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Control Switches and Signaling Devices

22.5 mm Metal Series

Control Switches and Signaling Devices, 22.5mm Metal Series 292

Non-Illuminated Operators, 22.5mm Metal Series 294

Illuminated Operators, 22.5mm Metal Series 296

Pilot Lights and Lens Assemblies, 22.5mm Metal Series 297

Control Switches and Signaling Devices, 22.5mm Metal Series 298

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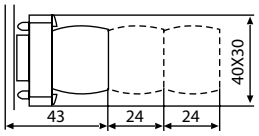
Control Switches and Signaling Devices, 22.5mm Metal Series

This range of 22.5mm metal series pushbuttons, selector switches, illuminated switches and pilot lights have been designed to provide the following features:

- Economy of space
- Self wiping contacts
- RoHS compliant
- Simple to mount (only need a screw driver)
- Mounting method is unaffected by excessive vibration
- Electric shock protection (grounded unit)
- Aesthetically pleasing
- Heavy-duty construction
- Shrouded terminals
- Very good flame resistance
- Use of LEDs for long life

Actuators
The circular actuators have chrome plated metal bezels and are functionally interchangeable on the different contact elements.

Contact elements
The contact elements are double break and have self-wiping contacts. The elements are interchangeable and can be stacked without additional hardware. 1 to 6 elements (NO or NC) can be used for non-illuminated actuators, whereas, 1 to 4 elements (NO or NC) can be used for illuminated actuators. Gold NO or NC contact elements for low voltage, low current, < 25mA, switching applications are available.



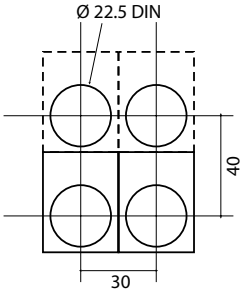
Illuminated pushbuttons and pilot lights
Pilot lights and pushbutton switches are suitable for direct connection through a series resistor, series resistor and diode, using bayonet cap filament bulb type BA9s as follows:

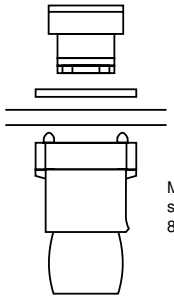
Supply voltage for direct connection without series resistor . . . . 6V - 130V
Supply voltage through series resistor . . . . . 12V - 415V
Supply voltage through resistor and diode . . . . . 230 VAC
Bulb . . . . . Filament, type BA9S with OAL max. 28mm

Pilot lights and illuminated actuators are available with integral LEDs, suitable for operating at various voltages; 6V, 12V, 24V, 30V, 48V, 63.3V, 110V, 125V, 230VAC or DC and 415VAC. Pilot lights and illuminated actuators are available with LED bulbs (bayonet cap, BA9s design with OAL max. 28mm) suitable for operating at various voltages; 24V, 48V, 110V and 230V. On request an extra short circuit protection consisting of built-in fuse in the LED modules can be provided. Pilot lights are available with built -in transformers suitable for operating at 110VAC, 230VAC input and 6V, 12V and 24V output.

Terminals
Contact elements and pilot lights are designed to have shrouded terminals with combination screws.

Mounting
The metal series control devices 22.5mm can be mounted in any position on panels of 1 to 6 mm thickness. We recommend minmum mounting centers of 30mm x 40mm. However, the dimensions and configuration should be decided on the basis of the application. The actuators and the lens assemblies lock on the holding bracket. See assembly details.





Mounting details

Mounting bracket screws torque 8 - 10 in/lbs

Electrical and mechanical characteristics

Environment	
Standards conformity:	CSA - C22.2 No. 14-95, UL508, EN60947-5-1 2000
Approvals:	CSA - C22.2 No. 14-95, UL508, VDE0660
Degree of protection:	IP 65 as per IEC529, NEMA 4X, 12 as per UL50
Ambient temperature:	-25°C to +70°C
Operating position:	All positions

Contact element block

Element screw torque:	3 - 4 in/lbs
Connection screw torque:	5 - 7 in/lbs
Rated insulationvoltage:	500V
Rated thermal current:	10A
Contact operation:	Self wiping, slow break NO or NC
Make and break capacity as per IEC 947-5-(1) 1990:	AC 15 - 4A, 415VAC DC 13 - 0.5A, 110VDC
as per CSA - C22.2 No. 14-95, UL508	A 600 Q 600

Terminal capacity:	Minimum 1 X 0.5mm^2 (20AWG), maximum 2 x 15mm^2 (2x16AWG), or 1 x 2.5mm^2 (1x14AWG)
Terminals marking:	1-2 for NC, 3-4 for NO
Short circuit protection:	10A cartridge fuse, HRC type, rated for resistive loading
Mechanical life:	Over one million operations
Electrical rating:	(one million operating cycles at 3600 cycles per hour, load factor 0.5)

AC15	V	24	120	230
	A	4	3	2

DC13	V	24	110
	A	0.5	0.2

Modules for pilot lights and illuminated switches with integral LED / LED bulb (BA9S cap)
Current consumption (applicatable to all colors)

24VAC/DC, 110VAC and 240VAC:	max. 20mA
110VDC:	max. 15mA
220VDC:	max. 10mA
Service life(at nominial voltage and at ambient temperature):	100,000 hours
Voltage limits (nominal voltage):	±20% of rated voltage
Short circuit protection:	on specific request
Terminal capacity:	min. 1 X 0.5mm^2 (20AWG) max. 2 x 1.5mm^2 (2x16AWG) or 1 x 2.5mm^2 (1x14AWG)

Ordering Information

1. Actuators, illuminated actuators, contact elements, lens assemblies and pilot lights are each ordered separately. For complete assemblies, please contact the factory for specific part numbers

2. Prefix AS2 for all actuators indicates 22.5 metal series

3. The type numbers of contact elements are:

NO	Actuator mounting	S1, S3	Note: S3, S4, S7, and S8 have gold plated contact suitable for low voltage, low current applications <25mA
	Individual mounting	S5, S7	
NC	Actuator mounting	S2, S4	
	Individual mounting	S6, S8	

4. Part number examples:

Actuator	AS2AF3	= flush actuator, green, component only
Pilot light	AS2PLB4	= pilot light without series resistor, red

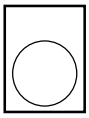
Accessories and spares

Legend plates

Legend plates 30 x 40 mm are supplied with the following standard text:

START	UP	OPEN	AUTO	SLOW	RESET	ON	RIGHT	FORWARD	TRIP
STOP	DOWN	CLOSE	HAND	FAST	INCH	OFF	LEFT	REVERSE	POWER ON

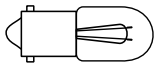
EMERGENCY STOP - legend plate is 60mm yellow with black text



Replacement bulbs

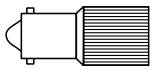
Filament Bulb type ABA9S, OAL 28mm

Voltage:	6	12	24	30	48	60	130
Watts:	1	2	2	2	2	2	2.6



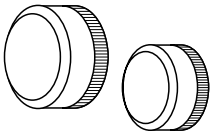
LED bulb type BA9S, OAL 28mm

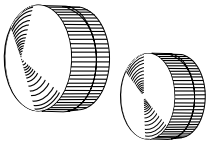
Color:	White	Green	Red	Amber	Blue	Yellow	V	W
P/N:	AMCB9124	AMCB9324	AMCB9424	AMCB9524	AMCB9624	AMCB9824	24	0.5
	AMCB91110	AMCB93110	AMCB94110	AMCB95110	AMCB96110	AMCB98110	110	1.0
	AMCB91230	AMCB93230	AMCB94230	AMCB95230	AMCB96230	AMCB98230	230	1.0



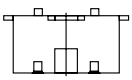
Lenses

Lens color: White	Translucent	Green	Red	Amber	Blue	Clear	Yellow
For pilot lights w/filament bulb	A2PLL1	A2PLL3	A2PLL4	A2PLL5	A2PLL6	A2PLL7	A2PLL8
For illuminated actuators w/filament bulb	A2LAL1	A2LAL3	A2LAL4	A2LAL5	A2LAL6	A2LAL7	A2LAL8
For pilot lights w/ LED	A2PLL1L	A2PLL3L	A2PLL4L	A2PLL5L	A2PLL6L	A2PLL7L	A2PLL8L
For illuminated actuators w/LED	A2LAL1L	A2LAL3L	A2LAL4L	A2LAL5L	A2LAL6L	A2LAL7L	A2LAL8L

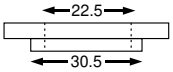




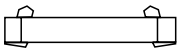
Push Push Mechanism to convert spring return actuator into maintained type
Part number: A2PPM



Adaptor
For mounting 22.5mm devices into 30.5mm cutout
Part number: A2ADP



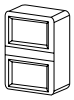
Mounting bracket: A2BRK



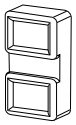
Boots
For flush/projecting illuminated actuator A2ALBT7

For non-illuminated flush actuator A2BT7

For twin actuator A2ATBT7

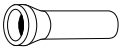


For twin illuminated actuator A2ATLBT7

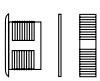


Padlock
Mushroom actuator: A2PAM
Projecting actuator: A2PAP

Bulb extractor: A2BA9SE



Hole plug
22.5mm, black A2BP2



Non-Illuminated Operators, 22.5mm Metal Series

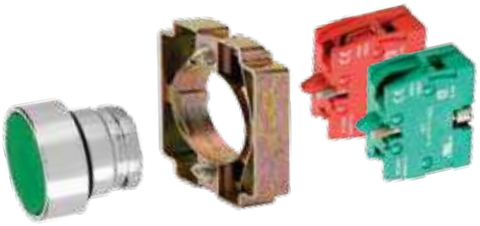
Operator Type

Flush

Flush Booted

Projecting

Mushroom 40mm with Key



Note:
Mounting bracket is included. However see tables 1 & 2 to order contact elements separately.

Airpax device, metal, 22.5mm

A	S	2	A	F	4		

1

Part Type	Code
Component	A

2

Operator Type	Code
Flush	F
Flush - booted	B
Projecting	P
Mushroom - 40mm with key	MLKB
Mushroom - 40mm spring return	M
Mushroom - 40mm push/pull	MPP
Mushroom - 40mm latching w/arrow indicator	ML
Mushroom - 30mm latching w/arrow indicator	MLS
Mushroom - 40mm latching trigger w/arrow indicator	MLT
Mushroom - 40mm latching trigger w/key	MLTKB
Jumbo mushroom - 60mm spring return	MJ
Jumbo mushroom - 60mm push/pull	MJPP
Jumbo mushroom 60mm latching w/arrow indicator	MLJ
Selector w/key*‡	K
Selector*†‡	S
Twin††	T

* Selector available in black only
† If extended selector is required, please select E from decision 4
†† Please select flush or projecting, available in standard green/red color combination
‡ Must select an option from decision 5

3

Operator Color	Code
White	1
Black*	2
Green	3
Red	4
Amber	5
Blue	6
Yellow	8

* Selector is available in black only

4

Options (see note)	Code
Extended (selector actuator only)	E

Note: Except for Selector types, your order number is complete after decision 3. However, if a Selector type is required, please continue with the remaining decisions.

5

Decision 5 is required only when a "Selector" type actuator is selected from decision 2.

Key Selector Functions	Key Removal Left	Key Removal Center	Key Removal Right	Code
Maintained	√		√	2PB
Maintained	√			2PO
Maintained			√	2PI
Spring return	√			2POSR
Maintained	√		√	3PB
Maintained	√	√	√	3PA
Maintained		√		3PC
Spring return		√		3PSR
Spring return		√		3PSRL
Spring return		√		3PSRR
Selector & Extended Selector Functions				**Code**
Maintained				2P
Spring return				2PSR
Maintained				3P
Spring return				3PSR
Spring return				3PSRL
Spring return				3PSRR

See Accessories for marking legend plates. If required, please contact factory for actuator marking.

Mushroom 40mm

Spring Return | Push Pull | Latching w/ Arrow Indicator

Mushroom 30mm Latching with arrow indicator

Mushroom 40mm Latching trigger type

With Arrow Indicator | With Key

Jumbo Mushroom 60mm

Spring Return | Push Pull | Latching w/ Arrow Indicator

Operator Type

Selector with Key | Selector | Extended Selector | Twin

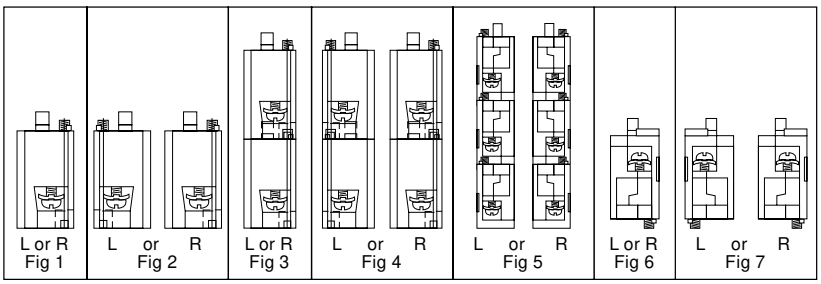
Table 1:

	Contact Element	Actuator Mounting	Panel Mounting	Figure Number	Diagram
Contact Elements	1NO	S1		1	
	1NC	S2		1	
	1NO+1NC	S1+S2		2 or 3	
	2NO	S1+S1		2 or 3	
	2NC	S2+S2		2 or 3	
	2NO+2NC	S1+S1 S2+S2		4	
	3NO+3NC	S1+S1+S1 S2+S2+S2		5	
	1NO	S3 †		1	
	1NC	S4 †		1	
	1NO		S5	6	
	1NC		S6	6	
	1NO+1NC		S5+S5		
	2NO		S5+S5	7	
	2NC		S6+S6	7	
	1NO		S7 †	6	
	1NC		S8 †	6	

† Gold contacts

Note:
Up to six contact elements can be installed on any non-illuminated operator
Up to four contact elements can be installed on any illuminated operator

Table 2: Contact element assembly variations for non-illuminated and illuminated pushbuttons. NO is supplied in green and NC is supplied in red. Order elements with P/N's S1 for (NO), S2 for (NC), S3 for (NO, gold contacts), etc. Contact elements S5, S6, S7 and S8 have the mounting screw reversed (see fig. 6 & 7) for mounting to a back panel or wall and cannot be ordered as part of a complete assembly.



See Accessories for marking legend plates. If required, please contact factory for actuator marking.

Illuminated Operators, 22.5mm Metal Series

Operator Type

Twin

Flush

Projecting

Selector

Bulb Holder Bracket Options

Filament Bulb

Integral LED (RL)

LED Bulb (LB)

Airpax device, metal, 22.5mm

A S 2 A L F 4 R L _ _

1

Part Type	Code
Component	A

2

Illumination Type	Code
Standard Illuminated Device	L
Illuminated Twin††	TL

†† Please select flush or projecting actuator, available with standard amber lens and green/red color combination. If selecting Integral LED or LED Bulb the illumination code must be placed before the operator code. (i.e. AS2ATL5LBF3F4 is twin, LED bulb illuminated, amber lens, flush, green, and flush, red)

3

Option	Code
No resistor	
Limiting resistor	R

4

Operator Type	Code
Flush	F
Projecting	P
Selector	S†

† Not available on twin option

5

Operator Color	Code
White	1
Black	2
Green	3
Red	4
Amber	5
Blue	6
Clear	7
Yellow	8

6

Holder Bracket*	Code
Filament bulb	
Integral LED	RL
LED bulb	LB

* Illuminated devices are supplied with a filament bulb holder unless another option is selected. Filament and LED bulbs must be ordered separately.

7

Decision 7 is required only when a "Selector" type actuator is selected from decision 4.

Selector		Code
Maintained		2P
Spring return		2PSR
Maintained		3P
Spring return		3PSR
Spring return		3PSRL
Spring return		3PSRR

8

Connection (table 3) Select Illumination Voltage (AC/DC)*	12	24	48	110	130	230	415
Filament bulb direct	x	x	x	x	x		
Filament bulb resistor/diode				x	x		
Integral LED**	x	x	x	x		x	x
LED bulb		x		x		x	

* Select one voltage, i.e. 24.
** If voltage is above 110, please indicate AC or DC at end of part number

See Accessories for marking legend plates. If required, please contact factory for actuator marking.

AIRPAX

Pilot Light Type

Pilot Light

Optional bulb holder transformer

Bulb Holder Bracket Options

Filament Bulb | Integral LED (RL) | LED Bulb (LB)

Airpax device, metal, 22.5mm

A S 2 P L B [1] [2] [3] 4 R L [5]

[1]

Part Type	Code
Lens assembly only (omit decision 2 & 5)	PLLA
Complete lamp assembly (lens & lamp holder)	PLB
See decision table below for bulb holder assembly only	

[2]

Option	Code
No resistor	
Limiting resistor	R
Transformer	T

[3]

Operator Color	Code
White	1
Green	3
Red	4
Amber	5
Blue	6
Clear	7
Yellow	8

4

Holder Bracket*	Code
Filament bulb	
Integral LED	RL
LED bulb	LB

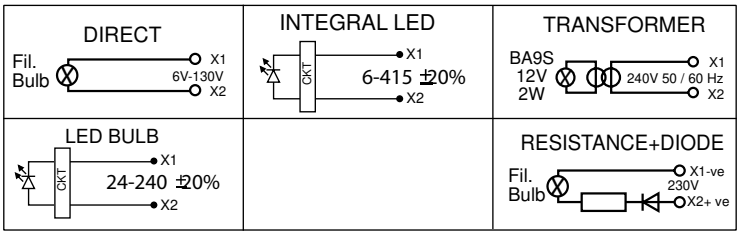
* Illuminated devices are supplied with a filament bulb holder unless another option is selected. Filament and LED bulbs must be ordered separately.

[5]

Connection (table 3)	Select Illumination Voltage (AC/DC)*												
	12	24	48	110	130	230	415	110/6	110/12	110/24	230/6	230/12	230/24
Filament bulb direct	x	x	x	x	x								
Filament bulb resistor/diode				x	x								
Integral LED**	x	x	x	x		x	x						
LED bulb		x		x		x							
Transformer								x	x	x	x	x	x

* Select one voltage, i.e. 24 or 110/12.
** If voltage is above 110, please indicate AC or DC at end of part number

Table 3:



Airpax device, metal, 22.5mm bulb holder assembly ONLY

A S 2 L H B T [1] [2] [3]

[1]

Holder Bracket	Code
Filament bulb	B
LED bulb	LB
Integral LED	RL

[2]

Option	Code
No resistor	
Limiting resistor	R
Transformer	T

[3]

Connection (table 3)	Select Illumination Voltage (AC/DC)*												
	12	24	48	110	130	230	415	110/6	110/12	110/24	230/6	230/12	230/24
Filament bulb direct	x	x	x	x	x								
Filament bulb resistor/diode				x	x								
Integral LED**	x	x	x	x		x	x						
LED bulb		x	x	x		x							
Transformer								x	x	x	x	x	x

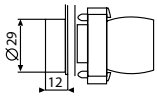
* Select one voltage, i.e. 24 or 110/12.
** If voltage is above 110, please indicate AC or DC at end of part number

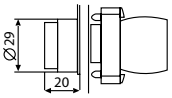
See Accessories for marking legend plates. If required, please contact factory for actuator marking.

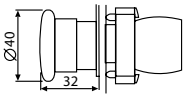
Control Switches and Signaling Devices, 22.5mm Metal Series

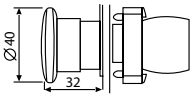
Common order number examples of control and signaling 22.5mm metal devices *(to convert to inches multiply by 0.03937)*

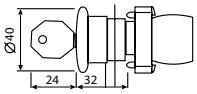
Description	Actuator or lens assembly	Actuator or lens color	Complete assembly order number
Flush pushbutton	AS2AF3 AS2AF8	Green Yellow	
Projecting pushbutton	AS2AP2 AS2AP4	Black Red	
Mushroom pushbutton spring return	AS2AM2 AS2AM4	Black Red	
Mushroom pushbutton latching with arrow	AS2AML2 AS2AML4	Black Red	
Mushroom pushbutton latching with key	AS2AMLKB4	Red	
Selector (2 position) Selector (3 position)	AS2AS22P AS2AS23P	Black Black	
Key Selector (3 position) key removeable in left and right positions	AS2AK23PB	Black	
Selector, illuminated (3 -position) with resistor (24V)	AS2SLR43P24	Red	
Twin pushbutton unmarked flush - projecting	AS2ATF3P4	Flush - Green Projecting -Red	
Twin illuminated pushbutton, marked “I O” flush - flush direct connect up to 130V	AS2ATL3F2F4IO130	Lens - Green Flush - Black Flush - Red	
Pilot light for direct connect up to 130V	AS2PLLA3 AS2PLLA4	Green Red	AS2PLB3130 AS2PLB4130
Pilot light with resistor and diode for 230VAC bulb 130V	AS2PLLA5 AS2PLLA6	Amber Blue	AS2PLBR5230AC AS2PLBR6230AC
Pilot light with transformer for 230V, bulb 24V	AS2PLLA4 AS2PLLA3	Red Green	AS2PLBT4230/24 AS2PLBT3230/24

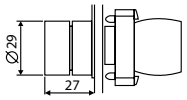


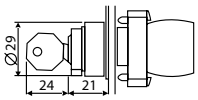


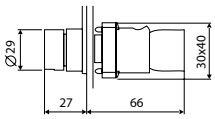


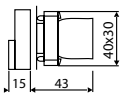


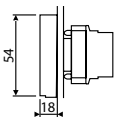


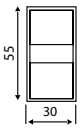


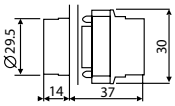


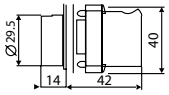


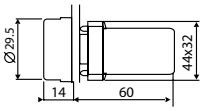












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