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Guard Lock Safety-Door Switch

- Best-selling guard lock safety-door switch available in several compact, multi-contact models
- Selectable Operation Key insertion direction and adjustable mounting ensure installation flexibility
- Built-in switches with multiple-contact construction are available
- Key holding force of 1,300 N minimum
- Can be used for either standard loads or microloads
- Lineup includes models with a conduit size of M20
- IP67 degree of protection
- Variety of metallic heads available
- A Rapid Delivery Product: Select models are available for shipment today or within 3 to 5 days



Specifications

Standards and EC Directives

Conforms to the following EC Directives:

- Machinery Directive
- Low Voltage Directive
- EN 1088
- EN 60204-1
- GS-ET-19

Certified Standards

Certification body	Standard	File No.
TÜV SÜD	EN 60947-5-1 (certified direct opening)	Consult your representative for details.
UL *1	UL 508, CSA C22.2 No.14	E76675
CQC (CCC)	GB14048.5	2003010305064267
KOSHA *2	EN60947-5-1	2005-196

*1. Certification for CSA C22.2 No. 14 is certified by the UL mark.

*2. Only certain models have been certified.

Certified Standard Ratings

TÜV (EN 60947-5-1), CCC (GB14048.5)

Item	Utilization category	AC-15	DC-13
Rated operating current (Ie)		3 A	0.27 A
Rated operating voltage (Ue)		240 V	250 V

Note: Use a 10 A fuse type gI or gG that conforms to IEC 60269 as a short-circuit protection device. This fuse is not built into the Switch.

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		

Q300

Rated voltage	Carry current	Current (A)		Volt-amperes (VA)	
		Make	Break	Make	Break
125 VDC	2.5 A	0.55	0.55	69	69
250 VDC		0.27	0.27		

Solenoid Coil Characteristics

Item	Type	24 VDC	110 VAC	230 VAC
Rated operating voltage (100% ED)		24 VDC ^{+10%} / _{-15%}	110 VAC ±10%	230 VAC ±10%
Current consumption		Approx. 200 mA	Approx. 50 mA	Approx. 30 mA
Insulation Class		Class F (130°C max.)		

Indicator Characteristics

Item	Type	LED
Rated voltage		10 to 115 VAC/VDC
Current consumption		Approx. 1 mA
Color (LED)		Orange

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Connections

Contact Form

Indicates conditions where the Key is inserted and the lock is applied. Terminals 12 and 41 are connected internally (as per GS-ET-19).

Model	Contact (door open/closed detection and lock monitor)	Contact form		Operating pattern	Remarks
		Door open/closed detection	Lock monitor		
D4NL-□AF□-□	1NC/1NO + 1NC/1NO				Only NC contacts 11-12 have a certified direct opening mechanism. (⊖) The terminals 11-42, 33-34, and 53-54 can be used as unlike poles.
D4NL-□BF□-□	1NC/1NO + 2NC				Only NC contacts 11-12 have a certified direct opening mechanism. (⊖) The terminals 11-42, 33-34, and 51-52 can be used as unlike poles.
D4NL-□CF□-□	2NC + 1NC/1NO				Only NC contacts 11-12 and 31-32 have a certified direct opening mechanism. (⊖) The terminals 11-42, 31-32, and 53-54 can be used as unlike poles.
D4NL-□DF□-□	2NC + 2NC				Only NC contacts 11-12 and 31-32 have a certified direct opening mechanism. (⊖) The terminals 11-42, 31-32, and 51-52 can be used as unlike poles.
D4NL-□EF□-□	2NC/1NO + 1NC/1NO				Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. (⊖) The terminals 11-42, 21-22, 33-34, and 53-54 can be used as unlike poles.
D4NL-□FF□-□	2NC/1NO + 2NC				Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. (⊖) The terminals 11-42, 21-22, 33-34, and 51-52 can be used as unlike poles.
D4NL-□GF□-□	3NC + 1NC/1NO				Only NC contacts 11-12, 21-22, and 31-32 have a certified direct opening mechanism. (⊖) The terminals 11-42, 21-22, 31-32, and 53-54 can be used as unlike poles.
D4NL-□HF□-□	3NC + 2NC				Only NC contacts 11-12, 21-22, and 31-32 have a certified direct opening mechanism. (⊖) The terminals 11-42, 21-22, 31-32, and 51-52 can be used as unlike poles.

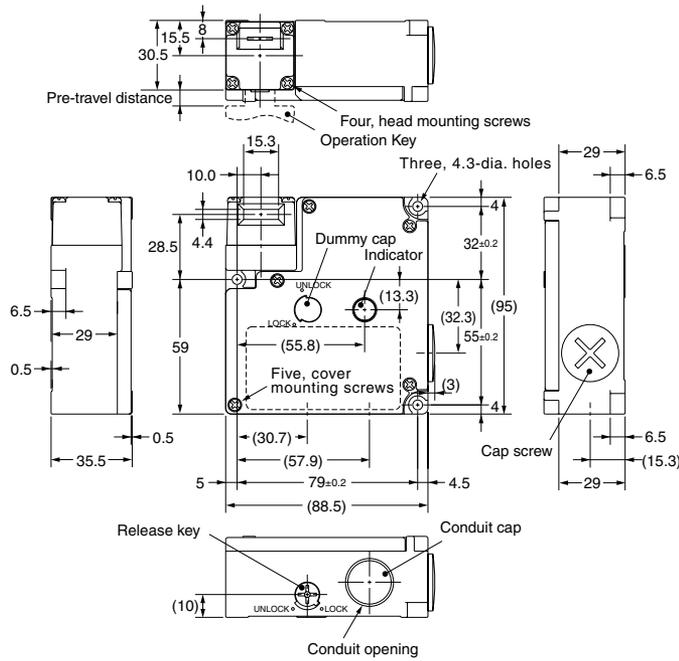
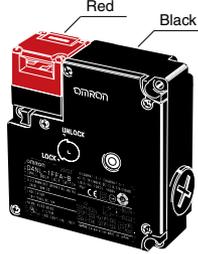
G

Dimensions and Operating Characteristics

(mm)

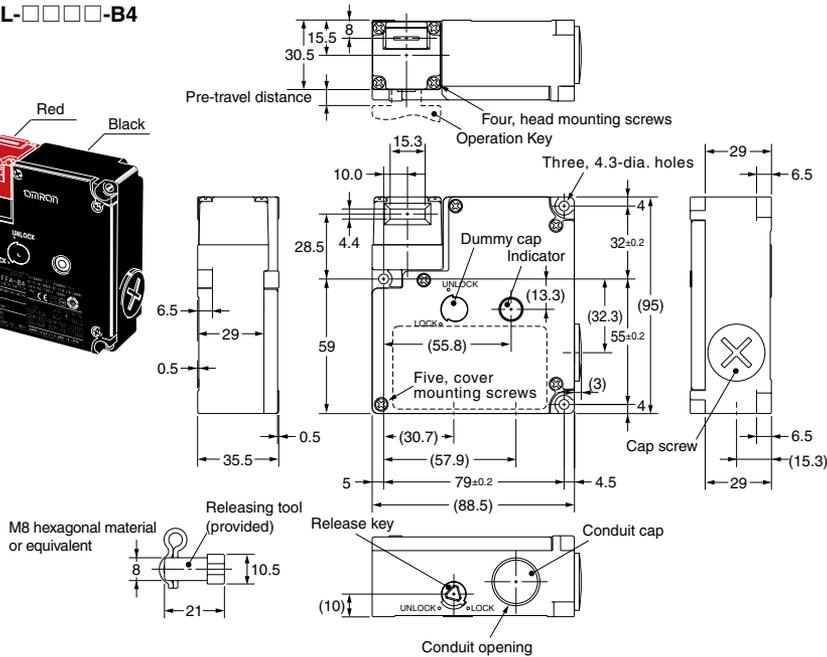
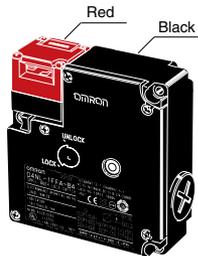
Switches

D4NL-□□□□-B



Operating characteristics	D4NL-□□□□-BS
Key insertion force	15 N max.
Key extraction force	30 N max.
Pre-travel distance	9 mm max.
Movement before being locked	3 mm min.

D4NL-□□□□-B4



Operating characteristics	D4NL-□□□□-B4
Key insertion force	15 N max.
Key extraction force	30 N max.
Pre-travel distance	9 mm max.
Movement before being locked	3 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 Switches with multiple poles (2NC, 2NC/1NO, or 3NC). Confirm performance before application.

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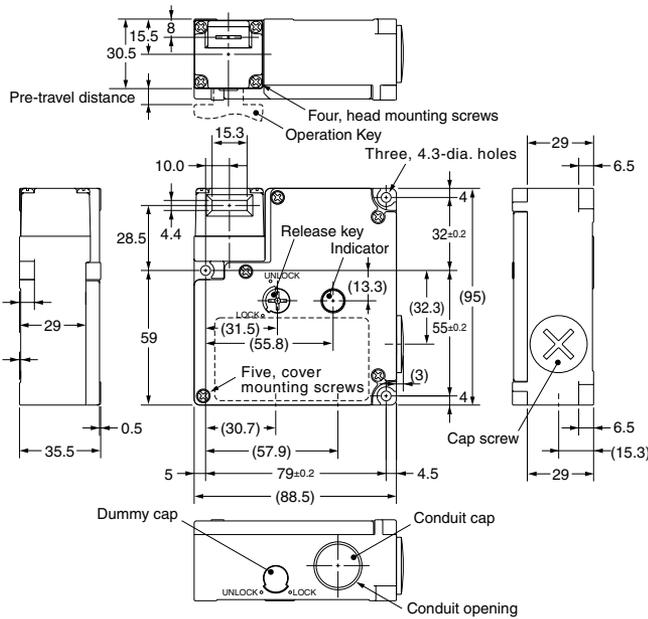
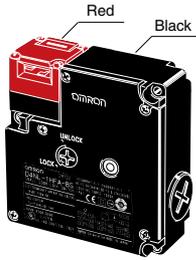
www.sti.com/info



Dimensions and Operating Characteristics (continued)

(mm)

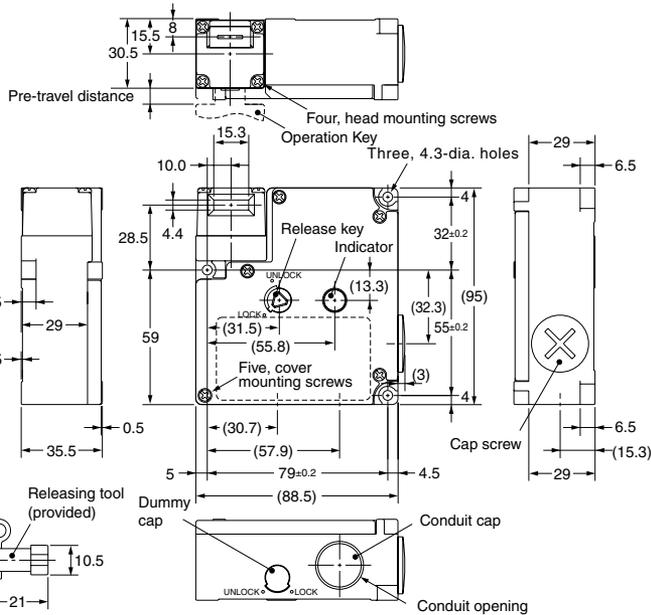
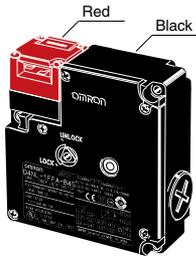
D4NL-□□□□-BS



Operating characteristics	D4NL-□□□□-BS
Key insertion force	15 N max.
Key extraction force	30 N max.
Pre-travel distance	9 mm max.
Movement before being locked	3 mm min.

G

D4NL-□□□□-B4S



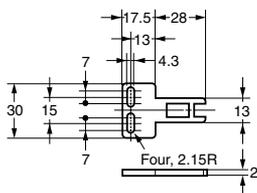
Operating characteristics	D4NL-□□□□-B4S
Key insertion force	15 N max.
Key extraction force	30 N max.
Pre-travel distance	9 mm max.
Movement before being locked	3 mm min.

Notes:

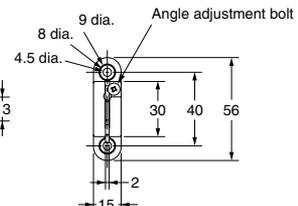
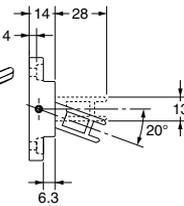
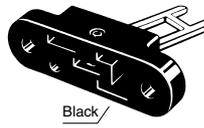
1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
2. There are fluctuations in the contact ON/OFF timing for Switches with multiple poles (2NC, 2NC/1NO, or 3NC). Confirm performance before application.

Operation Keys

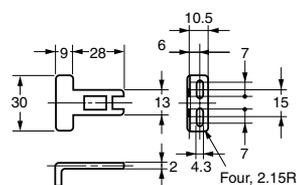
D4DS-K1



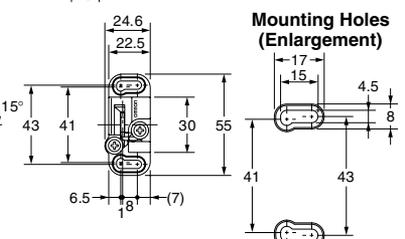
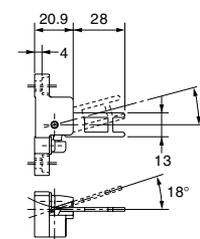
D4DS-K3



D4DS-K2



D4DS-K5



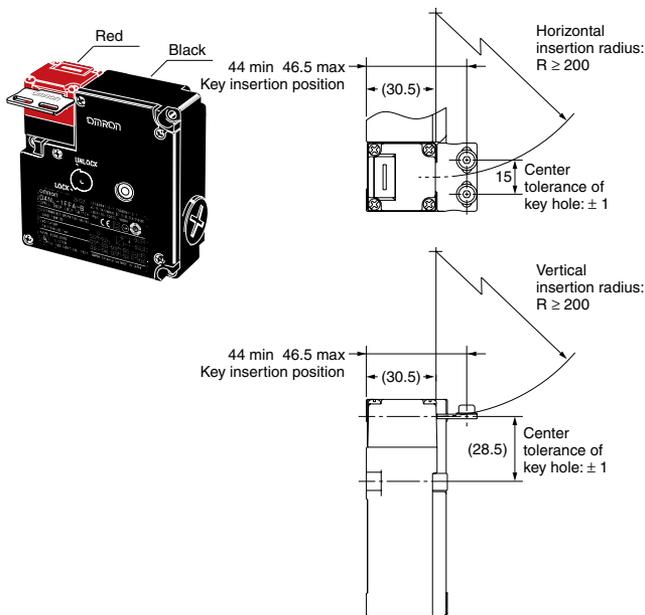
Mounting Holes (Enlargement)

Dimensions and Operating Characteristics (continued)

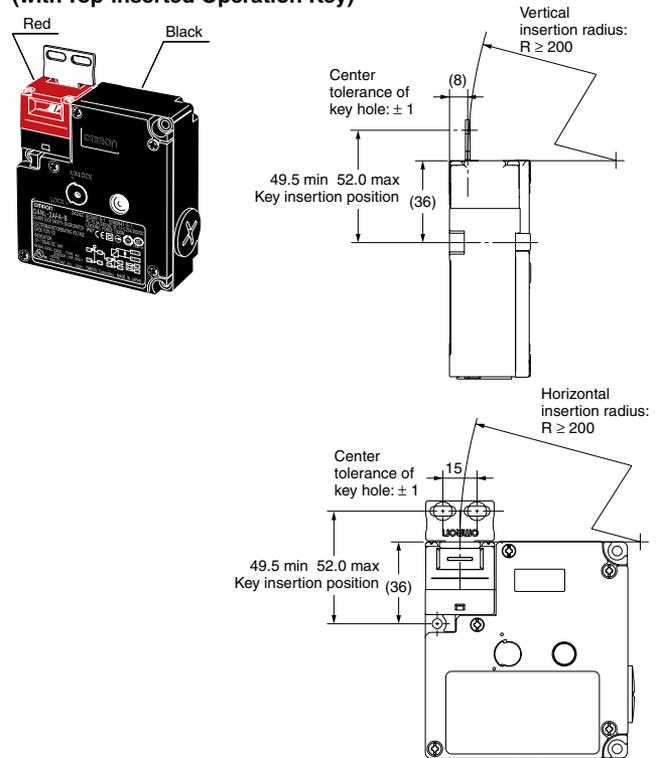
(mm)

With Operating Key Inserted

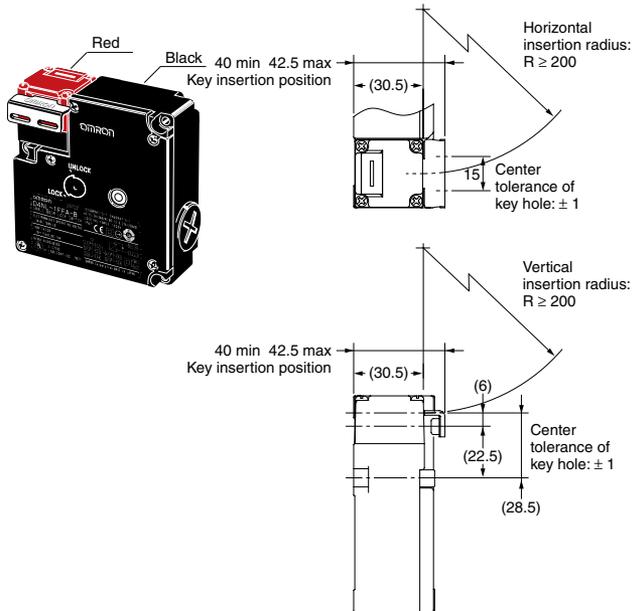
D4NL + D4DS-K1
(with Front-inserted Operation Key)



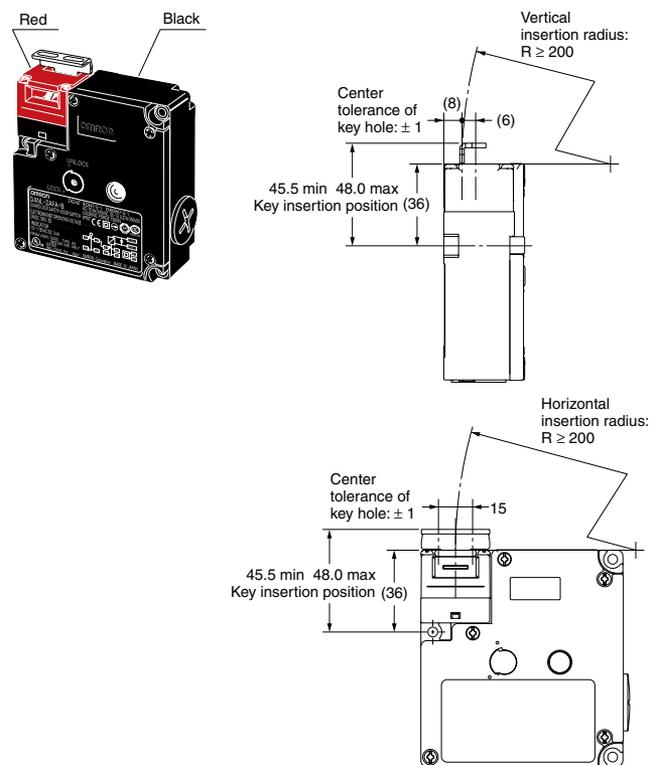
D4NL + D4DS-K1
(with Top-inserted Operation Key)



D4NL + D4DS-K2
(with Front-inserted Operation Key)



D4NL + D4DS-K2
(with Top-inserted Operation Key)



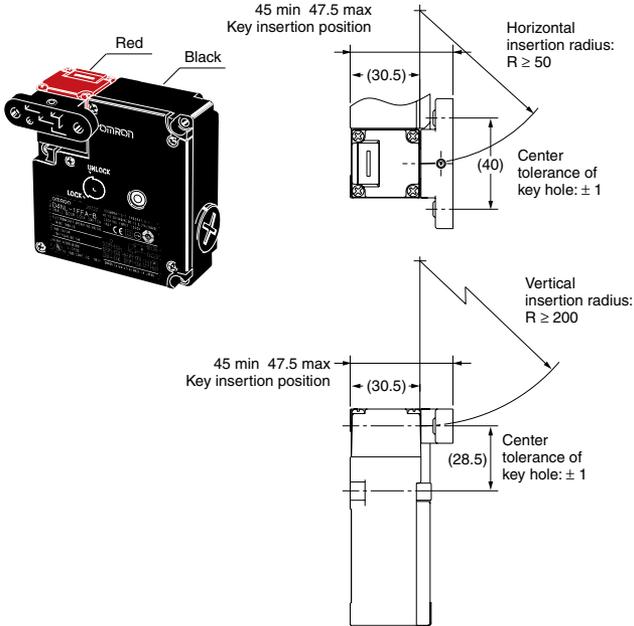
 Select models are available for Rapid Delivery.

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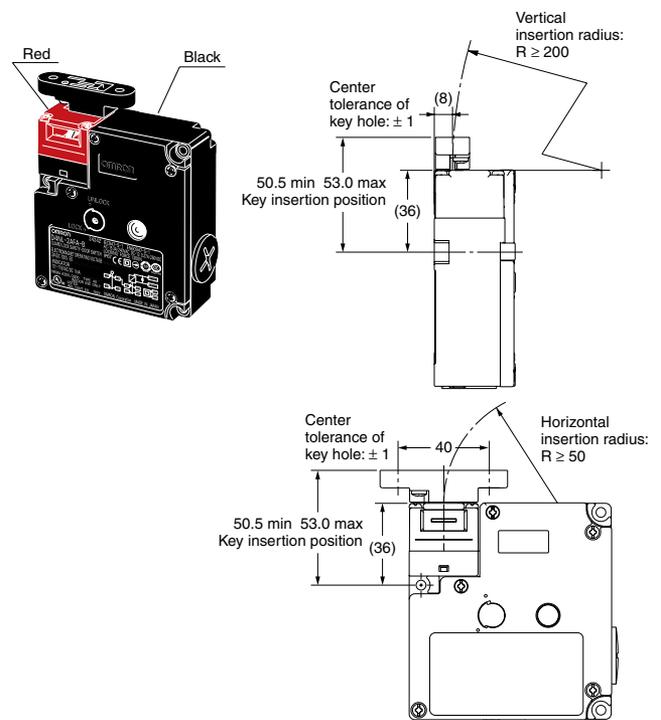
Dimensions and Operating Characteristics (continued)

(mm)

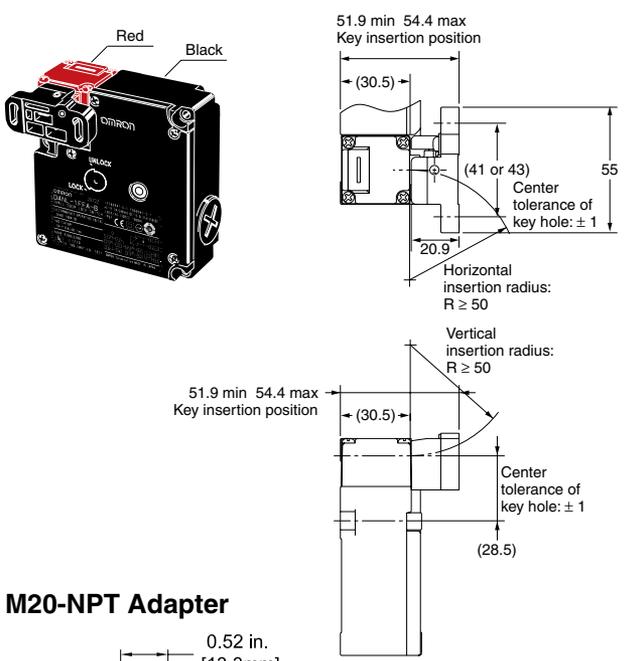
**D4NL + D4DS-K3
(with Front-inserted Operation Key)**



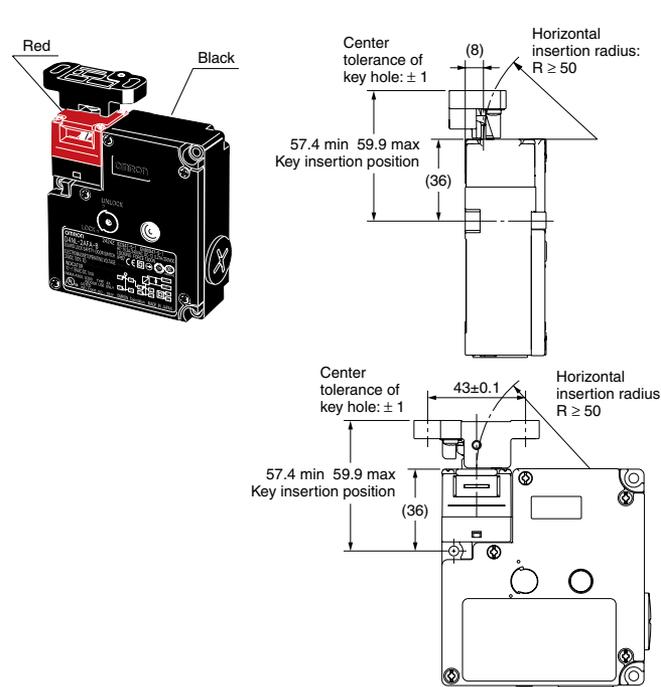
**D4NL + D4DS-K3
(with Top-inserted Operation Key)**



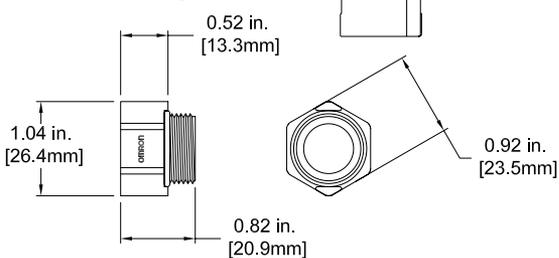
**D4NL + D4DS-K5
(with Front-inserted Operation Key)**



**D4NL + D4DS-K5
(with Top-inserted Operation Key)**



M20-NPT Adapter



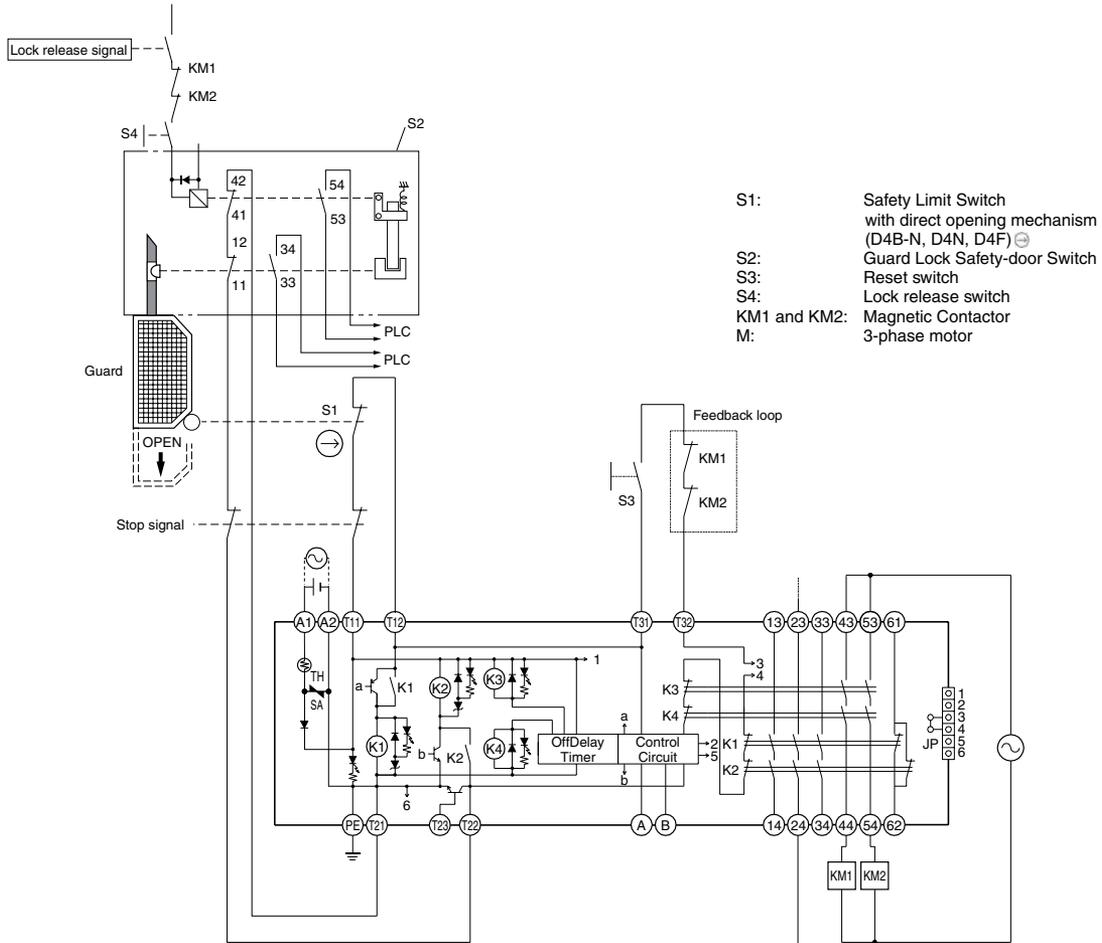
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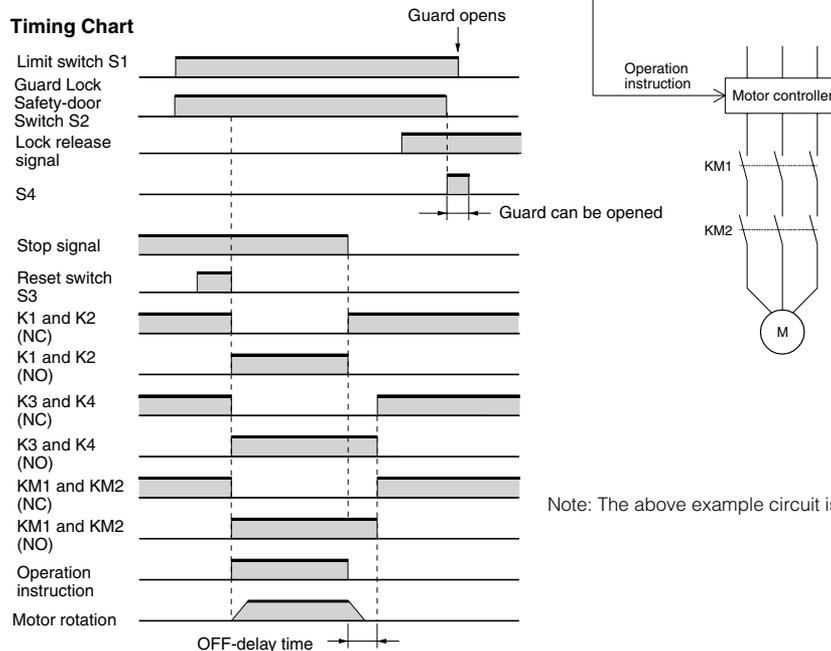
Application Examples

G9SA-321-T (24 VAC/VDC) + D4NL-A-A-, -A-B-, -A-C- (Mechanical Lock Type) Circuit Diagram (Manual Reset)



- 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: The above example circuit is for Category 3.

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Ordering

Model Number Structure

Switch

D4NL - □ □ □ □ - □ □ □ □
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Conduit Size
 - 1: Pg13.5
 - 2: G1/2
 - 4: M20
- ② Built-in Switch (with Door Open/Closed Detection Switch and Lock Monitor Switch Contacts)
 - A: 1NC/1NO (slow-action contacts) + 1NC/1NO (slow-action contacts)
 - B: 1NC/1NO (slow-action contacts) + 2NC (slow-action contacts)
 - C: 2NC (slow-action contacts) + 1NC/1NO (slow-action contacts)
 - D: 2NC (slow-action contacts) + 2NC (slow-action contacts)
 - E: 2NC/1NO (slow-action contacts) + 1NC/1NO (slow-action contacts)
 - F: 2NC/1NO (slow-action contacts) + 2NC (slow-action contacts)
 - G: 3NC (slow-action contacts) + 1NC/1NO (slow-action contacts)
 - H: 3NC (slow-action contacts) + 2NC (slow-action contacts)
- ③ Head Mounting Direction and Material
 - F: Four mounting directions possible (Front-side mounting at shipping)/plastic
 - D: Four mounting directions possible (Front-side mounting at shipping)/metal
- ④ Door Lock and Release
 - A: Mechanical lock/24 VDC solenoid release
 - B: Mechanical lock/110 VAC solenoid release*
 - G: 24 VDC solenoid lock/mechanical release
 - H: 110 VAC solenoid lock/mechanical release*
- ⑤ Indicator
 - B: 10 to 115 VAC/VDC (orange LED indicator)
- ⑥ Release Key Type
 - Blank: Standard
 - 4: Special release key
- ⑦ Release Key Position
 - Blank: Bottom
 - S: Front
- ⑧ M20-to-NPT Adapter
 - Blank: Adapter is not included
 - NPT: Adapter is included

Operation Key

D4DS-K □
 ①

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

Type	Model
Horizontal mounting 	D4DS-K1
Vertical mounting 	D4DS-K2
Adjustable mounting (horizontal) 	D4DS-K3
Adjustable mounting (horizontal/vertical) 	D4DS-K5

Special Release Key

Type	Model
Special Release Key for D4GL, D4JL, D4NL, and D4SL Switches 	D4NL-RK

* 110 VAC version is not available for -4□-NPT models.

 Select models are available for Rapid Delivery.

Visit this product on www.sti.com for details.

Ordering (continued)

List of Models

Switches with direct opening mechanisms (Operation Keys are sold separately)

Head material	Release key position	Release key type	Solenoid voltage/indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts) (slow-action) Certified direct opening NC contact	Conduit opening	Model
Plastic	Bottom	Standard	Solenoid: 24 VDC Orange LED: 10 to 115 VAC/MDC	Mechanical lock Solenoid release	1NC/1NO+1NC/1NO	M20	D4NL-4AFA-B
						M20 with 1/2" NPT adaptor	D4NL-4AFA-B-NPT
					1NC/1NO+2NC	M20	D4NL-4BFA-B
						M20 with 1/2" NPT adaptor	D4NL-4BFA-B-NPT
					2NC+1NC/1NO	M20	D4NL-4CFA-B
						M20 with 1/2" NPT adaptor	D4NL-4CFA-B-NPT
					2NC+2NC	M20	D4NL-4DFA-B
						M20 with 1/2" NPT adaptor	D4NL-4DFA-B-NPT
					2NC/1NO+1NC/1NO	M20	D4NL-4EFA-B
						M20 with 1/2" NPT adaptor	D4NL-4EFA-B-NPT
					2NC/1NO+2NC	M20	D4NL-4FFA-B
						M20 with 1/2" NPT adaptor	D4NL-4FFA-B-NPT
				3NC+1NC/1NO	M20	D4NL-4GFA-B	
					M20 with 1/2" NPT adaptor	D4NL-4GFA-B-NPT	
				3NC+2NC	M20	D4NL-4HFA-B	
					M20 with 1/2" NPT adaptor	D4NL-4HFA-B-NPT	
				Solenoid lock Mechanical release	1NC/1NO+1NC/1NO	M20	D4NL-4AFG-B
						M20 with 1/2" NPT adaptor	D4NL-4AFG-B-NPT
					1NC/1NO+2NC	M20	D4NL-4BFG-B
						M20 with 1/2" NPT adaptor	D4NL-4BFG-B-NPT
					2NC+1NC/1NO	M20	D4NL-4CFG-B
						M20 with 1/2" NPT adaptor	D4NL-4CFG-B-NPT
					2NC+2NC	M20	D4NL-4DFG-B
						M20 with 1/2" NPT adaptor	D4NL-4DFG-B-NPT
2NC/1NO+1NC/1NO	M20	D4NL-4EFG-B					
	M20 with 1/2" NPT adaptor	D4NL-4EFG-B-NPT					
2NC/1NO+2NC	M20	D4NL-4FFG-B					
	M20 with 1/2" NPT adaptor	D4NL-4FFG-B-NPT					
3NC+1NC/1NO	M20	D4NL-4GFG-B					
	M20 with 1/2" NPT adaptor	D4NL-4GFG-B-NPT					
3NC+2NC	M20	D4NL-4HFG-B					
	M20 with 1/2" NPT adaptor	D4NL-4HFG-B-NPT					

(Continued on next page)

 Select models are available for Rapid Delivery.

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Ordering (continued)

List of Models (continued)

Switches with direct opening mechanisms (Operation Keys are sold separately)

Head material	Release key position	Release key type	Solenoid voltage/indicator	Lock and release types	Contact configuration (door open/closed detection switch and lock monitor switch contacts) (slow-action) Certified direct opening NC contact	Conduit opening	Model
Plastic	Bottom	Special release key	Solenoid: 24 VDC Orange LED: 10 to 115 VAC/VDC	Mechanical lock Solenoid release	1NC/1NO+1NC/1NO	M20	D4NL-4AFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4AFA-B4-NPT
					1NC/1NO+2NC	M20	D4NL-4BFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4BFA-B4-NPT
					2NC+1NC/1NO	M20	D4NL-4CFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4CFA-B4-NPT
					2NC+2NC	M20	D4NL-4DFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4DFA-B4-NPT
					2NC/1NO+1NC/1NO	M20	D4NL-4EFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4EFA-B4-NPT
					2NC/1NO+2NC	M20	D4NL-4FFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4FFA-B4-NPT
					3NC+1NC/1NO	M20	D4NL-4GFA-B4
						M20 with 1/2" NPT adaptor	D4NL-4GFA-B4-NPT
				3NC+2NC	M20	D4NL-4HFA-B4	
					M20 with 1/2" NPT adaptor	D4NL-4HFA-B4-NPT	
				Solenoid lock Mechanical release	1NC/1NO+1NC/1NO	M20	D4NL-4AFG-B4
						M20 with 1/2" NPT adaptor	D4NL-4AFG-B4-NPT
					1NC/1NO+2NC	M20	D4NL-4BFG-B4
						M20 with 1/2" NPT adaptor	D4NL-4BFG-B4-NPT
					2NC+1NC/1NO	M20	D4NL-4CFG-B4
						M20 with 1/2" NPT adaptor	D4NL-4CFG-B4-NPT
					2NC+2NC	M20	D4NL-4DFG-B4
						M20 with 1/2" NPT adaptor	D4NL-4DFG-B4-NPT
					2NC/1NO+1NC/1NO	M20	D4NL-4EFG-B4
						M20 with 1/2" NPT adaptor	D4NL-4EFG-B4-NPT
					2NC/1NO+2NC	M20	D4NL-4FFG-B4
						M20 with 1/2" NPT adaptor	D4NL-4FFG-B4-NPT
3NC+1NC/1NO	M20	D4NL-4GFG-B4					
	M20 with 1/2" NPT adaptor	D4NL-4GFG-B4-NPT					
3NC+2NC	M20	D4NL-4HFG-B4					
	M20 with 1/2" NPT adaptor	D4NL-4HFG-B4-NPT					
Mechanical lock Solenoid release	2NC/1NO+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4EDA-B4-NPT				
		3NC+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4GDA-B4-NPT			
Solenoid lock Mechanical release	2NC/1NO+1NC/1NO		M20 with 1/2" NPT adaptor	D4NL-4EDG-B4-NPT			
		3NC+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4GDG-B4-NPT			

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Note: Consult factor for models with Korean S-mark certification.

 Select models are available for Rapid Delivery.

Visit this product on www.sti.com for details.