Sensing Edges, Push Buttons and ground contact sensors for automatic doors and gates as well as for public transportation applications.

Pressure wave switch

Sensing Edges, Push Buttons and ground contact sensors for automatic doors and gates as well as for public transportation applications.

Maintenance free, robust and proven

- Very reliable and sensitive switching characteristics
- Pressure wave technology ensures highest switching reliability
- Simple and extremely robust design
- Millions of units successfully installed and in use
For automatic doors and gates as well as for public transportation applications

Universal and ideal wherever a high reliable switching pulse is required
The pressure wave system due to its high sensitivity is able to detect people approaching from almost all sides. Because of the simple design the system is extremely reliable in very tough environments.

Reliable and extremely sensitive
A pressure wave of only 3 to 4 mbar is enough to guarantee a reliable switch of the electrical contact. Pressure wave switch systems are well proven and maintenance free, offering an excellent cost-performance ratio.

Pressure wave switch series
For more detailed information about the individual Pressure wave switch series, please refer to the following pages

<table>
<thead>
<tr>
<th>Series</th>
<th>Pressure wave switch</th>
<th>Response pressure</th>
<th>Max. pressure</th>
<th>Min./max. current</th>
<th>Min./max. operating voltage</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D1</td>
<td>2 mbar*</td>
<td>150 mbar</td>
<td>20 mA/500 mA (ACDC ohmic)</td>
<td>24–250 VAC, 24–50 VDC</td>
<td>NC or NO contact</td>
</tr>
<tr>
<td></td>
<td>D2</td>
<td>0.3–4.5 mbar (3 classes)</td>
<td>500 mbar</td>
<td>1 mA/500 mA (ACDC ohmic)</td>
<td>24 V/36 V/48 V</td>
<td>Semiconductor, (NPN or PNP) NC or NO contact</td>
</tr>
<tr>
<td></td>
<td>D3</td>
<td>2 mbar*</td>
<td>500 mbar</td>
<td>1 mA/1000 mA (ACDC ohmic)</td>
<td>6–250 VAC, 6–50 VDC</td>
<td>Switch</td>
</tr>
</tbody>
</table>

* factory setting
How it works

A pressure wave generated by pressing the sensing edge reaches the pressure wave switch. The membrane deflects and the electric contact switches.

The electric contact remains switched as long as the input pressure is above the response pressure.

Reliable in every application

**Situation**  
Overhead Door

**Solution**  
- Opening signal: Ground contact sensor DGU
- Safety: Pressure wave profile DWS

**Advantages**  
- The ground contact sensor is very robust and can be driven over by all kinds of vehicles
- The pressure wave profile is very sensitive and switches quickly

**Situation**  
Barrier

**Solution**  
- Opening signal: Ground contact sensor DGU
- Safety: Pressure wave profile DWS

**Situation**  
Bus door

**Solution**  
- Safety: Pressure wave profile DWS

**Advantages**  
- The pressure wave profile is very sensitive and switches quickly
- It protects people from getting injured by the door when the door is closing

**Situation**  
Vehicle vestibule

**Solution**  
- Opening signal: Pressure sensitive cell DGD
- Safety: Pressure wave profile DWS

**Advantages**  
- The pressure wave sensitive cell DGD is very flat and can be installed flush with the floor. It withstands high loads
- The pressure wave profile is very sensitive and switches quickly

**Situation**  
Sanitary area

**Solution**  
- Sensor: Hand-operated button

**Advantages**  
- Simple and safe activation of electric switching devices in moist environments or rooms with a potentially explosive atmosphere
**Pressure wave switch**

**D1 series pressure wave switch**

**Millions of units successfully in service**

The pressure wave switch from Bircher Reglomat is based on proven technology that has been working perfectly for over 40 years with millions of units installed and in use. The D1 is used in many different applications. Because of its simple and basic design it operates extremely reliably and without any interference from the external environment. A defined orifice equalizes for atmospheric and/or temperature changes.

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**Types of the D1 series**

Dimensions in inch (mm)

<table>
<thead>
<tr>
<th>Opening/closing contact function</th>
<th>Pressure closes</th>
<th>Pressure opens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating position</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DW10**

Pluggable pressure wave switch with connections at bottom

**DW10s**

Pluggable pressure wave switch with connections on side

**DW20s**

Pressure wave switch with screw connections. Easily accessible screw terminals and 0.25" (6.3 mm) blade terminals

**DW40**

Pressure wave switch with connection terminals and 0.25" (6.3 mm) plug tab with clip-on mounting bracket

**Specifications**

- Pressure equalization: 110 ml/min at 2 mbar. Other settings or fully sealed on request
- Mechanical lifetime: 50 million switchings
- Operating temperature: –20°F to +160°F (–30°C to +70°C)

**Ordering information**

**Type**

- DW10 209986
- DW10s 209999
- DW20s 210004
- DW40 210018
- DWGK11 210096
- DWGK11-DOE 210097

**d** = Sealed version

The DW40 switch can also be supplied in the housing GEHDWGK11 (see page 11 for housing details). Order information for the DW40 switch mounted in this housing is:

- DWGK11 210096(1)
- DWGK11-DOE 210097(2)

**DW40 Contacts:** (1) N/O contact

(2) N/C contact
D2 series pressure wave switch

Pressure wave switch with electrical output
The D2 series pressure wave switch is used where low currents have to be switched or where electronic self-holding effect is required. As standard the switch has a fixed valve orifice to compensate atmospheric and temperature changes. The Birotil (self-holding) version, on the other hand, operates with a pneumatic self-holding effect.

The D2 series pressure wave switch is equipped with a self-cleaning contact and a double membrane system. It is certified acc. to DEV, VDE and NEMKO.

Types of the D2 Series

Type selection
The D2 pressure wave switch is available in 3 operating pressure ranges:
Cl1: 0.3–1.0 mbar
Cl2: 1.0–2.0 mbar
Cl3: 2.0–4.5 mbar
Each operating pressure range can be set for the corresponding pressure or vacuum

D2 dimensions
in inch (mm)

Specifications
- Pressure equalization: sintered filter, fully sealed on request
- Mechanical life time: 30 million switchings
- Operation temperature: −13°F to +140°F (−25°C to +60°C)

Ordering information
- e.g. Cl2 D2 11 KV 24 03 NPN N

Operating pressure ranges
- Cl1 = 0.3–1.0 mbar
- Cl2 = 1.0–2.0 mbar
- Cl3 = 2.0–4.5 mbar

Type
- D2
Principle
- 11 = N.C. normal mounting
- 12 = N.C. circuit board mounting
- 13 = N.O. normal mounting
- 14 = N.O. circuit board mounting

Model
- K = Standard
- B = Birotil (self-holding)
- KV = Standard with delayed release
- BV = Birotil with delayed release

Connection voltage
- 24 V
Release delay
- 0.3 s; 1.0 s; 3.0 s
Output
- NPN, PNP
Housing

Vacuum

Pressure
D3 series pressure wave switch

Pressure wave switch with snap-action contact
The D3 series pressure wave switch is used for applications where a changeover contact is required as well as where a hysteresis effect is mandatory or where a pneumatic self-holding contact is required. With the D3 Switch the pneumatic system is completely separated from the electrical system. The pressure wave is converted into a linear movement. This linear movement is used to activate the snap-action switch which establishes a defined condition in regards to the contact pressure. The contact pressure is set with the adjusting screw. Three different basic types are available.

The D3 pressure wave switch is equipped with a self-cleaning contact and a snap-action switch. The design of the switch makes it possible to have a pneumatic self-holding contact.

Types of the D3 series

Type selection
D3-P
- A pressure wave activates the snap-action switch
- A valve orifice allows equalization for pressure, e.g. caused by temperature differences
- A sealed version is also available (w/o pressure equalization orifice)

D3-V
- Vacuum activates the snap-action switch
- A sealed version is available (w/o pressure equalization orifice)

D3-PB
- Pressure wave activates the changeover switch
- The additional “Birotill” (self-holding) mechanism ensures that the pressure equalization valve is sealed

D3 dimensions
in inch (mm)

<table>
<thead>
<tr>
<th>Type</th>
<th>D3-P 209853</th>
<th>D3-V 209872</th>
<th>D3-PB 209854</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>e.g. D3-PB K1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ordering information
- Pressure equalization: 65 ml/min at 2 mbar*, fully sealed on request
- Mechanical life time: 10 million switchings
- Operation temperature: –22°F to +176°F (–30°C to +80°C)

Specifications

* factory setting
Pneumatic pressure wave profiles

Safety with System
When the pressure wave profile gets compressed the air volume inside the profile gets compressed in a pulsed manner and a pressure wave is generated. The air wave travels extremely fast through the connecting hose to the connected pressure wave switch which triggers the contact.

Profile types
General technical data on rubber profiles and prefabricated safety edges can be found on the last page

<table>
<thead>
<tr>
<th>Dimensions (Dimensions in inch (mm))</th>
<th>Profile</th>
<th>Article no.</th>
<th>Material</th>
<th>Air cross section</th>
<th>Max. length</th>
<th>Weight with/without rail *lb/ft **kg/lfm)</th>
<th>Mounting Rail (Dimensions in inch (mm))</th>
<th>Rail Type</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DWS-D</td>
<td>210154</td>
<td>PVC black</td>
<td>0.12 sq in (77 mm²)</td>
<td>19.7’ (6m)</td>
<td>0.18* (0.27**) / 0.09* (0.14** )</td>
<td>0.24 (6)</td>
<td>DWSALUD</td>
<td>Aluminium</td>
</tr>
<tr>
<td></td>
<td>DWS-C</td>
<td>210152</td>
<td>PVC black</td>
<td>0.28 sq in (180 mm²)</td>
<td>19.7’ (6m)</td>
<td>0.44* (0.66**) / 0.22* (0.33** )</td>
<td>0.51 (13)</td>
<td>AP-2</td>
<td>Aluminium</td>
</tr>
<tr>
<td></td>
<td>DWS-B</td>
<td>210147</td>
<td>PVC black</td>
<td>0.62 sq in (400 mm²)</td>
<td>19.7’ (6m)</td>
<td>0.50* (0.75**) / 0.28* (0.42** )</td>
<td>0.39 (10)</td>
<td>AP-2</td>
<td>Aluminium</td>
</tr>
<tr>
<td></td>
<td>DWS-Bs</td>
<td>210149</td>
<td>PVC black</td>
<td>0.62 sq in (400 mm²)</td>
<td>19.7’ (6m)</td>
<td>0.52* (0.78**) / 0.31* (0.46** )</td>
<td>0.38 (10)</td>
<td>AP-2</td>
<td>Aluminium</td>
</tr>
<tr>
<td></td>
<td>DWS-A</td>
<td>210142</td>
<td>PVC black</td>
<td>0.85 sq in (550 mm²)</td>
<td>19.7’ (6m)</td>
<td>0.87* (1.3**) / 0.54* (0.8** )</td>
<td>0.71 (18)</td>
<td>AP-1</td>
<td>Aluminium</td>
</tr>
<tr>
<td></td>
<td>DWS-P</td>
<td>210175</td>
<td>PVC black</td>
<td>0.33 sq in (213 mm²)</td>
<td>19.7’ (6m)</td>
<td>0.20* (0.3** )</td>
<td>0.79 (20)</td>
<td>DWSPVCX</td>
<td>PVC</td>
</tr>
<tr>
<td></td>
<td>DWS-X</td>
<td>210197</td>
<td>PVC black</td>
<td>0.85 sq in (550 mm²)</td>
<td>19.7’ (6m)</td>
<td>1.78* (2.65**) / 1.44* (2.15** )</td>
<td>4.33 (110)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ground contact sensor DGU / Pressure sensitive cell DGD

Sensor for the installation in the ground
The ground contact sensor DGU is mostly used as an opening signal transmitter for automatic overhead doors and gates. It is very robust and can be driven over by all kinds of vehicles.

The pressure sensitive cell DGD is frequently used as a sensor in contact floors. It is extremely robust as well, and is also popular because of its flat design and easy installation.

Ground contact sensor DGU
See technical data on the last page

Type selection
The DGU ground contact sensor is available in 6 standard overall lengths.
Stand. overall length A in inch (mm):
21.26 (540), 40.94 (1040), 60.63 (1540), 80.31 (2040), 124.92 (3200), 237.80 (6040)
Stand. effective length B in inch (mm):
19.69 (500), 39.37 (1000), 59.06 (1500), 78.74 (2000), 118.11 (3000), 236.22 (6000)

Installation
During installation make sure that the steel channel base is flush with the ground and only the ribbed part of the rubber profile stands above the surface.

Ordering information
e.g. DGU 3000
Type
Ground contact sensor
Length in inch (mm)
19.69 (500), 39.37 (1000), 59.06 (1500), 78.74 (2000), 118.11 (3000), 236.22 (6000)

e.g. DGUG 1500
Type
Rubber profile for ground contact sensor
Length in inch (mm)
19.69 (500), 39.37 (1000), 59.06 (1500), 78.74 (2000), 118.11 (3000), 236.22 (6000)

Pressure sensitive cell DGD
See technical data on the last page

Sample applications

DGD dimensions in inch (mm)

Ordering information

Type
DGD pressure sensitive cell
Pneumatic foot and hand-operated push button DT

Sensor for door and gate opening systems and for moist environments
This reliable and proven products is easy to install. Depending on the application you can select between colored rubber buttons, a hermetically sealed version or a heavy duty version for heavy mechanical loads.

Pneumatic foot and hand-operated push button DT

All dimensions in inch (mm)

Button DTW
- DTWR version; rubber button in red
- DTWB version; rubber button in blue

Foot-operated button DTFA
- Visible parts are made from chromium-nickel steel

Foot-operated button DTHB
- Hermetically sealed version
- Blue rubber button

Foot-operated button DTFV
- Heavy-duty version
- Visible parts are made from chromium-nickel steel

Foot-operated button DTFU
Hand-operated button DTFUW
- Visible plate made from chromium-nickel steel
- Black rubber button
The DTFUW version is a hand-operated button and comes with an especially soft button.

Ordering information
Foot and hand-operated buttons DT

e.g. DTFUW

Type
DT button
Variants
..FU
..FUW
..WR
..WB
..HB
..FA
..FV
Connection elements

Easy connection
The pressure wave switch and sensor can be easily connected together in a variety of ways. A wide range of connection pieces and hoses guarantees flexibility and reliable functioning adapting to your application.

Connection elements

All dimensions in inch (mm)

**PVC 2/4**
PVC air hose with 0.08”/0.16” (2/4 mm) diameter

**NEO 2/4**
Neoprene air hose with 0.08”/0.16” (2/4 mm) diameter

**DWV**
Straight air hose connection piece

**DWL**
Air hose connection piece with 90° angle

**DWT**
Air hose connection piece with T-shape

**A3M5**
Connection piece with two 0.12” (3 mm) diameter connections, thread M5
Accessories

Maximum flexibility for your installation
Optimize space in your installation by using one of our plug-in bases. Protect the DW switch against manipulation and external conditions by using a cover hood. The user-friendly housing made out of impact-resistant plastic ensures protection against environmental influences acc. to IP54 (IEC 529).

Plug-in base, cover hood and housing

All dimensions in inch (mm)

DWSO plug-in base
- Space-saving and efficient installation for DW10 and DW10s
- Spring loaded socket
- Easily accessible connection terminals
- Ability to connect 0.25" (6.3 mm) blade terminals

DWH cover hood
- Protects the pressure wave switch against manipulation
- Can be used for DW10 with DWSO, DW20s
- The electrical supply cable can be on one or both sides

GEHDWGK 11
- Impact-resistant plastic housing for pressure wave switch DW40
- Index of protection IP 54 (IEC 529)
### Ordering information

<table>
<thead>
<tr>
<th>Ground contact sensor DGU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
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<tr>
<td><strong>Type</strong></td>
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<tr>
<td><strong>Length</strong></td>
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<td><strong>Type</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure sensitive cell DGD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pneumatic foot and hand-operated buttons DT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
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<td><strong>Type</strong></td>
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<table>
<thead>
<tr>
<th>Connection elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
</tr>
<tr>
<td><strong>Hose</strong></td>
</tr>
<tr>
<td><strong>Hose</strong></td>
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<tr>
<td><strong>Hose</strong></td>
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<tr>
<td><strong>Hose</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Plug-in base, cover hood and housing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
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<tr>
<td><strong>Type</strong></td>
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<td><strong>Type</strong></td>
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</tbody>
</table>

### Technical data

#### Pneumatic pressure wave profiles

<table>
<thead>
<tr>
<th><strong>Material</strong></th>
<th>PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Profile length</strong></td>
<td>max. 19.7' (6 m)</td>
</tr>
<tr>
<td><strong>Connection cable length to PW</strong></td>
<td>max. 32.8' (10 m)</td>
</tr>
<tr>
<td><strong>Manufacturing tolerances</strong></td>
<td>dia. 0.08'/0.16' (dia 2/4 mm)</td>
</tr>
<tr>
<td><strong>Width/height</strong></td>
<td>at 68°F (20°C)</td>
</tr>
<tr>
<td><strong>Length up to 39&quot; (1000 mm)</strong></td>
<td>± 0.08&quot; (± 2 mm)</td>
</tr>
<tr>
<td><strong>Length up to 79&quot; (2000 mm)</strong></td>
<td>± 0.12&quot; (± 3 mm)</td>
</tr>
<tr>
<td><strong>Length up to 157&quot; (4000 mm)</strong></td>
<td>± 0.20&quot; (± 5 mm)</td>
</tr>
<tr>
<td><strong>Length up to 236&quot; (6000 mm)</strong></td>
<td>± 0.35&quot; (± 9 mm)</td>
</tr>
<tr>
<td><strong>Length up to 236&quot; (6000 mm)</strong></td>
<td>± 0.59&quot; (± 15 mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ground contact sensor DGU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material</strong></td>
</tr>
<tr>
<td><strong>Connection cable length to PW</strong></td>
</tr>
<tr>
<td><strong>Loading capacity</strong></td>
</tr>
<tr>
<td><strong>Drive-over speed</strong></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure sensitive cell DGD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material</strong></td>
</tr>
<tr>
<td><strong>Loading capacity</strong></td>
</tr>
<tr>
<td><strong>Pressure load</strong></td>
</tr>
<tr>
<td><strong>Preload</strong></td>
</tr>
<tr>
<td><strong>Response weight</strong></td>
</tr>
<tr>
<td><strong>Deformation</strong></td>
</tr>
<tr>
<td><strong>Number of elements/system</strong></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Housing GEHDWGK11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material</strong></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
</tr>
<tr>
<td><strong>Fastening</strong></td>
</tr>
<tr>
<td><strong>Electrical connection</strong></td>
</tr>
<tr>
<td><strong>Air connection</strong></td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
</tr>
</tbody>
</table>

#### Note

Technical details and recommendations concerning our products are based on experience and are an aid for the orientation of the user. Details stated in our brochures and data sheets do not guarantee special properties of the products. This does not apply to special product properties confirmed by us in writing or individually. Subject to technical alterations.

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