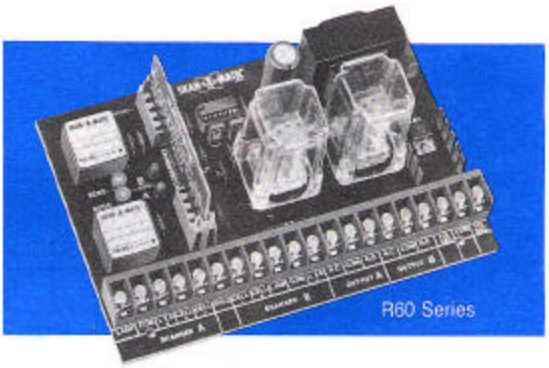
CLAROSTAT
SENSORS AND CONTROLS GROUP

SKAN-A-MATIC®

CONTROLS

Dual Channel Industrial Control R60 Series

Available thru 1/95



Features:

- Dual channel control
- Plug-in cards perform logic functions
- Four output options
- Plug-in relays
- Chassis mounted unit
- NEMA 12 enclosure available
- 115 or 230 VAC input

Description:

The R60 Series offers dual channel controls designed to operate two photoelectric sensors. The two channels can be used independently or be combined through the use of plug-in Logic Cards. A control's function can be changed at any time by substituting a different card. A number of standard Logic Cards are listed and described in this catalog; others designed for special applications can be quoted and engineered on request.

The R60 Series requires 115 or 230 VAC input and provides light source power and photodetector amplification for each channel. The control is ordered in modular form to enable the user to select the desired operational function and type of output(s). A Chassis and Logic Card must be ordered to obtain a functional control. The Output Device and Enclosure are optional.

Specifications: (at 25°C)

POWER INPUT	115 or 230 VAC ± 10%, 50–400 Hz, 10 VA
LAMP POWER	5 VDC at 125 mA per channel
LED POWER	100 mA per channel
SENSOR VOLTAGE	5 VDC supplied by unit at 1 mA max.
OUTPUT OPTIONS	
Open Collector	NPN transistor to switch up to 40 VDC at 250 mA max. Integral to chassis.
Relay 5 A	SPDT, 115 VAC or 28 VDC resistive load. 100,000 operations at rated load, with maximum cycle rate = 2 seconds ON/2 seconds OFF. Response time 25 milliseconds max. Counting rate 40 cps max. Part #R00030
Relay 10 A	SPDT, 115 VAC or 28 VDC resistive load. 25,000 operations at rated load. Response time 25 milliseconds max. Counting rate 40 cps max. Part #R00031
Solid State Relay 2.0 A	20–140 VAC. Response time 9 milliseconds max. 10 million operations at rated load. Part # R02003

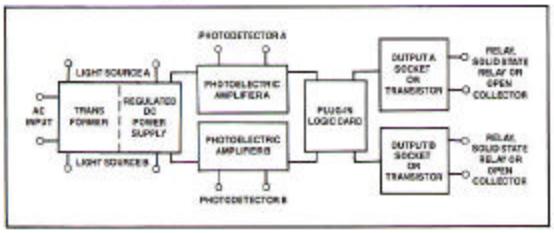
SENSITIVITY ADJUSTMENT	4 turns with indicator LED for each channel.
RESPONSE TIME	See Standard Amplifier under Response Time Chart in *Technical Information*
OPERATIONAL MODES	See Logic Card descriptions
TEMPERATURE	Operating: 0° to 40°C (enclosed chassis) 0° to 50°C (open chassis) Storage: –40° to 70°C
CHASSIS DIMENSIONS	5.0" (127.0mm) deep x 7.6" (193.0mm) wide x 3.0" (76.2mm) high max., .196" (4.98mm) dia. mounting holes on 4.25" (108.0mm) x 6.25" (158.8mm) centers. See Wiring Diagram & Dimensions.
OPTIONAL ENCLOSURE DIMENSIONS	NEMA 12 box 6.8" (172.7mm) deep x 9.5" (241.3mm) wide x 4" (101.6mm) high max., .30" (7.62mm) mounting holes on 4" (101.6mm) x 8.75" (222.3mm) centers. No access holes provided.

SKAN-A-MATIC®

CLAROSTAT SENSORS AND CONTROLS GROUP

R60 Series

Block Diagram



Compatibility With Sensors:

The R60 controls are designed to be used with most Skan-A-Matic reflective skanners and thrubeam combinations. When using LED light sources with these controls, a current limiting resistor must be used. The proper resistor is supplied on the control for light sources with 100 mA LED's. The 100 mA LED's are connected to the "LED" terminal. Units with 40 mA and 60 mA LED's should be connected to the "LAMP" terminals using a 120 ohm, 1/4 W or 68 ohm 1/2 W current limiting resistor respectively; these resistors are supplied with each sensor.

Model Selection Guide:

CHASSIS

Order the Chassis by specifying last digit of the part number to indicate choice of outputs. Either channel includes an 8 pin socket to accept a relay or an open collector transistor output.

Chassis Part#	R	6	0	0	0	

Outputs		
#	Channel A	Channel B
0. . .	Socket	Socket
1. . .	Open Collector	Open Collector
2. . .	No Output	Socket
3. . .	No Output	Open Collector
4. . .	Open Collector	Socket
5. . .	Socket	Open Collector

LOGIC CARD

The Logic Card is a required component for each control. Since some functions use only one output, it is wise to select the desired card before ordering the Chassis.

Logic Card — One Required per Chassis	
Part#	Description
T22020	High/Low Level or Edge Control; 2 outputs
T22021	Low to High Level Control; 1 output
T22022	Trigger/Inspect — for timed interval; 1 output
T22023	Trigger/Inspect — for full sensing interval; 1 output
T22028	Two Channel Independent — LIGHT or DARK; 2 outputs
T22029	AND/NAND — OR/NOR Logic; 1 output
T22033	Trigger/Inspect — momentary during sensing interval; 1 output

OUTPUT DEVICE

An Output Device is required only when a socket output is selected on the Chassis. None is required with a transistor output. The device may be a plug-in relay or solid state relay.

Output Device — Required for Socket Outputs Only	
Part#	Description
R00030	5 amp plug-in relay
R00031	10 amp plug-in relay
R02003	2.0 amp plug-in solid state relay

ENCLOSURE

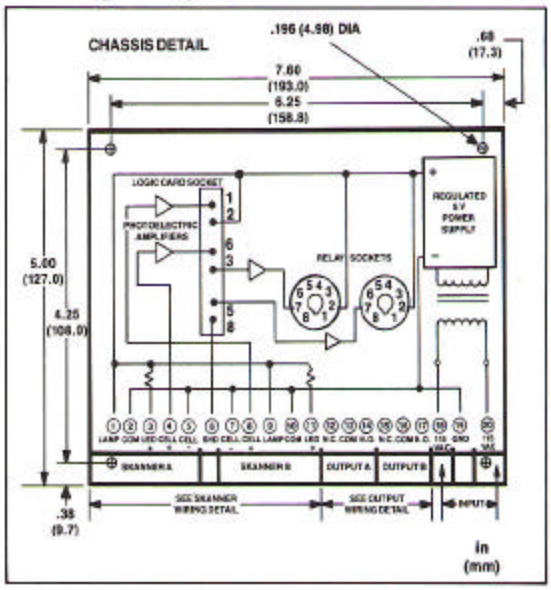
The Enclosure is an option which must be specified separately. When ordered together, Enclosure and Chassis are factory assembled before shipment.

Enclosure — Optional	
Part#	Description
B07016	NEMA 12 steel box with hinged cover

Example: To obtain an open chassis control (without enclosure) to operate two sensors in a full sensing interval Trigger/Inspect function, with a 5 amp relay on Output Channel B only, order R60002 + T22023 + R00030.

230 VAC models available. Add the suffix "230 VAC" to the part number. Example: R60001-230 VAC

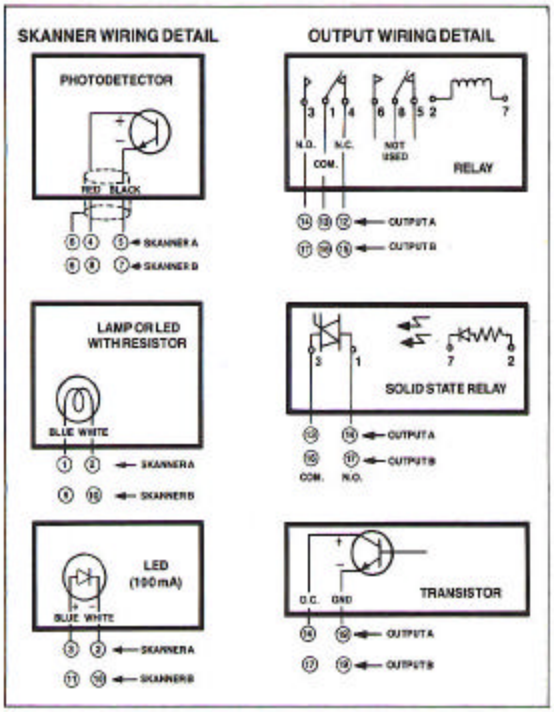
Wiring Diagram & Dimensions:



CLAROSTAT
SENSORS AND CONTROLS GROUP

SKAN-A-MATIC®

R60 Series

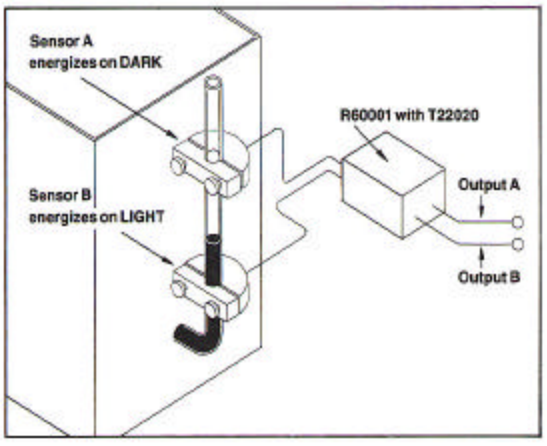


Logic Card Description/Typical Applications:

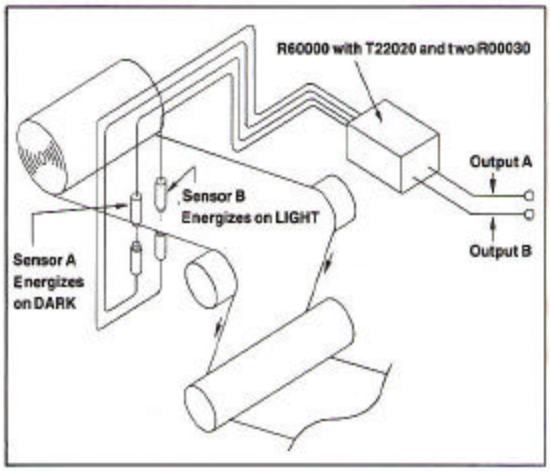
T22020 High/Low Level or Edge Control — 2 Outputs

May be used with two S19 Series Sight Glass Skanners or other thrubeam type sensors. Two outputs control high and low levels, product edges, etc. Sensor A is positioned at the high point and sensor B at the low point. When level or edge reaches high point, it cuts off light to sensor A, which energizes output A; sensor B is de-energized at this point. When level or edge drops below low point, sensor B sees light and energizes output B. When level or edge is between positions A and B, neither output is energized. Use with Chassis R60000, R60001, or R60005.

High/Low Level Control
Detects at maximum and minimum points.



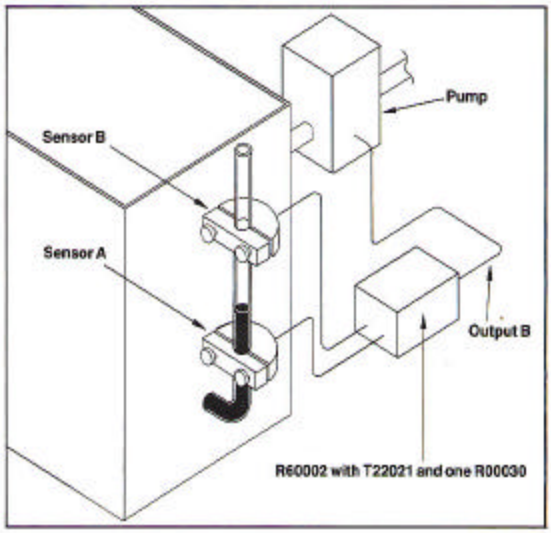
Edge Control
Aligns material by sensing single edge.



T22021 Low to High Level Control — 1 Output

Two S19 Series Sight Glass Skanners and a single output form a low to high level control. Typically, sensor A is positioned on a sight glass at the low level and sensor B is placed at the high level. When the level is below the low point, sensors A and B both see light and output B is energized. The output remains energized until the level reaches the high point, cutting off light to sensor B, as well as sensor A. When both sensors A and B darken, output B is de-energized. Use with Chassis R60002 or R60003.

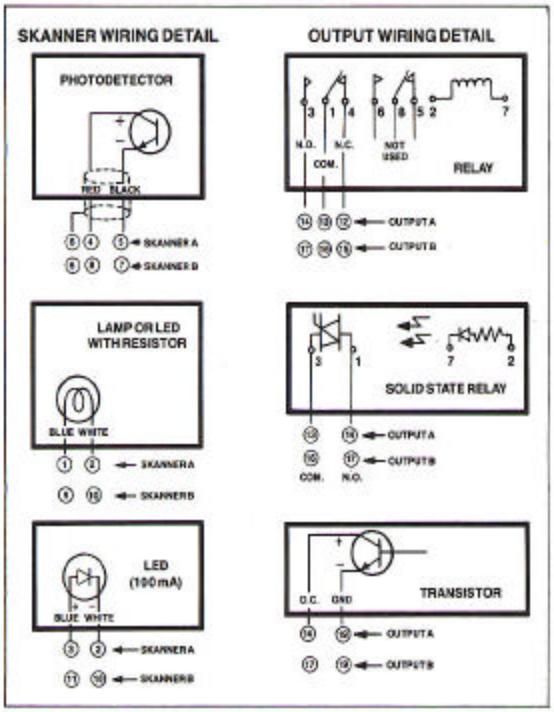
Low to High Level Control
Keeps liquid within desired limits.



CLAROSTAT
SENSORS AND CONTROLS GROUP

SKAN-A-MATIC®

R60 Series

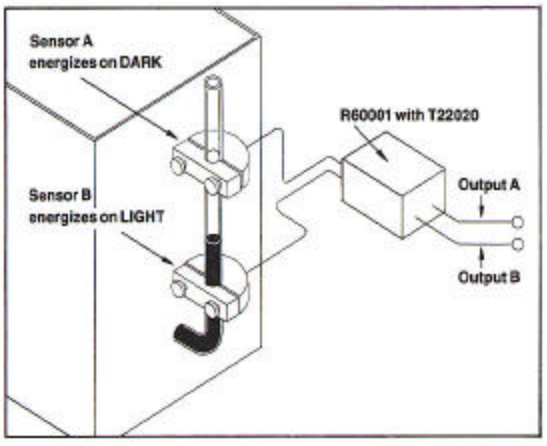


Logic Card Description/Typical Applications:

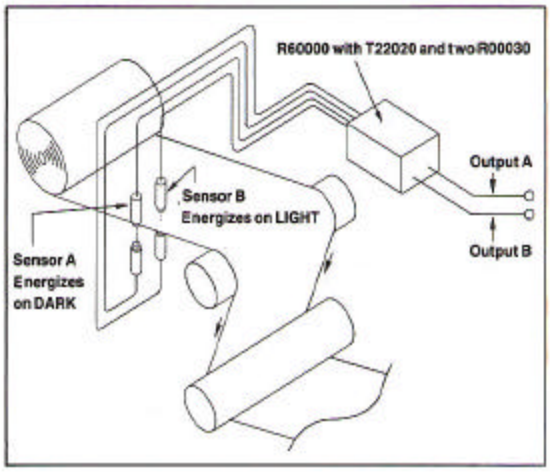
T22020 High/Low Level or Edge Control — 2 Outputs

May be used with two S19 Series Sight Glass Skanners or other thrubeam type sensors. Two outputs control high and low levels, product edges, etc. Sensor A is positioned at the high point and sensor B at the low point. When level or edge reaches high point, it cuts off light to sensor A, which energizes output A; sensor B is de-energized at this point. When level or edge drops below low point, sensor B sees light and energizes output B. When level or edge is between positions A and B, neither output is energized. Use with Chassis R60000, R60001, or R60005.

High/Low Level Control
Detects at maximum and minimum points.



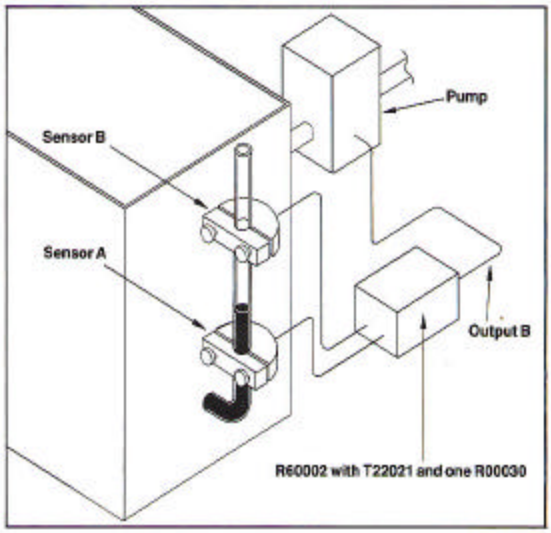
Edge Control
Aligns material by sensing single edge.



T22021 Low to High Level Control — 1 Output

Two S19 Series Sight Glass Skanners and a single output form a low to high level control. Typically, sensor A is positioned on a sight glass at the low level and sensor B is placed at the high level. When the level is below the low point, sensors A and B both see light and output B is energized. The output remains energized until the level reaches the high point, cutting off light to sensor B, as well as sensor A. When both sensors A and B darken, output B is de-energized. Use with Chassis R60002 or R60003.

Low to High Level Control
Keeps liquid within desired limits.



SKAN-A-MATIC®

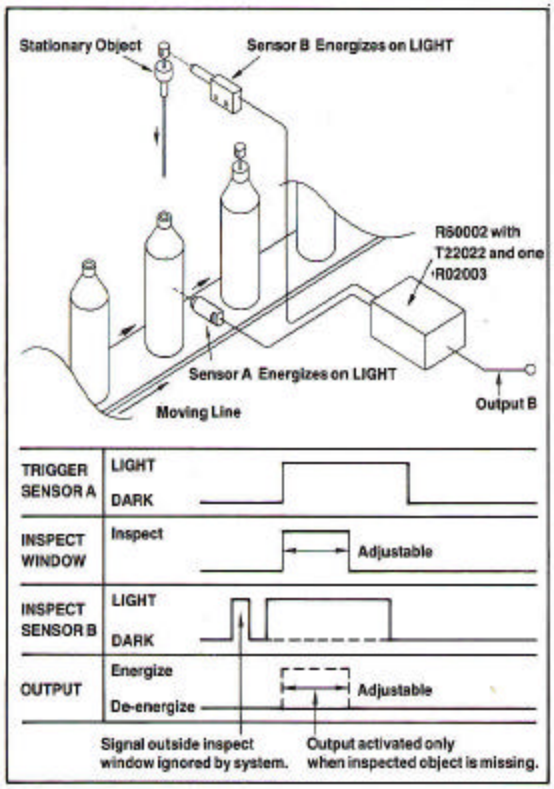
CLAROSTAT SENSORS AND CONTROLS GROUP

R60 Series

T22022 Trigger/Inspect for Timed Interval — 1 Output

Two sensors and single output form an inspection system. When trigger sensor A senses a target, it opens an adjustable time window. Sensor B must detect its target during the entire time window; if it does not, an alarm condition will be indicated on Output B. Both the time window and the alarm duration are adjustable from .02 to 1.0 seconds. The sensors can each be set to detect on LIGHT or DARK and the normal state of Output B can be energized or de-energized. Use with base chassis R60002 or R60003.

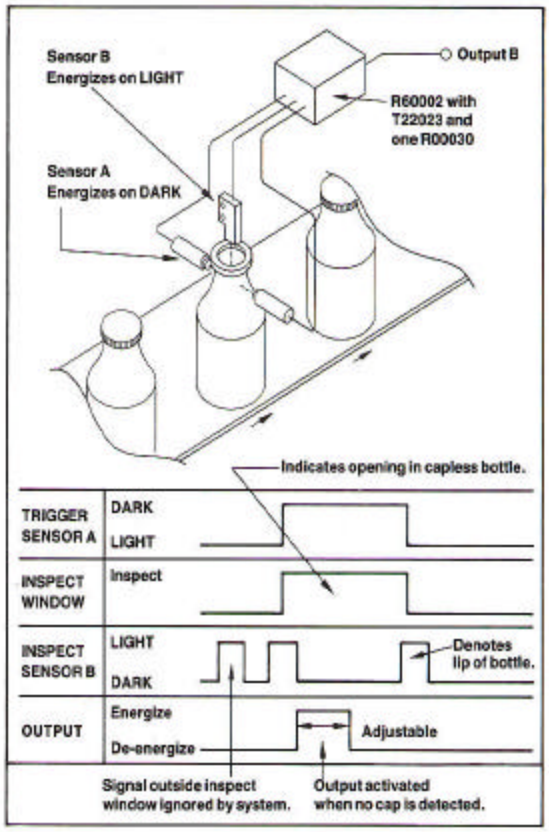
Trigger/Inspect for Timed Interval
Confirms presence and correct alignment of part before assembly.



T22023 Trigger/Inspect — For Full Sensing Interval, 1 Output

Utilizes two sensors and a single output in the same manner as T22022, except that sensor B is activated for the entire time that trigger sensor A sees its target, instead of for an adjustable time window. Sensor B must detect its target for the entire inspect window; if it detects partially or not at all, an alarm condition occurs. As in T22022, the output is on channel B and has an adjustable interval from .02 to 1.0 second. Use with Chassis R60002 or R60003.

Trigger/Inspect For Full Sensing Interval
Confirms presence of cap before packaging.

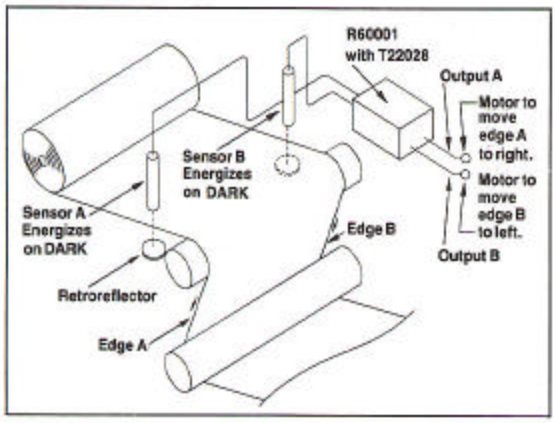


R60 Series

T22028 Two Channel Independent — LIGHT or DARK, 2 Outputs

Utilizes two sensors and outputs to provide two independent controls on one chassis. Particularly suited for two separate functions or for two distinct parts of a single application. Channels A and B can each be set for LIGHT or DARK operation. Use with Chassis R60000, R60001 or R60005.

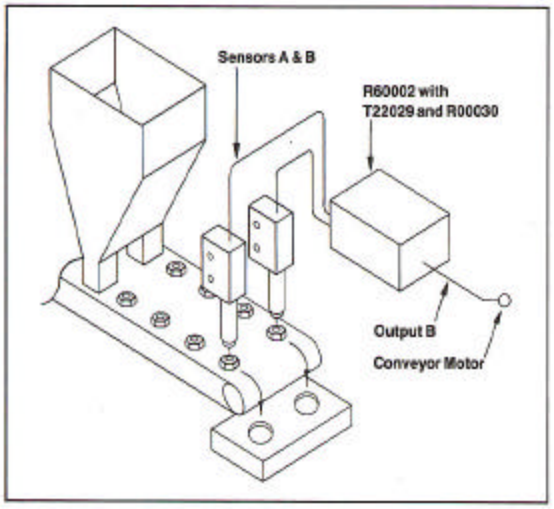
Two Channel Independent
Aligns material by sensing two edges.



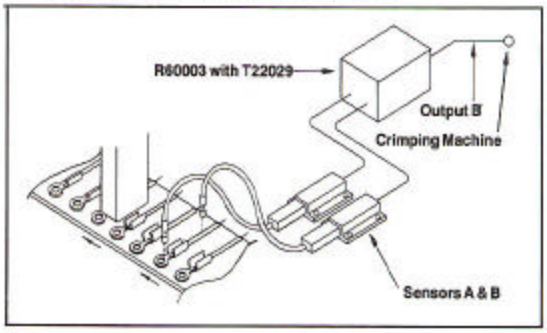
T22029 AND/NAND — OR/NOR Logic — 1 Output

Works with two sensors and a single output to perform any of four logic functions. Programming switches on the logic card may be adjusted to: set sensors A and B for either LIGHT or DARK operation; select the logic function; and select either one-shot or straight through output. The one-shot can be adjusted from .02 to 1.0 second. Use with Chassis R60002 or R60003.

Control with OR Logic
Stops line if either part is missing.



Control with AND Logic
Assembles wire and lug when both are in place.



T22033 Trigger/Inspect — Momentary During Sensing Interval, 1 Output

Utilizes two sensors and a single output in the same manner as T22023, except that sensor B can be activated only momentarily during the time that trigger sensor A sees its target. If sensor B detects its target at any time during the inspect window, it allows output B to remain in a de-energized condition. If sensor B fails to detect, it activates output B. Output B may be a resetable latch or a one-shot. The one-shot is adjustable for .02 to 1.0 second. Use with Chassis R60002 or R60003.

Trigger/Inspect — Momentary during sensing interval
Confirms that each pad receives liquid spray.