



# 1800 SERIES

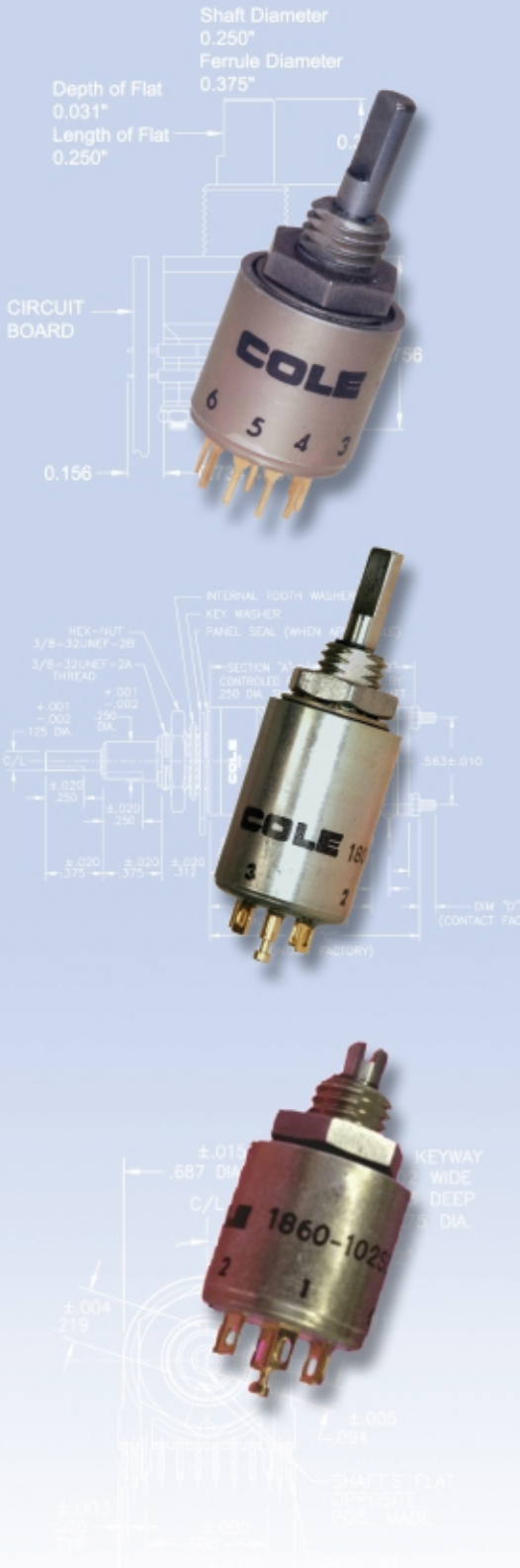
## Half Inch Enclosed Rotary Switches

The ultimate in a one half-inch rotary selector switch, the Cole series 1800 is engineered to meet or exceed applicable MIL-S-3786, style SR20 requirements. A QPL version is also available.

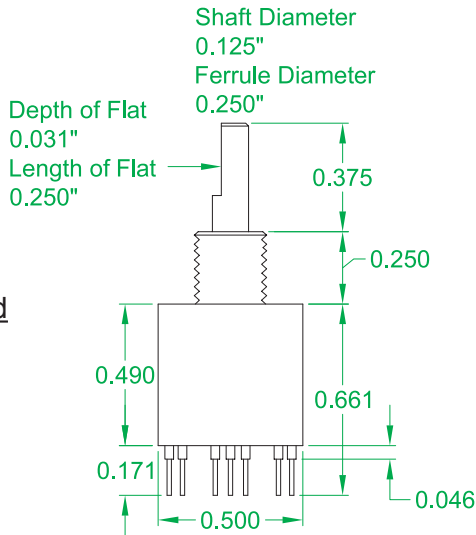
The series 1800 is available with 1 pole, 2-10 positions and 2 pole, 2-5 positions. Available in standard solder lug or PC terminals, the Cole Series 1800, with its unique design, renders the switch resistant to water, contaminants, and most solvents.

The Series 1800 enclosed switch is designed for demanding usage in aircraft, medical and industrial controls and instrumentation, electronic equipment and critical ordnance applications.

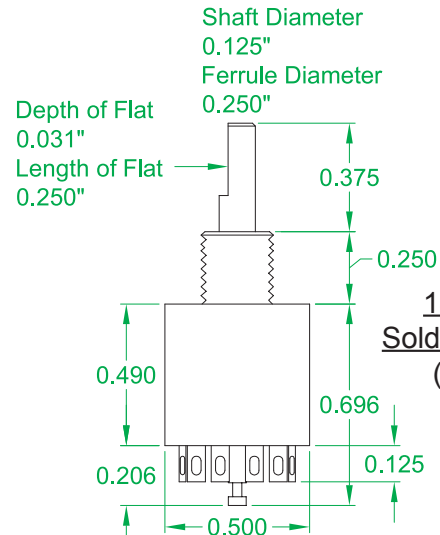
Quality construction, using materials that meet the strictest standards, allows these subminiature switches to combine high current switching capacity with constant low contact resistance. Exceedingly stringent inspection and testing procedures ensure long life and high reliability.



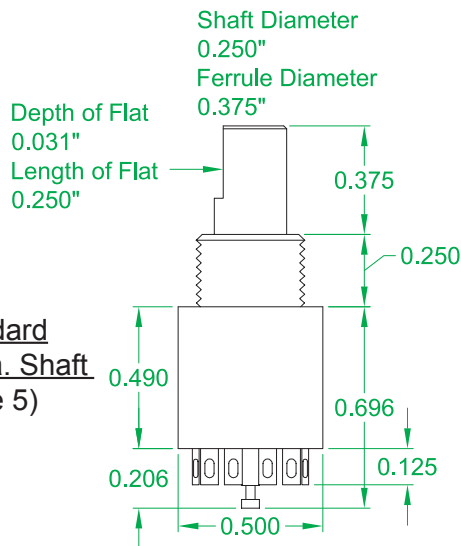
M1800 Standard  
(See Page 18)



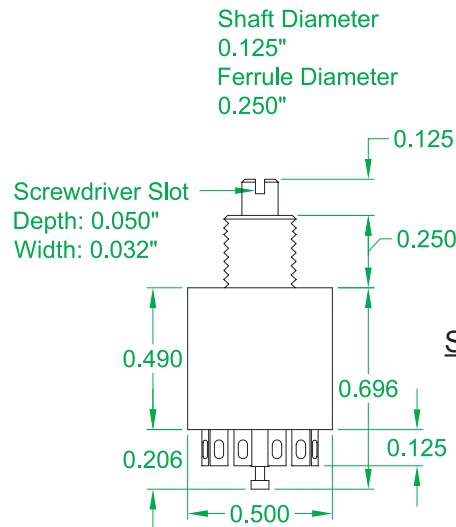
1800 Standard  
Solder Lug Terminals  
(See Page 4)



1800 Standard  
0.250 inch Dia. Shaft  
(See Page 5)



1800 Standard  
Screwdriver Shaft  
(See Page 4)

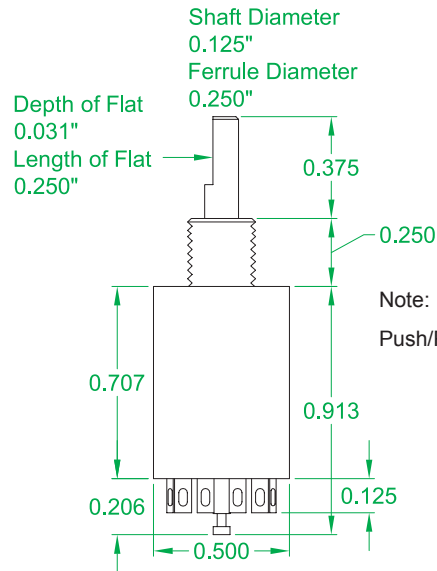
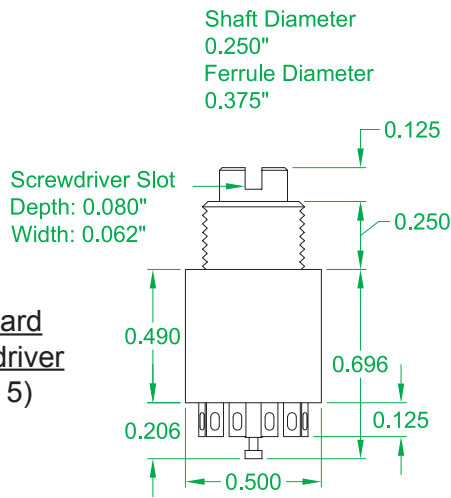


**NOTES:**

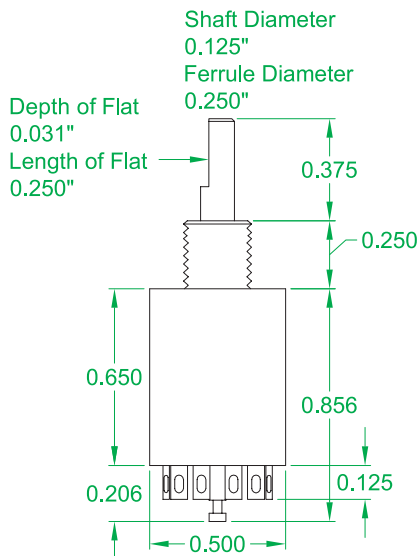
- 1800 Standard, Solder Lug Terminals - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., No Panel Seal, (See Page 4).
- 1800 Standard - 0.250 Shaft - .250 Shaft Dia., .375 Ferrule Dia., .500 Body Dia., Panel Seal, (See Page 5).
- 1800 Standard - Screwdriver Shaft - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., Panel Seal, (See Page 4).
- M1800 Series - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., No Panel Seal, (See Page 18).



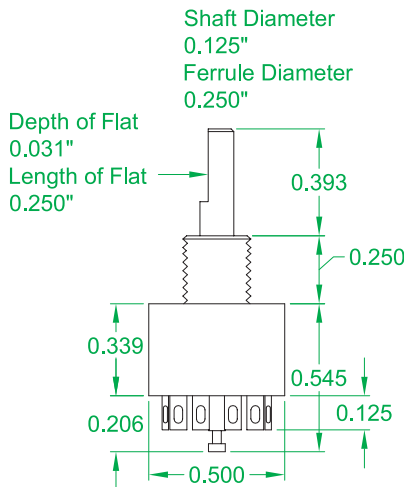
**1800 Standard  
0.250 Screwdriver**  
(See Page 5)



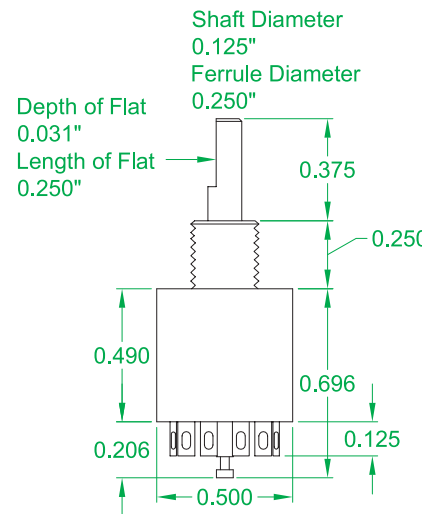
Note:  
Push/Pull Shaft Travel = 0.070 inch  
**1800 Push/Pull**  
(See Page 6)



**1800 - Spring Return**  
(See Page 8)



**1800 Condensed**  
(See Page 14)



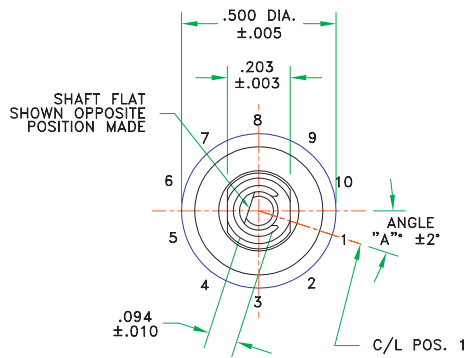
**C1800 Plastic Housing**  
(See Page 15 and 16)

**NOTES:**

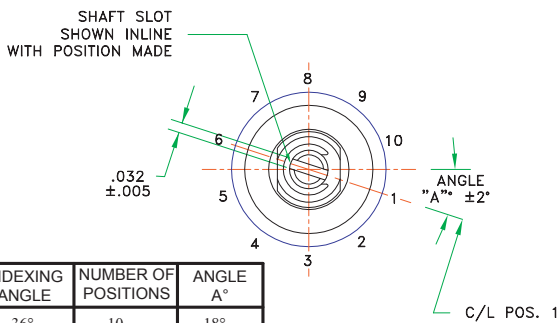
- 1800 Standard - 0.250 Screwdriver - .250 Shaft Dia., .375 Ferrule Dia., .500 Body Dia., No Panel Seal, (See Page 5).
- 1800 Push/Pull - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., No Panel Seal, (See Page 6).
- 1800 Spring Return - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., Panel Seal, (See Page 8).
- 1800 Condensed - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., Panel Seal, (See Page 14).
- C1800 Plastic Housing - .125 Shaft Dia., .250 Ferrule Dia., .500 Body Dia., Panel Seal, (See Page 15 and 16).



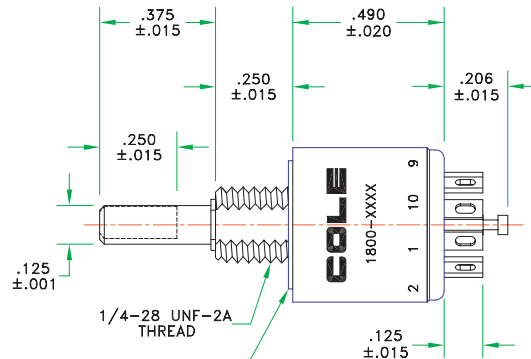
**1800 STANDARD - .125 inch Shaft Diameter**



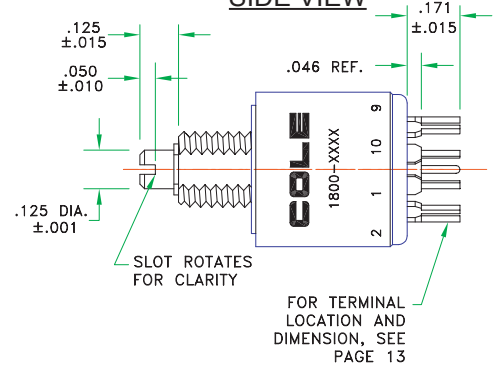
**FRONT VIEW**



INDEXING ANGLE	NUMBER OF POSITIONS	ANGLE A°
36°	10	18°
45°	8	22°30'
60°	6	30°
90°	4	45°

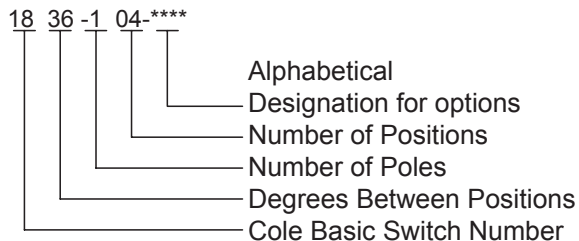


**SIDE VIEW**



**SCREW-DRIVER SHAFT**

**PART NUMBER ORDERING EXAMPLES**



**18 36 -1 04 -CPS**  
is a Part Number for a 1800, 1/8" dia. shaft, 36° indexing, 1 pole per deck, 4 positions per pole, shorting contacts shaft and panel seals, and PC terminals.

**18 45-2 02 -GQ**  
is a Part Number for a 1800, 1/4" dia. shaft, 45° indexing, 2 poles per deck, 2 positions per pole, non-shorting contacts, RFI-EMI shielding, and solder lug terminals.

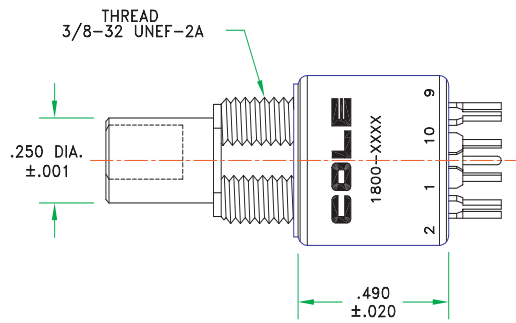
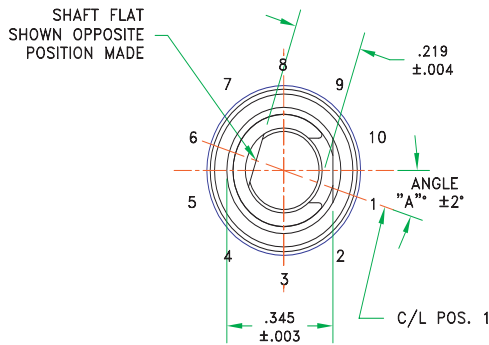
**OPTIONS**

The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number. Options listed in alphabetical order only.

- A = Adjustable stops.
- C = Printed circuit mounting terminals.
- D = Screwdriver shaft.
- F = Fixed stop between the first and last position on a full-turn switch.
- G = RFI-EMI shielding.
- L = Dry circuit (low level).
- P = Panel and shaft seals.
- Q = 1/4" diameter shaft.
- S = Shorting type switch (36° Only)
- T = Pre-tinned terminals.
- Y = Non-turn washer.

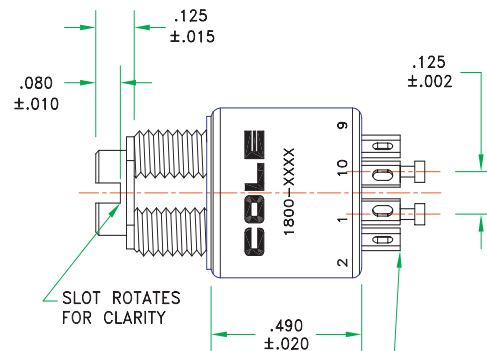
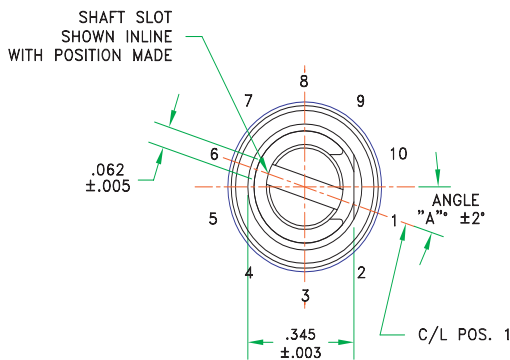


1800 STANDARD - .250 inch Shaft Diameter



FRONT VIEW

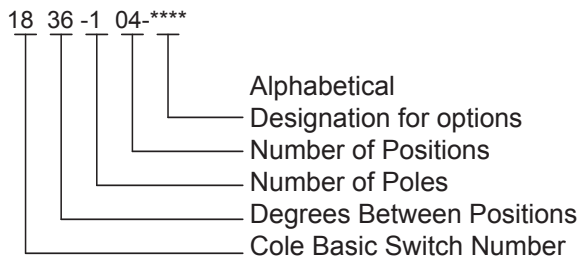
SIDE VIEW



SCREW-DRIVER SHAFT

FOR TERMINAL LOCATION AND DIMENSION, SEE PAGE 13

PART NUMBER ORDERING EXAMPLES



- Alphabetical
- Designation for options
- Number of Positions
- Number of Poles
- Degrees Between Positions
- Cole Basic Switch Number

**18 36 -1 04 -CPS**  
is a Part Number for a 1800, 1/8" dia. shaft, 36° indexing, 1 pole per deck, 4 positions per pole, shorting contacts shaft and panel seals, and PC terminals.

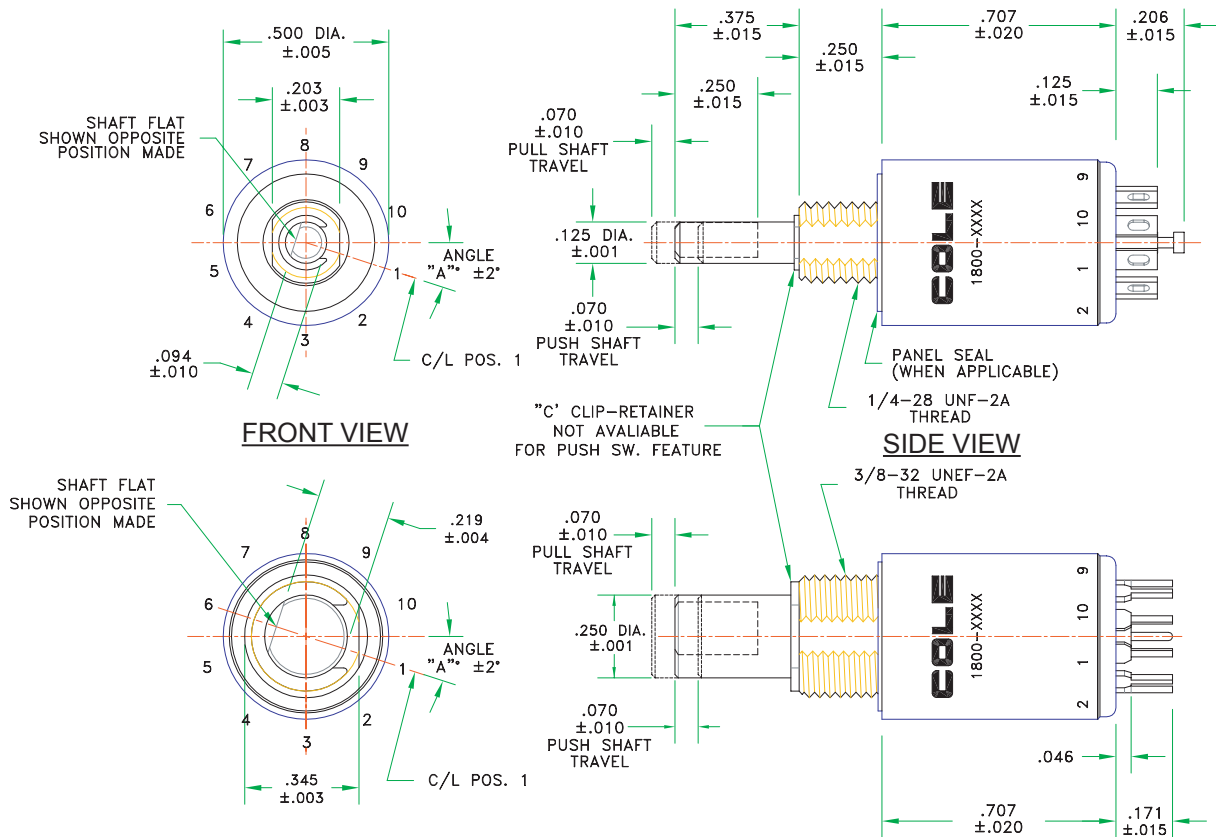
**18 45-2 02 -GQ**  
is a Part Number for a 1800, 1/4" dia. shaft, 45° indexing, 2 poles per deck, 2 positions per pole, non-shorting contacts, RFI-EMI shielding, and solder lug terminals.

OPTIONS

- The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number. Options listed in alphabetical order only.
- A = Adjustable stops.
  - C = Printed circuit mounting terminals.
  - D = Screwdriver shaft.
  - F = Fixed stop between the first and last position on a full-turn switch.
  - G = RFI-EMI shielding.
  - L = Dry circuit (low level).
  - P = Panel and shaft seals.
  - Q = 1/4" diameter shaft.
  - S = Shorting type switch (36° Only)
  - T = Pre-tinned terminals.
  - Y = Non-turn washer.

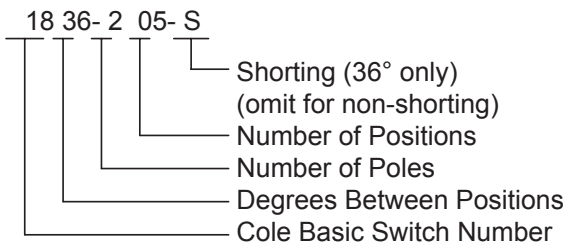


1800 SERIES PULL/PUSH



ORDERING INFORMATION

Begin by identifying the switch using the COLE part numbering system as shown:



Indicate this is a SPECIAL switch to ensure that no error is made when the order is entered.

Sample part number:

SPECIAL  
1836 - 205 - S (See Standard Code, Page 7)  
STOP1PS2PS3PS4 5STOP

This sample part number orders a series 1800 standard style switch, 36° indexing, 2 poles, 5 positions per pole shorting, and push-to turn isolation posts between positions 1-2, 2-3, and 3-4.

Although somewhat long, use of this numbering scheme will prevent error in orders processing. Upon receipt of your order, a special number will be issued unique to this switch. These numbers will not relate to the coding system and will be logged as "special".

The acknowledgment of your order will identify this number. Your specific switch will be the only one identified by this number.

Contact Cole for price.





## 1800 ISOLATED POSITION SWITCH DESCRIPTION

A special feature of rotary switches is available known as “isolated position”. This feature allows switch shaft rotation that requires the user to either pull or push the shaft before it will respond to rotational torque. The user identifies the position or positions affected by the isolation mechanism.

Incorporation of the isolated position feature in COLE’S SERIES 1800 switches will add 0.217 inches to the length.

### SPECIFYING POSITIONS

The Cole System for identifying isolation positions lets you perform the selection by inserting isolation posts next to the positions to be isolated. An 1800 series switch with 36° indexing and continuous rotation is shown below with no isolation position identified in the spaces between the terminals.

10\_1\_2\_3\_4\_5\_6\_7\_8\_9\_10

If you isolate positions 1, 2 and 3, the isolation post insertion points are identified by the letters PL (for actuation by pulling the shaft out), or PS ( for actuation by pushing the shaft in) as shown below:

10PL1PL2PL3PL4 5 6 7 8 9 10

This indicates that you can only get to positions 1, 2 and 3 by pulling on the shaft while all other positions can be achieved with normal rotational torque on the shaft.

if A Push positions 1 and 2 are isolated from all other position but nor from each other:

10PS12PS3 4 5 6 7 8 9 10

In this case you need to push on the shaft to get to position 1 from position 10 as well as position 2 from position 3. However, to get from position 1 to position 2 merely requires rotate the shaft from position 1 to 2 or 2 to 1.

As a special feature, certain positions on the switch can be isolated in unidirectional mode. That means that the positions can be achieved with normal rotation on the shaft, but requires a push or pull action to get to the next position (Ramp-In). Conversely, reaching the isolated position with a push or pull action on the shaft but requiring normal rotation (Ramp-out) for the next position, is also available. Please contact the factory for special features.

### SPECIFYING STOPS

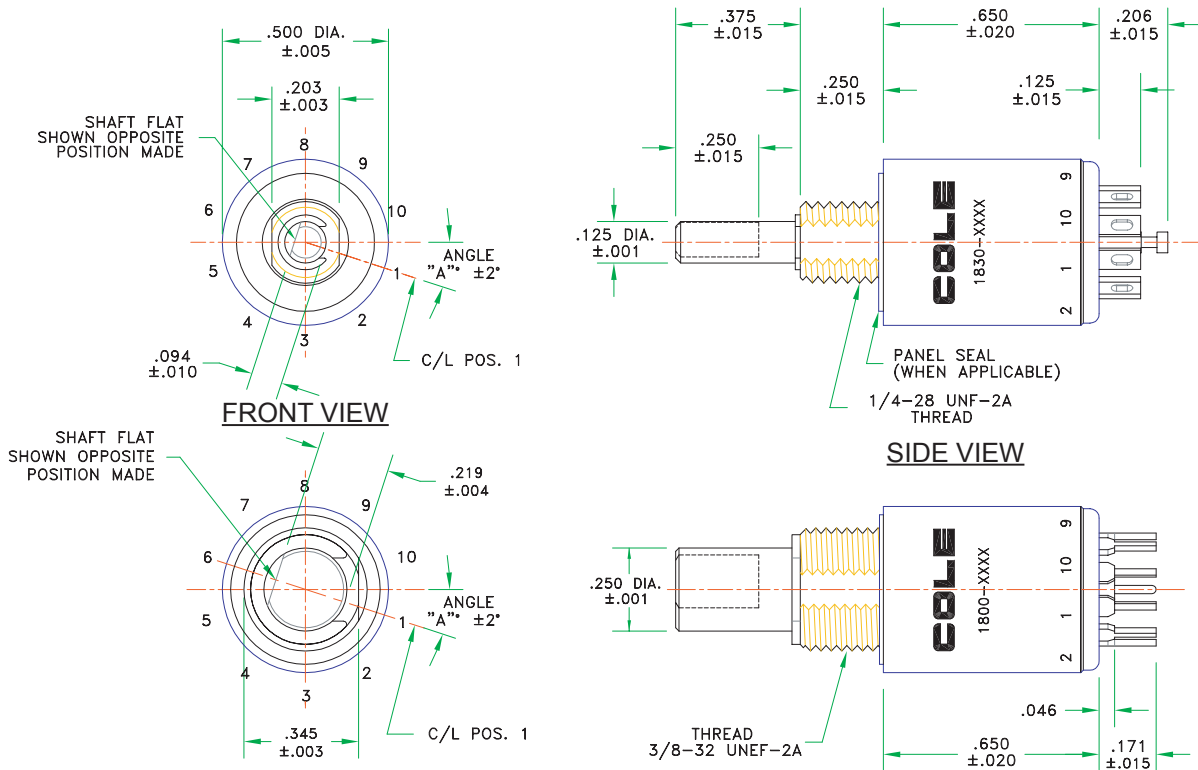
Stops must be incorporated when a switch has multiple poles or specifies less than the numbers of positions available. If a switch with 36° indexing is specified as an 8 position switch with position 1 isolated with push actuation required, the designation would be:

STOP1PS2 3 4 5 6 7 8STOP

Since the stop mechanism is inserted between positions 10 and 1, the isolation post is only required between positions 1 and 2. The stop mechanism inserted between terminals 8 and 9 serves to limit the switch to 8 positions. When stop and isolation mechanism are used in multipole switches, all poles are slaved to the first pole in the case of a 2 pole, 10 position switch with 36° indexing, isolating position 1 will automatically isolate position 6 too. (Refer to the standard switch schematics for 36° indexing switches, page No. 4



1800 SERIES SPRING RETURN



NOTES:

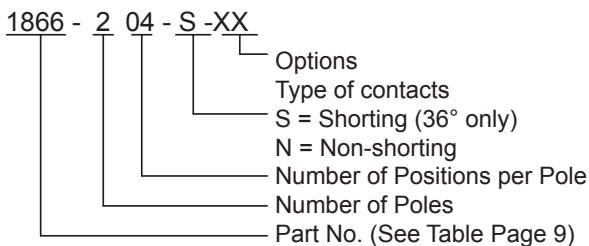
1. Dimensions are in inches.
2. Unless otherwise specified, tolerances are  $\pm 0.005$  and  $\pm 3^\circ$  on angles.
3. Shaft flat opposite position being made.
4. Switches are provided with a full circle of terminals, regardless of the number of activate positions.

DESCRIPTION:

A spring return rotary switch requires that manual torque be maintained at the desired switch position. Releasing the force allows the spring to return the contact to a normal, or detent positions. Arrows in the CONFIGURATIONS AND RESTRICTION TABLE indicate the direction the spring will return the contact so it assumes a normal detent position. The "D" designates a normal detent position. (See Table Page 9).

ORDERING INFORMATION

Create the part number using this example:



This sample part number orders a series 1800 switch with 36° indexing, momentary terminal 4 returning to terminal 3 (9 to 8 is slaved), 2 poles, 4 positions/pole, shorting contacts with options available as shown in the Table Page 9.

OPTIONS

The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number. Options listed in alphabetical order only.

- G = RFI-EMI shielding.
- L = Low level
- P = Panel and shaft seals.
- SD = Screwdriver slot.
- W = Washable.
- Y = Non-turn washer.





1800 SPRING RETURN ROTARY SWITCH DESCRIPTION

A rotary switch with a spring return mechanism allows certain selected positions to have momentary action wherein they can be maintained only with positive force on the shaft. Releasing the shaft will return the switch to its previous position. This feature is available in the COLE SERIES 1800, 1830, and 3600 switches.

Addition of this mechanism to the SERIES 1800 switch adds 0.217 inches to its length; all other dimensions remain unchanged.

The spring return feature in the SERIES 1800 switch is available in those with 36° and 45° angles of throw as a standard.

Custom requirements can be accommodated by contacting the factory.

CONFIGURATIONS AND RESTRICTIONS TABLE

INDEXING	Part No.	Switch Action	No. of poles	Position Per Pole	Terminal Opposite to Flat
36° SPRING RETURN	1860	1->2	1 or 2	2	2
	1861	1<-2	1 or 2	2	1
	1862	1->2D3	1 or 2	3	2
	1863	1D2<-3	1 or 2	3	1
	1864	1->2<-3	1 or 2	3	2
	1865	1->2D3D4	1 or 2	4	2
	1866	1D2D3<-4	1 or 2	4	1
	1867	1->2D3<-4	1 or 2	4	2
	1868	1->2D3D4D5	1 or 2	5	2
	1869	1D2D3D4<-5	1 or 2	5	1
45° SPRING RETURN	1870	1->2D3D4<-5	1 or 2	5	2
	1850	1->2	1 or 2	2	2
	1851	1<-2	1 or 2	2	1
	1852	1->2D3	1 or 2	3	2
	1853	1D2<-3	1 or 2	3	1
	1854	1->2<-3	1 or 2	3	2
	1855	1->2D3D4	1 or 2	4	2
	1856	1D2D3<-4	1 or 2	4	1
1857	1->2D3<-4	1 or 2	4	2	

THE MAXIMUM NUMBER OF POLES PER SWITCH IS 2.

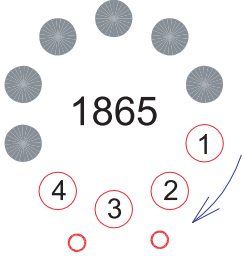
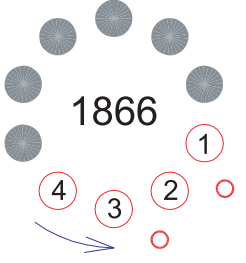
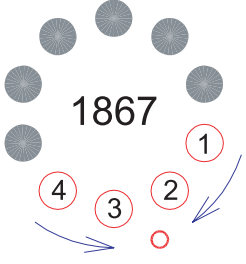
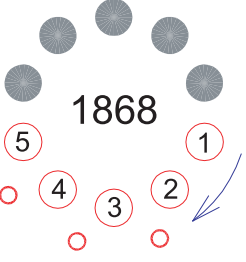
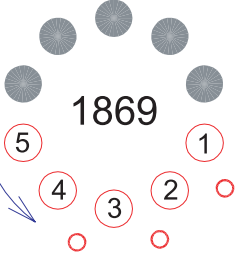
-> DIRECTION OF SPRING RETURN <-

FOR DEFFERENT REQUIREMENTS PLEASE CONTACT THE FACTORY.



Indexing	Part No.	Switch Action	Switch Action Description	No. of Poles	Position per Pole	Lowest Non-Momentary Position
36°	1860		1 → 2	1 or 2	2	2
36°	1861		1 ← 2	1 or 2	2	1
36°	1862		1 → 2D3	1 or 2	3	2
36°	1863		1D2 ← 3	1 or 2	3	1
36°	1864		1 → 2 ← 3	1 or 2	3	2



Indexing	Part No.	Switch Action	Switch Action Description	No. of Poles	Position per Pole	Lowest Non-Momentary Position
36°	1865		1→2D3D4	1 or 2	4	2
36°	1866		1D2D3←4	1 or 2	4	1
36°	1867		1→2D3←4	1 or 2	4	2
36°	1868		1→2D3D4D5	1 or 2	5	2
36°	1869		1D2D3D4←5	1 or 2	5	1



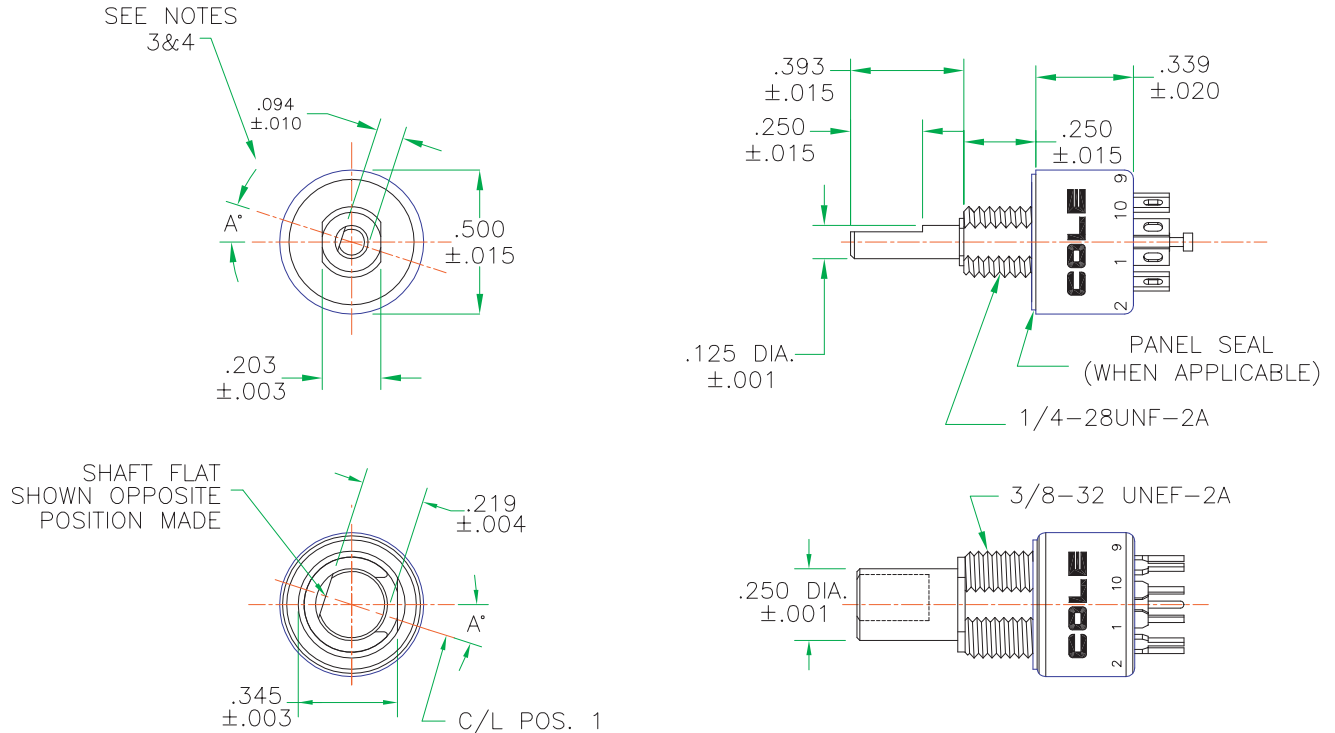
Indexing	Part No.	Switch Action	Switch Action Description	No. of Poles	Position per Pole	Lowest Non-Momentary Position
36°	1870		1→2D3D4←5	1 or 2	5	2
45°	1850		1→2	1 or 2	2	2
45°	1851		1←2	1 or 2	2	1
45°	1852		1→2D3	1 or 2	3	2
45°	1853		1D2←3	1 or 2	3	1



Indexing	Part No.	Switch Action	Switch Action Description	No. of Poles	Position per Pole	Lowest Non-Momentary Position
45°	1854	<p>1854</p>	1→2←3	1 or 2	3	2
45°	1855	<p>1855</p>	1→2D3D4	1 or 2	4	2
45°	1856	<p>1856</p>	1D2D3←4	1 or 2	4	1
45°	1857	<p>1857</p>	1→2D3←4	1 or 2	4	2



**1800 CONDENSED SERIES**

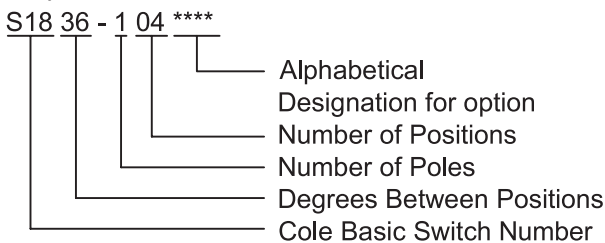


**NOTES:**

1. Dimensions are in inches.
2. Unless otherwise specified, tolerances are  $\pm 0.005$  and  $\pm 3^\circ$  on angles (Non-accumulative).
3. Shaft flat angle A is the angle between a line through the center of the shaft, perpendicular to the mounting bushing flats and another line through the center of the shaft and perpendicular to the shaft flat, with switch in position number 1.
4. Position 1 and terminal 1 coincide.
5. Dimension shown are typical for all angles of throw, unless otherwise specified.
6. Screwdriver actuation - S1800 Series switches can also be supplied with a slotted screwdriver shaft. The shaft dimensions are indicated; all other dimensions remain the same. The slot in the shaft lines up with the point of contact of Pole number one.

**ORDERING INFORMATION**

Sample Code:



The standard Series S1800 is furnished with solder lug terminations, non-shorting and without seals. The standard 10 position switch is continuous rotation.

**OPTIONS**

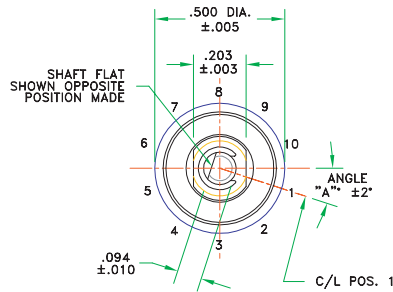
The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number.

- A = Adjustable stops
- C = printed Circuit mounting terminals
- F = Fixed stop between the last and first position on the 10 position switch.
- P = Panel and shaft seals.
- S = Shorting type switch (36° only).
- SD = Screwdriver slot.

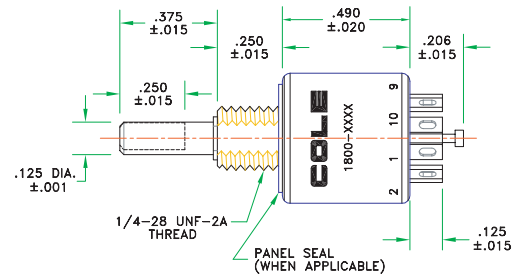
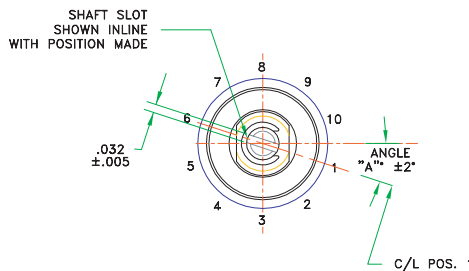




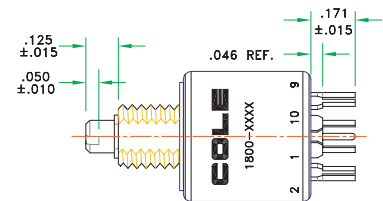
COMMERCIAL  
C1800  
SERIES  
-  
PLASTIC  
HOUSING  
-  
ECONOMICALLY  
PRICED  
-  
.125 DIA.  
SHAFT



FRONT VIEW



SIDE VIEW



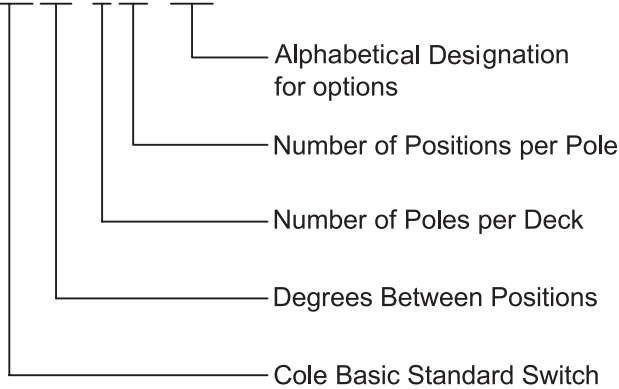
**NOTES:**

1. The switch Body of the C1800 series is Reinforced Thermoplastic.
2. The C1800 series meet the requirements of MIL-S-3786, but has not been qualified.

**ORDERING INFORMATION**

Sample Code

C18 36 - 1 04 - \*\*\*\*



**OPTIONS**

The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number. Options listed in alphabetical order only.

- A = Adjustable stops.
- C = Printed circuit mounting terminals.
- D = Screwdriver shaft.
- F = Fixed stop between the first and last position on a full-turn switch.
- G = RFI-EMI shielding.
- L = Dry circuit (low level).
- M = Stainless steel shaft.
- P = Panel and shaft seals.
- Q = 1/4" diameter shaft.
- S = Shorting type switch (36° only)
- T = Pre-tinned terminals.

**PART NUMBER ORDERING EXAMPLES**

C1836-1 04-CPS

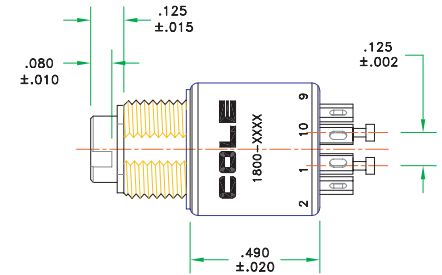
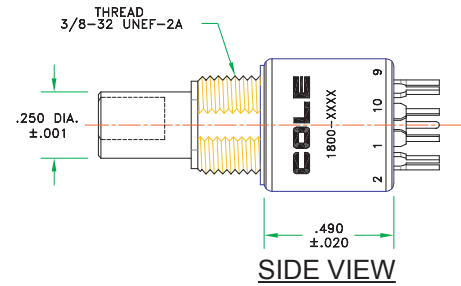
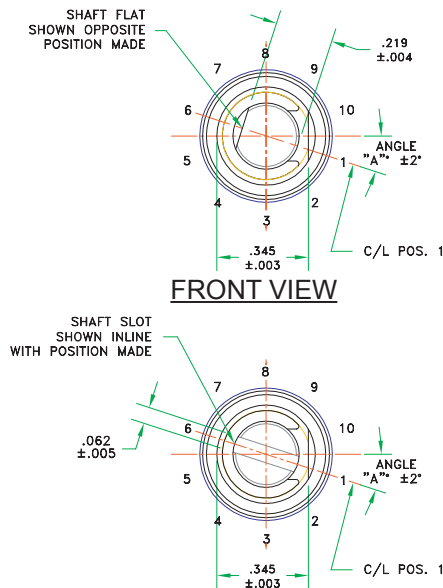
is a Part Number for a C1800, 1/8" dia. shaft, 36° indexing, 1 pole per deck, 4 positions per pole, shorting contacts, shaft and panel seals, and PC terminals.

C1845-2 02-GQ

is a Part Number for a C1800, 1/4" dia. shaft, 45° indexing, 2 poles per deck, 2 positions per pole, non-shorting contacts, RFI-EMI shielding, and solder lug terminals.



COMMERCIAL  
C1800  
SERIES  
-  
PLASTIC  
HOUSING  
-  
ECONOMICALLY  
PRICED  
-  
.250 DIA.  
SHAFT



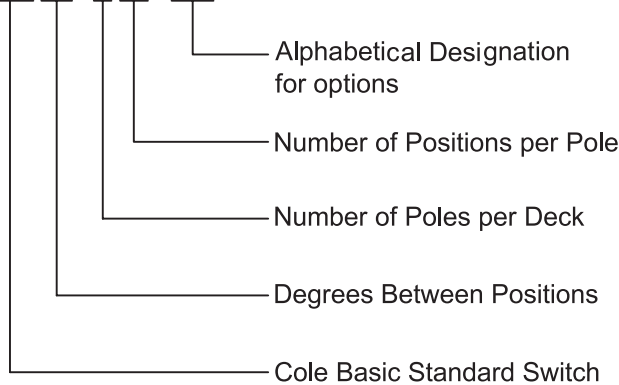
**NOTES:**

1. The switch Body of the C1800 series is Reinforced Thermoplastic.
2. The C1800 series meet the requirements of MIL-S-3786, but has not been qualified.

**ORDERING INFORMATION**

Sample Code

C18 36 -1 04 - \*\*\*\*



**OPTIONS**

The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number. Options listed in alphabetical order only.

- A = Adjustable stops.
- C = Printed circuit mounting terminals.
- D = Screwdriver shaft.
- F = Fixed stop between the first and last position on a full-turn switch
- G = RFI-EMI shielding.
- L = Dry circuit (low level).
- M = Stainless steel shaft.
- P = Panel and shaft seals.
- Q = 1/4" diameter shaft.
- S = Shorting type switch (36° only)
- T = Pre-tinned terminals.

**PART NUMBER ORDERING EXAMPLES**

C1836-1 04-CPS

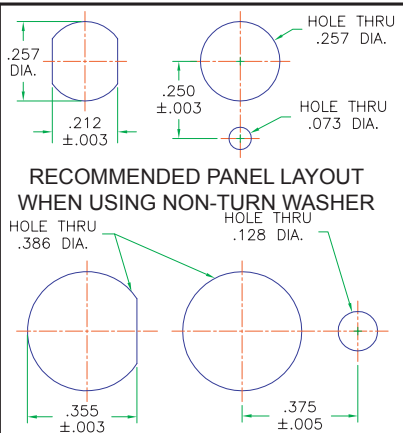
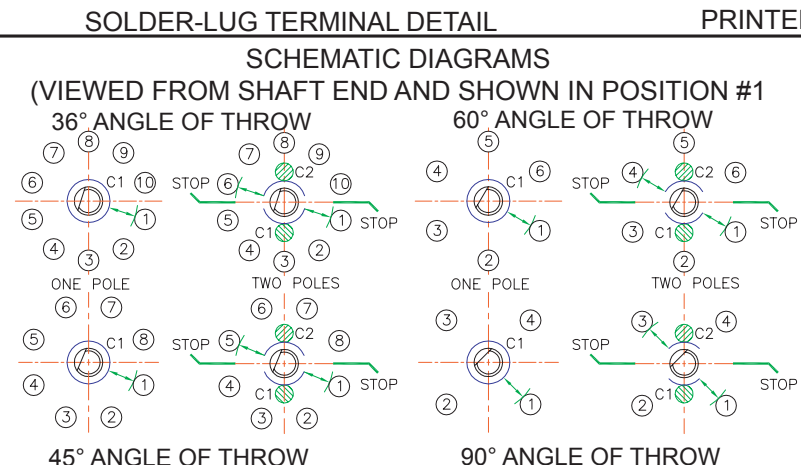
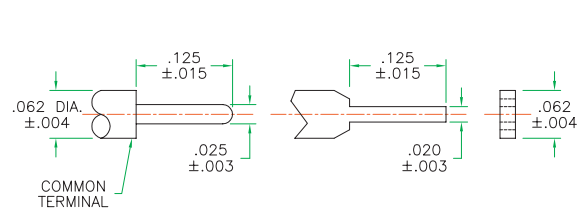
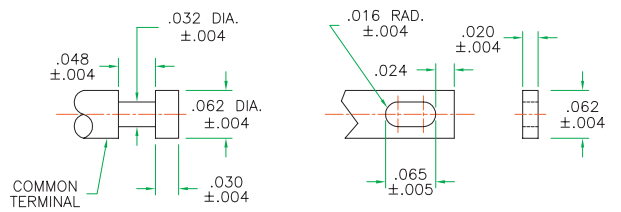
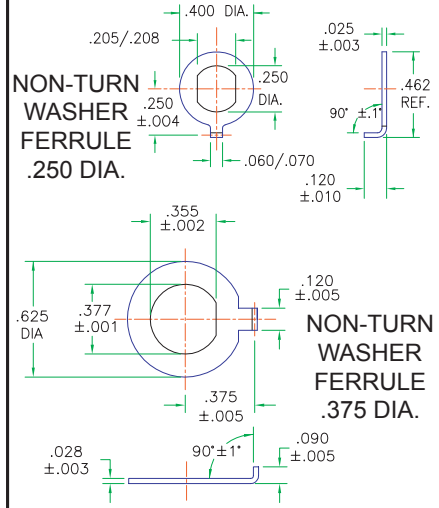
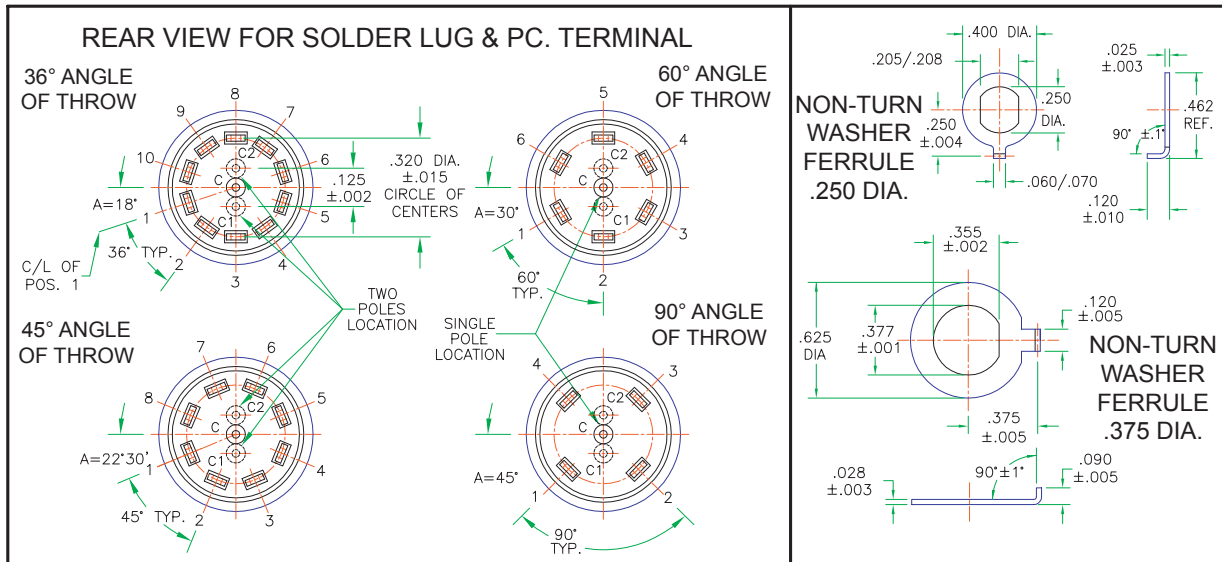
is a Part Number for a C1800, 1/8" dia. shaft, 36° indexing, 1 pole per deck, 4 positions per pole, shorting contacts, shaft and panel seals, and PC terminals.

C1845-2 02-GQ

is a Part Number for a C1800, 1/4" dia. shaft, 45° indexing, 2 poles per deck, 2 positions per pole, non-shorting contacts, RFI-EMI shielding, and solder lug terminals.



**1800 SERIES TYPICAL FEATURES**



- NOTES:**
1. Dimensions are in inches.
  2. Unless otherwise specified, tolerances are ±0.010 and ±3° on angles (Non-accumulative).
  3. Position 1 and Terminal 1 coincide.
  4. Dimension shown are typical for all angles of throw, unless otherwise specified.
  5. The screwdriver slot in the shaft lines up with the point of contact of position made.
  6. The standard C1800 is furnished with 1/8" diameter brass shaft, solder lug termination, non-shorting contact (break before make), without seal, and continuous rotation (no stops) for full-turn switches.

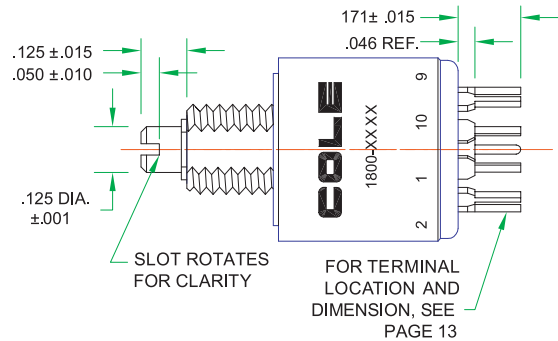
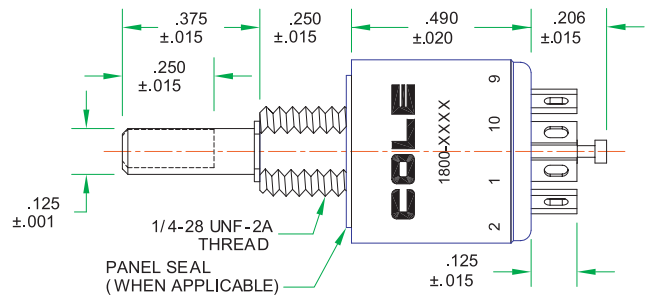
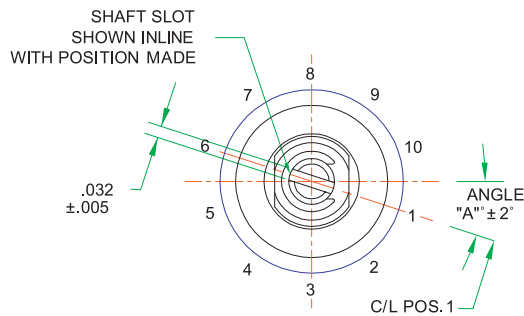
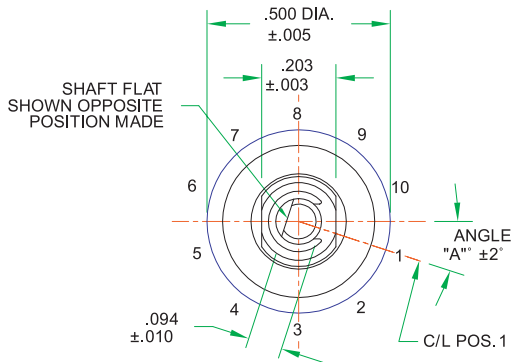


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PHONE 714.556.3100 SALES FAX 714.241.9061 www.cole-switches.com

ISO9001 CERTIFIED

MILITARY QUALIFIED M1800 SERIES



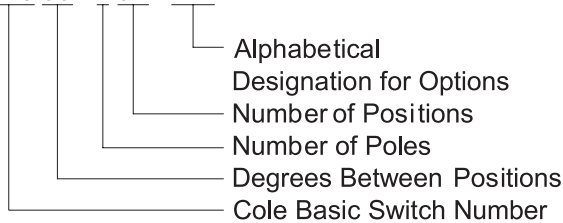
INDEX ANGLE	Number of Positions	A° ±1°
30°	10	18°
45°	8	22°30'
60°	6	30°
90°	4	45°

SCREW-DRIVER SHAFT

ORDERING INFORMATION

Sample Code

M18 36 - 1 04 - \*\*\*\*



M1836-104-CPS

Switch shown in the example code is M1800, 1/8" dia. shaft, 36° indexing, 1 pole per deck, 4 positions per pole, shorting contact, shaft and panel seals, and PC terminals

OPTIONS

The following options can be added to the standard switch. When ordering, simply add the letters after the basic part number. Options listed in alphabetical order only.

- A = Adjustable stops.
- C = Printed circuit mounting terminals.
- D = Screwdriver shaft.
- F = Fixed stop between the first and last position on a full-turn switch.
- G = RFI-EMI shielding.
- L = Dry circuit (low level).
- P = Panel and shaft seals.
- Q = 1/4" diameter shaft.
- S = Shorting type switch (36° Only)
- T = Pre-tinned terminals.
- Y = Non-turn washer.



## Series 1800 Technical Data

Specification	Unit	Value	Note:
Military Specifications		MIL-S-3786 Style SR20	
Continuous (Non-Switching) Current Carrying Capacity	Amps	6	at 28 VDC, with max. contact temperature rise of 20°C
Switching Current Capacity at 28 VDC resistive	Amps	0.200	at Atmospheric pressure with 85°C and at reduced Barometric pressure with 25°C
Switching Current Capacity at 115 VAC resistive	Amps	0.150	
Switching Current Capacity at 28 VDC inductive (2.8 H.)	Amps	0.030	
Switching Current Capacity at 28 VDC Lamp Load	Amps	0.100	
Low Level max. capacity	mA	10	at 30 millivolts DC max.
Dielectric Strength, min.	VRMS	600	
Contact resistance, max. (initial)	milliohms (mΩ)	10	
Contact resistance, max. (after life)	milliohms (mΩ)	20	
Insulation resistance, min. (initial)	megaohms (MΩ)	50,000	at 100 VDC
Insulation resistance, min. (after life)	megaohms (MΩ)	25,000	at 100 VDC
Switching Life	cycles	25,000	at rated loads, sea-level, 25°C, 68% relative humidity
Mechanical Life	cycles	25,000	
Rotational Torque, min.	inch ounces	8	
Rotational Torque, max.	inch ounces	24	
Stop Strength, max.	inch pounds	7.5	
Mounting Ferrule Strength	inch pounds	15	
Withstanding Shaft Push Force	pounds	100	
Weight	grams	13	
Molded Parts		thermoplastic	
Contact Surfaces		Gold plated	
Altitude	feet	70,000	typical pressure at 70,000 feet: 0.64 psi
Temperature, min.	degrees Celsius	-65	
Temperature, max.	degrees Celsius	85	
Vibration Tested		Meets	Per MIL-S-3786, MIL-STD-202, Method 204, test condition "B", vibration grade 3
Impact Shock, Medium		Meets	MIL-STD 202; Method 213
Impact Shock, High		Meets	at 100g, MIL-STD 202, Method 207
Moisture Resistant		Meets	MIL-STD 202; Method 106
Salt Spray Resistant		Meets	MIL-STD 202, Method 101, Condition "B"
Explosion Proof		Meets	MIL-STD 202, Method 109
Immersion		Meets	3 feet water, MIL-STD-202, method 104, test condition C
EMI/RFI		Meets	MIL-S-3786, 2 ohms Shaft to ground max.

