

Special Key Positively Pulls Contacts Apart, Increasing Machine Safety

- Wide operating temperature range:
-40°C to 80°C
- Mounting pitch and shape of the switch box conforms to CENELEC EN50041
- Enclosure rating of the switch box meets: IP67 (IEC529)
- Four unique head mounting positions
- Approved Standards

Agency	Standard	File No.
TÜV	EN60947-5-1 (→)	R9351022
Rheinland	(IEC947-5-1 VDE0660 Part 200, 206 (P))	
UL	UL508	E76675
CSA	CSA C22.2 No.14	LR45746
BIA	GS-ET-15 EN60947-5-1 (→)	9303323
SUVA	SUVA	5610/1



Ordering Information

MODEL NUMBER LEGEND

Limit Switch

D4BS -
 1 2 3 4

1. Conduit

- 3: 1/2-14NPT (standard)
- 7: 1/2-14NPT (3 conduit)

2. Built-in Switch

- 5: DPDB-1NC/1NO (Slow-action)
- A: DPDB-2NC (Slow-action)

3. Head Mounting Direction

- F: Front-side mounting

4. Head Variation

- S: Standard

Operation Key

D4BS - K
 1

1. Operation Key Type

- 1: Horizontal mounting
- 2: Vertical mounting
- 3: Adjustable mounting

SWITCHES

Head mounting direction	Conduit size			
	Standard 1/2-14NPT		3 Conduit Switch 1/2-14NPT	
	DPDB-1NC/1NO (Slow-action)	DPDB-2NC (Slow-action)	DPDB-1NC/1NO (Slow-action)	DPDB-2NC (Slow-action)
Front-side mounting	D4BS-35FS	D4BS-3AFS	D4BS-75FS	D4BS-7AFS


■ ACCESSORIES (ORDER SEPARATELY)

Operation Key

Mounting type	Part Number
Horizontal	D4BS-K1
Vertical	D4BS-K2
Adjustable	D4BS-K3

Specifications

■ RATINGS

- IEC 947-5-1 and EN60947-5-1 
AC-15 2A/400 V (TÜV File No. R9351022)
- UL 508 (UL File No. E76675)
CSA C22.2 No. 14 (CSA File No. LR45746-59)
NEMA A600 (UL/CSA Pilot Duty)

Rated voltage	Current			Switching power	
	Continuous	Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		
480 VAC		15 A	1.5 A		
600 VAC		12 A	1.2 A		

3. General Ratings

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
250 VAC	10 A		2 A	1 A	10 A		3 A	1.5 A
400 VAC	10 A		1.5 A	0.8 A	3 A		1.5 A	0.8 A
8 VDC	10 A		6 A	3 A	10 A		6 A	
14 VDC	10 A		6 A	3 A	10 A		6 A	
30 VDC	6 A		4 A	3 A	6 A		4 A	
125 VDC	0.8 A		0.2 A	0.2 A	0.8 A		0.2 A	
250 VDC	0.4 A		0.1 A	0.1 A	0.4 A		0.1 A	

- Note: 1. Resistive loads have a power factor ($\cos = f$) of 1.
 2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 3. Lamp loads have an inrush current of 10 times the steady-state current, while motor loads have an inrush current of 6 times the steady-state current.

■ CHARACTERISTICS

Operating speed	0.1 mm/s to 0.5 m/s
Operating frequency	30 operations/min max.
Insulation resistance	100 M Ω min. (at 500 VDC) between terminals of same or different polarity, between each terminal and ground, and between each terminal and non-current-carrying metal part
Contact resistance	25 m Ω max. (initial value)
Dielectric strength	Impulse dielectric strength (U_{imp}) 4 kV (IEC 947-5-1) for 1 min between terminals of same or different polarity, between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part
Rated insulation voltage (U_i)	600 VAC (IEC947-5-1)
Conventional enclosed thermal current (I_{the})	20 A (IEC947-5-1)
Short-circuit protective device	10 A fuse (type gl) (IEC 269)

Vibration resistance	Malfunction	10 to 500 Hz, 0.65-mm single amplitude with an imposed acceleration of 100 m/s ² (10G max.) (IEC68-2-6)
Shock resistance	Destruction	1,000 m/s ² min. (approx. 100G min.) (IEC68-2-27)
	Malfunction	300 m/s ² min. (approx. 30G min.) (IEC68-2-27)
Life expectancy	Mechanical	1,000,000 operations min.
	Electrical	500,000 operations min. (with a load rate of 0.5)
Contact gap		2 x 2.0 mm min.
Positive opening force (see note 1)		19.61 N min. (4.41 lbf)
Positive opening stroke (see note1)		20 mm min.
Ambient temperature	Operating	-40°C to 80°C (-40°C to 176 °F) with no icing
Ambient humidity	Operating	95% max.
Temperature rise		30 deg max. (UL508)
Operating environmental pollution level		Pollution degree 3 (IEC947-5-1)
Enclosure ratings (see note 2)	IEC529	IP67
Insulation class		Insulation class I (IEC536)
Weight		Approx. 285 g (10.05 oz) for D4BS-15FS

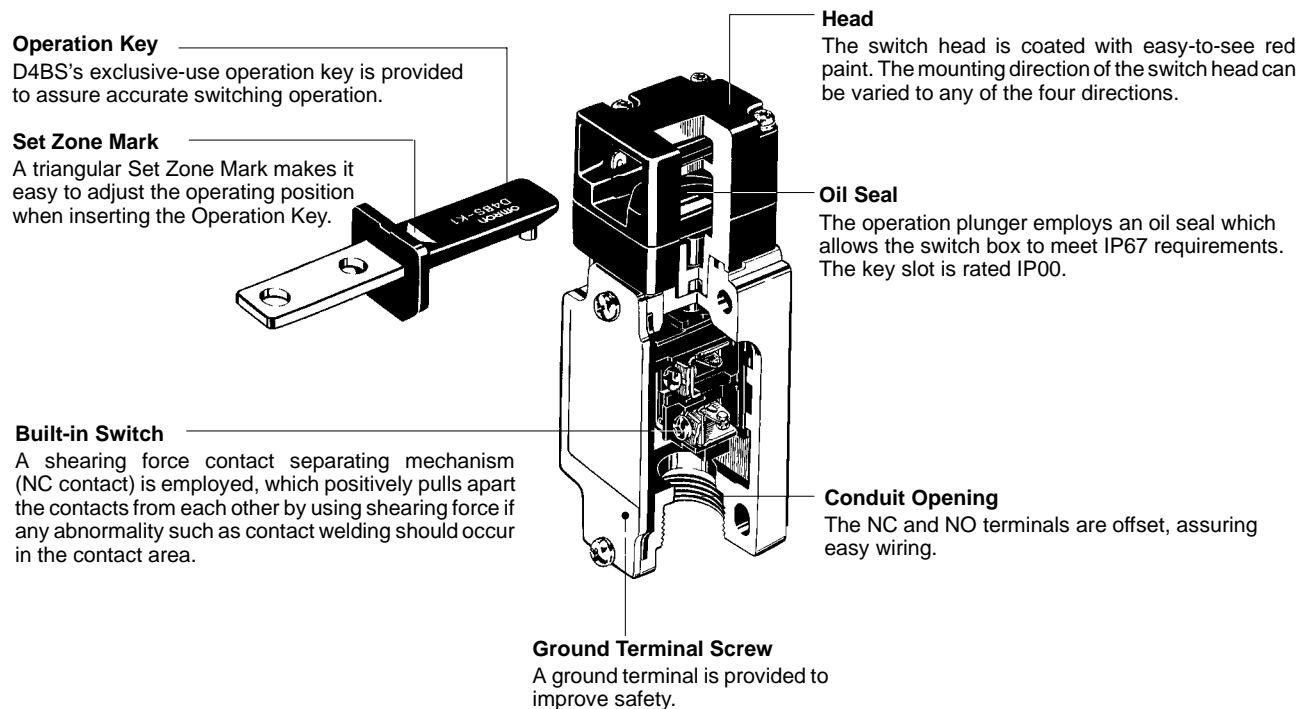
Note: 1. The above figures are minimum requirements for safe operation.

2. Although the switch box does not allow the penetration of dust, oil, or water, avoid as much as possible the penetration of dust, oil, or water into the head's Operation Key insertion mouth.

■ OPERATING CHARACTERISTICS

Operating force (extraction)	19.61 N (4.41 lbf) min.
Release force (insertion)	19.61 N (4.41 lbf) min.
Total travel	23 mm (0.91 inch) min.
Pretravel (PT)	10±5 mm (0.39±0.20 inch) min.

Nomenclature



Operation

CONTACT FORM

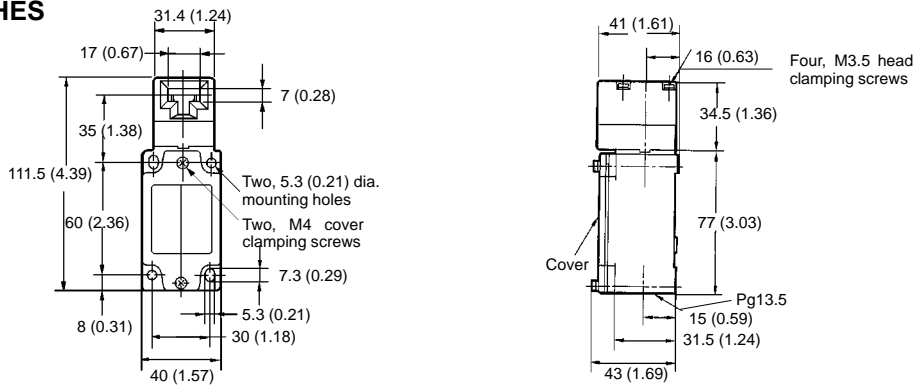
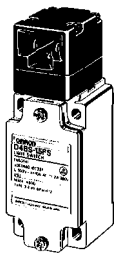
Part Number	Contact	Diagrams
D4BS-□5□S 1NC/1NO		<p>Stroke →</p> <p>Contact Operation Closed Open</p>
D4BS-□A□S 2NC		<p>Stroke →</p> <p>Insertion position Fully-drawn position</p>

Dimensions

Units: mm (inch)

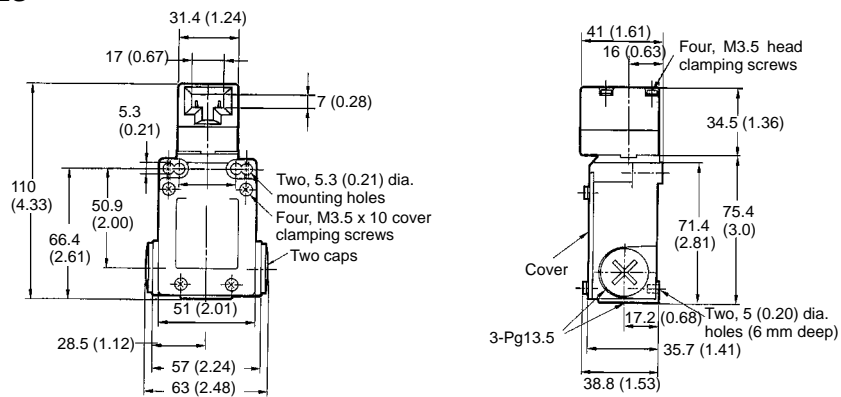
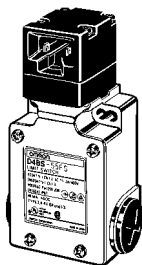
STANDARD SWITCHES

D4BS-3□□S



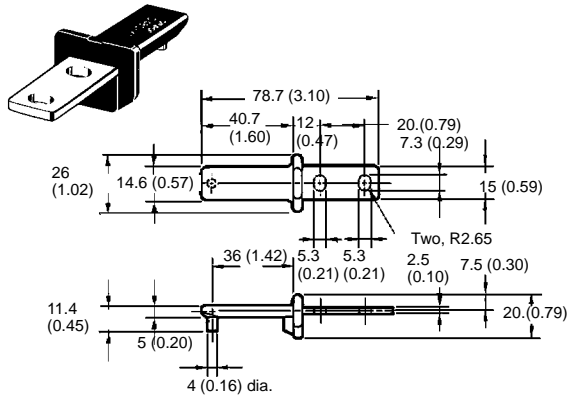
3 CONDUIT SWITCHES

D4BS-7□□S

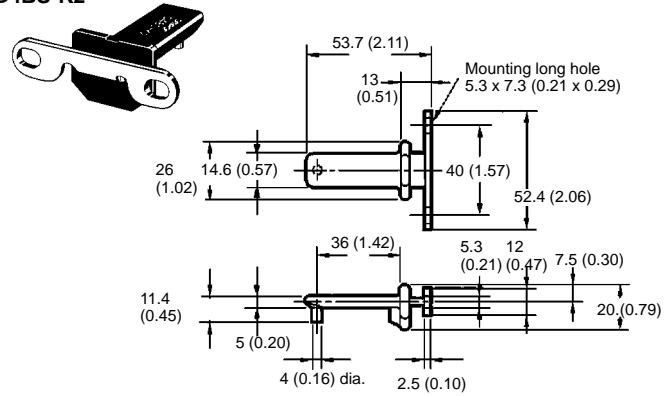


■ OPERATION KEYS

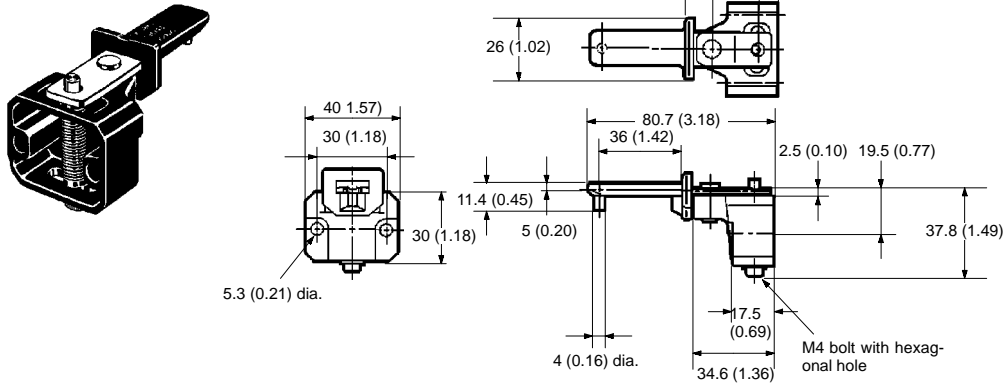
D4BS-K1



D4BS-K2

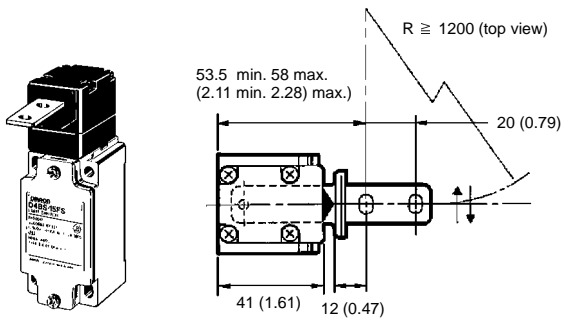


D4BS-K3

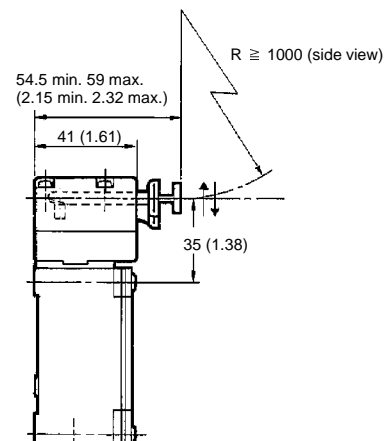
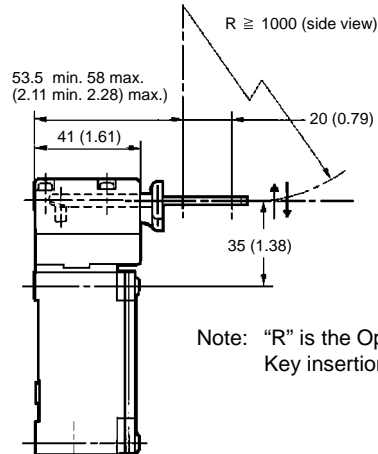
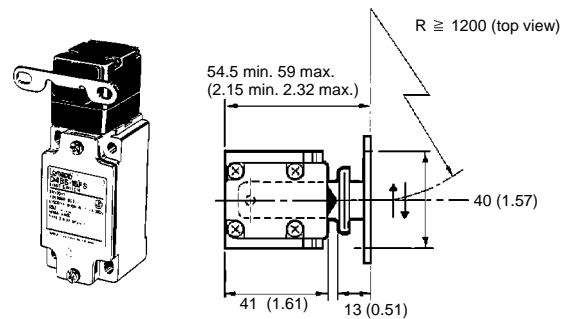


■ WITH OPERATION KEY INSERTED

D4BS-3□□S +D4BS-K1

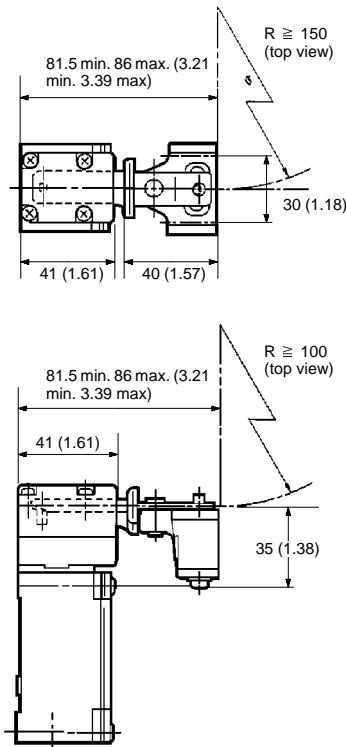
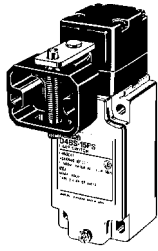


D4BS-3□□S +D4BS-K2



Note: "R" is the Operation Key insertion radius.

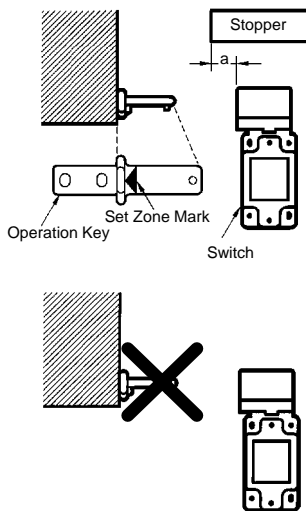
D4BS-3□□S +D4BS-K3



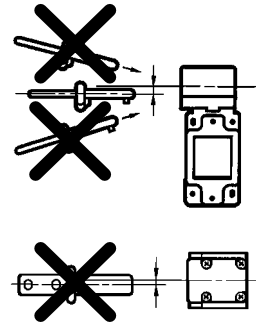
Precautions

■ MOUNTING

Be sure to install a stopper as shown in the following illustration when mounting the Safety-door Limit Switch. The range of space "a" must be determined according to the available set zone of the Operation Key.



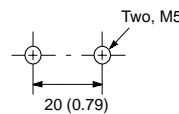
Refer to *Dimensions* for the mounting dimension of the Operation Key and mount the Operation Key correctly. The Operation Key will soon become damaged or worn away if it is not mounted correctly.



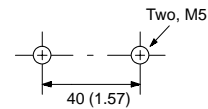
Tighten the mounting screws of the Operation Key with a tightening torque of 2.4 to 2.8 N•m (1.77 to 1.03 ft lbs).

The mounting holes for the Operation Key are as follows:

Horizontal Mounting



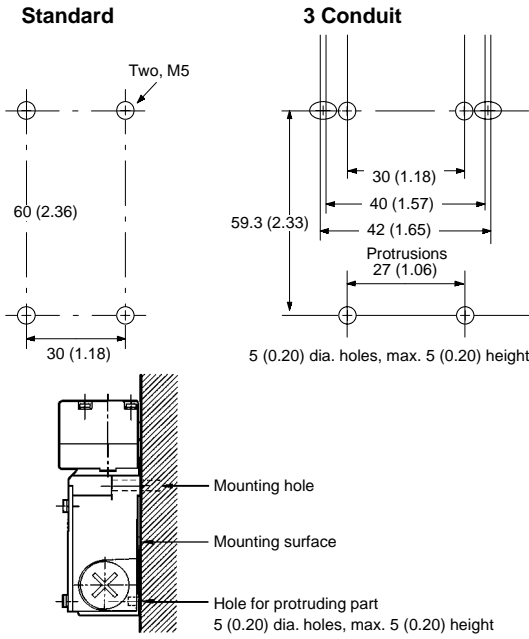
Vertical Mounting



Apply a tightening torque of 1.2 to 1.4 N•m (0.88 to 1.03 ft lbs) to M4 screws to mount a cover to the Standard Safety-door Limit Switch and a tightening torque of 0.8 to 0.9 N•m (0.59 to 0.66 ft lbs) to M3.5 screws to mount a cover to the 3-conduit Safety-door Limit Switch.

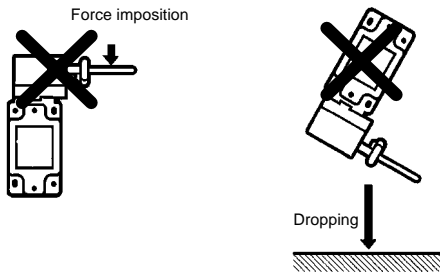
To mount the 3-conduit Safety-door Limit Switch, mounting screws are required as well as the preparation of two protruding parts (5 dia. $-0.05/-0.15$) to secure the switch as shown in the illustration.

Mounting Holes



OPERATION KEY

Do not impose excessive force to the Operation Key in the switch or drop the Operation Key, otherwise the Operation Key will be deformed or damaged.



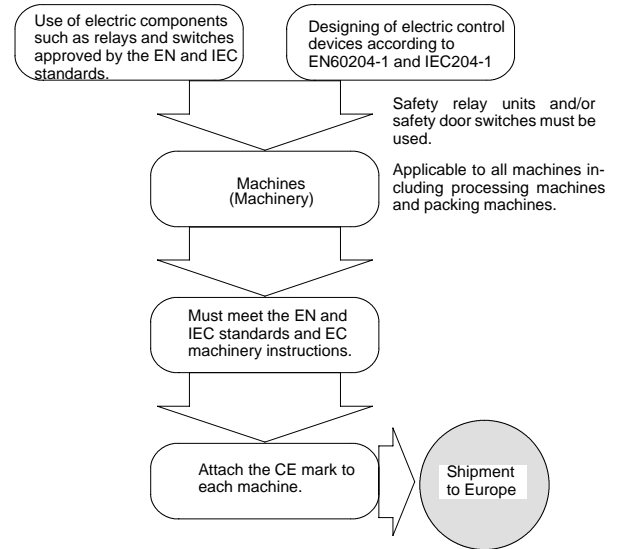
Do not operate the Safety-door Limit Switch with a tool other than OMRON's special Operation Key for the Safety-door Limit Switch, otherwise the Safety-door Limit Switch will be damaged or the safety of the system will not be assured.

SHIPMENTS OF CE-MARKED MACHINES FOR EUROPE

The CE Mark Is Essential for Machines Exported to Europe

According to the EC's machinery instruction 89/392/EEC, on and after January 1, 1995, shipments of machines with no CE mark to Europe will be restricted. The electric control parts of each CE-marked machine must meet the EN and IEC standards. Furthermore, EMC-restricted CE-marked electric devices and components must pass the EMC test. CE-marked machines are approved by the EC and can be exported to and imported from 18 European countries freely.

Confirmation of CE-marked Machines for Export



Must be Approved by Labor Accident Prevention Associations that Attach Great Importance to Safety and the Prevention of Accidents

CE-marked electric parts used for emergency stop circuits in safety door switches and other safety devices must meet the EN and IEC standards and, furthermore, must be approved by labor accident prevention associations. In Germany, the BG mark is attached to each part approved by the German Labor Accident Insurance Bureau called the BG (or VBG). In Switzerland, electric parts must be approved by the SUVA (Swiss Injury Insurance Bureau).

Purpose	Evaluated point	Standard	
Electric shock prevention	Insulation	EN	IEC and Electric Appliances Control Law
Fire prevention	Flame resistivity	UL, CSA	
Labor accident prevention	Prevention of malfunction and protection of workers	BIA (Germany) SUVA (Switzerland)	

BIA-approved BG Mark



CE Mark



NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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