

### Technical Data

Stroke : Max. 100 mm including spring reset  
 Switches : Max. TWO Switches - NO / NC / Bistable  
 Piston Speed : Max. 0.5 m/s in charging stroke

### Technical data of the Switch

Housing : Fibre-glass reinforced thermoplastic  
 Protection : IP 67  
 Connection : Cable H03 VV-F - 2 x 0.75 mm<sup>2</sup>  
 5000mm long  
 Temp. range : -20°C to +75°C (Standard)  
 -4°F to +167°F (Standard)

#### Life

Mechanical : min. 10<sup>9</sup> operations  
 Electrical : 10<sup>6</sup> - 10<sup>9</sup> operations  
 depending on circuit characteristics

### Switching Data

Speed : max. 18 m/s  
 Frequency : max. 300 ops/s  
 Time : maker - 0.3ms - 1.5ms  
 breaker - max. 0.5ms  
 bounce - 0.3ms - 0.6ms

**Electrical:** Refer switch specifications

### Description / Application

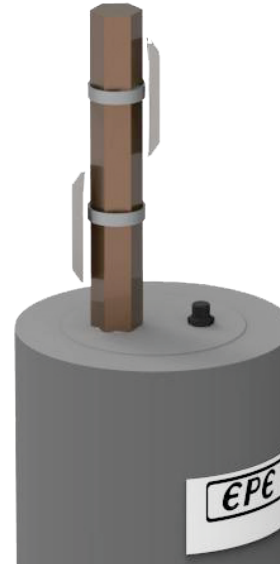
The ES type limit switching device is used in conjunction with Piston Accumulators for knowing when the piston tops on the gas side and for activating suitable safety / functional devices based on preset positions / pressure.

Installed on the gas side the device is screwed into the gas side top cover. For proper functioning of the device and to avoid damage to the device and/or the accumulator it is advised to always install the accumulator in vertical position with gas side on the top.

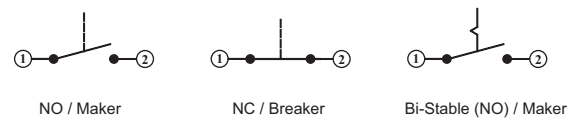
The ES device consists of a non-magnetic casing (1), a switch rod fitted with a set of permanent magnets (2) and required number of limit switches (3) and/or (4). These switches (3 & 4) are normally supplied with 5 m of cable. The limit switch unit, and its seal (5) is mounted on the gas side end cover of the accumulator. The casing (1) is pressurized.

As a standard the ES device is supplied with either One Switch (Normally Open) OR Two Switches (One NO + One NC). The bottom switch (nearer to the top cover) is an NO switch.

**Warning : Once installed and used the casing will get pressurized. Hence it is very important to release the gas pressure & remove the gas fill valve from the accumulator before undertaking maintenance of the ES device.**



### Hydraulic Symbol



### Operation (refer parts & dimensions)

The piston rod (2) extends into the gas side of the accumulator. When the accumulator is filled with liquid the piston moves the rod against the spring (6).

When the piston reaches the upper limit of its travel, the upper limit switch (3) will operate thus allowing various functions to be performed, e.g., pump switch-off, by-pass operation, etc.

When the liquid pressure falls, allowing the piston to move to the bottom of the accumulator, the spring (fixed) moves the switch rod down to the lower limit switch (4) thus allowing the pump to be reactivated and the accumulator to be recharged.

Note:- As the piston rod magnet cannot pass below the lower limit switch (4), the switch-on signal will always show when the piston is at its lowest position.

The NO / NC switches get activated by the passing magnet and deactivate automatically once the pull-in / drop-out value is reached.

The Bistable switch gets activated when the operating magnet passes it in the forward stroke and stays activated till the magnet deactivates when it passes in the reverse stroke.

Technical specifications subject to change.

## Ordering Code - ES Device

1 2 3 4 5 6  
**ES - 2 - BS - P / 100 / 5000**

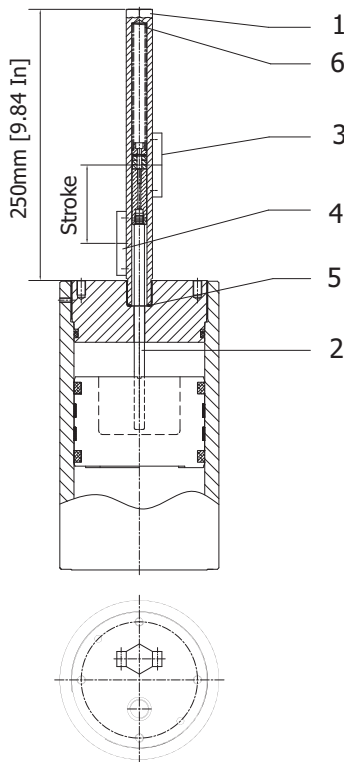
1	<b>Type</b>	Limit Switching Device Assembly	= <b>ES</b>
2	<b>No. of Switches</b>	One Switch Two Switches	= <b>1</b> (standard) = <b>2</b>
3	<b>Switch type</b>	Normally Open (contact maker) Normally Closed (contact breaker) Two Switches (One NO + One NC) Bi-stable - NO with One Snap-in Contact	= <b>NO</b> (standard) = <b>NC</b> = <b>NO+NC</b> = <b>BS</b>
4	<b>Sealing</b>	NBR/Nitrile Viton	= <b>P</b> (standard) = <b>V</b>
5	<b>Stroke Length</b>	Stroke length between top & bottom switches	= ... (in mm)
6	<b>Cable Length</b>	Length of electrical cable of switch	= ... (in mm)

\* Before ordering, check for availability.

## Ordering Code - Switch

3 6  
**ESS - BS / 5000**

## Parts & Dimensions



## Switch Specifications

Making / breaking capacity - See graph  
 Flashover Voltage : >600 V (50 Hz)  
 Restarting accuracy :  $\pm 0.25$  mm (T=const)  
 Vibration resistance : 30g (sinusoidal vibr)

### Making and / or Breaking Capacity

Voltage max. 250 VAC/DC (0.48A)  
 Current max. 3A  
 Power max. 120 VA/W

