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Rev. 1.13

Guard Lock Safety-Door Switch

- Release protective cover locks using controller signals or pushbutton switches after the cutting tool stops moving due to inertia
- A mechanical lock is applied automatically when the Operation Key is inserted. A high level of safety is achieved using a mechanism where the lock is only released when voltage is applied to the solenoid.
- Conforms to EN (TÜV) standards corresponding to the CE marking
- Certified by UL, CSA and CCC standards
- The Switch contact is opened by a direct opening mechanism (NC contacts only) when the protective cover is opened.
Direct opening mechanism that is EN-certified is indicated by  on the Switch
- Auxiliary release key ensures easy maintenance and unlocks the door in the case of a power failure.
- Tough aluminum die-cast body incorporating a switch box with degree of protection satisfying IP67, UL, and CSA TYPE6P, 13
- Equipped with a horizontal and vertical conduit opening
- Models incorporating easy-to-see indicators for monitoring and those using an adjustable Operation Key for a swinging door are available
- The mounting direction of the head can be changed to allow the Operation Key to be inserted from four directions
- A Rapid Delivery Product: Select models are available for shipment today or within 3 to 5 days



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Specifications

Standards and EC Directives

Conforms to the following EC Directives:

- Machinery Directive
- Low Voltage Directive
- EN 1088

Certified Standards

Certification body	Standard	File No.
TÜV Rheinland	EN 60947-5-1 (certified direct opening) GS-ET-19	R9451050
UL	UL 508	E76675
CSA	CSA C22.2, No. 14	LR45746
CQC (CCC)	GB14048.5	2003010305073836

Certified Standard Ratings

TÜV (EN 60947-5-1), CCC (GB14048.5)

Item	Standard Model	Indicator Model
Utilization category	AC-15	AC-15
Rated operating current (Ie)	3 A	6 A
Rated operating voltage (Ue)	250 V	115 V

Note: Use a 10 A fuse type gI or gG that conforms to IEC 60269 as a short-circuit protection device.

UL/CSA (UL 508, CSA C22.2 No. 14)
A300

Rated voltage	Carry current	Current (A)		Volt-amperes (VA)	
		Make	Break	Make	Break
120 VAC	10 A	60	6	7,200	720
240 VAC		30	3		

Note: The UL/CSA certified rating for products with indicators (-A) is 6 A/115 VAC.

Connections

Contact Forms

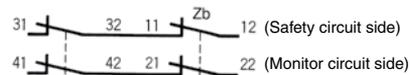
Diagrams show state with key inserted and lock engaged.

Model	Contact (door open/closed detection and lock monitor)	Contact form		Operating pattern	Remarks
		Lock monitor	Door open/closed detection		
D4BL-□C□□-□	1NC/1NO+1NC			<p>Only NC contacts 11-12 have a certified direct opening mechanism. (⊕)</p> <p>The terminals 11-12 and 23-24 can be used as unlike poles.</p>	
D4BL-□D□□-□	2NC+1NC			<p>Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. (⊕)</p> <p>The terminals 11-12 and 21-22 can be used as unlike poles.</p>	

Note: The EN-certified direct opening mechanism is indicated by the ⊕ switch.

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Contact Form (D4BL-2GRD-AT)

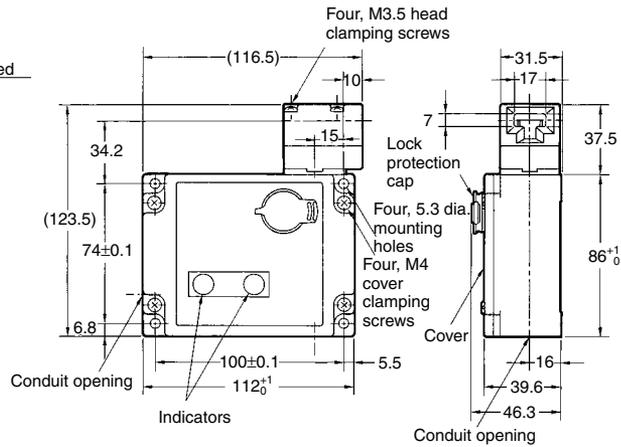
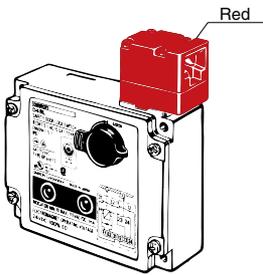


Dimensions and Operating Characteristics

(mm)

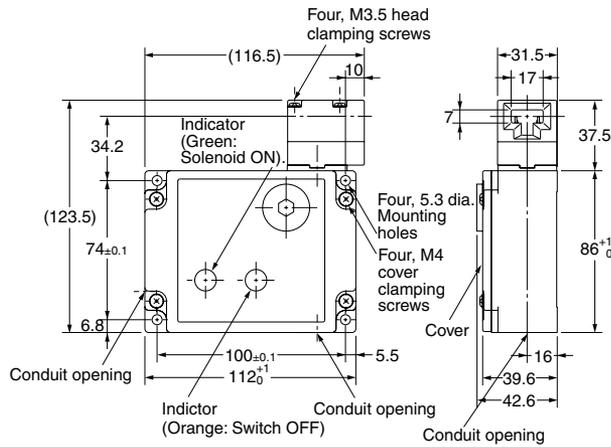
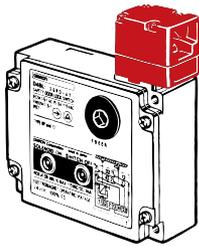
Switches

D4BL-□□□□-□



Operating characteristics	D4BL-□□□□
Key insertion force	19.61 N max.
Key extraction force	19.61 N max.
Movement before being locked	15 mm max.
Total Travel	23 mm min.

D4BL-2GRD-AT

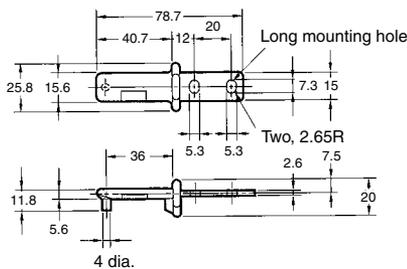


Operating characteristics	D4BL-2GRD-AT
Key insertion force	19.61 N max.
Key extraction force	19.61 N max.
Movement before being locked	15 mm max.
Total Travel	23 mm min.

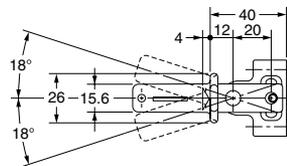
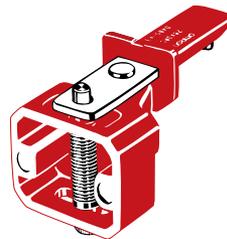
Notes: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
2. There are fluctuations in the contact ON/OFF timing for 2NC contacts. Confirm performance before application.

Operation Keys

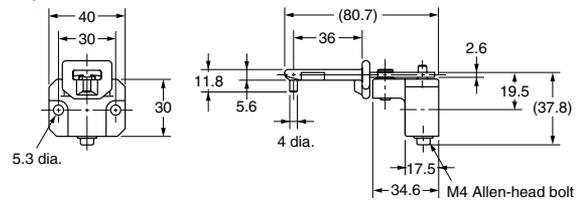
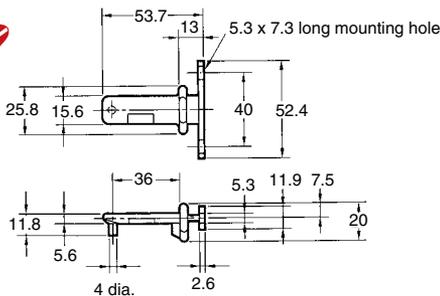
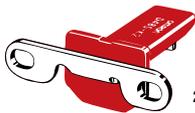
D4BL-K1



D4BL-K3



D4BL-K2

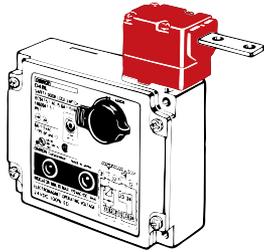


Dimensions and Operating Characteristics (continued)

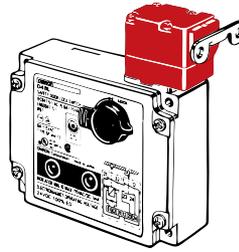
(mm)

With Operation Key Inserted

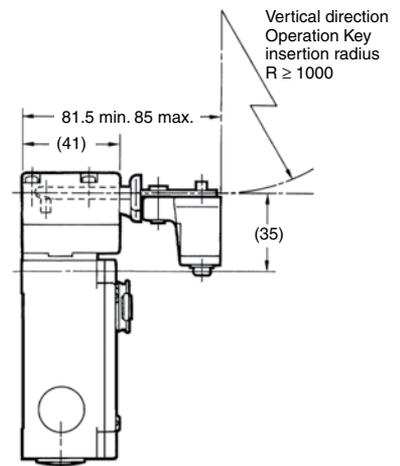
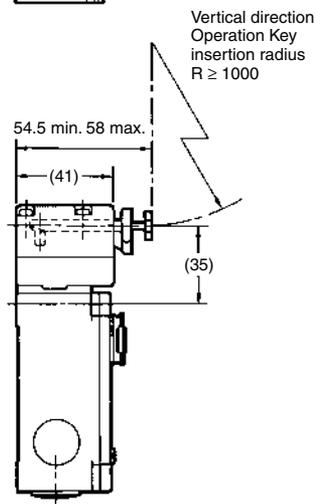
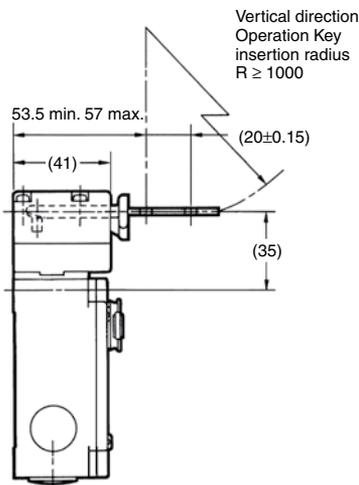
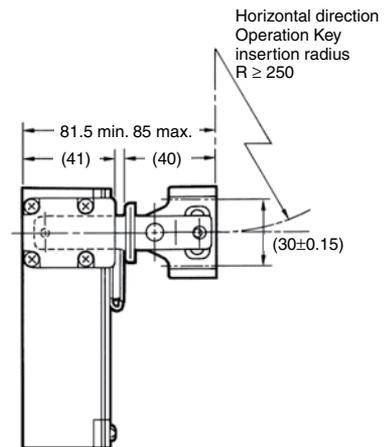
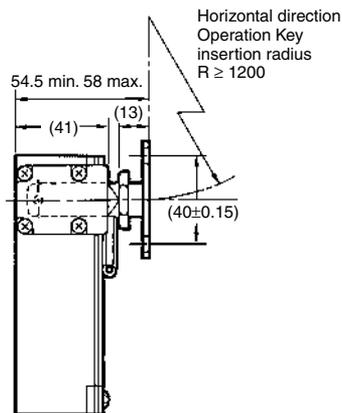
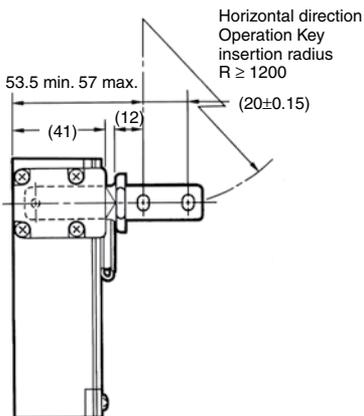
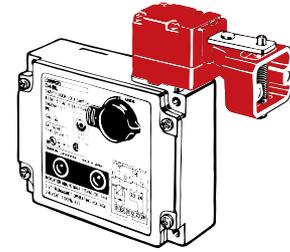
D4BL + D4BL-K1



D4BL + D4BL-K2



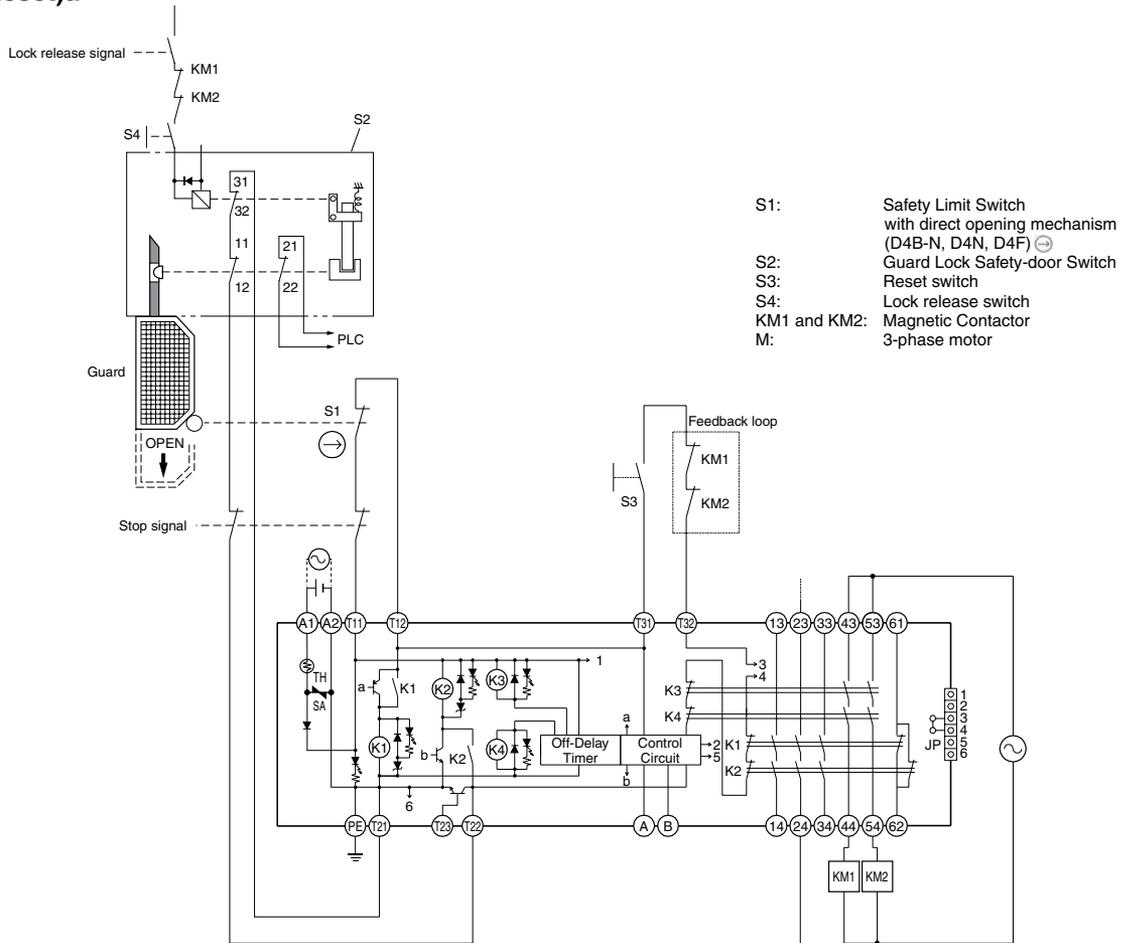
D4BL + D4BL-K3



- Notes: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
2. In the above diagrams, the Operation Key is inserted from the front.

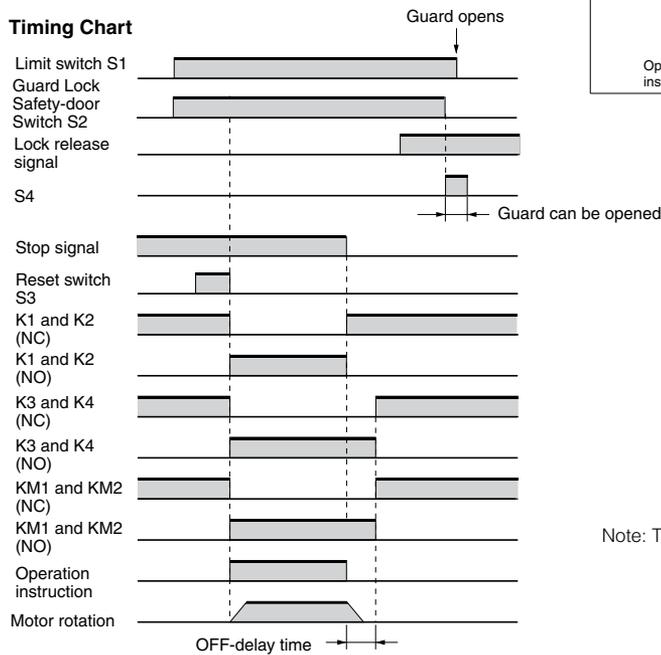
Application Example with G9SA Safety Relay Unit

G9SA-321-T□ (24 VAC/VDC) + D4BL-□D□A-□, - □D□B-□(Mechanical Lock Type) Circuit Diagram (Manual Reset)a



- S1: Safety Limit Switch with direct opening mechanism (D4B-N, D4N, D4F)
- S2: Guard Lock Safety-door Switch
- S3: Reset switch
- S4: Lock release switch
- KM1 and KM2: Magnetic Contactor
- M: 3-phase motor

Timing Chart



Note: This example circuit is for Category 3.

Ordering

Model Number Structure

Switch

D4BL - □ □ □ □ - □
 ① ② ③ ④ ⑤

- ① Conduit Size (2-conduit)
 - 1: Pg13.5
 - 2: G1/2
 - 4: M20
- ② Built-in Switch (with Safety Switch and Lock Monitor Switch Contacts)
 - C: 1NC/1NO (slow-action) + 1NC (slow-action)
 - D: 2NC (slow-action) + 1NC (slow-action)
- ③ Head Mounting Direction
 - R: Four mounting directions possible (Right-side mounting at shipping)
- ④ Door Lock and Release (Auxiliary Release Key in Incorporated by all models)
 - A: Mechanical lock/24 VDC solenoid release
 - G: 24 VDC solenoid lock/mechanical release
- ⑤ Indicator
 - Blank: Without indicator
 - A: 10 to 115 VAC or VDC driving (with orange and green LED indicator unit)

Operation Key

D4BL-K □
 ①

- ① Operation Key Type
 - 1: Horizontal mounting
 - 2: Vertical mounting
 - 3: Adjustable mounting (horizontal)

Type	Model
Horizontal mounting 	D4BL-K1
Vertical mounting 	D4BL-K2
Adjustable mounting 	D4BL-K3

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Switch

D4BL - 2 G R D - AT
 ① ② ③ ④ ⑤

- ① Conduit Size (2-conduit)
 - 2: G1/2
- ② Built-in Switch (with Safety Switch and Lock Monitor Switch Contacts)
 - G: 2NC (slow-action) + 2NC (slow-action)
- ③ Head Mounting Direction
 - R: Four mounting directions possible (Right-side mounting at shipping)
- ④ Door Lock and Release
 - D: Mechanical lock/24 VDC solenoid release
- ⑤ Indicator Lamp
 - A: Equipped with an orange and green LED display unit)

List of Models

Switches (Operation Keys are sold separately)

Lock method	Conduit size	Voltage for solenoid	Without indicator 1NC/1NO+ 1NC (Slow-action)	With LED indicator 1NC/1NO+ 1NC (Slow-action)	Without indicator 2NC+ 1NC (Slow-action)	With LED indicator 2NC+ 1NC (Slow-action)
Mechanical lock	PG13.5	24 VDC	D4BL-1CRA	D4BL-1CRA-A	D4BL-1DRA	D4BL-1DRA-A
		110 VAC	—	D4BL-1CRB-A	D4BL-1DRB	D4BL-1DRB-A
	G1/2	24 VDC	D4BL-2CRA	D4BL-2CRA-A	D4BL-2DRA	D4BL-2DRA-A
		110 VAC	—	—	—	D4BL-2DRB-A
	NPT	24 VDC	D4BL-4CRA-NPT	D4BL-4CRA-A-NPT	D4BL-4DRA-NPT	D4BL-4DRA-A-NPT
		24 VDC	D4BL-4CRA	D4BL-4CRA-A	D4BL-4DRA	D4BL-4DRA-A
M20	24 VDC	—	—	D4BL-4DRB	D4BL-4DRB-A	
	110 VAC	—	—	—	—	
Solenoid lock	Pg 13.5	24 VDC	D4BL-1CRG	D4BL-1CRG-A	D4BL-1DRG	D4BL-1DRG-A
	G1/2	24 VDC	D4BL-2CRG	D4BL-2CRG-A	D4BL-2DRG	D4BL-2DRG-A
	NPT	24 VDC	D4BL-4CRG-NPT	D4BL-4CRG-A-NPT	D4BL-4DRG-NPT	D4BL-4DRG-A-NPT
	M20	24 VDC	D4BL-4CRG	D4BL-4CRG-A	D4BL-4DRG	D4BL-4DRG-A