WOODWARD

Product Specification
37406B

MFR 300

Multifunction Relay / Measuring Transducer with CANopen / Modbus Communication

APPLICATIONS

The MFR 300 is a measuring transducer for monitoring single- and three-phase power systems. The MFR 300 has both voltage and current inputs for measuring an electrical power source. A digital processor makes it possible to accurately to measure true RMS values, regardless of harmonics, transients or disturbing pulses. The primary measured and calculated values are transmitted via CANopen / Modbus protocol to a supervisory control system.

The MFR 300 performs monitoring functions for mains decoupling, including four freely configurable time-dependent undervoltage monitoring functions for FRT (fault ride-through).

The primary measured values of voltage and current are used to calculate the real, reactive, and apparent power and the power factor (cosphi) values.

The list of measured values includes

- Measured
  - Voltage
    - Wye: V_{L1N} / V_{L2N} / V_{L3N}
    - Delta: V_{L12} / V_{L23} / V_{L31}
  - Frequency f_{L123}
  - Current I_{L1}/I_{L2}/I_{L3}

- Calculated
  - Average voltage $V_{ØL123}$ / V_{min} / V_{max}
  - Average current $I_{ØL123}$ / I_{min} / I_{max}
  - Real power P_{total} / P_{L1} / P_{L2} / P_{L3}
  - Reactive power Q_{total}
  - Apparent power S_{total}
  - Power factor ($\cos\varphi_{L1}$)
  - Active energy $kWh_{positive/negative}$
  - Reactive energy $kvarh_{leading/lagging}$

DESCRIPTION

Features

- 3 true RMS voltage inputs
- 3 true RMS current inputs
- Class 0.5 accuracy for voltage, frequency and current
- Class 1 accuracy for real and reactive power or energy
- Configurable trip/control setpoints
- Configurable delay timers for individual alarms (0.02 to 300.00 s)
- 4 configurable relays (change-over)
- 1 “Ready for operation” relay
- Switchable relay logic
- 2 kWh counters (max. 10^{12} kWh)
- 2 kvarh counters (max. 10^{12} kvarh)
- CANopen / Modbus communication
- Configurable via CAN bus / RS-485 / Service Port (USB/RS-232)
- 24 Vdc power supply

Protection (all)	ANSI #
Over-/undervoltage	(59/27)
Over-/underfrequency	(81O/U)
Voltage asymmetry	(47)
Overload	(32)
Positive/negative load	(32R/F)
Unbalanced load	(46)
Phase shift	(78)
Overcurrent	(50/51)
df/dt (ROCOF)	
Ground fault	
QV monitoring	
Voltage increase	
Freely configurable time-dependent undervoltage monitoring for:	
○ FRT (fault ride-through)	

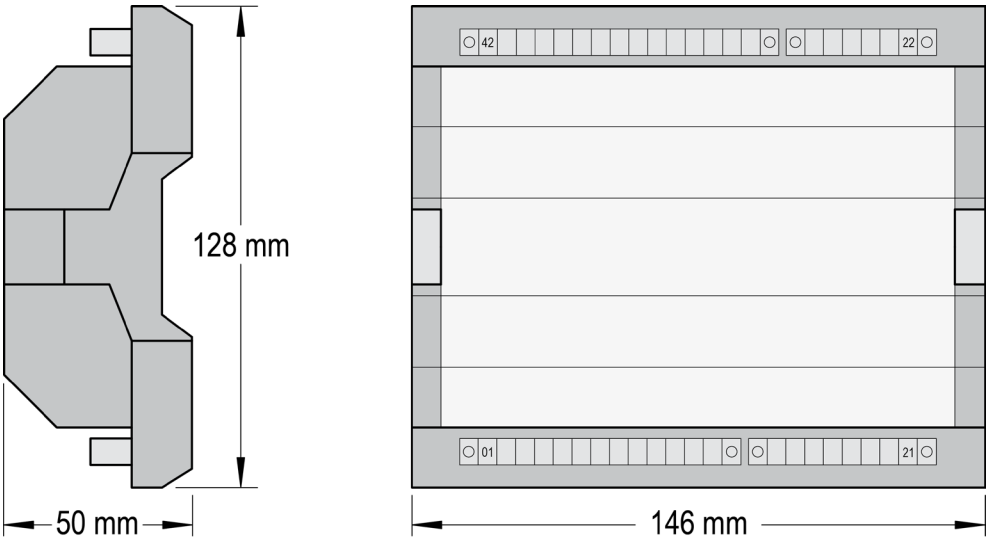
- True RMS sensing
- Class 0.5 accuracy for voltage, frequency and current
- Class 1 accuracy for real and reactive power or energy
- Programmable relay outputs
- Configurable via CAN bus / RS-485 / Service Port
- Programmable threshold setpoints with individual time delays
- Optional wiring configurations for either single phase, three phase, or a combination of both
- CANopen / Modbus communication
- UL/cUL Listed
- CE marked

SPECIFICATIONS

Accuracy ..... Class 0.5
Power supply ..... 12/24 Vdc (8 to 32 Vdc)
Intrinsic consumption ..... max. 5 W
Ambient temperature (operation) ..... -20 °C (-4 °F) / 70 °C (158 °F)
Ambient temperature (storage) ..... -40 °C (-40 °F) / 85 °C (185 °F)
Ambient humidity ..... 95 %, non-condensing
Voltage ..... Rated value ⅄/Δ: [1] 69/120 Vac or [7] 400/690 Vac
Rated voltage $V_{ph\text{-}ground}$: [1] 150 Vac or [7] 600 Vac
Max. cont. voltage $V_{ph\text{-}ph}$: [1] 150 Vac or [7] 862 Vac
Rated surge voltage: [1] 2.5 kV or [7] 6.0 kV
Measuring frequency ..... 45 to 65 Hz
Linear measuring range ..... 1.25 × V_{rated}
Input resistance ..... [1] >0.5 MΩ
[7] >2.0 MΩ
Max. power consumption per path ..... 0.15 W
Current (I_{rated}) ..... [1] ../1 A, [5] ../5 A
Linear measuring range ..... 3 × I_{rated}
Max. power consumption per path ..... < 0.15 VA
Rated short-time current (1 s) ..... [1] 10 Aac, [5] 50 Aac

Relay outputs ..... isolated
Contact type ..... Form C (change-over)
Contact material ..... AgCdO
Load (GP) ..... 2.00 Aac@250 Vac
..... 2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
Pilot duty (PD) .....
..... 1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Housing ..... Type Extrusion profile UM122
for DIN rail mounting
Dimensions ..... 146 × 128 × 50 mm
Connection ..... screw/plug terminals depending
on connector 2.5 mm² (14 AWG)
Protection system IP20
Weight ..... approx. 300 g
Disturbance test (CE) ..... tested according to applicable EN guidelines
Listings ..... UL/cUL listed (File No.: E231544), GOST-R

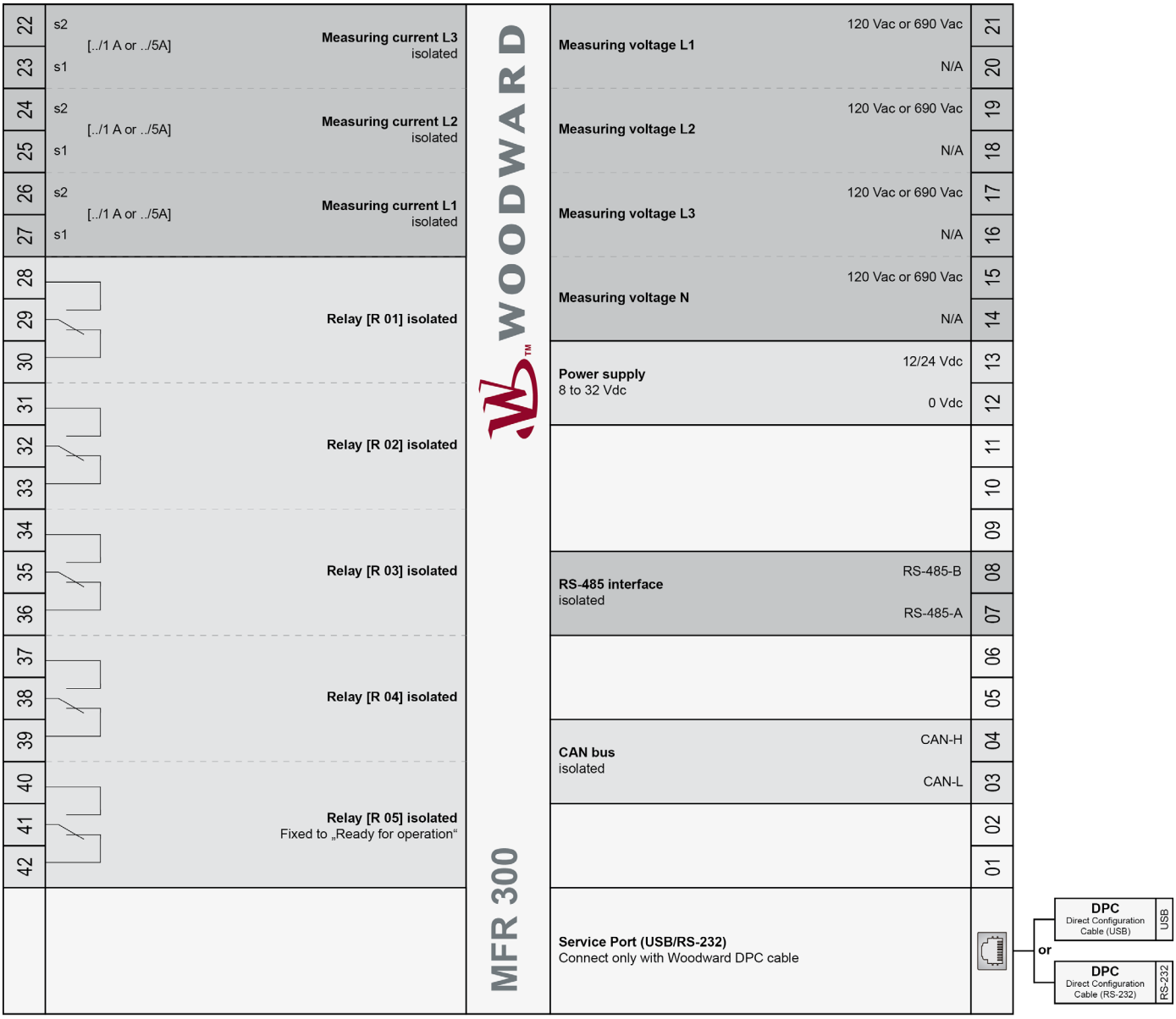
DIMENSIONS



PART NUMBERS

Model	Rated PT secondary	Rated CT secondary	Mounting	Part Number (P/N)
MFR300-11M	100 Vac [1]	../1 A [1]	DIN rail [M]	8444-1089
MFR300-15M	100 Vac [1]	../5 A [5]	DIN rail [M]	8444-1090
MFR300-71M	690 Vac [7]	../1 A [1]	DIN rail [M]	8444-1091
MFR300-75M	690 Vac [7]	../5 A [5]	DIN rail [M]	8444-1092
MFR300-75M/SU03	690 Vac [7]	../5 A [5]	DIN rail [M]	8444-1093
MFR300-75M/K28	690 Vac [7]	../5 A [5]	DIN rail [M]	8444-1094

WIRING DIAGRAM



Subject to technical modifications.

MFR 300 Wiring Diagram | Rev. NEW

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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.

www.woodward.com/power

For more information contact:

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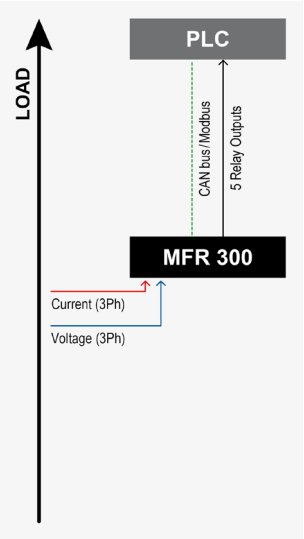
TYPICAL APPLICATIONS

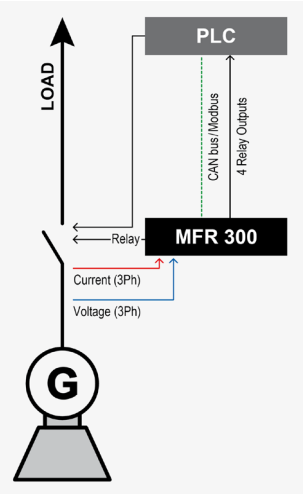
General Application



In this general application the device is used as a transducer with monitoring functions. The control does not operate any breaker.

- PLC measuring data V, f, I, P_{act}, P_{react}
- Monitoring V, f, I, P_{act}, P_{react}

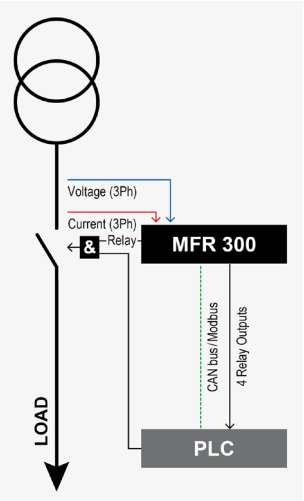
Generator Application



In this generator related application the device is used as a transducer with monitoring functions. The control can be used to open a breaker.

- Generator measuring data V, f, I, P_{act}, P_{react}
- Monitoring V, f, I, P_{act}, P_{react}

Mains Application



In this mains related application the device is used as a transducer with monitoring functions. The control can be used to open a breaker.

- Mains measuring data V, f, I, P_{act}, P_{react}
- Monitoring V, f, I, P_{act}, P_{react}