

MFR 13

Multi Function Relay Protection

- Complete generator protection in one unit
- True RMS sensing
- Synch-check
- Discrete inputs for enabling and remote control
- Programmable relay outputs
- PC and front panel configurable
- Microprocessor technology for accurate, repeatable and reliable operation
- Programmable threshold set-points with individual time delays
- CE marked
- UL/cUL Listed
- GL Approval

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 13 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 13/GP is for generator protection use while the MFR 13/GPX adds synch-check functionality for one breaker. A MOD bus RTU Slave interface for communication is added for the MFR 13/GPX-I package.

The compact size and multiple functions of the MFR 13 help to simplify switchgear design. The digital display offers a user-friendly interface to setup the unit as well as monitor the operation and display any alarms.

DESCRIPTION

Features (all)

- True RMS generator voltage measuring
- True RMS generator current measuring
- Configurable trip/control set points
- Configurable delays for each alarm
- Two-line LC display
- Programmable relay outputs to annunciate alarms
- kWh metering
- Front panel and PC configurable
- Multi level password protection
- Language manager (English/German switchable)
- 12/24 Vdc power supply

^{#1} not according to ANSI guidelines (three-step protection instead of inverse time characteristic)

^{#2} no GL approval

DESCRIPTION (continued)

Protection (all) ANSI

- Over-/undervoltage (59/27)
- Over-/underfrequency (81O/U)
- Voltage asymmetry (47)
- Zero voltage detection
- Overload (32)
- Reverse power (32R)
- Reduced power (32F)
- Unbalanced load (46)
- Re-active power
- Loss of excitation (40Q)
- Time-overcurrent (50/51)
- Voltage restraint time-overcurrent (51V)

Package GP

- 3 configurable relays
- Ground fault (calculated) (50GS/51^{#1}GS)

Package GPX

- 8 configurable relays
- True RMS busbar voltage measuring
- Synch-check

Package GPX-I

- 8 configurable relays
- True RMS busbar voltage measuring
- Synch-check
- RS485/MOD bus RTU slave interface

Package K08

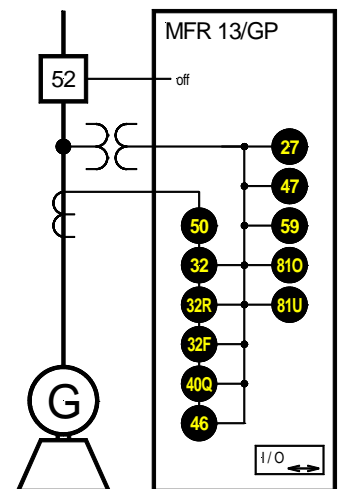
- Same as Package GPX-I plus
- Ground fault (calculated) ^{#2} (50GS/51^{#1}GS)

Package GPY-I

- Same as Package GPX-I plus
- 3 analog outputs -20/0/4 to 20 mA (configurable)
 - Impulse output

Package GPY-I-N

- Same as Package GPY-I but
- 75 to 265 Vac & 90 to 300 Vdc power supply (no 24 Vdc)

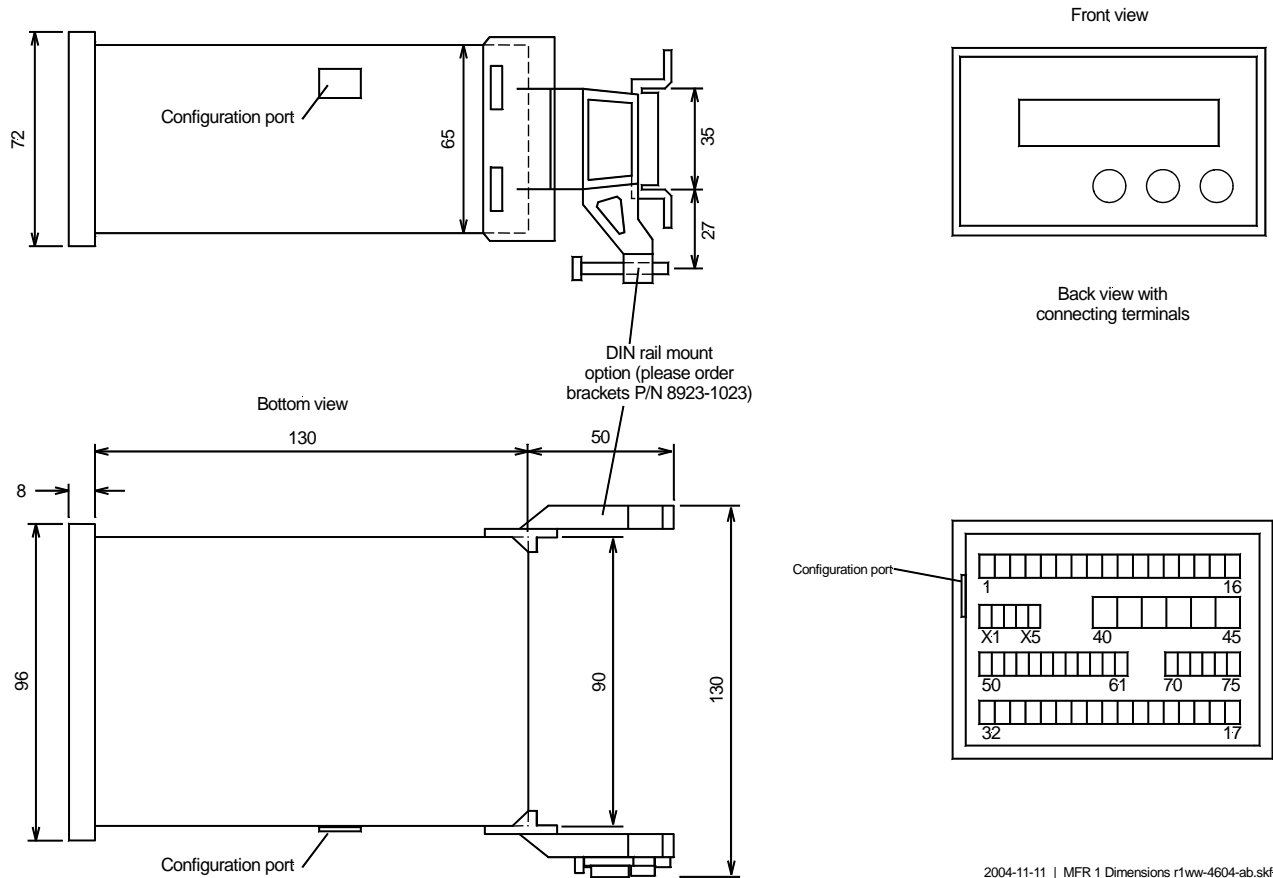


SPECIFICATIONS

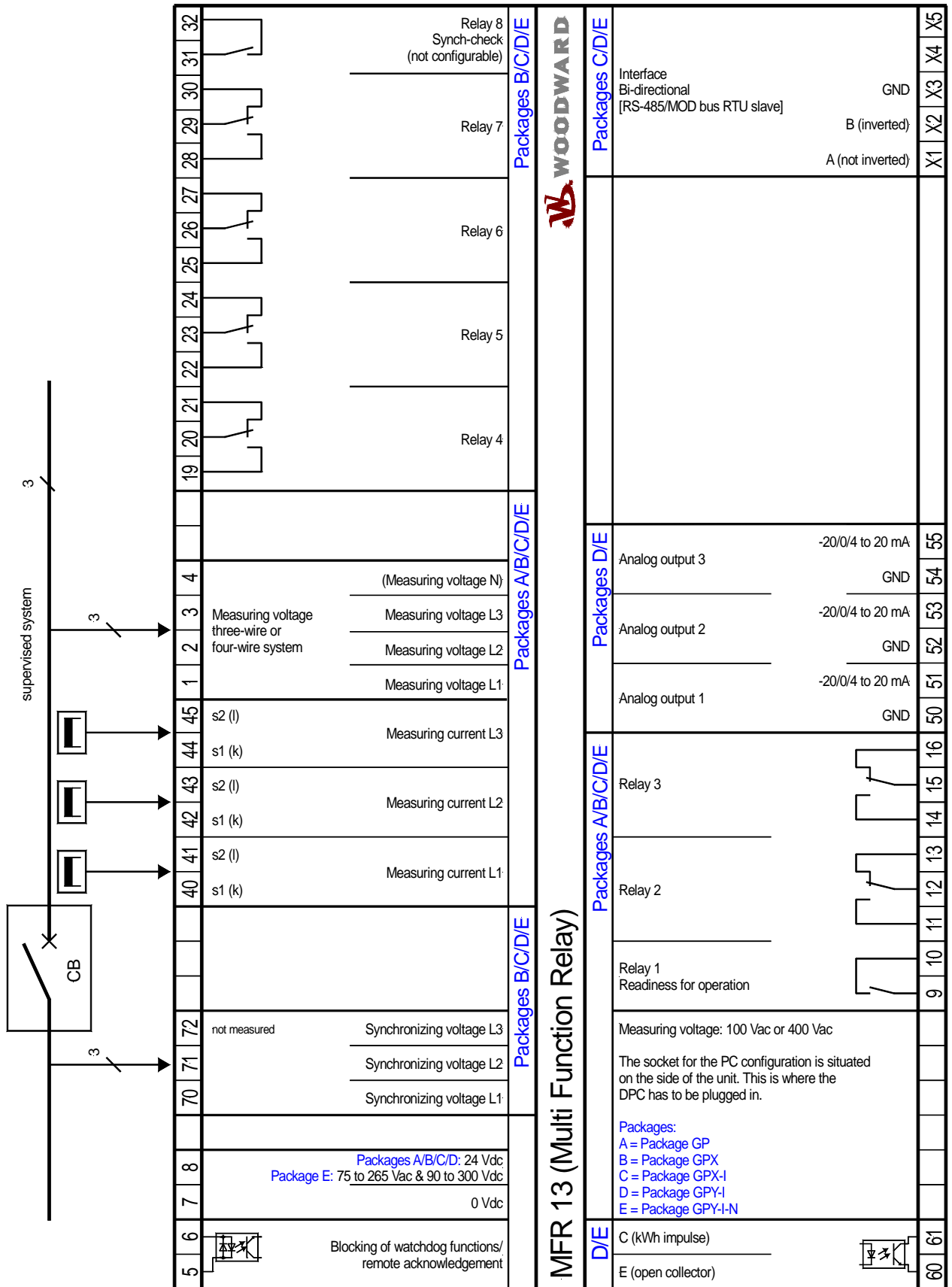
Accuracy Class 1
 Power supply 24 Vdc (18 to 32 Vdc)
 Intrinsic consumption max. 12 W
 Ambient temperature -20 to 70 °C
 Ambient humidity 95 %, non-condensing
Voltage Rated: [1] 57/100(120) Vac or [4] 230/400 Vac
 V_L: [1] max. 150 Vac or [4] max. 300 Vac
 Setting range: [1] 50 to 125 Vac or [4] 200 to 440 Vac
 Measuring frequency 50/60 Hz (40 to 70 Hz)
 Linear measuring range up to $1.3 \times V_{rated}$
 Input resistance [1] 0.21 M Ω , [4] 0.7 M Ω
 Max. power consumption per path < 0.15 W
Current [./1] ..1 A or [./5] ..5 A
 Current carrying capacity $3.0 \times I_{rated}$
 Load < 0.15 VA
 Rated short-time cur. (1 s) [./1] $50.0 \times I_{rated}$, [./5] $10.0 \times I_{rated}$
Discrete inputs isolated
 Input range 18 to 250 Vac/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 cutout 91 [+1.0] × 67 [+1.0] mm
 Connection screw/plug terminals depending on connector 1.5 mm², 2.5 mm² or 4mm²
 Front insulating surface
 Protection system IP 42 from front (with proper installation)
 Weight depending on version, approx. 800 g
Disturbance test (CE) tested according to applicable EN guidelines
Listings ...UL/cUL listed for ordinary locations (note: max. voltages apply)
Approvals GL (Germanischer Lloyd)

DIMENSIONS



WIRING DIAGRAM



Subject to technical modifications.

International
 Woodward
 PO Box 1519
 Fort Collins CO, USA
 80522-1519
 1000 East Drake Road
 Fort Collins CO 80525
 Ph: +1 (970) 482-5811
 Fax: +1 (970) 498-3058

Europe
 Woodward Governor Company
 Leonhard-Reglerbau GmbH
 Handwerkstrasse 29
 70565 Stuttgart, Germany
 Ph: +49 (711) 789 54-0
 Fax: +49 (711) 789 54-100

Distributors & Service
 Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

Corporate Headquarters
 Rockford IL, USA
 Ph: +1 (815) 877-7441

www.woodward.com/smart-power

For more information contact:

Subject to technical modifications.

This document is distributed for informational purposes only. It is not to be construed as creating or becoming part of any Woodward Governor Company contractual or warranty obligation unless expressly stated in a written sales contract.

We appreciate your comments about the content of our publications. Please send comments including the document number below to stgt-doc@woodward.com

© Woodward Governor Company

All Rights Reserved

03245C - 05/1/S

FEATURE OVERVIEW

		MFR 13						
		ANSI	GP	GPX	GPX-I	K08	GPY-I	GPY-I-N
Measuring/Display								
Voltage			✓	✓	✓	✓	✓	✓
Current			✓	✓	✓	✓	✓	✓
Accessories								
kWh meter			✓	✓	✓	✓	✓	✓
Configuration via PC #1			✓	✓	✓	✓	✓	✓
Protection								
Overvoltage	59		✓	✓	✓	✓	✓	✓
Undervoltage	27		✓	✓	✓	✓	✓	✓
Overfrequency	81O		✓	✓	✓	✓	✓	✓
Underfrequency	81U		✓	✓	✓	✓	✓	✓
Voltage asymmetry	47		✓	✓	✓	✓	✓	✓
Zero voltage			✓	✓	✓	✓	✓	✓
Overload	32		✓	✓	✓	✓	✓	✓
Reduced power	32F/37		✓	✓	✓	✓	✓	✓
Reverse power	32R		✓	✓	✓	✓	✓	✓
Unbalanced load	46		✓	✓	✓	✓	✓	✓
Re-active power			✓	✓	✓	✓	✓	✓
Loss of excitation	40Q		✓	✓	✓	✓	✓	✓
Time-overcurrent	50/51*		✓	✓	✓	✓	✓	✓
Voltage restraint time-o/c	51V		✓	✓	✓	✓	✓	✓
Ground fault, calculated	50GS/51*GS		✓			✓		
Function								
Synch-check	25			✓	✓	✓	✓	✓
I/O's								
Output relays (config.)	74		3	8	8	8	8	8
Analog outp. -20/0/4 to 20mA							3	3
Impulse output							✓	✓
RS485/MODbus RTU slv.					✓	✓	✓	✓
Power supply								
24 Vdc			✓	✓	✓	✓	✓	
75 to 265 Vac & 90 to 300 Vdc								✓
Listings/Approvals								
CE marked			✓	✓	✓	✓	✓	✓
UL/cUL listed			✓	✓	✓	✓	✓	
GL (Marine)			✓	✓	✓		✓	✓
Part numbers P/N								
Measuring inputs 120 Vac; .../1 A				8441-1083	8441-1075			
Measuring inputs 120 Vac; .../5 A		5448-886	5448-898	8441-1009	8441-1087	8441-1086	8441-1092	
Measuring inputs 400 Vac; .../1 A		8441-1114	8441-1108					
Measuring inputs 400 Vac; .../5 A		LR21035	8441-1033	8441-1104	8441-1099	8441-1095	8441-1119	

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

#1 Cable incl. software necessary (DPC)