e-Front runners

FUJI

Command Switches



AEH416d

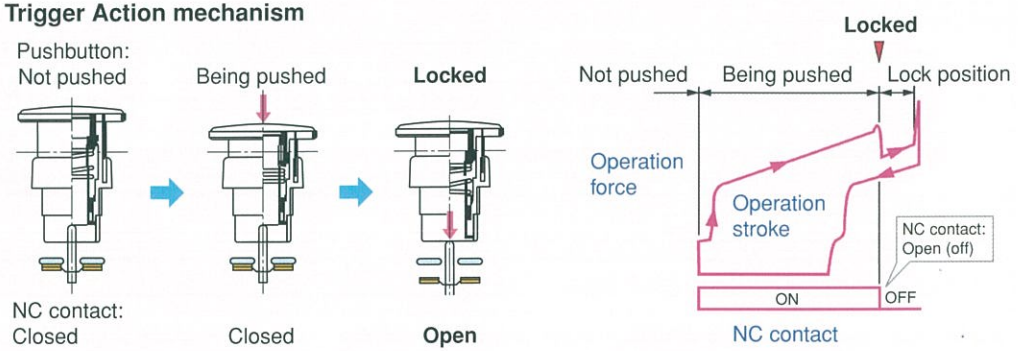
Fuji Electric FA Components & Systems Co., Ltd.

Features

Safety AR22 • DR22 AM22 • DM22 AR30 • DR30 AH164 • AH165

The emergency stop pushbuttons employ FUJI's original Trigger Action mechanism.
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.

Trigger Action mechanism



Excellent switch reliability

AR22 • DR22 AM22 • DM22 AR30 • DR30

- All the contacts are double break type and feature self-cleaning action.
- Every time the switch is operated, the contact surfaces are wiped with a sliding movement, thus ensuring high contact reliability even at low voltage and small current levels (5V, 5mA).

AH164 • AH165

- The switches employ a snap-action mechanism.
- This mechanism use double break contacts to ensure insulation distance of 1mm minimum.
- High contact reliability of 1mA at 5V AC/DC is assured.

Wiring AR22 • DR22 AM22 • DM22 AR30 • DR30

- Wiring the terminals from both vertical and lateral directions facilitates wiring in narrow spaces.
- Color coding of contact blocks, lamp terminal and transformer unit makes wiring and checking easy.

Wiring from two directions



1NO: Blue



1NC: Red

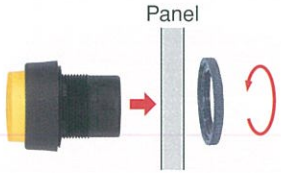


Lamp terminal and transformer unit: Black



Easy installation AR22 • DR22 AH164 • AH165

- No adjusting of panel thickness is necessary.
- The button and lens can be mounted on a panel while the operator is engaged.



Metal nut AM22 • DM22 AR30 • DR30

- Metallic locking nut models are available.
- Specify "ZM" at the end of the type number of the standard type.

Example



AM22EOR-□ZM



AR30E0R-□ZM

Note: The metal nut is not available for some models.

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Information in this catalog is subject to change without notice.

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2010-10 e / FCSAP

e-Front runners

FUJI Command Switches — Pushbuttor

AR22, DR22 Series Locking nut mounted from behind panel IP65

ϕ22

	Illuminated pushbuttons				
					
Operator	Flush round head	Extended round head	Extended with transparent full guard	Flush square head	Extended square head
Momentary action type 2-position/Maintained type	AR22F0L	AR22E0L	AR22G4L	AR22F0M	AR22E0M
Alternate action type 3-position/Maintained type	AR22F5L	AR22E5L	AR22G9L	AR22F5M	AR22E5M
Color	● ● ○ ● ● ●	● ● ○ ● ● ●	● ● ○ ● ● ●	■ ■ □ ■ ■ ■	■ ■ □ ■ ■ ■

ϕ22

	Emergency stop pushbuttons		Emergency stop illuminated pushbuttons		Selectors
	 Conform to EN 418	 Conform to EN 418	 Conform to EN 418	 Conform to EN 418	
Operator	Push-lock, turn-reset	Unibody push-lock, turn-reset	Push-lock, turn-reset	Unibody push-lock, turn-reset	Knob
Momentary action type 2-position/Maintained type	—	—	—	—	AR22PR-2
Alternate action type 3-position/Maintained type	AR22V0R	AR22VGE	AR22V0L	AR22VGF	AR22PR-3
Color	●	●	●	●	● ● ●

AM22, DM22 Series Locking nut mounted from panel surface IP65

ϕ22

	Illuminated pushbuttons			Pushbuttons			Emergency stop pushl
							 Conform to
Operator	Flush round head	Extended round head	Extended with transparent full guard	Flush round head	Extended round head	Extended with transparent full guard	Push-lock, turn-reset
Momentary action type 2-position/Maintained type	AM22F0L	AM22E0L	AM22G4L	AM22F0	AM22E0	AM22G4	—
Alternate action type 3-position/Maintained type	AM22F5L	AM22E5L	AM22G9L	AM22F5	AM22E5	AM22G9	AM22V0R
Color	● ● ○ ● ● ●	● ● ○ ● ● ●	● ● ○ ● ● ●	● ● ○ ● ● ●	● ● ○ ● ● ●	● ● ○ ● ● ●	●

Operator	Flush round head	Extended round head	Extended with transparent full guard	Flush round head	Extended round head	Mushroom head	Push-lock, turn-reset
Momentary action type 2-position/Maintained type	**AM22F0L**	**AM22E0L**	**AM22G4L**	**AM22F0R**	**AM22E0R**	**AM22M0R**	—
Alternate action type 3-position/Maintained type	**AM22F5L**	**AM22E5L**	**AM22G9L**	**AM22F5R**	**AM22E5R**	**AM22M5R**	**AM22V0E**
Color	●●○●●●	●●○●●●	●●○●●●	●●●○●●●	●●●○●●●	●●●○●●●	●

AR30, DR30 Series Locking nut mounted from panel surface IP65

ϕ30	Illuminated pushbuttons		Pushbuttons				
							
Operator	Extended round head	Extended with transparent full guard	Flush round head	Extended round head	Mushroom head	Giant head with full guard	Pushbutton with selector ring (2-position)
Momentary action type 2-position/Maintained type	**AR30E0L**	**AR30G4L**	**AR30F0R**	**AR30E0R**	**AR30M0R**	**AR30B2R**	**AR30S□R**
Alternate action type 3-position/Maintained type	**AR30E5L**	**AR30G9L**	**AR30F5R**	**AR30E5R**	**AR30M5R**	—	—
Color	●●○●●●	●●○●●●	●●●○●●●	●●●○●●●	●●●○●●●	●●●○●●●	●●●○●●●

AH164, AH165 Series Locking nut mounted from behind panel AH164: IP40 AH165: IP65

ϕ16	Illuminated pushbuttons				Pushbuttons		
							
Operator	Extended round head	Flush square head	Flush rectangular head	Flush rectangular head with guard	Extended round head	Flush square head	Flush rectangular head
Momentary action type 2-position/Maintained type	**AH164-L, AH165-L**	**AH164-SL, AH165-SL**	**AH164-TL, AH165-TL**	**AH164-TGL, AH165-TGL**	**AH164-E, AH165-E**	**AH164-SF, AH165-SF**	**AH164-TF, AH165-TF**
Alternate action type 3-position/Maintained type	**AH164-L5, AH165-L5**	**AH164-SL5, AH165-SL5**	**AH164-TL5, AH165-TL5**	**AH164-TGL5, AH165-TGL5**	**AH164-E5, AH165-E5**	**AH164-SF5, AH165-SF5**	**AH164-TF5, AH165-TF5**
Color	●●○●●●	■■□■■■	■■□■■■	■■□■■■	●●●○●●●	■■■□■■■	■■■□■■■

Note: Spring return type selectors for 2 and 3-position are also available.

●■ : Green ●■ : Red ●■ : Black ○□ : White ●■ : Yellow ●■ : Orange ●■ : Blue

s, Selectors, Pilot Lights, Buzzers

Your Best Choice is FUJI.

ushbuttons

					
ush round head	Extended round head	Mushroom head	Pushbutton with selector ring (2-position)	Flush square head	Extended square head
R22F0R	AR22E0R	AR22M0R	AR22S□R	AR22F0S	AR22E0S
R22F5R	AR22E5R	AR22M5R	—	AR22F5S	AR22E5S

Pilot lights

Buzzers

					
ever	Key	Dome	Extended round	Flush square	Electronic sound [IP00]
R22WR-2	AR22JR-2	DR22D0L	DR22E3L	DR22F3M	DR22B5
R22WR-3	AR22JR-3				
	—				

ons

Emergency stop illuminated pushbuttons

Selectors

Pilot lights

















Push-lock, turn-reset with mechanical indicator	Push-lock, turn-reset	Push-lock, turn-reset (Transparent in all colors)	Knob	Lever	Key	Dome	Extended round
—	—	—	**AM22PR-2**	**AM22WR-2**	**AM22JR-2**	**DM22D0L**	**DM22E3L**
AM22VME	**AM22V0F**	**AM22VDF**	**AM22PR-3**	**AM22WR-3**	**AM22JR-3**		
🔴	🔴	🔴	⚫🟢🔴	⚫🟢🔴	—	🟢🔴⚪🟡🟠🔵	🟢🔴⚪🟡🟠🔵

Emergency stop pushbuttons	Emergency stop illuminated pushbuttons	Selectors				Pilot lights	Buzzers
 Conform to EN 418	 Conform to EN 418						
Push-lock, turn-reset	Push-lock, turn-reset	Knob	Lever	Key	Lever (metal type)	Dome	Electronic sound [IP00]
—	—	**AR30PR-2**	**AR30WR-2**	**AR30JR-2**	**AR30HR-2**	**DR30D0L**	**DR30B6**
AR30V0R	**AR30V0L**	**AR30PR-3**	**AR30WR-3**	**AR30JR-3**	**AR30HR-3**		
🔴	🔴	⚫🟢🔴	⚫🟢🔴	—	—	🟢🔴⚪🟡🟠🔵	⚫

		Emergency stop pushbuttons	Selectors		Pilot lights		Buzzers
		 Conform to EN 418					
Flush rectangular head with guard	Mushroom head	Push-lock, turn-reset	Knob with rectangular bezel	Key with rectangular bezel	Extended round	Flush rectangular	Electronic sound [IP00]
AH164-TGF, AH165-TGF	**AH164-M, AH165-M**	—	**AH164-P2, AH165-P2**	**AH164-J2, AH165-J2**	**AH164-Z, AH165-Z**	**AH164-ZT, AH165-ZT**	**AH164-TX2**
AH164-TGF5, AH165-TGF5	**AH164-M5, AH165-M5**	**AH165-V6R**	**AH164-P3, AH165-P3**	**AH164-J3, AH165-J3**			
🟢🔴⚫⚪🟡🟠🔵	🟢🔴⚫⚪🟡🟠🔵	🔴	⚫	—	🟢🔴⚪🟡🟠🔵	🟢🔴⚪🟡🟠🔵	⚫

■ Performance data

● Pushbuttons, selectors and pilot lights

Series	AR22, AM22, AR30	DR22, DM22, DR30	AH164	AH165
Switch type	Pushbuttons, illuminated pushbuttons Emergency stop pushbuttons, emergency stop illuminated pushbuttons Selectors, illuminated selectors	Pilot lights	Pushbuttons, illuminated pushbuttons Emergency stop pushbuttons Selectors, pilot lights	
Rated insulation voltage	600V AC/DC Illuminated type without transformer and AR22VG type: 250V AC/DC	250V AC/DC With transformer: 600V AC	250V AC/DC	
Mechanical durability	Pushbuttons, illuminated pushbuttons, emergency stop pushbuttons, emergency stop illuminated pushbuttons Momentary action: 5 million operations Alternate action: 1 million operations With selector ring: 100,000 operations Push-lock, turn-reset: 100,000 operations Push-lock, pull-reset: 30,000 operations Selectors *1 Maintained 1, 2, 3, 4-contact: 1 million operations Maintained 5, 6, 7, 8-contact: 500,000 operations (7, 8-contact: AM22, AR30 only) Control type, spring return, spring/manual return: 200,000 operations Illuminated selectors Maintained Without transformer 1, 2, 3-contact: 1 million operations 4-contact: 500,000 operations With transformer 1, 2-contact: 1 million operations 3-contact: 500,000 operations Control type, spring return, spring/manual return: 200,000 operations	—	Pushbuttons Momentary action: 1 million operations Alternate action: 250,000 operations Push-lock, turn-reset: 100,000 operations Selectors 250,000 operations Key insertion/removal durability for key type: 10,000 operations	
Electrical durability	500,000 operations at 220V AC 6A 1 million operations at 220V AC 3A (AR22VG type: 100,000 operations)	—	100,000 operations at 220V AC 0.7A	
Operating frequency	1200 operations/h (on-load factor: 40%) (AR22VG type: 1800 operations/h (on-load factor: 40%))	—	1200 operations/h (on-load factor: 40%)	
Dielectric strength	2500V AC, 1 min Illuminated type without transformer: 2000V AC, 1 min (except AR22VGF type)	2000V AC, 1 min With trans.: 2500V AC, 1 min	2000V AC, 1 min (Between lamp and contact terminals: 1500V AC, 1 min)	
Insulation resistance	100MΩ or more (500V DC megger)		100MΩ or more (500V DC megger)	
Conditional short-circuit current	1000A	—	1000A	
Short-circuit protective device	Fuse 15A	—	Fuse 1A	
Pollution degree	3		3	
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm, Constant: 16.7Hz, double amplitude 3mm Emergency stop type: 10 to 500Hz, double amplitude 0.7mm (acceleration 50m/s^2)			
Shock	Malfunction durability: 100m/s^2 Emergency stop type: 150m/s^2 Mechanical durability: 500m/s^2	Mechanical durability: 500m/s^2	Malfunction durability: 100m/s^2 *2 Mechanical durability: 500m/s^2	
Ambient temperature (No condensation or no icing)	-20 to +70˚C AR22VGE type: -20 to +60˚C, illuminated type: –20 to +50˚C	–20 to +50˚C	–20 to +70˚C *3	-10 to +70˚C *4
Humidity (No condensation or no icing)	45 to 85% RH (within –5 to +40˚C)		45 to 85% RH (within –5 to +40˚C)	
Degree of protection	IP65		IP40	IP65

Notes: *1 Key insertion/removal durability for key type selector switch: 10,000 operations for key type, 20,000 operations for long durability key type
*2 Emergency stop type: 150m/s^2
*3 Illuminated pushbutton and pilot light: –20 to +55˚C
*4 Illuminated pushbutton and pilot light: –10 to +55˚C

● Buzzers

Type	DR22B5, DR30B6	AH164-TX2
Rated insulation voltage	Without transformer: 60V AC/DC With transformer: 250V AC	60V AC/DC
Sound level	90dB (0.1m), 70dB (1m)	70 to 90dB (0.1m), 50 to 70dB (1m)
Durability	1000h	1000h
Frequency	2.4 to 3.3kHz	2.4 to 3.3kHz
Intermittent cycle	Approx. 170-cycle/min	Approx. 170-cycle/min
Dielectric strength	Without transformer: 1000V AC 1 min With transformer: 2000V AC 1 minute	1000V AC 1 min
Insulation resistance	100MΩ or more (500V DC megger)	100MΩ or more (500V DC megger)
Pollution degree	2	2
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1mm Constant: 16.7Hz, double amplitude 3mm	Resonance: 10 to 55Hz, double amplitude 0.1mm Constant: 16.7Hz, double amplitude 3.0mm
Shock	Mechanical durability: 500m/s²	Mechanical durability: 500m/s²
Ambient temperature (No condensation or no icing)	-20 to +60°C	-20 to +60°C
Humidity (No condensation or no icing)	45 to 85%RH (within -5 to +40°C)	45 to 85%RH (within –5 to +40°C)
Degree of protection	IP00	IP00

■ Standards approved

UL508	File No. E44592	
CSA C22.2 No.14	File No. LR20479, File No. LR84365 (For AH165-ZM) cUL File No. E44592 (For AR22VG)	
TÜV: EN60947-5-1	• Pushbuttons AR22, AM22, AR30: R9551062 AH164, AH165: R9250087 (For AH165-V, V1: J9551059) • Illuminated pushbuttons AR22, AM22, AR30: R9551062 AH164, AH165: R9250087 • Selectors AR22, AM22, AR30: R9551060 AH164, AH165: R9250088 (For AH165-JM, RJM: J9551059)	• Pilot lights DR22, DM22, DR30: R9551061 AH164, AH165: R9250089 • Buzzers AH164: J9950092
TÜV: EN60947-5-1 EN60947-5-5	• Emergency stop pushbuttons AR22, AM22, AR30: R50028146 (except AR22VG) AR22VG: R50028137 AH165: R9950093	• Emergency stop illuminated pushbuttons AR22, AM22, AR30: R50028146 (except AR22VG) AR22VG: R50028137
GB14048.5	• Pushbuttons, illuminated pushbuttons AR22, AM22: 2003010305063372 AR30: 2003010305063384 AH164, AH165: 2003010305071068 • Selectors, illuminated selectors AR22, AM22: 2003010305063372 AR30: 2003010305063384 AH164, AH165: 2003010305071068	• Emergency stop pushbuttons, emergency stop illuminated pushbuttons AR22, AM22: 2003010305063372 (except AR22VG) AR22VG: 2005010305156646 AR30: 2003010305063384 AH165: 2003010305071068 • Pilot lights DR22, DM22: 2003010305063383 DR30: 2003010305063487 AH164, AH165: 2003010305071044