

**PRESSURE OPERATED PUMP
ADCAMAT PPA14
DN 80 x 50**

DESCRIPTION

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

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.



OPERATION

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

The pressurized liquid opens the outlet check valve and discharge begins. 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 that flows during a given period of time can be calculated by counting the number of cycles during that period. For that 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: No 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 PPA14-S - carbon steel construction (Carbon steel version is sandblasted, metalized and black painted).

SIZES: DN 80 x 50.

CONNECTIONS: Flanged EN1092-1 PN16. Special flanges upon request.
Female screwed ISO 7/1 Rp (BS21).

INSTALLATION: Horizontal installation.
See IMI – Installation and maintenance instructions.

MOTIVE GAS: Steam or compressed air.

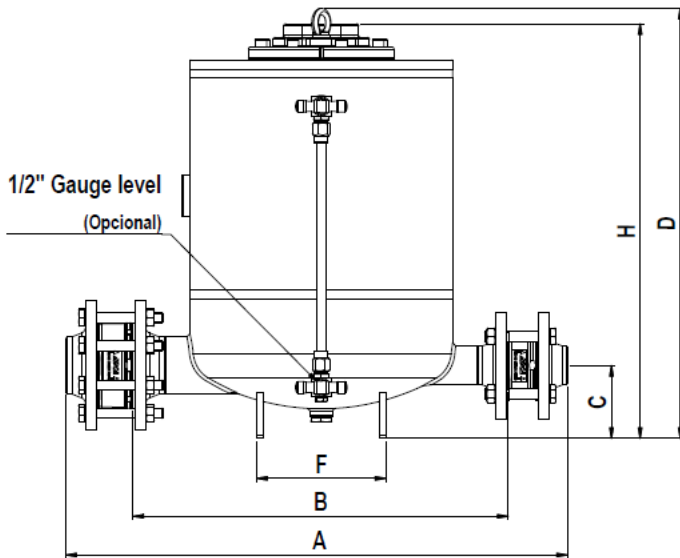
APPLICATION LIMITS	
Minimum density	0,80 kg/L
Maximum viscosity	5 °Engler
Maximum motive pressure	10 bar
Minimum motive pressure	1 bar
Pump discharge per cycle	25 L

CE MARKING – GROUP 2 (PED – European Directive)	
PN16	Category
DN 80 x 50	3 (CE marked)

DIMENSIONS (mm)

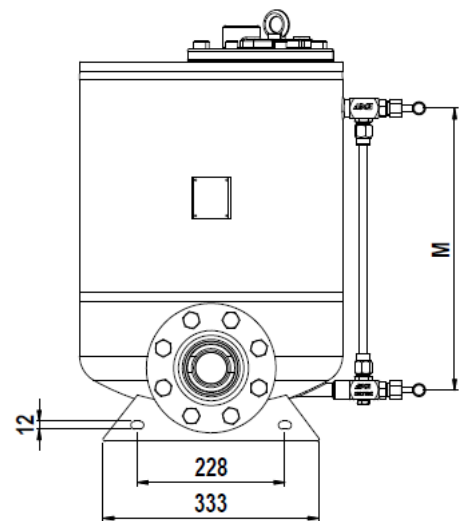
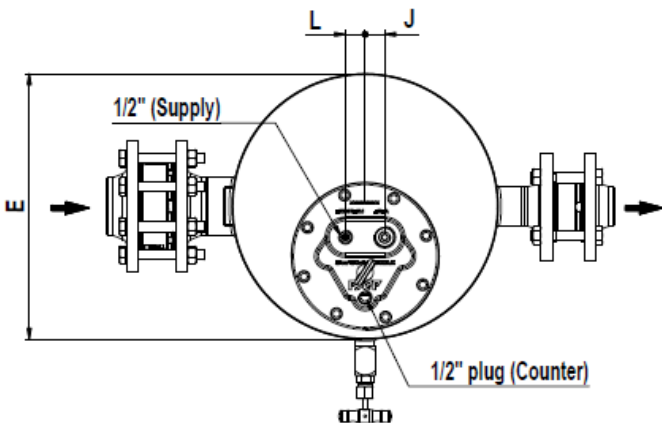
SIZE DN	A PN16	A ANSI 150 lb	B PN16	A ANSI 150 lb	C	D	E	F	H	J	L	M	WGT. (kg)	VOL. (L)
80 x 50	775	847	580	616	113	665	406	200	642	30	30	435	123	68

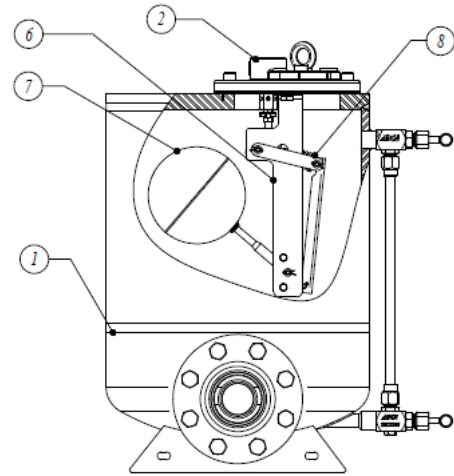
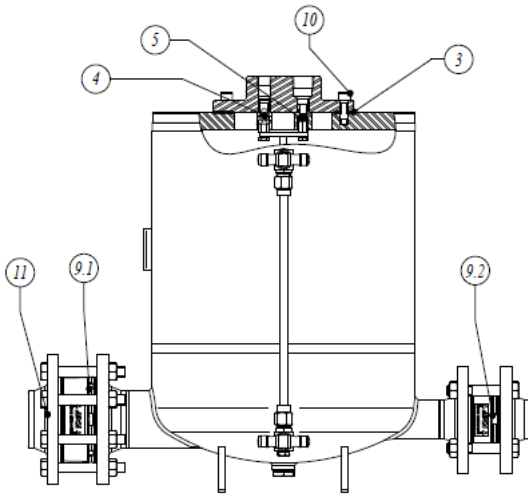
* With welding neck flanges. Dimensions are different if threaded flanges are requested.



LIMITING CONDITIONS *		
PPA14		
	Pressure (bar)	Temp. (°C)
PN16	16	50
	14	100
	13	195
	12	250
ANSI 150 lb	16	50
	13	195

Min. operating temp.: 20 °C;
Design code: AD-Merkblatt.
* Rating acc. to EN 1092-1:2018.





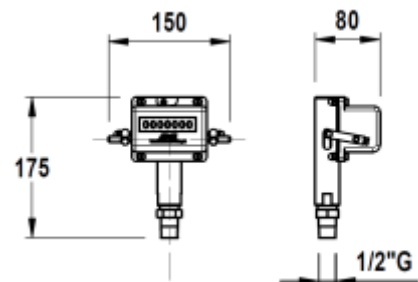
MATERIALS		
POS. Nº	DESIGNATION	MATERIAL PPA14-S
1	Pump body	P265GH / 1.0425 ; P235GH / 1.0345 ; S235JR / 1.0038
2	Cover	GJSS-400-15 / 0.7040
3	* Cover gasket	Non asbestos
4	* Inlet valve / Seat assembly	Stainless steel
5	* Exhaust valve / Seat assembly	Stainless steel
6	Internal mechanism	Stainless steel
7	*Float	Stainless steel
8	* Springs	INCONEL
9.1	* RD40 Outlet check valve	CF8M / 1.4408
9.2	* RD40 Inlet check valve	CF8M / 1.4408
10	Bolts	Steel 8.8
11	** PN16 EN 1092-1 flanges	P250GH / 1.0460

* Available spare parts;

** Welding neck EN 1092-1 flanges. Threaded flanges under 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).



SIZING AND INSTALLATION

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 other gases).
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).

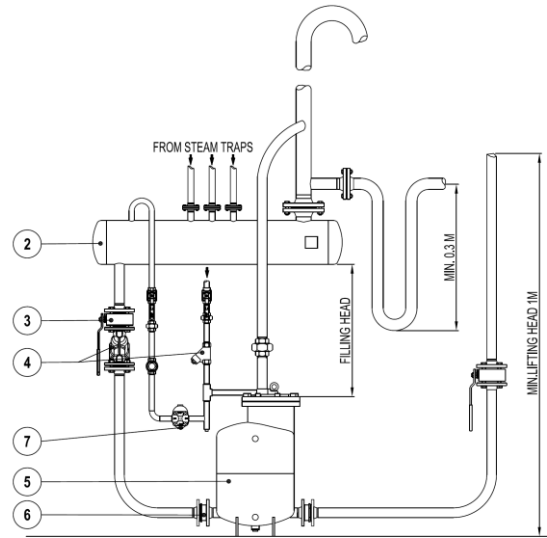


Fig. 1

INSTALLATION

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

MATERIALS			
POS.	DESIGNATION	POS.	DESIGNATION
2	Receiver	5	Pump
3	Ball valve	6	RD40 disc check valve
4	Strainer	7	Steam trap

Table 1

RECEIVER

A receiver is recommended to temporarily hold the liquid and prevent any flooding of the equipment, while the pump is in the pumping phase. Some suggested receiver sizes are described in Table 2.

SUGGESTED RECEIVER	
Pump size	DN 80 x 50
Receiver size Diam x lenght	323 x 1000

Table 2

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

Table 3

CAPACITY MULTIPLYING FACTORS FOR OTHER FILLING HEADS				
Pump size	Filling head (mm)			
	150	300	600	900
80 x 50	0,9	1	1,08	1,2

Table 4

FLOW RATE (kg/h) Installation with 600 mm filling head above the pump cover		
Motive pressure (bar)	Total lift (bar)	DN 80 x 50
1	0,35	3710
1,7		5470
3,5		5820
5		5970
7		6010
10		6290
1,7	1	3570
3,5		5160
5		5360
7		5470
10		5790
2,5	1,5	3435
3,5		4835
5		4980
7		5080
10		5390
3,5	3	2890
4		3440
5		3780
7		4040
10		4430
4,5	4	2505
5		2680
7		2990
10		3385

Table 5 (based on liquid specific gravity 0,9 – 1,0).

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

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

Calculations:

Total back pressure: $1,2 \text{ bar} + (10 \text{ m} \times 0,0981) = 2,181 \text{ bar}$
 Pump choice, assuming steam as motive fluid, at a pressure of 7 bar and a back pressure of 3 bar, the DN 80 x 50 pump has a capacity of 4040 kg/h, according to Table 5.

Correction for filling Head:

With 150 mm filling head the correction factor from table 4 is 0,9. The corrected capacity is:
 $4040 \text{ kg/h} \times 0,9 = 3636 \text{ kg/h}$

Correction for air as a motive fluid:

The % back pressure $2,181 \text{ bar} / 7 \text{ bar} = 31\%$
 The correction factor from table 3, is 1,08.
 The corrected capacity is, $3636 \text{ kg/h} \times 1,08 = 3926,88 \text{ kg/h}$,
 and so, a DN 80 x 50 pump is still recommended.