D4NL

For full product information, visit www.sti.com. Use the SpeedSpec Code or scan the QR Code for quick access to the specific web page.

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



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D4NL



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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 (le)	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 shortcircuit protection device. This fuse is not built into the Switch.

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

Rated Carry		Curre	nt (A)	Volt-amp	eres (VA)
voltage	current	Make	Break	Make	Break
120 VAC	10.4	60	6	7 000	720
240 VAC	10 A	30	3	7,200	/20

Q300

Rated Carry		Curre	nt (A)	Volt-amperes (VA)	
voltage	current	Make	Break	Make	Break
125 VDC	054	0.55	0.55	69	69
250 VDC	2.5 A	0.27	0.27	69	69

Solenoid Coil Characteristics

Item	Туре	24 VDC	110 VAC	230 VAC
Rated oper- voltage (10		24 VDC +10%	110 VAC ±10%	230 VAC ±10%
Current consumption		Approx. 200 mA	Approx. 50 mA	Approx. 30 mA
Insulation Class		CI	ass F (130°C ma	x.)

Indicator Characteristics

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







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).

	Contact	Conta	ct form		
Model	(door open/closed detection and lock monitor)	Door open/ closed detection	Lock monitor	Operating pattern	Remarks
D4NL-□AF□-□	1NC/1NO + 1NC/1NO		Lock monitor <u>41</u> <u>53</u> <u>54</u> <u>54</u>	Lock position	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	Door open/ closed detection 11 2b 33 34	Lock monitor $41 \xrightarrow{Zb} 42$ $51 \xrightarrow{52}$	Lock position 11-42 33-34 51-52 Stroke Operation Key insertion completion position completion position	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		Lock monitor 41 42 53 54	Lock position 11-42 31-32 53-54 Operation Key insertion completion position Completion position	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	Door open/ closed detection 11 12 31 32	Lock monitor 41 42 51 52	Lock position 11-42 31-32 51-52 Operation Key insertion completion position The position of the positio	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	Door open/ closed detection 112b 1122 3334	Lock monitor 41 53 53 54	Lock position 11-42 21-22 33-34 53-54 Stroke Operation Key insertion completion position Completion co	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	Door open/ closed detection 112b12 2122 3334	Lock monitor 41 - 42 51 - 52	Lock position 11-42 21-22 33-34 51-52 Stroke Operation Key insertion completion position Completion position Completion Comp	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		Lock monitor 41 42 53 54	Lock position 11-42 21-22 31-32 53-54 Stroke Operation Key insertion completion position Completion position	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	Door open/ closed detection Zb 11 - 12 21 - 22 31 - 32	Lock monitor 41 51 52 52	Lock position	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.





Dimensions and Operating Characteristics

Switches





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



Operating	D4NL-□□□-
characteristics	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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(mm)

Dimensions and Operating Characteristics (continued)

(mm)



7 +13 - - - - - - - - - - - - -

D4DS-K2





15

Black



D4NL-000-Operating characteristics BS Key insertion force 15 N max. **Key extraction** 30 N max. force **Pre-travel distance** 9 mm max. Movement before 3 mm min. being locked

Operating	D4NL-000-
characteristics	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.

Angle adjustment bolt

зo

Mounting Holes (Enlargement)

AUTOMATION & SAFETY

30 40 56

2

24.6 22.5

Dimensions and Operating Characteristics (continued)



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Vertical

insertion radius: $R \ge 200$

Horizontal insertion radius:

B > 200

Ο

15

-0) i Ø

With Operating Key Inserted D4NL + D4DS-K1 D4NL + D4DS-K1 (with Front-inserted Operation Key) (with Top-inserted Operation Key) Vertical Red insertion radius: R ≥ 200 Black Horizontal Red insertion radius: Black Center 44 min 46.5 max R ≥ 200 (8) tolerance of Key insertion position (30.5) key hole: ± 1 49.5 min 52.0 max Q Center Î tolerance of Key insertion position (36) key hole: ± 1 Vertical insertion radius: R ≥ 200 44 min 46.5 max Horizontal insertion radius: Key insertion position • (30.5) R ≥ 200 Center Center (28.5) tolerance of key hole: ± 1 15 tolerance of key hole: ± 1 Τ. 49.5 min 52.0 max Ò Key insertion position (36) Ο

D4NL + D4DS-K2

Red

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(with Top-inserted Operation Key) Black

Center

45.5 min 48.0 max

Key insertion position (36)

Center tolerance of key hole: ± 1

45.5 min 48.0 max Key insertion position (36)

tolerance of

key hole: ± 1

(8)

(6)

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









Dimensions and Operating Characteristics (continued)







Application Examples

G9SA-321-T (24 VAC/VDC) + D4NL- A -, - A -, - A -, - A - C -(Mechanical Lock Type) Circuit Diagram (Manual Reset) Lock release signal KM1 KM2 S2 S4 |-42 54 Safety Limit Switch with direct opening mechanism (D4B-N, D4N, D4F) ⊖ -M S1: ĿĿĔ 53 12 34 S2: Guard Lock Safety-door Switch S3: S4: Reset switch Lock release switch 33 11 KM1 and KM2: Magnetic Contactor PLC M: 3-phase motor PLC Guard S1 Feedback loop \ominus OPEN KM1 ŧ S3 KM2 Stop signal \odot Ηн 13233343636 **®**≹≹ (K2 K3 S K4 OffDel Time Contro , ÷2|K1 JF \bigcirc **K**4) Circuit K2 (123)--(12) AB 14/24/34/44/54/62 PE)(T KM1 KM2 Guard opens **Timing Chart** Limit switch S1 Operation instruction Guard Lock Safety-door Motor controller Switch S2 Lock release signal KM1 S4 Guard can be opened KM2 Stop signal Reset switch S3 K1 and K2 (NC) K1 and K2 (NO) K3 and K4 (NC) K3 and K4 (NO) KM1 and KM2 (NC) Note: The above example circuit is for Category 3. KM1 and KM2 (NO) Operation instruction Motor rotation OFF-delay time

Select models are available for Rapid Delivery.

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Ordering

Model Number Structure

Switch

D4NL – 🗆 🗆 🗆 – 🗆 🗆 – 🗆

- 0000 000 8
- Conduit Size
 - 1: Pg13.5
 - 2: G1/2
 - 4: M20
- 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

Ooor 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*
- Indicator
 - B: 10 to 115 VAC/VDC (orange LED indicator)
- Release Key Type
 Blank: Standard
 4: Special release key
- Release Key Position
 Blank: Bottom
 S: Front
- M20-to-NPT Adapter Blank: Adapter is not included NPT: Adapter is included
- * 110 VAC version is not available for -4 \Box -NPT models.

Operation Key

D4DS-K 🗆

- 0
- Operation Key Type
 - 1: Horizontal mounting
 - 2: Vertical mounting
 - 3: Adjustable mounting (horizontal)
 - 5: Adjustable mounting (horizontal/vertical)



Special Release Key



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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
						M20	D4NL-4AFA-B
					1NC/1NO+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4AFA-B-NPT
						M20	D4NL-4BFA-B
					1NC/1NO+2NC	M20 with 1/2" NPT adaptor	D4NL-4BFA-B-NPT
						M20	D4NL-4CFA-B
					2NC+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4CFA-B-NPT
						M20	D4NL-4DFA-B
				Mechanical lock	2NC+2NC	M20 with 1/2" NPT adaptor	D4NL-4DFA-B-NPT
				Solenoid release		M20	D4NL-4EFA-B
					2NC/1NO+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4EFA-B-NPT
					2010/1010 - 2010	M20	D4NL-4FFA-B
					2NC/1NO+2NC	M20 with 1/2" NPT adaptor	D4NL-4FFA-B-NPT
				2NO 1NO 110	M20	D4NL-4GFA-B	
				;	3NC+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4GFA-B-NPT
					3NC+2NC	M20	D4NL-4HFA-B
Plastic	Bottom	Standard	Solenoid: 24 VDC			M20 with 1/2" NPT adaptor	D4NL-4HFA-B-NPT
riastic	Bollom	Stanuaru	Orange LED:		1NC/1NO+1NC/1NO	M20	D4NL-4AFG-B
			10 to 115 VAC/VDC			M20 with 1/2" NPT adaptor	D4NL-4AFG-B-NPT
							M20
						1NC/1NO+2NC	M20 with 1/2" NPT adaptor
						-	D4NL-4CFG-B
						M20 with 1/2" NPT adaptor	D4NL-4CFG-B-NPT
					2NC+2NC	M20	D4NL-4DFG-B
				Solenoid lock Mechanical	2110+2110	M20 with 1/2" NPT adaptor	D4NL-4DFG-B-NPT
				release	2NC/1NO+1NC/1NO	M20	D4NL-4EFG-B
					2NC/ INO+ INC/ INO	M20 with 1/2" NPT adaptor	D4NL-4EFG-B-NPT
						M20	D4NL-4FFG-B
					2NC/1NO+2NC	M20 with 1/2" NPT adaptor	D4NL-4FFG-B-NPT
						M20	D4NL-4GFG-B
					3NC+1NC/1NO	M20 with 1/2" NPT adaptor	D4NL-4GFG-B-NPT
						M20	D4NL-4HFG-B
					3NC+2NC	M20 with 1/2" NPT adaptor	D4NL-4HFG-B-NPT

(Continued on next page)

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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-NPTt
				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





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

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