

ø22 HW Series Switches and Pilot Lights

Specifications

Operating Temperature	Non-illuminated: -25 to +60°C (no freezing) Illuminated: -25 to +50°C (no freezing) Jumbo dome pilot lights: -25 to +55°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Storage Temperature	-40 to +80°C (no freezing)
Contact Resistance	50 mΩ maximum (initial value)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Dielectric Strength	Between live and dead metal parts: 2,500V AC, 1 minute (Full voltage and illuminated units: 2,000V AC, 1 minute) (*1)
Vibration Resistance	Damage limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Damage limits: 1,000m/s ² Operating extremes: 100m/s ²
Mechanical Life (minimum operations)	Pushbutton, Illuminated pushbutton Momentary ······ 5,000,000 Maintained ······ 500,000 Dual pushbutton ······ 500,000 Selector switch ······ 500,000 Key selector switch (Disc tumbler) ······ 500,000 Key selector switch (Pin tumbler) ······ 100,000 Illuminated selector switch ······ 500,000 Pushbutton selector ······ 250,000 Mono-lever switches ······ 250,000
Electrical Life (*5)	Pushbutton, Illuminated pushbutton Momentary ······ 500,000 (*2) Maintained ······ 500,000 (*4) Dual pushbutton ······ 500,000 (*2) Selector switch ······ 500,000 (*3) Key selector switch (Disc tumbler) ······ 500,000 (*3) Key selector switch (Pin tumbler) ······ 100,000 (*3) Illuminated selector switch ······ 500,000 (*3) Pushbutton selector ······ 250,000 (*3) Mono-lever switches ······ 250,000 (*4)
Weight (Apporox.)	66g (HW1B-M122) 20g (HW1P-1Q4) 84g (HW1L-M122Q4) 66g (HW1S-2T22) 94g (HW1K-2A22) 72g (HW1K-2JPC11) 84g (HW1F-222Q4) 71g (HW1R-2A22) 82g (HW1M-2222-22N9) 72g (HW7D-B111111) 90g (HW7D-L111111Q4)

*1) Dielectric strength for dual pushbuttons are as follows:
Full voltage type: 1,000V AC, 1 minute (between live and dead metal parts)
Transformer and DC-DC converter types: 2,000V AC, 1 minute (between live and dead metal parts)

*2) Switching frequency 1,800 operations/h, duty ratio 40%

*3) Switching frequency 1,200 operations/h, duty ratio 40%

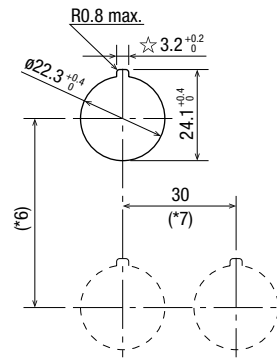
*4) Switching frequency 900 operations/h, duty ratio 40%

*5) Load condition 220V AC, 3A (AC-15)

Mounting Hole Layout

All dimensions in mm.

Panel Cut (IEC60947-5-1)



- The minimum mounting centers are applicable to switches with one layer of contact blocks (one to two contact blocks). When two layers of contact blocks are mounted, determine the minimum mounting centers in consideration of convenience for wiring.
- When high temperature is expected, take necessary measures such as securing sufficient mounting centers or using a cooling fan.

Minimum Mounting Centers

(Dimensions in mm)

Unit	A (*6)	B (*7)
ø40mm mushroom button	50	40
Pushbutton selector	50	50
Mono-lever switch	72	72
Pilot light	30	30
Jumbo dome pilot light	85	85
Dual pushbutton switch	55	30
Illuminated selector switch	50	50

- When using the safety lever lock, determine the vertical spacing (*6) in consideration of convenience for installing and removing the safety lever lock. (Recommended vertical spacing: 100 mm)
The minimum length of vertical spacing (*6) is 45 mm when safety lever lock is not used.
- The 3.2 mm recess is for preventing rotation and is not necessary when the nameplate or anti-rotation ring is not used.

Degree of Protection

Unit	IEC 60529
All units except dual pushbutton switches	IP65 (*8)
Dual pushbutton switches	IP40 (*9)

*8) When using a nameplate with the HW series, IP65 protection degree is achieved only when nameplates shown on **B-216** are used. (IP40 when other ø22 namplates such as NWA are used)

*9) IP65 protection degree when HW9Z-D7D button cover is used.



Ordering Information

Standard models

- Specify Ordering No. when ordering.
- Specify a button or lens color code in place of *.
- Pilot lights, illuminated pushbuttons, and illuminated selector switches have an LED lamp installed unless otherwise specified.
- Nameplates and accessories for mono-lever switch are ordered separately. See **B-216** to **B-218**.
- Color codes for units without LED lamps:
R (red), G (green), A (amber), Y (yellow), S (blue)
When using a commercially available lamp, choose a lamp with rated voltage 5 to 30V AC/DC and 1W maximum, and with the same base and shape. Make sure of correct operation before installation. The operation of HW series cannot be guaranteed when a commercially available lamp is used.

Mono-Lever Switches

Package Quantity: 1

Shape	Positions	Part No. (Ordering No.)
HW1M Standard Lever 	2-position	HW1M-1010-20
		HW1M-2020-20
		HW1M-0101-20
		HW1M-0202-20
	4-position	HW1M-0101-40
		HW1M-0202-40
HW1M-L Interlocking Lever 	2-position	HW1M-1111-22N9
		HW1M-2222-22N9
		HW1M-L1010-20
		HW1M-L2020-20
	4-position	HW1M-L0101-20
		HW1M-L0202-20
		HW1M-L0101-40
		HW1M-L0202-40
		HW1M-L1111-22N9
		HW1M-L2222-22N9

• On all mono-lever switches, the rated current (load switching current) is reduced to a half of the rated current of the contact block.
The rated insulation voltage and the rated thermal current remain unchanged.

Contact Arrangement Chart

2-position (Right/Left)

Contact Code	Contact Block		Lever Operator Position		
	Mounting Position	Contact	Left	Center	Right
20	①	NO	●		
	②	NO			●
40	①	NO	●		
	②	NO			●
	③	NO	●		
	④	NO			●

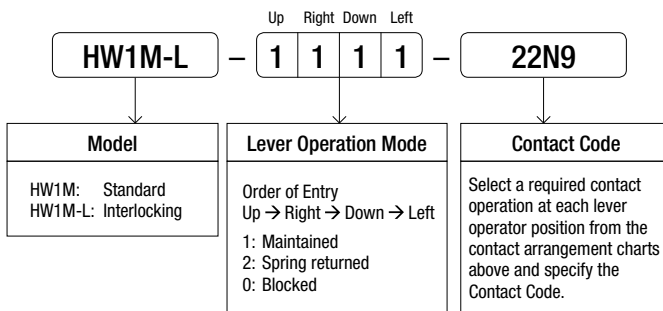
2-position (Up/Down)

Contact Code	Contact Block		Lever Operator Position		
	Mounting Position	Contact	Left	Center	Right
20	①	NO	●		
	②	NO			●
40	①	NO	●		
	②	NO			●
	③	NO	●		
	④	NO			●

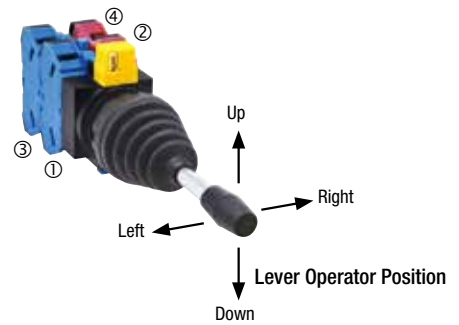
4-position

Contact Code	Contact Block		Lever Operator Position				
	Mounting Position	Contact	Down	Left	Center	Up	Right
22N9	①	NC					●
	②	NC	●				
	③	NO		●			
	④	NO				●	

Part No. Development



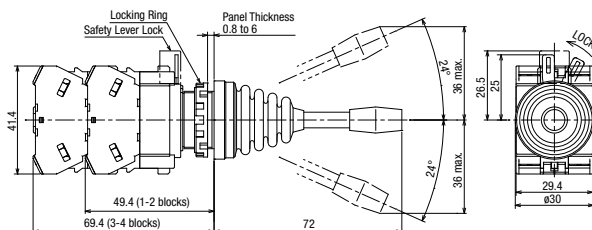
Contact Block Mounting Position and Lever Operation Position



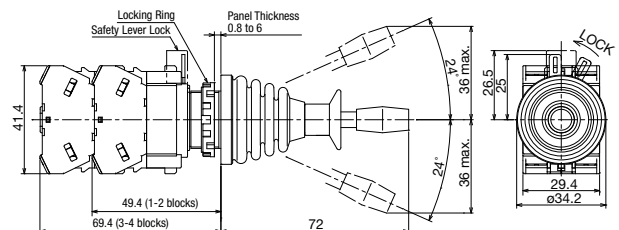
• The lever operator of the interlocking type HW1M-L is locked only in the center position. Pull on the interlocking lever before operating the lever up/down/right/left.

Dimensions

Standard Lever



Interlocking Lever



All dimensions in mm.

Terminal Screws M3.5 Integrated Terminal Cover
• See B-210 for the bottom view.