

**VERDERAIR PURE**

Pulsation dampeners PD-S

## TABLE OF CONTENTS

Dampener Matrix	3
ATEX	4
Warnings	4
Installation	7
Operation	8
Maintenance / repair	9
Parts and kits	11
Exploded views	11
Dimensions	12
Technical data	13
Torque Values	14
Flange connection option	14
Customer services & guarantee	16

## DAMPENER MATRIX

Before putting your dampener in operation, check the identification plate (ID) on the dampener. The ID is mentioning the year of construction, the serial number and the construction code of the dampener. Use the matrix below to define the components of your dampener. Make sure the wetted parts of the dampener are compatible to the pumped liquid.

**NOTE:**

- In case of doubt, please contact your local supplier. ([www.verderair.com](http://www.verderair.com))
- To build a dampener code, please use the below coding system.

### DAMPENER CODING PD-S

Dampener size	Housing and air section		Diaphragm	Connections
	Housing	Air section		
10 : 3/8"	E: PE	A: PA	TO : PTFE Overmolded	TB: Threaded BSP(f)
15 : 1/2"	G: PE conductive	G: PE conductive	EO : EPDM overmolded	TN: Threaded NPT(f)
25 : 1"	A: Aluminium			FD-P: Flanged DIN in PVC
40 : 1 1/2"	S: Stainless Steel 316			FD-S: Flanged DIN in SS304
50 : 2"				
80 : 3"				


Note: Not all combinations are available

**EXAMPLE :** PD-S25 SG TO TB

*ID-Plate of Dampener*

## ATEX



For use in ATEX environments, dampeners in conductive material have to be used. All dampeners made of conductive Polyethylene or metal, with air section made of conductive Polyethylene (Dampeners codes PD-Sxx GG, PD-Sxx AG or PD-Sxx SG) are ATEX certified.

 II 2G / 2GD Ex h IIC/ IIIC Tx Gb/Gb Db.

Pipelines and product connections must be grounded separately. To avoid ignition hazards, the formation of dust deposits on the units must be prevented. Pump and PD-S dampener needs to be grounded separately. The dampener has to be grounded at the appropriate connection.

When using conductive diaphragms at the liquid side, no restrictions are applicable.

When using non-conductive diaphragms, the explosion group inside the dampener/installation site:

- IIC applies for dampeners size PD-S10  
 II 2G / 2GD Ex h IIC/ IIIC Tx Gb/Gb Db
- IIB applies for dampeners size PD-S15 and PD-S25  
 II 2G / 2GD Ex h IIB/ IIIC Tx Gb/Gb Db

Following protective measures have to be taken for dampeners size PD-S40, PD-S50 and PD-S80 into

account:

- Pumped liquid must be conductive or soluble in water
- Dry running have to be prevented by means of monitoring systems which are placed in the pump system
- Additional you can use inerting during dry running with nitrogen, water, carbon dioxide, etc. following the pumping operation.

## WARNINGS

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure specific risk. When these symbols appear in the body of this manual, refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

### WARNING



#### FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:



- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).



- Keep work area free of debris, including solvent, rags and gasoline.



- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.



- Ground all equipment in the work area. See grounding instructions.



- Use only grounded hoses.

- If there is static sparking or you feel a shock, stop operation immediately.

Do not use equipment until you identify and correct the problem.

- Keep a working fire extinguisher in the work area.

Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable materials and gases. To help prevent fire and explosion:



- Clean plastic parts in a well ventilated area.

- Do not clean with a dry cloth.

**WARNING****EQUIPMENT MISUSE HAZARD**

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the Pressure Relief Procedure in this manual when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

**PRESSURIZED EQUIPMENT HAZARD**

Fluid from dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow Pressure Relief Procedure in this manual, when you stop the pump and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.

**THERMAL EXPANSION HAZARD**

Fluids subjected to heat in confined spaces, including hoses, can create a rapid rise in pressure due to the thermal expansion. Over-pressurization can result in equipment rupture and serious injury.



- Open a valve to relieve the fluid expansion during heating.
- Replace hoses proactively at regular intervals based on your operating conditions.



**WARNING****PLASTIC PARTS CLEANING SOLVENT HAZARD**

Use only compatible water-based solvents to clean plastic structural or pressure-containing parts. Many solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage. See Technical Data in this and all other equipment instruction manuals. Read fluid and solvent manufacturer's warnings.

**TOXIC FLUID OR FUMES HAZARD**

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.



- Read MSDS's to know the specific hazards of the fluids you are using.
- Route exhaust away from work area. If diaphragm ruptures, fluid may be exhausted with air.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when cleaning equipment.

**BURN HAZARD**

Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.
- Wait until equipment/fluid has cooled completely.

**PERSONAL PROTECTIVE EQUIPMENT**

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss.



- This equipment includes but is not limited to:
- Protective eyewear, gloves, and hearing protection
  - Protective clothing

## INSTALLATION

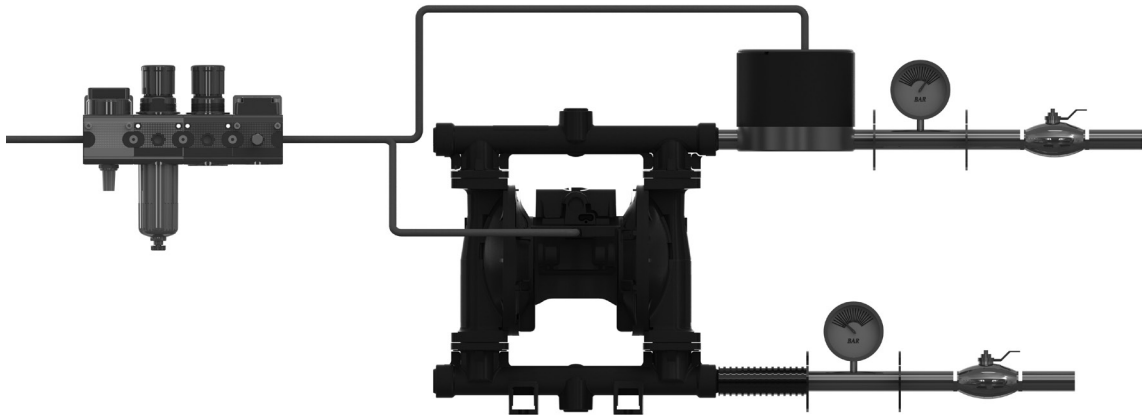
PLEASE CHECK THE ADDITIONAL DELIVERED EXPLODED VIEW FOR ALL POSITION NUMBERS

### Tighten Fasteners Before Setup

Before using the dampener for the first time, check and re-torque the housing bolts (6). Also after the first day of operation, after periods of important temperature fluctuations, after transport,

after dismantling of the dampener and after periods when the dampener hasn't been working the housing bolts have to be checked. For the housing bolts please use the torque values as mentioned on page 14.

### Recommended installation drawing



### Installation remarks

1. PD-S dampeners can be installed directly on the liquid installation as close as possible to pump discharge connection. the pulsation dampener needs to be installed "load free". If not, possible leakages and/or damage can occur. The user is responsible for the adequate and stable fixation of the piping.  
Note: there is no distinction between discharge and suction connection on dampener. Dampener can be installed without attention to direction of flow.
2. PD-S dampeners will be delivered with blind plugs to prevent dust or other materials to enter the dampener. These plugs have to be removed before installing the dampener!
3. As UV - radiation can damage Polyethylene. This must taken in account by installing PD-S dampeners.
4. Never use thread-seal for the connection of the plastic liquid part of dampener as this can damage the thread.
5. PD-S dampeners are needing a back pressure of at least 1 bar to have an optimal functioning.

## **OPERATION**

### **Starting and adjusting the pump + dampener**

1. See the pump manual.
2. PD-S dampeners are self regulating for different operation conditions. The dampeners needs a air supply with the same set-pressure of the pump for optimal dampening effect. See also installation drawing page 7.

### **Special precautions**

1. When medium is left in the dampener, this can generate a chemical reaction when pumping another fluid. Always flush pump and dampener with a neutral fluid before changing from medium.
2. Take care liquids left in the dampener can't freeze, this can damage the dampener.
3. In case of big changes in temperature while operating, it is necessary to control the tension on the bolts carefully. Sudden big temperature shocks can cause over or under tightening of the dampener and will lead to leaks and/or damage the dampener.



## MAINTENANCE / REPAIR

### Flushing and storage

Flush the pump and the dampener often enough to prevent the fluid you are pumping from drying or freezing in the dampener and damaging it. Always flush the dampener and follow the Pressure relief Procedure of the pump before storing the dampener for any length of time. Use a compatible flushing agent.

### Tightening Threaded connections

Check tightness of connection between dampener and installation before starting.

### Disassembly

#### **IMPORTANT:**

- **Follow the Pressure Relief Procedure of the Pump manual before disassembling the dampener from the pump!**
- **After a diaphragm rupture always make sure no liquid is left at the air side of the dampener**

Remove the cover (7) by pushing gently a screw driver in the recess of the air section (2) (see figure 1)

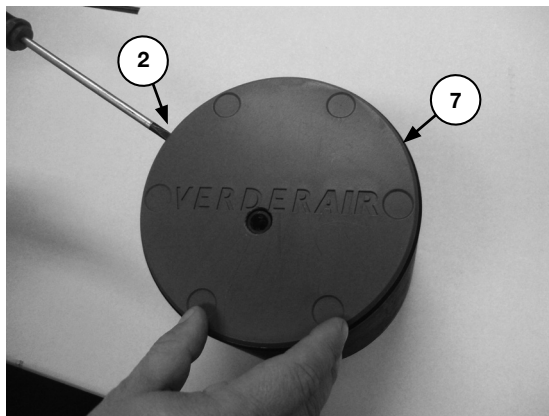


Figure 1

For plastic version of dampener, unscrew nuts of the assembly pins (6) and remove the pins out of dampener body. On Stainless Steel and Aluminum liquid part, nuts are only on the air housing side. Assembly pins are screwed in directly to liquid part.



Figure 2

Remove the liquid housing (1).

Pull out diaphragm (3) and the shaft (4).

Unscrew the diaphragm (3) of the shaft (4). (See figure 3)

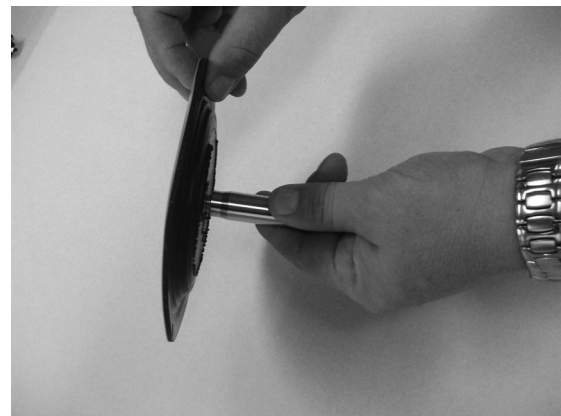


Figure 3

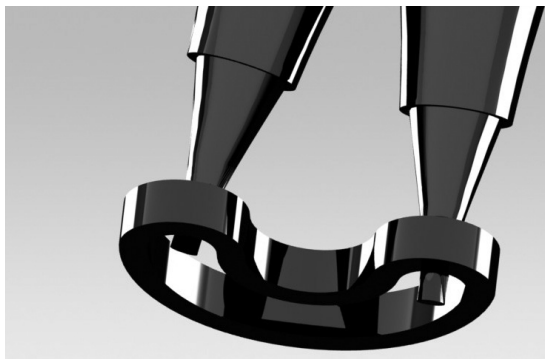
Remove carefully the shaft bearings and o-rings (5) from their groove in the air section (2).

**IMPORTANT NOTE:** if disassembled they need to be replaced!

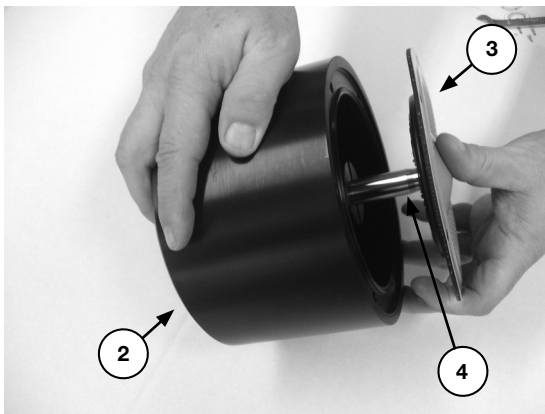
**Assembly**

Before starting to assemble please check all parts on possible damages. Especially the sealing area of the diaphragm have to be free from scratches.

Put first the o-rings of the shaft bearing set (5) into their grooves and then the bearings by forming them as kidney's with locking ring pliers. (see figure 4)



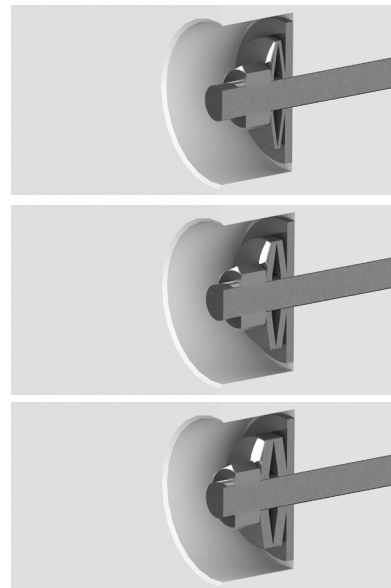
Screw the diaphragm (3) on the shaft (4) and push the shaft gently in the air section (2). (see figure 5)



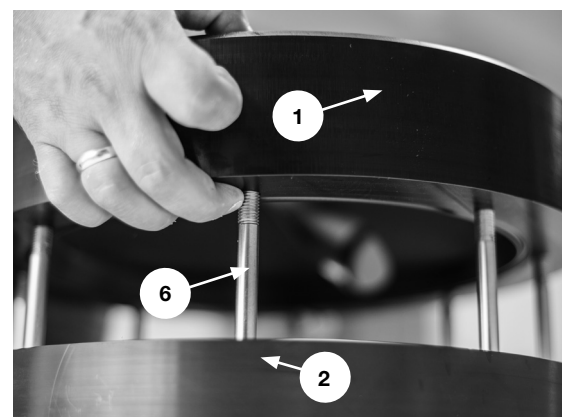
Align the holes in the diaphragm (3) with the holes in the air section (2).

Put the liquid housing (1) against the air section (2).

9. For plastic versions (PD-Sxx GG and EA) put the washers on the assembly pins (6) with closed nuts and place them through the liquid part. For metal liquid parts (PD-Sxx SG, AG, SA and AA) screw pins (6) in to liquid part first flushed to the bottom surface of the body. After assembly of complete air section put the washers on the assembly pins (6). Position the washers as shown on the example picture (figure 6).



Push the assembly pins through the holes of the air section (2) and the liquid housing (1). (see figure 7).



Fasten the bolts crosswise up to the torque value as mentioned on page 14.

Push the cover (7) on the air section (2).

## PART & KITS

### Parts

SEE SEPERATE PARTS LIST

### Kits

In case of break down, we recommend to have a spare part kit for your dampener on stock.  
Spare parts kits contains:

Spare part kit, content	Quantity
Shaft bearing set, cpl	1
Diaphragm	1

Please check the seperate spare parts list for the order nr. of the kit you need for your dampener.

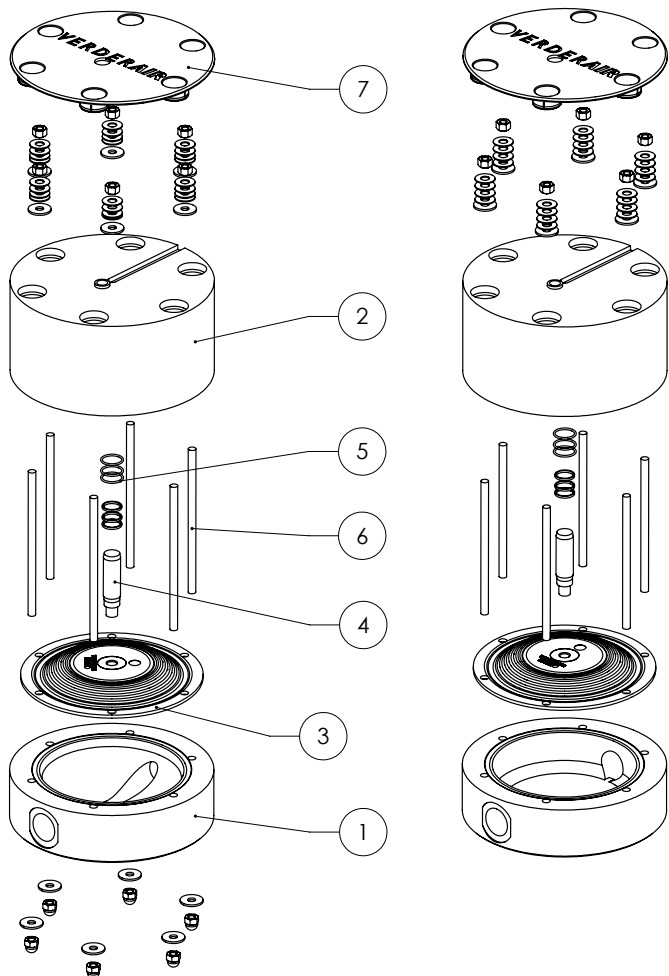
## EXPLODED VIEWS

POS. NR.	DESCRIPTION	QUANTITY NEEDED
1	DAMPENER HOUSING	1
2	DAMPENER AIR SECTION	1
3	DIAPHRAGM	1
4	DAMPENER SHAFT	1
5	SHAFT BEARING SET	1
6	ASSEMBLY PIN SET (*) (**)	(**)
7	CAP	4

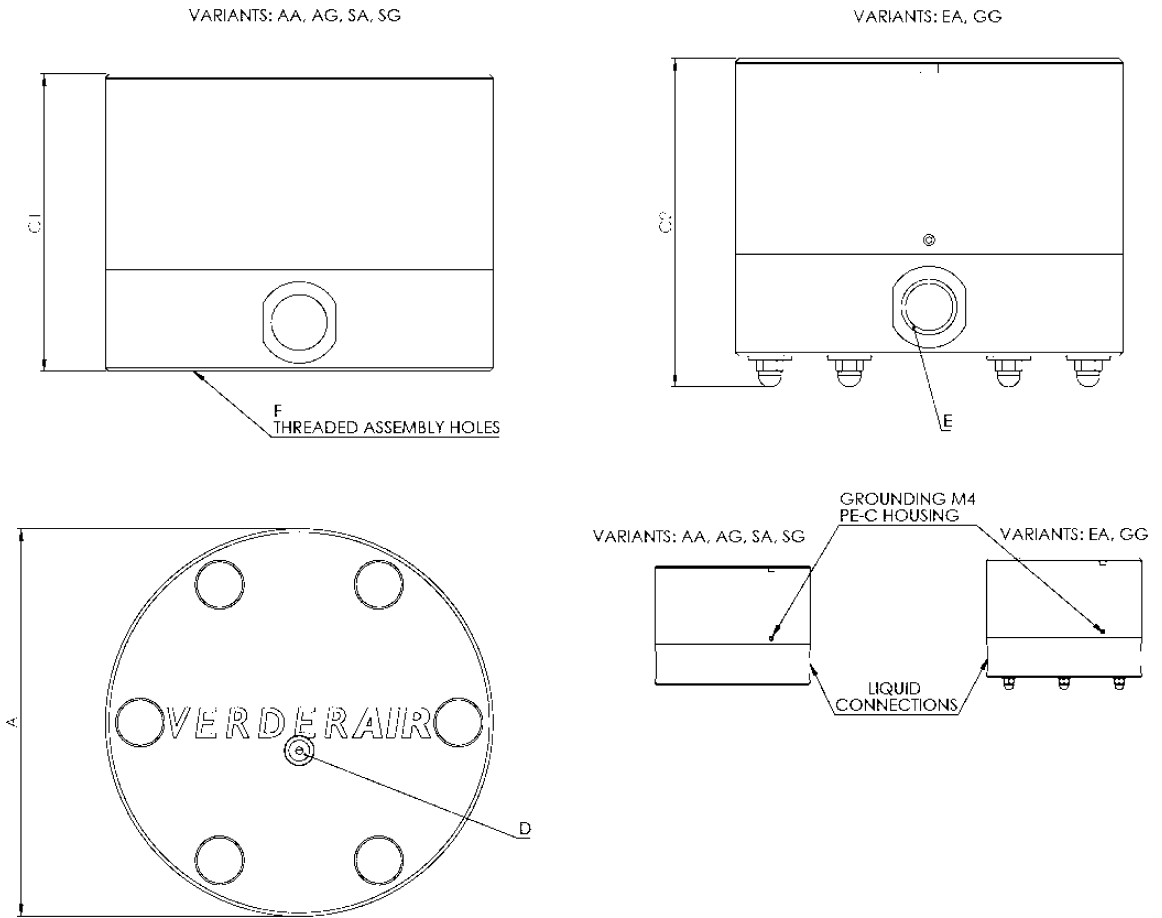
(\*) number of spring washer is different for different size dampeners

(\*\*) assembly pin set is different for dampeners with metal or plastic housing!

(\*\*\*) 4 for PD-S10, 6 for PD-S15 and PD-S25, 8 for PD-40,PD-S50 and PD-S80



**DIMENSIONS**



Type	A	B	C1	C2	D	E	F
PD-S10	114	85	98	109	R 1/8"	3/8"	N.A.
PD-S15	158	120	136	150	R 1/8"	1/2"	N.A.
PD-S25	214	137	164	181	R 1/4"	1"	4 x M8x16
PD-S40	295	196	227	245	R 1/4"	1 1/2"	4 x M8x16
PD-S50	375	198	234	255	R 1/2"	2"	4 x M10x18
PD-S80	375	212	262	283	R 1/2"	3"	4 x M10x18

*in mm*

Type	A	B	C1	C2	D	E	F
PD-S10	4,49	3,35	3,86	4,29	R 1/8"	3/8" (BSP or NPT)	N.A.
PD-S15	6,22	4,72	5,35	5,91	R 1/8"	1/2" (BSP or NPT)	N.A.
PD-S25	8,43	5,39	6,46	7,13	R 1/4"	1" (BSP or NPT)	4 x M8x0.63
PD-S40	11,61	7,72	8,94	9,65	R 1/4"	1 1/2" (BSP or NPT)	4 x M8x0.63
PD-S50	14,76	7,80	9,21	10,04	R 1/2"	2" (BSP or NPT)	4 x M10x0.71
PD-S80	14,76	8,35	10,31	11,14	R 1/2"	3" (BSP or NPT)	4 x M10x0.71

*in inches*

**TECHNICAL DATA**

ISO measurements							
Device model		PD-S10	PD-S15	PD-S25	PD-S40	PD-S50	PD-S80
Nominal port size		3/8"	1/2"	1"	1 1/2"	2"	3"
Air inlet		R1/8	R1/8	R1/4	R1/4	R1/2	R1/2
Weight (kg)	PD-Sxx SG	2,1	4,4	11,7	26,5	42,1	50,7
	PD-Sxx SA	2,2	4,6	12,1	27,5	43,5	52,1
	PD-Sxx AG	1,1	2,5	5,9	14,1	21,5	24,7
	PD-Sxx AA	1,1	2,7	6,3	15,1	23	26,1
	PD-Sxx GG	0,8	1,9	4,3	10,4	15,4	17,8
	PD-Sxx EA	0,9	2,1	4,6	11,4	16,7	19,1
Max. operating pressure (Bar)		7	7	7	7	7	7
Max. operating temperature (°C)	Dampeners with PE or PE-C liquid and/or air section	70	70	70	70	70	70
	Dampeners with metal liquid section and PE-C air section	80	80	80	80	80	80
	Dampeners with metal liquid section and PA air section	100	120	120	120	120	120

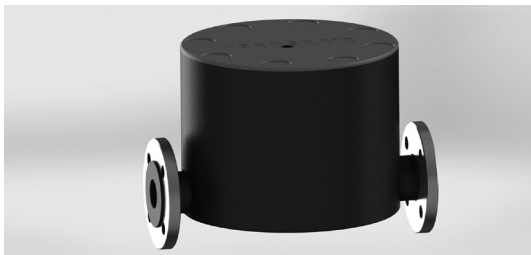
US measurements							
Device model		PD-S10	PD-S15	PD-S25	PD-S40	PD-S50	PD-S80
Nominal port size		3/8"	1/2"	1"	1 1/2"	2"	3"
Air inlet		R1/8	R1/8	R1/4	R1/4	R1/2	R1/2
Weight (lbs)	PD-Sxx SG	4,6	9,7	25,8	58,4	92,8	111,8
	PD-Sxx SA	4,9	10,1	26,7	60,6	95,9	114,9
	PD-Sxx AG	2,4	5,5	13	31,1	47,6	54,5
	PD-Sxx AA	2,4	6	13,9	33,3	50,7	57,5
	PD-Sxx GG	1,8	4,2	9,5	22,9	34	39,2
	PD-Sxx EA	2	4,6	10,1	25,1	36,8	42,1
Max. operating pressure (PSI)		102	102	102	102	102	102
Max. operating temperature (°F)	Dampeners with PE or PE-C liquid and/or air section	158	158	158	158	158	158
	Dampeners with metal liquid section and PE-C air section	176	176	176	176	176	176
	Dampeners with metal liquid section and PA air section	212	248	248	248	248	248

## TORQUE VALUES

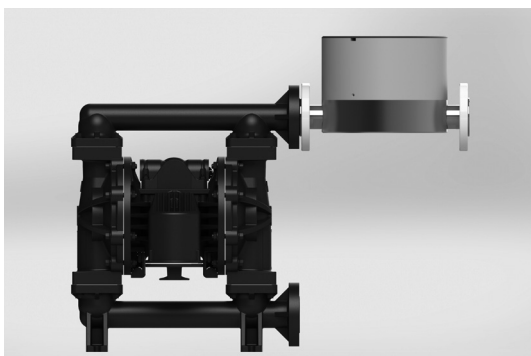
Torque values for housing bolts assembly in Nm						
Pulsation Dampener	PD-S10	PD-S15	PD-S25	PD-S40	PD-S50	PD-S80
All materials	2	3	6	10	11	11

Torque values for housing bolts assembly in inlb						
Pulsation Dampener	PD-S10	PD-S15	PD-S25	PD-S40	PD-S50	PD-S80
All materials	17,7	26,6	53,1	88,5	97,4	97,4

### FLANGE CONECTION OPTION



The flange connection is an optional type of PD-S pulsation dampener connection to the installation / pump. Consists of two flange sleeves and two DIN flanges. Flange connections have been prepared in the range of PD-S25 to PD-S80

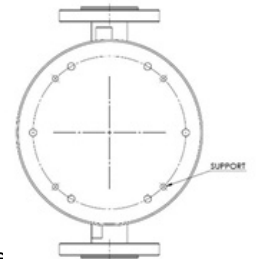


#### Assembly

Put the flange (9) on the flange sleeve (8) then screw it into the dampener housing (1)  
Remember to seal the thread before screwing. Use a suitable wrench to screw in the flange sleeve.  
Screw in the flange sleeve until its face rest against the dampener housing.

#### Support

Four threaded holes in the base of the pulsation damper are used to support it. They prevent the pulsation damper from rotating (see page 12)

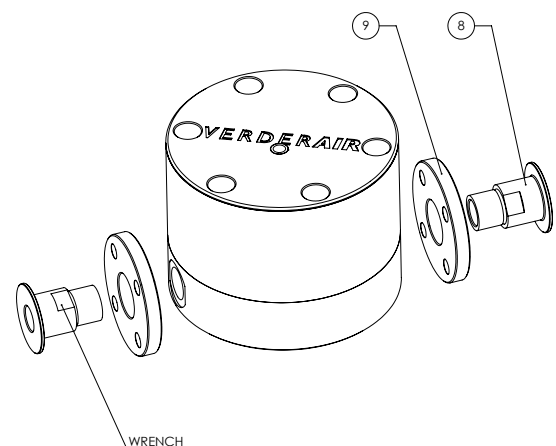


#### ATEX

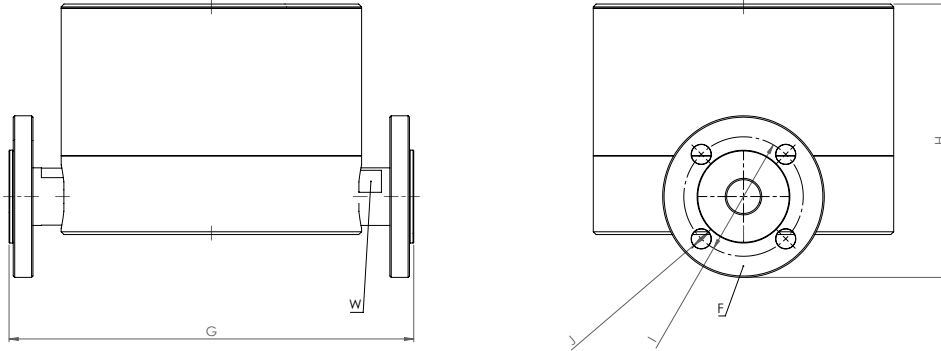
For use in Atex environments use made of conductive Polyethylene and metal flange (see page 4)

### EXPLODED VIEW FLANGE CONNECTION OPTION

POS. NR.	DESCRIPTION	QUANTITY NEEDED
8	FLANGE SLEEVE PE BSPP	2
8	FLANGE SLEEVE PE-C BSPP	2
9	PVC FLANGE	2
9	SS FLANGE	2



**DIMENSIONS**



Type	F	G	H	I	J	W
PD-S25	DN25 PN10	288	195	85	4 x M12	36
PD-S40	DN40 PN10	382	274	110	4 x M16	50
PD-S50	DN50 PN10	477	281	125	4 x M16	65
PD-S80	DN80 PN 10	511	312	160	8 x M16	95

dimensions in mm

Type	F	G	H	I	J	W
PD-S25	DN25 PN10	8,98	7,68	3,35	4 x M12	1"7/16
PD-S40	DN40 PN10	15,04	10,79	4,33	4 x M16	2"
PD-S50	DN50 PN10	18,78	11,06	4,92	4 x M16	2"9/16
PD-S80	DN80 PN 10	20,12	12,28	6,30	8 x M16	3" 3/4

dimensions in inch

## **CUSTOMER SERVICES & GUARANTEE**

### **Customer services**

If you require spare parts, please contact your local distributor, providing the following details:

- Dampener Model
- Type
- Serial Number
- Date of First Order

### **Customer services**

All Verder dampeners are warranted to the original user against defects in workmanship or materials under normal use (rental use excluded) for two years after purchase date. This warranty does not cover failure of parts or components due to normal wear, damage or failure which in the judgement of Verder arises from misuse.

Parts determined by Verder to be defective in material or workmanship will be repaired or replaced.

### **Limitation of liability**

To the extent allowable under applicable law, Verder's liability for consequential damages is expressly disclaimed. Verder's liability in all events is limited and shall not exceed the purchase price.

"End of product life dispose of / reprocess in accordance with local regulations or return to a specialized disposal facility."

In accordance to Machinery Directive 2006/42/WE

### **Warranty disclaimer**

Verder has made an effort to illustrate and describe the products accurately; however, such illustrations and descriptions are for the sole purpose of identification and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustration or descriptions.

### **Product suitability**

Many regions, states and localities have codes and regulations governing the sale, construction, illustration and/or use of products for certain purposes, which may vary from those in neighbouring areas. While Verder attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchasing and using a product, please review the product application as well as the national and local codes and regulations, and be sure that the product, installation, and use complies with them.