

## PRESSURE OPERATED PUMP ADCAMAT PPA-312

### DESCRIPTION

The ADCAMAT PPA fabricated carbon steel (stainless steel on request) is recommended in the transfer of high-temperature liquids such as condensate, oils and other liquids to a higher elevation or pressure.

The pump starts when there is something to pump and stops when there isn't.

Under certain conditions, it can drain a closed vessel under vacuum or pressure.

The pump can be operated by steam, compressed air or gas and can be used for lifting any kind of non corrosive liquids.

Connections are flanged.



### OPERATION

Liquid flows by gravity into the pump through an inlet check valve lifting a float which, at the upper limit of its travel, opens the supply valve which allows steam or compressed air to enter the pump body. Pressure in the pump builds up until just sufficient to overcome back pressure.

The pressurized liquid opens the outlet check valve and discharge commences. When the float reaches the minimum lower level it closes the steam or compressed air supply valve and opens the vent, allowing the liquid to fill the pump again.

As the amount of liquid discharged at each stroke is known, the total volume passed during a given period can be calculated by counting the number of strokes during that period. For this purpose a special counter is available which screws into a tapped connection on the top cover of the pump. This counter records the number of pumping strokes thus enabling the pump to function as a reliable flow meter.

**MAIN FEATURES:** Non-electric requirements.

**OPTIONS:** Duplex packaged design.  
Stainless steel construction.  
Level gauge.  
Stroke counter.

**USE :** To lift condensate or hot and cold liquids.

**AVAILABLE MODELS :** ADCAMAT PPA312S - carbon steel construction (Carbon steel version is sandblasted, metalized and black painted).

**SIZES :** DN50 x 50; DN 80 x 50.

**CONNECTIONS :** Flanged EN1092-1 PN16.  
ANSI Class 150 lb.  
Special flanges upon request.

**INSTALLATION :** Horizontal installation.  
See IMI installation and maintenance instructions.

**MOTIVE GAS :** Steam or compressed air.

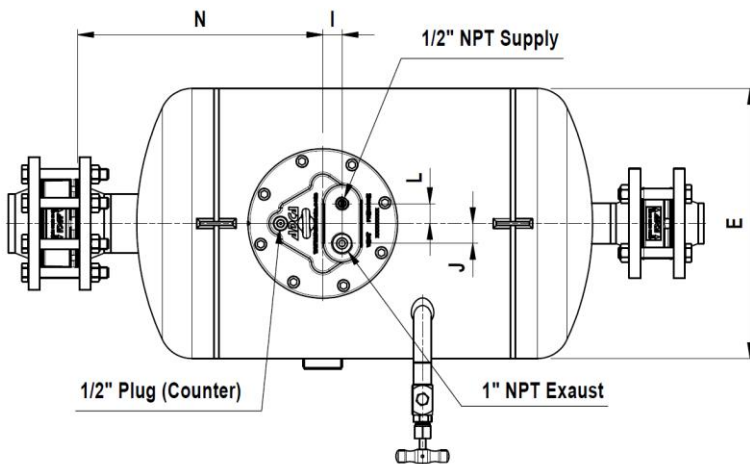
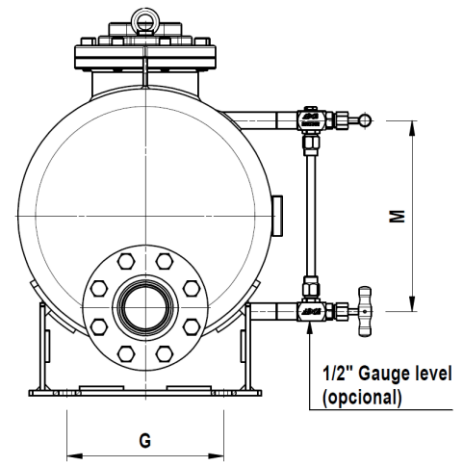
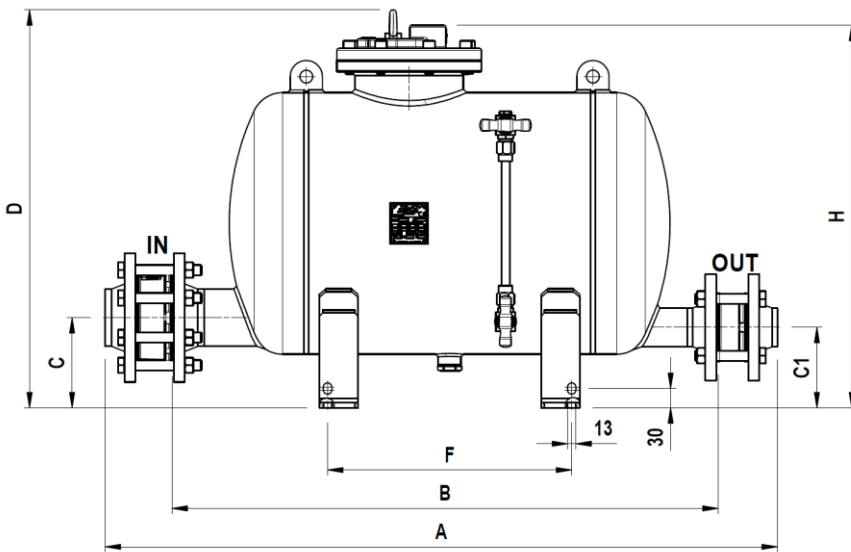
CE MARKING – GROUP 2 GASES (PED – European Directive)		
RATING	SIZE	CAT.
PN16	DN 50 X 50	3
	DN 80 X 50	3

APPLICATION LIMITS	
Minimum density	0,80 kg/L
Maximum viscosity	5 °Engler
Maximum motive pressure	10 bar
Minimum motive pressure	1 bar
Pump discharge per cycle	45 L

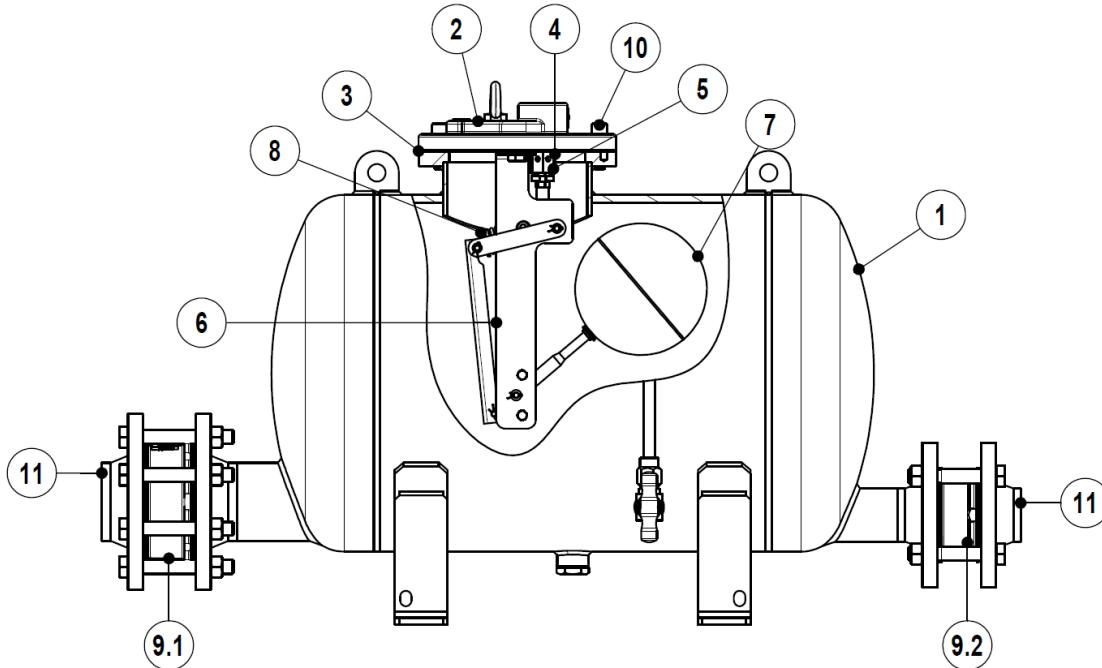
LIMITING CONDITIONS		
PPA-312S		
	PRESS. (bar)	TEMP. (°C)
PN16	16	50
	14	100
	13	195
	12	250
ANSI Cl. 150	16	50
	13	195

Minimum operating temperature: 20 °C.

Design code: AD-Merkblatt.



DIMENSIONS (mm)																		
SIZE DN	A EN Flg.	A ANSI 150 lb	B EN Flg.	B ANSI 150 lb	C	C1	D	E	F	G	H	I	J	L	M	N	WGT. (kg)	VOL. (L)
50 x 50	1020	1082	836	867	125	125	619	406	380	250	595	29	30	30	305	355	109	75,5
80 x 50	1046	1117	850	885	140	125	619	406	380	250	595	29	30	30	305	369	113	76



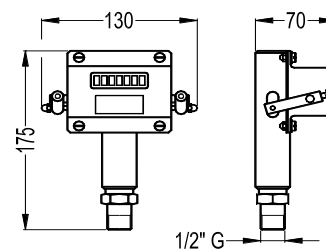
MATERIALS		
POS. N°	DESIGNATION	MATERIAL – PPA312S
1	Pump body	P265GH / 1.0425 ; P235GH / 1.0345 S235JR / 1.0038
2	Cover	GJS-400-15 / 0.7040
3	*Cover gasket	Non asbestos
4	*Motive inlet / Seat assembly	Stainless steel
5	*Exhaust valve / Seat assembly	Stainless steel
6	Internal mechanism	Stainless steel
7	*Float	Stainless steel
8	*Springs	Inconel
9.1	*RD40 inlet check valve	CF8M / 1.4408
9.2	*RD40 outlet check valve	CF8M / 1.4408
10	Bolts	Steel 8.8
11	Flanges	P250GH / 1.0460

\* Available spare parts.

\*\* Welding neck flanges. Threaded flanges on request.

**Stroke counter :**

Available on request, it can be screwed directly into the top cover of the pump or above the pump through a 1/2" size pipe for easier reading (max.1m).



## How to select and size

### SIZING OF THE SYSTEM

The discharge capacity of the pump is a function of:

1. Condensate load.....kg/h
2. The pressure of operating medium (steam, compressed air or gas).
3. The total lift or back pressure the pump will have to exhaust against. This includes the change in fluid level elevation after the pump (0.0981 bar/m of lift), plus pressure in the return piping, plus the pressure drop in bar caused by pipe friction, plus any other system component pressure drop the pump exhaust will have to overcome.
4. Filling head available (300 mm is recommended).

### INSTALLATION – Open system

Fig.1 shows a typical example of installation of ADCAMAT automatic pump. For further details and instructions please contact the factory or our distributor.

### RECEIVER

A receiver is recommended to temporarily hold the liquid and prevent any flooding of the equipment, while the pump is in the pumping cycle. A length of pipe of large diameter or a tank can also be used.

SUGGESTED RECEIVER	
PUMP SIZE	DN 80 x 50 DN 50 x 50
RECEIVER SIZE (diameter x length)	323 x 1000

Consult factory for correct selection.

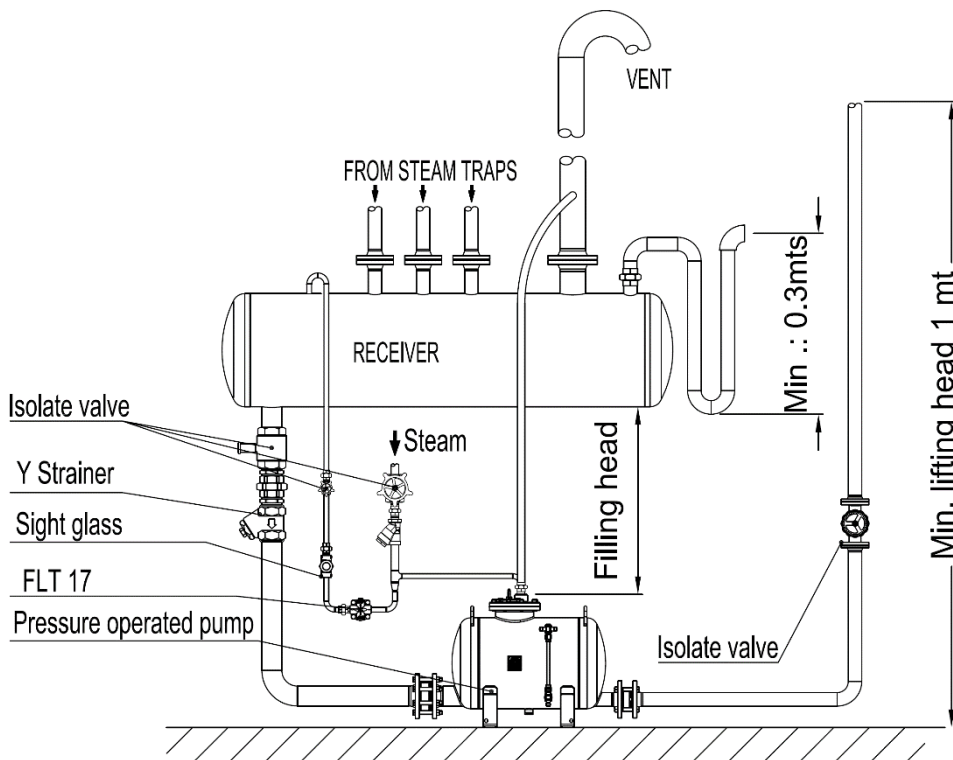


Fig.1

FLOW RATE (kg/h) Installation with 300 mm filling head above the pump cover			
Motive pressure (bar)	Total lift (bar)	DN 50 x 50	DN 80 x 50
1	0,35	3125	4070
1,7		4625	5980
3,5		4810	6845
5		4905	6935
7		5075	7030
8,5		5250	7520
10		5280	7540
1,7	1	3170	4075
3,5		4350	5800
5		4880	6430
7		4950	6480
8,5		5120	6845
10	5150	6870	
2,5	1,5	3210	3670
3,5		3760	4625
5		4585	5660
7		4635	5755
8,5		4680	5895
10		4695	5925
3,5	3	2580	2990
4		2990	3805
5		3440	4440
7		3810	4575
8,5		4260	4665
10	4285	4695	
4,5	4	2030	2715
5		2120	2900
7		2900	3215
8,5		2985	3355
10		3000	3385

Chart 1 (based on liquid specific gravity 0,9 – 1,0).

Filling head measured from the bottom of receiver to top of pump cover.

CAPACITY MULTIPLYING FACTORS FOR OTHER FILLING HEADS				
PUMP SIZE	FILLING HEAD (mm)			
	150	300	600	900
ALL	0,9	1	1,08	1,2

Chart 3

CAPACITY CORRECTION FACTORS FOR GASES OTHER THAN STEAM					
% Backpressure vs Motive pressure (BP / MP)	10%	30%	50%	70%	90%
Correction factor	1,04	1,08	1,12	1,18	1,28

Chart 2

**Example:**

Condensate load 3500 kg/h  
 Filling head 150 mm  
 Motive fluid Compressed air  
 Available pressure 7 bar  
 Vertical lift after pump 10 m  
 Return piping pressure 1,2 bar  
 Piping friction pressure drop Negligible

**Correction for filling Head:**

With 150 mm filling head the correction factor from chart 3 is 0,9. The corrected capacity is, 4040 kg/h x 0,9 = 3636 kg/h

**Calculations:**

Total back pressure: 1,2 bar + ( 10 m x 0,0981 ) = 2,181 bar  
 Pump choice, assuming steam as motive pressure at 7 bar and a back pressure of 3 bar, the DN 80x50 pump has a capacity of 4575 kg/h according to Chart 1.

**Correction for air as a motive fluid:**

The % back pressure 2,181 bar / 7 bar = 31%  
 The correction factor from chart 2, is 1,08.  
 The corrected capacity is 3636 kg/h x 1,08 = 3926,88 kg/h, and so a DN 80x50 pump is still recommended.