

■ **Features**

Design basis

The 16mm dia. series of compact size pushbuttons are 'finger-size', and consequently take up little panel space. AH165-2 series operators are about twice as large as the AH164 and AH165 series operators for easier operation. With many types of operator available, the most suitable switch can be identified by color, shape and legend, and have a smooth, quality "snap-action". In spite of their small size they have a highly reliable mechanism, and are eminently suited for solid state and other electronic circuits. AH164, AH165 and AH165-2 series contact block holders can easily be removed manually. Moreover, the contact block can be easily attached or detached without using any special tools, thus facilitating addition or replacement of contact.

Selector switches

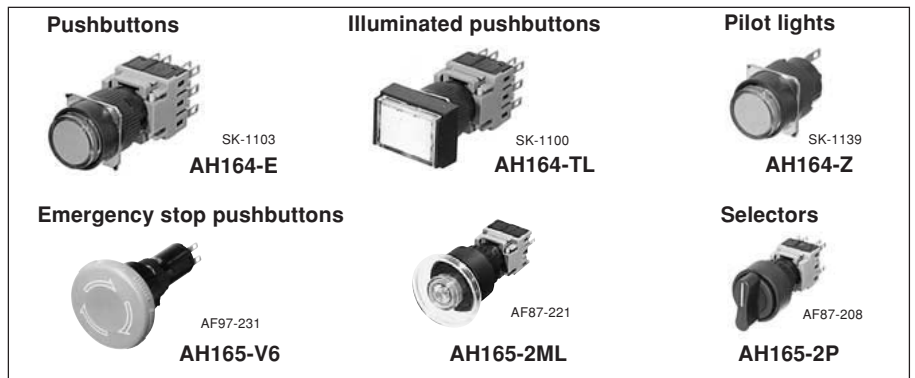
Selector switches can also be supplied in either knob-handle operated or key operated types.

Strong construction

The operator and contact blocks are molded from an excellent thermal resistance resin and can withstand the heat at the time of soldering. Since these pushbuttons are manufactured to industrial standards they can withstand vibration or shock thus eliminating lamp failure due to such causes as loose bases. With regard to the degree of protection, standard types which met the requirements of IP40 of Pub. No. 529, IEC Standards, and oil tight types which meet the requirements of IP65 of the said, are available. This permits the application to various fields, from machine tools to OA (Office Automation) facilities.

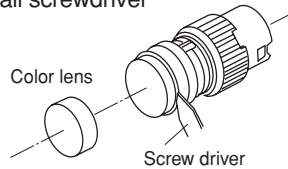
Quality feel tough

Both the operator and contact block are precisely engineered. There is no fear of the switch malfunction even after long use and it continues to operate smoothly for its service life of about 1,000,000 operations.



Easy color change

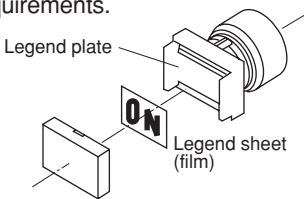
Color lenses fit over the inner button. The lens can easily be removed using a small screwdriver



Note: The luminous color of LEDs and neon illumination types varies with the body color of the product.

Visible inscription

Button legends are printed on legend sheet, which is stuck to the legend plate on the inner button. The lettering is back lit by the switch lamp and the inscription is highly visible through the color lens. Contact FUJI for your lettering requirements.

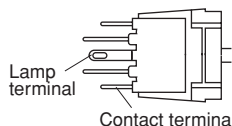


Excellent switch reliability

The switch uses a snap-action mechanism. The pushbuttons are available with either momentary or alternative actions. The snap-action switch has a double break movement which operates independently of the speed of switching. The contacts are made from gold-flashed silver. High contact reliability of 1mA at 5V AC/DC is assured. Contact blocks are available in 1NO+1NC to 3NO+3NC arrangement.

Large terminals

Solder/tab terminal is provided as standard. Wire-wrap terminal is available on request.



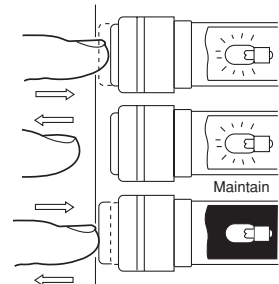
Safety

FUJI's original Trigger Action mechanism is used in the emergency stop pushbuttons. They are suitable for emergency stop and safety. This mechanism prevents the contacts from moving until the button is pushed and locked.

- Provided with a trigger action mechanism conforming to EN418.
- Provided with direct opening action (approved by TÜV) conforming to EN60947-5-1 and EN60947-5-5.

Alternate action

In the case of alternate action when the button is depressed the contacts are maintained and remain so even if the finger is removed. The button will not return to its free position. In order to remove the lock, the button must be given a second pressure before the button will return to its free position. This makes it most suitable as the switch for a power source.



Pushbutton with finger guards

Finger guards are provided for square or rectangular type pushbuttons (SF, TF, SL and TL types) in order to prevent operational error of adjacent buttons.

Approvals



For further information related to approved type, see page 04/132 to 04/136.











Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164, AH165 and AH165-2

Quick reference guide





















AH164 (standard) / AH165 (oil-tight)

■ Illuminated pushbutton switches

Operator	Type	Operator	Type	Operator	Type
Extended round head <i>See page 04/142</i> 	AH164-L, L5 AH165-L, L5  SK-1103	Flush square head <i>See page 04/142</i> 	AH164-SL, SL5 AH165-SL, SL5  SK-1102	Flush rectangular head <i>See page 04/142</i> 	AH164-TL, TL5 AH165-TL, TL5  SK-1100
Flush rectangular head with guard <i>See page 04/143</i> 	AH164-TGL, TGL5 AH165-TGL, TGL5  SK-1101	Flush square head with guard <i>See page 04/143</i> 	AH164-SGL, SGL5 AH165-SGL, SGL5  AF90-301		

Note: Spot LED and red/green LED types: Not approved standard

■ Pushbutton switches

Operator	Type	Operator	Type	Operator	Type
Extended round head <i>See page 04/147</i> 	AH164-E, E5 AH165-E, E5  SK-1103	Mushroom head <i>See page 04/147</i> 	AH164-M, M5 AH165-M, M5  SK-1136	Flush square head <i>See page 04/147</i> 	AH164-SF, SF5 AH165-SF, SF5  SK-1102
Flush rectangular head <i>See page 04/147</i> 	AH164-TF, TF5 AH165-TF, TF5  SK-1100	Flush rectangular head with guard <i>See page 04/147</i> 	AH164-TGF, TGF5 AH165-TGF, TGF5  SK-1101	Flush square head with guard <i>See page 04/147</i> 	AH164-SGF, SGF5 AH165-SGF, SGF5  AF90-301
Convex square head <i>See page 04/147</i> 	AH164-SM, SM5 AH165-SM, SM5  SK-1134	Convex rectangular head <i>See page 04/147</i> 	AH164-TM, TM5 AH165-TM, TM5  SK-1135	Push-lock, turn-reset (32mm dia.) ⊖ (Direct opening action) <i>See page 04/148</i> 	AH165-VR  AF91-584
Push-lock, turn-reset (40mm dia.) ⊖ (Direct opening action) <i>See page 04/148</i> 	AH165-V1R  AF91-583				

■ Emergency stop pushbutton switches ⊖ (Direct opening action), conform to EN418

Operator	Type	Operator	Type
Push-lock, turn-reset (32mm dia.) <i>See page 04/148</i> 	AH165-V5R  AF97-232	Push-lock, turn-reset (40mm dia.) <i>See page 04/148</i> 	AH165-V6R  AF97-231













Note: (CCC): *See page 04/245*

Pushbuttons/Selectors/Pilot Lights/Buzzers









AH164, AH165 and AH165-2

Quick reference guide







■ Selector switches

Operator	Type	Operator	Type	Operator	Type
Knob with rectangular bezel <i>See page 04/149</i> 	AH164-P AH165-P  SK-1099	Knob with square bezel <i>See page 04/149</i> 	AH164-SP AH165-SP  SK-1133	Key with rectangular bezel <i>See page 04/149</i> 	AH164-J AH165-J  SK-1098
Key with square bezel <i>See page 04/149, 04/152</i> 	AH164-SJ AH165-SJ  SK-1132	Key with rectangular bezel ⊖ (Direct opening action) <i>See page 04/150</i> 	AH165-JM  AF95-57	Key ⊖ (Direct opening action) <i>See page 04/150</i> 	AH165-RJM  AF99-320

■ Pilot lights

Lens	Type	Lens	Type	Lens	Type
Extended round <i>See page 04/154</i> 	AH164-Z AH165-Z  SK-1139	Flush square <i>See page 04/154</i> 	AH164-ZS AH165-ZS  SK-1138	Flush rectangular <i>See page 04/154</i> 	AH164-ZT AH165-ZT  SK-1137
Dome <i>See page 04/154</i> 	AH165-ZM  AF87-45				

■ Buzzers

Sound	Type	Sound	Type	Sound	Type
Standard <i>See page 04/156</i>	AH164-TX  AF87-317	Loud sound <i>See page 04/156</i>	AH164-TX1  AF87-44	Loud sound with volume control <i>See page 04/156</i> 	AH164-TX2B  AF93-297
Standard sound with volume control (IP54) <i>See page 04/156</i> 	AH165-X  AF96-243				





Note:  : *See page 04/245*

Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164, AH165 and AH165-2

Quick reference guide

■ Numerical indicators

Display	Type	Display	Type	Display	Type
Without decimal decoder <i>See page 04/157</i>	AH164-TS AH165-TS  SP-165	With decimal decoder (5, 12, 15V) <i>See page 04/157</i>	AH164-TC AH165-TC  AF87-315	With decimal decoder (24V) <i>See page 04/157</i>	AH164-TC4□E AH165-TC4□E  AF89-948
With sign decoder (±1 display) <i>See page 04/157</i>	AH164-TC4□E-1 AH165-TC4□E-1  AF88-1093				

AH165-2 (oil-tight)

■ Illuminated pushbutton switches

Operator	Type	Operator	Type	Operator	Type
Flush round head <i>See page 04/164</i>	AH165-2FL, 2FL5  AF87-211	Extended round head <i>See page 04/164</i>	AH165-2EL, 2EL5  AF87-210	Mushroom head <i>See page 04/164</i>	AH165-2ML  AF87-221
Mushroom head with square bezel <i>See page 04/164</i>	AH165-2YML  AF87-220	Flush square head <i>See page 04/165</i>	AH165-2SFL, 2SFL5  AF87-201	Extended square head <i>See page 04/165</i>	AH165-2SEL, 2SEL5  AF87-200
Concave square head <i>See page 04/165</i>	AH165-2SCL, 2SCL5  AF87-199	Push-lock, turn-reset <i>See page 04/166</i>	AH165-2VL  AF87-219	Push-lock, turn-reset with square bezel <i>See page 04/166</i>	AH165-2YVL  AF87-218























Note: (CCC) : See page 04/245

Pushbuttons/Selectors/Pilot Lights/Buzzers













AH164, AH165 and AH165-2

Quick reference guide

■ Pushbutton switches

Operator	Type	Operator	Type	Operator	Type
Flush round head <i>See page 04/167</i> 	AH165-2F, 2F5  AF87-211	Extended round head <i>See page 04/167</i> 	AH165-2E, 2E5  AF87-210	Mushroom head <i>See page 04/167</i> 	AH165-2M  AF87-215
Mushroom head with square bezel <i>See page 04/167</i> 	AH165-2YM  AF87-214	Flush square head <i>See page 04/167</i> 	AH165-2SF, 2SF5  AF87-210	Concave square head <i>See page 04/167</i> 	AH165-2SCE, 2SCE5  AF87-199
Extended square head <i>See page 04/167</i> 	AH165-2SE, 2SE5  AF87-200	With selector ring <i>See page 04/168</i> 	AH165-2S2  AF87-207	With selector ring with square bezel <i>See page 04/168</i> 	AH165-2YS2  AF87-206
Push-lock, turn-reset <i>See page 04/168</i> 	AH165-2V  AF87-217	Push-lock, turn-reset with square bezel <i>See page 04/168</i> 	AH165-2YV  AF87-216		

■ Selector switches

Operator	Type	Operator	Type	Operator	Type
Knob <i>See page 04/169</i> 	AH165-2P  AF87-208	Knob with square bezel <i>See page 04/169</i> 	AH165-2YP  AF87-202	Key <i>See page 04/169</i> 	AH165-2J  AF87-223
Key with square bezel <i>See page 04/169</i> 	AH165-2YJ  AF87-222	Lever <i>See page 04/170</i> 	AH165-2H  AF87-209	Lever with square bezel <i>See page 04/170</i> 	AH165-2SH  AF87-203

■ Illuminated selector switches

Operator	Type
Knob <i>See page 04/172</i> 	AH165-2PL  AF87-607



Note: : See page 04/245

Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164, AH165 and AH165-2

Quick reference guide

■ Pilot lights

Lens	Type	Lens	Type	Lens	Type
Flush round	AH165-2Z	Extended round	AH165-2ZE	Flush square	AH165-2SZ
<i>See page 04/173</i>	 AF87-213	<i>See page 04/173</i>	 AF87-212	<i>See page 04/173</i>	 AF87-205
					
Extended square	AH165-2SZE				
<i>See page 04/173</i>	 AF87-204				
					

Note: (CCC): See page 04/245

Pushbuttons/Selectors/Pilot Lights/Buzzers AH164 and AH165 Type number nomenclature

■ Type number nomenclature

Pushbuttons, illuminated pushbuttons and pilot lights

AH165 - L R 11 E 3 - W
① ② ③ ④ ⑤ ⑥ ⑦

① Product category

AH164: Standard (IP40)

AH165: Oil-tight (IP65)

② Operator or lens

• Operator for illuminated pushbutton

SL: Flush square head
SL5: Flush square head (Alternate)
TL: Flush rectangular head
TL5: Flush rectangular head (Alternate)
L: Extended round head
L5: Extended round head (Alternate)
TGL: Flush rectangular head with guard
TGL5: Flush rectangular head with guard (Alternate)
SGL: Flush square head with guard
SGL5: Flush square head with guard (Alternate)

• Operator for pushbuttons

SF: Flush square head
SF5: Flush square head (Alternate)
TF: Flush rectangular head
TF5: Flush rectangular head (Alternate)
E: Extended round head
E5: Extended round head (Alternate)
TGF: Flush rectangular head with guard
TGF5: Flush rectangular head with guard (Alternate)
SGF: Flush square head with guard
SGF5: Flush square head with guard (Alternate)
M: Mushroom head
M5: Mushroom head (Alternate)
SM: Convex square head
SM5: Convex square head (Alternate)
TM: Convex rectangular head
TM5: Convex rectangular head (Alternate)
V: Push-lock, turn-reset (32mm dia.)*1 *2
V1: Push-lock, turn-reset (40mm dia.)*1 *2

• Operator for emergency stop pushbuttons

V5: Push-lock, turn-reset (32mm dia.)*2
V6: Push-lock, turn-reset (40mm dia.)*2

• Lens for pilot lights

Z: Extended round
ZS: Flush square
ZT: Flush rectangular
ZM: Dome

Note: *1 Product with no trigger action mechanism

*2 AH165 type only, direct opening action

③ Color of button or lens

Code	color	Button	LED	Incandescent	Neon
G	Green	○	○	○	○
R	Red	○	○	○	○ (Orange)
B	Black*	○	—	—	—
Y	Yellow	○	○	○	○ (Orange)
W	White	○	○ (Orange)	○	○ (Orange)
S	Blue	○	○	○	○ (Green)
O	Orange	○	○ (Amber)	○	○
RG	Red/Green	—	○	—	—

Notes: • (): indicates luminous color
• AH165-V, V1, V5, V6: Red only
* Not available for illuminated types

④ Contact arrangement

01: 1NC*1
02: 2NC*1
11: 1NO+1NC

22: 2NO+2NC
33: 3NO+3NC*2

Notes: *1 Available for AH165-V, V1, V5, V6

*2 Not available for with transformer types

⑤ Lamp voltage

Code	LED	Incandescent**2	Neon*2
AA	5V DC*2	—	—
A	6V DC*2	5V AC/DC	—
B	12V DC	12V AC/DC	—
E	24V DC	24V AC/DC	—
H	100-110V AC*1 *2	100-110V AC*1	110V AC
K	—	—	120V AC
M	200-220V AC*1 *2	200-220V AC*1	220V AC
P	—	—	240V AC

Notes: *1 With transformer (LED: 24V, Incandescent: 28V)

*2 Not available AH165-ZM

• ZM type: LED lamp only (12, 24V DC)

⑥ Type of lamp

Blank: Incandescent

1: Neon
2: Spot LED, LED (ZM types)
3: Flat LED

⑦ Terminal

Blank: Solder/tab

W: Wire-wrap
S: Soder (AH165-V, V1, V5, V6 types only)

Note: ZM types: wire-wrap terminal only (Code is blank)

Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164 and AH165

Type number nomenclature

■ Type number nomenclature

Selector switches

AH165 - J 2 B 11 A - W
 ① ② ③ ④ ⑤ ⑥ ⑦

① Product category

AH164: Standard (IP40)
 AH165: Oil-tight (IP65)

② Operator

• 2-position, 3-position (operating angle 90°)

SP: Knob with square bezel

P: Knob with rectangular bezel

SJ: Key with square bezel

J: Key with rectangular bezel

JM: Key with rectangular bezel (Direct opening action) *

RJM: Key (Direct opening action) *

Note: * AH165 types (2-position) only

• 3-position (operating angle 45°)

SPK: Knob with square bezel

PK: Knob with rectangular bezel

SJK: Key with square bezel

JK: Key with rectangular bezel

③ Operation

2: 2-position, maintained

0: 2-position, spring return*

3: 3-position, maintained

6: 3-position, spring/manual return (Left to center)

7: 3-position, spring/manual return (Right to center)

1: 3-position, spring return

Note: * Except for JM and RJM types

④ Color of knob or key removable position

• Color of knob

B: Black

• Key removable position

Code	2-position		3-position (operating angle 90°)				3-position (operating angle 45°)			
	2	0	1	3	6	7	1	3	6	7
A	⊗	⊗	—	⊖	—	⊖	—	⊗	—	⊗
B	⊗	—	—	⊖	—	—	—	⊗	—	—
C	—	—	—	⊕	—	—	—	⊗	—	—
D	⊗	—	—	⊖	—	—	—	⊗	—	—
E	—	—	Ⓜ	—	—	—	Ⓜ	—	—	—
F	—	—	—	—	—	—	—	⊗	—	—
G	—	—	—	—	—	—	—	⊗	—	⊗

⑤ Contact arrangement

11: 1NO+1NC

22: 2NO+2NC

33: 3NO+3NC*

Note: * Except for JM and RJM types.

⑥ Key type No.

A (standard), B, C, D, E, F

⑦ Terminal

Blank: Solder/tab

W: Wire-warp

Note: JM, RJM types: Solder/tab terminal only

Buzzers

AH164 - T X B E
 ① ② ③ ④

① Product category

AH164: Standard (IP00)

AH165: Splash-proof (IP54)

② Sound

TX: Standard (AH164)

TX1: Loud sound (AH164)

TX2: Loud sound with volume control (AH164)

X: Standard sound with volume control (AH165)

③ Color of head

B: Black

④ Operating voltage

AAC: 6V AC*2

ADC: 6V DC*2

A: 6V AC/DC*1

E: 12 to 24V AC/DC

F: 35 to 48V AC/DC

Notes: *1 Except for TX and TX1 types

*2 Except for TX2 and X types

■ Type number nomenclature

Numerical indicators

AH164 - T C4 R E - 1 N K
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① **Product category**

AH164: Standard (IP40)

AH165: Splash-proof (IP54)

② **Shape of the indicator**

T: Rectangular

③ **Type of decoder**

S: Without decoder

C1: With decoder (74LS47: TTL, positive logic)

C4: With decoder (4511: C-MOS)

④ **Luminous color**

R: Red

G: Green

⑤ **Type of common or operating voltage**

• Type of common (without decoder)

A: Anode

C: Cathode

• Operating voltage (with decoder)

Blank: 5V DC

B: 12V DC *

C: 15V DC *

E: 24V DC *

Note: * TC4 types only

⑥ **Type of indicator**

Blank: Decimal*¹

1: Sign (±1 display)*²

Notes: *¹ Input voltage: 5, 12, 15V DC

*² Input voltage: 24V DC

⑦ **Input logic**

Blank: Positive logic

N: Negative logic *

Note: * Input voltage: 24V DC

⑧ **Card connector (Input voltage: 24V DC)**

K1: Without connector

K: With connector

Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164 and AH165

Ratings and specifications

■ Standards approved

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479 (except for AH165-ZM) File No. LR84365 (for AH165-ZM)
TÜV: EN60947-5-1	Pushbutton (except for AH165-V, V1), Illuminated pushbutton: R9250087 Pushbutton (for AH165-V, V1): J9551059 Selector (except for AH165-JM, RJM): R9250088 Selector (for AH165-JM, RJM): J9551059 Pilot lights: R9250089 Buzzer: J9950092 (for AH164-TX2, AH165-X)
TÜV: EN60947-5-1 EN60947-5-5	Emergency stop pushbutton: R9950093

■ Specifications (Indoor use)

- Pushbutton switches, illuminated pushbutton switches selector switches, pilot lights

Item	AH164	AH165
Rated insulation voltage	250V AC/DC	
Ambient temperature (no condensation or no icing)	-20 to +70°C *1	-10 to +70°C *2
Humidity	45 to 85%RH (at -5 to +40°C), no condensation or no icing	
Durability (operations)	Mechanical	Pushbutton switch Momentary action: 1 million Alternate action: 250,000 Push-lock, turn-reset: 100,000 Selector switch: 250,000 *3
	Electrical	100,000 (220V AC 0.7A)
Dielectric strength	2000V AC, 1 minute (Between lamp and contact terminals: 1500V AC, 1 minute)	
Conditional short-circuit current	1000A	
Short-circuit protective device	Fuse 1A *4	
Pollution degree	3	
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm *5 Constant: 16.7Hz, double amplitude 3mm	
Shock	Malfunction durability: 100m/s ² *6 Mechanical durability: 500m/s ²	
Operating frequency	1200 operation/hour (on-load factor: 40%)	
Insulation resistance	100MΩ or more (500V DC megger)	
Degree of protection	IP40	IP65

- Notes: *1 For illuminated pushbutton switch and pilot light: -20 to +55°C
 *2 For illuminated pushbutton switch and pilot light: -10 to +55°C
 *3 Key insertion/removal durability for selector switch key types: 10,000
 *4 AH165-V, V1, JM, RJM, V5, V6 types: Fuse 5A
 *5 Emergency stop type: 10 to 500Hz, double amplitude 0.7mm (acceleration 50m/s²), according to the test condition of EN60947-5-5 (1998)
 *6 Emergency stop type: 150m/s²

• Buzzers

Item	AH164-TX	AH164-TX1
Rated insulation voltage	60V AC/DC	
Operating voltage	6V AC, 6V DC, 12 to 24V AC/DC 35 to 48V AC/DC	
Sound level	80dB (0.1m) 60dB(1m)	90dB (0.1m) 70dB(1m)
Durability	1000h	
Frequency	2 ±0.5kHz	2.4 to 3.3kHz
Intermittent cycle	Approx. 170 cycle/minute	
Current consumption	7mA(24, 48V DC) 15mA(6V DC) 20mA (6, 24V AC) 30mA (48V AC)	15mA (24, 48V DC) 25mA (6V DC) 30mA (24V AC) 40mA (48V AC) 50mA (6V AC)
Dielectric strength	1000V AC, 1 minute	
Insulation resistance	100MΩ or more (500V DC megger)	
Ambient temperature	-20 to +60°C (no condensation or no icing)	
Humidity	45 to 85%RH (at -5 to +40°C)	
Operator protection	IP00	

Item	AH164-TX2	AH165-X
Rated insulation voltage	60V AC/DC	
Operating voltage	6V AC/DC, 12 to 24V AC/DC 35 to 48V AC/DC	
Sound level	70dB to 90dB (0.1m) 50dB to 70dB (1m)	60dB to 80dB (0.1m) 40dB to 60dB (1m)
Durability	1000h	
Frequency	2 ±0.5kHz	2.4 to 3.3kHz
Intermittent cycle	Approx. 170 cycle/minute	
Current consumption	30mA (6V DC) 20mA (24, 48V DC) 40mA (6, 24, 48V AC)	
Dielectric strength	1000V AC, 1 minute	
Insulation resistance	100MΩ or more (500V DC megger)	
Ambient temperature	-20 to +60°C (no condensation or no icing)	
Humidity	45 to 85%RH (at -5 to +40°C)	
Degree of protection	IP00	IP54

Pushbuttons/Selectors/Pilot Lights/Buzzers AH164 and AH165 Ratings and specifications

• Numerical indicators

Without decoder

Item		AH164-TS (LED)	AH165-TS (LED)
Electrical	Forward voltage V_F ($I_F=10\text{mA}$)	Red: 2.0V (max. 2.8V), green: 2.1V (max. 2.8V)	
	Reverse current I_R ($V_R=3\text{V}$)	100 μA	
Max. power dissipation pd/Seg		Red: 40mW, green: 60mW	
Max. forward current I_F		Red: 15mA, green: 20mA	
Max. reverse voltage V_R		3V	
Ambient temperature	Opening T_{opr}	-20 to +40°C (No condensation or no icing)	
	Storage T_{stg}	-30 to +85°C	
Degree of protection		IP40	IP65

With decoder

Item		AH164-TC1, TC4	AH165-TC1, TC4	AH164-TC4□E	AH165-TC□E
Power supply V_{CC} , V_{DD} (DC)		5V \pm 5%, 12V \pm 5%, 15V \pm 5%		24V \pm 20%	
Current consumption		5V Red: 120mA (C1), 100mA (C4), green: 170mA (C1), 150mA (C4) 12V Red: 90mA (C4), green: 130mA (C4) 15V Red: 90mA (C4), green: 130mA (C4)		Numerical indicator, decimal: 110mA Unit indicator: 80mA	
Ambient temperature	Opening T_{opr}	-20 to +40°C (No condensation or no icing)		-20 to +40°C (No condensation or no icing)	
	Storage T_{stg}	-30 to +85°C		-30 to +85°C	
Degree of protection		IP40	IP65	IP40	IP65

■ Contact ratings

• UL/CSA standards

Rated thermal current	Rated operational voltage	Maximum current	
		AC (Res. load)	DC (Res. load)
5A	24V	–	1.0A
	125V	–	0.2A
	250V	5.0A	–

• EN standards (TÜV approved)

Rated thermal current	Rated operational voltage	Rated operational current				
		AC 15 (Ind. load)	AC 13 (Ind. load)	AC 12 (Res. load)	DC 13 (Ind. load)	DC 12 (Res. load)
5A	24V	–	–	–	0.7A	1.0A
	100 to 120V	0.3A	1.0A	1.5A	–	–
	100 to 125V	–	–	–	0.15A	0.2A
	200 to 240V	0.3A	0.7A	1.0A	–	–

■ Lamp ratings

Rated operational voltage	Consumption		
	LED DC	Incandescent AC/DC	Neon AC
5V	14mA (Yellow: 28mA)	0.45W (6V)	–
6V	14mA (Yellow: 28mA)	–	–
12V	14mA	0.55W (14V)	–
24V	14mA	0.55W (28V)	–
110V	–	–	0.19VA
120V	–	–	0.21VA
220V	–	–	0.38VA
240V	–	–	0.42VA

Notes: • With transformer (LED): 1.5VA/110, 220V
 • With transformer (Incandescent): 2VA/110, 220V
 • For the incandescent lamps, the values in parentheses indicate the rated voltage of the lamps.




■ Contact reliability

FUJI has confirmed that the unit can be used in 1mA circuit conditions at 5V AC or DC. The operable range may vary depending on the ambient conditions and type of load.



Illuminated Pushbuttons

AH164 and AH165

■ Illuminated pushbutton switches/without transformer

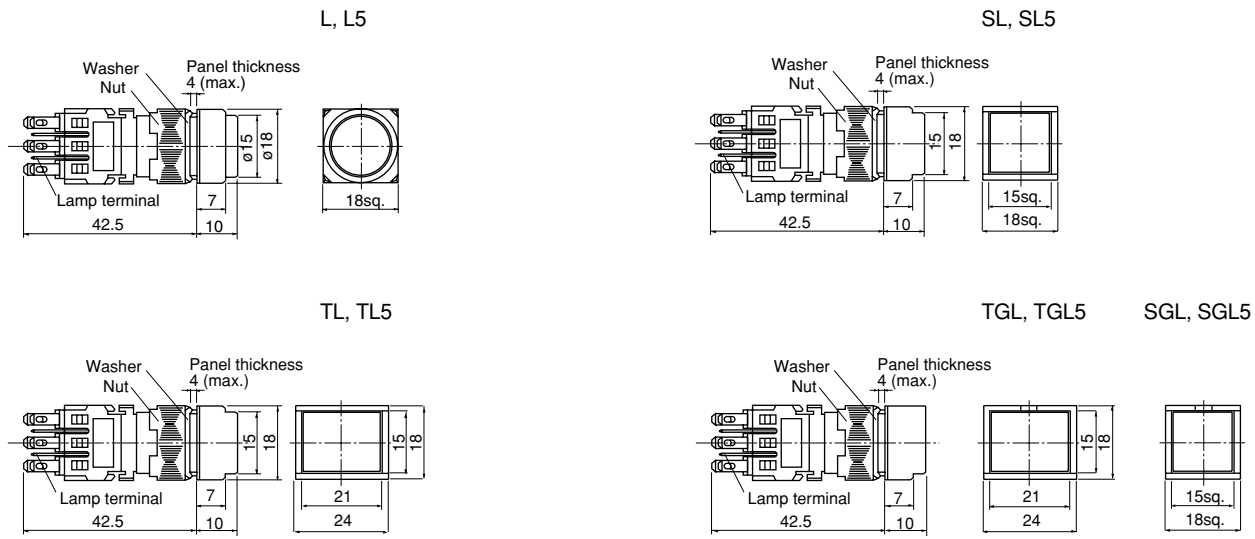
Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (Oil-tight) type	AH164 type	AH165 (Oil-tight) type
 SK-1103	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11E3 AH164-L□22E3 AH164-L□33E3	AH165-L□11E3 AH165-L□22E3 AH165-L□33E3	AH164-L5□11E3 AH164-L5□22E3 AH164-L5□33E3	AH165-L5□11E3 AH165-L5□22E3 AH165-L5□33E3
	Spot LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11E2 AH164-L□22E2 AH164-L□33E2	AH165-L□11E2 AH165-L□22E2 AH165-L□33E2	AH164-L5□11E2 AH164-L5□22E2 AH164-L5□33E2	AH165-L5□11E2 AH165-L5□22E2 AH165-L5□33E2
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11E AH164-L□22E AH164-L□33E	AH165-L□11E AH165-L□22E AH165-L□33E	AH164-L5□11E AH164-L5□22E AH164-L5□33E	AH165-L5□11E AH165-L5□22E AH165-L5□33E
	Neon	110V AC 220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-L□11H1 AH164-L□22H1 AH164-L□33H1 AH164-L□11M1 AH164-L□22M1 AH164-L□33M1	AH165-L□11H1 AH165-L□22H1 AH165-L□33H1 AH165-L□11M1 AH165-L□22M1 AH165-L□33M1	AH164-L5□11H1 AH164-L5□22H1 AH164-L5□33H1 AH164-L5□11M1 AH164-L5□22M1 AH164-L5□33M1	AH165-L5□11H1 AH165-L5□22H1 AH165-L5□33H1 AH165-L5□11M1 AH165-L5□22M1 AH165-L5□33M1
 SK-1102	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□11E3 AH164-SL□22E3 AH164-SL□33E3	AH165-SL□11E3 AH165-SL□22E3 AH165-SL□33E3	AH164-SL5□11E3 AH164-SL5□22E3 AH164-SL5□33E3	AH165-SL5□11E3 AH165-SL5□22E3 AH165-SL5□33E3
	Spot LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□11E2 AH164-SL□22E2 AH164-SL□33E2	AH165-SL□11E2 AH165-SL□22E2 AH165-SL□33E2	AH164-SL5□11E2 AH164-SL5□22E2 AH164-SL5□33E2	AH165-SL5□11E2 AH165-SL5□22E2 AH165-SL5□33E2
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□11E AH164-SL□22E AH164-SL□33E	AH165-SL□11E AH165-SL□22E AH165-SL□33E	AH164-SL5□11E AH164-SL5□22E AH164-SL5□33E	AH165-SL5□11E AH165-SL5□22E AH165-SL5□33E
	Neon	110V AC 220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SL□11H1 AH164-SL□22H1 AH164-SL□33H1 AH164-SL□11M1 AH164-SL□22M1 AH164-SL□33M1	AH165-SL□11H1 AH165-SL□22H1 AH165-SL□33H1 AH165-SL□11M1 AH165-SL□22M1 AH165-SL□33M1	AH164-SL5□11H1 AH164-SL5□22H1 AH164-SL5□33H1 AH164-SL5□11M1 AH164-SL5□22M1 AH164-SL5□33M1	AH165-SL5□11H1 AH165-SL5□22H1 AH165-SL5□33H1 AH165-SL5□11M1 AH165-SL5□22M1 AH165-SL5□33M1
 SK-1100	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□11E3 AH164-TL□22E3 AH164-TL□33E3	AH165-TL□11E3 AH165-TL□22E3 AH165-TL□33E3	AH164-TL5□11E3 AH164-TL5□22E3 AH164-TL5□33E3	AH165-TL5□11E3 AH165-TL5□22E3 AH165-TL5□33E3
	Spot LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□11E2 AH164-TL□22E2 AH164-TL□33E2	AH165-TL□11E2 AH165-TL□22E2 AH165-TL□33E2	AH164-TL5□11E2 AH164-TL5□22E2 AH164-TL5□33E2	AH165-TL5□11E2 AH165-TL5□22E2 AH165-TL5□33E2
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□11E AH164-TL□22E AH164-TL□33E	AH165-TL□11E AH165-TL□22E AH165-TL□33E	AH164-TL5□11E AH164-TL5□22E AH164-TL5□33E	AH165-TL5□11E AH165-TL5□22E AH165-TL5□33E
	Neon	110V AC 220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TL□11H1 AH164-TL□22H1 AH164-TL□33H1 AH164-TL□11M1 AH164-TL□22M1 AH164-TL□33M1	AH165-TL□11H1 AH165-TL□22H1 AH165-TL□33H1 AH165-TL□11M1 AH165-TL□22M1 AH165-TL□33M1	AH164-TL5□11H1 AH164-TL5□22H1 AH164-TL5□33H1 AH164-TL5□11M1 AH164-TL5□22M1 AH164-TL5□33M1	AH165-TL5□11H1 AH165-TL5□22H1 AH165-TL5□33H1 AH165-TL5□11M1 AH165-TL5□22M1 AH165-TL5□33M1

Note: Replace the □ mark by the button color code, see page 04/143.

Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (oil-tight) type	AH164 type	AH165 (oil-tight) type
Flush rectangular head with guard  SK-1101	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11E3	AH165-TGL□11E3	AH164-TGL5□11E3	AH165-TGL5□11E3
				AH164-TGL□22E3	AH165-TGL□22E3	AH164-TGL5□22E3	AH165-TGL5□22E3
	AH164-TGL□33E3	AH165-TGL□33E3	AH164-TGL5□33E3	AH165-TGL5□33E3			
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11E	AH165-TGL□11E	AH164-TGL5□11E	AH165-TGL5□11E
				AH164-TGL□22E	AH165-TGL□22E	AH164-TGL5□22E	AH165-TGL5□22E
	AH164-TGL□33E	AH165-TGL□33E	AH164-TGL5□33E	AH165-TGL5□33E			
Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11H1	AH165-TGL□11H1	AH164-TGL5□11H1	AH165-TGL5□11H1	
			AH164-TGL□22H1	AH165-TGL□22H1	AH164-TGL5□22H1	AH165-TGL5□22H1	
AH164-TGL□33H1	AH165-TGL□33H1	AH164-TGL5□33H1	AH165-TGL5□33H1				
220V AC	1NO+1NC 2NO+2NC 3NO+3NC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-TGL□11M1	AH165-TGL□11M1	AH164-TGL5□11M1	AH165-TGL5□11M1	
			AH164-TGL□22M1	AH165-TGL□22M1	AH164-TGL5□22M1	AH165-TGL5□22M1	
AH164-TGL□33M1	AH165-TGL□33M1	AH164-TGL5□33M1	AH165-TGL5□33M1				
Flush square head with guard  AF90-301	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11E3	AH165-SGL□11E3	AH164-SGL5□11E3	AH165-SGL5□11E3
				AH164-SGL□22E3	AH165-SGL□22E3	AH164-SGL5□22E3	AH165-SGL5□22E3
	AH164-SGL□33E3	AH165-SGL□33E3	AH164-SGL5□33E3	AH165-SGL5□33E3			
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11E	AH165-SGL□11E	AH164-SGL5□11E	AH165-SGL5□11E
				AH164-SGL□22E	AH165-SGL□22E	AH164-SGL5□22E	AH165-SGL5□22E
	AH164-SGL□33E	AH165-SGL□33E	AH164-SGL5□33E	AH165-SGL5□33E			
Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11H1	AH165-SGL□11H1	AH164-SGL5□11H1	AH165-SGL5□11H1	
			AH164-SGL□22H1	AH165-SGL□22H1	AH164-SGL5□22H1	AH165-SGL5□22H1	
AH164-SGL□33H1	AH165-SGL□33H1	AH164-SGL5□33H1	AH165-SGL5□33H1				
220V AC	1NO+1NC 2NO+2NC 3NO+3NC	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SGL□11M1	AH165-SGL□11M1	AH164-SGL5□11M1	AH165-SGL5□11M1	
			AH164-SGL□22M1	AH165-SGL□22M1	AH164-SGL5□22M1	AH165-SGL5□22M1	
AH164-SGL□33M1	AH165-SGL□33M1	AH164-SGL5□33M1	AH165-SGL5□33M1				

04

■ Dimensions, mm



• Button color

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Y	S	O

- The color lens is made of a tinted transparent material.
- A white illuminated pushbutton is fitted with a transparent color lens. (Except the neon lamp)
- With wire-wrap pin terminals have a depth of 47mm.

• Lamp voltage






Voltages other than above are available

Code	LED	Incandescent	Neon
AA	5V DC	—	—
A	6V DC	5V AC/DC	—
B	12V DC	12V AC/DC	—
K	—	—	120V AC
P	—	—	240V AC

Illuminated Pushbuttons

AH164 and AH165

■ Illuminated pushbutton switches/without transformer (Red/green LED)

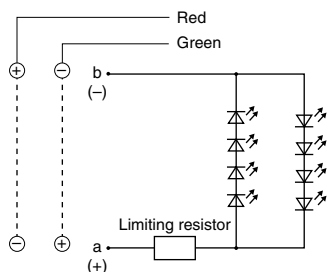
Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (oil-tight) type	AH164 type	AH165 (oil-tight) type
Extended round head  SK-1103	Red/green LED	24V DC	1NO+1NC	AH164-LRG11E3	AH165-LRG11E3	AH164-L5RG11E3	AH165-L5RG11E3
			2NO+2NC	AH164-LRG22E3	AH165-LRG22E3	AH164-L5RG22E3	AH165-L5RG22E3
			3NO+3NC	AH164-LRG33E3	AH165-LRG33E3	AH164-L5RG33E3	AH165-L5RG33E3
Flush square head  SK-1102	Red/green LED	24V DC	1NO+1NC	AH164-SLRG11E3	AH165-SLRG11E3	AH164-SL5RG11E3	AH165-SL5RG11E3
			2NO+2NC	AH164-SLRG22E3	AH165-SLRG22E3	AH164-SL5RG22E3	AH165-SL5RG22E3
			3NO+3NC	AH164-SLRG33E3	AH165-SLRG33E3	AH164-SL5RG33E3	AH165-SL5RG33E3
Flush rectangular head  SK-1100	Red/green LED	24V DC	1NO+1NC	AH164-TLRG11E3	AH165-TLRG11E3	AH164-TL5RG11E3	AH165-TL5RG11E3
			2NO+2NC	AH164-TLRG22E3	AH165-TLRG22E3	AH164-TL5RG22E3	AH165-TL5RG22E3
			3NO+3NC	AH164-TLRG33E3	AH165-TLRG33E3	AH164-TL5RG33E3	AH165-TL5RG33E3
Flush square head with guard  AF90-301	Red/green LED	24V DC	1NO+1NC	AH164-SGLRG11E3	AH165-SGLRG11E3	AH164-SGL5RG11E3	AH165-SGL5RG11E3
			2NO+2NC	AH164-SGLRG22E3	AH165-SGLRG22E3	AH164-SGL5RG22E3	AH165-SGL5RG22E3
			3NO+3NC	AH164-SGLRG33E3	AH165-SGLRG33E3	AH164-SGL5RG33E3	AH165-SGL5RG33E3
Flush rectangular head with guard  SK-1101	Red/green LED	24V DC	1NO+1NC	AH164-TGLRG11E3	AH165-TGLRG11E3	AH164-TGL5RG11E3	AH165-TGL5RG11E3
			2NO+2NC	AH164-TGLRG22E3	AH165-TGLRG22E3	AH164-TGL5RG22E3	AH165-TGL5RG22E3
			3NO+3NC	AH164-TGLRG33E3	AH165-TGLRG33E3	AH164-TGL5RG33E3	AH165-TGL5RG33E3

Note: • The only color codes used for red/green LEDs are R and G. The color lens is transparent.
 Red/green LEDs do not have high-brightness specifications.
 • 24V DC only





■ Dimensions, mm

See Page 04/143

Relationship between luminous color and terminal



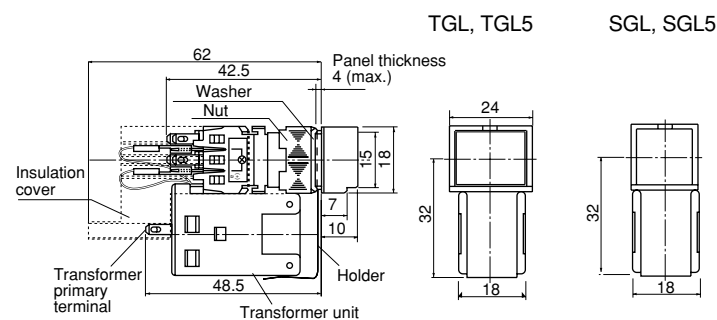
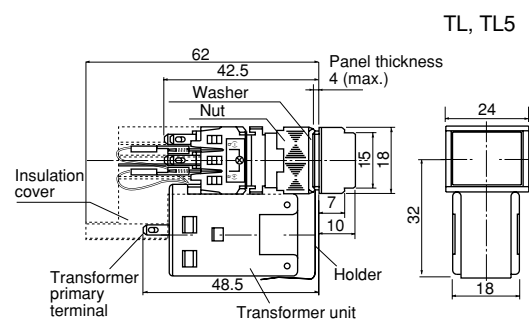
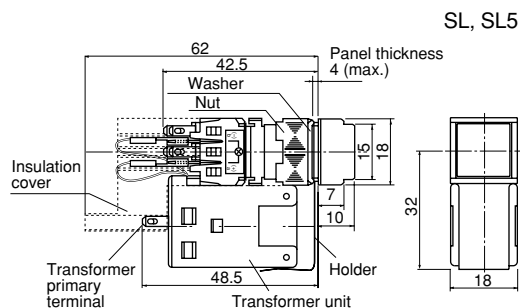
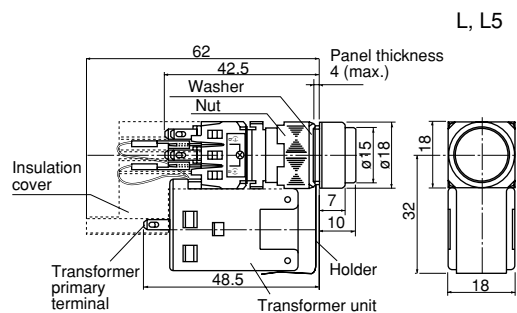
■ Illuminated pushbutton switches/with transformer

Operator	Lamp	Voltage	Contact	Momentary action		Alternate action	
				AH164 type	AH165 (oil-tight) type	AH164 type	AH165 (oil-tight) type
Extended round head  AF90-945	Flat LED	■ Voltage code H: 100-110V AC M: 200-220V AC	1NO+1NC	AH164-L□11■3	AH165-L□11■3	AH164-L5□11■3	AH165-L5□11■3
			2NO+2NC	AH164-L□22■3	AH165-L□22■3	AH164-L5□22■3	AH165-L5□22■3
	Incandescent		1NO+1NC	AH164-L□11■	AH165-L□11■	AH164-L5□11■	AH165-L5□11■
			2NO+2NC	AH164-L□22■	AH165-L□22■	AH164-L5□22■	AH165-L5□22■
Flush square head  AF90-946	Flat LED	■ Voltage code H: 100-110V AC M: 200-220V AC	1NO+1NC	AH164-SL□11■3	AH165-SL□11■3	AH164-SL5□11■3	AH165-SL5□11■3
			2NO+2NC	AH164-SL□22■3	AH165-SL□22■3	AH164-SL5□22■3	AH165-SL5□22■3
	Incandescent		1NO+1NC	AH164-SL□11■	AH165-SL□11■	AH164-SL5□11■	AH165-SL5□11■
			2NO+2NC	AH164-SL□22■	AH165-SL□22■	AH164-SL5□22■	AH165-SL5□22■
Flush rectangular head  AF90-947	Flat LED	■ Voltage code H: 100-110V AC M: 200-220V AC	1NO+1NC	AH164-TL□11■3	AH165-TL□11■3	AH164-TL5□11■3	AH165-TL5□11■3
			2NO+2NC	AH164-TL□22■3	AH165-TL□22■3	AH164-TL5□22■3	AH165-TL5□22■3
	Incandescent		1NO+1NC	AH164-TL□11■	AH165-TL□11■	AH164-TL5□11■	AH165-TL5□11■
			2NO+2NC	AH164-TL□22■	AH165-TL□22■	AH164-TL5□22■	AH165-TL5□22■
Flush rectangular head with guard  AF90-941	Flat LED	■ Voltage code H: 100-110V AC M: 200-220V AC	1NO+1NC	AH164-TGL□11■3	AH165-TGL□11■3	AH164-TGL5□11■3	AH165-TGL5□11■3
			2NO+2NC	AH164-TGL□22■3	AH165-TGL□22■3	AH164-TGL5□22■3	AH165-TGL5□22■3
	Incandescent		1NO+1NC	AH164-TGL□11■	AH165-TGL□11■	AH164-TGL5□11■	AH165-TGL5□11■
			2NO+2NC	AH164-TGL□22■	AH165-TGL□22■	AH164-TGL5□22■	AH165-TGL5□22■
Flush square head with guard  AF90-948	Flat LED	■ Voltage code H: 100-110V AC M: 200-220V AC	1NO+1NC	AH164-SGL□11■3	AH165-SGL□11■3	AH164-SGL5□11■3	AH165-SGL5□11■3
			2NO+2NC	AH164-SGL□22■3	AH165-SGL□22■3	AH164-SGL5□22■3	AH165-SGL5□22■3
	Incandescent		1NO+1NC	AH164-SGL□11■	AH165-SGL□11■	AH164-SGL5□11■	AH165-SGL5□11■
			2NO+2NC	AH164-SGL□22■	AH165-SGL□22■	AH164-SGL5□22■	AH165-SGL5□22■

Note: Replace the □ mark by the button color code, see page 04/146.

Illuminated Pushbuttons AH164 and AH165

■ Dimensions, mm


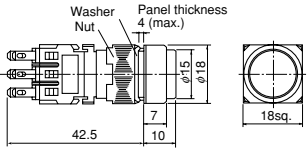

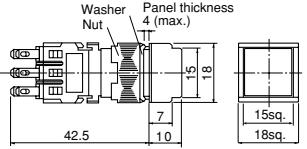

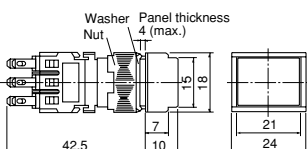

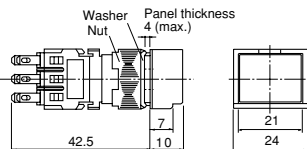

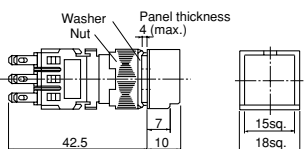

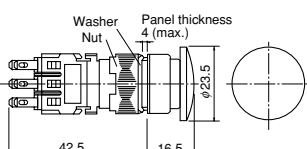

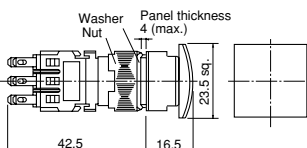

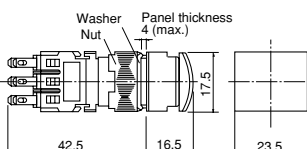


• Button color

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Y	S	O

- The color lens is made of a tinted transparent material.

■ Pushbutton switches

Operator	Contact	Momentary action		Alternate action		Dimensions, mm
		AH164 type	AH165 (oil-tight) type	AH164 type	AH165 (oil-tight) type	
Extended round head  SK-1103	1NO+1NC	AH164-E□11	AH165-E□11	AH164-E5□11	AH165-E5□11	
	2NO+2NC	AH164-E□22	AH165-E□22	AH164-E5□22	AH165-E5□22	
	3NO+3NC	AH164-E□33	AH165-E□33	AH164-E5□33	AH165-E5□33	
Flush square head  SK-1102	1NO+1NC	AH164-SF□11	AH165-SF□11	AH164-SF5□11	AH165-SF5□11	
	2NO+2NC	AH164-SF□22	AH165-SF□22	AH164-SF5□22	AH165-SF5□22	
	3NO+3NC	AH164-SF□33	AH165-SF□33	AH164-SF5□33	AH165-SF5□33	
Flush rectangular head  SK-1100	1NO+1NC	AH164-TF□11	AH165-TF□11	AH164-TF5□11	AH165-TF5□11	
	2NO+2NC	AH164-TF□22	AH165-TF□22	AH164-TF5□22	AH165-TF5□22	
	3NO+3NC	AH164-TF□33	AH165-TF□33	AH164-TF5□33	AH165-TF5□33	
Flush rectangular head with guard  SK-1101	1NO+1NC	AH164-TGF□11	AH165-TGF□11	AH164-TGF5□11	AH165-TGF5□11	
	2NO+2NC	AH164-TGF□22	AH165-TGF□22	AH164-TGF5□22	AH165-TGF5□22	
	3NO+3NC	AH164-TGF□33	AH165-TGF□33	AH164-TGF5□33	AH165-TGF5□33	
Flush square head with guard  AF90-301	1NO+1NC	AH164-SGF□11	AH165-SGF□11	AH164-SGF5□11	AH165-SGF5□11	
	2NO+2NC	AH164-SGF□22	AH165-SGF□22	AH164-SGF5□22	AH165-SGF5□22	
	3NO+3NC	AH164-SGF□33	AH165-SGF□33	AH164-SGF5□33	AH165-SGF5□33	
Mushroom head  SK-1136	1NO+1NC	AH164-M□11	AH165-M□11	AH164-M5□11	AH165-M5□11	
	2NO+2NC	AH164-M□22	AH165-M□22	AH164-M5□22	AH165-M5□22	
	3NO+3NC	AH164-M□33	AH165-M□33	AH164-M5□33	AH165-M5□33	
Convex square head  SK-1134	1NO+1NC	AH164-SM□11	AH165-SM□11	AH164-SM5□11	AH165-SM5□11	
	2NO+2NC	AH164-SM□22	AH165-SM□22	AH164-SM5□22	AH165-SM5□22	
	3NO+3NC	AH164-SM□33	AH165-SM□33	AH164-SM5□33	AH165-SM5□33	
Convex rectangular head  SK-1135	1NO+1NC	AH164-TM□11	AH165-TM□11	AH164-TM5□11	AH165-TM5□11	
	2NO+2NC	AH164-TM□22	AH165-TM□22	AH164-TM5□22	AH165-TM5□22	
	3NO+3NC	AH164-TM□33	AH165-TM□33	AH164-TM5□33	AH165-TM5□33	

• Button color

Replace the □ mark by the following color code

Color	Green	Red	Black	White	Blue	Yellow	Orange
Code	G	R	B	W	S	Y	O


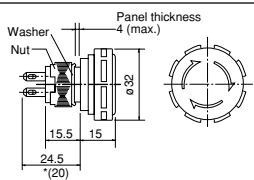

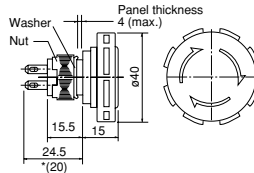
- The color lens is made of a tinted transparent material. (Except the M, SM, TM types)
- A white pushbutton is fitted with a transparent color lens. (Except the M, SM, TM types) A black pushbutton consists of a transparent color lens and an attached black legend plate. (Except M, SM, TM types)
- With wire-wrap pin terminals have a depth of 47mm.

Pushbuttons

AH165

■ Pushbutton switches

⊖ (Direct opening action)


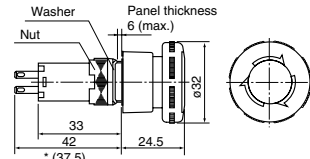

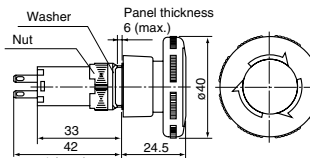
Operator	Button color	Contact	Terminal	AH165 (oil-tight) type	Dimensions, mm
Push-lock, turn-reset (32mm dia.)  <small>AF91-584</small>	Red	1NC	Solder/Tab Solder	AH165-VR01 (AH165-VR01-S)	
		2NC		AH165-VR02 (AH165-VR02-S)	
Push-lock, turn-reset (40mm dia.)  <small>AF91-583</small>	Red	1NC	Solder/Tab Solder	AH165-V1R01 (AH165-V1R01-S)	
		2NC		AH165-V1R02 (AH165-V1R02-S)	

Notes: * () For switch with solder terminal.

- Contact arrangements indicated in the table can be supplied.
- Product with no trigger action mechanism.

■ Emergency stop pushbutton switches


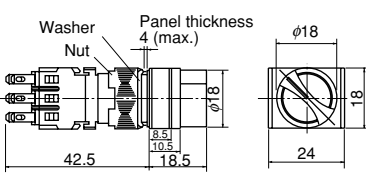

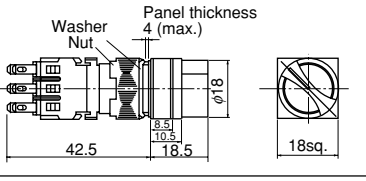

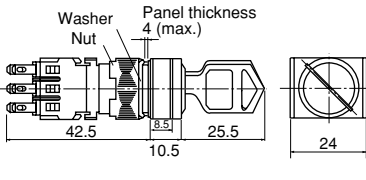

⊖ (Direct opening action), conform to EN418

Operator	Button color	Contact	Terminal	AH165 (oil-tight) type	Dimensions, mm
Push-lock, turn-reset (32mm dia.)  <small>AF97-232</small>	Red	1NC	Solder/Tab Solder	AH165-V5R01 (AH165-V5R01-S)	
		2NC		AH165-V5R02 (AH165-V5R02-S)	
Push-lock, turn-reset (40mm dia.)  <small>AF97-231</small>	Red	1NC	Solder/Tab Solder	AH165-V6R01 (AH165-V6R01-S)	
		2NC		AH165-V6R02 (AH165-V6R02-S)	

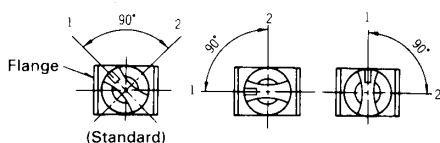
Notes: * () For switch with solder terminal.

- Contact arrangements indicated in the table can be supplied.

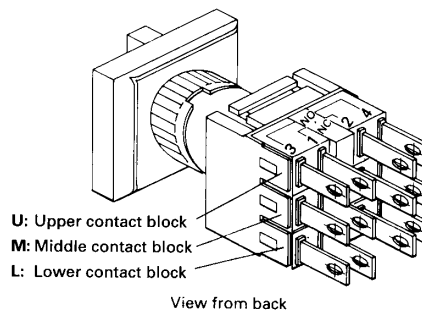
■ Selector switches/2-position (90-degree)

Operator	Operation	Key removable position	Contact	AH164 type	AH165 (oil-tight) type	Dimensions, mm		
Knob with rectangular bezel  AF89-564	Maintained	—	1NO+1NC 2NO+2NC 3NO+3NC	AH164-P2B11 AH164-P2B22 AH164-P2B33	AH165-P2B11 AH165-P2B22 AH165-P2B33			
	Spring return	—	1NO+1NC 2NO+2NC 3NO+3NC	AH164-P0B11 AH164-P0B22 AH164-P0B33	AH165-P0B11 AH165-P0B22 AH165-P0B33			
	Knob with square bezel  AF89-563	Maintained	—	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SP2B11 AH164-SP2B22 AH164-SP2B33		AH165-SP2B11 AH165-SP2B22 AH165-SP2B33	
Spring return		—	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SP0B11 AH164-SP0B22 AH164-SP0B33	AH165-SP0B11 AH165-SP0B22 AH165-SP0B33			
Key with rectangular bezel  AF89-561		Maintained	⊖	1NO+1NC 2NO+2NC 3NO+3NC	AH164-J2A11A AH164-J2A22A AH164-J2A33A	AH165-J2A11A AH165-J2A22A AH165-J2A33A		
	⊗		1NO+1NC 2NO+2NC 3NO+3NC	AH164-J2B11A AH164-J2B22A AH164-J2B33A	AH165-J2B11A AH165-J2B22A AH165-J2B33A			
	⊘		1NO+1NC 2NO+2NC 3NO+3NC	AH164-J2D11A AH164-J2D22A AH164-J2D33A	AH165-J2D11A AH165-J2D22A AH165-J2D33A			
	Spring return	⊖	1NO+1NC 2NO+2NC 3NO+3NC	AH164-J0A11A AH164-J0A22A AH164-J0A33A	AH165-J0A11A AH165-J0A22A AH165-J0A33A			
		Key with square bezel  AF89-562	Maintained	⊖	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SJ2A11A AH164-SJ2A22A AH164-SJ2A33A		AH165-SJ2A11A AH165-SJ2A22A AH165-SJ2A33A
				⊗	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SJ2B11A AH164-SJ2B22A AH164-SJ2B33A		AH165-SJ2B11A AH165-SJ2B22A AH165-SJ2B33A
	⊘			1NO+1NC 2NO+2NC 3NO+3NC	AH164-SJ2D11A AH164-SJ2D22A AH164-SJ2D33A	AH165-SJ2D11A AH165-SJ2D22A AH165-SJ2D33A		
	Spring return		⊖	1NO+1NC 2NO+2NC 3NO+3NC	AH164-SJ0A11A AH164-SJ0A22A AH164-SJ0A33A	AH165-SJ0A11A AH165-SJ0A22A AH165-SJ0A33A		

• The operating angle range can be changed as shown below by setting the attached flange shifted by 45° in combination with the contact block.
In this case, the minimum mounting pitch is 26mm because the contact block is shifted by 45° from the flange.



• Contact block position



• Contact arrangement and operator position: 2-position selector switch

Contact arrangement	1NO+1NC	2NO+2NC	3NO+3NC
Operator position	Left	M 1 0 1 0 2 3 0 0 4	U 1 0 1 0 2 3 0 0 4 L 1 0 1 0 2 3 0 0 4
	Right	M 1 0 1 0 2 3 0 0 4	U 1 0 1 0 2 3 0 0 4 M 1 0 1 0 2 3 0 0 4 L 1 0 1 0 2 3 0 0 4

3-position selector switch


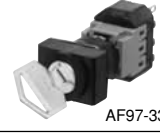
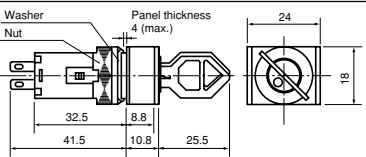
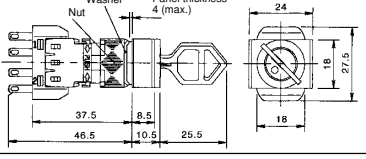


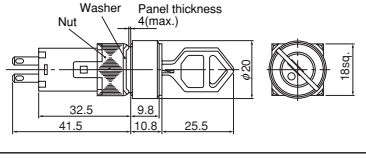
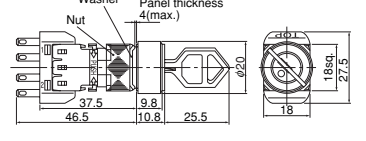
Contact arrangement	2NO+2NC	3NO+3NC
Operator position	Left	U L 1 0 1 0 2 1 0 1 0 2 3 0 0 4 3 0 0 4
	Center	U M L 1 0 1 0 2 1 0 1 0 2 1 0 1 0 2 3 0 0 4 3 0 0 4 3 0 0 4 3 0 0 4
	Right	U 1 0 1 0 2 1 0 1 0 2 1 0 1 0 2 3 0 0 4 3 0 0 4 3 0 0 4 3 0 0 4

- There are 6 available key types; A, B, C, D, E and F. Standard key code is A.
- With wire-wrap pin terminals have a depth of 47mm.

Selector Switches AH165

■ Selector switches/2-position (90-degree)

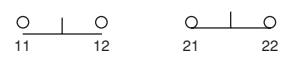

⊖ (Direct opening action)

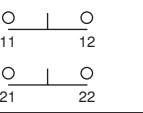
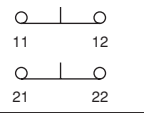
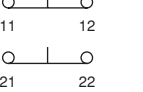
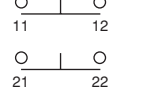
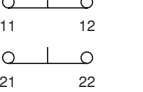
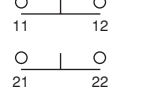


Operator	Operation	Key removable position	Contact	AH165 (oil-tight) type	Dimensions, mm
Key with rectangular bezel  AF95-57  AF97-334	Maintained	A ⊖	1NO+1NC	AH165-JM2A11A	
		B ⊗		AH165-JM2B11A	
		D ⊖		AH165-JM2D11A	
		A ⊖	2NO+2NC	AH165-JM2A22A	
		B ⊗		AH165-JM2B22A	
		D ⊖		AH165-JM2D22A	
Key with round bezel  AF99-320  AF99-320	Maintained	A ⊖	1NO+1NC	AH165-RJM2A11A	
		B ⊗		AH165-RJM2B11A	
		D ⊖		AH165-RJM2D11A	
		A ⊖	2NO+2NC	AH165-RJM2A22A	
		B ⊗		AH165-RJM2B22A	
		D ⊖		AH165-RJM2D22A	

• There are 6 available key types; A, B, C, D, E and F. Standard key code is A.

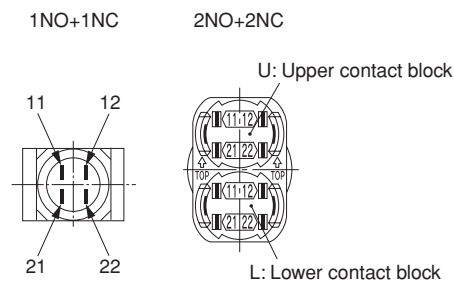
• Contact arrangement and operator positions:

2-position selector switch


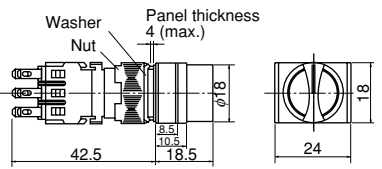

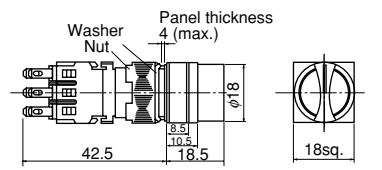

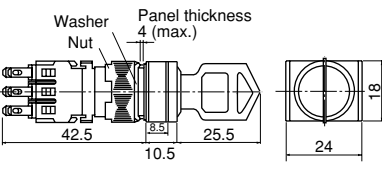

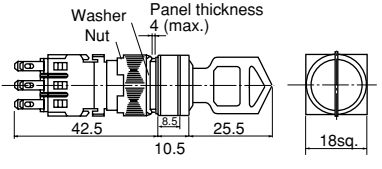
Contact arrangement	1NO+1NC	
Operator position	Left	
	Right	

Contact arrangement	2NO+2NC				
Operator position	Left	U		L	
		R		L	
Operator position	Right	U		L	
		R		L	

• Terminal number



■ Selector switches/3-position (90-degree)


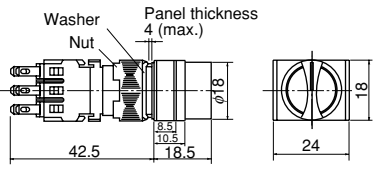

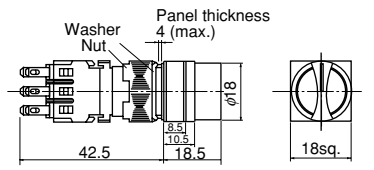

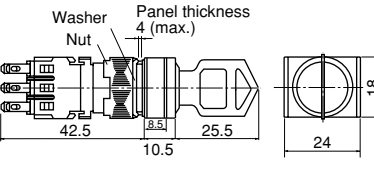

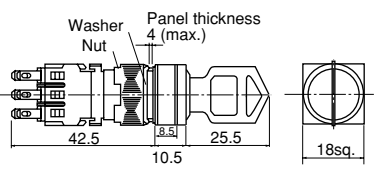
Operator	Operation	Key removable position	Contact	AH164 type	AH165 (oil-tight) type	Dimensions, mm		
Knob with rectangular bezel  SK-1099	Maintained	—	2NO+2NC 3NO+3NC	AH164-P3B22 AH164-P3B33	AH165-P3B22 AH165-P3B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-P6B22 AH164-P6B33	AH165-P6B22 AH165-P6B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-P7B22 AH164-P7B33	AH165-P7B22 AH165-P7B33			
	Spring return	⌚	2NO+2NC 3NO+3NC	AH164-P1B22 AH164-P1B33	AH165-P1B22 AH165-P1B33			
Knob with square bezel  SK-1133	Maintained	—	2NO+2NC 3NO+3NC	AH164-SP3B22 AH164-SP3B33	AH165-SP3B22 AH165-SP3B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-SP6B22 AH164-SP6B33	AH165-SP6B22 AH165-SP6B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-SP7B22 AH164-SP7B33	AH165-SP7B22 AH165-SP7B33			
	Spring return	⌚	2NO+2NC 3NO+3NC	AH164-SP1B22 AH164-SP1B33	AH165-SP1B22 AH165-SP1B33			
Key with rectangular bezel  SK-1098	Maintained*	⊖ A	2NO+2NC 3NO+3NC	AH164-J3A22A AH164-J3A33A	AH165-J3A22A AH165-J3A33A			
		⌚ E	2NO+2NC 3NO+3NC	AH164-J3E22A AH164-J3E33A	AH165-J3E22A AH165-J3E33A			
		⊖ D	2NO+2NC 3NO+3NC	AH164-J3D22A AH164-J3D33A	AH165-J3D22A AH165-J3D33A			
		⊕ C	2NO+2NC 3NO+3NC	AH164-J3C22A AH164-J3C33A	AH165-J3C22A AH165-J3C33A			
	Spring/ manual return	⌚ E	2NO+2NC 3NO+3NC	AH164-J6E22A AH164-J6E33A	AH165-J6E22A AH165-J6E33A			
		⊖ D	2NO+2NC 3NO+3NC	AH164-J6D22A AH164-J6D33A	AH165-J6D22A AH165-J6D33A			
	Spring/ manual return	⊖ A	2NO+2NC 3NO+3NC	AH164-J7A22A AH164-J7A33A	AH165-J7A22A AH165-J7A33A			
		⌚ E	2NO+2NC 3NO+3NC	AH164-J7E22A AH164-J7E33A	AH165-J7E22A AH165-J7E33A			
	Spring return	⌚ E	2NO+2NC 3NO+3NC	AH164-J1E22A AH164-J1E33A	AH165-J1E22A AH165-J1E33A			
	Key with square bezel  SK-1132	Maintained*	⊖ A	2NO+2NC 3NO+3NC	AH164-SJ3A22A AH164-SJ3A33A		AH165-SJ3A22A AH165-SJ3A33A	
			⌚ E	2NO+2NC 3NO+3NC	AH164-SJ3E22A AH164-SJ3E33A		AH165-SJ3E22A AH165-SJ3E33A	
			⊖ D	2NO+2NC 3NO+3NC	AH164-SJ3D22A AH164-SJ3D33A		AH165-SJ3D22A AH165-SJ3D33A	
⊕ C			2NO+2NC 3NO+3NC	AH164-SJ3C22A AH164-SJ3C33A	AH165-SJ3C22A AH165-SJ3C33A			
Spring/ manual return		⌚ E	2NO+2NC 3NO+3NC	AH164-SJ6E22A AH164-SJ6E33A	AH165-SJ6E22A AH165-SJ6E33A			
		⊖ D	2NO+2NC 3NO+3NC	AH164-SJ6D22A AH164-SJ6D33A	AH165-SJ6D22A AH165-SJ6D33A			
Spring/ manual return		⊖ A	2NO+2NC 3NO+3NC	AH164-SJ7A22A AH164-SJ7A33A	AH165-SJ7A22A AH165-SJ7A33A			
		⌚ E	2NO+2NC 3NO+3NC	AH164-SJ7E22A AH164-SJ7E33A	AH165-SJ7E22A AH165-SJ7E33A			
Spring return		⌚ E	2NO+2NC 3NO+3NC	AH164-SJ1E22A AH164-SJ1E33A	AH165-SJ1E22A AH165-SJ1E33A			

- There are 6 available key types; A, B, C, D, E and F. Standard key code is A.
- Contact arrangement and operator position: *See page 04/149.*
- Spring return, spring/manual return (spring return):
Operation angle 70-degree

- * Available key removable position: Code B ⊖
- With wire-wrap pin terminals have a depth of 47mm.

Selector Switches AH164 and AH165

■ Selector switches/3-position (45-degree)

Operator	Operation	Key removable position	Contact	AH164 type	AH165 (oil-tight) type	Dimensions, mm		
Knob with rectangular bezel  SK-1099	Maintained	—	2NO+2NC 3NO+3NC	AH164-PK3B22 AH164-PK3B33	AH165-PK3B22 AH165-PK3B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-PK6B22 AH164-PK6B33	AH165-PK6B22 AH165-PK6B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-PK7B22 AH164-PK7B33	AH165-PK7B22 AH165-PK7B33			
	Spring return	⌚	2NO+2NC 3NO+3NC	AH164-PK1B22 AH164-PK1B33	AH165-PK1B22 AH165-PK1B33			
Knob with square bezel  SK-1133	Maintained	—	2NO+2NC 3NO+3NC	AH164-SPK3B22 AH164-SPK3B33	AH165-SPK3B22 AH165-SPK3B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-SPK6B22 AH164-SPK6B33	AH165-SPK6B22 AH165-SPK6B33			
	Spring/ manual return	⌚	2NO+2NC 3NO+3NC	AH164-SPK7B22 AH164-SPK7B33	AH165-SPK7B22 AH165-SPK7B33			
	Spring return	⌚	2NO+2NC 3NO+3NC	AH164-SPK1B22 AH164-SPK1B33	AH165-SPK1B22 AH165-SPK1B33			
Key with rectangular bezel  SK-1098	Maintained	⊙ A	2NO+2NC 3NO+3NC	AH164-JK3A22A AH164-JK3A33A	AH165-JK3A22A AH165-JK3A33A			
		⊙ E	2NO+2NC 3NO+3NC	AH164-JK3E22A AH164-JK3E33A	AH165-JK3E22A AH165-JK3E33A			
		⊙ D	2NO+2NC 3NO+3NC	AH164-JK3D22A AH164-JK3D33A	AH165-JK3D22A AH165-JK3D33A			
		⊗ C	2NO+2NC 3NO+3NC	AH164-JK3C22A AH164-JK3C33A	AH165-JK3C22A AH165-JK3C33A			
	Spring/ manual return	⊙ E	2NO+2NC 3NO+3NC	AH164-JK6E22A AH164-JK6E33A	AH165-JK6E22A AH165-JK6E33A			
		⊙ D	2NO+2NC 3NO+3NC	AH164-JK6D22A AH164-JK6D33A	AH165-JK6D22A AH165-JK6D33A			
	Spring/ manual return	⊙ A	2NO+2NC 3NO+3NC	AH164-JK7A22A AH164-JK7A33A	AH165-JK7A22A AH165-JK7A33A			
		⊙ E	2NO+2NC 3NO+3NC	AH164-JK7E22A AH164-JK7E33A	AH165-JK7E22A AH165-JK7E33A			
	Spring return	⊙ E	2NO+2NC 3NO+3NC	AH164-JK1E22A AH164-JK1E33A	AH165-JK1E22A AH165-JK1E33A			
		⊙ E	2NO+2NC 3NO+3NC	AH164-JK1E22A AH164-JK1E33A	AH165-JK1E22A AH165-JK1E33A			
	Key with square bezel  SK-1132	Maintained	⊙ A	2NO+2NC 3NO+3NC	AH164-SJK3A22A AH164-SJK3A33A		AH165-SJK3A22A AH165-SJK3A33A	
			⊙ E	2NO+2NC 3NO+3NC	AH164-SJK3E22A AH164-SJK3E33A		AH165-SJK3E22A AH165-SJK3E33A	
⊙ D			2NO+2NC 3NO+3NC	AH164-SJK3D22A AH164-SJK3D33A	AH165-SJK3D22A AH165-SJK3D33A			
⊗ C			2NO+2NC 3NO+3NC	AH164-SJK3C22A AH164-SJK3C33A	AH165-SJK3C22A AH165-SJK3C33A			
Spring/ manual return		⊙ E	2NO+2NC 3NO+3NC	AH164-SJK6E22A AH164-SJK6E33A	AH165-SJK6E22A AH165-SJK6E33A			
		⊙ D	2NO+2NC 3NO+3NC	AH164-SJK6D22A AH164-SJK6D33A	AH165-SJK6D22A AH165-SJK6D33A			
Spring/ manual return		⊙ A	2NO+2NC 3NO+3NC	AH164-SJK7A22A AH164-SJK7A33A	AH165-SJK7A22A AH165-SJK7A33A			
		⊙ E	2NO+2NC 3NO+3NC	AH164-SJK7E22A AH164-SJK7E33A	AH165-SJK7E22A AH165-SJK7E33A			
Spring return		⊙ E	2NO+2NC 3NO+3NC	AH164-SJK1E22A AH164-SJK1E33A	AH165-SJK1E22A AH165-SJK1E33A			
		⊙ E	2NO+2NC 3NO+3NC	AH164-SJK1E22A AH164-SJK1E33A	AH165-SJK1E22A AH165-SJK1E33A			

- There are 6 available key types; A, B, C, D, E and F. Standard key code is A.
- Contact arrangement and operator position: See page 04/153.

• Key removable positions (JK, SJK)

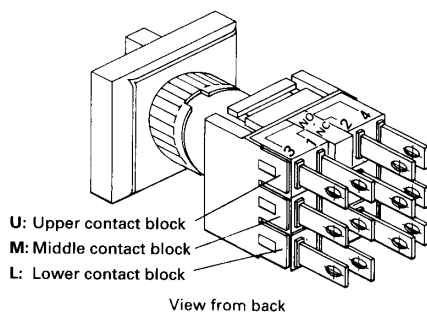
Remvable position							
Code	A	B	C	D	E	F	G

Operation code	Key removable position
3	A, B, C, D, E, F, G
6	D, E, F
7	A, E, G
1	E

• Key code No.

There are 6 available key types; A, B, C, D, E and F.
Standard key code is A.

• Contact block position




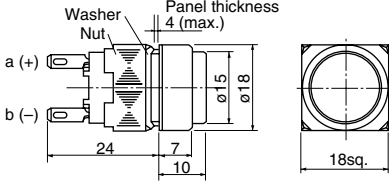

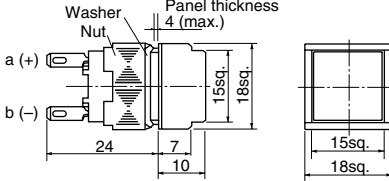

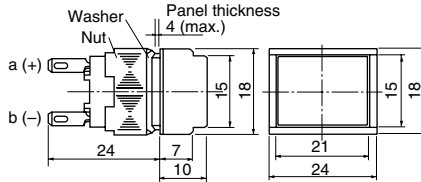

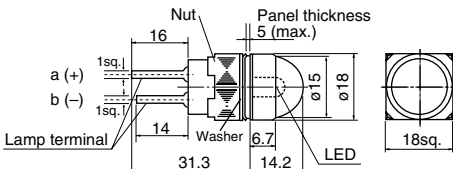
• Contact arrangement and operator position:

3-position selector switch

Contact arrange-ment		2NO+2NC	3NO+3NC
Operator position	Left 	U L 1O ₁ 1O ₂ 1O ₁ 1O ₂ 3O ₁ 04 3O ₁ 04	U M L 1O ₁ 1O ₂ 1O ₁ 1O ₂ 1O ₁ 1O ₂ 3O ₁ 04 3O ₁ 04 3O ₁ 04
	Center 	1O ₁ 1O ₂ 1O ₁ 1O ₂ 3O ₁ 04 3O ₁ 04	1O ₁ 1O ₂ 1O ₁ 1O ₂ 1O ₁ 1O ₂ 3O ₁ 04 3O ₁ 04 3O ₁ 04
	Right 	1O ₁ 02 1O ₁ 1O ₂ 3O ₁ 04 3O ₁ 04	1O ₁ 02 1O ₁ 1O ₂ 1O ₁ 1O ₂ 3O ₁ 04 3O ₁ 04 3O ₁ 04

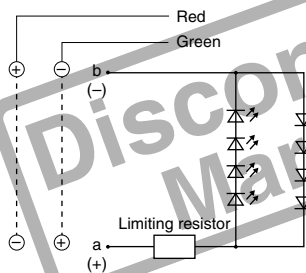
Pilot Lights AH164 and AH165

■ Pilot lights/without transformer

Lens	Lamp	Voltage	AH164 type	AH165 (oil-tight) type	Dimensions, mm
 SK-1139	Flat LED	24V DC	AH164-Z□E3	AH165-Z□E3	
	Spot LED	24V DC	AH164-Z□E2	AH165-Z□E2	
	Red/green LED	24V DC	AH164-ZRGE3	AH165-ZRGE3	
	Incandescent	24V AC/DC	AH164-Z□E	AH165-Z□E	
	Neon	110V AC 220V AC	AH164-Z□H1 AH164-Z□M1	AH165-Z□H1 AH165-Z□M1	
 SK-1138	Flat LED	24V DC	AH164-ZS□E3	AH165-ZS□E3	
	Spot LED	24V DC	AH164-ZS□E2	AH165-ZS□E2	
	Red/green LED	24V DC	AH164-ZSRGE3	AH165-ZSRGE3	
	Incandescent	24V AC/DC	AH164-ZS□E	AH165-ZS□E	
	Neon	110V AC 220V AC	AH164-ZS□H1 AH164-ZS□M1	AH165-ZS□H1 AH165-ZS□M1	
 SK-1137	Flat LED	24V DC	AH164-ZT□E3	AH165-ZT□E3	
	Spot LED	24V DC	AH164-ZT□E2	AH165-ZT□E2	
	Red/green LED	24V DC	AH164-ZTRGE3	AH165-ZTRGE3	
	Incandescent	24V AC/DC	AH164-ZT□E	AH165-ZT□E	
	Neon	110V AC 220V AC	AH164-ZT□H1 AH164-ZT□M1	AH165-ZT□H1 AH165-ZT□M1	
 AF87-45	LED	12V DC 24V DC	- -	AH165-ZM□B2 AH165-ZM□E2	

Note: • The only color codes used for red/green LEDs are R and G. The color lens is transparent.
Red/green LEDs do not have high-brightness specifications.

Relationship between luminous color and terminal



• Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA	5V DC	-	-
A	6V DC	5V AC/DC	-
B	12V DC	12V AC/DC	-
K	-	-	120V AC
P	-	-	240V AC

Note: Except for ZM types and red/green LED types


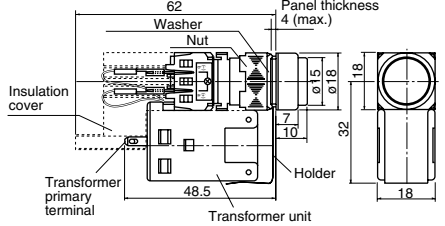

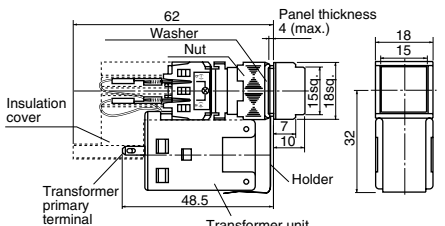

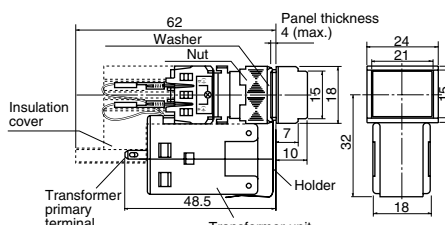
• Lens color

Replace the □ mark by the following lens color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Y	S	O

- The color lens is made of a tinted transparent material.
- A white pilot lights is fitted with a transparent color lens. (Except the neon lamp and dome).
- With wire-wrap pin terminals have a depth of 29mm. (Except for ZM type)

■ Pilot lights/with transformer

Lens	Lamp	Voltage	AH164 type	AH165 (oil-tight) type	Dimensions, mm
Extended square  AF90-944	Flat LED	■ Voltage H: 100-110V AC M: 200-220V AC	AH164-Z□■3	AH165-Z□■3	
	Incandescent		AH164-Z□■	AH165-Z□■	
Flush square  AF90-943	Flat LED	■ Voltage H: 100-110V AC M: 200-220V AC	AH164-ZS□■3	AH165-ZS□■3	
	Incandescent		AH164-ZS□■	AH165-ZS□■	
Flush rectangular  AF90-942	Flat LED	■ Voltage H: 100-110V AC M: 200-220V AC	AH164-ZT□■3	AH165-ZT□■3	
	Incandescent		AH164-ZT□■	AH165-ZT□■	

• Lens color

Replace the □ mark by the following lens color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Y	S	O


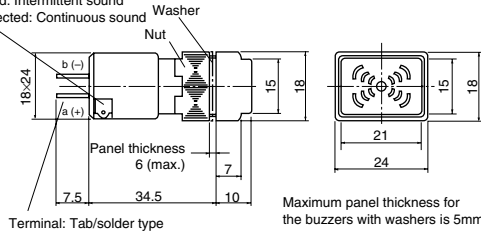

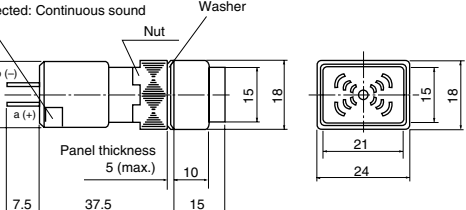

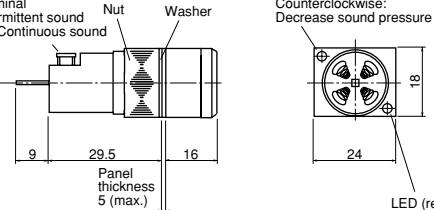

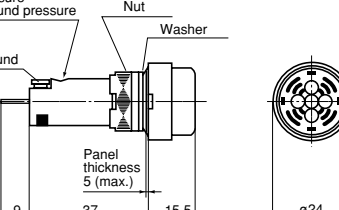
- The color lens is made of a tinted transparent material.
- A white pilot lights is fitted with a transparent color lens.

04


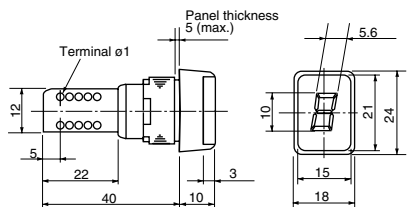

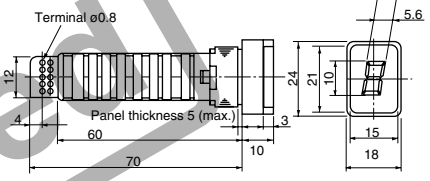

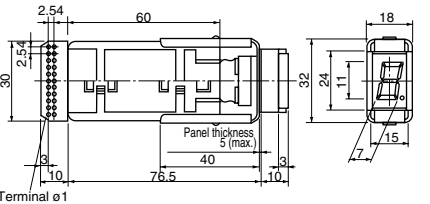

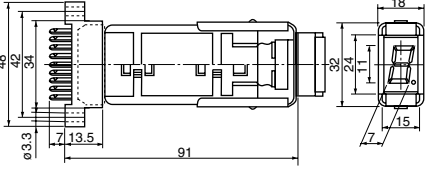
Buzzers

AH164 and AH165

■ Buzzers

Sound	Operating voltage	Type	Dimensions, mm
Standard  AF87-317	6V AC 6V DC 12 to 24V AC/DC 35 to 48V AC/DC	AH164-TXBAAC AH164-TXBADC AH164-TXBE AH164-TXBF	Short-circuit terminal Connected: Intermittent sound Not connected: Continuous sound  Panel thickness 6 (max.) Terminal: Tab/solder type Maximum panel thickness for the buzzers with washers is 5mm
Loud sound  AF87-44	6V AC 6V DC 12 to 24V AC/DC 35 to 48V AC/DC	AH164-TX1BAAC AH164-TX1BADC AH164-TX1BE AH164-TX1BF	Short-circuit terminal Connected: Intermittent sound Not connected: Continuous sound  Panel thickness 5 (max.)
Loud sound with volume control  AF93-297	6V AC/DC 12 to 24V AC/DC 35 to 48V AC/DC	AH164-TX2BA AH164-TX2BE AH164-TX2BF	Short-circuit terminal Connected: Intermittent sound Not connected: Continuous sound  Panel thickness 5 (max.) Volume Clockwise: Increase sound pressure Counterclockwise: Decrease sound pressure LED (red)
Standard sound with volume control (IP54)  AF96-243	6V AC/DC 12 to 24V AC/DC 35 to 48V AC/DC	AH165-XBA AH165-XBE AH165-XBF	Volume Clockwise: Increase sound pressure Counterclockwise: Decrease sound pressure Short-circuit terminal Connected: Intermittent sound Not connected: Continuous sound  Panel thickness 5 (max.)

■ Numerical indicators

Display	Input logic	Operating voltage	Description	AH164 type	AH165(oil-tight) type	Dimensions, mm
Without decimal decoder  SP-165	-	-	Anode	AH164-TS□A	AH165-TS□A	
			Cathode	AH164-TS□C	AH165-TS□C	
With decimal decoder (5, 12, 15V)  AF87-315	Positive (Low active)	5V DC	Decoder type: 74LS47	AH164-TC1□	AH165-TC1□	
		5V DC	Decoder type: 4511	AH164-TC4□	AH165-TC4□	
		12V DC		AH164-TC4□B	AH165-TC4□B	
		15V DC		AH164-TC4□C	AH165-TC4□C	
With decimal decoder (24V)  AF89-948	Positive	24V DC	Decoder type: 4511	AH164-TC4□E-K■	AH165-TC4□E-K■	Without connector 
	Negative			AH164-TC4□E-NK■	AH165-TC4□E-NK■	
With sign decoder (±1 display)  AF88-1093	Positive	24V DC	Decoder type: 4511	AH164-TC4□E-1K■	AH165-TC4□E-1K■	With connector 
	Negative			AH164-TC4□E-1NK■	AH165-TC4□E-1NK■	

• Luminous color

Replace the □ mark by the luminous color code

R: Red

G: Green

• Connector

Replace the ■ mark by the connector code

Blank: Without connector

1: With connector

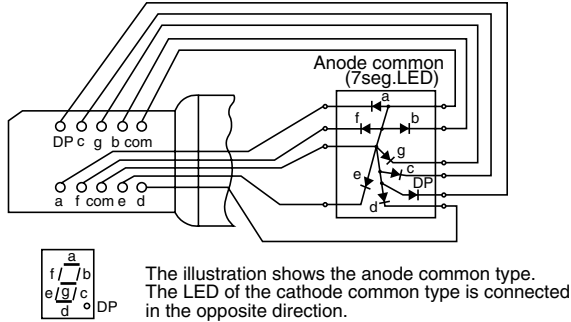
Numerical Indicators

AH164 and AH165

■ Without decoder, with decoder (5, 12 15V)

• Wiring diagrams

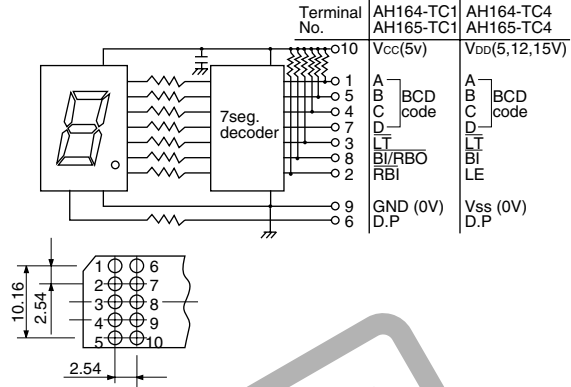
Without decoder/AH164-TS, AH165-TS



Note: As shown in the illustration, the structure of the TS type consists of a 7-segment LED provided with a casing only. Similar to a standard single 7-segment LED, use the TS type with a current limiting resistor connected.

With decoder (5, 12, 15V) /

AH164-TC1, AH165-TC1, AH164-TC4, AH165-TC4



• Truth value chart

AH164-TC1, AH165-TC1

BCD input (positive)				Input			Display
D	C	B	A	RBI	BI/RBO	LT	
L	L	L	L	H	H	H	0
L	L	L	L	L	H	H	1
L	L	L	H	L	H	H	2
L	L	L	H	L	H	H	3
L	L	H	L	L	H	H	4
L	L	H	L	L	H	H	5
L	L	H	H	L	H	H	6
L	L	H	H	L	H	H	7
L	H	L	L	L	H	H	8
L	H	L	L	L	H	H	9
L	H	L	H	L	H	H	0
L	H	L	H	L	H	H	1
L	H	H	L	L	H	H	2
L	H	H	L	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
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L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	7
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L	H	H	H	L	H	H	9
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L	H	H	H	L	H	H	2
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L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
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L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
L	H	H	H	L	H	H	1
L	H	H	H	L	H	H	2
L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H	H	H	L	H	H	8
L	H	H	H	L	H	H	9
L	H	H	H	L	H	H	0
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L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
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L	H	H	H	L	H	H	9
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L	H	H	H	L	H	H	3
L	H	H	H	L	H	H	4
L	H	H	H	L	H	H	5
L	H	H	H	L	H	H	6
L	H	H	H	L	H	H	7
L	H						

• Application to PLC

Used with	Input logic	Output from PLC	
		Transistor output (source) PNP	Transistor output (sink) NPN
AH164-TC1□, AH165-TC1□ AH164-TC1□B, AH165-TC4□B AH164-TC1□C, AH165-TC4□C	Positive (low active)	—	○

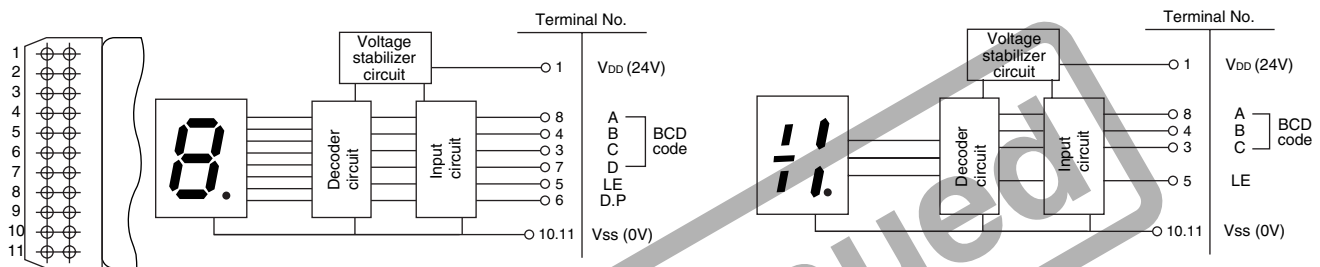
Note: ○ Available, — not available
 • As AH16□-TC1□, -TC4□B, and -TC4□C (5V, 12V, and 15V models) do not have an inverter circuit inside, use a programmable logic controller, inserting an inverter (reverse) instruction on your program. (Low Active)

■ With decoder (24V)

• Wiring diagrams

With decoder/AH164-TC4□E, AH165-TC4□E

With decoder/AH164-TC4□E-1, AH165-TC4□E-1



• Truth value chart

Decimal display

Positive					Negative					Display
D	C	B	A	LE	D	C	B	A	LE	
L	L	L	L	L	H	H	H	H	H	0
L	L	L	H	L	H	H	H	L	H	1
L	L	H	L	L	H	H	L	H	H	2
L	L	H	H	L	H	H	L	H	H	3
L	H	L	L	L	H	L	H	H	H	4
L	H	L	H	L	H	L	L	H	H	5
L	H	H	L	L	H	L	L	L	H	6
L	H	H	H	L	H	L	L	L	H	7
H	L	L	L	L	L	H	H	H	H	8
H	L	L	H	L	L	H	H	L	H	9
H	L	H	L	L	L	H	L	L	H	Extinguish
H	L	H	H	L	L	H	L	L	H	Extinguish
H	H	L	L	L	L	L	L	H	H	Extinguish
H	H	L	H	L	L	L	L	H	H	Extinguish
H	H	H	L	L	L	L	L	L	H	Extinguish
H	H	H	H	L	L	L	L	L	H	Extinguish
○	○	○	○	H	○	○	○	○	L	Latch

Note: ○ Operates independently from L and H signals.

• Terminal symbol

L.E (Latch Enable):

Holds the last entry when the positive logic type goes to (H) and the negative logic type goes to (L).

D.P (Decimal Point):

Displays a decimal point when the positive logic type goes to (H) and the negative logic goes to (L).

±1 display

Positive				Negative				Display
C	B	A	LE	C	B	A	LE	
L	L	L	L	H	H	H	H	#
L	L	H	L	H	H	L	H	Extinguish
L	H	L	L	H	L	H	H	#
L	H	H	L	H	L	L	H	-
H	L	L	L	L	H	H	H	!
H	L	H	L	L	H	L	H	-!
H	H	L	L	L	L	H	H	#
H	H	H	L	L	L	L	H	Extinguish
○	○	○	H	○	○	○	L	Latch

Note: ○ Operates independently from L and H signals.

• BCD input voltage

L	0 to 2V
H	12 to 30V

• Input current (L)

Positive logic	H	2mA max.
Negative logic	L	4mA max.

• Application to PLC

Used with	Input logic	Output from PLC	
		Transistor output (source) PNP	Transistor output (sink) NPN
AH164-TC4□E AH165-TC4□E	Positive	○	—
AH164-TC4□E-N AH165-TC4□E-N	Negative	—	○

Note: ○ Available, — not available

Pushbuttons/Selectors/Pilot Lights/Buzzers

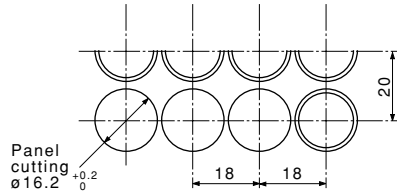
AH164 and AH165

Mounting space

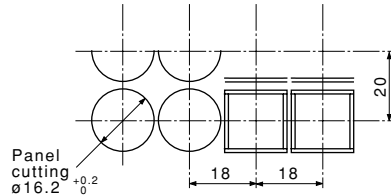
■ Mounting space, mm

- Pushbuttons and pilot lights

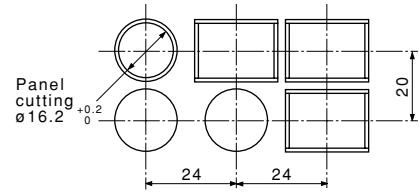
Extended round head or lens



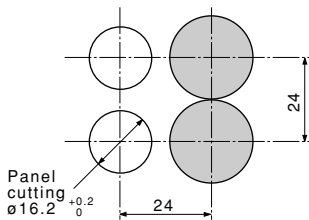
Flush square head or lens



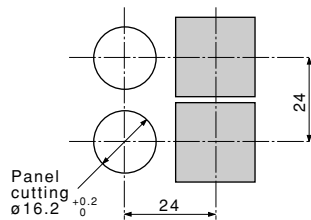
Flush rectangular head or lens



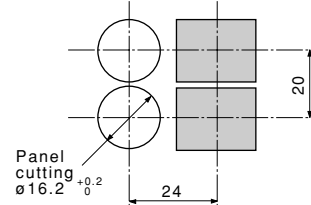
Mushroom head



Convex square head

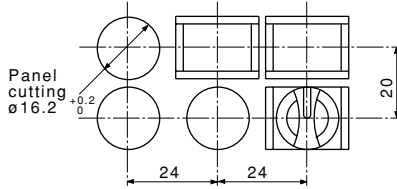


Convex rectangular head

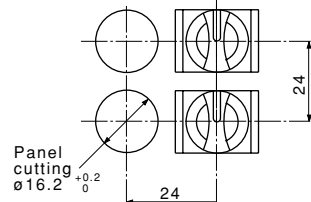


• Selector switches

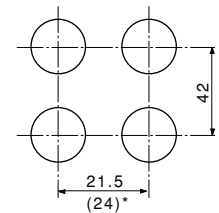
• When mounting the selector switches near the pilot light



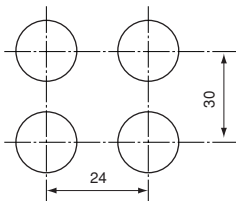
• When mounting the selector switches near each other



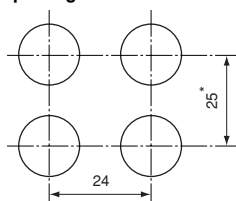
• With transformer



• When mounting the JM or RJM selector switches near each other (2NO+2NC only)



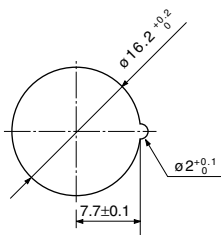
• When mounting the JM or RJM selector switches near the other selector switch, pushbutton switch and pilot lights



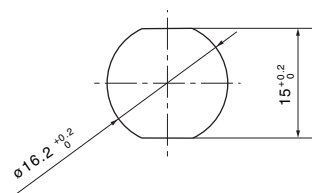
Note: * Mushroom, convex square, convex rectangular: 27

Note: * () For switch with flush rectangular head

• AH165-V, V1, V5, V6



• AH165-JM, RJM



■ Terminal number

• AH164, 165

Type	Wiring	Terminal position
Illuminated pushbuttons	<p>a (+) b (-)</p>	<p>Type number display side</p>
Pushbuttons Selector switches (except for JM, RJM types)		
Pilot lights (without transformer)	<p>a (+) b (-)</p>	<p>Type number display side</p>

■ **Type number nomenclature**

Pushbuttons, illuminated pushbuttons and pilot lights

AH165-2 FL R 11 E 3 - W
 ① ② ③ ④ ⑤ ⑥ ⑦

① **Product category**

AH165-2: Oil-tight (Large operator)

② **Operator or lens**

• Operator for illuminated pushbutton

- FL: Flush round head
- FL5: Flush round head (Alternate)
- SFL: Flush square head
- SFL5: Flush square head (Alternate)
- EL: Extended round head
- EL5: Extended round head (Alternate)
- SEL: Extended square head
- SEL5: Extended square head (Alternate)
- SCL: Concave square head
- SCL5: Concave square head (Alternate)
- ML: Mushroom head
- YML: Mushroom head with square bezel
- VL: Push-lock, turn-reset
- YVL: Push-lock, turn-reset with square bezel

• Operator for pushbuttons

- F: Flush round head
- F5: Flush round head (Alternate)
- SF: Flush square head
- SF5: Flush square head (Alternate)
- E: Extended round head
- E5: Extended round head (Alternate)
- SE: Extended square head
- SE5: Extended square head (Alternate)
- SCE: Concave square head
- SCE5: Concave square head (Alternate)
- M: Mushroom head
- YM: Mushroom head with square bezel
- V: Push-lock, turn-reset
- YV: Push-lock, turn-reset with square bezel
- S2: With selector ring
- YS2: With selector ring with square bezel

• Lens for pilot lights

- Z: Flush round
- SZ: Flush square
- ZE: Extended round
- SEZ: Extended square

③ **Color of button or lens**

Code	Color	Button	LED	Incandescent	Neon
G	Green	○	○	○	○
R	Red	○	○	○	○ (Orange)
B	Black*	○	—	—	—
Y	Yellow	○	○	○	○ (Orange)
W	White	○	○ (Orange)	○	○ (Orange)
S	Blue	○	○	○	○ (Green)
O	Orange	○	○ (Amber)	○	○

Notes: • () : indicates luminous color
 * Not available for illuminated types

④ **Contact arrangement (except pilot lights)**

- 11: 1NO+1NC
- 22: 2NO+2NC
- 33: 3NO+3NC

⑤ **Lamp voltage**

Code	LED	Incandescent	Neon
AA	5V DC	—	—
A	6V DC	5V AC/DC	—
B	12V DC	12V AC/DC	—
E	24V DC	24V AC/DC	—
H	—	—	110V AC
K	—	—	120V AC
M	—	—	220V AC
P	—	—	240V AC

⑥ **Type of lamp**

- Blank: Incandescent
- 1: Neon
- 3: Flat LED

⑦ **Terminal**

- Blank: Solder/tab
- W: Wire-wrap

Pushbuttons/Selectors/Pilot Lights

AH165-2

Type number nomenclature

■ Type number nomenclature

Selector switches

AH165-2 J 2 B 11 A - W

① ② ③ ④ ⑤ ⑥ ⑦

① Product category

AH165-2: Oil-tight (Large operator)

② Operator

• Knob and key type
2-position (operating angle 90°)
P: Knob
YP: Knob with square bezel
J: Key
YJ: Key with square bezel

3-position (operating angle 45°)

P: Knob
YP: Knob with square bezel
J: Key
YJ: Key with square bezel

• Lever type

2-position (operating angle 45°)
H: Lever
SH: Lever with square bezel
Note: The operation angle is 45° on the upper and lower side.

③ Operation

2: 2-position, maintained
0: 2-position, spring return*
3: 3-position, maintained
6: 3-position, spring/manual return (Left to center)
7: 3-position, spring/manual return (Right to center)
1: 3-position, spring return
Note: * Except for H and SH types

④ Color of knob, lever or key removable position

• Color of knob or lever
B: Black

• Key removable position

Code	2-position		3-position			
	2	0	1	3	6	7
A	⊙	⊙	—	⊙	—	⊙
B	⊗	—	—	⊗	—	—
C	—	—	—	⊗	—	—
D	⊙	—	—	⊙	—	—
E	—	—	①			
F	—	—	—	⊙	—	—
G	—	—	—	⊙	—	⊙

⑤ Contact arrangement

11: 1NO+1NC*
22: 2NO+2NC
33: 3NO+3NC
Note: * Except for 3-position

⑥ Key type No.

A (standard), B, C, D, E, F

⑦ Terminal

Blank: Solder/tab
W: Wire-wrap

Illuminated selector switches

AH165-2 PL 2 G 11 E 3

① ② ③ ④ ⑤ ⑥ ⑦

① Product category

AH165-2: Oil-tight (Large operator)

② Operator

• 2-position (operating angle 90°)
PL: Knob

• 3-position (operating angle 45°)
PL: Knob

③ Operation

2: 2-position, maintained
3: 3-position, maintained

④ Color of knob

Code	Color	LED	Incandescent	Neon
G	Green	○	○	○
R	Red	○	○	○ (Orange)
Y	Yellow	○	○	○ (Orange)
W	White	○ (Orange)	○	○ (Orange)
S	Blue	○	○	○ (Green)
O	Orange	○ (Amber)	○	○

Notes: • () : indicates luminous color

• The part other than the arrow of the knob is black.

⑤ Contact arrangement

11: 1NO+1NC*
22: 2NO+2NC
Note: * Except for 3-position

⑥ Lamp voltage

Code	LED	Incandescent	Neon
AA	5V DC	—	—
A	6V DC	5V AC/DC	—
B	12V DC	12V AC/DC	—
E	24V DC	24V AC/DC	—
H	—	—	110V AC
K	—	—	120V AC
M	—	—	220V AC
P	—	—	240V AC

⑦ Type of lamp

Blank: Incandescent

1: Neon

3: Flat LED

Note: Terminal with solder/tab only

■ **Standards approved**

UL508	File No. E44592
CSA C22.2 No.14	File No. LR20479 (except for AH165-2Z, 2ZE, 2SZ, 2SZE) File No. LR84365 (for AH165-2Z, 2ZE, 2SZ, 2SZE)
TÜV: EN60947-5-1	Pushbutton, illuminated pushbutton: R9250087 Selector (except for AH165-2H, SH), illuminated selector: R9250088 Selector (for AH165-2H, SH): R9250087 Pilot lights: R9250089

■ **Specifications (Indoor use)**

Item	AH165-2	
Rated insulation voltage	250V AC/DC	
Ambient temperature (no condensation or no icing)	-10 to +70°C *1	
Humidity	45 to 85%RH (at -5 to +40°C), no condensation or no icing	
Durability (operations)	Mechanical	Pushbutton and illuminated pushbutton switch Momentary action: 1 million Alternate action: 250,000 Push-lock, turn-reset: 100,000 With selector ring: 250,000
	Electrical	Selector and illuminated selector switch: 250,000*2 100,000 (220V AC 0.7A)
Dielectric strength	2000V AC, 1 minute (Between lamp and contact terminals: 1500V AC, 1 minute)	
Conditional short-circuit current	1000A	
Short-circuit protective device	Fuse 1A	
Pollution degree	3	
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm Constant: 16.7Hz, double amplitude 3mm	
Shock	Malfunction durability: 100m/s ² Mechanical durability: 500m/s ²	
Operating frequency	1200 operation/hour (on-load factor: 40%)	
Insulation resistance	100MΩ or more (500V DC megger)	
Operator protection	IP65	

Notes: *1 For illuminated pushbutton, illuminated selector switch and pilot light: -10 to +55°C

*2 Key insertion/removal durability for selector switch key types: 10,000

■ **Contact ratings**

See page 04/141

■ **Lamp ratings**

Rated operational voltage	Consumption		
	LED DC	Incandescent AC/DC	Neon AC
5V	14mA (Yellow: 28mA)	0.45W (6V)	—
6V	14mA (Yellow: 28mA)	—	—
12V	14mA	0.55W (14V)	—
24V	14mA	0.55W (28V)	—
110V	—	—	0.19VA
120V	—	—	0.21VA
220V	—	—	0.38VA
240V	—	—	0.42VA

Notes: For the incandescent lamps, the values in parentheses indicate the rated voltage of the lamps.


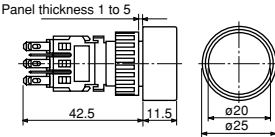

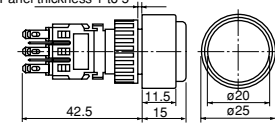

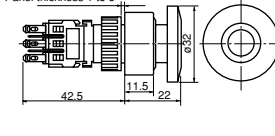

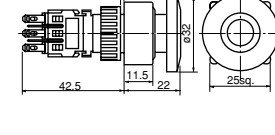
■ **Contact reliability**

FUJI has confirmed that the unit can be used in 1mA circuit conditions at 5V AC or DC. The operable range may vary depending on the ambient conditions and type of load.

Illuminated Pushbutton Switches


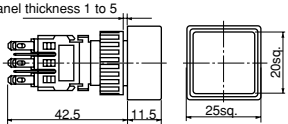

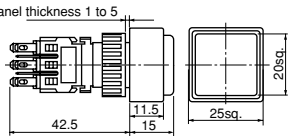

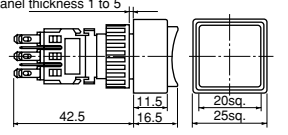
AH165-2

■ Illuminated pushbutton switches

Operator	Lamp	Voltage	Contact	Momentary action	Alternate action	Dimensions, mm		
				Type	Type			
 <p>AF87-211</p>	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2FL□11E3 AH165-2FL□22E3 AH165-2FL□33E3	AH165-2FL5□11E3 AH165-2FL5□22E3 AH165-2FL5□33E3			
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2FL□11E AH165-2FL□22E AH165-2FL□33E	AH165-2FL5□11E AH165-2FL5□22E AH165-2FL5□33E			
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2FL□11H1 AH165-2FL□22H1 AH165-2FL□33H1	AH165-2FL5□11H1 AH165-2FL5□22H1 AH165-2FL5□33H1			
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2FL□11M1 AH165-2FL□22M1 AH165-2FL□33M1	AH165-2FL5□11M1 AH165-2FL5□22M1 AH165-2FL5□33M1			
	 <p>AF87-210</p>	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2EL□11E3 AH165-2EL□22E3 AH165-2EL□33E3		AH165-2EL5□11E3 AH165-2EL5□22E3 AH165-2EL5□33E3	
		Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2EL□11E AH165-2EL□22E AH165-2EL□33E		AH165-2EL5□11E AH165-2EL5□22E AH165-2EL5□33E	
Neon		110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2EL□11H1 AH165-2EL□22H1 AH165-2EL□33H1	AH165-2EL5□11H1 AH165-2EL5□22H1 AH165-2EL5□33H1			
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2EL□11M1 AH165-2EL□22M1 AH165-2EL□33M1	AH165-2EL5□11M1 AH165-2EL5□22M1 AH165-2EL5□33M1			
 <p>AF87-221</p>		Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2ML□11E3 AH165-2ML□22E3 AH165-2ML□33E3	— — —		
		Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2ML□11E AH165-2ML□22E AH165-2ML□33E	— — —		
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2ML□11H1 AH165-2ML□22H1 AH165-2ML□33H1	— — —			
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2ML□11M1 AH165-2ML□22M1 AH165-2ML□33M1	— — —			
	 <p>AF87-220</p>	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YML□11E3 AH165-2YML□22E3 AH165-2YML□33E3	— — —		
		Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YML□11E AH165-2YML□22E AH165-2YML□33E	— — —		
Neon		110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YML□11H1 AH165-2YML□22H1 AH165-2YML□33H1	— — —			
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YML□11M1 AH165-2YML□22M1 AH165-2YML□33M1	— — —			

Note: Replace the □ mark by the following color code, see page 04/166.

■ Illuminated pushbutton switches

Operator	Lamp	Voltage	Contact	Momentary action	Alternate action	Dimensions, mm
				Type	Type	
 AF87-201	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SFL□11E3 AH165-2SFL□22E3 AH165-2SFL□33E3	AH165-2SFL5□11E3 AH165-2SFL5□22E3 AH165-2SFL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SFL□11E	AH165-2SFL5□11E	
				AH165-2SFL□22E	AH165-2SFL5□22E	
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SFL□11H1	AH165-2SFL5□11H1	
				AH165-2SFL□22H1	AH165-2SFL5□22H1	
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SFL□11M1	AH165-2SFL5□11M1	
AH165-2SFL□22M1				AH165-2SFL5□22M1		
 AF87-200	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SEL□11E3 AH165-2SEL□22E3 AH165-2SEL□33E3	AH165-2SEL5□11E3 AH165-2SEL5□22E3 AH165-2SEL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SEL□11E	AH165-2SEL5□11E	
				AH165-2SEL□22E	AH165-2SEL5□22E	
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SEL□11H1	AH165-2SEL5□11H1	
				AH165-2SEL□22H1	AH165-2SEL5□22H1	
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SEL□11M1	AH165-2SEL5□11M1	
AH165-2SEL□22M1				AH165-2SEL5□22M1		
 AF87-199	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SCL□11E3 AH165-2SCL□22E3 AH165-2SCL□33E3	AH165-2SCL5□11E3 AH165-2SCL5□22E3 AH165-2SCL5□33E3	
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SCL□11E	AH165-2SCL5□11E	
				AH165-2SCL□22E	AH165-2SCL5□22E	
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SCL□11H1	AH165-2SCL5□11H1	
				AH165-2SCL□22H1	AH165-2SCL5□22H1	
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SCL□11M1	AH165-2SCL5□11M1	
AH165-2SCL□22M1				AH165-2SCL5□22M1		


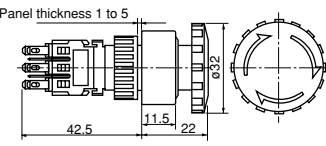

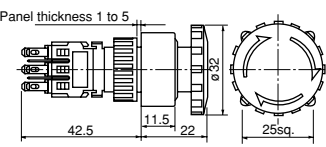
Note: Replace the □ mark by the following color code, see page 04/166.

04

Illuminated Pushbutton Switches

AH165-2

■ Illuminated pushbutton switches

Operator	Lamp	Voltage	Contact	Type	Dimensions, mm		
 <p>AF87-219</p>	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11E3 AH165-2VL□22E3 AH165-2VL□33E3			
	Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11E AH165-2VL□22E AH165-2VL□33E			
	Neon	110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11H1 AH165-2VL□22H1 AH165-2VL□33H1			
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2VL□11M1 AH165-2VL□22M1 AH165-2VL□33M1			
	 <p>AF87-218</p>	Flat LED	24V DC	1NO+1NC 2NO+2NC 3NO+3NC		AH165-2YVL□11E3 AH165-2YVL□22E3 AH165-2YVL□33E3	
		Incandescent	24V AC/DC	1NO+1NC 2NO+2NC 3NO+3NC		AH165-2YVL□11E AH165-2YVL□22E AH165-2YVL□33E	
Neon		110V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YVL□11H1 AH165-2YVL□22H1 AH165-2YVL□33H1			
		220V AC	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YVL□11M1 AH165-2YVL□22M1 AH165-2YVL□33M1			

• Button color

Replace the □ mark by the following button color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Y	S	O

- With wire-wrap pin terminals have a depth of 47mm.


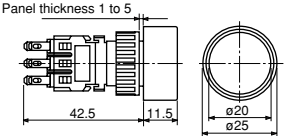

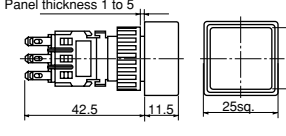

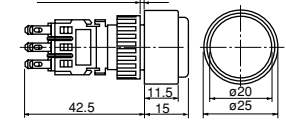

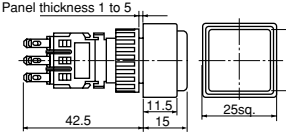

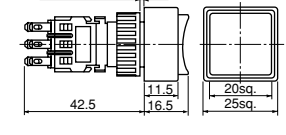

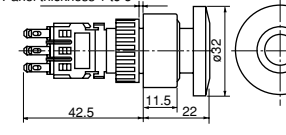

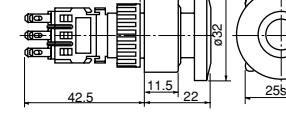
- A white illuminated pushbutton is fitted with a transparent color lens.
- The color lens is made of a tinted transparent material.

• Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA	5V DC	—	—
A	6V DC	5V AC/DC	—
B	12V DC	12V AC/DC	—
K	—	—	120V AC
P	—	—	240V AC

■ Pushbutton switches

Operator	Contact	Momentary action	Alternate action	Dimensions, mm
		Type	Type	
Flush round head  AF87-211	1NO+1NC	AH165-2F□11	AH165-2F5□11	Panel thickness 1 to 5 
	2NO+2NC	AH165-2F□22	AH165-2F5□22	
	3NO+3NC	AH165-2F□33	AH165-2F5□33	
Flush square head  AF87-201	1NO+1NC	AH165-2SF□11	AH165-2SF5□11	Panel thickness 1 to 5 
	2NO+2NC	AH165-2SF□22	AH165-2SF5□22	
	3NO+3NC	AH165-2SF□33	AH165-2SF5□33	
Extended round head  AF87-210	1NO+1NC	AH165-2E□11	AH165-2E5□11	Panel thickness 1 to 5 
	2NO+2NC	AH165-2E□22	AH165-2E5□22	
	3NO+3NC	AH165-2E□33	AH165-2E5□33	
Extended square head  AF87-200	1NO+1NC	AH165-2SE□11	AH165-2SE5□11	Panel thickness 1 to 5 
	2NO+2NC	AH165-2SE□22	AH165-2SE5□22	
	3NO+3NC	AH165-2SE□33	AH165-2SE5□33	
Concave square head  AF87-199	1NO+1NC	AH165-2SCE□11	AH165-2SCE5□11	Panel thickness 1 to 5 
	2NO+2NC	AH165-2SCE□22	AH165-2SCE5□22	
	3NO+3NC	AH165-2SCE□33	AH165-2SCE5□33	
Mushroom head  AF87-215	1NO+1NC	AH165-2M□11	—	Panel thickness 1 to 5 
	2NO+2NC	AH165-2M□22	—	
	3NO+3NC	AH165-2M□33	—	
Mushroom head with square bezel  AF87-214	1NO+1NC	AH165-2YM□11	—	Panel thickness 1 to 5 
	2NO+2NC	AH165-2YM□22	—	
	3NO+3NC	AH165-2YM□33	—	


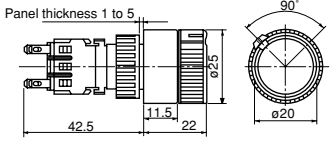

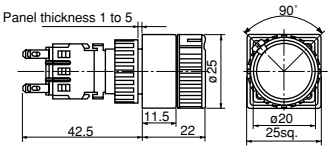

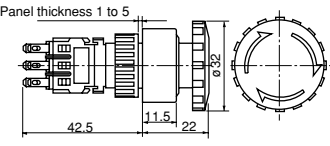

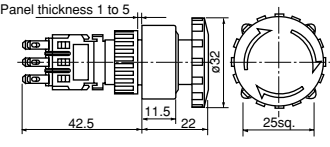
Note: Replace the □ mark by the following color code, see page 04/168.

04

Pushbutton Switches

AH165-2

■ Pushbutton switches

Operator	Contact	Type	Dimensions, mm
 <p>AF87-207</p>	2NO+2NC	AH165-2S2□22	
 <p>AF87-206</p>	2NO+2NC	AH165-2YS2□22	
 <p>AF87-210</p>	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2V□11 AH165-2V□22 AH165-2V□33	
 <p>AF87-200</p>	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YV□11 AH165-2YV□22 AH165-2YV□33	



• Button color

Replace the □ mark by the following button color code

Color	Green	Red	Black	White	Blue	Yellow	Orange
Code	G	R	B	W	S	Y	O

• Contact arrangement and operator position

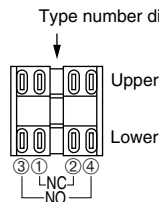
AH165-2S, 2YS

Button	Ring	Left	Right
			
Free		U L 1○ ——— 02 1○ ——— 02 3○ 04 3○ 04	U L 1○ ——— 02 1○ ——— 02 3○ 04 3○ 04
Depressed		1○ ——— 02 1○ ——— 02 3○ 04 3○ 04	1○ ——— 02 1○ ——— 02 3○ 04 3○ 04


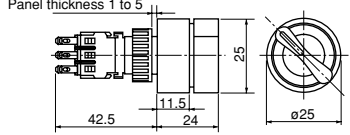

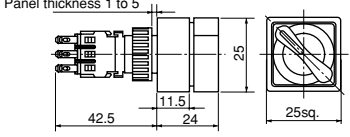

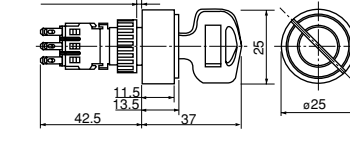

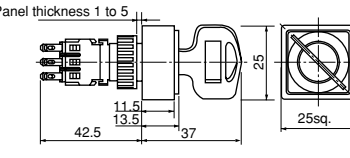
U: Upper contact block
L: Lower contact block

- The color lens is made of a tinted transparent material. (Except for M, YM, V, YV, types)
- A white pushbutton is fitted with a transparent color lens. A black pushbutton consists of a transparent color lens and an attached black legend plate. (Except for M, YM, V, YV, types)
- With wire-wrap pin terminals have a depth of 47mm.

• Terminal number and contact block position



■ Selector switches/2-position (90-degree)

Operator	Operation	Key removable position	Contact	Type	Dimensions, mm
 AF02-111	Maintained	—	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2P2B11 AH165-2P2B22 AH165-2P2B33	
	Spring return	—	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2P0B11 AH165-2P0B22 AH165-2P0B33	
 AF02-112	Maintained	—	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YP2B11 AH165-2YP2B22 AH165-2YP2B33	
	Spring return	—	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YP0B11 AH165-2YP0B22 AH165-2YP0B33	
 AF02-113	Maintained	⊖ A	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2J2A11A AH165-2J2A22A AH165-2J2A33A	
		⊗ B	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2J2B11A AH165-2J2B22A AH165-2J2B33A	
		⊘ D	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2J2D11A AH165-2J2D22A AH165-2J2D33A	
	Spring return	⊖ A	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2J0A11A AH165-2J0A22A AH165-2J0A33A	
		⊗ B	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ2B11A AH165-2YJ2B22A AH165-2YJ2B33A	
		⊘ D	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ2D11A AH165-2YJ2D22A AH165-2YJ2D33A	
 AF02-114	Maintained	⊖ A	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ2A11A AH165-2YJ2A22A AH165-2YJ2A33A	
		⊗ B	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ2B11A AH165-2YJ2B22A AH165-2YJ2B33A	
		⊘ D	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ2D11A AH165-2YJ2D22A AH165-2YJ2D33A	
	Spring return	⊖ A	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ0A11A AH165-2YJ0A22A AH165-2YJ0A33A	
		⊗ B	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ0B11A AH165-2YJ0B22A AH165-2YJ0B33A	
		⊘ D	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2YJ0D11A AH165-2YJ0D22A AH165-2YJ0D33A	

04

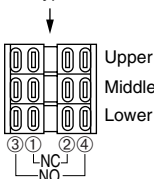
• The key can be removed only at the following positions:

A: ⊖ B: ⊗ D: ⊘

- For spring-return selector switches, the key can be removed at position A.
- There are 6 available key types; A, B, C, D, E and F. Standard key code is A.
- With wire-wrap pin terminals have a depth of 47mm.

• Terminal number and contact block position

Type number display side



Contact arrangement (terminal No.: common)
 1NO+1NC: Middle
 2NO+2NC: Upper, lower
 3NO+3NC: Upper, middle, lower

• Contact arrangement and operator positions:


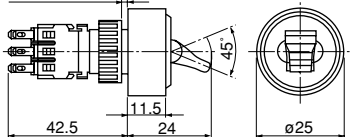

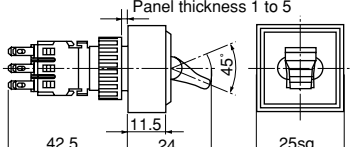
2-position

Contact arrangement	1NO+1NC	2NO+2NC	3NO+3NC	
Operator position	Left	1O — M — 02 3O — — 04	1O — U — 02 3O — — 04 1O — — 02 3O — L — 04	1O — — 02 3O — — 04 1O — — 02 3O — — 04 1O — — 02 3O — — 04
	Right	1O — M — 02 3O — — 04	1O — U — 02 3O — — 04 1O — — 02 3O — L — 04	1O — — 02 3O — — 04 1O — — 02 3O — — 04 1O — — 02 3O — — 04

U: Upper contact block
 M: Middle contact block
 L: Lower contact block



Selector Switches AH165-2

■ Selector switches/2-position

Operator	Lever color	Operation	Contact	Type	Dimensions, mm
 AF87-209	Black	Maintained	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2H2B11 AH165-2H2B22 AH165-2H2B33	Panel thickness 1 to 5 
 AF87-203	Black	Maintained	1NO+1NC 2NO+2NC 3NO+3NC	AH165-2SH2B11 AH165-2SH2B22 AH165-2SH2B33	Panel thickness 1 to 5 

• Contact arrangement and operator position

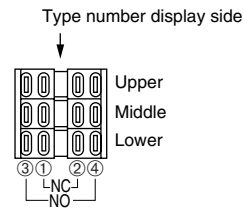
AH165-2H, 2SH

Contact block	Lever Up	Down
	 M 1O 02 3O 04	 M 1O 02 3O 04
2NO+2NC U L 1O 02 1O 02 3O 04 3O 04	U L 1O 02 1O 02 3O 04 3O 04	
3NO+3NC U M L 1O 02 1O 02 1O 02 3O 04 3O 04 3O 04	U M L 1O 02 1O 02 1O 02 3O 04 3O 04 3O 04	

U: Upper contact block
M: Middle contact block
L: Lower contact block


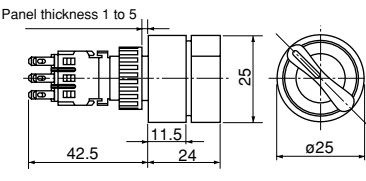

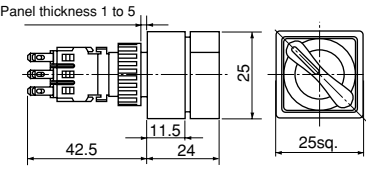

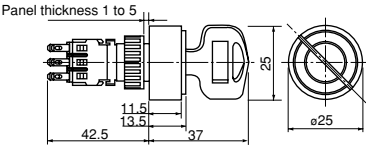

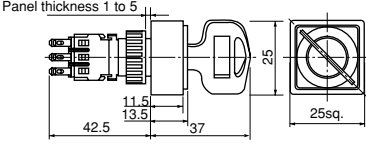
• With wire-wrap pin terminals have a depth of 47mm.

• Terminal number and contact block position



Contact arrangement (terminal No.: common)
 1NO+1NC: Middle
 2NO+2NC: Upper, lower
 3NO+3NC: Upper, middle, lower

■ Selector switches/3-position (45-degree)

Operator	Operation	Key removable position	Contact	Type	Dimensions, mm		
 <p>AF87-208</p>	Maintained	—	2NO+2NC 3NO+3NC	AH165-2P3B22 AH165-2P3B33			
	Spring/ manual return	①	2NO+2NC 3NO+3NC	AH165-2P6B22 AH165-2P6B33			
	Spring/ manual return	①	2NO+2NC 3NO+3NC	AH165-2P7B22 AH165-2P7B33			
	Spring return	①	2NO+2NC 3NO+3NC	AH165-2P1B22 AH165-2P1B33			
 <p>AF87-202</p>	Maintained	—	2NO+2NC 3NO+3NC	AH165-2YP3B22 AH165-2YP3B33			
	Spring/ manual return	①	2NO+2NC 3NO+3NC	AH165-2YP6B22 AH165-2YP6B33			
	Spring/ manual return	①	2NO+2NC 3NO+3NC	AH165-2YP7B22 AH165-2YP7B33			
	Spring return	①	2NO+2NC 3NO+3NC	AH165-2YP1B22 AH165-2YP1B33			
 <p>AF87-223</p>	Maintained	⊖ A	2NO+2NC 3NO+3NC	AH165-2J3A22A AH165-2J3A33A			
		⊕ E	2NO+2NC 3NO+3NC	AH165-2J3E22A AH165-2J3E33A			
		⊘ D	2NO+2NC 3NO+3NC	AH165-2J3D22A AH165-2J3D33A			
		⊗ C	2NO+2NC 3NO+3NC	AH165-2J3C22A AH165-2J3C33A			
	Spring/ manual return	⊕ E	2NO+2NC 3NO+3NC	AH165-2J6E22A AH165-2J6E33A			
		⊘ D	2NO+2NC 3NO+3NC	AH165-2J6D22A AH165-2J6D33A			
	Spring/ manual return	⊖ A	2NO+2NC 3NO+3NC	AH165-2J7A22A AH165-2J7A33A			
		⊕ E	2NO+2NC 3NO+3NC	AH165-2J7E22A AH165-2J7E33A			
	Spring return	⊕ E	2NO+2NC 3NO+3NC	AH165-2J1E22A AH165-2J1E33A			
		⊕ E	2NO+2NC 3NO+3NC	AH165-2YJ3A22A AH165-2YJ3A33A			
	 <p>AF87-222</p>	Maintained	⊖ A	2NO+2NC 3NO+3NC		AH165-2YJ3A22A AH165-2YJ3A33A	
			⊕ E	2NO+2NC 3NO+3NC		AH165-2YJ3E22A AH165-2YJ3E33A	
⊘ D			2NO+2NC 3NO+3NC	AH165-2YJ3D22A AH165-2YJ3D33A			
⊗ C			2NO+2NC 3NO+3NC	AH165-2YJ3C22A AH165-2YJ3C33A			
Spring/ manual return		⊕ E	2NO+2NC 3NO+3NC	AH165-2YJ6E22A AH165-2YJ6E33A			
		⊘ D	2NO+2NC 3NO+3NC	AH165-2YJ6D22A AH165-2YJ6D33A			
Spring/ manual return		⊖ A	2NO+2NC 3NO+3NC	AH165-2YJ7A22A AH165-2YJ7A33A			
		⊕ E	2NO+2NC 3NO+3NC	AH165-2YJ7E22A AH165-2YJ7E33A			
Spring return		⊕ E	2NO+2NC 3NO+3NC	AH165-2YJ1E22A AH165-2YJ1E33A			
		⊕ E	2NO+2NC 3NO+3NC	AH165-2YJ1E22A AH165-2YJ1E33A			

- The Key can be removed at the following positions:
A: ⊖ B: ⊗ C: ⊗ D: ⊘ E: ⊕ F: ⊕ G: ⊕

For spring-return selector switches, the key can be removed only at position E. For manual/spring-return selector switches, the key can be removed at positions D, E and F for type J6, and position A, E and G for type J7.

- There are 6 available key types; A, B, C, D, E and F. Standard key code is A.
- With wire-wrap pin terminals have a depth of 47mm.

• Contact arrangement and operator positions:


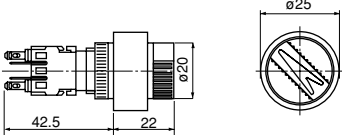
Contact arrangement		2NO+2NC	3NO+3NC
Operator position	Left ⊖	1 0 _U 0 ₂ 1 0 _L 0 ₂ 3 0 0 ₄ 3 0 ₄	1 0 _U 0 ₂ 1 0 _M 0 ₂ 1 0 _L 0 ₂ 3 0 0 ₄ 3 0 ₄ 3 0 ₄ 3 0 ₄
	Center ⊕	1 0 _U 0 ₂ 1 0 _U 0 ₂ 3 0 0 ₄ 3 0 0 ₄	1 0 _U 0 ₂ 1 0 _U 0 ₂ 1 0 _U 0 ₂ 3 0 0 ₄ 3 0 0 ₄ 3 0 0 ₄
	Right ⊘	1 0 0 ₂ 1 0 _U 0 ₂ 3 0 ₄ 3 0 0 ₄	1 0 0 ₂ 1 0 0 ₂ 1 0 _U 0 ₂ 3 0 ₄ 3 0 ₄ 3 0 ₄ 3 0 ₄

U: Upper contact block M: Middle contact block L: Lower contact block
• Contact block positions: See page 04/170

Selector Switches

AH165-2

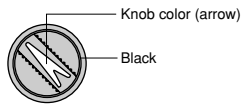
■ Illuminated selector switches

Operator	Operation	Lamp voltage	No. of positions	Contact	Type	Dimensions, mm
 <p>AF90-607</p>	Maintained	Flat LED 24V DC	2	1NO+1NC 2NO+2NC	AH165-2PL2□11E3 AH165-2PL2□22E3	
			3	2NO+2NC	AH165-2PL3□22E3	
			2	1NO+1NC 2NO+2NC	AH165-2PL2□11E AH165-2PL2□22E	
		Incandescent 24V AC/DC	3	2NO+2NC	AH165-2PL3□22E	
			2	1NO+1NC 2NO+2NC	AH165-2PL2□11H1 AH165-2PL2□22H1	
					AH165-2PL3□22H1	
		Neon 110V AC	2	1NO+2NC 2NO+2NC	AH165-2PL2□11M1 AH165-2PL2□22M1	
			3	2NO+2NC	AH165-2PL3□22M1	
			Neon 220V AC	2	1NO+2NC 2NO+2NC	
		3		2NO+2NC	AH165-2PL3□22M1	

• Knob color (arrow)

Replace the □ mark by the following color code

Color	Green	Red	White	Blue	Yellow	Orange
Code	G	R	W	S	Y	O



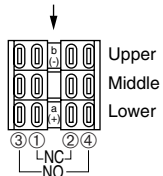
• Lamp voltage

Voltages other than above are available

Code	LED	Incandescent	Neon
AA	5V DC	—	—
A	6V DC	5V AC/DC	—
B	12V DC	12V AC/DC	—
K	—	—	120V AC
P	—	—	240V AC

• Terminal number and contact block position

Type number display side



Contact arrangement (terminal No.: common)

1NO+1NC: Middle
2NO+2NC: Upper, lower

• Contact arrangement and operator positions:

2-position


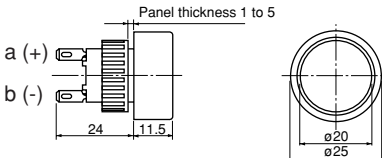

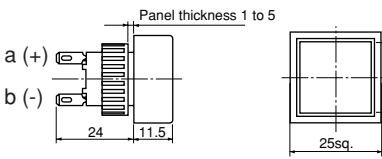

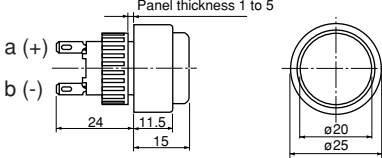

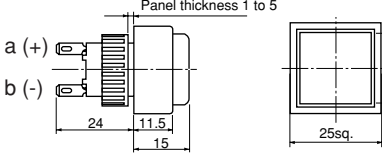
Contact arrangement	1NO+1NC	2NO+2NC	
Operator position	Left (⊖)	M $\begin{matrix} 1 \text{---} \text{---} 2 \\ 3 \text{---} \text{---} \text{---} 4 \end{matrix}$	U $\begin{matrix} 1 \text{---} \text{---} 2 \\ 3 \text{---} \text{---} \text{---} 4 \end{matrix}$ L $\begin{matrix} 1 \text{---} \text{---} 2 \\ 3 \text{---} \text{---} \text{---} 4 \end{matrix}$
	Right (⊕)	M $\begin{matrix} 1 \text{---} \text{---} \text{---} 2 \\ 3 \text{---} \text{---} 4 \end{matrix}$	U $\begin{matrix} 1 \text{---} \text{---} \text{---} 2 \\ 3 \text{---} \text{---} 4 \end{matrix}$ L $\begin{matrix} 1 \text{---} \text{---} \text{---} 2 \\ 3 \text{---} \text{---} 4 \end{matrix}$

3-position

Contact arrangement	2NO+2NC	
Operator position	Left (⊖)	U $\begin{matrix} 1 \text{---} \text{---} 2 \\ 3 \text{---} \text{---} \text{---} 4 \end{matrix}$ L $\begin{matrix} 1 \text{---} \text{---} \text{---} 2 \\ 3 \text{---} \text{---} 4 \end{matrix}$
	Center (⊙)	U $\begin{matrix} 1 \text{---} \text{---} 2 \\ 3 \text{---} \text{---} \text{---} 4 \end{matrix}$ L $\begin{matrix} 1 \text{---} \text{---} 2 \\ 3 \text{---} \text{---} \text{---} 4 \end{matrix}$
Right (⊕)	U $\begin{matrix} 1 \text{---} \text{---} \text{---} 2 \\ 3 \text{---} \text{---} 4 \end{matrix}$ L $\begin{matrix} 1 \text{---} \text{---} \text{---} 2 \\ 3 \text{---} \text{---} 4 \end{matrix}$	

U: Upper contact block
M: Middle contact block
L: Lower contact block

■ Pilot lights

Lens	Lamp	Voltage	Type	Dimensions, mm
 AF87-213	Flat LED	24V DC	AH165-2Z□E3	
	Incandescent	24V AC/DC	AH165-2Z□E	
	Neon	110V AC	AH165-2Z□H1	
		220V AC	AH165-2Z□M1	
 AF87-205	Flat LED	24V DC	AH165-2SZ□E3	
	Incandescent	24V AC/DC	AH165-2SZ□E	
	Neon	110V AC	AH165-2SZ□H1	
		220V AC	AH165-2SZ□M1	
 AF87-212	Flat LED	24V DC	AH165-2ZE□E3	
	Incandescent	24V AC/DC	AH165-2ZE□E	
	Neon	110V AC	AH165-2ZE□H1	
		220V AC	AH165-2ZE□M1	
 AF87-204	Flat LED	24V DC	AH165-2SZE□E3	
	Incandescent	24V AC/DC	AH165-2SZE□E	
	Neon	110V AC	AH165-2SZE□H1	
		220V AC	AH165-2SZE□M1	

04

• Lens color

Replace the □ mark by the following lens color code

Color	Green	Red	White	Yellow	Blue	Orange
Code	G	R	W	Y	S	O

• Lamp voltage

Voltage other than above is available

Code	LED	Incandescent	Neon
AA	5V DC	—	—
A	6V DC	5V AC/DC	—
B	12V DC	12V AC/DC	—
K	—	—	120V AC
P	—	—	240V AC

- The color lens is made of a tinted transparent material.
- A white lens is fitted with a transparent color lens.
- With wire-wrap pin terminals have a depth of 29mm.

Pushbuttons/Selectors/Pilot Lights

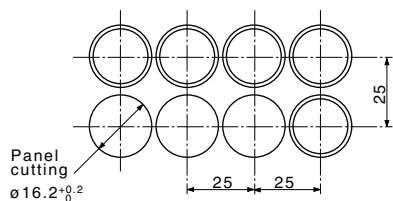
AH165-2

Mounting space

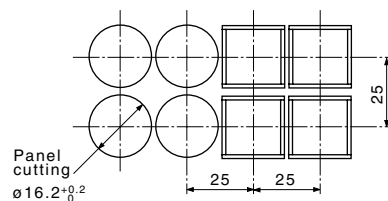
■ Mounting space, mm

- Illuminated pushbuttons, pushbuttons, selector switches, illuminated selector switches and pilot lights

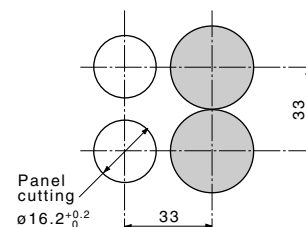
Round head



Square head



Mushroom head Push-lock, turn-reset



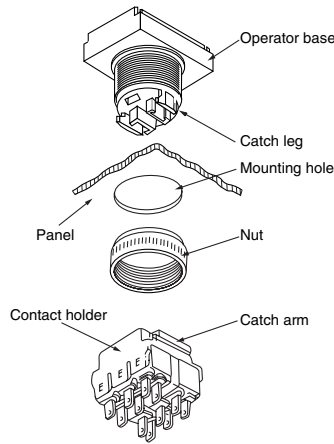
■ Terminal number

Type	Wiring	Terminal position
Illuminated pushbuttons, Illuminated selector switches		
Pushbuttons Selector switches		
Pilot lights (without transformer)		

Notes on use

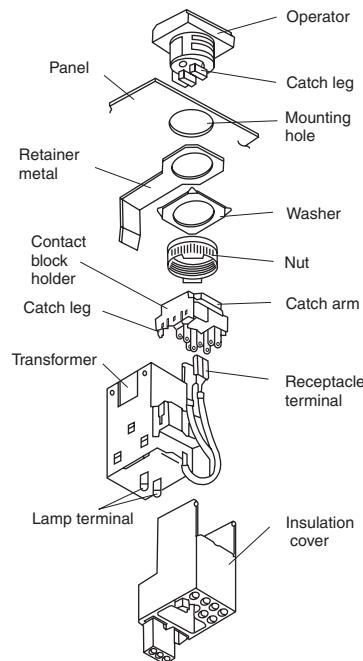
■ Installation on panel

- For installation, use dedicated wrench AHX601. The appropriate tightening torque is 0.6 to 1N·cm.
- The installation sequence is as follows:
 Pass the operator base through the hole in the panel and secure it by tightening the bezel. Properly position the catch arms of the contact holder and the catch legs of the operator base and push the contact holder onto the operator base. To remove the contact holder, pull it while pressing the catch arms inward.



■ Mounting steps of switch with transformer

- ① Pass the switch operator through the panel hole and secure with a nut by way of the retainer metal from the front of the panel.
- ② Align the position of the catch arm of the contact block holder with that of the catch leg of the switch operator. Engage these two catches by pushing them together.
- ③ Insert and secure the transformer unit while assembling the contact block holder with the retainer metal.
- ④ Connect the receptacle terminal with lead wires extending from the transformer to the lamp terminal of the contact block holder. (Be care on the polarity of the LED. Red: +, Black: -)
- ⑤ Push in and secure the standard accessory



insulation cover by aligning its position with each terminal. To replace the transformer, remove the transformer by widening the catch leg of the contact block holder. Pay attention not to excessively widen the catch leg. Mounting steps are the same as the above steps ③, ④, and ⑤.

■ Installing the protection cover / dust-tight cover, guard-ring

Be careful that the panel thickness does not exceed the following:
 Panel thickness
 Protection cover: 2.6mm max.
 Dust-tight cover: 2.0mm max.
 Guard ring: 2.5mm max.

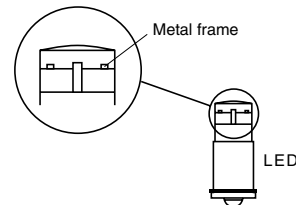
■ Operating voltage and rated voltage of incandescent lamps

Rated voltage	Operating voltage
6V	4 to 5V
14V	10 to 12V
28V (Standard)	20 to 24V

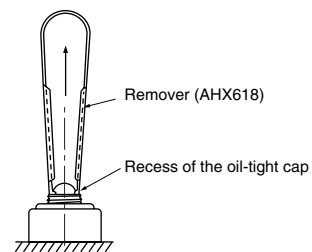
Incandescent lamps should be operated at the operating voltages if a lamp service life of 5,000 to 10,000 hours are needed. The ambient temperature must not exceed 30°C if the lamp is used at the rated voltage continuously.

■ Method of replacing lamp

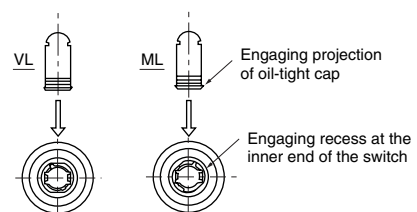
- Incandescent lamps/LED lamps/neon lamps
 Remove the color lens and inner button with a remover AHX618. Then draw out the lamp with a lamp changer AHX672. When installing lamps, do it manually and in the reverse order of removing.
- Products with blue and green LEDs
 The LED devices on products with high-brightness (blue and green) LEDs are very sensitive to static electricity. When replacing LED lamps do not allow static electricity to come into direct contact with the metal frame on the upper side of the LED lamp. The LED device may be damaged if this part is subjected to static electricity. When installing or removing an LED lamp, it is recommended that you use the lamp changer (AHX672).



- To replace the lamp of a AH165-2 illuminated pushbutton switch (ML, VL), remove the button and draw out the oil-tight cap.



- Then, replace the lamp using a lamp changer (AHX672) and push the oil-tight cap into its original position with its engaging projection properly adjusted (see the figure below).



Note: Lamp of AH165-ZM type can not be replaced.

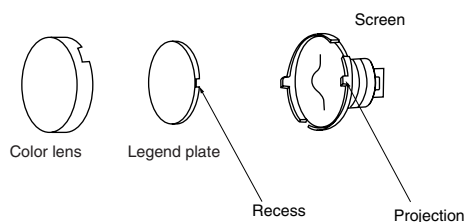
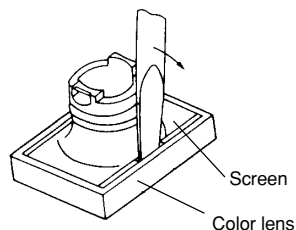
Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164, AH165 and AH165-2

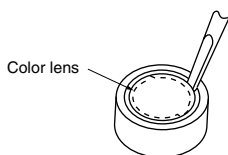
Notes on use

■ Method of replacing color lens

- To remove the color lens, insert a small screwdriver into the color lens and twist in direction of the arrow.



- For an AH165-2, use a small standard screwdriver or a similar tool with a flat end. If one side of the color lens is removed from the screen, insert the screwdriver or a similar tool deeper and remove the color lens together with the screen.



■ Replacing pushbuttons

In the case of alternative action type pushbutton switches and illuminated pushbutton switches, be sure not to replace the pushbuttons in their locked state. This could result in internal damage to the mechanism.

■ Description sheet

The Fuji description sheet is 25 μ m thick. If preparing custom description sheets, make sure that the thickness is 0.1mm or less.

■ Contact block

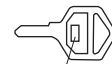
To replace a contact block, use removing tool AGX012. If excessive force is applied when attempting to open the support legs for the contact block holder, deformation or damage may occur.

■ Handling precautions

- Do not apply torque in excess of 1.0 N•m to operate the selectors switch (Type "P"). Required operating force of switches is less than 0.1 N•m.
- Do not tap on a pushbutton to turn it ON or OFF, such handling may damage it. Be sure to operate the pushbutton by hand.

■ Key type selector switch

- Five key types (Type B to Type F) are available besides Type A, which is the standard key type.



Symbol on the key



Symbol on the main unit

Be sure to use a key with a symbol which is matched with the symbol on the main unit.

- Fully insert the key into the main unit before turning the key.
- The key turning force should not exceed 0.1 N•m.
- Do not pull out or insert the key forcibly.

■ Wiring connections

- Use a soldering iron with a wattage of not more than 30W and a tip length of more than 20mm.

Use a rosin-core solder

With a 30W iron complete soldering within 5 seconds, or 10 seconds with a 20W iron. Do not apply external force to the terminals. Do not deform the terminals.

Because lead-free solder's melting point is slightly high, soldering work may be difficult. Use a soldering iron whose tip is rather large or whose calorie is rather high.

- Wires that can be connected
 - Two solid wires with a maximum diameter of 0.8mm (solder)
 - One stranded wire with a maximum area of 0.75mm² (solder)
- Flat connection terminal
 - (2.8□-1.25-5) 0.5 to 1.25mm²
 - (2.8□-0.5-5) 0.2 to 0.5mm²
- Using contact blocks
 - When using NO and NC contacts in the same contact block, avoid connection that involves opposite polarity or wiring from different types of power supply.
- For wiring to adjacent terminals, use insulated tubing to prevent short-circuit and to assure isolation. For solder terminals, be careful when connecting thick wires. Do not use too much solder.
- Wiring to wire-wrap pin terminals
 - Select the appropriate wire sizes and tools from the table below.

Wire size	Bit	Sleeve	Number of effective wraps
0.4mm dia.	3-A	1-B	About 8
0.5mm dia.	1-A	1-B	About 6
(0.65mm dia.)	(2-A)	(2-B)	(About 6)

Use ordinary wrapping for connection.

Wires of 0.65mm dia. must not be used on adjacent terminals. However, 0.65mm dia. wire can be mixed with 0.4 and 0.5mm dia. wires.

- Wiring to tab terminals
 - Use receptacles, No. 110.

■ Installing lamps in close order

When continuously lighting pilot lights or pressing illuminated pushbuttons installed in close order, care must be taken that the ambient temperature does not exceed the rated value.

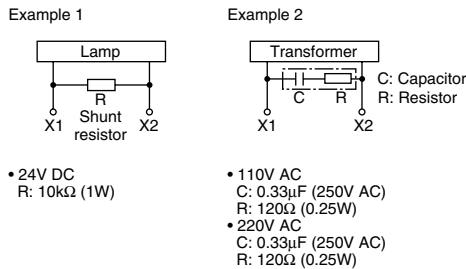
■ **LEDs**

• **LED Lamp Malfunctioning**

The LED lamp is lit by a very small level of current (approximately 0.01mA). Therefore, it may be erroneously lit by a current leaking from the surge absorption circuit or semiconductor circuit or due to stray capacitance between cables. In that case, provide a countermeasure (e.g., connect a resistor in parallel with the LED lamp).

• **Countermeasure for Malfunctioning**

Shunt Resistor R or CR elements connected in parallel Lamp malfunctions can be prevented by connecting a shunt resistor (R) or CR elements (a capacitor and resistor) in parallel with the LED lamp terminal. The resistance and CR values vary depending on the model and the operating conditions.



• **Incoming surge**

Be careful that since high luminance LED products use an element sensitive to static electricity, they may not be lit by an abnormal voltage like surge.

■ **Using a flat LED in 48V DC circuit**

When a flat LED lamps having a rated voltage of 24V DC is used with 48V DC circuit, connect an external resistor of 1,800Ω (2W).

■ **Preventing the neon lamp from incorrectly turning ON**

The neon lamp may incorrectly turn ON due to current leakage or voltage induction. In such a case, connect a shunt resistor in parallel with the lamp.

Example) 110V AC: 100k (0.25W)
 220V AC: 50k (2W)

If an external surge of 3kV or more may occur, connect a surge absorption element in parallel with the lamp.

■ **Numerical indicators**

To ensure high reliability and long life for the LED, design the circuit not to exceed the maximum ratings under any operating conditions.

- Keep in mind that the display may malfunction or be damaged due to noise in input signals. (TC type)
- Wire the TC type as shown on the nameplate. The IC may break if the supply voltage is connected in reverse.
- Keep in mind that the correct display will not appear with negative logic input because the TC type accepts positive logic input.

■ **Operation**

Do not use a hitting or bouncing action to operate the button, or the switch may break. Always operate the switch by hand.

■ **Storage and operation site**

- Use the unit within the rated operating ambient temperature and humidity ranges.
- Do not use the enclosed type in places where oil or water is sprayed or where dust accumulates. In places such as these, use the oil-tight type or provide a dust cover.
- The oil-tight type is evaluated with standard cutting oil and cooling oil applied. The oil-tight type cannot be used with some special oils.

■ **Buzzer**

• **Noise**

If the application circuit is likely to generate excessively strong noise, connect a surge absorber (e.g., FUJI'S ENC390D, provided that the switch is a 24V type) in parallel with the buzzer.

• **Place of Use**

The buzzer does not have a drip-proof construction. Do not use the buzzer in places where oil or water is sprayed or where dust accumulates. If the buzzer is a splash-proof type, it will resist sprays of water.







- Do not use the buzzer in places that are subject to an excessive amount of corrosive gas.
- Be careful that the buzzer is likely to sound erroneously due to leakage current or the like.




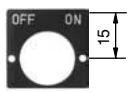
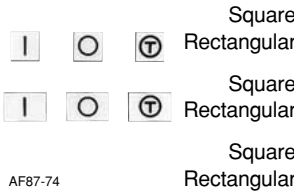
Pushbuttons/Selectors/Pilot Lights/Buzzers


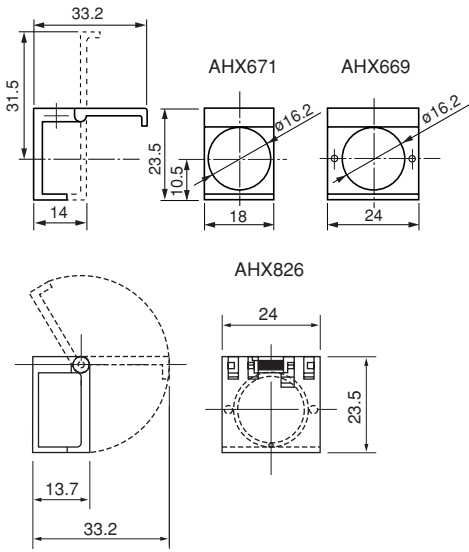



AH164 and AH165

Accessories

■ Accessories for AH164 and AH165

Description	Type	
Color chips (Round)	Color	Type
 <p>L, L5, E E5, Z</p>	Green	AHX631-G
	Red	AHX631-R
	White (For Neon)	AHX631-W
	Blue	AHX631-S
	Yellow	AHX631-Y
	Orange	AHX631-O
	Clear	AHX631-C
SF-682	For LED, Neon	Green AHX653-G
Color chips (Square)	Color	Type
 <p>SL, SL5, SGL, SGL5, SF, SF5, SGF, SGF5, ZS</p>	Green	AHX632-G
	Red	AHX632-R
	White (For Neon)	AHX632-W
	Blue	AHX632-S
	Yellow	AHX632-Y
	Orange	AHX632-O
	Clear	AHX632-C
SF-681	For LED, Neon	Green AHX653-SG
Color chips (Rectangular)	Color	Type
 <p>TL, TL5, TGL, TGL5, TF, TF5, TGF, TGF5, ZT</p>	Green	AHX633-G
	Red	AHX633-R
	White (For Neon)	AHX633-W
	Blue	AHX633-S
	Yellow	AHX633-Y
	Orange	AHX633-O
	Clear	AHX633-C
SF-680	For LED, Neon	Green AHX653-TG
Mushroom head button	Color	Type
 <p>M, M5</p>	Green	AHX682-G
	Red	AHX682-R
	White	AHX682-W
	Blue	AHX682-S
	Yellow	AHX682-Y
	Orange	AHX682-O
	Black	AHX682-B
SI-40		
Convex square head button	Color	Type
 <p>SM, SM5</p>	Green	AHX683-G
	Red	AHX683-R
	White	AHX683-W
	Blue	AHX683-S
	Yellow	AHX683-Y
	Orange	AHX683-O
	Black	AHX683-B
SI-43		
Convex rectangular head button	Color	Type
 <p>TM, TM5</p>	Green	AHX684-G
	Red	AHX684-R
	White	AHX684-W
	Blue	AHX684-S
	Yellow	AHX684-Y
	Orange	AHX684-O
	Black	AHX684-B
SI-44		

Description	Type		
Legend sheet	Round	Type: AHX615-□ Legend: ON, OFF, UP, DOWN	
	Square	Type: AHX616-□ Legend: ON, OFF, UP, DOWN START, STOP, OPEN CLOSE, AUTO, MAN, RESET, POWER, REV, FWD, HIGH, LOW	
	Rectangular	Type: AHX617-□ Legend: ON, OFF, UP, DOWN START, STOP, AUTO, MAN, FOWARD, REVERSE	
	When ordering, specify desired legend in the □ at the end of ordering code, Transparent blank sheets are also available. Use black oil ink.		
SH-165			
Legend plate (Acrylic resin)	Type	Color Dimensions, mm	
	Round	AHX665 White AHX665-C Transparent AHX665-B Black	ø12.2 x 0.9
	Square	AHX666 White AHX666-C Transparent AHX666-B Black	12.2sq. x 0.9
	Rectangular	AHX667 White AHX667-C Transparent AHX667-B Black	12.2 x 18.2 x 0.9
SH-164			
Legend plate for spot LED (Acrylic resin)	Type	Dimensions, mm	
	Round	AHX650 ø12.2 x 0.9	
	Square	AHX651 12.2sq. x 0.9	
	Rectangular	AHX652 12.2 x 18.2 x 0.9	
SP-113			
Legend plate for selector switch (2-position)	Type: AHX664 Legend: ON-OFF Legend: Blank	Dimensions, mm: 24sq. x 0.5	
			
	SH-226A		
Legend plate for symbol mark	Mark	Type	
	○	AHX666-E	
	□	AHX667-E	
	Ⓜ	AHX666-H	
	Ⓜ	AHX667-H	
	Ⓜ	AHX666-T	
	Ⓜ	AHX667-T	
AF87-74			


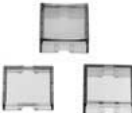



Description	Type		
<p>Protection cover</p>  <p>SM-378</p>	<p>For round and square head button Type: AHX671</p> <p>For rectangular head button Type: AHX669 AHX826</p> <p>This cover protect against accidental operation. Note: Not used for illuminated pushbuttons with guard. Applicable panel thickness is 2.6mm max.</p> <p>Dimensions, mm</p> 		
<p>Dust-tight cover</p>  <p>AF91-123, SI-41</p>	<p>For round and square head button Type: AHX822 Dimensions, mm: 24sq. x 14.2</p> <p>For rectangular head button Type: AHX668 Dimensions, mm: 24 x 30 x 14.2</p> <p>For mushroom head button Type: AHX649 Dimensions, mm: $\phi 30$ x 18</p> <p>These covers protect against dust. Note: Applicable panel thickness is 2.0mm max.</p>		
<p>Guard ring</p>  <p>SI-42</p>	Type	Color	Dimensions, mm
<p>AHX676-B Black $\phi 21$ x 12</p> <p>AHX676-GY Gray</p> <p>This guard ring is used in combination with an extended round head pushbutton (L or E). Note: Applicable panel thickness is 2.5mm max. Please place an order for a packing (AHX685) separately when you intend to use for AH165 series.</p>			
<p>Transformer</p>  <p>AF90-949</p>	Voltage	Type	Lamp
<p>100 to 110V AC AHX805-H LED</p> <p>200 to 220V AC AHX805-M</p> <p>100 to 110V AC AHX806-H Incandescent</p> <p>200 to 220V AC AHX806-M</p>			

Pushbuttons/Selectors/Pilot Lights/Buzzers

AH165-2







Accessories

■ Accessories for AH165-2

Description	Type													
Color lens (Round) 	For flush head (Used with 2F, 2F5, 2FL, 2FL5, 2Z)													
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2604-G</td> </tr> <tr> <td>Red</td> <td>AHX2604-R</td> </tr> <tr> <td>Yellow</td> <td>AHX2604-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2604-S</td> </tr> <tr> <td>Orange</td> <td>AHX2604-O</td> </tr> <tr> <td>Clear</td> <td>AHX2604-C</td> </tr> </table>	Color	Type	Green	AHX2604-G	Red	AHX2604-R	Yellow	AHX2604-Y	Blue	AHX2604-S	Orange	AHX2604-O	Clear
Color	Type													
Green	AHX2604-G													
Red	AHX2604-R													
Yellow	AHX2604-Y													
Blue	AHX2604-S													
Orange	AHX2604-O													
Clear	AHX2604-C													
Color lens (Square) 	For flush head (Used with 2SF, 2SF5, 2SFL, 2SFL5, 2SZ)													
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2606-G</td> </tr> <tr> <td>Red</td> <td>AHX2606-R</td> </tr> <tr> <td>Yellow</td> <td>AHX2606-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2606-S</td> </tr> <tr> <td>Orange</td> <td>AHX2606-O</td> </tr> <tr> <td>Clear</td> <td>AHX2606-C</td> </tr> </table>	Color	Type	Green	AHX2606-G	Red	AHX2606-R	Yellow	AHX2606-Y	Blue	AHX2606-S	Orange	AHX2606-O	Clear
Color	Type													
Green	AHX2606-G													
Red	AHX2606-R													
Yellow	AHX2606-Y													
Blue	AHX2606-S													
Orange	AHX2606-O													
Clear	AHX2606-C													
Mushroom head button 	For extended head (Used with 2E, 2E5, 2EL, 2EL5, 2ZE)													
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2605-G</td> </tr> <tr> <td>Red</td> <td>AHX2605-R</td> </tr> <tr> <td>Yellow</td> <td>AHX2605-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2605-S</td> </tr> <tr> <td>Orange</td> <td>AHX2605-O</td> </tr> <tr> <td>Clear</td> <td>AHX2605-C</td> </tr> </table>	Color	Type	Green	AHX2605-G	Red	AHX2605-R	Yellow	AHX2605-Y	Blue	AHX2605-S	Orange	AHX2605-O	Clear
Color	Type													
Green	AHX2605-G													
Red	AHX2605-R													
Yellow	AHX2605-Y													
Blue	AHX2605-S													
Orange	AHX2605-O													
Clear	AHX2605-C													
Mushroom head button 	For extended head (Used with 2SE, 2SE5, 2SEL, 2SEL5, 2SZE)													
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2607-G</td> </tr> <tr> <td>Red</td> <td>AHX2607-R</td> </tr> <tr> <td>Yellow</td> <td>AHX2607-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2607-S</td> </tr> <tr> <td>Orange</td> <td>AHX2607-O</td> </tr> <tr> <td>Clear</td> <td>AHX2607-C</td> </tr> </table>	Color	Type	Green	AHX2607-G	Red	AHX2607-R	Yellow	AHX2607-Y	Blue	AHX2607-S	Orange	AHX2607-O	Clear
Color	Type													
Green	AHX2607-G													
Red	AHX2607-R													
Yellow	AHX2607-Y													
Blue	AHX2607-S													
Orange	AHX2607-O													
Clear	AHX2607-C													
Mushroom head button 	For concave head (Used with 2SCE, 2SCE5, 2SCL, 2SCL5)													
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2608-G</td> </tr> <tr> <td>Red</td> <td>AHX2608-R</td> </tr> <tr> <td>Yellow</td> <td>AHX2608-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2608-S</td> </tr> <tr> <td>Orange</td> <td>AHX2608-O</td> </tr> <tr> <td>Clear</td> <td>AHX2608-C</td> </tr> </table>	Color	Type	Green	AHX2608-G	Red	AHX2608-R	Yellow	AHX2608-Y	Blue	AHX2608-S	Orange	AHX2608-O	Clear
Color	Type													
Green	AHX2608-G													
Red	AHX2608-R													
Yellow	AHX2608-Y													
Blue	AHX2608-S													
Orange	AHX2608-O													
Clear	AHX2608-C													

AF87-631


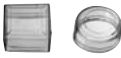

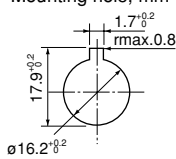
AF87-632

Description	Type															
Legend plate 	For flush head															
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Color	Type	Used with														
White	AHX2609-W	Incandescent lamp, LED lamp, Pushbutton * ¹														
Clear	AHX2609-C	Neon lamp * ²														
Black	AHX2609-B	Pushbutton * ³														
Mushroom head button 	For extended head															
	<table border="0"> <tr> <td>Color</td> <td>Type</td> <td>Used with</td> </tr> <tr> <td>White</td> <td>AHX2610-W</td> <td>Incandescent lamp, LED lamp, Pushbutton *¹</td> </tr> <tr> <td>Clear</td> <td>AHX2610-C</td> <td>Neon lamp *²</td> </tr> <tr> <td>Black</td> <td>AHX2610-B</td> <td>Pushbutton *³</td> </tr> </table> <p>Dimensions, mm: $\phi 18 \times 4.4$</p>	Color	Type	Used with	White	AHX2610-W	Incandescent lamp, LED lamp, Pushbutton * ¹	Clear	AHX2610-C	Neon lamp * ²	Black	AHX2610-B	Pushbutton * ³			
Color	Type	Used with														
White	AHX2610-W	Incandescent lamp, LED lamp, Pushbutton * ¹														
Clear	AHX2610-C	Neon lamp * ²														
Black	AHX2610-B	Pushbutton * ³														
Mushroom head button 	For flush square															
	<table border="0"> <tr> <td>Color</td> <td>Type</td> <td>Used with</td> </tr> <tr> <td>White</td> <td>AHX2611-W</td> <td>Incandescent lamp, LED lamp, Pushbutton *¹</td> </tr> <tr> <td>Clear</td> <td>AHX2611-C</td> <td>Neon lamp *²</td> </tr> <tr> <td>Black</td> <td>AHX2611-B</td> <td>Pushbutton *³</td> </tr> </table> <p>Dimensions, mm: 17sq. x 0.9</p>	Color	Type	Used with	White	AHX2611-W	Incandescent lamp, LED lamp, Pushbutton * ¹	Clear	AHX2611-C	Neon lamp * ²	Black	AHX2611-B	Pushbutton * ³			
Color	Type	Used with														
White	AHX2611-W	Incandescent lamp, LED lamp, Pushbutton * ¹														
Clear	AHX2611-C	Neon lamp * ²														
Black	AHX2611-B	Pushbutton * ³														
Mushroom head button 	For extended square, concave square															
	<table border="0"> <tr> <td>Color</td> <td>Type</td> <td>Used with</td> </tr> <tr> <td>White</td> <td>AHX2612-W</td> <td>Incandescent lamp, LED lamp, Pushbutton *¹</td> </tr> <tr> <td>Clear</td> <td>AHX2612-C</td> <td>Neon lamp *²</td> </tr> <tr> <td>Black</td> <td>AHX2612-B</td> <td>Pushbutton *³</td> </tr> </table> <p>Dimensions, mm: 17sq. x 4.4</p>	Color	Type	Used with	White	AHX2612-W	Incandescent lamp, LED lamp, Pushbutton * ¹	Clear	AHX2612-C	Neon lamp * ²	Black	AHX2612-B	Pushbutton * ³			
Color	Type	Used with														
White	AHX2612-W	Incandescent lamp, LED lamp, Pushbutton * ¹														
Clear	AHX2612-C	Neon lamp * ²														
Black	AHX2612-B	Pushbutton * ³														
Mushroom head button 	For illuminated pushbuttons (Used with 2ML, 2YML)															
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2614-G</td> </tr> <tr> <td>Red</td> <td>AHX2614-R</td> </tr> <tr> <td>White</td> <td>AHX2614-W</td> </tr> <tr> <td>Yellow</td> <td>AHX2614-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2614-S</td> </tr> <tr> <td>Orange</td> <td>AHX2614-O</td> </tr> </table>	Color	Type	Green	AHX2614-G	Red	AHX2614-R	White	AHX2614-W	Yellow	AHX2614-Y	Blue	AHX2614-S	Orange	AHX2614-O	
Color	Type															
Green	AHX2614-G															
Red	AHX2614-R															
White	AHX2614-W															
Yellow	AHX2614-Y															
Blue	AHX2614-S															
Orange	AHX2614-O															
Mushroom head button 	For non-illuminated pushbuttons (Used with 2M, 2YM)															
	<table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2613-G</td> </tr> <tr> <td>Red</td> <td>AHX2613-R</td> </tr> <tr> <td>White</td> <td>AHX2613-W</td> </tr> <tr> <td>Yellow</td> <td>AHX2613-Y</td> </tr> <tr> <td>Blue</td> <td>AHX2613-S</td> </tr> <tr> <td>Orange</td> <td>AHX2613-O</td> </tr> <tr> <td>Black</td> <td>AHX2613-B</td> </tr> </table>	Color	Type	Green	AHX2613-G	Red	AHX2613-R	White	AHX2613-W	Yellow	AHX2613-Y	Blue	AHX2613-S	Orange	AHX2613-O	Black
Color	Type															
Green	AHX2613-G															
Red	AHX2613-R															
White	AHX2613-W															
Yellow	AHX2613-Y															
Blue	AHX2613-S															
Orange	AHX2613-O															
Black	AHX2613-B															

AF87-631








AF87-630


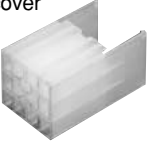



AF87-633


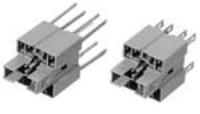
Description	Type																				
<p>Push-lock, turn-reset button</p>  <p>AF87-634</p>	<p>For illuminated pushbuttons (Used with 2VL, 2YVL)</p> <table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2616-G</td> </tr> <tr> <td>Red</td> <td>AHX2616-R</td> </tr> <tr> <td>White</td> <td>AHX2616-W</td> </tr> <tr> <td>Yellow</td> <td>AHX2616-Y</td> </tr> </table> <p>For pushbuttons (Used with 2V, 2YV)</p> <table border="0"> <tr> <td>Color</td> <td>Type</td> </tr> <tr> <td>Green</td> <td>AHX2615-G</td> </tr> <tr> <td>Red</td> <td>AHX2615-R</td> </tr> <tr> <td>Yellow</td> <td>AHX2615-Y</td> </tr> <tr> <td>Black</td> <td>AHX2615-B</td> </tr> </table>	Color	Type	Green	AHX2616-G	Red	AHX2616-R	White	AHX2616-W	Yellow	AHX2616-Y	Color	Type	Green	AHX2615-G	Red	AHX2615-R	Yellow	AHX2615-Y	Black	AHX2615-B
Color	Type																				
Green	AHX2616-G																				
Red	AHX2616-R																				
White	AHX2616-W																				
Yellow	AHX2616-Y																				
Color	Type																				
Green	AHX2615-G																				
Red	AHX2615-R																				
Yellow	AHX2615-Y																				
Black	AHX2615-B																				
<p>Dust-tight cover</p>  <p>AF87-636</p>	<p>For flush round (Used with 2F, 2FL, 2F5, 2FL5) Type: AHX2603-2</p> <p>For flush square (Used with 2SF, 2SFL, 2SF5, 2SFL5) Type: AHX2603-2S</p> <p>These covers protect against dust.</p>																				
<p>Key washer</p>  <p>AF87-635</p>	<p>Type: AHX2601</p> <p>Mounting hole, mm</p> 																				

Pushbuttons/Selectors/Pilot Lights/buzzers AH164, AH165 and AH165-2 Accessories

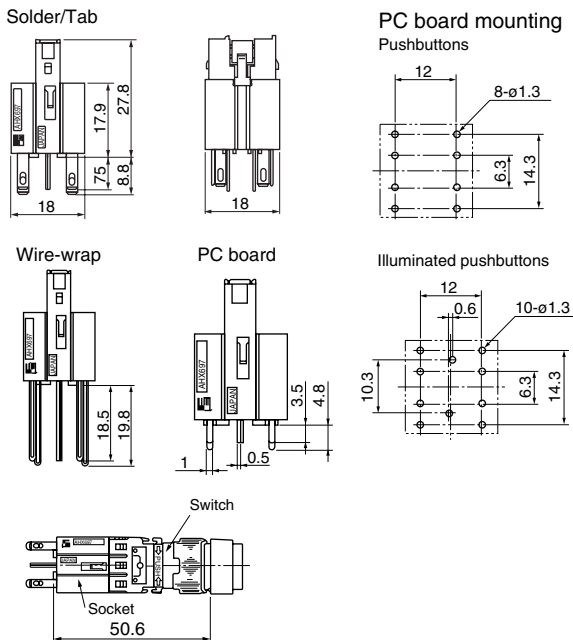
■ Accessories for AH164, AH165 and AH165-2

Description	Type		
Incandescent lamp  <small>SD-924</small>	Voltage	Type	
	6V, 0.6W	AHX641	
	14V, 0.7W	AHX642	
	28V, 0.7W	AHX643	
LED lamp  <small>AF02-116</small>	Voltage	Type	
	5V DC	AHX695-5 □	
	6V DC	AHX695-6 □	
	12V DC	AHX695-12 □	
	24V DC	AHX695-24 □	
	Replace the □ mark by the luminous color code Red (R), Green (G), Orange (O), Amber (A), Yellow (Y), Blue (S)		
Neon lamp  <small>SP-119</small>	Voltage	Type	Luminous color
	110V AC	AHX655-H AHX654-H	Green Orange
	120V AC	AHX655-K AHX654-K	Green Orange
	220V AC	AHX655-M AHX654-M	Green Orange
	240V AC	AHX655-P AHX654-P	Green Orange
Panel plug  <small>SI-186</small>	Color	Type	
Round	Black	AHX622-B	IP40
	Gray	AHX622-GY	IP40
	Black	AHX644-B	IP40
Square	Gray	AHX644-GY	IP40
	Black	AHX645-B	IP40
Rectangular	Gray	AHX645-GY	IP40
	Black	AHX850-B	IP65
Lamp changer  <small>AF02-117</small>	Type: AHX672		
	If the switch is fitted with a lamp, use this tool to remove the lamp. The tool is unnecessary when installing a lamp.		
Remover  <small>SE-34</small>	Type: AHX618		
	This tool is used for replacing the color chips or screens.		
Contact holder remover  <small>SP-522</small>	Type: AHX699		
	This tool is used to remove a contact holder when switches are densely installed.		

Description	Type	
Wrench  <small>SE-741</small>	Type: AHX601	
	When installing a command switch on a panel, this tool is useful for tightening the switch firmly and efficiently.	
Terminal cover  <small>AF87-637</small>	Type: AHX2602	
	This cover is used with AH164 and AH165 and AH165-2 (except pilot lights). Pass the wires through the cover, then mount the cover in position.	
Contact block  <small>SK-1140</small>	Terminal	Type
	Solder/Tab	AGX001
	Wire-wrap	AGX001-W
Dummy unit  <small>SK-1141</small>	Type: AGX002	
	A dummy unit is used to fill the space where no contact blocks are installed. For example, two dummy units are used if 1NO+1NC contact block is installed, and one dummy unit is used if 2NO+2NC contact blocks are installed.	
Remover  <small>SM-334</small>	Type: AGX012	
	This tool is used for replacing the contact blocks or dummy units.	

Description	Type		
Sockets 	Terminal	Type	Used with
	Solder/Tab Wire-wrap PC board	AHX697-S AHX697-W AHX697-P	Pushbuttons
Sockets for LED 	Terminal	Type	
	Solder/Tab Wire-wrap	AHX697-SH3 AHX697-WH3	
SM-1097	Contact arrangement is 2NO+2NC only. Except for AH165-2PL types		
SM-1098	<ul style="list-style-type: none"> • Contact arrangement is 2NO+2NC only. • These sockets are used only when LED lamps rated for 24V DC are used under 110V AC/DC. • Except for AH164, 165 and 165-2 series pilot lights or AH165-2PL type. • When side-by-side mounting and continuous lighting, note that a socket has higher temperature over the ambient temperature. 		

Dimensions, mm



For wiring to wire-wrap pin terminals, select appropriate wire sizes and tool from the table below.

Wire size	Bit	Sleeve	Number of effective wraps
0.4mm dia.	3-A	1-B	About 8
0.5mm dia.	1-A	1-B	About 6
(0.65mm dia.)	(2-A)	(2-B)	(About 6)

Use ordinary wrapping for connection. Wires of 0.65mm dia. must not be used on adjacent terminals. However, 0.65mm dia. wire can be mixed with 0.4mm and 0.5mm dia. wires.

Pushbuttons/Selectors/Pilot Lights/Buzzers

AH164, AH165 and AH165-2

Mass

■ Mass, gram

AH164 series

Type	1NO + 1NC	2NO + 2NC	3NO + 3NC
AH164-L,L5 (Without transformer)	12.5	13.5	14.5
L,L5 (With transformer)	53.5	54.5	-
SL,SL5 (Without transformer)	13.1	14.1	15.1
SL,SL5 (With transformer)	54.1	55.1	-
TL,TL5 (Without transformer)	13.9	14.9	15.9
TL,TL5 (With transformer)	54.9	55.9	-
TGL,TGL5 (Without transformer)	13.9	14.9	15.9
TGL,TGL5 (With transformer)	54.9	55.9	-
SGL,SGL5 (Without transformer)	13.1	14.1	15.1
SGL,SGL5 (With transformer)	54.1	55.1	-
AH164-E,E5	10.5	11.5	12.5
M,M5	12.5	13.5	14.5
SF,SF5	11.1	12.1	13.1
TF,TF5	11.9	12.9	13.9
TGF,TGF5	11.9	12.9	13.9
SGF,SGF5	11.1	12.1	13.1
SM,SM5	13.4	14.4	15.4
TM,TM5	13.1	14.1	15.1
AH164-P2,P0	16.4	17.4	18.4
P3,P6,P7,P1	-	17.4	18.4
PK3,PK6,PK7,PK1	-	17.4	18.4
SP2,SP0	15.8	16.8	17.8
SP3,SP6,SP7,SP1	-	16.8	17.8
SPK3,SPK6,SPK7,SPK1	-	16.8	17.8
J2,J0	30.4	31.4	32.4
J3,J6,J7,J1	-	31.6	32.6
JK3,JK6,JK7,JK1	-	31.6	32.6
SJ2,SJ0	29.8	30.8	31.8
SJ3,SJ6,SJ7,SJ1	-	30.8	31.8
SJK3,SJK6,SJK7,SJK1	-	30.8	31.8
AH164-Z (Without transformer)	6.9		
Z (With transformer)	50.9		
ZS (Without transformer)	7.5		
ZS (With transformer)	51.5		
ZT (Without transformer)	8.2		
ZT (With transformer)	52.2		
AH164-TX	16		
TX1	17.5		
TX2B	13.2		
AH164-TS	9.7		
TC	15.6		
TC4□E-□K1	46.4		
TC4□E-□K	52.8		

AH165 series

Type	1NO + 1NC	2NO + 2NC	3NO + 3NC
AH165-L,L5 (Without transformer)	12.5	13.5	14.5
L,L5 (With transformer)	53.5	54.5	-
SL,SL5 (Without transformer)	13.1	14.1	15.1
SL,SL5 (With transformer)	54.1	55.1	-
TL,TL5 (Without transformer)	13.9	14.9	15.9
TL,TL5 (With transformer)	54.9	55.9	-
TGL,TGL5 (Without transformer)	13.9	14.9	15.9
TGL,TGL5 (With transformer)	54.9	55.9	-
SGL,SGL5 (Without transformer)	13.1	14.1	15.1
SGL,SGL5 (With transformer)	54.1	55.1	-
AH165-E,E5	10.5	11.5	12.5
M,M5	12.5	13.5	14.5
SF,SF5	11.1	12.1	13.1
TF,TF5	11.9	12.9	13.9
TGF,TGF5	11.9	12.9	13.9
SGF,SGF5	11.1	12.1	13.1
SM,SM5	13.4	14.4	15.4
TM,TM5	13.1	14.1	15.1
VR	13.4 *1	14 *2	-
V1R	14.3 *1	14.9 *2	-
AH165-V5R	18 *1	18.6 *2	-
V6R	18.9 *1	19.5 *2	-
AH165-P2,P0	16.7	17.7	18.7
P3,P6,P7,P1	-	17.7	18.7
PK3,PK6,PK7,PK1	-	18	19
SP2,SP0	16.1	17.1	18.1
SP3,SP6,SP7,SP1	-	17.1	18.1
SPK3,SPK6,SPK7,SPK1	-	17.1	18.1
J2,J0	31.1	32.1	33.1
J3,J6,J7,J1	-	32.1	33.1
JK3,JK6,JK7,JK1	-	32.1	33.1
SJ2,SJ0	30.5	31.5	32.5
SJ3,SJ6,SJ7,SJ1	-	31.5	32.5
SJK3,SJK6,SJK7,SJK1	-	31.5	32.5
AH165-JM2	30	34.4	-
RJM2	29.6	34	-
AH165-Z (Without transformer)	6.9		
Z (With transformer)	50.9		
ZS (Without transformer)	7.5		
ZS (With transformer)	51.5		
ZT (Without transformer)	8.2		
ZT (With transformer)	52.2		
ZM (Without transformer)	5.4		
AH165-X	13.6		
AH165-TS	9.7		
TC	15.6		
TC4□E-□K1	46.4		
TC4□E-□K	52.8		

Note: *1 For 1NC
*2 For 2NC

■ **Mass, gram**
AH165-2 series

Type	1NO + 1NC	2NO + 2NC	3NO + 3NC
AH165-2FL,FL5	15.2	16.2	17.2
2EL,EL5	15.6	16.6	17.6
2ML	18.7	19.7	20.7
2YML	20.2	21.2	22.2
2SFL,SFL5	16.5	17.5	18.5
2SEL,SEL5	17.4	18.4	19.4
2SCL,SCL5	17.6	18.6	19.6
2VL	19.9	20.9	21.9
2YVL	21.4	22.4	23.4
AH165-2F,F5	14.4	15.4	16.4
2E,E5	14.8	15.8	16.8
2M	16.7	17.7	18.7
2YM	18.2	19.2	20.2
2SF,SF5	14.5	15.5	16.5
2SE,SE5	15.4	16.4	17.4
2SCE,SCE5	15.6	16.6	17.6
2S2	-	19	-
2YS2	-	20.6	-
2V	17.9	18.9	19.9
2YV	19.4	20.4	21.4
AH165-2P2,P0	17.1	18.1	19.1
2P3,P6,P7,P1	-	18.1	19.1
2YP2,YP0	18.7	19.7	20.7
2YP3,YP6,YP7,YP1	-	19.7	20.7
2J2,J0	40	41	42
2J3,J6,J7,J1	-	41	42
2YJ2	41.6	42.6	43.6
2YJ3,YJ6,YJ7,YJ1	-	42.6	43.6
2H	14.3	15.3	16.3
2SH	16.1	17.1	18.1
AH165-2PL2	17.3	18.3	-
2PL3	-	18.3	-
AH165-2Z	9.7		
2ZE	10.1		
2SZ	10.9		
2SZE	11.4		