

Ø25mm TWS Series Switches & Pilot Lights



IDEC CORPORATION

ø25 TWS Series (Selection Guide)

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
Page	9	9	9	C-9	10

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	10	10	10	11

Function	Pushbutton			
Category	Square Flush	Square Extended	Square Twin Momentary	Square Twin Maintained
	Momentary/Maintained			
Shape	    	    	    	    
Model	UBQS1 UOQS1	UBQS2	UWQN1	UWQN2
Page	11	11	12	12

Function	Pilot Light				
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	13	13	13	13	13

TWS Series (Selection Guide) ø25

Function	Illuminated Pushbutton				
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	15	16	17	18	18

Function	Illuminated Pushbutton	Selector Switch			Illuminated Selector Switch
Category	Square Flush (Marking)	Knob	Lever	Key	Knob
Shape	 	 	 	 	 
Model	ULQS1B UOLQS1B	ASS	ASS□L	ASS□K	ASLS
Page	19	21	22	23	24

ø25 TWS Series

Highly reliable heavy-duty switches and pilot lights 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

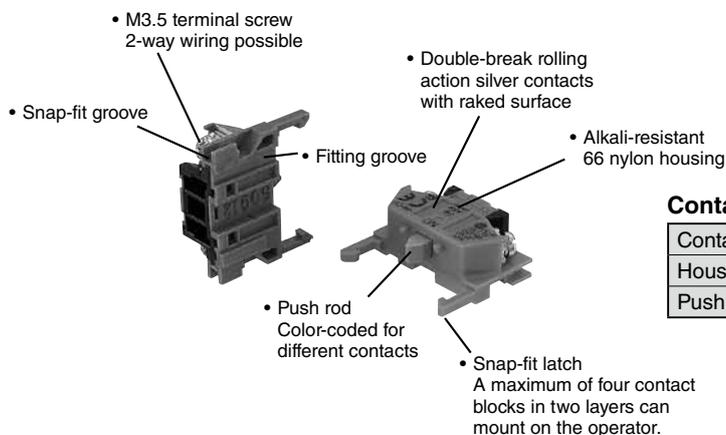
Operational Voltage			24V	48V	50V	110V	220V	440V
Operational Current	AC 50/60 Hz	AC-12 Control of resistive loads and solid state loads	10A	—	10A	10A	6A	2A
		AC-15 Control of electromagnetic loads (> 72 VA)	10A	—	7A	5A	3A	1A
	DC	DC-12 Control of resistive loads and solid state loads	8A	4A	—	2.2A	1.1A	—
		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 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.

- Selector switches and illuminated selector switches with contact code 2R, 3S, 4S, or 4R.

HW-C (Contact Block)



Contact Blocks

Contact	NO	NC	$\overline{\text{NO}}$ (early make)	$\overline{\text{NC}}$ (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)

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 115/120V AC/DC 200/220V AC/DC 230/240V AC/DC 380V AC/DC 400/440V AC/DC (50/60 Hz)		LSTD-6②	6V AC/DC ±10%	
			DC-DC Converter		110V DC	LSTD-6②	6V AC/DC ±10%

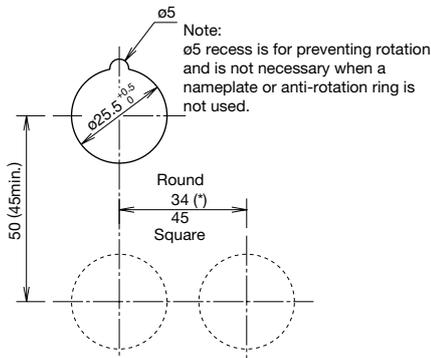
• Use a pure white (PW) LED for yellow illumination.

ø25 TWS Series Specifications

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 ±10%		12V AC/DC ±10%	24V AC/DC ±10%
Current Draw	AC	8 mA		11 mA
	DC	A, R, W: 7 mA, G, PW, S: 5.5 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				

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

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

Ordering Information

Standard Units

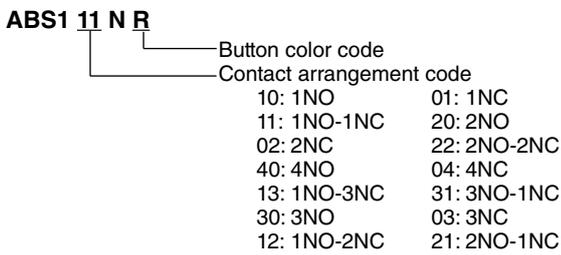
- Specify an operator or lens color code in the Part No.
- Full voltage illuminated units are not supplied with a lamp. Order LED lamps separately. Transformer and DC-DC converter illuminated units contain an LED lamp.
- All standard units are UL, CSA, EN, and TÜV approved (except DC-DC converter).
-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

Terminal Cover

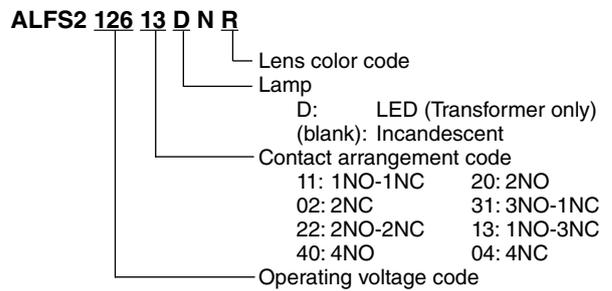
- When a terminal cover is required, order an applicable terminal cover referring to page 29.

The Part No. development charts shown below can be used to specify switches/pilot lights other than those listed on the following pages.

Pushbuttons



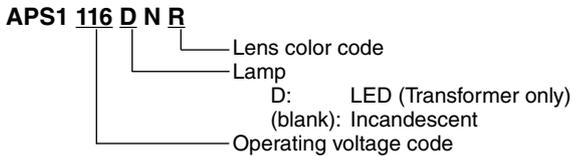
Illuminated Pushbuttons



Note:

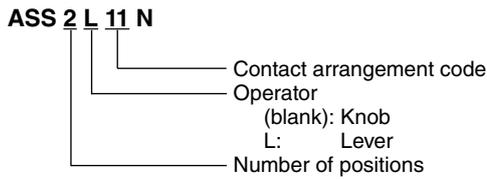
- Push-pull AYS3 can have a maximum of two contact blocks.

Pilot Lights



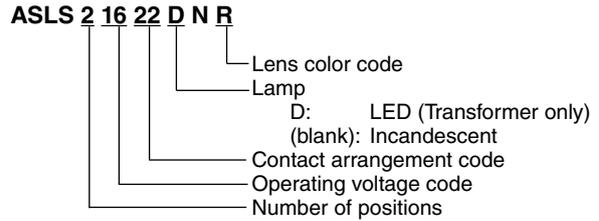
ø25 TWS Series (Ordering Information)

Selector Switch



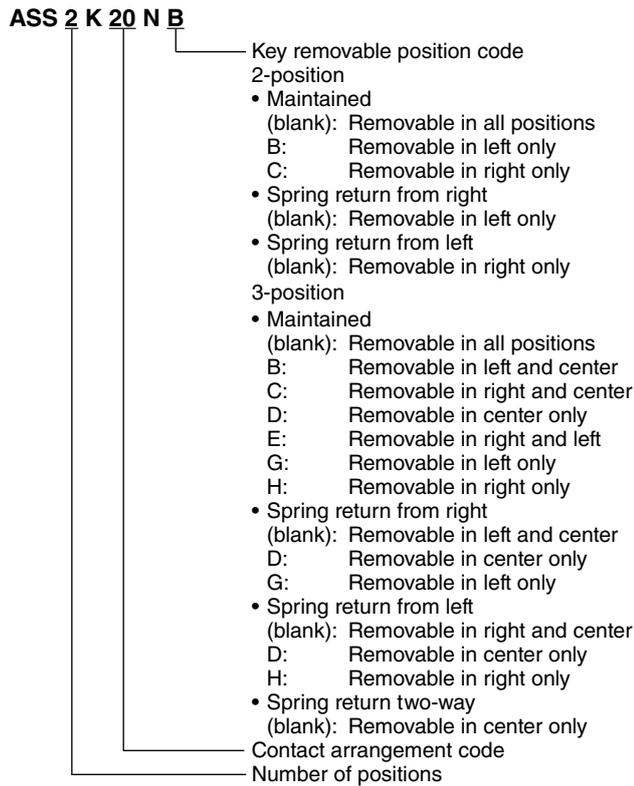
Note:
• See pages C-26 to C-28 for contact arrangement codes.

Illuminated Selector Switch



Note:
• See pages C-26 to C-28 for contact arrangement codes.

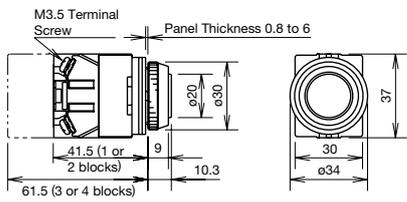
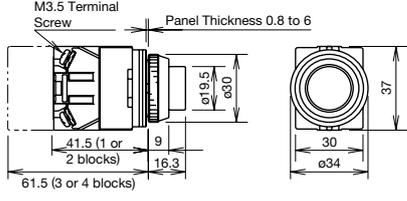
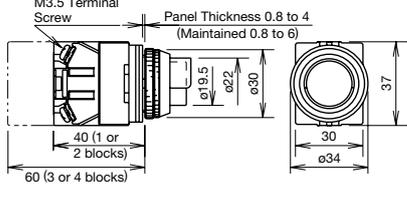
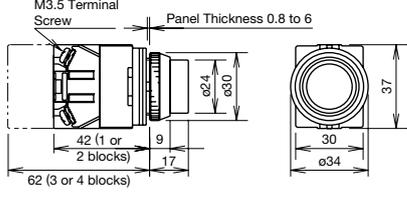
Key Selector Switch



Note:
• See page 26 to C-28 for contact arrangement codes.
• The key cannot be removed in the return position.

Flush / Extended Pushbuttons

Package Quantity: 1

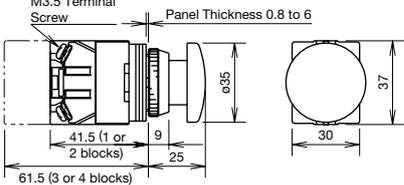
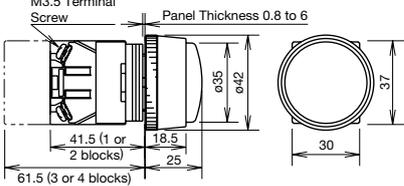
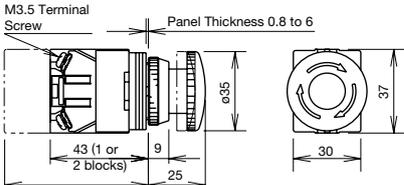
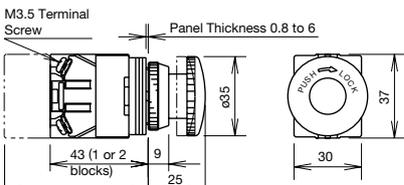
Shape	Operation	Contact	Part No.	① Button Color Code	Dimensions (mm)				
Flush ABS1 AOS1  	Momentary	1NO	ABS110N ①	Black (B), green (G), and red (R) buttons are supplied with each unit as standard. Specify S, W, or Y when a blue, white, or yellow button is required.	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>				
		1NC	ABS101N ①						
		1NO-1NC	ABS111N ①						
		2NO	ABS120N ①						
		2NC	ABS102N ①						
		2NO-2NC	ABS122N ①						
	Maintained	1NO	AOS110N ①						
		1NC	AOS101N ①						
		1NO-1NC	AOS111N ①						
		2NO	AOS120N ①						
		2NC	AOS102N ①						
		2NO-2NC	AOS122N ①						
		Extended ABS2 AOS2  	Momentary			1NO	ABS210N ①	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	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
						1NC	ABS201N ①		
1NO-1NC	ABS211N ①								
2NO	ABS220N ①								
2NC	ABS202N ①								
2NO-2NC	ABS222N ①								
Maintained	1NO		AOS210N ①						
	1NC		AOS201N ①						
	1NO-1NC		AOS211N ①						
	2NO		AOS220N ①						
	2NC		AOS202N ①						
	2NO-2NC		AOS222N ①						
	Extended with Half Shroud ABGS2 AOGS2  		Momentary	1NO	ABGS210N ①	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	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>		
				1NC	ABGS201N ①				
1NO-1NC		ABGS211N ①							
2NO		ABGS220N ①							
2NC		ABGS202N ①							
2NO-2NC		ABGS222N ①							
Maintained		1NO	AOGS210N ①						
		1NC	AOGS201N ①						
		1NO-1NC	AOGS211N ①						
		2NO	AOGS220N ①						
		2NC	AOGS202N ①						
		2NO-2NC	AOGS222N ①						
		Extended with Full Shroud ABFS2 AOFS2  	Momentary	1NO	ABFS210N ①			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	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
				1NC	ABFS201N ①				
1NO-1NC	ABFS211N ①								
2NO	ABFS220N ①								
2NC	ABFS202N ①								
2NO-2NC	ABFS222N ①								
Maintained	1NO		AOFS210N ①						
	1NC		AOFS201N ①						
	1NO-1NC		AOFS211N ①						
	2NO		AOFS220N ①						
	2NC		AOFS202N ①						
	2NO-2NC		AOFS222N ①						

- 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 7.

ø25 TWS Series Pushbuttons

Mushroom / Pushlock Turn Reset / Push Turn Lock Pushbuttons

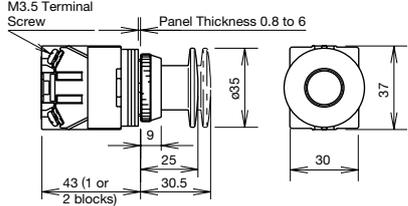
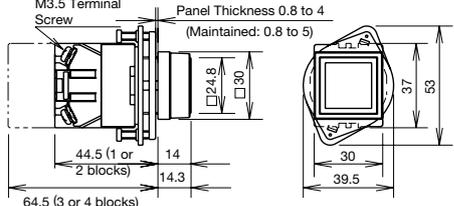
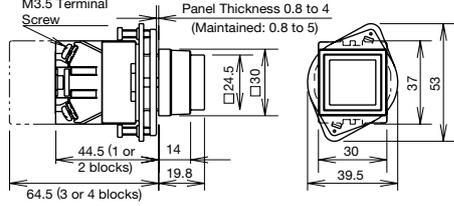
Package Quantity: 1

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	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
		1NC	ABS301N①		
		1NO-1NC	ABS311N①		
		2NO	ABS320N①		
		2NC	ABS302N①		
	Maintained	2NO-2NC	ABS322N①		
		1NO	AOS310N①		
		1NC	AOS301N①		
		1NO-1NC	AOS311N①		
		2NO	AOS320N①		
Mushroom with Full Shroud ABGS3 AOGS3  	Momentary	1NO	ABGS310N①	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	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
		1NC	ABGS301N①		
		1NO-1NC	ABGS311N①		
		2NO	ABGS320N①		
		2NC	ABGS302N①		
	Maintained	2NO-2NC	ABGS322N①		
		1NO	AOGS310N①		
		1NC	AOGS301N①		
		1NO-1NC	AOGS311N①		
		2NO	AOGS320N①		
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 C-7.
 - **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	 <p>Note: The depth behind the panel of the maintained unit is 1.5mm longer than the momentary unit.</p>
		1NC	UBQS101N ①		
		1NO-1NC	UBQS111N ①		
		2NO	UBQS120N ①		
		2NC	UBQS102N ①		
	Maintained	1NO	UOQS110N ①		
		1NC	UOQS101N ①		
		1NO-1NC	UOQS111N ①		
		2NO	UOQS120N ①		
		2NC	UOQS102N ①		
Square Extended UBQS2  	Momentary	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 C-7
- **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.

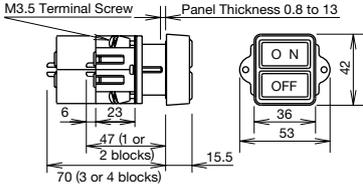
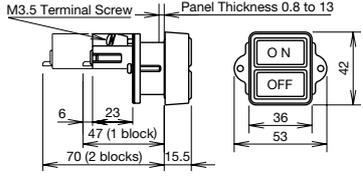
Panel Mounting of Square Pushbuttons

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.

ø25 TWS Series Pushbuttons

Square Twin Pushbuttons

Package Quantity: 1

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

- 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.

Dome / Square / Rectangular (Marking) Pilot Lights

Package Quantity: 1

Shape	Lamp	Part No.	②Lens/LED Color Code
Dome APS1  	Without Lamp	APS199 ②	NA: amber, NC: clear, NG: green, NR: red, NS: blue, NW: white, DNY: yellow
	LED	APS1 ③ DN ②	A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow
Square (Marking) UPQS1B (Plastic Bezel)  	Without Lamp	UPQS1B99 ②	NA: amber, NG: green, NR: red, NS: blue, NW: white, DNY: yellow
	LED	UPQS1B ③ DN ②	A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow
Square (Marking) UPQMS1B (Metal Bezel)  	Without Lamp	UPQMS1B99 ②	NA: amber, NG: green, NR: red, NS: blue, NW: white, DNY: yellow
	LED	UPQMS1B ③ DN ②	A: amber, G: green, PW: pure white, R: red, S: blue, W: white, Y: yellow
Rectangular (Marking) UPQS4B (Plastic Bezel)  	Without Lamp	UPQS4B99N ②	A: amber, G: green, R: red, S: blue, W: white
Push-to-Check APS1*PN  	Without Lamp	APS199PN ②	A: amber, C: clear, G: green, R: red, S: blue, W: white

• Incandescent lamp is also available.

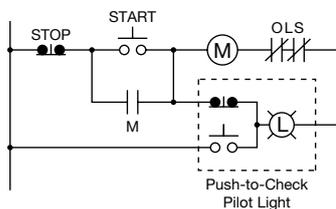
Operating Voltage Code

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

③ Operating Voltage Code	Input
LED	
66: 6V AC/DC	Full Voltage
11: 12V AC/DC	
22: 24V AC/DC	
16: 100/110V AC	Transformer
126: 115/120V AC	
26: 200/220V AC	
246: 230/240V 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).

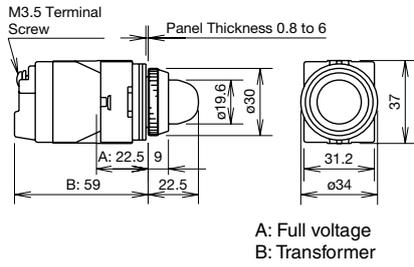
The lamp of push-to-check pilot light is not connected to the contact terminal. To connect, refer to the circuit diagram example below.



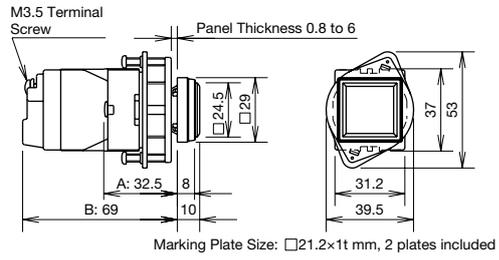
ø25 TWS Series Pilot Lights

Dimensions

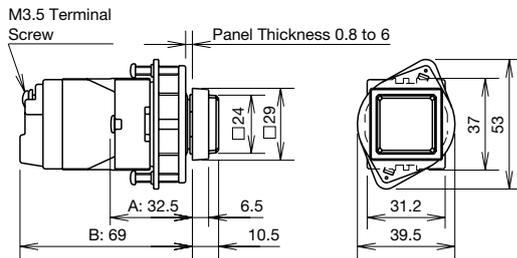
Dome APS1



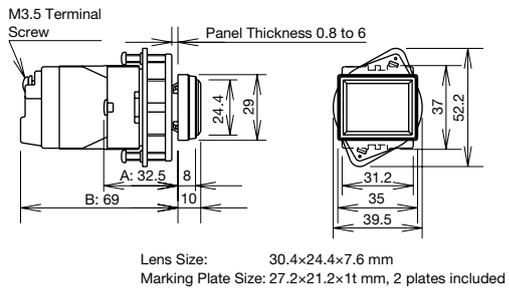
Square (Marking) UPQS1B (Plastic Bezel)



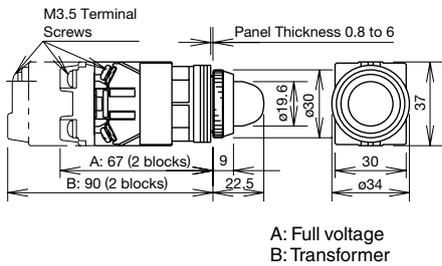
Square (Marking) UPQMS1B (Metal Bezel)



Rectangular (Marking) UPQS4B



Push-to-Check APS1*PN



All dimensions in mm.

Terminal Wiring (Bottom View)

Arrows indicate access directions for wiring.

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.

Round Extended Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
Round Extended ALS2 AOLS2     	Momentary	Without Lamp	1NO-1NC	ALS29911 ②
			2NO	ALS29920 ②
			2NO-2NC	ALS29922 ②
		LED	1NO-1NC	ALS2 ③ 11DN ②
			2NO	ALS2 ③ 20DN ②
			2NO-2NC	ALS2 ③ 22DN ②
			1NO-1NC	ALS21611DDN ② (Note)
			2NO	ALS21620DDN ② (Note)
			2NO-2NC	ALS21622DDN ② (Note)
	Maintained	Without Lamp	1NO-1NC	AOLS29911 ②
			2NO	AOLS29920 ②
			2NO-2NC	AOLS29922 ②
		LED	1NO-1NC	AOLS2 ③ 11DN ②
			2NO	AOLS2 ③ 20DN ②
			2NO-2NC	AOLS2 ③ 22DN ②
			1NO-1NC	AOLS21611DDN ② (Note)
			2NO	AOLS21620DDN ② (Note)
			2NO-2NC	AOLS21622DDN ② (Note)

Note: DC-DC converter types.

- Incandescent lamp is also available.

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	LED			
Specify a lens color code in place of ②. NA: amber NC: clear NG: green NR: red NS: blue NW: white DNY: yellow	Specify a lens/LED color code in place of ②. 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.	66: 6V AC/DC	Full Voltage		
		11: 12V AC/DC			
		22: 24V AC/DC			
				16: 100/110V AC	Transformer
				126: 115/120V AC	
				26: 200/220V AC	
				246: 230/240V 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 7.

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

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	ALGS2 ^② 9911
			2NO	ALGS2 ^② 9920
			2NO-2NC	ALGS2 ^② 9922
		LED	1NO-1NC	ALGS2 ^③ 11DN
			2NO	ALGS2 ^③ 20DN
			2NO-2NC	ALGS2 ^③ 22DN
			1NO-1NC	ALGS2 ^③ 1611DDN (Note)
			2NO	ALGS2 ^③ 1620DDN (Note)
			2NO-2NC	ALGS2 ^③ 1622DDN (Note)
	Maintained	Without Lamp	1NO-1NC	AOLGS2 ^② 9911
			2NO	AOLGS2 ^② 9920
			2NO-2NC	AOLGS2 ^② 9922
		LED	1NO-1NC	AOLGS2 ^③ 11DN
			2NO	AOLGS2 ^③ 20DN
			2NO-2NC	AOLGS2 ^③ 22DN
			1NO-1NC	AOLGS2 ^③ 1611DDN (Note)
			2NO	AOLGS2 ^③ 1620DDN (Note)
			2NO-2NC	AOLGS2 ^③ 1622DDN (Note)

Note: DC-DC converter types.

- Incandescent lamp is also available.

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	LED			
Specify a lens color code in place of ②. NA: amber NC: clear NG: green NR: red NS: blue NW: white DNY: yellow	Specify a lens/LED color code in place of ②. 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.	66: 6V AC/DC	Full Voltage		
		11: 12V AC/DC			
		22: 24V AC/DC			
				16: 100/110V AC	Transformer
				126: 115/120V AC	
				26: 200/220V AC	
				246: 230/240V AC	
				386: 380V AC	
				46: 400/440V AC	
				486: 480V AC	DC-DC Converter *
		16□□D: 110V DC			

- Round bezel (metal): Chrome-plated

- Other contact arrangements are also available. See page 7.

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

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	ALFS29911 ②
			2NO	ALFS29920 ②
			2NO-2NC	ALFS29922 ②
		LED	1NO-1NC	ALFS2 ③ 11DN ②
			2NO	ALFS2 ③ 20DN ②
			2NO-2NC	ALFS2 ③ 22DN ②
			1NO-1NC	ALFS21611DDN ② (Note)
			2NO	ALFS21620DDN ② (Note)
			2NO-2NC	ALFS21622DDN ② (Note)
	Maintained	Without Lamp	1NO-1NC	AOLFS29911 ②
			2NO	AOLFS29920 ②
			2NO-2NC	AOLFS29922 ②
		LED	1NO-1NC	AOLFS2 ③ 11DN ②
			2NO	AOLFS2 ③ 20DN ②
			2NO-2NC	AOLFS2 ③ 22DN ②
			1NO-1NC	AOLFS21611DDN ② (Note)
			2NO	AOLFS21620DDN ② (Note)
			2NO-2NC	AOLFS21622DDN ② (Note)

Note: DC-DC converter types.

- Incandescent lamp is also available.

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	LED	
Specify a lens color code in place of ②.	Specify a lens/LED color code in place of ②.	66: 6V AC/DC	Full Voltage
		11: 12V AC/DC	
		22: 24V AC/DC	
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	16: 100/110V AC	Transformer
		126: 115/120V AC	
		26: 200/220V AC	
		246: 230/240V AC	
		386: 380V AC	
		46: 400/440V AC	
	A pure white LED lamp is used for yellow illumination.	486: 480V AC	DC-DC Converter *
		16□□D: 110V DC	

- Round bezel (metal): Chrome-plated

- Other contact arrangements are also available. See page 7.

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

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	ALS39911N ^②
			2NO	ALS39920N ^②
			2NO-2NC	ALS39922N ^②
			1NO-1NC	AOLS39911N ^②
			2NO	AOLS39920N ^②
			2NO-2NC	AOLS39922N ^②
	Maintained	Without Lamp	1NO-1NC	AOLS3^③11N ^②
			2NO	AOLS3^③20N ^②
			2NO-2NC	AOLS3^③22N ^②
			1NO-1NC	AOLS3^③11N ^②
			2NO	AOLS3^③20N ^②
			2NO-2NC	AOLS3^③22N ^②
Mushroom Pushlock Turn Reset AVLS3  	Without Lamp	Without Lamp	1NO-1NC	AVLS39911NR
			2NO	AVLS39920NR
			2NO-2NC	AVLS39922NR
			1NO-1NC	AVLS3^③11DNR
			2NO	AVLS3^③20DNR
			2NO-2NC	AVLS3^③22DNR
	LED	LED	1NO-1NC	AVLS3^③11DNR
			2NO	AVLS3^③20DNR
			2NO-2NC	AVLS3^③22DNR

• Incandescent lamp is also available.

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

- Round bezel (metal): Chrome-plated
- Other contact arrangements are also available. See page 7.
- **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).

Square Flush Illuminated Pushbuttons

Package Quantity: 1

Shape	Operation	Lamp	Contact	Part No.
Square Flush (Marking) ULQS1B UOLQS1B      	Momentary	Without Lamp	1NO-1NC	ULQS1B9911 ②
			2NO	ULQS1B9920 ②
			2NO-2NC	ULQS1B9922 ②
		LED	1NO-1NC	ULQS1B ③ 11DN ②
			2NO	ULQS1B ③ 20DN ②
			2NO-2NC	ULQS1B ③ 22DN ②
	Maintained	Without Lamp	1NO-1NC	UOLQS1B9911 ②
			2NO	UOLQS1B9920 ②
			2NO-2NC	UOLQS1B9922 ②
		LED	1NO-1NC	UOLQS1B ③ 11DN ②
			2NO	UOLQS1B ③ 20DN ②
			2NO-2NC	UOLQS1B ③ 22DN ②

• Incandescent lamp is also available.

Designation Code

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

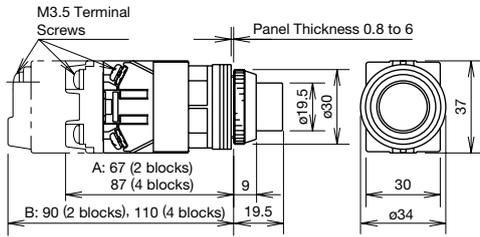
② Lens/LED Color Code		③ Operating Voltage Code	Input
Without Lamp	LED	LED	
Specify a lens color code in place of ②. NA: amber NG: green NR: red NS: blue NW: white DNY: yellow	Specify a lens/LED color code in place of ②. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination.	66: 6V AC/DC 11: 12V AC/DC 22: 24V AC/DC 16: 100/110V AC 126: 115/120V AC 26: 200/220V AC 246: 230/240V AC 386: 380V AC 46: 400/440V AC 486: 480V AC	Full Voltage 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 38.
- Other contact arrangements are also available. See page 7.

ø25 TWS Series Illuminated Pushbuttons

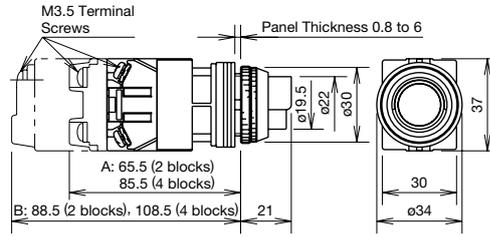
Dimensions

Round Extended ALS2 / AOLS2



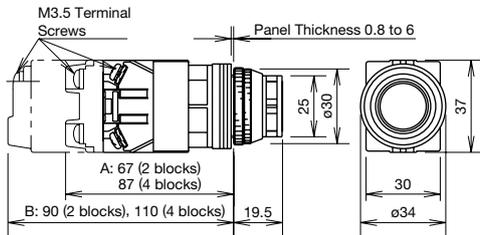
A: Full voltage
B: Transformer

Round Extended with Half Shroud ALGS2 / AOLGS2



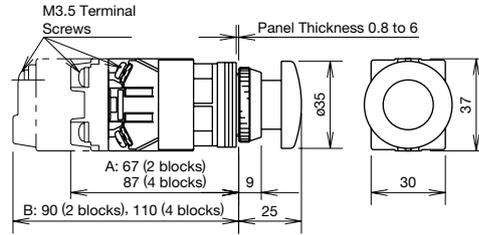
A: Full voltage
B: Transformer

Round Extended with Full Shroud ALFS2 / AOLFS2



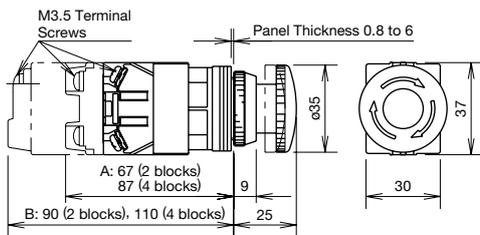
A: Full voltage
B: Transformer

ø35mm Mushroom ALS3 / AOLS3



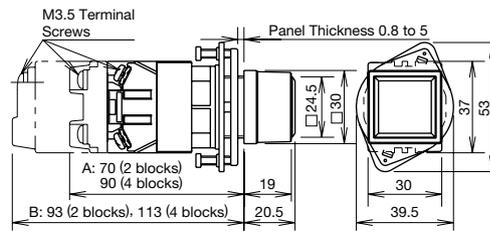
A: Full voltage
B: Transformer

Mushroom Pushlock Turn Reset AVLS3



A: Full voltage
B: Transformer

Square Flush ULQS1B / UOLQS1B



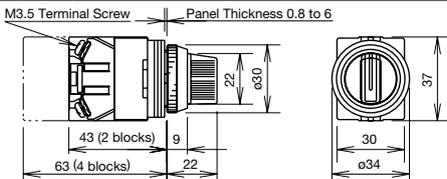
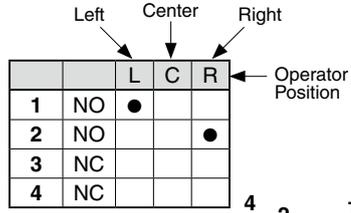
Marking Plate Size: □21.2×11 mm, 2 plates included

A: Full voltage
B: Transformer

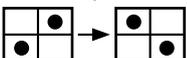
All dimensions in mm.

Selector Switches (Knob Operator)

Package Quantity: 1

No. of Positions	Shape		ASS		 						
	Contact Arrangement Chart										
90° 2-position	Contact Code	Mounting Position	Contact	Operator Position		Maintained	Spring Return from Right	Spring Return from Left	—		
	10 (1NO)	1	NO		●					—	
		2	Dummy								
	11 (1NO-1NC)	1	NO		●		ASS210N	ASS2110N	ASS2210N *	—	
		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	Mounting Position	Contact	Operator Position			Maintained	Spring Return from Right	Spring Return from Left	Spring Return Two-way	
	20 (2NO)	1	NO	●							
		2	NO		●						
	02 (2NC)	1	NC		■		ASS320N	ASS3120N	ASS3220N	ASS3320N	
		2	NC		■						
	22 (2NO-2NC)	1	NO	●			ASS322N	ASS3122N	ASS3222N	ASS3322N	
		2	NO		●						
		3	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	Mounting Position	Contact	Operator Position					Maintained	Maintained	Contact Block Mounting Position and Contact Arrangement Chart 
	4S ★	1	NO		■						
		2	NC		●						
	4S ★	1	NO	●					ASS44SN-407 ★	—	
		2	NC		●						
		3	NC			●					
	3S ★	1	NO	●					ASS44SN-411 ★	—	
		2	NC		●						
		3	NC			●					
		4	NO				●				
	4S ★	1	NO	●					ASS43SN-461 ★	—	
		2	NC		●						
3		NC			●						
4		Dummy									
4S ★	1	NO	●					—	ASS54SN-501 ★		
	2	NC		●							
	3	NC			●						
	4	NO				●					

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

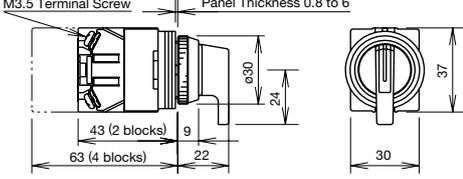
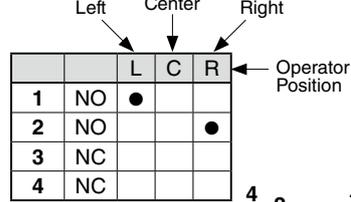


- On the contact arrangement marked with ★ in the table above, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.
- Selector switches with one or three contact blocks contain a dummy block.
- Knob operator: White indicator on black knob

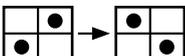
ø25 TWS Series Selector Switches

Selector Switches (Lever Operator)

Package Quantity: 1

No. of Positions	Shape		ASS□L		 						
	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	●		ASS2L10N	ASS21L10N	ASS22L10N *	—		
		2	Dummy								
	11 (1NO-1NC)	1	NO	●		ASS2L11N	ASS21L11N	ASS22L11N *			
		2	NC		●						
	20 (2NO)	1	NO	●	●	ASS2L20N	ASS21L20N	ASS22L20N *			
		2	NO		●						
	22 (2NO-2NC)	1	NO	●	●	ASS2L22N	ASS21L22N	ASS22L22N *			
		2	NC		●						
3		NO	●	●							
2R★ (1NO-1NC)	1	NO	●	■	ASS2L2RN-118 ★	ASS21L2RN-118 ★	—				
	2	NC		■							
2R★ (1NO-1NC)	1	NC		■	—	—	ASS22L2RN-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	●			ASS3L20N	ASS31L20N	ASS32L20N	ASS33L20N	
		2	NO			●					
	02 (2NC)	1	NC		■		ASS3L02N	ASS31L02N	ASS32L02N	ASS33L02N	
		2	NC		■						
	22 (2NO-2NC)	1	NO	●			ASS3L22N	ASS31L22N	ASS32L22N	ASS33L22N	
		2	NO			●					
		3	NC		■						
	40 (4NO)	1	NO	●			ASS3L40N	ASS31L40N	ASS32L40N	ASS33L40N	
		2	NO			●					
		3	NO	●							
		4	NO			●					
	04 (4NC)	1	NC		■		ASS3L04N	ASS31L04N	ASS32L04N	ASS33L04N	
		2	NC		■						
		3	NC		■						
4		NC		■							
3S ★	1	NO	●			ASS3L3SN-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	NC		■					ASS4L4SN-407 ★	—
		2	NC		■						
		3	NC		■						
		4	NO	●							
	4S ★	1	NO	●						ASS4L4SN-411 ★	—
		2	NC		■						
		3	NC		■						
		4	NO	●							
	3S ★	1	NO	●						ASS4L3SN-461 ★	—
		2	NC		■						
		3	NC		■						
		4	Dummy								
	4S ★	1	NO	●						—	ASS5L4SN-501 ★
		2	NC		■						
3		NC		■							
4		NO	●					●			

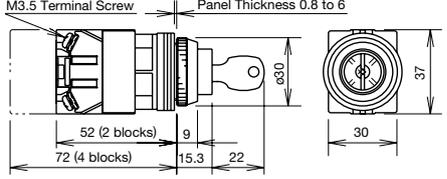
• On the 2-position selector switches marked with * above, the contact operation is reversed as follows.



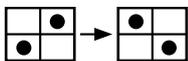
- On the contact arrangement marked with ★ in the table above, the rated current (load switching current) is reduced to a half of the rated current of the contact block. The rated insulation voltage and the rated thermal current remain unchanged.
- Selector switches with one or three contact blocks contain a dummy block.
- Lever operator: White indicator on black lever

Key Selector Switches

Package Quantity: 1

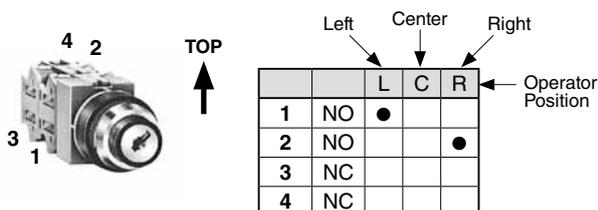
No. of Positions	Shape			Contact Arrangement Chart			 			
	Shape	Symbol	UL	UL	UL	UL	Maintained	Spring Return from Right	Spring Return from Left	—
90° 2-position	10 (1NO)	1	NO		●		ASS2K10N	ASS21K10N	ASS22K10N *	—
		2	Dummy							
	11 (1NO-1NC)	1	NO		●		ASS2K11N	ASS21K11N	ASS22K11N *	
		2	NC	●						
	20 (2NO)	1	NO		●		ASS2K20N	ASS21K20N	ASS22K20N *	
		2	NO		●					
	22 (2NO-2NC)	1	NO		●		ASS2K22N	ASS21K22N	ASS22K22N *	
		2	NO	●						
		3	NO		●					
	2R ★ (1NO-1NC)	1	NO		■		ASS2K2RN-118 ★	ASS21K2RN-118 ★	—	
		2	NC	■						
	2R ★ (1NO-1NC)	1	NC	■			—	—	ASS22K2RN-169 ★	
2		NO		■						
45° 3-position	20 (2NO)	1	NO	●			ASS3K20N	ASS31K20N	ASS32K20N	ASS33K20N
		2	NO			●				
	02 (2NC)	1	NC			■	ASS3K02N	ASS31K02N	ASS32K02N	ASS33K02N
		2	NC			■				
	22 (2NO-2NC)	1	NO	●			ASS3K22N	ASS31K22N	ASS32K22N	ASS33K22N
		2	NO			●				
		3	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			■				
	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 C-8.
- 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 C-26 to C-28.

ø25 TWS Series Illuminated Selector Switches

Illuminated Selector Switches

90° 2-position

Package Quantity: 1

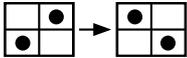
Shape		ASLS						
Contact Arrangement Chart								
Contact Code	Contact Block		Operator Position		Lamp	Maintained	Spring Return from Right	Spring Return from Left
	Mounting Position	Contact	L	R		L R	L R	L R
11 (1NO-1NC)	1	NO		●	Without Lamp	ASLS29911②	ASLS219911②	ASLS229911② *
	2	NC	●		LED	ASLS2③11DN②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

Designation Code

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

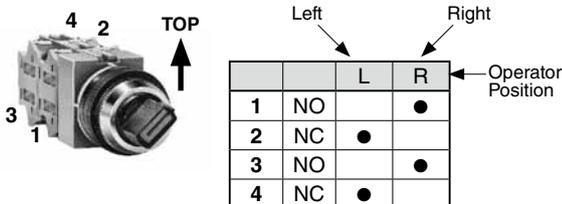
② Lens/LED Color Code		③ Operating Voltage Code	Input
Without Lamp	LED	LED	
Specify a lens color code in place of ②. NA: amber NG: green NR: red NS: blue NW: white DNY: yellow	Specify a lens/LED color code in place of ②. A: amber G: green R: red S: blue W: white Y: yellow A pure white LED lamp is used for yellow illumination.	66: 6V AC/DC	Full Voltage
		11: 12V AC/DC	
22: 24V AC/DC			
		16: 100/110V AC	Transformer
		136: 115/120V AC	
		26: 200/220V AC	
		256: 230/240V AC	
		386: 380V AC	
		46: 400/440V AC	
		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 C-26 to C-28.

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	ASLS39920 ^②	ASLS319920 ^②	ASLS329920 ^②	ASLS339920 ^②
	2	NO			●	LED	ASLS3 ^③ 20DN ^②	ASLS31 ^③ 20DN ^②	ASLS32 ^③ 20DN ^②	ASLS33 ^③ 20DN ^②
02 (2NC)	1	NC		■		Without Lamp	ASLS39902 ^②	ASLS319902 ^②	ASLS329902 ^②	ASLS339902 ^②
	2	NC	■			LED	ASLS3 ^③ 02DN ^②	ASLS31 ^③ 02DN ^②	ASLS32 ^③ 02DN ^②	ASLS33 ^③ 02DN ^②
22 (2NO-2NC)	1	NO	●			Without Lamp	ASLS39922 ^②	ASLS319922 ^②	ASLS329922 ^②	ASLS339922 ^②
	2	NO			●	Without Lamp	ASLS39922 ^②	ASLS319922 ^②	ASLS329922 ^②	ASLS339922 ^②
	3	NC		■		Without Lamp	ASLS39922 ^②	ASLS319922 ^②	ASLS329922 ^②	ASLS339922 ^②
	4	NC	■			Without Lamp	ASLS39922 ^②	ASLS319922 ^②	ASLS329922 ^②	ASLS339922 ^②
40 (4NO)	1	NO	●			Without Lamp	ASLS39940 ^②	ASLS319940 ^②	ASLS329940 ^②	ASLS339940 ^②
	2	NO			●	Without Lamp	ASLS39940 ^②	ASLS319940 ^②	ASLS329940 ^②	ASLS339940 ^②
	3	NO	●			LED	ASLS3 ^③ 40DN ^②	ASLS31 ^③ 40DN ^②	ASLS32 ^③ 40DN ^②	ASLS33 ^③ 40DN ^②
	4	NO			●	LED	ASLS3 ^③ 40DN ^②	ASLS31 ^③ 40DN ^②	ASLS32 ^③ 40DN ^②	ASLS33 ^③ 40DN ^②
04 (4NC)	1	NC		■		Without Lamp	ASLS39904 ^②	ASLS319904 ^②	ASLS329904 ^②	ASLS339904 ^②
	2	NC	■			Without Lamp	ASLS39904 ^②	ASLS319904 ^②	ASLS329904 ^②	ASLS339904 ^②
	3	NC		■		Without Lamp	ASLS39904 ^②	ASLS319904 ^②	ASLS329904 ^②	ASLS339904 ^②
	4	NC	■			Without Lamp	ASLS39904 ^②	ASLS319904 ^②	ASLS329904 ^②	ASLS339904 ^②

• Incandescent lamp is also available.

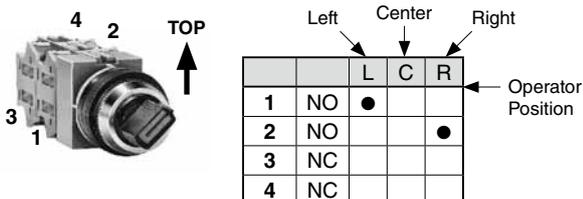
Designation Code

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	LED	
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.	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	Full Voltage Transformer

• Round bezel (Metal): Chrome-plated

Contact Block Mounting Position and Contact Arrangement Chart



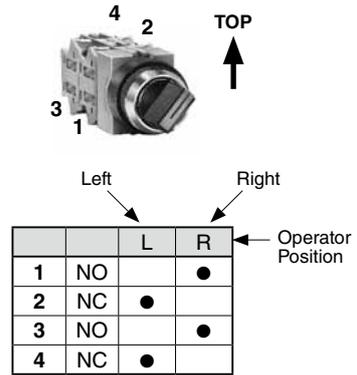
• For more contact arrangement chart, see pages C-26 to C-28.

ø25 TWS series Selector Switch Contact Arrangement Charts

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)	—	1	NO		●	●			
		2	NC	●			●		
	103	1	NC	●			●		
		2	NO		●	●			
20 (2NO)	—	1	NO		●	●			
		2	NO		●	●			
02 (2NC)	—	1	NC	●			●		
		2	NC	●			●		
		22 (2NO-2NC)	—	1	NO		●	●	
				2	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

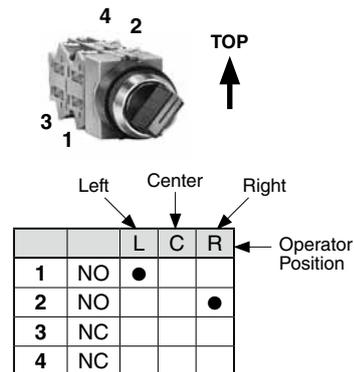
45° 3-position (Maintained / Spring Return)

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

Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions		
				L	C	R
11 (1NO-1NC)	202	1	NO	●		
		2	NC			
	203	1	NC			
		2	NO			●
	302	1	NO	●		●
		2	NC			
303	1	NC		●		
	2	NO			●	
20 (2NC)	—	1	NO	●		
		2	NO			●
	301	1	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			
	207	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		
				L	C	R
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

ø25 TWS Series Selector Switch Contact Arrangement Charts

45° 3-position (Maintained)

Positions				Maintained			
Operator				Knob, Lever, Illuminated			
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions			
				L	C	R	
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				
Operator				Knob, Lever				
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions				
				1	2	3	4	
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				
Operator				Knob, Lever				
Contact Code	Circuit No.	Mounting Position	Contact	Operator Positions				
				1	2	3	4	5
4S ★	501 ★	1	NO	●				
		2	NC		●			
		3	NC				●	
		4	NO					●

Contact Block Mounting Position and Contact Arrangement Chart

		L	C	R
1	NO	●		
2	NC			
3	NO	●		●
4	NC			●

• 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

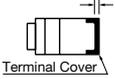
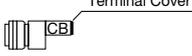
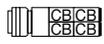
— Contact Code
— 3-position

- When circuit number is required:

ASS 3 4S N - 233

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

Terminal Covers

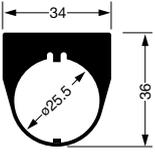
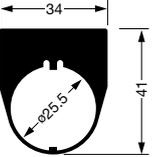
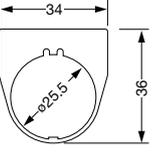
Terminal Cover		HW-VL2	HW-VL3	HW-VL5	APS-PVL	Use of terminal covers increases the depth by the dimensions below. 
Switch/Pilot Light		 39.8H × 14.1W	 37.8H × 26W	 39.1H × 15.5W	 36H × 29.4W	
<ul style="list-style-type: none"> • Pilot light APS UPQS UPQMS 	Full Voltage				X	+6 mm
	Transformer DC-DC Converter		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 AOLF5 AOLS ULOS ALGS UOLQS AOLGS AVLS ALFS ATLS 	Full Voltage	X 2 pieces				+3.5 mm
	Full Voltage 				X	+3 mm
<ul style="list-style-type: none"> • Illuminated selector switch ASLS 	Full Voltage					+3 mm
<ul style="list-style-type: none"> • Push-to-check pilot light APS 	Transformer DC-DC Converter		X			+3 mm
						

Ordering Terminal Covers

Terminal covers are ordered separately.
When ordering terminal covers, specify the Part No. and required quantity.

ø25 TWS Series Accessories and Replacement Parts

Nameplates

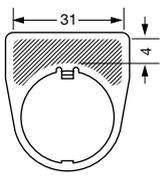
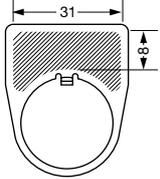
Dimensions (mm)	Legend	Material	Part No.	Ordering No.	Package Quantity	Description
	Blank	Aluminium 1.2 mm thick	NSA-0	NSA-0	1	• Black
				NSA-0PN10	10	
	With Legend		NSA-*	NSA-*	1	• White letters on black back- ground
				NSA-*PN10	10	
	Blank	Aluminium 1.2 mm thick	NSALO	NSALO	1	• Black
				NSALOPN10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

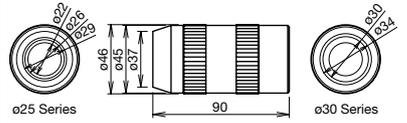
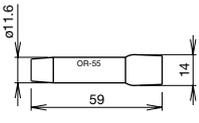
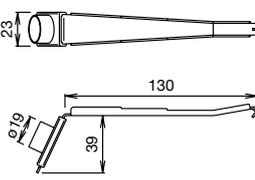
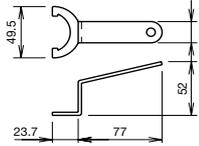
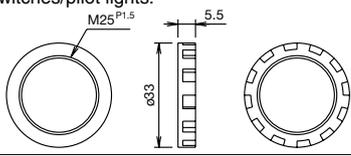
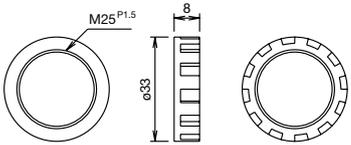
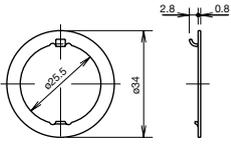
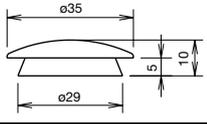
Code	Legend
0	(blank)
1	ON
2	OFF
3	START
4	STOP
31	OFF-ON
35	HAND-AUTO
53	HAND-OFF-AUTO

Example of Shape and Engraving Area

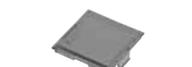
Shape	Engraving Area		Max. No. of Lines	No. of Letters on 1 Line
	Height	Width		
Standard (NSA/NFSO) 	4	31	1	17
Mushroom (NSALO) 	8	31	2	17

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

Accessories

Shape	Material	Part No.	Ordering No.	Package Quantity	Dimensions (mm)
	Rubber (nitril)	OR-12	OR-12	1	<ul style="list-style-type: none"> Used to tighten the round bezel when installing the TWS switch/pilot light onto a panel. 
	Rubber (nitril)	OR-55	OR-55	1	<ul style="list-style-type: none"> Used to install and remove LED/incandescent lamps. 
	Metal (steel: zinc-plated) / Rubber (nitril)	TW-KC1	TW-KC1	1	<ul style="list-style-type: none"> Used to remove contact blocks, transformers, lenses and adapters. 
	Metal (steel: zinc-plated)	TWST-T1	TWST-T1	1	<ul style="list-style-type: none"> Used to tighten the locking ring on the square switches/pilot lights. 
Locking Ring (For Square Units) 	Pushbutton Illuminated Pushbutton	OG-RT1	OG-RT1PN02	2	<ul style="list-style-type: none"> Used to attach square pushbuttons and illuminated pushbuttons on to the panel. Mounting centers are the same as round switches/pilot lights. 
	Pilot Light	OG-RT2	OG-RT2PN02	2	<ul style="list-style-type: none"> Used to attach pilot lights on to the panel. Mounting centers are the same as round switches/pilot lights. 
	Metal (steel: zinc-plated)	OGL-21	OGL-21PN10	10	<ul style="list-style-type: none"> Used to prevent the operator from rotating. Generally used when using no nameplates on selector switches. 
	Rubber (nitril /black)	OBS-13B	OBS-13BPN05	5	<ul style="list-style-type: none"> Used to plug unused ø25.5mm mounting holes. Gray also available (ordering no. OBS-13PN05) 

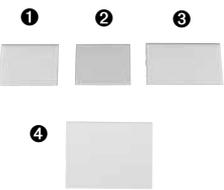
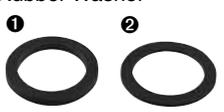
Maintenance Parts

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

ø25 TWS series Accessories and Replacement Parts

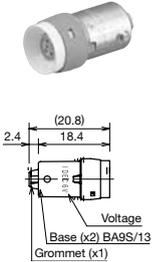
Maintenance Parts

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		

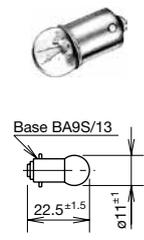
Note: Specify a color code in place of ① or ② in the Ordering No.

Maintenance Parts

LED Lamps (LSTD)

Dimensions	Operating Voltage	Current Draw		Part No.	Ordering No.	Illumination Color Code	Package Quantity	Base
		AC	DC					
 <p>2.4 (20.8) 18.4</p> <p>Voltage</p> <p>Base (x2) BA9S/13 Grommet (x1)</p>	6V AC/DC ±5%	8 mA	7 mA (A, R, W) 5.5 mA (G, PW, S)	LSTD-6②	LSTD-6② LSTD-6②PN10	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 10	BA9S/13
	12V AC/DC ±10%	11 mA	10 mA	LSTD-1②	LSTD-1② LSTD-1②PN10		1 10	
	24V AC/DC ±10%	11 mA	10 mA	LSTD-2②	LSTD-2② LSTD-2②PN10	Use a pure white (PW) LED lamp with yellow (Y) lens.	1 10	

Incandescent Lamps (LS)

Dimensions	Rated Operating Voltage	Lamp Ratings	Part No.	Package Quantity
 <p>Base BA9S/13</p> <p>22.5±1.5 0.11±1</p>	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	

ø25 TWS Series Accessories and Replacement Parts

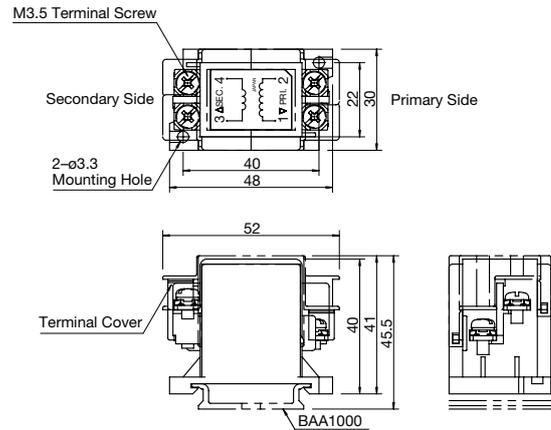
Transformer

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

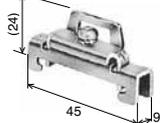


Accessories

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.

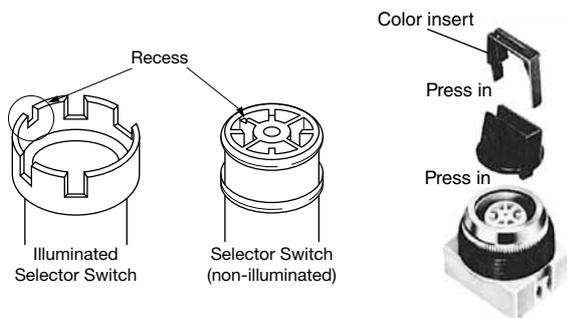
Safety Precautions

- Turn off the power to the TWS series 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.

Instructions

Installation of Selector Operators

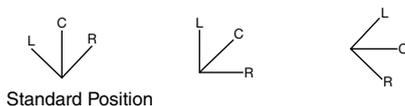
1. The shaft of each selector or illuminated selector switch has a recess to identify in which direction to install the operator. Align the operator with the recess and press in the operator.
2. Press color insert (non-illuminated) into the operator. The color insert retains the operator.



Standard Position

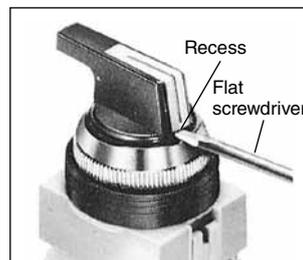
2-Position, 90°	3-Position, 45°	4-Position, 45°	5-Position, 30°

[Example]



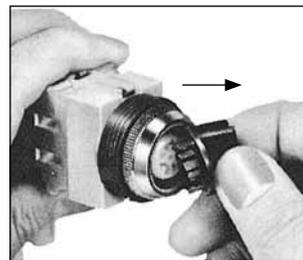
The non-illuminated operators can be installed in positions other than the standard position as shown above.

Removing the Operator



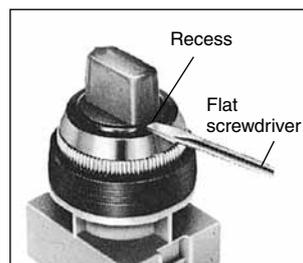
1. Removing the Color Insert

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.

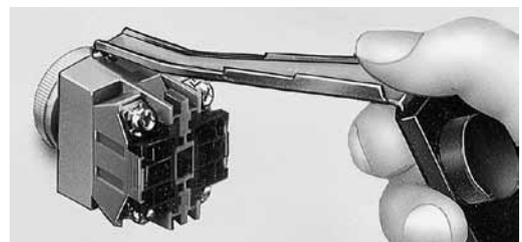


3. Removing the Operator (Illuminated)

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.



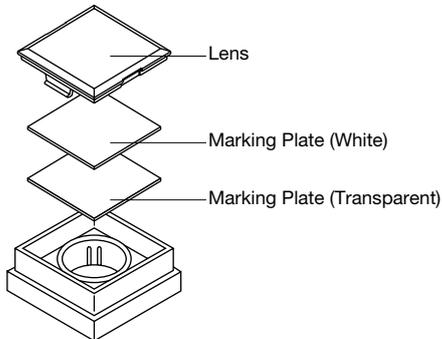
Instructions

Installing Lenses

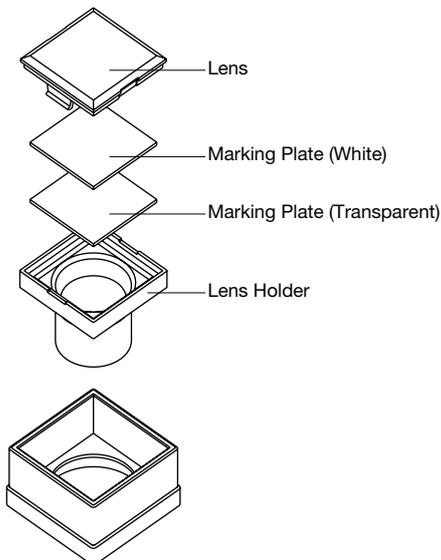
Lens Structure and Marking Plate

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.

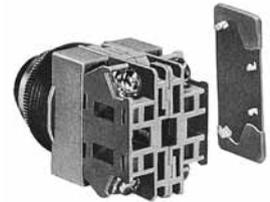
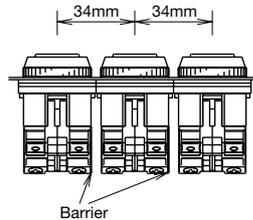


OR-55



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.



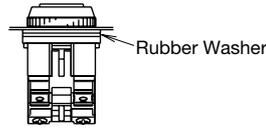
Tightening Torque

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

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

1. Switching power supply

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

2. 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.

3. 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.

4. Single-phase half-wave rectification

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

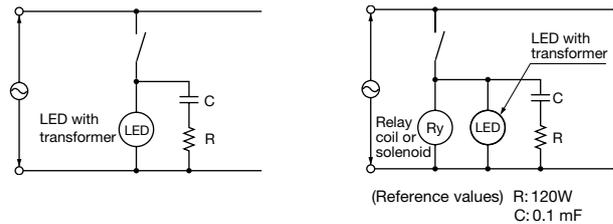
Noise

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.

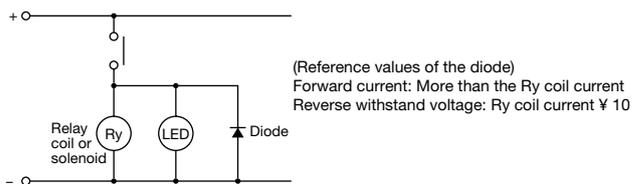
3. Notes for Pure White LED Lamps

- 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

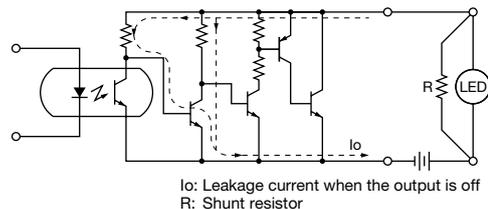


Countermeasures against Dim Lighting

- 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.



Io: Leakage current when the output is off
R: Shunt resistor

Specifications and other descriptions in this brochure are subject to change without notice.



IDEC CORPORATION

6-64, Nishi-Miyahara 2-Chome, Yodogawa-ku, Osaka 532-0004, Japan
Tel: +81-6-6398-2527, Fax: +81-6-6398-2547
E-mail: marketing@idec.co.jp

IDEC CORPORATION (USA)
1175 Elko Drive, Sunnyvale, CA 94089-2209, USA
Tel: +1-408-747-0550 / (800) 262-IDEAC (4332)
Fax: +1-408-744-9055 / (800) 635-6246
E-mail: opencontact@idec.com

IDEC CANADA LIMITED
3155 Pepper Mill Court, Unit 4
Mississauga, Ontario, L5L 4X7, Canada
Tel: +1-905-890-8561, Toll Free: (800) 262-IDEAC (4332)
Fax: +1-905-890-8562
E-mail: sales@ca.idec.com

IDEC AUSTRALIA PTY. LTD.
Unit 17, 104 Ferntree Gully Road,
Oakleigh, Victoria 3166, Australia
Tel: +61-3-8523-5900, Toll Free: 1800-68-4332
Fax: +61-3-8523-5999
E-mail: sales@au.idec.com

IDEC ELECTRONICS LIMITED
Unit 2, Beechwood, Chineham Business Park,
Basingstoke, Hampshire RG24 8WA, UK
Tel: +44-1256-321000, Fax: +44-1256-327755
E-mail: sales@uk.idec.com

IDEC ELEKTROTECHNIK GmbH
Wendenstrasse 331, 20537 Hamburg, Germany
Tel: +49-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24
E-mail: service@idec.de

IDEC (SHANGHAI) CORPORATION
Room 701-702 Chong Hing Finance Center,
No. 288 Nanjing Road West, Shanghai 200003, PRC
Tel: +86-21-6135-1515
Fax: +86-21-6135-6225 / +86-21-6135-6226
E-mail: idec@cn.idec.com

IDEC (BEIJING) CORPORATION
Room 211B, Tower B, The Grand Pacific Building,
8A Guanghua Road, Chaoyang District,
Beijing 100026, PRC
Tel: +86-10-6581-6131, Fax: +86-10-6581-5119

IDEC (SHENZHEN) CORPORATION
Unit AB-3B2, Tian Xiang Building, Tian'an Cyber Park,
Fu Tian District, Shenzhen, Guang Dong 518040, PRC
Tel: +86-755-8356-2977, Fax: +86-755-8356-2944

IDEC IZUMI (H.K.) CO., LTD.
Unit G & H, 26/F., MG Tower,
No. 133 Hoi Bun Road, Kwun Tong, Kowloon,
Hong Kong
Tel: +852-2803-8989, Fax: +852-2565-0171
E-mail: info@hk.idec.com

IDEC TAIWAN CORPORATION
8F-1, No. 79, Hsin Tai Wu Road, Sec. 1,
Hsi-Chih District, 22101 New Taipei City, Taiwan
Tel: +886-2-2698-3929, Fax: +886-2-2698-3931
E-mail: service@tw.idec.com

IDEC IZUMI ASIA PTE. LTD.
No. 31, Tannery Lane #05-01,
HB Centre 2, Singapore 347788
Tel: +65-6746-1155, Fax: +65-6844-5995
E-mail: info@sg.idec.com

IDEC ASIA (THAILAND) CO., LTD.
20th Fl., Sorachai Bldg., No.23/78,
Soi Sukhumvit 63, Sukhumvit Rd.,
Klongton-nua, Wattana, Bangkok 10110
Tel: +662-392-9765, Fax: +662-392-9768
E-mail: sales@th.idec.com