

\varnothing 25mm TWS Series Control Units

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



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Stations

















Explosion
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
















References

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Function	Pushbutton				
Category	Flush	Extended	Extended with Half Shroud	Extended with Full Shroud	Mushroom
	Momentary/Maintained				
Shape					
	   	   	   	   	   
Model	ABS1 AOS1	ABS2 AOS2	ABGS2 AOGS2	ABFS2 AOFS2	ABS3 AOS3
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Function	Pushbutton			
Category	Mushroom with Full Shroud	Mushroom Pushlock Turn Reset	Mushroom Push Turn Lock	Mushroom Push-Pull
	Momentary/Maintained			
Shape				
	   	  	   	   
Model	ABGS3 AOGS3	AVS3	AJS3	AYS3
Page	372	372	372	373

Function	Pushbutton			
Category	Square Flush	Square Extended	Square Twin	Square Twin
	Momentary/Maintained		Momentary	Maintained
Shape				
	   	   	 	 
Model	UBQS1 UOQS1	UBQS2	UWQN1	UWQN2
Page	373	373	374	374

Function	Pilot Light (LED/Incandescent)				
Category	Dome	Square (Marking) (Plastic Bezel)	Square (Marking) (Metal Bezel)	Rectangular (Marking) (Plastic Bezel)	Dome Push-to-Check
Shape					
	   	   	   	   	   
Model	APS1	UPQS1B	UPQMS1B	UPQS4B	APS1*PN
Page	375	375	375	375	375

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Function	Illuminated Pushbutton (LED/Incandescent)				
Category	Extended (Non-marking)	Extended with Half Shroud (Non-marking)	Extended with Full Shroud (Non-marking)	ø35mm Mushroom (Non-marking)	Mushroom Pushlock Turn Reset
Shape	 	 	 	 	 
Model	ALS2 AOLS2	ALGS2 AOLGS2	ALFS2 AOLFS2	ALS3 AOLS3	AVLS3
Page	377	378	379	380	380

Function	Illuminated Pushbutton (LED/Incandescent)	Selector Switch			Illuminated Selector Switch (LED/Incandescent)
Category	Square Flush (Marking)	Knob	Lever	Key	Knob
Shape	 	 	 	 	 
Model	ULQS1B UOLQS1B	ASS	ASS□L	ASS□K	ASLS
Page	381	383	384	385	386

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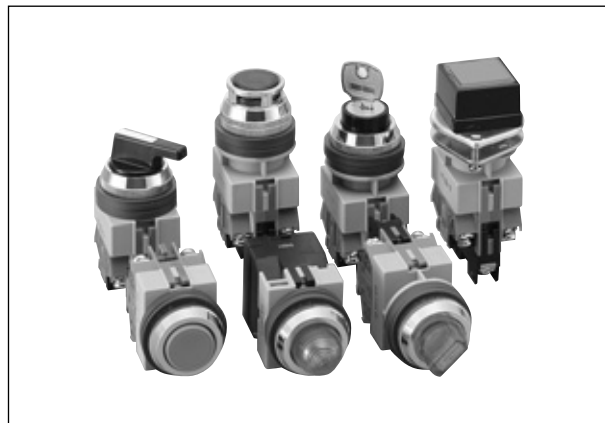
References

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Highly reliable heavy-duty control units Suitable for industrial use

- HW-C contact blocks are used.
- Degree of protection: IP65 (IEC 60529)
- UL and CSA approved, EN and CCC compliant

Applicable Standards	Mark	File No. or Organization
UL508		UL Listing File No. E68961
CSA C22.2 No.14		CSA File No. LR21451
EN60947-1		TÜV Rheinland
		EU Low Voltage Directive
GB14048.5		CCC No. 2007010305223156 (Pilot light: 2007010304226714)



Specifications and Ratings

Contact Ratings

Contact Block	Rated Insulation Voltage	600V
	Rated Continuous Current	10A
	Contact Ratings by Utilization Category IEC 60947-5-1	AC-15 (A600) DC-13 (P600)

Characteristics

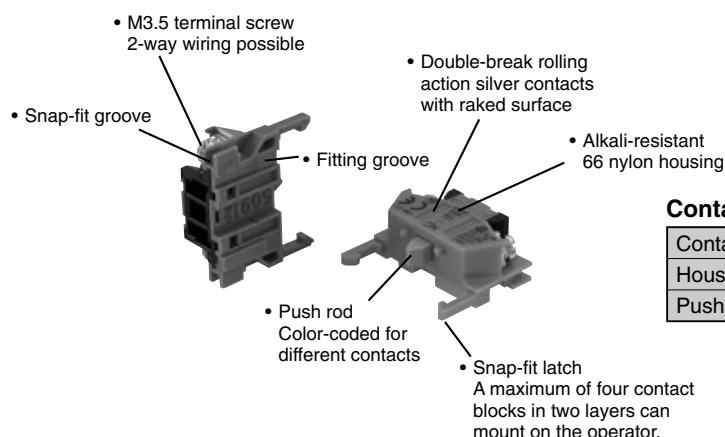
Contact Ratings by Utilization Category

Operational Voltage			24V	48V	50V	110V	220V	440V
Operational 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	8A	4A	—	2.2A	1.1A	—
		DC-13 Control of electromagnets	4A	2A	—	1.1A	0.6A	—

Minimum applicable load: 3V AC/DC, 5 mA (applicable range may vary with operating conditions and load types)

For the control units listed below, the rated current (load switching current) is reduced to a half of the rated operational current of the contact block. The rated insulation voltage (600V) and the rated thermal current (10A) remain unchanged.

HW-C (Contact Block)



Contact Blocks

Contact	NO	NC	\overline{NO} (early make)	\overline{NC} (late break)
Housing	Blue	Purple red	Blue	Purple red
Push Rod	Green	Red	Black	White

Note: BS contact block is used for square twin pushbuttons UWQN1 and UWQN2.

Specifications

Operating Temperature	−25 to +50°C (no freezing)
Storage Temperature	−40 to +80°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
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 illuminated units: 2,000V AC, 1 minute)
Vibration Resistance	Damage Limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Damage limits: 1,000 m/s ² Operating extremes: 100 m/s ²
Mechanical Life (minimum operations)	Pushbuttons, Illuminated pushbuttons Momentary: 5,000,000 Others: 500,000 Pushlock turn reset: 250,000 Selector switches: 500,000 Key selector switches: 500,000 Illuminated selector switches: 500,000
Electrical Life (minimum operations)	Pushbuttons: 500,000 *1 Illuminated pushbuttons: 500,000 *1 Pushlock turn reset: 250,000 *1 Square twin maintained: 500,000 *2 Selector switches: 500,000 *3 Key selector switches: 500,000 *3 Illuminated selector switches: 250,000 *3 Others: 500,000 *1 *1 Switching frequency 1,800 operations/h, duty ratio 40% *2 Switching frequency 900 operations/h, duty ratio 40% *3 Switching frequency 1,200 operations/h, duty ratio 40%
Wegiht (approx.)	72g (ABS122N) 36g (APS122DN) 97g (ALS22222DN) 76g (ASS222N) 117g (ASS2K22N) 97g (ASLS22222DN)

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LED Illuminated Unit Specifications

Unit	Color Code ②	Input	Operating Voltage	LED Lamp		
				Lamp Base	Part No.	Voltage
Pilot Light Illuminated Pushbutton Illuminated Selector Switch	A: amber G: green PW: pure white R: red S: blue W: white Y: yellow	Full Voltage	6V AC/DC	BA9S/13	LSTD-6②	6V AC/DC ±10%
			12V AC/DC		LSTD-1②	12V AC/DC ±10%
			24V AC/DC		LSTD-2②	24V AC/DC ±10%
		Transformer	100/110V AC/DC		LSTD-6②	6V AC/DC ±10%
			115V AC/DC			
			120V AC/DC			
Pilot Light Illuminated Pushbutton Illuminated Selector Switch	A: amber G: green PW: pure white R: red S: blue W: white Y: yellow	Transformer	200/220V AC/DC	BA9S/13	LSTD-6②	6V AC/DC ±10%
			230V AC/DC			
			240V AC/DC			
			380V AC/DC			
			400/440V AC/DC			
			(50/60 Hz)			
Pilot Light Illuminated Pushbutton Illuminated Selector Switch	A: amber G: green PW: pure white R: red S: blue W: white Y: yellow	DC-DC Converter	110V DC	BA9S/13	LSTD-6②	6V AC/DC ±10%

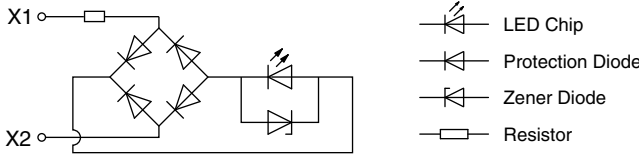
• Use a pure white (PW) LED for yellow illumination.

Incandescent Illuminated Unit Specifications

Unit	Color Code ②	Input	Operating Voltage	Incandescent Lamp		
				Lamp Base	Part No.	Rating
Pilot Light Illuminated Pushbutton Illuminated Selector Switch	A: amber C: clear G: green R: red S: blue W: white	Full Voltage	6V AC/DC	BA9S/13	LS-6	1W (6.3V)
			12V AC/DC		LS-8	1W (18V)
			24V AC/DC		LS-3	1W (30V)
		Transformer	100/110V AC/DC	BA9S/13	LS-6	1W (6.3V)
			115V AC/DC			
			120V AC/DC			
Pilot Light Illuminated Pushbutton Illuminated Selector Switch	A: amber C: clear G: green R: red S: blue W: white	Transformer	200/220V AC/DC	BA9S/13	LS-6	1W (6.3V)
			230V AC/DC			
			240V AC/DC			
			380V AC/DC			
			400/440V AC/DC			
			480V AC/DC			
Pilot Light Illuminated Pushbutton Illuminated Selector Switch	A: amber C: clear G: green R: red S: blue W: white	Transformer	(50/60 Hz)	BA9S/13	LS-6	1W (6.3V)

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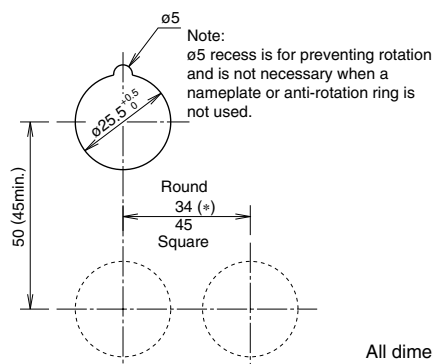
LED Lamp Ratings (LSTD)

Part No.	LSTD-6②		LSTD-1②	LSTD-2②
Lamp Base	BA9S/13			
Rated Voltage	6V AC/DC		12V AC/DC	24V AC/DC
Voltage Range	6V AC/DC $\pm 10\%$		12V AC/DC $\pm 10\%$	24V AC/DC $\pm 10\%$
Current Draw	AC	8 mA	11 mA	11 mA
	DC	A, R, W: 7 mA, G, PW, S: 5.5 mA	10 mA	10 mA
Color Code ②	A (amber), G (green), PW (pure white), 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 is reduced to 50% the initial intensity when used on complete DC.)			
Internal Circuit				

Incandescent Lamp Ratings (LS)

Part No.	LS-6	LS-8	LS-2	LS-3
Lamp Base	BA9S/13			
Rated Voltage	6V AC/DC	12V AC/DC	18V AC/DC	24V AC/DC
Wattage	1W (6.3V)	1W (18V)	1W (24V)	1W (30V)
Voltage Marking	Die stamped on the base			
Life (reference value)	Approx. 1,000 hours minimum (mean value when used on the rated voltage)			

Mounting Hole Layout



* The minimum mounting centers are applicable to 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.

- ø35mm mushroom: 35 mm minimum
- Mushroom with shroud: 42 mm minimum
- 2-position, 3-position lever selector switch: 42 mm minimum
- 4-position, 5-position lever selector switch: 50 mm minimum

All dimensions in mm.

Degree of Protection

Part No.	Unit	NEMA ICS 6-110	IEC 60529
A****	Pushbuttons, pilot lights, illuminated pushbuttons, and selector switches	Type 1, 2, 3, 3R, 4, 5, 12, 13	IP65
	Illuminated selector switches and key selector switches	Type 1, 2, 3R, 5, 12, 13	IP54
U****	Square pushbuttons, square pilot lights, and square illuminated pushbuttons	Type 1, 2	IP40

TWS Series Control Units (Ordering Information) ø25

Ordering Information

Standard Units

- Specify an operator or lens color code in the Part No.
- Full voltage illuminated units are not supplied with a lamp. Order LED or incandescent lamps separately. Transformer and DC-DC converter illuminated units contain an LED or incandescent lamp.
- All standard units are UL, CSA, EN, and TÜV approved (except DC-DC converter).
- Terminal covers, nameplates, and accessories are ordered separately.

Terminal Cover

- When a terminal cover is required, order an applicable terminal cover referring to page 391.

The Part No. development charts shown below can be used to specify control units other than those listed on the following pages.

Pushbuttons

ABS1 11 N R

Button color code
Contact arrangement code

10: 1NO	01: 1NC
11: 1NO-1NC	20: 2NO
02: 2NC	22: 2NO-2NC
40: 4NO	04: 4NC
13: 1NO-3NC	31: 3NO-1NC
30: 3NO	03: 3NC
12: 1NO-2NC	21: 2NO-1NC

Note:

- Push-pull AYS3 can have a maximum of two contact blocks.

Pilot Lights

APS1 116 D N R

Lens color code
Lamp
D: LED (Transformer only)
(blank): Incandescent
Operating voltage code

Illuminated Pushbuttons

ALFS2 126 13 D N R

Lens color code
Lamp
D: LED (Transformer only)
(blank): Incandescent
Contact arrangement code

11: 1NO-1NC	20: 2NO
02: 2NC	31: 3NO-1NC
22: 2NO-2NC	13: 1NO-3NC
40: 4NO	04: 4NC

Operating voltage code

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Selector Switch

ASS 2 L 11 N

- Contact arrangement code
- Operator
(blank): Knob
L: Lever
- Number of positions

Note:

- See pages 388 to 390 for contact arrangement codes.

Illuminated Selector Switch

ASLS 2 16 22 D N R

- Lens color code
- Lamp
D: LED (Transformer only)
(blank): Incandescent
- Contact arrangement code
- Operating voltage code
- Number of positions

Note:

- See pages 388 to 390 for contact arrangement codes.

Key Selector Switch

ASS 2 K 20 N B

- Key removable position code
- 2-position
 - Maintained
(blank): Removable in all positions
B: Removable in left only
C: Removable in right only
 - Spring return from right
(blank): Removable in left only
 - Spring return from left
(blank): Removable in right only
- 3-position
 - Maintained
(blank): Removable in all positions
B: Removable in left and center
C: Removable in right and center
D: Removable in center only
E: Removable in right and left
G: Removable in left only
H: Removable in right only
 - Spring return from right
(blank): Removable in left and center
D: Removable in center only
G: Removable in left only
 - Spring return from left
(blank): Removable in right and center
D: Removable in center only
H: Removable in right only
 - Spring return two-way
(blank): Removable in center only
- Contact arrangement code
- Number of positions






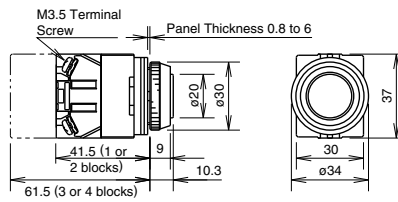





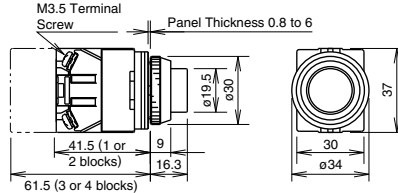





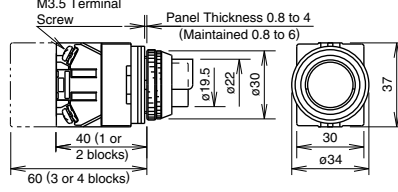





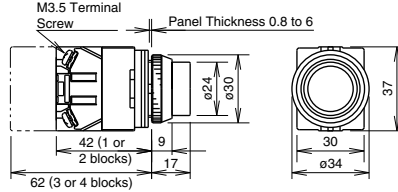
Note:

- See page 388 to 390 for contact arrangement codes.
- The key cannot be removed in the return position.

TWS Series Pushbuttons **ø25**

Flush / Extended Pushbuttons

Package Quantity: 1

Shape	Operation	Contact	Part No.	① Button Color Code	Dimensions (mm)	
<div>Flush ABS1 AOS1</div> <div></div> <div>   </div>	Momentary	1NO	ABS110N①	Black (B), green (G), and red (R) buttons are supplied with each unit as standard.	<div></div> <div>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</div>	
		1NC	ABS101N①			
		1NO-1NC	ABS111N①			
		2NO	ABS120N①			
		2NC	ABS102N①			
	Maintained	2NO-2NC	ABS122N①	Specify S, W, or Y when a blue, white, or yellow button is required.		
		1NO	AOS110N①			
		1NC	AOS101N①			
		1NO-1NC	AOS111N①			
		2NO	AOS120N①			
	Maintained	2NC	AOS102N①			
		2NO-2NC	AOS122N①			
<div>Extended ABS2 AOS2</div> <div></div> <div>   </div>		Momentary	1NO	ABS210N①		<div></div> <div>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</div>
			1NC	ABS201N①		
			1NO-1NC	ABS211N①		
	2NO		ABS220N①			
	2NC		ABS202N①			
	Maintained	2NO-2NC	ABS222N①			
		1NO	AOS210N①			
		1NC	AOS201N①			
		1NO-1NC	AOS211N①			
		2NO	AOS220N①			
	Maintained	2NC	AOS202N①			
		2NO-2NC	AOS222N①			
<div>Extended with Half Shroud ABGS2 AOGS2</div> <div></div> <div>   </div>		Momentary	1NO	ABGS210N①	Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow	<div></div> <div>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</div>
			1NC	ABGS201N①		
			1NO-1NC	ABGS211N①		
	2NO		ABGS220N①			
	2NC		ABGS202N①			
	Maintained	2NO-2NC	ABGS222N①			
		1NO	AOGS210N①			
		1NC	AOGS201N①			
		1NO-1NC	AOGS211N①			
		2NO	AOGS220N①			
	Maintained	2NC	AOGS202N①			
		2NO-2NC	AOGS222N①			
<div>Extended with Full Shroud ABFS2 AOFSS2</div> <div></div> <div>   </div>		Momentary	1NO	ABFS210N①		<div></div> <div>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</div>
			1NC	ABFS201N①		
			1NO-1NC	ABFS211N①		
	2NO		ABFS220N①			
	2NC		ABFS202N①			
	Maintained	2NO-2NC	ABFS222N①			
		1NO	AOFSS210N①			
		1NC	AOFSS201N①			
		1NO-1NC	AOFSS211N①			
		2NO	AOFSS220N①			
	Maintained	2NC	AOFSS202N①			
		2NO-2NC	AOFSS222N①			

- Specify a button color code in place of ① in the Part No.
- Round bezel and shroud (metal): Chrome-plated
- Pushbuttons with one or three contact blocks contain a dummy block.
- Other contact arrangements are also available. See page 369.

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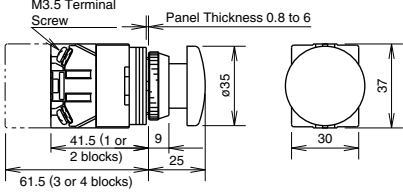
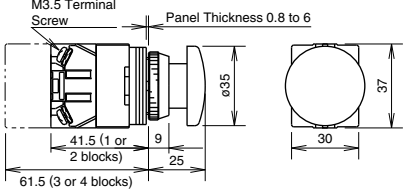




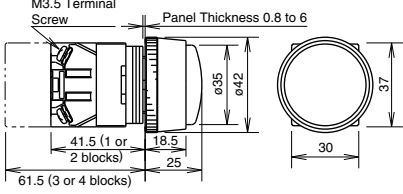
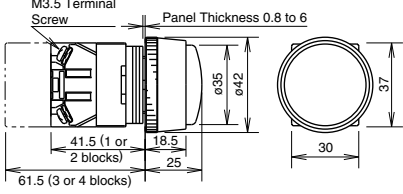




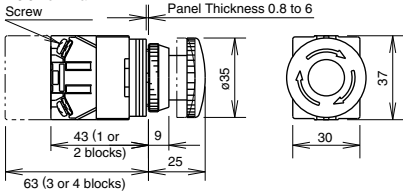




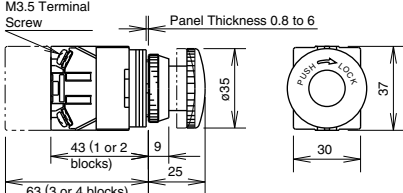
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Mushroom / Pushlock Turn Reset / Push Turn Lock Pushbuttons



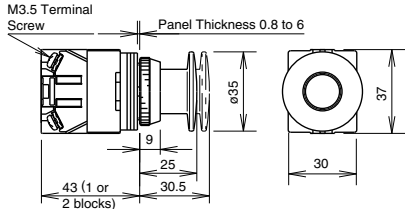


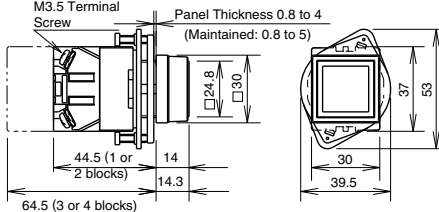


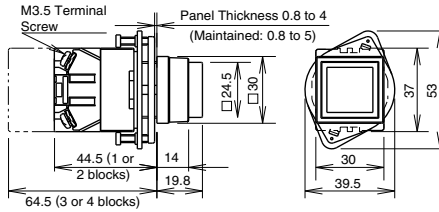
Package Quantity: 1

Shape	Operation	Contact	Part No.	① Button Color Code	Dimensions (mm)
Mushroom ABS3 AOS3    	Momentary	1NO	ABS310N①	Specify a button color code in place of ① in the Part No. B: black G: green R: red S: blue W: white Y: yellow	
		1NC	ABS301N①		
		1NO-1NC	ABS311N①		
		2NO	ABS320N①		
		2NC	ABS302N①		
	Maintained	2NO-2NC	ABS322N①		 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
		1NO	AOS310N①		
		1NC	AOS301N①		
		1NO-1NC	AOS311N①		
		2NO	AOS320N①		
		2NC	AOS302N①		
Mushroom with Full Shroud ABGS3 AOGS3    	Momentary	1NO	ABGS310N①		
		1NC	ABGS301N①		
		1NO-1NC	ABGS311N①		
		2NO	ABGS320N①		
		2NC	ABGS302N①		
	Maintained	2NO-2NC	ABGS322N①		 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
		1NO	AOGS310N①		
		1NC	AOGS301N①		
		1NO-1NC	AOGS311N①		
		2NO	AOGS320N①		
		2NC	AOGS302N①		
Pushlock Turn Reset AVS3    		1NO	AVS310N①	R: red Y: yellow	
		1NC	AVS301N①		
		1NO-1NC	AVS311N①		
		2NO	AVS320N①		
		2NC	AVS302N①		
		2NO-2NC	AVS322N①		
Push Turn Lock AJS3    		1NO	AJS310N①	B: black G: green R: red Y: yellow	
		1NC	AJS301N①		
		1NO-1NC	AJS311N①		
		2NO	AJS320N①		
		2NC	AJS302N①		
		2NO-2NC	AJS322N①		

- Specify a button color code in place of ① in the Part No.
 - Round bezel (metal): Chrome-plated
 - Pushbuttons with one or three contact blocks contain a dummy block.
 - Other contact arrangements are also available. See page 369.
 - **Pushlock Turn Reset:** Button is maintained when pressed and is reset when turned clockwise.
- Note: AVS3 and AJS3 cannot be used as emergency stop switches. When emergency stop switches are required, use HW series emergency stop switches with HW9Z-A25 ring adapter (ISO 13850 and IEC 60947-5-5 compliant).
- **Push Turn Lock:** Button is locked when turned clockwise in the depressed position and is reset when turned counterclockwise.

Push-Pull / Square Flush / Square Extended Pushbuttons

















Package Quantity: 1

Shape	Operation	Contact	Part No.	① Button Color Code	Dimensions (mm)
Mushroom Push-Pull AYS31  	Maintained	1NO	AYS3110N ①	B: black G: green R: red Y: yellow	
		1NC	AYS3101N ①		
		1NO-1NC	AYS3111N ①		
		2NO	AYS3120N ①		
		2NC	AYS3102N ①		
Square Flush UBQS1 UOQS1  	Momentary	1NO	UBQS110N ①	B: black G: green R: red S: blue Y: yellow	
		1NC	UBQS101N ①		
		1NO-1NC	UBQS111N ①		
		2NO	UBQS120N ①		
		2NC	UBQS102N ①		
	Maintained	2NO-2NC	UBQS122N ①		Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.
		1NO	UOQS110N ①		
		1NC	UOQS101N ①		
		1NO-1NC	UOQS111N ①		
		2NO	UOQS120N ①		
Square Extended UBQS2  	Momentary	2NC	UOQS122N ①		
		1NO	UBQS210N ①		
		1NC	UBQS201N ①		
		1NO-1NC	UBQS211N ①		
		2NO	UBQS220N ①		
		2NC	UBQS202N ①		
		2NO-2NC	UBQS222N ①		

- Specify a button color code in place of ① in the Part No.
- Round bezel (metal): Chrome-plated
- Square bezel (plastic): Black
- Pushbuttons with one or three contact blocks contain a dummy block.
- Other contact arrangements are also available. See page 369.
- **Push-Pull:** Button is maintained in both depressed and reset positions. Up to 2 contact blocks (1 layer) can be mounted on AYS31 push-pull switches.

Note: AYS31 cannot be used as emergency stop switches. When emergency stop switches are required, use HW series emergency stop switches with HW9Z-A25 ring adapter (ISO 13850 and IEC 60947-5-5 compliant).

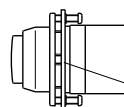
Contact Statuses of Push-Pull Switch

Contact	AYS31			
	Push		Pull	
1NO				
1NC				
1NO-1NC				
2NO				
2NC				

Note: Push-pull switch can have a maximum of two contact blocks.

Panel Mounting of Square Pushbuttons

1. Tighten the square bezel to the operator and position the ring correctly.
2. Lightly tighten the screw to secure the pushbutton onto the panel.



- Tighten the screw lightly so that this plate does not bend.

Recommended tightening torque:
0.15 N·m

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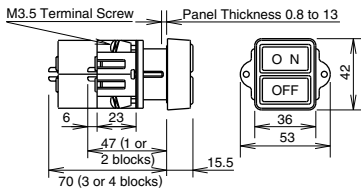



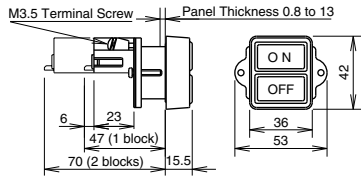
Protection	

References

ø25 TWS Series Pushbuttons

Square Twin Pushbuttons











Package Quantity: 1

Shape	Contact		Part No.	Button Color	Dimensions (mm)
Square Twin (Momentary) UWQN1   	ON	OFF		ON: Black OFF: Red	
	1NO	1NO	UWQN11010		
	1NO	1NC	UWQN11001		
	2NO	2NC	UWQN12002		
Square Twin (Maintained) UWQN2   	1NO		UWQN21000	ON: Black OFF: Red	
	1NC		UWQN20100		
	1NO-1NC		UWQN21100		
	2NO		UWQN22000		
	2NC		UWQN20200		

- **Square Twin (Momentary):** Two independent momentary switches are contained in one unit, each operated by ON or OFF button. With the ø30 adapter removed from the sleeve, the unit can mount in a ø25.5mm mounting hole for the ø25 series.
- **Square Twin (Maintained):** The contact operates when ON button is pressed and is maintained in the depressed position. The button is reset by pressing the OFF button. With the ø30 adapter removed from the sleeve, the unit can mount in a ø25.5mm mounting hole for the ø25 series.

TWS Series Pilot Lights **ø25****Dome / Square / Rectangular (Marking) Pilot Lights**

Package Quantity: 1

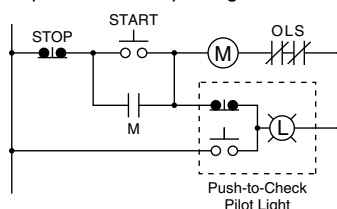
Shape	Lamp	Part No.	②Lens/LED Color Code
Dome APS1  	Without Lamp	APS199②	NA: amber, NC: clear, NG: green, NR: red, NS: blue, NW: white, DNY: yellow
	LED	APS1③DN②	A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow
	Incandescent	APS1③N②	A: amber, C: clear, G: green, R: red, S: blue, W: white
Square (Marking) UPQS1B (Plastic Bezel)  	Without Lamp	UPQS1B99②	NA: amber, NG: green, NR: red, NS: blue, NW: white, DNY: yellow
	LED	UPQS1B③DN②	A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow
	Incandescent	UPQS1B③N②	A: amber, G: green, R: red, S: blue, W: white
Square (Marking) UPQMS1B (Metal Bezel)  	Without Lamp	UPQMS1B99②	NA: amber, NG: green, NR: red, NS: blue, NW: white, DNY: yellow
	LED	UPQMS1B③DN②	A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow
	Incandescent	UPQMS1B③N②	A: amber, G: green, R: red, S: blue, W: white
Rectangular (Marking) UPQS4B (Plastic Bezel)  	Without Lamp	UPQS4B99N②	A: amber, G: green, R: red, S: blue, W: white
	Incandescent	UPQS4B③N②	
Push-to-Check APS1*PN  	Without Lamp	APS199PN②	A: amber, C: clear, G: green, R: red, S: blue, W: white
	Incandescent	APS1③PN②	

Operating Voltage Code

Specify an operating voltage code in place of ③ in the Part No.

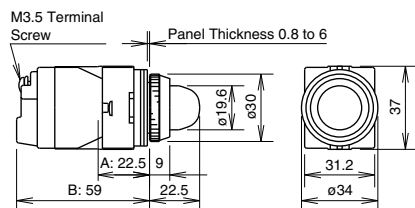
③ Operating Voltage Code		Input
LED	Incandescent	
66: 6V AC/DC	66: 6V AC/DC	Full Voltage
11: 12V AC/DC	88: 12V AC/DC	
22: 24V AC/DC	33: 24V AC/DC	
16: 100/110V AC		Transformer
116: 115V AC		
126: 120V AC		
26: 200/220V AC		
236: 230V AC		
246: 240V AC		
386: 380V AC		
46: 400/440V AC		
486: 480V AC		DC-DC Converter *
16D: 110V DC	—	

- Specify a color code in place of ② in the Part No.
- Round bezel (metal): Chrome-plated Square bezel (plastic): Black Square bezel (metal): Chrome-plated
- * DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).
- The lamp of push-to-check pilot light is not connected to the contact terminal. To connect, refer to the circuit diagram example below.



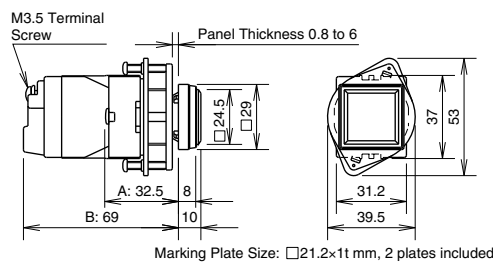
Dimensions

**Dome
APS1**



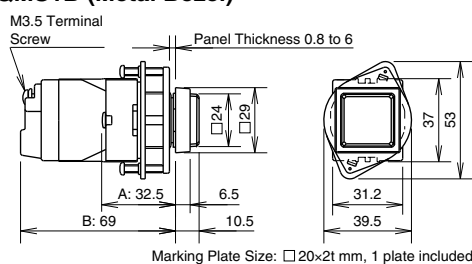
A: Full voltage
B: Transformer

Square (Marking)
UPQS1B (Plastic Bezel)



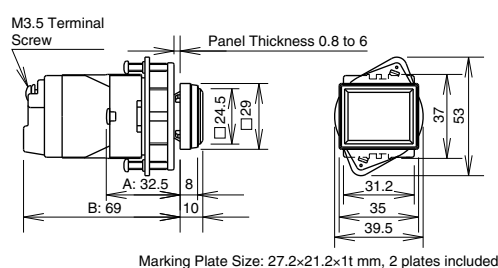
A: Full voltage
B: Transformer

Square (Marking)
UPQMS1B (Metal Bezel)



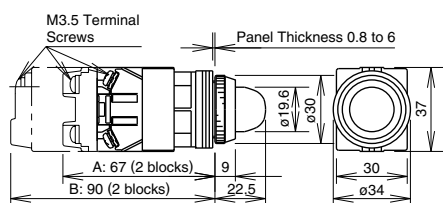
A: Full voltage
B: Transformer

Rectangular (Marking)
UPQS4B



A: Full voltage
B: Transformer

Push-to-Check APS1*PN



A: Full voltage
B: Transformer

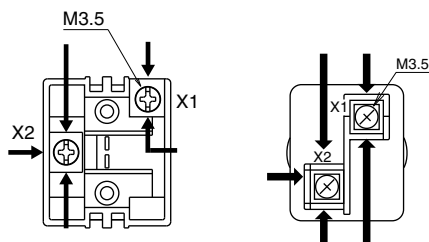
All dimensions in mm.

Terminal Wiring (Bottom View)

Arrows indicate access directions for wiring.

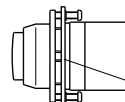
Full Voltage

Transformer DC-DC Converter



Panel Mounting of Square and Rectangular Pilot Lights

1. Tighten the square or rectangular bezel to the operator and position the ring correctly.
2. Lightly tighten the screw to secure the pilot light onto the panel.




- Tighten the screw lightly so that this plate does not bend.

Recommended tightening torque:
0.15 N·m

TWS series Illuminated Pushbuttons ø25

Round Extended Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
Round Extended ALS2 AOLS2 	Momentary	Without Lamp	1NO-1NC	ALS29911②
			2NO	ALS29920②
			2NO-2NC	ALS29922②
		LED	1NO-1NC	ALS2③11DN②
			2NO	ALS2③20DN②
			2NO-2NC	ALS2③22DN②
			1NO-1NC	ALS21611DDN② (Note)
			2NO	ALS21620DDN② (Note)
			2NO-2NC	ALS21622DDN② (Note)
		Incandescent	1NO-1NC	ALS2③11N②
			2NO	ALS2③20N②
			2NO-2NC	ALS2③22N②
	Maintained	Without Lamp	1NO-1NC	AOLS29911②
			2NO	AOLS29920②
			2NO-2NC	AOLS29922②
		LED	1NO-1NC	AOLS2③11DN②
			2NO	AOLS2③20DN②
			2NO-2NC	AOLS2③22DN②
			1NO-1NC	AOLS21611DDN② (Note)
			2NO	AOLS21620DDN② (Note)
			2NO-2NC	AOLS21622DDN② (Note)
		Incandescent	1NO-1NC	AOLS2③11N②
			2NO	AOLS2③20N②
			2NO-2NC	AOLS2③22N②

Note: DC-DC converter types.

Designation Code

Specify a code in place of ② or ③ in the Part No.

② Lens/LED Color Code			③ Operating Voltage Code		Input
Without Lamp	LED	Incandescent	LED	Incandescent	
Specify a lens color code in place of ②.	Specify a lens/LED color code in place of ②.	Specify a lens color code in place of ②.	66: 6V AC/DC	66: 6V AC/DC	Full Voltage
NA: amber NC: clear NG: green NR: red NS: blue NW: white DNY: yellow	A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination.	A: amber G: green R: red S: blue W: white	11: 12V AC/DC	88: 12V AC/DC	
			22: 24V AC/DC	33: 24V AC/DC	
			16: 100/110V AC		Transformer
			116: 115V AC		
			126: 120V AC		
			26: 200/220V AC		
			236: 230V AC		
			246: 240V AC		
			386: 380V AC		
			46: 400/440V AC		
			486: 480V AC		
			16□□D: 110V DC	—	DC-DC Converter *

- Round bezel (metal): Chrome-plated
- Other contact arrangements are also available. See page 369.

* DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).

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References

ø25 TWS Series Illuminated Pushbuttons

Round Extended with Half Shroud Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
Round Extended with Half Shroud ALGS2 AOLGS2     	Momentary	Without Lamp	1NO-1NC	ALGS29911②
			2NO	ALGS29920②
			2NO-2NC	ALGS29922②
		LED	1NO-1NC	ALGS2③11DN②
			2NO	ALGS2③20DN②
			2NO-2NC	ALGS2③22DN②
			1NO-1NC	ALGS21611DDN② (Note)
			2NO	ALGS21620DDN② (Note)
			2NO-2NC	ALGS21622DDN② (Note)
		Incandescent	1NO-1NC	ALGS2③11N②
			2NO	ALGS2③20N②
			2NO-2NC	ALGS2③22N②
	Maintained	Without Lamp	1NO-1NC	AOLGS29911②
			2NO	AOLGS29920②
			2NO-2NC	AOLGS29922②
		LED	1NO-1NC	AOLGS2③11DN②
			2NO	AOLGS2③20DN②
			2NO-2NC	AOLGS2③22DN②
			1NO-1NC	AOLGS21611DDN② (Note)
			2NO	AOLGS21620DDN② (Note)
			2NO-2NC	AOLGS21622DDN② (Note)
		Incandescent	1NO-1NC	AOLGS2③11N②
			2NO	AOLGS2③20N②
			2NO-2NC	AOLGS2③22N②

Note: DC-DC converter types.

Designation Code

Specify a code in place of ② or ③ in the Part No.

② Lens/LED Color Code			③ Operating Voltage Code		Input
Without Lamp	LED	Incandescent	LED	Incandescent	
Specify a lens color code in place of ②.	Specify a lens/LED color code in place of ②.	Specify a lens color code in place of ②.	66: 6V AC/DC 11: 12V AC/DC 22: 24V AC/DC 16: 100/110V AC 116: 115V AC 126: 120V AC 26: 200/220V AC 236: 230V AC 246: 240V AC 386: 380V AC 46: 400/440V AC 486: 480V AC 16□□D: 110V DC	66: 6V AC/DC 88: 12V AC/DC 33: 24V AC/DC —	Full Voltage
NA: amber NC: clear NG: green NR: red NS: blue NW: white DNY: yellow	A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination.	A: amber G: green R: red S: blue W: white			Transformer
					DC-DC Converter *






- Round bezel (metal): Chrome-plated
- Other contact arrangements are also available. See page 369.

* DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).

TWS series Illuminated Pushbuttons ø25

Round Extended with Full Shroud Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
Round Extended with Full Shroud ALFS2 AOLFS2     	Momentary	Without Lamp	1NO-1NC	ALFS29911②
			2NO	ALFS29920②
			2NO-2NC	ALFS29922②
		LED	1NO-1NC	ALFS2③11DN②
			2NO	ALFS2③20DN②
			2NO-2NC	ALFS2③22DN②
			1NO-1NC	ALFS21611DDN② (Note)
			2NO	ALFS21620DDN② (Note)
			2NO-2NC	ALFS21622DDN② (Note)
		Incandescent	1NO-1NC	ALFS2③11N②
			2NO	ALFS2③20N②
			2NO-2NC	ALFS2③22N②
	Maintained	Without Lamp	1NO-1NC	AOLFS29911②
			2NO	AOLFS29920②
			2NO-2NC	AOLFS29922②
		LED	1NO-1NC	AOLFS2③11DN②
			2NO	AOLFS2③20DN②
			2NO-2NC	AOLFS2③22DN②
			1NO-1NC	AOLFS21611DDN② (Note)
			2NO	AOLFS21620DDN② (Note)
			2NO-2NC	AOLFS21622DDN② (Note)
		Incandescent	1NO-1NC	AOLFS2③11N②
			2NO	AOLFS2③20N②
			2NO-2NC	AOLFS2③22N②

Note: DC-DC converter types.

Designation Code

Specify a code in place of ② or ③ in the Part No.

② Lens/LED Color Code			③ Operating Voltage Code		Input
Without Lamp	LED	Incandescent	LED	Incandescent	
Specify a lens color code in place of ②.	Specify a lens/LED color code in place of ②.	Specify a lens color code in place of ②.	66: 6V AC/DC	66: 6V AC/DC	Full Voltage
			11: 12V AC/DC	88: 12V AC/DC	
			22: 24V AC/DC	33: 24V AC/DC	
NA: amber	A: amber	A: amber	16: 100/110V AC		Transformer
NC: clear	G: green	C: clear	116: 115V AC		
NG: green	PW: pure white	G: green	126: 120V AC		
NR: red	R: red	R: red	26: 200/220V AC		
NS: blue	S: blue	S: blue	236: 230V AC		
NW: white	W: white	W: white	246: 240V AC		
DNY: yellow	Y: yellow		386: 380V AC		
	A pure white LED lamp is used for yellow illumination.		46: 400/440V AC		
			486: 480V AC		DC-DC Converter *
			16□□□: 110V DC	—	

• Round bezel (metal): Chrome-plated

• Other contact arrangements are also available. See page 369.

* DC-DC converter types are not approved by UL, CSA, and TÜV, and not CE compliant (operating voltage 90 to 140V DC).

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Control
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References

ø25 TWS Series Illuminated Pushbuttons

Mushroom / Mushroom Pushlock Turn Reset Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
ø35mm Mushroom ALS3 AOLS3  	Momentary	Without Lamp	1NO-1NC	ALS39911N②
			2NO	ALS39920N②
			2NO-2NC	ALS39922N②
		Incandescent	1NO-1NC	ALS3③11N②
			2NO	ALS3③20N②
			2NO-2NC	ALS3③22N②
	Maintained	Without Lamp	1NO-1NC	AOLS39911N②
			2NO	AOLS39920N②
			2NO-2NC	AOLS39922N②
		Incandescent	1NO-1NC	AOLS3③11N②
			2NO	AOLS3③20N②
			2NO-2NC	AOLS3③22N②
Mushroom Pushlock Turn Reset AVLS3  		Without Lamp	1NO-1NC	AVLS39911NR
			2NO	AVLS39920NR
			2NO-2NC	AVLS39922NR
		LED	1NO-1NC	AVLS3③11DNR
			2NO	AVLS3③20DNR
			2NO-2NC	AVLS3③22DNR
		Incandescent	1NO-1NC	AVLS3③11NR
			2NO	AVLS3③20NR
			2NO-2NC	AVLS3③22NR

Designation Code

Specify a code in place of ② or ③ in the Part No.

② Lens Color Code	③ Operating Voltage Code		Input
	LED	Incandescent	
Specify a lens color code in place of ②. A: amber G: green R: red S: blue W: white	66: 6V AC/DC	66: 6V AC/DC	Full Voltage
	11: 12V AC/DC	88: 12V AC/DC	
	22: 24V AC/DC	33: 24V AC/DC	
	16: 100/110V AC		Transformer
	116: 115V AC		
	126: 120V AC		
	26: 200/220V AC		
	236: 230V AC		
	246: 240V AC		
	386: 380V AC		
	46: 400/440V AC		
	486: 480V AC		


- Round bezel (metal): Chrome-plated
- Other contact arrangements are also available. See page 369.
- **Pushlock Turn Reset:** Lens is maintained when pressed and is reset when turned clockwise. Red lens only.

Note: AVLS3 pushlock turn reset switches cannot be used as emergency stop switches. When emergency stop switches are required, use HW series emergency stop switches with HW9Z-A25 ring adapters (ISO 13850 and IEC 60947-5-5 compliant).

TWS series Illuminated Pushbuttons ø25

Square Flush Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
Square Flush (Marking) ULQS1B UOLQS1B 	Momentary	Without Lamp	1NO-1NC	ULQS1B9911②
			2NO	ULQS1B9920②
			2NO-2NC	ULQS1B9922②
		LED	1NO-1NC	ULQS1B③11DN②
			2NO	ULQS1B③20DN②
			2NO-2NC	ULQS1B③22DN②
		Incandescent	1NO-1NC	ULQS1B③11N②
			2NO	ULQS1B③20N②
			2NO-2NC	ULQS1B③22N②
	Maintained	Without Lamp	1NO-1NC	UOLQS1B9911②
			2NO	UOLQS1B9920②
			2NO-2NC	UOLQS1B9922②
		LED	1NO-1NC	UOLQS1B③11DN②
			2NO	UOLQS1B③20DN②
			2NO-2NC	UOLQS1B③22DN②
		Incandescent	1NO-1NC	UOLQS1B③11N②
			2NO	UOLQS1B③20N②
			2NO-2NC	UOLQS1B③22N②

Flush
SilhouetteSwitches &
Pilot LightsDisplay
LightsLED
Illumination
UnitsDisplay
UnitsSafety
ProductsTerminal
BlocksComm.
Terminals

AS-Interface

Relays &
Timers

Sockets

Circuit
ProtectorsPower
SuppliesPLCs &
SmartRelayOperator
Interfaces

Sensors

Control
StationsExplosion
Protection

References

Designation Code

Specify a code in place of ② or ③ in the Part No.

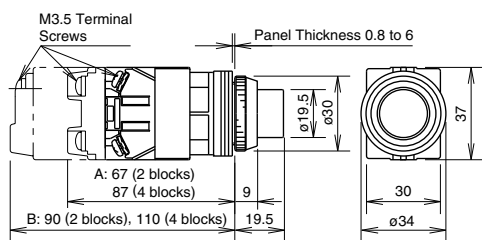
② Lens/LED Color Code			③ Operating Voltage Code		Input
Without Lamp	LED	Incandescent	LED	Incandescent	
Specify a lens color code in place of ②.	Specify a lens/LED color code in place of ②.	Specify a lens color code in place of ②.	66: 6V AC/DC	66: 6V AC/DC	Full Voltage
			11: 12V AC/DC	88: 12V AC/DC	
			22: 24V AC/DC	33: 24V AC/DC	
NA: amber NG: green NR: red NS: blue NW: white DNY: yellow	A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination.	A: amber G: green R: red S: blue W: white	16: 100/110V AC 116: 115V AC 126: 120V AC 26: 200/220V AC 236: 230V AC 246: 240V AC 386: 380V AC 46: 400/440V AC 486: 480V AC		Transformer

- Square bezel (plastic): Black
- Marking plate size: 21.2×1.0 mm (2 pieces supplied)
- Illumination color W (white) and PW (pure white) marking consist of clear lens and white marking plate. See page 400.
- Other contact arrangements are also available. See page 369.

ø25 TWS Series Illuminated Pushbuttons

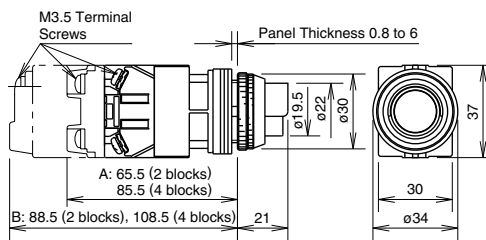
Dimensions

Round Extended ALS2 / AOLS2



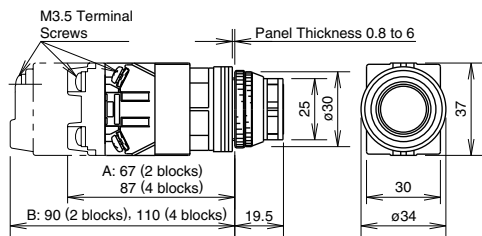
A: Full voltage
B: Transformer

Round Extended with Half Shroud ALGS2 / AOLGS2



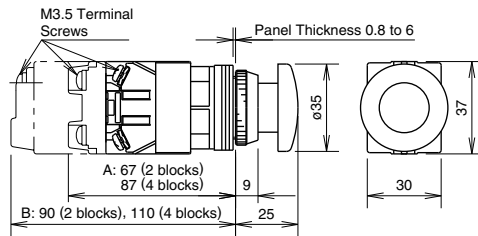
A: Full voltage
B: Transformer

Round Extended with Full Shroud ALFS2 / AOLFS2



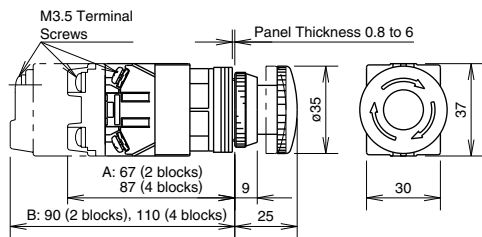
A: Full voltage
B: Transformer

**ø35mm Mushroom
ALS3 / AOLS3**



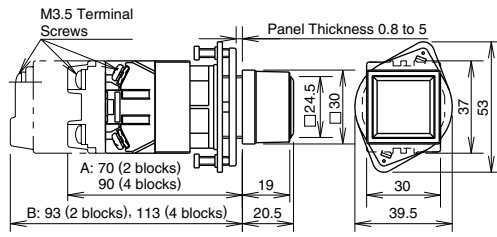
A: Full voltage
B: Transformer

Mushroom Pushlock Turn Reset AVLS3



A: Full voltage
B: Transformer

Square Flush
ULQS1B / UOLQS1B



Marking Plate Size: ☐ 21.2x1t mm, 2 plates included


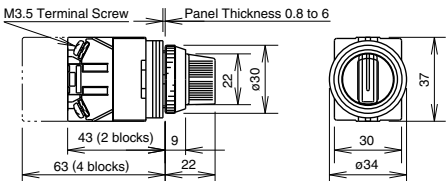










A: Full voltage
B: Transformer

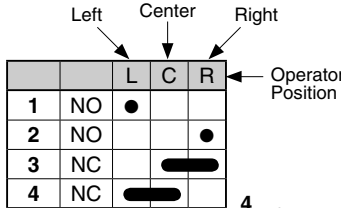
All dimensions in mm.

TWS Series Selector Switches **ø25**


Selector Switches (Knob Operator)

Package Quantity: 1

No. of Positions	Shape					ASS						
	Contact Arrangement Chart											
90° 2-position	Contact Code	Contact Block		Operator Position		Maintained	Spring Return from Right	Spring Return from Left	—			
		Mounting Position	Contact	L	R							
	10 (1NO)	1	NO		●	ASS210N	ASS2110N	ASS2210N *	—			
		2	Dummy									
	11 (1NO-1NC)	1	NO		●	ASS211N	ASS2111N	ASS2211N *				
		2	NC	●								
	20 (2NO)	1	NO		●	ASS220N	ASS2120N	ASS2220N *				
		2	NO		●							
	22 (2NO-2NC)	1	NO		●	ASS222N	ASS2122N	ASS2222N *				
		2	NC	●								
3		NO		●								
2R ★ (1NO-1NC)	1	NO		●	ASS22RN-118 ★	ASS212RN-118 ★	—					
	2	NC	●									
2R ★ (1NO-1NC)	1	NC	●		—	—	ASS222RN-169 ★					
	2	NO	●									
45° 3-position	Contact Code	Contact Block		Operator Position			Maintained	Spring Return from Right	Spring Return from Left	Spring Return Two-way		
		Mounting Position	Contact	L	C	R						
	20 (2NO)	1	NO	●			ASS320N	ASS3120N	ASS3220N	ASS3320N		
		2	NO			●						
	02 (2NC)	1	NC			●	ASS302N	ASS3102N	ASS3202N	ASS3302N		
		2	NC	●								
	22 (2NO-2NC)	1	NO	●			ASS322N	ASS3122N	ASS3222N	ASS3322N		
		2	NO			●						
		3	NC			●						
		4	NC	●								
	40 (4NO)	1	NO	●			ASS340N	ASS3140N	ASS3240N	ASS3340N		
		2	NO			●						
		3	NO	●								
		4	NO			●						
	04 (4NC)	1	NC			●	ASS304N	ASS3104N	ASS3204N	ASS3304N		
		2	NC	●								
3		NC			●							
4		NC	●									
3S ★	1	NO	●			ASS33SN-243 ★	—	—	—			
	2	NO			●							
	3	NC			●							
	4	Dummy										
30° 5-position / 45° 4-position	Contact Code	Contact Block		Operator Position					Maintained	Maintained	Contact Block Mounting Position and Contact Arrangement Chart	
		Mounting Position	Contact	1	2	3	4	5				
	4S ★	1	NO		●				ASS44SN-407 ★	—		
		2	NC			●						
		3	NC				●					
		4	NO					●				
	4S ★	1	NO	●					ASS44SN-411 ★	—		
		2	NC		●							
		3	NC			●						
		4	NO				●					
	3S ★	1	NO	●					ASS43SN-461 ★	—		
		2	NC		●							
		3	NC			●						
		4	Dummy									
	4S ★	1	NO	●					—	ASS54SN-501 ★		
		2	NC		●							
3		NC			●							
4		NO				●						

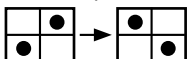


		Left	Center	Right	
		L	C	R	Operator Position
1	NO	●			
2	NO			●	
3	NC			●	
4	NC	●			



• For more contact arrangement chart, see pages 388 to 390.

- On the 2-position selector switches marked with * above, the contact operation is reversed as follows.



- On the contact arrangement marked with ★ in the table above, 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.
- Selector switches with one or three contact blocks contain a dummy block.
- Knob operator: White indicator on black knob

Flush
SilhouetteSwitches &
Pilot LightsDisplay
LightsLED
Illumination
UnitsDisplay
UnitsSafety
ProductsTerminal
BlocksComm.
Terminals

AS-Interface

Relays &
Timers

Sockets

Circuit
ProtectorsPower
SuppliesPLCs &
SmartRelayOperator
Interfaces

Sensors


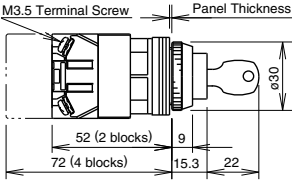
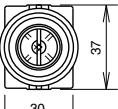




















Control
StationsExplosion
Protection

References

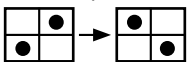
TWS Series Selector Switches ø25

Key Selector Switches

Package Quantity: 1

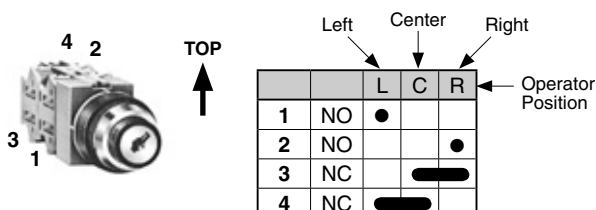
No. of Positions	Shape						ASS□K							
	Contact Arrangement Chart													
90° 2-position	Contact Code	Contact Block	Operator Position	Maintained		Spring Return from Right		Spring Return from Left		—				
														
	Mounting Position	Contact	L	R	ASS2K10N		ASS21K10N		ASS22K10N *					
	10 (1NO)	1	NO		●									
	2	Dummy												
	11 (1NO-1NC)	1	NO		●	ASS2K11N		ASS21K11N		ASS22K11N *				
	2	NC	●											
	20 (2NO)	1	NO		●	ASS2K20N		ASS21K20N		ASS22K20N *				
	2	NO		●										
	22 (2NO-2NC)	1	NO		●	ASS2K22N		ASS21K22N		ASS22K22N *				
	2	NC	●											
	3	NO		●										
4	NC	●												
2R ★ (1NO-1NC)	1	NO			ASS2K2RN-118 ★		ASS21K2RN-118 ★		—					
2	NC			—		—		ASS22K2RN-169 ★						
2R ★ (1NO-1NC)	1	NC												
2	NO													
45° 3-position	Contact Code	Contact Block	Operator Position	Maintained		Spring Return from Right		Spring Return from Left		Spring Return Two-way				
														
	Mounting Position	Contact	L	C	R	ASS3K20N		ASS31K20N		ASS32K20N		ASS33K20N		
	20 (2NO)	1	NO	●										
	2	NO			●									
	02 (2NC)	1	NC				ASS3K02N		ASS31K02N		ASS32K02N		ASS33K02N	
	2	NC												
	1	NO	●											
	22 (2NO-2NC)	2	NO			●	ASS3K22N		ASS31K22N		ASS32K22N		ASS33K22N	
	3	NC												
	4	NC												
	40 (4NO)	1	NO	●			ASS3K40N		ASS31K40N		ASS32K40N		ASS33K40N	
	2	NO			●									
	3	NO	●											
	4	NO			●									
	04 (4NC)	1	NC				ASS3K04N		ASS31K04N		ASS32K04N		ASS33K04N	
	2	NC												
	3	NC												
	4	NC												
	3S ★	1	NO	●			ASS3K3SN-243 ★		—		—		—	
2	NO			●										
3	NC		●											
4	Dummy													

- On the spring-returned, the key can be released only from the maintained position. On the maintained, the key can be released from every position. Key retained positions are also available. See page 370.
- On the 2-position selector switches marked with * above, the contact operation is reversed as follows.



- On the contact arrangement marked with ★ in the table above, 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.
- Key selector switches with one or three contact blocks contain a dummy block.
- Cylinder cover: Black
- Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart



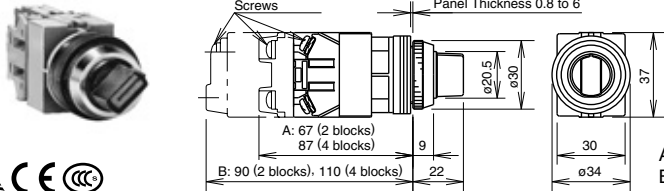

- For more contact arrangement chart, see pages 388 to 390.

Ø25

Illuminated Selector Switches

90° 2-position

Package Quantity: 1

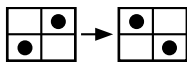
Shape					ASLS 			
Contact Arrangement Chart								
Contact Code	Contact Block		Operator Position		Lamp	Maintained L R	Spring Return from Right L R	Spring Return from Left L R
	Mounting Position	Contact	L	R				
11 (1NO-1NC)	1	NO		●	Without Lamp	ASLS29911②	ASLS219911②	ASLS229911② *
	2	NC	●		LED	ASLS2③11DN②	ASLS21③11DN②	ASLS22③11DN② *
					Incandescent	ASLS2③11N②	ASLS21③11N②	ASLS22③11N② *
20 (2NO)	1	NO		●	Without Lamp	ASLS29920②	ASLS219920②	ASLS229920② *
	2	NO		●	LED	ASLS2③20DN②	ASLS21③20DN②	ASLS22③20DN② *
					Incandescent	ASLS2③20N②	ASLS21③20N②	ASLS22③20N② *
22 (2NO-2NC)	1	NO		●	Without Lamp	ASLS29922②	ASLS219922②	ASLS229922② *
	2	NC	●					
	3	NO		●	LED	ASLS2③22DN②	ASLS21③22DN②	ASLS22③22DN② *
	4	NC	●					
					Incandescent	ASLS2③22N②	ASLS21③22N②	ASLS22③22N② *

Designation Code

Specify a code in place of ② or ③ in the Part No.

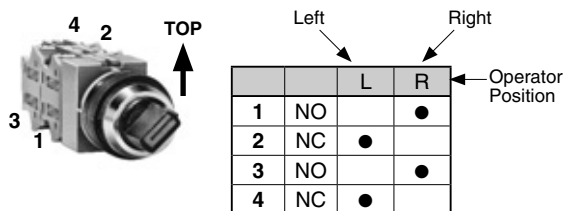
② Lens/LED Color Code			③ Operating Voltage Code		Input
Without Lamp	LED	Incandescent	LED	Incandescent	
Specify a lens color code in place of ②.	Specify a lens/LED color code in place of ②.	Specify a lens color code in place of ②.	66: 6V AC/DC	66: 6V AC/DC	Full Voltage
			11: 12V AC/DC	88: 12V AC/DC	
			22: 24V AC/DC	33: 24V AC/DC	
NA: amber	A: amber	A: amber	16: 100/110V AC		Transformer
NG: green	G: green	G: green	136: 115/120V AC		
NR: red	R: red	R: red	26: 200/220V AC		
NS: blue	S: blue	S: blue	256: 230/240V AC		
NW: white	W: white	W: white	386: 380V AC		
DNY: yellow	Y: yellow		46: 400/440V AC		
	A pure white LED lamp is used for yellow illumination.		486: 480V AC		

• On the selector switches marked with * above, the contact operation is reversed as follows.



- Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart



- For more contact arrangement chart, see pages 388 to 390.

TWS Series Illuminated Selector Switches ø25

Illuminated Selector Switches

45° 3-position

Contact Code	Contact Block		Operator Position			Lamp	Maintained	Spring Return from Right	Spring Return from left	Spring Return Two-way
	Mounting Position	Contact	L	C	R					
20 (2NO)	1	NO	●			Without Lamp	ASLS39920②	ASLS319920②	ASLS329920②	ASLS339920②
	2	NO			●	LED	ASLS3③20DN②	ASLS31③20DN②	ASLS32③20DN②	ASLS33③20DN②
						Incandescent	ASLS3③20N②	ASLS31③20N②	ASLS32③20N②	ASLS33③20N②
02 (2NC)	1	NC		■		Without Lamp	ASLS39902②	ASLS319902②	ASLS329902②	ASLS339902②
	2	NC		■		LED	ASLS3③02DN②	ASLS31③02DN②	ASLS32③02DN②	ASLS33③02DN②
						Incandescent	ASLS3③02N②	ASLS31③02N②	ASLS32③02N②	ASLS33③02N②
22 (2NO-2NC)	1	NO	●			Without Lamp	ASLS39922②	ASLS319922②	ASLS329922②	ASLS339922②
	2	NO			●	Without Lamp	ASLS39922②	ASLS319922②	ASLS329922②	ASLS339922②
	3	NC		■		LED	ASLS3③22DN②	ASLS31③22DN②	ASLS32③22DN②	ASLS33③22DN②
	4	NC		■		LED	ASLS3③22DN②	ASLS31③22DN②	ASLS32③22DN②	ASLS33③22DN②
40 (4NO)	1	NO	●			Without Lamp	ASLS39940②	ASLS319940②	ASLS329940②	ASLS339940②
	2	NO			●	Without Lamp	ASLS39940②	ASLS319940②	ASLS329940②	ASLS339940②
	3	NO	●			LED	ASLS3③40DN②	ASLS31③40DN②	ASLS32③40DN②	ASLS33③40DN②
	4	NO			●	LED	ASLS3③40DN②	ASLS31③40DN②	ASLS32③40DN②	ASLS33③40DN②
04 (4NC)	1	NC		■		Without Lamp	ASLS39904②	ASLS319904②	ASLS329904②	ASLS339904②
	2	NC		■		Without Lamp	ASLS39904②	ASLS319904②	ASLS329904②	ASLS339904②
	3	NC		■		LED	ASLS3③04DN②	ASLS31③04DN②	ASLS32③04DN②	ASLS33③04DN②
	4	NC		■		LED	ASLS3③04DN②	ASLS31③04DN②	ASLS32③04DN②	ASLS33③04DN②
						Incandescent	ASLS3③04N②	ASLS31③04N②	ASLS32③04N②	ASLS33③04N②

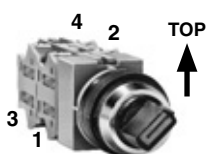
Designation Code

Specify a code in place of ② or ③ in the Part No.

② Lens/LED Color Code			③ Operating Voltage Code		Input
Without Lamp	LED	Incandescent	LED	Incandescent	
Specify a lens color code in place of ②. NA: amber NG: green NR: red NS: blue NW: white DNY: yellow	Specify a lens/LED color code in place of ②. A: amber G: green R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination.	Specify a lens color code in place of ②. A: amber G: green R: red S: blue W: white	66: 6V AC/DC 11: 12V AC/DC 22: 24V AC/DC 16: 100/110V AC 136: 115/120V AC 26: 200/220V AC 256: 230/240V AC 386: 380V AC 46: 400/440V AC 486: 480V AC	66: 6V AC/DC 88: 12V AC/DC 33: 24V AC/DC	Full Voltage
					Transformer

• Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart










		Left	Center	Right	
		L	C	R	Operator Position
1	NO	●			
2	NO			●	
3	NC		■		
4	NC		■		

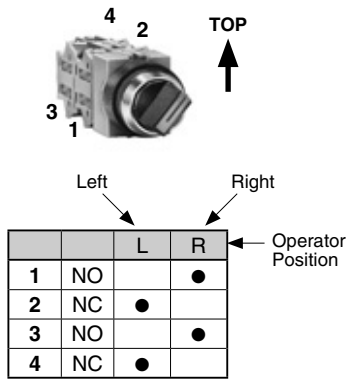
• For more contact arrangement chart, see pages 388 to 390.

Ø25

90° 2-position (Maintained / Spring Return)

Positions				Maintained	Spring Return from Right	Spring Return from Left	
							
Operator				Knob, Lever, Key, Illuminated			
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions			
							
				L	R	L	R
10 (1NO)	—	1	NO		●	●	
		2	Dummy				
01 (1NC)	—	1	NC	●			●
		2	Dummy				
11 (1NO-1NC)	— 103	1	NO		●	●	
		2	NC	●			●
		1	NC	●			●
		2	NO		●		
20 (2NO)	—	1	NO		●	●	
		2	NO		●	●	
02 (2NC)	—	1	NC	●			●
		2	NC	●			●
22 (2NO-2NC)	—	1	NO		●	●	
		2	NC	●			●
		3	NO		●	●	
		4	NC	●			●
	110	1	NC	●			●
		2	NO		●	●	
		3	NC	●			●
		4	NO		●	●	
	111	1	NO		●	●	
		2	NO		●	●	
		3	NC	●			●
		4	NC	●			●
	117	1	NC	●			●
		2	NO		●	●	
		3	NO		●	●	
		4	NC	●			●
31 (3NO-1NC)	107	1	NC	●			●
		2	NO		●	●	
		3	NO		●	●	
		4	NO		●	●	
40 (4NO)	—	1	NO		●	●	
		2	NO		●	●	
		3	NO		●	●	
		4	NO		●	●	
2R ★	118 ★	1	NO		■		
		2	NC	■			
	168 ★	1	NO				■
		2	NC				■
	119 ★	1	NC	■			
		2	NO		■		
169 ★	1	NC				■	
	2	NO				■	
4R ★	120 ★	1	NO		■		
		2	NC	■			
		3	NO		■		
		4	NC	■			
	170 ★	1	NO				■
		2	NC				■
		3	NO				■
		4	NC				■
	121 ★	1	NC	■			
		2	NO		■		
		3	NC	■			
		4	NO		■		
	171 ★	1	NC				■
		2	NO				■
		3	NC				■
		4	NO				■

Contact Block Mounting Position and Contact Arrangement Chart



- On the contact arrangement marked with ★ in the table, 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.

Part No. Development

- When circuit number is not required:

ASS 2 11 N

- Contact Code (1NO-1NC)
- 2-position

- When circuit number is required:

ASS 2 11 N - 103

— Circuit No.
 — Contact Code (1NO-1NC)
 — 2-position

TWS series Selector Switch Contact Arrangement Charts ø25

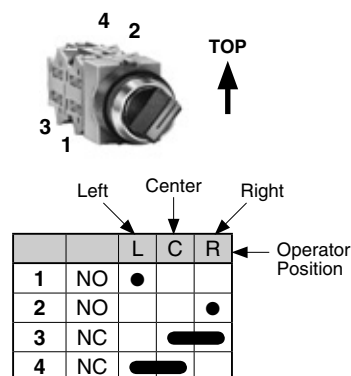
45° 3-position (Maintained / Spring Return)

Positions	Maintained	Spring Return from Right	Spring Return from Left	Spring Return Two-way
Operator/c	Knob, Lever, Key, Illuminated			

Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions		
11 (1NO-1NC)	202	1	NO	●		
		2	NC	■		
	203	1	NC			■
		2	NO			●
	302	1	NO	●		●
		2	NC	■		
20 (2NC)	—	1	NO	●		
		2	NO			●
	301	1	NO			●
		2	NO			●
02 (2NC)	—	1	NC	■		
		2	NC	■		
	304	1	NC		●	
		2	NC	■		
22 (2NO-2NC)	—	1	NO	●		
		2	NO			●
		3	NC			■
		4	NC	■		
	210	1	NC			■
		2	NO			●
		3	NC			■
		4	NO			●
	308	1	NO	●		●
		2	NC	■		
		3	NO	●		●
		4	NC	■		
	309	1	NO	●		●
		2	NC	■		
		3	NC		●	
		4	NO			●
	310	1	NC		●	
		2	NO			●
		3	NC		●	
		4	NO			●
31 (3NO-1NC)	206	1	NO	●		
		2	NC	■		
		3	NO	●		
		4	NO			●
	207	1	NC			■
		2	NO			●
		3	NO	●		
		4	NO			●
13 (1NC-3NC)	212	1	NO	●		
		2	NC	■		
		3	NC			■
		4	NC	■		
	313	1	NC		●	
		2	NO			●
		3	NC		●	
		4	NC	■		

Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions		
40 (4NO)	—	1	NO	●		
		2	NO			●
		3	NO	●		
		4	NO			●
	305	1	NO	●		●
		2	NO			●
		3	NO	●		●
		4	NO			●
04 (4NC)	—	1	NC			■
		2	NC	■		
		3	NC			■
		4	NC	■		
	314	1	NC		●	
		2	NC	■		
		3	NC		●	
		4	NC	■		

Contact Block Mounting Position and Contact Arrangement Chart



Part No. Development

- When circuit number is not required:

ASS 3 22 N

— Contact Code (2NO-2NC)
— 3-position

- When circuit number is required:

ASS 3 22 N - 210

— Circuit No.
— Contact Code (2NO-2NC)
— 3-position

Flush Silhouette

Switches & Pilot Lights

Display Lights

LED Illumination Units

Display Units

Safety Products

Terminal Blocks

Comm. Terminals

AS-Interface

Relays & Timers

Sockets

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Control Stations

Explosion Protection

References

ø25 TWS series Selector Switch Contact Arrangement Charts

45° 3-position (Maintained)

Positions				Maintained		
				<div> <div>L</div> <div>C</div> <div>R</div> </div>		
Operator				Knob, Lever, Illuminated		
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions		
				<div> <div></div> <div>L</div> </div>	<div> <div></div> <div>C</div> </div>	<div> <div></div> <div>R</div> </div>
3S★	243★	1	NO	●		
		2	NO			●
		3	NC		●	
		4	Dummy			
4S★	233★	1	NO	●		
		2	NC		■	
		3	NO	●		●
		4	NO			●
	234★	1	NO	●		
		2	NC		■	
		3	NC			●
		4	NC		■	
	235★	1	NC			■
		2	NO			●
		3	NC		●	
		4	NO			●
	237★	1	NO	●		
		2	NO			●
		3	NC		●	
		4	NO			●
	240★	1	NC			■
		2	NC		■	
		3	NC		●	
		4	NO			●

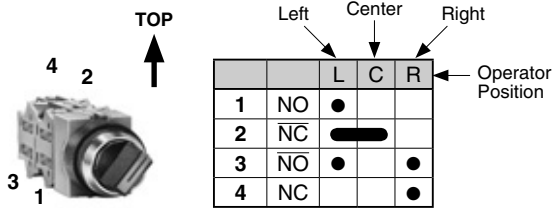
45° 4-position (Maintained)

Positions				Maintained			
				<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div>			
Operator				Knob, Lever			
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions			
				<div> <div></div> <div>1</div> </div>	<div> <div></div> <div>2</div> </div>	<div> <div></div> <div>3</div> </div>	<div> <div></div> <div>4</div> </div>
3S★	461★	1	NO	●			
		2	NC		●		
		3	NC			●	
		4	Dummy				
4S★	405★	1	NC			■	
		2	NC		●		
		3	NC			●	
		4	NC				■
	407★	1	NC			■	
		2	NC		●		
		3	NC			●	
		4	NO				●
	409★	1	NO	●			
		2	NC		●		
		3	NC			●	
		4	NC			■	
	411★	1	NO	●			
		2	NC		●		
		3	NC			●	
		4	NO				●

30° 5-position (Maintained)

Positions				Maintained				
				<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> </div>				
Operator				Knob, Lever				
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions				
				<div> <div></div> <div>1</div> </div>	<div> <div></div> <div>2</div> </div>	<div> <div></div> <div>3</div> </div>	<div> <div></div> <div>4</div> </div>	<div> <div></div> <div>5</div> </div>
4S★	501★	1	NO	●				
		2	NC		●			
		3	NC				●	
		4	NO					●

Contact Block Mounting Position and Contact Arrangement Chart



• On the contact arrangement marked with ★ in the table, 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.

Part No. Development

• When circuit number is not required:





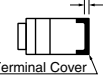



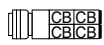

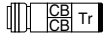
ASS 3 4S N
 — Contact Code
 — 3-position

• When circuit number is required:

ASS 3 4S N - 233
 — Circuit No.
 — Contact Code (2NO-2NC)
 — 3-position

TWS Series Accessories and Replacement Parts ø25

Terminal Covers

Terminal Cover		TW-VLC	HW-VL3	HW-VL5	APS-PVL	Use of terminal covers increases the depth by the dimensions below.
Control Unit		 44.6H × 14.1W	 37.8H × 26W	 39.1H × 15.5W	 36H × 29.4W	
<ul style="list-style-type: none"> Pilot light APS UPQS UPQMS 	Full Voltage				X	+6 mm
	Transformer DC-DC Converter		X			+3 mm
<ul style="list-style-type: none"> Pushbutton ABS AOS ABGS AOGS ABFS AOFS AKS AVS AJS AZS ATS UTS AYS Selector switch ASS 	1 contact block 	X				+3.5 mm
	2 contact blocks 	X 2 pieces				
	3 contact blocks 	X 2 pieces				
	4 contact blocks 	X 2 pieces				
<ul style="list-style-type: none"> Illuminated pushbutton ALS AOLFS AOLS ULOS ALGS UOLQS AOLGS AVLS ALFS ATLS Illuminated selector switch ASLS Push-to-check pilot light APS 	Full Voltage 			X		+3 mm
	Transformer DC-DC Converter 		X			+3 mm

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SmartRelayOperator
Interfaces

Sensors

Control
StationsExplosion
Protection

References

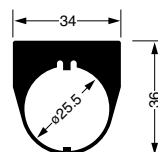
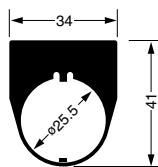
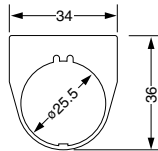
Ordering Terminal Covers

Terminal covers are ordered separately.

When ordering terminal covers, specify the Part No. and required quantity.

Ø25

Nameplates

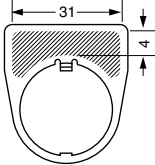
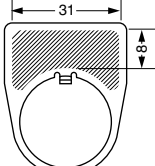
Dimensions (mm)	Legend	Material	Part No.	Ordering No.	Package Quantity	Description
	Blank	Aluminium 1.2 mm thick	NSA-0	NSA-0	1	• Black
				NSA-0PN10	10	
	With Legend		NSA-*	NSA-*	1	• White letters on black back- ground
				NSA-*PN10	10	
	Blank	Aluminium 1.2 mm thick	NSALO	NSALO	1	• Black
				NSALOPN10	10	
	Blank	Stainless steel 0.8 mm thick	NFSO	NFSO	1	• Stainless steel ground color
				NFSOPN10	10	

- Specify a legend code in place of * in the Ordering No.

Legends

Code	Legend
0	(blank)
1	ON
2	OFF
3	START
4	STOP
31	OFF-ON
35	HAND-AUTO
53	HAND-OFF-AUTO


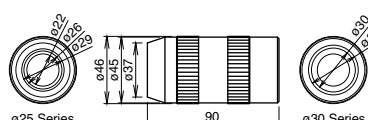

Example of Shape and Engraving Area

Shape	Engraving Area		Max. No. of Lines	No. of Letters on 1 Line
	Height	Width		
Standard (NSA/NFSO) 	4	31	1	17
Mushroom (NSALO) 	8	31	2	17

- The above example is when the letter is 3 mm tall.
- Engraving must be made within 1.5 mm from the sides.

TWS Series Accessories and Replacement Parts ø25

Accessories

Shape		Material	Part No.	Ordering No.	Package Quantity	Dimensions (mm)
<div>Locking Ring Wrench</div> <div></div>		Rubber (nitril)	OR-12	OR-12	1	<div><ul style="list-style-type: none">Used to tighten the round bezel when installing the TWS control unit onto a panel.</div> <div></div>
<div>Lamp Holder Tool</div> <div></div>		Rubber (nitril)	OR-55	OR-55	1	<div><ul style="list-style-type: none">Used to install and remove LED/incandescent lamps.</div> <div></div>

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Operator Interfaces

Sensors


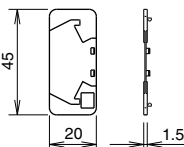

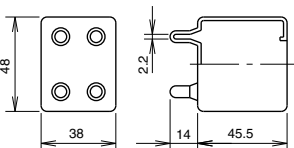
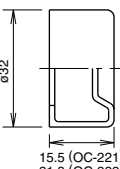

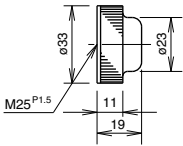

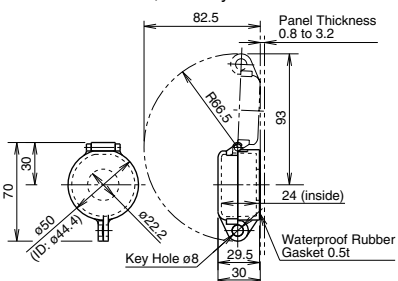

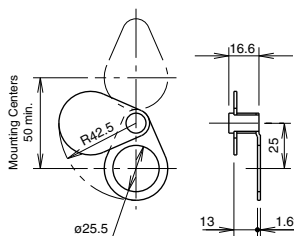
Control Stations

Explosion Protection

References

ø25 TWS Series Accessories and Replacement Parts



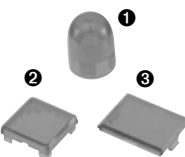
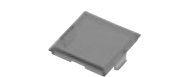

Accessories

Shape		Material	Part No.	Ordering No.	Package Quantity	Dimensions (mm)
Barrier		Polyamide	HW-VL1	HW-VL1PN10	10	<ul style="list-style-type: none"> Used to prevent contact between adjacent lead wires when units are mounted closely. Barriers should be always used in close mounting. 
Contact Rubber Boot	 <p>For 1 layer of contact blocks (2 contact blocks)</p>	Rubber (nitril) Black	OCS-99	OCS-99	1	<ul style="list-style-type: none"> Dust cover boot used for pushbuttons and selector switches. Temperature range: -5 to +60°C Black 
Button Clear Boot	For flush pushbuttons	Rubber (EPDM)	OC-221	OC-221	1	<ul style="list-style-type: none"> Used to cover and protect pushbuttons where units are subject to water splash. Not suitable for outdoor use or where the units are subject to oil splash. 
	For extended pushbuttons		OC-222	OC-222	1	
Button Cover		Rubber (nitril)	OCS-11①	OCS-11①	1	<p>B (black), G (green), R (red), Y (yellow)</p> <ul style="list-style-type: none"> Metallic bezels covered with rubber boot to enhance waterproof and oiltight characteristics. Button is installed in the cover. Remove the button from the pushbutton before using the button cover. Temperature range: -5 to +60°C 
Padlock Cover		Polyarylate (gasket: nitril rubber)	OLS-KL1	OLS-KL1	1	<ul style="list-style-type: none"> Used to protect momentary and maintained pushbuttons, illuminated pushbuttons, knob selector switches, and key selector switches. 
Metal Protector		Metal (steel: zinc-plated)	OLS-C	OLS-C	1	<ul style="list-style-type: none"> Used to protect flush buttons from inadvertent operation. Can be easily attached under the round bezel. 

Note: Specify a button cover color code in place of ① in the Ordering No.

TWS Series Accessories and Replacement Parts ø25

Maintenance Parts

Shape		Material	Part No.	Ordering No.	Package Quantity	Color Code	
	①Pushbutton Pilot Light	Polycarbonate	OGP-22①	OGP-22①PN02	2	B (black), G (green), R (red), Y (yellow), W (white) • Cannot be used for control units with half shroud or full shroud.	
	②Selector Switch		OGP-33①	OGP-33①PN02			
	③Pushbutton Pilot Light Key Selector Illuminated Selector	Metal (chrome-plated) ZDC	OG-22	OG-22PN02	1	• Cannot be used for control units with half shroud or full shroud.	
	④Selector Switch (except key selector)		OG-33	OG-33PN02			
	⑤Pushbutton with Full Shroud		ABS2FN	ABS2FN			
	⑥Mushroom with Full Shroud		ABS3GN	ABS3GN			
	⑦Pushbutton, Illuminated Pushbutton with Half Shroud	Shroud: brass Others: ZDC	ALS1G	ALS1G			
	⑧Illuminated Pushbutton with Full Shroud	Metal (chrome-plated) ZDC	ALS1F	ALS1F			
	①Flush	Polyacetal	ABS1BN-①	ABS1BN-①PN05	5	B (black), G (green), R (red), S (blue), Y (yellow), W (white) • Light color	
	②Extended		ABS2BN-①	ABS2BN-①PN05			
	③ø35mm Mushroom		ABS3BN-①	ABS3BN-①PN02	2		
	④Square Flush		UBQS1BN-①	UBQS1BN-①PN02	2	B (black), G (green), R (red), S (blue), Y (yellow) • Light color R (red), Y (yellow) B (black), G (green), R (red), Y (yellow)	
	⑤Square Extended		UBQS2BN-①	UBQS2BN-①PN02			
	⑥Pushlock Turn Reset		AVS3BN-①	AVS3BN-①PN02			
	⑦Push-Pull		AYS3BN-①	AYS3BN-①PN02			
			①Dome	AS resin	APS106L-②	APS106L-②PN05	5
②For Square Metal Bezel Unit		APS106LD-②	APS106LD-②PN05		A (amber), W (white), Y (yellow)		
		UPQS306L-②	UPQS306L-②PN05		C (clear), G (green), R (red), S (blue)		
		UPQS306LD-②	UPQS306LD-②PN05		A (amber), Y (yellow)		
		③Rectangular	UPQS406L-②		UPQS406L-②PN05	A (amber), C (clear), G (green), R (red), S (blue)	
	For Square with Plastic Bezel	AS resin	UPQS106L-②	UPQS106L-②PN05	5	C (clear), G (green), R (red), S (blue)	
			UPQS106LD-②	UPQS106LD-②PN05	5	A (amber), Y (yellow)	
	①Extended	AS resin	ALS06L-②	ALS06L-②PN05	5	C (clear), G (green), R (red), S (blue)	
			ALS06LD-②	ALS06LD-②PN05		A (amber), Y (yellow), W (white)	
	②Mushroom		ALS3L-②	ALS3L-②PN02	2	G (green), R (red), S (blue)	
			ALS3LD-②	ALS3LD-②PN02		A (amber), W (white)	
	③Pushlock Turn Reset			AVLS3L-R	AVLS3L-RPN02		

Note: Specify a button color code or lens color code in place of ① or ② in the Ordering No.
Use a clear lens for white or pure white illumination.

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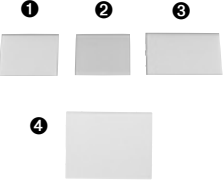








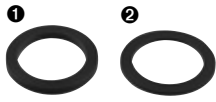
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ø25 TWS Series Accessories and Replacement Parts

Maintenance Parts

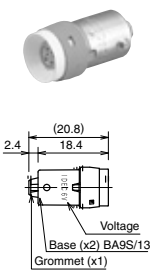
Shape		Material	Part No.	Ordering No.	Package Quantity	Remarks
	① Knob	Plastic	ASSHHY-①	ASSHHY-①PN02	2	B (black), G (green), R (red)
	② Lever		ASSHHL-①	ASSHHL-①PN02		
	③ Color Insert	Plastic	TWS-HC1①	TWS-HC1①PN05	5	B (black), G (green), R (red), S (blue), Y (yellow), W (white)
	④ Illuminated Selector		ASLSLDY-②	ASLSLDY-②		
		Plastic	AKS2B-①	AKS2B-①PN05	5	B (black), R (red)
		Plastic	ABS1B-C	ASB1B-CPN05	5	B (black), G (green), R (red), W (white), Y (yellow) • Used on flush pushbuttons to indicate a mark or a symbol engraved on the marking plate. The clear button cover holds the marking plate.
		Plastic	TWS-0①	TWS-0①PN10	10	
	① For Square Pilot Lights and Illuminated Pushbuttons	Plastic	UPQS106P-W	UPQS106P-WPN02	2	• □21.2 × 1t mm
			UPQS106P-C	UPQS106P-CPN02		
	② For Square Pilot Lights with Metal Bezel		UPQS306N-W	UPQS306N-WPN02		• □20 × 2t mm
			UPQS406P-W	UPQS406P-WPN02		
	③ ④ For Rectangular Pilot Lights		UPQS406P-C	UPQS406P-CPN02		27.2 × 21.2 × 1t mm
	1NO		HW-C10	HW-C10	1	Housing: Blue Push rod: Green
	1NC		HW-C01	HW-C01		Housing: Purple red Push rod: Red
	Early Make		HW-C10R	HW-C10R		Housing: Blue Push rod: Black
	Late Break		HW-C01R	HW-C01R		Housing: Purple red Push rod: White
			TW-DB	TW-DBPN10	10	• Used for non-illuminated units with 1NO or 1NC contact blocks.
			TW-DA1B	TW-DA1BPN02	2	• Adapter with M3.5 screws used for illuminated pushbutton or illuminated selector switch. Snaps on to the back of the contact block.
	For Key Selector Switch	Metal	TW-SK-0	TW-SK-0PN02	2	
	① 3.0-mm thick	Rubber	OW-22	OW-22PN10	10	• Outside diameter: ø33.8 • Inside diameter: ø25.5
	② 1.5-mm thick		OW-21	OW-21PN10		

Note: Specify a color code in place of ① or ② in the Ordering No.

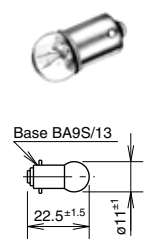
TWS Series Accessories and Replacement Parts ø25

Maintenance Parts

LED Lamps (LSTD)

Dimensions	Operating Voltage	Current Draw		Part No.	Ordering No.	Illumination Color Code	Package Quantity	Base
		AC	DC					
	6V AC/DC $\pm 5\%$	8 mA	7 mA (A, R, W) 5.5 mA (G, PW, S)	LSTD-6②	LSTD-6②	Specify a color code in place of ② in the Ordering No. A: amber G: green PW: pure white R: red S: blue W: white	1	BA9S/13
					LSTD-6②PN10		10	
	12V AC/DC $\pm 10\%$	11 mA	10 mA	LSTD-1②	LSTD-1②		1	
					LSTD-1②PN10		10	
	24V AC/DC $\pm 10\%$	11 mA	10 mA	LSTD-2②	LSTD-2②		1	
					LSTD-2②PN10		10	
						Use a pure white (PW) LED lamp with yellow (Y) lens.		

Incandescent Lamps (LS)

Dimensions	Rated Operating Voltage	Lamp Ratings	Part No.	Package Quantity
	6V AC/DC	1W (6.3V)	LS-6	1
	12V AC/DC	1W (18V)	LS-8	
	18V AC/DC	1W (24V)	LS-2	
	24V AC/DC	1W (30V)	LS-3	

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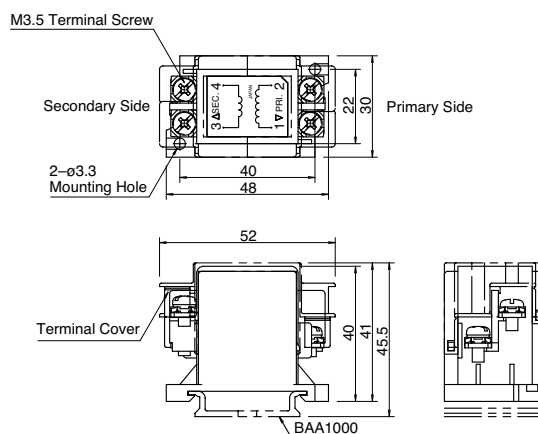
Transformer

Shape	Primary Voltage	Secondary Voltage	Part No.	Applicable Load
For 6V 	100/110V AC	5.5V AC, 1W	TWR516	LSTD-6 LED lamp (6V AC/DC) or LS-6 incandescent lamp (6V AC/DC, 1W)
	115/120V AC		TWR5126	
	200/220V AC		TWR526	
	230/240V AC		TWR5246	
	380V AC		TWR5386	
	400/440V AC		TWR546	
	480V AC		TWR5486	

Specifications

Operating Voltage	100/110V AC, 115/120V AC, 200/220V AC, 230/240V AC, 380V AC, 400/440V AC, 480V AC (50/60Hz)
Current Draw	2.4 VA
Rated Insulation Voltage	600V
Insulation Resistance	100 MΩ minimum (500V DC megger)
Operating Temperature	−30 to +60°C (no freezing)
Storage Temperature	−40 to +80°C (no freezing)
Operating Humidity	35 to 85% RH (no condensation)
Vibration Resistance	Damage Limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Damage limits : 1,000 m/s ²
Dielectric Strength	2,500V AC, 1 minute
Terminal Screw	M3.5
Applicable Wire	2 mm ² maximum, 2 wires maximum
Weight (approx.)	87g

Dimensions

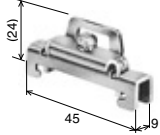


Accessories

DIN Rail

Part No.	Ordering No.	Length	Weight (approx.)	Material	Package Quantity
BAA1000	BAA1000PN10	1000 mm	200g	Aluminum	10
BAP1000	BAP1000PN10	1000 mm	320g	Steel	10

End Clip

Part No.	Ordering No.	Applicable DIN Rail	Weight (approx.)	Material	Package Quantity	Dimensions
BNL6	BNL6PN10	BAA1000 BAP1000	15g	Steel (Zinc-plated)	10	

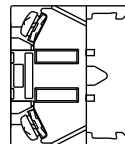
- Use plastic end clip BC9Z-E/NS35N when using 400/440V AC primary voltage transformers.

Safety Precautions

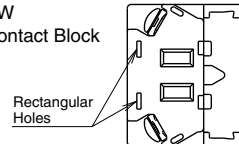
- Turn off the power to the TWS series control units before starting installation, removal, wiring, maintenance, and inspection of the products. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid a burn on your hand, use the lamp holder tool when replacing lamps.
- For wiring, use wires of a proper size to meet the voltage and current requirements. Tighten the M3.5 terminal screws to a tightening torque of 1.0 to 1.3 N·m. Failure to tighten terminal screws may cause overheat and fire.

- Use HW-C contact blocks for the TWS series. Do not replace with or add conventional TW series contact blocks. Using a different type of contact block may lead to malfunction.

HW-C
Contact Block



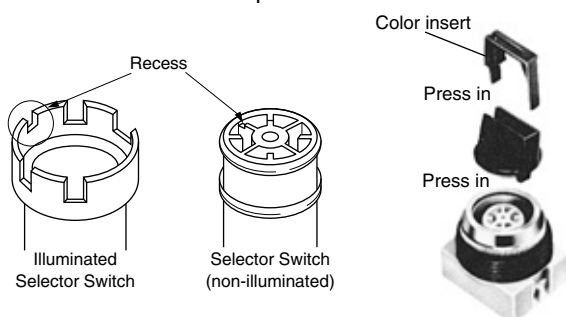
TW
Contact Block



Instructions

Installation of Selector Operators

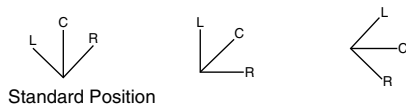
1. The shaft of each selector or illuminated selector switch has a recess to identify in which direction to install the operator. Align the operator with the recess and press in the operator.
2. Press color insert (non-illuminated) into the operator. The color insert retains the operator.



Standard Position

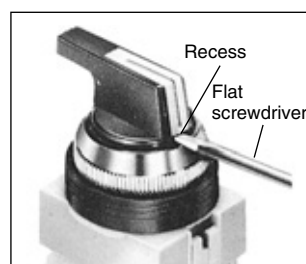
2-Position, 90°	3-Position, 45°	4-Position, 45°	5-Position, 30°

[Example]



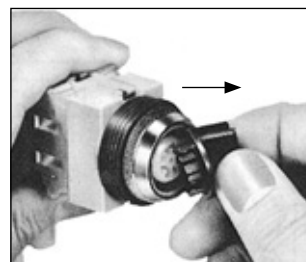
The non-illuminated operators can be installed in positions other than the standard position as shown above.

Removing the Operator



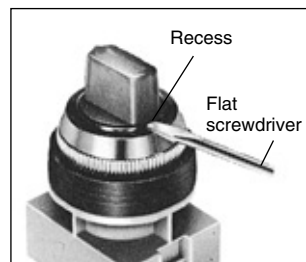
1. Removing the Color Insert

Insert a flat screwdriver (4.5mm wide at maximum) into the recess of the color insert. Turn the screwdriver to push out the insert from the operator.



2. Removing the Operator (Non-illuminated)

Push the operator sideways as shown in the left photo to remove the operator.

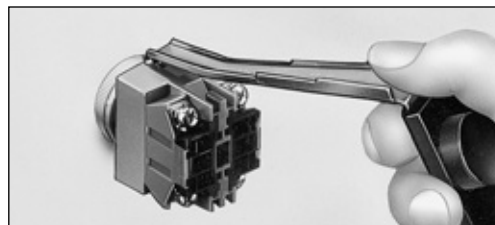


3. Removing the Operator (Illuminated)

Insert a flat screwdriver into the recess of the operator and turn the screwdriver to remove the operator.

Removing Contact Blocks, Transformers, and Full Voltage Adapters

Insert the end of the contact block removal tool into the snap-fit latch of the contact block (or transformer, full voltage adapter) and pull the tool as shown on the right.



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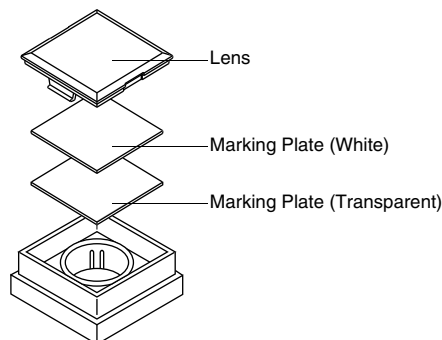
Instructions

Installing Lenses

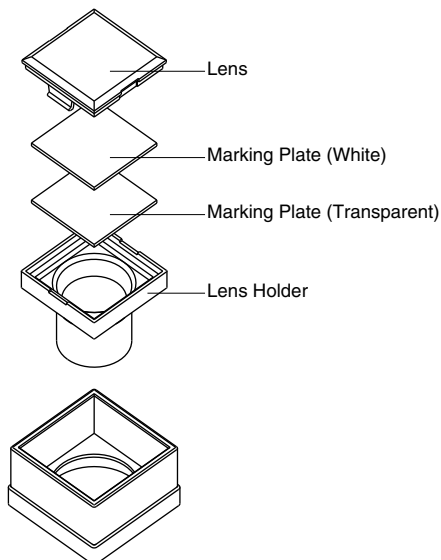
Lens Structure and Marking Plate

All square lens units are marking types. To engrave on the marking plate, remove the marking plate from the lens.

Square Pilot Lens



Square Illuminated Pushbutton



Replacement of Lamps

Lamps can be replaced by using the lamp holder tool (OR-55) from the front of the panel.

How to remove

To remove, slip the lamp holder tool onto the lamp head lightly. Then push slightly, and turn the lamp holder tool counterclockwise.

How to install

To install, insert the lamp head into the lamp holder tool. Place the pins on the lamp base to the grooves in the lamp socket. Insert the lamp and turn it clockwise.

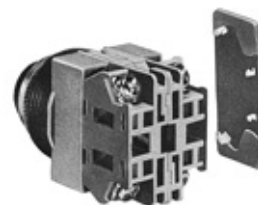
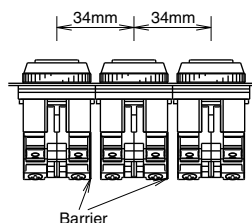


OR-55



Collective Mounting

When mounting the units closely in a horizontal row on 34mm centers, use optional barriers to prevent interconnection between adjoining terminals. The barriers can be attached simply by pressing them onto the sides of contact blocks.



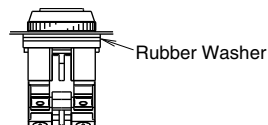
Tightening Torque

Tighten the M3.5 terminal screws to a torque of 1.0 to 1.3 N·m.

Instructions

Panel Thickness and Rubber Washer

Adjust the thickness of the rubber washers according to the panel thickness. Also, make sure to include the nameplate thickness when using a nameplate.



Applicable Models

- Momentary Pushbutton (Excluding Extended with Half Shroud, Extended with Full Shroud, and Square)
- Round Pilot Light (APS1)

Panel Thickness (mm)	Rubber Washer	
	1.5 mm	3.0 mm
Supplied	2 pieces	1 piece
0.8 to 2.5	2 pieces	1 piece
2.5 to 4.0	1 piece	1 piece
4.0 to 5.5	—	1 piece
5.5 to 6.0	1 piece	—

Applicable Models

- Momentary Pushbutton with Half Shroud (ABGS2)

Panel Thickness (mm)	Rubber Washer	
	1.5 mm	3.0 mm
Supplied	1 piece	1 piece
0.8	1 piece	1 piece
0.8 to 2.3	—	1 piece
2.3 to 3.8	1 piece	—

Applicable Models

- Maintained Extended Pushbutton with Half Shroud (AOGS2)
- Momentary Illuminated Pushbutton with Half Shroud (ALGS2)
- Maintained Illuminated Pushbutton with Half Shroud (AOLGS2)

Panel Thickness (mm)	Rubber Washer	
	1.5 mm	3.0 mm
Supplied	2 pieces	1 piece
0.8	2 pieces	1 piece
0.8 to 2.3	1 piece	1 piece
2.3 to 3.8	—	1 piece
3.8 to 5.3	1 piece	—

Applicable Models

- Momentary Extended Pushbutton with Full Shroud (ABFS2)

Panel Thickness (mm)	Rubber Washer	
	1.5 mm	3.0 mm
Supplied	3 pieces	1 piece
0.8 to 1.5	3 pieces	1 piece
1.5 to 3	2 pieces	1 piece
3.0 to 4.5	1 piece	1 piece
4.5 to 6	—	1 piece

Applicable Models

- Maintained Extended Pushbutton with Full Shroud (AOFSS2)

Panel Thickness (mm)	Rubber Washer	
	1.5 mm	3.0 mm
Supplied	4 pieces	1 piece
0.8 to 1.5	4 pieces	1 piece
1.5 to 3.0	3 pieces	1 piece
3.0 to 4.5	2 pieces	1 piece
4.5 to 6.0	1 piece	1 piece

Applicable Models

- Other Models (Excluding Square)

Panel Thickness (mm)	Rubber Washer	
	1.5 mm	3.0 mm
Supplied	3 pieces	1 piece
0.8 to 2.5	3 pieces	1 piece
2.5 to 4.0	2 pieces	1 piece
4.0 to 5.5	1 piece	1 piece
5.5 to 6.0	—	1 piece

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Installation of LED Illuminated Units

1. Note the polarity for wiring when connecting to DC-DC converter unit.

Terminal No.	Polarity
X1	Positive
X2	Negative

2. Transformer units are recommended for use in areas subjected to noise.

Notes on LED Illuminated Units

LED lamps consist of semiconductors. If the applied voltage exceeds the rated voltage, LED elements may deteriorate due to overheat, resulting in significant decrease in luminance, hue change, or failure of lighting. Also, if an extraneous noise, transient voltage, or transient current is applied to the circuit, similar effects may occur. When using LED lamps, observe the following instructions.

Rated Voltage

The LED lamps are rated at 6V, 12V, or 24V AC/DC, and can be used within $\pm 10\%$ the rated voltage of either AC or DC.

DC Power

- Switching power supply

Regulated voltage from switching power supply is best suited. Make sure to use within the rated voltage of the LED lamp.
- Rechargeable battery

Note that the battery voltage may exceed the rated voltage of the LED lamp while the battery is being charged and immediately after the charging is complete. Be sure to use the LED lamp on a voltage of $\pm 10\%$ the rated voltage.
- Full-wave rectification

Since the LED lamp is AC/DC compatible, a diode bridge for rectification is not necessary. If the LED lamp is used on a full-wave rectification current through a diode bridge, the rectifier diodes will reduce the voltage, resulting in lower luminance.
- Single-phase half-wave rectification

This is not suitable for the power source of LED lamps. Use constant-voltage DC power.

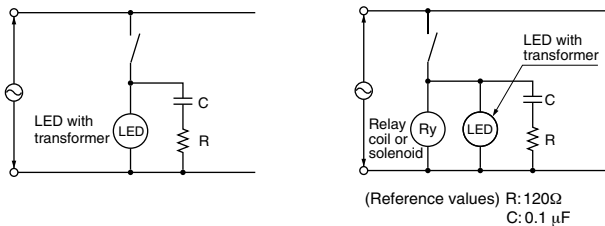
Noise

LED elements deteriorate due to extraneous noise, resulting in significant decrease in luminance, hue change, or failure of lighting. When such effects are anticipated, take a protection measure shown below, such as RC elements or a surge absorber.

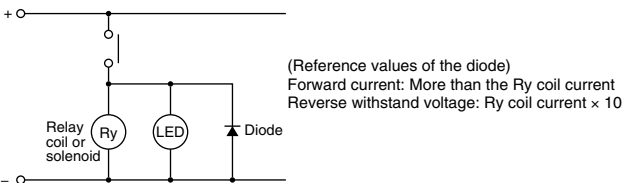
3. Notes for Pure White LED Lamps

- Do not use the pure white LED outdoors, otherwise it will lead to the degradation of brightness and color. Do not remove or apply shock to the cap on the pure white LED lamp, otherwise it may break or damage the cap.
- For the pure white LED, use a white lens. The illumination color will be dull if a different color is used.

[Protection Example 1] For AC circuit



[Protection Example 2] For DC circuit



Countermeasures against Dim Lighting

- Leakage currents through the transistors or a contact protection circuit may cause the LED lamp to illuminate dimly even when the output is off.
- When the LED lamp is illuminated by a transistor output, take the following measure.

[Circuit Example]

Connect shunt resistor R in parallel with the LED lamp.

