



PRECISION & HEAVY DUTY LIMIT SWITCHES



BCH ELECTRIC LIMITED



Heavy Duty Limit Switches

BCH Limit Switches are designed with one aim only to help you produce better...faster... with less production down time. These limit switches will keep operating in highly contaminated atmospheres and extremely high shock and vibration conditions. Every limit switch that comes off the Bhartia Cutler-Hammer assembly line passes through rigid quality tests before it reaches you.

Versions

- 1NO + 1NC
- 2NO + 2NC
- Screw Terminal
- Pre-cabled



Operating Head

Type NL Limit Switches are available with a variety of operating heads to meet diverse applications.

Rotary lever operating heads

These heads, which are of the spring return variety, with rotary shafts, can be readily changed on the job to operate clockwise, counter clockwise or in both directions. Operating levers may be rotated and locked on the rotary shaft in any one position, through 360°. The operating head is adjustable in four 90° apart positions. The levers are provided with 19mm dia. metal rollers. Two types of roller lever operators, with a fixed length of 38mm and 76.2mm, are available. A third type had an adjustable length between 32mm and 82.5mm.

Top push operating heads

These are available in two designs. One has an adjustable push button, the length of which can be adjusted up to 8 mm. The second type has a metal roller of 11.1mm diameter.

Side push operating head

The head is also available with an adjustable push button alternatively a metal roller of 11.1mm dia. These are designed for small space and low travel application where the actuator travel is perpendicular to the switch.

Cat whisker operating head (Nylon & Steel Rod)

This head has been designed for applications where extremely low operating force is available. The operator consists of a nylon covered wire/steel rod, which is a spring return switch moving the extension in any direction from the centre operates the contacts.

Contact block

The contact mechanism is enclosed in a phenolic moulding with a transparent thermoplastic front cover. The complete unit can be removed and released without the risk of changing the operating characteristic of the limit switch.

The single pole double throw, twin break silver contacts (normally open / normally closed change over) provide quick make, quick break action and full contact pressure at all times. There is no point of zero contact pressure - no matter how slowly the switch is operated.

Both the normally open and normally closed contacts can be used simultaneously, provided they are connected on the same polarity.

The IP 67 degree conformity (applicable for NL type Limit Switches) makes it more suitable for all adverse applications.

Operating Data

TYPES	NLL1, NLL2 NLLA, NLJW	LTPR LTPBA (mm)	LSPR LSPRH LSPBA (mm)	LCW	LLGS (mm)	LPGS (mm)
Travel to Trip A	7-12°	1.3	2.0	20°	4.5	3.5
Travel to reset from trip point B	6°	1.1■	1.7■	18°■	2.5■	2.0■
Over Travel C	34	5.5	5.1	5°■	2.5■	1.0■
Total Travel D	45■	6.8	7.0	25°●	7.0■	4.5
Force to Trip (max.) Kg.	1.0■	2.0	2.0	0.285●	1.5	1.5
Force to be applied at a radius of (mm)	28	-	-	25.5	-	-

■ Max. ● Min.

Precision Limit Switches



Precision Limit Switches are designed for industrial applications. These are small in size, reliable in operation, have exceptionally long life and are accurate. The wide variety of switch operating mechanisms coupled with the choice of either single pole 1NO + 1NC or double pole 2NO + 2NC changeover contacts permit easy selection and application for many needs.

Contact Mechanism

- Quick make & quick break action.
- Low bounce mechanisms.
- Long life on high load applications.
- Serrated-silver stationary contacts, definite wiping action and high contact pressure assure reliability on dry circuit applications.
- Semi dust-tight moulded, phenolic case of great physical strength and high arc-resisting capacity.

Versatile

A wide variety of operators are available for use in combination with the basic switch. These operators with individual mounting variations afford a high degree of versatility.

Electrical and Mechanical ratings

Utilisation category	: AC 15 and DC 13 as per IS/IEC60947-5
Thermal current (Ith)	: 15 A
Insulation voltage (Ui)	: 600 V AC

Operational current and voltage

AC15 RATING	SINGLE POLE (1NO + 1NC CHANGEOVER CONTACTS)	DOUBLE POLE (2NO + 2 NC CHANGEOVER CONTACTS)
110V	4.0A	3.0A
240V	2.0A	1.5A
440V	1.0A	0.8A
600V	0.8A	0.6A

DC13 RATING	SINGLE THROW	DOUBLE THROW	SINGLE THROW	DOUBLE THROW
115V	2.0A	0.50A	1.0A	0.2A
230V	0.5A	0.20A	0.3A	0.1A
600V	0.1A	0.02A	0.1A	-

Mechanical & electrical life	: 20x10 ⁶ operations without operator 10x10 ⁶ operations with operator
Terminal capacity	: 2.5mm ² solid or stranded conductors
Frequency of operation	: 2500 operations per hour (max.)

Types Of Operators

Push Button Plunger

These are designed for one hole panel mounting. The plunger mechanism is of oil-tight construction and prevents any ingress of oil, including coolant. These operations are designed for an in-line actuating motion with controlled over-travel.

Top Push Roller Plunger

Operators are designed for one hole mounting and are of oil-tight construction. The roller plunger comes assembled either in line with the length of the contact block or at right angles to it. This allows the roller to accept cam or slide operation from any of the four directions.

Six Inch (150 mm) Lever

These operators provide either top and right hand mounting or top and left hand mounting. with this do-it-yourself operator, the lever may be formed by the user to satisfy unusual requirements and can be cut or bent to any desired length or shape.

Roller Lever

These operators are available with either top and right hand mounting or top and left hand mounting and are equipped with a steel roller which may be operated by a cam or some similar actuating device. Operation is provided in both directions.

Selection Chart

DESCRIPTION	CATALOGUE CODE	
	1NO + 1NC	2NO + 2NC
With Top Push Button Operator	PSTPB	PSTPB2
With Top Push Roller Operator assembled in line with contact block	PSTPRA	PSTPR2A
With Top Push Roller Operator assembled at right angles to contact block	PSTPRB	PSTPR2B
With Six Inch Lever Operator (right hand mounting)	PSSILR	PSSIL2R
With Six Inch Lever Operator (left hand mounting)	PSSILL	PSSIL2L
With Roller Lever Operator (right hand mounting)	PSRLR	PSRL2R
With Roller Lever Operator (left hand mounting)	PSRLL	PSRL2L
Without Operator	SP20S1	SP20S2

Electrical and Mechanical Ratings

Utilisation Category : AC15 & DC13 as per IS/IEC60947-5

Thermal Current (Ith) : 10A

Insulation Voltage (Ui) : 600 V AC
240 V DC

Operational Current and Voltage

AC15 rating

Voltage	110V	220	415-440V	550V
1NO+1NC	6.0A	3.0A	1.5A	1.2A
2NO+2NC	3.0A	1.5A	0.8A	0.6A

DC13 rating

Voltage	24V	60V	110	220-240V
1NO+1NC	1.0A	0.5A	0.2A	0.1A
2NO+2NC	---	---	0.2A	0.1A

Contact Combination : 1NO + 1NC, 2NO + 2NC

Frequency of Operation : 2500 operations per hour

Mechanical Life : 20 x 10⁶ operations

Enclosed Category : Zinc die cast enclosure to IP67

Terminal Capacity : 2.5 mm² solid or stranded

Pilot Devices & Limit Switches

Heavy Duty Limit Switch - Snap Action Type NL

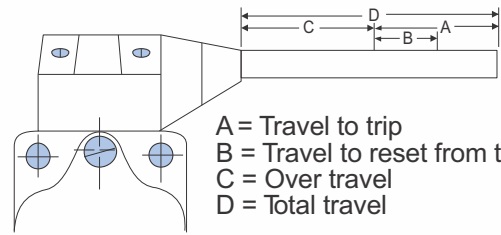
TYPE	DESCRIPTION	CAT. NO SCREW TERMINAL (1NO+1NC)	CAT. NO. PRECABLED (1NO+1NC)	SCREW TERMINAL CAT NO. (2NO+2NC)	PRECABLED CAT NO. (2NO+2NC)
Roller Lever	Standard-38mm	NLL1	NLL1C	NLL1-22	NLL1-22C
	Standard-76.2mm	NLL2	NLL2C	NLL2-22	NLL2-22C
	Adjustable	NLLA	NLL4C	NLLA-22	NLLA-22C
Maintained Type	LL1	NLL1M	NLL1MC	NLL1M-22	NLL1M-22C
	LL2	NLL2M	NLL2MC	NLL2M-22	NLL2M-22C
	LLA	NLLAM	NLL4MC	NLLAM-22	NLLAM-22C
Push Roller	Top	NLTPR	NLTPRC	NLTPR-22	NLTPR-22C
	Side	NLSPR	NLSPRC	NLSPR-22	NLSPR-22C
Push Button	Top Adjustable	NLTPBA	NLTPBAC	NLTPBA-22	NLTPBA-22C
	Side Adjustable	NLSPBA	NLSPBAC	NLSPBA-22	NLSPBA-22C
Cat Whisker	Nylon Rod	NLCW	NLCWC	NLCW-22	NLCW-22C
	Steel Rod	NLJW	NLJWC	NLJW-22	NLJW-22C
Fork Type	Roller in same Line	NLLF	NLLFC	NLLF-22	NLLF-22C
	Offset Rollers	NLLFO	NLLFOC	NLLFO-22	NLLFO-22C
	Rolleer in same line	NLLFM	NLLFMC	NLLFOM-22	NLLFOM-22C
	Maintained Offset Rollers	NLLFOM	NLLFOMC	NLLFM-22	NLLFM-22C
General Purpose	Angular Roller	LLGS	-	-	-
	Top Plunger	LPGS	-	-	-

Spares

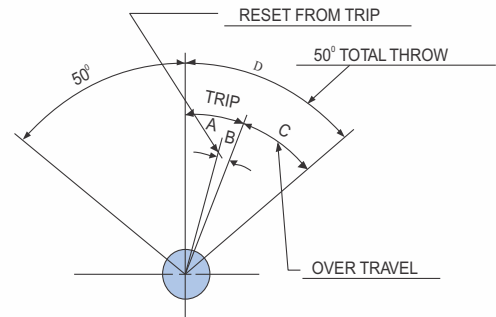
DESCRIPTION	CATALOGUE
38 mm Lever	SP40L1
76.2 mm Lever	SP40L2
Adjustable Lever	SP40LA
Operating Head	SP40HLG
Operating Head	SP40HL
Operating Head	SP40HTP B or R
Operating Head	SP40HSP B or R
Operating Head with Lever	SP40CW
Limit Switch Assembly	SP40S1
Operating Head in Line	SP40LF
Operatng Head Offset	SP40LFO
Operating Head Maintained	SP40HLM

B - Button R - Roller

Linear Motion

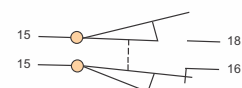


Angular Motion



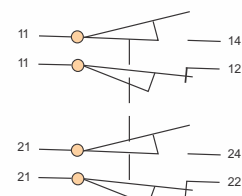
Wiring Diagram

1NO + 1NC



Must be same polarity

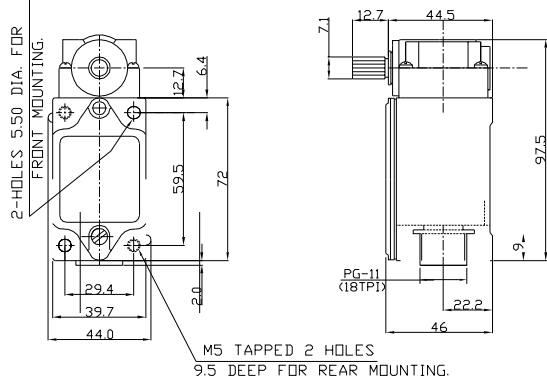
2NO + 2NC



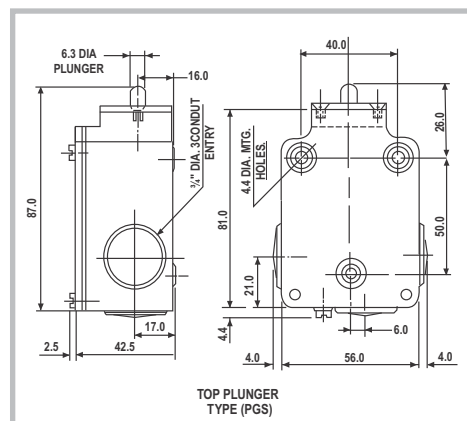
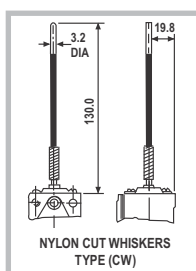
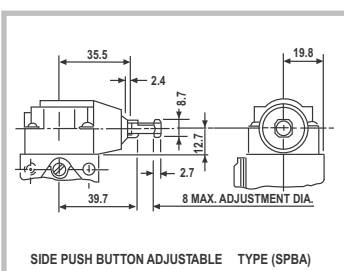
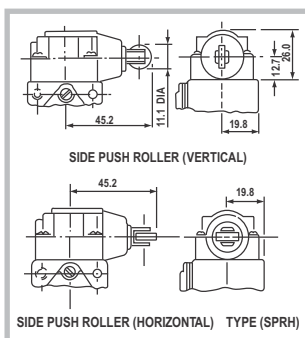
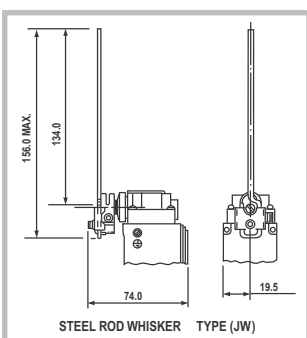
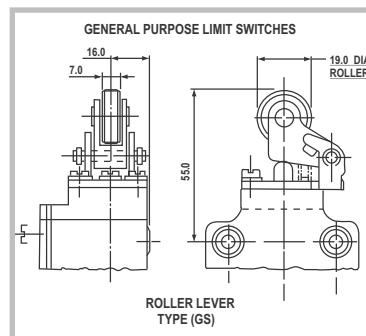
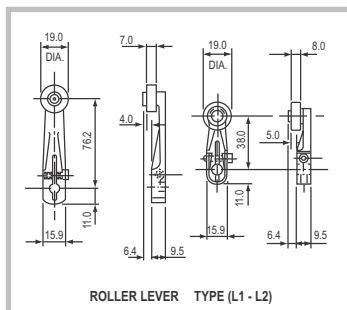
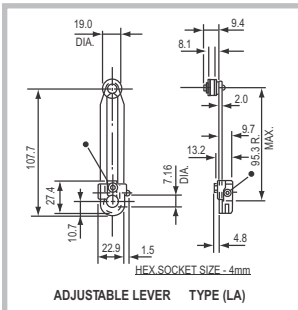
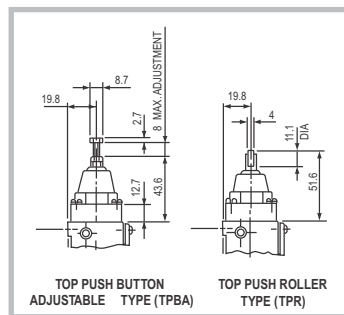
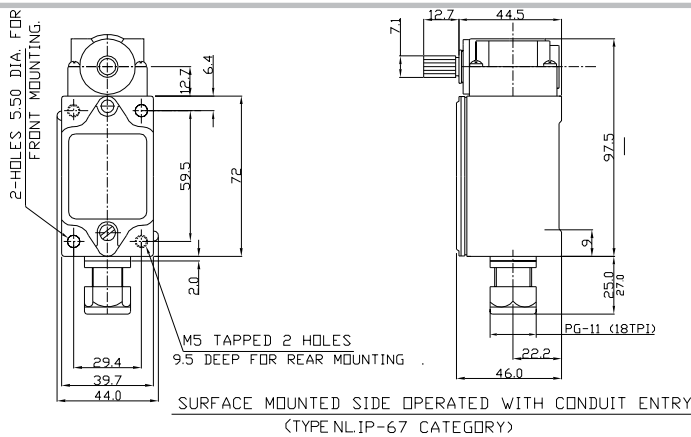
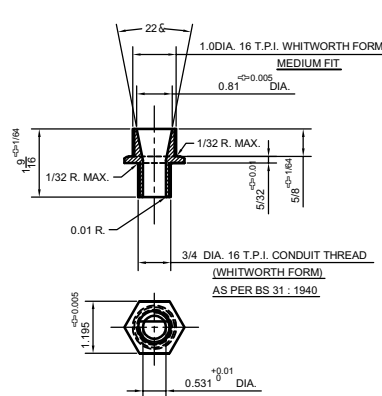
Must be same polarity

Dimensions

Surface Mounted Side Operated (Type L, IP65)

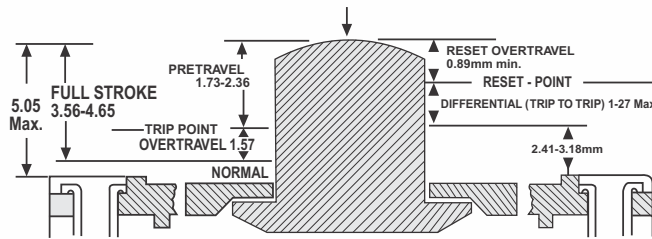


Conduit Entry (Type L)

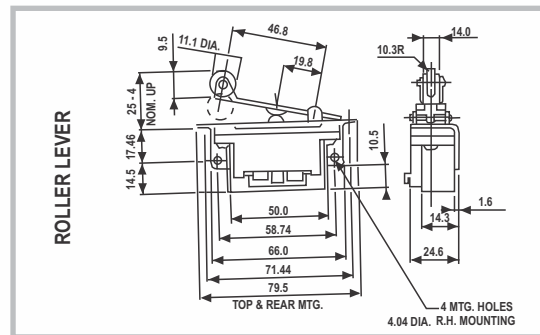
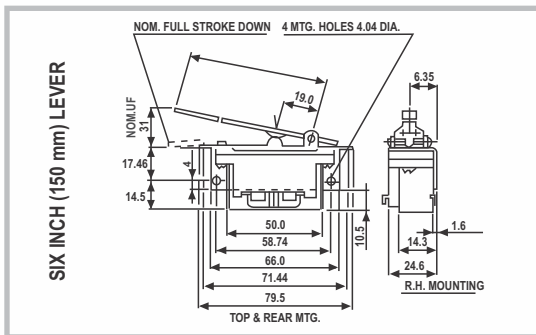
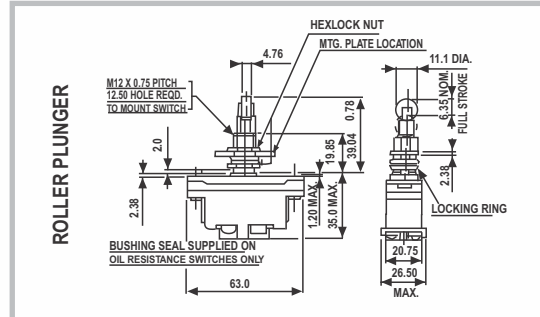
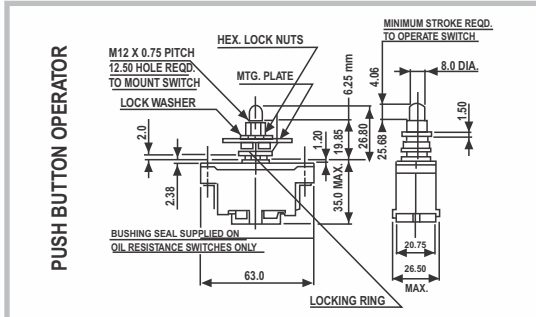


The Repeat Accuracy Of Individual

OPERATING PRESSURE min. 0.387 Kg. max. 0.595 Kg



The repeat accuracy of individual switch trip points is such that after millions of operations they do not drift more than two or three thousands of an inch.



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Since product improvement is a continuous process, the data furnished in this brochure may undergo revision without prior notice.