# D4GL

SpeedSPEC www.sti.com D4GL

## Guard Lock Safety-Door Switch

- Vertically mounting guard lock safety-door switch ideal for limited installation space
- Selectable operation key insertion direction
- Slim safety-door switch with an electromagnetic lock or unlock mechanism
- Built-in switches with multiple-contact construction are available
- A key holding force of 1,000 N minimum
- Can be used for either standard loads or microloads
- Lineup includes models with a conduit size of M20
- Variety of metallic heads available

## 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 | 2003010305064264 |
| KOSHA *2 | EN60947-5-1 | 2007-26 |

*1. Certification for CSA C22.2 No. 14 is authorized 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) | 0.75 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.

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

**C300**

| Rated voltage | Carry current | Current (A) | | Volt-amperes (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC | 2.5 A | 15 | 1.5 | 1,800 | 180 |
| 240 VAC | | 7.5 | 0.75 | | |

**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 |
|---|---|
| Rated operating voltage (100% ED) | 24 VDC ±10% |
| Current consumption | Approx. 200 mA |
| Insulation Class | Class F (130°C max.) |

### Indicator Characteristics

| Item / Type | LED |
|---|---|
| Rated voltage | 24 VDC |
| Current consumption | Approx. 3 mA |
| Color (LED) | Orange/Green |



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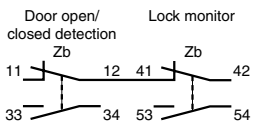
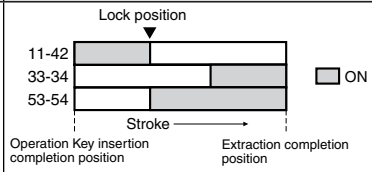
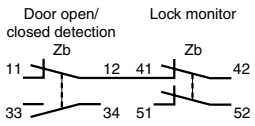
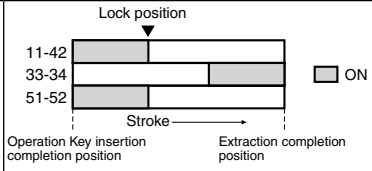
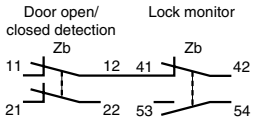
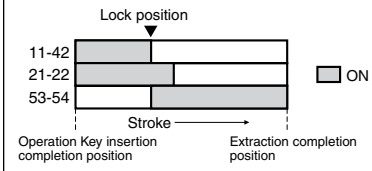
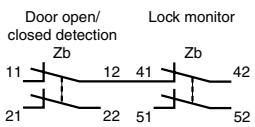
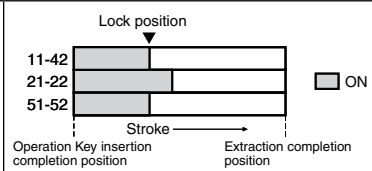
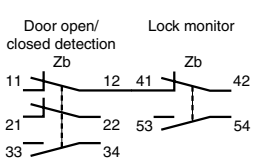
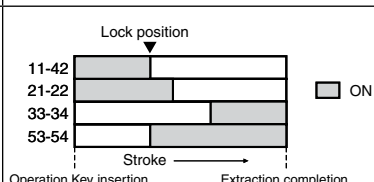
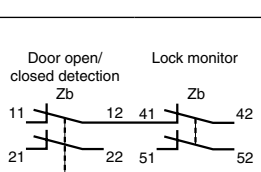
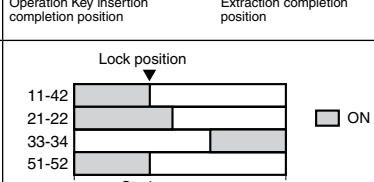
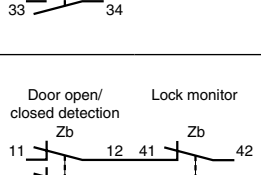
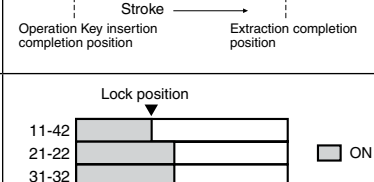
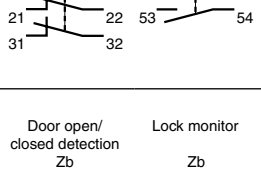
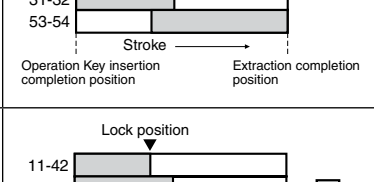
# Connections

## Contact Form

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

| Model | Contact (door open/closed detection and lock monitor) | Contact form | | Operating pattern | Remarks |
|---|---|---|---|---|---|
| | | Door open/ closed detection | Lock monitor | | |
| D4GL-☐AF☐-☐ | 1NC/1NO + 1NC/1NO |  | |  | Only NC contact 11-12 has a certified direct opening mechanism. ⊖<br>The terminals 11-42, 33-34, and 53-54 can be used as unlike poles. |
| D4GL-☐BF☐-☐ | 1NC/1NO + 2NC |  | |  | Only NC contact 11-12, has a certified direct opening mechanism. ⊖<br>The terminals 11-42, 33-34, and 51-52 can be used as unlike poles. |
| D4GL-☐CF☐-☐ | 2NC + 1NC/1NO |  | |  | Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. ⊖<br>The terminals 11-42, 21-22, and 53-54 can be used as unlike poles. |
| D4GL-☐DF☐-☐ | 2NC + 2NC |  | |  | Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. ⊖<br>The terminals 11-42, 21-22, and 51-52 can be used as unlike poles. |
| D4GL-☐EF☐-☐ | 2NC/1NO + 1NC/1NO |  | |  | Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. ⊖<br>The terminals 11-42, 21-22, 33-34, and 53-54 can be used as unlike poles. |
| D4GL-☐FF☐-☐ | 2NC/1NO + 2NC |  | |  | Only NC contacts 11-12 and 21-22 have a certified direct opening mechanism. ⊖<br>The terminals 11-42, 21-22, 33-34, and 51-52 can be used as unlike poles. |
| D4GL-☐GF☐-☐ | 3NC + 1NC/1NO |  | |  | Only NC contacts 11-12, 21-22, and 31-32 have a certified direct opening mechanism. ⊖<br>The terminals 11-42, 21-22, 31-32, and 53-54 can be used as unlike poles. |
| D4GL-☐HF☐-☐ | 3NC + 2NC |  | |  | Only NC contacts 11-12, 21-22, and 31-32 have a certified direct opening mechanism. ⊖<br>The terminals 11-42, 21-22, 31-32, and 51-52 can be used as unlike poles. |

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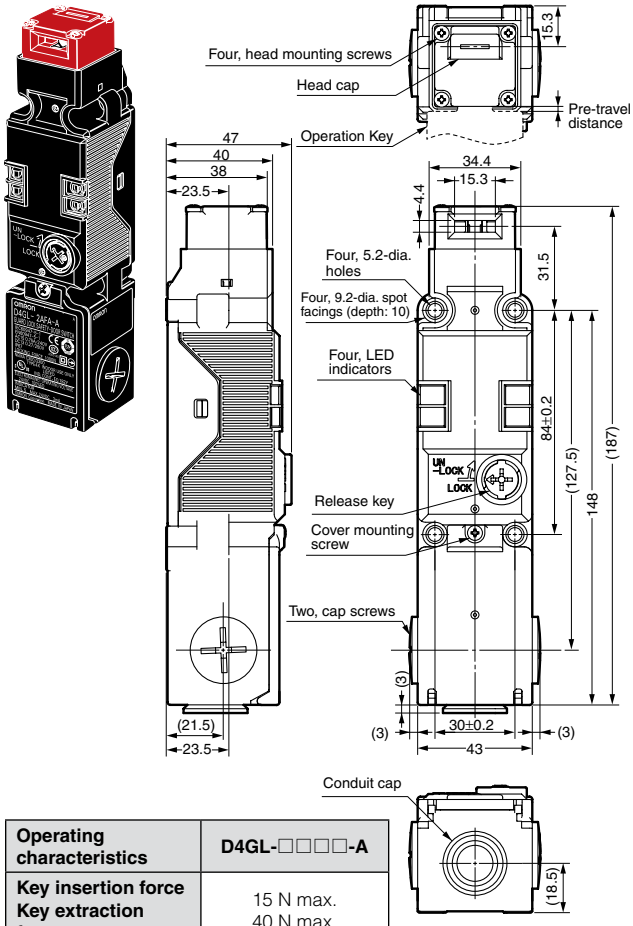
# Dimensions and Operating Characteristics

(mm)

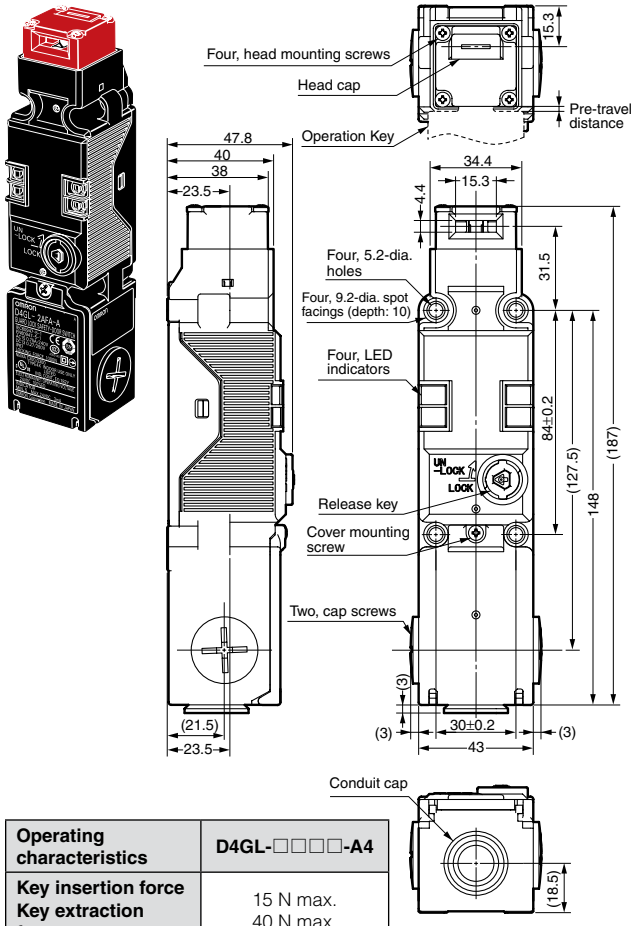
## Switches

### D4GL-□□□□-A




| Operating characteristics | D4GL-□□□□-A |
|---|---|
| Key insertion force<br>Key extraction force | 15 N max.<br>40 N max. |
| Pre-travel distance | 10 mm max. |
| Movement before being locked | 4 mm min. |

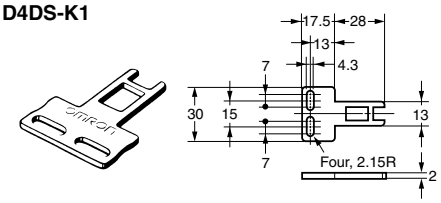
### D4GL-□□□□-A4



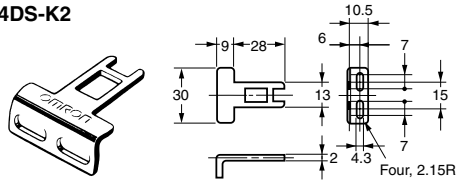

| Operating characteristics | D4GL-□□□□-A4 |
|---|---|
| Key insertion force<br>Key extraction force | 15 N max.<br>40 N max. |
| Pre-travel distance | 10 mm max. |
| Movement before being locked | 4 mm min. |

## Operation Keys

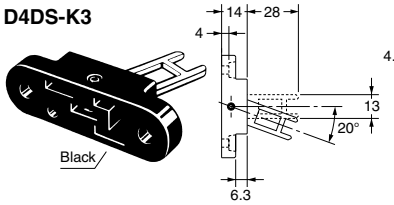
### D4DS-K1



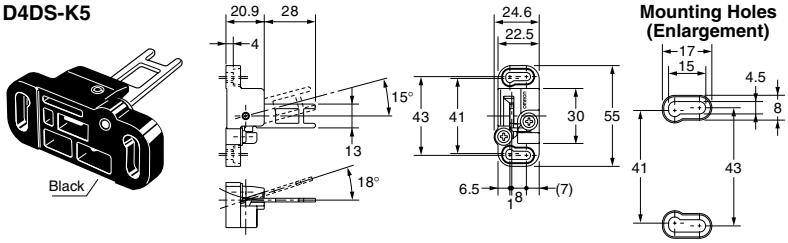

### D4DS-K2




### D4DS-K3




### D4DS-K5




Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.



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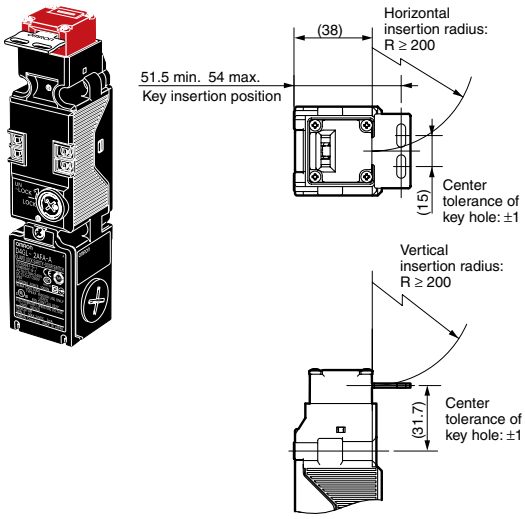
## Dimensions and Operating Characteristics (continued)

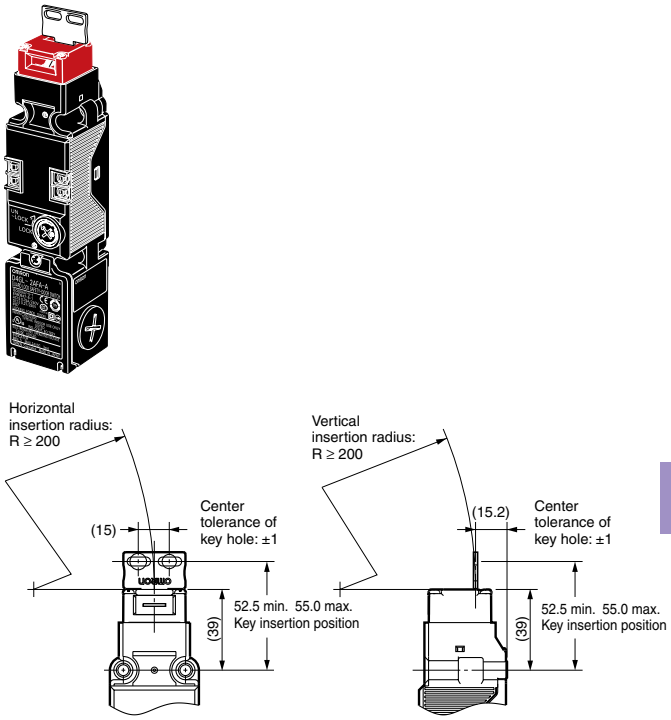
(mm)

### With Operation Key Inserted

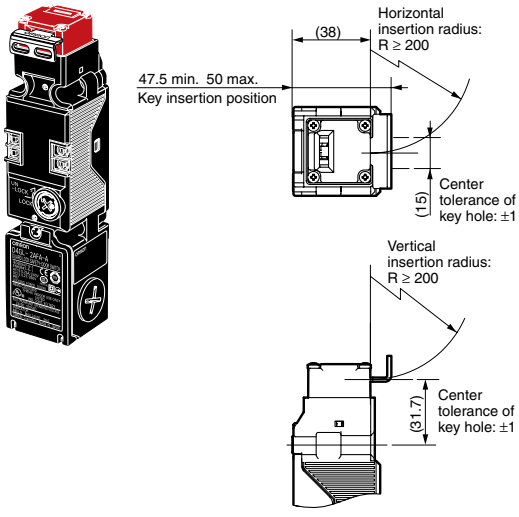
**D4GL + D4DS-K1**
**(with Front-inserted Operation Key)**



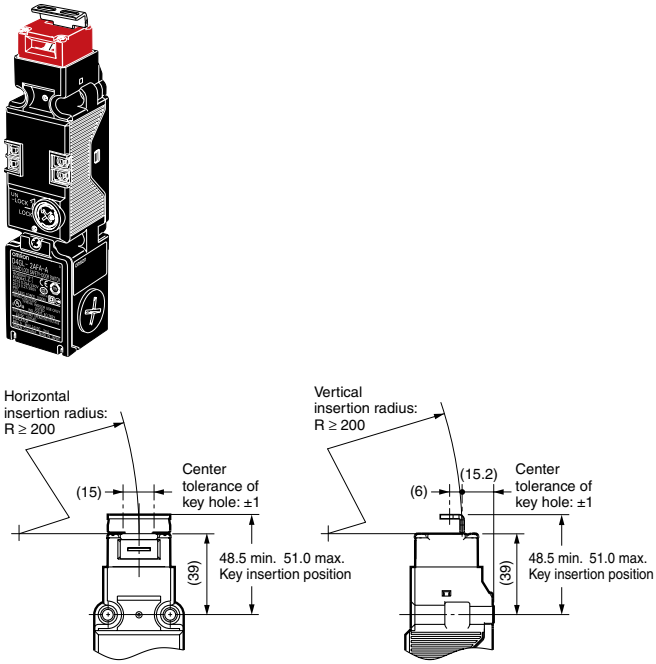

**D4GL + D4DS-K1**
**(with Top-inserted Operation Key)**




**D4GL + D4DS-K2**
**(with Front-inserted Operation Key)**




**D4GL + D4DS-K2**

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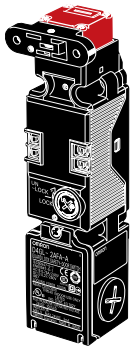
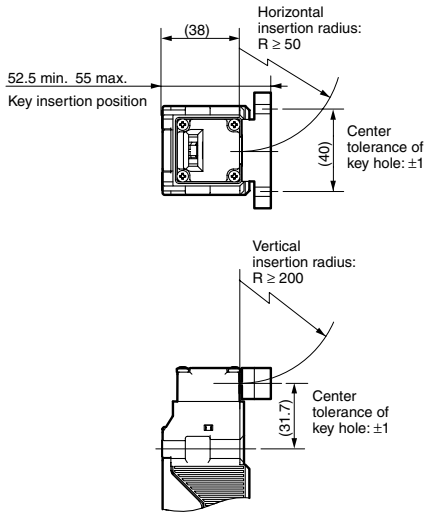
# Dimensions and Operating Characteristics (continued)

(mm)

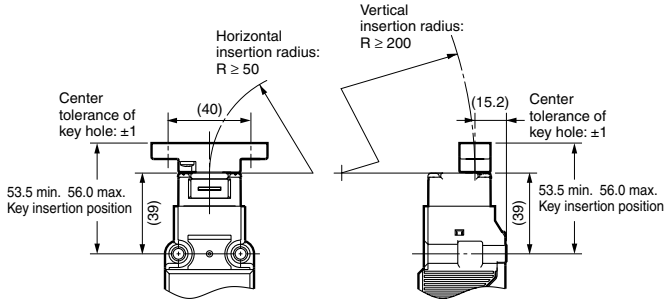
## With Operation Key Inserted

### D4GL + D4DS-K3 (with Front-inserted Operation Key)

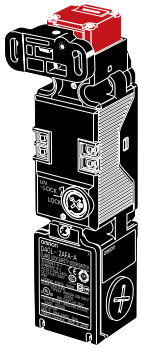


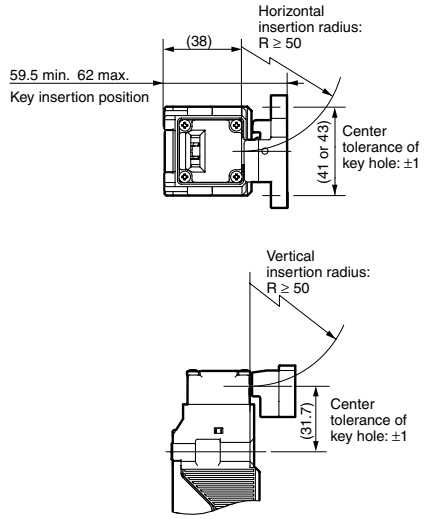



### D4GL + D4DS-K3 (with Top-inserted Operation Key)

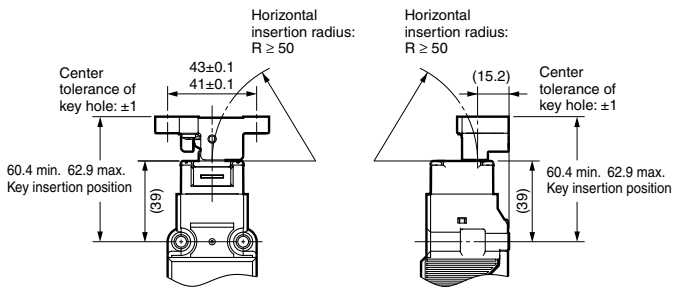



### D4GL + D4DS-K5 (with Front-inserted Operation Key)






### D4GL + D4DS-K5 (with Top-inserted Operation Key)



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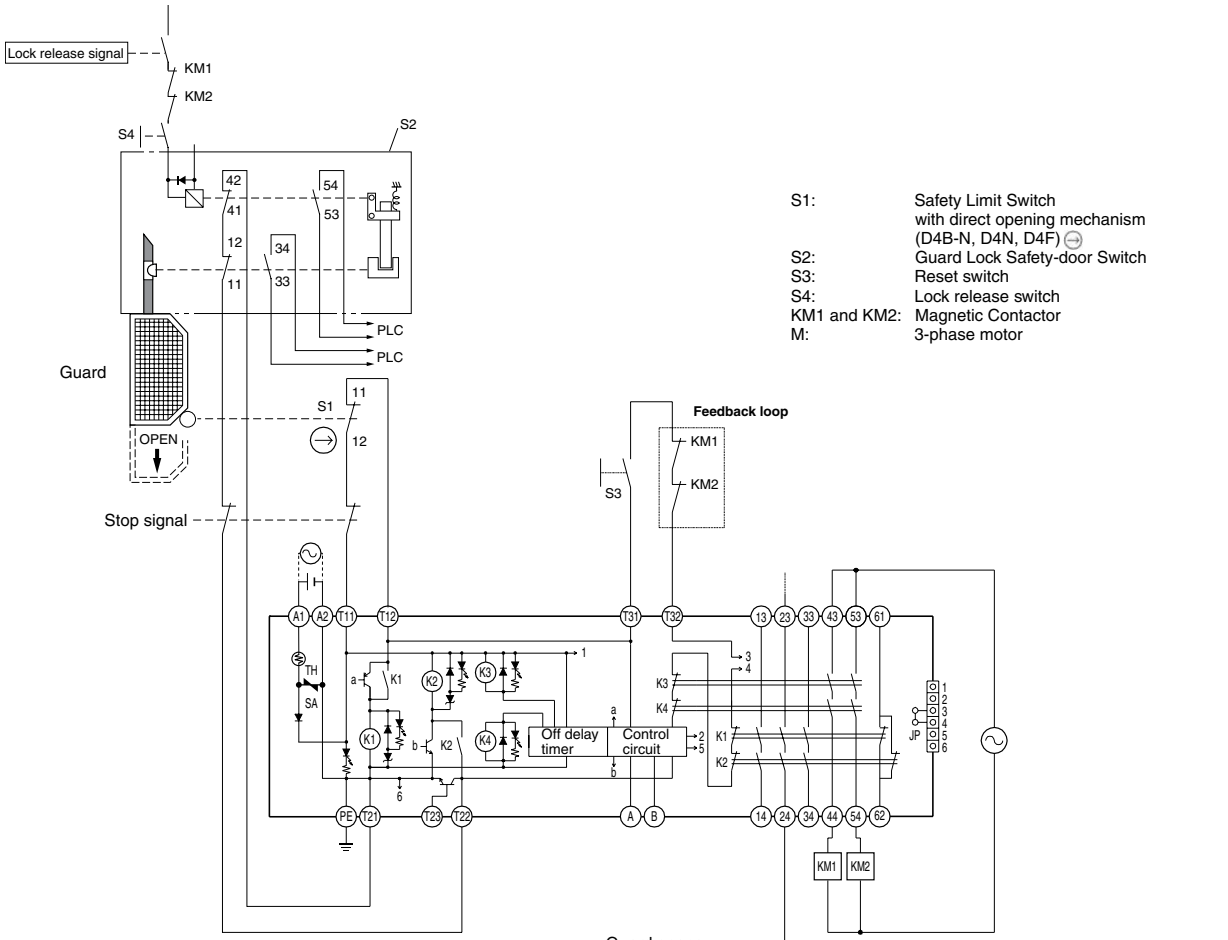
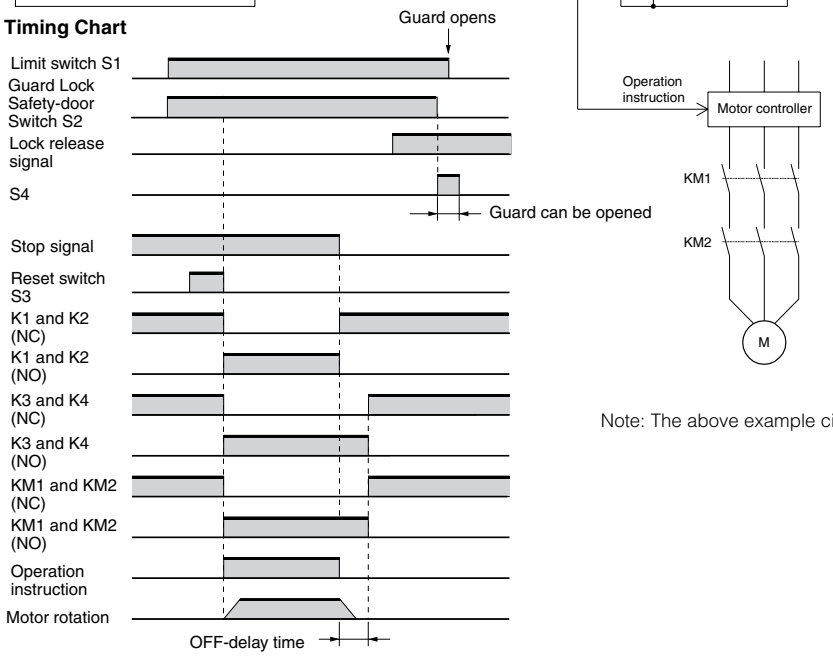
# Application Examples

## G9SA-321-T + D4GL-□AFA-□ (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.

# Ordering

## Model Number Structure

### Switch

D4GL – ☐ ☐ ☐ ☐ – ☐ ☐
❶ ❷ ❸ ❹ ❺ ❻

❶ Conduit Size
1: Pg13.5
2: G1/2
4: M20

❷ 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)

❸ 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

❹ Door Lock and Release
A: Mechanical lock/24 VDC solenoid release
G: 24 VDC solenoid lock/mechanical release

❺ Indicator
A: 24 VDC (orange/green LED indicator)

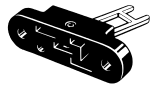
❻ Release Key Type
Blank: Standard release key
4: Special Release Key

❼ NPT, 1/2"-14 NPT Conduit Adapter included
(Applicable to M20 Conduit models only)
Note: To specify 1/2" NPT adapter, add "-NPT" to end of model code.

### Operation Key

D4DS-K ☐
❶

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

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

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

For information on the D4GL-SK10-LK Slide Key, see page G215.





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## Ordering (continued)

### List of Models

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

| Head Material | 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 size | Model |
|---|---|---|---|---|---|---|
| Plastic | Standard | Solenoid: 24 VDC Orange/Green LED: 24 VDC | Mechanical lock Solenoid Release | 1NC/1NO+1NC/1NO | M20 | D4GL-4AFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4AFA-A-NPT |
| | | | | 1NC/1NO+2NC | M20 | D4GL-4BFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4BFA-A-NPT |
| | | | | 2NC+1NC/1NO | M20 | D4GL-4CFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4CFA-A-NPT |
| | | | | 2NC+2NO | M20 | D4GL-4DFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4DFA-A-NPT |
| | | | | 2NC/1NO+1NC/1NO | M20 | D4GL-4EFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4EFA-A-NPT |
| | | | | 2NC/1NO+2NC | M20 | D4GL-4FFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4FFA-A-NPT |
| | | | | 3NC+1NC/1NO | M20 | D4GL-4GFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4GFA-A-NPT |
| | | | | 3NC+2NC | M20 | D4GL-4HFA-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4HFA-A-NPT |
| | | | Solenoid lock Mechanical Release | 1NC/1NO+1NC/1NO | M20 | D4GL-4AFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4AFG-A-NPT |
| | | | | 1NC/1NO+2NC | M20 | D4GL-4BFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4BFG-A-NPT |
| | | | | 2NC+1NC/1NO | M20 | D4GL-4CFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4CFG-A-NPT |
| | | | | 2NC+2NO | M20 | D4GL-4DFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4DFG-A-NPT |
| | | | | 2NC/1NO+1NC/1NO | M20 | D4GL-4EFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4EFG-A-NPT |
| | | | | 2NC/1NO+2NC | M20 | D4GL-4FFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4FFG-A-NPT |
| | | | | 3NC+1NC/1NO | M20 | D4GL-4GFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4GFG-A-NPT |
| | | | | 3NC+2NC | M20 | D4GL-4HFG-A |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4HFG-A-NPT |

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(Continued on next page)

## Ordering (continued)

### List of Models (continued)

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

| Head Material | 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 size | Model |
|---|---|---|---|---|---|---|
| Plastic | Special Release Key | Solenoid: 24 VDC Orange/Green LED: 24 VDC | Mechanical lock Solenoid Release | 1NC/1NO+1NC/1NO | M20 | D4GL-4AFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4AFA-A4-NPT |
| | | | | 1NC/1NO+2NC | M20 | D4GL-4BFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4BFA-A4-NPT |
| | | | | 2NC+1NC/1NO | M20 | D4GL-4CFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4CFA-A4-NPT |
| | | | | 2NC+2NO | M20 | D4GL-4DFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4DFA-A4-NPT |
| | | | | 2NC/1NO+1NC/1NO | M20 | D4GL-4EFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4EFA-A4-NPT |
| | | | | 2NC/1NO+2NC | M20 | D4GL-4FFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4FFA-A4-NPT |
| | | | | 3NC+1NC/1NO | M20 | D4GL-4GFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4GFA-A4-NPT |
| | | | | 3NC+2NC | M20 | D4GL-4HFA-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4HFA-A4-NPT |
| | | | Solenoid lock Mechanical Release | 1NC/1NO+1NC/1NO | M20 | D4GL-4AFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4AFG-A4-NPT |
| | | | | 1NC/1NO+2NC | M20 | D4GL-4BFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4BFG-A4-NPT |
| | | | | 2NC+1NC/1NO | M20 | D4GL-4CFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4CFG-A4-NPT |
| | | | | 2NC+2NO | M20 | D4GL-4DFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4DFG-A4-NPT |
| | | | | 2NC/1NO+1NC/1NO | M20 | D4GL-4EFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4EFG-A4-NPT |
| | | | | 2NC/1NO+2NC | M20 | D4GL-4FFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4FFG-A4-NPT |
| | | | | 3NC+1NC/1NO | M20 | D4GL-4GFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4GFG-A4-NPT |
| | | | | 3NC+2NC | M20 | D4GL-4HFG-A4 |
| | | | | | M20 with 1/2" NPT adaptor | D4GL-4HFG-A4-NPT |
| Metal | Special Release Key | 24 VDC | Mechanical lock Solenoid Release | 2NC/1NO + 1NC/NO | M20 with 1/2" NPT adaptor | D4GL-4EDA-A4-NPT |
| | | | Solenoid lock Mechanical Release | 3NC+1NC/1NO | | D4GL-4GDG-A4-NPT |
| | | | | 2NC/1NO + 1NC/NO | | D4GL-4EDG-A4-NPT |

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