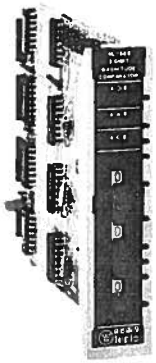
# 12-BIT COMPARATOR
# Catalog No. NL-366L and NL-366LT

## DESCRIPTION

Compares two 12-bit numbers. Numbers can be set by an on-board (NL-366T) or remote thumbwheel, or generated by 12 logic-level inputs. Four outputs provided: A > B, (or B < A), A < B, (or B > A), A = B, and A ≠ B. LEDs provided for A > B, A < B, A = B.
PICTORIAL LENS. Standard lens shown. Blank lens available for customer marking by user.
TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.
KEY SLOTS. Prevent incorrect module replacement.

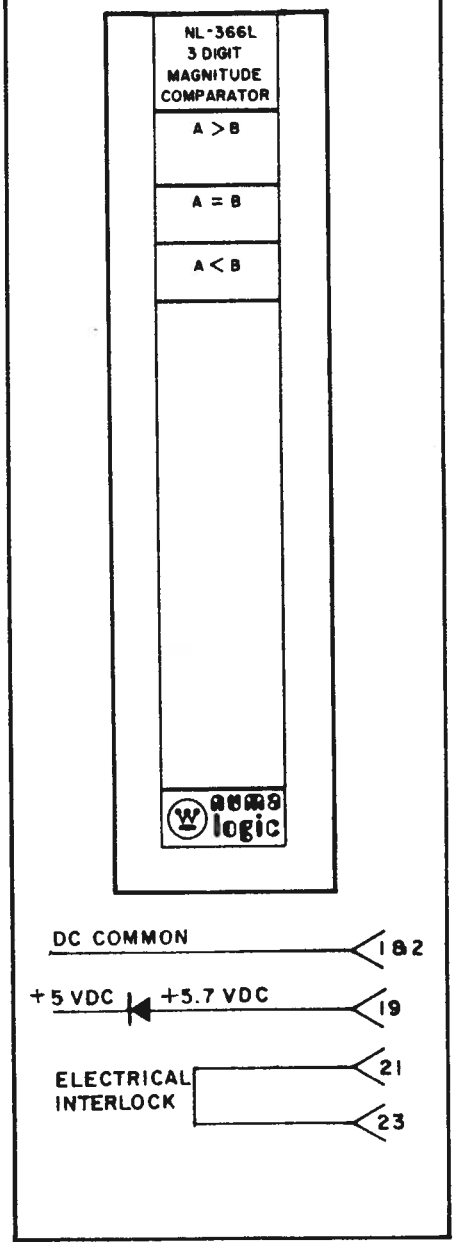


## SPECIFICATIONS

| | |
|---|---|
| Number of circuits | 1 |
| Logic type | TTL |
| Fan-in | |
| Logic 1 | 1 unit load (1.6 mA, source) |
| Logic 0 | 1 unit load (40 microamps, sink) |
| Fan-out | |
| Logic 1 | 10 unit loads (16 mA, sink) |
| Logic 0 | 10 unit loads (400 microamps, source) |
| Logic levels | |
| Logic 1 | 0.0 to 0.8 VDC |
| Logic 0 | 2.4 to 5.0 VDC |
| Propagation delay | 0.1 ms, 4750 Hz (nominal) |
| Power requirement | + 5.7 ± 0.25 VDC<br>430 mA |
| Temperature rating | 0° to 85° C |
| Noise energy rejection | 25 x $10^{-6}$ watt seconds |
| Mechanical keying | Between pins 13 & 15 and pins 33 & 35 |
| Electrical interlock | Pin 21 to pin 23 |

**WARNING: Do not use this module in a rack slot where pin 41 is bussed to AC Neutral. (See Application Note 5).**

CONNECTION DIAGRAM



# 12-BIT COMPARATOR

**TRUTH TABLE FOR USING COMPARATOR WITH BCD INPUTS**

| TRUTH TABLE FOR GROUP A & B LOGIC LEVEL INPUTS | | | | | | | | | TRUTH TABLE FOR GROUP A THUMBWHEEL INPUTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bit Value | | | | | | | | | Bit Value | | | | | | | | |
| Digit Value | Voltage Level | | | | Logic Level | | | | Digit Value | Voltage Level | | | | Logic Level | | | |
| | 8 | 4 | 2 | 1 | 8 | 4 | 2 | 1 | | 8 | 4 | 2 | 1 | 8 | 4 | 2 | 1 |
| 0 | H | H | H | H | 0 | 0 | 0 | 0 | 0 | L | L | L | L | 1 | 1 | 1 | 1 |
| 1 | H | H | H | L | 0 | 0 | 0 | 1 | 1 | L | L | L | H | 1 | 1 | 1 | 0 |
| 2 | H | H | L | H | 0 | 0 | 1 | 0 | 2 | L | L | H | L | 1 | 1 | 0 | 1 |
| 3 | H | H | L | L | 0 | 0 | 1 | 1 | 3 | L | L | H | H | 1 | 1 | 0 | 0 |
| 4 | H | L | H | H | 0 | 1 | 0 | 0 | 4 | L | H | L | L | 1 | 0 | 1 | 1 |
| 5 | H | L | H | L | 0 | 1 | 0 | 1 | 5 | L | H | L | H | 1 | 0 | 1 | 0 |
| 6 | H | L | L | H | 0 | 1 | 1 | 0 | 6 | L | H | H | L | 1 | 0 | 0 | 1 |
| 7 | H | L | L | L | 0 | 1 | 1 | 1 | 7 | L | H | H | H | 1 | 0 | 0 | 0 |
| 8 | L | H | H | H | 1 | 0 | 0 | 0 | 8 | H | L | L | L | 0 | 1 | 1 | 1 |
| 9 | L | H | H | L | 1 | 0 | 0 | 1 | 9 | H | L | L | H | 0 | 1 | 1 | 0 |

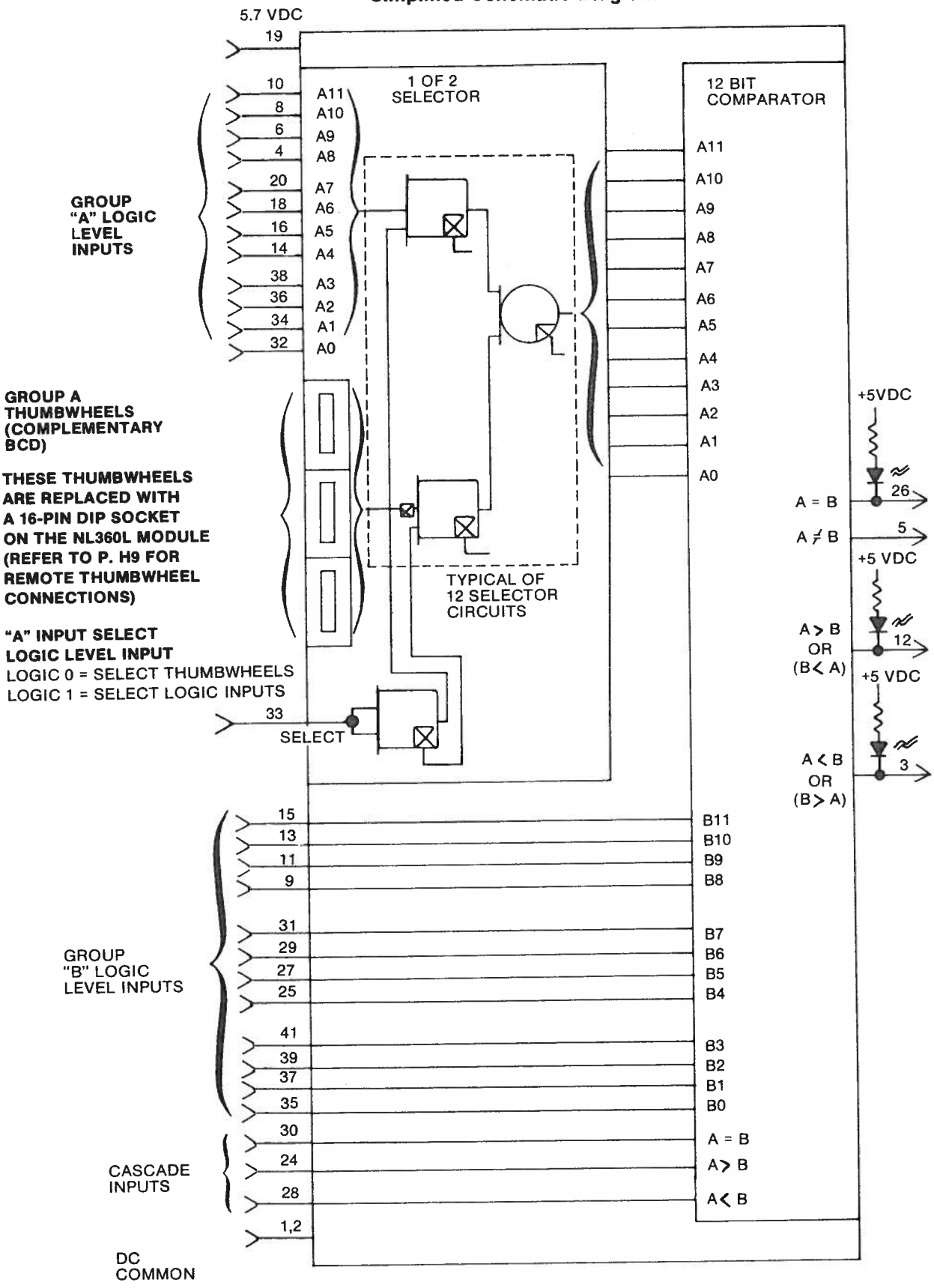
1. An unused (open) input is at Logic 0, even though it will typically measure 1.7 VDC.
2. Thumbwheel inputs are inverted ("NOT") with respect to the logic level inputs.

**APPLICATION NOTES:**

1. Both the Group A inputs and the Group B inputs must use the same coding (either BCD or binary) for the comparator to achieve the proper result. The thumbwheels (on-board or remote) are BCD. Therefore if Group A inputs are received from the thumbwheels, Group B inputs must also be BCD.
2. Positive and negative numbers can be compared by using the most significant bit as the sign bit to represent the sign of the number (+ or –). The sign bit is defined as + = logic "1" and – = logic "0". When using sign bits, two zeros are defined, + 000 and - 000. This may cause a problem in comparing two zeros.
3. The 16-pin dip socket on the NL-366L module may be used as another group A logic level input. These inputs, however, are inverted or NOT inputs.
4. When not being used as cascade inputs, tie pins 30, 24 and 28 together.
5. Do not use this module in a rack slot where pin 41 is bussed to AC Neutral. Doing so will destroy the module and may cause other damage to the system.

# 12-BIT COMPARATOR

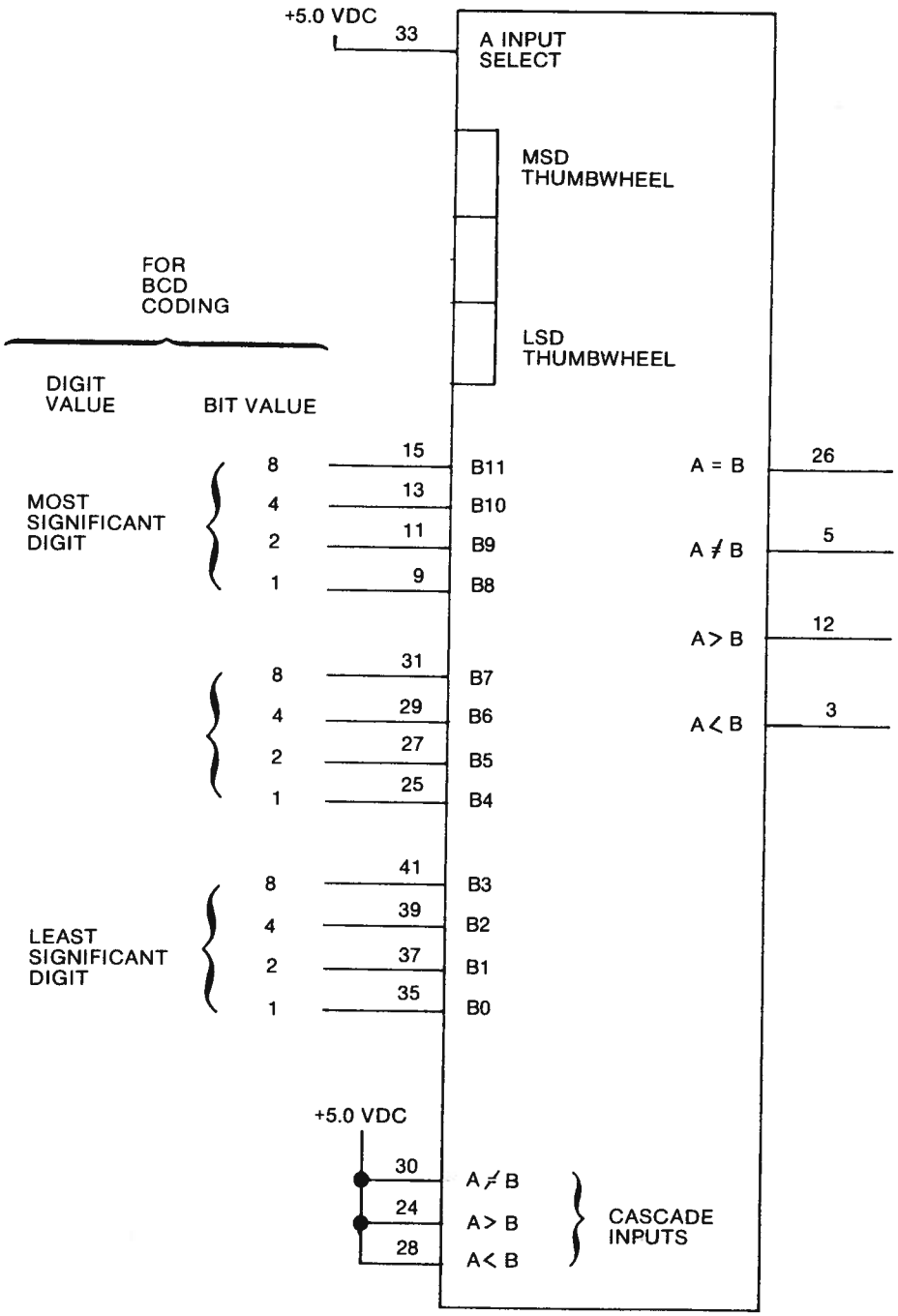
**Simplified Schematic Diagram**



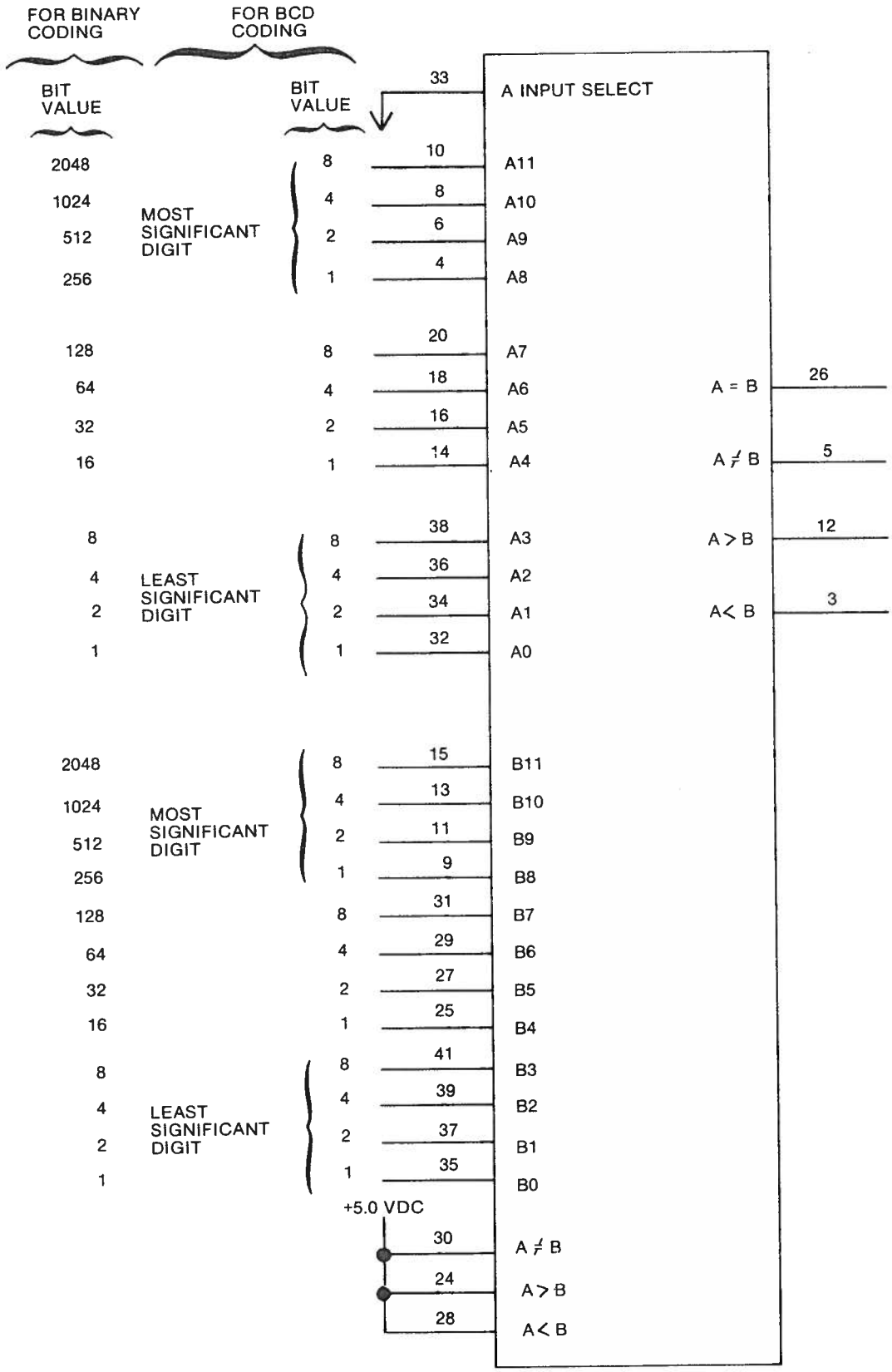
# 12-BIT COMPARATOR

**WIRING EXAMPLES:**

1. Simplified wiring diagram for Comparator with Group A inputs from thumbwheels. (Backplane pin connections are the same for either remote or on-board thumbwheels. Refer to page H9 for remote thumbwheel connections.)

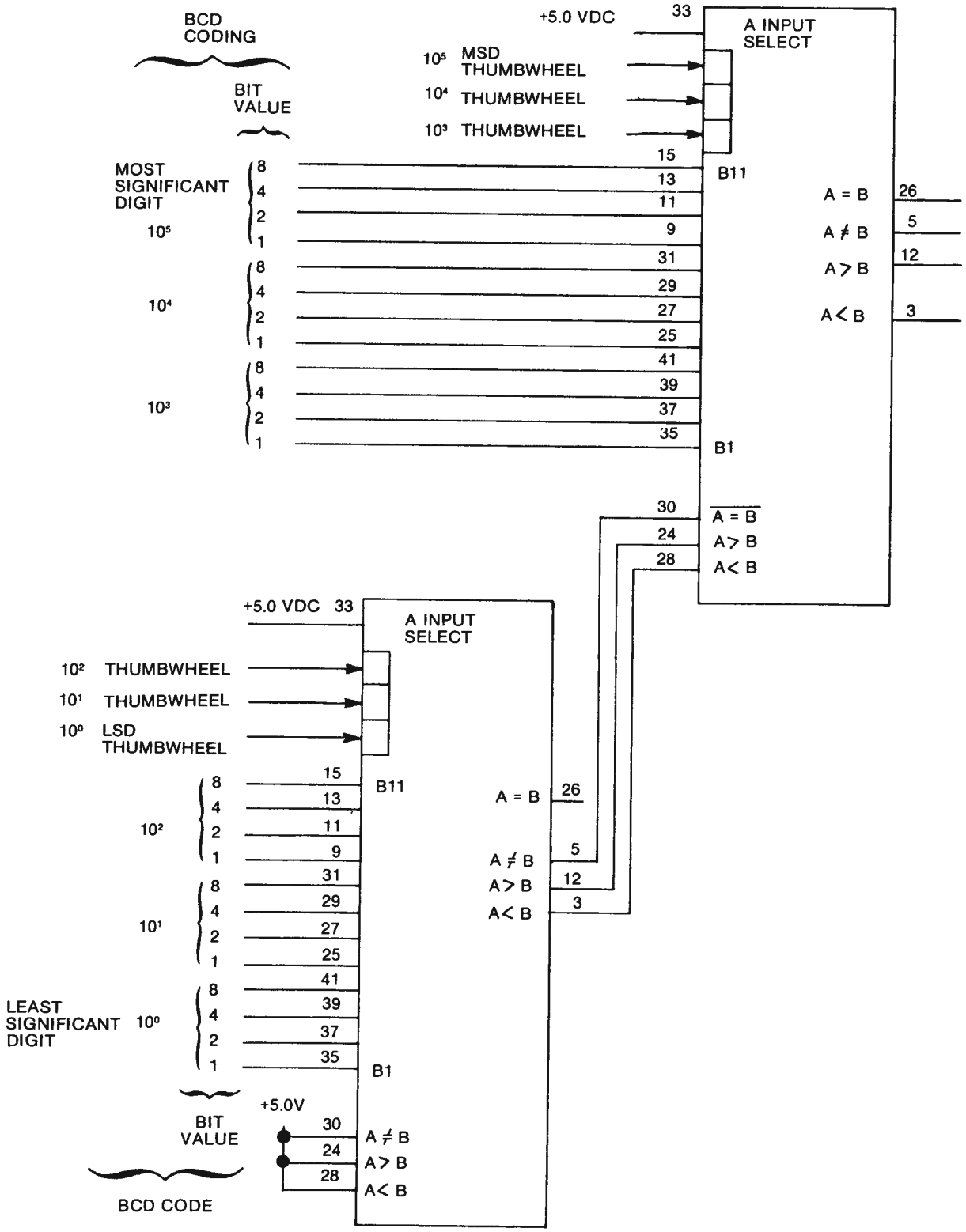


2. Simplified wiring diagram for Comparator with Group A inputs from logic inputs.



# 12-BIT COMPARATOR

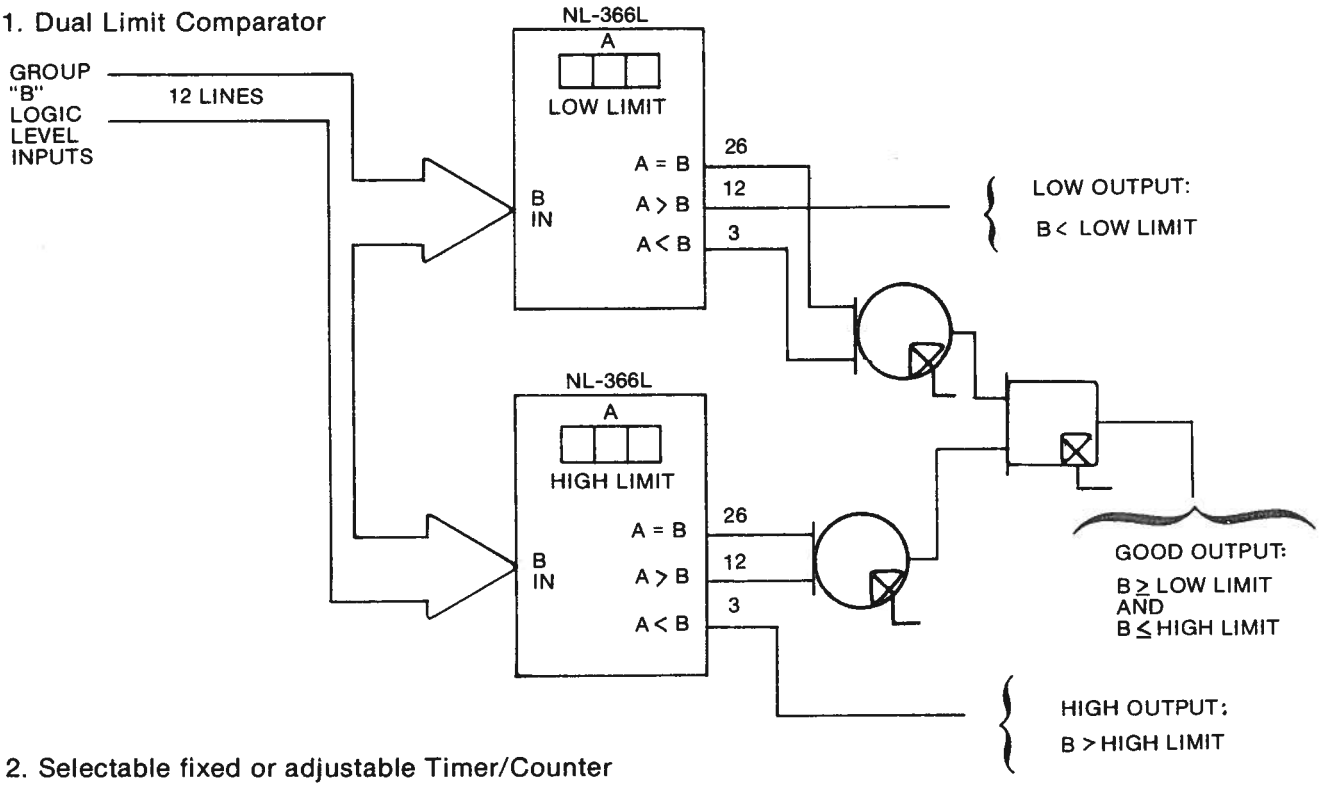
3. Simplified wiring diagram for cascading two NL-366L cards to form a 6-digit BCD comparator with Group A inputs from thumbwheels.



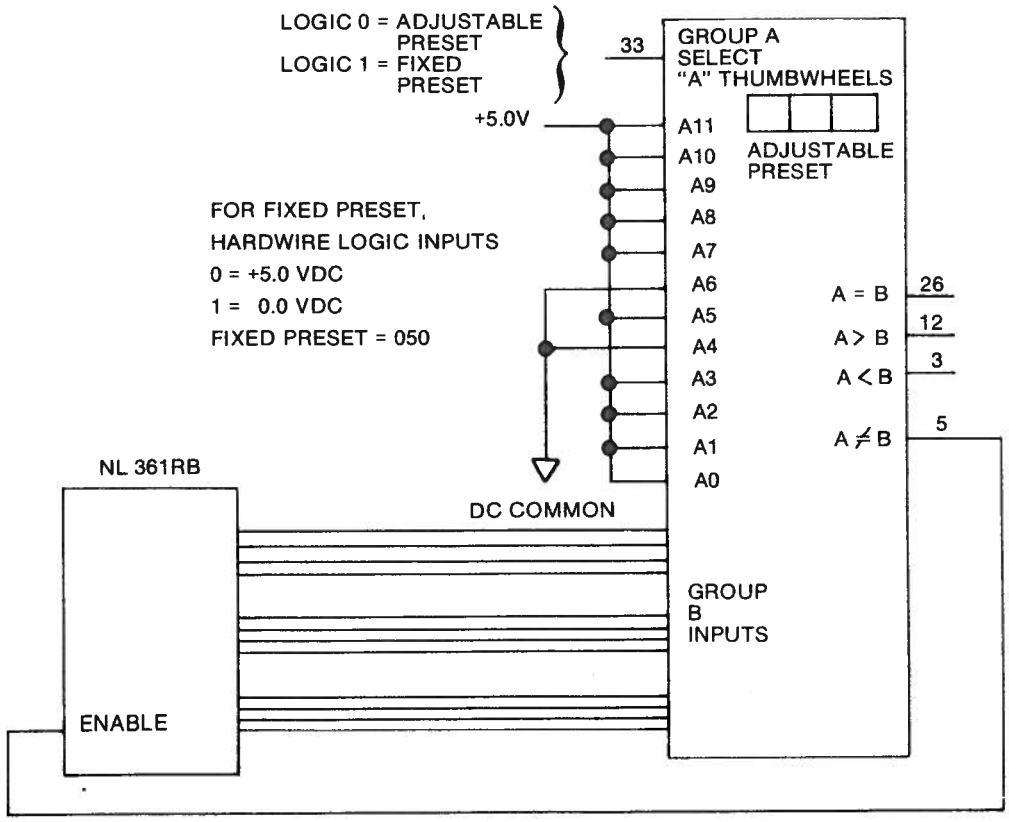
# 12-BIT COMPARATOR

**APPLICATION EXAMPLES:**

1. Dual Limit Comparator

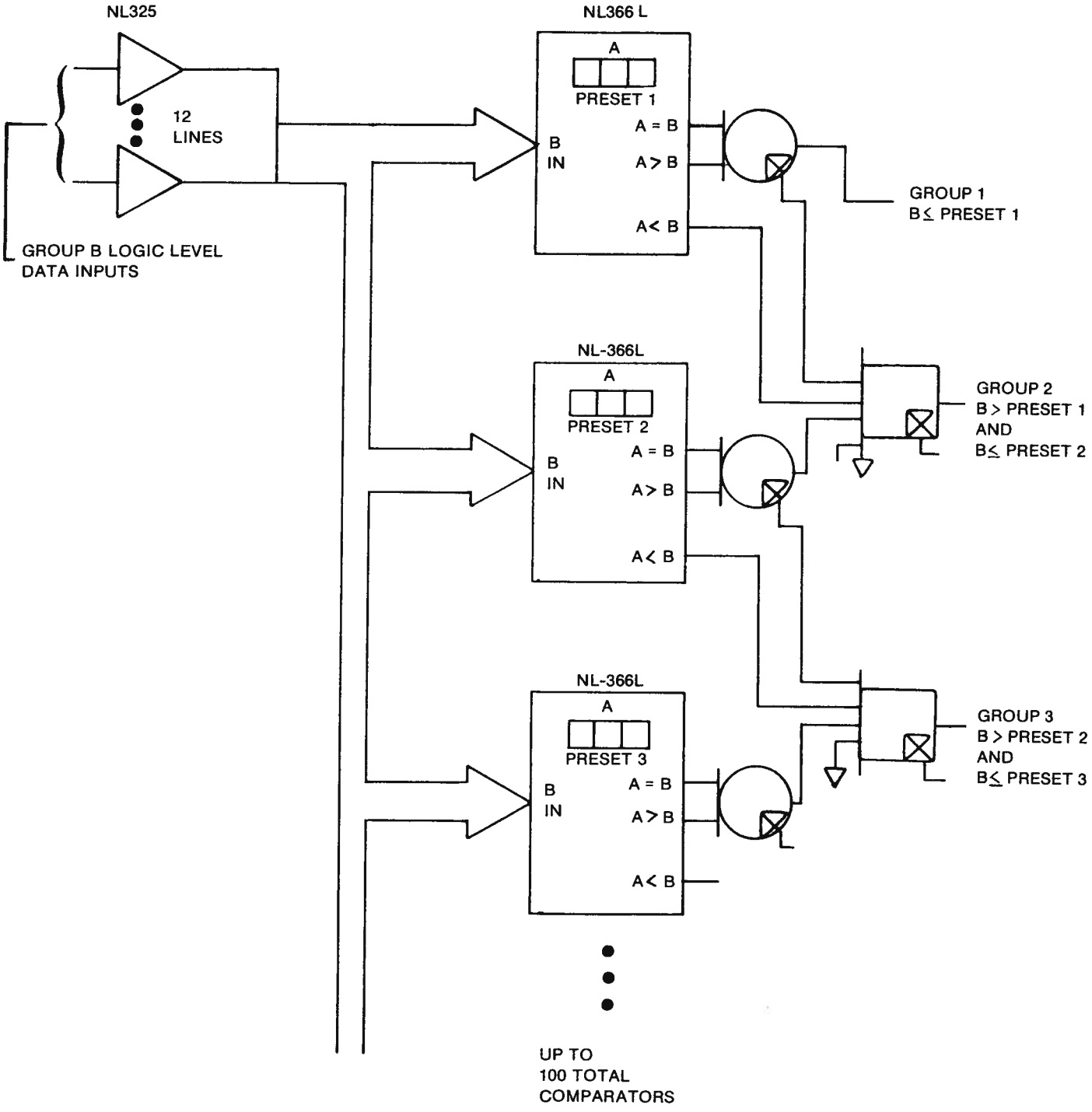



2. Selectable fixed or adjustable Timer/Counter



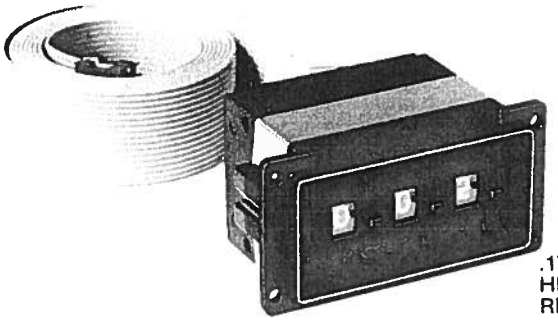
# 12-BIT COMPARATOR

3. Group Classifier (up to 100 groups possible).

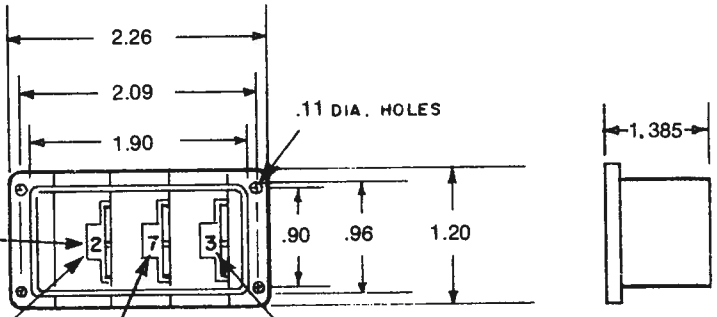


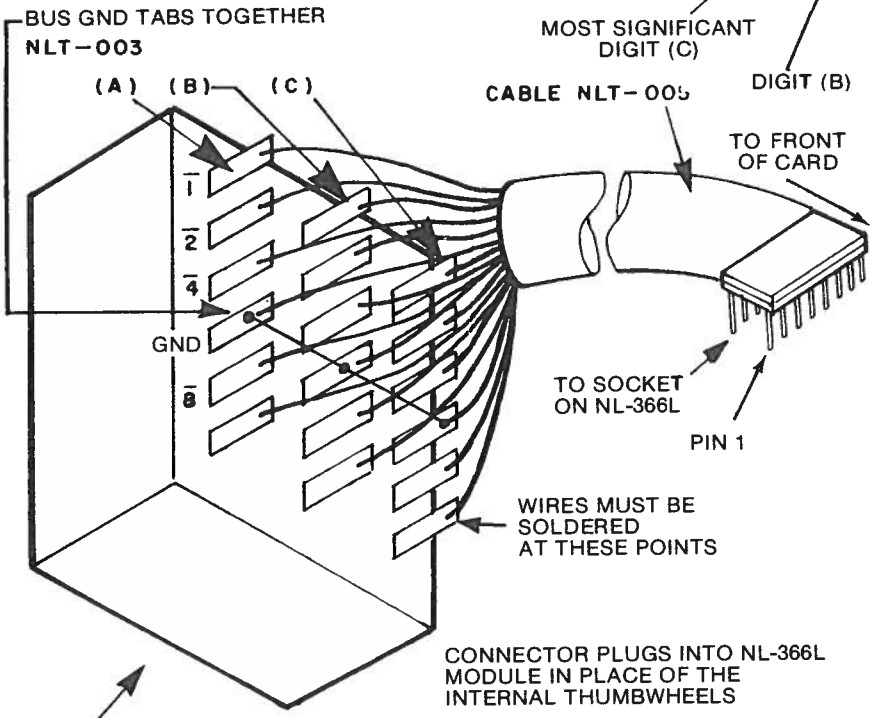
## REMOTE THUMBWHEELS NLT-003

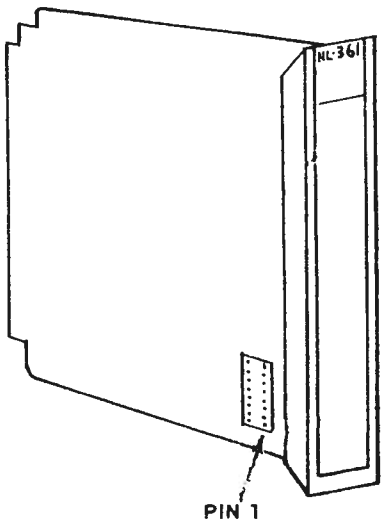
CONNECTION DIAGRAM FOR THE NL-366L MODULE



**DIMENSIONS In Inches**




### CONNECTIONS

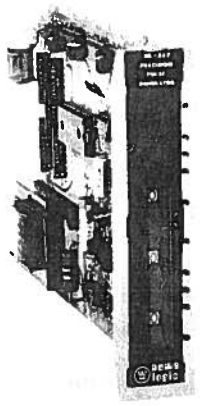
| FUNCTION | WIRE NO. | |
|---|---|---|
| $\overline{C1}$ | 1 | 8 |
| N.C. | 2 | 9 |
| $\overline{C2}$ | 3 | 7 |
| $\overline{B1}$ | 4 | 10 |
| $\overline{C4}$ | 5 | 6 |
| $\overline{B2}$ | 6 | 11 |
| $\overline{C8}$ | 7 | 5 |
| GND | 8 | 12 |
| $\overline{A1}$ | 9 | 4 |
| GND | 10 | 13 |
| $\overline{A2}$ | 11 | 3 |
| $\overline{B4}$ | 12 | 14 |
| $\overline{A4}$ | 13 | 2 |
| $\overline{B8}$ | 14 | 15 |
| $\overline{A8}$ | 15 | 1 |
| NC | 16 | 16 |

RED STRIPE
C = PREFIX MSD
B = PREFIX NSD
A = PREFIX LSD

# PULSE GENERATOR
# Catalog Nos. NL-367 & NL-367T

## DESCRIPTION

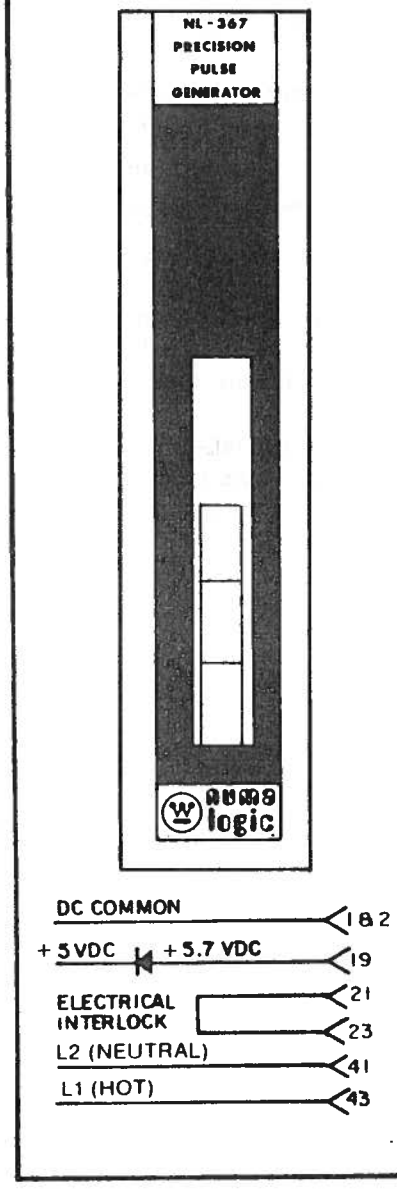
Generates a specified pulse rate between 0 and 999 pulses per second. Pulse rate can be set by an internal thumbwheel (NL-367T), remote thumbwheel, or hard-wired logic using the NL-325L module.
PICTORIAL LENS. Standard lens shown. Blank lens available for custom marking by user.
TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.
KEY SLOTS. Prevent incorrect module replacement.



## SPECIFICATIONS

| | |
|---|---|
| Number of circuits | 1 |
| Logic type | TTL |
| Frequency (range) | 0 - 999 pulses/sec |
| Fan-in | |
| Logic 1 | 1 unit load (1.6 mA, source) |
| Logic 0 | 1 unit load (40 microamps, sink) |
| Fan-out (per TRUE or NOT output | |
| Logic 1 | 10 unit loads (16 mA, sink) |
| Logic 0 | 10 unit loads (400 microamps, source) |
| Logic levels | |
| Logic 1 | 0.0 to 0.8 VDC |
| Logic 0 | 2.4 to 5.0 VDC |
| Response time (change of rate inputs to setting of rate outputs) | 0.25 sec |
| Power requirement | +5.7 ± 0.25 VDC |
| At all frequencies | 130 mA |
| Temperature rating | 0° to 85°C |
| Mechanical keying | Between pins 13 & 15 and pins 35 & 37 |
| Electrical interlock | Pin 21 to pin 23 |

## CONNECTION DIAGRAM




## TRUTH TABLE FOR BCD THUMBWHEEL OR LOGIC INPUTS

| Digit Value | Voltage Level | | | | Logic Level | | | |
|---|---|---|---|---|---|---|---|---|
| | 8 | 4 | 2 | 1 | 8 | 4 | 2 | 1 |
| 0 | L | L | L | L | 1 | 1 | 1 | 1 |
| 1 | L | L | L | H | 1 | 1 | 1 | 0 |
| 2 | L | L | H | L | 1 | 1 | 0 | 1 |
| 3 | L | L | H | H | 1 | 1 | 0 | 0 |
| 4 | L | H | L | L | 1 | 0 | 1 | 1 |
| 5 | L | H | L | H | 1 | 0 | 1 | 0 |
| 6 | L | H | H | L | 1 | 0 | 0 | 1 |
| 7 | L | H | H | H | 1 | 0 | 0 | 0 |
| 8 | H | L | L | L | 0 | 1 | 1 | 1 |
| 9 | H | L | L | H | 0 | 1 | 1 | 0 |

**H = 8.4 — 12.0 VDC = Logic 0**
**L = 0.0 — 3.6 VDC = Logic 1**

# PULSE GENERATOR

**APPLICATION NOTES:**

1. An unused (open) input will be at logic 0 even though it will typically measure 1.7 VDC.

2. The NL-367 module **does not** have a power up clear function, therefore the pulse output will be undefined during power up.

3. Approximately 0.25 seconds is needed for the NL-367 output to settle to the selected pulse rate. During this settling time, the pulse rate will be changing.

4. The NL-367 generates a pulsed output that directly corresponds to a 3-digit pulse rate input. The pulse output (pin 7) is a logic level output. With a BCD input of 000, the output will be at logic 0 (2.4 - 5.0 VDC); with an input of 001, the output will be off (logic 0) for 0.5 seconds, then on (logic 1) for 0.5 seconds; with an input of 002 the output will be off for 0.25 seconds, then on for 0.25 seconds.

5. The 3-digit pulse rate input is a 12 VDC CMOS logic level input (high true). The signal can be initiated through one of three different sources:

   A. Thumbwheels mounted on the module (NL-367T).

   B. Remote thumbwheels.

   C. From logic signals.

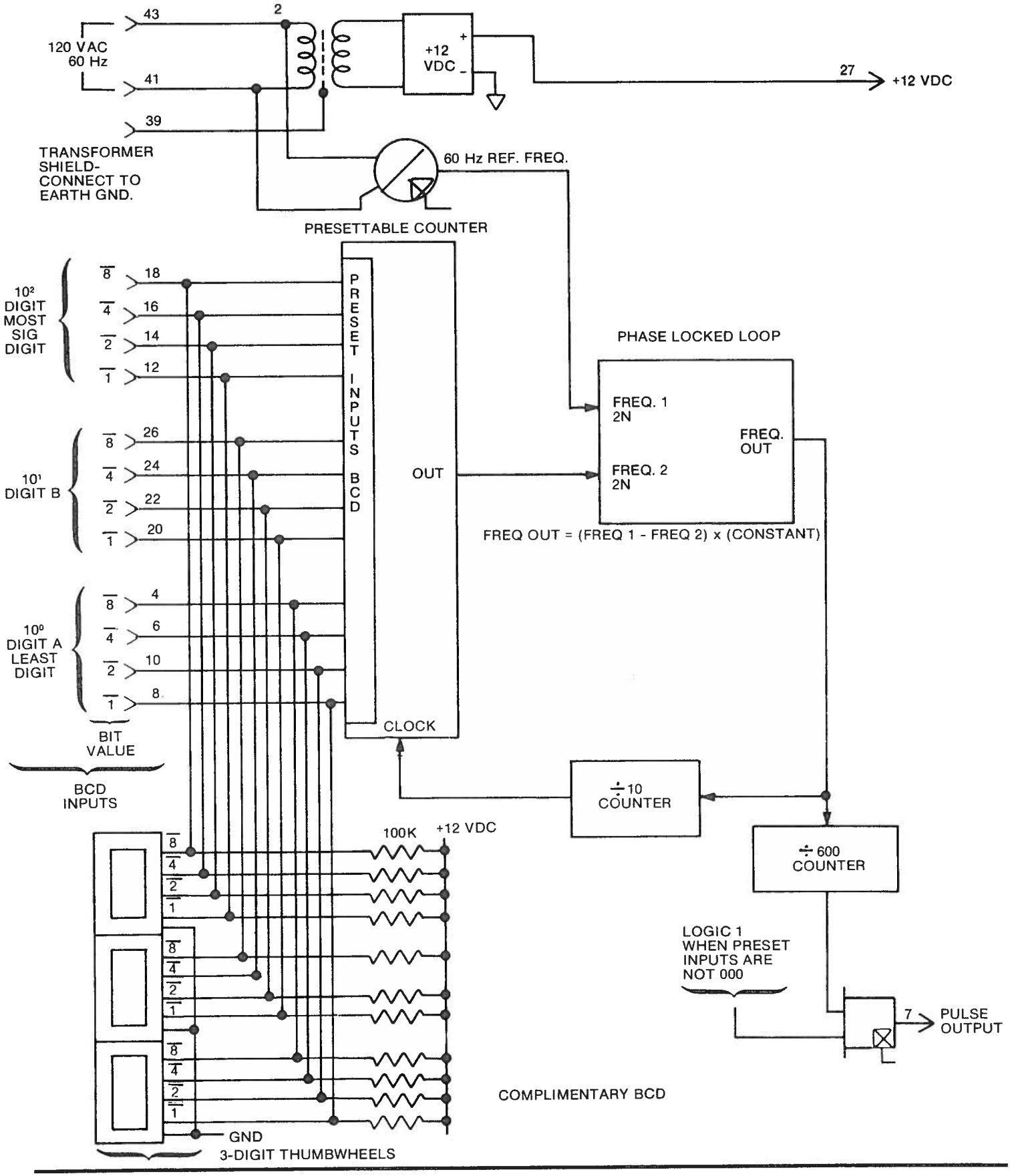
6. When using thumbwheels as inputs, the preset pins must not be used to supply logic signal inputs. If logic signals are used as inputs, use only the NL-367 module and **do not** connect any remote thumbwheels to the socket.

7. Use only the NL-325 module or the NLT-003 Remote Thumbwheel for driving the BCD inputs (pins 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, & 26) on the NL-367 module. These inputs are 12 VDC CMOS inputs. Valid voltage levels for these inputs are:

**L = 0.0 — 3.6 VDC NOMINAL**
**H = 8.4 — 12. VDC NOMINAL**

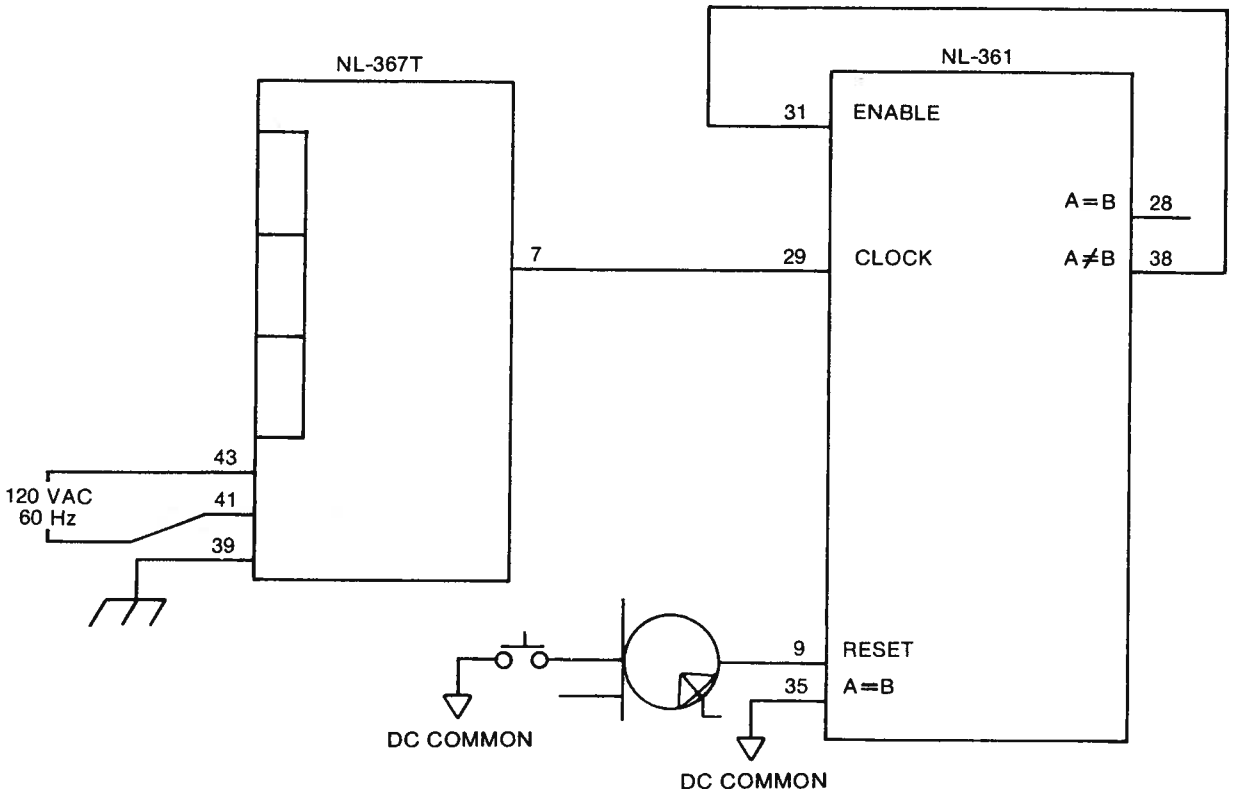
# PULSE GENERATOR

## NL-367T SIMPLIFIED SCHEMATIC



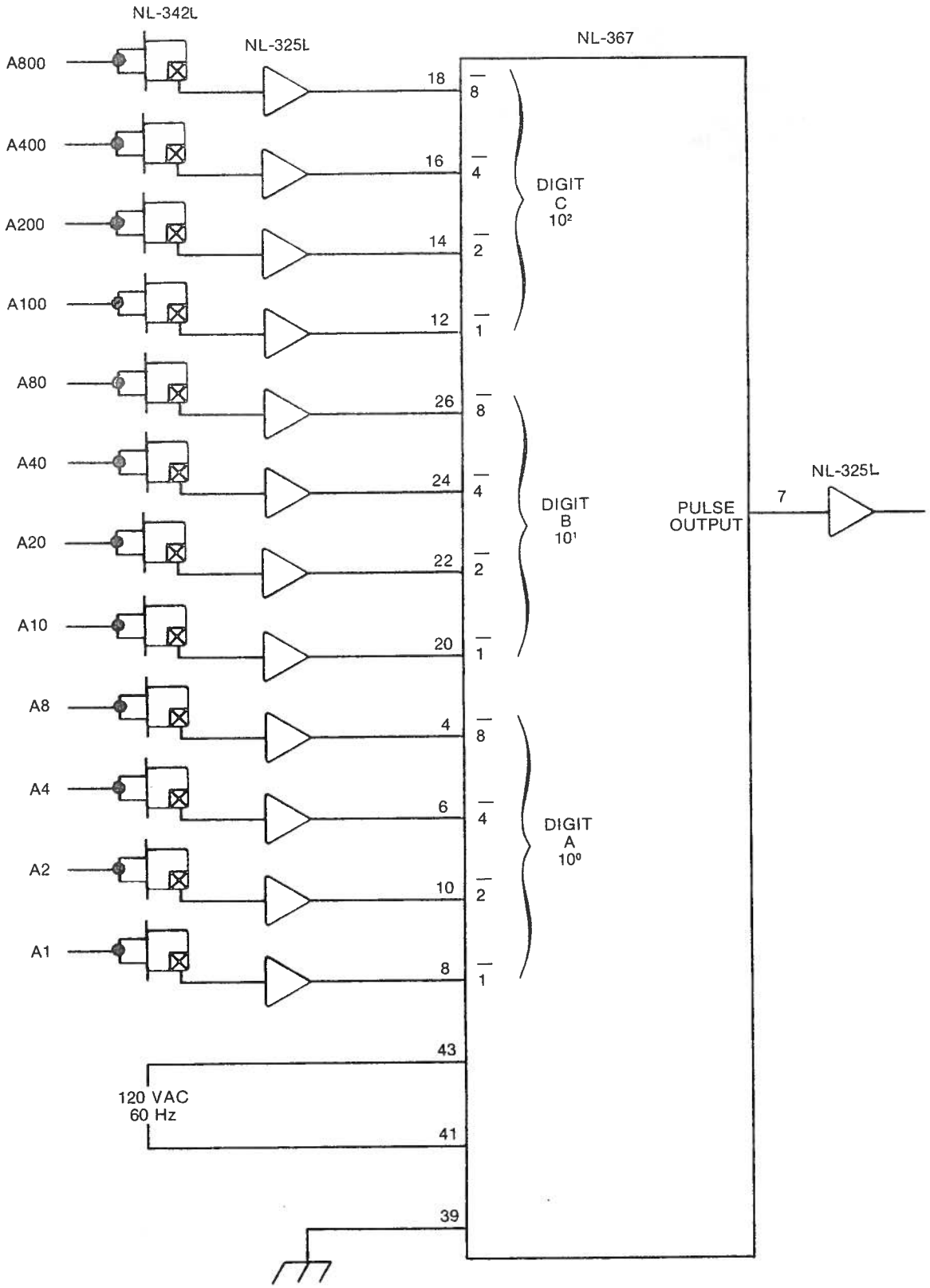
# PULSE GENERATOR

**APPLICATION EXAMPLES:**
1. Time base for NL-360 or NL-361 timers.



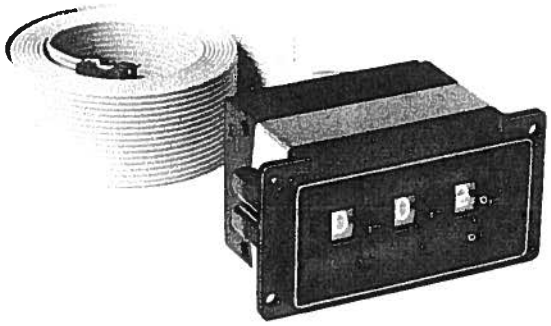

FOR 0.01 SECOND TIMER, SET NL-367T THUMBWHEELS TO 100; FOR 0.002 SECOND TIMER, SET THUMBWHEELS TO 500.

2. Pulse rate generator for stepper motor or variable frequency AC drives. Rate controlled by logic level inputs: A1 — A800.

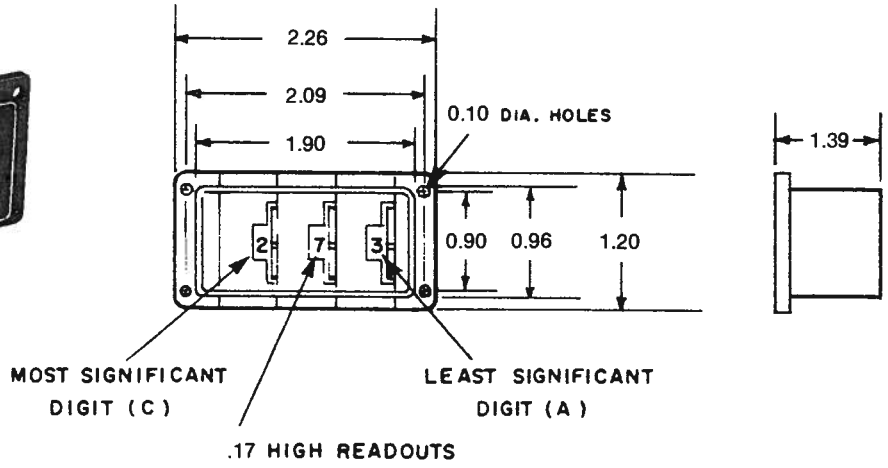


# PULSE GENERATOR

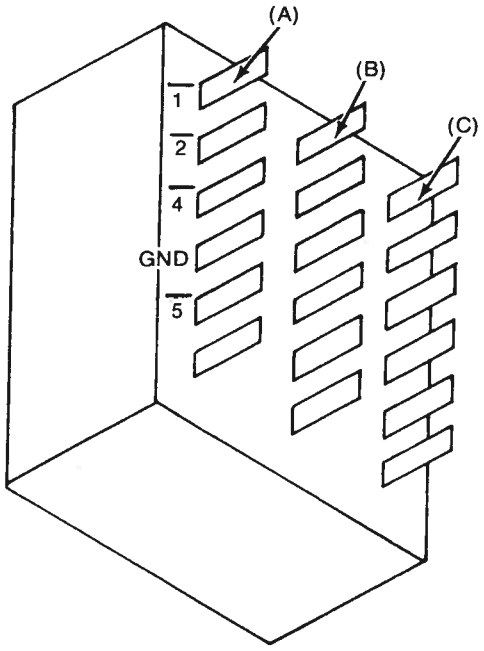
## REMOTE THUMBWHEELS NLT-003



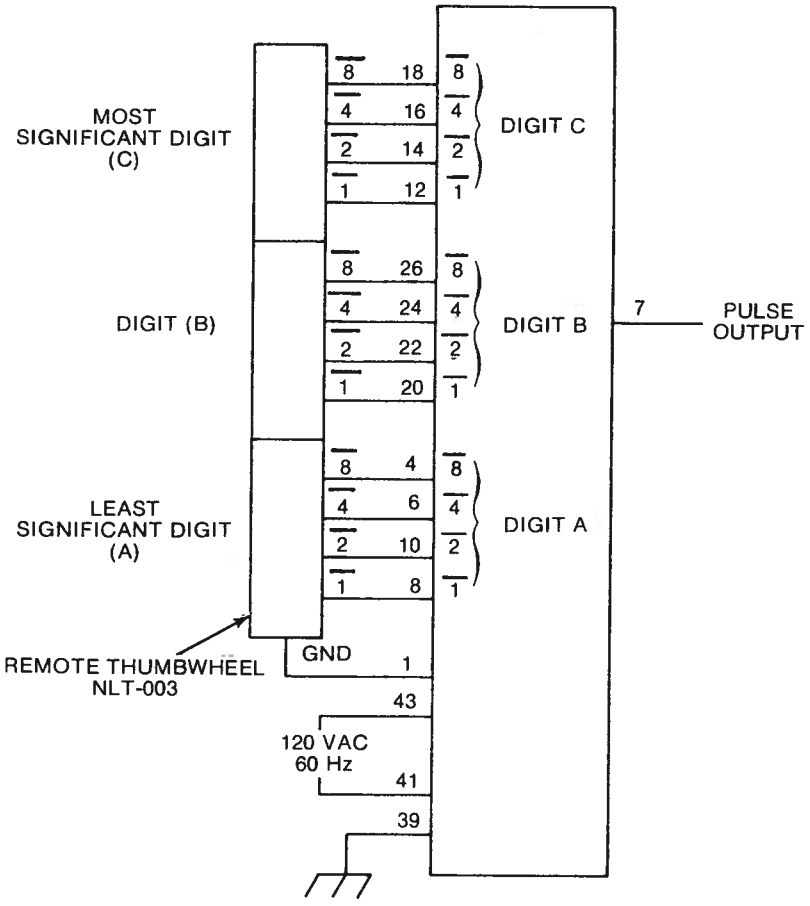
**DIMENSIONS In Inches**




NLT-003



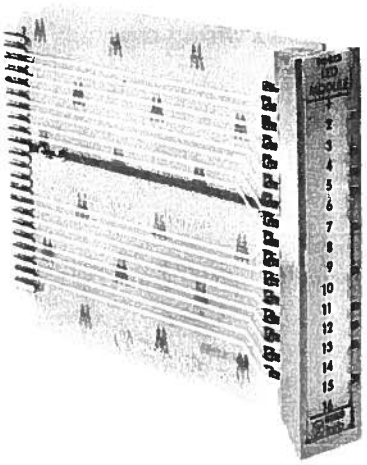

**REMOTE THUMBWHEEL CONNECTIONS FOR NL-367**



# EIGHT AND SIXTEEN - POINT ANNUNCIATORS
## Catalog Nos. NL-372L & NL-373L

### DESCRIPTION

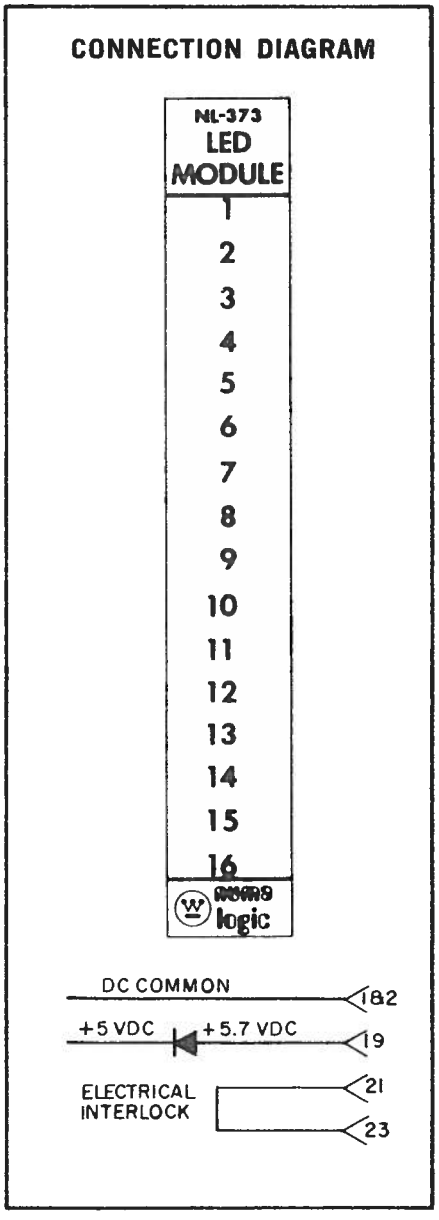
LEDS provide visual indication of the status of eight points. (NL-372L) or sixteen points (NL-373L).
PICTORIAL LENS. Standard lens shown. Blank lens available for custom marking by user.
TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.
KEY SLOTS. Prevent incorrect module replacement.



### SPECIFICATIONS

| | |
|---|---|
| Fan-in | 6 unit loads (9.6 mA, sink) |
| Logic levels | |
| Logic 1 | 0.0 to 0.8 VDC (nominal) |
| Logic 0 | 2.4 to 5.0 VDC (nominal) |
| Power Requirement | +5.7 VDC ± 0.25 VDC |
| All LEDS on | 100 mA - NL-372L<br>200 mA - NL-373L |
| Temperature rating | 0° to 85°C |
| Mechanical keying | Between pins 15 & 17 and pins 27 & 29 |
| Electrical interlock | Pin 21 to pin 23 |

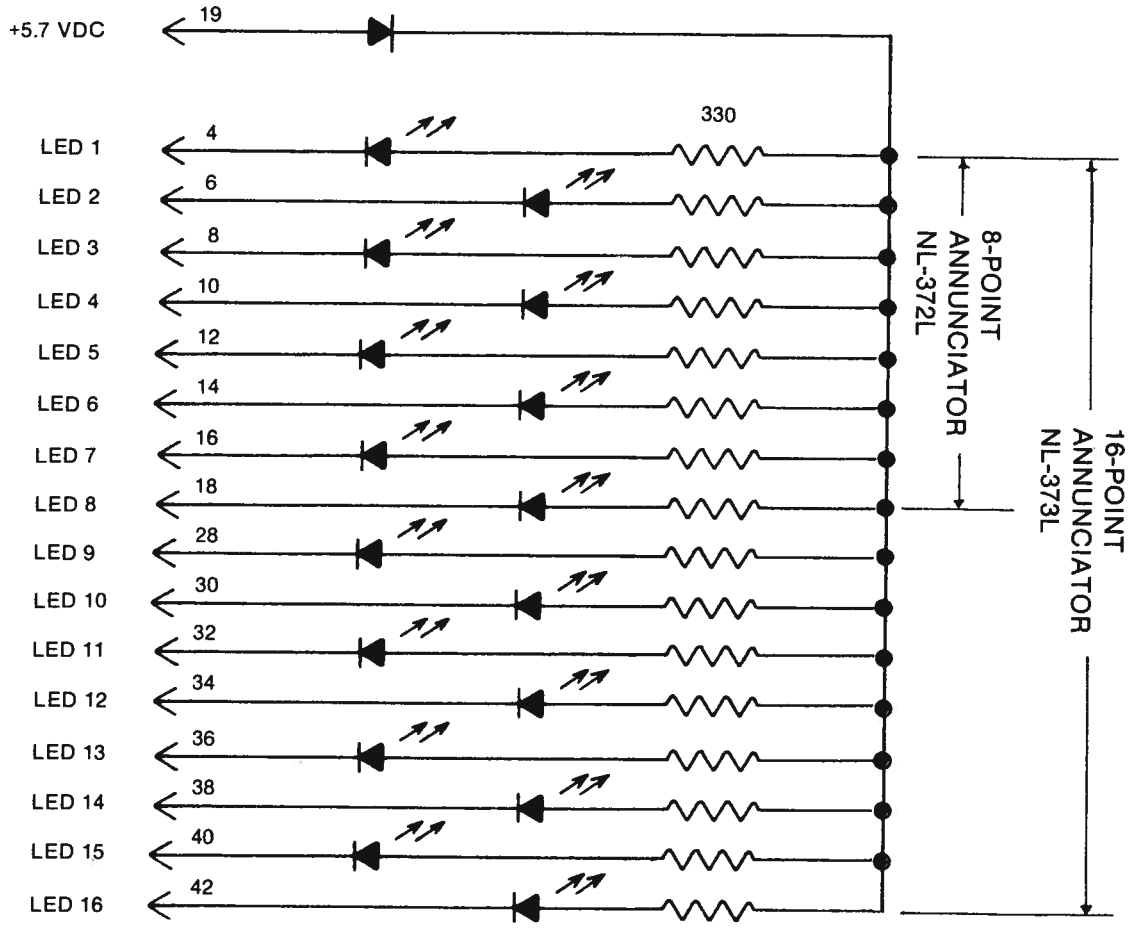
### CONNECTION DIAGRAM



# EIGHT AND SIXTEEN - POINT ANNUNCIATORS

**APPLICATION NOTES:**

1. Simplified wiring diagram for NL-372 and NL-373.




2. WHEN THE INPUT FOR THE LED IS AT A LOGIC 1 (0.0 - 0.8 VDC, 9.6 mA, SINK) THE LED WILL LIGHT. WHEN THE INPUT SWITCHES TO A LOGIC 0 (2.4 - 5.0 VDC) THE LED WILL TURN OFF.

# METER MODULE
# Catalog No. NL-380L

**DESCRIPTION**

System module used to provide convenient, low cost method of metering parts of elevators or machines in parts handling systems. Adjustable rate 0.3 to 18 sec. One circuit.

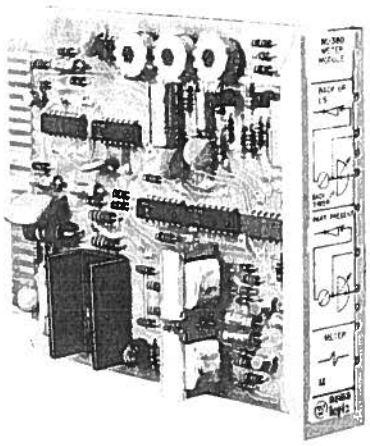
1. INPUT: 120 VAC, 50/60 Hz to TTL levels with off-delay adjustable timer (50 ms to 5 sec) to qualify meter.
2. INPUT: 120 VAC, 50/60 Hz to TTL levels with on-delay adjustable timer (50 ms to 5 sec) to qualify meter.
3. OUTPUT: Converts TTL logic levels to 120 VAC at 1.25 amps (150 VA) at 85°C (185°F). Includes plug-in fuse and LEDs.

PICTORIAL LENS. Standard lens (English logic) shown.

TEST POINTS. All TRUE outputs are accessible at front faceplate to facilitate signal tracing.

TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.

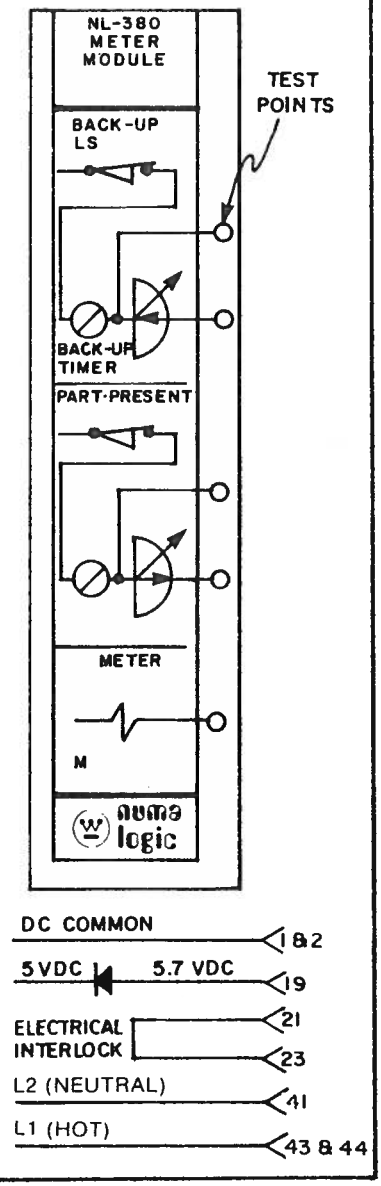
KEY SLOTS. Prevent incorrect module replacement.



**SPECIFICATIONS**

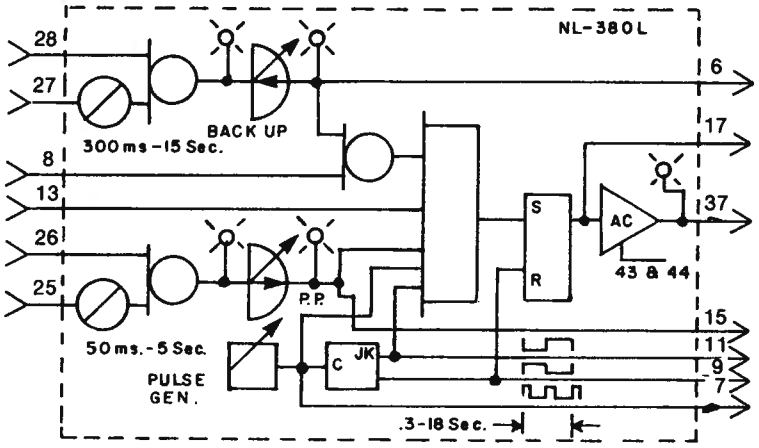
| | |
|---|---|
| Number of circuits | 1 |
| Logic type | TTL |
| Fan-in | |
| Logic 1 | 1 unit load (1.6 mA, source) |
| Logic 0 | 1 unit load (40 microamps, sink) |
| Fan-out (per TRUE or NOT output) | |
| Logic 1 | 10 unit loads (16 mA, sink) |
| Logic 0 | 10 unit loads (400 microamps, source) |
| Logic levels | |
| Logic 1 | 0.0 to 0.8 VDC (nominal) |
| Logic 0 | 2.4 to 5.0 VDC (nominal) |
| Propagation delay | 3 ms (165 Hz) nominal |
| Power requirement | 160 mA, 5.7 ± 0.25 VDC |
| Temperature rating | 0° to 85° C |
| Noise energy rejection | 25 x $10^{-6}$ watt seconds |
| Mechanical keying | Between pins 17 & 19 and pins 21 & 23 |
| Electrical interlock | Pin 21 to pin 23 |

**CONNECTION DIAGRAM**



# METER MODULE

## CONNECTION DIAGRAM




## TRUTH TABLE

| Inputs | | | | | | Outputs | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC | | DC | | | | DC | | | | | | AC |
| Pins | | Pins | | | | Pins | | | | | | Pin |
| 27 | 25 | 28 | 8 | 13 | 26 | 6 | 17 | 15 | 11 | 9 | 7 | 37 |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | ① | ① | ② | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | | | | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | | | | 0 |
| 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | | | | 1 |
| 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | | | | 1 |
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | | | | 0 |
| 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | | | | 1 |

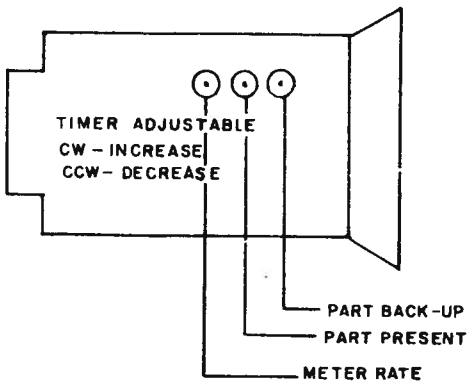
## APPLICATION NOTES

1. Contains power-on reset delay circuit (30 ms, nominal)
2. For AC input data, see spec sheet NL-302L, Hex AC Input Module.
3. For AC output data, see spec sheet NL-320L, Quad AC Output Module.
4. For timer data, see spec sheet NL-344L, Dual Timer Module.
5. Timer input test points may be jumpered to DC Common to time out timer.

①6. Pin 11 is the true square wave output and pin 9 is the inverted wave output, for external meter qualifying.

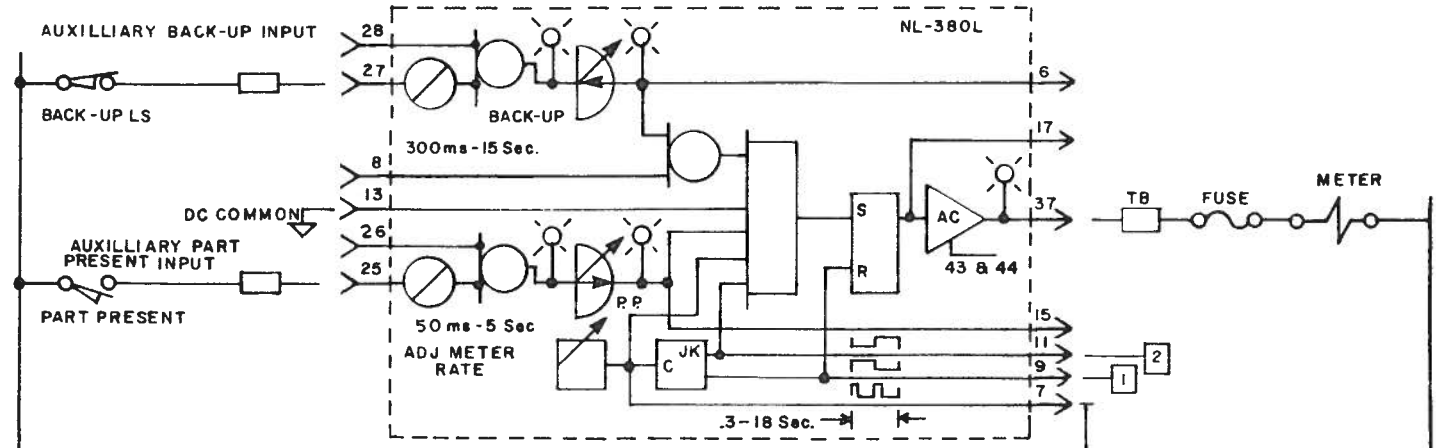
②7. Pin 7 one-shot pulse for qualifying meters in phase or 180° out of phase.

8. Potentiometer locations (viewed from component side).

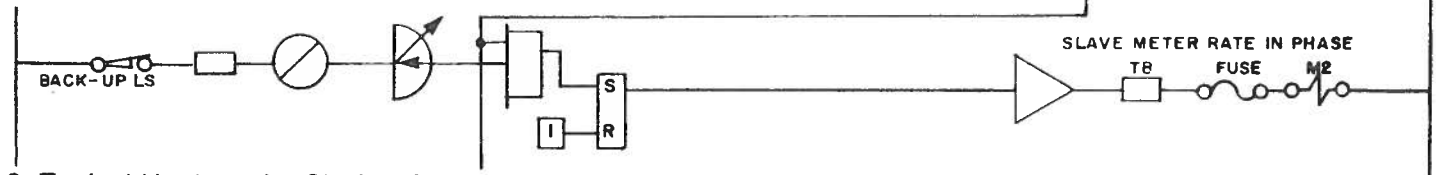


## APPLICATION EXAMPLES

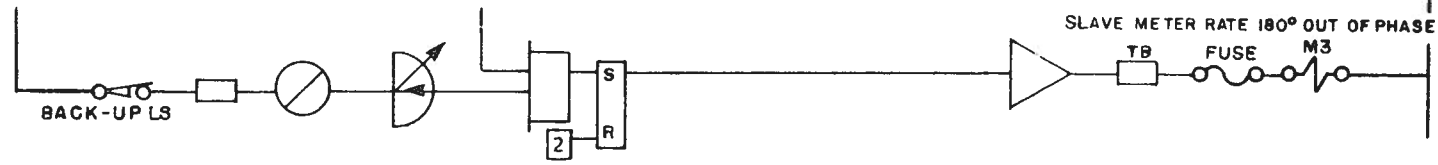
1. Simplified wiring diagram for Meter with AC Inputs



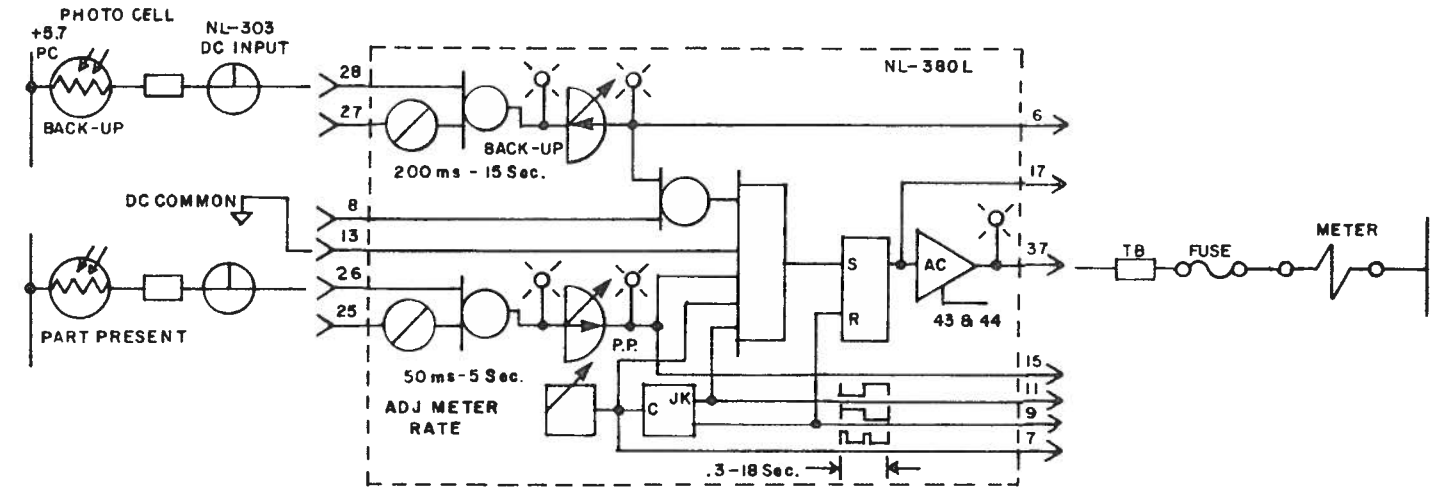

2. Typical Hook-up for Slaving Additional Meters in Phase with Master



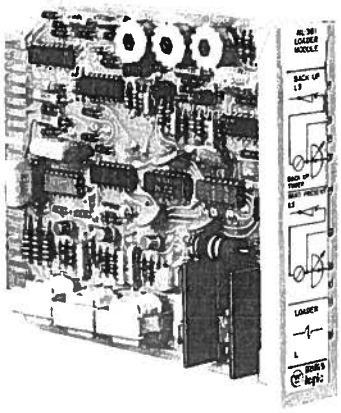

3. Typical Hook-up for Slaving Additional Meters Out of Phase with Master.




4. Simplified wiring diagram for Meter with Photo Cell Input



# LOADER MODULE
# Catalog No. NL-381L



## DESCRIPTION

System module used to provide convenient, low cost method of controlling elevator loaders, machine loaders and machine unloaders. One circuit.

Loader and Unloader: The following features are provided:

1. BACK-UP INPUT: 120 VAC, 50/60 Hz to TTL logic levels with adjustable off-delay timer (300 ms to 15 sec) with LEDs.
2. PART PRESET INPUT: Converts 120 VAC, 50/60 Hz to TTL logic levels with adjustable on-delay timer (50 ms to 5 sec) with LEDs.
3. SINGLE SHOT INPUT, PIN 7: Single shot input 15 ms pulse width.
4. RESET TIMER: Reset timer adjustable from 50 ms to 5 sec.
5. INPUT: Converts 120 VAC, 50/60 Hz to TTL logic levels to be used with reset timer or single-shot.
6. AC OUTPUT: Optical coupled output converts TTL logic levels to 120 VAC at 1.25 amps (150 VA) at 85°C (185°F). Includes plug-in fuse and LEDs.

PICTORIAL LENS. Standard lens (English logic) shown.

TEST POINTS. All TRUE outputs are accessible at front faceplate to facilitate signal tracing.

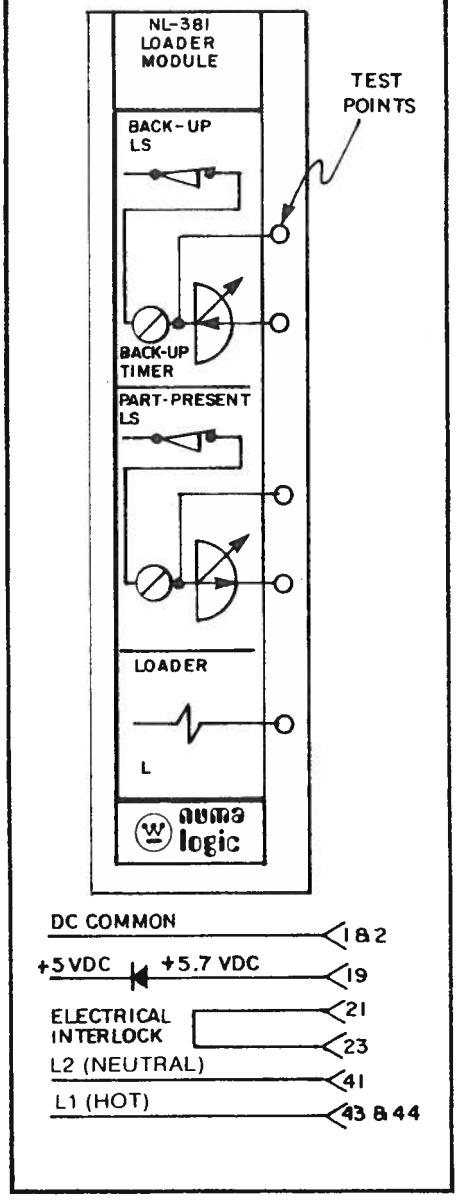
TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.

KEY SLOTS. Prevent incorrect module replacement.

## SPECIFICATIONS

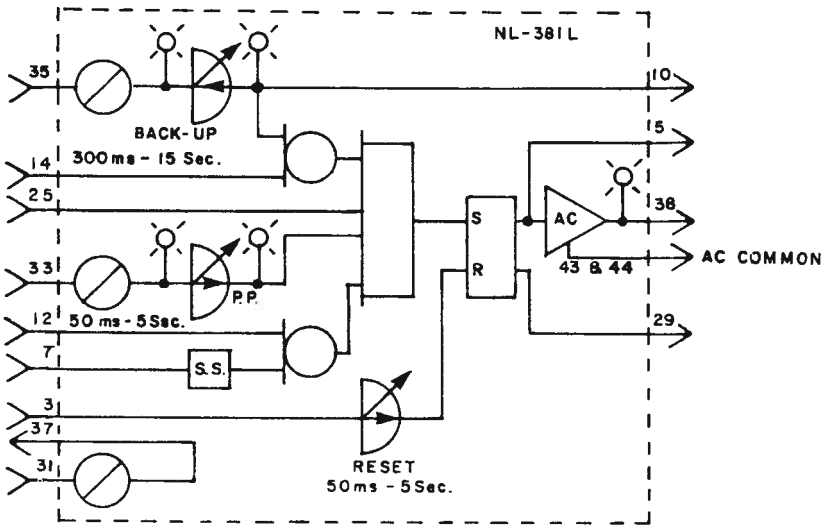
| | |
|---|---|
| Number of circuits | 1 |
| Logic type | TTL |
| Fan-in | |
| Logic 1 | 1 unit load (1.6 mA, source) |
| Logic 0 | 1 unit load (40 microamps, sink) |
| Fan-out (per TRUE or NOT output) | |
| Logic 1 | 10 unit loads (16 mA, sink) |
| Logic 0 | 10 unit loads (400 microamps, source) |
| Logic levels | |
| Logic 1 | 0.0 to 0.8 VDC (nominal) |
| Logic 0 | 2.4 to 5.0 VDC (nominal) |
| Propagation delay | 3 ms (165 Hz) nominal |
| Power requirement | 160 mA, +5.7 ± 0.25 VDC |
| Temperature rating | 0° to 85° C |
| Noise energy rejection | 25 x $10^{-6}$ watt seconds |
| Mechanical keying | Between pins 17 & 19 and pins 23 & 25 |
| Electrical interlock | Pin 21 to pin 23 |

## CONNECTION DIAGRAM



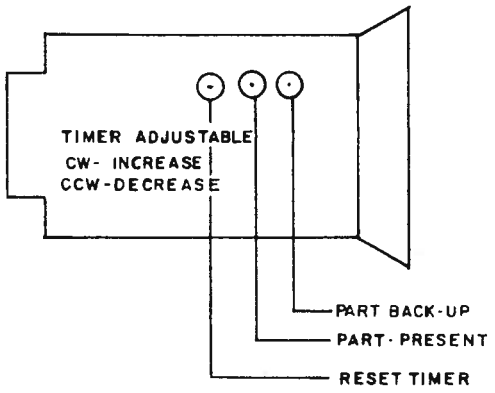
# LOADER MODULE

## CONNECTION DIAGRAM



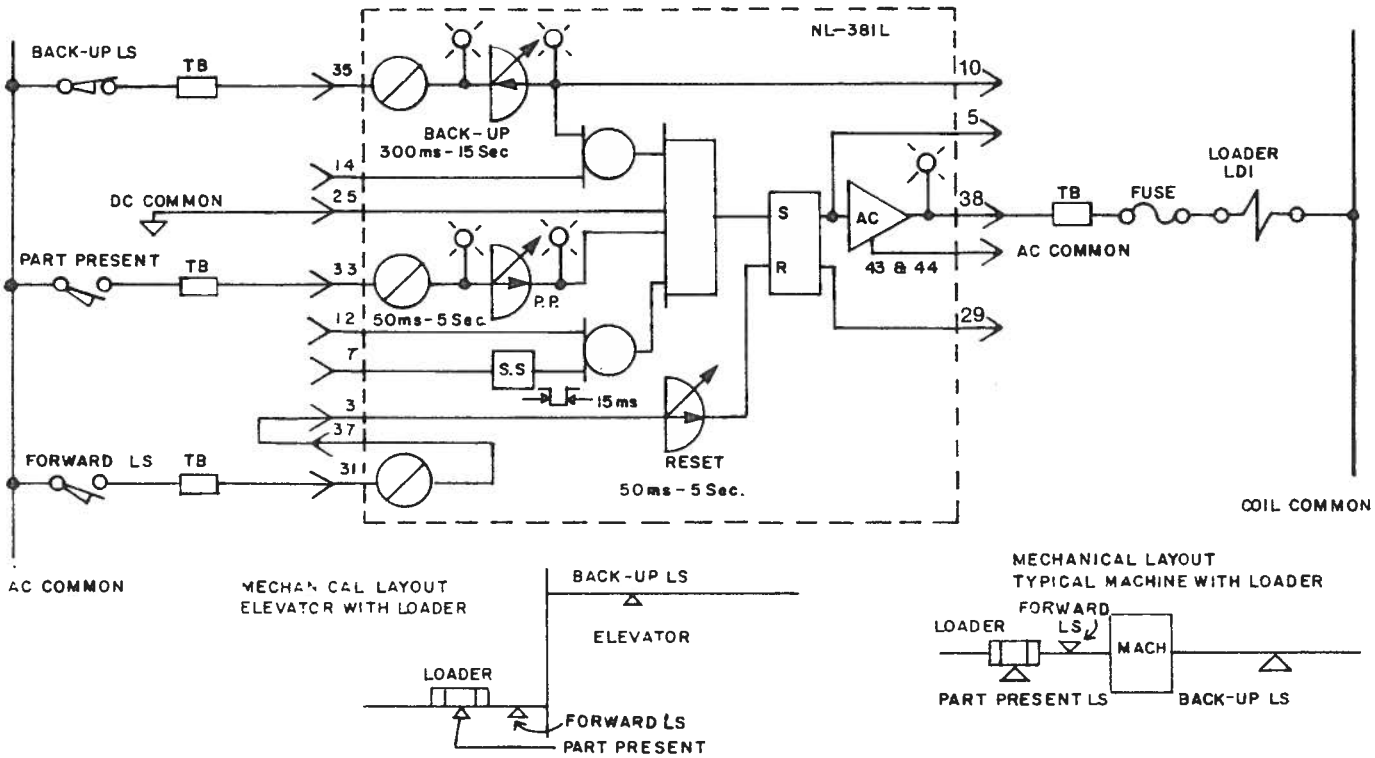

## APPLICATION NOTES

1. Contains power-on reset delay circuit (30 ms, nominal).
2. For AC input data, see spec sheet NL-302L, Hex AC Input Module.
3. For AC output data, see spec sheet NL-320L, Quad AC Output Module.
4. For timer data, see spec sheet NL-344L, Dual Timer Module.
5. Timer input test points may be jumpered to DC Common to time out timer.
6. Potentiometer locations (viewed from component side).

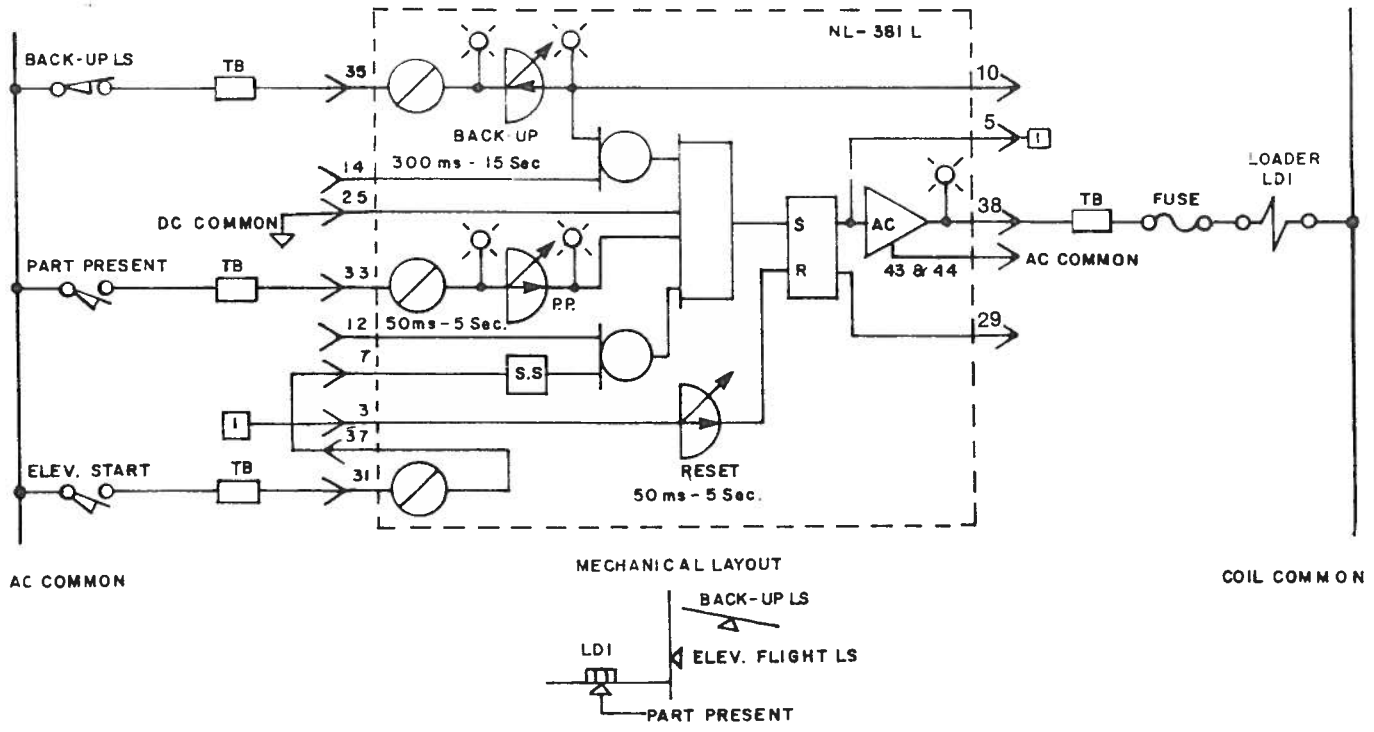


## APPLICATION EXAMPLES

1. Simplified wiring diagram for Loader with (forward) limit switch.




2. Simplified wiring diagram for timed loader with elevator and flight limit switch.



# DUAL INPUT/OUTPUT
# Catalog No. NL-382

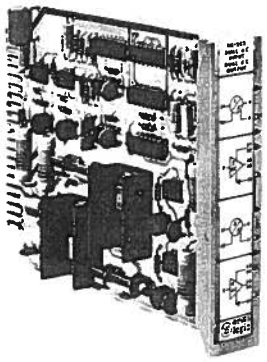
**DESCRIPTION**

Each module contains two optically coupled input converters which convert 120 VAC or DC to TTL logic levels, and two optically coupled output converters which convert the TTL logic levels to 120 VAC (1.25 amps).

PICTORIAL LENS. Standard lens (English logic) shown. Blank lens available for custom marking by user.

TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.

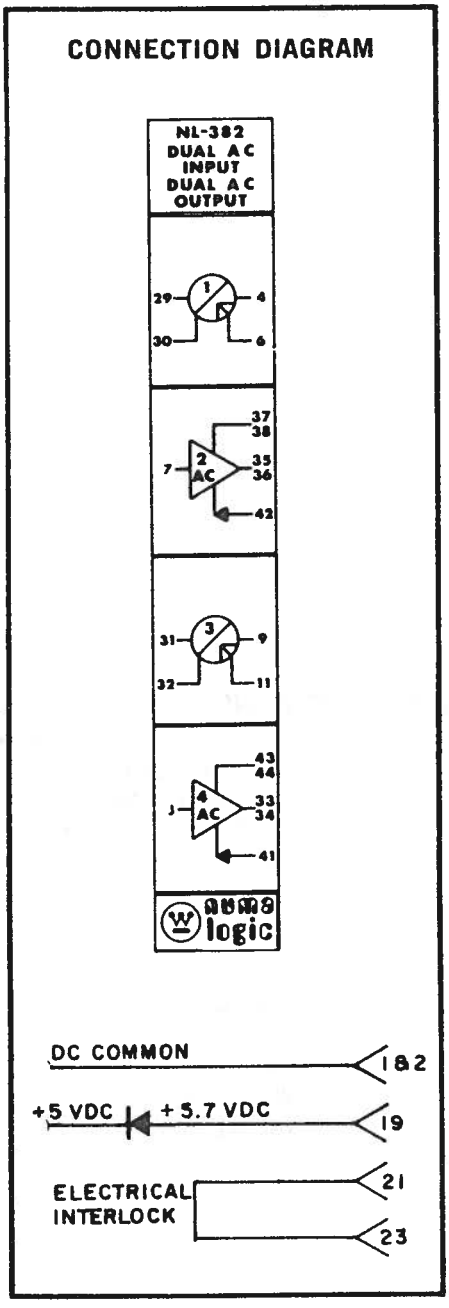
KEY SLOTS. Prevent incorrect module replacement.



**SPECIFICATIONS**

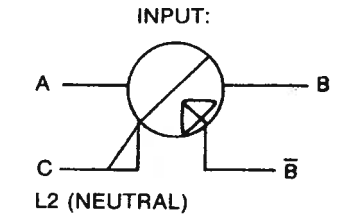
| | |
|---|---|
| Number of circuits | 4 (2-inputs, 2-outputs) |
| Logic type | TTL |
| AC/DC input | |
| Logic 1 | 80-135 VAC/VDC |
| Logic 0 | 0-40 VAC/VDC |
| Input current | 9 mA (nominal) |
| Fan-in (output circuits) | |
| Logic 1 | 1 unit load (1.6 mA, source) |
| Logic 0 | 1 unit load (40 microamps, sink) |
| Fan-out (per TRUE OR NOT output — input circuits) | |
| Logic 1 | 10 unit loads (16 mA, sink) |
| Logic 0 | 10 unit loads (400 microamps, source) |
| Logic levels | |
| Logic 1 | 0.0 to 0.8 VDC |
| Logic 0 | 2.4 to 5.0 VDC |
| Propagation delay | INPUTS — 8-16 ms. (nominal)<br>OUTPUTS — 3-12 ms (nominal) |
| Power requirement | +5.7 ± 0.25 VDC |
| All inputs off | 65 mA all outputs off; 70 mA all outputs on |
| All inputs on | 140 mA all outputs off; 150 mA all outputs on |
| Temperature rating | 0° to 85°C |
| Noise energy rejection | 8 x $10^{-3}$ watt seconds |
| Mechanical keying | Between pins 17 & 19 and pins 25 & 27 |
| Electrical interlock | Pin 21 to pin 23 |
| Output driver | 120 VAC |
| Inrush | see Fig. 1 |
| Continuous | 1.25A (150 VA) max at 85°C |
| Voltage drop | 1.5 VAC (nominal) |
| Leakage current | 2.76 mA (nominal) |
| Fuse Size | 4 amps, 7AG |

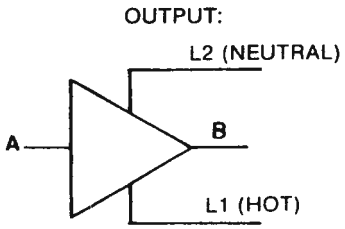
**CONNECTION DIAGRAM**



# CATALOG NO. NL-382

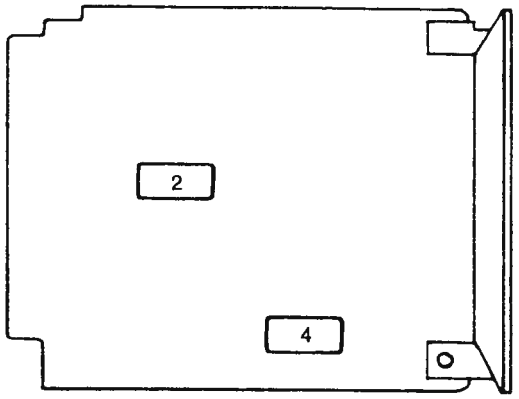
### ENGLISH LOGIC SYMBOL




| TRUTH TABLE | | | | | | |
|---|---|---|---|---|---|---|
| INPUTS | | | | OUTPUTS | | |
| Inputs-AC | | Outputs-DC | | Inputs-DC | Outputs-AC | |
| Power | A | B | $\overline{B}$ | A | B | Power |
| 80-135V | 1 | 1 | 0 | 1 | 1 | 120V |
| 0- 40V | 0 | 0 | 1 | 0 | 0 | 0V |

### Fuse Diagram




The number on the fuse symbol indicates which circuit the fuse is protecting.

### APPLICATION NOTES

1. The NL-382L module has separate power-up reset delay circuits for the inputs and outputs:
   Inputs = 15 ms (nominal)
   Outputs = 30 ms (nominal)

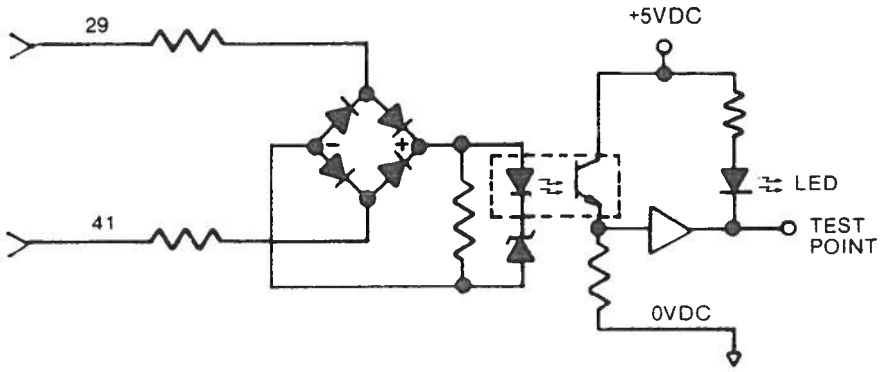
CAUTION: Electrician's continuity tester may turn on or trigger input.

2. Test points are on the logic side of the input and output converters. LED's are on the logic side of the input converters and on the power side of the output converters.

3. The NL-382L contains two input converter circuits, each similar to the NL-309L circuits, and two output converter circuits, each similar to the NL-322L circuits (with a lower ampere rating).

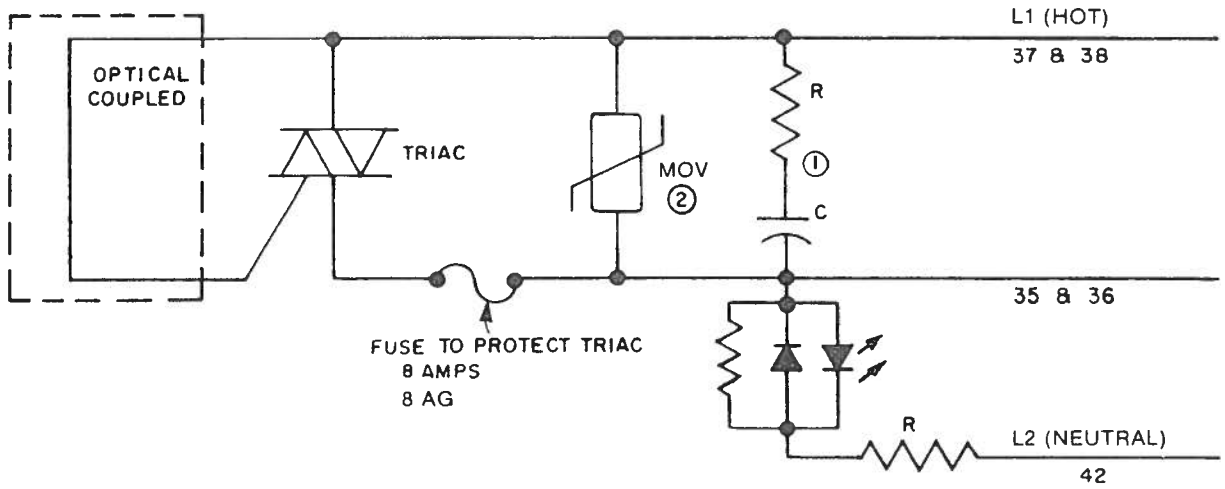
**APPLICATION EXAMPLES**

1. Simplified input circuit diagram (circuit #1 shown).




2. For further application notes on the input circuits, refer to the NL-309L Component Data sheets, pp. A17-19.

3. Simplified output circuit (circuit #2 shown).




① RC NETWORK FOR DV/DT PROTECTION WILL CAUSE A VOLTAGE TO APPEAR ACROSS THE LOAD IN THE OFF STATE. RC IMPEDANCE IS 53K OHMS CAPACITIVE.

② METAL OXIDE VARISTOR (MOV) FOR TRANSIENT SUPPRESSION TO PROTECT TRIAC.

4. For further application notes on the output circuits, refer to the NL-322L Component Data sheets p. B9.