

WATER SUPPLIES DEPARTMENT
STANDARD SPECIFICATION E-86-11
ELECTRO-MECHANICAL PRESSURE SWITCHES

1. **GENERAL**

The operation of pressure switches is actuated by a change in pressure of liquid or gas in contact. The pressure switches shall be of electro-mechanical type that shall be activated upon reaching a specific predetermined pressure setting for protection and control applications of pumping plant and air compressor, etc.

The actuation set point of the pressure switch shall be fully adjustable by means of a lockable screw against a calibrated scale in metre head of water or kPa according to the Particular Specification within the range of the instrument.

2. **GENERAL REQUIREMENTS**

Unless otherwise specified in the Particular Specification, the pressure switches shall meet the following requirements:

Repeatability	:	Better than $\pm 1\%$ of operating range
Operating temperature	:	$-5^{\circ}\text{C} - 50^{\circ}\text{C}$
Output contacts	:	DPDT contacts rated at 1A 220V 50Hz and 1A 24V d.c.
Dead band	:	Hysteresis (on & off) of the control loop shall be furnished.
Enclosure rating	:	IP 65

3. **TYPES**

3.1 **Differential Pressure Switch**

Differential pressure switch is used to detect the difference between two input pressures applied to either side of a flexible diaphragm. It shall have an over-range protection of 6000 kPa on either side of the port without damage. It shall withstand the surge pressure in the system and shall be suitable for operation at static condition. Each differential pressure switch shall incorporate a valve assembly comprising two isolating valves, one equalising valve and two drain / vent valves to facilitate maintenance. The materials of construction of the valve assembly shall be suitable for the specified application.

3.2 Gauge Pressure Switch

Gauge pressure switch is used to detect a pressure with respect to the atmospheric pressure. The over-range protection of the gauge pressure switch shall be 6000 kPa.

Each pressure switch shall incorporate an isolation valve with material suitable for the specified application.

3.3 Vacuum Pressure Switch

Vacuum pressure switch is used to detect a pressure lower than the atmospheric pressure. It shall have the same requirement as the gauge pressure switches.

4. CONSTRUCTION

The enclosure shall be fabricated from die-cast aluminium alloy coated with epoxy-polyester paint or equivalent. For general applications, the wetted part and the pressure sensing element shall be made of 316 stainless steel. For sea water applications, either Monel or Hastelloy C material shall be used.

The pressure switches shall be suitable for mounting on a vertical wall or on pipe with suitable mounting bracket provided.

5. EQUIPMENT PARTICULARS

The contractor should refer to the Particular Specification for the following particulars of the equipment:

- (a) Type of pressure : Differential / Gauge / Vacuum type switches
- (b) Media to be measured : Liquid (fresh water, raw water, sea water, oil) / Gas (air)
- (c) Working pressure : Head of water (m) / kPa and setting ranges