HW Series Emergency Stop Switches

Emergency Stop Switches (with Removable Contact Block) Specifications

- Direct opening action mechanism.
  IEC60947-5-5, 5.2, IEC60947-5-1, Annex K
- Safety lock mechanism(IEC60947-5-5, 6.2)
- Degree of protection: IP65 (IEC60529)

Specifications

Operating Temperature	–25 to +60°C (no freezing)
Storage Temperature	–40 to +80°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Minimum Force Required for Direct Opening Action	50N
Minimum Operator Stroke Required for Direct Opening Action	5.5 mm
Maximum Operator Stroke	10 mm
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Dielectric Strength	Between live and dead metal parts Between terminals of different poles Between terminals of the same pole 2,500V AC, 1 minute
Shock Resistance	Operating extremes: 100 m/s^2 Damage limits: 1,000 m/s^2
Vibration Resistance	Operating extremes: 5 to 55Hz, amplitude 0.5 mm Damage limits: 30 Hz, amplitude 1.5 mm
Operating Frequency	900 operations/h
Life	Mechanical:500,000 operations minimum (push-pull: 250,000 operations) Electrical: 500,000 operations minimum (push-pull: 250,000 operations) (at 900 operations/h, duty ratio 40%)
Protection	IP65 (IEC 60529)
Short-circtuit protection	250V/10A fuse (Type aM IEC60269-1/IEC60269-2)
Terminal Style	M3.5 screw
Weight (approx.)	76g (HW1B-V322) 99g (HW1B-X422R) 54g (HW1B-Y202) 79g (HW1B-V422R-EMO)

Contact Ratings

Contact Block	Rated Insulation Voltage	600V
	Rated Thermal Current	10A
	Contact Ratings by Utilization Category IEC60947-5-1	AC-15 (A600) DC-13

Operating Voltage and Current by Utilization Category

Operating Voltage			24V	48V	50V	110V	220V	440V
Operating Current	AC 50/60 Hz	AC-12 Control of resistive loads and solid state loads	10A	–	10A	10A	6A	2A
		AC-15 Control of electromagnetic loads (> 72 VA)	10A	–	7A	5A	3A	1A
	DC	DC-12 Control of resistive loads and solid state loads	10A	5A	–	2.2A	1.1A	–
		DC-13 Control of electromagnets	5A	2A	–	1.1A	0.6A	–

Pushlock Turn Reset Switches

Shape	Contact	Part No.	Button Color
ø29mm Mushroom Pushlock Turn Reset HW1B-V3	1NC	HW1B-V301①	Specify a button color code in place of ① in the Part No. R: red Y: yellow
	1NO-1NC	HW1B-V311①	
	2NC	HW1B-V302①	
	2NO-2NC	HW1B-V322①	
ø40mm Mushroom Pushlock Turn Reset HW1B-V4	1NC	HW1B-V401①	
	1NO-1NC	HW1B-V411①	
	2NC	HW1B-V402①	
	2NO-2NC	HW1B-V422①	
ø60mm Mushroom Pushlock Turn Reset HW1B-V5	1NC	HW1B-V501①	
	1NO-1NC	HW1B-V511①	
	2NC	HW1B-V502①	
	2NO-2NC	HW1B-V522①	

- Yellow buttons cannot be used as emergency stop switches in compliance with EN standards.
- For pushlock turn reset, when pressed, the button is held depressed. The button is released by turning clockwise.
- Pushlock turn reset switches with one or three contact blocks contain a dummy block.
- Safety lever lock HW9Z-LS is supplied with the switch.
- Other contact arrangements and gold-plated silver contacts are also available. See page 2.

Pushlock Key Reset Switches

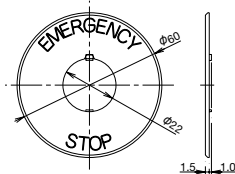| Shape		Contact	Part No.	Button Color
ø40mm Mushroom Pushlock Key Reset HW1B-X4		1NC	HW1B-X401R	Red only
		1NO-1NC	HW1B-X411R	
		2NC	HW1B-X402R	
		2NO-2NC	HW1B-X422R	

• For pushlock key reset switches, when pressed, the button is held depressed. The button is released by turning the key clockwise.

• Pushlock key reset switches with one or three contact blocks contain a dummy block.

• Two identical keys are supplied. (HW9Z-SK-231)

• Lever stopper is supplied. (HW9Z-LS)

• Other contact arrangements and gold-plated silver contacts are also available. See Part No. Development.

Push-Pull Switches

Shape		Contact	Part No.	Button Color
ø40mm Mushroom Push-Pull (2-position) HW1B-Y2		1NC	HW1B-Y201①	Specify a button color code in place of ① in the Part No. R: red Y: yellow
		1NO-1NC	HW1B-Y211①	
		2NC	HW1B-Y202①	

• Yellow buttons cannot be used as emergency stop switches in compliance with EN standards.

• For push-pull switches, the button is maintained at either pulled or depressed position.

• Push-pull switches with one contact block contain a dummy block.

• Push-pull switches are available with one or two contact blocks.
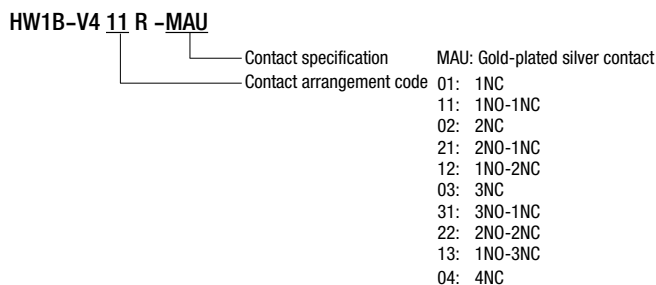
• Lever stopper is supplied. (HW9Z-LS)

Nameplate (for ø22 Emergency Stop Switches)

Shape	Name	Part No.	Ordering No.	Remarks
	Blank	HWAV-0-Y	HWAV-0-Y	HWAV-27-Y Background: Yellow Legend: Black Applicable panel thickness: 0.8 to 4.5mm Material: Polyamide Plastic Note) Not applicable for ø60 mm mushroom buttons. Legend "EMERGENCY STOP" is indicated outside a ø44mm circle. (Panel cut-out: page 3)
	EMERGENCY STOP	HWAV-27-Y	HWAV-27-Y	

• EMERGENCY OFF and white nameplates (blank) also available. For SEMI Emergency Off (EMO) Switches and Stop Switches, see website.

Part No. Development

HW series Emergency Stop Switches (page 1, 2)

HW1B–V4 11 R –MAU

Contact specification — MAU: Gold-plated silver contact

Contact arrangement code
01: 1NC
11: 1NO-1NC
02: 2NC
21: 2NO-1NC
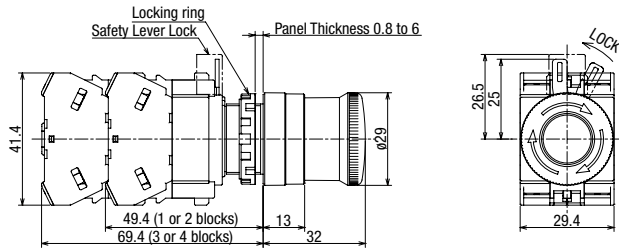12: 1NO-2NC
03: 3NC
31: 3NO-1NC
22: 2NO-2NC
13: 1NO-3NC
04: 4NC

Note
• Push-pull HW1B-Y2 can have a maximum of two contact blocks.
• For emergency stop purposes, these switches must contain at least one NC contact block.
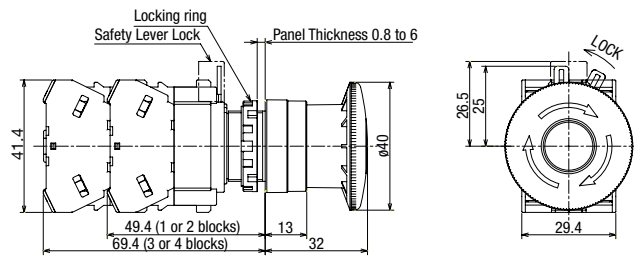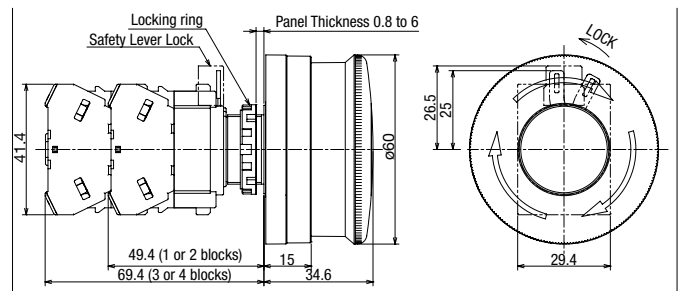
Dimensions

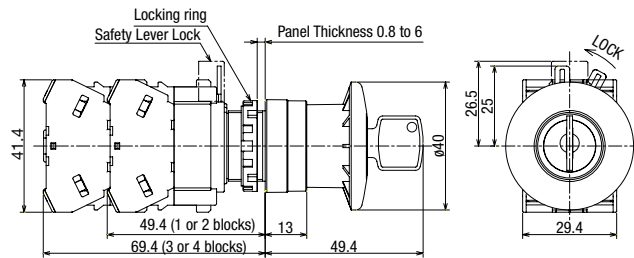(All dimensions in mm)

ø29mm Pushlock Turn Reset
HW1B-V3

Locking ring
Safety Lever Lock
Panel Thickness 0.8 to 6
LOCK
41.4
26.5
25
ø29
49.4 (1 or 2 blocks)
69.4 (3 or 4 blocks)
13
32
29.4

ø40mm Pushlock Turn Reset
HW1B-X4

Locking ring
Safety Lever Lock
Panel Thickness 0.8 to 6
LOCK
41.4
26.5
25
ø40
49.4 (1 or 2 blocks)
69.4 (3 or 4 blocks)
13
32
29.4

ø60mm Pushlock Turn Reset
HW1B-V5

Locking ring
Safety Lever Lock
Panel Thickness 0.8 to 6
LOCK
41.4
26.5
25
ø60
49.4 (1 or 2 blocks)
69.4 (3 or 4 blocks)
15
34.6
29.4

ø40mm Pushlock Turn Reset
HW1B-X4

Locking ring
Safety Lever Lock
Panel Thickness 0.8 to 6
LOCK
41.4
26.5
25
ø40
49.4 (1 or 2 blocks)
69.4 (3 or 4 blocks)
13
49.4
29.4

ø40mm Push-Pull
HW1B-Y2

Locking ring
Safety Lever Lock
Panel Thickness 0.8 to 6
LOCK
41.4
26.5
25
ø40
49.4 (1 or 2 blocks)
13
32
29.4

Bottom View

Dummy block
Dummy block

1 contact block
3 contact blocks
2, 4 contact blocks
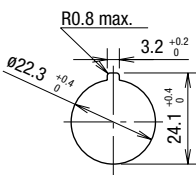
• For wiring, see ø22 HW series Switches & Pilot Lights catalog
• Integrated terminal cover

Panel Cut-Out / Mounting Hole Layout

R0.8 max.
3.2 $^{+0.2}_{0}$
ø22.3 $^{+0.4}_{0}$
24.1 $^{+0.4}_{0}$

HW1B (Minimum Mounting Centers for Emergency Stop Switches)
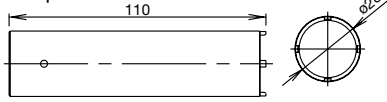
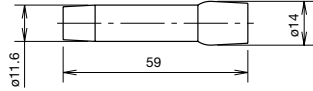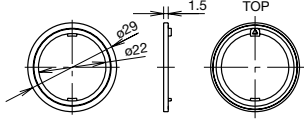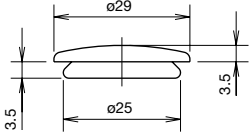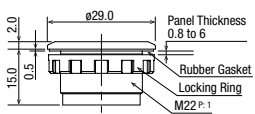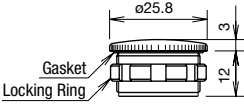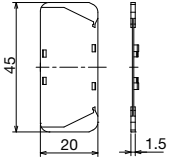|	Vertical Spacing	Horizontal Spacing
HW1B-V3 HW1B-V4 HW1B-X4 HW1B-Y2	50mm minimum	50mm minimum
HW1B-V5	60mm minimum	60mm minimum

Note: When using the safety lever lock, determine the vertical spacing in consideration of convenience for installing and removing the safety lever lock.
Recommended vertical spacing: 100 mm

• The minimum mounting centers shown below are applicable to emergency stop switches with one layer of contact blocks (two contact blocks). When two layers of contact blocks are mounted, determine the minimum mounting centers in consideration of convenience for wiring. (see ø22 HW series Switches & Pilot Lights catalog)

Accessories

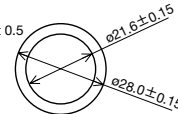| Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
Locking Ring Wrench	Metal (brass) (weight: approx. 150g)	MW9Z-T1	MW9Z-T1	1	Used to tighten the locking ring when installing the HW switch onto a panel.
Lamp Holder Tool	Rubber (Black)	OR-55	OR-55	1	Used to install and remove the LED lamps.
Anti-rotation ring	<Ring> Polyamide <Gasket> Nitrile rubber	HW9Z-RL	HW9Z-RLPN10	10	IP65 protection
Mounting Hole Plug	Rubber (Black) Nitrile	OB-31	OB-31PN05	5	• Used to plug the unused ø22.2 mm mounting holes. • Degree of protection: IP40
Mounting Hole Plug	Polyamide	LW9Z-BP1	LW9Z-BP1	1	• Used to plug the unused ø22.2mm mounting holes. • Tightening torque: 2.0 N·m • Degree of protection: IP65 • Panel thickness: 0.8 to 6.0mm
Mounting Hole Plug	<Plug> Metal (Diecast) <Locking ring> Polyamide <Gasket> Nitrile rubber	LW9Z-BM	LW9Z-BM	1	• Used to plug the unused ø22.2 mm mounting holes. • Tightening torque : 1.2N·m • Degree of protection: IP66 (without ø3.2 anti-rotation ring) • Panel thickness: 0.8 to 6.0mm
Barrier	Polyamide	HW-VU1	HW-VU1PN10	10	• Used to prevent contact between adjacent lead wires when units are mounted closely (Barriers should always be used in close mounting.)
Ring Adapter	Rubber	HW9Z-A25	HW9Z-A25PN05	5	• Used to install the HW series units into ø25 mm mounting holes. IP65 • Cannot be used with anti-rotation, nameplate • Mounting panel thickness: 1.2 to 6.0 mm
Ring Adapter	Body: Plastic Washer: Metal	HW9Z-A30	HW9Z-A30PN02	2	• Used to install the HW series units (round type) into ø30 mm mounting holes (except for HW1E.) • Degree of protection: IP65 • Cannot be used with anti-rotation ring, nameplate fullshroud illuminated pushbuttons, pushbutton selectors, and mono-lever switches. • Mounting panel thickness: 1.6 to 4.0 mm

Maintenance Parts

Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
Safety Lever Lock	Polyacetal (yellow)	HW9Z-LS	HW9Z-LSPN10	10	A safety lever lock is supplied with a standard HW series
Lockig Ring	Polyamide (black) ø28.4 H5 M22P1	HW9Z-LN	HW9Z-LNPN05	5	Black
Gasket	Nitryl rubber (black)	HW9Z-WM	HW9Z-WMPN10	10	Black t 0.5 ø21.6±0.15 ø28.0±0.15
Spare Key	Metal (nickel-plated brass)	HW9Z-SK-231	HW9Z-SK-231PN02	2	For pushlock key reset switches

⚠ Safety Precautions

- Turn off the power before starting installation, removal, wiring, maintenance, and starting installation, removing, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid a burn on your hand, use the lamp holder tool when replacing lamps.

- For wiring, use wires of a proper size to meet the voltage and current requirements. Tighten the terminal screws to the recommended tightening torque (see page 6). Failure to tighten terminal screws may cause overheat and fire.

Operating Instructions

Panel Mounting

1) Remove the contact block from the operator.
2) Remove the locking ring from the operator.
3) Insert the operator into the panel cut-out from the front.
   When installing the namplate insert between the operator and panel.
4) Tighten the locking ring from the back to install the contact block to the operator.

Panel Thickness 0.8 to 6mm

Nameplate

HW Series Operator (example)

Rubber Gasket HW9Z-WM (Thickness = 0.5)

Panel

Locking Ring
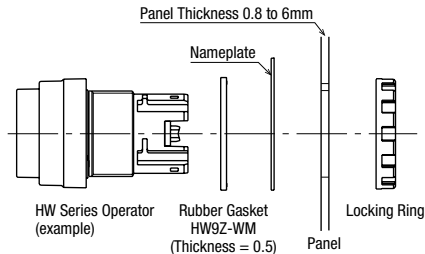
Mounting panel thickness is reduced by 1.5 mm when using a nameplate.

Removing the Contact Block

1) Remove the safety lever lock (yellow) from the lock lever by inserting a flat screwdriver into the safety lever lock and push upwards.

Locking Lever

Install

Safety Lever Lock

LOCK

26.5

Safety Lever Lock

Screwdriver

Remove

Operator

Contact Unit

Panel
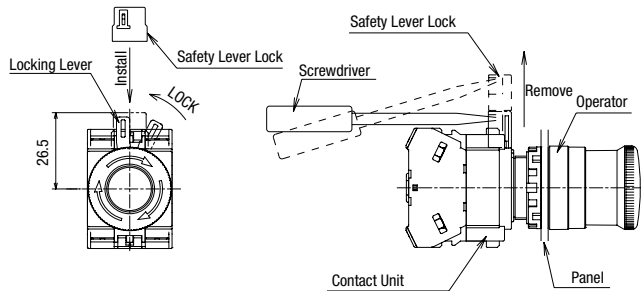
2) Remove the operator from the contact block by turning the locking lever in the direction of the arrow shown below. Then the operator can be pulled out.
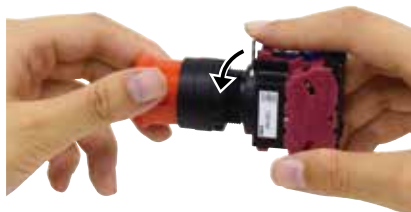
3) To reinstall, place the TOP marking on the operator and the lock lever in the same direction, and insert the operator into the contact block mounting adapter. Then turn the locking lever in the opposite direction.
4) Install the safety lever lock (yellow) on the lock lever. The safety lever lock cannot be installed when the lock lever is not upright.

Safety Lever Lock

IDEC strongly recommends using the safety lever lock (HW9Z-LS, yellow) to ensure that lock lever is locked, or to prevent maintenance personnel from unlocking contacts during wiring.

How to install

Mount the HW series onto the panel, lock the lever, and push in the safety lever lock.

Spacing in Vertical Direction

HW series can be installed with a minimum of 50 mm spacing in vertical direction. Be sure to take the space required for installing/removing the safety lever lock into consideration. When the spacing is narrower than the recommended value, install the HW series units in the order of low to high. When removing, do so in the opposite direction.

Notes for Panel Mounting

Locking ring wrench recommended torque

Tighten the bezel to a tightening torque of 2.0 N·m.

Locking ring wrench

Locking ring wrench (MW9Z-T1) can be used to tighten the bezel. Do not use pliers. Excessive tightening will damage the locking ring.
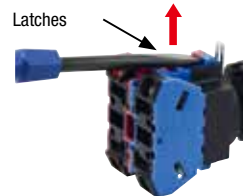
Locking ring wrench (MW9Z–T1)

Panel Thickness

HW series can be mounted on a panel with thickness of 0.8 to 6.0 mm. Take the thickness of nameplate and/or switch guard into consideration.

Contact Blocks

Insert a flat screwdriver (4 to 6 mm) into the snap-fit latches of the contact block or full voltage adapter and lift to remove.

Latches

• Make sure to lift both latches. Contact blocks cannot be removed by lifting one latch only.
• Do not apply excessive force to the latches, otherwise damage maybe caused.

Recommended Tightening Torque
Number of Wires

Unit	Wire		Number of Wires	Recommended Tightening Torque	Terminal Screw
HW-U Contact Block	Crimping Terminal		2	1.0 to 1.3	M3.5
	Solid Wire	ø0.5 to 1.6 mm (AWG14 to 22)	2	1.0 to 1.3	
		ø1.7 to 2.0 mm (AWG12)	1	1.2 to 1.3	
	Stranded Wire	0.3 to 2.0 mm² (AWG14 to 22)	2	1.0 to 1.3	
		2.1 to 3.5 mm² (AWG12)	1	1.2 to 1.3	

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