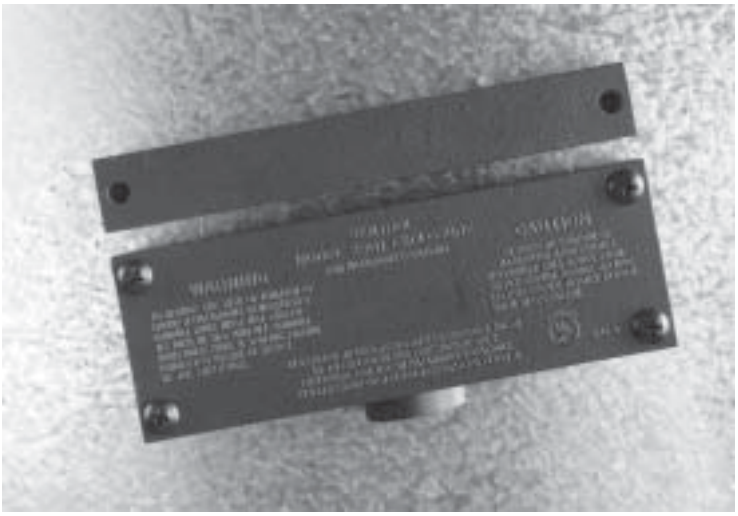
www.edwardssignaling.com

GuardSwitch™ Series 300

Safety Interlock Switch

371-BT ☐ *371-BT*



Description

The 371-BT Series DPST safety interlock switch is designed for use with safety monitored relays or monitored circuits. To achieve the optimum Series 300 defeat resistant feature of the 371-BT, both the switch circuit (Circuit 1) and the tamper circuit (Circuit 2) must be connected.

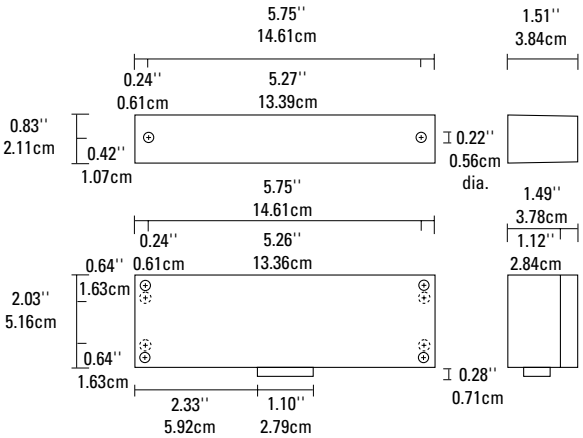
Notes:

1. Environmental: Pollution Degree II
2. Correct use of this control device is an essential part of proper machine cycle control.
3. Failure to follow ALL instructions could lead to serious bodily injury or death.
4. Maintenance to be done by qualified personnel only
5. The connecting cables between the INT devices and the switches must be located in an IP 23 type enclosure (minmum).
6. The mounting for the switch and the actuator magnet must be accomplished per this specification.
7. Non-removable hardware must be used for installation.
8. The housing of the 300-BT must be connected to the PE (Primary Earth) ground circuit via a lock washer on the mounting screw. The PE ground symbol must be placed adjacent to the screw.

To verify switch operation with an ohmmeter:

Set range at 20 mega ohms (switches with triac output, set ohm range at 20 kilo ohms). For a normally open switch, the meter will read a high impedance with the actuator away. It will read very high to infinity range (triac switches will read high kilo ohm to infinity range) with the actuator within sense range. You will see the opposite reading for a normally closed switch.

Dimensions



Installation

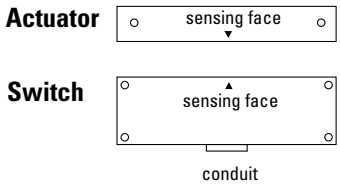
Use non-removable screws, bolts, or nuts to mount the switch and actuator. Do not over-torque mounting hardware.

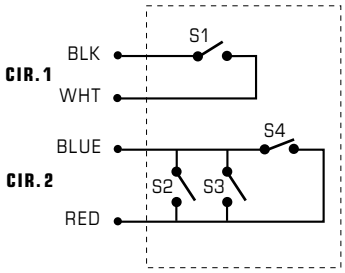
1. Position the switch and actuator so the labels are reading in the same direction. (See Figure 1.)
2. Mount the switch on the stationary frame of the machine and mount the actuator on the moveable guard, door or gate. Keep the switch and actuator within the listed sense range. (See Ordering Information.)

   See Figure 2 or recommended mounting configurations.
3. Mounting on a ferrous material will effect the sense range a minimum of 50%. However, a 1/4" non-ferrous spacer positioned under the actuator and/or switch should restore most of the lost sense range.
4. For best protection against operator defeat, mount with non-removable screws, bolts or nuts (see Accessories).
5. **Caution!** When not used with a INT safety relay, particular care must be taken to determine the actual load of the switch circuit. High voltage transients from coils, motors, contactors, and solenoids must be considered. Transient protection, such as back-to-back zener diodes (TransZorb®) or an RC network, is recommended for such loads to ensure that maximum ratings of the switch are not exceeded. Not recommended to be used with tungsten filament loads because of high current inrush surges. Line capacitance and load capacitance must be considered. Excessive line capacitance can be caused by cable lengths over 50' when using a maximum 48 VAC. A resistor can be added in series to limit the inrush current (at least 48 Ohms for 24V applications). The resistor can be added in series just before the load. The voltage drop and the power rating of the resistor must be considered. Voltage drop = I•R; Watts = I^2R (I = maximum continuous current of the load).

6. When mounting the switch on an ungrounded machine, ground the switch housing by connecting your ground lead to one of the switch mounting screws.

Figure 1





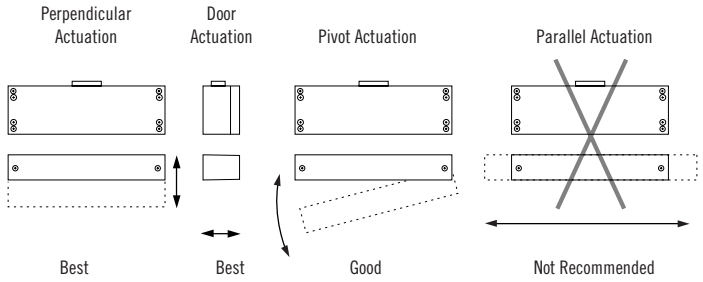
**Circuits shown with magnet actuator away from switch.*

S1 Normally open reed switch, closed when actuator is within 0.6"
S2, S3 Normally open reed switches, will close if misaligned or tampered with a standard magnet
S4 Biased closed reed switch, open when actuator is between 0.3" and 0.6"

N.O. circuit: Black and white wires.
N.C. biased tamper circuit: Red and blue wires.

Mounting Configurations

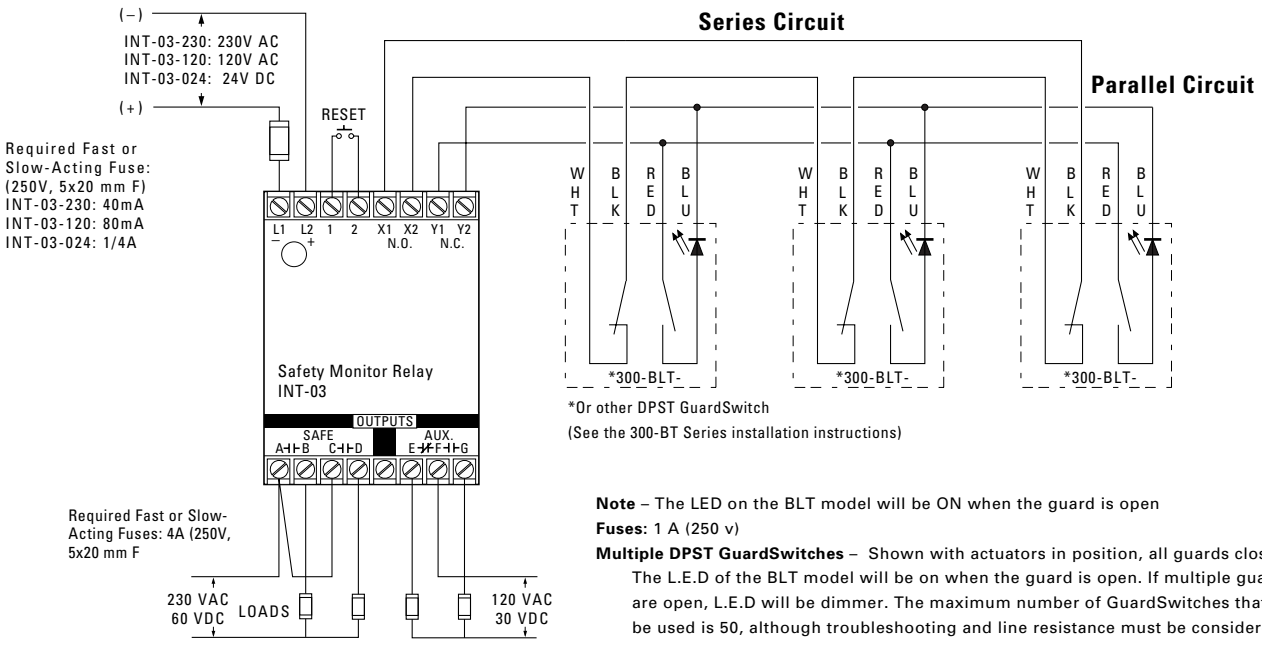
Figure 2



The parallel actuation can result in on/off/on signal if the actuator passes by the switch rather than coming to rest in proximity to it. This is NOT a recommended configuration for safety interlock applications.

Wiring Diagram for Category 3

Inputs shown with safety gates/guards in closed position. One Series 300-BT GuardSwitch™ required for each safety gate.



Note – The LED on the BLT model will be ON when the guard is open
Fuses: 1 A (250 v)
Multiple DPST GuardSwitches – Shown with actuators in position, all guards closed. The L.E.D of the BLT model will be on when the guard is open. If multiple guards are open, L.E.D will be dimmer. The maximum number of GuardSwitches that can be used is 50, although troubleshooting and line resistance must be considered. (Do not exceed 30 Ohms of combined contact and line resistance. Each GuardSwitch will have less than 0.5 Ohms of resistance.)

CE Compliance Information

Declaration of Conformity available upon request.

European Directives
Machinery Directive (89/392/EEC)
EMC Directive (89/336/EEC)
Low Voltage Directive (73/23/EEC)
Specific European Standards
EN60204-1 Safety of electrical equipment of industrial machines
EN292 Part 1, 2 Safety of Machinery, basic terminology, technical principles
EN954-1 Risk Assessment Category 3 or 4 depending on wiring method, see diagrams
EN55081-2 Electromagnetic Emissions
EN50082-2 Electromagnetic Immunity
EN1088 Interlocking Devices
EN947-5-3 Control Circuit Devices
EN50178 Safety of Electrical Equipment
IEC 664-1 Insulation requirements
IEC 68, part 2-1, 2-2, 2-3, 2-8, 2-14, 2-27, 2-30

General Specifications

Enclosure	UL Explosion Proof, Die Cast Anodized Aluminum
UL Enclosure Classified for Use in Hazerdous Locations:	
	Class I, Group B, C, D
	Class II, Group E, F, G
	Class III, Divisions 1 & 2
Temperature Range	-40 ºF to 180 ºF (-40 ºC to 80 ºC)
Environmental	Hermetically Sealed Contact Switch
	Encapsulated in Polyurethane
NEMA Rating	1, 2, 5
Protection Class	IP 64
Response Time	1 msec
Individual Circuits	The two circuits do not switch simultaneously, and depend on the speed of the guard closure. Based on closure speed of 1' per second and a gap of 1/8", a delay less than 50 msec is typical.
Life Cycles	100,000 Under Full Load;
	Up to 200,000,000 Under Dry Circuit
Conduit Connection	1/2" Threaded NPT
UL/CSA	All Models

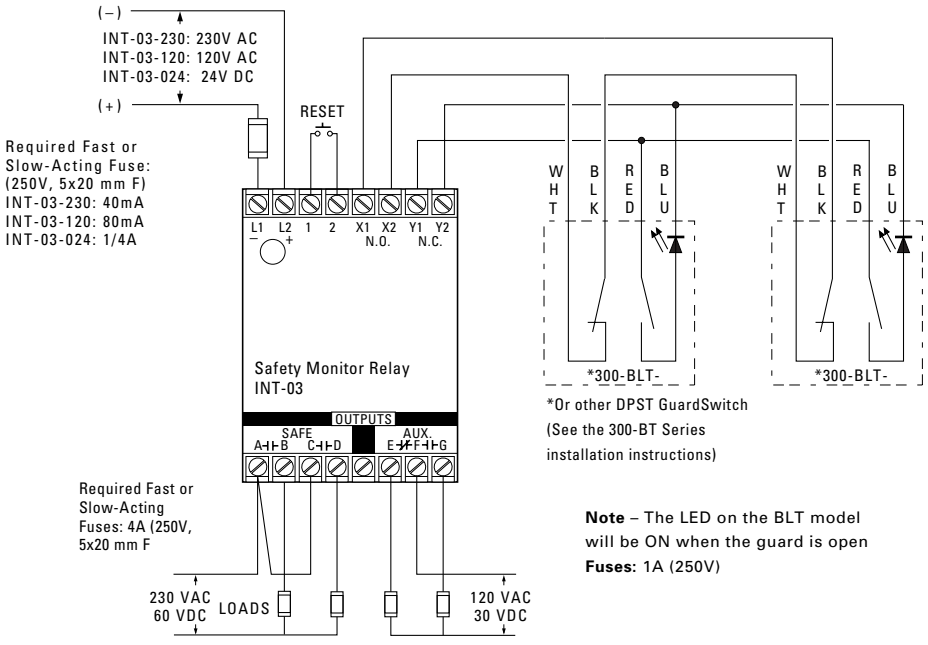
File E 122942

LR89176

Wiring Diagram for Category 4

Inputs shown with safety gate/guard in closed position. Two Series 300-B GuardSwitches™ with one INT relay are required for each safety gate.

When first applying the INT Safety Monitor Relay, the inputs must be cycled to check for proper operation before the output contacts close. To cycle the inputs, the guard must be opened and then closed. This start-up test is sufficient; however, we recommend that the proper operation of the switches and relay be checked at least every 24 hours.



Note – The LED on the BLT model will be ON when the guard is open
Fuses: 1A (250V)

Electrical Specifications

CIRCUIT NUMBER	CIRCUIT TYPE	CONTACT CONFIGURATION	LOAD RATING	SWITCHING VOLTAGE	SWITCHING CURRENT
1	Switch: S1	N.O.	40W/VA	48VAC/VDC	1.0ADC, 0.7AAC
2	Tamper: S2, S3, S4	N.C.	10W/VA	48VAC/VDC	0.3A

Ordering Information

PART NUMBER	CONTACT[1] CONFIGURATION	SENSE RANGE[2] MINIMUM	SENSE RANGE[2] MAXIMUM	BREAK RANGE	TERMINAL TYPE
371-BT	DPST: 1 N.O., 1 N.C.	0.3"(0.8cm)	0.6"(1.5cm)	1.2"(3.0cm)	#6 screws

Accessories

PART NUMBER	TAMPER PROOF SCREWS & SCREWDRIVER
1953	#6 x 3/4"L Tampruf Roundhead Screw
1954	#8 x 1-1/2"L Tampruf Roundhead Screw
1955	Tampruf® Screwdriver
1956	Tampruf® 1/4" Drive Bit for #6 and #8 Screws

Warning— Each electrical rating is an individual maximum and cannot be exceeded!

1 Configuration with actuator away from the switch

2 Proximity of ferrous materials usually reduces sense range — typically by 50%. The shape and type of material cause a wide diversity of effects. Testing is required to determine actual sense range for specific applications.