# Pressure Switches Series 3000

This series of pressure switches can be used for all applications where an electrical circuit is required to close or open at a required pressure.
The robustness of this series of pressure switches enables all applications in all industries to be satisfied.

- **Robust and Reliable**
- **Diaphragm Operated**
- **Proven Performance**
- **Stainless steel Housing**
- **Wetted parts for use with all Fluids**
- **Externally Adjustable**
- **Enclosure Rating IP65**
- **CE marked for all Directives that apply**

## Pressure Ranges

| TYPE No. | PRESSURE RANGE | HYSTERESIS TYPICAL |
|---|---|---|
| 3311 | -1 to +1 bar | Adjustable |
| 3311 | 0.2 to 3 bar | Adjustable |
| 3311 | 0.6 to 8 bar | Adjustable |
| 3311 | 1 to 20 bar | Adjustable |
| 3311 | 2 to 30 bar | Adjustable |
| 3311 | 2 to 40 bar | Adjustable |
| 3411 | 10 to 160 mbar | Adjustable |
| 3411 | 20 to 400 mbar | Adjustable |
| 3511 | 2.5 to 40 mbar | 1.5 mbar Fixed |

## Hysteresis

Where the hysteresis is shown as adjustable in the table above it can be adjustable over 5 to 95% of pressure range.

## Maximum Pressure

To ensure long service life select the pressure range as follows:
Dynamic pressure applications Pmax =75% of Range
Static pressure applications Pmax = 100% of Range
Maximum pressure that can be applied is 125% of pressure range.

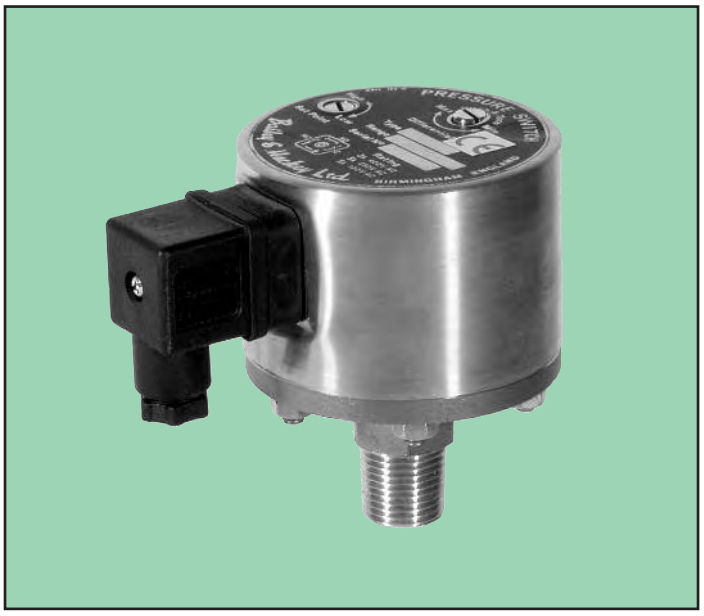
## Electrical Ratings

10 amp at 250V 50Hz Inductive load
1 amp at 30V dc Inductive load
For other voltages and currents please consult our technical department.

**Setting Accuracy .....±2%**

**Temperature Range .....–10 to +85ºC**
(Process fluids must not solidify)

**Temperature Coefficient .....0.05%**
of per ºC from 20ºC



## Installation

These pressure switches can be mounted directly on the connecting thread. Sealing groves are machined onto the end face of parallel threads for use with sealing washers. A mounting bracket is available if required.

## Vacuum Setting

At ambient pressure the switches will be in the operated condition consequently the wiring should be reversed i.e. NO becomes NC.

## Connecting Threads

All connecting threads used in industry are available including British, American and metric. Please state the connection thread when ordering.

## Flanges and Hygienic Fittings

(See page 5 for alternative connections)
Flanged fittings are available and all types of hygienic fittings can be supplied assembled directly onto the Pressure Switch.
If flush diaphragms are required please consult our Technical Department.

## Materials of Construction Types 3311 & 3411

Diaphragm.....17 / 7 PH Stainless Steel
Seal .....Glass filled PTFE < 11bar
Nitrile rubber > 11 bar
Base .....316 Stainless Steel
Housing .....316 Stainless Steel

## Materials of Construction Type 3511

Diaphragm.....Beryllium Copper
Seal .....Nitrile rubber
Base .....Brass
Housing .....316 Stainless Steel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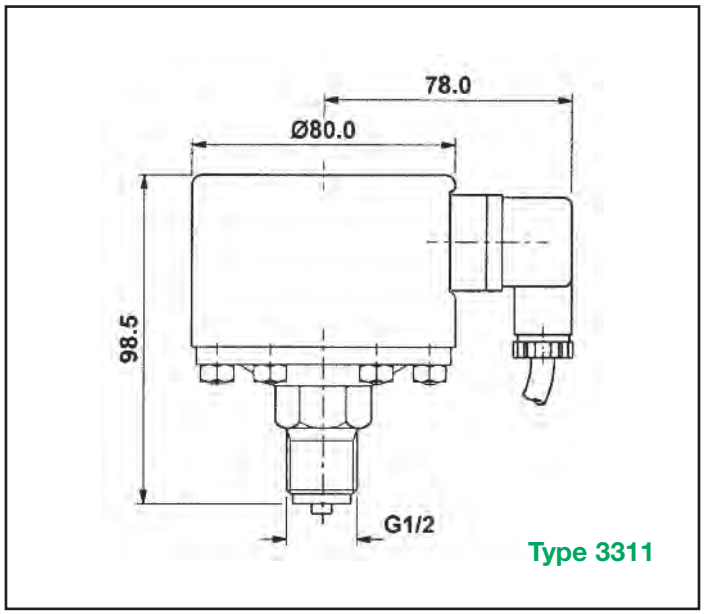
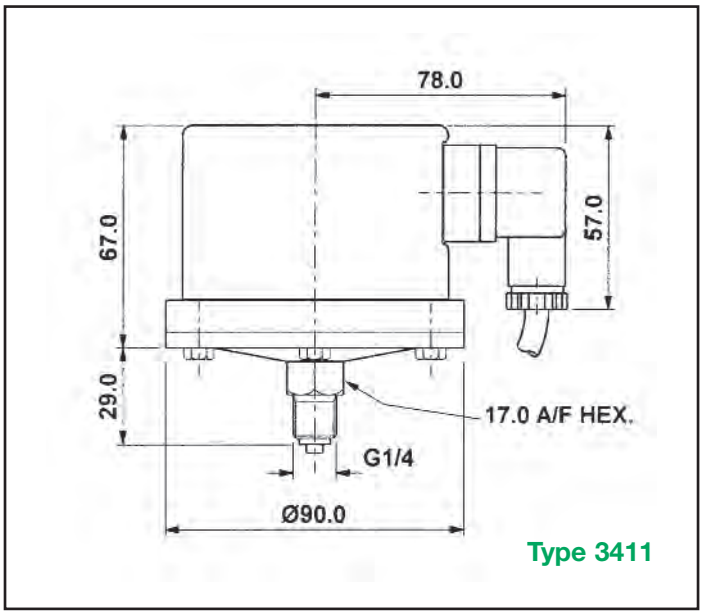


Type 3311



Type 3411

## Alternative Wetted Parts

**(see page 9 for abbreviated chemical compatibility chart)**

Switches with standard wetted parts above are suitable for applications using air, nitrogen, inert gasses, oils, water and steam.

Alternative wetted parts for use with fluids other than these are shown opposite.

Please contact our technical Department for further information.

| TYPE | MATERIAL | BASE | DIAPHRAGM | PROTECTION DISC |
|---|---|---|---|---|
| 3311 | 316 Stainless | Yes | No | Yes |
| 3311 | Carbon Steel | Yes | No | No |
| 3311 & 3411 | UPVC | Yes | No | No |
| 3311 & 3411 | PTFE | Yes | No | Yes |
| 3311 & 3411 | PVDF | Yes | No | No |
| 3311 | Halar Lined | Yes | No | No |
| 3311 | Rubber Lined | Yes | No | No |
| 3311 & 3411 | Chrome Plated | Yes | Yes | No |
| 3311 & 3411 | 17/7 Stainless Steel | No | Yes | No |
| 3311 & 3411 | Silver Plate | Yes | Yes | No |
| 3311 | Pure Silver | No | No | Yes |
| 3311 & 3411 | PVDF (Dykor) coated | No | Yes | No |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# Options available for Series 3000

**To make Series 3000 Pressure Switches more suitable for many applications there are several standard options available.**

## Option D – Degreased for oxygen use

Pressure switches for use on oxygen have to be free from all traces of oil or grease. Diaphragm pressure switches have the diaphragm, pressure chamber and seal specially cleaned and handled during assembly and are marked with the 'Use no oil' symbol.

## Option G – Gold plate Micro-switches

Micro-switches with Gold plated contacts are used in low power circuits where the contact resistance of standard silver contact is too high. For electrical loads below 6V at 0.1A dc.

## Option H – Low leak assembly

A modified design of pressure switch is available for use on extinguishers, switchgear, transformers or sealed pressure systems. Special machining and assembly gives freedom from leaks greater than $10^{-5}$ Nccs / sec.

## Option M – For Mining Applications

No aluminium parts used

## Option Q – overload Protection

Pressures above the adjustable range shown in the table should not be applied to the switches. Overload will strain the diaphragm, either causing distortion that will alter the set point of the pressure switch or reduce the diaphragm life through fatigue failure.
Normally, the pressure range should be chosen to cover the highest pressures likely to develop in the system; Series 3000 switches can be constructed to accept higher pressures than the adjustable range by fully supporting the diaphragm above its normal operating deflection.
Maximum temperature 60°C

| MAXIMUM ADJUSTABLE RANGE | OVERLOAD PRESSURE ALT. 1 | OVERLOAD PRESSURE ALT. 2 |
|---|---|---|
| 40 mbar | 1 bar | – |
| 20 to 400 bar | 7 bar | – |
| 1 bar | 28 bar | 200 bar |
| 2 to 40 bar | 70 bar | 200 bar |



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# Series 3000 Differential Pressure Switches

This series of pressure switches are used to monitor the difference between two pressures. For example, they can be used to monitor filter condition and signal when the filter is becoming blocked. They can also be used as flow monitoring switches if used across orifice plates etc.

- **Robust and Reliable**
- **Diaphragm Operated**
- **Proven Performance**
- **Fully adjustable**
- **Enclosure Rating IP65**
- **CE marked for all Directives that apply**

## Pressure Ranges

| TYPE No. | PRESSURE RANGE | HYSTERESIS TYPICAL |
|---|---|---|
| 3312 | 0.07 to +1 bar | 0.04 bar |
| 3312 | 0.2 to 3 bar | Adjustable |
| 3312 | 0.6 to 8 bar | Adjustable |
| 3312 | 1 to 20 bar | Adjustable |
| 3412 | 10 to 160 mbar | Adjustable |
| 3412 | 20 to 400 mbar | Adjustable |

Available hysteresis range from 5% to 90% of range typical.

## Max. Line Pressure

Pressure range > 250 mbar ..... 34 bar
Pressure range < 250 mbar ..... 14 bar

## Electrical Ratings

10 amp at 250V 50Hz Inductive load
1 amp at 30V dc Inductive load
For other voltages and currents please consult our technical department.

## Overload

Dimensions of the diaphragm housing are such that movement is stopped when the diaphragm exceeds the range. This ensures that the differential pressure switches will accept the accidental application of 4 times the range without damage except for a possible setting shift of up to 2% of the Range. It is possible that these switches can be modified to accept the full line pressure on one side of the diaphragm.

## Temperature Range .....–10 to +85ºC

(Process fluid must not be allowed to solidify)

## Temperature Coefficient .....0.05%

of range per ºC from 20 ºC


## Installation

These pressure switches can be mounted directly on the connecting thread. A Mounting Bracket is available if required.

## Vacuum Use

If used to detect the difference between two levels of vacuum a slight modification is needed and vacuum use must be specified when ordering. At ambient pressure the switches will be in the operated condition consequently the wiring should be reversed i.e. NO becomes NC.

## Materials of Construction Types 3312 & 3412

Diaphragm.....17 / 7ph Stainless Steel
Seals .....Nitrile rubber
Connection .....316 Stainless Steel
Housing .....316 Stainless Steel

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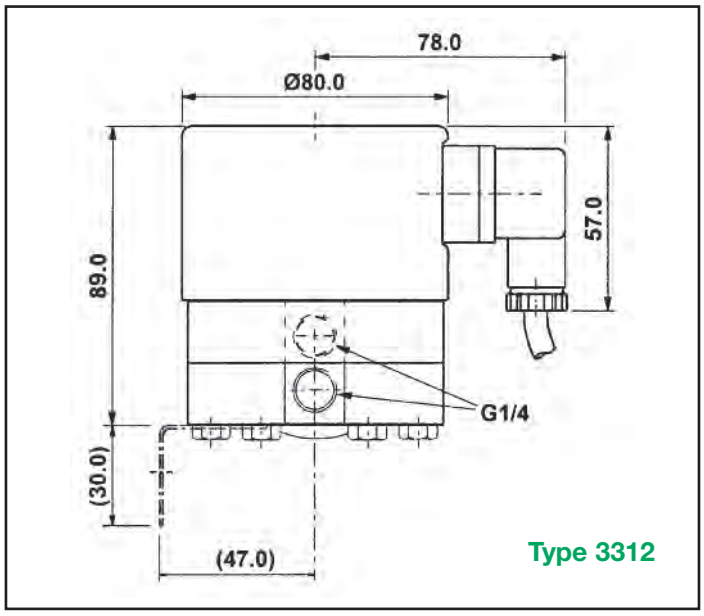


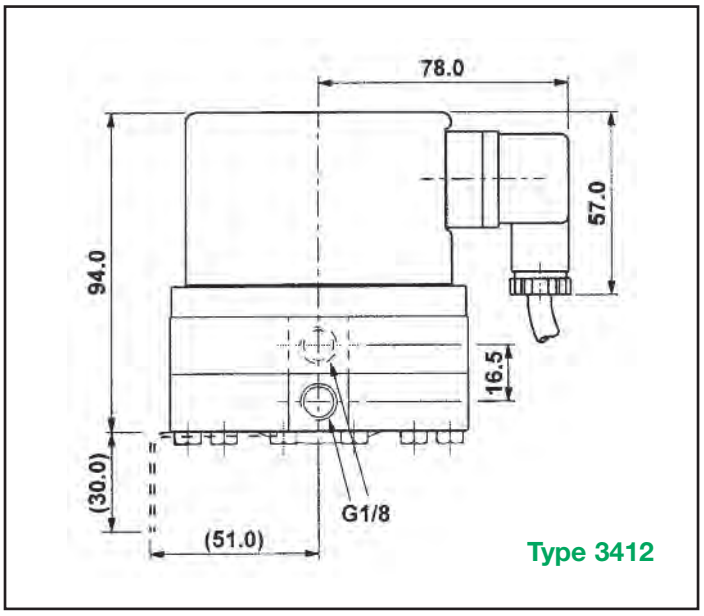


## Options Available

To make Series 3000 Differential Pressure Switches more suitable for many applications there are several standard options available. A suffix letter that follows the Type Number designates these options.

## Option D – Degreased for oxygen use

Pressure switches for use on oxygen have to be free from all traces of oil or grease. Diaphragm pressure switches have the diaphragm, pressure chamber and seal specially cleaned and handled during assembly and are marked with the 'Use no oil' symbol.

## Option G – Gold plate Micro-switches

Micro-switches with Gold plated contacts are used in low power circuits where the contact resistance of standard silver contact is too high. For electrical loads below 6V at 0.1A dc.

## Option V – Adjustable Hysteresis

This option enables the hysteresis to be increased and can be varied between approximately 5 % and 95 % of the adjustable pressure range.

## Option X

In some applications a higher electrical rating is required this option is fitted with a micro-switch for 15 amps at 250V 50Hz



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