



MFR 15

Multi Function Relay Protection & Control

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 15 model includes a synchronizer and a load (kW) and power factor (cosphi) controller via discrete outputs to combine protection and control into one unit. The SNY-I package offers additional functionality. It has kW load sharing capability for multiple unit applications.

The compact size and multiple functions of the MFR 15 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.

Features (all)

- True RMS voltage (generator/busbar)
- True RMS current (generator)
- Configurable trip/control set points
- Configurable delays for each alarm
- 3 configurable relays
- 3 dedicated control relay outputs
- Two-line LC display

DESCRIPTION

Protection (all) ANSI

- Over-/undervoltage (59/27)
- Over-/underfrequency (81O/U)
- Voltage asymmetry (47)
- Overload (32)
- Reverse power (32R)
- Reduced power (32F)
- Unbalanced load (46)
- Loss of excitation (40Q)
- Independent time-overcurrent (50/51)

Package SYN-I

- Synchronizer for 1 CB
 - Isolated operation
 - Mains parallel operation
- Speed/frequency/real power
- Voltage/power factor (cosphi)
- Remote real power set-point (0/4 to 20 mA)
- Load sharing via 0 to 4 Vdc analog line
- Interface RS-485/Modbus RTU Slave

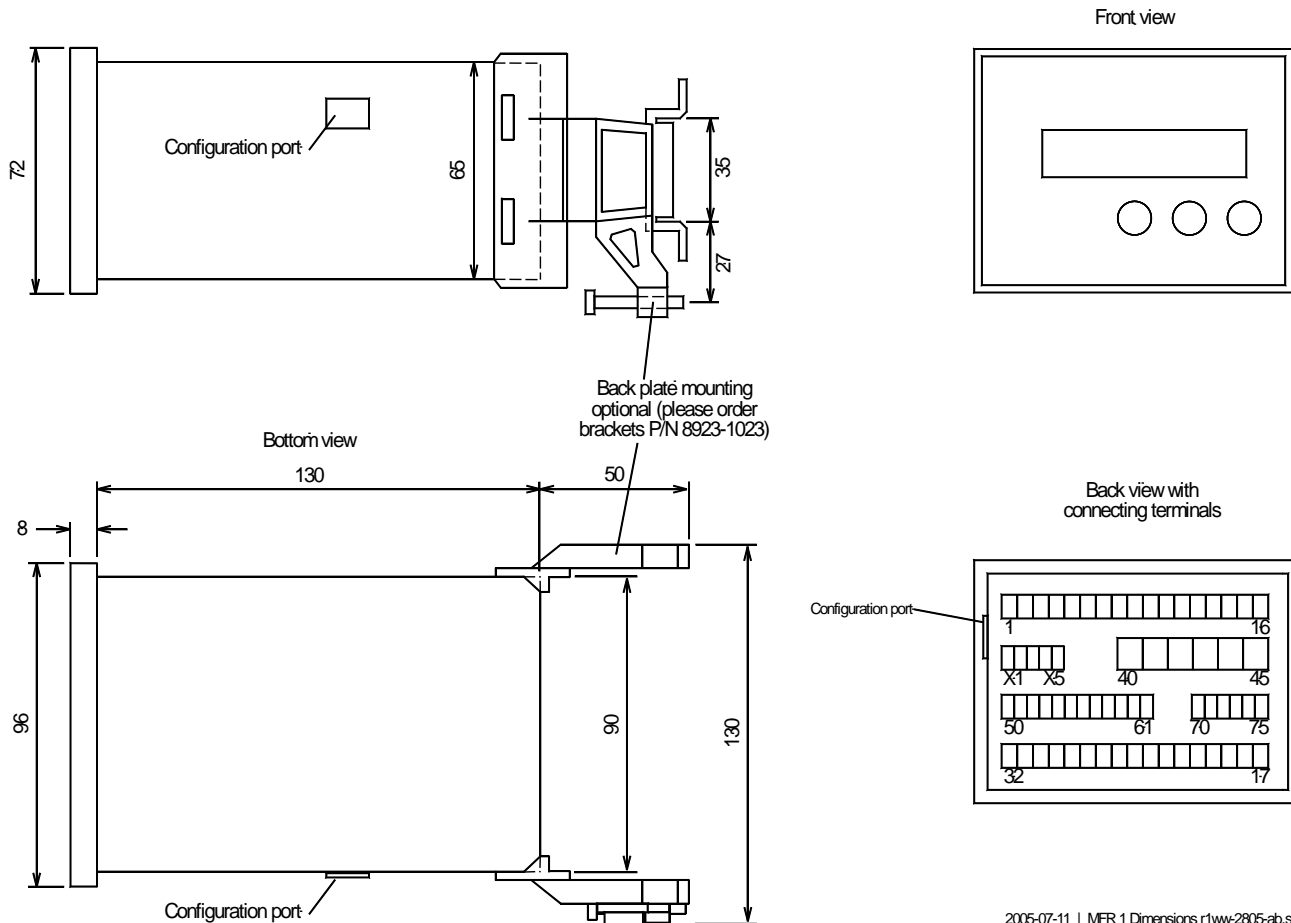
- Complete generator protection and controller in one unit
- True RMS sensing
- Synchronization for one breaker
- Load sharing
- Discrete inputs for remote control
- Programmable relay outputs
- PC and front panel configurable
- Microprocessor technology for accurate, repeatable and reliable operation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

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 \sqrt{D} :	[1] 66/115 Vac or [4] 230/400 Vac
	Maximum value (V_{max}):	[1] 150 Vac or [4] 300 Vac
	Rated voltage $V_{ph-ground}$:	[1] 150 Vac or [4] 300 Vac
	Rated surge voltage:	[1] 2.5 kV or [4] 4.0 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 MW, [4] 0.7 MW	
Max. power consumption per path	< 0.15 W	
Current (I_{rated})	[1] ..1 A or [5] ..15 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/dc	
Input resistance	approx. 68 kW	

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[+0.8]×67[+0.7] 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 for ordinary locations
Approvals	GL (Germanischer Lloyd)

DIMENSIONS



International
 Woodward
 PO Box 1519
 Fort Collins CO, USA
 80522-1519
 1000 East Drake Road
 Fort Collins CO 80525
 Ph: +1 (970) 498-3634
 Fax: +1 (970) 498-3058
 email:
 SalesPGD_NAandCA@woodward.com

Europe
 Woodward GmbH
 Handwerkstrasse 29
 70565 Stuttgart, Germany
 Ph: +49 (0) 711 789 54-510
 Fax: +49 (0) 711 789 54-101
 email:
 SalesPGD_EMEA@woodward.com

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

For more information contact:

Subject to technical modifications.

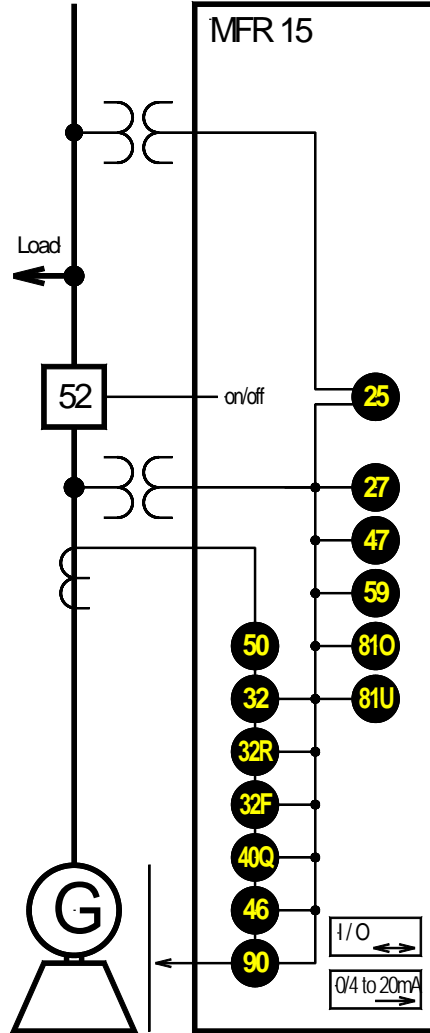
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		MFR 15
		ANSI
Control		
Breaker control logic		1
Synchronization		ü
Isolated single-unit operation		ü
Mains parallel operation		ü
Accessories		
kWh counter		ü
Configuration via PC #1		ü
Protection		
Overvoltage	59	ü
Undervoltage	27	ü
Overfrequency	810	ü
Underfrequency	81U	ü
Voltage asymmetry	47	ü
Overload	32	ü
Reverse power	32R	ü
Reduced power	32F/37	ü
Unbalanced load	46	ü
Loss of excitation	40Q	ü
Independent time-overcurrent	50/51*	ü
Controller		
Discrete raise/lower: n/f & P (speed/frequency/real power)		ü
Discrete raise/lower: V & Q (voltage/power factor cosphi)		ü
Remote real power set-point (0 to 20 mA)		ü
Load sharing (0 to 4 Vdc)		ü
I/Os		
Analog output -20/0/4 to 20 mA (configurable, scaleable)		
Pulse output for kWh		
Relay outputs (configurable)	74	3
RS-485/Modbus RTU Slave		ü
Listings/Approvals		
CE marked		ü
UL/cUL listed		ü
GL (Marine)		ü
Part numbers P/N		
Measuring inputs 120 Vac, ..5 A		8440-1016
Measuring inputs 400 Vac, ..5 A		8440-1448

* not according to ANSI guidelines (three-step protection instead of inverse time characteristic)
 #1 Cable incl. software necessary (DPC, Product Number P/N 5417-557)