

THUMB WHEEL SWITCHES



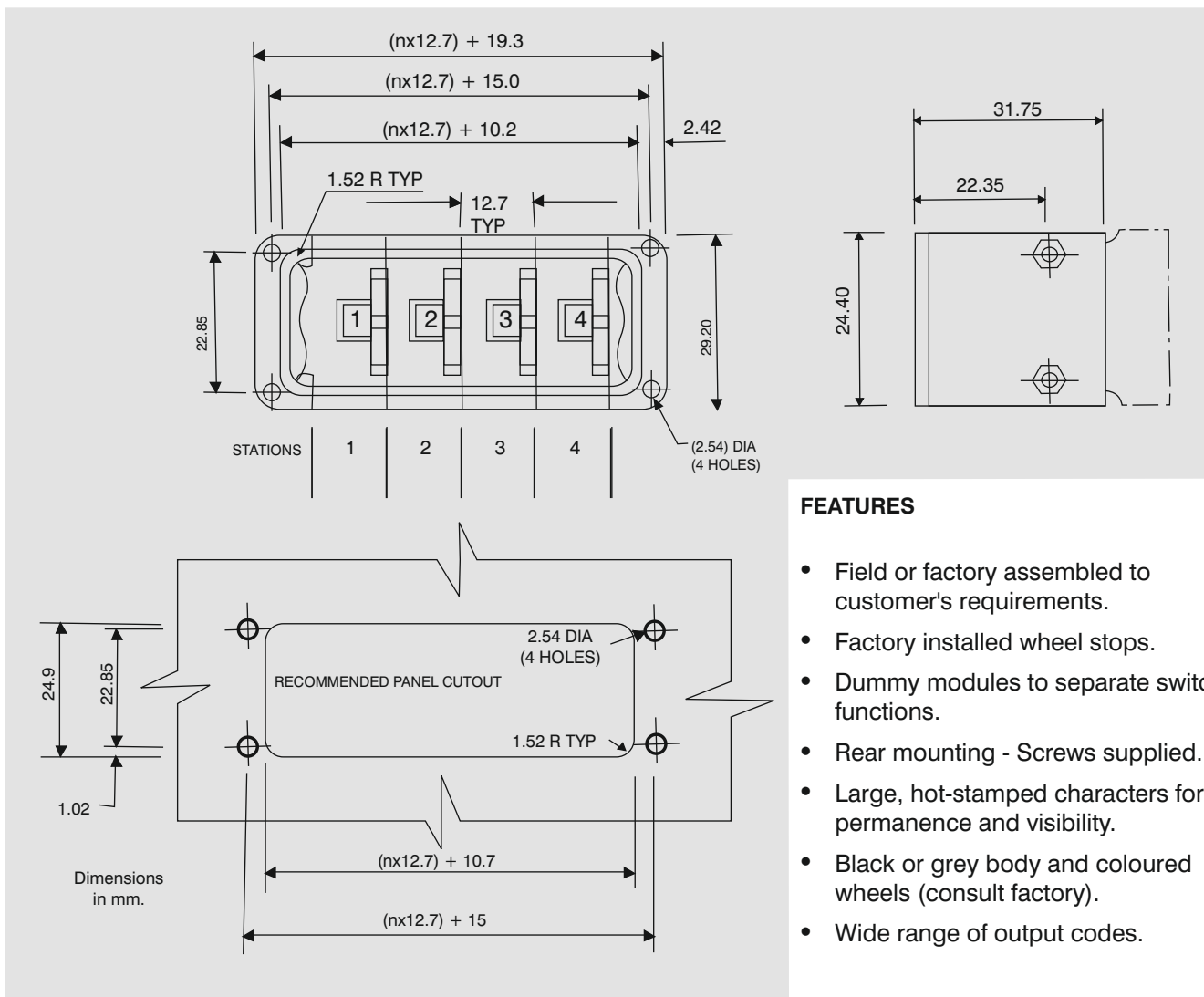
Series TWS-80

DESCRIPTION

Integral Type TWS-80 Thumb Wheel Switches are high quality switches of small size for use in a wide variety of applications in Instrumentation, Machine Controls, Process Controls, etc. TWS-80 is a sturdy rear-mounted type fixed with screws to the panel. Available with an extensive range of output codes, up to 10 modules can be easily coupled with sides, to form any combination as per customer's requirements. The switches have a positive detent action so that the positions snap into place. The switches have large digits hot-stamped for good visibility. The switches can be ordered either as complete assemblies or individual modules with sides separately.



DIMENSIONAL DETAILS



FEATURES

- Field or factory assembled to customer's requirements.
- Factory installed wheel stops.
- Dummy modules to separate switch functions.
- Rear mounting - Screws supplied.
- Large, hot-stamped characters for permanence and visibility.
- Black or grey body and coloured wheels (consult factory).
- Wide range of output codes.

All Dimensions in mm.

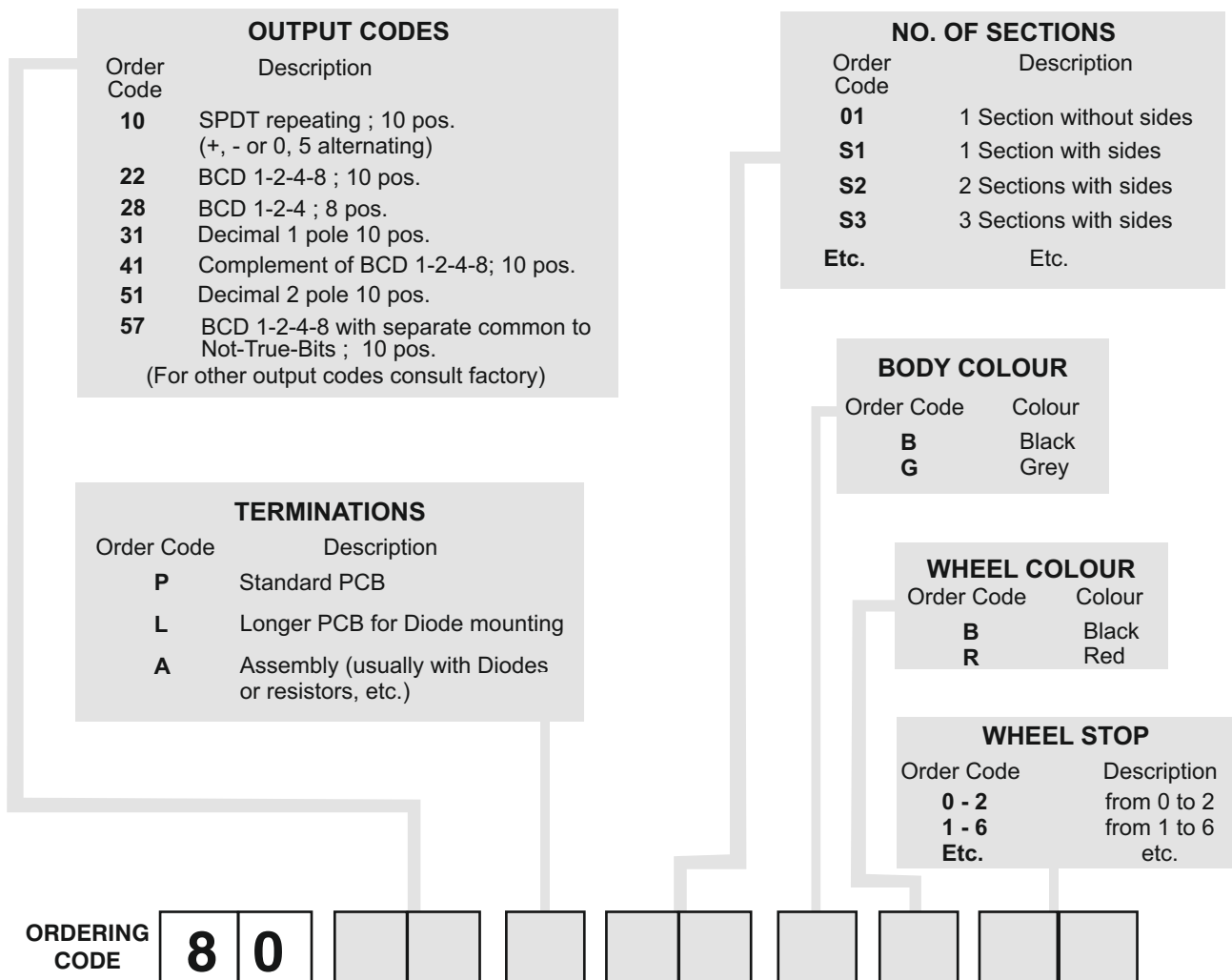
SPECIFICATIONS

CONTACT RATING	: Switching 125 mA max. Carrying : 1 Amp continuous
OPERATING VOLTAGE	: 50 mV to 28 V DC or 120V AC.
CONTACT RESISTANCE	: Less than 150 milli ohms Initial @ 2-6 V DC, 100 mA.
INSULATION RESISTANCE	: 1000 Megohms min.
DIELECTRIC STRENGTH	: 750 V RMS min @ sea level
ELECTRICAL LIFE	: 100,000 detent operations
OPERATING TEMP	: -25°C to +70°C
NO. OF POSITIONS	: 8 and 10 (stops available)

MATERIALS & FINISHES

BODY, WHEEL AND CAM	: Engineering Thermoplastics (Polycarbonate/ABS/Poly acetal)
WIPER CONTACT	: Hard Gold over Nickel on Copper Alloy
STATOR CONTACT	: Hard Gold over Nickel over Copper on Glass Epoxy laminated sheet to Nema FR4.
HARDWARE	: Steel, Zinc plated
DETENT SPRING	: Stainless steel wire
SIZE OF CHARACTER ON THE WHEEL	: 8 and 10 positions - 4.5 mm (Consult factory for non-standard printing).

ORDERING INFORMATION : Given below are the variations possible and corresponding ordering code.. In case only the Output Code (say 22) is specified the standard shall be (8022) a BCD code switch with a Black body, Black wheel without any stop, standard PCB. Consult factory for any other variation not given below. If sides are ordered separately, the order code is 8000 to represent 1 pair of side.



THUMB WHEEL SWITCHES



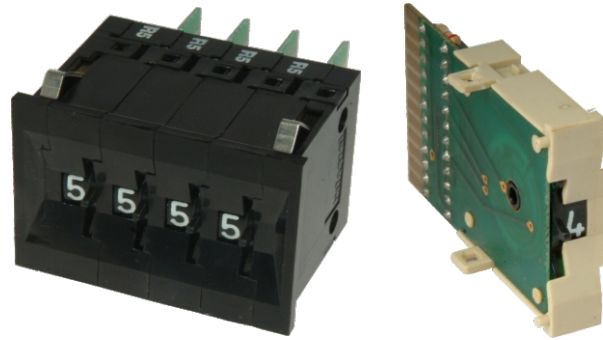
Series SL-82

DESCRIPTION

Integral Type SL-82 Series Thumb Wheel Switches are slim compact switches of high quality used in a wide variety of applications in Instrumentation, Machine Controls, Process Controls, etc. The switches are fixed from front of the panel, and are snap-mounted without the aid of screws. Snap-up design between sections also eliminates screws for fixing the sections together and virtually unlimited number of sections can be latched together. The switches are available with an extensive range of output codes, and have large sized digits hot-stamped for good visibility.

Modules like Dummy, Projected Dummy are available for separating various sections functionally if needed. The above design makes it possible to alter an assembly consisting of sections by the customer at the site itself.

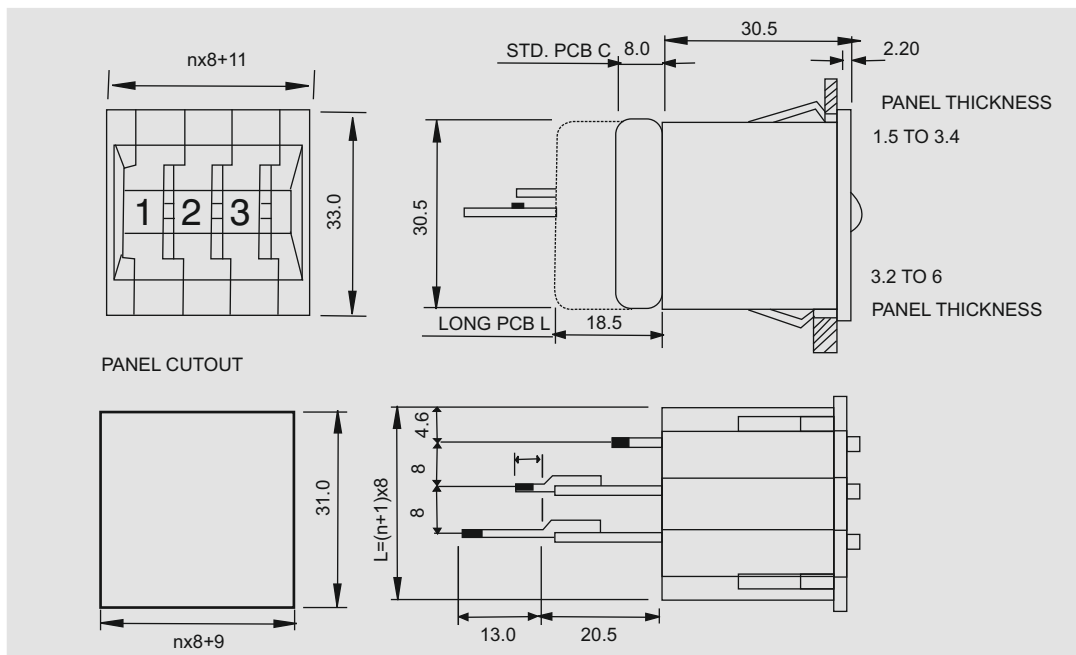
The switches can be ordered either as complete assemblies or individual modules with sides separately.



FEATURES

- Slim-Line (only 8 mm wide) sections.
- Snap-in front mounting clicks into the panel cut-out.
- Field or Factory assembled without any hardware.
- Factory set wheel stops.
- Dummy Modules to separate switch functions.
- Large Hot Stamped characters for permanence and visibility.
- Black and Grey Body and coloured wheels (consult factory)
- Wide range of output codes.
- Wide range of PCB terminations including wire-wrap Pins.

DIMENSIONAL DETAILS



All Dimensions in mm.

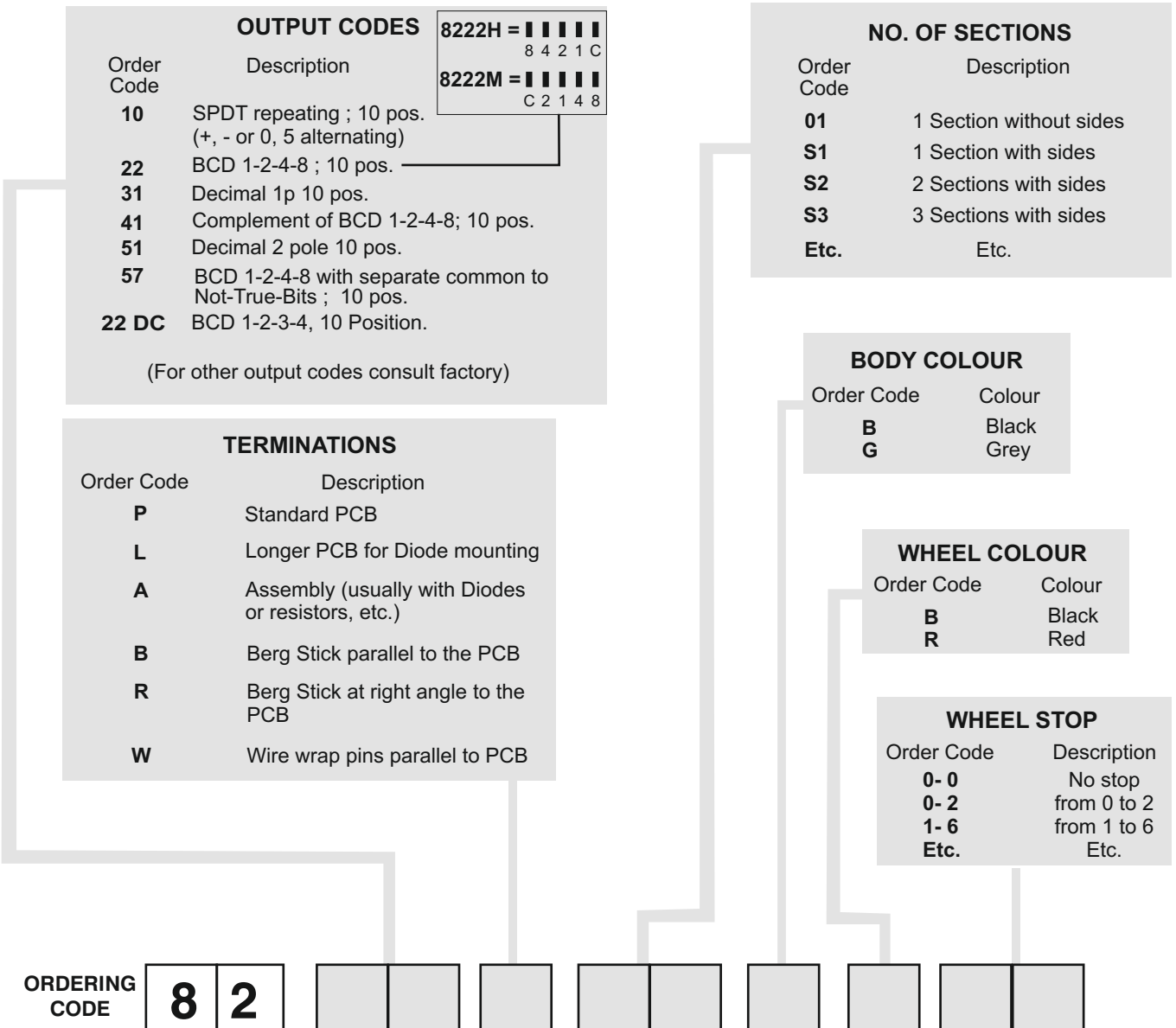
SPECIFICATIONS

CONTACT RATING	: Switching 125 mA max. Carrying : 1 Amp continuous
OPERATING VOLTAGE	: 50 mV to 28 V DC or 120V AC.
CONTACT RESISTANCE	: Less than 150 milli ohms Initial @ 2-6 V DC, 100 mA.
INSULATION RESISTANCE	: 1000 Megohms min.
DIELECTRIC STRENGTH	: 750 V RMS min @ sea level
ELECTRICAL LIFE	: 100,000 detent operations
OPERATING TEMP	: -25°C to +70°C
NO. OF POSITIONS	: 10 (stops available)

MATERIALS & FINISHES

BODY, WHEEL AND CAM	: Engineering Thermoplastics (Polycarbonate/ABS/Poly acetal)
WIPER CONTACT	: Hard Gold over Nickel on Copper Alloy
STATOR CONTACT	: Hard Gold over Nickel over Copper on Glass Epoxy laminate to Nema Fr4.
HARDWARE	: Steel, Zinc plated
SIZE OF CHARACTER ON THE WHEEL	: 10 positions - 5 mm (Consult factory for non-standard printing).

ORDERING INFORMATION : Given below are the variations possible and the method of selecting them. In case only the Output Code (say 22) is specified the standard shall be (8222) a BCD code switch with a Black body, Black wheel without any stop, standard PCB with sides attached. Consult factory for any other variation not given below. . If sides are ordered separately, the order code is 8200 to represent 1 pair of sides.



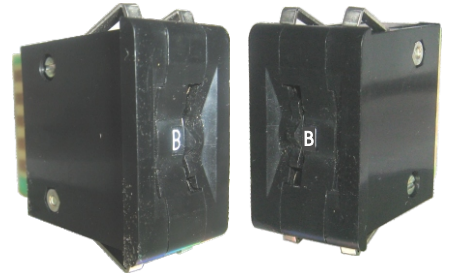
THUMB WHEEL SWITCHES



Series SL-83

DESCRIPTION

Integral Type SL-83 Series Thumb Wheel Switches are slim compact switches of high quality used in a wide variety of applications in Instrumentation, Machine Controls, Process Controls, etc. The switches are fixed from front of the panel, and are snap-mounted without the aid of Switches.



The switches can be ordered either as complete assemblies or individual modules with sides separately. If sides are ordered separately, the order code is 8300 to represent 1 pair of sides.

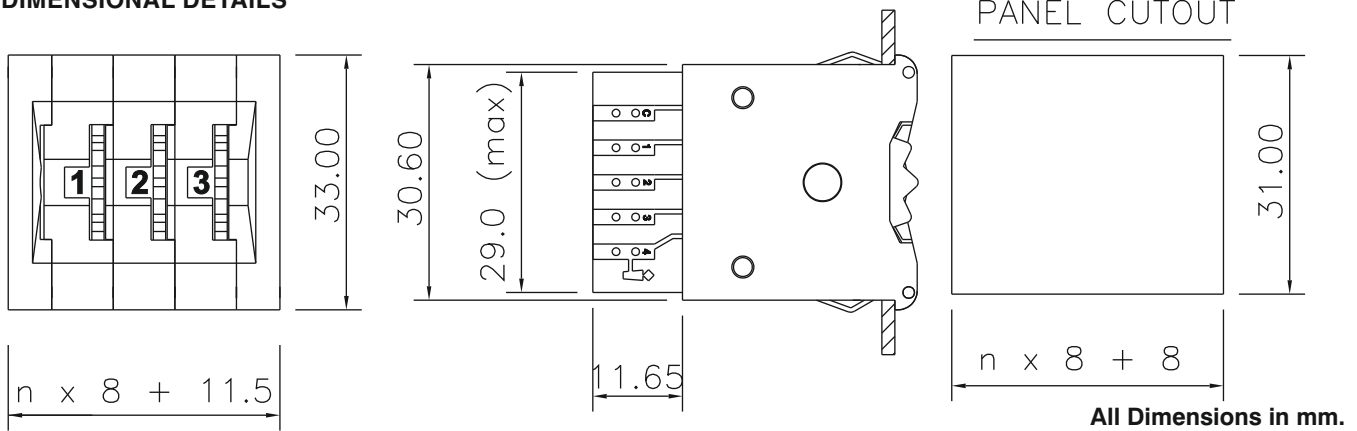
SPECIFICATIONS

CONTACT RATING	: Switching 125 mA max. Carrying: 1 Amp continuous
OPERATING VOLTAGE	: 50 mV to 28 V DC or 120V AC.
CONTACT RESISTANCE	: Less than 200 milli ohms Initial @ 2-6 V DC, 100 mA.
INSULATION RESISTANCE	: 1000 Megohms min.
DIELECTRIC STRENGTH	: 750 V RMS min @ sea level
ELECTRICAL LIFE	: 100,000 detent operations
OPERATING TEMP	: -25°C to +70°C
NO. OF POSITIONS	: 16 (stops available)

MATERIALS & FINISHES

BODY, WHEEL AND CAM	: Engineering Thermoplastics (Polycarbonate/ABS/Poly acetal)
WIPER CONTACT	: Hard Gold over Nickel on Copper Alloy
STATOR CONTACT	: Hard Gold over Nickel over Copper on Glass Epoxy laminate to Nema Fr4.
HARDWARE	: Steel, Zinc plated
SIZE OF CHARACTER ON THE WHEEL	: 16 positions - 5 mm (Consult factory for non-standard printing).

DIMENSIONAL DETAILS



OUTPUT CODES		TERMINATIONS		NO. OF SECTIONS		BODY COLOUR	
Order Code	Description	Order Code	Description	Order Code	Description	Order Code	Colour
16	BCD 1-2-4-8 ; 16 pos.	P	Standard PCB	01	1 Section without sides	B	Black
61	BCD 1-2-4-8 ; 16 pos. Complementary	A	Assembly (usually with Diodes or resistors, etc.)	S1	1 Section with sides	G	Grey
		B	Berg Stick parallel to the PCB	S2	2 Sections with sides		
		R	Berg Stick at right angle to the PCB	S3	3 Sections with sides		
				Etc.	Etc.		

ORDERING CODE		WHEEL COLOUR	
Order Code	Description	Order Code	Colour
8	8	B	Black
3	3	R	Red

10/2011 ISSUE 03, DCR 1182

PUSH WHEEL SWITCHES



Series PW 86

DESCRIPTION:

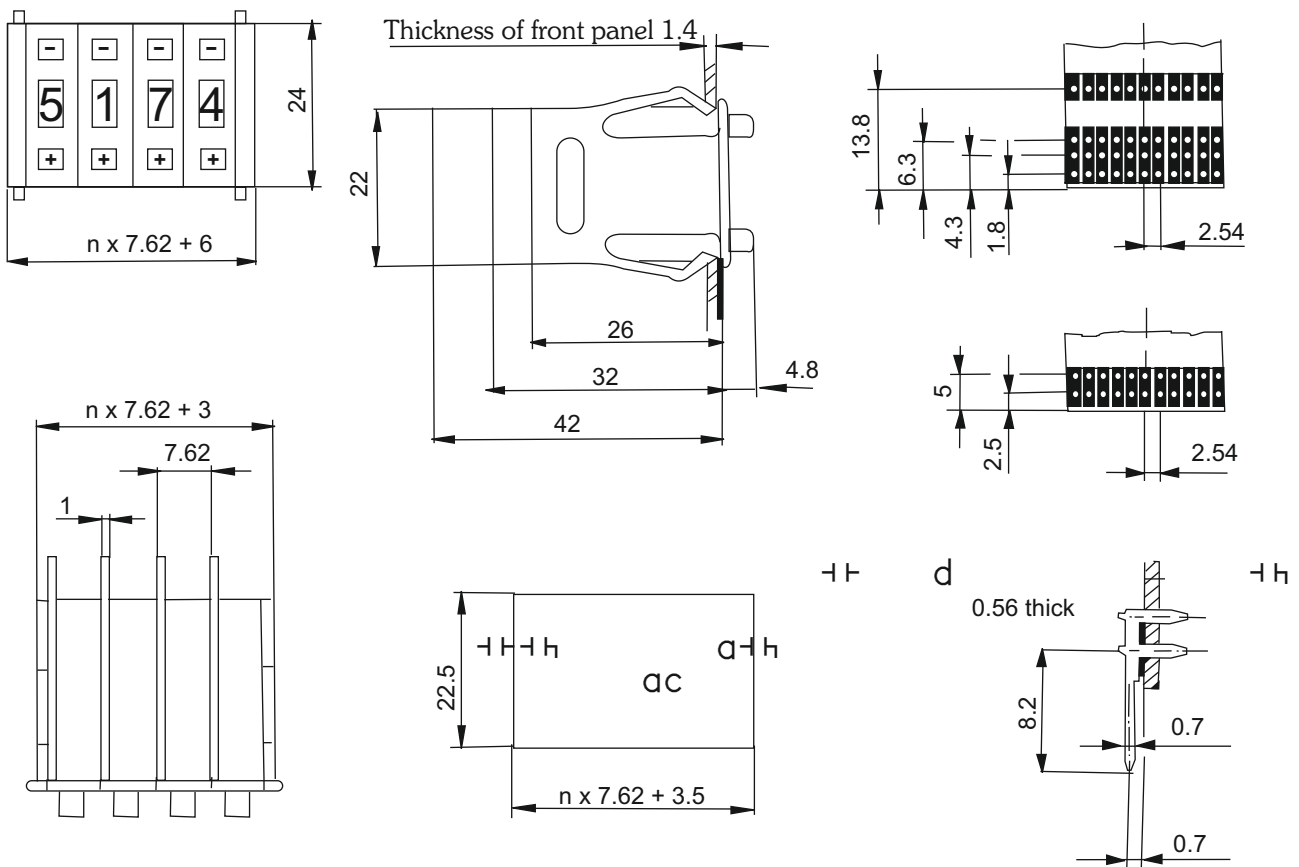
Integral Type PW 86 series push wheel switches are easy to put together at customers' end since there is no hardware involved. It makes for a very compact switch with facility to reach any digit easily because of bidirectional rotation. The characters, hot stamped, are easily readable and the switch gives a crisp feel with each change of digit. The switches can be ordered either as complete assemblies or individual sections and sides separately.



FEATURES

- Snap-in front mounting clicks into panel cutout
- Panel thickness between 1.0 to 4.0 mm
- Field or Factory assembly of switch sections possible
- Factory set wheel stops
- Hot stamped letters of large size for good visibility
- Dust protected
- No hardware required for assembling sections or the switch to the panel
- Switch available in black colour - wheels in different colours (consult factory)

DIMENSIONAL DETAILS



All Dimensions in mm.

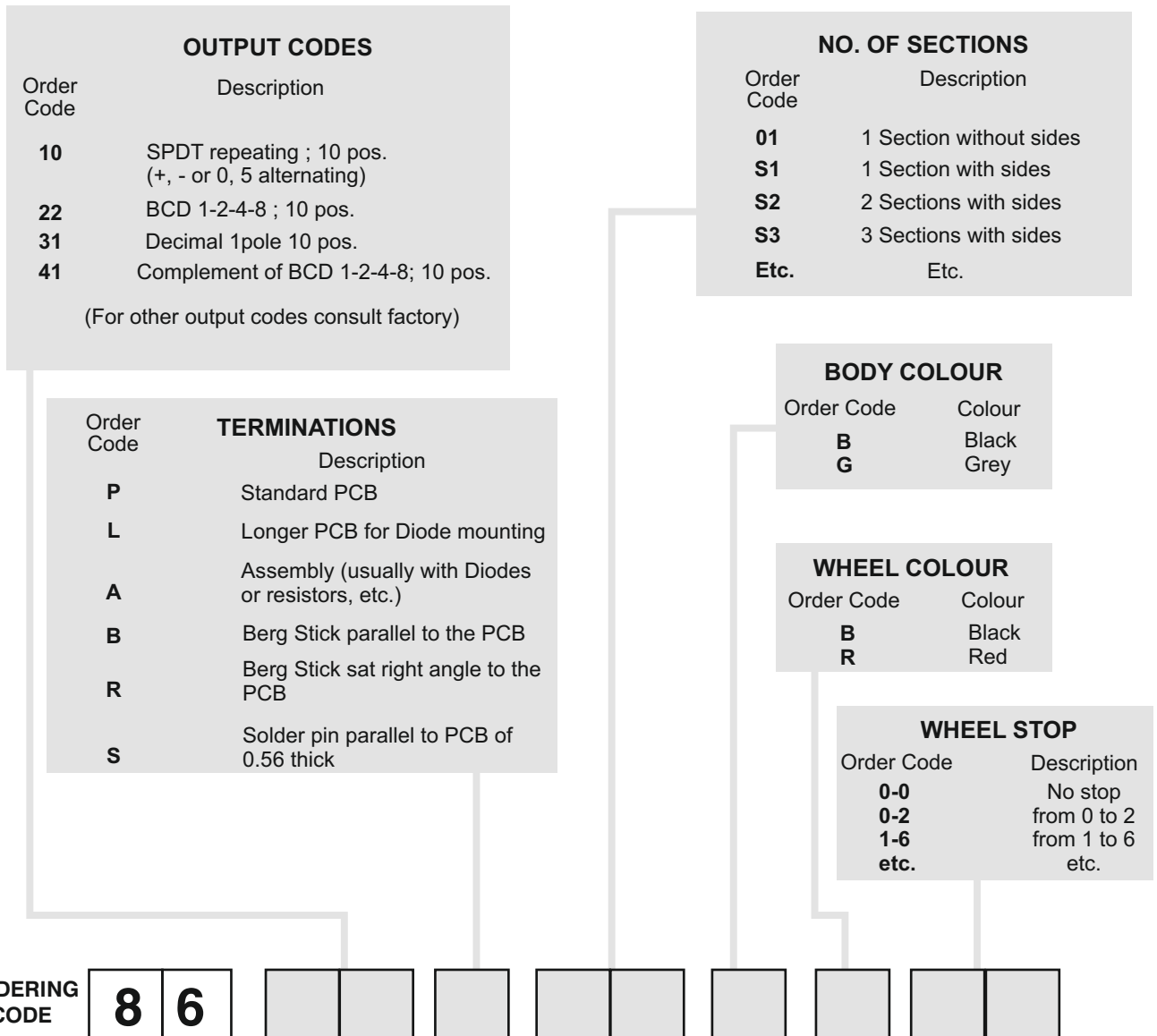
SPECIFICATIONS

CONTACT RATING	: Switching 125 mA max. Carrying : 0.5 Amp continuous
OPERATING VOLTAGE	: 50 mV to 28 V DC or 120V AC.
CONTACT RESISTANCE	: Less than 150 milli ohms Initial @ 2-6 V DC, 100 mA.
INSULATION RESISTANCE	: 1000 Megohms min.
DIELECTRIC STRENGTH	: 500 V RMS min @ sea level
ELECTRICAL LIFE	: 100,000 detent operations
OPERATING TEMP	: -25°C to +70°C
NO. OF POSITIONS	: 10 (stops available)

MATERIALS & FINISHES

BODY, WHEEL AND LEVER	: Engineering Thermoplastics (Polycarbonate/ABS/Poly acetal)
WIPER CONTACT	: Hard Gold over Nickel on Copper Alloy
STATOR CONTACT	: Hard Gold over Nickel over Copper on Glass Epoxy laminated sheet to Nema FR4.
HARDWARE	: Steel /Zinc plated
SIZE OF CHARACTER ON THE WHEEL	: 10 positions - 5 mm (Consult factory for non-standard printing).

ORDERING INFORMATION : Given below are the variations possible and the method of selecting them. In case only the Output Code (say 22) is specified the standard shall be (8622) a BCD code switch with a Black body, Black wheel without any stop, standard PCB with sides attached. Consult factory for any other variation not given below. If sides are ordered separately, the order code is 8600 to represent 1 pair of sides.



10/2011 ISSUE 03, DCR 1182

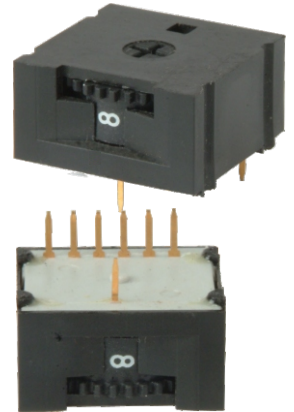
THUMBWHEEL PRESET SWITCHES



Series 88

DESCRIPTION:

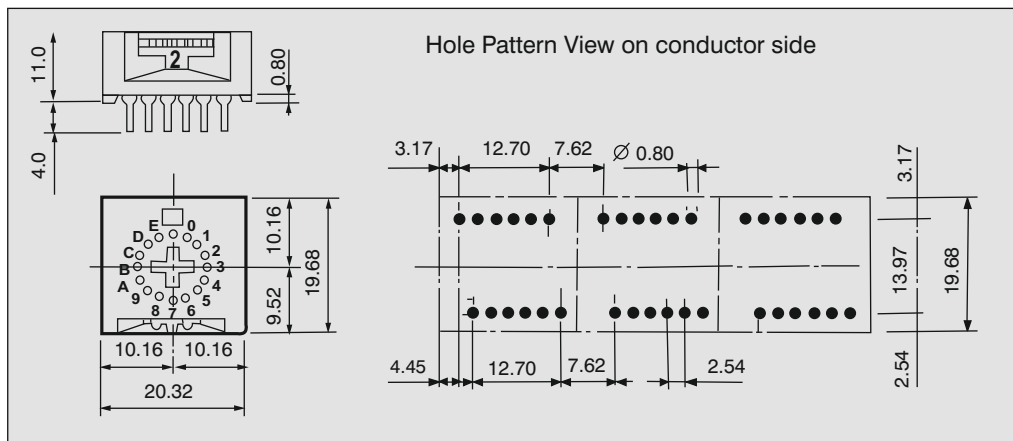
Series 88 is a PCB mountable Thumb Wheel Switch offering the most economical method of handsetting coded values. It eliminates wiring, requires minimum space and can be mounted horizontally or vertically to suit the application. 10 or 16 legend locations assure readability from top or side. Series 88 can be set by knurled wheel, screwdriver or optional extended shaft and the finished bezel allows front panel mounting. Optional stops, coloured rotors, or special making are available.



FEATURES

- Direct PCB mountable
- Allows front panel operation
- Optional marking/colour available
- Contacts insert moulded
- Available in various Truth Tables/Codes
- Occupies in small volume

DIMENSIONAL DETAILS



All Dimensions in mm.

SPECIFICATIONS

CONTACT RATING	: Switching 100mA max. @ 28 V DC : Carrying 1A @ 28 VDC
CONTACT RESISTANCE	: Less than 100 milli ohms initial @ 2-6 V DC, 100 mA.
INSULATION RESISTANCE (dry)	: More than 100 Megohms (DC 500 V megger)
DIELECTRIC STRENGTH	: 500 V RMS min @ sea level
ELECTRICAL LIFE	: 10,000 cycles
OPERATING TEMP	: -25°C to +70°C
NO. OF POSITIONS	: 10 or 16 (stops available)

MATERIALS & FINISHES

PLASTIC COMPONENTS	: Nylon (GF-30%)
STATOR CONTACT	: Copper alloy, hard gold plated over nickel*
MOVING CONTACT	: Glass epoxy PCB, gold plated Over nickel

*The contacts are insert moulded to prevent contamination by solder flux.

ORIENTATION OF SWITCH

ACW ROTATION					
ORDER CODE	A2	A4	A5	A8	TOP VIEW
CW ROTATION					
ORDER CODE	C1	C3	C6	C7	TOP VIEW

Views shown are of thermal side of switch with thumb-wheel opening at top.

CW Clockwise

ACW Anticlockwise

Arrows indicate direction of rotation for increasing numbers. All thumbwheels can be rotated in both directions. Legend is both on the top and side as shown. For any other marking on top and side consult factory

Note - All "C" or "C" terminals must be connected together external to switch

TERMINAL IDENTIFICATION

CODE	31	10/22	41	16/61	57
CW					
ACW					

SEE TRUTH TABLE (B13) FOR OUTPUT DETAILS

OUTPUT CODES

Order Code	Description
10	SPDT repeating ; 10 pos. (+, - or 0, 5 alternating)
22	BCD 1-2-4-8 ; 10 pos.
31	Decimal 1p 10 pos.
41	Complement of BCD 1-2-4-8; 10 pos.
16	Hexadecimal 1-2-4-8; 16 pos.
61	Hexadecimal complement 1-2-4-8 ; 16 pos.
57	BCD 1-2-4-8 with separate common to Not-True-Bits ; 10 pos.

(For other output codes consult factory)
PLEASE SEE TABLE (ABOVE) FOR TERMINAL IDENTIFICATION FOR CODES

BODY COLOUR

Order Code	Colour
B	Black
G	Grey

WHEEL COLOUR

Order Code	Colour
B	Black
R	Red

ORDERING CODE

8	8					
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10

1 or 2 Pole : 2 throw
Common (C1) and (C2) connected to terminals indicated.

DIAL	+	C1		C2	
		A1	B1	A2	B2
0	0	+			
5	1	-	•	•	•
0	0	+	•	•	•
5	1	-	•	•	•
0	0	+	•	•	•
5	1	-	•	•	•
0	0	+	•	•	•
5	1	-	•	•	•
0	0	+	•	•	•
5	1	-	•	•	•

16

Binary Code
1Pole, 16 Postion
Common (C) Connected to Terminals indicated.

DIAL				
	1	2	4	8
0	0			
1	1	•		
2	2		•	
3	3	•	•	
4	4			•
5	5	•		•
6	6		•	•
7	7	•	•	•
8	8			•
9	9	•		
A	10		•	•
B	11	•		•
C	12			•
D	13	•		•
E	14		•	•
F	15	•	•	•

22

BCD
1Pole, 10 Postion
Common (C) Connected to Terminals indicated.

DIAL				
	1	2	4	8
0				
1	•			
2		•		
3	•	•		
4			•	
5	•		•	
6		•	•	
7	•	•	•	
8				•
9	•			•

22 DC

BCD
1Pole, 10 Postion
Common (C) Connected to Terminals indicated.

DIAL				
	1	2	3	4
0				
1	•			
2		•		
3			•	
4				•
5	•			•
6		•		•
7			•	•
8	•		•	•
9		•	•	•

31

DECIMAL
1Pole, 10 Postion
Common (C) Connected to Terminals indicated.

DIAL										
	0	1	2	3	4	5	6	7	8	9
0	•									
1		•								
2			•							
3				•						
4					•					
5						•				
6							•			
7								•		
8									•	
9										•

41

BCD Complement only
1Pole, 10 Postion
Common (C) Connected to Terminals indicated.

DIAL				
	1	2	4	8
0	•	•	•	•
1		•	•	•
2	•		•	•
3			•	•
4	•	•		•
5				•
6	•			•
7		•		•
8	•	•	•	
9		•	•	

51

2Pole, 10 Postion
Common (C) and (C) Connected to Terminals indicated.

DIAL										
	0	1	2	3	4	0	1	2	3	4
0										
1		•						X		
2			•						X	
3				•						X
4					•					
C										
1		•						X		
2			•						X	
3				•						X
4					•					

57

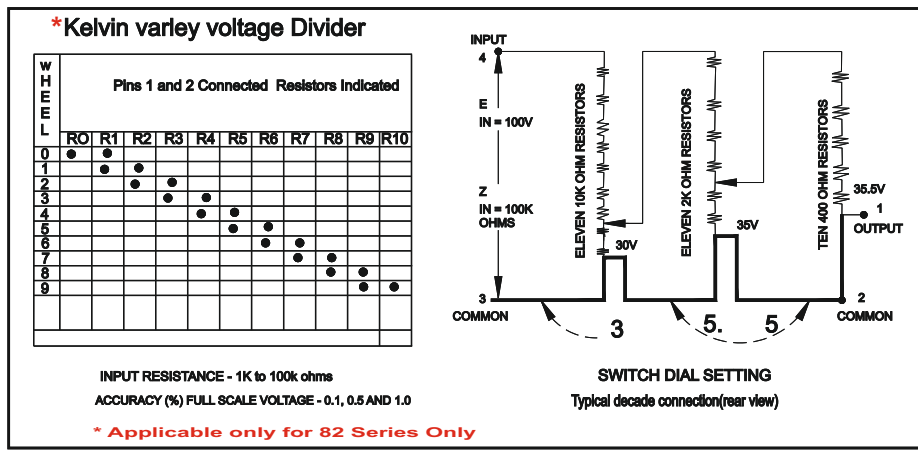
BCD 2Pole, 10 Postion
sept. com to NT Bits
Common C(•) & C(X)
Connected to Terminals indicated

DIAL				
	1	2	4	8
0	X	X	X	X
1	•	X	X	X
2	X	•	X	X
3	•	•	X	X
4	X	X	•	X
5	•	X	•	X
6	X	•	•	X
7	•	•	•	X
8	X	X	X	•
9	•	X	X	•

61

Binary Complement only
1 Pole, 16 Postion
Common (C) Connected to Terminals indicated.

DIAL				
	1	2	4	8
0	•	•	•	•
1		•	•	•
2	•		•	•
3	•	•		•
4	•	•	•	
5	•		•	•
6	•			•
7				•
8	•	•	•	
9	•	•	•	
A	•		•	
B	11		•	
C	12	•	•	
D	13		•	
E	14	•		
F	15			



FOR SPECIAL TYPE TRUTH TABLE PLEASE CONSULT FACTORY