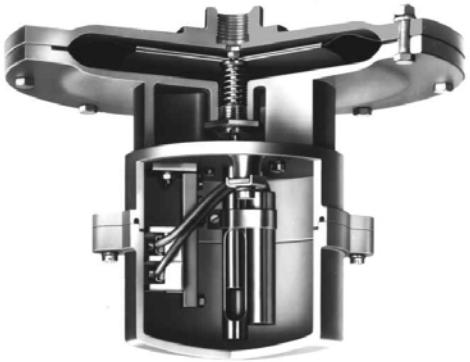
Low pressure control switches and meters for

Differential pressure type 241
Negative pressure type 244
Positive pressure type 246



These spring supported diaphragm units are designed for long term operation and are used for the precise control and measurement of pressures in industrial plant, high value machines and apparatus. They are capable of controlling and measuring low pressures from 0.1 mbar to 2.5 bar whilst remaining undamaged by high media pressure often experienced with differential pressure. The set point of the control unit is available either fixed or adjustable.

Models

Type 241 Differential pressure switch	side process connections; control range of series 0.1 mbar to 2.5 bar; for maximum static pressure of 120 bar; suitable for use without pressure balance valve.
Type 244 Negative pressure switch	bottom process connection, measuring range of series for negative pressures from 800 mbar to 0.1 mbar against atmosphere.
Type 246 Positive pressure switch	top process connection, measuring range of series for positive pressures from 0.1 mbar to 2.5 bar against atmosphere.
Type 241(Ex)i; 244(Ex)i; 246(Ex)i	suitable for the use in intrinsically safe circuits.
Type 241(Ex); 244(Ex); 246(Ex)	flameproof models EEx de II CT6 according to ATEX
Type 241vind.; 244vind.; 246vind.	with inductive proximity sensor (Namur, direct switching 2- and 3-wire system).
Type 241p; 244p; 246p	with pneumatically operated switching device.
Type 241az; 244az, 246az	with reliable mechanical indication of actual pressure, optional with switch contact.
Type 241afp; 244afp; 246afp	with analogue pneumatically output signal 0.2 to 1 bar and local mechanical indication.
Type 241B	Model with bellows made of Material no.1.4571 instead of using a diaphragm

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Operation

- *Types 241; 241(Ex)i; 241(Ex); 241p; 244(Ex); 244p; 246(Ex); 246p*
  The differential pressure acts upon a spring loaded diaphragm. A permanent magnet fixed to the diaphragm and guided within a rising tube operates one encapsulated reed contact situated adjacent to the rising tube or a pneumatically operated switch contact.

- *Types 241az; 241afp; 244az; 244vind; 244afp; 246az; 246afp*
  In units with local indication the movement of the permanent magnet is transferred to a pivoted soft iron core vane on a shaft located outside the rising tube. The shaft operates the indicator needle or a pneumatic transformer.

- *Types 241vind., 244; 244ind., 244(Ex)i;, 246, 246(Ex)i, 246vind.*
  The movement of the diaphragm is sensed via a core fixed to the diaphragm which operates either a micro switch, an inductive proximity sensor.

Advantages

- The units are sensitive and the simple construction makes them highly reliable.
- High static pressures do not damage the unit or affect adjustment.
- Reliable and suitable for long term operation.
- Models available for use in maritime and humid tropical climates.
- Simple installation.
- No maintenance needed.
- Long term continuity of spares availability.

Suitability of differential pressure switches

⇒ Flow control in combination with differential pressure sensors, such as Pitot tube, orifice plate or Venturi tube.
⇒ Filter control.
⇒ Level control of pressurised containers.
⇒ Leakage detection.
⇒ Control of pressure fluctuations in compressors.
⇒ Differential pressure control in gas turbines.
⇒ Flap valve control.
⇒ Burst control of containers.

Suitability for positive pressure switches

⇒ Pressure control of forced ventilation, e. g. in enclosed electrical installations.
⇒ Control of scavenging air in hazardous areas by means of pressurised apparatus (Ex)p – type 246(Ex) – when combined with air flow switch type 171(Ex).
⇒ Ventilation control.
⇒ Monitoring of liquid levels under atmospheric pressure.
⇒ Leakage detection.

Suitability for negative pressure switches

⇒ Control of negative pressure in forced ventilation, e.g. turbo machines and enclosed electrical installations.
⇒ Suction sided control of pumps.
⇒ Ventilation control for feed and exhaust air.
⇒ Leakage detection.

Technical data

Measuring ranges	0.1 - 10.0	mbar with diaphragm chamber-∅	300 mm
	0.3 - 10.0	mbar with diaphragm chamber-∅	250 mm
	3.0 - 100.0	mbar with diaphragm chamber-∅	200 mm
	30.0 - 2500.0	mbar with diaphragm chamber-∅	150 mm

Adjustable set point
Type 244; 246: in the range 1 : 3, e.g. 2 - 6 mbar.
Type 241 in the range 1 : 10, e.g. 1 - 10 mbar.

Admissible deviation of actual value
+/- 5 % of set value.

Repeatability of actual value
+/- 5 % of set value.

Hysteresis between on and off
at 0.1 to 0.5 mbar about 100 % of adjusted set point.
at 0.6 to 2.0 mbar max. 50 % of adjusted set point.
at 2.0 mbar to 1.0 bar max. 30 % of adjusted set point.
from 1 bar max. 20 % of adjusted set point.
(dependent upon switch contact)

Indicating range
Types 244az; 246az; 241az: in the ratio 1 : 5, e.g. 2 - 10 mbar.

Accuracy of indication
+/- 1 % of max. indicated value.

Pressure protection [bar] *depending* upon diaphragm chamber -∅ and material

diaphragm chamber ∅ [mm] 100	150	200	250	300	
-----	----	0.3	0.2	0.1	Aluminium
----	16.0	3.0	1.5	1.0	Gun metal/brass
16.0	30.0	16.0	12.0	12.0	Stainless steel
----	0.3	0.2	0.15	0.1	PTFE/PVC

Special model for high pressure
Material No. 1.4571 for max. pressure 120 bar.

Max. temperature
Standard model: max. 60 °C within the unit.
Special model: max. 200 °C within the unit.

Materials
Diaphragm chamber aluminium, sea water resistant gun metal Rg10, stainless steel, material no. 1.4571 (similar to 316Ti), PVC; PTFE; HC4. Diaphragm of a fabric with fluorocarbon-polymer coating with FEP, PTFE. Moving parts of material no. 1.4571, Hastelloy C. Switch housing aluminium, stainless steel, material no. 1.4408 (similar to AISI CF-8M).

Cable entry
Pg 11, Pg16 or M20 x 1.5 ISO.

Protection class to DIN 40 050	Types 241; 241ind.BZ; 241(Ex); 241(Ex)i; 244(Ex); 246(Ex): IP 65. Types 241az; 244az; 246az: IP 54. Types 241vind.; 244vind.; 246vind.: IP 65 with angular plug connection.
Explosionproof:	(Ex) II 2G EEx de II CT6, EG design approve certificate TÜV 03 ATEX 2163

Switch contacts

Metal encapsulated S.P.C.O. snap action reed contacts• Type GW with silver-palladium contacts.
Capacity: 250 V AC/1 A, P = max. 250 VA, or 250 V DC/1 A, p = max. 100 W
Type GWW with tungsten contacts.
Capacity: 250 V AC/3 A, P = max. 450 VA, or 250 V DC/3 A P = max. 300 W.
Type GWG with gold contacts.
Capacity: 42 V AC/0.3 A, P = max. 13 VA, or 42 V DC/0.3 A, P = max. 13 W.

- *Type 177(Ex) GWW or GWG,*
  Protection class Ex II 2 G Ex de II CT6, TÜV 03 ATEX 2163.

Capacity type 177 Ex GWW:	250 V AC/2A, p = max. 300 VA or 250 V DC. p = max. 200 W.
Capacity type 177 Ex GWG	42 VAC/0,3 A, p = max. 13 VA or 42 VDC/0.3A, p = max. 13 W

- *S.P.C.O. micro switch* for types 244, 246.
  Capacity: 250 V AC/4 A.

- *Inductive proximity sensor* (Namur or direct switching 2- and 3-wire performance).

- *Pneumatic contacts.*

Note

If a mounting bracket is requested with the order, the unit will be delivered ready mounted to the bracket, the bracket is to be fixed to the wall by means of 4 x M8 screws.
If not specified in the order the unit is mounted vertically with switch housing uppermost.
For de-aeration the units can be supplied with screws for venting. Both chambers have to be filled with the liquid and then agitated until all the air has escaped.

The two connecting pipes are connected to the unit in such a way that the over pressure pipe is connected to the threaded process marked „**+**“.

10/2003 Subject to technical changes.