



## Pressure Wave Switches

Profiles, push buttons, pressure cells and ground sensors for automatic doors, gates and barriers

**Maintenance free, robust, tried-and-tested**

- **Very fast closing**
- **Pressure wave technology for a high standard of switching reliability**
- **Straightforward and robust structure**
- **Millions of units successfully in service**

# Pressure wave switches

## For automatic doors, gates and barriers

### Can be used wherever a reliable switching pulse is required

The highly sensitive response of the pressure wave system means that it protects people and vehicles from almost all directions. The robustness and durability of the pressure wave switch make it an impressive opening sensor as well.

### Quick and reliable

Even low pressure of 3 to 4 mbar is enough to guarantee the electric contact will switch. Pressure wave switch systems are well proven and maintenance free, as well as offering a particularly good cost-performance ratio.

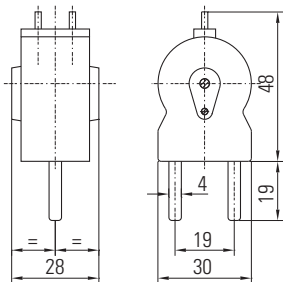


## Types of the D1 and D3 series

Technical data see back page, measurements in mm

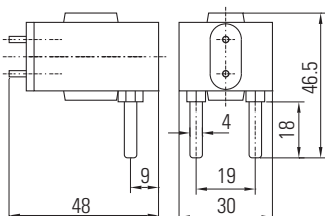
### D1 series – small and universal DW10

Pluggable pressure wave switch  
Connections at bottom



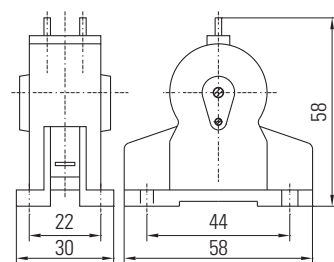
### DW10s

Pluggable pressure wave switch  
Connections on the side



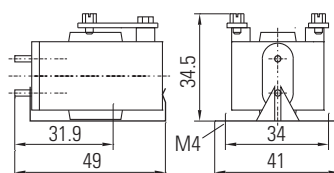
### DW20s

Pressure wave switch with screw connections. Easily accessible screw terminals and 6.3 mm blade terminals



### DW40

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



### Types

- 209986 DW10
- 209999 DW10s
- 210004 DW20s
- 210018 DW40

### D1 options e.g. for DW40

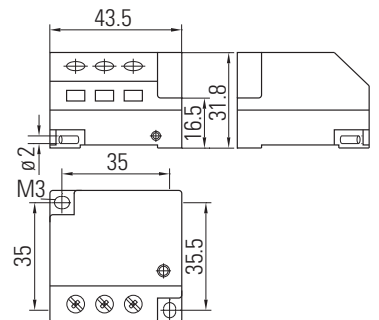
- 210018 DW40**  
Pressure closes contact
- 210020 DW40D**  
Pressure closes contact, sealed pressure equalisation valve

### 210025 DW40DOE

Pressure opens contact

### D3 series – wide range use

Pressure wave switch with two-hole baseplate



### Types

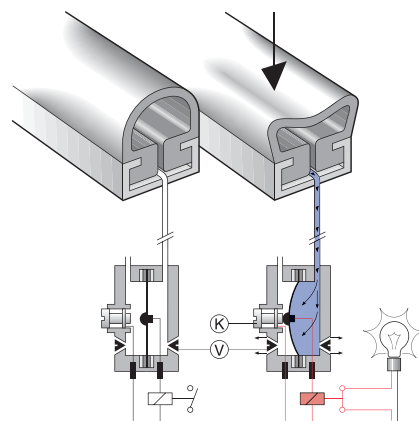
- 209853 D3-P**  
Pressure activates the binary switch
- 209854 D3-PB**  
Pressure activates the binary switch, pressure equalisation valve is sealed (birotitil)



## Functional principles

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

The electric contact remains switched for as long as the input pressure is above the response pressure. With the contact (K) and valve screw (V) the switch's sensitivity can be set individually.



## Reliable in every application

### Situation

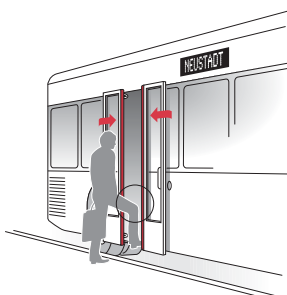
Bus door/Train door

### Solution

- Safety: Pressure wave profile DWS

### Advantages

- The pressure wave profile is very sensitive and switches quickly
- It protects against crushing and shearing, when the door is closing



### Situation

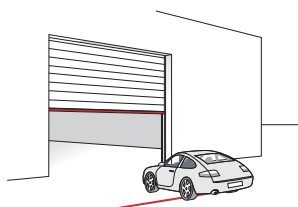
Roller gate

### Solution

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

### Advantages

- The ground 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

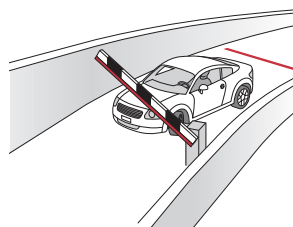
Barrier

### Solution

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

### Advantages

- The ground 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

Sanitary area / explosive area

### Solution

- Sensor: foot or hand-operated push button

### Advantages

- Simple and safe control of electric switching procedures in damp rooms or rooms with a potentially explosive atmosphere



# Pressure wave sensor

## Pneumatic pressure wave profiles

### Safety with profile

When a rubber profile gets an impact, the inside air volume is compressed pulsed and thereby generates a pressure wave. It passes through the connecting hose to the pressure wave switch, where it triggers a contact.

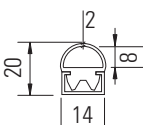
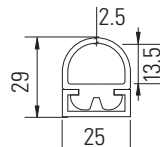
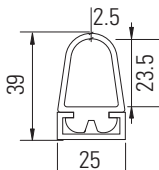
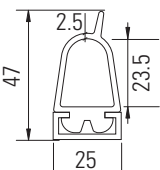
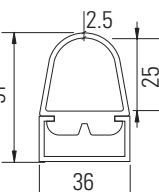
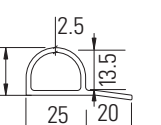
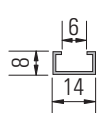
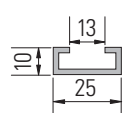
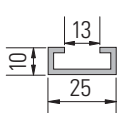
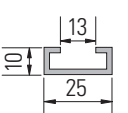
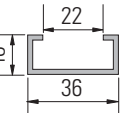
### Order possibilities of the edges and rubber profiles

1. Fully assembled edge incl. of rubber and aluminium profile, e.g. DWS-C/1000 mm
2. Only rubber profile with pneumatic connections, e.g. DWSGUMMI-C/1000 mm
3. Made to measure rubber profile, e.g. DWSGO-C/1000 mm
4. Made to measure aluminium profile, e.g. DWSALU-C/1000 mm



## Profile types

Technical data see back page, measurements in mm

Dimensions						
	small air chamber	universal	universal + high	with sealing lip	big air chamber	adhesive
<b>Rubber profile</b>	DWS-D	DWS-C	DWS-B	DWS-Bs	DWS-A	DWS-P
<b>Article no.</b>	210173	210171	210167	210168	210165	210175
<b>Material</b>	PVC black	PVC black	PVC black	PVC black	PVC black	PVC black
<b>Air cross section</b>	77 mm <sup>2</sup>	180 mm <sup>2</sup>	400 mm <sup>2</sup>	400 mm <sup>2</sup>	550 mm <sup>2</sup>	213 mm <sup>2</sup>
<b>Weight*</b> with/without rail	0.27 kg/lfm / 0.14 kg/lfm	0.66 kg/lfm / 0.33 kg/lfm	0.75 kg/lfm / 0.42 kg/lfm	0.78 kg/lfm / 0.46 kg/lfm	1.3 kg/lfm / 0.8 kg/lfm	0.3 kg/lfm
<b>Mounting Rail</b> (Dimensions in mm)						
<b>Aluminium profile</b>	DWSALUD	AP-2	AP-2	AP-2	AP-1	
<b>Article no.</b>	210144	209577	209577	209577	209574	
<b>Packaging unit</b>	6 m	6 m	6 m	6 m	6 m	
<b>End pieces</b>	DWSED	DWSEC	DWSEB	DWSEB	DWSEA	DWSEC
<b>Article no.</b>	209154	208995	208996	208996	208997	208995

# Pressure wave sensor

## Pneumatic ground sensor / pressure cell / push button

### Sensor for installation in the floor

The ground sensor DGU is principally used as a control signal transmitter in automatic door and gate opening systems. 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 ease of installation.

### Sensor for door and gate opening systems and for sanitary areas

Pneumatic foot and hand-operated push buttons are simple, robust sensors and are specifically suitable for damp rooms or rooms with a potentially explosive atmosphere. These tried-and-tested products are easy to install and offer reliable functions.



## Ground sensor DGU\*

Technical data see back page

### Type selection

The DGU ground sensor is available in five standard overall lengths.

#### Standard overall length A in mm:

540, 1040, 1540, 2040, 3040

#### Standard effective length B in mm:

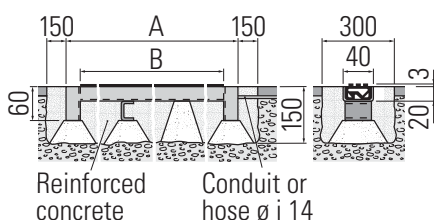
500, 1000, 1500, 2000, 3000

### Installation

During installation care should be taken that the steel channel base is flush with the ground and only the ribbed part of the rubber profile projects above the surface.

### Installation dimensions

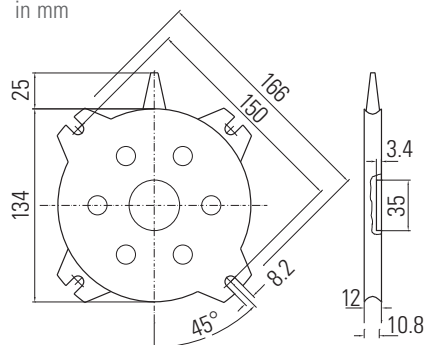
in mm



## Pressure cell DGD\*

### DGD dimensions

in mm



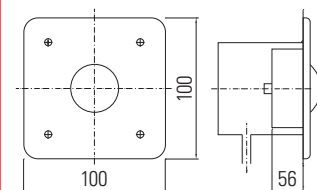
### Specifications

- Max. pressure load 5 t / element
- Max. preload 40 kg / element
- Response weight ca. 5 kg / element
- Deformation 0.2 mm / 100 N
- Max. deformation 1.2 mm / 600 N
- Number of elements per system max. 8
- Operating temperature -20° to +70° C

## Push buttons DT\*

### DT dimensions

in mm



### Foot-operated push button DTFU

### Hand-operated push button DTFUW

- Visible plate made from chromium-nickel steel
  - Black push button bellows
- The DTFUW version is a handoperated push button and has an especially soft bellows.

### Type

- 209979 DTFU
- 209981 DTFUW

### Replacement part

- 209689 Bellows to DTFU
- 209690 Bellows to DTFUW

\*Remark: the needed pressure wave switch and the air hose are not included



# Pressure wave switches and sensors

## Connection elements

### Simplicity of connection

Pressure wave switches and sensors can be connected together easily and in a variety of ways. A wide range of connection pieces and hoses guarantees flexibility and reliable function appropriate to your application.

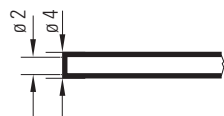


## Connection elements

Measurements in mm

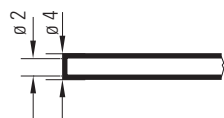
### PVC 2/4

PVC air hose with 2/4 mm diameter, colour transparent



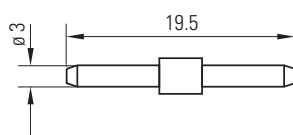
### NEO 2/4

Neoprene air hose with 2/4 mm diameter, colour black, flame retardant



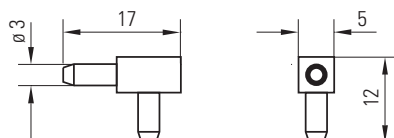
### DWV

Straight air hose connection piece



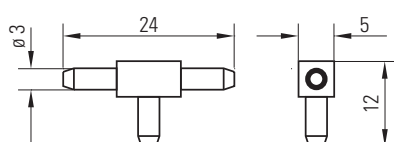
### DWL

Air hose connection piece with L-shape



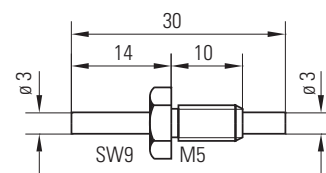
### DWT

Air hose connection piece with T-shape



### A3M5

Connection piece with two 3 mm diameter connections, thread M5



# Pressure wave switches

## Accessories

### Maximum flexibility for installation

Install your pressure wave switches efficiently and compactly with a plug-in base. The practical housing made from impact-resistant plastic ensures protection against environmental influences according to IP54 or IP65.

### Order possibilities

1. Separate housing, e.g. 212865 GEHDWGK1
2. Housing incl. of pressure wave switch, e.g. 210095 DWGK1

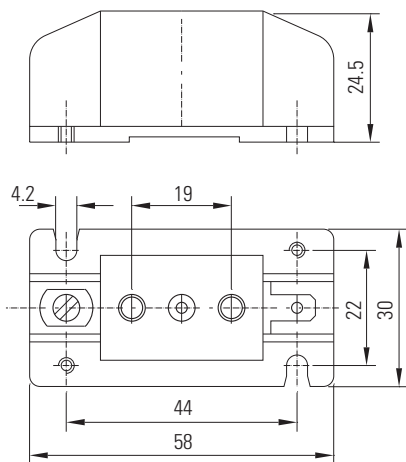


## Plug-in base, cover hood and housing

Measurements in mm

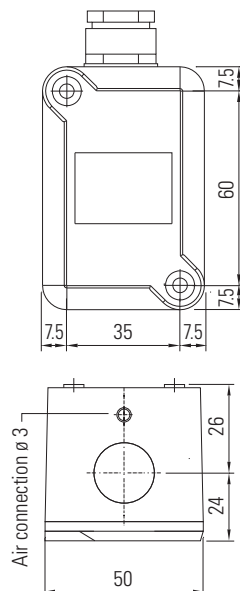
### DWSO plug-in base

- Space-saving and efficient installation of DW10 and DW10s
- Spring-mounted plugs
- Easily accessible connection terminals
- Ability to connect 6.3 mm blade terminals



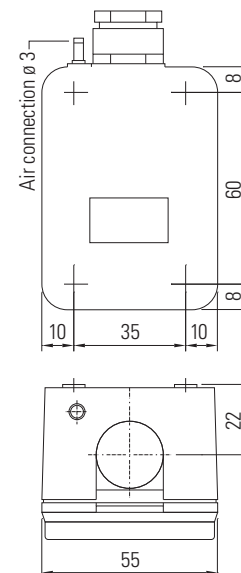
### GEHDWGK 1

- Impact-resistant screw-on housing for pressure wave switch serie D1
- Protection class 65 (EN 60529)



### GEHDWGK 11/GEHD3K1

- Impact-resistant snap-in housing for pressure wave switch serie D1 and D3
- Protection class 54 (EN 60529)



# Ordering information

## Ground sensor DGU

<b>209932</b>	DGU500	500 mm
<b>209928</b>	DGU1000	1000 mm
<b>209929</b>	DGU1500	1500 mm
<b>209930</b>	DGU2000	2000 mm
<b>209931</b>	DGU3000	3000 mm

## Replacement rubber

<b>209942</b>	DGUG500
<b>209935</b>	DGUG1000
<b>209936</b>	DGUG1500
<b>209937</b>	DGUG2000
<b>209941</b>	DGUG3000



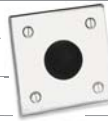
## Pressure sensitive cell DGD

<b>209926</b>	<b>DGD</b>	DGD pressure sensitive cell
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## Pneumatic foot and hand-operated push buttons DT

<b>209979</b>	<b>DTFU</b>	Foot-operated push button DTFU
<b>209689</b>	<b>B-DTFU</b>	Bellows to DTFU
<b>209981</b>	<b>DTFUW</b>	Hand-operated push button DTFUW
<b>209690</b>	<b>B-DTFUW</b>	Bellows to DTFUW



## Connection elements

<b>207495</b>	<b>PVC 2/4</b>	PVC air hose, transparent, 100 m
<b>207502</b>	<b>NEO 2/4</b>	Neoprene air hose, black, 100 m
<b>208930</b>	<b>DWV</b>	Straight air hose connection piece
<b>208929</b>	<b>DWL</b>	Air hose connection piece with L-shape
<b>208928</b>	<b>DWT</b>	Air hose connection piece with T-shape
<b>208968</b>	<b>A3M5</b>	Connection piece with two $\varnothing$ 3 mm connections, thread M5



## Accessoires

<b>210191</b>	<b>DWSO</b>	Plug-in base for DW10 and DW10s
<b>212865</b>	<b>GEHDWGK1</b>	Impact-resistant screw-on housing for pressure wave switch serie D1
<b>212866</b>	<b>GEHDWGK11</b>	Impact-resistant snap-in housing for pressure wave switch serie D1, grey housing bottom
<b>212864</b>	<b>GEHD3K1</b>	Impact-resistant snap-in housing for pressure wave switch serie D3, black housing bottom
<b>210032</b>	<b>D1CLIP</b>	Mounting bracket for DW40
<b>213966</b>	<b>SPK3</b>	Spiral cable 3 m, 4 x 0.5 mm <sup>2</sup> , PU
<b>239889</b>	<b>SPK5</b>	Spiral cable 5 m, 4 x 0.5 mm <sup>2</sup> , PU
<b>213967</b>	<b>SPK-APD</b>	Connection box, surface mount, 52 x 50 x 40 mm, material ABS



The rubber profiles can be joined to the end pieces by using Tetrahydrofuran that can be bought at your local chemical store.

# Technical data

## D1 series – DW10/DW10s/DW20s/DW40

<b>Response pressure</b>	2 mbar
<b>Max. pressure</b>	150 mbar
<b>Pressure equalisation</b>	110 ml/min. at 2 mbar
<b>Min./max. current</b>	20 mA/500 mA (ACDC ohmic)
<b>Min./max. operating voltage</b>	24–250 VAC, 24–50 VDC
<b>Output</b>	NC or NO
<b>Mechanical service life</b>	50 million switchings
<b>Ambient temperature</b>	–30°C to +70°C

## D3 series – D3P/D3PB

<b>Response pressure</b>	2 mbar
<b>Max. pressure</b>	500 mbar
<b>Pressure equalisation</b>	65 ml/min. at 2 mbar
<b>Min./max. current</b>	1 mA/1000 mA (ACDC ohmic)
<b>Min./max. operating voltage</b>	6–250 VAC, 6–50 VDC
<b>Output</b>	Changeover switch
<b>Mechanical service life</b>	10 million switchings
<b>Ambient temperature</b>	–30°C to +80°C

## Pneumatic pressure wave profiles

<b>Material</b>	PVC
<b>Profile length</b>	max. 6 m
<b>Connection cable to PW</b>	max. 10 m ( $\varnothing$ 2/4 mm)
<b>Manufacturing tolerances</b>	at 20°C
<b>Width/height</b>	$\pm$ 2 mm
<b>Length up to 1000 mm</b>	$\pm$ 3 mm
<b>Length up to 2000 mm</b>	$\pm$ 5 mm
<b>Length up to 4000 mm</b>	$\pm$ 9 mm
<b>Length up to 6000 mm</b>	$\pm$ 15 mm

## Ground sensor DGU

<b>Material</b>	U-profile: galvanised steel Rubber profile: EPDM
<b>Connection cable to PW</b>	max. 10 m ( $\varnothing$ 2/4 mm)
<b>Loading capacity</b>	max. 2 t
<b>Drive-over speed</b>	max. 30 km/h
<b>Operating temperature</b>	–20°C to +60°C

## Housing GEHDWGK-1 / GEHDWGK-11

<b>Material</b>	Impact-resistant plastic, Luran 786R, grey or black
<b>Fastening</b>	2 x M4 screw
<b>Electrical connection</b>	PG-cable gland PG11
<b>Air connection</b>	Connection nipple $\varnothing$ 3 mm
<b>Protection class</b>	IP 54 or IP 65 (EN 60529)

### 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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