



**BrayLINE**  
ACCESSORIES

**SERIES 52**

2 INDUCTIVE PROXIMITY SENSORS  
AC, DC & INTRINSICALLY SAFE VERSIONS

**2N1™ PROXSENSOR**  
VALVE STATUS MONITOR



# SERIES 52

## Bray 2N1™ ProxSensor THE NEXT GENERATION OF VALVE POSITION SIGNALING

In response to the needs of today's discrete manufacturing and process industries, Bray Controls is proud to offer the 2N1™ ProxSensor valve status monitor. Bray's innovative engineering has uniquely combined 2 inductive proximity sensors in 1 self-contained, fully sealed, compact enclosure.

The Series 52 offers the bounce-free electronic valve signaling required for all PLC, computer and solid-state circuitry vital to process control and information networks. Costly external junction boxes are eliminated and field wiring costs are greatly reduced. Bray's approach to valve monitoring delivers the most compact, reliable and economical valve position signaling system available.

### ELECTRICAL CONNECTION

A multi-pin electrical connector is designed for full compatibility with today's industrial wiring requirements. Standardized factory pre-wiring prevents wiring errors and provides quick-connect field installation.

### INDUCTIVE PROXIMITY SENSORS

Bray Series 52 sensors are solid-state electronic controls which provide high resolution, are spark free and contain no moving electrical parts to wear out. AC, DC and AC/DC sensors are available. The AC sensors operate on 20 to 250 VAC. No amplifier is needed for AC applications. The standard DC sensor, offered as either PNP or NPN, has an economical internal amplifier and operates on 10 to 65 VDC. The Intrinsically Safe DC sensor can be supplied with amplifier as a complete system. The AC/DC sensor is capable of operating with either AC or DC power sources.



### LED INDICATORS

Bray supplies the 2N1 ProxSensor with two built in LED indicators. The LED's give positive verification that the sensors are electrically functioning. A pointer, made of highly visible yellow ABS, shows valve position locally throughout the full range of travel.

### MOISTURE, CHEMICAL AND CORROSION PROTECTION

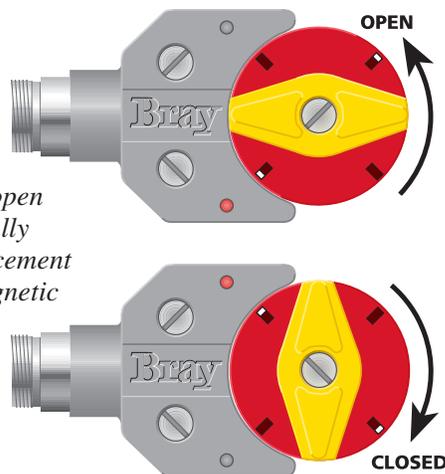
The two proximity sensors are completely encapsulated with epoxy resin in a rigid nylon enclosure that is impervious to moisture and most chemical and corrosive agents. Once the multi-pin connection is made, the cable link to plant wiring is completely sealed. No removable covers or conduit entries which can allow failure due to moisture are used. These protections make the 2N1 ProxSensor the superior choice for hostile environments.

### 2N1 NYLON ENCLOSURE

Bray's design of 2 sensors in 1 rugged enclosure greatly reduces space requirements and expensive housings needed for previous dual switch applications. The epoxy resin encapsulation protects the sensors against vibration or shock.

### VALVE POSITION TARGET

A unique, symmetrically designed target is mounted inside the valve position pointer. The target is factory pre-aligned for Bray products. No cams or set screws are required and time consuming field adjustment is eliminated. The target is stainless steel and the sensor is nonmagnetic. It will not attract and be falsely tripped by loose metal objects.



*Normally open  
and normally  
closed placement  
of non-magnetic  
target.*



# FEATURES

## DIRECT MOUNTING TO BRAY® ACTUATORS

The 2N1™ ProxSensor mounts directly to Bray Series 90/91 pneumatic actuators without using external brackets and adapters, therefore eliminating contamination buildup between sensor and actuator. The mounting pattern complies with VDI/VDE 3845 (NAMUR recom-

mendations). An important feature of the 2N1 ProxSensor is the ability to signal valve position of manually operated Bray butterfly valves. The Series 52 is also adaptable to a wide variety of other manual valve types.



2N1 ProxSensor mounted to Bray Series 21 Butterfly valve.



Bray 2N1 ProxSensor mounted to a ball valve.

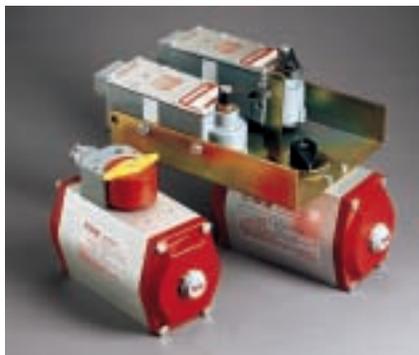
## PRODUCT COMPARISON



Bray 2N1 ProxSensor compared to a switch box with mechanical, reed or proximity switches.



2N1 ProxSensor compared to 2 externally mounted proximity switches.



2N1 ProxSensor compared to 2 externally mounted mechanical switches.

Bray's 2N1 ProxSensor offers the most compact and reliable system for dual sensing of valve position.

The 2N1 ProxSensor requires

- less space,
- less mounting hardware,
- less installation time,
- less adjustment, and
- less maintenance

than other types of designs.

Additionally, the Series 52's multi-pin connector prevents field wiring errors.

## INTEGRAL Y-CONNECTION

Bray offers an integrally connected Series 52 and DIN solenoid. The Y-Connection can be wired to a remote electrical junction box by either cordset, extension cord or conduit adapter. Bray can supply a Series 52, solenoid and actuator as a completely assembled system.



## INDUSTRIES

Bray's 2N1 ProxSensor is applicable to a wide range of industries world wide, including – Chemical, Pharmaceutical, Petroleum Refining, Microelectronics, Pulp and Paper, Water and Waste Water Treatment, Brewing, Food Processing, Beverages, Power Generation, Mining, Textile and HVAC.

## APPLICATIONS

The Series 52 is the best solution for applications where:

- valve position indication is needed.
- fast electronic control systems require an input signal with no contact bounce and low energy consumption.
- long service life and rugged reliability are specified.
- hostile environments demand excellent moisture, chemical and corrosion resistance.
- rapid response capability and a high sensing rate are needed.

## FULL 5-YEAR WARRANTY

Bray's confidence in the reliability and long service life of the Series 52 is demonstrated by a unique **5-year warranty** against material or workmanship defects. For further information regarding our warranty of the 2N1 ProxSensor, the most advanced position sensor product in the industry, please refer to your Bray representative or factory for complete details.

# TECHNICAL DATA

## SENSORS

Bray offers four types of sensors: 5-pin AC, 5-pin AC/DC, 4-pin DC (either PNP or NPN versions) or 4-pin Intrinsically Safe DC. The Intrinsically Safe sensor operates with a switching amplifier for spark free operation required by hazardous applications. 5-pin MINI units have 7/8-16 UN threads. 4-pin EURO units have M12 x 1 metric threads.

## ACCESSORIES

**Cordsets:** quick-connect cable connections to matching pins of the Series 52 and flying leads for traditional customer connections.

**Extension Cords/Receptacles:** quick-connect cable connections at both ends, mates with receptacle at the junction box.

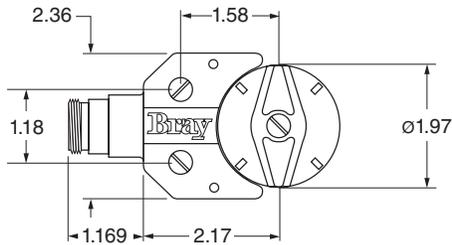
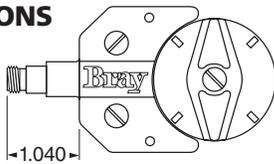
Cordsets and Extension Cords/Receptacles are available for all Series 52 Sensors.

**Conduit Adapter:** quick-connects conduit to the Series 52. For AC and AC/DC sensors only.

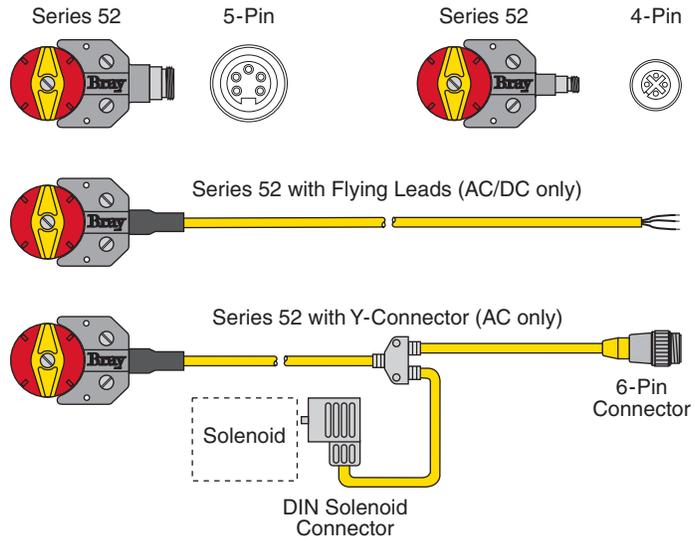
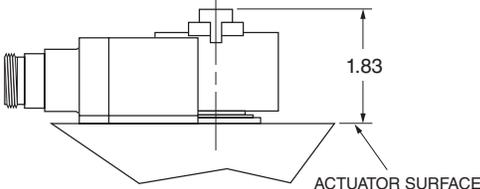
Bray standard connectors are stainless steel for high corrosion resistance, or optionally available in chrome plated brass. All connections feature gold plated contact pins, a sturdy threaded coupling nut which protects against twisting and ensures a secure weatherproof fit, longer threads which completely cover the contact pins, and positive keying that prevents improper assembly.

## DIMENSIONS

4-PIN (EURO)

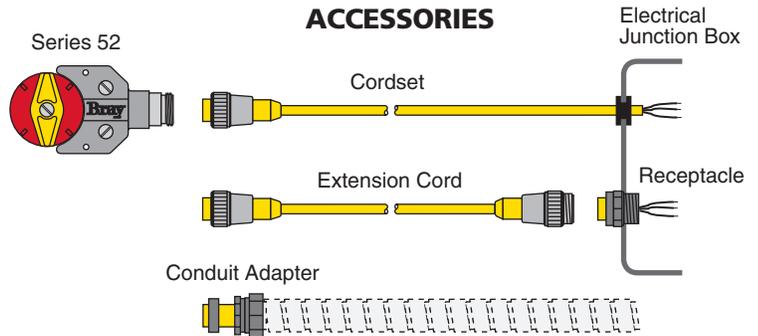


5-PIN (MINI)

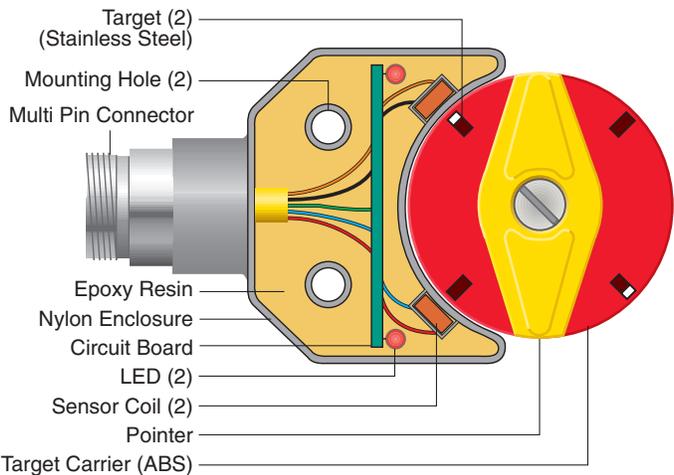


Y-Connector cables without integral Series 52 ProxSensors are also available for DC or AC service.

## ACCESSORIES



## COMPONENTS AND MATERIALS



## AVOID SHORT-CIRCUIT AND OVERLOAD PROBLEMS

### Short-Circuit

Do not operate a proximity sensor directly from a wall outlet without a load. This is considered a short circuit and can cause damage.



### Overload

Do not operate an incandescent light bulb greater than 25 watts as a load. The current inrush when the bulb is cold can cause an overload.



### Overload

Do not directly operate a motor with a proximity sensor. The current inrush can cause an overload. Always use a motor starter, relay or other appropriate device.



# SWITCH HISTORY

## HISTORY OF VALVE POSITION INDICATION

The first generation of electrical valve position indication began in the 1950's with the MECHANICAL SNAP ACTING switch. This type of switch offered simple, cost effective signaling. The power supply connected to the switch element was typically 120 VAC and generated a spark between the contacts. This spark would eventually damage the contacts and could ignite hazardous atmospheres.

The next generation introduced glass enclosed, HERMETICALLY-SEALED REED switches which contained the spark, but the glass enclosure was fragile and easily damaged by vibration and shock. The Reed switches depended upon magnetic operation. Magnetic forces

could attract loose metal objects that falsely trip the switch.

Enclosures were developed to provide better environmental protection for both the switches and their electrical wiring. The enclosures, commonly called SWITCH BOXES, could contain either mechanical or reed switches.

As PLC's and computers became widely used, a new set of problems arose. Many plants employed low power DC communication from the control room to the field switches. The metal contacts inside both mechanical and reed switches would bounce several times when activated. The computers were fast enough to interpret these bounces as multiple switch closures. Also, low power signals were often unable to conduct through contamination on the switch contacts, resulting in a false open circuit reading.

INDUCTIVE PROXIMITY sensors were designed to solve these problems. They are completely solid-state with no moving electrical parts to wear out.

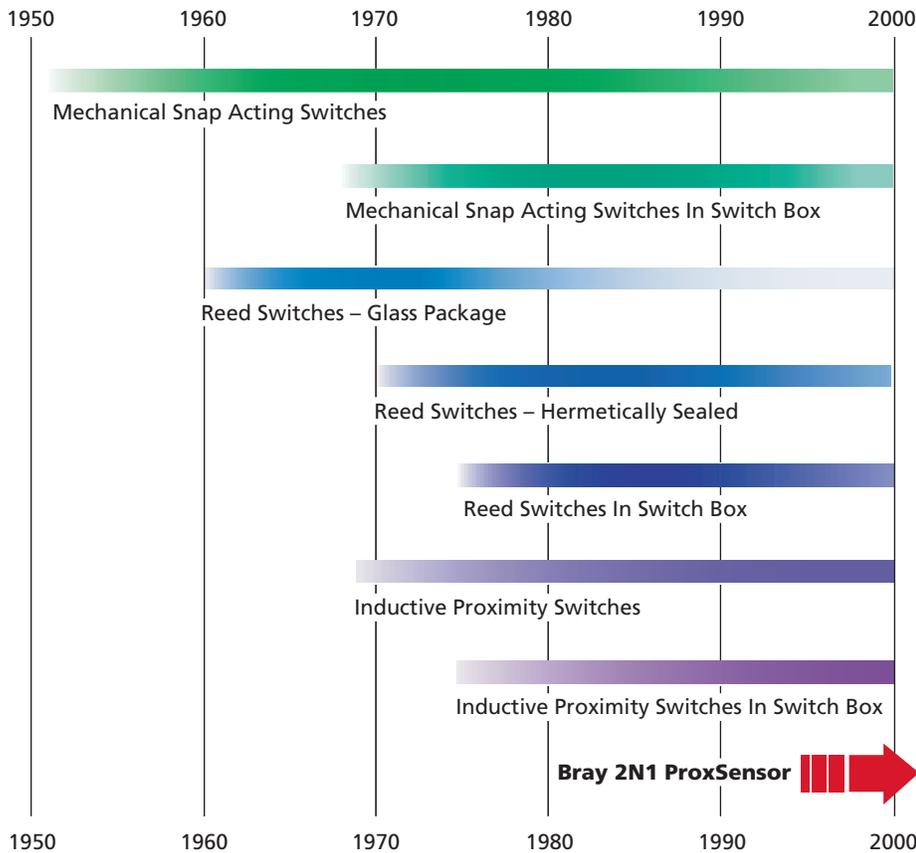
These sensors do not spark, have no contact bounce and operate reliably with low power computer circuitry.

Since two switches are required for valve position applications, inductive proximity sensors have typically been expensive and large – especially when placed in an enclosure designed to protect mechanical and reed switches. Therefore, many customers have limited their use of inductive sensors to special applications.

## BRAY'S 2N1™ ProxSensor, THE VALVE STATUS MONITOR FOR THE NEXT GENERATION

Bray has placed two inductive proximity sensors in one economical, compact, self-contained, and totally encapsulated enclosure. Now inductive sensors can be used for almost any application in any environment. The 2N1 ProxSensor fully meets today's industrial needs. Bray is confident this will be the valve status monitor of the 21st Century.

## TIME LINE OF SWITCHES FOR VALVE POSITION INDICATION



## SERIES 52 ADVANTAGES

The 2N1 ProxSensor offers the following advantages vs. Snap Acting Switches:

- No switch sparking (explosion or wear)
- No contact bounce
- No moving switch elements
- Fully sealed enclosure

The 2N1 ProxSensor offers the following advantages vs. Reed Switches:

- No switch sparking (wear)
- No contact bounce
- Nonmagnetic operation
- No attraction of metal objects
- No moving switch elements
- Not fragile to vibration or shock

The 2N1 ProxSensor offers the following advantages vs. Externally Mounted Inductive Proximity Switches:

- 2 sensors in 1 enclosure
- No complex bracketry
- More compact design
- Reduced installation cost

The 2N1 ProxSensor offers the following advantages vs. Two Inductive Proximity Switches in standard switchbox:

- Lower cost
- More compact design
- Fully encapsulated enclosure
- Reduced installation cost

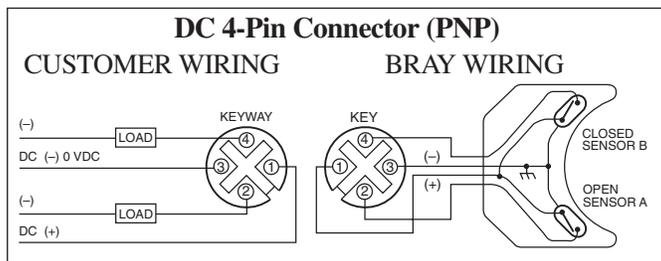
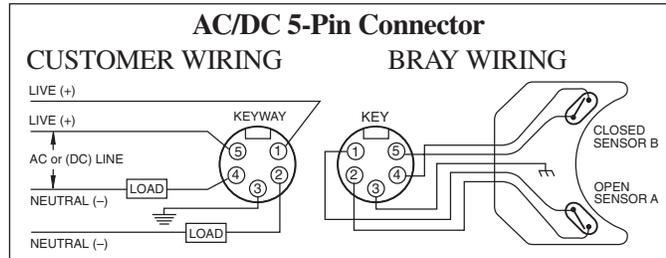
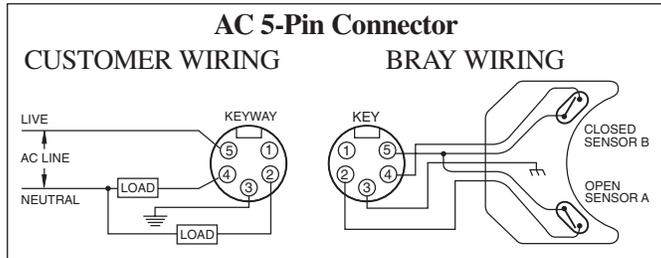
# SPECIFICATIONS

Parameter	AC Sensor	DC Sensor (3 Wire)	AC/DC Sensor		Intrinsically Safe DC*
			AC	DC (2 Wire)	
Supply Voltage	20 – 250 VAC	10 – 65 VDC	20 – 250 VAC	20 – 300 VDC	Customer connection is through Switching Amplifier.
Line Frequency	40 – 60 Hz	—	40 – 60 Hz	—	
Load Current	500 mA	200 mA	400 mA	300 mA	
Inrush Current	0.7A/2 cycles (33 ms)	—	8A/2 cycles (10 ms)	—	
Leakage Current	1.7 mA Max.	20 µA Max.	1.7 mA Max.	—	
Voltage Drop	6 V	1.8 V	6.3 V	6.3 V	
Switching Frequency	20 Hz	1,000 Hz	20 Hz	20 Hz	
Switching Point Drift	± 10% Sr	± 10% Sr	± 10% Sr	± 10% Sr	
Differential Travel	± 2 – 15% Sr	± 2 – 15% Sr	± 3 – 15% Sr	± 3 – 15% Sr	
Output Status	2 LED's Red	2 LED's Red	2 LED's Red	2 LED's Red	
Output Function	Normally Open	Normally Open	Normally Open	Normally Open	Normally Closed
Housing Material	PA12-GF30 Nylon				
Temperature Range	-13°F to +158°F -25°C to +70°C				
Output Connector	5 pin Mini	4 pin Euro	5 pin Mini	5 pin Mini	4 pin Euro
Protection Class	NEMA 4, 4X, 6, 12, 13 IP 65, 66, 67	NEMA 4, 4X, 6, 12, 13 IP 65, 66, 67	NEMA 4, 4X, 6, 12, 13 IP 65, 66, 67	NEMA 4, 4X, 6, 12, 13 IP 65, 66, 67	For Hazardous Locations

\* Intrinsically Safe units must be used with an external Switching Amplifier. Various Switching Amplifiers can be used to meet the electrical conditions required by the customer.

## WIRING DIAGRAMS

Shown are typical wiring diagrams for general application. Bray offers factory wiring to meet alternative wiring configurations. Please consult the Bray factory for wiring diagrams for your applications.



For Wiring Diagrams of the DC 4-Pin (NPN) Sensors, Y-Connector AC 6-Pin and Intrinsically Safe DC 4-Pin Sensors please consult the Bray factory.



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