HW Series — 22mm IEC Style Global Pushbuttons

Key features include:

- Locking lever removable contact blocks
- Finger-safe IP20 contacts as standard, other terminal styles available
- Tamperproof construction
- All E-stops meet EN418 and are compliant with SEMI S2 standards
- Worldwide approvals
- Easy to assemble
- Choice of black plastic or metallic front bezels
- Incandescent or LED illumination
- Transformer or full voltage
- Slow make double break self cleaning contacts

HW: The Best Engineered Switch in the World

IDEC's HW switches are "The best engineered switch in the world" for a reason. Carrying the CE mark, UL, CSA, CCC (Chinese), and TUV approvals, these switches are designed for use in almost any part of the world.

Complete with finger-safe contact blocks offering IP20 protection, these 7/8" (22mm) switches include illuminated and non-illuminated pushbuttons, pilot lights, selector switches, and emergency stop switches.

All switches also incorporate mechanically keyed safety locking levers, ensuring correct installation and maintaining safety in high-vibration applications.

File No. E68961

File No. LR92374

Registration No. R9551089 (E-stops)
Registration No. R50054316 (Dual Pushbuttons)
Registration No. J9650511 (Pilot Lights)
Registration No. J9551458 (all other switches)

TÜV Rheinland
Certificate No.
2005010305145656

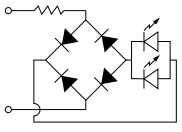
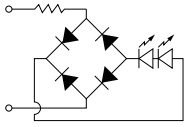
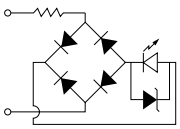
Specifications

Electrical	Rated Operational Characteristics	AC-15: A600 or Ue = 250V, Ie = 3A (NO, NC, NO-EM, NC-LB) DC-13: P600 or Ue = 125V, Ie = 1.1A (NO, NC) DC-13: Q600 or Ue = 125V, Ie = 0.9A (NO-EM, NC-LB)
	Maximum Inrush Current	40 A (40 ms)
	Rated Insulation Voltage	600V
	Rated Switching Over-Voltage	Less than 4kV, conforming to IEC60947-1
	Rated Impulse Withstanding Voltage	4kV for contact circuit, 2.5kV for lamp circuit
	Rated Thermal Current	10 Amp
	Minimum Switching Capacity	5 mA at 3V AC/DC
	Electrical Reliability	MTBF < 1 fault for 10 million operation cycles (3V DC, 5mA)
	Lamp Ratings	Incandescent: 1 W LEDs: 6V/17mA max, 12V & 24V/11mA max, 120 & 240V/10mA max
Mechanical	Contact Operation	Slow break NC or NO, self-cleaning
	Positive Action Operation (Emergency Stops with NC contacts)	5.5mm to 10mm travel to latch, 45N minimum force to latch 10mm maximum travel, 1,800 operations per hour maximum for a Pushlock Turn Reset 900 operations per hour maximum for a Push-Pull
	Operating Force	Flush and extended pushbuttons—with 1NO or 1NC contact: 6.2±2N (momentary), 7.0±2N (maintained) Additional contacts—1NO or 1NC: +3.2N (momentary), + 3.3N (maintained)
	Recommended Terminal Torque	0.8 N m (7.1 in lb.)
	Applicable Wire Size	Minimum 1 x 22 AWG, max. 2 x 14 AWG or 1 x 12 AWG
	Contact Resistance	Initial contact resistance of 50mΩ or less
	Contact Gap	4mm (NO and NC), 2mm (NO-EM and NC-LB)
	Horsepower Rating	Reference Value: 1/4 HP @ 120V (1ø non-reversing), 1HP @ 240V (3ø non-reversing)
	Contact Material	Silver (gold plated contacts available - contact IDEC)
	Operating Temperature	Operation: –25 to +50°C (without freezing), Storage: –40 to +70°C (without freezing)
	Vibration Resistance	10 to 55Hz, 98m/sec^2 (10G) conforming to IEC6068-2-6
	Shock Resistance	980m/sec^2 (100G) conforming to IEC6068-2-7
	Mechanical Life	Momentary pushbuttons: 5,000,000 (900 operations per hour), All other switches: 500,000

Standards & Approvals	Conforming to Standards		EN60947-1, EN60947-5-1, VDE0660-200, UL508, CSA C22-2 No.14					
	Approvals File No. E68961 (UL) File No. LR92374 (SP) (CCC) Registration No. R9551089 (E-stops) Registration No. R50054316 (Dual Pushbuttons) Registration No. J9650511 (Pilot Lights) Registration No. J9551458 (all other switches) TÜV Rheinland Certificate No. 2005010305145656		CSA: pushbuttons and selector switches: A600 pilot lights and illuminated pushbuttons, direct supply pilot lights and illuminated pushbuttons with integral transformer (100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V) UL: pushbuttons and selector switches: A600 pilot lights and illuminated pushbuttons, direct supply pilot lights and illuminated pushbuttons with integral transformer (100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V) TÜV: pushbuttons and selector switches: A600=P600 (NO, NC)/Q600 (NO-EM, NC-LB) pilot lights and illuminated pushbuttons, direct supply pilot lights and illuminated pushbuttons with integral transformer (100/110, 115, 120, 200/220, 230, 240, 380, 400/440, 480V)					
	Electric Shock Protection		Class 0 conforming to IEC60536					
	Degree of Protection (conforming to IEC60529) (conforming to NEMA ICS6-110)		IP65 (from front of the panel) IP20 (Type HW-F contact block) NEMA 1, 2, 3, 3R, 3S, 4, 4X, 5, 12, 13 (from front of panel)					
	Pollution Degree (conforming to IEC60947-1)		3 for switches not using a transformer, 2 for switches using a transformer					
	External Short-Circuit Protection		10A 250V fuse conforming to IEC60269-1					
	Terminal Referencing		Conforming to CENELEC EN50005					
Contact Ratings	Pushbuttons Illuminated Pushbuttons Selector Switches Illuminated Selector Switches Pushbutton Selectors		Contact Block		Type HW-C/HW-F /HW-G			
			Rated Insulation Voltage		600V			
			Rated Continuous Current		10A			
			Contact Ratings by Utilization Category IEC 60947-5-1		AC-15 (A600) DC-13 (P600)			
Characteristics	Operational Voltage			24V	48V	50V	110V	220V	440V
	Operational Current	AC 50/60 Hz	AC-12 Control of resistive loads & solid state loads	10A	—	10A	10A	6A	2A
			AC-15 Control of electromagnetic loads (> 72VA)	10A	—	7A	5A	3A	1A
		DC	DC-12 Control of resistive loads & solid state loads	8A	5A	—	2.2A	1.1A	—
			DC-13 Control of electromagnets	5A	2A	—	1.1A	0.6A	—

For dimensions, see page 551.

LED Lamp Ratings (LSTD Type)

Model No.			LSTD-6②	LSTD-1②	LSTD-2②	LSTD-H2②	LSTD-M4②
Lamp Base			BA9S/13				
Rated Voltage			6V AC/DC	12V AC/DC	24V AC/DC	120V AC	240V AC
Voltage Range			6V AC/DC ±10%	12V AC/DC ±10%	24V AC/DC ±10%	120V AC ±5%	240V AC ±5%
Current Draw	AC	A, R, W:	17mA	11mA	11mA	10mA	10mA
		G, S:	8mA				
	DC	A, R, W:	14mA	10mA	10mA	–	–
		G, S:	5.5mA				
Color Code			A (amber), G (green), R (red), S (blue), W (white)				
Lamp Base Color			Same as illumination color				
Voltage Marking			Die stamped on the base				
Life (reference value)			Approx. 50,000 hours (The luminance reduces to 50% the initial intensity when used on complete DC.)				
Internal Circuit			A, R, W	A, R, W			
							
			G, S				
							

In place of ②, specify the Lens/LED Color Code.

Pilot Lights (Assembled)

		Round Flush		Dome	
		Plastic Bezel	**Metal Bezel**	**Plastic Bezel**	**Metal Bezel**
Operator Only		*HW1P-1FQ0-②*	*HW4P-1FQ0-②*	*HW1P-2FQ0-②*	*HW4P-2FQ0-②*
Full Voltage		HW1P-1FQ④-②-③	HW4P-1FQ④-②-③	HW1P-2FQ④-②-③	HW4P-2FQ④-②-③
Transformer	**120V AC**	HW1P-1FH2④-②	HW4P-1FH2④-②	HW1P-2FH2④-②	HW4P-2FH2④-②
	240V AC	HW1P-1FM4④-②	HW4P-1FM4④-②	HW1P-2FM4④-②	HW4P-2FM4④-②
	480V AC	HW1P-1FT8④-②	HW4P-1FT8④-②	HW1P-2FT8④-②	HW4P-2FT8④-②
DC-DC Converter*	**110V DC**	HW1P-1D2D-②	–	HW1P-2D2D-②	–

		Square Flush
		Plastic Bezel
Operator Only		*HW2P-1FQ0-②*
Full Voltage		HW2P-1FQ④-②-③
Transformer	**120V AC**	HW2P-1FH2④-②
	240V AC	HW2P-1FM4④-②
	480V AC	HW2P-1FT8④-②
DC-DC Converter*	**110V DC**	HW2P-1D2D-②

② Lens/LED Color Code

Color	Code
Amber	A
Green	G
Red	R
Blue	S
White	W
Yellow	Y

③ Full Voltage Code

Voltage	Code
6VAC/DC	6V
12VAC/DC	12V
24VAC/DC	24V
120V AC (LED only)	120V
240V AC (LED only)	240V

④ Lamp Type Code

Lamp	Code
Incandescent	Blank
LED	D

1. In place of ②, specify the Lens/LED Color Code from table below.
2. In place of ③specify the Full Voltage Code from table below.
3. In place of ④ specify Lamp Type Code from table below.
4. *DC-DC convertor voltage input from 90-140V DC, comes with spring-up terminals only.
5. DC-DC converter models with LED lamps only.
6. For nameplates and accessories, see page 546 and 549.
7. For dimensions, see page 551.
8. **Pilot lights do not come with anti-rotation ring.**
9. Operator models come with operator and lens.
10. **Yellow pilot light comes with white LED.**

Part Number Structure

H W 1 P – 2 F Q D – R – 12V

Bezel
1: Round Plastic
2: Square Plastic
4: Round Metal

Operator
1: Flush
2: Dome

Illumination Circuit
Q: Full Voltage
H2: 120V AC Transformer
M4: 240V AC Transformer
T8: 480V AC Transformer
D2: DC-DC Converter

Lamp Type Code
D: LED
Blank: Incandescent

Lens/LED Colors
A: Amber
G: Green
R: Red
S: Blue
W: White
Y: Yellow

Lamp Voltage
(full voltage units only)
6V: 6V AC/DC
12V: 12V AC/DC
24V: 24V AC/DC
120V: 120V AC*
240V: 240V AC*
*LED only

Pilot Lights (Replacement Parts)

Transformer*	+	Lamp	+	Operator	+	Lens	=	Completed Unit





(not applicable for full voltage units)

Transformer Units

Style	Voltage	Part Number
LED/Incandescent  (6V secondary voltage)	120V AC	HW-FH20 HW-MH20*
	240V AC	HW-FM40 HW-MM40*
	480V AC	HW-FT80 HW-RT80*
	110V DC**	HW-RD0*

1. *With spring-up terminals - to use spring-up terminal type, must use transformer type operator designed for spring-up transformer.
2. ** DC-DC converter voltage input from 90-140V DC.

Lamps

Type	Voltage	Part Number
LED 	6V AC/DC	LSTD-6②
	12V AC/DC	LSTD-1②
	24V AC/DC	LSTD-2②
	120V AC	LSTD-H2②
	240V AC	LSTD-M4②
Incandescent 	6V AC/DC	IS-6
	12V AC/DC	IS-12
	24V AC/DC	IS-24

1. In place of ②, specify the LED Color Code.
2. The LED contains a current-limiting resistor and reverse polarity protection diodes.

② LED Color Code

Color	Code	Color	Code
Amber	A	Blue	S
Green	G	White	W
Red	R		

For yellow lens use white LED.

Operators

Style		Type	Plastic Bezel	Metal Bezel
Round Flush 	Full Voltage	Standard	HW1P-1FQ0	HW4P-1FQ0
		Spring-up Terminals	HW1P-1Q0	HW4P-1Q0
	Transformer	Standard	HW1P-10	HW4P-10
		Spring-up Terminals	HW1P-100	–
Dome 	Full Voltage	Standard	HW1P-2FQ0	HW4P-2FQ0
		Spring-up Terminals	HW1P-2Q0	HW4P-2Q0
	Transformer	Standard	HW1P-20	HW4P-20
		Spring-up Terminals	HW1P-200	–
Square Flush 	Full Voltage	Standard	HW2P-1FQ0	–
		Spring-up Terminals	HW2P-1Q0	
	Transformer	Standard	HW2P-10	–
		Spring-up Terminals	HW2P-100	–

1. Transformer type requires separate transformer & lamp. Must select correct transformer bases on standard or spring up terminal type. Use 6V lamps or LEDs.
2. Full voltage type only requires lamp.

Lenses

Style		Part Number
Round/ Flush		HW1A-P1-③
Dome		HW1A-P2-③
Square/ Flush		HW2A-P1-③

In place of ③, specify the Lens Color Code.

③ Lens Color Code

Color	Code
Amber	A
Green	G
Red	R
Blue	S
White	W
Yellow	Y

For yellow lens use white LED.

Accessories

	Appearance	Description/Usage		Part Number	
Locking Ring Wrench		Metallic tool used to tighten the plastic locking ring when installing the HW series in a panel		MW9Z-T1	
Lamp/LED Removal Tool		Rubber tool makes lamp/LED removal easier.		OR-55	
Anti-Rotation Ring		Prevents rotation of switches in panel. (included with all assembled switches except pilot lights)		for notched panel cutout (standard)	HW9Z-RL
				for round panel cutout	LW9Z-L
Rubber Mounting Hole Plug		Black rubber plug fills unused 7/8" mounting holes in panel.		OB-31	
Metallic Mounting Hole Plug		For plugging unused 7/8" mounting holes in the panel. Tighten the attached locking ring to a torque of 12 kfg-cm maximum Degree of protection: IP66		LW9Z-BM	
Barrier		To prevent contact between adjacent lead wires when buttons or switches are tightly mounted close together.		HW-VL1	
Pushbutton Clear Boot		Used to cover and protect pushbuttons Operating temperature: –50 to +60°C		Flush Pushbuttons	OC-31
				Extended Pushbuttons	OC-32
Padlock Cover		Plastic hinged padlockable cover to protect pushbuttons or selector switches. (Not intended for E-Stops) Degree of protection: IP65		HW9Z-KL1	
Tab Terminal Adapter		Tab #250 (6.35 x 0.8mm): Single tab		TW-FA1	
Mounting Adaptor		Used to mount round HW series (except Jumbo Mushroom, unibody, and square units) into a larger panel cut-out. (includes both pieces)	22 to 30mm	HW9Z-A30	
			22 to 25mm	HW9Z-A25	
Replacement Safety Lever Lock		Used to prevent contact mounting lever from moving due to heavy vibration or panel maintenance.		HW9Z-LS	
Reset Rod for Contactors Overload		5" rod used with HW1B-M0.		HW9Z-RS-TK2141	
Replacement Operator Washer		Provided with operator. Insert between bezel and locking ring.		HWM-WASHER	
Replacement Locking Ring		Plastic locking nut comes with all HW operators & assemblies.		Standard (plastic)	HW9Z-LN
				Optional (metal)	HW9Z-LNM
Switch Cover (Square)		Used only with round or square flush pushbuttons.		HW9Z-K1 (spring return) HW9Z-K11 (maintained cover)	
Replacement Keys		Pair of Keys (#231)		HW9Z-SKP	

	Appearance	Description/Usage	Part Number
Replacement Lens		HW Illuminated Unibody Replacement Lens	HWLV-LENSR
Replacement Jumbo Dome Lens		Polycarbonate Replacement Lens	HW1A-P5① ① = (A, G, R, S, W, Y)
Replacement Jumbo LED Diffusing Lens			HW9Z-PP5C
Replacement LED Lamps for HW Jumbo Dome		Replacement LED Lamp - applicable for jumbo pilot lights only	LSTDB-2① ① = (A, G, R, S, W, Y)
Rubber Cover for Dual Pushbuttons		Clear Silicon rubber cover	HW9Z-D7D
Barrier for Dual Pushbuttons		Plastic barrier. Used when mounting the HW7 units on 30mm horizontal centers, to prevent possible interconnections between adjoining terminals.	HW-VG1
EMO Sticker		Emergency stop nameplate sticker	HW9Z-EMO-NP-TK2120

E-Stop Shrouds

Style	Part Numbers	E-Stop Types	Applicable Standards
	HW9Z-KG1	40mm Mushroom Head	SEMI S2-0703, 12.5.1 Compliant
	HW9Z-KG2	40mm, and 60mm Mushroom Head	SEMI S2-0703, 12.5.1 & SEMATECH Compliant

Style	Part Numbers	E-Stop Types	Applicable Standards
	HW9Z-KG3	40mm Mushroom Head	SEMI S2 Compliant (Approved by TUV)
	HW9Z-KG4	40mm Mushroom Head	SEMI S2 Compliant (Approved by TUV) & SEMATECH

Contact Assemblies

Standard Contact Assemblies

For use with Non-Illuminated Pushbuttons & E-Stops

Style	Contacts	Part Number
Standard Fingersafe Contacts 	1NO	HW-CBF10
	1NC	HW-CBF01
	1NO/1NC	HW-CBF11
	2NO	HW-CBF20
	2NC	HW-CBF02
	2NO/2NC	HW-CBF22
Spring Up Terminal Contacts 	1NO	HW-CB10
	1NC	HW-CB01
	1NO/1NC	HW-CB11
	2NO	HW-CB20
	2NC	HW-CB02
	2NO/2NC	HW-CB22

Gold contact option is available for spring-up terminals. Add suffix "MAU" to end of part number. For example, HW-CB20 becomes HW-CB20-MAU.

Full Voltage Contact Assemblies

For use with Illuminated Pushbuttons.

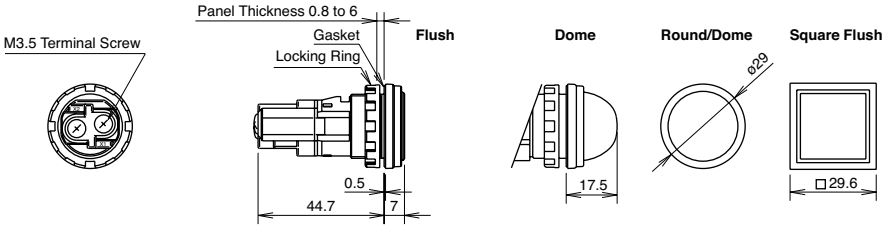
Style	Contacts	Part Number
	1NO	HW-FL10Q0
	2NO	HW-FL20Q0
	1NO/1NC	HW-FL11Q0
	1NC	HW-FL01Q0
	2NC	HW-FL02Q0

Order lamp separately.

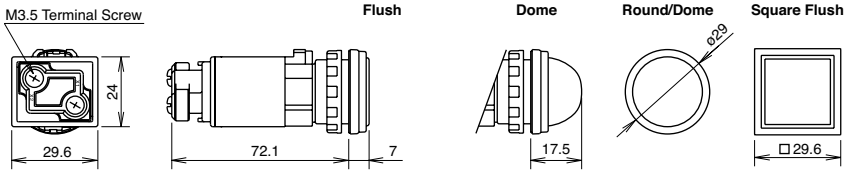
Pilot Lights

Dimensions (mm)

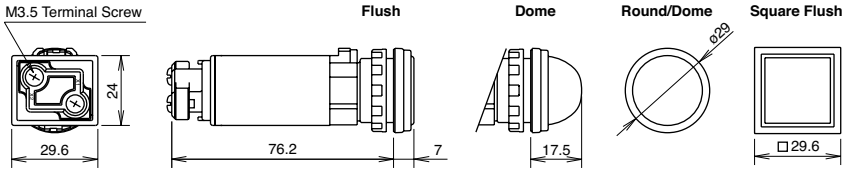
Full Voltage



Transformer

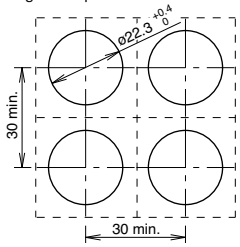


DC-DC Converter



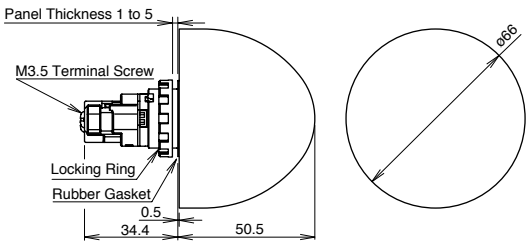
Mounting Hole Layout

Close mounting on 30mm centers
Degree of protection: IP65

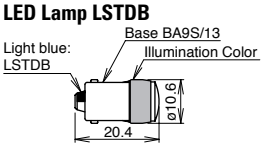


When mounting transformer or DC-DC converter type units on 30mm centers vertically and horizontally, keep the ambient temperature below 40ºC.

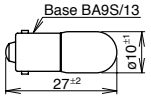
Jumbo Dome Pilot Lights



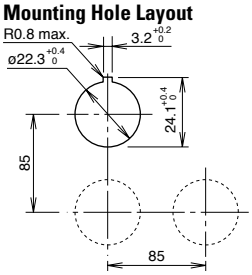
LED Lamp LSTDB



Incandescent Lamp LSB



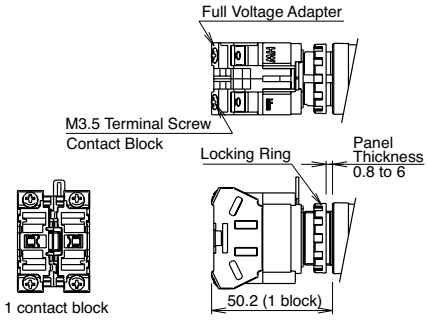
Mounting Hole Layout



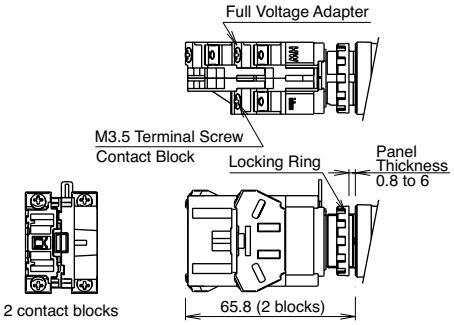
Illuminated Pushbuttons

Full Voltage Models

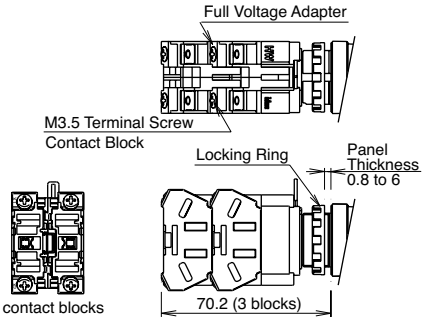
1 Contact Block



2 Contact Blocks

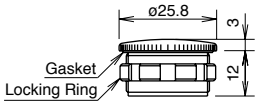


3 Contact Blocks

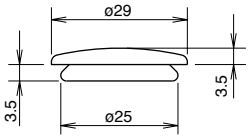


Accessory Dimensions

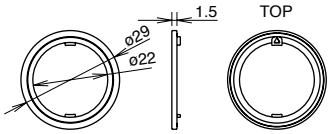
LW9Z-BM
Metallic Mounting Hole Plug



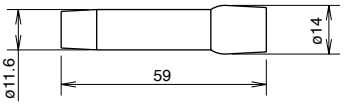
OB-31
Rubber Mounting Hole Plug



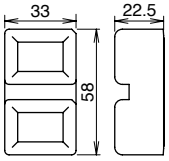
HW9Z-RL
Anti-Rotation Ring



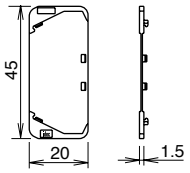
OR-55
Lamp/LED Removal Tool



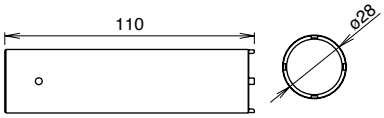
HW9Z-D7D
Dual Pushbutton Rubber Cover



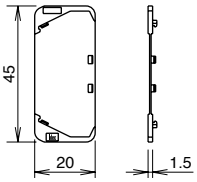
HW-VG1
Dual Pushbutton Barrier



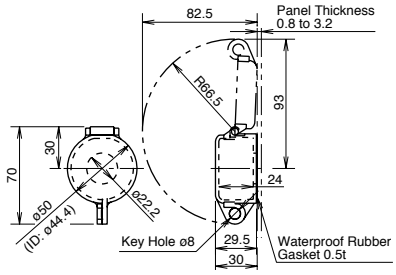
MW9Z-T1
Locking Ring Wrench



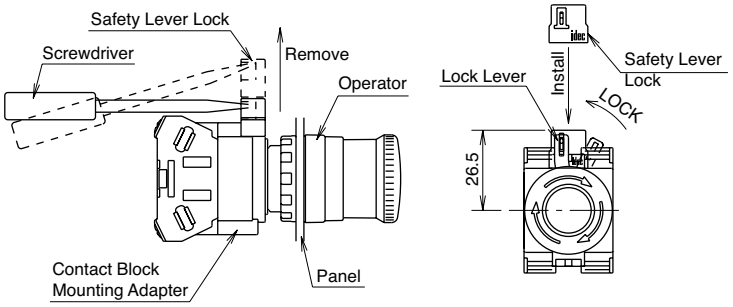
HW-VL1
Barrier



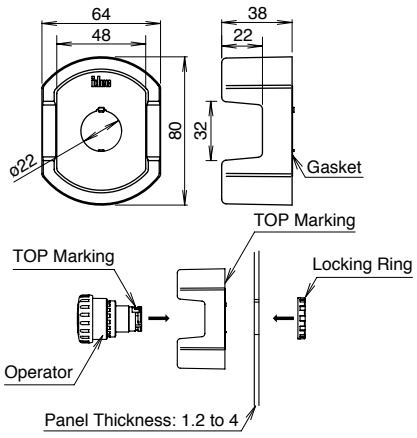
HW9Z-KL1
Padlock Cover



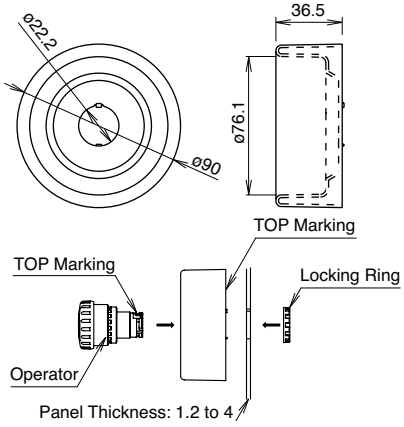
HWLS-TK1971
Safety Lever Lock



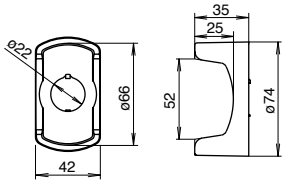
HW9Z-KG1



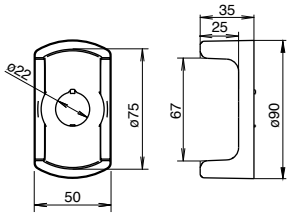
HW9Z-KG2



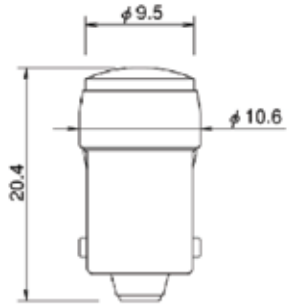
HW9Z-KG3



HW9Z-KG4



LSTD



HW Safety Precautions

Turn off power to HW series control units before starting installation, removal, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shocks or fire hazard.

To avoid the possibility of burning yourself, use the lamp holder tool when replacing lamps.

For wiring, use wires of a proper size to meet voltage and current requirements. Tighten the M3.5 terminal screws to a tightening torque of 1.0 to 1.3 N·m. Failure to tighten terminal screws may cause overheating and fire.

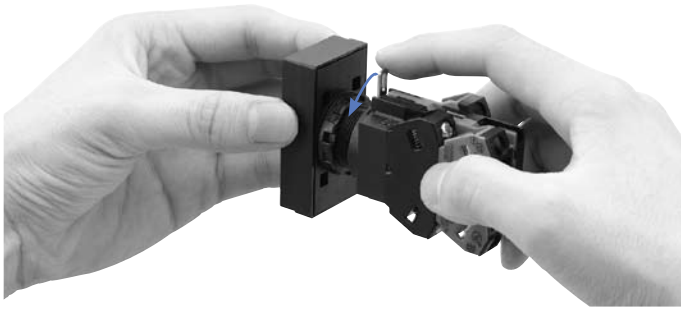
HW General Instructions

Panel Mounting

Remove the contact block assembly from the operator (for transformer type pilot lights, remove the transformer from the illumination unit). Remove the locking ring from the operator. Insert the operator into the panel cut-out from the front, tighten the locking ring from the back, then install the contact block assembly to the operator.

Removing and Installing the Contact Block Assembly

1. To remove the operator from the contact block, turn the locking lever in the direction of the arrow shown below. The operator can now be removed.
2. To reinstall, place the TOP markings on the operator and the contact block mounting adapter in the same direction, and insert the operator into the contact block mounting adapter. Then turn the locking lever in the opposite direction.



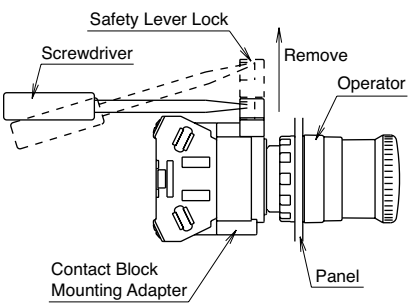
Notes for Panel Mounting

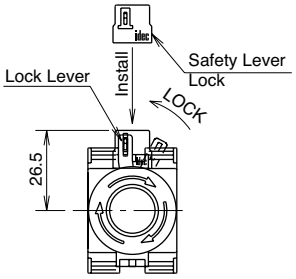
1. When mounting the operator onto a panel, use the optional locking ring wrench (MW9Z-T1) to tighten the locking ring. Tightening torque must not exceed 2.0 N·m. Do not use pliers. Excessive tightening will damage the locking ring.
2. For the contact blocks and transformers housing LED and incandescent lamps, make sure not to press the lamps too hard, otherwise the lamp socket may be damaged.

Safety Lever Lock

IDEC strongly recommends using the safety lever lock (HW9Z-LS, yellow) to prevent heavy vibration or maintenance personnel from unlocking the contact assembly.

1. HW series can be mounted vertically with a minimum spacing of 55 mm but spacing should be determined to ensure easy operation (recommended minimum spacing: 100 mm).
2. Mount the control unit onto the panel, lock the lever, and push in the safety lever lock to install.
3. When the spacing is narrower than the recommended value, with the lever unlocked, mount the safety lever lock and insert the contact unit to the operator. Then, lock the lever and strongly push in the safety lever lock to install.
4. To remove the safety lever lock, insert a flat screwdriver into the safety lever and push upwards.





Dual Pushbutton Instructions

Replacement of Lens

Removing

Remove the lens by inserting a screwdriver into the recess of the lens through the bezel.

Installing

Install the lens in the recess between the buttons by pressing against the bezel.