

# Fuji Electric Command Series Pilot Devices

Fuji Electric Command Series pilot devices are used in machine tools, industrial machines, control panels, distribution panels, and instrumentation panels. Pushbuttons improve interfacing by allowing better layout and wiring, easier installation and increased safety. Reliability is also built in to handle complex multi-functional controls.

The AR16, AR22 and AR30 series are configurable with a wide range of choices. Our selection of 16mm, 19mm, 22mm and 30mm pushbuttons include non-illuminated as well as

illuminated models with flush round heads, extended round heads, and mushroom style heads. Other 16mm, 22mm and 30mm pilot devices available include emergency stop pushbuttons, selector switches, pilot lights, joystick selector switches, and buzzers.

We also offer a wide array of accessories to complement our selection of Fuji 16mm, 19mm, 22mm and 30mm Command Series pilot devices.

## AR16 Series Features

- 16.2 or 19.2 mm diameter hole
- Fits 1 to 6mm max panel thickness
- Integrated structure with built-in contacts that reduce control panel depth
- Offered in Thin-type profile with only 2mm of panel protrusion for high-density mounting and attractive panel designs
- Bright LED-illuminated surface with less power consumption
- Gold-plated contacts and snap-action mechanism with low 1mA at 5V switching
- Oil- and dust-proof operator modules (IP65)

## AR22 Series Features

- 22.3 mm diameter hole
- Fits 1 to 6mm max panel thickness
- Mountable in either a 22.3 or 25.5 mm diameter cutout (except for joysticks and buzzers)
- Provided with release arm
- Terminal cover included for added safety
- Wiring possible in vertical and horizontal directions
- Oil- and dust-proof operator modules (IP65), except for buzzers DR22B5 (IP00), DR22B8 (IP54)

## AR30 Series Features

- 30.5 mm diameter hole
- Fits 1mm to 6mm max panel thickness
- Quick snap-on replacement of contact blocks
- Double-break self-cleaning contacts
- Terminal cover included for added safety
- Wiring possible in vertical and horizontal directions
- Oil- and dust-proof operator modules (IP65) except for buzzer DR30B5 (IP00)



Pushbuttons



E-Stop Pushbuttons



Selector Switches



Pilot Lights



Electronic Buzzers



Joysticks

## Command Series Accessories



TO OBTAIN THE MOST CURRENT AGENCY APPROVAL INFORMATION, SEE THE AGENCY COMPLIANCE & CERTIFICATIONS CHECKLIST SECTION ON THE SPECIFIC PART NUMBER'S WEB PAGE.

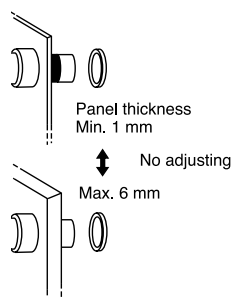
# Fuji Electric 22mm Pilot Devices Overview

## Pushbuttons, Selectors, Pilot Lights, Joysticks, Buzzers

Fuji Electric AR22 pilot devices can be mounted on panels up to 6mm thick by securing the operator with a locking nut from behind the panel without needing any adjustment.

### Easy mounting

Fuji AR22 pilot devices can be mounted on panels between 1 and 6mm thick and are mountable in panel cutouts of 22.3 or 25.5 mm. The button and lens can be mounted on a panel while the operator is engaged.



### Pushbuttons



**AR22F0R-01RZA**

### Illuminated Pushbuttons



**AR22F0L-10E3YZA**

### Pilot Lights



**DR22E3L-E3SZA**

### E-Stop Pushbuttons



**AR22V0R-01R**

### Selector Switches



**AR22PR-210BZA**

### Buzzers



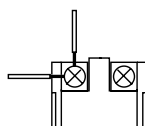
**DR22B8-EB**

### Wiring

These pilot devices can be wired in both vertical and lateral directions making wiring in narrow spaces easier. Contact block color coding makes wiring even easier.

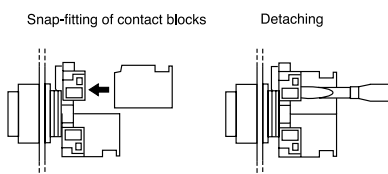
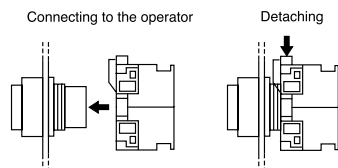
1N.O. Blue, 1N.C. Red

Lamp terminal and transformer unit: black



### Quick contact block and transformer replacement

Fuji AR22 pilot devices have a snap-on mounting that makes replacing or adding a contact block and transformer unit easier.



### Safety

AR22 pilot devices include terminal covers for added safety and security. Emergency stop pushbuttons include a trigger action mechanism that prevents the contacts from moving until the button is pushed and locked.

### Protection

AR22 pilot devices feature oil and dust-tight operator construction (IP65), except for buzzers DR22B5 (IP00), DR22B8 (IP54).

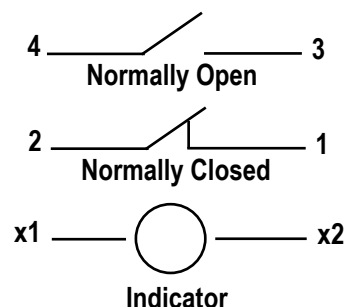
### Short depth

Fuji AR22 pilot devices are designed to occupy less space than traditional 22mm devices.



## Control Circuit Contact Electrical Ratings and Wiring

### Typical Wiring



### NEMA Mechanical Switching Ratings and Test Values for DC Control Circuit Contacts

Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum Make or Break DC Current (A)			Volt amperes
		125 Volts	250 Volts	301 to 600 Volts	
<b>P300</b>	5.0	1.1	0.55	---	138
<b>P600</b>	5.0	1.1	0.55	0.20	138
<b>Q300</b>	2.5	0.55	0.27	---	69
<b>Q600</b>	2.5	0.55	0.27	0.10	69
<b>R300</b>	1.0	0.22	0.11	---	28

This chart is provided as a guideline only, and the ratings and values are not guaranteed to be accurate. It is the users' responsibility to properly size their control circuit devices. The chart values are from NEMA Standard ICS 5-2000, Table 1-4-2.

### NEMA Mechanical Switching Ratings and Test Values for AC Control Circuit Contacts

Contact Rating Designation	Thermal Continuous Test Current (A)	Maximum AC Current, 50/60Hz (A)								Volt amperes	
		120 Volts		240 Volts		480 Volts		600 Volts			
		Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
A300	10	60	6.00	30	3.00	---	---	---	---	7200	720
A600	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B300	5	30	3.00	15	1.50	---	---	---	---	3600	360
B600	5	30	3.00	15	1.50	7.5	0.75	6	0.60	3600	360
C600	2.5	15	1.5	7.5	0.75	3.75	0.375	3.00	0.30	1800	180

This chart is provided as a guideline only, and the ratings and values are not guaranteed to be accurate. It is the users' responsibility to properly size their control circuit devices. The chart values are from NEMA Standard ICS 5-2000, Table 1-4-1.

# Command Series 22mm Pilot Devices Specifications

Specifications (Indoor Use)			
	<b>Pushbuttons</b> <i>Emergency stop pushbuttons</i> <i>Selector switches</i>	<b>Joysticks</b>	<b>Pilot Lights</b>
<b>Rated thermal current (contact block)</b>	A600 / P600	–	–
<b>Mechanical durability</b>	See durability table below	250,000 operations	–
<b>Electrical durability</b>	500,000 operations at 220V AC 6A 1 million operations at 220V AC 3A	100,000 operations at 220V AC 1A (Res. load)	–
<b>Operating frequency</b>	1200 operations/hour (On-load factor: 40%)		–
<b>Operating force (Avg)</b>	9N – Pushbuttons 30-45 N – Emergency stop pushbuttons 0.15 - 0.1 N·m – Selector switches	Less than 100N	
<b>Positive opening operation</b>	All functions incorporating a N.C. contact are positive-opening operation.		
<b>Dielectric strength</b>	2,500VAC, 1 minute (w/o transformer 2000VAC)	2000VAC, 1 minute (Pilot light with transformer: 2500 VAC, 1minute)	
<b>Insulation resistance</b>	100MΩ or more (500VDC megger)		
<b>Rated impulse dielectric strength</b>	6kV	–	6kV
<b>Conditional short-circuit current</b>	1000A		–
<b>Short-circuit protective device</b>	Fuse 15A (recommended, not supplied)	Fuse 1A (recommended, not supplied)	–
<b>Pollution degree</b>	3		
<b>Vibration</b>	Resonance: 10 to 55Hz, double amplitude 0.1 mm* / Constant: 16.7 Hz, double amplitude 3mm		
<b>Shock</b>	Malfunction durability: 100 m/s² ** /	Mechanical durability: 500 m/s²	Mechanical durability: 500 m/s²
<b>Ambient temperature (no condensation or no icing)</b>	-20 to +70°C [-4 to +158°F] Illuminated type: -20 to -50°C [-4 to -58°F]	-5 to +60°C [+23 to +140°F]	-2 to +50°C [-4 to +122°F]
<b>Temperature ratings</b>	Storage: -40 to +80°C [-40 to +176°F]		
<b>Humidity</b>	45 to 85% RH (within -5° to +40°C)		
<b>Degree of protection</b>	IP65		
<b>Initial contact resistance</b>	≤ 50mΩ	–	–
<b>Terminal markings</b>	IEC 60445	–	–
<b>Connections</b>	AWG 18 to AWG 14; Stripping length: 8mm to 11mm / Tightening torque: 0.8 to 1.0 N·m, 7.1 in·lb to 8.8 in·lb		
<b>Contacts operation</b>	Self-cleaning types. Slow action. Positive opening.		
<b>Operation frequency</b>	1,200 cycle/hour (Application ratio 40%)	–	–
<b>Utilization category/contact ratings</b>	AC-15: 24VAC at 6A, 110VAC at 6A DC-13: 24VDC at 4A, 110VDC at 1.3 A	AC-1: 110VAC at 0.3 A DC-13: 24VDC at 0.7 A, 110VDC at 0.15 A	–
<b>Rated insulation voltage</b>	600V AC/DC***	250V AC/DC	250V AC/DC (w/transformer 600VAC)
<b>Materials</b>	Enclosure: Polyamide / Contacts: silver, nickel		
<b>Standards</b>	UL 508, CSA C22.2, No.14, TUV - EN60947-5-1		
<b>Approvals</b>	UL file E44592, CSA file LR20479		

\* Emergency stop type: 10 to 500 Hz, double amplitude 0.7mm(acceleration 50m/s<sup>2</sup>), according to test condition of EN60947-5-5 (1998)

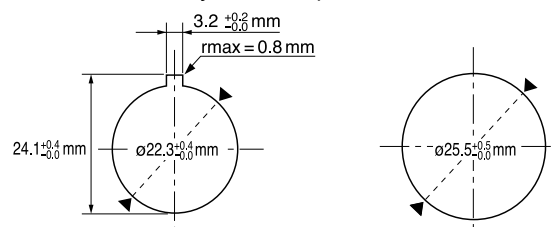
\*\* Emergency stop type: 150 m/s<sup>2</sup> \*\*\*Illuminated type without transformer

Mechanical Durability		
		<b>Operations</b>
<b>Pushbutton switch</b>	Momentary action	5 million
<b>Illuminated pushbutton switch</b>	Alternate action	1 million
<b>E-stop pushbutton switch</b>	Push-lock, turn-reset	100,000
<b>E-stop illuminated pushbutton</b>	Push-lock, pull-reset	30,000
<b>Selector switch</b>	Maintained 1, 2, 3, 4-contact	1 million
	Maintained 5, 6-contact	500,000
	Spring return, spring/manual return	200,000
<b>Illuminated selector switch</b>	Maintained	
	Without transformer 1, 2, 3-contact	1 million
	4-contact	500,000
	With transformer 1, 2-contact	1 million
	3-contact	500,000
	Spring return, spring/manual return	200,000

Note: Key insertion/removal durability for selector switch key types • Key type 10,000

## 22mm Pilot Devices Cutouts

AR22 pilot devices can be mounted in either 22.3 or 25.5 mm diameter holes as shown in the figure below without any extra adapter.



Note: If key washer or legend plate is not used, 3.2 mm-wide location holes do not need to be cut out.