



MFR 12

Multi Function Relay Protection

APPLICATIONS

The MFR 1 Series is a family of industrial grade protective relays that offer multiple protective features in a single package.

Using a digital processor to measure true RMS values enables the control to have a high measuring accuracy, regardless of harmonics, transients or disturbing pulses.

The MFR 12 model is a complete generator protection unit packaged into one compact device. Typical applications are generators and switchgear equipment that require independent protection architecture. Different packages offer additional functionality.

The MFR 12/**CP** is for independent time-overcurrent protection (TOC) with configurable tripping times for two different current values. It also includes protection for calculated ground fault.

The MFR 12/**51V** is designed to protect the generator for (independent time-overcurrent [TOC], calculated ground fault, inverse time-overcurrent (acc. to IEC255) and inverse time-overcurrent with voltage restraint.

The MFR 12/**50-51GN** package includes protection for measured ground faults via current transformer.

The compact size and multiple functions of the MFR 12 help to simplify switchgear design. The digital display offers a user-friendly interface to set up the unit as well as monitor the operation and display of alarms.

DESCRIPTION

Features

- Configurable trip set points
- Configurable delays for each alarm
- Two-line LC display

Package **CP**

- 3 configurable relays
- True RMS current (generator)
- Independent time-overcurrent (50/51#)
- Ground fault (calculated) (50GS/51#GS)
 $I_E = I_{L1} + I_{L2} + I_{L3}$

Package **51V**

- 8 configurable relays
- True RMS current (generator)
- True RMS voltage (generator)
- Independent time-overcurrent (50/51#)
- Ground fault (calculated) (50GS/51#GS)
- Inverse time-overcurrent (IEC255)
- Inverse time-overcurrent with voltage restraint (51V)

Package **50-51GN**

- 3 configurable relays
- Ground fault (measured via current transformer ..1A or 5A) (50/51GN)

* not according to ANSI guidelines (three-step protection instead of inverse time characteristic)

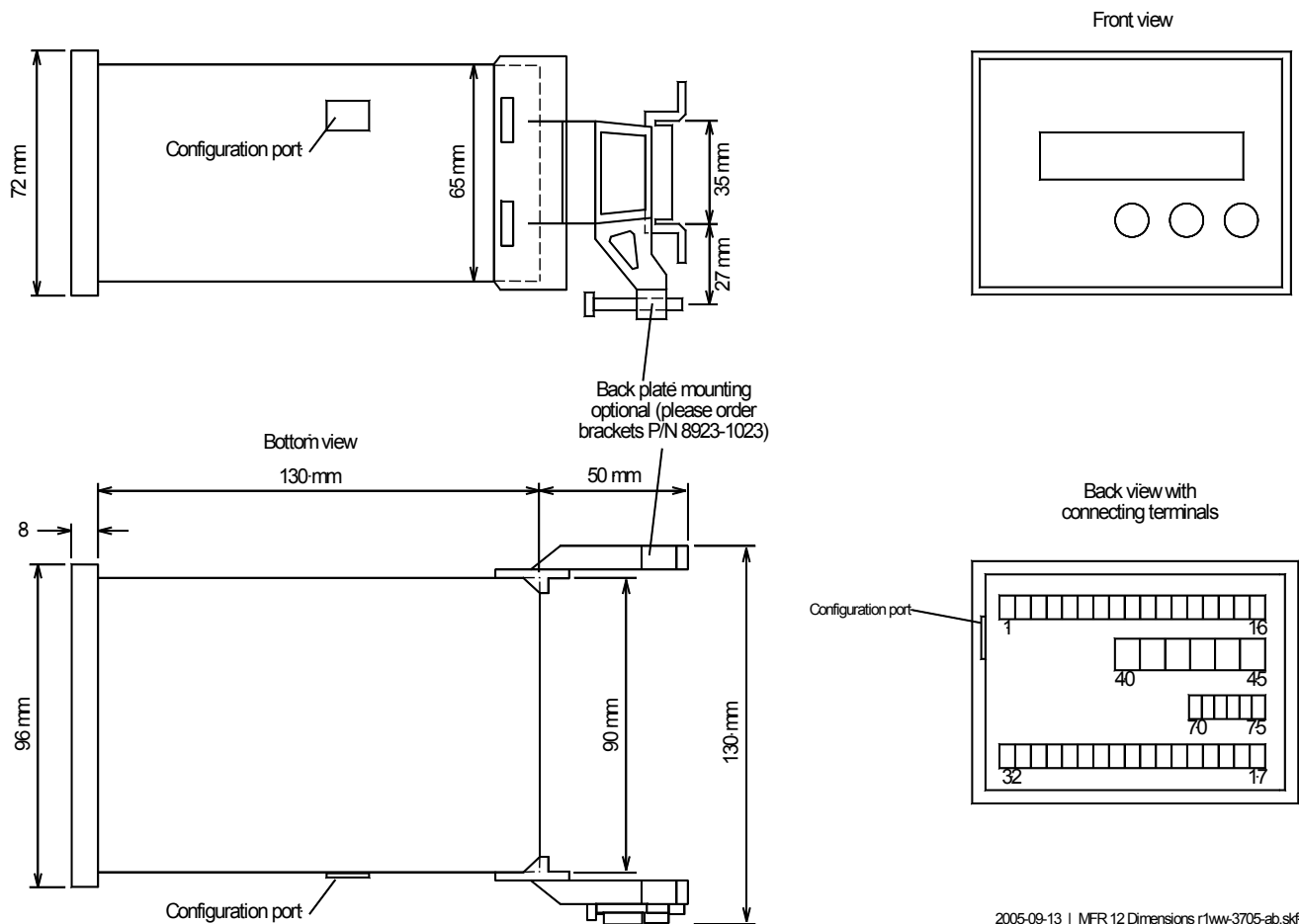
- True RMS sensing
- 3 phase independent time-overcurrent protection ($3 \times I_{rated}$)
- Programmable relay outputs
- Discrete input for enabling or remote acknowledgement
- PC and front panel configurable
- Microprocessor technology for accurate, repeatable and reliable operation
- Programmable threshold setpoints with individual time delays
- CE marked
- UL/cUL Listed
- GL Approval

SPECIFICATIONS

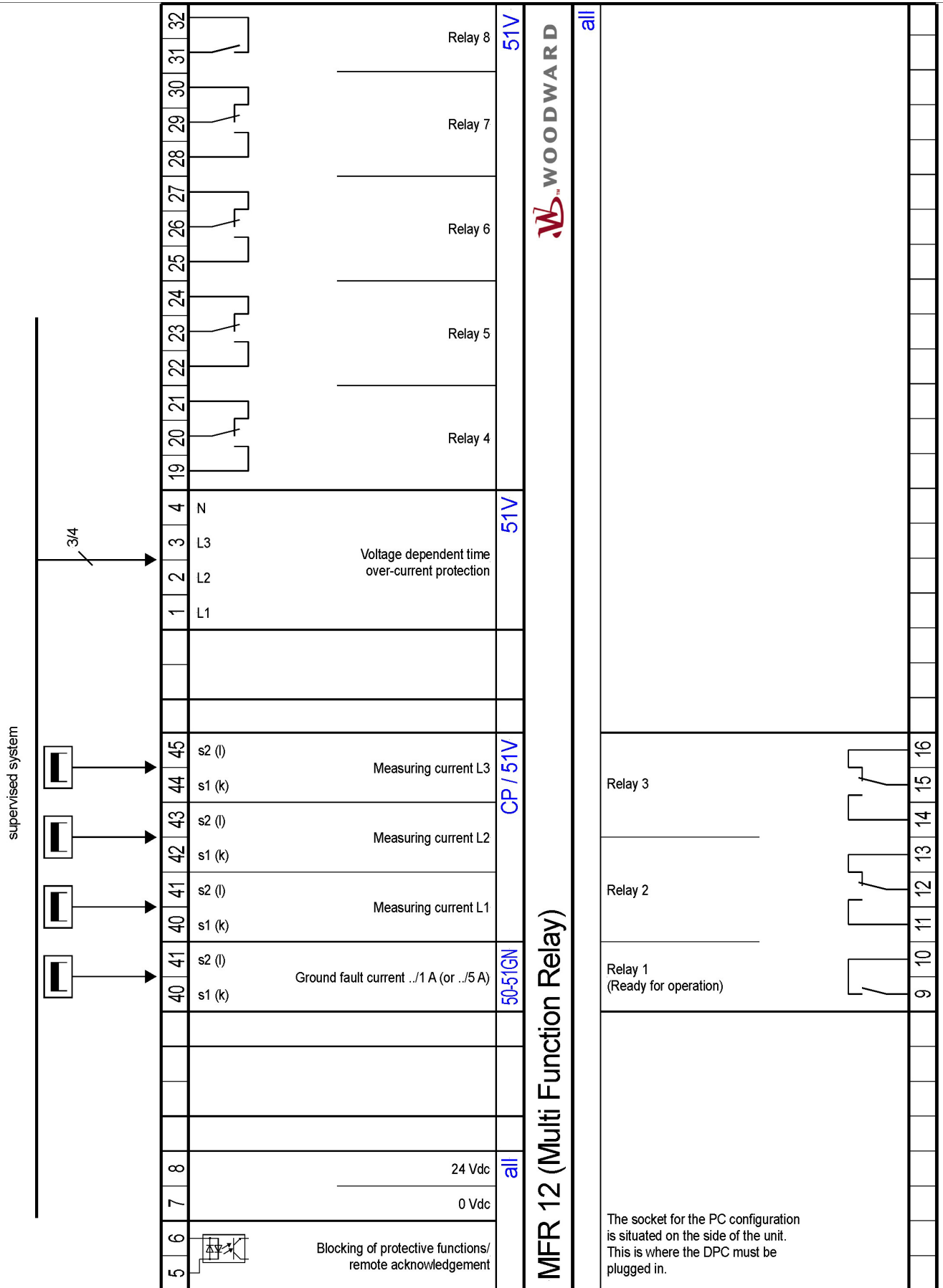
Accuracy	Class 1
Power supply	24 Vdc (18 to 30 Vdc)
Intrinsic consumption	max. 12 W
Ambient temperature	-20 to 70 °C
Ambient humidity	95 %, non-condensing
Voltage	Rated value \sphericalangle/Δ : 66/115 Vac
	Maximum value (V_{max}): 150 Vac
	Rated voltage $V_{ph-ground}$: 150 Vac
	Rated surge voltage: 2.5 kV
Linear measuring range up to	$1.3 \times V_{rated}$
Measuring frequency	50/60 Hz (40 to 70 Hz)
Input resistance	[1] 0.21 M Ω
Max. power consumption per path	< 0.15 W
Current (I_{rated})	[1] ..1 A or [5] ..1.5 A
Linear measuring range up to	$3.0 \times I_{rated}$
Load	< 0.15 VA
Rated short-time cur. (1 s)	[1] 100.0 $\times I_{rated}$, [5] 20.0 $\times I_{rated}$
Discrete inputs	isolated
Input range	18 to 250 Vac or dc
Input resistance	approx. 68 k Ω

Relay outputs	isolated
Contact material	AgCdO
Load (GP)	24 Vdc@2 Adc, 250 Vac@2 Aac
Pilot duty (PD)	24 Vdc@1 Adc
Housing	Type APRANORM DIN 43 700
Dimensions	96×72×130 mm
Front cut-out	91×67 mm
Connection	screw/plug terminals depending on connector 1.5 mm ² , 2.5 mm ² or 4mm ²
Front	insulating surface
Protection system	IP 21
Weight	depending on version, approx. 800 g
Disturbance test (CE)	tested according to applicable EN guidelines
Listings	UL/cUL listed (note: max. voltages apply) for ordinary loc., file E231544
Approvals	GL (Germanischer Lloyd)

DIMENSIONS



WIRING DIAGRAM



Subject to technical modifications

FEATURES OVERVIEW

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		MFR 12			
	ANSI	CP	51V	50-51GN	
Measuring/Display					
Voltage			✓		
Current		✓	✓	✓	
Accessories					
Configuration via PC #1		✓	✓	✓	
Protection					
Independent time-overcurrent monitoring (TOC)	50/51*	✓	✓		
Inverse time-overcurrent monit. (acc. to IEC255) #2			✓		
Inverse time-overcurrent monit. with volt. restraint #3	51V		✓		
Ground fault monitoring, calculated	50GS/51GS*	✓	✓		
Ground fault monitoring, measured (1A or 5A)	50/51GN			✓	
I/O's					
Output relays (configurable)	74	3	8	3	
Listings/Approvals					
CE marked		✓	✓	✓	
UL/cUL listed		✓	✓	✓	
GL (Marine)		✓	✓	✓	
Part Numbers P/N					
Measuring inputs ..1 A		8441-1106		8441-1132	
Measuring inputs ..5 A		5448-883		8441-1008	
Measuring inputs 100 Vac, ..1 A			8441-1082		
Measuring inputs 100 Vac, ..5 A			8441-1006		

- * not according to ANSI guidelines (three-step protection instead of inverse time characteristic)
- #1 Configuration software 'LeoPC' available free at www.woodward.com, connection requires Woodward DPC cable P/N 5417-1251
- #2 only when inverse time-overcurrent monitoring with voltage restraint is disabled
- #3 measured via 100 Vac measuring input

