Model YMA/YQA

Power Monitor, AC Powered
50/60/400 Hz, Single or Three-Phase
Field Adjustable

GENERAL

These Power Monitors are used to monitor voltage, frequency and phase characteristics of single or three-phase power lines, allowing normal operation of system loads when the power line characteristics are within predetermined limits. In the event that either voltage (any phase) or frequency is not within specified limits, or the phase sequence is other than ABC, the relay de-energizes to operate alarm indicators or system shutdown contactors. Voltage sensing is accomplished with the use of an "RMS" type detector and is relatively insensitive to line distortion.

OPERATION

If the voltage and frequency of the input three-phase signal are within the preset high and low limits, and the phase sequence is ABC, the output relay will energize after the pick-up time delay. If the high or low voltage limits of any phase are exceeded for a time greater than the preset "drop-out" time delay, the relay de-energizes and remains de-energized until all phase voltages return within limits and remain at normal levels for longer than the preset "pick-up" time delay.

If the input frequency exceeds the preset high and low frequency limits for a time exceeding the preset "drop-out" time delay, the relay de-energizes and remains de-energized until the frequency returns within limits and remains at normal levels for longer than the preset "pick-up" time delay.

The output relay will not energize if the phase sequence is other than ABC. When the output relay is energized, loss of any phase* will cause the relay to drop out immediately, overriding the time delay.

High and low voltage limits, high and low frequency limits, and "pick-up" and "drop-out" time delay may be adjusted in the field by manipulation of the adjustment potentiometers located under a removable access cover. Values are increased by clockwise rotation. Factory settings are as specified in the part number and adjustment pots are marked for easy location.

**A phase loss is defined as complete loss of phase Extreme low voltage conditions are recognized by Model YMA/YQA and will provide a delayed drop out of the control circuit relays When these power monitors are used with rotating equipment, consideration must be given to the possibility of induced (ghost) voltages, which might appear on the open line. The existence of such a voltage may mask the phase loss from the YMA/YQA phase detector. Depending on the magnitude of the "ghost" voltage and the monitor's preset voltage limits, this "ghost" might be detected as a low voltage condition and cause a delayed drop out of the control relay.*

STANDARD SPECIFICATIONS

ELECTRICAL:

Input (operating)

Voltage (nominal)	115 VRMS ±20% 4-wire wye
Frequency (nominal)	50/60/400 Hz ±20%
Power Characteristics	Per MIL-STD-704

Input (sense)

Voltage	115v NOMINAL
High	118-138 adjustable
Low	92-113 adjustable

Frequency	50Hz (Nominal)	60Hz (Nominal)	400 Hz (Nominal)
High	51.5-58 Adj.	62-72 Adj.	408-480 Adj
Low	45-48.5 Adj.	48-58 Adj.	320-392 Adj.

Accuracy (1)	±1%
Hysteresis	0.5% maximum
Phase Sequence	ABC
Time Delay (pick-up) (2)	250ms to 10 sec. adjustable
Time Delay (drop-out) (2)	250ms to 10 sec. adjustable

OUTPUT CONTACT:

Contact Form	DPDT or 3PDT
Contact Rating (@28Vdc)	10 Amp Res. 6 Amp Ind.
(@ 115V, 400 Hz)	5 Amp Res. 2.5 Amp Ind.
Contact Life	50,000 operations minimum
Contact Resistance	.075 ohms maximum
Dielectric Strength	900Vrms @ 60 Hz, all terminals to case
Insulation Resistance	100Meg ohms @ 500Vdc, all terminals to case
Power Dissipation	6 watts maximum

ENVIRONMENTAL:

Temperature	Per MIL-STD-810C, Methods 501.1, 502.2
Operating	YMA -55°C to +125°C YQA -40°C to +85°C
Storage	-65°C to +150°C
Vibration	Per MIL-STD-810C, Method 514.2, Procedure I, 10-2000Hz 20g's
Acceleration	Per MIL-STD-810C, Method 513.2, Procedure I, and II, ± 10g's
Shock	Per MIL-STD-810C, Method 516.2, Procedure I, 50g s 11 ±1 ms, any axis
Humidity	Per MIL-STD-810C, Method 507.1 Procedure II
Altitude	Per MIL-STD-810C, Method 504.1, Category 6 Equipment, Sea level to 70,000 ft
General	Per MIL-STD-810C, Class 4 except paragraph 3.1.29

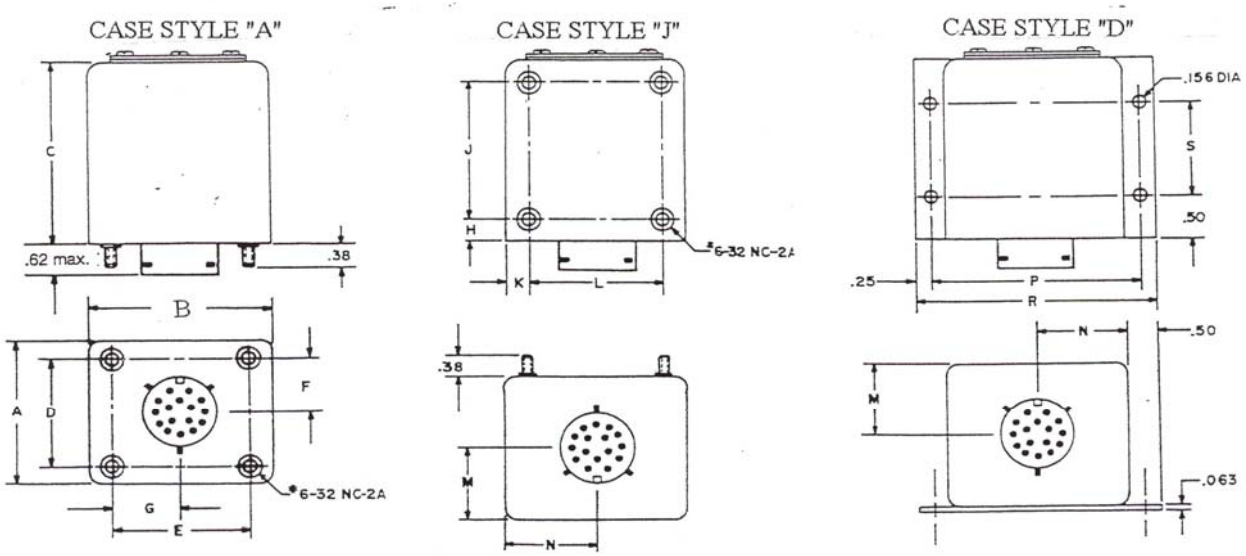
PHYSICAL:

Finish	Electro Tin Plate per ASTM-B545
Connector	MS 3113H-20-16PN or equivalent
Marking	Model number, date code, operating voltage and wiring diagram
Enclosure	Environmentally sealed and potted with access cover for adjustment potentiometers
Weight	30 oz. maximum

(1) Defined as maximum difference between factory set points and specified set point over any combination of input voltage and ambient temperature.

(2) Specified time delay does not include input filter response time. Refer to Table 1 for the typical delay which must be added to the specified

CASE STYLES



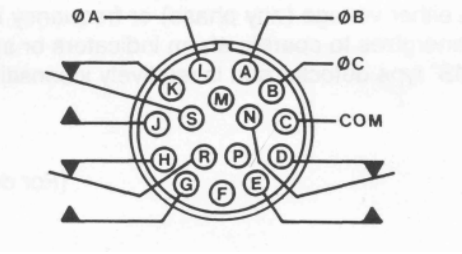
CASE DIMENSIONS

SYMBOL	DIMENSION
A	2.56" (65.02mm)
B	2.94" (74.68mm)
C	3.17" (80.52mm)
D	1.875" (47.625mm)
E	2.250" (57.150mm)
F	.656" (16.662mm)
G	1.125" (28.575mm)
H	.39" (9.91mm)
J	2.375" (60.325mm)
K	.39" (9.91mm)
L	2.156" (54.763mm)
M	1.00" (25.40mm)
N	1.47" (1.47mm)
P	3.437" (87.300mm)
R	3.94" (100.76mm)
S	2.171" (55.144mm)

TABLE 1

% VOLTAGE CHANGE (ΔV)	SET PT. %	TYPICAL 50/60/400 HZ FILTER RESPONSE MSEC.
+20	+5	60
+20	+10	110
+20	+15	175
+10	+5	100
-10	-5	90
-20	-5	80
-20	-10	110
-20	-15	210

WIRING



1. FOR SINGLE PHASE OPERATION USE PINS B & C.
2. FOR DPDT OPERATION DELETE PINS D, E, & N.

Tolerance .XX" ± .030" (± .762mm), XXX" ± .010" (± .254mm)

ORDERING INFORMATION

To order, specify all parameters using the part numbering system shown below.

YMA 3 4 12 A (92/130) (360/440) (2/2) 115 **(Example Part Number)**

- 115 — Nominal Operating Voltage:
- (2/2) — Factory set (Drop Out / Pick –up) time delay in seconds
- (360/440) — Frequency sense band, specify factory set (Low/High) frequency limits (XX if high or low limit is not required)
- (92/130) — Voltage sense band, specify factory set (Low/High) voltage limits (XX if high or low limit not required).
- A — Case Style:
  - A
  - J
  - D
- 12 — Contact Form and Rating:
  - 12 DPDT@ 10A
  - 13 3PDT @ 10A
- 4 — Nominal Operating Frequency:
  - 4 400 Hz
  - 5 50 Hz
  - 6 60 Hz
- 3 — Phase:
  - 1 (Single)
  - 3 (Three)
- YMA — Type:
  - YMA (– 55° C to +125° C)
  - YQA (– 40° C to +85° C)