D4BL

SpeedSPEC www.sti.com D4BL

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

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.

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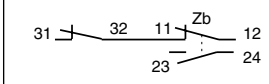
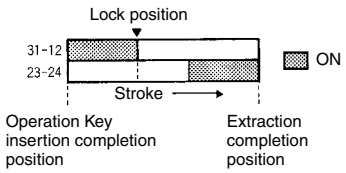
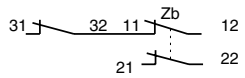
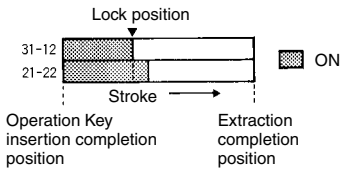
Connections

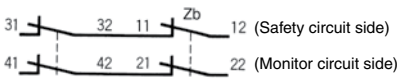
Contact Forms

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	Lock monitor / Door open/closed detection 			Only NC contacts 11-12 have a certified direct opening mechanism. ⊖ The terminals 11-12 and 23-24 can be used as unlike poles.
D4BL-□D□□-□	2NC+1NC	Lock monitor / Door open/closed detection 			Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. ⊖ The terminals 11-12 and 21-22 can be used as unlike poles.

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

Contact Form (D4BL-2GRD-AT)

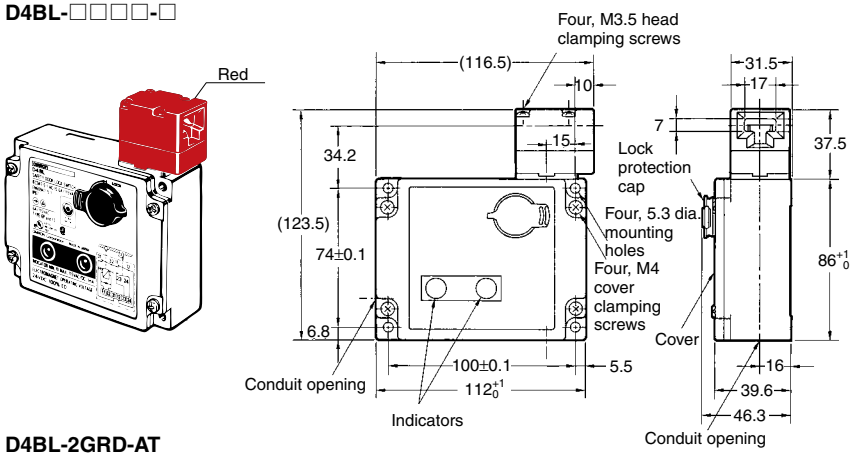


Dimensions and Operating Characteristics

(mm)

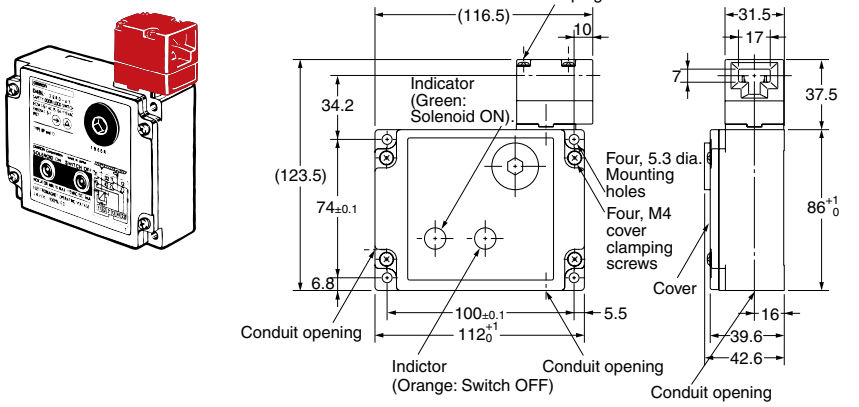
Switches

D4BL-□□□□-□



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

D4BL-2GRD-AT

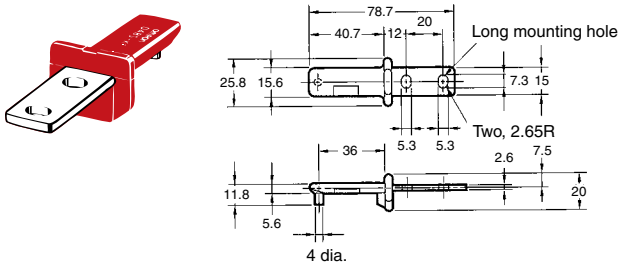


Operating characteristics	D4BL-2GRD-AT
Key insertion force Key extraction force	19.61 N max. 19.61 N max.
Movement before being locked	15 mm max.
Total Travel	23 mm min.

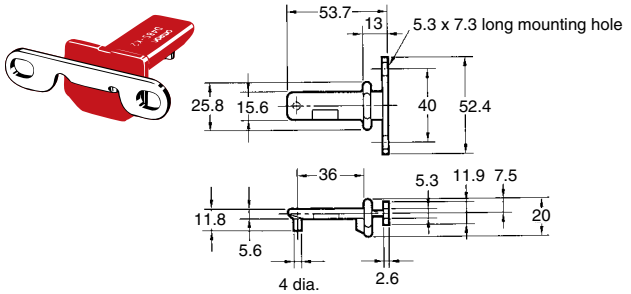
Notes: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
2. There are fluctuations in the contact ON/OFF timing for 2NC contacts. Confirm performance before application.

Operation Keys

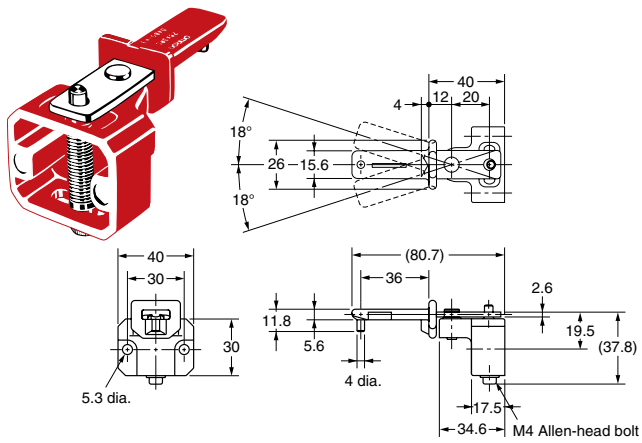
D4BL-K1



D4BL-K2



D4BL-K3



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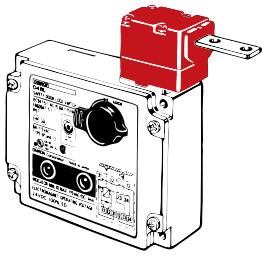
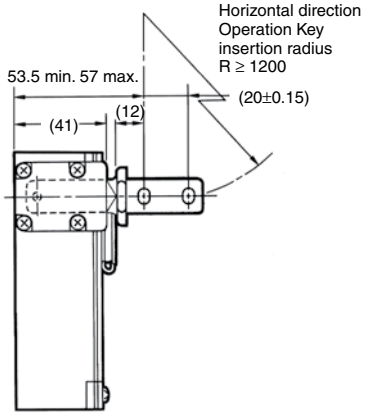
Dimensions and Operating Characteristics (continued)

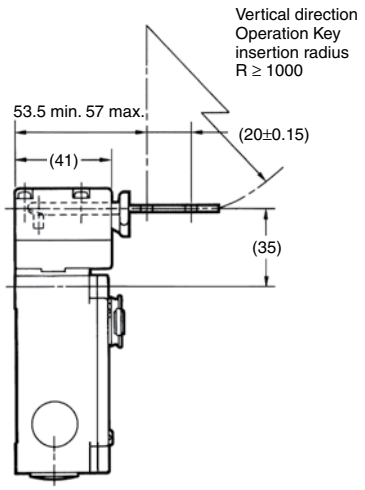
(mm)

With Operation Key Inserted

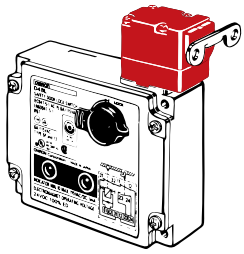
D4BL + D4BL-K1

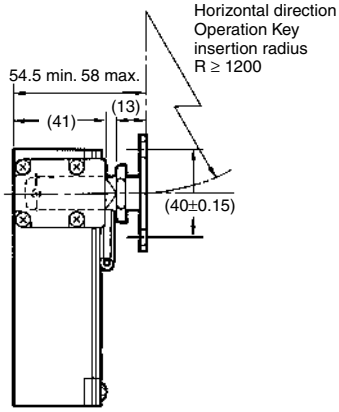


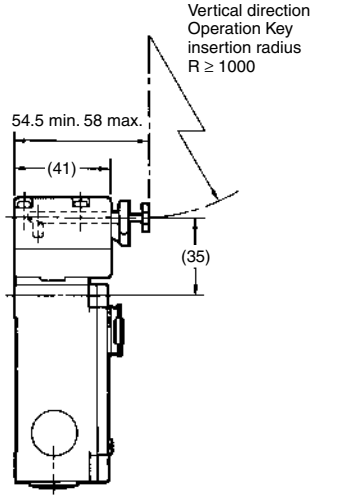




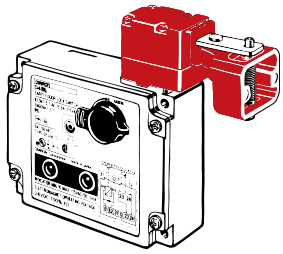
D4BL + D4BL-K2

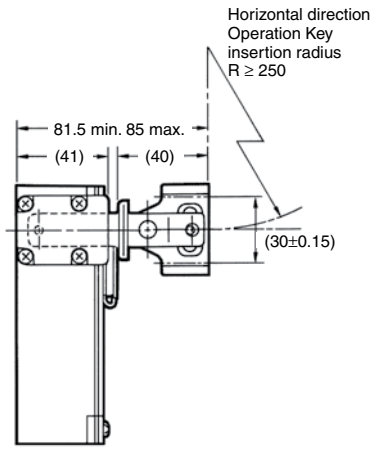


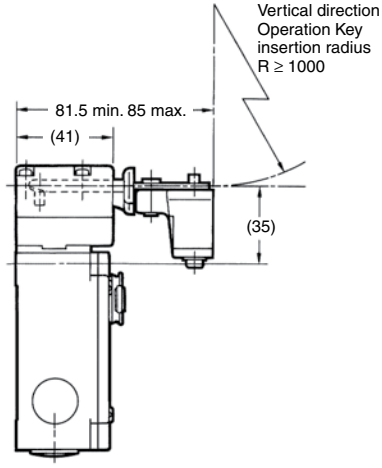




D4BL + D4BL-K3



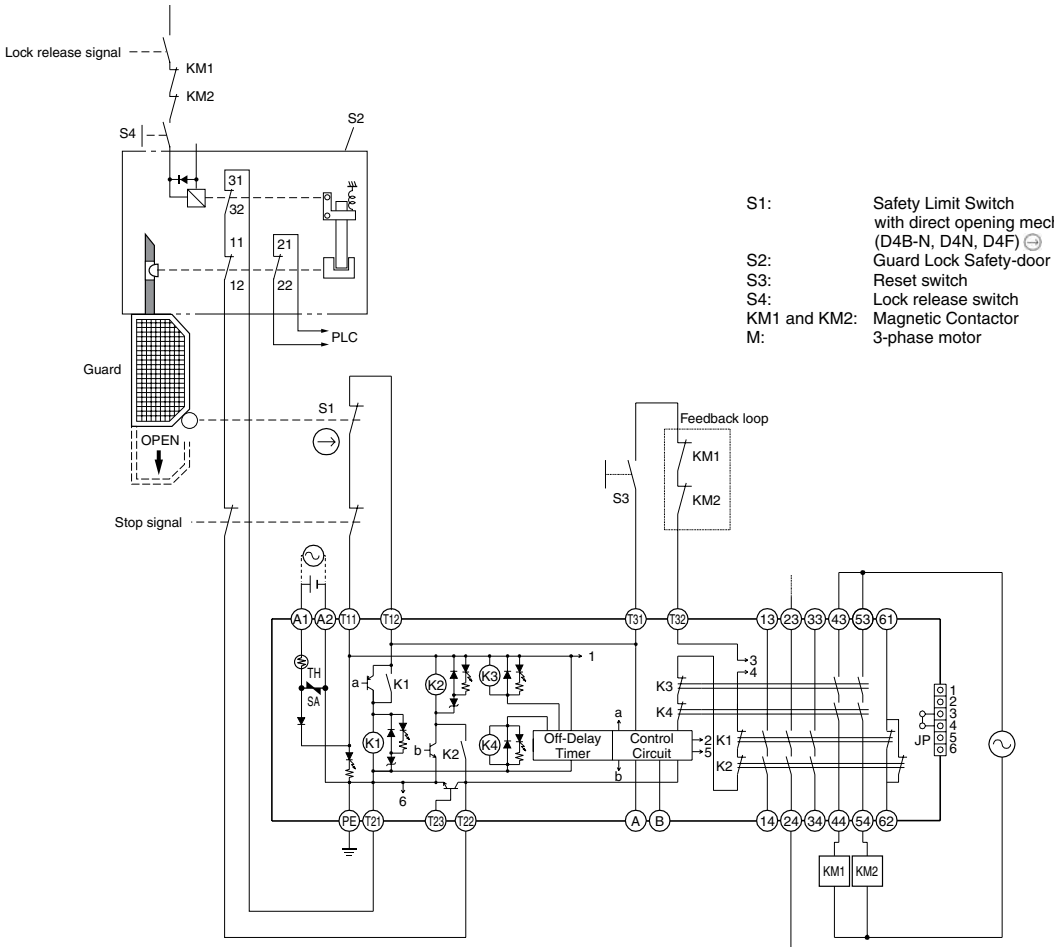




Notes: 1. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
2. In the above diagrams, the Operation Key is inserted from the front.

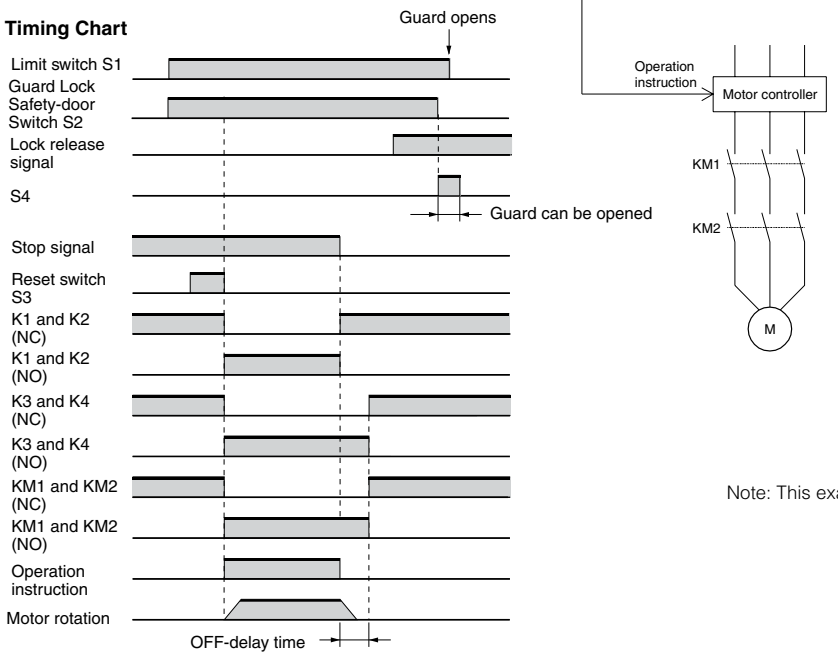
Application Example with G9SA Safety Relay Unit

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.

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Ordering

Model Number Structure

Switch

D4BL – ☐ ☐ ☐ ☐ – ☐
❶ ❷ ❸ ❹ ❺

❶ Conduit Size (2-conduit)
1: Pg13.5
2: G1/2
3: 1/2-14 NPT
4: M20

❷ 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)

❸ Head Mounting Direction
R: Four mounting directions possible (Right-side mounting at shipping)

❹ Door Lock and Release (Auxiliary Release Key in Incorporated by all models)
A: Mechanical lock/24 VDC solenoid release
B: Mechanical lock/110 VAC solenoid release
G: 24 VDC solenoid lock/mechanical release

❺ Indicator
Blank: Without indicator
A: 10 to 115 VAC or VDC driving (with orange and green LED indicator unit)

Switch

D4BL – 2 G R D - AT
❶ ❷ ❸ ❹ ❺

❶ Conduit Size (2-conduit)
2: G1/2

❷ Built-in Switch (with Safety Switch and Lock Monitor Switch Contacts)
G: 2NC (slow-action) + 2NC (slow-action)

❸ Head Mounting Direction
R: Four mounting directions possible (Right-side mounting at shipping)

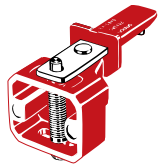
❹ Door Lock and Release
D: Mechanical lock/24 VDC solenoid release

❺ Indicator Lamp
A: Equipped with an orange and green LED display unit)

Operation Key

D4BL-K ☐
❶

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

Type	Model
Horizonal mounting	D4BL-K1
Vertical mounting	D4BL-K2
Adustable mounting 	D4BL-K3

= Highlighted **Rapid Delivery** products are available for shipment today or within **FIVE** days.

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	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-2CRB	D4BL-2CRB-A	D4BL-2DRB	D4BL-2DRB-A
	1/2-14NPT	24 VDC	D4BL-3CRA	D4BL-3CRA-A	D4BL-3DRA	D4BL-3DRA-A
		110 VAC	D4BL-3CRB	D4BL-3CRB-A	D4BL-3DRB	D4BL-3DRB-A
	M20	24 VDC	D4BL-4CRA	D4BL-4CRA-A	D4BL-4DRA	D4BL-4DRA-A
		110 VAC	D4BL-4CRB	D4BL-4CRB-A	D4BL-4DRB	D4BL-4DRB-A
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
	1/2-14NPT	24 VDC	D4BL-3CRG	D4BL-3CRG-A	D4BL-3DRG	D4BL-3DRG-A
	M20	24 VDC	D4BL-4CRG	D4BL-4CRG-A	D4BL-4DRG	D4BL-4DRG-A

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D4BL-1CRA D4BL-1CRG-A D4BL-2CRA D4BL-2GRD-AT D4BL-3CRA-A D4BL-3CRA OKUMA D4BL-3CRB-A D4BL-3CRG D4BL-3CRG-A D4BL-3DRB D4BL-3DRB-A D4BL-3DRG D4BL RELEASE KEY D4BL-4CRG-A D4BL-4CRG-A