

Meter Relays

077 Series Analogue Meter Relays



Series 077 meter relays combine a highly accurate indicator with High and Low set point relay. The relays can operate alarm and control devices when the monitored signal value moves outside the chosen set point limits shown by adjustable red index pointers.

A single compact case houses the unit which requires only the input signal and power supply thus saving space and installation time.

Features

- Monitors and controls any variable which can be converted to an A.C. or D.C. signal.
- Rugged, shock and vibration resistant design
- Indicator, relays and power unit in one housing
- Stable electronic switching circuit does not use lamps, photocells, inductors or capacitors
- Taut band, fluid damped indicator
- Isolated input signal
- LED relay state indicators
- Built-in 0 - 10 second adjustable time delays
- UL Approved
File No. E75911SP

Applications

- Voltage monitoring/control current monitoring
- Overload alarm
- Battery monitoring/charging
- Temperature indication
- Temperature control
- Load shedding
- Power factor correction
- Frequency monitoring
- Level control

Meter Relays

Product Code

One relay, two setpoints

Upscale de-energized, down scale energized.
Typical applications: Liquid level control, load shedding and power factor correction.

077-300

One relay, one set point

Upscale energized, downscale de-energized.
Typical application: High alarm.

077-301

Two relays, two set points

Mid band de-energized, outside band energized.
Typical applications: High and Low alarm, High alarm plus shut down.

077-302

Two relays, two setpoints

Both upscale energized, downscale de-energized.
Typical application: High alarm plus shutdown.

077-303

Two relays, two setpoints

High and low midband energized, outside band de-energized. No time delay.
Typical application: High alarm plus shutdown.

077-304

Two relays, two set points

Both upscale de-energized,downscale energized.
Typical application: Frequency monitoring.

077-305

One relay, one set point

Upscale de-energized, downscale energized.
Typical application: Low alarm.

077-307

Two relays, two set points

Midband de-energized, outside band energized.
Operates from from 2, 3 or 4 wire resistance temperature detector (RTD).
Typical application: Temperature indication / control.

077-30R

Two relays, two set points

Midband de-energized, outside band energized.
Operates from thermocouple input.
Cold junction compensation and thermocouple break protection are standard features.
Typical application: Temperature indication / control.

077-30T

Meter Relays

077 Series Analogue Meter Relays

Specification

Input signal ratings:

Frequency monitoring: 45/65Hz or 55/65Hz
 100/125 V, 200/250V
 380/440V or 480V system

D.C. Voltage: 10mV to 500V - 10kΩ/V

D.C. Current: 10μA to 500mA - 20mV drop
 4/20mA

A.C. Voltage: 6V to 600V - 1000 Ω/V

A.C. Current: 100μA to 1A - 1V drop
 5A CT operation - 0.5VA

Thermocouples:

Standard outputs

RTD Operation:

10Ω Copper
 100Ω Platinum
 0-200°C, 0-150°C
 or 20 - 140°C

Overloads:

1.2 x continuous, up to 200V
 or 100mA - 10 x for 10 secs.

Indicator Accuracy:

Max error 1.5%

Damping time:

1 second

4" Scale:

100° deflection

Set point accuracy:

Max error 1.5%

Repeatability:

0.5%

Differential:

1% of span

Operating time:

250m sec to 10 sec adjustable

Set-point Adjustments:

Single - 100% of scale
 Double - 98% of scale

Minimum span:

2% between setpoints

Colour:

Red

Output Relay:

Mounted internally

Operation:

SPDT contacts on each setpoint
 Optional latching on either or
 both relays (077-301, 077-302
 or 077-307 only)

Contact Rating:

5A, 250V, 1000W non-
 inductive

Ambient Temperature Range:

-10°C to +60°C
 (+14°F to 140°F)

Standard calibration:

20°C (68°F)

Panel Material:

Ferrous or non-ferrous

Dielectric test:

2600V r.m.s. for 1 minute

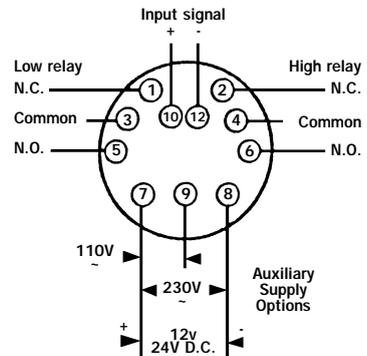
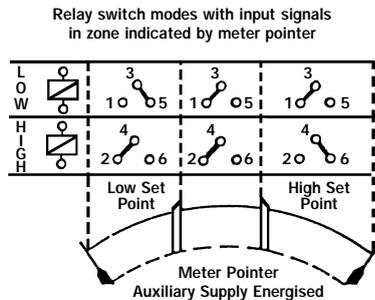
Auxiliary power requirement:

A.C.: Dual rating - 120/240, 50/60Hz
 D.C.: 12V, 24V or 125V DC
 Burden: 3W maximum

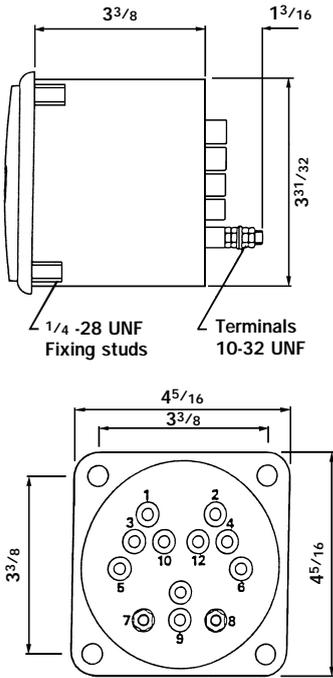
Options

- BR Non reflecting window
- CT Calibrated at customer specified temperature
- EB Both relays latch, external switch to reset
- EH High relay latch, external switch to reset
- EL Low relay latch, external switch to reset
- FK Finger knob setpoint adjusters
- LB Both relays latch, remove auxiliary supply to reset
- LH High relays latch, remove auxiliary supply to reset
- LL Low relays latch, remove auxiliary supply to reset
- PD Electrical heavily damped movements
- PG Panel mounting gasket
- SL Red line on instrument dial
- SM Customer logo on instrument dial
 (Note: one off setup charge may apply)
- SZ Coloured band on instrument dial
- TP TPC-Time proportional control
 (proportional plus derivative control)

Connections



Dimensions and panel cut-out



Approvals



Meter Relays

239 Series Analogue Meter Relays



Series 239 meter relays combine a highly accurate indicator with High and Low set point relays. The relays can operate alarm and control devices when the monitored signal value moves outside the chosen set point limits shown by adjustable red index pointers.

A single compact case houses the unit which requires only the input signal and power supply thus saving space and installation time.

Features

- Monitors and controls any variable which can be converted in to an A.C. or D.C. signal
- Rugged shock and vibration resistant design
- Indicator, relays and power unit in one housing
- Control function continues if the indicator becomes damaged
- Stable electronic switching circuit does not use lamps, photocells, inductors or capacitors
- Taut band, fluid damped indicator
- Isolated input signal
- LED relay state indicators

Applications

- Voltage monitoring/ control current monitoring
- Overload alarm
- Battery monitoring/ charging
- Temperature indication
- Temperature control
- Load shedding
- Power factor correction
- Frequency monitoring
- Level control

Meter Relays

One relay, two setpoints

Upscale de-energised, down scale energised.
Typical applications: Liquid level control, load shedding & power factor correction.

One relay, one set point

Upscale energised, downscale de-energised.
Typical application: High alarm.

Two relays, two set points

Mid band de-energised, outside band energised.
Typical applications: High and Low alarm, High alarm plus shut down.

Two relays, two setpoints

Both upscale energised, downscale de-energised
Typical application: High alarm plus shutdown.

Two relays, two setpoints

High and low midband energised, outside band de-energised. No time delay.
Typical application: High alarm plus shutdown.

Two relays, two set points

Both upscale de-energised,downscale energised.
Typical application: Frequency monitoring.

One relay, one set point

Upscale de-energised, downscale energised.
Typical application: Low alarm.

Two relays, two set points

Midband de-energised, outside band energised.
Operates from from 2, 3 or 4 wire resistance temperature detector (RTD).
Typical application: Temperature indication / control.

Two relays, two set points

Midband de-energised, outside band energised.
Operates from thermocouple input. Cold junction compensation and thermocouple break protection are standard features.
Typical application: Temperature indication / control.

Product Code

239-300

239-301

239-302

239-303

239-304

239-305

239-307

239-30R

239-30T

Meter Relays

239 Series Analogue Meter Relays

Specification

Adjustments

Front panel comprises Set-point potentiometer(s), one per set-point
 Rear panel comprises Delay potentiometer(s), one per set-point

Measuring Input:

Note: All inputs are average sensing, but RMS calibrated

A.C. Voltage: 10V to 600V RMS (Sensitivity 1K Ω /V to 100K Ω /V, max. 2.5M Ω)
 A.C. Current: 1mA to 15A RMS (20mV drop)
 D.C. Voltage: 10mV to 600V RMS (Sensitivity 1K Ω /V to 100K Ω /V, max. 2.5M Ω Centre zero option up to 600/0/600V)
 D.C. Current: 100 μ A to 15A (20mV drop) Centre zero option up to 15/0/15 amps

Maximum continuous input voltage 1.2 x rating continuously (600V max.)
 Maximum continuous input current 1.2 x nominal (15A max.)
 Maximum short duration input current 6 x nominal for 6 seconds (30A max.)
 Frequency monitoring: 50Hz to 60Hz \pm 10%
 Burden <0.5VA

Damping time: 1 second
4" Scale: 100° deflection
Panel material: Ferrous or non-ferrous
Dielectric test: 2600V r.m.s. for 1 minute

Auxiliary supply

Aux. voltage A.C. 110, 120, 220, 230, 240, 277, 480V A.C. (\pm 20%)
 Aux. voltage D.C. 12, 24, 48, 120, or 135V maximum 156V D.C.
 Aux. frequency 50 to 60Hz \pm 10%
 Burden: <1.5W

Adjustments and Accuracy

Indicator accuracy Class 1.5
 Set-point range 98% of scale
 Set-point accuracy 1% of range
 Set-point hysteresis 1% of range
 Trip repeatability 0.5% of range

Relay tripping time <1 second
 Time delay 0 to 20 seconds, adjustable by potentiometer on rear panel **Option:** 0 to 10 seconds and 0 to 40 seconds
 Indication Single red LED, per set-point, to indicate trip condition

Outputs

Relays DPCO contacts rated 5A @ 250V A.C. 5A @ 30V D.C. resistive electrical life >10⁴ operations @ 5A, 250V A.C. contact class IIB (IEC 60255-0-20)

Relay logic Configurable to energise or de-energise on trip

Options

Relay latching When the measured signal reaches the set-point, the relay changes state and stays in this condition until the auxiliary supply is interrupted

Environmental and Mechanical

Ambient temperature reference range +15°C to +30°C nominal range of use 0°C to +60°C
 Storage temperature -20°C to +70°C
 Relative humidity <90%, non condensing
 Shock 15g/11ms (EN 60068-2-27)
 Bumping 40g/6ms (EN 60068-2-29)
 Vibration 10 to 300Hz (EN 60068-2-6)
 Protection class (BS EN 60529) Terminals to IP20 Enclosure to IP50

Enclosure

Flammability UL94V1
 Terminal capacities 1 to 4mm² solid or stranded conductors
 Weight <1kg

EU Directives

Low Voltage Directive 73/23/EEC amended by 93/68/EEC
 EMC Directive 89/336/EEC amended by 93/68/EEC
 CE Mark Directive 93/68/EEC

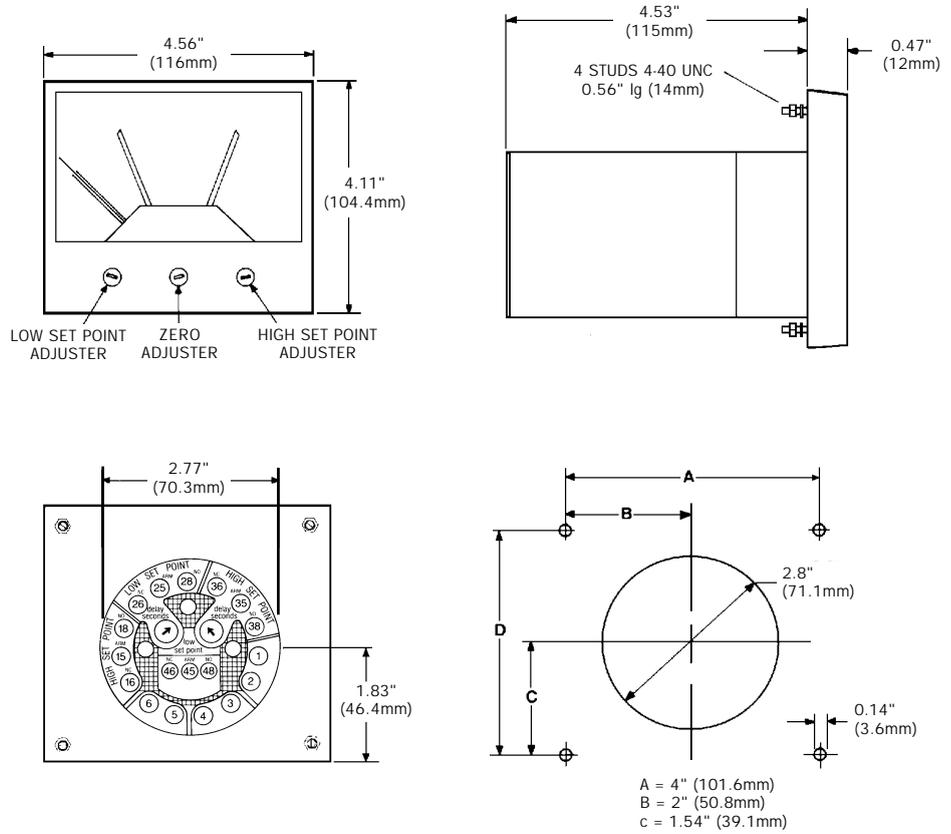
Options

- | | | | |
|----|---|----|---|
| CT | Calibrated at °C | LL | Low relays latch, remove auxiliary supply to reset |
| EB | Both relays latch, external switch to reset | MC | Clamp band fixing |
| EH | High relay latch, external switch to reset | NH | Hysteresis |
| EL | Low relay latch, external switch to reset | PD | Electrical heavily damped movements |
| FK | Finger knob setpoint adjusters | PG | Panel mounting gasket |
| KV | Sensitivity 100k/volt for A.C. input | RP | Retro-fit plate 237 meter relay |
| KW | Sensitivity 1k/volt for D.C. input | SL | Red line on instrument dial |
| KX | Sensitivity 100k/volt for D.C. input | SM | Customer logo on instrument dial (Note: one off setup charge may apply) |
| LB | Both relays latch, remove auxiliary supply to reset | SZ | Coloured band on instrument dial |
| LH | High relays latch, remove auxiliary supply to reset | TP | TPC-Time proportional control (proportional plus derivative control) |

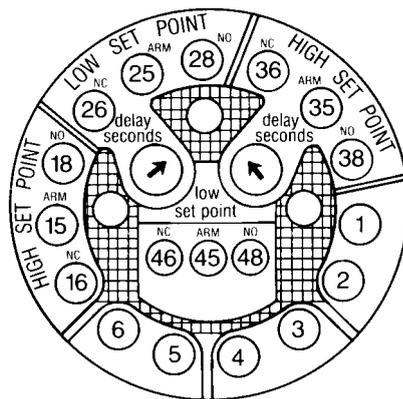
Meter Relays

239 Series Analogue Meter Relays

Dimensions and Panel cut-out



Connections



Measuring Input

Terminal

- 1 Meter N or -VE
- 2 Meter L or +VE
- 3, 4. RTD or Thermocouple input
5. Auxiliary supply neutral (-ve if D.C.)
6. Auxiliary supply live (+ve if D.C.)
4. Auxiliary supply tap for dual supply models

Meter Relays

244 Series Analogue Meter Relays



244 series meter relays combine a highly accurate indicator with high and low set-points which can operate alarm and control circuits when the monitored signal value moves outside the set-point limits indicated by the adjustable red index pointers.

These relays monitor and control any parameter which can be converted into an A.C. or D.C. signal.

The indicator, relays and power unit are in one housing and the control function continues should the indicator become damaged. A time delay is available as an optional extra.

Applications

- Voltage monitoring/control current monitoring
- Overload alarm
- Battery monitoring/charging
- Temperature indication
- Temperature control
- Load shedding
- Power factor correction
- Frequency monitoring
- Level control

Approvals



Meter Relays

- 1 relay, 2 set-points**
Upscale de-energised, downscale energised
- 1 relay, 1 set-point**
Upscale de-energised, downscale energised
- 2 relays, 2 set-points**
Mid-band de-energised, outside band energised
- 2 relays, 2 set-points**
Both upscale energised, downscale de-energised
- 2 relays, 2 set-points**
High & low mid-band energised, outside band de-energised
- 2 relays, 2 set-points**
Both upscale de-energised, downscale energised
- 1 relay, 1 set-point**
Upscale de-energised, downscale energised
- 2 relays, 2 set-points**
High and high upscale de-energised
- 1 relay, 2 set-points**
Low de-energised, high energised
- RDT operated 2 relays, 2 set-points**
Mid-band de-energised, outside band energised
- Thermo couple 2 relays, 2 set-points**
Mid-band de-energised, outside band energised

Product Code

- 244-300
- 244-301
- 244-302
- 244-303
- 244-304
- 244-305
- 244-307
- 244-308
- 244-309
- 244-30R
- 244-30T

Options

- | | |
|--|---------------------------------------|
| BP Polycarbonate window | SM Customer logo on dial |
| CT Calibrated at customer specified temperature | SN No logo on dial |
| DS Dual scale | SR Red index line on dial |
| FK Finger knob adjustment | SZ Coloured band on dial |
| LB Both relays latch, remove auxiliary supply to reset | TB Time delay 0.3 - 10 sec |
| LH High relays latch, remove auxiliary supply to reset | TC Time delay 0.3 - 30 sec |
| LL Low relays latch, remove auxiliary supply to reset | TD Time delay 0.3 - 20 sec |
| PD Heavily damped movement | TH Time delay 0.3 - 10 sec high relay |
| PG Panel gasket | TI Time delay 0.3 - 30 sec high relay |
| SL Red line on dial | TL Time delay 0.3 - 10 sec low relay |
| | TM Time delay 0.3 - 30 sec low relay |
| | TP Time proportional control |

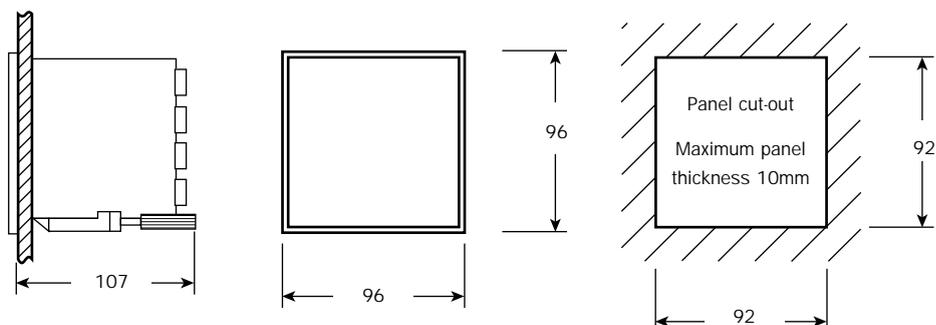
Meter Relays

244 Series Analogue Meter Relays

Specification

| | | | |
|------------------------------|---|--------------------------|--|
| Accuracy Indicator: | Class 1.5 | Optional Ratings: | D.C. Volts: 20mV to 500V (10K Ω /V) |
| Set-point: | Class 1.5 | D.C. Current: | 10 μ A to 15A (20mV drop) |
| Repeatability: | 0.5% | Thermocouple: | Types J, K, R, S, T minimum 10mV span |
| Differential: | 1% of span | RTD: | 2 wire 10 Ω copper 100 Ω platinum, 120 Ω nickel |
| Set-point adjustment: | 98% of scale | Auxiliary Supply: | A.C.: Dual rating 100/125V or 200/250V 50/60Hz. |
| Minimum span: | 2% between set points | D.C.: | 12V or 24V. +/-14% Maximum 15% ripple on unregulated supplies |
| Ratings: | | Burden: | 3VA maximum |
| A.C. Volts: | 6V to 500V (1K Ω /V) 50/60Hz | Fixing: | Screw clamps |
| Single Frequencies: | 25Hz to 3kHz on request | Enclosure: | IP52 |
| A.C. Current: | 100 μ A to 1A (1V drop) 1A & 5A C.T. operation (0.5VA) 50/60Hz. | | |
| Frequencies: | 25Hz to 3kHz on request | | |
| Time delay: | 0.3 to 10 or 0.3 to 30 seconds | | |

Dimensions



Connections

