

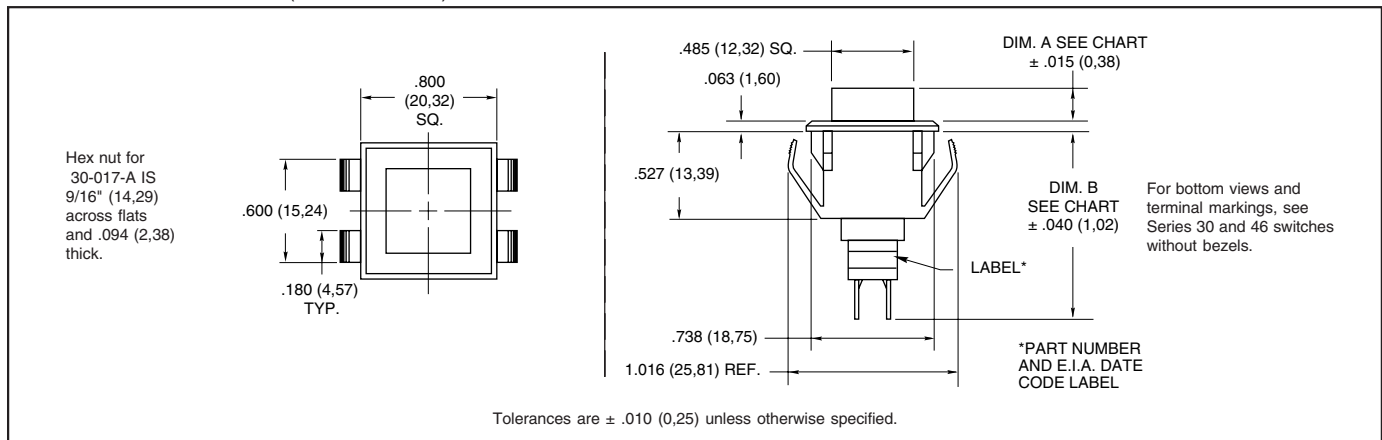
SERIES 30 and 46 Snap-in Panel Mount

FEATURES

- Sleek Black Matte Bezel
- Convenient Snap-In Front Mount
- Choice of 6 Button Colors
- SPST, SPDT or DPDT Circuitry
- Alternate Action, Positive Feel and Overtravel Versions
- Printed Button Option

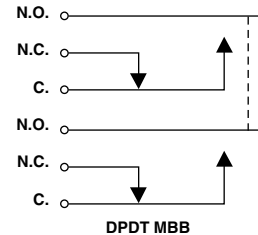
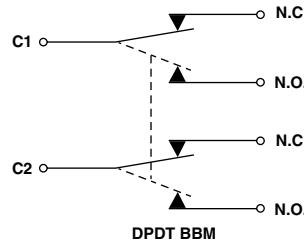
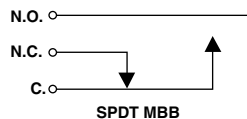
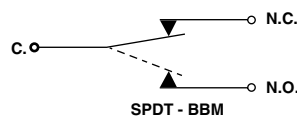


DIMENSIONS In Inches (and millimeters)



CIRCUITRY

Switches have momentary action unless otherwise indicated in the chart below.



ADDITIONAL DIMENSIONS AND PART NUMBERS

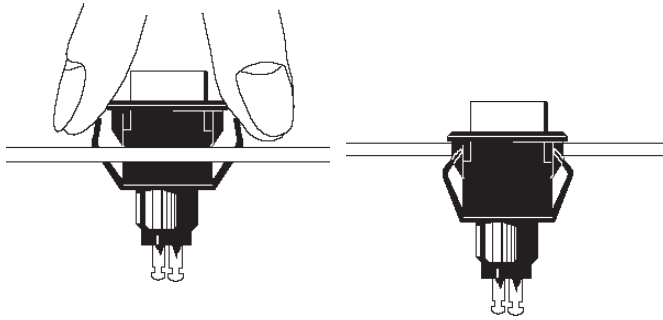
Circuitry and Features	Dim. A: Button Height (± .015)	Dim. B: Behind Panel Length (± .040)	Total Travel	Actuating Force	Partial Part No.*
Butt Contact Switches - Series 30					
SPST-N.O.	.205 (5,21)	1.119 (28,42)	.062 ± .010 (1,57 ± 0,25)	10 ± 4 oz.	30-001-A*
SPST-N.O., Overtravel	.205 (5,21)	1.204 (30,58)	.125 ± .020 (3,18 ± 0,51)	8 ± 4 oz.	30-015-A*
SPST-N.O., Overtravel & Positive Feel	Adjustable**	Adjustable**	.156 ± .015 (3,96 ± 0,38)	18 ± 4 oz.	30-017-A*
SPST-N.O., Economical	.205 (5,21)	1.119 (28,42)	.062 ± .010 (1,57 ± 0,25)	10 ± 4 oz.	30-601-A*
SPST-N.C.	.205 (5,21)	1.132 (28,75)	.065 ± .015 (1,65 ± 0,38)	8 ± 4 oz.	30-002-A*
Wiping Contact Switches - Series 46					
SPDT, BBM	.205 (5,21)	1.417 (35,99)	.180 (4,57) min.	1.1 ± .25 lbs.	46-102-A*
SPDT, MBB	.205 (5,21)	1.417 (35,99)	.180 (4,57) min.	1.1 ± .25 lbs.	46-111-A*
SPDT, BBM, Alternate Action	.293 (7,44)	1.448 (36,78)	.180 (4,57) min.	1.5 ± .25 lbs.	46-502-A*
DPDT, BBM	.205 (5,21)	1.448 (36,78)	.180 (4,57) min.	2.2 ± .5 lbs.	46-200-A*
DPDT, MBB	.205 (5,21)	1.448 (36,78)	.180 (4,57) min.	2.2 ± .5 lbs.	46-201-A*
DPDT, BBM, Alternate Action	.293 (7,44)	1.448 (36,78)	.180 (4,57) min.	1.8 ± .5 lbs.	46-402-A*

*Partial part number, complete part number by adding a dash for button color: white -01; red -03; green -04; blue -05; yellow -06 or black -07, see Ordering Information.

**Adjustable from Dim. A .170 (4,32) minimum, Dim. B 1.285 (32,64) maximum to Dim. A .290 (7,37) maximum, Dim. B 1.165 (29,59) minimum with hex nut below bezel.

MOUNTING

Easy Snap-In Mounting



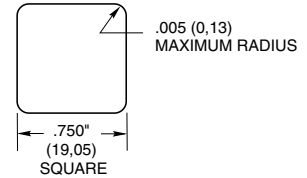
Just snap into pre-cut panel hole.

Plastic wings lock switch in place.

PANEL CUTOUT

Recommended Panel Cut

Switch will fit panels .049" (1,24) to .125" (3,18) thick. Recommended panel thickness is 18 gauge.



SPECIFICATIONS

Life Limiting Criteria—Series 30 & 46

Contact Resistance: Less than 25 milliohms on a new switch

Voltage Breakdown: 1,000 Vac between mutually insulated parts

Insulation Resistance: 1,000 megohms minimum

Ratings—Series 30

Current Rating:

30-601 150 mA, 5 Vdc resistive and 20 mA, 20 Vdc resistive

All others 1 A, 115 Vac resistive, or 0.5 A, 220 Vac resistive

Life Expectancy:

30-015 500,000 operations

30-017 200,000 operations

All others 1,000,000 operations

Ratings—Series 46

Current Rating: 250 mA, 115 Vac resistive or 125 mA, 220 Vac resistive

Life Expectancy: 250,000 operations

Materials and Finishes—Series 30

Bezel: Nylon

Button Cap: ABS plastic

Switch Bushing: Brass, tin zinc

Base: Thermoset plastic

Spring: Tinned music wire

Plunger: Polycarbonate

Shorting Bar:

30-601 Brass, gold-plated over nickel

All Others Brass with fine silver contact area

Base Contacts:

30-601 Brass, gold-plated over nickel

30-002 Brass with fine silver contact area

All Others Bronze with fine silver contact area

Terminals:

30-002 Brass, silver-plated

30-601 Bronze, gold-plated over nickel

All Others Bronze, silver-plated

Nut: Provided only on 30-017; allows button height adjustment. Brass, zinc trivalent chromate-plated.

Materials and Finishes—Series 46

Bezel: Nylon

Button Cap: ABS plastic

Switch Bushing: Brass, zinc trivalent chromate-plated.

Base: Thermoset plastic

Spring: Tinned music wire

Plunger: 46-402/502 Nickel-plated brass

All Others Polycarbonate

Shorting Bar: Phosphor bronze, silver-plated

Base Contacts: Phosphor bronze with silver contact area

Terminals: Phosphor bronze, tin/silver plating

Covers (46-200/201): Brass, zinc trivalent chromate-plated

STANDARD OPTIONS

Epoxy-sealed terminals and wire leads, see page E-35.

LEGENDING OPTION

Contact Grayhill

A button legend can be printed in epoxy ink which bonds to the surface of the button cap. Any type style or design which can be photographed can be used to produce the legend.

There is a per-button printing charge. A nominal set up charge per legend applies to orders of 1 to 99 pieces. Non-standard legends are subject to one time artwork and tooling charges. Consult Grayhill for help with actual legend.

ORDERING INFORMATION

Use the partial part number you have selected from the Dimensions and Part Number chart, and add the button color suffix. Example:

46-200-A-03 Color: 01, 03, 04, 05, 06, 07

01 = White 03 = Red 04 = Green
05 = Blue 06 = Yellow 07 = Black

SERIES 30 and 46
Decorator Line

FEATURES

- Attractive Front Panel Bezels (6 choices)
- Space-Saving: Only 5/8" Diameter (SPST & SPDT) and 3/4" Diameter (DPDT) Round Bezels
- SPST with Option of Positive Feel
- SPDT, DPDT with Momentary Contact or Alternate Action
- Sturdy Metal Sleeve or Bushing and Nut Provide Secure Mounting
- UL Recognized Version



DIMENSIONS In Inches (and millimeters)

SPST—Normally Open
30-05-01-502-*
30-05-04-502-*

B = .375 ± .010 (9,53 ± 0,25) DIA.
C = .625 ± .005 (15,88 ± 0,13) DIA.
D = .255 ± .032 (6,48 ± 0,81) DIA.
E = .093 ± .010 (2,36 ± 0,25) DIA.
F = .355 ± .015 (9,02 ± 0,38) DIA.
G = .220 ± .025 (5,59 ± 0,64) DIA.

DIM A ± .020 (0,51) (SEE CHART)

1/2-32 UN-2A THREAD
INSULATING BARRIER

*PART NUMBER AND E.I.A. DATE CODE LABEL

Feature	Partial Part No.	Dim. A
Momentary	30-05-01-502-*	.710 (18,03)
Pos. Feel	30-05-04-502-*	.910 (23,11)

SPDT—Break Before Make
46-05-05-502-*
46-05-07-502-*

B = .375 ± .010 (9,53 ± 0,25) DIA.
C = .625 ± .005 (15,88 ± 0,13) DIA.
D = .255 ± .032 (6,48 ± 0,81) DIA.
E = .093 ± .010 (2,36 ± 0,25) DIA.
F = .355 ± .015 (9,02 ± 0,38) DIA.
G = .150 ± .010 (3,81 ± 0,25) DIA.

DIM A ± .015 (0,38) (SEE CHART)

1/2-32 UN-2A THREAD
INSULATING BARRIER

*PART NUMBER AND E.I.A. DATE CODE LABEL

Terminals are marked on switch.

Feature	Partial Part No.	Dim. A
Momentary	46-05-05-502-*	.992 (25,20)
Alt. Action	46-05-07-502-*	1.278 (32,46)

DPDT—Break Before Make
46-05-08-502-* (UL)**
46-05-09-502-*

B = .375 ± .010 (9,35 ± 0,25) DIA.
C = .750 ± .005 (19,05 ± 0,13) DIA.
D = .255 ± .032 (6,48 ± 0,81) DIA.
F = SEE CHART ± .015 (0,38)
E = .093 ± .010 (2,36 ± 0,25) DIA.
G = .150 ± .010 (3,81 ± 0,25) DIA.

DIM A ± .015 (0,38) (SEE CHART)

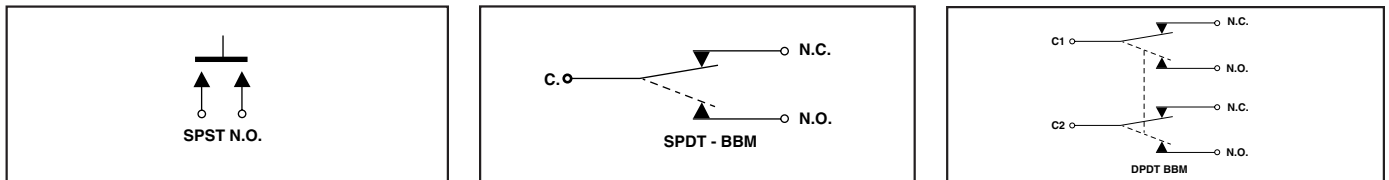
5/8-32 UN-2A THREAD
INSULATING BARRIER

*PART NUMBER AND E.I.A. DATE CODE LABEL

Terminals are marked on switch.

Feature	Partial Part No.	Dim. A	Dim. F
Momentary	46-05-08-502-*	1.001 (25,43)	.314 (7,98)
Alt. Action	46-05-09-502-*	1.130 (28,70)	.355 (9,02)

CIRCUITRY



RECOMMENDED PANEL CUTOUT AND MOUNTING HARDWARE

SPST AND SPDT VERSION

.440 (11,17) MIN. ACROSS FLATS

.516 (13,10) MIN. DIA.

DPDT VERSION

.565 (14,35) MIN. ACROSS FLATS

.641 (16,28) MIN. DIA.

Mounting Hardware

For 46-05-08-502 & 46-05-09-502:
One internal tooth lockwasher
One knurled ring nut .765 ± .010 (19,43 ± 0,25) Dia.
.094 ± .010 (2,39 ± 0,25) Thk.

For SPST & SPDT switches
One internal tooth lockwasher
One knurled ring nut .640 ± .010 (16,26 ± 0,25) Dia.
.094 ± .010 (2,39 ± 0,25) Thk.

*Partial part number; complete part number by adding a dash for button color: white -01; red -03; green -04; blue -05; yellow -06 or black -07, see Ordering Information.
** Contact Grayhill for part number.

SERIES 30 and 46 Decorator Line

FEATURES

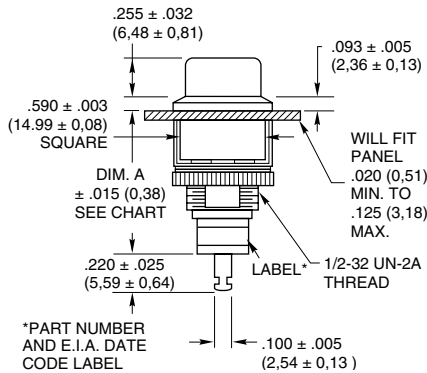
- Attractive Front Panel Bezels (6 choices)
- Space-Saving: Only 11/16" Square
- SPST with Option of Positive Feel
- SPDT, DPDT with Momentary Contact or Alternate Action
- Sturdy Metal Sleeve or Bushing and Nut Provide Secure Mounting



DIMENSIONS In Inches (and millimeters)

SPST—Normally Open

30-01-01-500-*
30-01-04-500-*

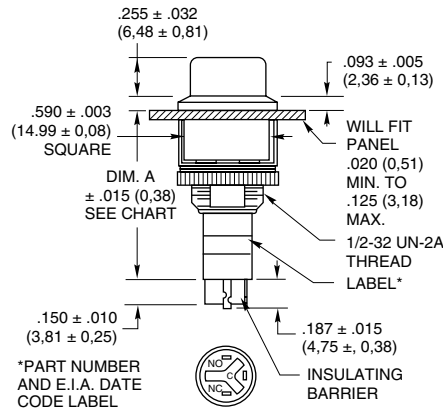


*PART NUMBER AND E.I.A. DATE CODE LABEL

Feature	Partial Part No.	Dim. A
Momentary	30-01-01-500-*	.880 (22,35)
Pos. Feel	30-01-04-500-*	1.037 (26,34)

SPDT—Break Before Make

46-01-05-500-*
46-01-07-500-*



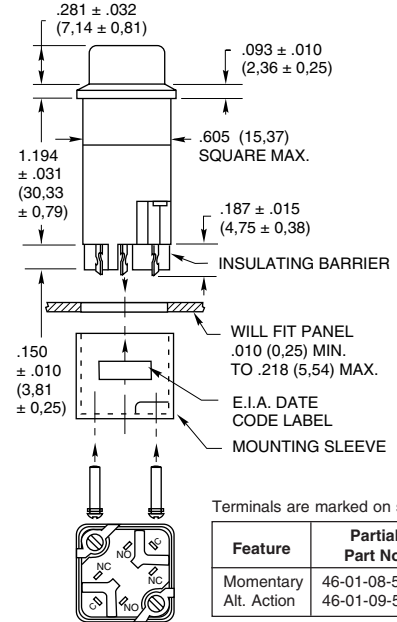
*PART NUMBER AND E.I.A. DATE CODE LABEL

Terminals are marked on switch.

Feature	Partial Part No.	Dim. A
Momentary	46-01-05-500-*	1.174 (29,82)
Alt. Action	46-01-07-500-*	1.264 (32,11)

DPDT—Break Before Make

46-01-08-500-*
46-01-09-500-*

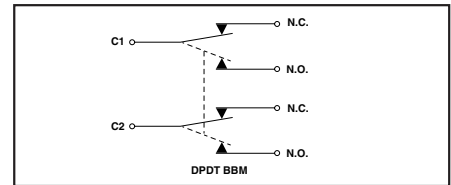
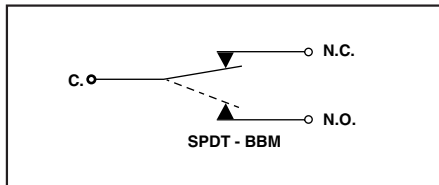
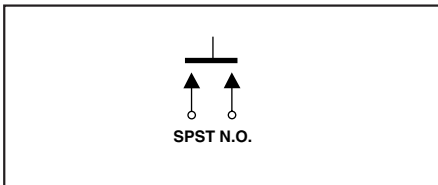


Terminals are marked on switch.

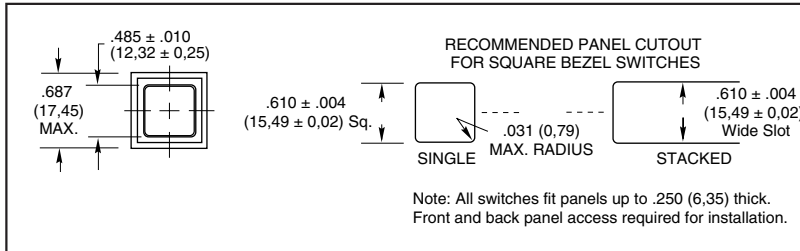
Feature	Partial Part No.
Momentary	46-01-08-500-*
Alt. Action	46-01-09-500-*

Pushbutton Switches

CIRCUITRY



FRONT VIEWS AND MOUNTING



Note: All switches fit panels up to .250 (6,35) thick. Front and back panel access required for installation.

Mounting Hardware

For 46-01-08-500 & 46-01-09-500

(See drawing above—mounting hardware shipped loose.)

For SPST & SPDT switches

One internal tooth lockwasher

One knurled ring nut .640 ± .010 (16,26 ± 0,25) DIA.

.094 ± .010 (2,39 ± 0,25) Thk.

*Partial part number; complete part number by adding a dash for button color: white -01; red -03; green -04; blue -05; yellow -06 or black -07, see Ordering Information.

SPECIFICATIONS

Material and Finishes

Lockwasher (Round Bezel): Steel, zinc trivalent chromate-plated

Behind Panel Plate (Square Bezel): Steel, zinc trivalent chromate-plated

Mounting Sleeve and Screws (46-01-08-500, 46-01-09-500 only): Steel, zinc trivalent chromate-plated. **Base:** Phenolic per MIL-M-14, Type CFG

Square Bezel: ABS (SPST, SPDT), thermoset plastic (DPDT)

Mounting Nut, Bushing, and Round Bezel: Brass, tin zinc

Button Cap: ABS (UL version is PPS)

Shorting Bar: Series 30—Fine silver contact area

Series 46—Phosphor bronze, silver-plated

Terminals: Series 30—Fine silver contact area with silver-plated terminal ends

Series 46—Silver contact surface with tin/silver clad terminal ends

Spring: Tinned music wire

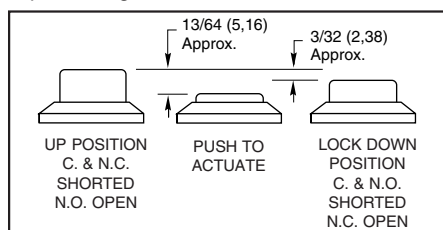
Plunger: Polyphenylene sulfide (PPS) for 30-01-01-500-X and 46-01-05-500-X. Nickel-plated brass for 46-01-07-500-X, 46-05-07-502-X, 46-01-09-500-X and 46-05-09-502-X. Zinc trivalent chromate-plated brass for 46-01-08-500-X. Polycarbonate for all others.

Operating Temperature: -40°C to +85°C

ALTERNATE ACTION (PUSH-PUSH) OPERATING SEQUENCE

Part Number* 46-05-07-502, 46-05-09-502, 46-01-07-500, 46-01-09-500

Alternate action (Push-Push) switches provide a maintained actuated position until the button is pushed again to release.



STANDARD OPTIONS

Epoxy-sealed terminals and wire leads, see page E-35.

ORDERING INFORMATION & OPERATING FEATURES

	Square Bezel	Round Bezel	Circuitry	Feature	Total Travel	Bottoming Force	Actuating Force	Overtravel
Butt Contact	30-01-01-500*	30-05-01-502*	SPST—N.O.	Momentary	.080 ± .015 (2,03 ± 0,38)	—	10 ± 4 oz.	—
	30-01-04-500*	30-05-04-502*	SPST—N.O.	Positive Feel & Overtravel	.156 ± .015 (3,96 ± 0,38)	—	18 ± 4 oz.	.046 Min.
Wiping Contact	46-01-05-500*	46-05-05-502*	SPDT	Momentary	.180 min. (4,57)	1.1 ± .25 Lbs.	—	—
	46-01-07-500*	46-05-07-502*	SPDT	Alternate Action	.210 ± .015 (5,33 ± 0,38)	1.5 ± .25 Lbs.	—	—
	46-01-08-500*	46-05-08-502*	DPDT	Momentary	.180 min. (4,57)	1.6 ± .5 Lbs.	—	—
	46-01-09-500*	46-05-09-502*	DPDT	Alternate Action	.210 ± .015 (5,33 ± 0,38)	1.8 ± .5 Lbs.	—	—

*Partial part number; complete the part number by adding a dash for button color: white -01; red -03; green -04; blue -05; yellow -06 or black -07.

Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

RATINGS

Electrical Ratings	Series 30	Series 46
Contacts	Butt type	Wiping type
Rating at 115 Vac Res.	1 Amp	0.25 Amp
Rating at 220 Vac Res.	0.5 Amp	0.125 Amp
Circuitry	SPST—N.O. (Standard); SPST—N.O. (w/Overtravel), SPST—N.O. (w/Positive Feel)	SPDT, DPDT Break Before Make
Life Expectancy	SPST—N.O. (Standard): 1,000,000 operations SPST—N.O. (w/Positive Feel): 200,000 operations; SPST—N.O. (w/Overtravel): 500,000 operations	250,000 operations
Contact Resistance	25 milliohms or less on a new switch	
Voltage Breakdown	1000 Vac between mutually insulated parts	
Insulation Resistance	1000 megohms minimum	
Operating Temperature	-40°C to +85°C	

LEGENDS

All button caps can be printed in epoxy ink. Any type style or design can be used to produce the legend. If News Gothic Condensed style is used, limits can be approximated from the chart below; actual limits depend on specific legend.

There is a per-button impression charge. A nominal set up charge per legend applies to orders of 1 to 99 pieces. (Non-standard legends are subject to a one time tooling charge. Contact Grayhill for more specifics.)

Grayhill Type Identification No.	Character Height (Typ.)	Sample Style and Sizes	Square Button Character and Line Limitation		Round Button Character and Line Limitation	
			Character	Line	Character	Line
4GH088	.083 (2,1)	ABCDEFGHIJ	6 Char. 2 Lines	TAB LOCATE	3 Char. 1 Line	OFF
1GH125	.138 (3,5)	ABCDEFGHIJ	5 Char. 1 Lines	INDEX	3 Char. 1 Line	TAB
3GH187	.207 (5,3)	ABCDEF	3 Char. 1 Line	OFF	2 Char. 1 Line	15
2GH250	.276 (7,0)	ABCD	2 Char. 1 Line	15	N/A	N/A

Pushbutton Switches