

sensing the future



## 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

# Pressure Wave Switch

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

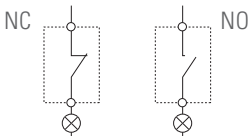
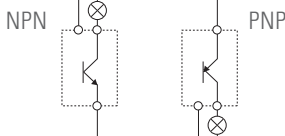
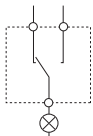
A pressure wave of only 3 to 4 mbar is enough to guarantee a reliable switch of the electrical contact. Pressure wave switch systems are well proven and maintenance free, offering an excellent cost-performance ratio.



## Pressure wave switch series

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



<b>Series</b> Pressure wave switch	<b>D1</b> DW10–DW40	<b>D2</b> D2...	<b>D3</b> D3P /B /V
<b>Response pressure</b>	2 mbar*	0.3–4.5 mbar (3 classes)	2 mbar*
<b>Max. pressure</b>	150 mbar	500 mbar	500 mbar
<b>Min./max. current</b>	20 mA / 500 mA (ACDC ohmic)	1 mA / 500 mA (ACDC ohmic)	1 mA / 1000 mA (ACDC ohmic)
<b>Min./max. operating voltage</b>	24–250 VAC, 24–50 VDC	24 V / 36 V / 48 V	6–250 VAC, 6–50 VDC
<b>Output</b>	NC or NO contact 	Semiconductor, (NPN or PNP) NC or NO contact 	Switch 

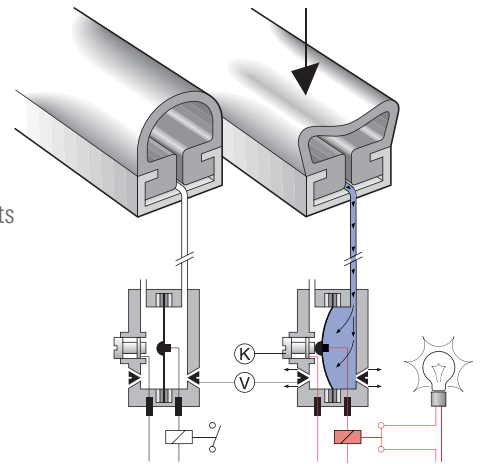
\* factory setting



## 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

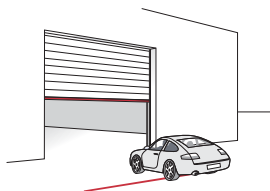
Overhead Door

### 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

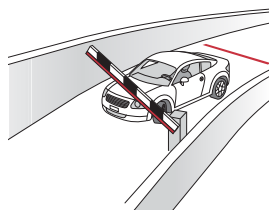
Barrier

### Solution

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

### 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

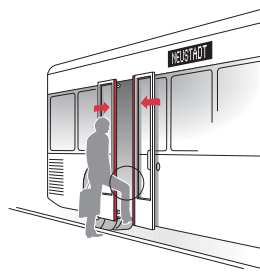
Bus door

### 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

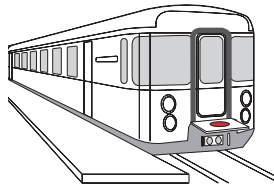
Vehicle vestibule

### 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

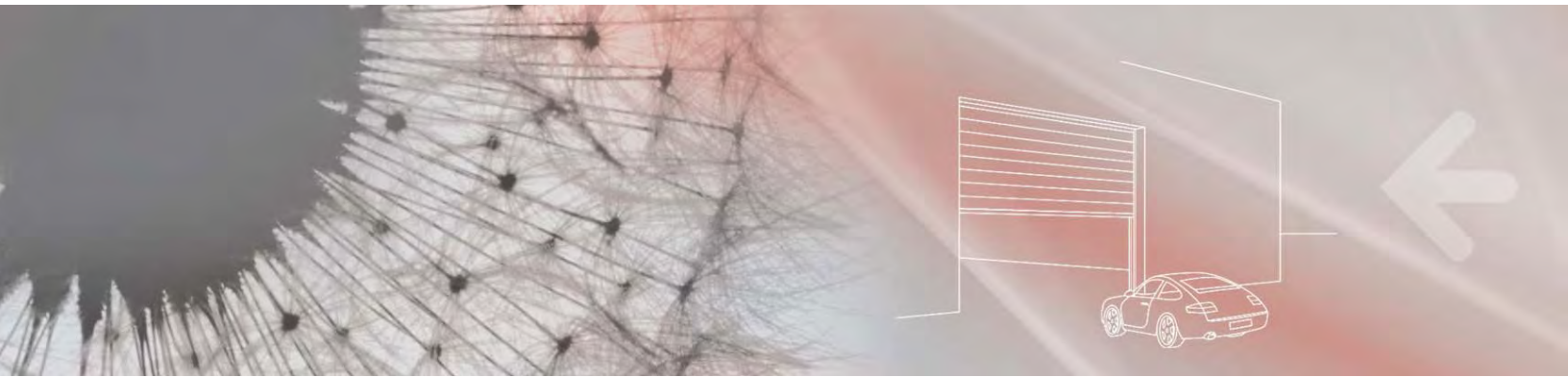


# Pressure wave switch

## 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.

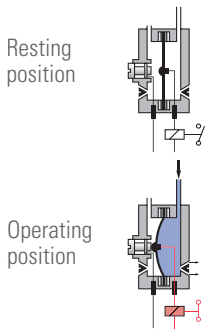


## Types of the D1 series

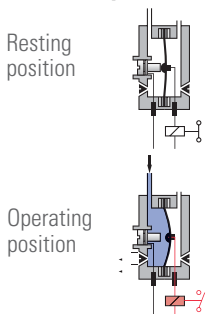
Dimensions in inch (mm)

### Opening/closing contact function

#### Pressure closes

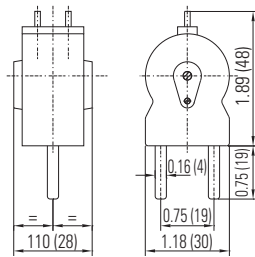


#### Pressure opens



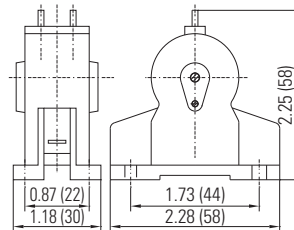
### DW10

Pluggable pressure wave switch with connections at bottom



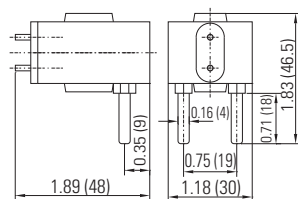
### DW20s

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



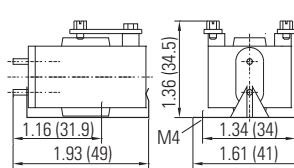
### DW10s

Pluggable pressure wave switch with connections on side



### 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 life time: 50 million switchings
- Operating temperature: -20°F to +160°F (-30°C to +70°C)

### Ordering information

#### Type

DW10 209986 DW20s 210004  
DW10s 209999 DW40 210018

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<sup>(1)</sup>

DWGK11-DOE 210097<sup>(2)</sup>

DW40 Contacts: <sup>(1)</sup> N/O contact

<sup>(2)</sup> N/C contact

# Pressure wave switch

## 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:

CI1: 0.3–1.0 mbar

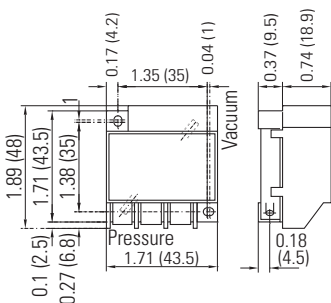
CI2: 1.0–2.0 mbar

CI3: 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:  $-13^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$  ( $-25^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ )

### Ordering information

e.g. CI2 D2 11 KV 24 03 NPN N

### Operating pressure ranges

CI1 = 0.3–1.0 mbar

CI2 = 1.0–2.0 mbar

CI3 = 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

# Pressure wave switch

## 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

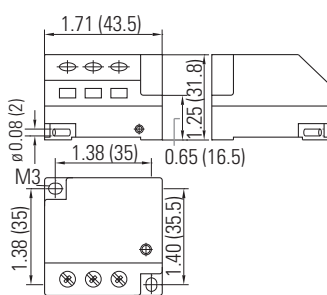
- Vacuum activates the snap-action switch
- A sealed version is available (w/o pressure equalization orifice)

#### D3-PB

- Pressure wave activates the changeover switch
- The additional "Birotil" (self-holding) mechanism ensures that the pressure equalization valve is sealed

### D3 dimensions

in inch (mm)



### Specifications

- 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)

### Ordering information

e.g. D3-PB K1

#### Type

D3-P	209853
D3-V	209872
D3-PB	209854

(K1 = Synthetic Housing)

# Pressure wave sensor

## 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.

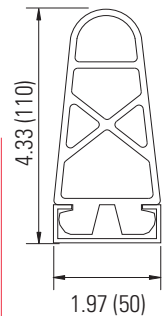
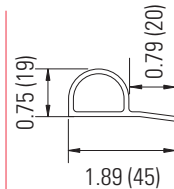
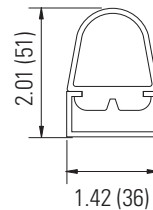
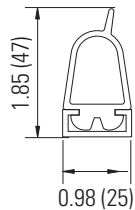
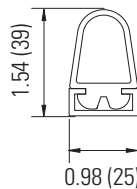
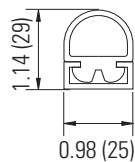
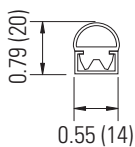


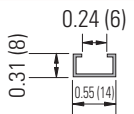
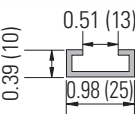
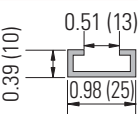
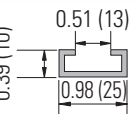
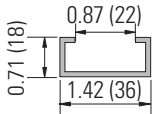
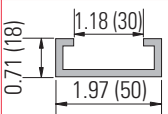
## Profile types

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

### Dimensions

(Dimensions in inch (mm))



Profile	DWS-D	DWS-C	DWS-B	DWS-Bs	DWS-A	DWS-P	DWS-X
Article no.	210154	210152	210147	210149	210142	210175	210197
Material	PVC black	PVC black	PVC black	PVC black	PVC black	PVC black	PVC black
Air cross section	0.12 sq in (77 mm <sup>2</sup> )	0.28 sq in (180 mm <sup>2</sup> )	0.62 sq in (400 mm <sup>2</sup> )	0.62 sq in (400 mm <sup>2</sup> )	0.85 sq in (550 mm <sup>2</sup> )	0.33 sq in (213 mm <sup>2</sup> )	0.85 sq in (550 mm <sup>2</sup> )
Max. length	19.7' (6m)	19.7' (6m)	19.7' (6m)	19.7' (6m)	19.7' (6m)	19.7' (6m)	19.7' (6m)
Weight with/without rail *lb/ft (**kg/lfm)	0.18* (0.27**)/ 0.09* (0.14**)	0.44* (0.66**)/ 0.22* (0.33**)	0.50* (0.75**)/ 0.28* (0.42**)	0.52* (0.78**)/ 0.31* (0.46**)	0.87* (1.3**)/ 0.54* (0.8**)	0.20* (0.3**)	1.78* (2.65**)/ 1.44* (2.15**)
Mounting Rail (Dimensions in inch (mm))							
Rail Type	DWSALUD	AP-2	AP-2	AP-2	AP-1		DWSPVCX
Material	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium		PVC

# Pressure wave sensor

## 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):

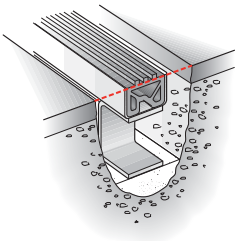
21.26 (540), 40.94 (1040), 60.63 (1540), 80.31 (3040), 237.80 (6040)

#### 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)

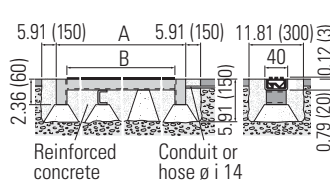
### Installation

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.



### Installation dimensions

in inch (mm)



### 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

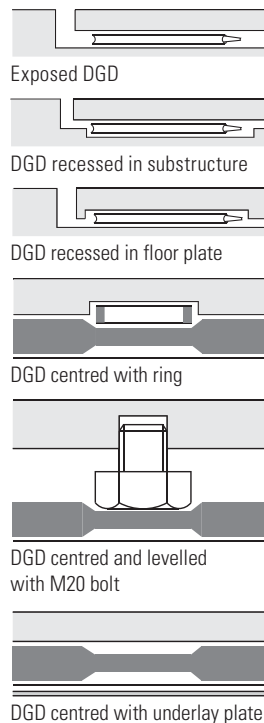
#### Length in inch (mm)

19.69 (500), 39.37 (1000), 59.06 (1500), 78.74 (2000), 118.11 (3000), 236.22 (6000)

## Pressure sensitive cell DGD

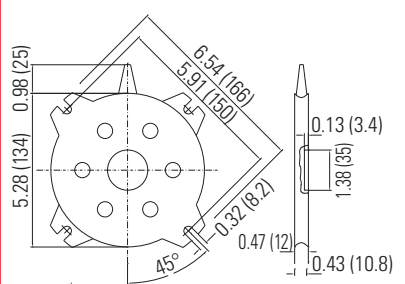
See technical data on the last page

### Sample applications



### DGD dimensions

in inch (mm)



### Ordering information

e.g. DGD

#### Type

DGD pressure sensitive cell



# Pressure wave sensor

## 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.

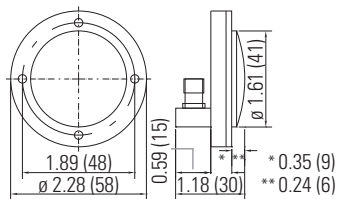


## Pneumatic foot and hand-operated push button DT

All dimensions in inch (mm)

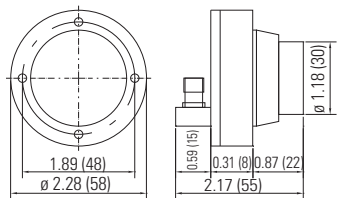
### Button DTW

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



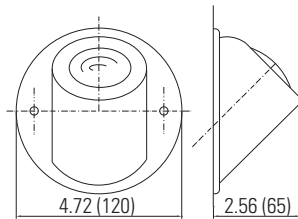
### Button DTHB

- Hermetically sealed version
- Blue rubber button



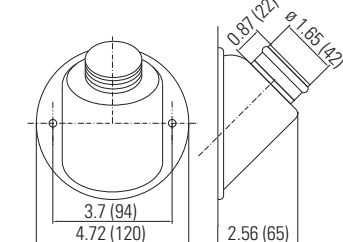
### Foot-operated button DTFA

- Visible parts are made from chromium-nickel steel



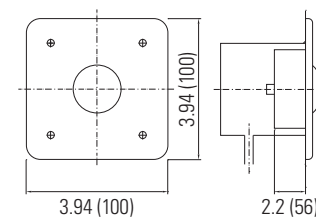
### Foot-operated button DTFV

- 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

# Pressure wave switch and sensors

## 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.

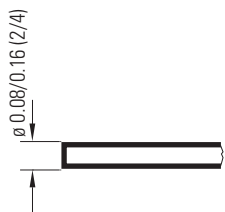


## Connection elements

All dimensions in inch (mm)

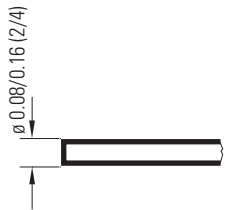
### PVC 2/4

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



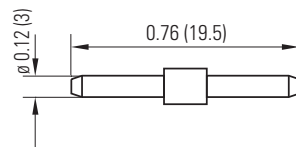
### NEO 2/4

Neoprene air hose with 0.08"/0.16" (2/4 mm) diameter



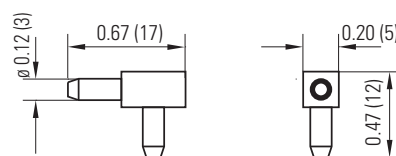
### DWV

Straight air hose connection piece



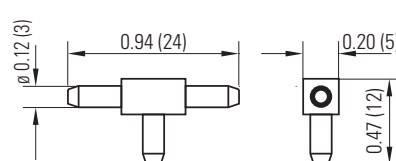
### DWL

Air hose connection piece with 90° angle



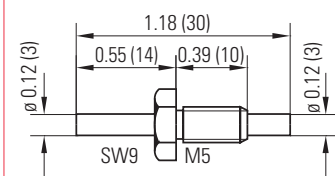
### DWT

Air hose connection piece with T-shape



### A3M5

Connection piece with two 0.12" (3 mm) diameter connections, thread M5



# Pressure wave switch

## 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).

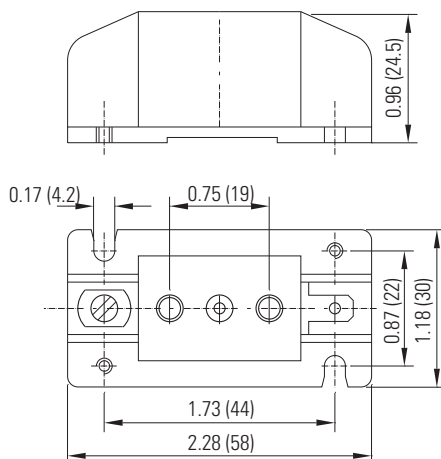


## Plug-in base, cover hood and housing

All dimensions in inch (mm)

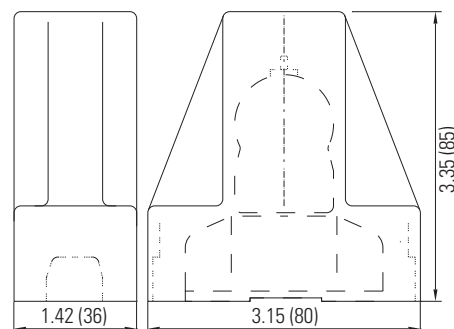
### DWSO plug-in base

- 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



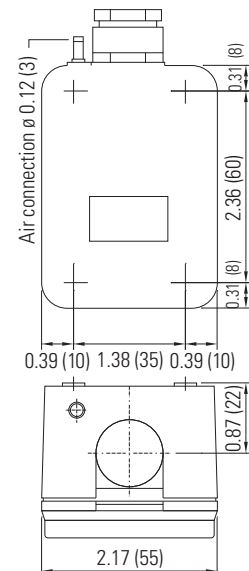
### DWH cover hood

- 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


### Ground contact sensor DGU

Length	19.69" (500 mm)	39.37" (1000 mm)	59.06" (1500 mm)	
Type	DGU500	DGU1000	DGU1500	
	<b>209932</b>	<b>209928</b>	<b>209929</b>	
Length	78.74" (2000 mm)	118.11" (3000 mm)	236.22" (6000 mm)	
Type	DGU2000	DGU3000	DGU6000	
	<b>209930</b>	<b>209931</b>	<b>209934</b>	


### Pressure sensitive cell DGD


<b>209926</b>	<b>DGD</b>	DGD pressure sensitive cell	
---------------	------------	-----------------------------	---

### Pneumatic foot and hand-operated buttons DT




<b>209985</b>	<b>DTWR</b>	Button DTW, red rubber button	
<b>209984</b>	<b>DTWB</b>	Button DTW, blue rubber button	
<b>209983</b>	<b>DTHB</b>	Button DTHB, hermetically sealed, blue rubber button	
<b>209978</b>	<b>DTFA</b>	Foot-operated button DTFA	
<b>209982</b>	<b>DTFV</b>	Foot-operated button DTFV, heavy-duty version	
<b>209979</b>	<b>DTFU</b>	Foot-operated button DTFU, black rubber button	
<b>209981</b>	<b>DTFUW</b>	Hand-operated button DTFUW, special soft black rubber button	

### Connection elements

Length	32.8' (10 m)	82' (25 m)	164' (50 m)	328' (100 m)	
Hose	PVC 2/4	PVC 2/4	PVC 2/4	PVC 2/4	
	<b>207492</b>	<b>207493</b>	<b>207494</b>	<b>207495</b>	
Hose	NEO 2/4	NEO 2/4	NEO 2/4	NEO 2/4	
	<b>207499</b>	<b>207500</b>	<b>207501</b>	<b>207502</b>	

<b>208930</b>	<b>DWV</b>	Straight air hose connection piece	
<b>208929</b>	<b>DWL</b>	Air hose connection piece with 90° angle	
<b>208928</b>	<b>DWT</b>	Air hose connection piece with T-shape	
<b>208968</b>	<b>A3M5</b>	Connection piece with dia. 0.12" (dia. 3 mm) connections, thread M5	

### Plug-in base, cover hood and housing

<b>210191</b>	<b>DWSO</b>	Plug-in base for DW10 and DW10s	
<b>210123</b>	<b>DWH</b>	Cover hood for DW10 with DWSO, DW20s	
<b>212866</b>	<b>GEHDWGK11</b>	Impact-resistant plastic housing for pressure wave switch DW40	

## Technical data

### Pneumatic pressure wave profiles

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

### Ground contact sensor DGU

<b>Material</b>	U-profile: Galvanized steel Rubber profile: EPDM
<b>Connection cable length to PW</b>	max. 32.8' (10 m) dia 0.08"/0.16" (dia 2/4 mm)
<b>Loading capacity</b>	max. 4400 lbs (2 t)
<b>Drive-over speed</b>	max. 19 mph (30 km/h)
<b>Operating temperature</b>	-4°F to +140°F (-20°C to +60°C)

### Pressure sensitive cell DGD

<b>Material</b>	Galvanized steel, natural rubber, ring, protected by silicone
<b>Loading capacity</b>	
<b>Pressure load</b>	max. 11000 lbs/element (5 t)
<b>Preload</b>	max. 88 lbs/element (40 kg)
<b>Response weight</b>	approx. 11 lbs/element (5 kg)
<b>Deformation</b>	0.008"/22.5 lbf (0.2 mm/100 N)
<b>Max. deformation</b>	0.047"/135 lbf (1.2 mm/600 N)
<b>Number of elements/system</b>	max. 8
<b>Operating temperature</b>	-4°F to +160°F (-20°C to +70°C)

### Housing GEHDWGK-11

<b>Material</b>	Impact-resistant plastic, Luran 786R, grey
<b>Weight</b>	3 oz (85 g) / 1.6 oz (45 g) empty
<b>Fastening</b>	2 x M4 screw
<b>Electrical connection</b>	PG-cable gland PG11
<b>Air connection</b>	Connection nipple dia. 0.12" (dia. 3 mm)
<b>Protection class</b>	IP 54 (IEC 529)

#### 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.

## Your contacts

### Bircher America Inc.

870 Pratt Avenue  
Schaumburg, IL 60193  
USA

Phone +1 800 252 1272

Fax +1 847 952 2005

sales@bircherreglomat.com

www.bircherreglomat.com