

TOP-TECHNIC



MAINS ANALYSER NA96



MAINS ANALYSER MF7



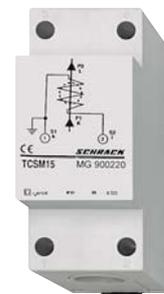
DC AMMETER



AC AMMETER



AC VOLTMETER/AMMETER



MODULAR CURRENT TRANSFORMER



MODULAR HOUR METER FOR DIN RAIL MOUNTING



MODULAR HOUR METER FOR FLUSH MOUNTING

*“Law is the rule
by which the design of things
can be determined.”*

Immanuel Kant, German philosopher

MEASURING INSTRUMENTS

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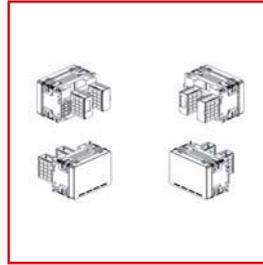
NET-ANALYSER NA96 AND NA96+



NA96



NA96+



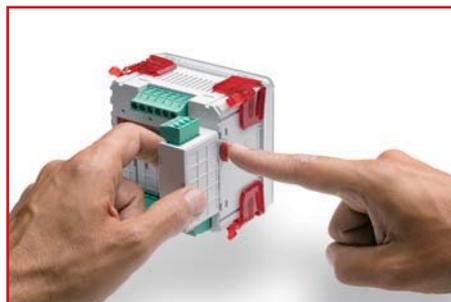
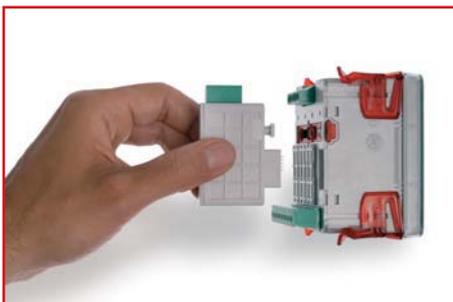
GENERAL INFORMATION

- Multifunction measurements (4 quadrants)
- Active energy metering (2 quadrants)
- AC supply
- Single-phase, three-phase or 4-wire (adjustable)
- Connection with external dedicated CT (optional)
- 2 pulse outputs (relay) for energy (optional module)
- 2 relay outputs (optional module)
- 2 analogue outputs (optional module)
- RS485 communication (optional module)
- Profibus communication (optional module)
- Lon-Works (optional module)
- M-bus (optional module)
- Fast mounting

SCHRACK-INFO

- 4-quadrant measurement
- Voltage – phase - phase
- Minimum voltage per phase
- Maximum voltage per phase
- Harmonic content of each phase
- Current – phase and neutral, average per phase, maximum average per phase, total current, harmonic content of each phase
- Total output – active, reactive and apparent power, power per phase – active, reactive and apparent power, average, maximum average
- Power factor – overall, per phase
- Frequency
- Working hours
- Active energy– positive overall, positive for each phase
- Reactive energy– positive overall, positive for each phase
- Active energy – negative overall
- Reactive energy – negative overall

APPLICATION



TECHNICAL DATA

HOUSING	
Panel cut-out flush mounting	92 x 92 mm
Front frame	96 x 96 mm
Depth	62 mm, 81 mm (including optional module)
Connection	Screw terminal, voltage – max. 4 mm ² , current – max. 6 mm ²
Housing material	Polycarbonate (self-extinguishing)
Degree of protection	IP 54 (front) – IP 20 (terminals)
AMBIENT CONDITIONS	
Reference temperature	23 °C + 2 °C
Operating temperature	-5 to 55 °C
Max. temperature range (storage/transport)	-25 to 70 °C
Temperature influence	≤ 0.1%/°C
Power loss	≤ 5 W
DISPLAY	
LCD backlit 68 x 65 mm	Backlighting switches off automatically after 20 seconds without operation
Measuring display	4 lines – 4 digits
Reading update:	1.1 seconds
Energy count	8 digits (6+2 decimals)
Accuracy (+ 1 digit)	
Active energy	NA96: Class 1 (EN62053-21), NA96+: Class 0.5 (EN62053-21)
Reactive energy	Class 2 (EN62053-23)
Voltage	NA96: ± 0.5% (80 ... 500 V phase-phase), NA96+: ± 0.2% (80 ... 690 V phase-phase)
Current	NA96: ± 0.5% (10 ... 120% I _n), NA96+: ± 0.2% (10 ... 120% I _n)
Power	NA96: ± 1% (10 ... 120% P _n , Q _n , S _n), NA96+: ± 0.5% (10 ... 120% P _n , Q _n , S _n)
Power factor	NA96: ± 1% (0.5 ind ... 0.5 cap), NA96+: ± 0.5% (0.5 ind ... 0.5 cap)
Frequency	± 0.15 Hz
PROGRAMMING	
	4 front keys, access protected by password
	Parameter retention in non-volatile memory
PROGRAMMABLE PARAMETERS	
Mains type	1-phase or 3/4-phase connection
Current rating	1 – 5 A
Transformer ratio	NA96: 1...10 (voltage – max. primary voltage 1,200 V) NA96+: 1...3000 (voltage – max. primary voltage 300,000 V) 1...9999 (current – max. primary current 50 kA/5 A – 10 kA/1 A)
Communication (optional modules)	e.g.: RS 232, address, baud rate, parity bit
Pulse value	Active or reactive energy, significance, pulse duration
Relay	Allocation of measured variable, threshold, min. or max. – NO or NC, hysteresis, On delay, Off delay
Current and power average	Integration time 5/8/10/15/20/30/60 minutes
Display	Contrast: 4 levels
Backlight	0–30 – 70–100%
Display page	After switch-on (measured quantity)
INPUT	
Voltage	AC, three-phase mains 3- and 4-wire connection NA96: 80 ... 500 V (three-phase AC mains phase-phase), NA96+: 80 ... 690 V (three-phase AC phase-phase) NA96: 50 ... 290 V (AC mains), NA96+: 50 ... 400 V (AC mains)
Current rating	5 A – 1 A – only current transformer connection
Max. current I _{max}	1.2 I _n continuous
Overload	20 I _n /0.5 s
Nominal frequency	50 Hz
Operating frequency	47 ... 63 Hz
Type of measurement	Tue RMS value
Harmonic content	NA96: up to the 16th harmonic, NA96+: up to the 22nd harmonic
Start of measurement (energy meter)	< 5 s
Intrinsic consumption	Voltage path: < 0.5 VA (per phase), current path: < 0.5 VA (per phase)

TECHNICAL DATA – continued

AUXILIARY VOLTAGE	
Auxiliary voltage	80 265 V AC
Nominal frequency	50 Hz
Operating frequency	47 ... 63 Hz
Intrinsic consumption	≤ 4 VA (without optional modules)
Auxiliary voltage	110 300 V DC
Intrinsic consumption	< 3.5 W (without optional modules)
Reverse polarity protection	
INSULATION	
Installation category	III
Pollution degree	2
Insulation voltage rating	300 V (phase - neutral)
Surge voltage protection	6 kV, 1.2/50 µs, 0.5 J
Test circuit	Measurement input, auxiliary voltage
Test voltage	4 kV, rms, 50 Hz/1 min
Test circuit	All circuits and earth
ELECTROMAGNETIC COMPATIBILITY	
Emission and immunity tests	Acc. to EN 62052-11
AMBIENT CONDITIONS	
Reference temperature	23 °C ± 2 °C
Operating temperature	-5 ... 55 °C
Limit range for storage and transport	-25 ... 70 °C
Temperature influence	≤ 0.1%/°C
Power dissipation for thermal dimensions of the control cabinet	≤ 5 W

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Net analyser NA96 basic unit	9004840550993		MGF39000
Net analyser NA96+ basic unit	9004840618419		MGF39001

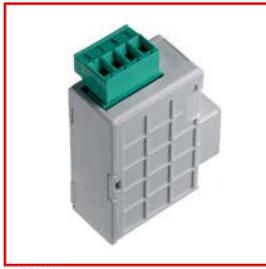


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PLUG-IN MODULE ALARM CONTACTS, 2 INDEPENDENT AND INSULATED LIMIT CONTACTS



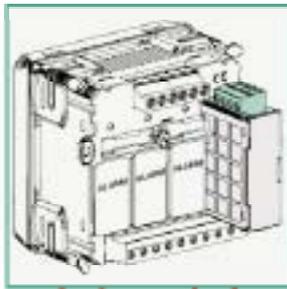
MGF3900A

SCHRACK-INFO

Programming of: measured quantity, limit value, type of alarm, relay behaviour, hysteresis, On delay, and Off delay. The NA96 and NA96+ modules in conjunction with the multi-function module allow the monitoring of two measured quantities by two limit contacts. Each multi-function module, NA96 and NA96+, can accommodate up to two MGF3900A modules so that 4 limit contacts are available.

NA96 AND NA96+

MGF3900A



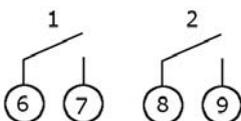
Alarm 1
Alarm 1

Alarm 2
Alarm 2

DIMENSIONS



CONNECTION DIAGRAM



PROGRAMMABLE PARAMETERS

Measured quantity: for each output according to the table below

MEAS			
3n3E	3-3E	3-2E	1-n1E
U1			U1
U2			
U3			
U12	U12	U12	
U23	U23	U23	
U31	U31	U31	
A1	A1	A1	A2
A2	A2	A2	
A3	A3	A3	
P1			
P2			
P3			
VAR1			
VAR2			
VAR3			
P	P	P	P
Var	Var	Var	Var
PF	PF	PF	PF
FrEg	FrEg	FrEg	FrEg

3n3E	4-wire three-phase mains, 3 current transformers
3-3E	3-wire three-phase main, 3 current transformers
3-2E	3-wire three-phase power, 2 current transformers (ARON)
1n1E	AC mains
U1-U2-U3	Phase voltage
U12-U23-U31	Phase-to-phase voltage
A1-A2-A3	Phase current
P1-P2-P3	Active power (phase)
P	Active power (total); single-phase for mains type 1n1E
VAR1-VAR2-VAR3	Reactive power (phase)
Var	Reactive power (total); single-phase for mains type 1n1E
PF	Power factor
FrEq	Frequency
Limit value	
Alarm type:	Min and Max contact
Relay state:	Relay On or Off in normal state
Hysteresis:	0...20%
On delay:	0...99 s
Off delay:	0...99 s

TECHNICAL DATA

OUTPUT

2 relays with CO contacts SPDT-NO, potential-free

Contact load: 5 A 250 V AC cos ϕ 1 – 3A 250 V AC - cos ϕ 0.4 – 5 A 30 V DC

AUXILIARY VOLTAGE (data apply to a combination of NA96 + MGF3900A module)

Intrinsic consumption MGF3900A: \leq 1 VA

Intrinsic consumption NA96 + module MGF3900A: \leq 5 VA

Intrinsic consumption NA96 + 2 modules MGF3900A: \leq 6 VA

ELECTRICAL SAFETY (data apply to a combination of NA96 + MGF3900A module)

Test voltage: 2 kV rms 50 Hz/1 min

Test circuits: Measurement input, auxiliary voltage, output 1 - output 2

HOUSING

Housing: Module with connector (for connecting to NA96)

Housing depth: 81 mm (NA96 + module)

Connection: Screw terminal

Connection: Rigid cable max. 4.5 mm², flexible cable max. 2.4 mm²

Housing material: Polycarbonate, self extinguishing

Weight: 40 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for alarm output, 2 limit contacts	9004840551006		MGF3900A

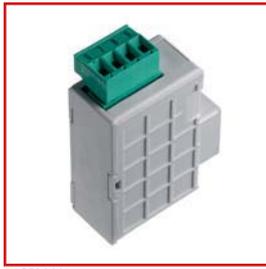


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PLUG-IN MODULE WITH PULSE OUTPUT FOR ENERGY MEASUREMENTS 2 INDEPENDENT AND GALVANICALLY ISOLATED OUTPUTS



MGF3900I

SCHRACK-INFO

Programming of: Energy allocation (active and/or reactive), pulse value and pulse duration. The module MGF3900I in combination with a device of type NA96 and NA96+ allows the transfer of energy values. Both independent and galvanically isolated pulse outputs can be freely allocated to active and/ or reactive energy. For each device (NA96), a maximum of two modules MGF3900I can be used, resulting in 4 pulse outputs.

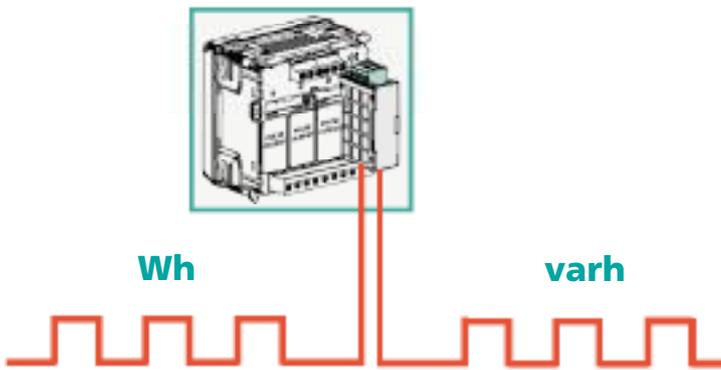
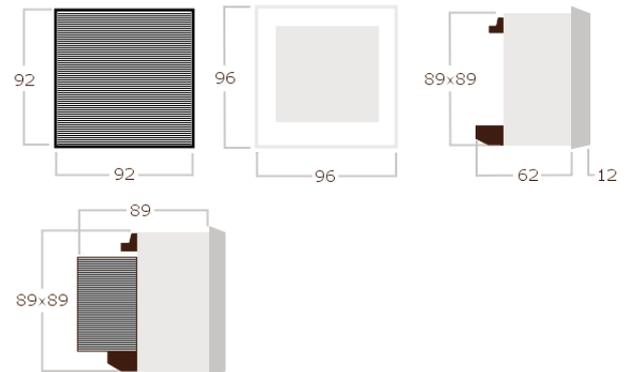
NA96 AND NA96+



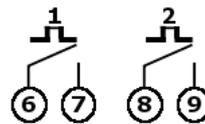
MGF3900I



DIMENSIONS



CONNECTION DIAGRAM



TECHNICAL DATA

PROGRAMMABLE PARAMETERS (for each output)

Allocatable quantity:	Active or reactive energy
Pulse value:	1 pulse/10 Wh - 100 Wh - 1 kWh - 10 kWh - 100 kWh - 1 MWh - 10 MWh 1 pulse/10 Varh - 100 Varh - 1 kvarh - 10 kvarh - 100 kvarh - 1 Mvarh - 10 Mvarh
Pulse duration:	50 - 100 - 200 - 300 ms

OUTPUT

2 optical relays with potential-free contacts SPST-NO	
Loading capacity:	110 V AC / DC - 50 mA

AUXILIARY VOLTAGE (data apply to a combination of NA96 + module MGF3900I)

Intrinsic consumption MGF3900I:	≤ 1 VA
Intrinsic consumption NA96 + module MGF3900I:	≤ 5 VA
Intrinsic consumption NA96 + 2 modules MGF3900I:	≤ 6 VA

ELECTRICAL SAFETY (data apply to a combination of NA96 + module MGF3900I)

Test voltage:	2 kV rms 50 Hz/1 min
Test circuits:	Measurement input, auxiliary voltage, output 1 - output 2

HOUSING

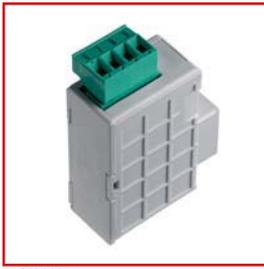
Housing:	Plug-in housing with connection for NA96
Housing depth:	81 mm (NA96 + module)
Connection:	Screw terminal
Connection:	Rigid cable max. 4.5 mm ² , flexible cable max. 2.5 mm ²
Housing material:	Polycarbonate, self extinguishing
Weight:	40 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for pulse output	9004840551020		MGF3900I



Order no. blue: on stock, usually ready for delivery on the day of order!

PLUG-IN MODULE ANALOGUE OUTPUT, 2 INDEPENDENT AND ISOLATED OUTPUTS



MGF3900M

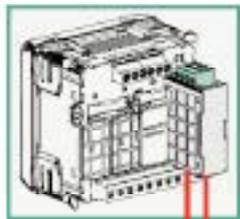
SCHRACK-INFO

Programming of: Measured quantity, initial value of the measuring range, final value of the measuring range, output 0...20 mA - 4...20 mA. The module MGF3900M in conjunction with the multi-function module NA96 and NA96+ allows the mapping of two measured quantities to the analogue signal 0... 20 mA signal and/or 4... 20 mA. Each multi-function module NA96 and NA96+ can accommodate a maximum of 2 modules MGF3900M so that 4 analogue outputs are available.

NA96 AND NA96+



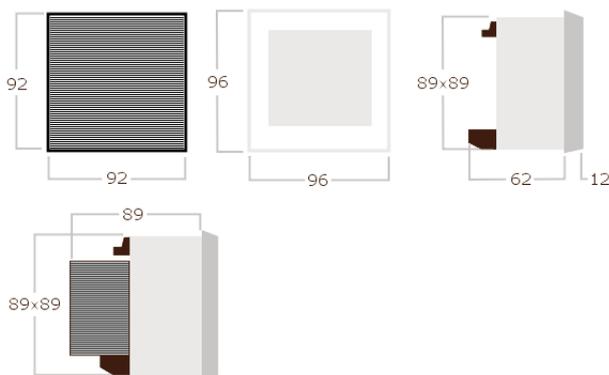
MGF3900M



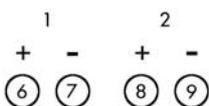
0/4...20 mA



DIMENSIONS



CONNECTION DIAGRAM



PROGRAMMABLE PARAMETERS

Measured quantity: for each output according to the table below

MEAS			
3n3E	3-3E	3-2E	1-n1E
U1			U1
U2			
U3			
U12	U12	U12	
U23	U23	U23	
U31	U31	U31	
A1	A1	A1	A2
A2	A2	A2	
A3	A3	A3	
P1			
P2			
P3			
VAR1			
VAR2			
VAR3			
P	P	P	P
Var	Var	Var	Var
PF	PF	PF	PF
FrEg	FrEg	FrEg	FrEg

3n3E	4-wire three-phase mains, 3 current transformers
3-3E	3-wire three-phase main, 3 current transformers
3-2E	3-wire three-phase power, 2 current transformers (ARON)
1n1E	AC mains
U1-U2-U3	Phase voltage
U12-U23-U31	Phase-to-phase voltage
A1-A2-A3	Phase current
P1-P2-P3	Active power (phase)
P	Active power (total); single-phase for mains type 1n1E
VAR1-VAR2-VAR3	Reactive power (phase)
VAR	Reactive power (total); single-phase for mains type 1n1E
PF	Power factor
FrEg	Frequency
Output signal:	0...20 mA - 4...20 mA
Initial value	
of the measuring range:	Value of the measured quant. that is 0 mA (for output 0... 20 mA) or 4 mA (for output 4...20 mA).
Final value	
of the measuring range:	Value of the measured quantity that is 20 mA

TECHNICAL DATA

OUTPUT

Type:	Unidirectional
Accuracy:	Class 0.5
Set time:	≤ 600 ms
Nominal current:	0...20 and 4...20 mA
Output burden:	≤ 750 Ω

AUXILIARY VOLTAGE (data apply to a combination of NA96 + module MGF3900M)

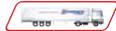
Intrinsic consumption MGF3900M:	≤ 1 VA
Intrinsic consumption NA96 + module MGF3900M:	≤ 6 VA
Intrinsic consumption NA96 + 2 modules MGF3900M:	≤ 8 VA

ELECTRICAL SAFETY (data apply to a combination of NA96 + module MGF3900M)

Test voltage:	2 kV rms 50 Hz/1 min
Test circuits:	Measurement input, auxiliary voltage, output 1 - output 2

HOUSING

Housing:	Module with connector (for connecting to NA96)
Housing depth:	81 mm (NA96 + module)
Connection:	Screw terminal
Connection:	Rigid cable max. 4.5 mm ² , flexible cable max. 2.4 mm ²
Housing material:	Polycarbonate, self extinguishing
Weight:	40 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for analogue values	9004840551013		MGF3900M



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PLUG-IN MODULE M-BUS INTERFACE FOR NA96 AND NA96+



NA96



MGF3900B

SCHRACK-INFO

The module MGF3900B in conjunction with the device of type NA 96 allows reading of kWh by the M-bus interface. Not calibratable!

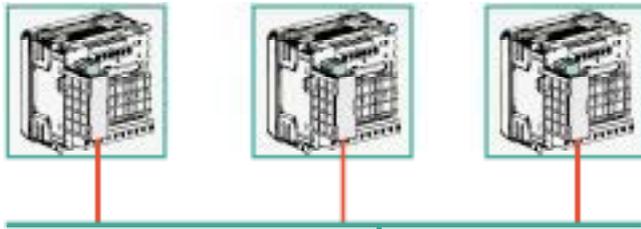
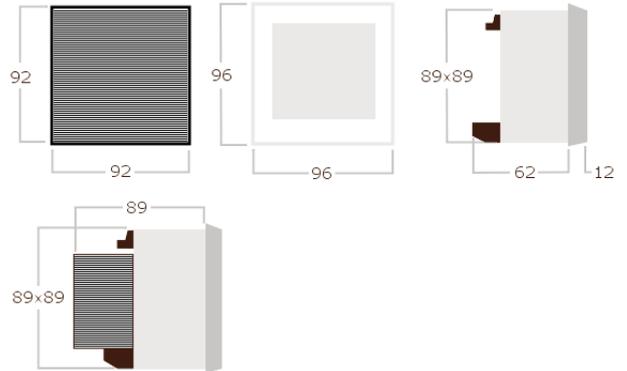
NA96 AND NA96+



MGF3900B

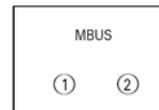


DIMENSIONS



M-BUS

CONNECTION DIAGRAM



TECHNICAL DATA

M-BUS COMMUNICATION – Galvanic isolation between input and supply (NA96/NA96+)

Standard:	EN1434-3
Transfer:	Asynchronous serial
Protocol:	M-BUS
Number of bits:	8
Stop bit:	1

PROGRAMMABLE PARAMETERS

Address:	0...250
Baud rate:	300 - 600 - 1,200 - 2,400 - 4,800 - 9,600 bps

AUXILIARY VOLTAGE (The quantities depend on the combination NA96/ NA96+ and module)

Intrinsic consumption:	≤ 5 VA
------------------------	--------

ELECTRICAL SAFETY (The data depend on the combination of from NA96/NA96+ and module MGF39000B)

Test voltage:	AC 2 kV rms 50 Hz/1 min
Test circuits:	Measurement input, auxiliary voltage

HOUSING

Housing:	Plug-in housing with connection for NA96
Max housing depth:	81 mm (NA96 + module)
Connections:	Screw terminals
Input terminals:	Rigid cable max. 4.5 mm ² , flexible cable max. 2.5 mm ²
Housing material:	Self-extinguishing plastic
Weight:	30 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for M-bus	9004840665994		MGF3900B

PLUG-IN MODULE PROFIBUS COMMUNICATION FOR NA96 AND NA96+



MGF3900P

SCHRACK-INFO

The module MGF3900P in conjunction with the multi-function module NA 96 and NA96+ allows the readout of all measured values and configuration parameters via PROFIBUS communication.

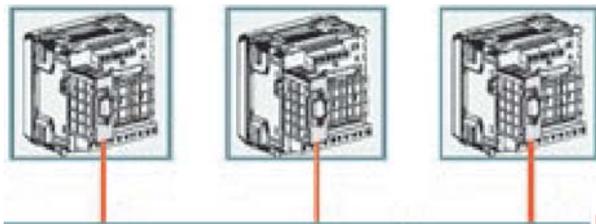
NA96 AND NA96+



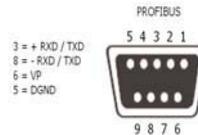
MGF3900P



DIMENSIONS



PROFIBUS CONNECTION DIAGRAM



TECHNICAL DATA

PROFIBUS COMMUNICATION – Galvanic isolation between input and auxiliary voltage (NA96)

Standard:	PROFIBUS EN50170
Response time:	≤ 10 ms
Maximum distance from master:	Standard
Baud rate:	up to 3 Mbps

PROGRAMMABLE PARAMETERS

Address:	1...127
----------	---------

AUXILIARY VOLTAGE (data apply to a combination of NA96 + module MGF3900P)

Intrinsic consumption:	≤ 5 VA
------------------------	--------

ELECTRICAL SAFETY (data apply to a combination of NA96 + module MGF3900P)

Test voltage:	2 kV rms 50 Hz/1 min
Test circuits:	Measurement input, auxiliary voltage, output 1 - output 2

HOUSING

Housing:	Module with connector (for connecting to the device NA96)
Housing depth:	81 mm (NA96 + module)
Connection:	SUB-D, 9-pole
Housing material:	Polycarbonate, self extinguishing
Weight:	50 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for Profibus	9004840554281		MGF3900P



Order no. blue: on stock, usually ready for delivery on the day of order!

PLUG-IN MODULE LONWORKS FOR NA96 AND NA96+



MGF3900L

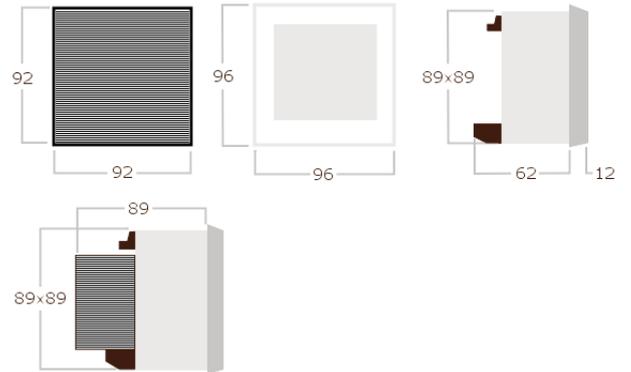
NA96 AND NA96+



MGF3900M



DIMENSIONS



LONWORKS



TECHNICAL DATA

LONWORKS COMMUNICATION – Galvanic isolation between input and auxiliary voltage (NA96)

Standard: FTT10

AUXILIARY VOLTAGE (data apply to a combination of NA96 + module MGF3900L)

Intrinsic consumption: ≤ 5 VA

ELECTRICAL SAFETY (data apply to a combination of NA96 + module MGF3900L)

Test voltage: 1 kV rms 50 Hz/1 min

HOUSING

Housing: Module with connector (for connecting to the device NA96)

Housing depth: 81 mm (NA96 + module)

Housing material: Polycarbonate, self extinguishing

Weight: 50 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for LonWorks	9004840586107		MGF3900L

PLUG-IN MODULE RS485 INTERFACE FOR NA96 AND NA96+



MGF3900R

SCHRACK-INFO

The module MGF3900R in conjunction with the device of type NA 96 and NA96+ allows read-out of all available parameterized data through the RS485 interface.

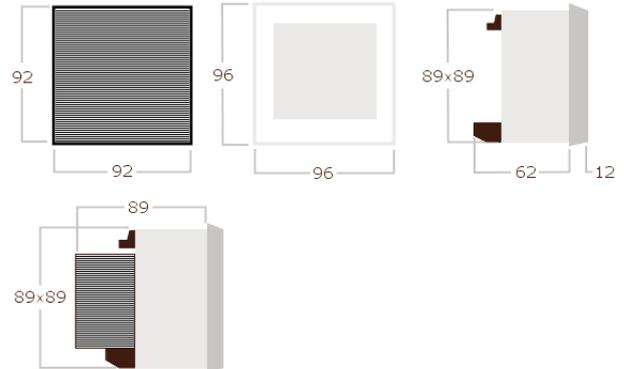
NA96 AND NA96+



MGF3900R

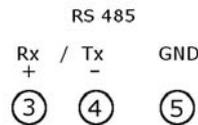


DIMENSIONS



RS485

CONNECTION DIAGRAM



TECHNICAL DATA

RS485 INTERFACE – Galvanic isolation between input and supply (NA96)

Standard:	RS485 - 3-wire
Transfer:	Asynchronous serial
Protocol:	Compatible with JBUS / MODBUS
Number of bits / stop bits:	8 / 1
Data read-out time:	≤ 200 ms
Number of devices to be connected:	32 (up to 255 with RS485 repeater)
Maximum distance of devices:	1200m

PROGRAMMABLE PARAMETERS

Address:	1...255
Transfer speed:	4,800 - 9,600 - 19,200 - 38,400 bps
Parity bit:	none - even - odd

AUXILIARY VOLTAGE (data apply to a combination of NA96 + module MGF3900R)

Intrinsic consumption:	≤ 5 VA
------------------------	--------

ELECTRICAL SAFETY (data apply to a combination of NA96 + module MGF3900R)

Test voltage:	2 kV rms 50 Hz/1 min
Test circuits:	Measurement input, auxiliary voltage, output 1 - output 2

HOUSING

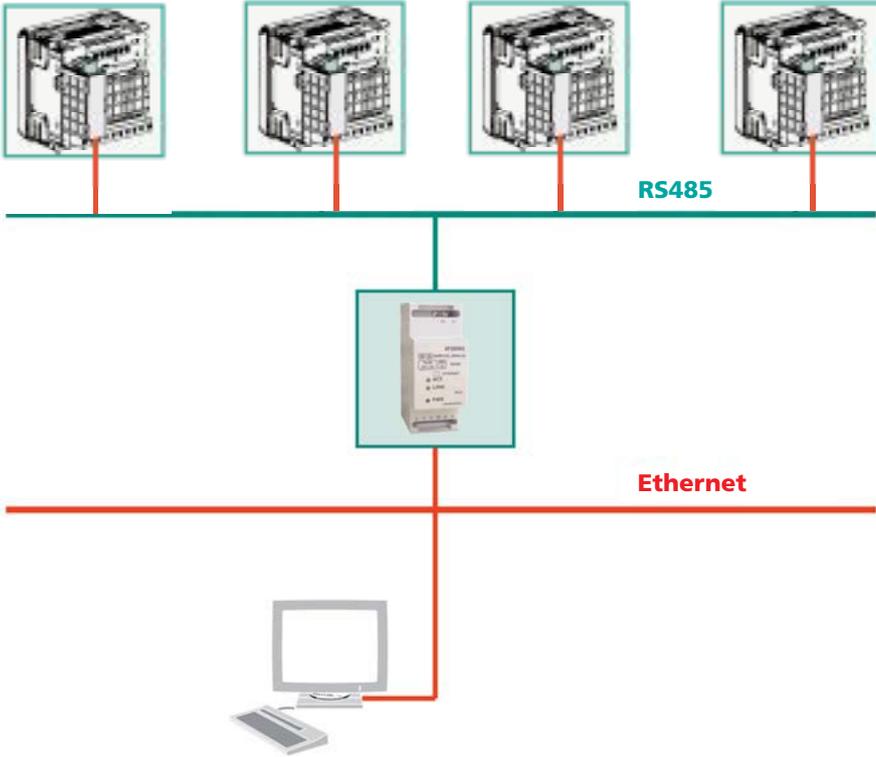
Housing:	Plug-in housing with connection for NA96
Housing depth:	81 mm (NA96 + module)
Connection:	Screw terminal
Connection:	Rigid cable max. 4.5 mm ² , flexible cable max. 2.5 mm ²
Housing material:	Polycarbonate, self extinguishing
Weight:	30 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Plug-in module for RS485 interface	9004840551037		MGF3900R

ETHERNET INTERFACE RS485 COMMUNICATION, 2 MODULES, FOR NA96 AND NA96+

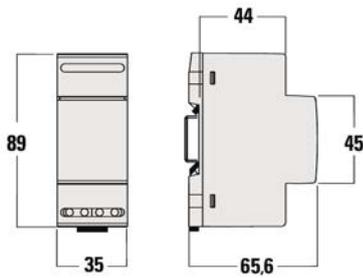


MGZEM001

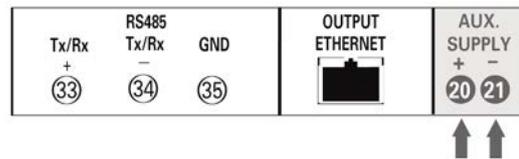


up to 32 devices!

DIMENSIONS



CONNECTION DIAGRAM



TECHNICAL DATA

ETHERNET INTERFACE RS485 COMMUNICATION - Input and power supply galvanically isolated

Standard: IEEE802.3

PROGRAMMABLE PARAMETERS

IP address

STATUS LEDS

ACT: Yellow LED, active connection

LINK: Green LED, Ethernet network On

PWR: Green LED power indicator

AUXILIARY VOLTAGE

Auxiliary voltage: 22...260 V DC/AC

Frequency: 47...63 Hz

Intrinsic consumption: ≤ 4 VA

INSULATION (EN61010-1)

Installation category: III

Pollution degree: 2

AC test voltage: 2.5 kV TRMS 50 Hz/1 min

Concerned circuits: Power supply - RS485 and Ethernet

AC test voltage: 1.5kV TRMS 50 Hz/1 min

Concerned circuits: RS485 to Ethernet

AC test voltage: 4kV TRMS 50 Hz/1 min

Concerned circuits: All circuits and earth

TEST FOR EMC COMPATIBILITY

Emission and immunity tests: According to EN61326

AMBIENT CONDITIONS

Reference temperature: 23 °C ± 2 °C

Maximum operating temperature: -5...55 °C

Maximum storage and transport temperature: -25...70 °C

Maximum heat dissipation

for the thermal calculation of distributor: 3.5 W

HOUSING

Housing: 2 MW according to DIN43880

CONNECTIONS

Power supply: Screw terminals

RS485: Plug connector

Ethernet: RJ-45 connector

Mounting: Snap-on DIN rail (35mm)

DIN rail: TH35-15 (EN60715)

Housing material: Polycarbonate

Weight: 110 grams

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Ethernet module	9004840666007		MGZEM001



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NET-ANALYSER MF7



SCHRACK-INFO

- Low voltage network monitor
- Three-phase network 340...450 V (phase - phase)
- Single-phase network 195...260 V (phase - neutral)
- Connection with dedicated CT
- Programmable primary CT 5...8000 A (41 range)
- True RMS value measurement

TECHNICAL DATA

Display	Voltage phase-phase and phase-N Current wire and neutral wire current Frequency Average current Maximum value of average current Working hours (hours and minutes)
Display	LCD backlit
Backlight	Turns off automatically after 20 seconds without operation
Display	10,000 points (4 digits)
Engineering units	Automatic, depending on the setting of the transformer primary current
Resolution	Automatic, with the highest possible decimal places
Reading update	1.2 seconds
Accuracy (of reading)	
Voltage	± 0.5% (80...450 V phase - phase)
Current	± 0.5% (10...120% I _N)
Neutral wire current	± 2%
Frequency	± 0.2 Hz

MEASURING INSTRUMENTS AND MAINS ANALYSERS

TECHNICAL DATA

DISPLAY

Type of display:	LCD backlighted Automatic backlit reduction after 20s from last key activation
Measurement display:	Subdivided on various pages, with manual or automatic scanning
Display pages:	Three-phase 4-network: Phase current Phase voltage Linked voltage Neutral current + frequency Current demand Current max. demand Working hours and minutes
Page 1	Single-phase network: Current + frequency + voltage
Page 2	Current demand, max. current demand
Page 3	Working hours and minutes
Page 4	
Page 5	
Page 6	
Page 7	
N° of display points:	10.000 (4 digits)
Engineering units:	Automatic display
Resolution:	Automatic, with the highest possible number of decimals
Run hour meter:	Hours and minutes
Reading update:	1,2 seconds
Accuracy (of the reading)	
- Voltage:	± 0,5% (80...600V phase - phase)
- Current:	± 0,5% (10...120% I _n)
- Neutral current:	± 2%
- Frequency:	± 0,2 Hz
CURRENT DEMAND	
Display:	Current demand and max. current demand
Averaging period:	Only for current and power
Value selectable:	5/8/10/15/20/30/60 minutes selectable
Calculation:	Average on the selected period
Max. demand reset:	By hand, by keyboard
PROGRAMMING	
Parameters programming:	Front keyboard, 2 keys
Programming access:	Key combination
Data and configuration parameters retention:	Non volatile memory (no battery)
PROGRAMMABLE PARAMETERS	
Connection:	Single-phase - three-phase 3 and 4 wire
External CT primary:	41 ranges (see table)

Programmable primary currents (A)														
5					10			15		20	25	30		40
50	60	70	75	80	100	120	125	150	160	200	250	300		400
500	600	700	750	800	1000	1200	1250	1500	1600	2000	2500	3000	3200	4000
5000	6000	7000	7500	8000										

Current max. demand:	Delay time, reset
Working hours:	Reset
INPUT	
Single-phase and three-phase 4-wire network	
Three-phase voltage:	340...450V (phase-phase)
Single-phase voltage:	195...260V
Current rating I _n :	5A or 1A
Continuous overload:	1,2I _n
Istantaneous overload:	20I _n /0,5 seconds
Connection with external dedicated current transformer Inputs have a common point	
Frequency rating f _n :	50Hz
Tolerance:	47...63Hz
Type of measurement:	True RMS
Harmonic content:	Up to the 16th harmonic
Voltage rated burden:	≤ 1VA (each phase)
Current rated burden:	≤ 0,5VA (each phase)

TECHNICAL DATA – continued

AUXILIARY SUPPLY

Taken from measurement (selfsupplied)

INSULATION

Installation category: III

Pollution degree: 2

Insulation voltage rating: 660V

A.C. voltage test 4kV r.m.s. value 50Hz/1min – Considered circuits: All circuits and earth

TESTS FOR ELETROMAMAGNETIC COMPATIBILITY

Emission tests according to EN 61000-6-3

Immunity tests according to EN 61000-6-2

ENVIRONMENTAL CONDITIONS

Reference temperature: 23°C ± 2°C

Specified operating range: -5...55°C

Limit range for storage and transport: -25...70°C

Variation of the class index: ≤ 0,1% /°C

Max. power dissipation for switchboard thermal calculation: ≤ 6,8W

HOUSING

Housing: Flush mounting (panel cutout 68x68mm)

Front frame: 72x72mm

Depth: 75 mm

Ammetric terminals range: Rigid cable min.0,05mm² / max. 4mm²
Flexible cable min.0,05mm² / max. 2,5mm²

Volmetric terminals range: Rigid cable min. 0,05mm² / max. 4mm²
Flexible cable min.0,05mm² / max. 2,5mm²

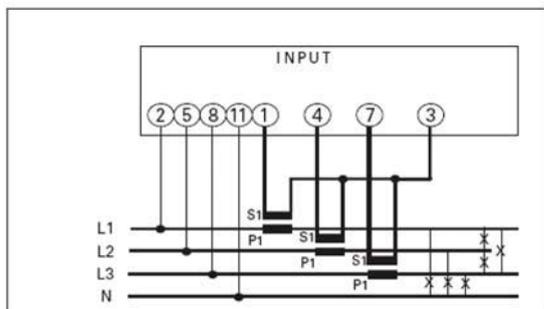
Housing material: Self-extinguishing makrolon

Protection degree (EN60529): IP54 front frame, IP20 terminals

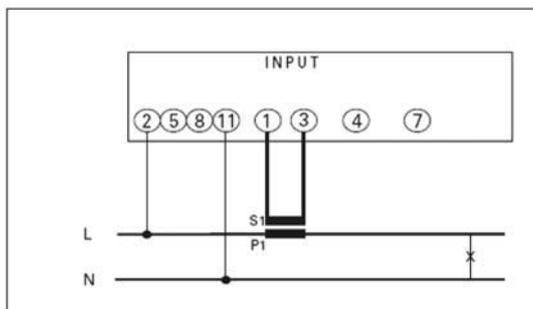
Weight: 250 grams

CIRCUIT DIAGRAMS

4-wire three-phase network



Single-phase network



DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Net analyser 72 x 72	9004840546385		MGF37000



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MODULAR NET-ANALYSER



SCHRACK-INFO

- Three-phase network 80...600 V (phase - phase)
- Single-phase network 50...350 V (phase - neutral)
- Connection with dedicated CT
- Primary CT 5...8000 A
- 41 primary currents settable
- True RMS measurement
- Display with manual or automatic scanning

TECHNICAL DATA

DISPLAY

Type of display:	LCD backlighted Automatic backlit reduction after 20s from last key activation	
Measurement display:	Subdivided on various pages, with manual or automatic scanning	
Display pages:	Three-phase 4-network:	Single-phase network:
Page 1	Phase voltage	Voltage - Current
Page 2	Phase current	Active, reactive, apparent power
Page 3	Linked voltage	Frequency - Power factor
Page 4	Phase active power	Working hours and minutes
Page 5	Phase reactive power	Power demand - Power Max. demand
Page 6	Active, reactive, apparent power	Current demand, max. current demand
Page 7	Neutral current, frequency, power factor	
Page 8	Working hours and minutes	
Page 9	Power demand - Power Max. demand	
Page 10	Phase current demand	
Page 11	Phase current max. demand	
N° of display points:	10.000 (4 digits)	
Engineering units:	Automatic display according to the set CT ratios	
Resolution:	Automatic, with the highest possible number of decimals	
Run hour meter:	Hours and minutes	
Reading update:	1,2 seconds	
Accuracy (of the reading)		
- Voltage:	± 0,5% (340...450V phase - phase)	
- Current:	± 0,5% (10...120% I _n)	
- Neutral current:	± 2%	
- Power:	± 1,5% (10...120% P _n /q _n /s _n cosj 0,5 ind...0,5cap)	
- Power factor:	± 2%	
- Frequency:	± 0,2 Hz	
CURRENT DEMAND - POWER DEMAND		
Display:	Current and active power demand, max. current demand and max. power demand	
Averaging period:	Only for current and power	
Value selectable:	5/8/10/15/20/30/60 minutes	
Calculation:	Average on the selected period	
Max. demand reset:	By keyboard	
PROGRAMMING		
Parameters programming:	Front keyboard, 2 keys	
Programming access:	Key combination	
Data and configuration parameters retention:	Non volatile memory (no battery)	

TECHNICAL DATA – continued

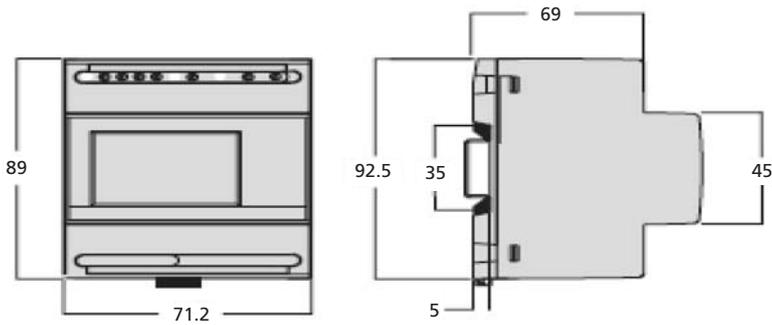
PROGRAMMABLE PARAMETERS

Display:	Manual or automatic scanning
Connection:	Single-phase - three-phase 3 and 4 wire
External CT primary:	41 ranges (see table)

Selectable primary current (A)														
5					10			15		20	25	30		40
50	60	70	75	80	100	120	125	150	160	200	250	300		400
500	600	700	750	800	1000	1200	1250	1500	1600	2000	2500	3000	3200	4000
5000	6000	7000	7500	8000										

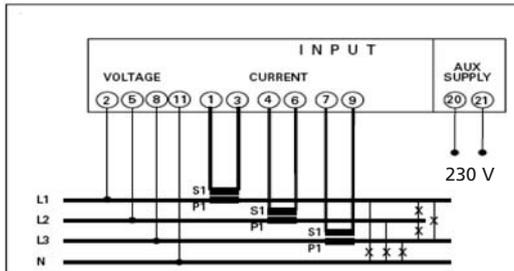
Current - Power max. demand:	Averaging time, max. demand reset
Working hours:	Reset
INPUT	
Single-phase network, three-phase network 3 and 4-wire	
Three-phase voltage:	80...600V (phase-phase)
Single-phase voltage:	50...350V
Current rating In:	5A or 1A
Continuous overload:	1,2In
Istantaneous overload:	20In/0,5 seconds
Connection with external dedicated current transformer Inputs have a common point (terminals 3 - 6 - 9)	
Frequency rating fn:	50Hz
Tolerance:	47...63Hz
Type of measurement:	True RMS
Harmonic content:	Up to the 16th harmonic
Voltage rated burden:	≤ 1VA (each phase)
Current rated burden:	≤ 0,5VA (each phase)
AUXILIARY SUPPLY	
Rated value Uaux ac:	115 – 230 e 240 - 400V
Tolerance:	0,85...1,1Uaux
Rated frequency:	50Hz
Working frequency:	47...63Hz
Rated burden:	≤ 5VA – 2,5W
INSULATION	
Installation category:	III
Pollution degree:	2
Insulation voltage rating:	660V
Impulse voltage test 6kV 1,2/50µs 0,5J – Considered circuits:	Measure, aux. supply
A.C. voltage test 2,5kV r.m.s. value 50Hz/1min – Considered circuits:	Measure, aux. supply
A.C. voltage test 4kV r.m.s. value 50Hz/1min – Considered circuits:	All circuits and earth
TESTS FOR ELETROMAMAGNETIC COMPATIBILITY	
Emission tests according to EN 61000-6-3	
Immunity tests according to EN 61000-6-2	
ENVIRONMENTAL CONDITIONS	
Reference temperature:	23°C ± 2°C
Specified operating range:	-5...55°C
Limit range for storage and transport:	-25...70°C
Variation of the class index:	≤ 0,1% /°C
Max. power dissipation for switchboard thermal calculation:	≤ 6,8W
HOUSING	
Custodia:	4 moduli DIN 43880
Connections:	Screw terminals
Ammetric terminals range:	Rigid cable min.0,05mm ² / max. 4mm ² Flexible cable min.0,05mm ² / max. 2,5mm ²
Volmetric terminals range:	Rigid cable min. 0,05mm ² / max. 4mm ² Flexible cable min.0,05mm ² / max. 2,5mm ²
Mounting:	Snap-on 35mm rail
Rail type:	Top hat TH35-15 (EN60715)
Housing material:	Self-extinguishing polycarbonate
Protection degree (EN60529):	IP54 front frame, IP20 terminals
Weight:	260 grams

DIMENSIONS

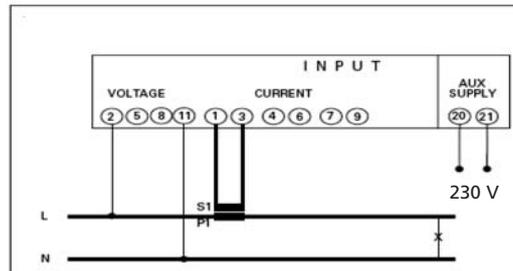


CIRCUIT DIAGRAMS

4-wire three-phase network



Single-phase network



DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Net analyser MF7-45	9004840588668		MGR30000



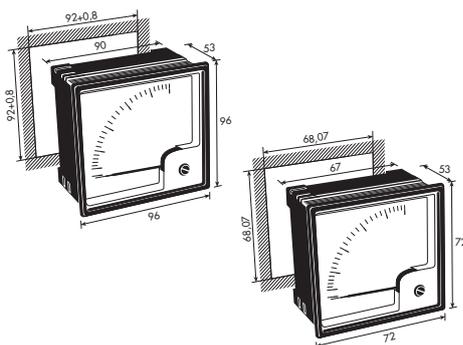
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MEASURING INSTRUMENTS FOR PANEL INSTALLATION - GENERAL INFORMATION



TECHNICAL DATA

- Class ± 1.5
- Nominal voltage max. 500 V
- Test voltage 2 kV, 50 Hz, 1 min

ACCESSORIES

- Scale plates
- Terminal cover
- Quick mounting

SYMBOLS AND THEIR MEANINGS

Symbols indicating the principle function of the instrument and accessory

Symbol	Specification
	Magnetoelectric instrument (with moving coil and permanent magnet)
	Instrument with moving iron
	Ferrodynamic instrument (electrodynamic with iron)
	Induction instrument
	Bimetal instrument
	Electronic device in the measuring circuit
	Electronic device in an auxiliary circuit
	Shunt for measuring instrument
	General accessory

If the (1) symbol is associated with the symbol of the instrument this means that the device is incorporated.
If the (1) symbol is associated with the (2) this means that the device is external.

Symbols indicating the characteristics of the instrument in relation to its connection with the network

Symbol	Specification
	Circuit with direct current
	Single-phase circuit with alternating current
	Single-phase direct and alternating current circuit
	Three-phase alternating current circuit (general symbol)
	Three-phase alternating current circuit with unbalanced load (general symbol)
	A measuring element for 3 wire networks
	A measuring element for 4 wire networks
	Two measuring elements for 3 wire networks with unbalanced load
	Two measuring elements for 4 wire networks with balanced load
	Three measuring elements for 4 wire networks with unbalanced load

Symbols for accuracy class

Symbol	Specification
1,5	Class indicator (eg. 1.5) with errors expressed in percentage of conventional value, except when the latter is as long as the graduation or the true value
	Class indicator (eg. 1.5) when the conventional value corresponds to the true value.
	Class indicator of an instrument with a non linear scale, contracted in the case where the conventional value is as long as the graduation and the indication of the error is expressed as a percentage of the true value. (for example: class indicator 1: relative error limit of 5%) (par. 2.3.11.36)

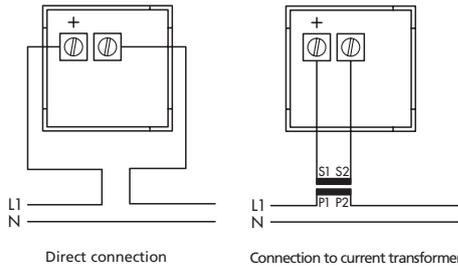
Symbols indicating the working position

Symbol	Specification
	Instrument to use with the dial vertical
	Instrument to use with the dial horizontal
	Instrument to use with dial inclined (60° for example) in relation to the horizontal plane.

Symbols regarding safety

Symbol	Specification
	500V test voltage
	Test voltage of more than 500V (2kV for example)
	Instrument exempt from voltage test
	High voltage on the accessory and/or on the instrument

AC AMMETER



SCHRACK-INFO

The instruments with transformer connection are delivered without a scale-plate. The scale plate is chosen according to the CT. Therefore, the scale plate must be ordered separately.

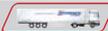
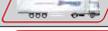
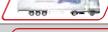
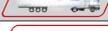
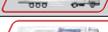
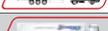
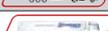
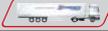
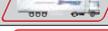
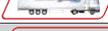
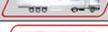
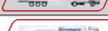
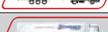
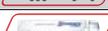
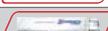
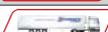
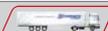
TECHNICAL DATA

- Moving iron type, overcurrent range 2x In
- Frequency 45-65 Hz
- 0.5...60 A AC direct, 10 A...10 kA via current transformer connection

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
48x48			
AMMETER 48X48 5 A AC DIR.	9004840545616		MGF54005
Ammeter 48x48 10 A AC DIR.	9004840545609		MGF54010
Ammeter 48x48 15 A AC DIR.	9004840545586		MGF54015
Ammeter 48x48 25 A AC DIR.	9004840545593		MGF54025
Ammeter 48x48 for CT 5 A	9004840560329		MGF54000
72x72			
Ammeter 72x72 5 A AC DIR.	9004840546460		MGF57005
Ammeter 72x72 10 A AC DIR.	9004840546453		MGF57010
Ammeter 72x72 25 A AC DIR.	9004840546446		MGF57025
Ammeter 72x72 50 A AC DIR.	9004840546514		MGF57050
Ammeter 72x72 for CT 5 A	9004840545647		MGF57000
96x96			
Ammeter 96x96 10 A AC DIR.	9004840546545		MGF59010
Ammeter 96x96 15 A AC DIR.	9004840546538		MGF59015
Ammeter 96x96 25 A AC DIR.	9004840546521		MGF59025
Ammeter 96x96 50 A AC DIR.	9004840546507		MGF59050
Ammeter 96x96 for CT 5 A	9004840545715		MGF59000



AC AMMETER – continued

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
SCALE PLATES 48x48			
Scale plate 25 A/5 A 48x48	9004840560343		MG554025
Scale plate 50 A/5 A 48x48	9004840560350		MG554050
Scale plate 100 A/5 A 48x48	9004840560336		MG554100
SCALE PLATES 72x72			
Scale plate 50/5 A AC 72x72	9004840553352		MG557050
Scale plate 60/5 A AC 72x72	9004840553369		MG557060
Scale plate 80/5 A AC 72x72	9004840553376		MG557080
Scale plate 100/5 A AC 72x72	9004840553383		MG557100
Scale plate 150/5 A AC 72x72	9004840551143		MG557150
Scale plate 200/5 A AC 72x72	9004840553413		MG557200
Scale plate 250/5 A AC 72x72	9004840553420		MG557250
Scale plate 300/5 A AC 72x72	9004840553437		MG557300
Scale plate 400/5 A AC 72x72	9004840553444		MG557400
Scale plate 500/5 A AC 72x72	9004840545722		MG557500
Scale plate 600/5 A AC 72x72	9004840553451		MG557600
Scale plate 800/5 A AC 72x72	9004840553468		MG557800
Scale plate 1000/5 A AC 72x72	9004840553390		MG5571K0
Scale plate 1500/5 A AC 72x72	9004840553406		MG5571K5
SCALE PLATES 96x96			
Scale plate 60/5 A AC 96x96	9004840551372		MG559060
Scale plate 80/5 A AC 96x96	9004840551389		MG559080
Scale plate 100/5 A AC 96x96	9004840545739		MG559100
Scale plate 150/5 A AC 96x96	9004840551396		MG559150
Scale plate 200/5 A AC 96x96	9004840551402		MG559200
Scale plate 250/5 A AC 96x96	9004840551419		MG559250
Scale plate 300/5 A AC 96x96	9004840551440		MG559300
Scale plate 400/5 A AC 96x96	9004840551464		MG559400
Scale plate 500/5 A AC 96x96	9004840545760		MG559500
Scale plate 600/5 A AC 96x96	9004840551471		MG559600
Scale plate 800/5 A AC 96x96	9004840551488		MG559800
Scale plate 1000/5 A AC 96x96	9004840545746		MG5591K0
Scale plate 1500/5 A AC 96x96	9004840545753		MG5591K5
Scale plate 2000/5 A AC 96x96	9004840551426		MG5592K0
Scale plate 2500/5 A AC 96x96	9004840551433		MG5592K5
Scale plate 3000/5 A AC 96x96	9004840551457		MG5593K0

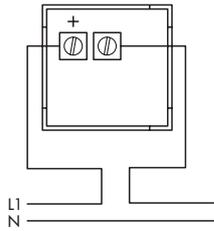


I KNOW WHERE TO FIND IT!

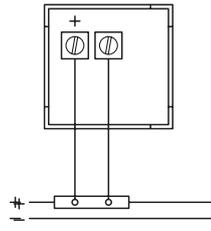
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DC AMMETER



Direct connection



Connection to shunt 60 mV

SCHRACK-INFO

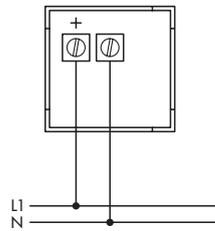
The instruments with shunt connection 60 mV are delivered without a scale-plate. The scale plate is chosen according to the shunt. The scale plate must be ordered separately.

TECHNICAL DATA

- Moving coil type
- 1...60 A direct
- 10 A... 10 kA via shunt

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
72x72			
Ammeter 72x72 25 A DC DIR.	9004840545630		MGF17025
Ammeter 72x72 60 A DC DIR.	9004840548105		MGF17060
Ammeter 72x72 for shunt	9004840545623		MGF17000
SCALE PLATES 72x72			
Scale plate 60 A DC 72x72	9004840560770		MGS17060
Scale plate 100 A DC 72x72	9004840560763		MGS17100
Scale plate 300 A DC 72x72	9004840560794		MGS17300
Scale plate 500 A DC 72x72	9004840560817		MGS17500

AC VOLTMETER



Anschluß

SCHRACK-INFO

- Frequency 45-65 Hz
- Moving iron type
- 30...500 V AC direct
- Up to 800 V AC on request

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
48x48			
Voltmeter 48x48 500 V AC	9004840545654		MGF64500
72x72			
Voltmeter 72x72 30 V AC	9004840546477		MGF67030
Voltmeter 72x72 300 V AC	9004840546484		MGF67300
Voltmeter 72x72 500 V AC	9004840546491		MGF67500
96x96			
Voltmeter 96x96 300 V AC	9004840546576		MGF69300
Voltmeter 96x96 500 V AC	9004840546569		MGF69500



VOLTMETER WITH INTEGRATED SWITCH

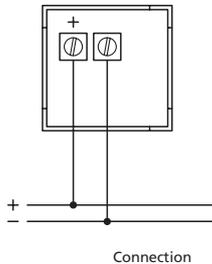


SCHRACK-INFO

- Frequency 45-65 Hz
- Moving iron type
- AC voltmeter with integrated switch
L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
72x72			
Voltmeter 72x72 500 V AC	9004840545708		MGF77500
96x96			
Voltmeter 96x96 500 V AC	9004840545692		MGF79500

DC VOLTMETER

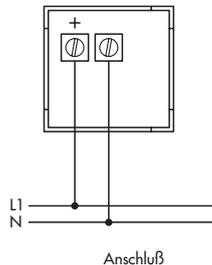


SCHRACK-INFO

- Moving coil type
- 15... 300 V DC direct
- Up to 600 V DC on request

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
72x72			
Voltmeter 72x72 15 V DC	9004840545524		MGF27015
Voltmeter 72x72 30 V DC	9004840545531		MGF27030
Voltmeter 72x72 60 V DC	9004840545548		MGF27060
Voltmeter 72x72 300 V DC	9004840545555		MGF27300

FREQUENCY METER

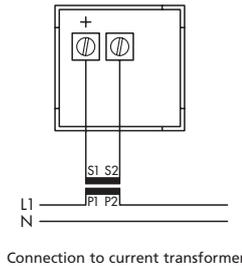


SCHRACK-INFO

- 230 V
- Class 0.5

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Frequency meter 72x72	9004840545685		MGF87050
Frequency meter 96x96	9004840545661		MGF89050

MAXIMUM DEMAND AMMETER



SCHRACK-INFO

- These instruments consist of a bi-metal measuring mechanism which shows the maximum current recorded by a red drag pointer, and a moving iron measuring mechanism for measuring the momentary current.
- Moving iron mechanism, overcurrent range $2x I_n$, intrinsic consumption max. 1.2 VA, class 1.5
- Bi-metal measuring mechanism, overcurrent range $1.2 I_n$, intrinsic consumption 2.5 VA, class 3
- Response time 15 min., current transformer connection .. / 5 A, requires matching scale plate
- Frequency 45-65 Hz

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Maximum demand ammeter	9004840564518		MGF49005
Scale 100-120-200/5 A	9004840551136		MG549100

FRONT PROTECTION KIT IP 65

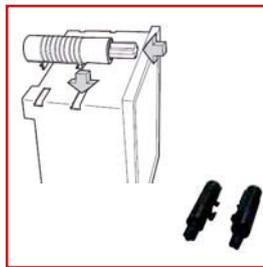
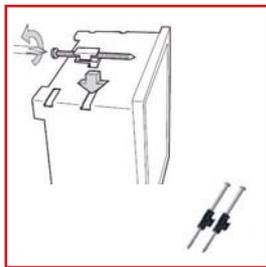


SCHRACK-INFO

- Front protection kit for IP 65
- Additional 2 mounting fasteners

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Front protection kit 72x72 IP65	9004840545784		MGZD7000
Front protection kit 96x96 IP65	9004840545791		MGZD9000

ACCESSORIES FOR MEASURING INSTRUMENTS FOR PANEL INSTALLATION



SCHRACK-INFO

- Terminal cover as touch protection suitable for all panel installation devices

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
REAR TERMINAL COVER			
Rear terminal cover 48x48	9004840143195		MG900010
Rear terminal cover 72x72	9004840090642		MG900011
Rear terminal cover 96x96	9004840090659		MG900012

FIXING SYSTEMS

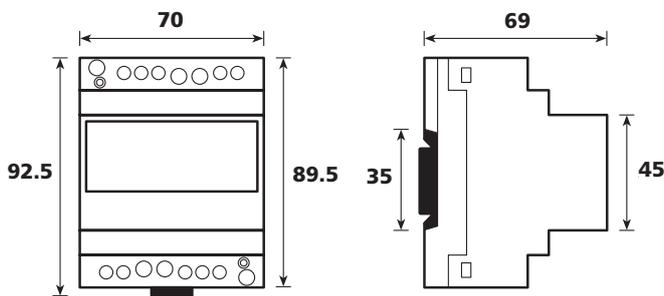
Additional fixing set	9004840546699		MGZ00001
Quick fixing set	9004840546682		MGZ00002

ANALOGUE MEASURING INSTRUMENTS FOR RAIL MOUNTING – GENERAL INFORMATION



MEASURING INSTRUMENTS REG

DIMENSIONS



TECHNICAL DATA

Standards:	Electrical: CENELEC HD 233, IEC 51, VDE 0410, BS 89 Safety: CENELEC HD 215, IEC 414, DIN 57410, BS 5458
Ambient temperatures:	Temperature influence $\pm 0.03\%/^{\circ}\text{C}$ Operating temperature $-20\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$ Storage temperature $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$ Vibration-proof
Overload capability:	Current paths $1.2x I_n$ continuous, $10x I_n$ 10 sec. Voltage paths $1.2x U_n$ continuous, $2x U_n$ 5 sec.
Stray field influence:	Up to 0.5 mT without additional errors
Accuracy class:	1.5
Response time:	max. 2 sec.
Width:	4 MW
Scale:	120°



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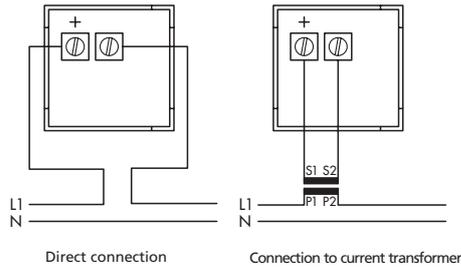
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AC AMMETER



MG159010



SCHRACK-INFO

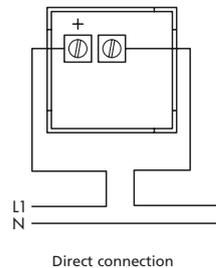
- Moving iron measuring mechanism
- Possible direct measurement ranges: 2, 5, 10, 25, 40 A
- 5 A transformer connection type available
- Standard scale $1 \times I_N$
- Overload scale $2 \times I_N$
- Frequency range 45-65 Hz
- Intrinsic consumption approx. 1.1 VA

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
AC AMMETER						
5 A direct or CT	4	70x92.5x69	0.13	9004840058338		MG159005
10 A direct	4	70x92.5x69	0.13	9004840058345		MG159010
25 A direct	4	70x92.5x69	0.13	9004840136906		MG159025
40 A direct	4	70x92.5x69	0.13	9004840058352		MG159040
SCALE PLATES						
Scale plate 50 A	4	-	-	9004840080421		MG95A050
Scale plate 100 A	4	-	-	9004840080438		MG95A100
Scale plate 150 A	4	-	-	9004840080445		MG95A150
Scale plate 200 A	4	-	-	9004840080452		MG95A200
Scale plate 250 A	4	-	-	9004840080469		MG95A250
Scale plate 400 A	4	-	-	9004840080476		MG95A400

DC AMMETER



MG154010



SCHRACK-INFO

- Moving coil measuring mechanism

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
10 A direct	4	70x92.5x69	0.12	9004840058307		MG154010
25 A direct	4	70x92.5x69	0.12	9004840058314		MG154025



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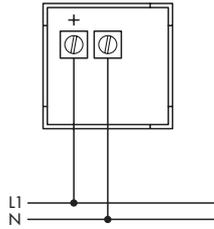
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AC VOLTMETER



MG059250



Direct connection

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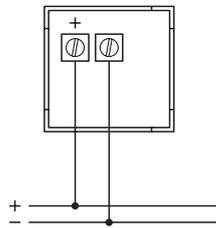
- Moving iron measuring mechanism
- Transformer connection 100-110 V possible
- Possible direct measurement ranges: 250, 500 V
- Frequency range: 45-65 Hz
- Intrinsic consumption approx. 3 VA

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
250 V	4	70x92.5x69	0.13	9004840058185		MG059250
500 V	4	70x92.5x69	0.13	9004840058192		MG059500

DC VOLTMETER



MG054100



Direct connection

SCHRACK-INFO

- Moving coil measuring mechanism
- Possible direct measurement ranges: 1-100 V
- Intrinsic consumption: 1 mA at 0.5-600 V (1000 OhmV)
- Type 60 mV for connection to shunt

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
100 V	4	70x92.5x69	0.12	9004840058161		MG054100

FREQUENCY METER



MG359055

SCHRACK-INFO

- Pointer frequency meter 45 to 55 Hz, 400 V
- Accuracy $\pm 1\%$ of scale length
- Intrinsic consumption approx. 4 VA
- Permissible voltage fluctuation $\pm 15\%$

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
45-55 Hz, 400 V	4	70x92.5x69	0.2	9004840058383		MG359055



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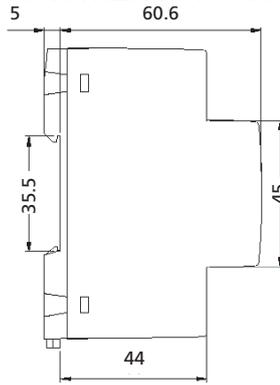
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DIGITAL MEASURING INSTRUMENTS FOR RAIL MOUNTING – GENERAL INFORMATION



MEASURING INSTRUMENTS REG DIGITAL



SCHRACK-INFO

- Overload indicator
- 3-digit display, max. display: 999
- Display digits: green, 14 mm high
- Test voltage: 2 kV, 50 Hz
- Accuracy: Class 1 + 1 digit
- Terminals: Screw terminals
- Temperature range: 5 °C to 40 °C
- Limit temperature range: -40 °C to +70 °C

TECHNICAL DATA

Continuous overload:

- 1.2x U_n
- 1.2x I_n

Short overload:

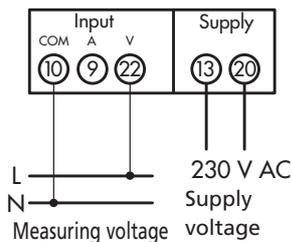
- 2x $U_n/5$ sec.
- 10x $I_n/10$ sec.

AC VOLTMETER/AMMETER

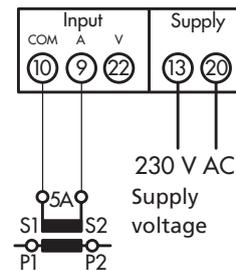


MGU076K8

Connection as voltmeter



Connection as ammeter with current transformer



SCHRACK-INFO

- Can be used as voltmeter or ammeter
- Current measuring ranges settable from 5-8000 A by key (CT connection)
- Voltage range 0-500 V with overload indicator up to 600 V
- Auxiliary voltage 230 V, 50 Hz
- Nominal frequency 50 Hz, working frequency range 47-420 Hz
- TRMS measurement type

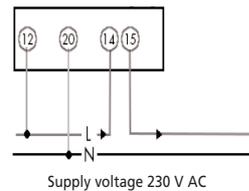
DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
5-8000 A for transformer connection x/5 A						
0-500 (600) V AC	4	70x92.5x69	0.3	9004840449945		MGU076K8

AC AMMETER



MG109020

AC ammeter with measurement input direct connection



SCHRACK-INFO

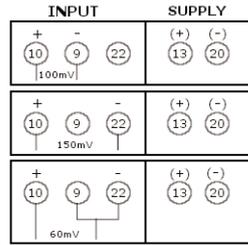
- Frequency range: 45-65 Hz
- Intrinsic consumption approx. 1 VA
- Possible measuring ranges: 10, 20 A

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
10 A direct	4	70x92.5x69	0.3	9004840058222		MG109010
20 A direct	4	70x92.5x69	0.3	9004840058246		MG109020

DC AMMETER



MG10D999-A



SCHRACK-INFO

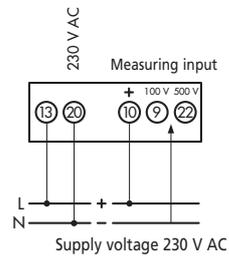
- Possible measuring ranges: 5 – 8000 A settable by key
- Can optionally connected to 60/100/150 mV shunt
- Overload 1.2 I_N

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
5-8000 A, via shunt 60/100/150 mV	4	70x92.5x67	0.3	9004840449952		MG10D999-A

DC VOLTMETER



MG004600-A



SCHRACK-INFO

- Measuring range 0-99.9 V and 0-500 V optionally connectable
- Overload indicator 1.2 U_N
- Supply voltage 230 V AC

DESCRIPTION	MW	DIM. (WxHxD) mm	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
100 (120) V/500 (600) V	4	70x92.5x67	0.3	9004840449976		MG004600-A



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MODULAR HOUR METER FOR DIN RAIL MOUNTING, SERIES OPTIMA



BZ326418

SCHRACK-INFO

- With screw terminals for DIN-rail mounting
- Durable, maintenance-free technology
- Robust and reliable

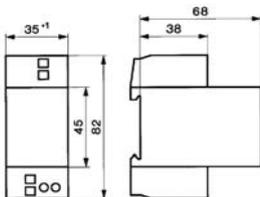
Applications:

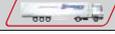
- Operating hour control in machines and pumps

TECHNICAL DATA

Dimensions H x W x D (mm)	82 x 35 x 68
Panel cut-out (mm)	–
Cut-out (mm)	46 x 36
Overall depth (mm)	68
Weight (g) approx.	90
Connection	See order information
Power consumption	Approx. 1 VA
Ambient temperature	–20 °C to +55 °C
Protection class	II
Degree of protect. of front side	IP 20
Accuracy	Synchronised with mains
Counting capacity	99999.99 h
Running indicator	Yes
Mounting type	Distribution rail
Connection type	Captive ± screw terminals 1 x 2.5 or 2 x 1.5 mm ²

DIMENSIONS



DESCRIPTION	MW	EAN CODE	AVAILABLE	ORDER NO.
Hour meter 220-240 V AC, 50 Hz	2	9004840015409		BZ326418-P
Hour meter 18-26 V AC, 50 Hz	2	9004840015447		BZ326423



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HOUR METER

MODULAR HOUR METER FOR FLUSH MOUNTING, SERIES OPTIMA



BZ326413



BZ326416

SCHRACK-INFO

- With screw terminals for installation
- Durable, maintenance-free technology
- Robust and reliable

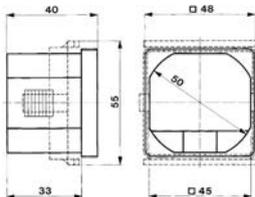
Applications:

- Operating hour control in machines and pumps

TECHNICAL DATA

Dimensions H x W x D (mm)	55 x 48 x 40
Panel cut-out (mm)	45 x 45
Cut-out (mm)	-
Overall depth (mm)	33
Weight (g) approx.	60
Connection	See order information
Power consumption	Approx. 1 VA
Ambient temperature	-20 °C to +55 °C
Protection class	II
Degree of protect. of front side	IP 20
Accuracy	Synchronised with mains
Counting capacity	99999.99 h
Running indicator	Yes
Mounting type	Installation
Connection type	Screw terminals

DIMENSIONS



DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
Hour meter 220-240 V AC, 50 Hz, IP20	9004840015348		BZ326413-P
Hour meter 220-240 V AC, 50 Hz, IP54	9004840015355		BZ326414
ACCESSORIES			
Adapter 55 x 55 mm for BZ326413-P	9004840277555		BZ326416



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MODULAR CURRENT TRANSFORMERS FOR DISTRIBUTOR INSTALLATION



MG900220

SCHRACK-INFO

- Suitable for other REG devices such as RCCB, etc., 45 mm slot
- Easy to feedthrough
- For coarse display of measured value
- Space-saving - only 2 MW wide

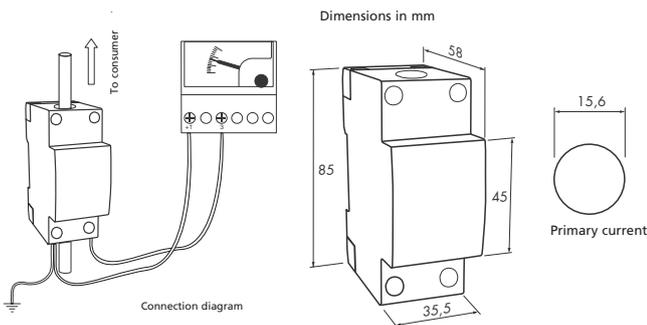
TIPS & TRICKS

Do not confuse current direction (energy flow) during feedthrough. The secondary load (e.g. 2 VA) must fit the consumption of the measuring instrument!

TECHNICAL DATA

- 2 MW housing with primary feedthrough max. 15 mm
- Mounting: DIN rail
- Class 3, 40 - 80 A
- Class 1, 100 - 150 A
- Powers 2 / 3 / 5 VA

DIMENSIONS AND CIRCUIT DIAGRAMS



POWER TABLE

A	Class 1		Class 3	
	Secondary current 5 A		Secondary current 5 A	
	Type	VA	Type	VA
40			TCSM15 40 A	2
50			TCSM15 50 A	2
60			TCSM15 60A	3
80			TCSM15 80A	3
100	TCSM15 100A	3		
120	TCSM15 120A	5		
150	TCSM15 150A	5		

DESCRIPTION	PU	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
Modular current transformer 40 A / 5 A	2	TCSM15 40 A	0.25	9004840277289		MG900220
Modular current transformer 50 A / 5 A	2	TCSM15 50 A	0.25	9004840277296		MG900221
Modular current transformer 60 A / 5 A	2	TCSM15 60 A	0.25	9004840277302		MG900222
Modular current transformer 80 A / 5 A	2	TCSM15 80 A	0.25	9004840277319		MG900224
Modular current transformer 100 A / 5 A	2	TCSM15 100 A	0.25	9004840277326		MG900225
Modular current transformer 120 A / 5 A	2	TCSM15 120 A	0.25	9004840277333		MG900226
Modular current transformer 150 A / 5 A	2	TCSM15 150 A	0.25	9004840277340		MG900227



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CURRENT TRANSFORMERS

MINIATURE CURRENT TRANSFORMERS FOR CABLE 13 mm Ø



MG900300

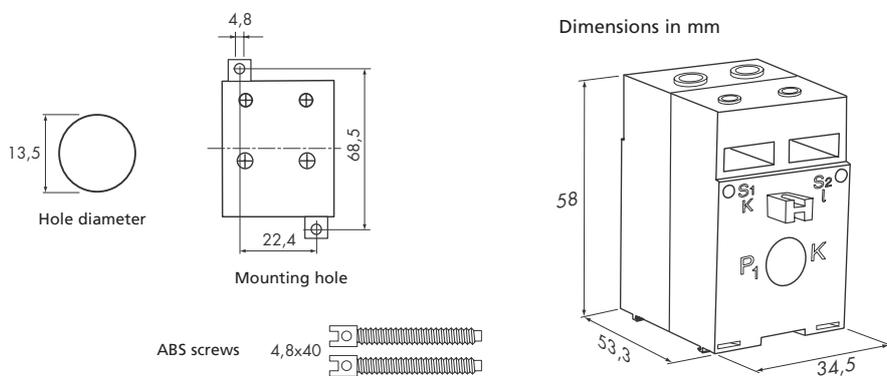
SCHRACK-INFO

- Sealable terminal cover
- Degree of protection IP 20 (excluding terminal cover)

TECHNICAL DATA

- 3x secondary connection: Faston connector, quick-connect spring-clamp terminal, screw terminal
- Screw mounting to the busbar/connector, optional snap-on mounting

DIMENSIONS AND CIRCUIT DIAGRAMS



POWER TABLE

A	Class 1		Class 3	
	Type	VA	Type	VA
40			TCS13 40 A	2
50			TCS13 50 A	2
60			TCS13 60A	3
75			TCS13 75A	3
80			TCS13 80A	3
100	TCS13 100A	3		
120	TCS13 120A	5		
150	TCS13 150A	5		

DESCRIPTION	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
Miniature current transformer 40 A / 5 A	TCS13 40 A	0.25	9004840277357		MG900300
Miniature current transformer 50 A / 5 A	TCS13 50 A	0.25	9004840277364		MG900301
Miniature current transformer 60 A / 5 A	TCS13 60 A	0.25	9004840277371		MG900302
Miniature current transformer 75 A / 5 A	TCS13 75 A	0.25	9004840277388		MG900303
Miniature current transformer 80 A / 5 A	TCS13 80 A	0.25	9004840277395		MG900304
Miniature current transformer 100 A / 5 A	TCS13 100 A	0.25	9004840277401		MG900305
Miniature current transformer 150 A / 5 A	TCS13 150 A	0.25	9004840277425		MG900307



CURRENT TRANSFORMERS, SERIES TAR – GENERAL INFORMATION



THROUGH-WIRING CURRENT TRANSFORMER TAR

SCHRACK-INFO

- Case in ABS
- Degree of protection IP30
- Design complies with standards IEC 185, VDE 0414, EN 60044-1 (38-1)

TECHNICAL DATA

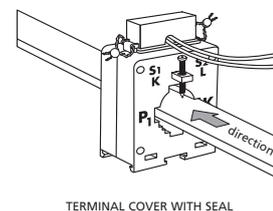
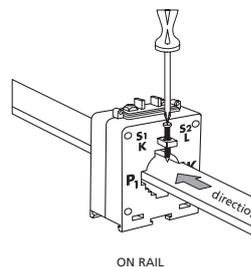
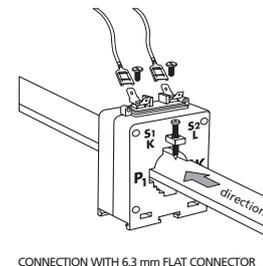
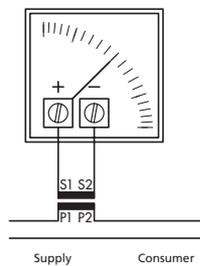
- Secondary current: Standard 5 A (other secondary currents on request)
- Maximum operating voltage: 1.2 kV
- Test voltage: 6 kV at 50 Hz for 1 minute
- Thermal nominal short-time current (I_{th}): $40 I_{pN}/1 s$
- Dynamic short-circuit current (I_{dyn}): $2.5 I_{th}/1 s$
- Permanent overload: $1.2 I_{pN}$
- Nominal frequency: 50/60 Hz
- Insulation class E (IEC 185)

TIPS & TRICKS

- During the installation make sure of the exact input direction (P1 - K) and output (P2 - L) of the primary cable
- In the case of the types with primary and secondary cables on terminals, do not invert the connection of the primary cable with the secondary one
- If is necessary to disconnect the measuring instruments from the CT while operating it is necessary to make a short circuit between the two terminals of the secondary on the CT
- It is recommended to ground the CTs
- Use class 0.5 for calibrated energy meters Class 1 for display measuring instruments and non-calibrated energy meters Class 3 for relays and measuring instrument without accuracy requirements (coarse display)
- Don't neglect the load of the measuring line! (e.g., 4 m of 1.5 mm² Cu wires required 2.31 VA at 5 A secondary current)

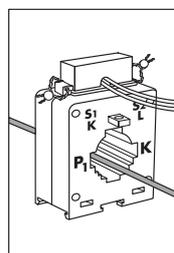
POWER TABLE AND MOUNTING

Current transformer													
Series	TAR 1D	TAR 3D	TAR 4D	TAR 5	TAR 6	TAR 8	TAR 12						
Version	Plug-on transformer												
WINDING	Horiz. rail	–	30 x 10	40 x 10		64 x 20	80 x 30	125 x 50					
	Cable	20	23	32		50	2 x 30	2 x 50					
Primary current	Power (VA) - Class	Power (VA) - Class	Power (VA) - Class	Power (VA) - Class	Power (VA) - Class	Power (VA) - Class	Power (VA) - Class	Power (VA) - Class					
	(A)	0,5 1 3	0,5 1 3	0,5 1	0,5	0,2 0,5 1	0,5 1	0,5 1					
50		3		2									
60		3		3									
80		3											
100		3		3									
150	3		3										
200	3		3										
250	5		5										
300			5										
400			5		10	6							
500			6		10								
600			6		10	10							
800			6		10		5 10 20						
1000							5 20 40	10 20					
1500							30 60 20 40						
2000							30 60 20 40	30 60					
2500								20 40	40 80				
3000									40 80				
4000									50 100				

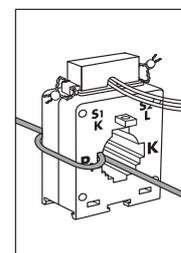


By repeated wrapping of the primary cable around the current transformer, each wrap results in half the primary current, while the power and class remain unchanged.

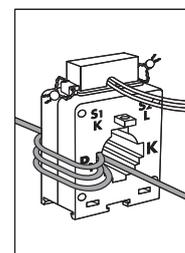
EXAMPLE:



TAR 4D 200/5 A WITH ONE CABLE PASS



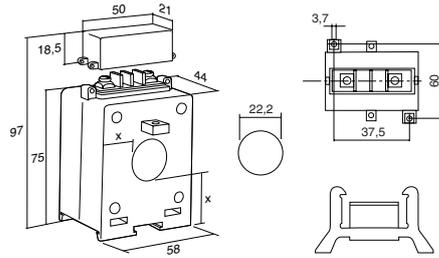
RECEIVES 100/5 A WITH 2-FOLD CABLE PASS



RECEIVES 50/5 A WITH 4-FOLD CABLE PASS

CURRENT TRANSFORMERS

CURRENT TRANSFORMERS, SERIES TAR 1D, FOR CABLES UP TO 20 mm Ø

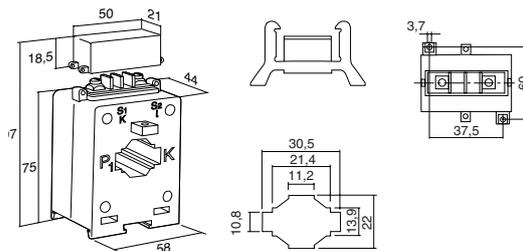


SCHRACK-INFO

- Suitable for cables up to 20 mm diameter
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
50/5 A	58x97x44	TAR1D-50	0.3	9004840090338		MG952005
60/5 A	58x97x44	TAR1D-60	0.3	9004840090345		MG952006
80/5 A	58x97x44	TAR1D-80	0.3	9004840090352		MG952008
100/5 A	58x97x44	TAR1D-100	0.3	9004840090369		MG952010
150/5 A	58x97x44	TAR1D-150	0.3	9004840090376		MG952015
200/5 A	58x97x44	TAR1D-200	0.3	9004840090383		MG952020
250/5 A	58x97x44	TAR1D-250	0.3	9004840090390		MG952025

CURRENT TRANSFORMER, SERIES TAR 3D, FOR BUSBAR UP TO 30x10 mm



SCHRACK-INFO

- Also suitable for cables up to 23 mm diameter
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
50/5 A	58x97x44	TAR3D-50	0.3	9004840203011		MG954005
60/5 A	58x97x44	TAR3D-60	0.3	9004840203028		MG954006
100/5 A	58x97x44	TAR3D-100	0.3	9004840090406		MG954010
150/5 A	58x97x44	TAR3D-150	0.3	9004840090413		MG954015
200/5 A	58x97x44	TAR3D-200	0.3	9004840090420		MG954020
250/5 A	58x97x44	TAR3D-250	0.3	9004840090437		MG954025
300/5 A	58x97x44	TAR3D-300	0.3	9004840090444		MG954030
400/5 A	58x97x44	TAR3D-400	0.3	9004840090451		MG954040
500/5 A	58x97x44	TAR3D-500	0.3	9004840090468		MG954050
600/5 A	58x97x44	TAR3D-600	0.3	9004840090475		MG954060



I KNOW WHERE TO FIND IT!

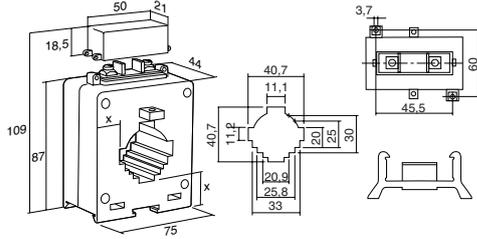
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CURRENT TRANSFORMERS

CURRENT TRANSFORMER, SERIES TAR 4D, FOR BUSBAR UP TO 40x10 mm

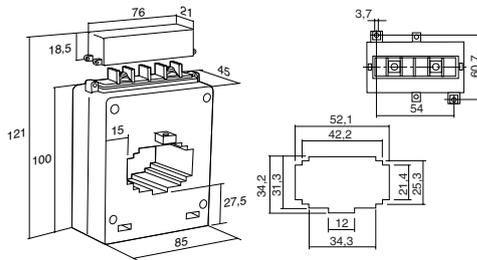


SCHRACK-INFO

- Suitable for cables up to 32 mm diameter
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
400/5 A	75x97x44	TAR4D-400	0.4	9004840090482		MG955040
500/5 A	75x97x44	TAR4D-500	0.4	9004840090499		MG955050
600/5 A	75x97x44	TAR4D-600	0.4	9004840090505		MG955060
800/5 A	75x97x44	TAR4D-800	0.4	9004840090512		MG955080

CURRENT TRANSFORMER, SERIES TAR 5D, FOR BUSBAR UP TO 50x30 mm



SCHRACK-INFO

- For busbar systems
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
400/5 A	121x62x85	TAR5-400		9004840622911		MG956040
600/5 A	121x62x85	TAR5-600		9004840622904		MG956060



I KNOW WHERE TO FIND IT!

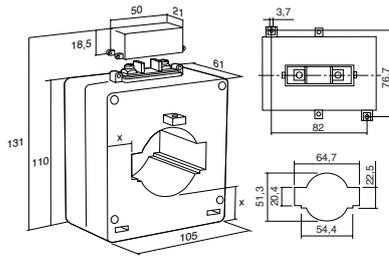
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CURRENT TRANSFORMERS

CURRENT TRANSFORMER, SERIES TAR 6D, FOR BUSBAR UP TO 60x20 mm

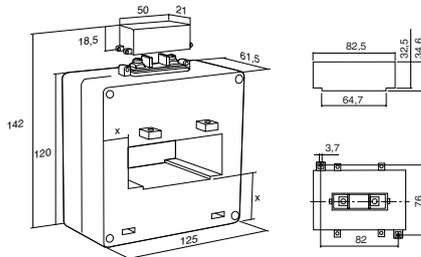


SCHRACK-INFO

- Also suitable for cables up to 50 mm diameter
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
800/5 A	105x131x61	TAR6-800	0.7	9004840101836		MG957080
1000/5 A	105x131x61	TAR6-1000	0.7	9004840091038		MG957100
1500/5 A	105x131x61	TAR6-1500	0.8	9004840115291		MG957150
2000/5 A	105x131x61	TAR6-2000	0.8	9004840091045		MG957200

CURRENT TRANSFORMER, SERIES TAR 8D, FOR BUSBAR UP TO 80x30 mm



SCHRACK-INFO

- Also suitable for cables up to 30 mm diameter
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
1000/5 A	125x142x61.5	TAR8-1000	0.7	9004840091052		MG958100
1500/5 A	125x142x61.5	TAR8-1500	1.0	9004840091069		MG958150
2000/5 A	125x142x61.5	TAR8-2000	1.0	9004840091076		MG958200
2500/5 A	125x142x61.5	TAR8-2500	1.0	9004840091083		MG958250



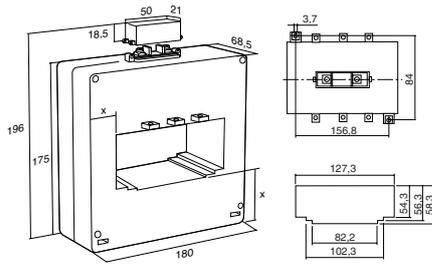
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CURRENT TRANSFORMERS

CURRENT TRANSFORMER, SERIES TAR 12D, FOR BUSBAR UP TO 125x50 mm



SCHRACK-INFO

- Also suitable for cables up to 50 mm diameter
- Secondary current: 5 A

TRANSFORMER	DIM. (WxHxD) mm	TYPE	WEIGHT (kg)	EAN CODE	AVAILABLE	ORDER NO.
2000/5 A	180x196x68.5	TAR12-2000	1.5	9004840149951		MG959200
2500/5 A	180x196x68.5	TAR12-2500	1.6	9004840149968		MG959250
3000/5 A	180x196x68.5	TAR12-3000	1.6	9004840149975		MG959300
4000/5 A	180x196x68.5	TAR12-4000	2.0	9004840149982		MG959400



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CURRENT TRANSFORMERS

SPLIT CORE CURRENT TRANSFORMERS



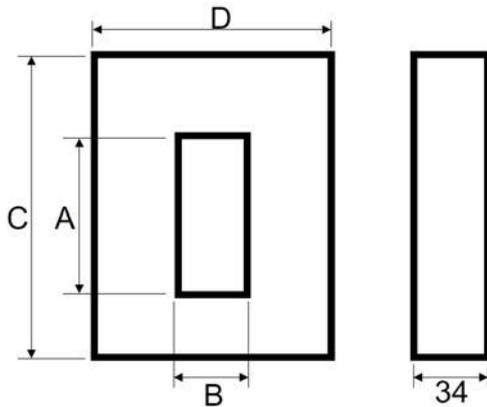
SCHRACK-INFO

- Easy mounting of a current transformer into an existing low-voltage system
- IP30

TECHNICAL DATA

- Primary current: 100 A, 150 A, 250 A, 400 A, 600 A
- Secondary current: 5 A
- Nominal voltage: 0.72 kV
- Frequency: 50-60 Hz
- Test voltage: 3 kV for 1 minute (at 50 Hz)
- Thermal class: A
- Thermal short-circuit current (I_{th}): $60 I_n$
- Dynamic limiting current (I_{dyn}): $2.5 I_{th}$
- Overcurrent limiting factor: FS 5
- Housing: Self-extinguishing plastic
- Mounting: Screw fastening

DIMENSIONS



POWER TABLE

Primary current	Class 0.5	Class 1	Class 3
100 A			3.00
150 A			3.75
250 A		3.75	5.00
400 A	2.50	3.75	7.50
600 A	5.00	7.50	20.0

Primary current	A	B	C	D	Capacity / copper rail	Capacity / cable
100 A	32 mm	22 mm	106 mm	90 mm	30 x 20 mm	≤ 20 mm
150 A	32 mm	22 mm	106 mm	90 mm	30 x 20 mm	≤ 20 mm
250 A	32 mm	22 mm	106 mm	90 mm	30 x 20 mm	≤ 20 mm
400 A	62 mm	32 mm	136 mm	100 mm	60 x 30 mm	≤ 30 mm
600 A	62 mm	32 mm	136 mm	100 mm	60 x 30 mm	≤ 30 mm

DESCRIPTION	EAN CODE	AVAILABLE	ORDER NO.
100/5 A, 30x20 mm	9004840665949		MG967100
150/5 A, 30x20 mm	9004840665956		MG967150
250/5 A, 30x20 mm	9004840665963		MG967250
400/5 A, 60x30 mm	9004840665970		MG968400
600/5 A, 60x30 mm	9004840665987		MG968600



SHUNTS



MG900118

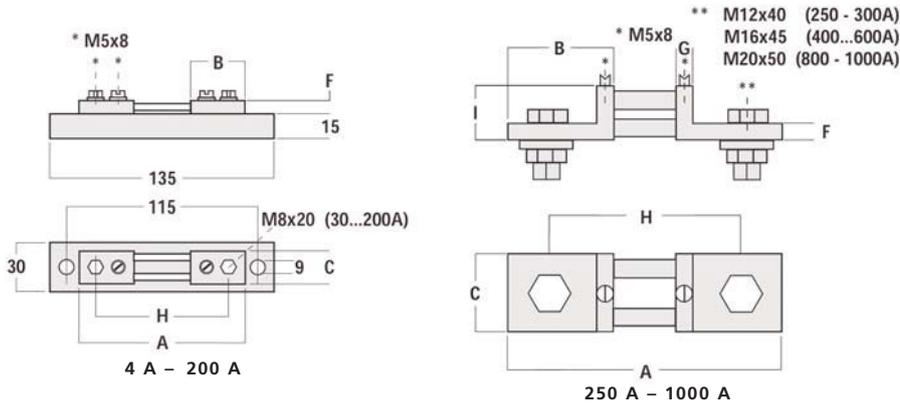
SCHRACK-INFO

- Ambient temperatures -25 °C to + 60 °C
- Relative humidity ≤ 95%
- Overload capability
 - 1.2x I_n continuous
 - 10x I_n 5 s up to 250 A
 - 5x I_n 5 s from 251 to 1000 A
- Accuracy: Class 0.5
- Measuring voltage: at I_n ...60 mV

TIPS & TRICKS

- For direct current instruments A/60 mV can be used
- Complies with the DIN standard
- Available up to 25 A on insulated carrier part

DIMENSIONS



Amperage	A	B	C	F	G	H	I
4 A	90	28	20	8		78	
6 A	90	28	20	8		78	
10 A	90	28	20	8		78	
15 A	90	28	20	8		78	
20 A	90	28	20	8		78	
25 A	90	28	20	8		78	
40 A	100	30	20	8		80	
60 A	100	30	20	8		80	
100 A	100	30	20	8		80	
150 A	100	30	20	8		80	
200 A	100	33	20	8		80	
250 A	145	55	30	10	10	105	30
300 A	145	55	30	10	10	105	30
400 A	145	55	40	10	10	105	30
500 A	145	55	40	10	10	105	30
600 A	145	55	40	10	10	105	30
800 A	165	65	60	10	10	115	30
1000 A	165	65	60	10	10	115	30

NOMINAL CURRENT	DIM. (WxHxD) mm	PU	EAN CODE	AVAILABLE	ORDER NO.
15 A	135x30x23	1	9004840058529		MG900105
20 A	135x30x23	1	9004840058536		MG900106
25 A	135x30x23	1	9004840058543		MG900107
40 A	135x30x23	1	9004840058567		MG900109
60 A	135x30x23	1	9004840058581		MG900111
100 A	135x30x23	1	9004840058598		MG900112
150 A	135x30x23	1	9004840058604		MG900113
200 A	135x30x23	1	9004840058611		MG900114
250 A	145x30x30	1	9004840058628		MG900115
300 A	145x30x30	1	9004840058635		MG900116
400 A	145x30x30	1	9004840058642		MG900117
500 A	145x30x30	1	9004840058659		MG900118
600 A	145x30x30	1	9004840058666		MG900119
800 A	165x60x30	1	9004840058673		MG900120
1000 A	165x60x30	1	9004840058680		MG900121



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