operated	A	1A, 5A
AC Ammeter direct measurement	A	100mA-10A
AC voltmeter	V	6-600V
Aux Supply	V	230VAC±15% 45-65 Hz
Rated insulation voltage	V	1000V
Proof voltage	V	2kV
OVERLOAD CAPACITY :		
Continuous		1.2 x rated voltage/current
Short duration Voltage path		2 x rated voltage, 5sec. max.
Ammeter	5sec 1sec	10 times (200A max.) 40 times (250A max.)
Scale length	mm	97mm



Dimensions (in mm)		EQC 96
Bezel	a	96
Case	b	87.5
Depth	c	60
	d	5
	f	72
Cutout Size	e	$92^{+0.8}$

CONNECTION DIAGRAMS:



ORDERING INFORMATION

Please specify ordering information as given below,

Type	Size	Over Range	Measuring Range	Index Pointer	Front Facia	Color of Bezel	Aux	Modes

ORDER EXAMPLE

EQC 96	96	0-5	Amps	Red	Normal glass	Black	230V AC	Cascade I

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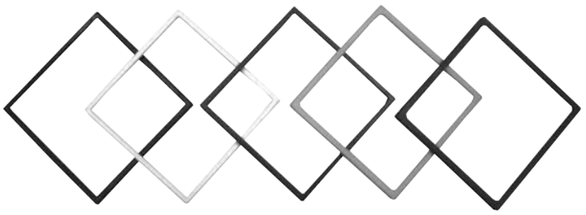
Accessories - Analogue Panel Meters

SCALES

Ziegler can supply blank and printed scales as accessories. The special color marking, scale mark with different color bands also supplied on request. All scales are printed as per the DIN standard. Also plastic scale can be supplied on request.

DIFFERENT SIZES AND COLOR BEZELS

In Ziegler meters we can change scale very easily and can use different color bezel for indication. Eg: Red, White, Yellow, Blue & Black. Available in 48x48, 72x72, 96x96, 144x144mm sizes.



TERMINAL COVER / BACK COVER

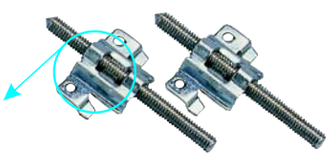
The click fit back cover can be supplied as an accessory with different DIN sizes 48, 72, 96 & 144. For protection we have other option as terminal cover.

ADAPTER PLATE

Available for following size:
96x144
72x96

MOUNTING CLAMPS

The swivel screw and leaf spring can be supplied as accessories.



RED POINTER KIT

Available for following size:
48X48
72X72
96X96
144X144
Available in 90° & 240°

PLOTTER AND ACCESSORIES

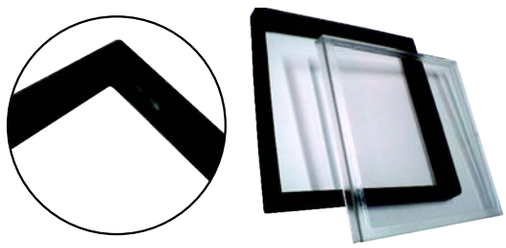
Plotter & Printing Software can be supplied on request for printing the scales locally in bulk quantities.

GLASS

The Glass can also be replaced and can be ordered as an accessory. The Antiglare, Polycarbonate glasses can be supplied on request

IP 65 KIT

48X48
72X72
96X96



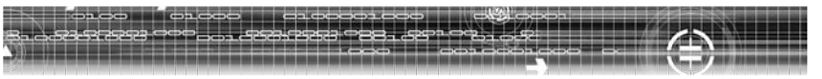
PANEL WINDOWS

72X72
96X96

2012-Z-GCA

Digital Panel Meters

Digital Panel Meters



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DIGITAL PANEL METERS

SECTION INDEX

Ziegler

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DC Digital Panel Meter

24 x 48
24 x 96
48 x 96
96 x 96
72 x 144

DC Ammeter
DC Voltmeter
for multirange direct
current voltage
measurement

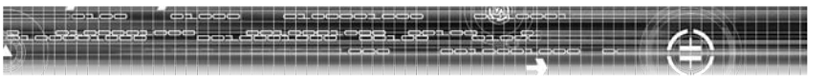
The DC Digital Panel Meter come in 5 standard sizes 24x48, 24x96, 48x96, 96x96, 72x144mm.
The DC DPM's are designed for industrial applications which require precise and onsite adjustment for display ranges.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance standard for direct acting instrument	DIN EN60051
Digital Measurement	DIN 43 751
Device Safety	IEC 61010
Protection Class (Front Facia)	IP 20 according to IEC 60529 IP 54 (IP 65 on request)
Safety Class	II according to IEC 348/ VDE 0411
Climatic Class	Class 2 VDE / DIN 3540
EMC Immunity	DIN EN 61000-4-1 to 4
EMC Radiated Interference	DIN EN 50081 Class B

FACT SHEET:

Casing Details	Moulded case suitable for mounting in control / switchgear panels, machinery console
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass-polycarbonate (RED transparent)
Color of Bezel	Black
Position of use	Vertical
Panel Fixing	Metal side clamps / snap in
Panel thickness	≤40mm
Terminals	Plug-in screw terminal block
Display Type	Bright RED seven segment LED
Display Count	1999[1]
Negative display indication	"-"
Overload indication	Last 3 digits blank
Setting Time	<1sec. (0...99%)
ISOLATION:	
DC voltage version	1kV
AC voltage version	2kV
AMBIENT CONDITIONS:	
Operating Temp.	0...50°C
Storage Temp.	-40°C...80°C



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TECHNICAL SPECIFICATIONS:

Model	24x48D	24x48F	24x96S	48x96A 96x96A 72x144A 72x144AN	48x96B 96x96B 72x144B 72x144BN	48x96C 96x96C 72x144C 72x144CN	48x96F
Measured Qty	Voltage/ Current	Voltage	Voltage/ Current	Current	Current	Voltage	Voltage
Measurement Range	10V 0...1mA 0...20mA 4...20mA	0...0.2V 0...2V 0...20V	0...0.2V, 0...1V, 0...5V, 0...25V, 0...100V, 0...300V, 0...1mA, 0...20mA, 0...200mA, 4...20mA	0...2mA 0...20mA 0...200mA	0...20mA 4...20mA	0...60mV 0...75mV 0...150mV	0...2V 0...20V 0...200V 0...500V
Range selection by	Positioning DIP switches.		Selectable by using jumpers at the back	Input choice			
Range adjustment span	From 10% to 100% of range		From 20% to 100% of range	From 10% to 100% of range			
Zero offset (suppression)	–	–	upto -1000	–			
Accquracy	<0.2% + 1D			<0.1% + 1D			<0.2% + 1D
Decimal point position	Programmable, settable by DIP switch		Selections by short links	Selectable by rear jumper position[3]			
Digit Height	8mm / 7- segment digits			14mm / 7 - segment digits[2]			
Temperature coefficient	100 ppm / C, plus						
Zero point drift	200 ppm / °C		100 ppm / °C				
Interference voltage suppression	>40dB		–				

DIMENSIONS & WEIGHTS :

Bezel size	24x48mm DIN 43718	96x24mm DIN 43718	96x48mm DIN 43718
Panel Cutout	45 + 0.6mm x 22.2 + 0.3mm	92 + 0.8mm x 22.2 + 0.3mm	92 + 0.8mm x 43.5 + 0.6mm
Overall depth	69mm	72mm	138mm
Weight	<50g.	210g approx (5V DC version 90g.)	500g. approx.

POWER SUPPLY :

Direct voltage DC	5V +/- 10%		
	12V +/- 10 %		
	24V (21...30 VDC)		
	48V +/- 10 %		
	–	110V +/- 10 %	

Alternating voltage AC	–		24V +10%, -15%
		110V + 10% -15%	115V + 10% -15%
	–	230V + 10% -15%	

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Redefine Innovative Metering

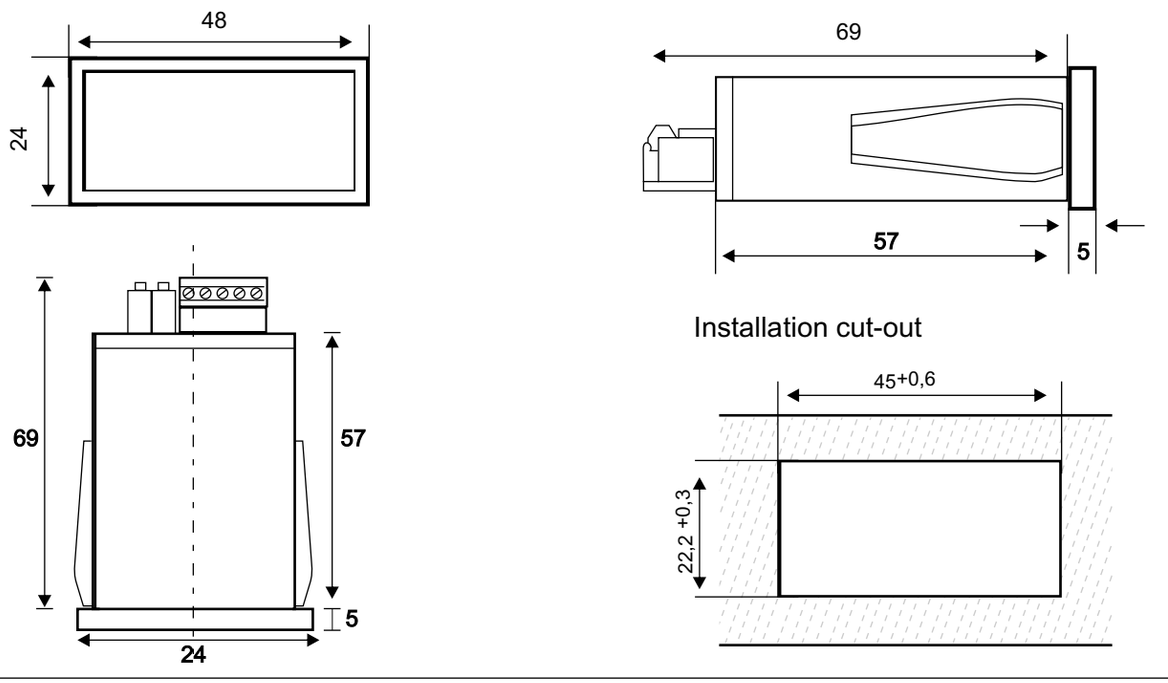
Model	24x48D	24x48F	24x96S	48x96A 96x96A 72x144A&N	48x96B 96x96B 72x144B&N	48x96C 96x96C 72x144C&N	48x96F
Power Consumption	1.2 W approx. (isolated)		110 V DC /48 V DC : 5.5W 24V DC (21 ... 30 V DC)/12 V DC /5 V DC : 4 W / 230V /110V : 2 W	max 5.5W approx (isolated)			

Note :

1) 4 ½ Digit DPM - display range 19999
2) On request 20 mm display height available
3) For 48x96 Size decimal point is selected by external wires
4) For 24x48 DPM only AC Aux possible

DIMENSIONAL DRAWINGS:

24x48D/F



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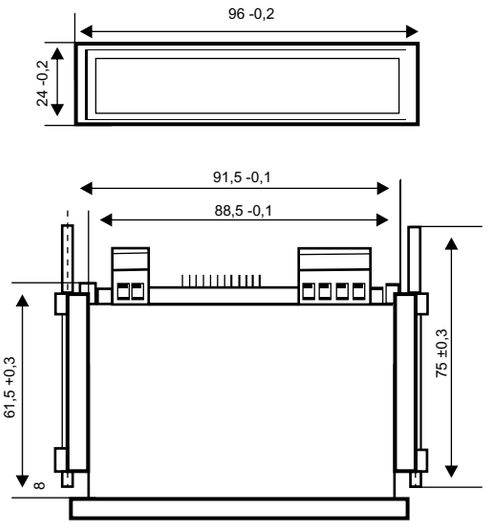
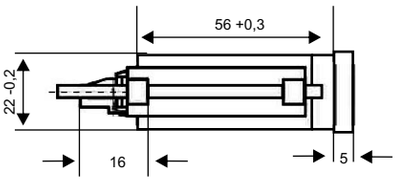
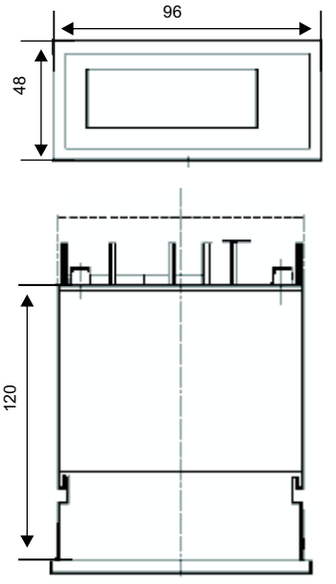
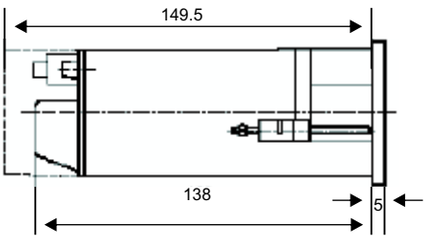
24x96S



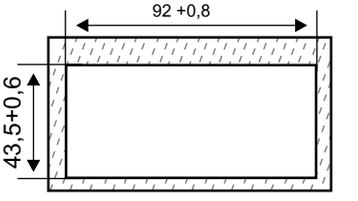


48x96

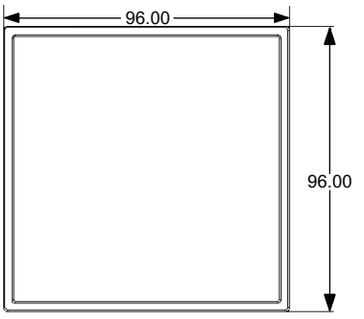


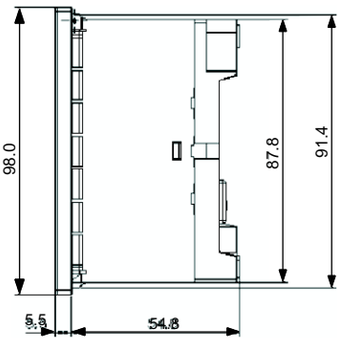


Installation Cut-out

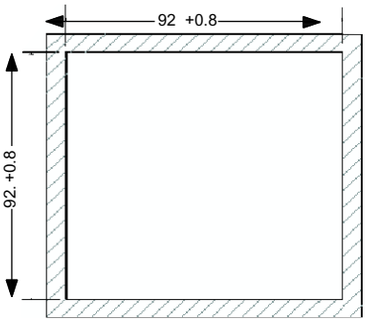


96x96

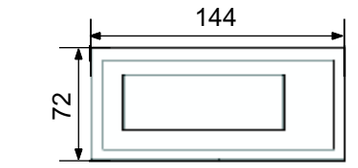


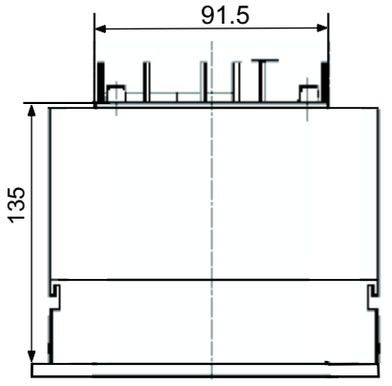


Installation Cut-out:

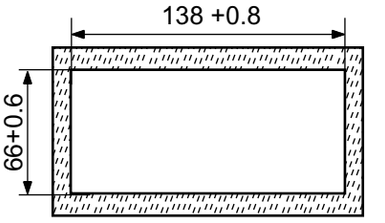


72x144

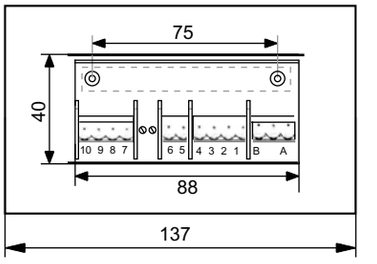




Installation Cut-out

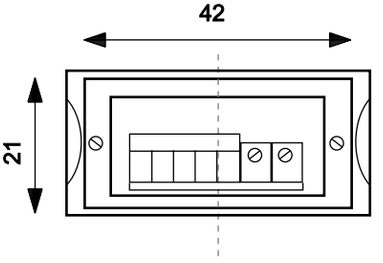


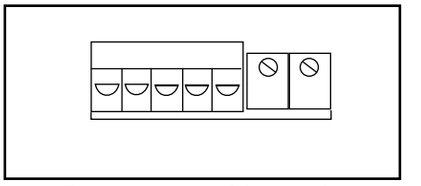
Mounting Position



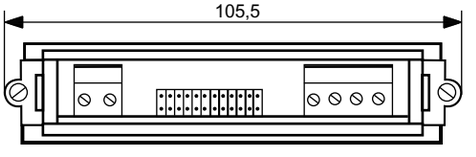
CONNECTION DIAGRAMS :

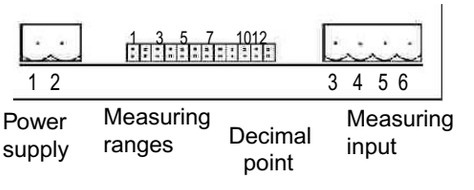
24x48D/F



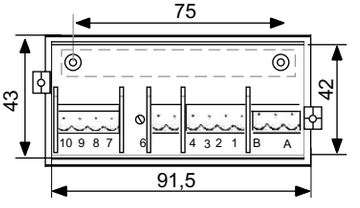


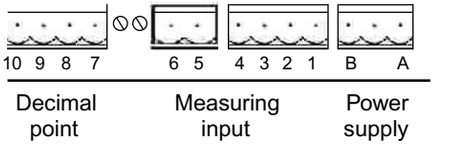
24x96S





48x96





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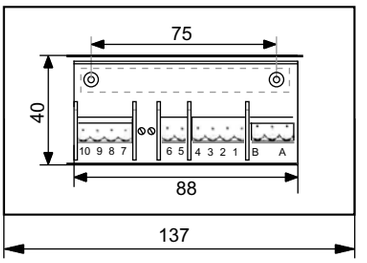
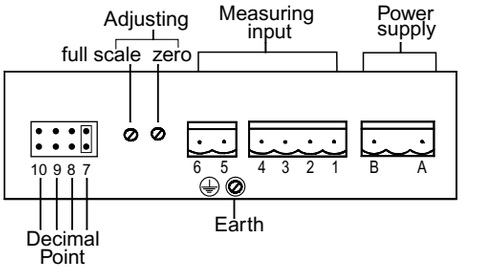
Redefine Innovative Metering

72X144





ORDERING INFORMATION

Please specify ordering information as given below,

Type	Measuring Input	Display	Display caption	Options	Supply voltage

ORDER EXAMPLE

24x48 D	0....20mA	0....12.00	pH	----------	24V DC

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Redefine Innovative Metering

AC Digital Panel Meter

48 x 96 96 x 96	AC Ammeter AC Voltmeter for multirange alternate current & voltage measurement

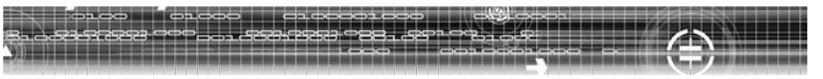
The AC Digital Panel Meter come in 2 standard sizes 48x96, 96x96mm. The AC DPM's are designed for industrial applications which require precise and onsite adjustment for display ranges for AC parameter measurements

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance standard for direct acting instrument	DIN EN60051
Digital Measurement	DIN 43 751
Device Safety	IEC 61010
Protection Class (Front Facia)	IP 20 according to IEC 60529 IP 54 (IP 65 on request)
Safety Class	II according to IEC 348/ VDE 0411
Climatic Class	Class 2 VDE / DIN 3540
EMC Immunity	DIN EN 61000-4-1 to 4
EMC Radiated Interference	DIN EN 50081 Class B

FACT SHEET:

Casing Details	Moulded case suitable for mounting in control / switchgear panels, machinery console
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass-polycarbonate (RED transparent)
Color of Bezel	Black
Position of use	Vertical
Panel Fixing	Metal side clamps
Panel thickness	≤40mm
Terminals	Plug-in screw terminal block
Display Type	Bright RED seven segment LED
Display Count	1999 & 19999
Negative display indication	"-"
Overload indication	Last 3 digits blank
Setting Time	<1sec. (0...99%)
ISOLATION:	
DC voltage version	1kV
AC voltage version	2kV
AMBIENT CONDITIONS:	
Operating Temp.	0...50°C
Storage Temp.	-40°C...80°C



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Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	**48x96AC**	**48x96ACI 96x96-196A 96x96-396A 96x96-196AN[1] 96x96-396AN[1]**	**48x96ACV 96x96-196V 96x96-396V 96x96-196VN[1] 96x96-396VN[1]**
Measured Qty	Voltage, Current	Current	Voltage
Measurement Range	0...1A_{ac} 0...5A_{ac} 0...500V_{ac}	0...1A_{ac} 0...5A_{ac}	0...500V_{ac} [2]
Frequency Range	For 45Hz - 65Hz & 400Hz		
Range selection by	Positioning DIP switches/ input choice	NA	NA
Range adjustment span	from 10% - 100% of range	from 5% - 100% of range	
Accuracy	<0.5% + 1D		
Display range	1999 & 19999		
Decimal point position	Selectable by rear jumper position & / or short link position		
Digit Height	14mm, 20mm[3] & 26mm/7-segment digits		
Temperature coefficient	100 ppm / °C, plus		
Zero point drift	200 ppm / °C, plus		

DIMENSIONS & WEIGHTS

Bezel size	96x48mm & 96x96mm DIN 43718
Panel Cutout	92 + 0.8mm x 43.5 + 0.6mm & 92 + 0.8mm x 92 +0.8mm
Overall depth	138mm 48x96, 55mm for 96x96 models & 145mm
Weight	500g. approx. for 48x96 & 96x96 models 1000g.

POWER SUPPLY

Direct voltage DC	5V +/- 10%
	12V +/- 10 %
	24V (21...30 VDC)
	48V +/- 10 %
	110V +/- 10 %
	220V +/- 10 %
Alternating voltage AC	24V +10%, -15%
	115V + 10% -15%
	230V + 10% -15%
Power Consumption	max 5.5W approx (isolated)

Note :

1) 4 ½ Digit DPM

2) For 3 phase voltage DPM voltage range are 0...110$V_{(LL)}$, 0...240$V_{(LL)}$ & 0...415$V_{(LL)}$

3) On request 20mm display height available

4) For low backdepth only 60mm

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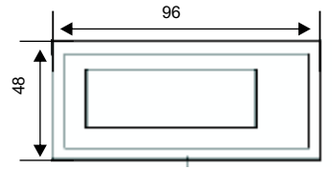
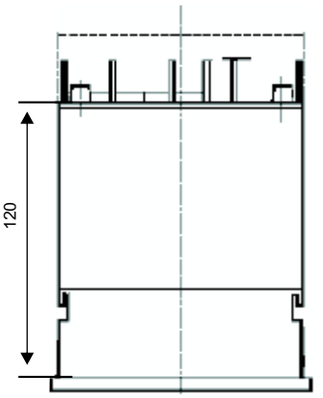
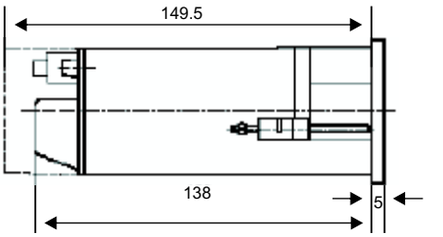
Redefine Innovative Metering

DIMENSIONAL DRAWINGS:

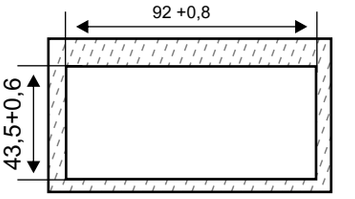
48x96



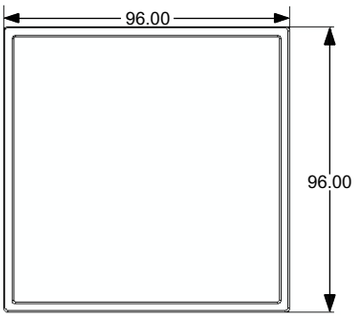


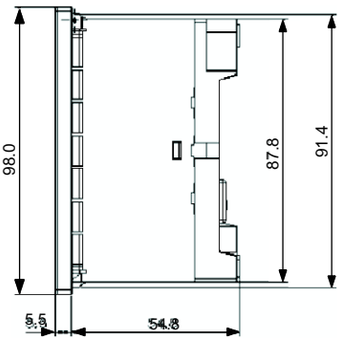


Installation Cut-out

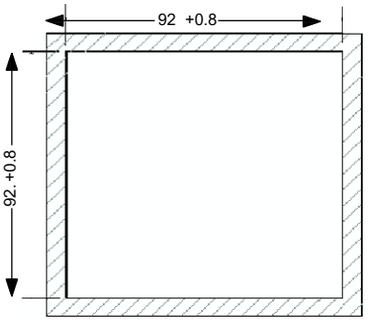


96x96





Installation Cut-out:



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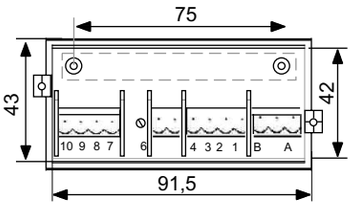
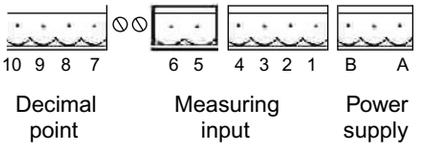
Redefine Innovative Metering

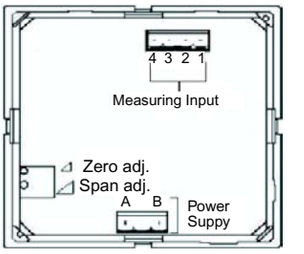
CONNECTION DIAGRAMS :

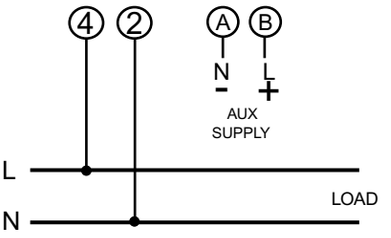
48x96

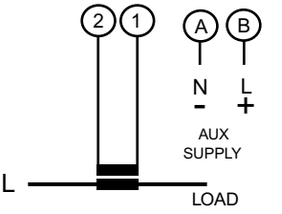




96x96

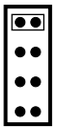
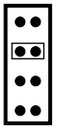
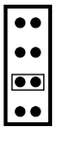
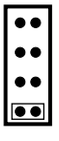






DECIMAL POINT SELECTION :

Decimal Point position is selectable by short links at the front side of Display

Short Link Position	Decimal Point Position On Display
	XXXX
	X.XXX
	XX.XX
	XXX.X

Note : For 96x96 DPM only

ORDERING INFORMATION

Please specify ordering information as given below,

Type	Measuring Input	Display	Display caption	Options	Supply voltage

ORDER EXAMPLE

48x96 AC I	5 A	1000 A	A	96 Adaptor Plate	230 V AC

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Redefine Innovative Metering

Digital Panel Meter for Temperature Measurement

48 x 96T | Digital panel meter for measuring temperature with RTD input

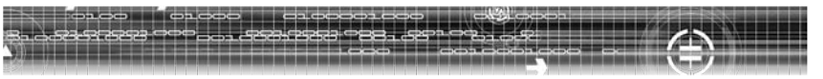
The Temperature Measuring Digital Panel Meter comes 48x96mm size. This instrument accepts resistance input from PT100 and Ni100 sensor, with 2/3/4 wire, and displays the proportionate temperature.
The Temperature Measuring DPM's are designed for industrial applications which require precise and onsite adjustment for display ranges.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance standard for direct acting instrument	DIN EN60051
Digital Measurement	DIN 43 751
Device Safety	IEC 61010
Protection Class (Front Facia)	IP 20 according to IEC 60529 IP 54 (IP 65 on request)
Safety Class	II according to IEC 348/ VDE 0411
Climatic Class	Class 2 VDE / DIN 3540
EMC Immunity	DIN EN 61000-4-1 to 4
EMC Radiated Interference	DIN EN 50081 Class B

FACT SHEET:

Casing Details	Moulded case suitable for mounting in control / switchgear panels, machinery console
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass-polycarbonate (RED transparent)
Color of Bezel	Black
Position of use	Vertical
Panel Fixing	Metal side clamps
Panel thickness	≤40mm
Terminals	Plug-in screw terminal block
Display Type	Bright RED seven segment LED
Display Count	1999
Negative display indication	"-"
Overload indication	Last 3 digits blank
Setting Time	<1sec. (0...99%)
ISOLATION:	
DC voltage version	1kV
AC voltage version	2kV
AMBIENT CONDITIONS:	
Operating Temp.	0...50°C
Storage Temp.	-40°C...80°C



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Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	48x96T
Measured Qty	Temperature
Measurement Range	-100°C...850°C -199.9°C...199.9°C 2-,3-,4-, wire
Sensor type	PT100, Ni100
Range selection by	Positioning DIP switches
Range adjustment span	5%
Accuracy	<0.2% + 1D
Display range	1999
Decimal point position	Selectable by rear jumper position
Digit Height	14mm /7-segment digits
Temperature coefficient	100 ppm / °C, plus
Zero point drift	100 ppm / °C, plus
DIMENSIONS & WEIGHTS	
Bezel size	48x96mm DIN 43718
Panel Cutout	92 + 0.8mm x 43.5 + 0.6mm
Overall depth	138mm 48x96
Weight	500g. approx.
POWER SUPPLY	
Direct voltage DC	5V +/- 10%
	12V +/- 10 %
	24V (21...30 VDC)
	48V +/- 10 %
	110V +/- 10 %
Alternating voltage AC	24V +10%, -15%
	115V + 10% -15%
	230V + 10% -15%
Power Consumption	max 5.5W approx (isolated)
OPTIONS	
HOLD input	Yes

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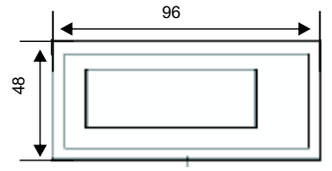
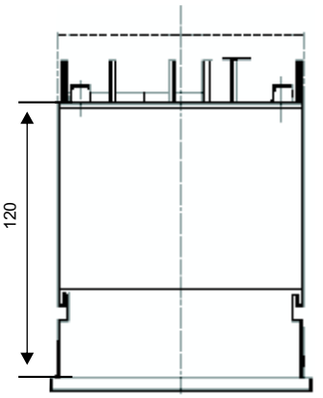
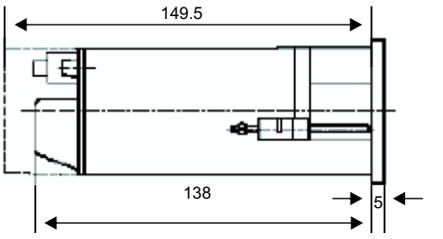
Redefine Innovative Metering

DIMENSIONAL DRAWINGS:

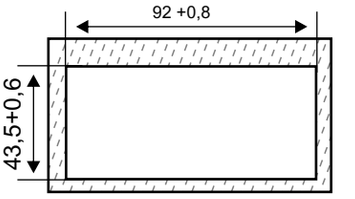
48x96





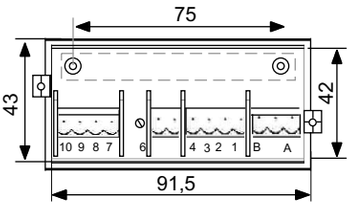


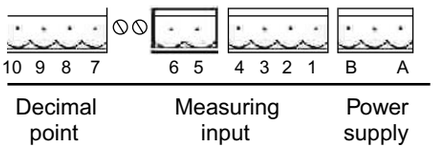
Installation Cut-out



CONNECTION DIAGRAMS :

48x96





ORDERING INFORMATION

Please specify ordering information as given below,

Type	Measuring Input	Display	Display caption	Options	Supply voltage

ORDER EXAMPLE

48x96 T	PT 100 0...100°C	0...100°C	°C	Hold Option	115 V AC

Ziegler

Redefine Innovative Metering

Digital Panel Meter for Frequency Measurement

48 x 96AK | Digital panel meter for measuring Frequency.

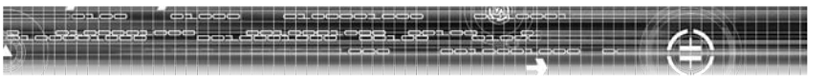
The Frequency Measuring Digital Panel Meter comes 48x96mm size.
The Frequency Measuring DPM's are designed for industrial applications which require precise and onsite adjustment for display ranges.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance standard for direct acting instrument	DIN EN60051
Digital Measurement	DIN 43 751
Device Safety	IEC 61010
Protection Class (Front Facia)	IP 20 according to IEC 60529 IP 54 (IP 65 on request)
Safety Class	II according to IEC 348/ VDE 0411
Climatic Class	Class 2 VDE / DIN 3540
EMC Immunity	DIN EN 61000-4-1 to 4
EMC Radiated Interference	DIN EN 50081 Class B

FACT SHEET:

Casing Details	Moulded case suitable for mounting in control / switchgear panels, machinery console
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass-polycarbonate (RED transparent)
Color of Bezel	Black
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps
Panel thickness	≤40mm
Terminals	Plug-in screw terminal block
Display Type	Bright RED seven segment LED
Display Count	1999
Negative display indication	"-"
Overload indication	1…" if display>1999
Setting Time	<1sec. (0...99%)
ISOLATION:	
DC voltage version	1kV
AC voltage version	2kV
AMBIENT CONDITIONS:	
Operating Temp.	0...50°C
Storage Temp.	-40°C...80°C



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Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	48x96AK
Measured Qty	Frequency
Measurement Range	12... 199.9 Hz (80... 700 V) 12... 500 Hz (80... 700 V)
Accuracy	± (0.25% + 5 digit)
Display range	1999
Decimal point position	adjustable at front panel
Digit Height	14mm /7-segment digits
Temperature coefficient	< 190 ppm/ °k, plus
Zero point drift	max. 0.2 digit /°k
Series Mode Rejection Ratio (SMRR)	>50dB at 50Hz
DIMENSIONS & WEIGHTS :	
Bezel size	48x96mm DIN 43718
Panel Cutout	92 + 0.8mm x 43.5 + 0.6mm
Overall depth	138mm 48x96
Weight	500g. approx.
POWER SUPPLY :	
Direct voltage DC	5V +/- 10%
	12V +/- 10 %
	24V (21...30 VDC)
	48V +/- 10 %
	110V +/- 10 %
Alternating voltage AC	24V +10%, -15%
	115V + 10% -15%
	230V + 10% -15%
Power Consumption	max 5.5W approx (isolated)
OPTIONS :	
LED color	Green
A-D CONVERSION :	
Converion Method	Dual Slope
Integration Time	Approx. 100ms
Measurements per Second	Typically 3, response time for the entire instrument is dependent upon the measured quantity
CONTROL COMMANDS :	
Display Value Storage	externally controlled
Segment Test	externally controlled

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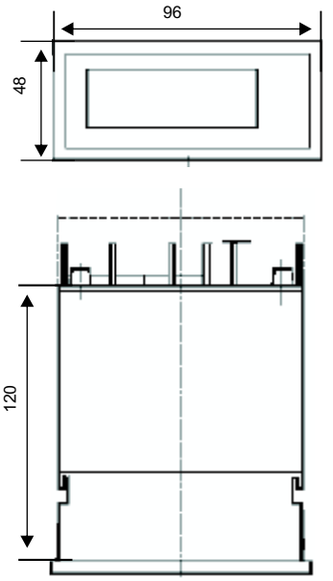
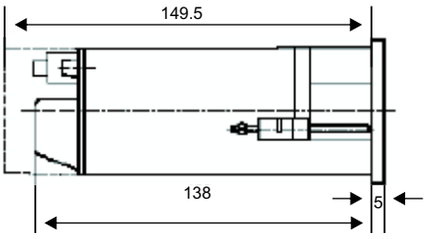
Redefine Innovative Metering

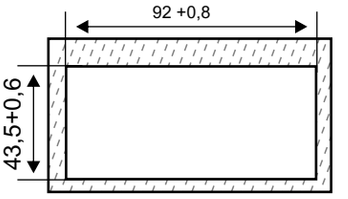
DIMENSIONAL DRAWINGS:

48x96

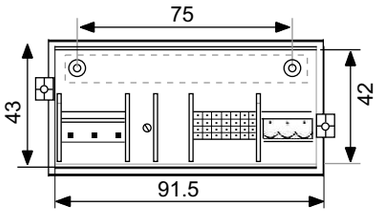


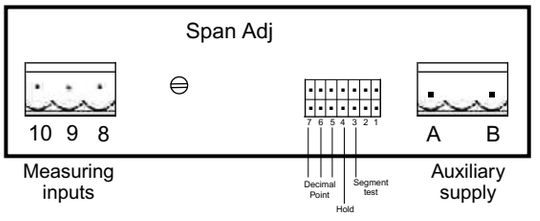


Installation Cut-out



CONNECTION DIAGRAMS :





ORDERING INFORMATION

Please specify ordering information as given below,

Type	Measuring Input	Display	Display caption	Options	Supply voltage

ORDER EXAMPLE

48x96 AK	500V	12...199.9Hz	Hz	-------	230 V AC

Ziegler

Redefine Innovative Metering

DPM 96x96 (KW. KVar, KVA, PF)

96 x 96

Active Power (KW) DPM
Reactive Power (Kvar) DPM
Apparant Power (KVA) DPM
Power Factor (PF) Meter

DPM 96x96 Series measures system active power (Import / Export), Reactive power(Import / Export), Apparent Power & Power Factor of three phase & single phase network. IT has 4 digit single line auto ranging LED display with polarity Indication

GENERAL FEATURES:

APPLICABLE STANDARDS	
Performance standard for direct acting instrument	DIN EN60051
Digital Measurement	DIN 43 751
Device Safety	IEC 61010
Protection Class (Front Facia)	IP 54 according to IEC 60529
Safety Class	II according to IEC 348/ VDE 0411
Climatic Class	Class 2 VDE / DIN 3540
EMC Immunity	DIN EN 61000-43
EMC Radiated Interference	IEC 61326
Reference conditions for Accuracy:	
Reference temperature	23°C +/- 2°C
Input waveform	Sinusoidal (distortion factor 0.005)
Input frequency	50 or 60 Hz ±2%
Auxiliary supply voltage	Rated Value ±1%
Auxiliary supply frequency	Rated Value ±1%

FACT SHEET:

Casing Details	Moulded case suitable for mounting in control / switchgear panels, machinery console
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Glass-polycarbonate
Color of Bezel	Black
Position of use	Vertical
Panel Fixing	Side clamps
Panel thickness	≤40mm
Terminals	Plug-in screw terminal block
Display Type	Bright RED seven segment LED
Negative display indication	"-"
Overload indication	Last 3 digits blank
Setting Time	<1sec. (0...99%)
ISOLATION:	
DC voltage version	1kV
AC voltage version	2kV
AMBIENT CONDITIONS:	
Operating Temp.	-10 to +55°C
Storage Temp.	-20 to +65°C

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Redefine Innovative Metering

TECHNICAL SPECIFICATIONS:

Model	DPM kW	DPM kVA	DPM kVar	DPM PF
Measured Qty	kW	kVA	kVar	PF
Input Range	Voltage : 57.7 - 277V L-N (100-480V L-L) Current : 1A or 5A AC programmable onsite			
Frequency Range	40-70Hz			
Accuracy	0.5% of range		1% of range	2%
Digit Height	11mm & 20mm			
Temperature Coefficient	0.025% /°C for Voltage, 0.05% / °C for Current			

DIMENSIONS & WEIGHTS

Bezel size	96x96mm
Panel Cutout	92.08mm x 92.08mm
Overall depth	<80mm
Weight	0.7 Kg

POWER SUPPLY

Direct DC voltage	12V to 48V DC +/- 10%
Alternating AC voltage	110V, 230V, 380VAC -15% +20%
AC/DC Voltage	100-250V AC/DC +/- 10%

VA Burden:

Nominal input voltage burden	< 0.2 VA approx. per phase
Nominal input current burden	< 0.6 VA approx. per phase
AC Supply burden	Approx. 4 VA

Overload Withstand:

Voltage	2 x rated value for 1 second, repeated 10 times at 10 second intervals
Current	20x for 1 second, repeated 5 times at 5 min

Operating Measuring Ranges

Voltage	5… 120% of rated value
Current	5 … 120% of rated value
Frequency	40…70 Hz
Power Factor	0.5 Lag ... 1... 0.5 Lead for kW, kVAr DPM / 0.1 Lag ... 1... 0.1 lead for PF DPM

Application:

DPM 96x96 s eries measures system active Power (Import / Export), Reactive Power (Import / Export), Apparent Power & Power Factor of Three phase and single phase Network. It has 4 digit single line auto ranging LED display with polarity indication.

Product Range :

- Active Power (kW) DPM.
- Reactive Power (kVAr) DPM.
- Apparent Power (kVA) DPM.
- Power Factor (PF) meter.

Product Features:

*On site programmable PT/CT ratios:

It is possible to program primary of external potential Transformer (PT), primary of external Current Transformer (CT) on site via front panel keys by entering into Programming mode.

*User selectable CT Secondary 5A/1A

The secondary of external Current Transformer (CT) can be programmed on site to either 5A or 1A using front panel keys.

*User selectable 3 phase 3W or 4W

User can program on site the network connection as either 3 Phase 3 Wire or 4 Wire using front panel keys.

*Note: For Power Factor DPM Customer need to specify CT ratio, PT ratio & network type 3phase (3 or 4 wire) / single phase (1P2W) requirement while ordering.

User selectable Power Parameter

User can select any one of the power parameter (Active / Reactive / Apparent) on site as per its requirement, reducing inventory cost.

True RMS measurement:

The instrument measures distorted waveform up to 15th Harmonic.

High brightness LED display

Single line four digit. Digit heights 11mm or 20 mm.

Enclosure Protection for dust and water:

conforms to IP 54 (front face) as per IEC60529

Compliance to International Safety standards:

Compliance to International Safety standard IEC 61010-1- 2001

EMC Compatibility :

Compliance to International standard IEC 61326

Low back depth:

The instrument has very low back depth (behind the panel) of less than 80 mm .

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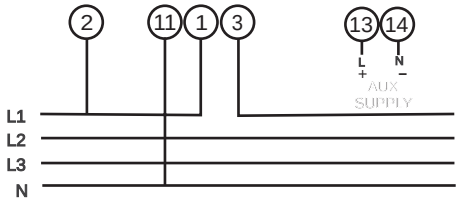
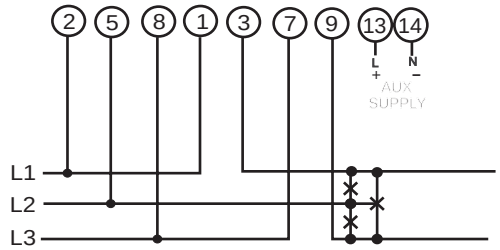
CONNECTION DIAGRAMS :

For Single Phase

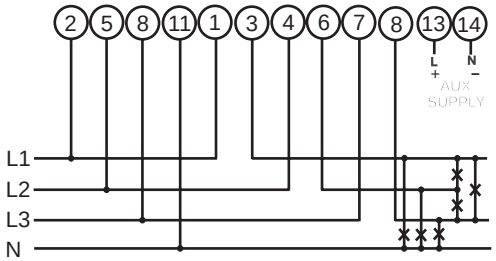


3 Phase 3 Wire Unbalanced Load



For Direct operated meter

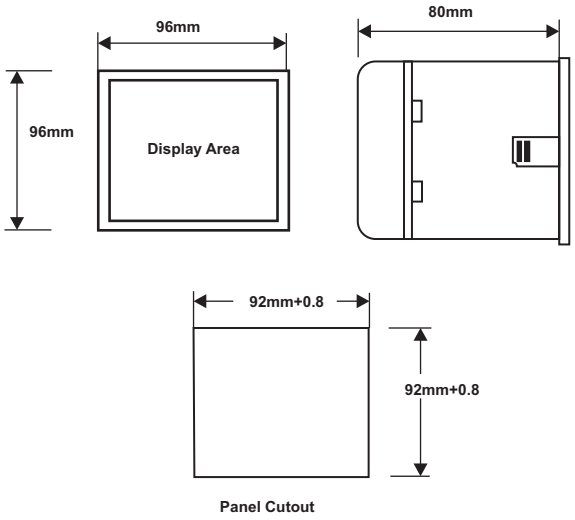
3 Phase 4 Wire Unbalanced Load



For Direct operated meter

It is recommended that the wires used for connedions to the instrument should have lugs soldered at the end. That is, the connections should be made with Lugged wires for secure connections. The Maximum diameter of the lug should be 7.0mm and maximum thickness 3.5 mm.
Permissible cross section of the connection wires:
<= 4.0 mm^2 single wire or 2 × 2.5 mm^2 fine wire

DIMENSIONAL DIAGRAMS :



ORDERING INFORMATION

Please specify ordering information as given below,

Type	System	Voltage	Current	Aux. Supply	Digit Height

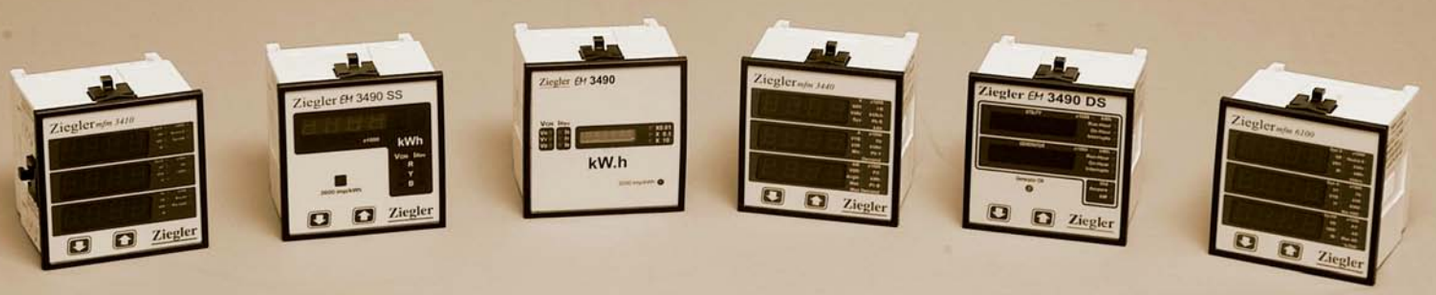
ORDERING EXAMPLE

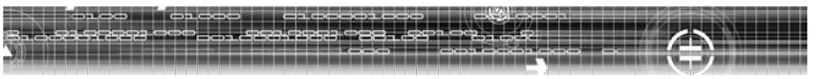
DPM-PF	3P4W	415V_{LL}	5A	230VAC	11

2012-Z-GCA

Digital Multifunction Meters

Digital Multifunction Meters





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DIGITAL MULTIFUNCTIONAL METERS

SECTION INDEX

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Digital Multifunction Meters

3410
3420
3430
3440
6100
2000
3490
3490 SS
3490 DS

Digital multifunction power and energy meters.

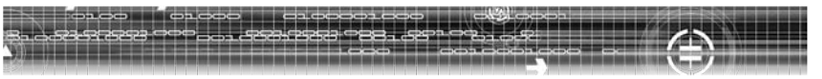
Digital multifunction meters from Ziegler instruments with multiple parameter measurement is world renowned in the power & energy sector.

GENERAL FEATURES:

APPLICABLE STANDARDS	
EMC	IEC 61326
Immunity	IEC 61000-4-3.10V/m min 3 industrial low level
Safety	IEC 61010-1-2001, Permanently connected use
IP for water & dust	IEC 60529
Pollution degree	2
Installation category	III
EMC Immunity	DIN EN 61000-4-1 to 4
High Voltage Test	2.2 kV AC, 50Hz for 1 min between all electrical circuits
ENVIRONMENTAL	
Operating Temperature	-10 to +55ºC
Storage Temperature	-20 to +65ºC
Relative Humidity	0..90% non condensing
Warm up time	Minimum 3 min
Shock	15g in 3 planes
Vibration	10...55Hz, 0.15mm amplitude
Enclosure	IP54 (front face only) IEC60529

FACT SHEET:

Casing Details	Moulded case suitable for mounting in control / switchgear panels, machinery console
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Front Facia	Polycarbonate
Color of Bezel	Black
Position of use	Vertical
Panel Fixing (mountable in a single cutout)	Metal side clamps
Panel thickness	40mm
Terminals	Plug-in screw terminal block
Display Type	Bright RED seven segment LED
Display Count	1999
Negative display indication	"-"
Overload indication	Last 3 digits blank
Setting Time	<1sec. (0...99%)
ISOLATION	
DC voltage version	1kV
AC voltage version	2kV
AMBIENT CONDITIONS	
Operating Temp.	0...50°C
Storage Temp.	-40°C...80°C



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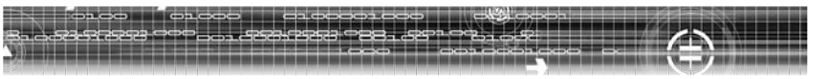
TECHNICAL SPECIFICATIONS

Model	MFM 3410	MFM 3420	MFM 3430	MFM 3440	MFM 6100	MFM 2000	EM 3490	EM 3490SS	EM 3490DS
Number of Parameters Measured	18	14	37	50	28	100+		34	42
Short Description	Basic VAFd model	kWh Measurement	Complete Electrical Network Information	Includes Demand	%THD measurement	LCD display	Electromechanical counter type Energy meter.	Energy meter : Single Source monitoring.	Energy meter: Dual Source monitoring.
INPUT DETAILS									
Voltage Input (AC RMS)	57.7V $_{L-N}$ to 277V $_{L-N}$ (63.5V $_{L-L}$ to 480V $_{L-L}$)								
	110V $_{L-L}$ (63.5V $_{L-N}$)								
	230V $_{L-L}$ (133V $_{L-N}$)								
	415V $_{L-L}$ (239.6V $_{L-N}$)								
	440V $_{L-L}$ (254V $_{L-N}$)								
PT Primary	Programmable onsite							Programmable onsite	
Max continuous input voltage	120% of rated value								
Current Input (AC RMS)	1 A or 5 A AC RMS selectable onsite				1 A/ 5A	5A	1 A/ 5A		
CT Primary	Programmable onsite								
System	1phase 2 wire				NA	NA	1phase 2 wire		
	3phase 3 or 4 wire selectable onsite						3phase 3 / 4 Wire		
Max continuous input current	120% of rated value								
OPERATING MEASURING RANGES									
Voltage	5… 120% of rated value								
Current	5… 120% of rated value								
Frequency	40…70 Hz				45Hz…60Hz	45Hz…66Hz	45Hz-55Hz	40…70 Hz	
Power Factor	NA	0.5 Lag ... 1... 0.8 Lead							
Voltage for THD measurement		50 .. 120% of rated value							
Current for THD measurement		50 .. 120% of rated value							
Apparent power (VA) / Active power (W) / Reactive power (VAr)	5 .. 120% of rated value, Max 360 Mega VA							5 .. 120% of rated value, Max 360 Mega VA	
Total Harmonic Distortion(Up to15th Harmonic)		0%-40%							
AUXILLARY SUPPLY OPTIONS									
AC Auxiliary Voltage (45 to 66 Hz AC Auxiliary supply frequency range)	110V AC -15% / +20% /					NA	Self Powered.	110V AC -15% / +20% /	
	230V AC -15% / +20% /					NA		230V AC -15% / +20% /	
	380V AC-15% / +20					NA		380V AC-15% / +20	
AC/DC Auxiliary Supply Voltage	NA	NA	100 – 250V AC/DC+/- 10%					100 – 250V AC/Dc +/- 10%	
DC Auxiliary Supply	NA	NA	NA	12…48Vdc				12…48Vdc	
ACCURACY									
Voltage	±0.5% of range (50...100% of rated value)					±0.5%	NA	±0.5% of range (50...100% of rated value)	
Current	±0.5% of range (10...100% of rated value)					±0.5%	NA	±0.5% of range (10...100% of rated value)	
Frequency	. 0 15% of mid frequency				0.16% of mid frequency	±0.5%	NA	0.15% of mid frequency	
Active Power / Re-Active Power	NA	NA	±0.5% of range (10... 100% of rated value)		±1% of range (Voltage =Rated value	±0.5%	NA	±0.5% of range (10... 100% of rated value)	
System Apparent Power (VA)	±0.5% of range (10...100% of rated value)	NA	±0.5% of range (10... 100% of rated value)		±1% of range (Voltage =Rated value	±0.5%	NA	±0.5% of range (10... 100% of rated value)	
Neutral Current (for 4 Wire only)	±4% of range (10...100% of rated value)	NA	±4% of range (10...100% of rated value)		3% of range	±0.5%	NA	±4% of range (10...100% of rated value)	



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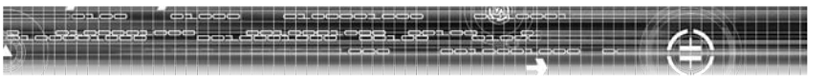
TECHNICAL SPECIFICATIONS

Active energy (kWh) / Re Active energy (kVArh) / Apparent energy (kVAh)		NA	1% (IEC 62053-21) Active P. F. 0.866 lag... 1...0.866 lead				2000	Class 1.	1% (IEC 62053-21) Active P. F. 0.866 lag... 1...0.866 lead	
Ampere Hour (kAh)		NA	NA	n	1%	NA	1% of range	NA	NA	NA
Accuracy of Analog Output		NA	NA	1 % of Output end value		NA		NA	NA	NA
Power Factor		NA	NA	1% of range		1% of Unity (Voltage =Rated value ±2%,Current=40...100% of rated value)	1% of range	NA	1% of range	
Phase Angle		NA	NA	1% of range		NA	± 0.013%/°C	NA	1% of range	
Total Harmonic Distortion (THD – R)		NA	NA	NA	NA	1% (Voltage: 60….100% of rated value,Current: 20….100% of rated value)		NA	NA	NA
Temperature coefficient :(for rated value range of use (0…50°C)		0.025%/°C for Voltage (50... 120% of rated value) and 0.05%/°C for Current (10... 120% of rated value)				0.08%/°C for voltage and 0.13%/°C for other			0.025%/°C for Voltage (50... 120% of rated value) and 0.05%/°C for Current	
Display update rate: Response time to step input		1 sec approx.	min 1 sec approx. (can be programmed up to 5 sec)			550 milliseconds approx.			min 1 sec approx. (can be programmed up to 5 sec)	
VA Burden:										
Nominal input voltage burden		< 0.2 VA approx. per phase				0.25 VA approx. per	0.2VA	<15VA per phase.	< 0.2 VA approx. per phase	
Nominal input current burden		< 0.6 VA approx. per phase				0.65 VA approx. per phase	0.6VA	<0.2 VA per phase.	< 0.6 VA approx. per phase	
AC / DC Supply burden		4 VA				3.5 VA	3VA	NA	4 VA	
Overload Withstand:										
Voltage		2 x rated value for 1 second, repeated 10 times at 10 second intervals					2x10 times		2 x rated value for 1 second, repeated 10 times at 10 second intervals	
Current		20x rated value for 1 second, repeated 5 times at 5 min					20x5 times	20xrated value for 0.5 sec.	20x rated value for 1 second, repeated 5 times at 5 min	
Options (add ons)										
RS 485 module		NA	NA	YES	YES	YES		NA	YES	YES
1 pulse output module		NA	YES	YES	YES	YES		YES	YES	YES
2 pulse output module		NA	YES	YES	YES	YES		NA	YES	YES
2 Analog output module		NA	NA	YES	YES	NA		NA	NA	NA



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MFM SELECTION CHART

Sr.	PARAMETERS OF COMPARISON	Ziegler MFM 3410	Ziegler MFM 3420	Ziegler MFM 3430	Ziegler MFM 3440	Ziegler MFM 6110	Ziegler MFM 2000	Ziegler MFM 3490	Ziegler MFM 3490 SS	Ziegler MFM 3490 DS
1	Single Phase Version	*	*	*	*	NA	*	NA	*	*
2	Three Phase Version	*	*	*	*	*	*	*	*	*
3	Onsite CT/PT Programmable	*	*	*	*	*	*	*	*	*
4	User Selectable 1A/5A	*	*	*	*	-	-	-	*	*
5	User Selectable 3 Phase 3W or 4W	*	*	*	*	-	-	-	*	*
6	TRMS Measurement	*	*	*	*	*	-	*	*	*
7	Onsite selection of Auto Scroll or Fixed Screen	*	*	*	*	-	*	-	*	*
8	Min/ Max Storage of Voltageand Current	-	*	*	*	-	*	-	-	-
9	User Selectable Low CurrentSuppression	-	*	*	*	-	-	-	-	-
10	Onsite Adjustable displayupdate time	-	*	-	-	-	-	-	-	-
11	Phase reversal indication	-	*	-	*	-	-	-	-	-
12	Parameter Screen recall	-	*	*	*	-	-	-	-	-
13	Energy Count Storage	-	*	*	*	-	-	-	*	*
14	Confirguration of Instrumentsvis Modbus	-	-	-	*	-	-	-	*	*
15	User Assignable resister for RS485 MODBUS	-	-	-	*	-	-	-	*	-
16	Auto resettable mech counter(8 Digit)	-	-	-	-	-	-	*	-	-
17	Password Protection	*	*	*	*	*	*	-	*	*
18	EMC Compatibility	*	*	*	*	*	*	*	*	*
	OPTIONS :									
1	RS 485 MODBUS	-	-	*	*	*	*	-	*	*
2	Digital outputs (One orTwo)	-	*	*	*	*	*	*	*	*
3	Analog Outputs (One or Two)(4-20mA/0-1mA)	-	-	*	*	-	*	-	*	*
	PARAMETER MEASUREMENTS	18	14	37	50	28	100+	1	34	42
1	System Volts	*	*	*	*	*	*	-	*	*
2	System Current	*	*	*	*	*	*	-	*	*
3	Volts L1 – N	*	*	*	*	*	*	-	*	*
4	Volts L2 – N	*	*	*	*	*	*	-	*	*
5	Volts L3 – N	*	*	*	*	*	*	-	*	*
6	Volts L1 – L2	*	*	*	*	*	*	-	*	*
7	Volts L2 – L3	*	*	*	*	*	*	-	*	*
8	Volts L3 – L1	*	*	*	*	*	*	-	*	*
9	Current L1	*	*	*	*	*	*	-	*	*
10	Current L2	*	*	*	*	*	*	-	*	*
11	Current L3	*	*	*	*	*	*	-	*	*
12	Neutral Current	*	-	*	*	*	*	-		*
13	Frequency	*	*	*	*	*	*	-	*	*
14	Import kWh (8 digitresolution)	-	*	-	-	-	-	*	*	-
15	Export kWh (8 digitresolution)	-	*	-	-	-	-	-	-	-
16	System Current Demand	*	-	-	-	-	-	-	-	-
17	System Max CurrentDemand	*	-	-	-	-	-	-	-	-
18	System KVA Demand	*	-	-	-	-	-	-	-	-
19	System Maximum KVAdemand	*	-	-	-	-	-	-	-	-
20	System Active Power(kW)	-	-	*	*	*	*	-	*	*
21	Active Power L1(kW)	-	-	*	*	-	*	-	*	*
22	Active Power L2(kW)	-	-	*	*	-	*	-	*	*
23	Active Power L3(kW)	-	-	*	*	-	*	-	*	*
24	System Re-active Power(kVAr)	-	-	*	*	*	*	-	*	*
25	Re-active Power L1(kVAr)	-	-	*	*	-	*	-	*	*
26	Re-active Power L2(kVAr)	-	-	*	*	-	*	-	*	*
27	Re-active Power L3(kVAr)	-	-	*	*	-	*	-	*	*
28	System Apparent Power(kVA)	*	-	*	*	*	*	-	*	*
29	Apparent Power L1(kVA)	-	-	*	*	-	*	-	*	*
30	Apparent Power L2(kVA)	-	-	*	*	-	*	-	*	*
31	Apparent Power L3(kVA)	-	-	*	*	-	*	-	*	*
32	System Power Factor	-	-	*	*	*	*	-	*	*
33	Power Factor L1	-	-	*	*	-	*	-	*	*
34	Power Factor L2	-	-	*	*	-	*	-	*	*
35	Power Factor L3	-	-	*	*	-	*	-	*	*
36	System Phase Angle	-	-	-	-	-	*	-	*	*
37	Phase Angle L1	-	-	*	*	-	*	-	*	*
38	Phase Angle L2	-	-	*	*	-	*	-	*	*
39	Phase Angle L3	-	-	*	*	-	*	-	*	*
40	Active Energy Kwh	-	-	-	-	*	*	-	-	-
41	Import kWh (8 digit resolution)	-	-	*	*	-	*	-	-	*
42	Export kWh (8 digit resolution)	-	-	*	*	-	*	-	-	-
43	Reactive Energy	-	-	-	-	*	*	-	-	-
44	Import kVArh (8 digit resolution)	-	-	*	*	-	*	-	-	-
45	Export kVArh (8 digit resolution)	-	-	*	*	-	*	-	-	-
46	Import kVAh (8 digit resolution)	-	-	-	-	-	-	-	-	-
47	Export kVAh (8 digit resolution)	-	-	-	-	-	-	-	-	-
48	KvAh (8 digit resolution)	-	-	*	*	-	*	-	*	*
49	KAh (8 digit resolution)	-	-	-	*	-	*	-	-	*
50	Current Demand	-	-	-	*	*	*	-	-	-
51	KVA demand	-	-	-	*	-	*	-	-	-
52	KW Demand	-	-	-	-	*	*	-	-	-
53	KW import Demand	-	-	-	*	-	*	-	-	-
54	KW export Demand	-	-	-	*	-	*	-	-	-
55	Max Current Demand	-	-	-	*	*	*	-	-	-
56	Max KVA demand	-	-	-	*	-	*	-	-	-
57	Max KW Demand	-	-	-	-	*	*	-	-	-
58	Max KW import Demnad	-	-	-	*	-	*	-	-	-
59	Max KW export demand	-	-	-	*	-	*	-	-	-
60	Run Hour	-	-	-	*	-	-	-	-	*
61	On Hour	-	-	-	*	-	-	-	-	*
62	Number of Interruptions	-	-	-	*	-	-	-	-	*
63	Phase reversal Indication	-	-	-	*	-	-	-	-	-
64	% THD of System Voltage	-	-	-	-	*	-	-	-	-
65	% THD of System Current	-	-	-	-	*	-	-	-	-
66	% THD of all three line voltages (L-L)	-	-	-	-	*	-	-	-	-
67	% THD of all three phase voltages (L-N)	-	-	-	-	*	-	-	-	-
68	% THD of all three phase Currents	-	-	-	-	*	-	-	-	-

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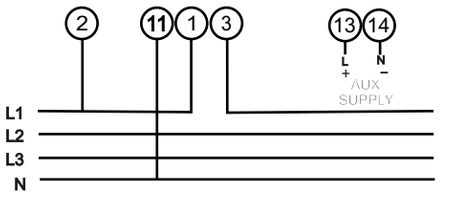
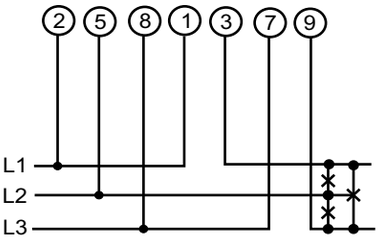
Redefine Innovative Metering

CONNECTION DIAGRAM

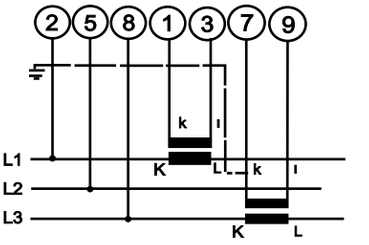
For Single Phase



3 Phase 3 Wire Unbalanced Load

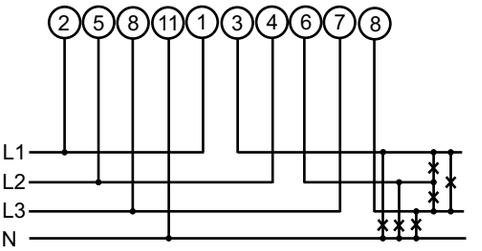


For Direct operated meter

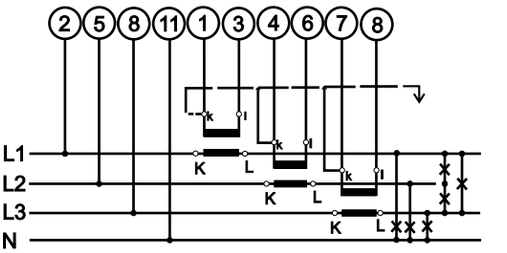


For CT operated meter

3 Phase 4 Wire Unbalanced Load



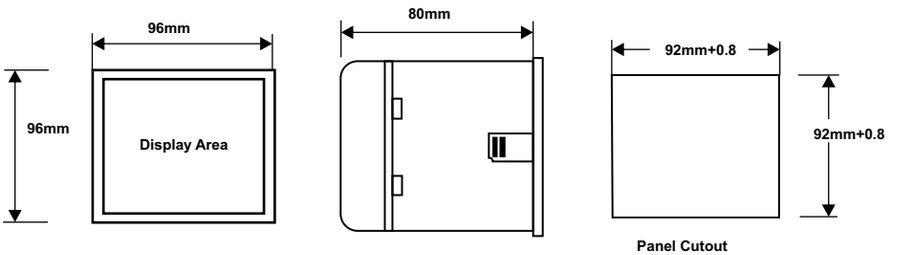
For Direct operated meter



For CT operated meter

DIMENSIONS

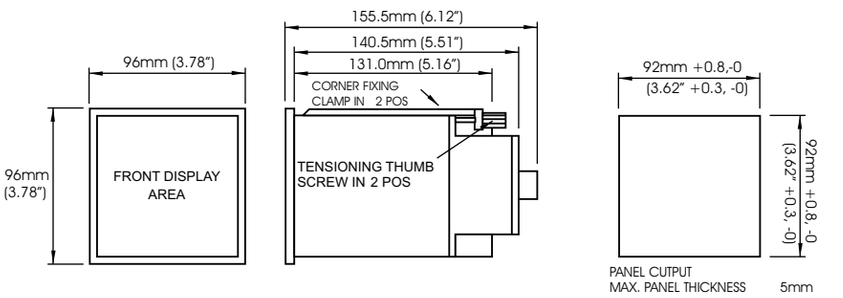
3410, 3420, 3430, 3440, 6100, 3490, 3490 SS, 3490 DS

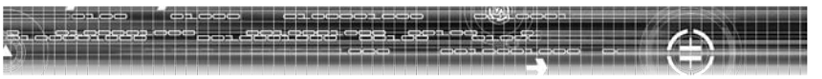


Panel Cutout

DIMENSIONS

2000





Ziegler

Redefine Innovative Metering

MFM ORDERING INFORMATION

Type	System Type	Input Voltage	I/p Current	Aux Supply	RS 485 output	Pulse Output	Analog Output
Ziegler 3410	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	NA	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H** 100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	NA	NA	NA
Ziegler 3420	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	NA	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H** 100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	NA	One Pulse O/P **S** Two Pulse O/P **D** Not Used **Z**	NA
Ziegler 3425	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	NA	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H**	NA	One Pulse O/P **S** Two Pulse O/P **D** Not Used **Z**	NA
Ziegler 3430	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	NA	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H** 100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	RS 485 O/P **R** Not Used **Z**	One Pulse O/P **S** Two Pulse O/P **D** Not Used **Z**	2 O/P(4-20mA) **1** 2 O/P(0-1mA) **2** Not Used **Z**
Ziegler 3440	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	NA	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H** 100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	RS 485 O/P R Not Used Z	One Pulse O/P **S** Two Pulse O/P **D** Not Used **Z**	2 O/P(4-20mA) **1** 2 O/P(0-1mA) **2** Not Used **Z**
Ziegler 3490	3PH 3W **3** 3PH 4W **4**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440** 480 LL (277LN) **480**	1 Amp **1** 5 Amp **5**	Self Powered **SP**	NA	One Pulse O/P **S**	NA
Ziegler 3490 SS	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	1 Amp **1** 5 Amp **5**	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H** 100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	RS 485 O/P **R** Not Used **Z**	One Pulse O/P **S** Not Used **Z**	NA
Ziegler 3490 DS	1 Phase **1** 3 Phase **3**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	1 Amp **1** 5 Amp **5**	110VAC (-15%/+20%) **L** 230VAC (-15%/+20%) **M** 380VAC (-15%/+20%) **H** 100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	RS 485 O/P **R** Not Used **Z**	Two Pulse O/P **UG** Not Used **Z**	NA
Ziegler 6100	3PH 3W **3** 3PH 4W **4**	110 V L-L(63.5 LN) **110** 230V LL (133 LN) **230** 415 LL (239.6 LN) **415** 440 LL (254 LN) **440**	1 Amp **1** 5 Amp **5**	100-250 VAC/VDC(+/-10%) **AD** 12V-48 VDC(+/- 10%) **D**	RS 485 O/P **R** Not Used **Z**	One Pulse O/P **S** Not Used **Z**	NA

2012-Z-GCA

Electrical Transducers

Electrical Transducers

Ziegler

Redefine Innovative Metering

ELECTRICAL TRANSDUCER

1. Transducers for AC Current & Voltage
2. Transducers for Frequency.
3. Transducers for Active, Reactive Power & Power factor, Phase angle Difference.
4. Multitransducer with Onsite Programming of Parameters.
5. Passive DC Isolators, Amplier, Convertor.
6. Temperature Transmitter & Programmable Universal Transmitter.

Ziegler

Redefine Innovative Metering

Transducers for AC current / AC Voltage

IXX/ E15 Current	AC current transducer
VXX/ E15 Voltage	AC voltage transducer
E1D	AC voltage & current transducer with dual output
E13	3 channel AC current & voltage transducer

Ziegler IXX / VXX / E1X measuring transducers are used to convert a sine wave or distorted AC current and AC voltage into an impressed load independent output signal.
The output signal is proportional to the root mean square value of the input current and voltage.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance	Acc. to IEC 60688
Housing Protection	IP 40 acc. to EN 60 529 Terminal IP 20
Rated Insulation Voltage	Measuring input AC 300 V Power supply AC 300 V, DC 230V Measuring output DC 40V
Contamination level	2
Over voltage category	III
Protection class	II
Safe isolation	Acc. to IEC 61010 and DIN/DE 106, part 101
Impulse withstand voltage acc. to IEC 255-4Cl. III	5kV, 1.2/50ms, 0.5Ws Common-mode and differential mode between any terminals
Test voltage	3.7kV/50Hz/1min. between electrically isolated circuits Measuring output versus housing 0.5kV/50kV/1min measuring 2:0.5kV/50Hz/1min Measuring output 1 versus
ENVIRONMENTAL CONDITIONS	
Climatic rating	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	-25 to +55°C
Storage temperature	-40 to +70°C
Relative humidity	75% (STD), 90% (Enhanced)
Permissible vibration	2g acc. to EN 60 068-2-6
Shock	3x50g (3 shocks each in 6 directions)

FACT SHEET:

Mechanical Design	Moulded case housing 35mm width
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Position of use	Any
Higher load capacity	750Ω at 20mA
Mounting	DIN rail mounting (35x15/7.5mm) acc. to EN 50 022 or directly onto wall or panel mounting. Easy “onsite”conversion possible
Protection type	Output short circuit and open circuit proof
Terminal connection	Screw-type terminals with indirect wire pressure 2 for max. 2x2.5mm^2 or 1x6mm^2 Electricians delight. Even suitable for multistrand or solid wire connection. Large space for looping of wires

Ziegler

Redefine Innovative Metering

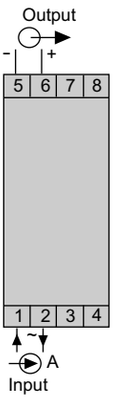
VOLTAGE CURRENT & FREQUENCY TRANSDUCERS

Models	I11/V11	I12	E15	E1D	E13	I21/V21	I22/V22
Measuring quantity	AC Current/Voltage	AC Current	AC Current/Voltage				
Nominal Input	Current: 1A or 5A Voltage: 110V/ 3/ 110/150/240/415/ 440V	1A or 5A site configurable.	Current: 1/1.2/5 or 6A Voltage: 100/ 3/110 3/120/ 3/ 100/110/116.66/120/125/133.33/150/250/400 or 500V	Current: 1/1.2/5 or 6A Voltage: 100/ 3/110 3/120/ 3/ 100/110/116.66/120/125/133.33/150/250/400 or 500V		Current: 0-1A to 0-7.5A Voltage: 0-100V to 0-500V	
Nominal Frequency	50, 60Hz			50, 60 or 400Hz			50, 60Hz
Output Quantity	Load Independent DC Current or DC Voltage						
Output Range	0-1/0-5/0-10 or 0-20mA 4-20mA-wire connection 0-10V	0-5/0-10/0-20mA 0-10V	0-10V/1-5V 0-1//5/10/20mA or 4-20mA Option:Dual Output.	0-1,0-5,0-10, 0-20 or 4-20mA 0-10V, 1-5V Dual output	3 channel	0-1mA to 0-20mA,4-20mA 0-1V to 0-10V Option: Dual Output.	
Ripple	<1% P-P					<0.5% P-P	
Output Burden	Current Output:R_{ext}=15V/I {Full Scale} [750Ω @ 20mA or 1500 Ω @ 10mA] Voltage Output:Rext= Output Voltage/20mA.						
Auxiliary Supply	Self Powered OR 12V-30V (Only for 2 wire connection with output 4-20mA)	Self Powered	AC 24/115/120/230/240/250V + 15% 50/60Hz DC 24,48,60 or 110V - 15% +33%.	AC 24/115/120/230/240/250V + 15% 50/60Hz DC 24,48,60 or 110V - 15% +33%.	AC 110 or 230V	AC 24/110/230/400V AC/DC 24-60V AC/DC 85-230V	
Power Consumption	---	1 VA	< 0.2 VA in Current < 1 VA in Voltage	<0.2VA <2VA	<0.2VA <1VA	<4VA	
Response Time	<300ms	<2s	<300ms			<300 ms (< 50ms option)	
High Insulation Level	4kV	3.7kV	4kV	4kV	3.7kV	3.7kV	
Impluse Withstand Voltage	5kV, 1.2/50µsec,0.5 Ws						
Accuracy as per IEC 688	Class 0.5						Class 0.2
Operating Temperature	-25 to 55˚C						
Weight	Approx. 0.4kg	Approx. 0.5kg		Approx. 0.7kg	Approx. 0.9kg	Approx. 0.5kg	

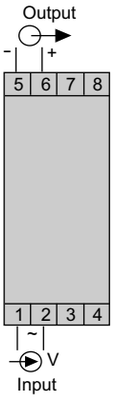
Ziegler

Redefine Innovative Metering

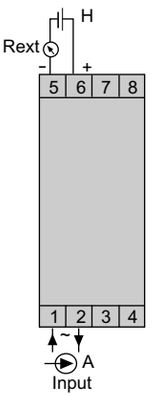
ELECTRICAL CONNECTION



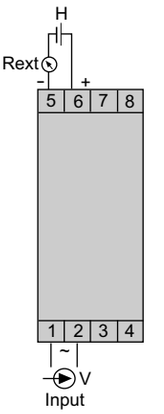
Ziegler Transducer I11
for measuring AC Current



Ziegler Transducer V11
for measuring AC Voltage



Ziegler Transducer I11
as 2-wire converter
with 4.. 20 mA output.



Ziegler Transducer V11,
as 2-wire converter
with 4.. 20 mA output.

I11,V11

Connection	Connecting terminals
Measuring input E 1A~	1 and 3
Measuring input E 5A~	1 and 2
Measuring output A	5 - and 6 +

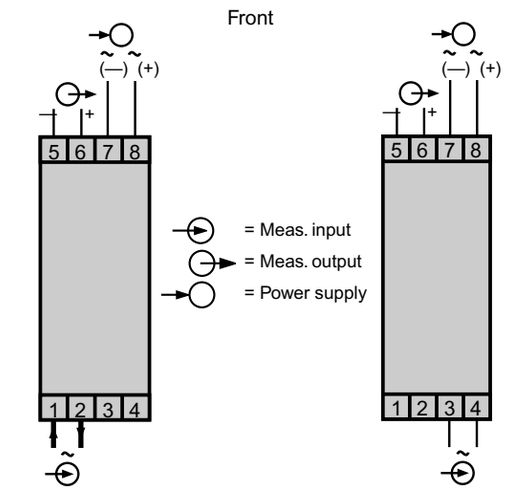
I12

Connection	Terminals	
Measuring input	~	1
	~	3
Measuring Output	+	13
	-	14
Power supply	~,+	21
	~,-	22

I11,V11/ I21 / I22

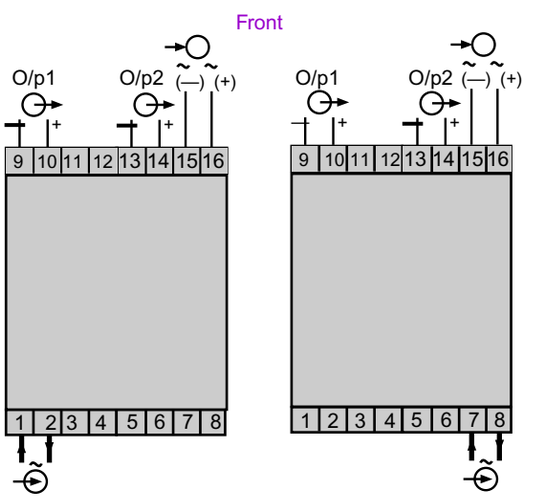
Connection	Terminals	
Measuring input	~	2
	~	5
Measuring Output	+	13
	-	14
Power supply	~,+	21
	~,-	22

V21 / V22



Ziegler Tranducer E 15 one output
for AC current measurement.

Ziegler Tranducer E15 one
output for AC voltage
measurement.



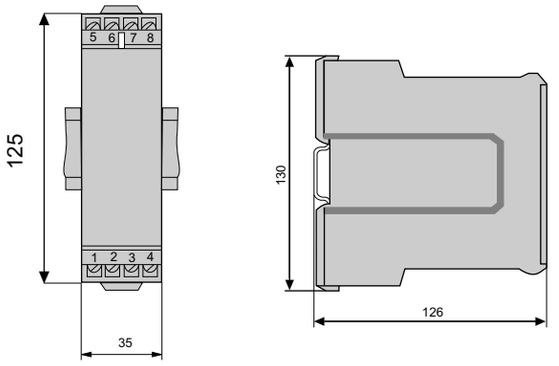
Ziegler Tranducer E15 two
output for AC current
measurement.

Ziegler Tranducer E15 two
output for AC voltage
measurement.

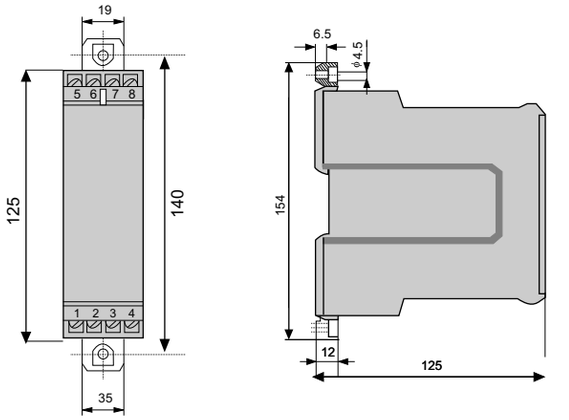
Ziegler

Redefine Innovative Metering

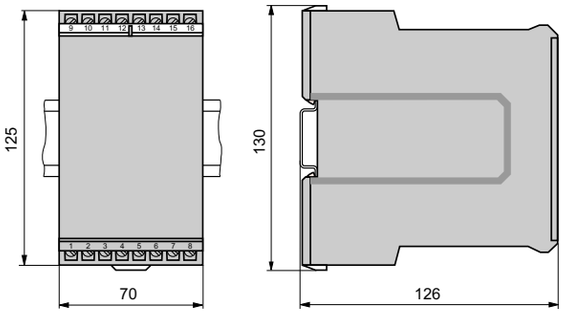
DIMENSIONAL DRAWING



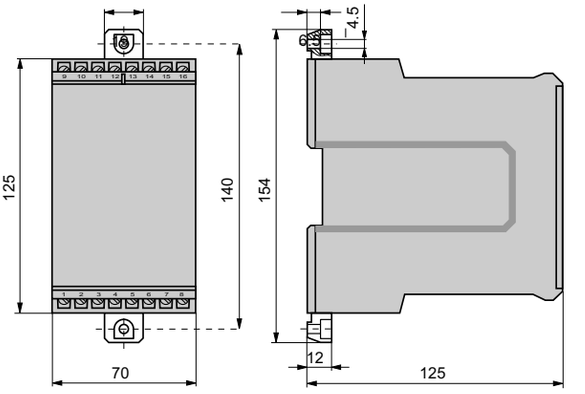
Transducer in housing E8 clipped onto a top-hat rail (35 x 15 mm or 35 x 7.5 mm acc. to EN 50 022).



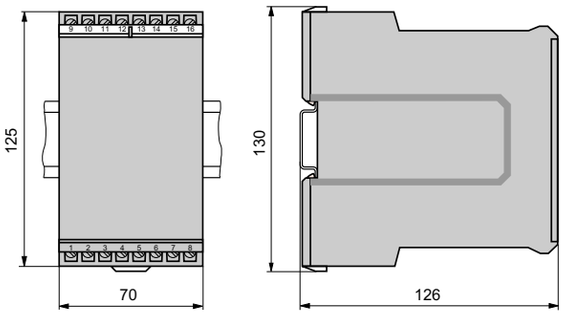
Transducer in housing E8 with the screw hole brackets pulled out for wall mounting.



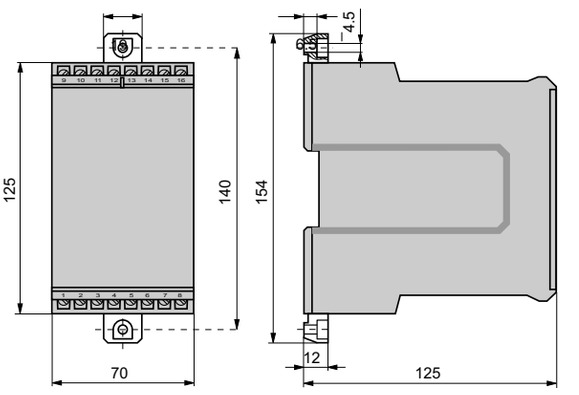
Transducer E15 two output in housing E16 clipped onto a top hat rail (35 X 15 mm or 35 7.5 mm) acc. to EN 50022.



Transducer E15 two output in housing E16 with the screw hole brackets pulled out for wall mounting.



Transducer E1D two output in housing E16 clipped onto a top hat rail (35 X 15 mm or 35 7.5 mm) acc. to EN 50022.



Transducer E1D two output in housing E16 with the screw hole brackets pulled out for wall mounting.

ORDERING INFORMATION:

Please specify ordering information as given below,

Type	Measuring qty.	Measuring Range/Input	Output	Aux supply

ORDER EXAMPLE:

E15	Voltage	400V	4... 20mA	230VAC

Ziegler

Redefine Innovative Metering

Transducers for Frequency Measurement

F11 F12	Frequency measurement transducer

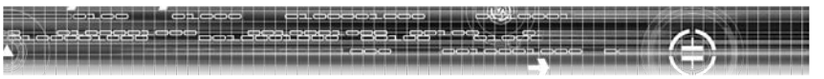
Ziegler F11/F12 measuring transducers are used for frequency measurement.
The output signal is proportional to measured frequency & is either a load independent DC current or a load independent DC voltage.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance	Acc. to IEC 60688
Housing Protection	IP 40 acc. to EN 60 529 Terminal IP 20
Rated Insulation Voltage	Measuring input AC 300 V Power supply AC 300 V, DC 230V Measuring output DC 40V
Contamination level	2
Over voltage category	III
Protection class	II
Safe isolation	Acc. to IEC 61010 and DIN/DE 106, part 101
Impulse withstand voltage acc. to IEC 255-4Cl. III	5kV, 1.2/50ms, 0.5Ws Common-mode and differential mode between any terminals
Test voltage	Measuring input versus Measuring output 3.7kV/50Hz/1min. Measuring input versus housing 3.7kV/50Hz/1min. Measuring output versus housing 3.7kV/50Hz/1min. 0.5kV/50Hz/1min. Measuring output 1 versus output 2 500V/50Hz/1min
ENVIRONMENTAL CONDITIONS	
Climatic rating	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	0-60°C
Storage temperature	-20°C to +70°C
Relative humidity	75% (STD)
Permissible vibration	2g acc. to EN 60 068-2-6
Shock	3x50g (3 shocks each in 6 directions)

FACT SHEET:

Mechanical Design	Moulded case housing 35mm width
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Position of use	Any
Higher load capacity	750Ω at 20mA
Mounting	DIN rail mounting (35x15/7.5mm) acc. to EN 50 022 or directly onto wall or panel mounting. Easy “onsite”conversion possible
Protection type	Output short circuit and open circuit proof
Terminal connection	Screw-type terminals with indirect wire pressure 2 for max. 2x2.5mm^2 or 1x6mm^2 Electricians delight. Even suitable for multistrand or solid wire connection. Large space for looping of wires



Ziegler

Redefine Innovative Metering

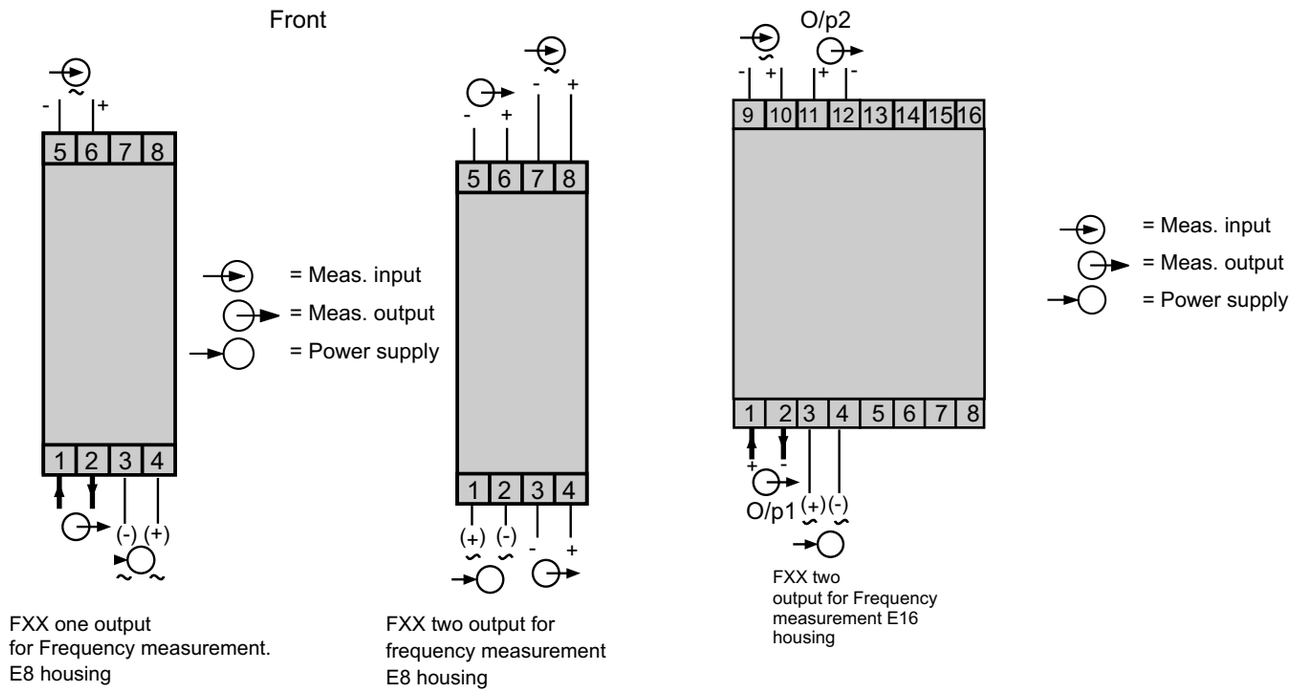
VOLTAGE CURRENT & FREQUENCY TRANSDUCERS

Models	F11	F12
Measuring quantity	Frequency	
Nominal Input	63.5V…480V 45-55Hz/55-65Hz/45-65Hz/360Hz-440Hz	
Nominal Frequency	45-65Hz	
Output Quantity	Load independent DC current or DC voltage	
Output Range	0-1/0-5/0-10/0-20mA/4-20mA 0-5/10V Option: Dual Output	
Ripple	<0.5% of full rated O/P	
Output Burden	Current output: R_{ext} = 15V/I(full scale) Voltage Output: R_{ext} = output voltage/20mA	
Auxiliary Supply	AC 24/110/120/230/380V DC 24-60V AC/DC or 85-230V AC/DC	
Power Consumption	<2 VA, <5 VA for dual output	
Response Time	<400ms	
High Insulation Level	3.7kV	
Impluse Withstand Voltage	5kV, 1.2/50 µsec., 0.5Ws	
Accuracy as per IEC 688	Class 0.5	Class 0.2
Operating Temperature	0-60˚C	
Weight	approx. <0.45kg	

Ziegler

Redefine Innovative Metering

CONNECTION DIAGRAM

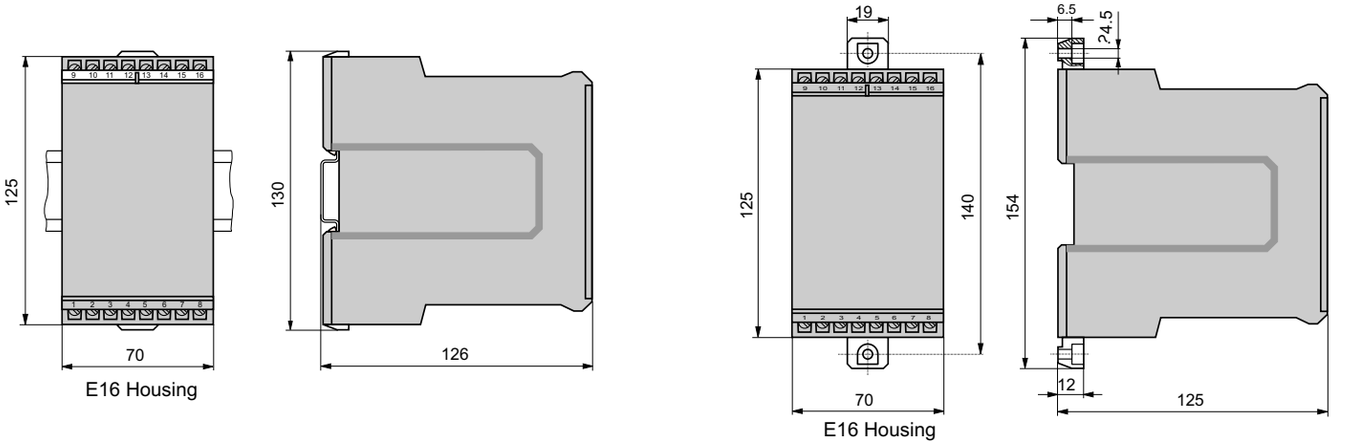


FXX one output
for Frequency measurement.
E8 housing

FXX two output for
frequency measurement
E8 housing

FXX two
output for Frequency
measurement E16
housing

DIMENSIONS



FXX in housing E8 / E16 clipped onto a top-hat rail
(35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

FXX in housing E8 / E16 with the screw hole brackets
pulled out for wall mounting.

ORDERING INFORMATION:

Please specify ordering information as given below,

Type	Nominal Input	Measuring Range/Input	Output	Aux supply

ORDER EXAMPLE:

F12	415V	55-65Hz	1mA-20mA	85-230V AC/DC

Ziegler

Redefine Innovative Metering

Transducers for Power, Power Factor & Phase Angle Measurement.

P11	Active, Reactive Power Measurement
C11	Power Factor/Phase Angle Measurement
C12	Phase Angle Difference of 2 Single Phase Balanced Network

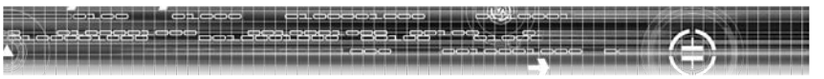
Ziegler P11 measures active/reactive power of a single/three phase system with balanced or unbalanced load by TDM (Time Division Multiplexing) principle and converts it into proportionate load independent DC current or voltage.
Ziegler C11 measures the phase angle between current & voltage of a single or three phase balanced network having sine wave form. The output signal is in the form of load independent DC current or voltage which is proportional to phase angle between current and voltage.
Ziegler C12 converts the phase angle difference of 2 synchronized supply into an output signal, that can serve several receiving instruments.

GENERAL FEATURES :

APPLICABLE STANDARDS	
Product Performance	Acc. to IEC 60688
Housing Protection	IP 40 acc. to EN 60 529 Terminal IP 20
Rated Insulation Voltage	Measuring input AC 300 V Power supply AC 300 V, DC 230V Measuring output DC 40V
Contamination level	2
Over voltage category	III
Protection class	II
Safe isolation	Acc. to IEC 61010 and DIN/DE 106, part 101
Impulse withstand voltage acc. to IEC 255-4Cl. III	5kV, 1.2/50ms, 0.5Ws Common-mode and differential mode between any terminals
Test voltage	Measuring input versus Measuring output 3.7kV/50Hz/1min. Measuring input versus housing 3.7kV/50Hz/1min. Measuring output versus housing 3.7kV/50Hz/1min. 0.5kV/50Hz/1min. Measuring output 1 versus output 2 500V/50Hz/1min
ENVIRONMENTAL CONDITIONS	
Climatic rating	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	0-60°C
Storage temperature	-20°C to +70°C
Relative humidity	75% (STD)
Permissible vibration	2g acc. to EN 60 068-2-6
Shock	3x50g (3 shocks each in 6 directions)

FACT SHEET :

Mechanical Design	Moulded case housing 35mm width
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Position of use	Any
Higher load capacity	750Ω at 20mA
Mounting	DIN rail mounting (35x15/7.5mm) acc. to EN 50 022 or directly onto wall or panel mounting. Easy “onsite”conversion possible
Protection type	Output short circuit and open circuit proof
Terminal connection	Screw-type terminals with indirect wire pressure 2 for max. 2x2.5mm^2 or 1x6mm^2 Electricians delight. Even suitable for multistrand or solid wire connection. Large space for looping of wires



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Redefine Innovative Metering

ZIEGLER RANGE OF POWER, POWER FACTOR & PHASE ANGLE DIFFERENCE TRANSDUCER :

Models	P11	C11	C12
Measuring quantity	Active,Reactive Power	Power Factor/Phase Angle	Phase Angle difference of two single phase balanced ntwork
Measuring Principle	Time Division Multiplication	Measurement of zero crossing interval	Measurement of zero crossing interval
Nominal Input	Current:1A or 5A CT secondary(0.01 to 10A) Voltage:110 3,110,230,240,400,500 V (10V-660V)		Voltage:10 to 660V
Std Measuring Ranges	-----	0.9 Cap-1-ind 0.5 0.8Cap-1-ind 0 0.5 Cap-1-ind 0.5 0.5 -ind-0-Cap-1-0-Cap 0.5	± 60 to ±175° elec
Output Quantity	Load independent DC Voltage or DC Current (Unipolar/Bipolar)		
Output Range	Current:0-1/0-5/0-10/0-20/4-20mA, -1…0…1 to -20…0…20mA (Bipolar) Voltage: 0-10V/1-5V-10…0…10V(Bipolar) Option:Dual Output.		
Ripple	1% P-P	2% P-P	
Output Burden	Current Output:Rext=15V/I(Full Scale) 750Ω @ 20mA or 1500Ω @ 10mA Voltage Output:Rext=Output Voltage/20mA		
Auxiliary Supply	AC 24V/115V or 230V/240V ± 15% DC 24V…90V or 90…240V -15%/33%		
Own Consumption	< 0.1 VA per current path,Un*1mA per Voltage path		
Response Time	<300ms		
High Insulation Level	4kV		
Impluse Withstand Voltage	1kV,1.2/50µsec,0.5Ws		
Accuracy as per IEC 688	Class 0.5		
Operating Temperature	-25 to 55°C		
Weight	Approx 0.5Kg	Approx 0.6Kg	

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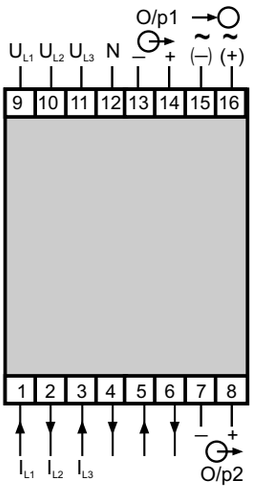
Redefine Innovative Metering

ELECTRICAL CONNECTIONS FOR P11

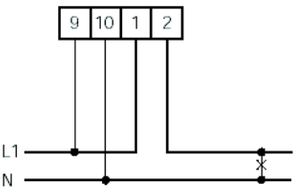
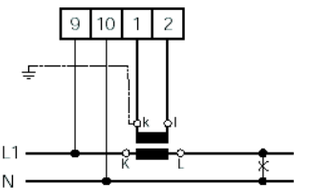
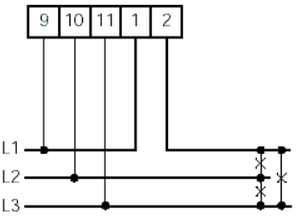
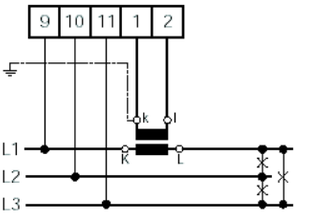
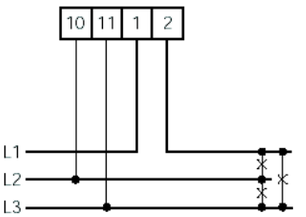
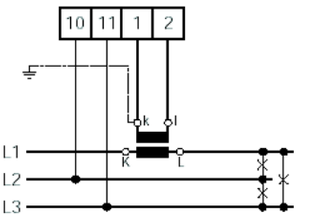
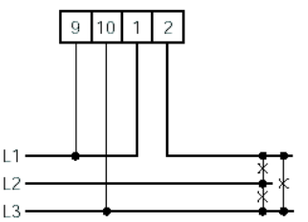
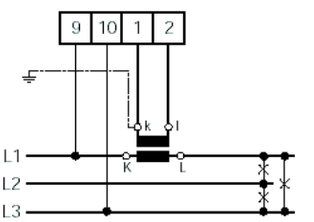
U_{L1} , U_{L2} ,U_{L3}
I_{L1} , I_{L2} ,I_{L3}
N
} = Measuring Inputs

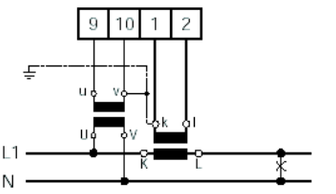
= Measuring output O/p1 & O/p2

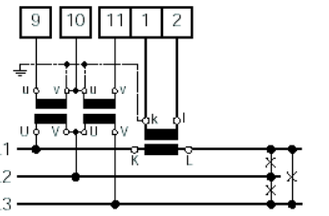
= Power supply

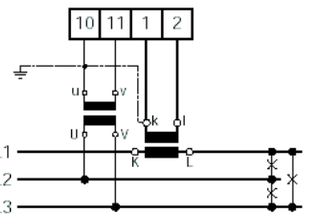


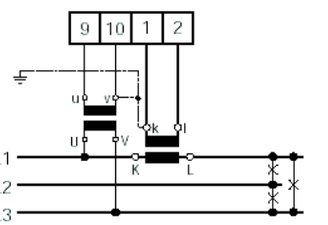
Front

Measuring Inputs		
Application	Terminal allocation	
Active or reactive power measurement in single-phase AC network		
Active power measurement in 3-wire 3-phase network balanced load		
Reactive power measurement in 3-wire 3-phase network balanced load		
Active or reactive power measurement in 3-wire 3-phase network balanced load Phase shift U: L1-L3 I: L1		









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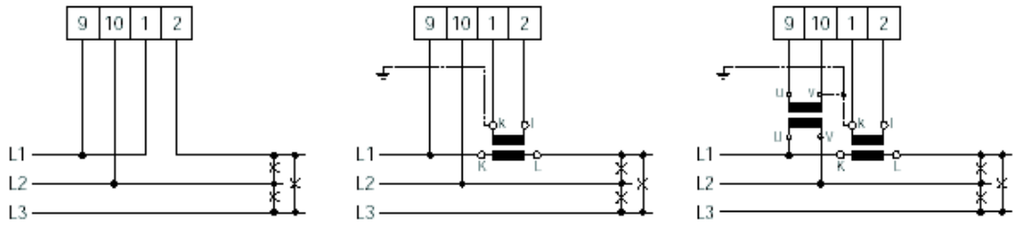
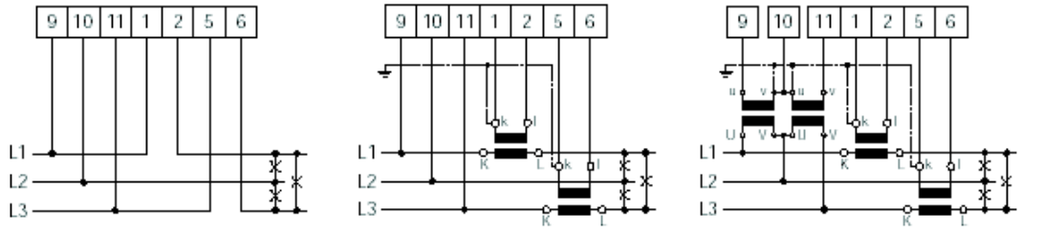
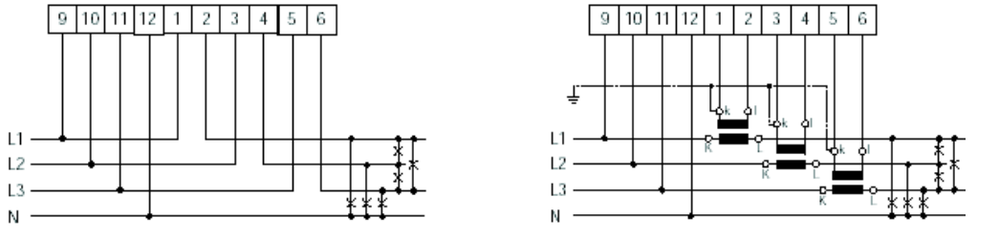
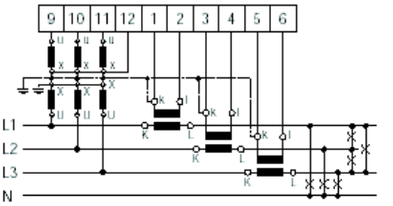
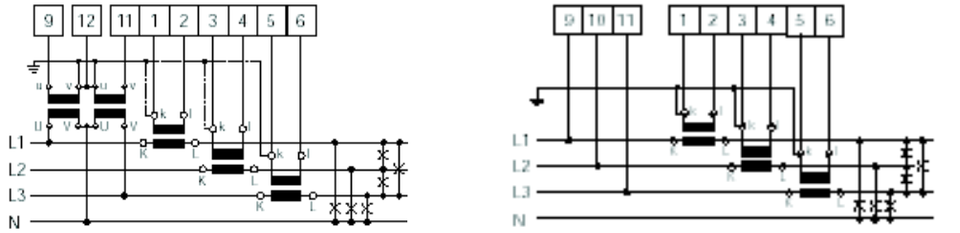
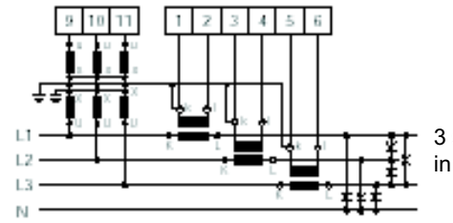
Redefine Innovative Metering

ELECTRICAL CONNECTIONS

Measuring Inputs

Application	Terminal allocation
Active or reactive power measurement in 3-wire 3-phase network balanced load Phase shift U: L1-L2 I: L1	
Active or reactive power measurement in 3-wire 3-phase network unbalanced load	
Active power measurement in 4-wire 3-phase network unbalanced load	  3 single-pole insulated voltage transformer in the high-voltage system
Active or reactive power measurement in 4-wire 3-phase network unbalanced load (special circuit)	  3 single-pole insulated voltage transformer in the high-voltage system

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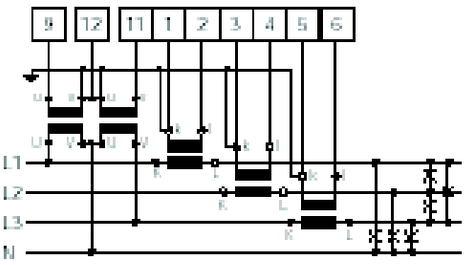
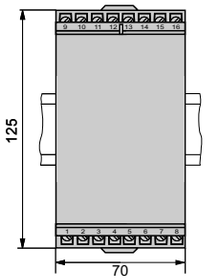
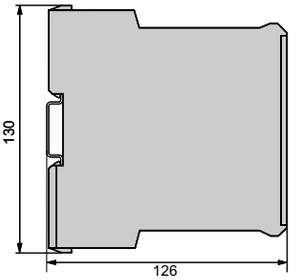
Redefine Innovative Metering

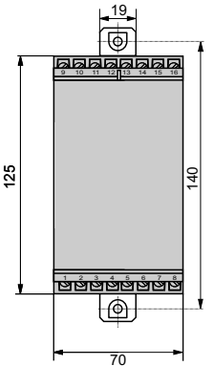
Measuring Inputs	
Application	Terminal allocation
Active or reactive power measurement in 4-wire 3-phase network unbalanced load (special circuit)	 (Delta connection using 2 VT's L1 – N and L3 – N, Open-Y connection)

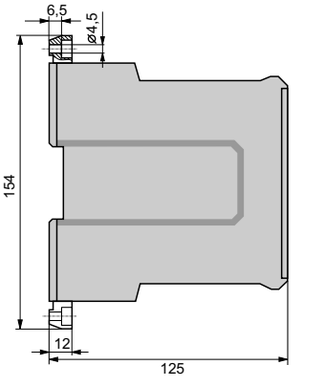
DIMENSIONAL DRAWINGS





P11 in housing E16 clipped onto a top hat rail
(35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).





P11 in housing E16 with the screw hole brackets pulled out
for wall mounting.

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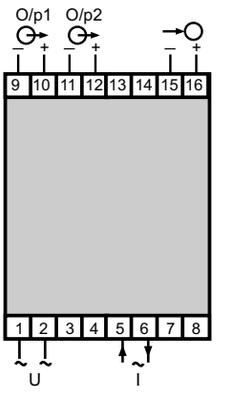
Redefine Innovative Metering

ELECTRICAL CONNECTIONS FOR C11 & C12

C11

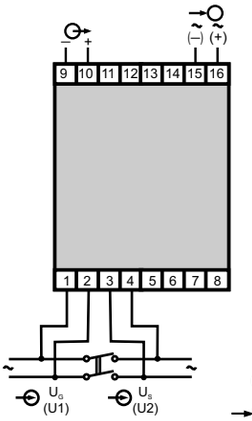


U, I = Measuring Inputs

= Measuring output O/p1 & O/p2

= Power supply

C12

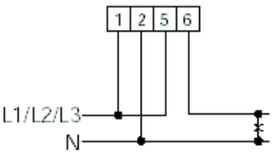
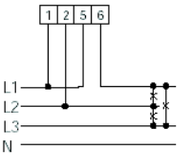
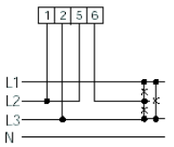
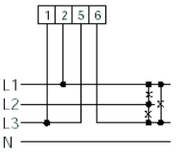
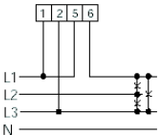
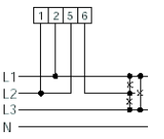
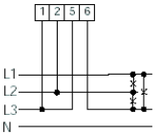


U_G = Measuring Inputs, generator Voltage

U_S = Measuring Inputs, bus Voltage

= Measuring output

= Power supply

Measuring Inputs			
Application	Terminal allocation	Application	Terminal allocation
Phase angle measurement in single-phase AC network		Phase angle measurement in 3- or 4-wire 3-phase network balanced U: L1 – L2 I: L1	
Phase angle measurement in 3- or 4-wire 3-phase network U: L2 – L3 I: L2		Phase angle measurement in 3- or 4-wire 3-phase network U: L2 – L3 I: L2	
Phase angle measurement in 3- or 4-wire 3-phase network U: L1 – L3 I: L1		Phase angle measurement in 3- or 4-wire 3-phase network U: L1 – L3 I: L1	
Phase angle measurement in 3- or 4-wire 3-phase network U: L3 – L2 I: L3			

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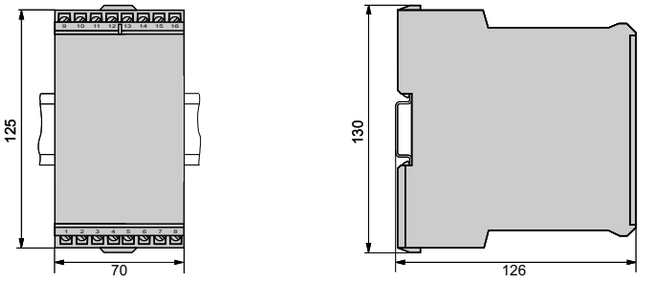
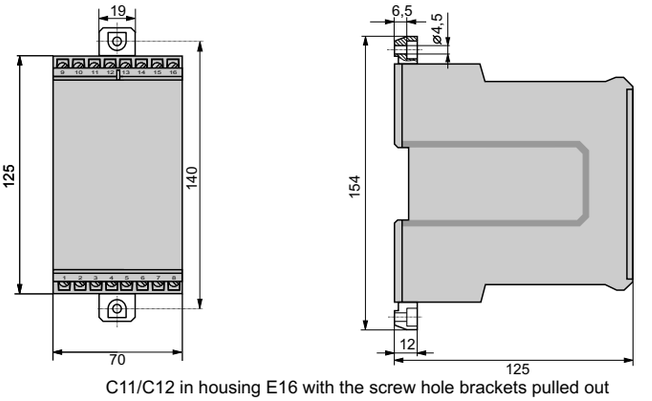
DIMENSIONAL DRAWINGS



C11/C12 in housing E16 clipped onto a top hat rail
(35 x15 mm or 35 x 7.5 mm, acc. to EN 50 022).



C11/C12 in housing E16 with the screw hole brackets pulled out
for wall mounting.

ORDERING INFORMATION:

Please specify ordering information as given below,

Type	Nominal input	Measuring Range/Input	Output	Aux supply

ORDER EXAMPLE:

C11	415V, 5A	0.9 Cap-1-ind 0.5	4... 20mA	230VAC

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Redefine Innovative Metering

Programmable Multi-Transducers

M42	4 Analogue, 2 Digital outputs
M24	2 Digital outputs, 4 Analogue
M40	4 Analogue outputs
M01	LON BUS Interface
M20	2 Analogue outputs
M30	3 Analogue outputs

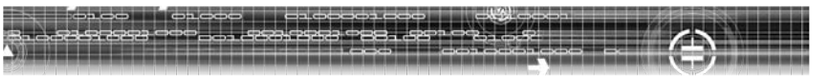
The RS232/485 interface at the multi-transducers enables programming with the help of PC and Software and can also be used to initialize helpful ancillary functions.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance	Acc. to IEC 60688
Housing Protection	IP 40 acc. to EN 60 529 Terminal IP 20
Rated Insulation Voltage	Measuring input AC 300 V Power supply AC 300 V, DC 230V Measuring output DC 40V
Contamination level	2
Over voltage category	III
Protection class	II
Safe isolation	Acc. to IEC 61010 and DIN/DE 106, part 101
Impulse withstand voltage acc. to IEC 255-4Cl. III	5kV, 1.2/50ms, 0.5Ws Common-mode and differential mode between any terminals
Test voltage	Measuring input versus Measuring output 3.7kV/50Hz/1min. Measuring input versus housing 3.7kV/50Hz/1min. Measuring output versus housing 3.7kV/50Hz/1min. 0.5kV/50Hz/1min. Measuring output 1 versus output 2 500V/50Hz/1min
ENVIRONMENTAL CONDITIONS:	
Climatic rating	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	0-60°C
Storage temperature	-20°C to +70°C
Relative humidity	75% (STD)
Permissible vibration	2g acc. to EN 60 068-2-6
Shock	3x50g (3 shocks each in 6 directions)

FACT SHEET:

Mechanical Design	Moulded case housing 35mm width
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Position of use	Any
Higher load capacity	750Ω at 20mA
Mounting	DIN rail mounting (35x15/7.5mm) acc. to EN 50 022 or directly onto wall or panel mounting. Easy “onsite”conversion possible
Protection type	Output short circuit and open circuit proof
Terminal connection	Screw-type terminals with indirect wire pressure 2 for max. 2x2.5mm^2 or 1x6mm^2 Electricians delight. Even suitable for multistrand or solid wire connection. Large space for looping of wires



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Redefine Innovative Metering

ZIEGLER SERIES OF PROGRAMMABLE MULTITRANSDUCERS :

Models		M42	M24	M40	M01	M20
Analog Output		4	2	4	0	2
Digital Output		2	4	0	0	0
Interface		RS232		RS232/RS485		RS232
Measured Variables		Current,Voltage,Active/Reactive Power,Cosφ,Sinφ & Power Factor,Amper Demand,Frequency,Energy.				
Systems		Single Phase AC,3 Phase 3 wire Balanced/Unbalanced load,3 Phase 4 wire Balanced/Unbalanced load.				
INPUTS	Frequency	50 to 60 Hz,16 Hz.				
	Nominal Voltage	57 to 400V				
	Nominal Current	1A to 6A				
Continuous overload capacity	Current	10A				
	Voltage	480 V Single Phase System 813V Three Phase System.				
OUTPUTS	Load independent DC current	1mA to 20mA				
	Load independent DC Voltage	1V to 10V				
Accuracy: DIN IEC 688	Frequency	0.15%				
	Current/Voltage	0.20%				
	Power & Power factor	0.25%				
Power Supply	AC Voltage	100V,110V,230V,400V,500V or 693V.				
	DC/AC Voltage	24V to 60V or 85V to 230V.				
Response Time		1..2 times the measurement cycle.				
Measurement Cycle		Approx 0.25 sec to 0.5sec for 50Hz.				
Weight		Approx 0.7Kg				

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Redefine Innovative Metering

CONFIGURATION SOFTWARE MXX

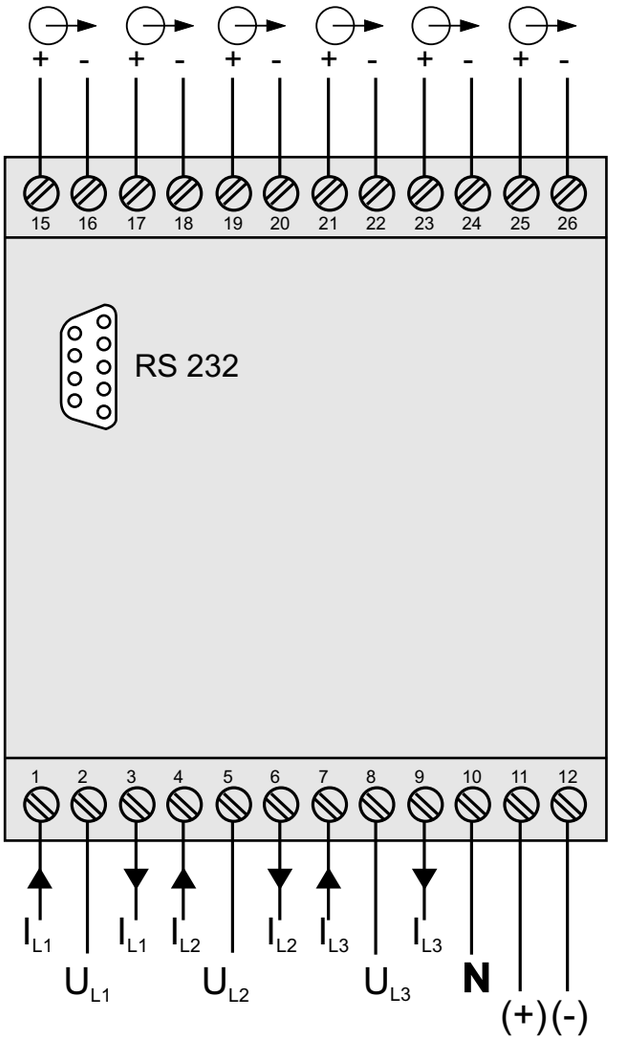
- Software provides the flexibility in the selection of : Single Phase loads/3 Phase 3 Wire Balanced/Unbalanced loads, 3 Phase 4 Wire Balanced/Unbalanced loads.
- Primary and Secondary of C.T. and P.T. can be configured. The configuration can be changed any time.
- Response characteristics for each individual output variable can be programmed. The programmed configuration is password protected.
- The configuration can be stored for future use in event of reprogramming of the unit.
- Output characteristics can be Bent. Linear or Live Zero and output can be programmed accordingly without necessitating any kind of hardware change.
- The digital output can be logically summed for 4 internal counter and have digital output (True/False) if the set condition is achieved.
- The measured variables are displayed on PC monitor. The measured variables can be logged in an Excel sheet for maintaining records.

SYSTEM CONFIGURATION :

- 4 wire system, Asymmetrical.
- 3 wire system, Asymmetrical (Aron)
- 4 wire system Asymmetrical (Open Y)
- 4 wire system, Balanced load.
- 3 wire system, Balanced load
- Single line system.
- Programmable for specific systems (1/3 phase, $2^{3}/_{4}$ wire)
- Nominal current programmable from 1 to 6 A
- Nominal voltage programmable from 57V to 400V (Phase-to-neutral) or 100Vto 693V (phase-to-phase)
- Programmable analog outputs (Current or Voltage)
- Digital outputs can be used for limit value monitoring energy metering
- Programmable Bend Characteristics
- Programmable response time
- Universal (AC,DC) power pack with very wide tolerance range or AC auxiliary supply
- Configurable from a PC or RS232 interface
- Power system check
- Display of measurement values at a PC monitor
- Simulation of outputs
- Recording of data in excel file & more

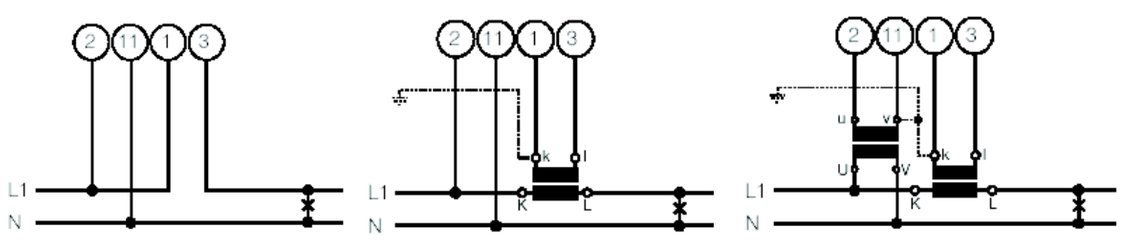
ELECTRICAL CONNECTIONS

Function				Connection
Meas. input	AC current	IL1		1 / 3
		IL2		4 / 6
		IL3		7 / 9
Meas. input	AC Voltage	UL1		2
		UL2		5
		UL3		8
		N		11
Outputs	Analogue	Digital		
	A		+	15
			–	16
	B		+	17
			–	18
	C	E	+	19
			–	20
	D	F	+	21
			–	22
		G	+	23
			–	24
		H	+	25
			–	26
Power Supply	AC		~	13
			~	14
	DC		+	13
			-	14



If power supply is taken from the measured voltage internal connections are as follow:

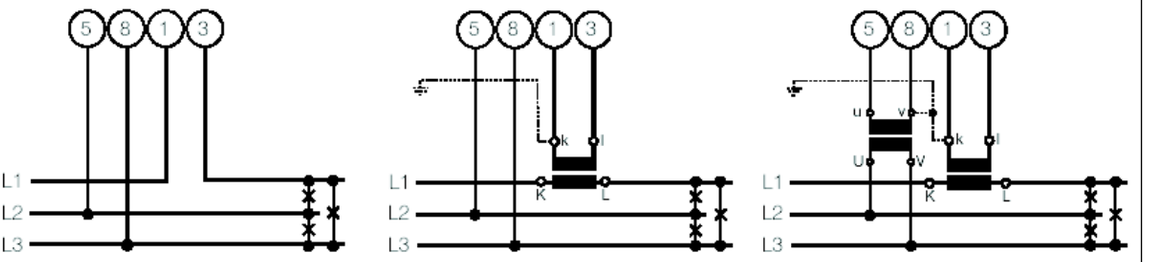
Application (system)	Internal connection Terminal / System
Single phase AC current	2 / 11 (L1 - N)
4-wire 3-phase symmetric load	2 / 11 (L1 - N)
All other *	2 /5 (L1 - L2)

Measuring input	
System / application	Terminals
Single-phase AC system	

Measuring input

System / application	Terminals

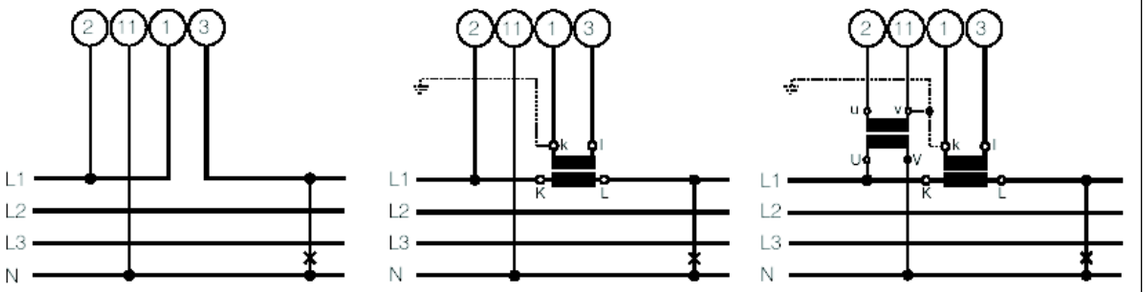
3-wire 3-phase symmetric load Phase-shift U: L2 - L3 I: L1



Connect the voltage according to the following table for current measurement in L2 or L3:

Current transformer	Terminals		5	8
L2	1	3	L3	L1
L3	1	3	L1	L2

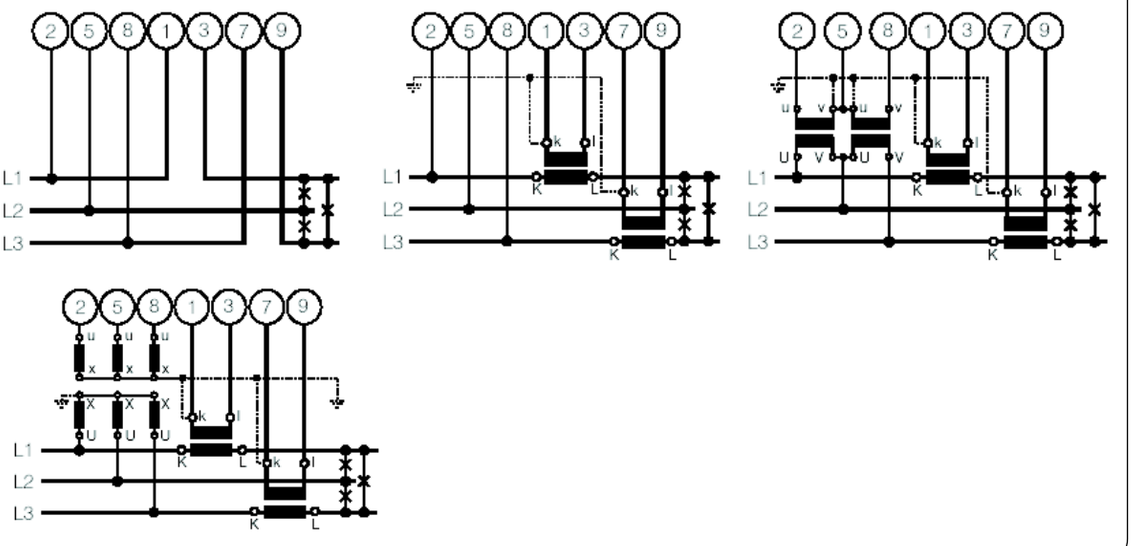
4-wire 3-phase symmetric load I: L1



Connect the voltage according to the following table for current measurement in L2 or L3:

Current transformer	Terminals		2	11
L2	1	3	L2	N
L3	1	3	L3	N

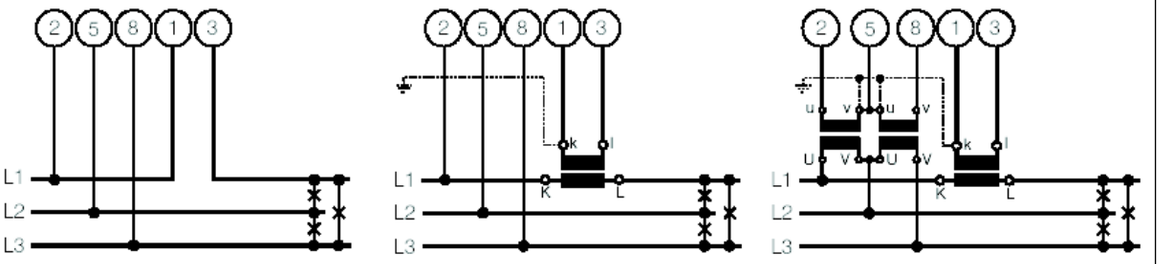
3-phase 3-wire asymmetric load *



Measuring input

System / application	Terminals

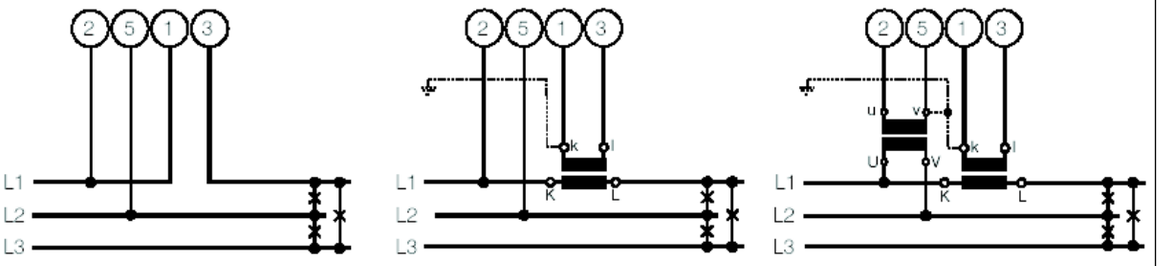
3-wire
3-phase
symmetric
load
I: L1



Connect the voltage according to the following table for current measurement in L2 or L3:

Current transformer	Terminals		2	5	8
L1	1	3	L2	L3	L1
L3	1	3	L3	L1	L2

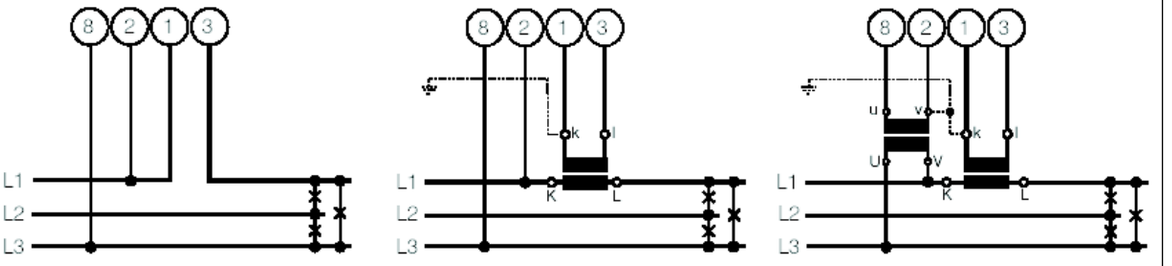
3-wire
3-phase
symmetric
load
Phase-shift
U: L1 - L2
I: L1



Connect the voltage according to the following table for current measurement in L2 or L3:

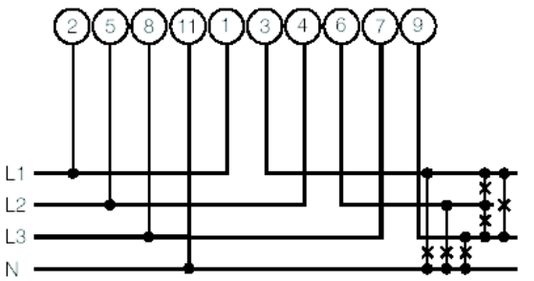
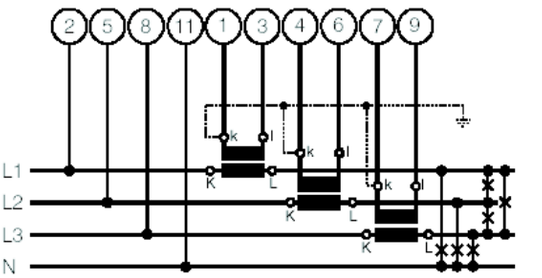
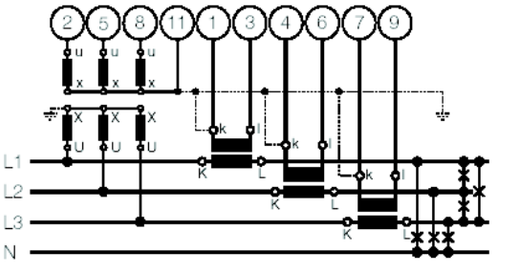
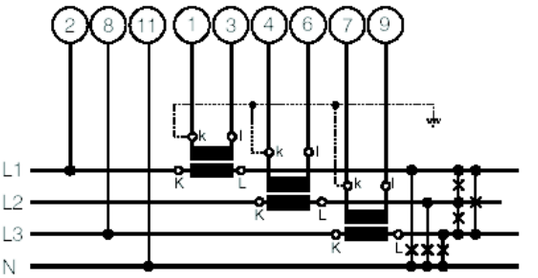
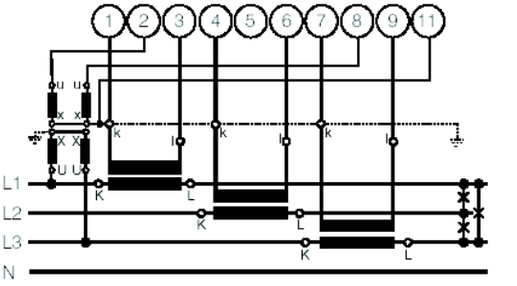
Current transformer	Terminals		2	5
L2	1	3	L2	L3
L3	1	3	L3	L1

3-wire
3-phase
symmetric
load
Phase-shift
U: L3 - L1
I: L1

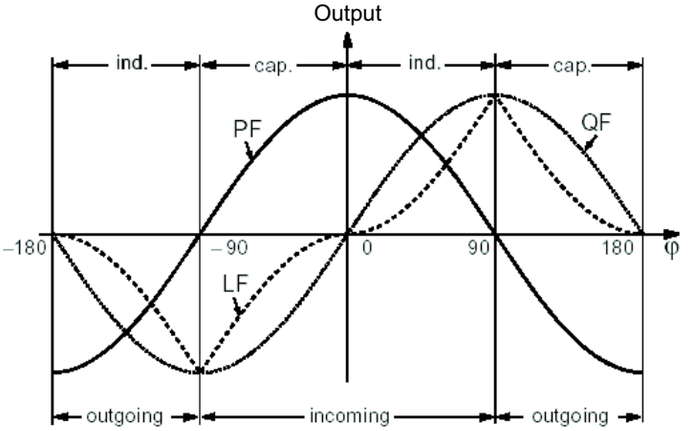


Connect the voltage according to the following table for current measurement in L2 or L3:

Current transformer	Terminals		8	2
L2	1	3	L1	L2
L3	1	3	L2	L3

Measuring input	
System / application	Terminals
3-phase 3-wire asymmetric load *	   3 single-pole insulated voltage transformers in high-voltage system
4-wire asymmetric load, 3-phase Open Y connection*	 Low-voltage system  2 single-pole insulated voltage transformers in high-voltage system

Relationship between PF, QF and LF



Active power PF----- , reactive power QF ------, power factor LF------ .

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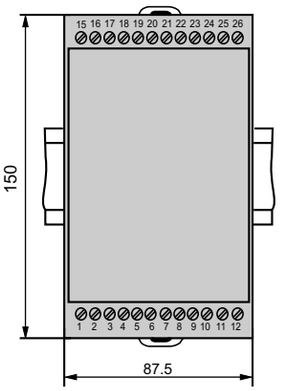
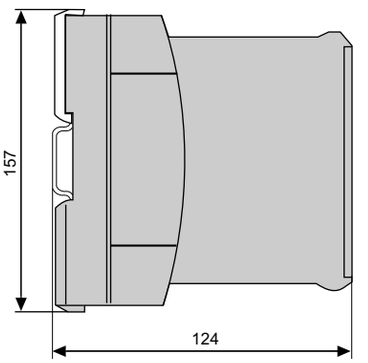
Redefine Innovative Metering

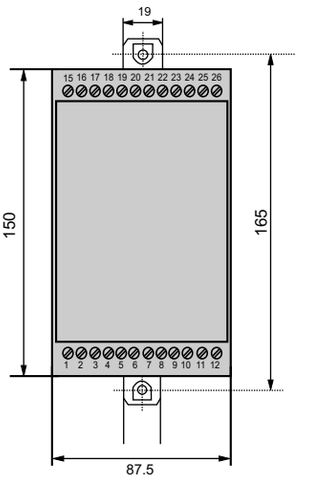
DIMENSIONAL DRAWING



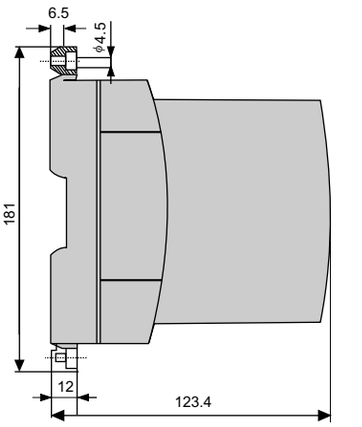
MXX in housing
(35 X 15 mm or 35 X 7.5 mm, acc. to EN 50 022).



T24 clipped onto a top-hat rail



MXX in housing
brackets pulled out.



T24, screw hole mounting

ORDERING INFORMATION:

Please specify ordering information as given below,

Type	System type	Input	Programming	Aux supply

ORDER EXAMPLE:

M42	3 phase 4 wire unbalanced	400V, 5A	Basic	85...230V AC/DC

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Redefine Innovative Metering

Passive DC Signal Isolator/ Converter/Isolating Amplifier.

TI816	DC Signal Isolators
TI807	DC Signal Isolators
TV808	Isolating Amplifier

The DC signal isolator serves to electrically isolate the analog DC signal in the range from 0(4)-20mA which, depending on version, is then converted to a current signal 0(4)-20mA or voltage signal 0(2)-10V. It does not require a separate power supply, but derives the little auxiliary energy it needs from the DC signal.
Isolating amplifier Ziegler TV808, finds its applications for isolation, amplification and conversion of DC signals.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance	Acc. to IEC 60688
Housing Protection	IP 40 acc. to EN 60 529 Terminal IP 20
Rated Insulation Voltage	Measuring input AC 300 V Power supply AC 300 V, DC 230V Measuring output DC 40V
Contamination level	2
Over voltage category	III
Protection class	II
Safe isolation	Acc. to IEC 61010 and DIN/DE 106, part 101
Impulse withstand voltage acc. to IEC 255-4Cl. III	5kV, 1.2/50ms, 0.5Ws Common-mode and differential mode between any terminals
Test voltage	Measuring input versus Measuring output 3.7kV/50Hz/1min. Measuring input versus housing 3.7kV/50Hz/1min. Measuring output versus housing 3.7kV/50Hz/1min. 0.5kV/50Hz/1min. Measuring output 1 versus output 2 500V/50Hz/1min
ENVIRONMENTAL CONDITIONS:	
Climatic rating	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	0-60°C
Storage temperature	-20°C to +70°C
Relative humidity	75% (STD)
Permissible vibration	2g acc. to EN 60 068-2-6
Shock	3x50g (3 shocks each in 6 directions)

FACT SHEET:

Mechanical Design	Moulded case housing 12.5mm(TI816), 17.5mm (TI807) width
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Position of use	Any
Higher load capacity	750Ω at 20mA
Mounting	DIN rail mounting (35x15/7.5mm) acc. to EN 50 022 or directly onto wall or panel mounting. Easy “onsite”conversion possible
Protection type	Output short circuit and open circuit proof
Terminal connection	Screw-type terminals with indirect wire pressure 2 for max. 2x2.5mm^2 or 1x6mm^2 Electricians delight. Even suitable for multistrand or solid wire connection. Large space for looping of wires

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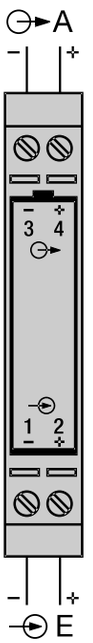
Redefine Innovative Metering

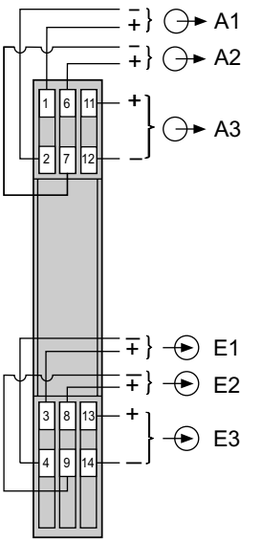
ZIEGLER PASSIVE DC SIGNAL ISOLATOR/CONVERTER/ISOLATING AMPLIFIER :

Models	TI 816	TI807	TV808
Measuring quantity	DC Current		DC Current & Voltage
Measuring Principle	DC Signal Isolation		
Nominal Input	DC Current:0-20mA		DC Current:0..0.1 to 0-40mA
Std Measuring Ranges	-----	-----	Current: 0 … 0.1 mA, 0…0.2 mA, 0 … 0.5 mA,0 … 1 mA,0 … 2 mA,0 … 5 mA, 0 … 10 mA,0 … 20 mA, 0.2 …1 mA,1 … 5 mA,2 … 10 mA,4 … 20 mA Voltage:0…0.06V, 0 … 0.1V,0 …0.2V,0 …0.5V,0 …1V, 0 …2 V,0 …5 V,0 …10 V,0…20 V,0 …40 V.
Output Quantity	DC current or DC Voltage.	DC Current	DC current or DC Voltage.
Output Range	0-20mA or 0-10V	0-20mA.	Current:0 ... 20 mA, 4 ... 20 mA,+ 20mA Voltage: 0 ... 10 V, 2 ... 10 V, + 10 V
Inputs & Outputs Available	1 input-1 output 2 inputs-2 outputs 3 inputs-3 outputs		1 input-1 output 1 input-2 outputs 2 inputs-2 outputs
Output Burden	Current: 600 Ω Voltage Signal	1000Ω	Current Output:Rext=Uan[V]/5mA..
Auxiliary Supply	Self		24 ...60 V DC/AC ,85 ... 230 V DC / AC
Response Time	Approx 5ms	Approx 3ms	Approx < 50ms.
High Insulation Level	3.7kV		
Accuracy as per IEC 688	Current:< ±0.1 % Voltage:< ±0.2 %		Current & Voltage:±0.2%
Operating Temperature	-20 to + 65°C		-25 to 55°C
Weight	Approx 0.35 Kg		Approx 0.20Kg

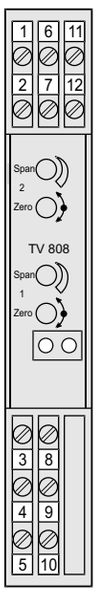
ELECTRICAL CONNECTIONS



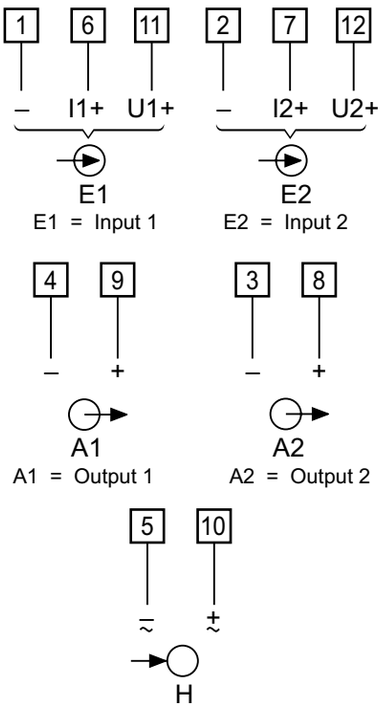
TI816
E = Input signal (IN)
A = Output signal (OUT)



Signal isolator in housing S17
with three isolation and
transmission channels
TI807-113.
standard version



TV808
Without
transparent cover



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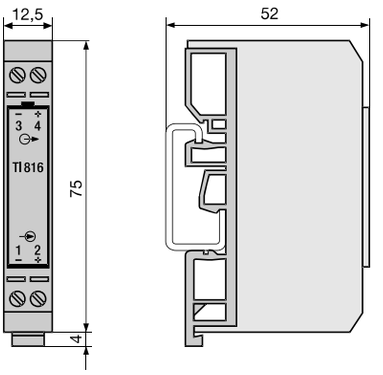
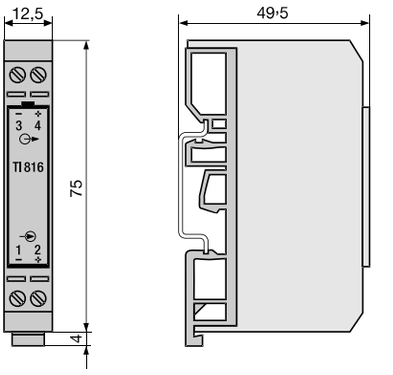
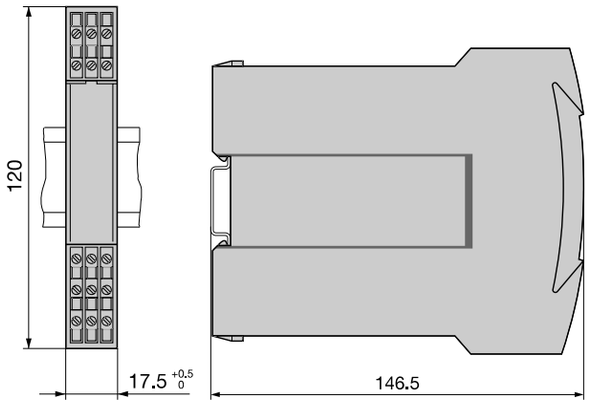
DIMENSIONAL DRAWINGS



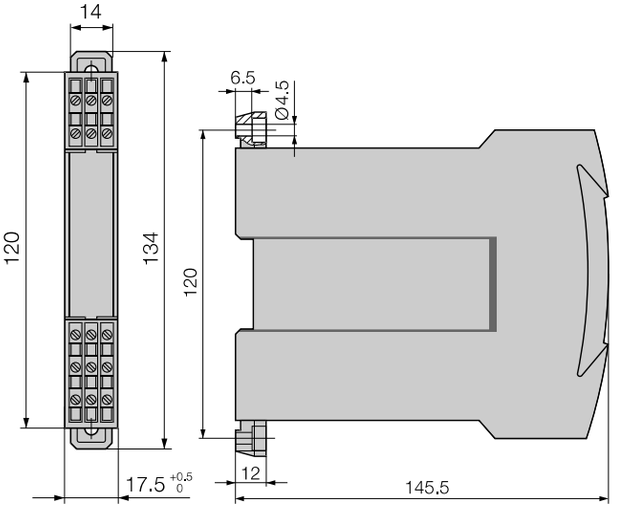
TI816 in carrying rail housing N12 on G-Type rail EN 50 035 - G 32



TI816 in carrying rail housing N12 on top - hat rail EN 50 022 - 35 X 7.5



TI807-1/TV 808 in housing S 17 clipped onto a top - hat rail (35 x 15 mm or 35 x 7.5 mm, acc to EN 50 022).



TI807-1/TV 808 in housing S 17, screw hole mounting brackets pulled out.

ORDERING INFORMATION:

Please specify ordering information as given below,

Type	Nominal input	No. of inputs	Output	No. of outputs

ORDER EXAMPLE:

TI807	0..20mA	2	0..20mA	2

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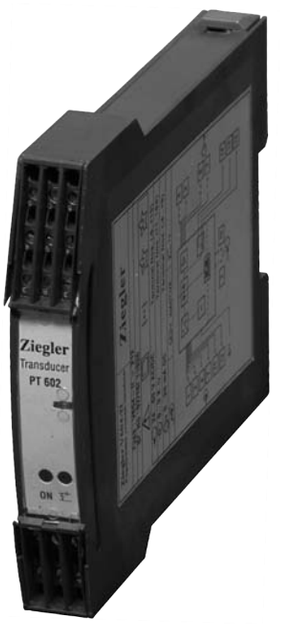
Redefine Innovative Metering

Temperature Transmitter & Programmable Universal Transmitter



PT602	Configurable transmitter for Pt100 temp. sensor
V604-II	Programmable universal transmitter

PT602 converts the input variable - a signal from a resistance thermometer PT100 to a proportionate temp. linear output signal. The analogue output signal is either an impressed current or a superimposed voltage which is processed by other devices.
V604 converts the variable - a DC current or voltage or a signal from a thermocouple, resistance thermometer, remote sensor or potentiometer to proportionate analogue output singnal

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance	Acc. to IEC 60688
Housing Protection	IP 40 acc. to EN 60 529 Terminal IP 20
Rated Insulation Voltage	Measuring input AC 300 V Power supply AC 300 V, DC 230V Measuring output DC 40V
Contamination level	2
Over voltage category	III
Protection class	II
Safe isolation	Acc. to IEC 61010 and DIN/DE 106, part 101
Impulse withstand voltage acc. to IEC 255-4Cl. III	5kV, 1.2/50ms, 0.5Ws Common-mode and differential mode between any terminals
Test voltage	Measuring input versus Measuring output 3.7kV/50Hz/1min. Measuring input versus housing 3.7kV/50Hz/1min. Measuring output versus housing 3.7kV/50Hz/1min. 0.5kV/50Hz/1min. Measuring output 1 versus output 2 500V/50Hz/1min
ENVIRONMENTAL CONDITIONS:	
Climatic rating	Climate class 3Z acc. to VDI/VDE 3540
Operating temperature	0-60°C
Storage temperature	-20°C to +70°C
Relative humidity	75% (STD)
Permissible vibration	2g acc. to EN 60 068-2-6
Shock	3x50g (3 shocks each in 6 directions)

FACT SHEET:

Mechanical Design	Moulded case housing 17.5mm width
Case Material	Glass filled polycarbonate, Flame retardant & drip proof as per UL 94 V0
Position of use	Any
Higher load capacity	750Ω at 20mA
Mounting	DIN rail mounting (35x15/7.5mm) acc. to EN 50 022 or directly onto wall or panel mounting. Easy “onsite”conversion possible
Protection type	Output short circuit and open circuit proof
Terminal connection	Screw-type terminals with indirect wire pressure 2 for max. 2x2.5mm^2 or 1x6mm^2 Electricians delight. Even suitable for multistrand or solid wire connection. Large space for looping of wires

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Redefine Innovative Metering

TECHNICAL SPECIFICATIONS :

Models	Pt602	V604-II
Measuring quantity	Temperature	Temperature,Resistance,DC Current,Voltage.
Nominal Input	For 2 wire connection: -150 to +800°C For 3 or 4wire connection:-170 to + 800 °C.	Plz refer the table 1
Output Quantity	DC Current,Voltage.	DC Current,Voltage.
Output Range	Current:0-20mA or 4-20mA. Voltage:0-10V DC	Current:0-20mA or 4-20mA. Voltage:0-5,0-10 or 2-10V DC
Inputs & Outputs Available	1 input 1 output 2 input 2 output.	2 inputs 2 outputs
Output Burden		
Auxiliary Supply	24…60V DC/AC 85…230V DC/AC	24…60V DC/AC 85…230V DC/AC
Own Consumption	1 Channel : 2.3VA 2 Channel : 3.4VA	2.7VA
Response Time	500ms	1 sec.
High Insulation Level	3.7kV	3.7kV
Accuracy as per IEC 688	±0.5%	±0.2%
Operating Temperature	-25 to 55°C	'-25 to 55°C
Weight	1 Channel:Approx 0.18Kg 2 Channel:0.2Kg	Approx 0.25Kg.

TABLE 1 : MEASURED VARIABLES AND MEASURING RANGES

Measured variables	Measuring ranges		
	Limits	Min. Span	Mix. Span
DC voltages direct input	±300 mV[1]	2 mV	300 mV
via potential divider [2]	± 40 V[1]	300 mV	40 V
DC currents low current range	± 12 mA[1]	0.08 mA	12 mA
high current range	–50 to + 100 mA[1]	0.75 mA	100 mA
Temperature monitored by two, three or four-wire resistance thermometers	–200 to 850 °C		
low resistance range	0...740[1]	8	740
high resistance range	0...5000[1]	40	5000
Temperature monitored by thermocouples	–270 to 1820 °C	2 mV	300 mV
Variation of resistance of remote sensors / potentiometers low resistance range	0...740[1]	8	740
high resistance range	0...5000[1]	40	5000

[1] Note permissible value of the ratio “full-scale value/span ≤ 20”.

PROGRAMMING

A PC with RS 232 C interface (Windows 3.1x,95,98, NT or 2000) the programming cable PRKAB 600 and the configuration software VC 600 are required to program the transmitter.

The connections between
"PC ⟷ PRKAB 600 ⟷ V 604" can be seen from fig. The power supply must be applied to V604 before it can be programmed.

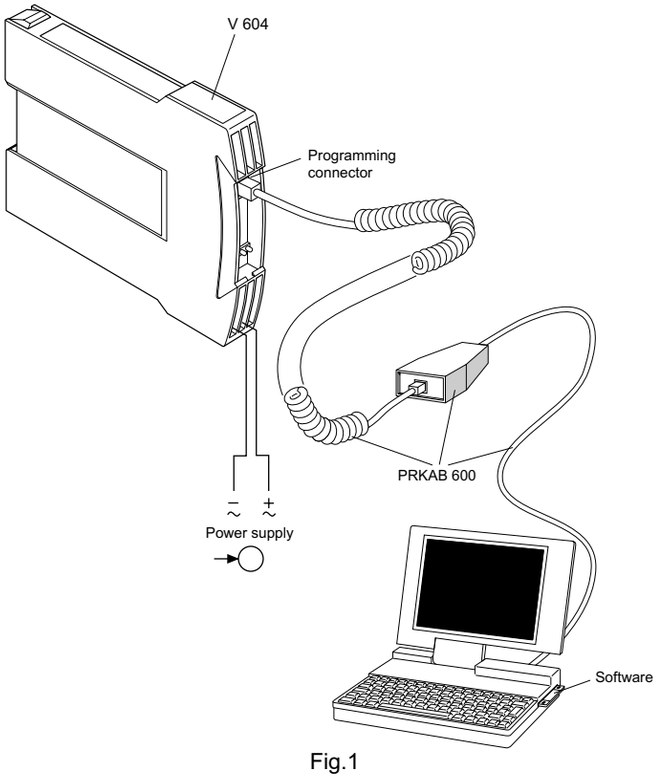


Fig.1

The Software VC 600 is supplied on a CD.

The programming cable PRKAB 600 adjusts the signal level and provides the electrical insulation between the PC and V604

The programming cable PRKAB 600 is used for programming both standard and Ex versions.

Of the programmable details listed one parameter - the output signal - has to be determined by PC programming as well as mechanical setting on the transmitter unit.....

..... the output signal range by PC

..... the type of output (current or voltage signal) has to be set by DIP switch (see Fig.2)

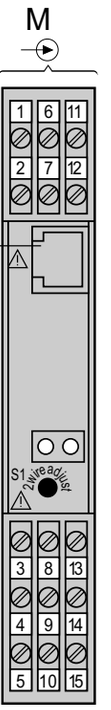
DIP switches	Type of output signal
	load-independent current
	load-independent voltage

Fig.2

Screenshot of V604 configuration software.

ELECTRICAL CONNECTIONS

V604-II

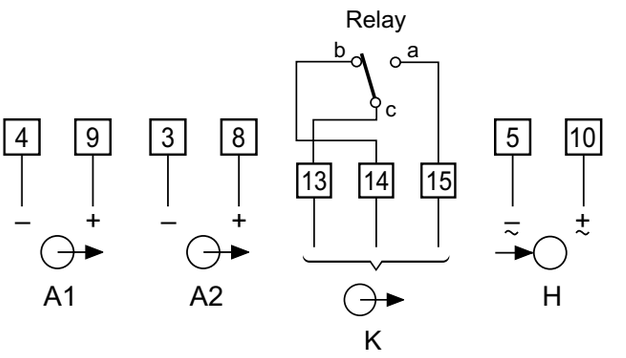


Without transparent cover

Programming connector

S1 Calibration button for automatically compensating the leads for used in conjunction with a two - wire resistance

- ● **ON** Green LED for indicating device standing by
- ● Red LED for indicating operation of open - circuit
  OR
  (⎍) Trip point GW
  (Where a limit monitor is ordered instead of the open - circuit sensor supervision)



Energised: a – c
De-energised: b – c

M = Measured variable / measuring input, Terminal allocation acc. to the measuring mode and application see "Table: Measuring input"

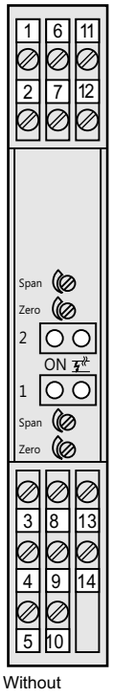
A1 = Output signal / measuring output

A2 = 2nd output (field indicator) (Only brief use permitted in the case of the Ex version)

K = Output contact for open - circuit sensor supervision or for monitoring a limit GW

H = Power supply

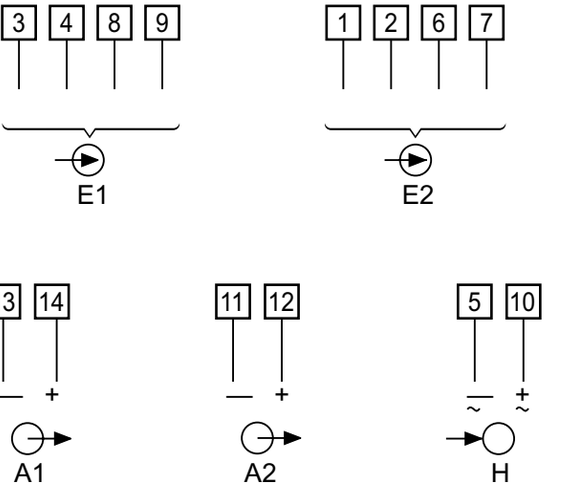
PT602



Without transparent cover

● ON
Green LED's for indicating device standing by

Red LED's for indicating operation of open - circuit or short - circuit



E1 = Measuring input 1 } Terminal allocation acc. to
E2 = Measuring input 2 } Connection mode, see Table 4
A1 = Measuring Output 1
A2 = Measuring Output 2
H = Power supply

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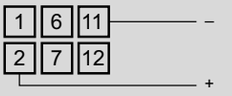
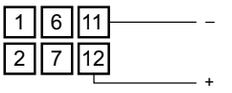
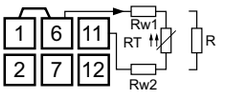
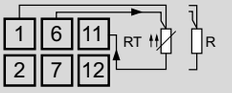
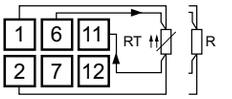
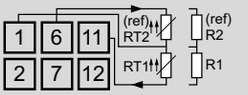
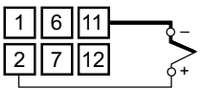
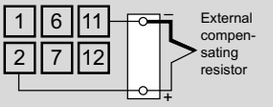
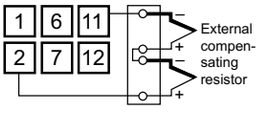
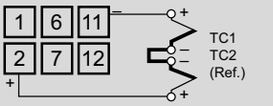
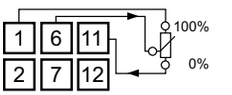
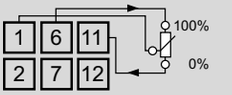
MEASURING INPUT OF V604-II

Measurement	Measuring range limits	Measuring span	Wiring diagram	
			No.	Terminal arrangement
DC voltage (direct input)	– 300...0...300 mV	2...300 mV	1	
DC voltage (input via potential divider)	– 40...0...40 V	0.3 .... 40 V	2	
DC current	– 12...0... 12 mA/ – 50...0...100 mA	0.08... 12 mA / 0.75...100 mA	3	
Resistance thermometer RT or resistance measurement R, two-wire connection	0... 740 Ω / 0...5000 Ω	8... 740 Ω 40...5000 Ω	4	
Resistance thermometer RT or resistance measurement R, three-wire connection	0... 740 Ω / 0...5000 Ω	8... 740 Ω / 40...5000 Ω	5	
Resistance thermometer RT or resistance measurement R, four-wire connection	0... 740 Ω 0...5000 Ω	8... 740 Ω / 40...5000 Ω	6	
2 identical three-wire resistance transmitters RT for deriving the difference	RT1 - RT2 0... 740 Ω 0...5000 Ω	8... 740 Ω / 40...5000 Ω	7	
Thermocouple TC Cold junction compensation internal	– 300...0...300 mV	2...300 mV	8	
Thermocouple TC Cold junction compensation external	– 300...0...300 mV	2...300 mV	9	
Thermocouple TC in a summation circuit for deriving the mean temperature	– 300...0...300 mV	2...300 mV	10	
Thermocouple TC in a differential circuit for deriving the mean temperature	TC1 - TC2 – 300...0...300 mV	2...300 mV	11	
Resistance sensor WF	0... 740 Ω 0...5000 Ω	8... 740 Ω 40...5000 Ω	12	
Resistance sensor WF DIN	0... 740 Ω 0...5000 Ω	8... 740 Ω 40...5000 Ω	13	

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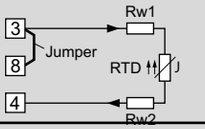
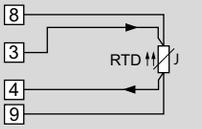
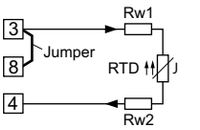
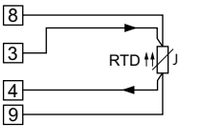
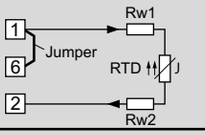
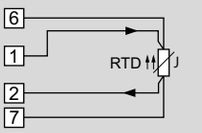
CONNECTION OF THE MEASURING INPUT LEADS E1 & E2 FOR PT602

	Measuring inputs	Connection mode*	Wiring diagram Terminal arrangement
Version with 1 input	Measuring input → E1	Two-wire connection	
		Three-wire connection	
		Four-wire connection	
Version with 2 inputs	Measuring input → E1	Two-wire connection	
		Three-wire connection	
		Four-wire connection	
	Measuring input → E2	Two-wire connection	
		Three-wire connection	
		Four-wire connection	

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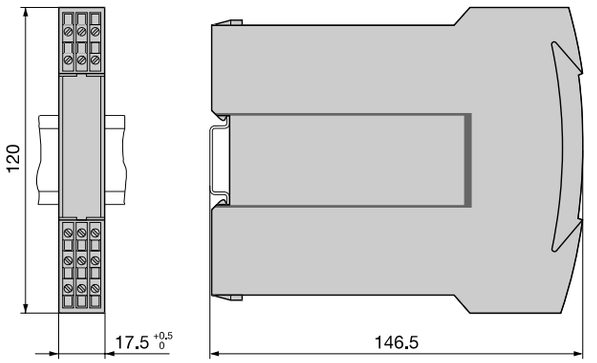
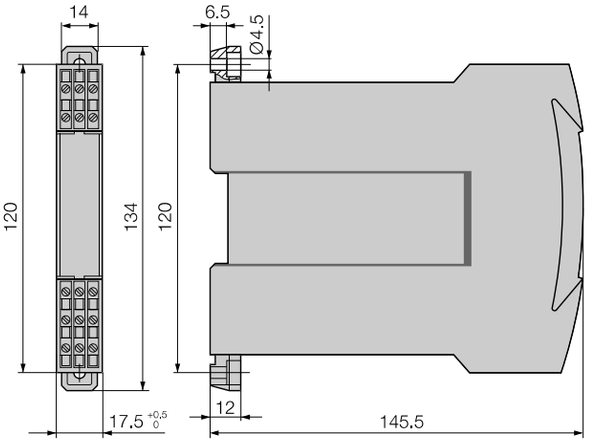
DIMENSIONAL DRAWINGS



PT 602 in housing S 17 clipped onto a top -hat rail
(35 X 15 mm or 35 X 7.5 mm, acc. to EN 50 022).



PT 602 in housing S 17 with screw hole brackets
pulled out for wall mounting.

ORDERING INFORMATION:

Please specify ordering information as given below,

Type	Measuring qty.	Measuring Range/Input	Output	Aux supply

ORDER EXAMPLE:

PT602	Temperature	0...100°C	4... 20mA	85-230V AC/DC

2012-Z-GCA

Test & Measuring Instruments

Test & Measuring Instruments

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TEST AND MEASURING INSTRUMENTS

DIGITAL MULTIMETERS

1. Industrial Grade Digital Multimeters
2. Technician Grade Economical Series Digital Multimeters

INSULATION TESTERS

3. Digital Insulation Tester for 1kV test voltage
4. Analog Insulation Tester for 5kV test voltage

DIGITAL CLAMP METERS

5. Digital Clamp Meters for 1000Ampere AC & 300Ampere AC.

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Industrial Grade Digital Multimeters

RM 11...15	3 ¾ Digital Multimeters
RM 16	3 ¾ TRMS Digital Multimeters
RM 18	4 ¾ TRMS Digital Multimeters

RM Series of Digital Multimeters are high accuracy, high safety range of Testing Instrument suitable for use in rough and harsh industrial environments, with unique features like protective rubber holster, automatic terminal blocking (ABS) system, the Multimeter of high accuracy. RM Series are available in 3¾ digit and 4¾ digit with RMS & TRMS measurements

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance-Digital Measuring Instruments	DIN 43751
Test Equipment and test procedures -Degree of protection provided by enclosures (IP Code)	DIN EN 60529 DIN VDE 0470 part 1
Safety requirements for electrical equipment for measurement, control and laboratory use.	IEC 61010-1:2001 DIN EN 61010 part 1 VDE 0411 -1
Generic emission standard; Residential, commercial and light industry.	EN 61326:2002
Reliability of measuring and control equipment.	VDI/VDE 3540

AUTOMATIC TERMINAL BLOCKING SYSTEM (ABS)

The automatic Terminal blocking system prevents incorrect connection of the test leads and incorrect selection of the measured quantity. This reduces danger to the user, the meter and the system to a remarkable extent.

INTERFACE AND SOFTWARE RICHT COM 100

The multimeters are fitted with a serial RS-232 C interface via which the measured values can be transmitted to a PC. These values, electrically isolated, are transmitted to the attachable interface adaptor with infrared light through the case*

MIN/MAX VALUE STORAGE

In addition to the display of the actual measured value, the minimum or maximum value can constantly be updated and stored.

INDICATION OF NEGATIVE VALUES ON THE ANALOG SCALE

When measuring DC quantities, also negative values are shown on the analog scale so that variations of the measured value can be observed at the zero point.

TRMS Measurement

The measuring principle employed permits the measurement of the root-mean-square value (TRMS) of AC quantities and mixed quantities (AC and DC) regardless of the waveform.

AUTOMATIC DATA HOLD*

The DATA HOLD function makes it possible to hold the digitally displayed measured value. The held measured value appears on the digital display. The actual measured value continues to be shown on the analog scale.

AUTORANGING / MANUAL RANGE SELECTION

The measured values are selected with rotary switch. The measuring range is automatically matched to the measured value. The measuring range can also be selected manually via the AUTO/MAN push button.

CONTINUITY TEST

This permits testing for short circuit and open circuit. In addition to the display, a facility of sound signal is available.

TEMPERATURE MEASUREMENT

It is possible to use all models of RM series,in direct connection of temperature sensor Pt 100 / Pt 1000. The meters automatically detects the type of sensors connected to it & displays directly measured temperature.

SIGNALLING IN THE CASE OF A BLOWN FUSE

The display FUSE points to a blown fuse.

POWER ECONOMIZING CIRCUIT

The meter disconnects automatically when the measured value remains unchanged for about 10 minutes and no operating control was operated during this time. The disconnection facility can be disabled.

OVERLOAD WARNING

A sound signal indication violation of the overload limits.

PROTECTIVE HOLSTER FOR ROUGH DUTY

A holster of soft rubber with tilt stand protects the meter against damage in the case of shock and drop. The rubber material makes for the meter to stand firmly even on vibrating surface.

TOP MODEL RM18

The top model RM18 features a 4 3/4 digit display (31 000 digits)as well as the following additional functions : Event counter, measurement of the duration of the event, time counter (stop watch), data compare, dB measurment, wide-range capacitance measurement.

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SPECIFICATIONS RM 11...16

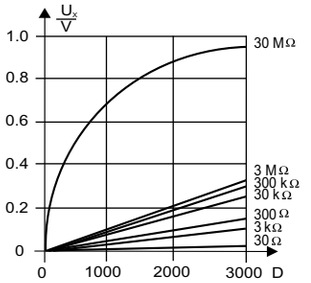
Meas. function	Measuring range	Inherent deviation of the digital display ± (...% of meas. val. + ...digits) for reference condition						Resolution	Input impedance			Inherent deviation of the digital display ± (...% of meas. val. + ...digits) for reference condition					4) Overload capacity		Measuring function
	RM	11	12	13	14	15	16					12	13	14	15	16	Overload value	Overload duration	
V⎓	30.00 mV	0.5 +3 5)					0.5 + 3 5)	10 µV	> 10GΩ // < 40 pF			0.5 +3 5)				0.5 + 3 5)	1000 V DC	cont.	V⎓
	300.0mV	0.5 + 3					0.5 + 3	100 µV	> 10GΩ // < 40 pF			0.5 + 3				0.5 + 3			
	3.000 V	0.25 +1					0.1 + 1	1 mV	11MΩ // < 40 pF			0.25 +1				0.1 + 1			
	30.00 V	0.25 + 1					0.1 + 1	10 mV	10MΩ // < 40 pF			0.25 + 1				0.1 + 1			
	300.0 V	0.25 + 1					0.1 + 1	100 mV	10MΩ // < 40 pF			0.25 + 1				0.1 + 1			
	1000 V	0.35 + 1					0.1 + 1	1 V	10M Ω// < 40 pF			0.35 + 1				0.1 + 1			
V~	3.000 V	0.75 + 2(10... 300 D) 0.75 + 1 (> 300 D)					0.75 + 3 (> 10 D)	1 mV	11MΩ // < 40 pF			0.75 + 2(10... 300 D) 0.75 + 1 (> 300 D)				0.75 + 3 (> 10 D)	AC effective sinusoidal		V~
	30.0 V							10 mV	10MΩ // < 40 pF										
	300.0 V							100 mV	10MΩ // < 40 pF										
	1000 V							1 V	10MΩ // < 40 pF										
V⎓~	3.000 V	---	---	---	---	---	0.75 + 3 (> 10 D)	1 mV	11MΩ // < 40 pF			---	---	---	---	0.75 + 3 (> 10 D)			V⎓~
	30.00 V	---	---	---	---	---		10 mV	10MΩ // < 40 pF			---	---	---	---				
	300.0 V	---	---	---	---	---		100 mV	10MΩ // < 40 pF			---	---	---	---				
	1000 V	---	---	---	---			1 V	10MΩ // < 40 pF			---	---	---	---				
									Voltage drop. approx.										
									12S	13S	14S / 15S/16S								
A⎓	300.0 µA	---	---	1.0 + 5 (> 10D)			0.5 + 5 (> 10 D)	100 nA	---	---	15 mV	---	---	1.0 + 5 (> 10D)		0.5 + 5 (> 10 D)	0.36 A	cont.	A⎓
	3.000 mA	1.0 + 5 (> 10D)		1.0 + 2			0.5 + 2	1 µA	15 mV	15 mV	150 mV	1.0 + 5 (> 10D)		1.0 + 2		0.5 + 2			
	30.00 mA	0.25 + 2		1.0 + 5 (<10 D)			0.5 + 5 (> 10 D)	10 µA	150 mV	150 mV	650 mV	0.25 + 2		1.0 + 5 (<10 D)		0.5 + 5 (> 10 D)			
	300.0 mA	1.0 + 2					0.5 + 2	100 µA	1 V	1 V	1 V	1.0 + 2				0.5 + 2			
	3.000 A	---	1.0 + 5 (> 10 D)				1.0 + 5 (> 10 D)	1 mA	---	100 mV	100 mV	---	1.0 + 5 (> 10 D)			1.0 + 5 (> 10 D)	7)	7)	
	10.00 A	---	1.0 + 2				1.0 + 2	10 mA	---	300/270mV	270 mV	---	1.0 + 2			1.0 + 2			
A~	3.000 mA	---	---	1.5 + 2 (> 10 D)			---	1 µA	---	---	150 mV	---	---	1.5 + 2 (> 10 D)		---	0.36 A	cont.	A~
	30.00 mA	1.5 + 2 (> 10 D)		---	---	---	---	10 µA	150 mV	150 mV	---	1.5 + 2 (> 10 D)		---	---	---			
	300.0 mA	1.5 + 2 (> 10D)					---	100 µA	1 V	1 V	1 V	1.5 + 2 (> 10D)				---			
	10.00 A	---	1.5 + 2 (> 10 D)				---	10 mA	---	300/270mV	270 mV	---	1.5 + 2 (> 10 D)			---	7)	7)	
A~	30.00 A 2)	1.5 + 2	---	---	---	---	---	10 mA	150 mV	---	---	1.5 + 2	---	---	---	---	0.36 A	cont.	A~
	300.0 A 2)	(> 10 D)	---	---	---	---	---	100 mA	1 V	---	---	(> 10 D)	---	---	---	---			
A⎓~	3.000 mA	---	---	---	---	---	1.5 + 4 (> 10 D)	1 µA	---	---	150 mV	---	---	---	---	1.5 + 4 (> 10 D)	12 A	10 min	A⎓~
	300.0 mA	---	---	---	---	---	1.5 + 4 (> 10 D)	100 µA	---	---	1 V	---	---	---	---	1.5 + 4 (> 10 D)			
	10.00 A	---	---	---	---	---	1.75 + 4 (> 10 D)	10 mA	---	---	270 mV	---	---	---	---	1.75 + 4 (> 10 D)			
									No-load voltage										
Ω	30.00 Ω	0.5 + 3 5)					0.4 + 3 5)	10 mΩ	max. 3.2 V			0.5 + 3 5)				0.4 + 3 5)	1000 V DC AC effective sinusoidal	10 min	Ω
	300.0 Ω	0.5 + 3					0.4 + 3	100 mΩ	max. 3.2 V			0.5 + 3				0.4 + 3			
	3.000 kΩ	0.4 + 1					0.2 + 1	1Ω	max. 1.25 V			0.4 + 1				0.2 + 1			
	30.00 kΩ	0.4 + 1					0.2 + 1	10Ω	max. 1.25 V			0.4 + 1				0.2 + 1			
	300.0 kΩ	0.4 + 1					0.2 + 1	100Ω	max. 1.25 V			0.4 + 1				0.2 + 1			
	3.000 MΩ	0.6 + 1					0.4 + 1	1 kΩ	max. 1.25 V			0.6 + 1				0.4 + 1			
	30.00 MΩ	2.0 + 1					2.0 + 1	10 kΩ	max. 1.25 V			2.0 + 1				2.0 + 1			
⊣▶⊢	2.000 V	0.25 + 1					0.1 + 1	1 mV	max. 3.2 V			0.25 + 1				0.1 + 1			⊣▶⊢
										Discharge resistance	$U_{0\ max}$								
F	30.00 nF	---	---	---		1.0 + 3 6)		10 pF		250 kΩ	2.5 V	---	---	---	1.0 + 3 6)		1000 V DC / AC effective sinusoidal	10 min	F
	300.0 nF	---	---	---		1.0 + 3		100 pF		250 kΩ	2.5 V	---	---	---	1.0 + 3				
	3.000 µF	---	---	---		1.0 + 3		1 nF		25 kΩ	2.5 V	---	---	---	1.0 + 3				
	30.00 µF	---	---	---		3.0 + 3		10 nF		25 kΩ	2.5 V	---	---	---	3.0 + 3				
									Sensor	F_{min} V ⎓	F_{min} V ~								
Hz	300.0 Hz	---	---	---				0.1 Hz		1 Hz	45 Hz	---	---	---			≤ 3 kHz: 1000V ≤ 30 kHz: 300V ≤100 kHz: 30 V	cont.	Hz
	3.000 kHz	---	---	---		0.5 + 1 8)		1 Hz		1 Hz	45 Hz	---	---	---		0.5 + 1 8)			
	30.00 kHz	---	---	---				10 Hz		10 Hz	45 Hz	---	---	---					
	100.0 kHz	---	---	---				100 Hz		100 Hz	100 Hz	---	---	---					
%	2.0... 98.0 %	---	---	---		1 Hz.....1kHz: ± 5 D 9) 1Hz.....10kHz:±5 D/kHz 9)		0.1 %		1 Hz	---	---	---	---		1 Hz.....1kHz: ± 5 D 9) 1Hz.....10kHz:±5 D/kHz 9)			%
°C	- 200.0... + 200.0 C	2 Kelvin + 5 D 10)						0.1 °C	Pt 100	---	---	2 Kelvin + 5 D 10)					1000 V DC AC effective sinusoidal	10 min	°C
	+ 200.0... + 850.0 C	1.0 + 5 10)						0.1 °C		---	---	1.0 + 5 10)							
	-100.0... + 200.0 C	2 Kelvin + 2 D 10)						0.1 °C	Pt 1000	---	---	2 Kelvin + 2 D 10)							
	+ 200.0 ... + 850.0 C	1.0 + 2 10)						0.1 °C		---	---	1.0 + 2 10)							

1) TRMS measurement
2) Direct display with clip-on transformer 1000:1
4) At 0°C... + 40°C
5) With zero setting; w/o zero setting + 35 digits
6) With zero setting; w/o zero setting + 50 digits
7) RM multi 13S (w/o 16 A fuse!) : 16A cont., 20A for 5 min;
RM multi 14S... 16S: 12A for 5 min, 16A for 30s

8) Range 3 V ≃: U_E = 1.5 V_{rms} ... 100 V_{rms}
30 V ≃: U_E = 15 V_{rms} ... 300V_{rms}
300 V ≃: U_E = 150 V_{rms} ... 1000V_{rms}

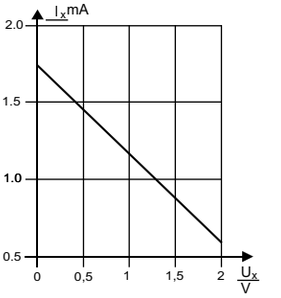
9) On the range 3V⎓ rectangular signal positive at one end 5 ... 15 V, f = const., not 163.84 Hz or integer multiple.
10) Without sensor

MEASURING VOLTAGE WITH RESISTANCE MEASUREMENT 12S ... 16S



Voltage U_x across the resistance R_x to be measured as a function of measuring range and display.

MEASURING CURRENT WITH DIODE TEST AND / OR CONTINUITY TEST 12S ... 16S



Measuring current I_x as a function of the displayed voltage U_x on the device under test.

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Redefine Innovative Metering

SPECIFICATIONS RM18

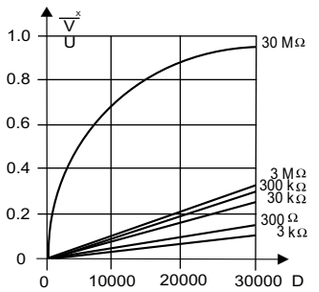
Meas. function	Measuring range		Resolution	Input impedence		Inherent error of the digital display ± (...% of rdg.+... digits) at reference conditions		2) Overload capacity		Meas. function
				⎓	⏦ 1) ≂ 1)	⎓	⏦ 1) ≂ 1)	Overload value	Overload duration	
V	300.00 mV		10 µV	>10 GΩ	5 MΩ// < 40 pF	0.05 + 3; 0.05 + 20 3)	1.0 + 30 (> 600 Digit)	1000 V DC AC RMS sinusoidal	cont.	**V**
	3.0000 V		100 µV	11 MΩ	5 MΩ// < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
	30.000 V		1 mV	10 MΩ	5 MΩ// < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
	300.00 V		10 mV	10 MΩ	5 MΩ// < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
	1000.0 V		100 mV	10 MΩ	5 MΩ// < 40 pF	0.05 + 3	0.5 + 30 (> 300 Digit)			
dB	See table below			—	as at V~	—	± 0.5 dB 4)			**dB**
				Voltage drop. approx.						
				⎓	≂ 1)	⎓	≂ 1)			
mA	300.00 µA		10 nA	15 mV	15 mV	0.2 + 20	1.2 + 30 (> 300 Digit)	0.36 A	cont.	**mA**
	3.0000 mA		100 nA	150 mV	150 mV	0.2 + 10	1.2 + 30 (> 300 Digit)			
	30.000 mA		1 µA	30 mV	30 mV	0.05 + 10	1.2 + 50 (> 300 Digit)			
	300.00 mA		10 µA	300 mV	300 mV	0.2 + 10	1.2 + 30 (> 300 Digit)			
A	3.0000 A		100 µA	150 mV	150 mV	0.5 + 10	1.2 + 50 (> 300 Digit)	12A 5)	5 min	**A**
	10.000 A		1 mA	400 mV	400 mV	0.5 + 10	1.2 + 30 (> 300 Digit)			
				No-load voltage	Short circuit current					
Ω	300.00 Ω		10 mΩ	max. 4.00 V	max. 1 mA	0.1 + 6; 0.1 + 30 3)		1000 V DC AC RMS sinusoidal	1 min	Ω
	3.0000 kΩ		100 mΩ	max. 1.25 V	max. 100 µA	0.1 + 6				
	30.000 kΩ		1 Ω	max. 1.25 V	max. 10 µA	0.1 + 6				
	300.00 kΩ		10 Ω	max. 1.25 V	max. 1 µA	0.1 + 6				
	3.0000 MΩ		100 Ω	max. 1.25 V	max. 0.1 µA	0.1 + 6				
	30.000 MΩ		1k Ω	max. 1.25 V	max. 0.1 µA	1.0 + 6				
→|	3.0000 V-		1mV	max. 4.00 V	---	0.2 + 3				→|
				Discharge resist.	U_{0max}					
F	3.000 nF		1 pF	1.5 MΩ	4 V	1.0 + 8; 1.0 + 60 3)		1000 V DC AC RMS sinusoidal	1 min	**F**
	30.00 nF		10 pF	1.5 MΩ	4 V	1.0 + 8; 1.0 + 30 3)				
	300.0 nF		100 pF	150 kΩ	4 V	1.0 + 3				
	3.000 µF		1 nF	150 kΩ	4 V	1.0 + 3				
	30.00 µF		10 nF	15 kΩ	2 V	1.0 + 3				
	300.0 µF		100 nF	1.5 kΩ	2 V	5.0 + 6				
	3000 µF		1 µF	1.5 kΩ	2 V	5.0 + 6				
	10000 µF		10 µF	1.5 kΩ	2 V	5.0 + 6				
				f_{min} 6)						
Hz	300.00 Hz		0.01 Hz	10 Hz		0.1 + 3 7)		⎓< 3 kHz; 1000 V ⎓< 30 kHz; 300 V ⎓< 100 kHz 30 V	cont.	**Hz**
	3.0000 kHz		0.1 Hz	10 Hz						
	30.000 kHz		1 Hz	10 Hz						
	100.00 kHz		10 Hz	100 Hz						
°C	Pt 100	- 200.0... + 100.0 °C	0.1 °C	–	–	0.5 Kelvin + 3 8)		1000 V DC AC rms sine	1 min.	**°C**
		+ 100.0... + 850.0 °C	0.1 °C	–	–	0.5 + 3 8)				
	Pt 1000	- 100.0... + 100.0 °C	0.1 °C	–	–	0.5 Kelvin + 3 8)				
		+ 100.0... + 850.0 °C	0.1 °C	–	–	0.5 + 3 8)				

dB ranges

Measuring ranges	Display span at reference voltage U = 0.775 V	Display span at reference voltage U_{ref} (V)
300 mV ~	- 48 dB... - 8 dB	- 40 dB... + 110 dB
3 V~	- 38 dB... + 12 dB	-60 dB... + 100 dB
30 V~	- 18 dB... + 32 dB	- 80 dB... + 80 dB
300 V~	+ 2dB... + 52 dB	- 100 dB... + 60 dB
1000 V~	+ 22 dB... + 63 dB	- 110 dB... + 40 dB
	Display (dB) = 20 lg U_x(V) / 0.775 V	Display (dB) = 20 lg U_x(V) / U_{ref} (V)

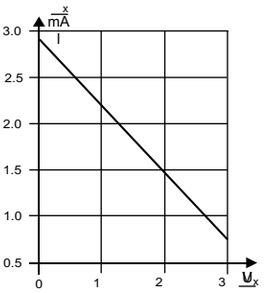
1) TRMS measurement
values < 100 digit (<500 digit for measuring range 300mV) will be supressed
2) At - 10 °C... + 40 °C
3) With zero adjuster; without zero adjuster
4) At a resolution of 0.01 dB
5) 16 A for 30s
6) Lowest measurable frequency with a sinusoidal measuring signal which is symmetrical to zero
7) Range
3 V ⎓ : U_e = $1V_{eff/rms}$ ... **10 $V_{eff/rms}$**
30 V ⎓ : U_e = $10V_{eff/rms}$ ... 100 $V_{eff/rms}$
300 V ⎓ : U_e = $100V_{eff/rms}$ ... 1000 $V_{eff/rms}$
8) Without sensor

MEASURING VOLTAGE WITH RESISTANCE MEASUREMENT RM18



Voltage U_x across the resistance R_x to be measured as a function of measuring range and display.

Measuring current with diode test and / or continuity test Rm18



Measuring current I_x as a function of the displayed voltage U_x on the device under test.

REFERENCE CONDITIONS

Ambient temperature	+23 C° ± 2K
Relative humidity	45%... 55%
Frequency of the measured quantity	45 Hz... 65 Hz
Waveform of the measured quantity	Sinusoidal
Battery voltage	8V ± 0.1 V

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DISPLAY

LCD field (65 mm x 30 mm) with analog indication and digital display and with annunciators for unit of measurement, function and various special functions.

ANALOG

Indication	LCD scale with pointer
Scale length	55 mm on V ⎓ and A ⎓; 47 mm on all other ranges
Scaling	∓ 5…0…± 30 with 35 scale divisions on ⎓, 0…30 with 30 scale divisions on all other ranges
Polarity indication	With automatic reversal
Overrange indication	By triangle
Sampling rate	20 readings/s, On Ω 10 readings/s

DIGITAL

Display/ height of numerals	RM 12… 16, 7 segment numerals / 15mm RM 18: 7-segment numerals/12 mm
Number of counts	RM 12…16, 3 ¾ digit ⏢ 3100 counts RM 18: 4 ¾ digit ⏢ 31000 counts
Overange display	"**OL**" is shown
Polarity display	"-" sign is shown, When positive pole to "⊥"
Sampling rate	2 readings/s, On Ω and °C:1 reading/s

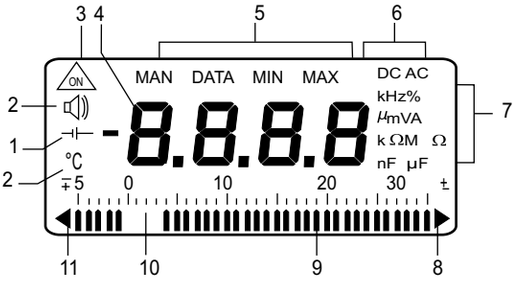
POWER SUPPLY

Battery	9-V flat cell battery: manganese-dioxide cell according to IEC 6 F 22. alkaline Manganese cell according to IEC 6 LR 61 or corresponding NiCd storage battery
Operating time	With alkaline-manganese cell: RM 12…16 Approx. 220 hours on V⎓ , A⎓ Approx. 80 hours on V ~, A~ (Rm12…15) approx. 60 hours on V~, A~ (RM16) with interface operation times x 0.7 RM 18S: approx. 120 hours on V⎓ approx. 90 hours on V~, A~ A ⎓
Battery test	Automatic display of the " ⊣⊢ " symbol, when the battery voltage drops below approximately 7 V.

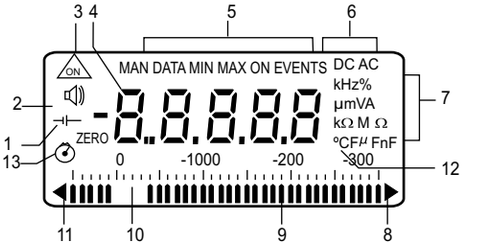
FUSES

Fuse link for the ranges up to 300 mA	FF 1.6A/1000V 6.3 mm x 32 mm; Switching capacity 10 kA on 1000 VAC/DC and ohmic load; in connection with power diodes protects all current measuring ranges up to 300 mA
Fuse link for ranges up to 10A	16 A / 1000 V or 15 A / 1000 V 10 mm X 38 mm, Switching capacity 30 kA on 600 V ~ and ohmic load; protects the 3 A and 10 A ranges up to 1000 V

DISPLAY RM12... 16



DISPLAY RM MULTI 18



1. Display with low battery voltage
2. Display with sound signal on
3. Symbol for “CONTINUOUSLY ON”
4. Digital display with indication of decimal point and polarity
5. Display with manual range selection as well as with data and MIN/MAX hold
6. Display of the selected function
7. Display of the unit of measurement
8. Display with overrange
9. Pointer for analog indication
10. Scale for analog indication
11. Indication that negative analog range is exceeded
12. Display of the unit °C when measuring temperature
13. Display with time counter switched on

ELECTRICAL SAFETY

(Except 13S)

Protection class	As per IEC 61010-1:2001	
Overvoltage category	III	IV
Nominal voltage	1000 V	600V
Degree of pollution	2	2
Nominal Test Voltage	6.7KV~ acc. To IEC 348/DIN VDE 0411	

ELECTROMAGNETIC COMPATIBILITY EMC

Emission	EN 61326: 2002 class B
Immunity	EN 50082-1: 1992 EN 61326: 2002 IEC 61000-4-2 8 KV atmospheric discharge 4 KV contact discharge IEC 61000-4-3 3 V/m

DATE INTERFACE

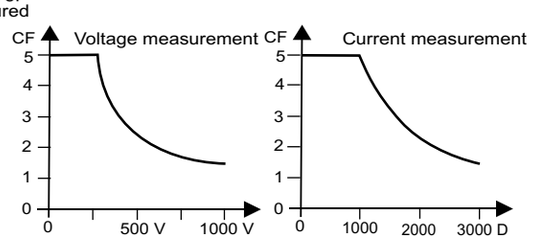
Type	RS-232C, serial, according to DIN 19241
Data transmission	Optical, with infrared light through the case
Baud rate	8192 bit/s

INFLUENCE QUANTITIES AND VARIATIONS FOR RM12... 16

Influence quantity	Influence range	Measured quantity / measuring range	Variation [1] ± (...% of meas. val. +... digits) 12S...	14S	15S	16S
Temperature	0 °C... + 21 °C and +25 °C... + 40 °C	30/300 mV ⎓	1.0 + 3			1.0 + 1
		3... 300 V ⎓	0.15 + 1			0.1 + 1
		1000 V ⎓	0.2 + 1			0.1 + 1
		V ~	0.4 + 2			0.3 + 2
		300 µ A [2] ... 300 mA ⎓	0.5 + 1			0.15 + 1
		3A / 10 (16) A ⎓	0.5 + 1			
		A ~	0.75 + 1			0.75 + 3
		30 Ω [2]	0.15 + 2			
		300 Ω	0.25 + 2			0.15 + 2
		3 kΩ ... 3 MΩ	0.15 + 1			0.1 + 1
		30 MΩ	1.0 + 1			0.6 + 1
		30 nF [2] ... 3 µF	---		0.5 + 2	
		30 µF	---		2.0 + 2	
		Hz	---		0.5 + 1	
		%	---		± 5 D	
		-200... + 200 °C	0.5 K + 2			
		+ 200... + 850 °C	0.5 + 2			
Frequency of the measured quantity	15 Hz... < 30 Hz	3 ... 300 V ~	---		---	**1.0 + 3**
	30 Hz... < 45 Hz		---		---	**0.5 + 3**
	> 65 Hz... 400Hz		2.0 + 3			**0.5 + 3**
	> 400 Hz... 1 kHz		2.0 + 3			**1.0 + 3**
	> 1kHz... 20 kHz		---		---	**2.0 + 3**
	15 Hz... < 30 Hz	1000 V ~	---		---	**1.0 + 3**
	30 Hz... < 45 Hz		---		---	**0.5 + 3**
	> 65 Hz... 1kHz		3.0 + 3			**2.0 + 3**
	15 Hz... < 30 Hz	A~	---			**1.0 + 3**
	30 Hz... <45 Hz		---			**0.5 + 3**
	> 65 Hz... 1kHz		2.0 + 3			**3.0 + 3**
	Crest factor CF 1 ...3	V ~ [4], A~ [4]	---		---	**± 1% of rdg.**
	> 3 ...5		---		---	**± 3 % of rdg.**

The permissible crest factor CF of the AC quantity to be measured is a function of the displayed value :

Waveform of the measured quantity [3]

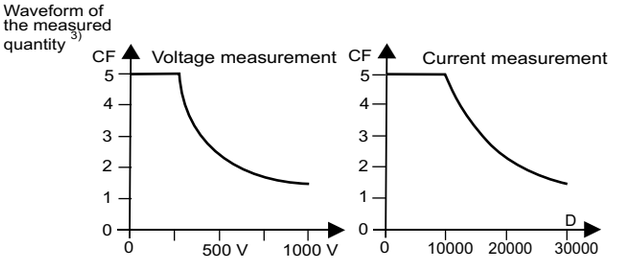


Influence quantities and variations for RM18

Influence quantity	Influence range	Measured quantity / measuring range [1]	Variation [2] ± (...% of meas. val. +... digits)
Temperature	- 10 °C...+ 21 °C and +25 °C... + 40 °C	V ⎓	0.05 + 3
		V ~, V ⎓	0.2 + 30
		300 µA / 3 mA	0.2 + 3
		30 mA ⎓	0.1 + 3
		300 mA... 10 A ⎓	0.2 + 3
		300 µA... 300 mA ⎓	0.3 + 30
		3A / 10 A ⎓	0.5 + 30
		300 Ω	0.1 + 5
		3 kΩ ... 3 MΩ	0.1 + 3
		30 MΩ	0.6 + 3
		30 nF... 3 µF	0.5 + 3
		30 µF	2.0 + 3
		Hz	0.1 + 3
		-200... + 100 °C	0.5 Kelvin + 2 D
		+ 100... + 850 °C	0.5 + 2
Frequency of the measured quantity	15 Hz... < 45 Hz	300 mV ~	1.0 + 20
	65 Hz... < 200 Hz		1.4 + 20
	> 15 Hz...< 30 Hz	3... 300 V~	1.0 + 20
	> 30 Hz... < 45Hz		0.5 + 20
	> 65 Hz... 400 Hz		0.5 + 20
	> 400 Hz... 1 kHz		1.0 + 20
	> 1 k Hz... 20 kHz		2.0 + 20
	15 Hz... < 30 Hz	1000 V ~	1.0 + 20
	30 Hz... < 45 Hz		0.5 + 20
	> 65 Hz... 1 kHz		2.0 + 20
	15 Hz... < 45 Hz	A~	1.0 + 20
	> 65 Hz... 1kHz		1.0 + 20
	Crest factor CF 1 ...3	V ~ [4], A~ [4]	± 1% of rdg.
	> 3 ...5		± 3 % of rdg.

The permissible crest factor CF of the AC quantity to be measured is a function of the displayed value :

Waveform of the measured quantity [3]



Influence quantity	Influence range	Measured quantity / measuring range	Variation 12S... 16S
Battery voltage	⊣⊢ [5] ... < 7.9 V	V ⎓	± 2 D
	> 8.1 V... 10.0 V	V ~	± 4 D
		A ⎓	± 4 D
		A~	± 6 D
		30Ω / 300Ω / °C	± 4 D
		3 kΩ ... 30 MΩ	± 3 D
		nF, µF	± 1 D
		Hz	± 1 D
		%	± 1 D
Relative humidity	75 % 3 days Meter off	V ⎓ A ⎓ Ω F Hz %	1x Intrinsic error
DATA		°C	± 1 D
MIN / MAX		V ⎓, A ⎓	± 2 D

Influence quantity	Influence range	Measured quantity / measuring range	Variation
Battery voltage	⊣⊢ [5] ... < 7.9 V	V ⎓	± 6 D
	> 8.1 V... 10.0 V	V ~	± 30 D
		A ⎓	± 30 D
		A~	± (1% of rdg.+ 10D)
		Ω	± 10 D
		3 nF... 30 µF	± 10 D
		Hz	± 6 D
		°C	± 5 D
Relative humidity	75 % 3 days Meter off	V, dB, A, Ω, F, Hz °C	1x inherent deviation
DATA		V, dB, A, Ω, Hz	± 20 D
		F	± 2 D
MIN / MAX		V, dB, A, Ω, Hz	± 10 D
		°C, F	± 1 D

1) With temperature; Error data is per 10 K change in temperature.
   With frequency; Error data is valid from a display of 300 digits.
2) With zero setting
3) With unknown waveform (crest factor CF > 2), the measurement must be made with manual range selection.
4) Except for sinusoidal waveform
5) From the time the symbol "⊣⊢" appears.

Influence quantity	Influence range	Meas. range 12... 16	Damping
Common mode voltage	Disturbance variable max. 1000 V ~	V ⎓	> 120 dB
	Disturbance variable max. 1000 V ~ 50 Hz, 60 Hz sinusoidal	3 V ~ 30 V ~	> 70 dB
		300 V ~	> 70 dB
		1000 V ~	> 60 dB
Normal mode voltage	Disturbance variable V ~, nom. value of meas, range at a time, max. 1000 V ~, 50 Hz, 60 Hz sinusoidal	V ⎓	> 50 dB
	Disturbance variable max. 1000 V --	V ~	> 110 dB

RESPONSE TIME
RESPONSE TIME FOR RM12... 16 (AFTER MANUAL RANGE SELECTION)

Measured quantity measuring range	Response time of analog indication	Response time of digital display	Leap function of the measured quantity
V ⎓ V ~ A ⎓ A ~	0.7 s	1.5 S	from 0 to 80% of the upper range limit
30Ω... 3MΩ	1.5 S	2 S	from ∞ to 50% of the upper range limit
30MΩ	4 S	5 S	
→|←	0.7 S	1.5 S	from 0 to 50% of the upper range limit
nF, µF, °C		max. 1... 3S	
300 Hz, 3kHz		max. 2 S	
30, 100kHz		max. 0.7 S	
% (1 Hz)		max. 9 S	
% (≥10 Hz)		max. 2.5 S	

1) With zero setting
2) With temperature; Error data is per 10 K change in temperature.
   With frequency; Error data is valid from a display of 10% of the measuring range.
3) With unknown waveform (crest factor CF > 2), the measurement must be made with manual range selection.
4) Except for sinusoidal waveform
5) From the time the symbol "⊣⊢" appears.

Influence quantity	Influence range	Meas. range Rm18	Damping
Common mode voltage	Disturbance variable max. 1000 V ~	V ⎓	> 120 dB
	Disturbance variable max. 1000 V ~ 50 Hz, 60 Hz sinusoidal	300 mV 30 V ~	> 80 dB
		300 V ~	> 70 dB
		1000 V ~	> 60 dB
Normal mode voltage	Disturbance variable V ~, nom. value of meas, range at a time, max. 1000 V ~, 50 Hz, 60 Hz sinusoidal	V ⎓	> 48 dB
	Disturbance variable max. 1000 V --	V ~	> 110 dB

RESPONSE TIME FOR RM18 (AFTER MANUAL RANGE SELECTION)

Measured quantity measuring range	Response time of analog indication	Response time of digital display	Leap function of the measured quantity
V ⎓ V ~ A ⎓ A ~	0.7 S	1.5 S 300 mV ⎓: 8S	from 0 to 80% of the upper range limit
30Ω... 3MΩ	1.5 S	2 S	from ∞ to 50% of the upper range limit
30MΩ	4 S	5 S	
→|←	0.7 S	1.5 S	
3 nF... 300 µF	max. 2 S	max. 2S	from 0 to 50% of the upper range limit
3 000 µF	max. 7 S	max. 7 S	
10 000 µF	max. 14 S	max. 14 S	
> 10 Hz	max. 1.5 S	max. 1.5 S	
°C		max. 3 S	

ENVIRONMENTAL CONDITIONS

Working temperature range	RM 12... 16: -10 °C... + 50 °C RM 18, -20 °C... + 50 °C
Storage temperature range	-25 °C... + 70 °C (excl. batteries)
Climatic class	RM 12... 16: 2z/-10/50/70/75% with reference to VDI/VDE 3540 RM 18: 2z/-20/50/70/75% with reference to VDI/VDE 3540
Altitude above sea level	up to 2000m

MECHANICAL CONFIGURATION

Protection type	For meters; IP 50, for connection sockets: IP 20
Dimensions	84 mm x 195 mm x 35 mm
Weight	0.35 kg, approx., incl. battery

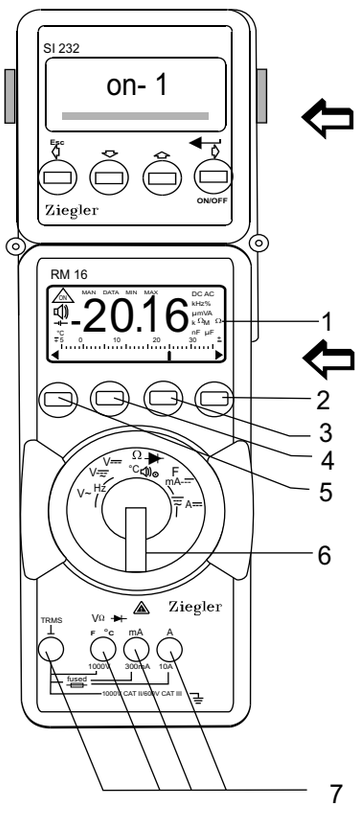
SCOPE OF DELIVERY

1 multimeter
1 Probe Set
1 copy of operating instructions
1 test certificate
1 rubber holster with tilt stand and carrying strap
warranty card
1 set of extra fuses.

WARRANTY

1 year against defects in materials and workmanship & calibration from the date of purchase.

OPERATING CONTROLS RM12... 18



Option storage adapter RM SI232

Analog-to-digital multimeter RM

1 LC display
2 ON/OFF push-button
3 Push-button for data hold and MIN/MAX storage
4 Push-button for manual range selection
5 Multi-function push-button
6 Switch for measurement functions
7 Connection sockets with automatic blocking system

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Redefine Innovative Metering

Economical Digital Multimeters (4000 Counts)

RA 10	4000 Counts 3 ¾ Digital Multimeters
RA 14	4000 Counts 3 ¾ TRMS Digital Multimeters

RA series economical digital multimeters are suited for universal, general applications in the electrical and electronics fields, as well as in radio and television service, training and education
They are of especially flat design, and thus fit into any bag. The protective cover, which is provided as standard accessory, can be opened at an angle for convenient reading from the workbench, and provides for easy transport. RA series multimeter come with 4000 count display.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance-Digital Measuring Instruments	DIN 43751
Test Equipment and test procedures -Degree of protection provided by enclosures (IP Code)	DIN EN 60529 DIN VDE 0470 part 1
Safety requirements for electrical equipment for measurement, control and laboratory use.	IEC 61010-1:2001 DIN EN 61010 part 1 VDE 0411 -1
Generic emission standard; Residential, commercial and light industry.	EN 61326:2002
Reliability of measuring and control equipment.	VDI/VDE 3540

SELECTION OF INPUT RESISTANCE FOR VOLTAGE MEASUREMENT

In addition to the usual voltage input with one resistance value of 10 MΩ, which is selected via ~ or V ⎓, this measuring instrument provides the electrician with an additional selector switch position for $V_{400K\Omega}$ with an input resistance of approx. 400 kΩ. This allows for the avoidance of negative influences from capacitive coupling during voltage measurements in power supply systems.

EFFECTIVE VALUE FOR DISTORTED WAVEFORM (*RA* 14)

The built-in effective value transducer allows for effective value measurement (TRMS) indepedent of waveform for alternating magnitudes (AC).

HOLD

By pressing the HOLD/ON key, the currently displayed measurement value can be held and “HOLD” is simultaneously displayed.

MIN/MAX

The minimum and maximum values which were present at the input of the measuring instrument after activation of the MIN MAX mode can be selectively ‘retained’ with the MIN MAX function. The most important application is the determination of the minimum or maximum value during long term observation of measurement quantities. MIN/MAX has no effect on the analog display; it continues to display the current measurement value.

AUTOMATIC/MANUAL MEASURING RANGE SELECTION

The measurement quantities are chosen with the rotary selector switch. The measuring range is automatically adjusted to the measurement value. The measuring range can also be manually selected with the AUTO/MAN button.

DIODE AND CONTINUITY TESTING

This provides for the testing of the polarity of diodes, as well as inspection for short-circuits and circuit interruptions. In addition to the display, resistance of less than 40 Ω are indicated with an acoustic signal.

OVERLOAD WARNING

An acoustic signal occurs, if the range limit value is exceeded.

ENERGY SAVING CIRCUIT

The instrument is switched off automatically, if none of the operating elements have been activated for about 30 minutes.

PROTECTIVE COVER FOR ROUGH OPERATING CONDITIONS

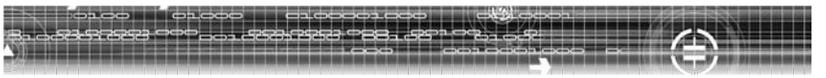
A protective cover of ABS with a built-in stand protects the instrument against jolts and falls. It also secures the test probes for one-hand operation, and allows for winding of the measurement cable which provides protection during transport.

CALIBRATION

RA series multimeters are calibrated using Fluke 5500 & Wavetek 9100. These sources are calibrated at regular intervals.

THEFT PROTECTION

Company name and name of the user can be entered into the field next to the display with an indelible etching needle for identification of the owner.



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CHARACTERISTIC VALUES FOR *RA* 10 AND 14

Meas. Function	Measuring Range			Resolution	Input Impedance 100 pF/XΩ		Digital display inherent deviation at reference condition ±(...% of rdg. + ...digits)	Overload capacity [1]	
	RA	10	14		V ⎓ / ~	$V_{400K\Omega}$		Overload value	Overload Duration
V ⎓	400.0mV	•	•	100mV	>20MΩ	~400KΩ	0.75+2	720V ⎓	Continuous
	4.000V	•	•	1mV	11MΩ	~400KΩ	0.5+2		
	40.00V	•	•	10mV	10MΩ	~400KΩ			
V_{400KW} ⎓	400.0V	•	•	100mV	10MΩ	~400KΩ			
	600V	1000V	•	1V	10MΩ	~400KΩ			
V~	400.0mV	•	•[2]	100mV	>20MΩ	~400KΩ	1.5+5 [3]	720V ~ effective sine	Continuous
	4.000V	•	•[2]	1mV	11MΩ	~400KΩ	1+5 [3]		
	40.00V	•	•[2]	10mV	10MΩ	~400KΩ			
$V~_{400KW}$	400.0V	•	•[2]	100mV	10MΩ	~400KΩ			
	600V	•	•[2]	1V	10MΩ	~400KΩ	1+10 [3]		
					Approx. voltage drop at max. meas. current				
A ⎓	40.00mA	•	•	10mA	450mV		0.8+2	480mA	Continuous
	400.0mA	•	•	100mA	1.5V				
	10.00A [6]	•	•	10mA	750mV		1.5+5	[6]	[6]
A~	40.0mA	•	•[2]	10mA	450mV		1+5 [3]	480mA	Continuous
	400.0mA	•	•[2]	100mA	1.5V				
	10.00A [6]	•	•[2]	10mA	750mV		2+5 [3]	[6]	[6]
					Open - circuit voltage				
Ω	400.0Ω	•	•	100mΩ	approx. 0.5V		0.8+5	420 V DC/AC effective sine	10 min
	4.000KΩ	•	•	1Ω			0.8+2		
	40.00KΩ	•	•	10Ω					
	400.0KΩ	•	•	100Ω					
	4000KΩ	•	•	1KΩ			1+5		
	40.00MΩ	•	•	10KΩ			2+5		
BUZZER	400.0	•	•	100mΩ			Acoustic signal for 0...< 40Ω		
DIODE	3.000	1V	•	1m	approx. 3V		2+10		
F	4.000nF	5nF	•	1pF			3+40 [4]	420 V DC/AC effective sine	10 min
	40.00nF	50nF	•	10pF			3+10 [4]		
	400.0nF	500nF	•	100pF			3+10		
	4.000mF	5µF	•	1nF					
	40.00mF	50µF	•	10nF			5+10		
		200µF		100nF	fmin				
Hz [5]	10.000Hz	•		0.001Hz	10Hz		0.2+2 10Hz...1kHz:±5D 1kHz...10kHz:±5D/kHz	≤1KHz : 600V ≤10KHz : 400V ≤400KHz : 40V	Continuous
	100.00Hz	•	•	0.01Hz	10Hz				
	1.0000KHz	•	•	0.1Hz	10Hz				
	10.000KHz	•	•	1Hz	10Hz				
	100.00KHz	•	•	10Hz	10Hz				
	400.0KHz	500kHz	•	100Hz	100Hz				
°C	0...+1300°C	•		1°C	Sensor K,NiCr-Ni		2+3D	$500V_{rms}$ DC/AC	10min

1) At 0°C ... + 40 °C
2) Effective value measurement (TRMS) for *RA* 14
   TRMS measurement is independent of waveform.
3) The specified inherent deviation is valid for the *RA 14*
   from an indication of '0200'
4) With zero adjustment 'REL' ; without zero adjustment
   +300 digits in 4nF range
   +30 digits in 40nF range
5) Indication of the frequency measurement expanded up to 9999 digits.
6) max. 10 A/30 min
   12 A/5 min
   16 A/30 sec

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REFERENCE CONDITIONS

Ambient temperature	+ 23 °C ± 2 °K
Relative humidity	45 % ... 55 %
Frequency of meas. quantity	Sine 50 Hz
Operating voltage	*RA* 12: 3 V ± 0.1 V *RA* 14: 8 V ± 0.1 V

DISPLAY

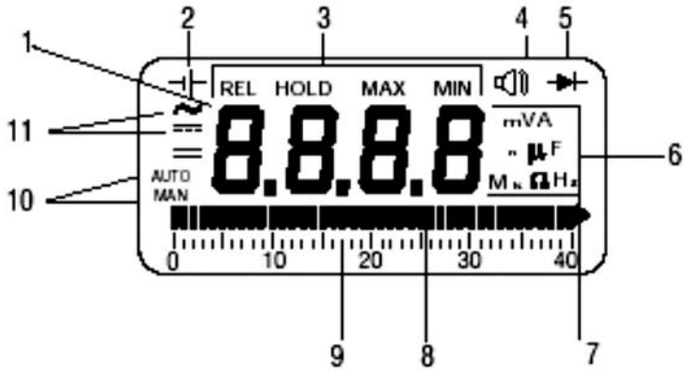
LCD display field (50 mm x 30 mm) with analog and digital display and with display of measurement unit, type of current and various special functions.

DIGITAL

Display	7 segment
Character height	10 mm
Number of digits	3 3/4 digit ⩙ 3999 steps
Overflow display	‚4000' with blinking ‚4'
Polarity display	‚–' sign is displayed when plus pole at ‚⊥'
Measurement rate	3 measurements/s for V, I, ⌖. 1 measurement/s for capacitive and frequency measurements.

ANALOG

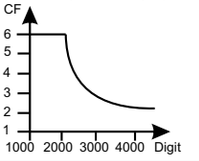
Display	LCD scale with bar graph display
Scale lengtht	40 mm
Scaling	0...40 with 40 scale division
Polarity display	with automatic reversal
Overflow display	Bar with triangle
Measurement rate	20 measurement/s



***RA* display :**

1 Digital display with comma and polarity display
2 Low Battery Indication
3 Display for REL and HOLD as well MIN MAX storage
4 Continuity test display:
speaker symbol appears when acoustic signal is switched on
5 Display for diode measurement
6 Measurement unit display
7 Display for exceeding of measuring range
8 Indicator for analog display
9 Scale for analog display
10 Display for automatic or manual measuring range selection
11 Display for selected type of current (AC or DC)

INFLUENCE VARIABLES AND EFFECTS

Influence variable	Influence range		Meas. Quantity / Meas. Range	Influence Effect
Temperature	0 ⌖C ... +21 ⌖C and +25 ⌖C ... +40 ⌖C		V ⎓ V ⎓ A ⎓ A ⎓ Ω F Hz	0.1 x intrinsic error / K
Waveform *RA* 14	Crest factor CF	1 ...1.4	4, 40, 400V, mA, A [2]	± 1% of rdg.
		> 1.4 ... 5		± 5% of rdg.
Measuring Magnitude Waveform [1]	The allowable crest factor CF of the alternating magnitude to be measured is dependent upon the displayed value: 			

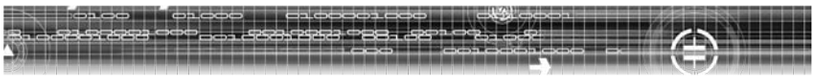
1) For unknown waveform (crest factor CF > 2) measurement to be made with manual range selection
2) Except for sine waveform

Influence variable	Influence range (max. resolution)	Frequency	Inherrent Error at Ref. (...%rdg + ...digits)
Frequency V_{AC}	4, 40, 400V	20Hz ... <50Hz >50Hz ... 500Hz	2 + 3
	400mV, 600V	20Hz ... <50Hz >50Hz ... 100Hz	2 + 3

Influence Variable	Influence Range	Meas. Quantity / Meas. Range	Influence Effect
Relative humidity	55 ... 75%	V ≃ A ≃ W F Hz	1 x Inherent error

Influence Variable	Interference Magnitude	Meas. Quantity / Meas. Range	Attenuation
Common Mode Interference Voltage	600V DC/AC 50Hz sinusoidal	All V DC	>100 dB
	600V DC	All V DC	>100 dB
	600V AC 50Hz sinus	400mV / 4V AC	>80 dB
		40V AC	>63 dB
		400V AC	>43 dB
		600V AC	>23 dB
Series - Mode Interference voltage	AC 50/60 Hz	V DC	>43 dB
	MAX. 600V DC	V AC	>55 dB

Aux. Voltage Influence (without ⊣⊢ display) — all ranges except AC : ± 5 D; AC range : ± 20 D



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POWER SUPPLY

Battery	*RA* 12: 2 ea. 1.5 V mignon cell Zinc-carbon cell per IEC R6 Alkaline manganese dry cell per IEC LR 6 *RA* 14: 9 V flat cell battery Zinc-carbon cell per IEC 6 F 22 Alkaline manganese dry cell per IEC 6 LR 61
Service life	*RA* 12: Zinc-carbon cell: approx. 300 hours Alkaline manganese dry cell: approx. 600 hours *RA* 14: Zinc-carbon cell: approx. 150 hours Alkaline manganese dry cell approx. 300 hours
Battery test	Automatic display of „ ⊥" symbol when battery voltage falls below following value: *RA* 12: approx. 2.3V *RA* 14: approx. 7V

FUSING

Fuse for ranges up to 400 mA	FF 1.6 / 500 V; 6.3 mm x 32mm Breaking capacity 50 kA at 500 V ~ and non-reactive load, cos φ < 0.2; protects all current measuring ranges up to 400 mA in connection with power diodes
Fuse for 10 A range	FF 16 A / 500 V; 6.3 mm x 32 mm breaking capacity 50 kA at 500 V ~ and non-reactive load, cos φ < 0.2

ELECTRICAL SAFETY

Protection class	II per IEC 1010-1/EN 61010-1/VDE 0411-1	
Overvoltage Classification	II	III
Nominal voltage	600 V	300 V
Contamination level	2	2
Test voltage	3.7 kV ~IEC 1010-1/EN 61010-1 VDE 0411-1	

ELECTROMAGNETIC COMPATIBILITY

Interference emission	EN 50081-1: 1992 EN 55022: 1987 class B
Interference immunity 10 A range	EN 50082-1 : 1992 EN 61000-4-2:8kV air discharge EN 61000-4-3: 3 V/m EN 61000-4-4; 0.5 kV

AMBIENT CONDITIONS

Operating temperature range	-10 C ... + 50 °C
Storage temperature range	- 25 °C ... + 70 °C (without batteries)
Climate classification	2z/-10/50/70/75% in correspondence with VDI/VDE 3540
Relative humidity	45 ... 75 %
Elevation	up to 2000 m

MECHANICAL DESIGN

Protection	Instruments: IP 50 Connector sockets: IP 20
Dimensions	W x H x D: 92 mm x 154 mm x 25 mm
Weight	Approx. 0.2 Kg with battery

INCLUDED EQUIPMENT

1 Multimeter
1 Probe set
1 Copy Operating Instructions
1 Protective Case with tilt stand

Designation	Type	Order Code
Analog-Digital multimeter	*RA* 12	33040
Analog-Digital multimeter with TRMS	*RA* 14	33050
RA Fuse 1.6A		42124
RA Fuse 16A		42198
RA Probe Set		42199
Safety cover ZIEGLER 12/14		42200

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Redefine Innovative Metering

Digital Insulation and Continuity Tester.

RI 10	1kV 999MΩ Insulation Tester
RI 20	1kV 2GΩ Insulation Tester

RI series analog digital insulation testers are suitable for measurement of insulation resistance on electrically dead motors, transformers, generators, household appliances, cables & other equipments and systems with test voltages upto $1000V_{DC}$.
This handy instrument is very useful for onsite service and maintenance job.
The equipment under test should be electrically dead before carrying the test for the protection of equipment and operating person.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance-Digital Measuring Instruments	DIN 43751
Test Equipment and test procedures -Degree of protection provided by enclosures (IP Code)	DIN EN 60529 DIN VDE 0470 part 1
Safety requirements for electrical equipment for measurement, control and laboratory use.	IEC 61010-1:2001 VDE 0411 -1
Generic emission standard; Residential, commercial and light industry.	EN 61326:2002
Reliability of measuring and control equipment.	VDI/VDE 3540
Devices for testing, measuring and monitoring protective safety measures in system with voltages of upto 1000 V A.C. and 1500 V D.C. - General requirements - Insulation resistance measuring instruments - Low-resistance measuring instruments	IEC/EN 61557 VDE 0413 Part 1 Part 2 Part 3

TEST VOLTAGES 50V/ 100V/ 250V/ 500V/ 1000V

Test voltages from 50V to 1000V can be selected for Insulation Resistance measurement. It covers all insulation tests up to 1000V.

INSULATION RESISTANCE MEASUREMENT

The instrument is capable of measuring insulation resistance from 10 KΩ...999 MΩ

HANDS-FREE CONTINUITY TESTING

Continuity testing (0-10Ω with acoustic signal) can be done without pressing the test button. In addition to the display function, an acoustic signal can be activated which sounds if the adjustable limit value is violated.

VOLTMETER

Instrument measures voltages > 25V ... 600 V AC/DC.

AUTOMATIC DISCHARGE FOR CAPACITIVE CIRCUITS AFTER TEST MEASUREMENT

Capacitive devices under test, such as cables and windings, that get charged during the test, are discharged by the tester.

LIVE CIRCUIT DETECTION

Displays presence of voltages>25V irrespective of function selected.

PRE-SELECTABLE MEASUREMENT TIME FOR INSULATION RESISTANCE MEASUREMENT:

In normal course, the insulation test terminates and the measured insulation resistance value remains on display for 2 sec after the test key is released. With the **Pre-selectable measurement time** feature, the insulation test continues and the measured value remains on the display for the pre-determined time. Pre-selectable time: 10 sec - 5 min.

PRE-SELECTABLE LIMIT CHECKS (GO/ NO-GO OPTION) FOR MΩ

An acoustic signal can be generated when the measured value of insulation resistance falls below an adjustable limit value.

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LEAD RESISTANCE NULL FACILITY

The instrument provides a facility to compensate the resistance of the leads for an accurate measurement of low resistance.

STORAGE OF MIN/MAX VALUES

In addition to the display of the actual measured value, the minimum or maximum value can constantly be updated or stored.

STORAGE MEMORY FOR LAST 50 READINGS

The instrument provides a facility to store and recall 10 values in each of the 5 ranges of insulation resistance measurement.

BLOWN FUSE INDICATION

The display FUSE points to a blown fuse.

LOW BATTERY INDICATION

Automatic display of the Symbol " ⊣├ " when battery cells are exhausted.

STOP WATCH

This function allows you to measure elapsed time up to 1 hour.

AUTO-POWER OFF FUNCTION

The instrument turns off automatically, if any of the keys or the selector switch have not been activated for about 10 minutes in insulation range and 5 minutes in other ranges or can be switched to continuous operation.

PROTECTIVE HOLSTER FOR ROUGH DUTY

A holster of soft rubber with tilt stand protects the meter against damage in the case of shock and drop.

LOW RESISTANCES MEASUREMENT: (0.01 Ω ... 99.9 Ω)

Low resistances can be measured up to 99.9 Ω. There are two measuring ranges for Low Ω.: 9.99Ω and 99.9Ω.

SPECIFICATION

Meas. Function	Range	RI 10	RI 20	Resolution	Accuracy +(...% of rdg +...Digit)	Overload value and duration
Insulation 1) Resistance MΩ 1) U_N=50V, 100V	0.01 MΩ to 0.99 MΩ	●	●	10 KΩ (0.01 MΩ)	± 3% ± 2D	1200 Vrms 10 sec
	>1.0 MΩ to 9.9 MΩ	●	●	100 KΩ (0.1 MΩ)	± 5% ± 2D	
	>10 MΩ to 99 MΩ	●	●	1 MΩ	± 30%	
Insulation 1) Resistance MΩ 1) U_N=250V, 500V,1000V	0.01 MΩ to 9.99 MΩ	●	●	10 KΩ (0.01 MΩ)	± 3% ± 2D	
	>10.0 MΩ to 99.9 MΩ	●	●	100 KΩ (0.1 MΩ)	± 5% ± 2D	
	>100 MΩ to 999MΩ	●	●	1 MΩ	± 30% service error	
	>1GΩ to 2GΩ		●	10 k Ω		
Low Ohms 2) Ω	0 to 9.99Ω	●	●	0.01Ω at 210 mA	± 3% ± 2D	
	≥10 Ω to 99.9Ω	●	●	0.1 Ω at 21 mA	± 5% ± 2D	
Continuity 2)	0 to 9.99Ω	●	●	0.01Ω at 210 mA	± 3% ± 2D	
	>10Ω to 99.9Ω	●	●	0.1Ω at 21 mA	± 5% ± 2D	
V AC/DC	25V to 450V	●	●	1V	± 2% ± 3D	
	450V to 600V	●	●	1V	± 3%	

1) For Insulation Resistance Range:
- Terminal voltage on open circuit (DC) -0% + 30% of rated voltage
- Short circuit current < 2 mA
- Test current on load 1 mA at minimum pass values of Insulation as specified in VDE 0413 Part 1.

2) For Low Ohms/Continuity Ranges:
- Open circuit voltage 5V + 1V D.C.
- Lead Resistance Compensation: 0 - 9.99Ω

ANALOG

Display	LCD scale with bar graph pointer
Scale Length	47 mm
Scaling	0...30 with 30 graduations
Overflow Display	Bar with triangle

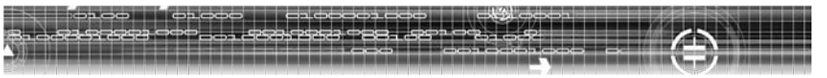
DIGITAL

Display/Char.Height	7 segment digits/ 12mm
Number of Digits	3 digit for MΩ and Ω 4 digit for Stop watch
Overflow Display	OL

POWER SUPPLY

Battery	6 x 1.5 V cells IEC LR6 (Nickel cadmium rechargeable cells may be used)
Service Life	Typically 2500 x 5 sec. operations
Battery Test	Automatic display of the Symbol " ⊣├ " when battery voltage < 5.4V.

Note : *Battery cells should not be left in the instrument which may remain unused for extended period of time.*



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AUTO TURN OFF

Meter turns off automatically, if any of the keys or the selector switch have not been activated for about 10 minutes in insulation range and 5 minutes in other ranges.

Fuse 500 mA(F)/440V H.B.C.10kA min (32mm x 6mm)

REFERENCE CONDITIONS

Ambient Temp.	+23 °C ± 2 K
Relative Humidity	45% ... 55%
Battery Voltage	8V ± 0.1V
Voltage Measurement	AC (Sine), 50/60 Hz

DISPLAY

LCD display field (65 mm x 30mm) with analog indication and digital display and with display of unit of measured quantity and functions.

ELECTRICAL SAFETY

Protection class	II per IEC 61010-1/EN61010-1/ VDE0411-1	
Overvoltage Category	II	III
Nominal Voltage	600V	300V
Contamination degree	2	2
Test Voltage	3.7KV-per IEC 61010-1 /EN61010-1	

ENVIRONMENTAL CONDITIONS

Temperature Coefficient	<0.1% per °C
Operating Temp.	-20°C...+40°C (full range) -20°C...+60°C (upto 100MΩ)
Storage Temp.	-25°C...+65°C
Relative Humidity	90% RH at 40°C max.

MECHANICAL DESIGN

Protection	Instrument : IP 50 For terminal socket : IP 20 according to DIN VDE 0470 part 1 / EN60529
Dimensions	W x H x D 84 mm x 195 mm x 35 mm
Weight	500 g including battery

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Analog High-Voltage Insulation Tester

RI 5000A	5kV 1TΩ Battery Operated Insulation Tester
RI 5000AK	5kV 1TΩ Battery Operated Insulation Tester
RI 5000AKM	5kV 1TΩ Battery & Crank Operated Insulation Tester

RI series analog insulation testers are suitable for measurement of insulation resistance on electrically dead motors, transformers, generators, household appliances, cables & other equipments and systems with test voltages upto $5000V_{DC}$.
The equipment under test should be electrically dead before carrying the test for the protection of equipment and operating person.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance- Direct acting Electrical Measuring Instruments	DIN EN 60051
Test Equipment and test procedures -Degree of protection provided by enclosures (IP Code)	DIN EN 60529 DIN VDE 0470 part 1
Safety requirements for electrical equipment for measurement, control and laboratory use.	IEC 61010-1:2001 VDE 0411 -1
Generic emission standard; Residential, commercial and light industry.	EN 61326:2002
Reliability of measuring and control equipment.	VDI/VDE 3540
Devices for testing, measuring and monitoring protective safety measures in system with voltages of upto 1000 V A.C. and 1500 V D.C. - General requirements - Insulation resistance measuring instruments	IEC/EN 61557 VDE 0413 Part 1 Part 2

TEST VOLTAGES 5000V

This instrument is suited for the non-destructive measurement of insulation resistance in electrical systems at machines and transformers and in cables as well as within the electrical equipment of, for example, locomotives, tram systems and ocean going vessels, with eight selectable test voltages upto 5kV.

VOLTAGE MEASUREMENT TO 2000V

With the voltage measuring ranges, test objects can be checked for the absence of voltage in network of upto 2kV. This is important for insulation resistance measurement, because extraneous voltages distort measurement results.

DISCHARGE OF CAPACITIVE DEVICES UNDER TEST

Capacitive devices under test such as cables and coils, which might be discharged to test voltage, are discharged by the measuring instrument. The drop in voltage can be observed at the needle gauge.

MEASUREMENT IN ACCORDANCE WITH En61557 PART 1 & 2 / IS 2992 (VDE 0413)

Measuring current is equal to 1mA at a test voltage of 100V, 250V, 500V and 1000V.

MEASUREMENT CABLES WITH HEAVY- DUTY INSULATION

The measurement cables with heavy-duty insulation are permanently connected for safety and technical reasons. Possible danger caused by the unintentional removal of cables is thus avoided, for example when charging occurs due to capacitive test objects.

NEEDLE GAUGE WITH LED'S

Three LEDs arranged within the needle gauge make reading easier. The lamp lights up which is located next to the scale, which is assigned to the selected measuring range. During the measurement sequence, the green LED indicates whether or not the battery charge is sufficient for the measurement.

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MEASURING RANGES

Insulation Resistance (For Battery + Crank Generator)

Scale/ Standard	Nominal/Open Circuit Voltage U_N/U_O	Meas. Range	Nom. Current I_N	S-c Current I_K	Intrinsic error [1]	Deviation
1 VDE0413	100V / 250V 500V / 1000V	100k Ω ------ 100M Ω	1mA	1.3mA	±2.5%	±30% of rdg.
2	100V / 250V 500V / 1000V	10k Ω 1T Ω	1mA	1.3mA	±5%	
2	1500V 2000V 2500V 5000V	10k Ω 1T Ω	0.7mA 0.5mA 0.4mA 0.1mA	1.3mA	±5%	

SPECIFICATIONS

Insulation Resistance (For Mains) :

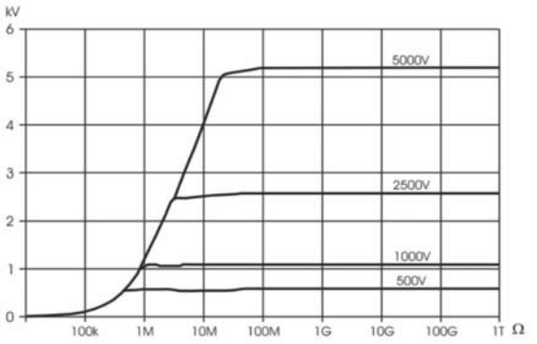
Scale/ Standard	Nominal/Open Circuit Voltage U_N/U_O	Meas. Range	Nom. Current I_N	S-c Current I_K	Intrinsic error [1]	Deviation
1 VDE0413	100V / 250V 500V / 1000V	100k Ω ------ 100M Ω	1mA	1.3mA	±2.5%	±30% of rdg.
2	100V / 250V 500V / 1000V	10k Ω 1T Ω	1mA	1.3mA	±5%	
2	1500V 2000V 2500V 5000V	10k Ω 1T Ω	0.7mA 0.5mA 0.4mA 0.1mA	1.3mA	±5%	
2	100V / 250V 500V / 1000V 1500V 2000V 2500V 5000V	10MΩ	1mA 1mA 0.7mA 0.5mA 0.4mA 0.1mA	1.3mA	±6.5%	

DIRECT AND ALTERNATING VOLTAGE :

Measuring range	Frequency	Internal Resistance	Max. Allowable voltage	Intrinsic error [1]
0...2000V AC/DC	15...500Hz	5 M	2200VAC/DC max. 10s	±5%

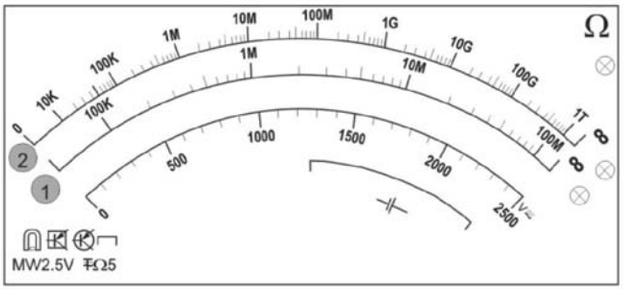
[1] referring to scale length

U-RDiagrams for RI 5000A



DISPLAY

Movement: Core-magnet moving-coil mechanism
Scale length: 111.5mm (longest scale)



REFERENCE CONDITIONS

Ambient Temperature	+23 °C ± 2K
Relative Humidity	45 ... 55%
Meas. Quantity Frequency	50Hz ±10 Hz (for voltage measurements)

LINE VOLTAGE

Waveform	Sine, deviation between effective and rectified value <1%
Battery voltage	8V ±1%
Operating position	Horizontal

Power Supply Voltage (Mains) : 9V

POWER SUPPLY (BATTERY)

Standard or Storage Battery	6 nos. 1.5V single cell per IEC R20
Working range	6 V ... 10 V
Battery service life	100 hours for no-load and Intermittent operation 7500 measurements for test voltage of 1000 V with meas. Resistance of 1 MΩ 15000 measurements for test voltage of 500V with meas. resist. of 500 kΩ measurement of 5 s - pause 25 s
Crank generator (Optional)	2 to 3 r.p.s. With moderate strength The W LED ON signals sufficient Crank Frequency and consequently the Validity of measuring values
Nominal Voltage	7.5 V (at approx. 2.5 r.p.s.)
Nominal Power	4 W (at approx. 2.5 r.p.s.)

POWER SUPPLY (MAINS)

Nominal Power (Mains): 230V AC, ± 15%, 50Hz
Nominal Voltage : 9V

AMBIENT CONDITIONS

Operating Temperature	0°C ... + 40°C
Storage Temperature	-20°C ... + 60°C (without batteries)
Relative Humidity	max. 75%, condensation must be avoided
Elevation	up to 2000m

Ziegler

Redefine Innovative Metering

Analog-Digital Clamp Meter

RC 300A	300A Digital Clamp Meter with 44mm jaw
RC 1000A	1000A Digital Clamp Meter with 55mm jaw

RC series analog digital clamp meter are suitable for measuring high ampere AC current with other measurements like voltage, resistance, capacitance, frequency & temperature.
RC digital clamp meter are equipped with highly innovative design features which ensure high degree of safety and comfort for the user.

a) Rotating clamp jaws facilitate the measurement at physically awkward positions, vertical bus bars, conductors placed at positions difficult to access.

b) Clamp jaws can be opened or closed with the trigger placed at bottom side away from the jaws. This allows the user to place his/her hand at safer distance from live conductor. This greatly reduces exposure of human beings to electrical shocks

c) Location and design of trigger eliminates fatigues caused by single finger operation. It allows spreading the force required to open the jaws over more than one finger to ensure comfortable operation.

d) Comfortable operation of push buttons and function selector switch, in adverse field conditions.

GENERAL FEATURES:

APPLICABLE STANDARDS	
Product Performance-Digital Measuring Instruments	DIN 43751
Test Equipment and test procedures -Degree of protection provided by enclosures (IP Code)	DIN EN 60529 DIN VDE 0470 part 1
Safety requirements for electrical equipment for measurement, control and laboratory use.	IEC 61010-1:2001 VDE 0411 -1
Generic emission standard; Residential, commercial and light industry.	EN 61326:2002

LARGE JAW OPENING

Jaw opening of 44 mm for Standard wire diameter of 40 mm

NARROW BODY

Narrow housing for firm grip and easy to carry.

HIGH ACCURACY FOR LOW CURRENT MEASUREMENT

The clamp meter can measure accurately at not only the High currents but also Low current ranges.

USER SELECTABLE BACKLIT : (OPTIONAL)

It is possible to conduct measurement using the clamp meter during night time in darkness with the help of Backlit. The back lit can be switched ON or OFF by pressing a single key.

TEMPERATURE MEASUREMENT

Temperatures from -200 to 800°C using pt 100 and pt 1000 sensors.

AUTO POWER OFF

In order to save the power of the Batteries, the clamp meter will automatically shut OFF if it detects no activity for 10 minutes.

AUTO AND MANUAL RANGING MODES

In AUTO ranging mode the instrument automatically selects the range with best resolution depending on the applied input.
In MANUAL ranging mode range is user selectable using **MAN** key.

DIODE MEASUREMENT

For testing diode and transistors, diode measurement function is available.

ENCLOSURE PROTECTION FOR DUST AND WATER:

Applicable IP 50 for the housing and IP20 for terminals as per IEC60529

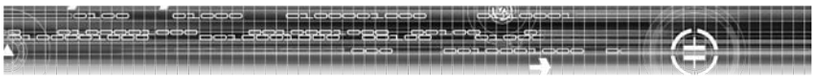
APPLICABLE INTERNATIONAL SAFETY STANDARDS

600 V CAT IV/1000V CAT III as per International Safety standard IEC 61010-1- 2001

DOUBLE MOLDED COVER FOR SOFT TOUCH AND FIRM GRIP OF THE INSTRUMENT

ANALOG SCALE

Analog scale that updates at the rate 20 times/sec to observe fluctuations in input.



Ziegler

Redefine Innovative Metering

CONTINOUS ON MODE

In this mode, AUTO POWER OFF is disabled.

DATA HOLD FUNCTION

By pressing DATA HOLD button, reading on the display can be latched for Hands free operation.

MIN,MAX FUNCTION

By pressing MIN/MAX button, the clamp meter will start recording latest Minimum and Maximum readings

NULL ZERO CORRECTION FOR RESISTANCE

For Low ohm measurement, the lead resistance can be compensated by pressing the shift key (Yellow Key)

NULL ZERO CORRECTION FOR CAPACITANCE

Null zero connection for capacitance. For nF range, stray capacitance can be compensated by shift key (Yellow Key)

SPECIFICATIONS :

Measuring function	Measuring range	Resolution	Input impedance	Intrinsic error of digital display ± (…% of rdg + …digit) at reference condition	Over load capacity [1]	
					Over load value	Overload duration
V dc	30.00 mV	10 µV	>10 GΩ // <40pF	0.5 + 3 [2]	1000 V DC AC eff / rms Sine wave	Continuously
	300.0 mV	100 µV	>10 GΩ // <40pF	0.5 + 3		
	3.000 V	1 mV	11 MΩ // <40pF	0.25 + 1		
	30.00 V	10 mV	10 MΩ // <40pF	0.25 + 1		
	300.0 V	100 mV	10 MΩ // <40pF	0.25 + 1		
	1000 V	1 V	10 MΩ // <40pF	0.35 + 1		
V ~	3.000 V	1 mV	11 MΩ // <40pF	0.75 + 2 (10….300 Digit) 0.75 + 1 > 300 Digit		
	30.00 V	10 mV	10 MΩ // <40pF			
	300.0 V	100 mV	10 MΩ // <40pF			
	1000 V	1V	10 MΩ // <40pF			
Ω			**No load voltage**			
	30.00 Ω	10 mΩ	Max. 3.2 V	0.5 + 3 [2]	1000 V DC AC eff / rms Sine wave	10 min
	300.0 Ω	100 mΩ	Max. 3.2 V	0.5 + 3		
	3.000 KΩ	1Ω	Max. 1.25 V	0.4 + 1		
	30.00 KΩ	10 Ω	Max. 1.25 V	0.4 + 1		
	300.0 KΩ	100 Ω	Max. 1.25 V	0.4 + 1		
	3.000 MΩ	1 KΩ	Max. 1.25 V	0.6 + 1		
	30.00 MΩ	10 KΩ	Max. 1.25 V	2.0 + 1		
⊣▶⊢	2.000 V	1 mV	Max. 3.2 V	0.25 + 1		
A ~ 300 A	30.00 A	0.01 A	-----	1.5 % + 5 Digits	360 A	Continuously
	300.0 A	0.1 A	-----	1.5 % + 5 Digits		
A ~ 1000 A	300.0 A	0.1 A	-----	1.5 % + 5 Digits	1100 A	Continuously
	1000 A	1 A	-----	1.5 % + 5 Digits		

Measuring Function	Measuring range		Resolution	Discharge resistance	U_0 max.	Intrinsic error of digital display ± (…% of rdg + …digit) at reference condition	Over load capacity [1]	
							Over load value	Over load duration
F	30.00 nF		10 pF	250 KΩ	2.5 V	1.0 + 3 [2]	1000 V DC AC eff / rms Sine	10 min
	300.0 nF		100 pF	250 KΩ	2.5 V	1.0 + 3		
	3.000 µF		1 nF	25 KΩ	2.5 V	1.0 + 3		
	30.00 µF		10 nF	25 KΩ	2.5 V	3.0 + 3		
				f min V dc	**f min V ~**			
Hz	300.0 Hz		0.1 Hz	1 Hz	45 Hz	0.5 + 1 [3]	≤ 3 kHz 1000 v ≤ 30 kHz; 300 V ≤100 kHz 30 V	Continuously
	3.000 KHz		1 Hz	1 Hz	45 Hz			
	30.00 KHz		10 Hz	10 Hz	45 Hz			
	100.0 KHz		100 Hz	100 Hz	100 Hz			
%	2.0....98.0%		0.1 %	2 Hz	-	2 Hz… 1kHz ± 5 Digit [4] 1 kHz … 10 kHz; ± 5 Digit / kHz [4]		
ºC	Pt 100	-200.0... +200.0 ºC	0.1 ºC	-	-	2 Kelvin + 5 Digit [5]	1000 V DC AC eff / rms Sine	10 min
		+200.0... +850.0 ºC	0.1 ºC			1.0 + 5 [5]		
	Pt 1000	-100.0... +200.0 ºC	0.1 ºC	-	-	2 Kelvin + 2 Digit [5]		
		+200.0... +850.0 ºC	0.1 ºC			1.0 + 2 [5]		

1) At 0º …. + 40 ºC

2) With zero adjustment, without zero adjustment + 35 digits

3) Range

3 V ac/dc: Ue = 1.5 V eff/rms … 100 V eff/rms
30 V ac/dc: Ue = 15 V eff/rms … 300 V eff/rms
300 V ac/dc: Ue = 150 V eff/rms … 1000 V eff/rms

4) On the range 3 V dc, square – wave signal positive on one side 5 … 15 V, f = const., not 163.84 Hz or integral multiple.

5) Without sensor

Influence Quantity	Range of Influence	Measured Quantity/ Measuring Range	Variation [1] ± (….% of rdg. + ….digits)
Temperature	0 °C +21 °C and +25 °C…+40°C	30/300 mV dc	1.0 + 3
		3...300 V dc	0.15 + 1
		1000 V dc	0.2 + 1
		V ~	0.4 + 1
		A ~	0.75 + 1
		30 Ω [2]	0.15 + 2
		300 Ω	0.25 + 2
		3 KΩ – 3 MΩ	0.15 + 1
		30 MΩ	1.0 + 1
		30 nF [2] – 3 µF	0.5 + 2
		30 µF	2.0 + 2
		Hz	0.5 + 1
		%	± 5 digits
		-200…+200 °C	0.5 K + 2
		+200…+850°C	0.5 + 2
Frequency of the measured quantity	15 Hz...<30 Hz	3…300 V ~	-
	30 Hz...<45 Hz		-
	> 65 Hz...400 Hz		2.0 + 3
	>400 Hz…1 KHz		2.0 + 3
	>1 KHz…20 KHz		-
	15 Hz…<30 Hz	1000 V ~	
	30Hz …<45 Hz		
	>65 Hz … 1 KHz		3.0 + 3
	15 Hz…<30 Hz	A ~	
	30Hz …<45 Hz		
	>66 Hz… 1 kHz		
Wave form of the measured quantity [3]	Crest factor CF	V ~ [4] A ~ [4]	
Battery Voltage	[5] …< 7.9 V > 8.1 V …10.0 V		
		V DC	2 Digit
		V~	4 Digit
		A ~	6 Digit
		30Ω / 300 Ω/˚C	4 Digit
		3 kΩ – 30MΩ	3 Digit
		nF, µF	1 Digit
		Hz	1 Digit
		%	1 Digit
Relative humidity	75% 3 Days Meter off	V~,VDC A~ Ω F Hz % ˚C	1 x intrinsic error
HOLD	-		± 1 digits
MIN/MAX	-	V ac/dc , A ~	± 2 digits

1) With temperature: Error data apply per 10 K change in temperature.
With frequency: Error data apply to a display from 300 digits onwards.

2) With zero adjustment.

3) With unknown waveform (crest factor CF > 2), measure with manual range selection

4) With the exception of sinusoidal waveform.

5) After the " " symbol is displayed

ZIEGLER CURRENT TRANSFORMER SERIES

Ziegler Instruments, leader in measuring instruments unveils its world class plastic cased Square and Round Current Transformers. Ziegler Current Transformers or Ziegler CT's as they are better known are encased with polycarbonate housing conforming to UL 94-V0. These are available for different ratings, VA burdens & Accuracy classes. The catalog describes the different possible combinations.

GENERAL SPECIFICATION

- **APPLICABLE STANDARD:** IEC/EN 60044 -1, BS 3938,
- **CASE:** 10% glass filled polycarbonate, flame retardant grades classified UL 94V-0.
- **CONNECTION:** Two connection on each side. M4 screws with self lifting clamp strap assembly for Ziegler series and 1 connection on each side M4 screws with self lifting clamp strap for Ziegler CT series.
- **INSULATION CLASS:** E (120˚C max)
- **SYSTEM VOLTAGE:** 720V maximum
- **TEST VOLTAGE:** 4kV 50 Hz 1 min
- **OPERATING FREQUENCY:** 50Hz or 60Hz
- **RATED PRIMARY RATING:** 30A to 4000A
- **RATED SECONDARY OUTPUT:** 5A standard (1A optional)
- **RATED BURDEN:** 1, 1.25, 1.5, 2.5, 3.75, 5, 7.5,10, 12.5, 15,20, 30, 45, 60 VA
- **CLASS OF ACCURACY:**
  0.2, 0.2S for laboratory and power measurement
  0.5, 0.5S for accurate measuring, kWh
  1 for general measurement
  3 for indicating instruments
- **AMBIENT TEMPERATURE :** -20˚C...+45˚C
- **STORAGE TEMPERATURE :** -50˚C...+80˚C
- **THERMAL SHORT CIRCUIT CURRENT (I_{TH}) :** $60xI_n$
- **DYNAMIC SHORT CIRCUIT CURRENT (I_{DYN}) :** $2.5xI_{th}$
- **INSTRUMENT SECURITY FACTOR:** 2.5, 5, 10

CONNECTION- WIRE CONSUMPTION IN [VA]

Cross	For secondary current Isec=1A								For secondary current Isec=5A										
section	L= distance from CT to measuring point								L= distance from CT to measuring point										
(mm2)"	1m	2m	4m	6m	8m	10m	15m	20m	1m	2m	4m	6m	8m	10m	15m	20m	30m	40m	50m
2x0.5	1.837	3.670	7.350	11.02	---	---	---	---	0.074	0.150	0.300	0.440	0.590	0.740	1.110	1.480	2.220	2.960	3.700
2x0.75	1.235	2.470	4.940	7.410	9.880	---	---	---	0.049	0.100	0.200	0.290	0.390	0.490	0.740	0.980	1.470	1.960	2.450
2x1	0.918	1.840	3.670	5.510	7.340	9.180	---	---	0.037	0.070	0.150	0.220	0.300	0.370	0.560	0.740	1.110	1.480	1.850
2x1.5	0.613	1.230	2.450	3.680	4.940	6.130	9.200	---	0.025	0.050	0.100	0.150	0.200	0.250	0.380	0.500	0.750	1.000	1.250
2x2.5	0.368	0.740	1.470	2.210	2.940	3.680	5.520	7.360	0.015	0.030	0.060	0.090	0.120	0.150	0.230	0.300	0.450	0.600	0.750
2x4	0.233	0.470	0.930	1.400	1.860	2.330	3.500	4.660	0.009	0.020	0.040	0.050	0.070	0.090	0.140	0.180	0.270	0.360	0.450
2x6	0.149	0.300	0.600	0.890	1.190	1.490	2.230	2.980	0.003	0.006	0.012	0.018	0.024	0.030	0.045	0.060	0.090	0.120	0.150

TABLE NO. 1

VA BURDEN GUIDE

- Moving iron ammeter (frame dimension of 48, 72, 96, 144) 1.0 VA
- Bimetal instruments (.../5A) 3.0 VA
- Bimetal and Moving iron instruments (.../5A) 3.5 VA
- Wattmeter 5.5 VA
- Power factor meter 4.0 VA
- Current transducer 0.5 VA
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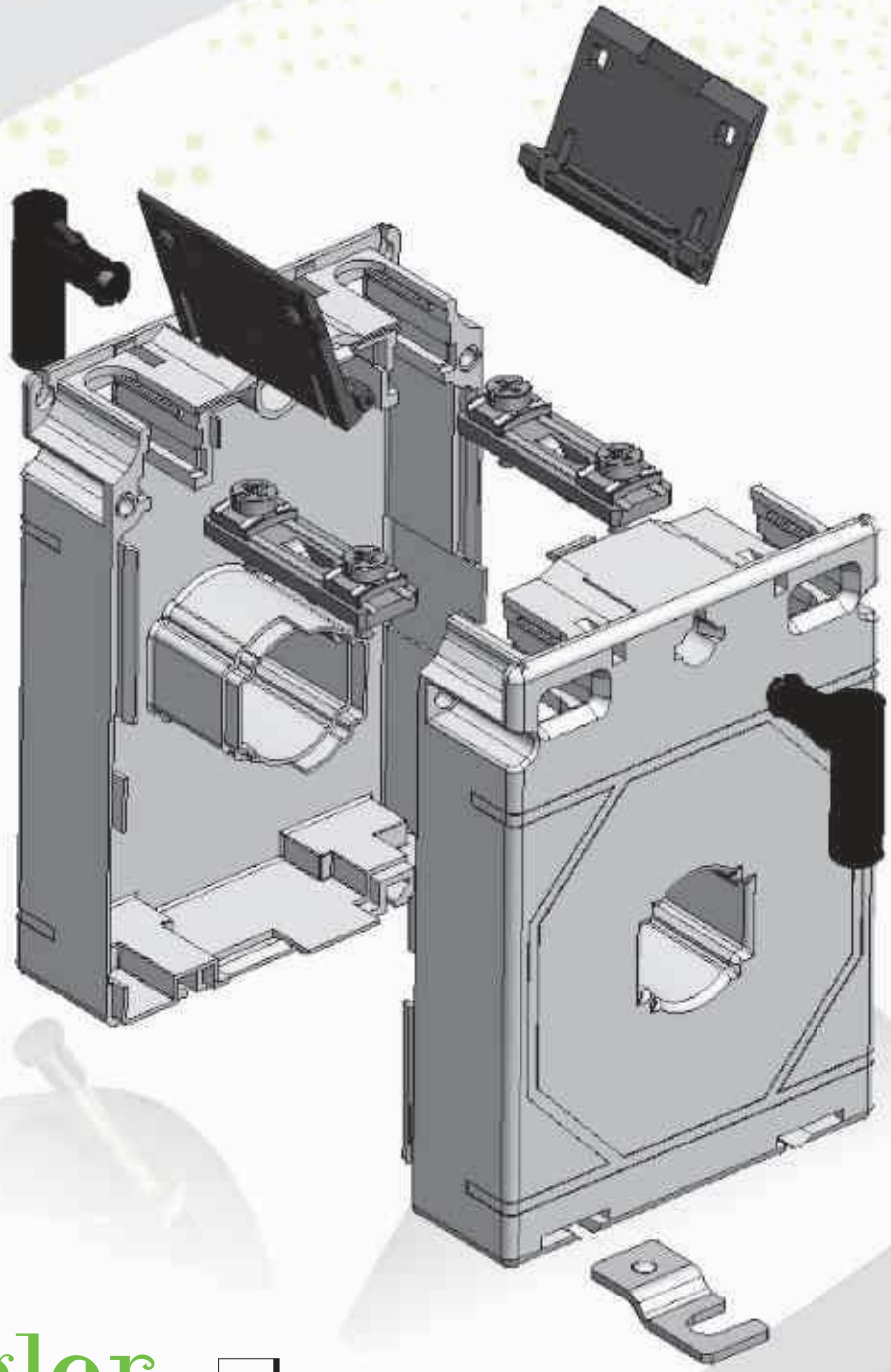
- kWh-meter 2.5 VA
- Trivector meter 5.0 VA

FEATURES

- Comprehensive measurement of class accuracy
- Cost effective moulded case current transformer
- Wide range of system current ratings bus bar sizes, case widths and apertures
- Various mounting options like wall mounting, cable mounting, bas bar mounting, DIN rail mounting
- Wire sealable terminal covers

2012-Z-GCA

Current Transformers



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2x1	0.918	1.840	3.670	5.510	7.340	9.180	---	---	0.037	0.070	0.150	0.220	0.300	0.370	0.560	0.740	1.110	1.480	1.850
2x1.5	0.613	1.230	2.450	3.680	4.940	6.130	9.200	---	0.025	0.050	0.100	0.150	0.200	0.250	0.380	0.500	0.750	1.000	1.250
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INDEX

Current Range	Primary Conduction upto		CT Width	Type	Page
	FOR BUSBAR	FOR RING			
SQUARE TYPE CT's					
40...300	-	14 mm	40 mm	ZiS 4.14B	
50...400	-	21 mm	40 mm	ZiS 4.21B	
50...300	-	14 mm	31 mm	ZiS 5.14A	
50...400	10.5 mm x 20.5 mm	21 mm	31 mm	ZiS 5.21A	
75...600	10.5 mm x 30.5 mm	25 mm	31 mm	ZiS 5.30A	
50...300	-	14 mm	51 mm	ZiS 5.14D	
50...400	10.5 mm x 20.5 mm	21 mm	51 mm	ZiS 5.21D	
50...600	10.5 mm x 30.5 mm	25 mm	51 mm	ZiS 5.30D	
50...600	-	22 mm	40 mm	ZiS 6.20B	
50..400	20.5 mm X 12.5 mm	-	40 mm	ZiS 6.22B	
50...800	31 mm X 11 mm	30 mm	40 mm	ZiS 6.30B	
100...800	40.5 mm X 11 mm	31 mm	40 mm	ZiS 6.40B	
30...400	21 mm X 11 mm	20.4 mm	45 mm	ZiS 7.20C	
30...800	31 mm X 15 mm	26 mm	45 mm	ZiS 7.30C	
40...1000	41 mm X 12.5 mm	35 mm	45 mm	ZiS 7.40C	
100...1000	51 mm X 12.5 mm	41 mm	45 mm	ZiS 7.50C	
50...1000	41 mm X 11 mm	36 mm	45 mm	ZiS 8.40C	
100...1250	51 mm X 12.5 mm	46 mm	45 mm	ZiS 8.50C	
100...1600	61 mm X 21 mm	51 mm	45 mm	ZiS 8.60C	
100...1600	61 mm X 12.5 mm	54 mm	45 mm	ZiS 10.60C	
200...2000	81 mm X 12.5 mm	65 mm	45 mm	ZiS 10.80C	
200...2000	81 mm X 31 mm	73 mm	45 mm	ZiS 14.80C	
200...3000	101 mm X 31 mm	86 mm	45 mm	ZiS 14.10HC	
200...4000	101 mm X 31 mm	86 mm	45 mm	ZiS 14.10VC	
ROUND TYPE CT's					
Current Range	**Primary Conduction upto**		**CT Width**	**Type**	**Page**
	FOR BUSBAR	**FOR RING**			
50...150	-	30 mm	40 mm	ZiR 7.30B	
50...200	-	40 mm	50 mm	ZiR 7.30D	
400...600	-	43 mm	41 mm	ZiR 8.43B	
400...600	-	58 mm	41 mm	ZiR 10.58B	
800...1000	-	72 mm	41 mm	ZiR 11.72B	
1200...3200	-	113 mm	40 mm	ZiR 15.113B	

▶ ALLOWABLE LOAD CAPACITY OF PAINTED COPPER AND ALUMINUM BARS

Allowable load capacity of painted copper and aluminum bars Bar section vertical. Bars are separated the thickness of one bar Maximum current in A						
Dimensions	1 bars		2 bars		3 bars	
(mm)	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
12 X 2	150	80	232	140	262	
15 X 2	180	95	275	170	300	
15 X 3	282	115	364	210	440	
20 X 2	230	120	348	270	360	
20 X 3	290	145	453	350	520	
20 X 5	319	254	560	446	728	570
20 X 10	497	393	924	730	1320	1060
25 X 3	350	180	540	330	600	
25 X 5	470	230	760	430	965	
30 X 3	410	205	625	385	680	
30 X 5	447	356	760	606	944	739
30 X 10	676	536	1200	956	1670	1340
40 X 3	530	280	800	500	835	
40 X 5	573	456	952	762	1140	898
40 X 10	850	677	1470	1180	2000	1650
50 X 5	697	556	1140	916	1330	1050
50 X 10	1020	815	1720	1400	2320	1940
60 X 5	826	655	1330	1070	1510	1190
60 X 10	1180	951	1960	1610	2610	2200
80 X 5	1070	851	1680	1360	1830	1460
80 X 10	1500	1220	2410	2000	3170	2660
100 X 5	1300	1050	2010	1650	2150	1730
100 X 10	1810	1480	2850	2390	3720	3110
120 X 10	2570	1350	3780	2400	4600	3250
160 X 10	3290	1750	4750	3000	5800	4150
200 X 10	4000	2150	5700	3650	6950	4950
200 x 15		2550		4200		5600

TABLE NO. 1

▶ LIMITS OF CURRENT ERROR AND PHASE DISPLACEMENTS (CLASSES FROM 0.1 TO 1)

Limits of current error and phase displacements for measuring current transformers (Classes from 0.1 to 1)												
Accuracy class	+/- percentage current (ratio) error at percentage of rated current shown below				+/- phase displacements at percentage of rated current shown below							
					Minutes				Centiradians			
	5	20	100	120	5	20	100	120	5	20	100	120
0.1	0.4	0.2	0.1	0.1	15	8	5	5	0.45	0.24	0.15	0.15
0.2	0.75	0.35	0.2	0.2	30	15	10	10	0.9	0.45	0.3	0.3
0.5	1.5	0.75	0.5	0.5	90	45	30	30	2.7	1.35	0.9	0.9
1	3	1.5	1	1	180	90	60	60	5.4	2.7	1.8	1.8

TABLE NO. 2

▶ LIMITS OF CURRENT ERROR AND PHASE DISPLACEMENTS (FOR SPECIAL APPLICATION)

Limits of current error and phase displacements for measuring current transformers (For special application)															
Accuracy class	+/- percentage current (ratio) error at percentage of rated current shown below					+/- phase displacements at percentage of rated current shown below									
						Minutes					Centiradians				
	1	5	20	100	120	1	5	20	100	120	1	5	20	100	120
0.2S	0.75	0.35	0.2	0.2	0.2	30	15	10	10	10	0.9	0.45	0.3	0.3	0.3
0.5S	1.5	0.75	0.5	0.5	0.5	90	45	30	30	30	2.7	1.35	0.9	0.9	0.9

TABLE NO. 3

▶ LIMITS OF CURRENT ERROR (CLASSES 3 AND 5)

Class	+/- percentage current (ratio) error at percentage of rated current shown below	
	50	120
3	3	3
5	5	5

TABLE NO. 4

▶ CHARACTERISTIC PARAMETERS :

Current transformers convert an alternating current usually high in to a proportional lower one, depending on their use. Measurement type CTs are required to transform the primary current, at various classes of accuracy, as specified by the class designation, over a current range from 1 to 120 percent of its rated primary ratio. The design of this type of transformer requires the inclusion of a core and winding which will when connected to its rated burden; perform within the limits of error as indicated by the standard's specification. It is an advantage for a measurement type transformer to saturate above this range, which provides a protection against damage to instruments by limiting the secondary current when surge currents or faults appear in the primary circuit.

▶ MEASURING TRANSFORMER:

A current transformer intended to supply indicating instruments integrated meter, relay and similar apparatus.

▶ CURRENT TRANSFORMER:

An instruments transformer in which the secondary current, in normal condition of use, is substantially proportional to the primary current and differs in phase it by an angle which is approximately zero for an appropriate direction of connections.

▶ RATED PRIMARY CURRENT:

The value of primary current which appears in the designation of the transformer and on which the performance of the currant transformer is based.

▶ RATED SECONDARY CURRENT:

The value of secondary current which appears in the designation of the transformer and on which the performance of the currant transformer is based.

▶ RATED TRANSFORMATION RATIO:

The ratio of the rated primary current to the rated secondary current.

▶ CURRENT ERROR (RATIO ERROR):

The error with a transformer introduces into the measurement of a current and which arises from the fact that actual transformation ratio is not equal to the rated transformer ratio.

THE CURRENT ERROR EXPRESSED IN PERCENTAGE IS GIVEN BY THE FORMULA:

$$\text{Current error, percent} = (Ka.Is-Ip) \times 100 / Ip$$

Where Ka= rated transformation ratio
Ip= actual primary current
Is= actual secondary current when Ip is flowing under the conditions of measurement

- **PHASE DISPLACEMENT:**

  The difference in phase between the primary and secondary current vectors, the direction of the vectors being so chosen that the angle is zero for the perfect transformer. The phase displacement is said to be positive when the secondary current vector leads the primary current vector. It is usually express in minutes.

- **ACCURACY CLASS:**

  A designation assigned to a current transformer the errors of which remain within specified limit under prescribed conditions of use.

- **BURDEN:**

  The impedance of the secondary circuit in ohms and power factor.

- **RATED BURDEN:**

  The impedance of the secondary circuit on which the accuracy requirements are based. It is usually expressed as apparent power (in VA), at the rated secondary current and at a specified power factor.

- **RATED OUTPUT:**

  The value of the apparent power (in volt-amperes at a specified power factor) which the current transformer is intended to supply to the secondary circuit at the rated secondary current and with rated burden connected to it.

- **HIGHEST SYSTEM VOLTAGE:**

  The highest RMS line to line voltage which can be sustained under normal operating conditions at any time and at any point on the system. It excludes temporary voltage variations due to fault condition and the sudden disconnection of large loads.

- **RATED INSULATION LEVEL:**

  That combination of voltage values (power frequency and lightning impulse, or where applicable, lightning and switching impulse) which characterizes the insulation of a transformer with regard to its capability to withstand by dielectric stresses. For low voltage transformer the test voltage 4kV, at power-frequency, applied during 1 minute.

- **RATED SHORT-TIME THERMAL CURRENT (I_{TH}):**

  The RMS value of the primary current which the current transformer will withstand for a rated time, with their secondary winding short circuited without suffering harmful effects.

- **RATED DYNAMIC CURRENT (I_{DYN}):**

  The peak value of the primary current which a current transformer will withstand, without being damaged electrically for mechanically by the resulting electromagnetic forces, the secondary winding being short-circuited.

- **RATED CONTINUOUS THERMAL CURRENT:**

  The value of current which can be permitted to flow continuously in the primary winding, the secondary windings being connected to the rated burdens, without the temperature rise exceeding the specified values.

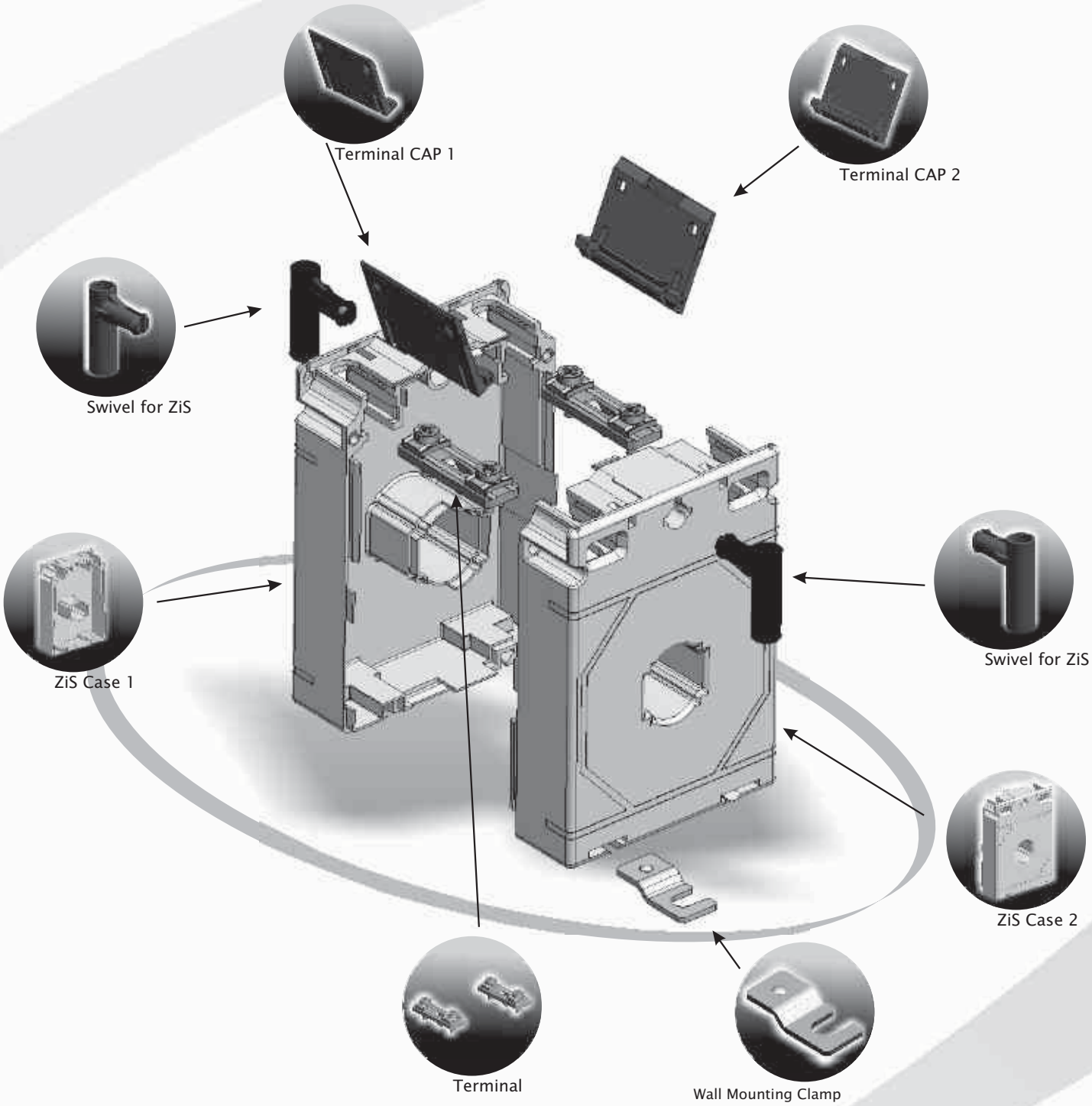
- **INSTRUMENT SECURITY FACTOR (I_{SF}):**

  The ratio of rated instrument limit primary current to the rated primary current. The times that the primary current must be higher then the rated value, for the composite error of a measuring current transformer to be equal to or greater than 10%, the secondary burden being equal to the rated burden. The lower this number is, the more protected the connected instrument are against.

WE ALSO MANUFACTURE FOLLOWING CT'S AS PER CUSTOMERS SPECIFICATION :

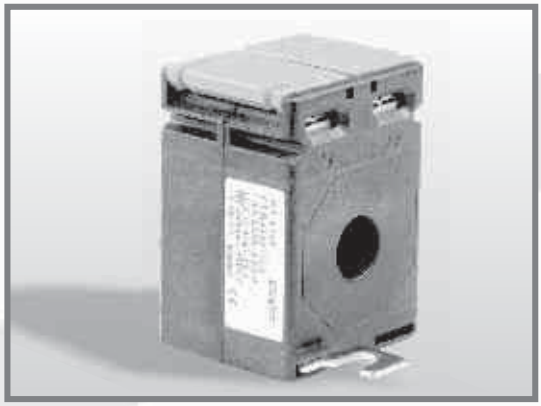
1) Wound Primary CT
2) Busbar CT
3) Protection CT (P Class)
4) Protection Special (PS Class)
5) Summation CT
6) Core Balance CT
7) Resin Cast

COMPONENTS OF ZIEGLER SQUARE TYPE CURRENT TRANSFORMER

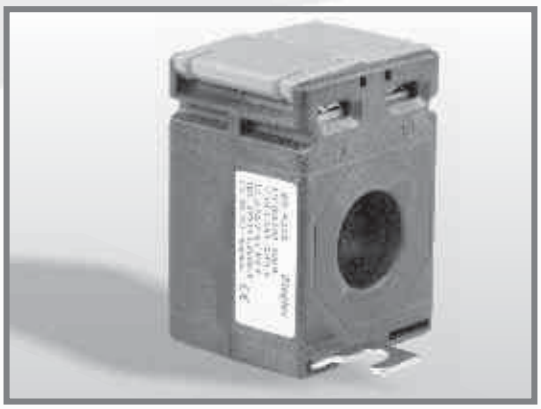


▶ ZIEGLER ZiS 4 Series Current Transformer :

ZiS 4.14B



ZiS 4.21B



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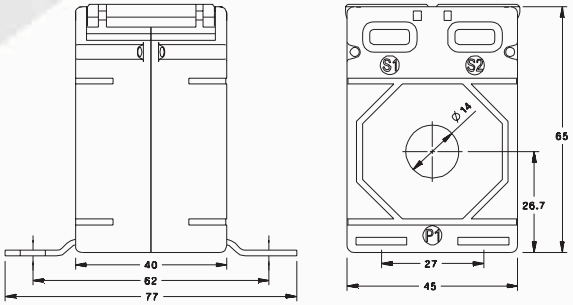
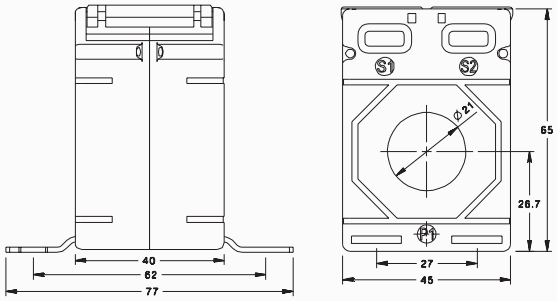


ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 4 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated PRIMARY CURRENT	Type : ZiS 4.14B			Type : ZiS 4.21B		
	Accuracy Class			Accuracy Class		
	0.5	1	3	0.5	1	3
40A	-	–	1VA	–	–	–
50A	–	1VA	1.5VA	–	1VA	1.5VA
60A	–	1.5VA	1.5VA	–	1VA	1.5VA
75A	–	1.5VA	2.5VA	–	1.5VA	1.5VA
80A	–	1.5VA	2.5VA	1VA	1.5VA	2.5VA
100A	1.5VA	2.5VA	3.75VA	1.5VA	2.5VA	2.5VA
120A	1.5VA	3.75VA	3.75VA	1.5VA	2.5VA	3.75VA
125A	1.5VA	3.75VA	5VA	2.5VA	3.75VA	3.75VA
150A	2.5VA	5VA	5VA	2.5VA	3.75VA	5VA
200A	3.75VA	5VA	7.5VA	3.75VA	3.75VA	5VA
250A	5VA	7.5VA	10VA	3.75VA	5VA	5VA
300A	5VA	10VA	10VA	5VA	5VA	7.5VA
400A	--	–	–	3.75VA	5VA	7.5VA

ORDER EXAMPLE : ZiS 4.14B :

Rated primary current : 100A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 2.5VA

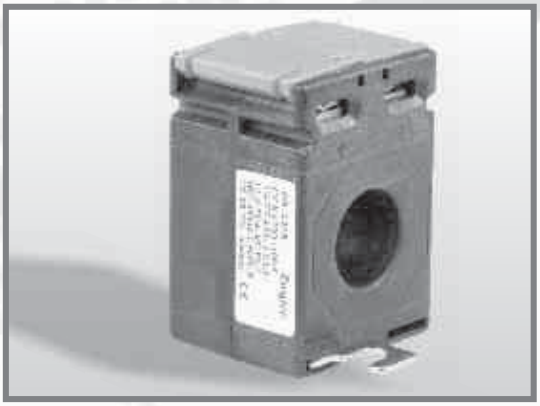
ORDER EXAMPLE : ZiS 4.21B

Rated primary current : 200A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 3.75V A

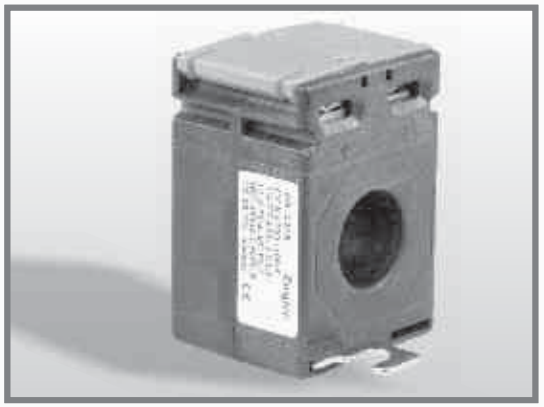
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 5 Series Current Transformer :

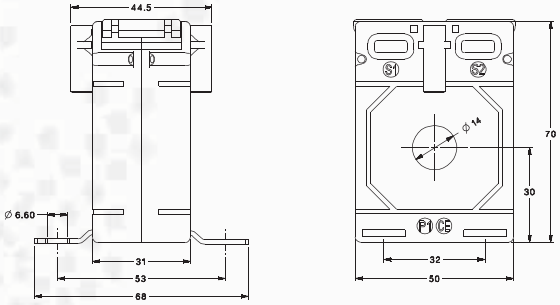
ZiS 5.14A



ZiS 5.21A

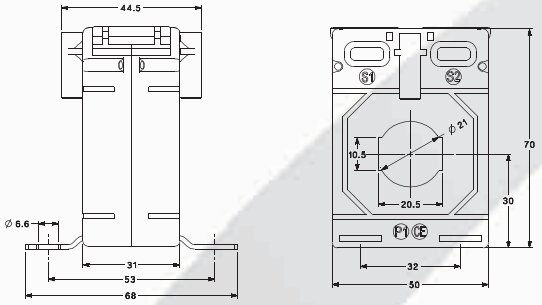


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 5 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary Current	ZiS 5.14A Accuracy Class		ZiS 5.21A Accuracy Class	
	0.5	1	0.5	1
50A	–	1.0VA	–	1.0VA
60A	–	1.5VA	–	1.0VA
75A	–	1.5VA	–	1.5VA
80A	–	1.5VA	–	1.5VA
100A	1.5VA	2.5VA	1.5VA	2.5VA
120A	1.5VA	3.75VA	1.5VA	2.5VA
125A	1.5VA	3.75VA	1.5VA	3.75VA
150A	2.5VA	5.0VA	2.5VA	3.75VA
200A	3.75VA	5.0VA	3.75VA	3.75VA
250A	5.0VA	7.5VA	3.75VA	5.0VA
300A	5.0VA	10VA	3.75VA	5.0VA
400A	–	–	5.0VA	5.0VA
500A	–	–	–	–
600A	–	–	–	–

ORDER EXAMPLE : ZiS 5.14A :

Rated primary current : 100A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 2.5VA

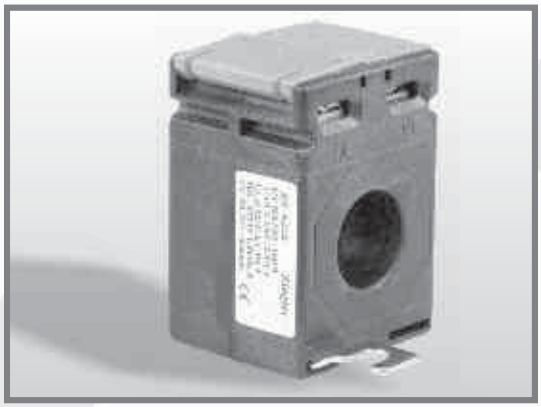
ORDER EXAMPLE : ZiS 5.21A :

Rated primary current : 200A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 3.75VA

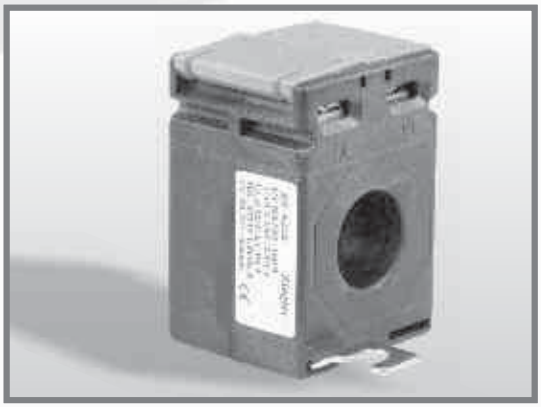
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 5 Series Current Transformer :

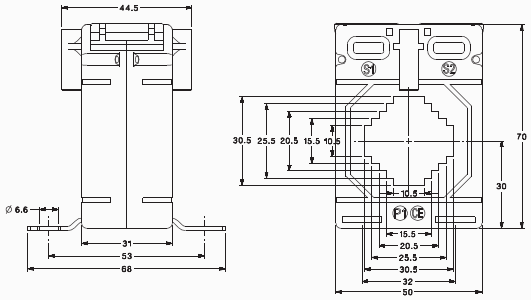
ZiS 5.30A



ZiS 5.14D



MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

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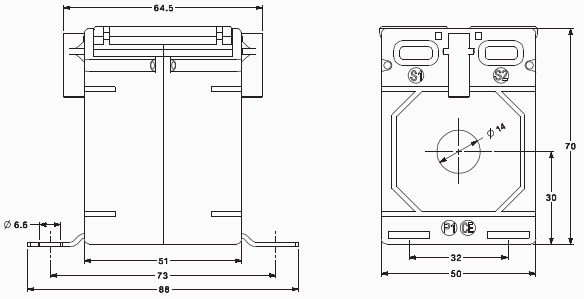


ALL DIMENSIONS ARE IN MM

ZiS 5 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary Current	ZiS 5.30A Accuracy Class		ZiS 5.14D Accuracy Class	
	0.5	1	0.5	1
50A	–	–	–	1.5VA
60A	–	–	–	1.5VA
75A	–	1.5VA	–	3.75VA
80A	–	1.0VA	1.5VA	3.75VA
100A	–	2.5VA	2.5VA	5.0VA
120A	–	2.5VA	3.75VA	5.0VA
125A	–	2.5VA	3.75VA	5.0VA
150A	–	2.5VA	3.75VA	7.5VA
200A	–	3.75VA	7.5VA	10VA
250A	–	5.0VA	10VA	12.5VA
300A	–	5.0VA	10VA	12.5VA
400A	2.5VA	5.0VA	–	–
500A	2.5VA	5.0VA	–	–
600A	2.5VA	5.0VA	–	–

ORDER EXAMPLE : ZiS 5.30A :

Rated primary current : 400A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 5VA

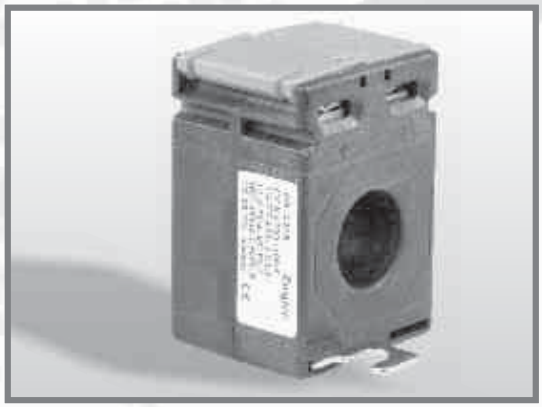
ORDER EXAMPLE : ZiS 5.14D :

Rated primary current : 200A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 10VA

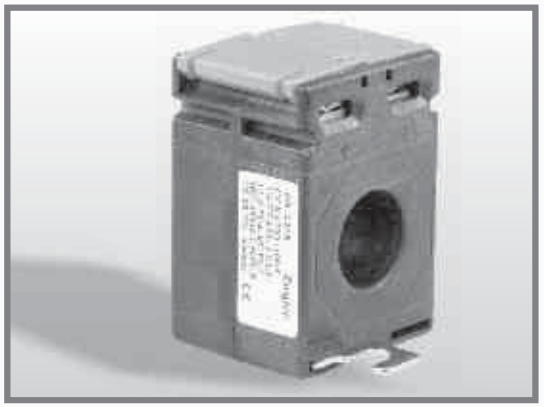
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 5 Series Current Transformer :

ZiS 5.21D



ZiS 5.30D



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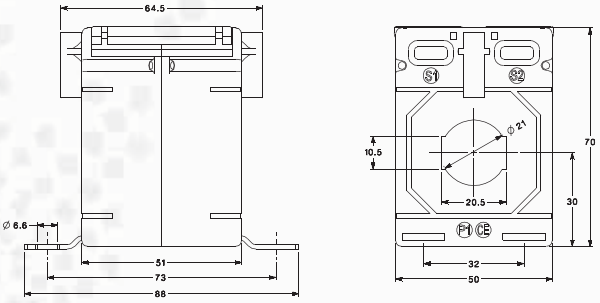
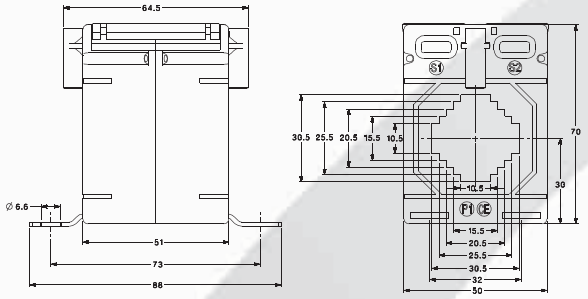


ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 5 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary Current	ZiS 5.21D Accuracy Class		ZiS 5.30D Accuracy Class	
	0.5	1	0.5	1
50A	–	1.0VA	–	1.0VA
60A	–	1.0VA	–	1.0VA
75A	–	2.5VA	–	2.5VA
80A	–	2.5VA	–	2.5VA
100A	2.5VA	5.0VA	–	5.0VA
120A	3.75VA	5.0VA	–	5.0VA
125A	3.75VA	5.0VA	–	5.0VA
150A	3.75VA	7.5VA	–	5.0VA
200A	5.0VA	10VA	3.75VA	10VA
250A	7.5VA	12.5VA	3.75VA	10VA
300A	7.5VA	12.5VA	5.0VA	10VA
400A	10VA	15VA	5.0VA	10VA
500A	–	–	7.5VA	10VA
600A	–	–	7.5VA	10VA

ORDER EXAMPLE : ZiS 5.21D :

Rated primary current : 200A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 5VA

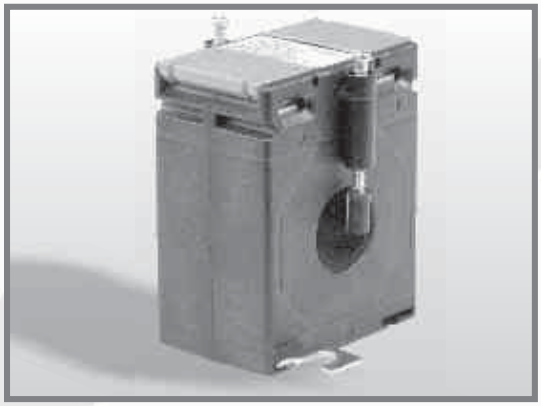
ORDER EXAMPLE : ZiS 5.30D :

Rated primary current : 500
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 7.5VA

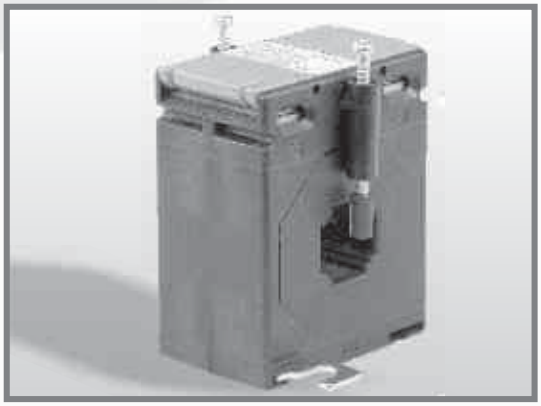
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

ZIEGLER ZiS 6 Series Current Transformer :

ZiS 6.22B:



ZiS 6.20B:



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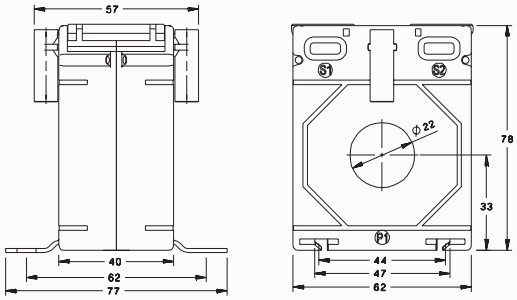
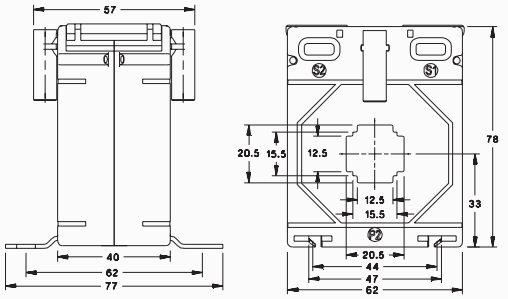


ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 6 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiS 6.22B				ZiS 6.20B				
	Accuracy Class				Accuracy Class				
	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
50A	--	–	1.5	2.5VA	–	–	–	1.5VA	2.5VA
60A	--	–	1.5VA	2.5VA	–	–	–	1.5VA	2.5VA
75A	--	–	1.5VA	5.0VA	–	–	–	3.75VA	5.0VA
80A	--	1.5VA	3.75VA	5.0VA	–	–	1.5VA	3.75VA	5.0VA
100A	--	2.5VA	5.0VA	5.0VA	1.5VA	–	2.5VA	5.0VA	5.0VA
120A	--	3.75VA	5.0VA	7.5VA	1.5VA	–	3.75VA	5.0VA	7.5VA
125A	--	3.75VA	5.0VA	7.5VA	1.5VA	–	3.75VA	5.0VA	7.5VA
150A	1.5VA	3.75VA	7.5VA	–	1.5VA	–	3.75VA	7.5VA	–
200A	1.5VA	7.5VA	10VA	–	3.75VA	5.0VA	7.5VA	10VA	–
250A	1.5VBA	10VA	12.5VA	–	2.5VA	2.5VA	10VA	12.5VA	–
300A	2.5VA	15VA	12.5VA	–	3.75VA	5.0VA	10VA	12.5VA	–
400A	7.5VA	15VA	15VA	–	3.75VA	7.5VA	15VA	15VA	–
500A	10VA	15VA	15VA	–	–	–	–	–	–
600A	10VA	15VA	15VA	–	–	–	–	–	–

ORDER EXAMPLE : ZiS 6.22B :

Rated primary current : 300A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 15VA

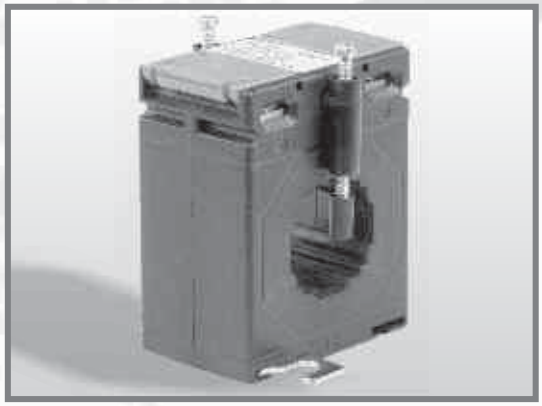
ORDER EXAMPLE : ZiS 6.20B :

Rated primary current : 200A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 10VA

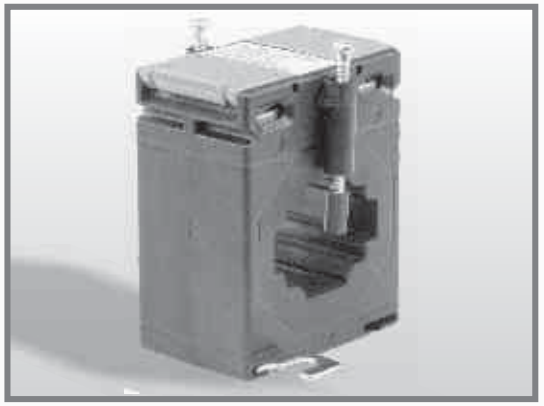
NOTE: On request orders for types different from table are accepted. | On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 6 Series Current Transformer :

ZiS 6.30B



ZiS 6.40B



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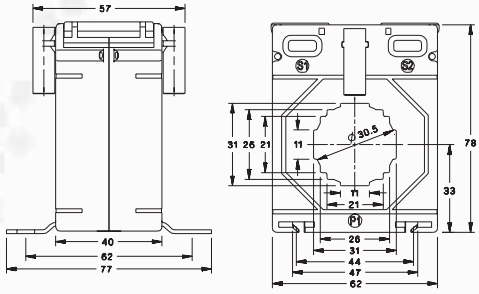
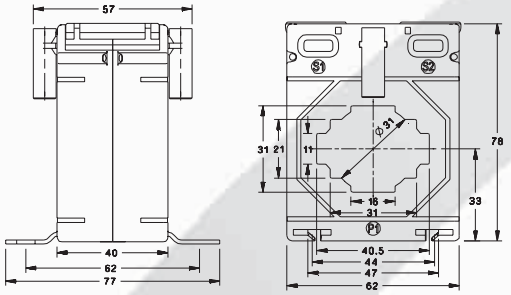


ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 6 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiS 6.30B Accuracy Class					ZiS 62.40B Accuracy Class				
	0.2S	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
50A	–	–	–	1.5VA	2.5VA	–	–	–	–	–
60A	–	–	–	1.5VA	2.5VA	–	–	–	–	–
75A	–	–	–	1.5VA	3.75VA	–	–	–	–	–
80A	–	–	–	1.5VA	3.75VA	–	–	–	–	–
100A	1.0VA	1.0VA	1.5VA	2.5VA	5.0VA	–	–	–	1VA	1.5VA
120A	–	–	2.5VA	3.75VA	5.0VA	–	–	–	1.5VA	2.5VA
125A	1.0VA	1.0VA	2.5VA	3.75VA	5.0VA	–	–	–	1.5VA	2.5VA
150A	1.5VA	1.5VA	3.75VA	5.0VA	7.5VA	–	–	–	2.5VA	3.75VA
200A	2.5VA	2.5VA	5.0VA	7.5VA	–	1.0VA	1.0VA	1.5VA	3.75VA	5.0VA
250A	2.5VA	3.75VA	5.0VA	7.5VA	–	1.5VA	1.5VA	2.5VA	5.0VA	5.0VA
300A	2.5VA	3.75VA	7.5VA	10VA	–	1.5VA	1.5VA	5.0VA	5.0VA	7.5VA
400A	3.75VA	5.0VA	7.5VA	10VA	–	2.5VA	2.5VA	5.0VA	5.0VA	7.5VA
500A	5.0VA	5.0VA	10VA	10VA	–	3.75VA	5.0VA	5.0VA	7.5VA	–
600A	5.0VA	7.5VA	15VA	15VA	–	5.0VA	7.5VA	7.5VA	10VA	–
750A	5.0VA	10VA	15VA	15VA	–	5.0VA	10VA	10VA	10VA	–
800A	5.0VA	10VA	15VA	15VA	–	5.0VA	10VA	10VA	10VA	–

ORDER EXAMPLE : ZiS 6.30B :

Rated primary current : 600A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 15VA

ORDER EXAMPLE : ZiS 6.40B :

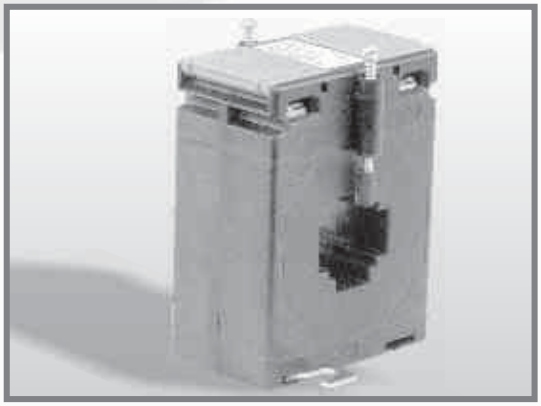
Rated primary current : 800A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 10VA

NOTE: On request orders for types different from table are accepted. | On request order for clip for DIN EN 50022 rail are accepted.

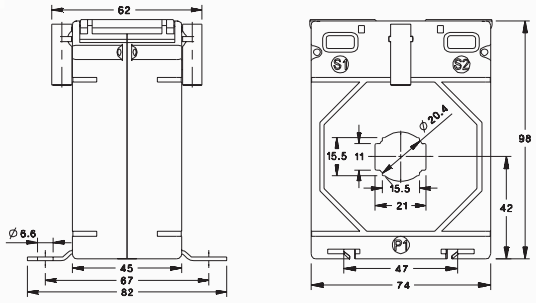
▶ ZIEGLER ZiS 7 Series Current Transformer :

ZiS 7.20C:

ZiS 7.30C:

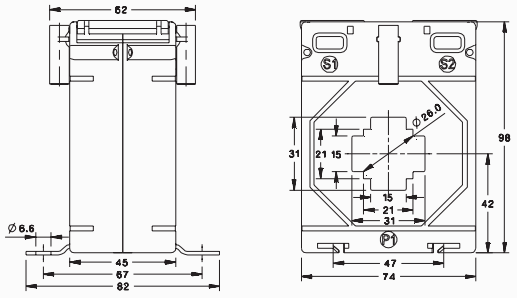


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 7 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiS 7.20C Accuracy Class					ZiS 7.30C Accuracy Class				
	0.2S	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
30A	–	–	–	1.5VA	2.5VA	–	–	–	1.0VA	1.5VA
40A	–	–	–	1.5VA	2.5VA	–	–	–	1.5VA	2.5VA
50A	–	–	–	2.5VA	3.75VA	–	–	–	1.5VA	2.5VA
60A	–	–	–	3.75VA	5.0VA	–	–	–	2.5VA	3.75VA
75A	–	–	1.5VA	5.0VA	7.5VA	–	–	1.5VA	2.5VA	3.75VA
80A	–	–	1.5VA	5.0VA	7.5VA	–	–	1.5VA	3.75VA	5.0VA
100A	1.5VA	1.5VA	3.75VA	5.0VA	10VA	1.5VA	1.5VA	2.5VA	5.0VA	7.5VA
120A	1.5VA	1.5VA	5.0VA	10VA	–	1.5VA	1.5VA	2.5VA	5.0VA	7.5VA
125A	1.5VA	1.5VA	5.0VA	10VA	–	1.5VA	1.5VA	2.5VA	5.0VA	7.5VA
150A	2.5VA	2.5VA	7.5VA	12.5VA	–	1.5VA	]1.5VA	3.75VA	5.0VA	7.5VA
200A	5.0VA	5.0VA	10VA	15VA	–	2.5VA	2.5VA	5.0VA	10VA	12.5VA
250A	3.75VA	5.0VA	10VA	15VA	–	2.5VA	2.5VA	7.5VA	10VA	15VA
300A	5.0VA	7.5VA	15VA	15VA	–	2.5VA	5.0VA	10VA	15VA	20VA
400A	5.0VA	10VA	15VA	20VA	–	5.0VA	7.5VA	15VA	20VA	–
500A	–	–	–	–	–	5.0VA	10VA	15VA	20VA	–
600A	–	–	–	–	–	5.0VA	15VA	15VA	20VA	–
750A	–	–	–	–	–	7.5VA	20VA	20VA	30VA	–
800A	–	–	–	–	–	10VA	30VA	30VA	30VA	–

ORDER EXAMPLE : ZiS 7.20C :

Rated primary current : 400A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 15VA

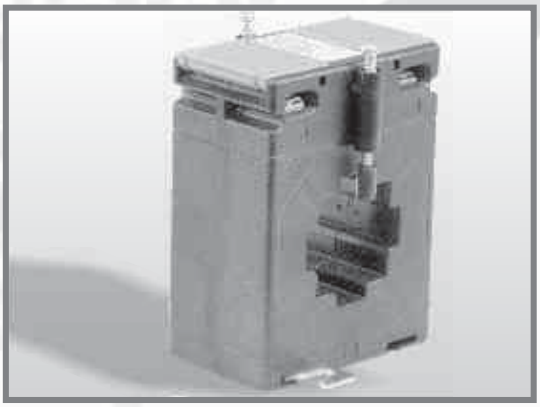
ORDER EXAMPLE : ZiS 7.30C

Rated primary current : 800A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 30VA

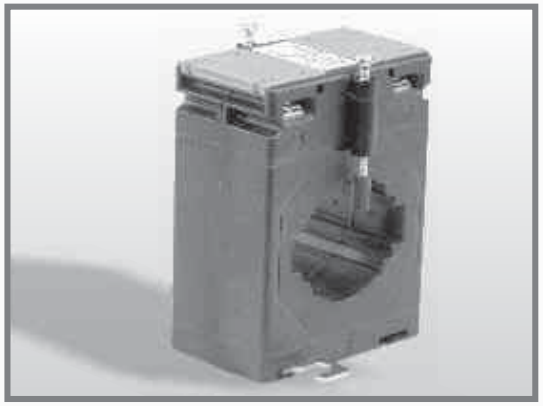
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 7 Series Current Transformer :

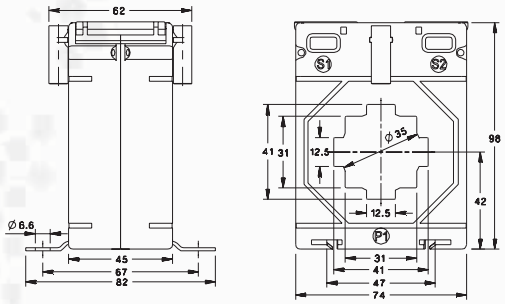
ZiS 7.40C:



ZiS 7.50C :

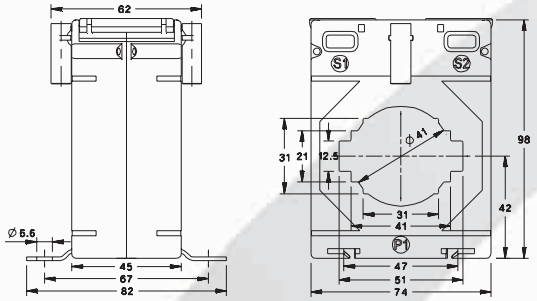


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

Rated Primary current	ZiS 7.40C					ZiS7.50C				
	Accuracy Class					Accuracy Class				
	0.2S	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
40A	–	--	--	1.0VA	--	--	--	--	--	--
50A	--	--	--	1.0VA	1.5VA	--	--	--	--	--
60A	--	--	--	1.0VA	1.5VA	--	--	--	--	--
75A	--	--	--	1.5VA	2.5VA	--	--	--	--	--
80A	--	--	--	1.5VA	2.5VA	--	--	--	–	--
100A	--	--	1.5VA	2.5VA	3.75VA	--	--	--	1.5VA	--
120A	--	--	1.5VA	2.5VA	3.75VA	--	--	--	1.5VA	2.5VA
125A	--	--	1.5VA	2.5VA	3.75VA	--	--	--	1.5VA	2.5VA
150A	–	–	2.5VA	3.75VA	5.0VA	--	–	–	2.5VA	3.75VA
200A	2.5VA	2.5VA	3.75VA	5.0VA	7.5VA	--	–	1.5VA	3.75VA	5.0VA
250A	2.5VA	2.5VA	5.0VA	7.5VA	10VA	1.5VA	1.5VA	2.5VA	5.0VA	7.5VA
300A	2.5VA	2.5VA	5.0VA	7.5VA	10VA	1.5VA	1.5VA	5.0VA	7.5VA	10VA
400A	5.0VA	5.0VA	7.5VA	12.5VA	15VA	2.5VA	2.5VA	5.0VA	7.5VA	10VA
500A	5.0VA	7.5VA	10VA	15VA	–	5.0VA	5.0VA	7.5VA	10VA	12.5VA
600A	5.0VA	10VA	15VA	20VA	–	5.0VA	7.5VA	10VA	12.5VA	15VA
750A	5.0VA	10VA	15VA	20VA	–	5.0VA	10VA	12.5VA	15VA	–
800A	7.5VA	15VA	15VA	20VA	–	5.0VA	10VA	12.5VA	15VA	–
1000A	10VA	15VA	15VA	20VA	–	5.0VA	10VA	12.5VA	15VA	–

ORDER EXAMPLE : ZiS 7.40C:

Rated primary current : 600A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 10VA

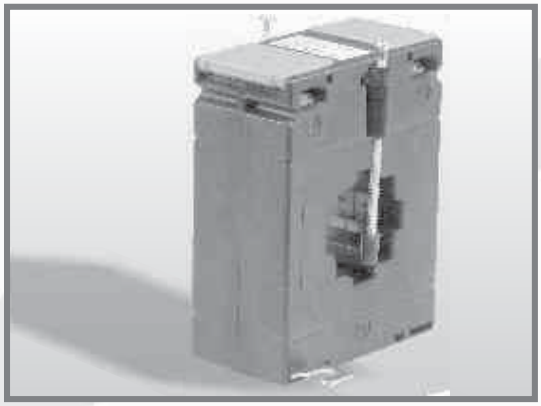
ORDER EXAMPLE : ZiS 7.50C :

Rated primary current : 1000A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 10VA

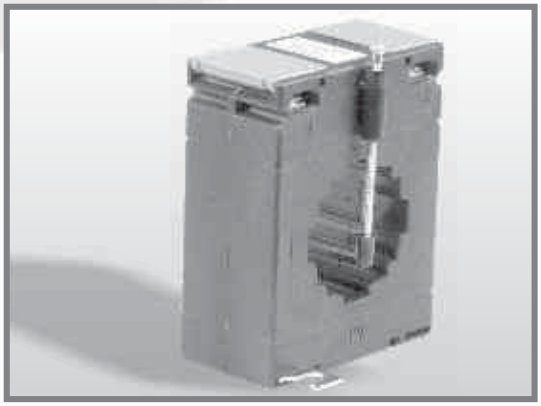
NOTE: On request orders for types different from table are accepted. | On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 8 Series Current Transformer :

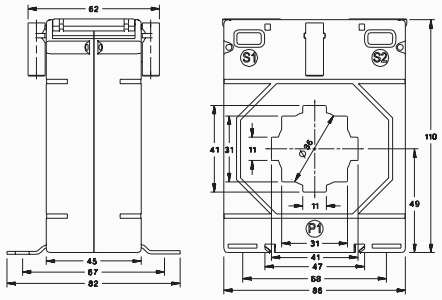
ZiS 8.40C:



ZiS 8.50C:

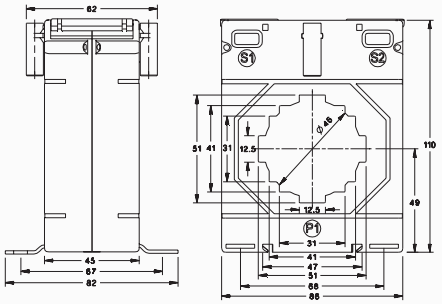


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

Rated Primary current	ZiS 8.40C					ZiS 8.50C				
	Accuracy Class					Accuracy Class				
	0.2S	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
50A	--	–	–	1.5VA	2.5VA	–	--	–	–	–
60A	–	–	–	1.5VA	2.5VA	–	–	–	–	–
75A	--	–	–	2.5VA	3.75VA	–	–	–	–	–
80A	--	–	–	2.5VA	3.75VA	–	–	–	–	–
100A	1.5A	1.5VA	1.5VA	3.75VA	5.0VA	–	–		1.5VA	2.5VA
120A			2.5VA	5.0VA	7.5VA	–	–	1.5VA	2.5VA	3.75VA
125A	1.5VA	1.5VA	2.5VA	5.0VA	7.5VA	–	–	1.5VA	2.5VA	3.75VA
150A	2.5VA	2.5VA	3.75VA	5.0VA	10VA	–	–	2.5VA	5.0VA	7.5VA
200A	2.5VA	2.5VA	5.0VA	7.5VA	12VA	–	–	5.0VA	7.5VA	10VA
250A	3.75VA	3.75VA	7.5VA	12.5VA	15VA	–	--	7.5VA	10VA	12.5VA
300A	3.75VA	5.0VA	10VA	15VA	–	1.5VA	1.5VA	7.5VA	10VA	12.5VA
400A	3.75VA	7.5VA	15VA	20VA	–	2.5VA	2.5VA	10VA	12.5VA	15VA
500A	5.0VA	10VA	20VA	30VA	–	2.5VA	5.0VA	12.5VA	15VA	20VA
600A	7.5VA	15VA	30VA	30VA	–	5.0VA	7.5VA	15VA	20VA	–
750A	7.5VA	15VA	30VA	30VA	–	5.0VA	10VA	15VA	20VA	–
800A	10VA	15VA	30VA	30VA	–	7.5VA	12.5VA	20VA	30VA	–
1000A	10VA	15VA	30VA	30VA	–	10VA	20VA	30VA	30VA	–
1200A	–	–	–	–	–	10VA	20VA	30VA	30VA	–
						10VA	20VA	30VA	30VA	–

ORDER EXAMPLE : ZiS 8.40C :

Rated primary current : 400A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 15VA

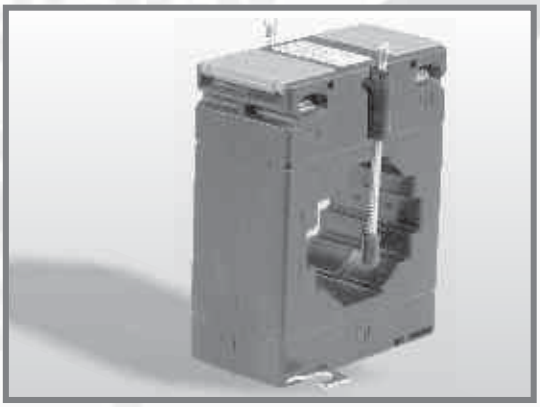
ORDER EXAMPLE : ZiS 8.50C

Rated primary current : 1200A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 20VA

NOTE: On request orders for types different from table are accepted. | On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 8 Series Current Transformer :

ZiS 8.60C:

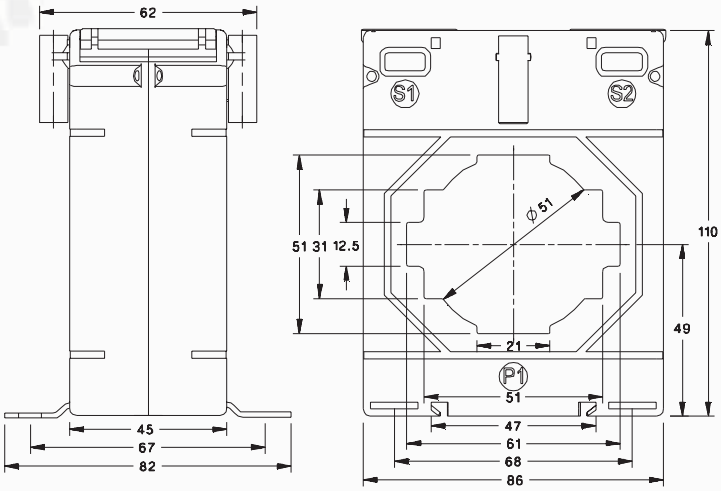


ORDER EXAMPLE : ZiS 8.60C :

Rated primary current :	1500A
Rated Secondary Current:	5A
Class of accuracy :	0.2
Rated Burden :	15VA

NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

MOUNTING WITH COPPER BUS BAR DRAWING :



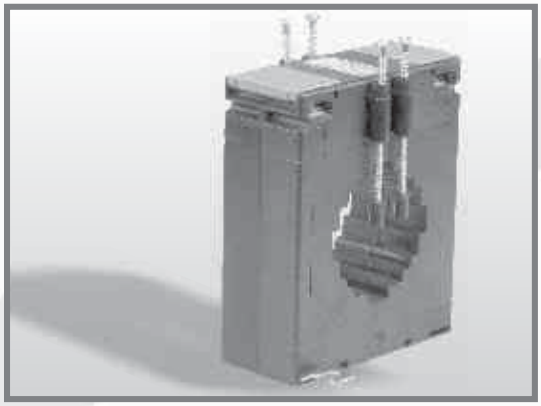
ALL DIMENSIONS ARE IN MM

ZiS 8 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

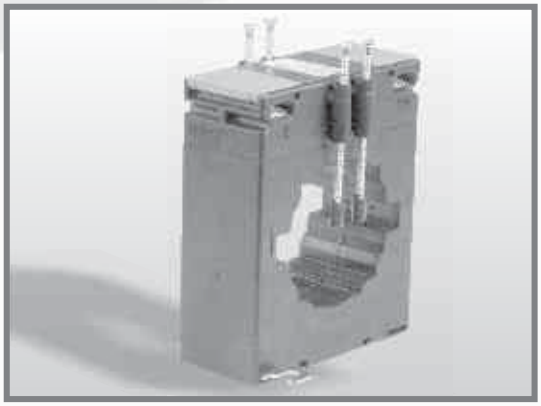
Rated Primary current	ZiS 8.60C Accuracy Class				
	0.2S	0.2	0.5	1	3
100A	–	–	–	–	1.5VA
120A	–	–	–	1.5VA	2.5VA
125A	–	–	–	2.5VA	3.75VA
150A	–	–	–	2.5VA	3.75VA
200A	–	–	1.5VA	3.75VA	5.0VA
250A	–	–	2.5VA	5.0VA	7.5VA
300A	1.5VA	1.5VA	5.0VA	7.5VA	10VA
400A	2.5VA	2.5VA	10VA	12.5VA	15VA
500A	2.5VA	3.75VA	10VA	12.5VA	15VA
600A	5.0VA	5.0VA	15VA	15VA	20VA
750A	5.0VA	10VA	15VA	15VA	–
800A	7.5VA	12.5VA	20VA	20VA	–
1000A	10VA	15VA	20VA	20VA	–
1200A	10VA	15VA	20VA	20VA	–
1250A	10VA	15VA	20VA	20VA	–
1500A	10VA	15VA	20VA	20VA	–
1600A	10VA	15VA	20VA	20VA	–

▶ ZIEGLER ZiS 10 Series Current Transformer :

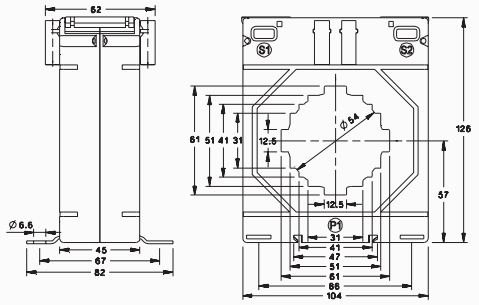
ZiS 10.60C :



ZiS 10.80C :

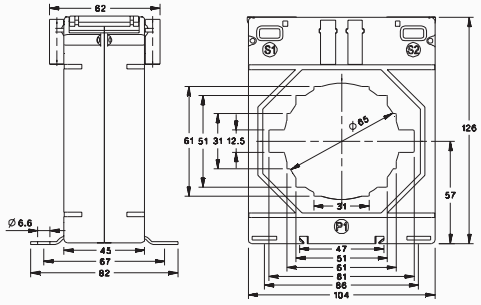


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

Primary current	ZiS 10.60C Accuracy Class					ZiS 10.80C Accuracy Class				
	0.2S	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
100A	–	–	–	1.5VA	3.75VA	–	–	–	–	–
120A	–	–	–	2.5VA	5VA	–	–	–	–	–
125A	–	–	–	2.5VA	5VA	–	–	–	–	–
150A	–	–	2.5VA	5VA	10VA	–	–	–	–	–
200A	–	–	3.75VA	10VA	15VA	–	–	–	1.5VA	–
250A	–	1.5VA	7.5VA	12.5VA	15VA	–	–	1.5VA	2.5VA	7.5VA
300A	1.5VA	2.5VA	10VA	15VA	20VA	–	–	2.5VA	7.5VA	–
400A	2.5VA	3.75VA	10VA	15VA	20VA	–	1.5VA	5VA	10VA	12.5VA
500A	3.75VA	7.5VA	15VA	20VA	30VA	–	1.5VA	5VA	10VA	12.5VA
600A	5VA	10VA	15VA	30VA	–	–	2.5VA	7.5VA	12.5VA	15VA
750A	5VA	15VA	20VA	30VA	–	5VA	5VA	10VA	15VA	–
800A	7.5VA	15VA	30VA	30VA	–	5VA	7.5VA	10VA	15VA	–
1000A	10VA	20VA	30VA	45VA	–	7.5VA	12.5VA	20VA	20VA	–
1200A	10VA	30VA	30VA	45VA	–	5VA	15VA	20VA	30VA	–
1250A	10VA	30VA	30VA	45VA	–	10VA	15VA	20VA	30VA	–
1500A	10VA	30VA	30VA	45VA	–	10VA	15VA	20VA	30VA	–
1600A	10VA	30VA	30VA	45VA	–	10VA	15VA	20VA	30VA	–
2000A	–	–	–	–	–	10VA	15VA	20VA	30VA	–

ORDER EXAMPLE : ZiS 10.60C

Rated primary current : 1500A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 30VA

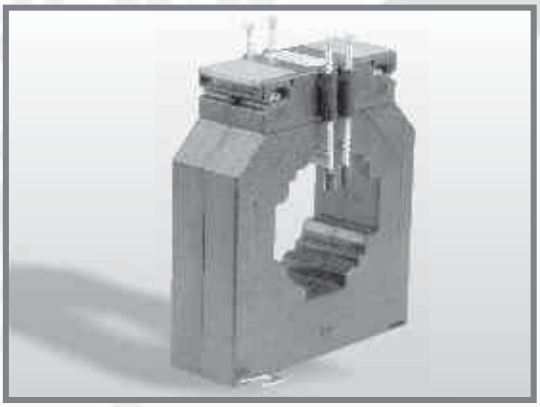
ORDER EXAMPLE : ZiS 10.80C

Rated primary current : 2000A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 20VA

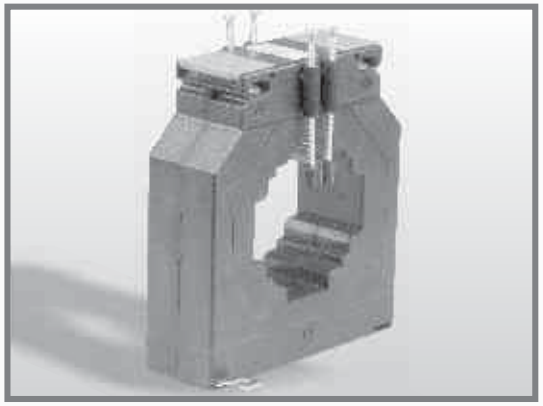
NOTE: On request orders for types different from table are accepted. | On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiS 14 Series Current Transformer :

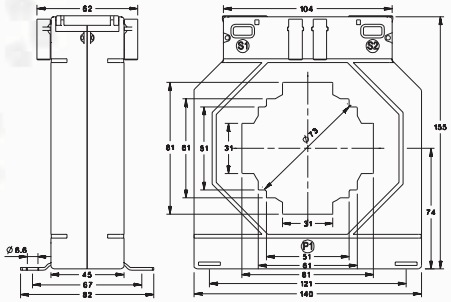
ZiS 14.80C:



ZiS 14.10VC:

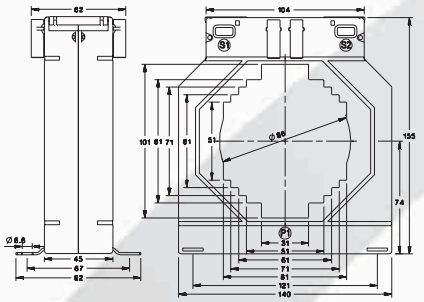


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 14 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiS 14.80C Accuracy Class					ZiS 14.10VC Accuracy Class				
	0.2S	0.2	0.5	1	3	0.2S	0.2	0.5	1	3
200A	–	–	2.5VA	5.0VA	7.5VA	–	–	1.5VA	3.75VA	5.0VA
250A	–	--	5.0VA	10VA	15VA	–	–	2.5VA	5.0VA	–
300A	–	1.5VA	7.5VA	15VA	–	–	–	–	7.5VA	10VA
400A	–	2.5VA	10VA	15VA	20VA	–	–	7.5VA	10VA	12.5VA
500A	2.5VA	5.0VA	15VA	30VA	45VA	–	2.5VA	10VA	12.5VA	12.5VA
600A	3.75VA	7.5VA	15VA	30VA	45VA	–	3.75VA	10VA	15VA	20VA
750A	5.0VA	10VA	15VA	45VA	60VA	–	5VA	15VA	20VA	30VA
800A	5.0VA	10VA	15VA	45VA	60VA	–	5VA	15VA	20VA	30VA
1000A	10VA	15VA	30VA	60VA	60VA	–	10VA	15VA	20VA	30VA
1200A	10VA	15VA	30VA	60VA	–	–	15VA	15VA	30VA	–
1250A	10VA	30VA	60VA	60VA	–	–	15VA	15VA	30VA	–
1500A	10VA	30VA	60VA	60VA	–	–	20VA	15VA	30VA	–
1600A	10VA	30VA	60VA	60VA	–	–	20VA	30VA	45VA	–
2000A	10VA	30VA	60VA	60VA	–	–	30VA	45VA	45VA	–
2500A	–	–	–	–	–	–	30VA	45VA	45VA	–
3000A	–	–	–	–	–	–	30VA	60VA	60VA	–

ORDER EXAMPLE : ZiS 14.80C

Rated primary current : 2000A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 30VA

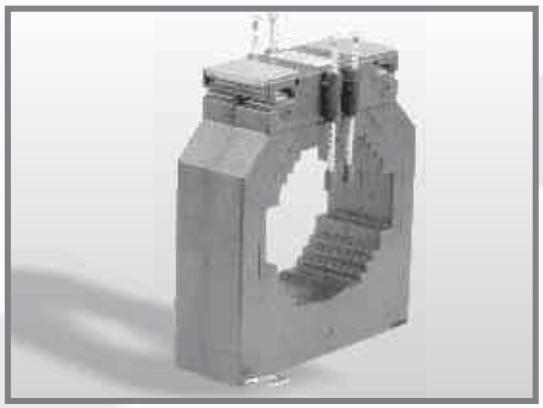
ORDER EXAMPLE : ZiS 14.10VC:

Rated primary current : 3000A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 30VA

NOTE: On request orders for types different from table are accepted. | On request order for clip for DIN EN 50022 rail are accepted.

ZIEGLER ZiS 14 Series Current Transformer :

ZiS 14.10HC:

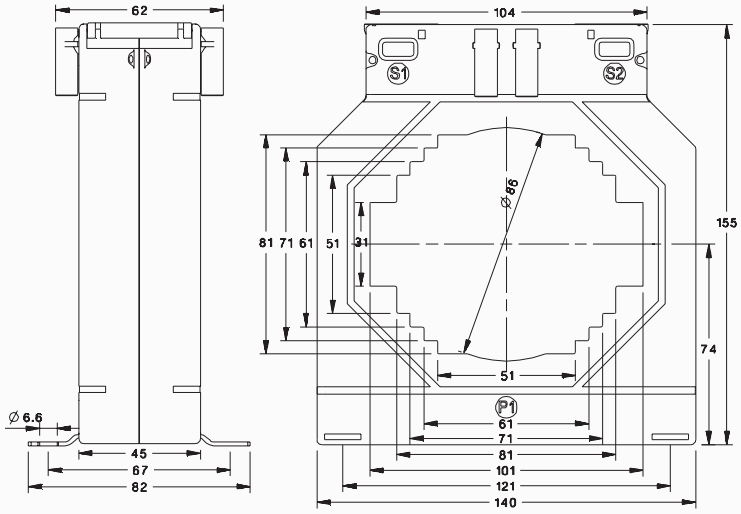


ORDER EXAMPLE : ZiS 14.10HC:

Rated primary current :	4000A
Rated Secondary Current:	5A
Class of accuracy :	0.5
Rated Burden :	60VA

NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiS 14 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

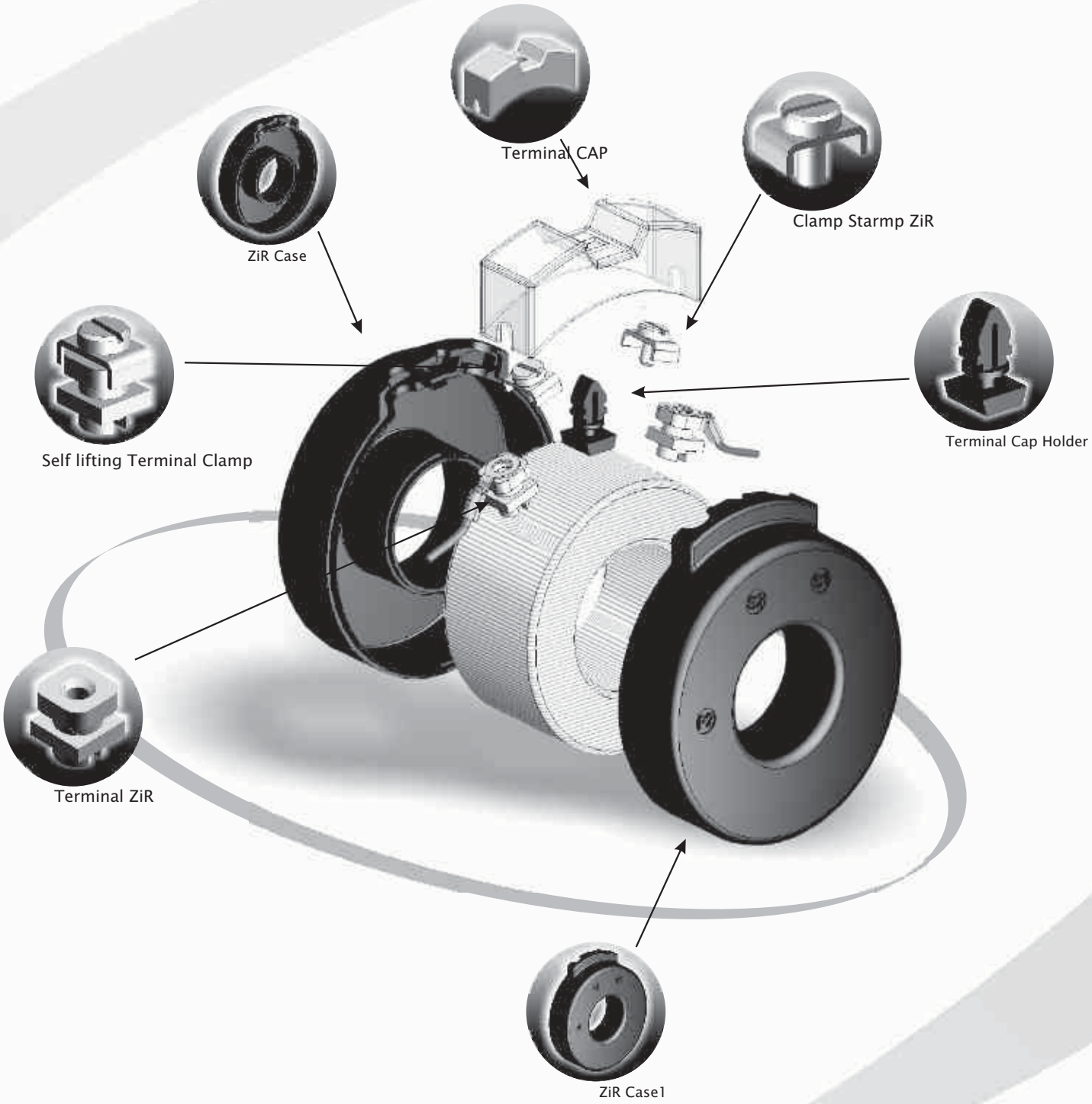
Rated Primary current	ZiS 14.10HC Accuracy Class				
	0.2S	0.2	0.5	1	3
200A	–	–	1.5VA	3.75VA	5.0VA
250A	–	–	2.5VA	5.0VA	–
300A	–	–	–	7.5VA	10VA
400A	–	1.5VA	7.5VA	10VA	12.5VA
500A	–	2.5VA	10VA	12.5VA	–
600A	2.5VA	3.75VA	10VA	15VA	20VA
750A	5.0VA	5VA	15VA	20VA	30VA
800A	5.0VA	5VA	15VA	20VA	30VA
1000A	5.0VA	7.5VA	15VA	20VA	30VA
1200A	10VA	15VA	15VA	20VA	–
1250A	10VA	15VA	15VA	30VA	–
1500A	10VA	20VA	20VA	30VA	--
1600A	10VA	20VA	20VA	45VA	–
2000A	10VA	30VA	45VA	45VA	–
2500A	10VA	30VA	45VA	45VA	–
3000A	10VA	30VA	60VA	60VA	–
4000A	10VA	30VA	60VA	60VA	–

ZiR SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiR 7.30B			PRIMARY	ZiR 7.30D				PRIMARY	ZiR 8.43B			
	Dimension of busbar hole. ∅ 30mm			CURRENT	Dimension of busbar hole. ∅ 30 mm				CURRENT	Dimension of busbar hole. ∅ 43 mm			
	Accuracy Class				Accuracy Class					Accuracy Class			
	0.5	1	3		0.2	0.5	1	3		0.2	0.5S	0.5	1
50A	–	1.5VA	2.5VA	50A	–	–	1.5VA	3.75VA	50A	–	–	–	–
60A	–	1.5VA	2.5VA	60A	–	–	1.5VA	5VA	60A	–	–	–	–
75A	–	1.5VA	3.75VA	75A	–	1.5VA	2.5VA	5VA	75A	–	–	–	–
100A	1.5VA	2.5VA	5VA	100A	–	2.5VA	5VA	7.5VA	100A	–	–	–	–
125A	2.5VA	3.75VA	5VA	125A	–	2.5VA	5VA	7.5VA	125A	–	–	–	–
150A	2.5VA	5VA	7.5VA	150A	–	3.75VA	7.5VA	10VA	150A	–	–	–	–
200A	–	–	–	200A	3.75VA	7.5VA	15VA	–	200A	2.5VA	5VA	5VA	10VA
250A	–	–	–	250A	–	–	–	–	250A	3.75VA	7.5VA	7.5VA	15VA
300A	–	–	–	300A	–	–	–	–	300A	5VA	10VA	10VA	20VA

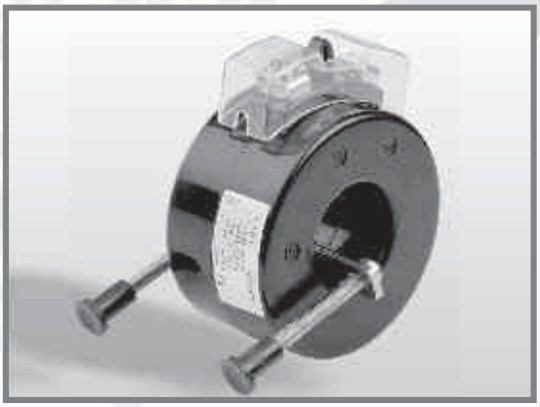
Rated Primary current	ZiR 10.58B				ZiR 11.72B					ZiR 15.11B				
	Dimension of busbar hole. ∅ 58mm				Dimension of busbar hole. ∅ 72 mm					Dimension of busbar hole. ∅ 113 mm				
	Accuracy Class				Accuracy Class					Accuracy Class				
	0.2S	0.2	0.5	1	0.2S	0.2	0.5S	0.5	1	0.2S	0.2	0.5S	0.5	1
400A	3.75VA	5VA	10VA	20VA	–	–	–	–	–	–	–	–	–	–
500A	5VA	7.5VA	15VA	25VA	–	–	–	–	–	–	–	–	–	–
600A	7.5VA	10VA	15VA	25VA	–	–	–	–	–	–	–	–	–	–
800A	–	–	–	–	10VA	10VA	15VA	15VA	30VA	–	–	–	–	–
1000A	–	–	–	–	10VA	10VA	15VA	15VA	30VA	–	–	–	–	--
1200A	–	–	–	–	–	–	–	–	–	10VA	15VA	15VA	20VA	30VA
1250A	–	–	–	–	–	–	–	–	–	10VA	15VA	15VA	20VA	30VA
1500A	–	–	–	–	–	–	–	–	–	15VA	15VA	15VA	20VA	30VA
1600A	–	–	–	–	–	–	–	–	–	15V	15VA	20VA	20VA	30VA
2000A	–	–	–	–	–	--	–	–	–	15VA	20VA	20VA	25VA	45VA
2500A	–	–	–	–	–	–	–	–	–	15VA	20VA	20VA	25VA	45VA
3000A	–	–	–	–	–	–	–	–	–	15VA	20VA	20VA	30VA	45VA
3200A	–	–	–	–	–	–	–	–	–	15VA	20VA	20VA	30VA	45VA

COMPONENTS OF ZIEGLER ROUND TYPE CURRENT TRANSFORMER

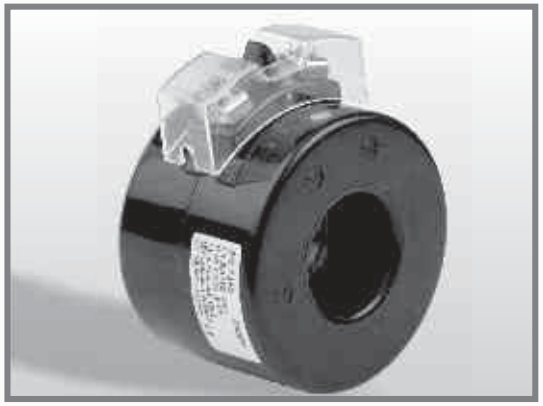


▶ ZIEGLER ZiR Series Current Transformer :

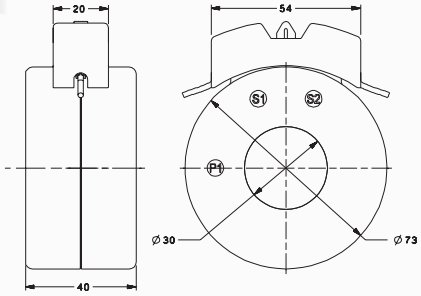
ZiR 7.30B



ZiR 7.30D

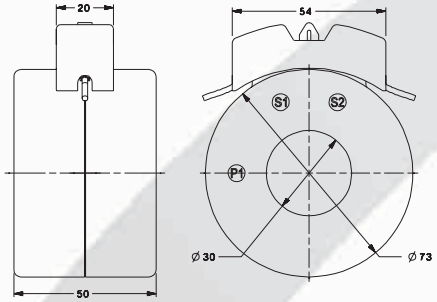


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiR 7 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiR 7.30B		
	Dimensions of busbar hole.Dia 30 mm		
	Accuracy Class		
	0.5	1	3
50A	–	1.5VA	2.5VA
60A	–	1.5VA	2.5VA
75A	–	1.5VA	3.75VA
100A	1.5VA	2.5VA	5VA
125A	2.5VA	3.75VA	5VA
150A	2.5VA	5VA	7.5VA

Rated Primary current	ZiR 7.30D		
	Dimensions of busbar hole.Dia 30 mm		
	Accuracy Class		
	0.2	0.5	3
50A	–	–	3.75VA
60A	–	–	5VA
75A	–	1.5VA	5VA
100A	–	2.5VA	7.5VA
125A	–	2.5VA	7.5VA
150A	–	3.75VA	10VA
200A	3.75VA	7.5VA	

ORDER EXAMPLE : ZiR 7.30B :

Rated primary current : 150A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 5VA

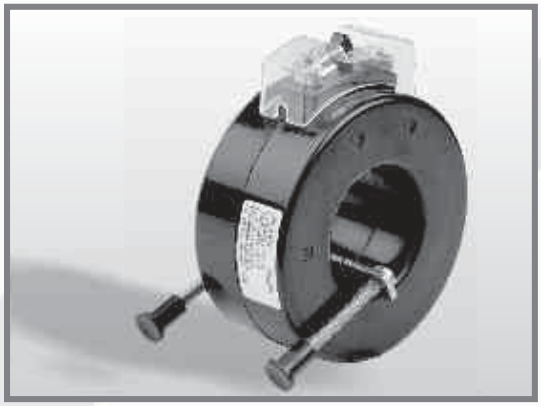
ORDER EXAMPLE : ZiR 7.40D :

Rated primary current : 200A
Rated Secondary Current: 5A
Class of accuracy : 1
Rated Burden : 15VA

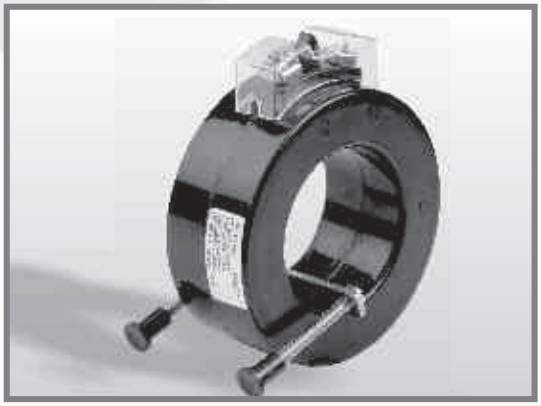
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiR Series Current Transformer :

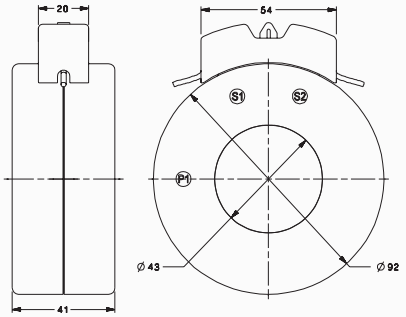
ZiR 8.43B



ZiR 10.58B

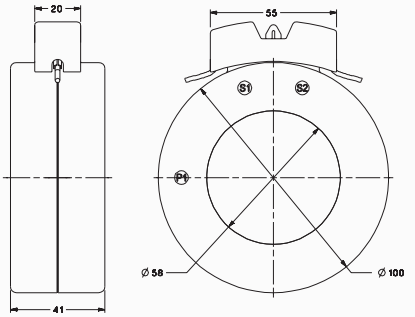


MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiR 8 & 10 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiR 8.43B			
	Dimensions of busbar hole.Dia 43 mm			
	Accuracy Class			
	0.2S	0.5S	0.5	1
200A	2.5VA	5VA	5VA	20VA
250A	3.75VA	7.5VA	7.5VA	15VA
300A	5VA	10VA	10VA	20VA

Rated Primary current	ZiR 10.58B			
	Dimensions of busbar hole.Dia 58 mm			
	Accuracy Class			
	0.2S	0.2	0.5	1
400A	3.75VA	5VA	10VA	20VA
500A	5VA	7.5VA	15VA	25VA
600A	7.5VA	10VA	15VA	25VA

ORDER EXAMPLE : ZiR 8.43B :

Rated primary current : 300A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 10VA

ORDER EXAMPLE : ZiR 10.58B

Rated primary current : 600A
Rated Secondary Current: 5A
Class of accuracy : 0.5
Rated Burden : 15VA

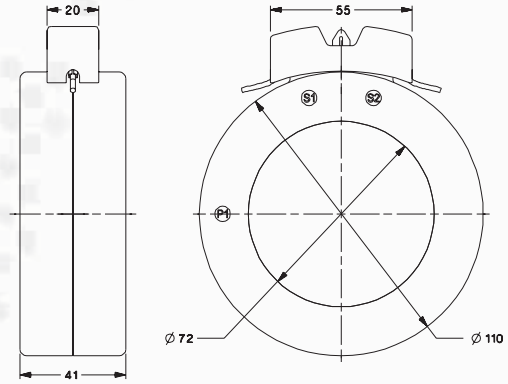
NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

▶ ZIEGLER ZiR Series Current Transformer :

ZiR 11.72B

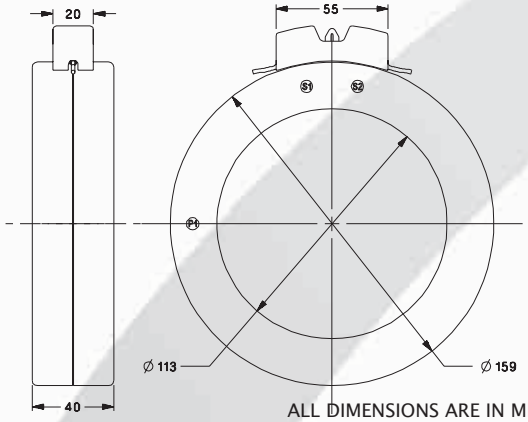
ZiR 15.113B

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

MOUNTING WITH COPPER BUS BAR DRAWING :



ALL DIMENSIONS ARE IN MM

ZiR 11 & 15 SERIES CURRENT TRANSFORMER POSSIBLE COMBINATIONS :

Rated Primary current	ZiR 11.72B				
	Dimensions of busbar hole.Dia 72 mm				
	Accuracy Class				
	0.2S	0.2	0.5S	0.5	1
800A	10VA	10VA	15VA	15VA	30VA
1000A	10VA	10VA	15VA	15VA	30VA

Rated Primary current	ZiR 15.11B				
	Dimensions of busbar hole.Dia 113 mm				
	Accuracy Class				
	0.2S	0.2	0.5S	0.5	1
1200A	10VA	15VA	15VA	20VA	30VA
1250A	10VA	15VA	15VA	20VA	30VA
1500A	15VA	15VA	15VA	20VA	30VA
1600A	15VA	15VA	20VA	20VA	30VA
2000A	15VA	20VA	20VA	25VA	45VA
2500A	15VA	20VA	20VA	25VA	45VA
3000A	15VA	20VA	20VA	30VA	45VA
3200A	15VA	20VA	20VA	30VA	45VA

ORDER EXAMPLE : ZiR 11.72B :

Rated primary current : 1000A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 10VA

ORDER EXAMPLE : ZiR 15.11B :

Rated primary current : 3000A
Rated Secondary Current: 5A
Class of accuracy : 0.2
Rated Burden : 20VA

NOTE: On request orders for types different from table are accepted.
On request order for clip for DIN EN 50022 rail are accepted.

ROUTINE TEST:

Tests carried out on each current transformer to check requirements likely to vary during production.

The following tests apply to each individual transformer:

A. Verification of terminal markings
B. Power-frequency withstands test primary winding.
C. Partial discharge measurement.
D. Power-frequency withstand test on secondary windings.
E. Power-frequency withstand test, between sections.
F. Inter-turn over voltage test
G. Determination of errors.

The order of the tests is not standardized, but determination of error shall be performed after the other test.

SPECIAL TESTS / OPTIONAL TESTS:

Test which may be in the nature of type tests or routine tests, and are carried out only by agreement between manufacturer and purchaser.

TYPE TEST:

Tests carried out to prove the general qualities and design of a given type of current transformer in accordance with the requirements of the applicable standers.

Tests may be carried out on a prototype which may incorporate special arrangements for the measurements required by applicable standard.

The following tests are type test:

A. Short time current test
B. Temperature rise test
C. Lightning impulse test
D. Switching impulse test
E. Wet test for outdoor type transformer
F. Determination of errors
G. Radio interference voltage measurement (RIV) (As specified in IEC 60044-1)

All the dielectric type test should be carried out on the same transformer, unless otherwise specified.

SHORT TIME CURRENT TEST:

For the thermal short time current Ith test the transformer shall be at a temperature 10˚C to 40˚C. The test shall be made with the secondary winding short circuited and at the current I for a time t, so that (I^2t) is not less then (I^2th) and provided t has a value between 0,5 s and 5 s.

The dynamic test shall be made with the secondary winding (s) short-circuited, and with a primary current the peak value of which is not less than the rated dynamic current (Idyn) for at least one peak.

The dynamic test may be combined with the thermal test above, provided the first major peak current of that test is not less than the rated dynamic current (Idyn).

The transformer shall be deemed to have passed these tests if, after cooling to ambient temperature (between 10˚C and 40˚C), it satisfies the following requirements:

A. It is not visibly damaged; **B.** Its errors after demagnetization do not differ from those recorded before the tests by more than half the limits of error appropriate to its accuracy class **C.** It withstands the dielectric tests specified in 8.2, 8.3 and 8.4 but with the test voltage or currents reduced to 90% of those given. **D.** On examination, the insulation next to the surface of the conductor dose not show significant deterioration (e.g. carbonization).

TEMPERATURE-RISE TEST:

A test shall be made to prove compliance with the requirement of 4.6. for the purpose of this test, current transformers shall be deemed to have attained steady temperature when the rate of temperature rise dose not exceed 1 K per hour.

The test-site ambient temperature shall be between 10˚C and 30˚C. For the test the transformer shall be mounted in a manner representative of the mounting in service.

The temperature rise of winding shall, when practicable, be measured by the increase in resistance method, but for winding of very low resistance, thermocouples may be employed.

The temperature rise of parts other than windings may be measured by thermometer or thermocouples.

VERIFICATION OF TERMINAL MARKINGS:

It shall be verified that the terminal markings are correct.

POWER-FREQUENCY TEST:

The power frequency withstand test shall be performed in accordance with IEC 60060-1.

The test voltage shall have the appropriate value given in table 3 or 5 (in IEC 60044-1 standard) depending on the highest voltage for equipment. The duration shall be 60 s.

The test voltage shall be applied between the short-circuited primary winding and earth. The short-circuited secondary winding (s), the frame, case (if any) and core (if there is a special earth terminal) shall be connected to earth.

INTER-TURN OVER VOLTAGE TEST:

The inter-turn over voltage test shall be performed in accordance with one of the following procedures.

Procedure B: with the primary winding open-circuited, the prescribed test voltage (at same suitable frequency) shall be applied for 60 s to the terminals of each secondary winding, providing that the r m s value of the secondary current dose not exceed the rated secondary current (or rated extended current).

The value of the test frequency shall be not greater than 400 Hz. At this frequency if the voltage value achieved at the rated secondary current (or rated extended current) is lower than 4.5 kV peak the obtained voltage is to be regarded as the best voltage. When the frequency exceeds twice the rated frequency, the duration of the test may be reduced from 60 s.

(**Note:** The tests which are applicable to ring type/ window type, low tension, [LT] C.T. are given here. For remaining test procedure, please refer applicable standard.)

Ziegler

Redefine Innovative Metering

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