

PRECISION & HEAVY DUTY LIMIT SWITCHES



BCH ELECTRIC LIMITED
we care for you



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

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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 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.

Electrical and Mechanical Ratings

Utilisation Category : AC15 & DC13 as per IEC947-5 IS 13947-5
 Thermal Current (Ith) : 10A
 Insulation Voltage (Ui) : 600 V AC
 240 V DC

Operational Current and Voltage

AC15 rating

Voltage	110V	220V	440V	550V
Rating	6.0A	3.0A	1.5A	1.2A

DC13 rating

Voltage	24V	60V	110V	220V
Rating	1.0A	0.5A	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

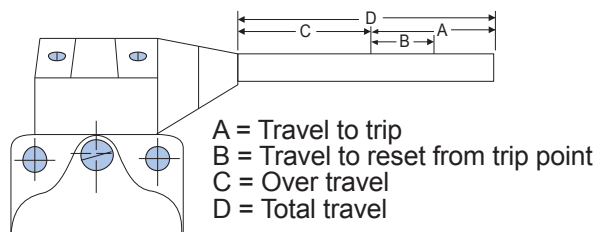
TYPE	DESCRIPTION	CAT. NO SCREW TERMINAL (1NO+1NC)	CAT. NO. PRECABLED (1NO+1NC)	SCREW TERMINAL CAT NO. (2NO+2NC)	PRECABLED CAT NO. (2NO+2NC)
Roller Lever	Standard-38mm	NLL1	NLL1C	NLL1-22	NLL1-22C
	Standard-76.2mm	NLL2	NLL2C	NLL2-22	NLL2-22C
	Adjustable	NLLA	NLL4C	NLLA-22	NLLA-22C
	Maintained Type LL1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

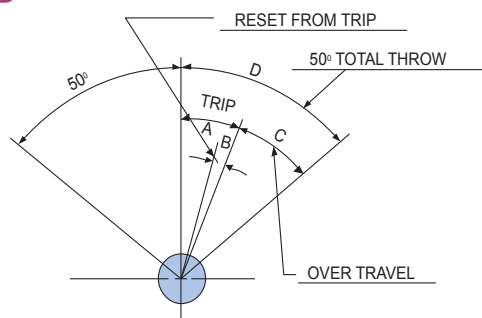
DESCRIPTION	CATALOGUE
38 mm Lever	SP40L1
76.2 mm Lever	SP40L2
Adjustable Lever	SP40LA
Operating Head	SP40HLG
Operating Head	SP40HL
Operating Head	SP40HTP B or R
Operating Head	SP40HSP B or R
Operating Head with Lever	SP40CW
Limit Switch Assembly	SP40S1
Operating Head in Line	SP40LF
Operatng Head Offset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

B - Button R - Roller

Linear Motion

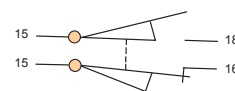


Angular Motion



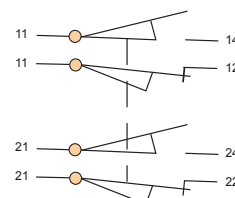
Wiring Diagram

1NO + 1NC



Must be same polarity

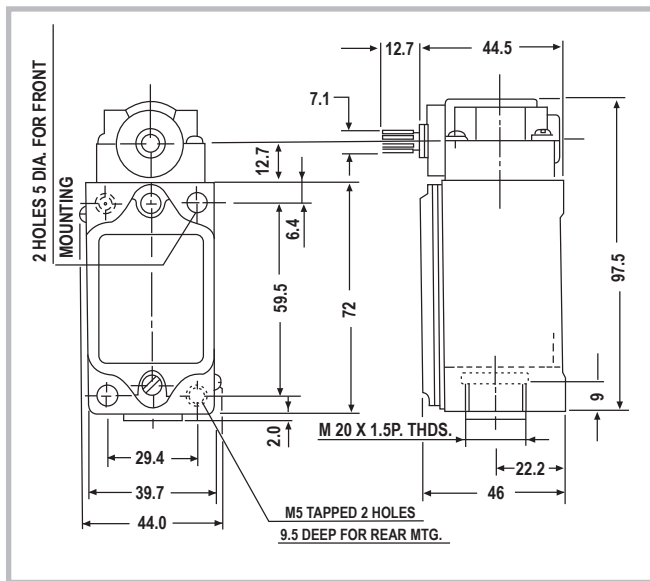
2NO + 2NC



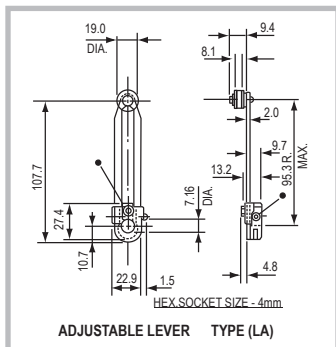
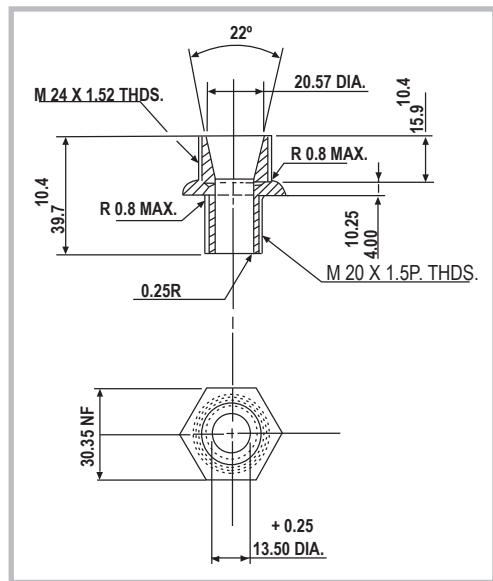
Must be same polarity

Dimensions

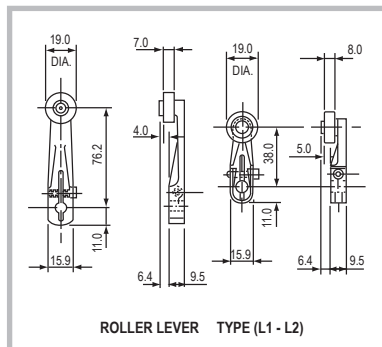
Conduit Entry



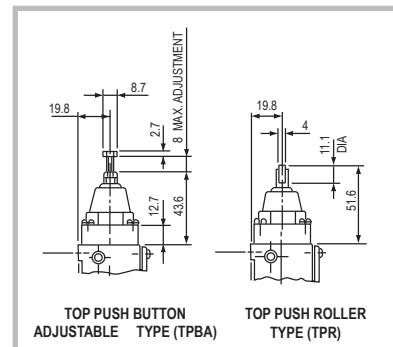
Surface Mounted Side Operated



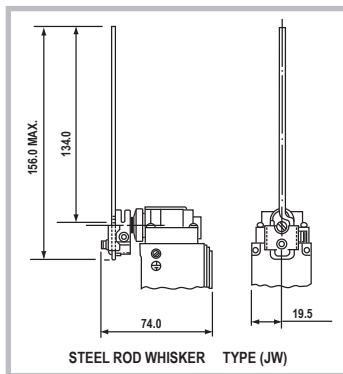
ADJUSTABLE LEVER TYPE (LA)



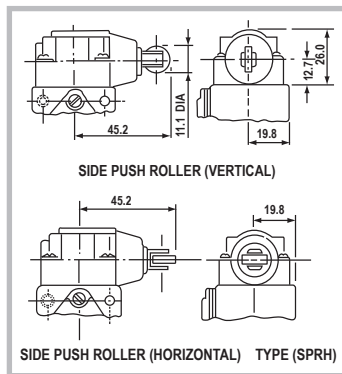
ROLLER LEVER TYPE (L1 - L2)



TOP PUSH BUTTON ADJUSTABLE TYPE (TPBA) TOP PUSH ROLLER TYPE (TPR)

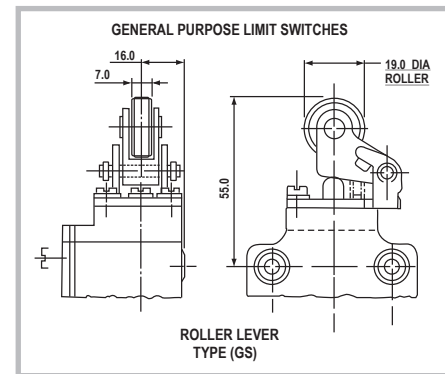


STEEL ROD WHISKER TYPE (JW)



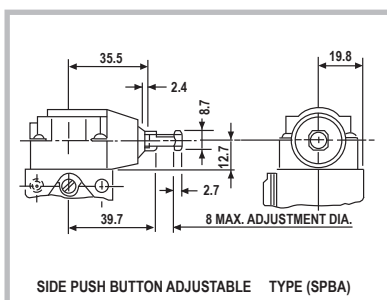
SIDE PUSH ROLLER (VERTICAL)

SIDE PUSH ROLLER (HORIZONTAL) TYPE (SPRH)

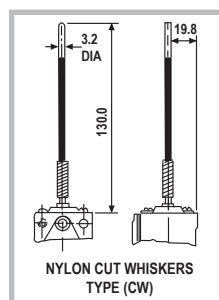


GENERAL PURPOSE LIMIT SWITCHES

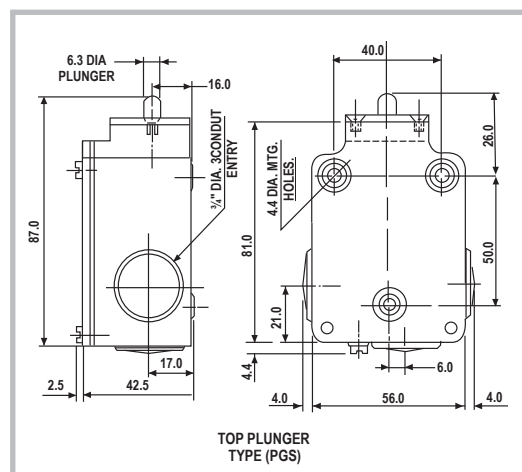
ROLLER LEVER TYPE (GS)



SIDE PUSH BUTTON ADJUSTABLE TYPE (SPBA)



NYLON CUT WHISKERS TYPE (CW)



TOP PLUNGER TYPE (PGS)

Weights :

Oil Tight Limit Switches (except type LLG) : 500 gms.
General Purpose Limit Switch (LLG) : 300 gms.

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 IEC 337-1 and IS : 6875
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 : 20x10⁶ operations without operator
10x10⁶ operations with operator
Terminal capacity : 2.5mm² 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.

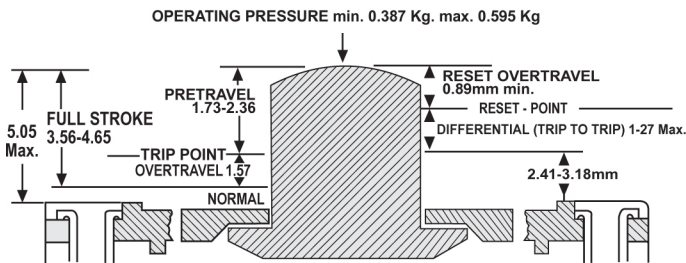
Roller Lever

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

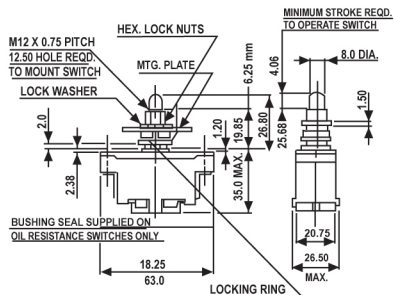
DESCRIPTION	CATALOGUE CODE	
	1NO + 1NC	2NO + 2NC
With Top Push Button Operator	PSTPB	PSTPB2
With Top Push Roller Operator assembled in line with contact block	PSTPRA	PSTPR2A
With Top Push Roller Operator assembled at right angles to contact block	PSTPRB	PSTPR2B
With Six Inch Lever Operator (right hand 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

The Repeat Accuracy Of Individual

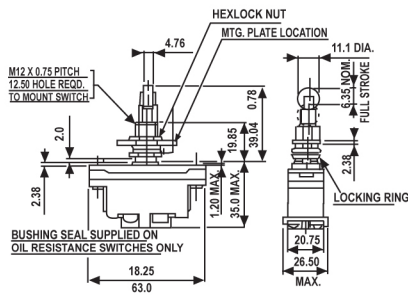


The repeat accuracy of individual switch trip points is such that after millions of operations they do not drift more than two or three thousands of an inch.

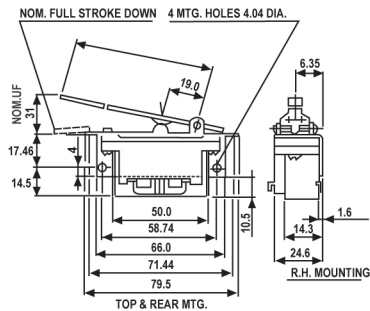
PUSH BUTTON OPERATOR



ROLLER PLUNGER



SIX INCH (150 mm) LEVER



ROLLER LEVER

