

VERDERAIR PURE

Pulsation dampeners PD-P

24-VA-MA_PD-P_VA_rev02_en

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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)
- To build a pump code, please use the below coding system or use the pump configurator on www.verderair.com.

DAMPENER CODING PD-P


Dampener size	Housing and air section		Diaphragm	Connection
	Housing	Air section		
10 : 3/8"	E : PE	A : PA	TO : PTFE overmolded	TN : Threated NPT
15 : 1/2"	G : PE conductive	G : PE conductive	EO : EPDM overmolded	FS : Flanged slotted for DIN/ANSI/JIS
25 : 1"	T : PTFE			
40 : 1 1/2"	U : PTFE conductive			
50 : 2"				

Note: Not all combinations are available

EXAMPLE : PD-P25EG TO TN





ATEX

For use in ATEX environments, dampeners in conductive plastic have to be used. All dampeners made of conductive Polyethylene or conductive PTFE, with air section made of conductive Polyethylene (Dampeners codes PD-PxxGG or PD-PxxUG) are ATEX certified.  II 2G / 2GD Ex h IIC/ IIIC T70°C 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. When used mounted on an ATEX certified VA-P series pump, the dampener don't need to be grounded separately as the dampener is connected conductively to the pump. For grounding of the pump please check the pump manual.

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-P10 and PD-P15  II 2G / 2GD Ex h IIC/ IIIC T70°C Gb/Gb Db
- IIB applies for dampeners size PD-P25 and PD-P40  II 2G / 2GD Ex h IIB/ IIIC T70°C Gb/Gb Db








Following protective measures have to be taken for dampeners size PD-P50 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

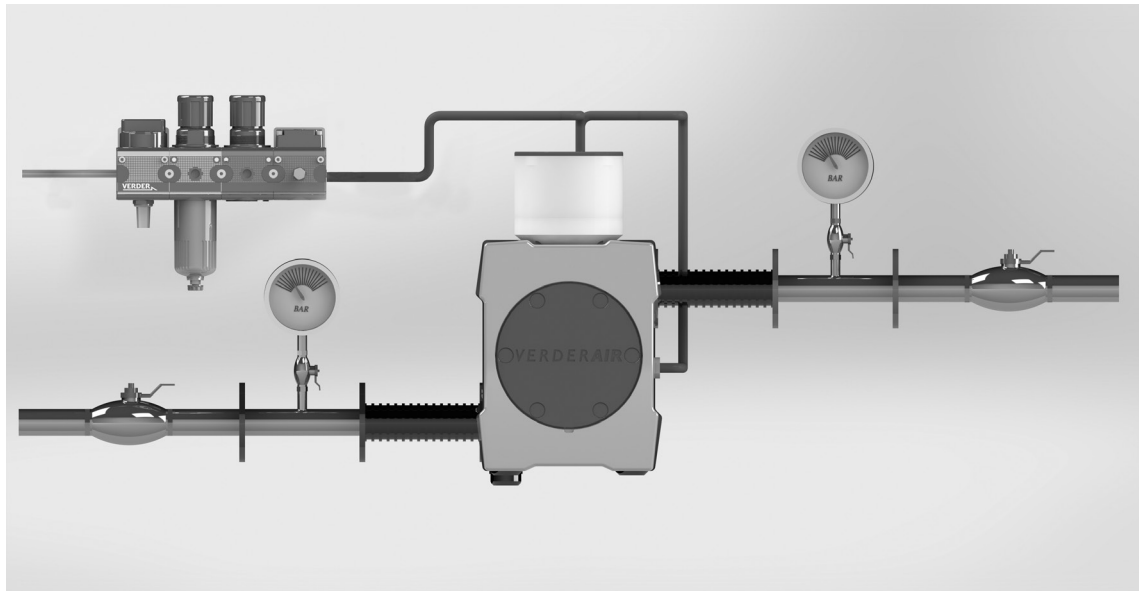
PLEASE CHECK THE ADDITIONAL DELIVERED EXPLODED VIEW FOR ALL POSITION NUMBERS

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 15.

Recommended installation drawing



Installation remarks

1. PD-P dampeners can be installed directly on the center connection on top of your PURE pump.
Note : when using a dampener, the pump can only be used with the horizontal suction and discharge fluid connections. Pumps with the optional code PD (pulsation dampener prepared) are delivered with the center connection faced up words to mount the dampener easily. If your pump is having the center connection faced down words, you can turn the center block 180° to mount the pulsation dampener.
2. PD-P dampeners will be delivered with a blind plug to prevent dust or other materials to enter the dampener. This plug have to be removed before installing the dampener!
3. As UV - radiation can damage Polyethylene. This must taken in account by installing PD-P dampeners.
4. Never use thread-seal for the connection of pump and dampener as this can damage the thread.
5. PD-P dampeners with threaded connections can be mounted into the thread of the center section connection of the pump. Make sure to place the flange o-ring (pos.29) in the groove of the center section before screwing on the dampener. The dampener has to be screwed in until it touches the center section. Do not screw too hard as this can damage the thread.
6. For pumps with flanged connections (coding FD/FA or FJ of the pump connections), you can use a dampener with a flanged connection (code FS of the dampener). Flanged dampeners are having slotted grooves to be able to mount them on pumps with DIN, ANSI or JIS connections. Do not forget to place the flange o-ring (pos. 29) in the groove of the center section. Fasten the flange bolts using the torque values mentioned on page 15.
7. PD-P 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-P dampeners are self regulating for different operation conditions.

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 on page 10 of the Pump manual before storing it for any length of time. Use a compatible flushing agent.

Tightening Threaded connections

Check to be sure the connection between pump and dampener before starting. For flanged dampeners, used the torques as mentioned on page 15.

Disassembly

IMPORTANT:

- **Follow the Pressure Relief Procedure at page 10 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)

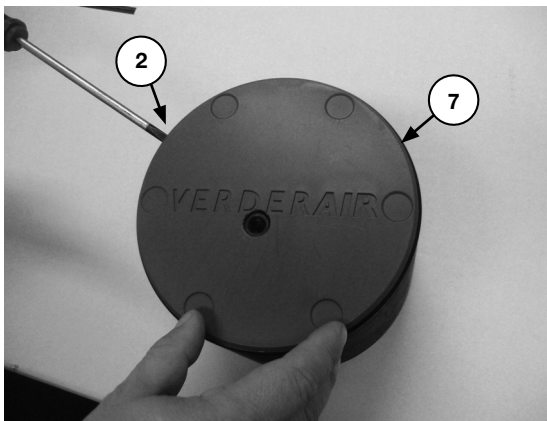


Figure 1

Unscrew the bolts of the assembly pins (6) and remove the pins out of the dampener body. (see figure 2)

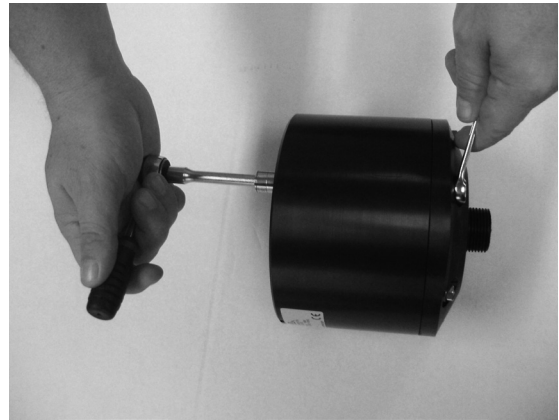


Figure 2

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)

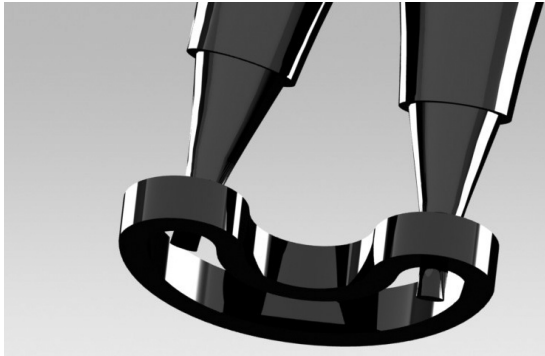


Figure 4

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

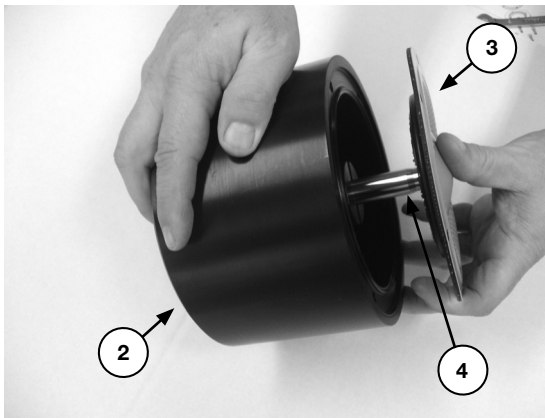


Figure 5

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).

Put the washers on the assembly pins (6). Position the washers as shown on the example drawing (figure 6).

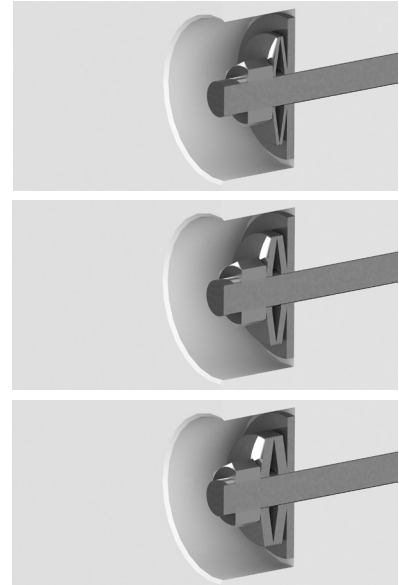


Figure 6

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

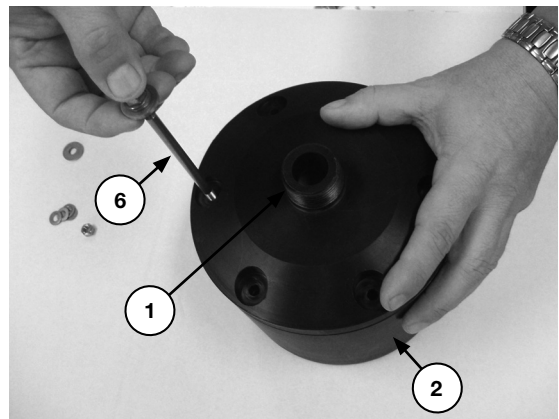


Figure 7

Fasten the bolts crosswise up to the torque value as mentioned on page 15.

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:

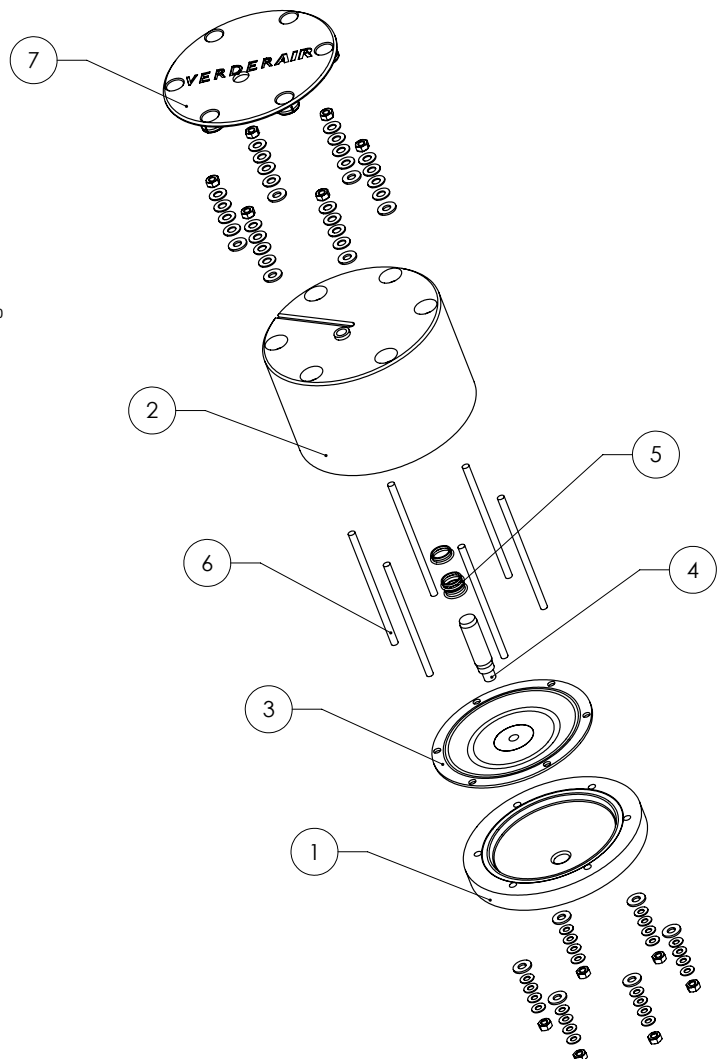
Spare part kit, content	Quantity
Shaft bearing set, cpl	1
Diaphragm	1
Flange, o-ring	1

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

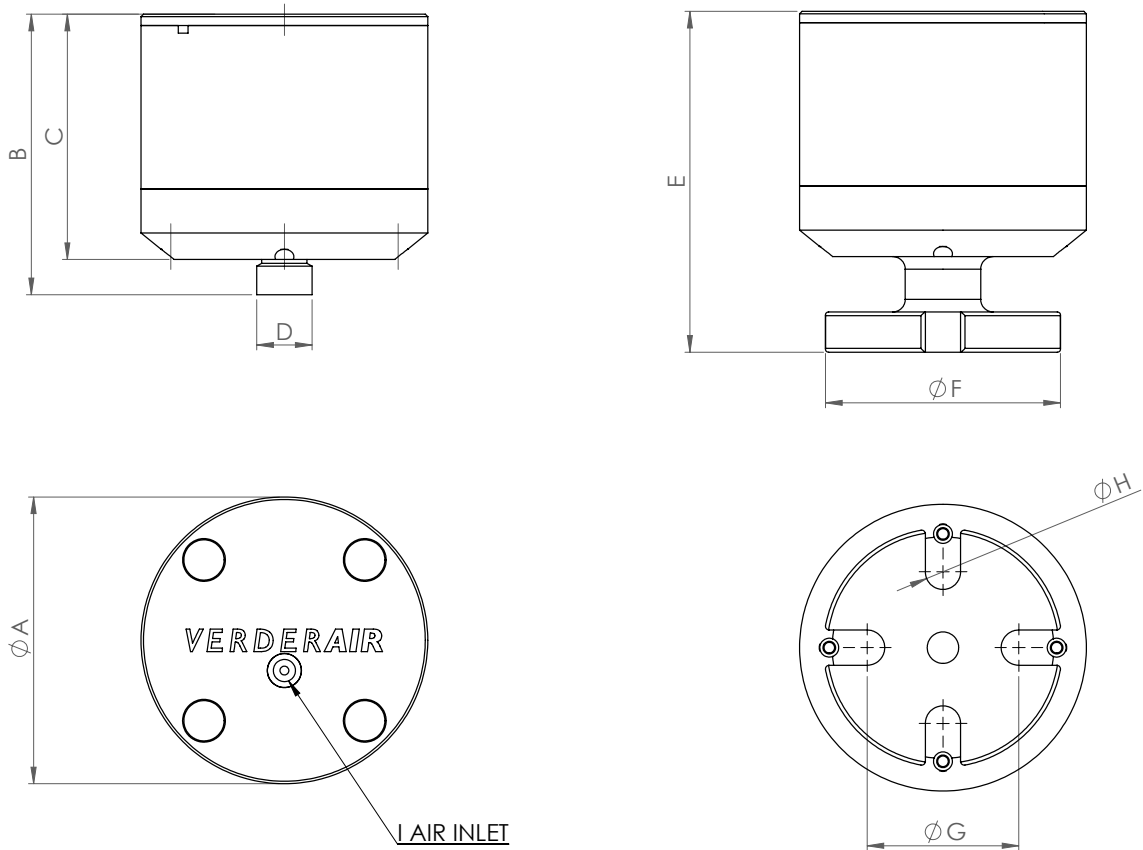
EXPLODED VIEWS

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
(**) 4 for PD-P10 and PD-P15, 6 for PD-P25 and PD-P40, 8 for PD-P50



DIMENSIONS



TYPE	A	B	C	D	E	F	G	H	I
P10	75	102	90	NPT 3/8"	-	-	-	-	R 1/8"
P15	114	115	97,5	NPT 1/2"	135,5	95	60,30	14	R 1/8"
P25	158	149	131	NPT 1"	179	112	79,40	14	R 1/8"
P40	213,75	192	166	NPT 1 1/2"	222	145	98,40	18	R 1/4"
P50	295	259	227	NPT 2"	287	165	120	18	R 1/4"

in mm

TYPE	A	B	C	D	E	F	G	H	I
P10	2,95	4,02	3,54	NPT 3/8"	-	-	-	-	R 1/8"
P15	4,49	4,33	3,84	NPT 1/2"	5,35	3,74	2,37	0,55	R 1/8"
P25	6,22	5,70	5,16	NPT 1"	7,05	4,41	3,13	0,55	R 1/8"
P40	8,42	7,00	6,54	NPT 1 1/2"	8,58	5,71	3,87	0,71	R 1/4"
P50	11,61	9,65	8,94	NPT 2"	11,30	6,50	4,72	0,71	R 1/4"

in inches

TECHNICAL DATA

ISO measurements						
Device model		PD-P10	PD-P15	PD-25	PD-P40	PD-P50
Nominal port size	PD-Pxx xx xx TN	1/4"	3/8"	1/2"	1"	1 1/2"
	PD-Pxx xx xx FS	/	Flanged DIN DN15	Flanged DIN DN25	Flanged DIN DN40	Flanged DIN DN50
Air inlet		R 1/8"	R 1/8"	R 1/8"	R 1/4"	R 1/4"
Weight (kg)	PD-Pxx EA xx TN	0,4	0,9	2	4,6	11,6
	PD-Pxx EG xx TN	0,4	0,8	1,8	4,1	10,3
	PD-Pxx TA xx TN	0,5	1,7	2,4	6,3	15
	PD-Pxx TG xx TN	0,5	1,1	2,2	5,8	13,8
	PD-Pxx GG xx TN	0,4	0,8	1,7	4,1	10,3
	PD-Pxx UG xx TN	0,5	1	2,1	5,7	13,2
	PD-Pxx EA xx FS		0,9	2,1	4,9	12
	PD-Pxx EG xx FS		0,9	1,9	4,4	10,7
	PD-Pxx TA xx FS		1,4	2,8	7	16
	PD-Pxx TG xx FS		1,3	2,6	6,5	14,8
	PD-Pxx GG xx FS		0,8	1,9	4,4	10,6
	PD-Pxx UG xx FS		1,2	2,5	6,4	14,2
Max. operating pressure (Bar)		7	7	7	7	7
Max. operating temperature (°C)	PD-Pxx EA or PD-Pxx EG	70	70	70	70	70
	PD-Pxx TA	100	120	120	120	120
	PD-Pxx GG	70	70	70	70	70
	PD-Pxx TG or PD-Pxx UG	70	70	70	70	70

US measurements						
Device model		PD-P10	PD-P15	PD-25	PD-P40	PD-P50
Nominal port size	PD-Pxx xx xx TN	1/4"	3/8"	1/2"	1"	1 1/2"
	PD-Pxx xx xx FS	/	Flanged ANSI 1/2"	Flanged ANSI 1"	Flanged ANSI 1 1/2"	Flanged ANSI 2"
Air inlet		R 1/8"	R 1/8"	R 1/8"	R 1/4"	R 1/4"
Weight (lbs)	PD-Pxx EA xx TN	0,9	2,0	4,4	10,1	25,6
	PD-Pxx EG xx TN	0,9	1,8	4,0	9,0	22,7
	PD-Pxx TA xx TN	1,1	3,7	5,3	13,9	33,1
	PD-Pxx TG xx TN	1,1	2,4	4,9	12,8	30,4
	PD-Pxx GG xx TN	0,9	1,8	3,7	9,0	22,7
	PD-Pxx UG xx TN	1,1	2,2	4,6	12,6	29,1
	PD-Pxx EA xx FS		2,0	4,6	10,8	26,5
	PD-Pxx EG xx FS		2,0	4,2	9,7	23,6
	PD-Pxx TA xx FS		3,1	6,2	15,4	35,3
	PD-Pxx TG xx FS		2,9	5,7	14,3	32,6
	PD-Pxx GG xx FS		1,8	4,2	9,7	23,4
	PD-Pxx UG xx FS		2,6	5,5	14,1	31,3
Max. operating pressure (Bar)		7	7	7	7	7
Max. operating temperature (°F)	PD-Pxx EA or PD-Pxx EG	158	158	158	158	158
	PD-Pxx TA	212	248	248	248	248
	PD-Pxx GG	158	158	158	158	158
	PD-Pxx TG or PD-Pxx UG	158	158	158	158	158

TORQUE VALUES

Torque values for housing bolts assembly in Nm					
Pulsation Dampener	PD-P10	PD-P15	PD-P25	PD-P40	PD-P50
Housing material PE1000 and PE1000 cond.	2,0	3,0	6,0	10,0	11,0
Housing material PTFE and PTFE cond.	2,0	3,0	6,0	10,0	11,0

Device model	PD-P15	PD-P25	PD-P40	PD-P50
Torque values for flange connections assembly in Nm	4,0	5,0	12,0	15,0

Torque values for housing bolts assembly in inlb					
Pulsation Dampener	PD-P10	PD-P15	PD-P25	PD-P40	PD-P50
Housing material PE1000 and PE1000 cond.	17,7	26,6	53,1	88,5	97,4
Housing material PTFE and PTFE cond.	17,7	26,6	53,1	88,5	97,4

Device model	PD-P15	PD-P25	PD-P40	PD-P50
Torque values for flange connections assembly in inlb	35,4	44,3	106,2	132,8

CUSTOMER SERVICES & GUARANTEE

Customer services

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

- Pump 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.

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.

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