PRESSURE OPERATED PUMP
ADCAMAT POP-S
DN 100

DESCRIPTION

The ADCAMAT POP (Pressure Operated Pump) 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

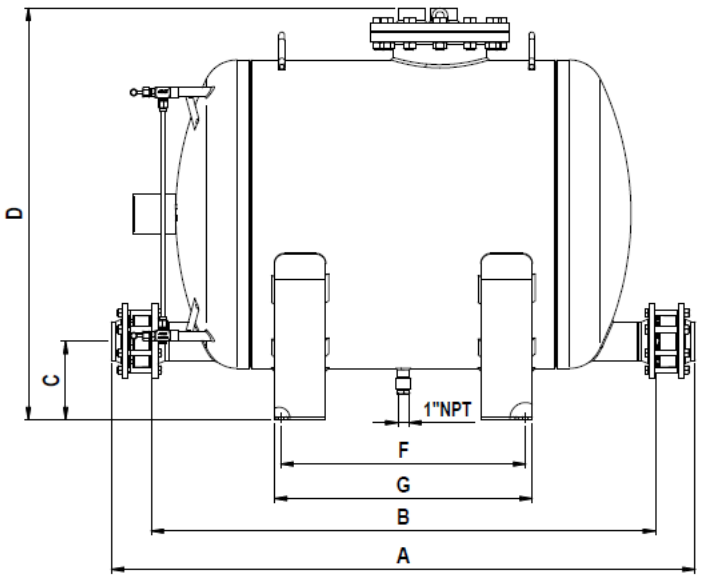
Liquid flows by gravity into the pump through an inlet check valve lifting a float which, at the upper limit of its stroke, opens the supply valve, allowing steam or compressed air to enter the pump's body. Pressure in the pump builds up until it's just sufficient to overcome back pressure.
The pressurized 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 POPS - Carbon steel construction (Carbon steel version is sandblasted, metallized and black painted).
SIZES:	DN 100 x 100 (for smaller sizes see IS 9.101E).
CONNECTIONS:	Flanged EN1092-1 PN16. Female screwed ISO 7/1 Rp (BS21) (Threaded flanges). Others on request.
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 ºEngler
Maximum motive pressure	10 bar
Minimum motive pressure	1 bar
Pump discharge per cycle	325 L

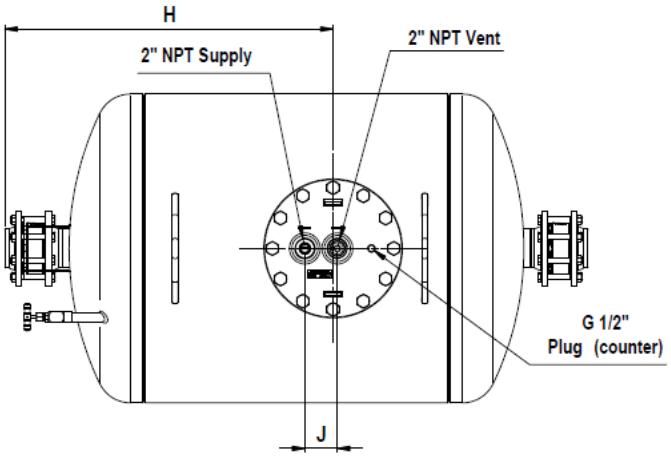
CE MARKING – GROUP 2 (PED – European Directive)	
PN16	**Category**
All sizes	4 (CE marked)

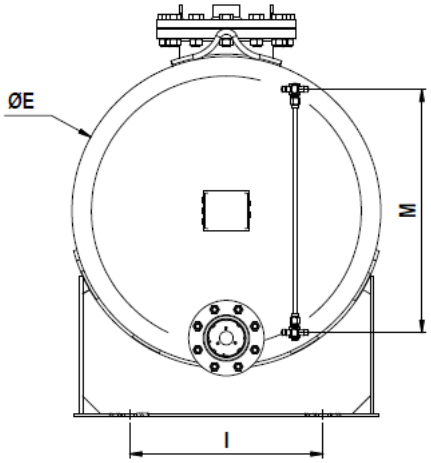
DIMENSIONS (mm)														
SIZE	**A PN16**	**A ANSI 150 lb**	**B**	**C**	**D**	**ØE**	**F**	**G**	**H**	**I**	**J**	**M**	**WGT. (kg)**	**VOL. (L)**
DN 100 (4")	1705	1760	1473	229	1200	900	715	753	960	564	95	710	565	1028

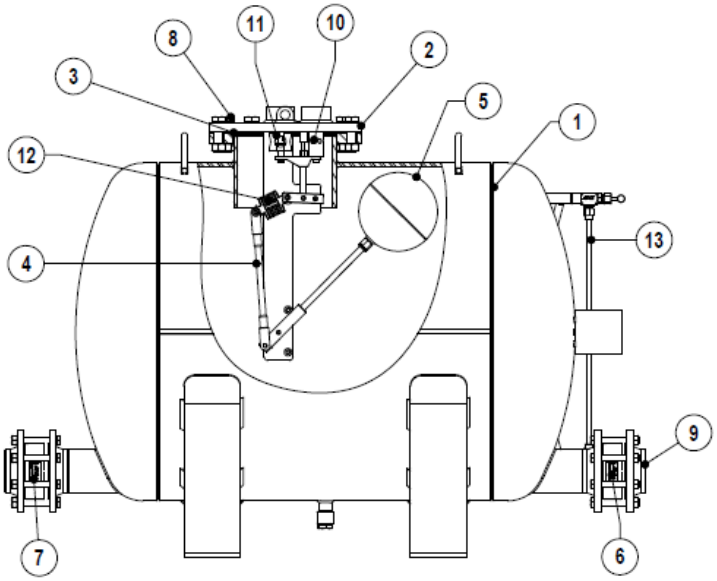


LIMITING CONDITIONS *		
	Pressure (bar)	**Temp. (ºC)**
PN16	16	50
	14	100
	13	195
	12	250
ANSI 150 lb	16	50
	13	195

Min. operating temp.: 20 ºC;
Design code: AD-Merkblatt.
* Rating according to EN1092-1:2018.





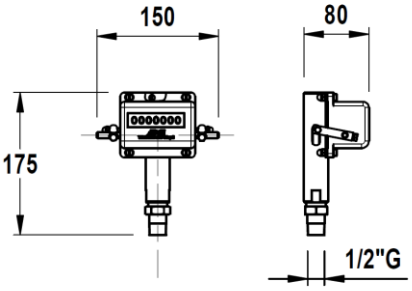


MATERIALS		
POS. N°	**DESIGNATION**	**MATERIAL POP-S**
1	Pump body	P265GH / 1.0425 ; P235GH / 1.0345 ; S235JR / 1.0038
2	Cover	GJSS-400-15 / 0.7040
3	* Cover gasket	Non asbestos
4	Internal mechanism	Stainless steel
5	* Float	Stainless steel
6	* RD40 Outlet check valve	CF8M / 1.4408
7	* RD40 Inlet check valve	CF8M / 1.4408
8	Bolts	Steel 8.8
9	** PN16 EN 1092-1 Flanges	P250GH / 1.0460
10	* Motive inlet valve / Seat assy.	Stainless steel
11	* Exhaust valve / Seat assy.	Stainless steel
12	* Springs	INCONEL
13	*** Level gauge cocks / Glass	See catalog IS LGC 135.10

* Available spare parts;
** Welding neck EN 1092-1:2018 flanges. Threaded flanges under request;
*** Optional.

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 (600 mm is recommended).

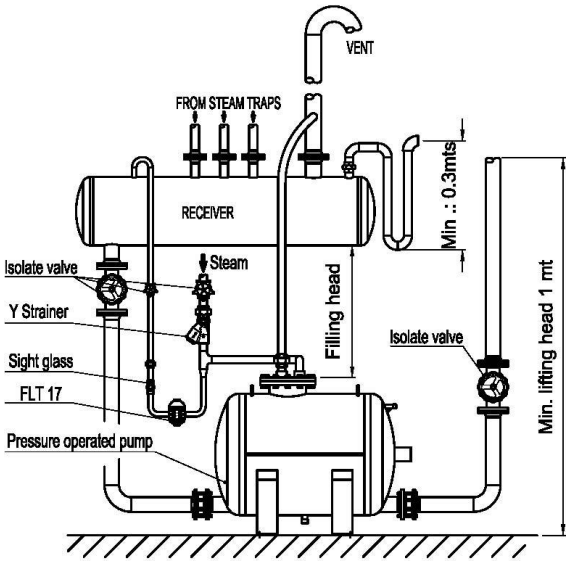


Fig. 1

INSTALLATION

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

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 100 x 100**		
Receiver size Diam x lenght	406 x 2000	640 x 1500	800 x 1500

Table 1

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 2

CAPACITY MULTIPLYING FACTORS FOR OTHER FILLING HEADS				
Pump size	**Filling head (mm)**			
	150	**300**	**600**	**900**
DN 100 x 100	0,7	0,8	1	1,08

Table 3

FLOW RATE (kg/h) Installation with 600 mm filling head above the pump cover		
Motive pressure (bar)	**Total lift (bar)**	**DN 100 x 100**
1	0,35	13130
1,7		16850
3,5		21900
5		24830
7		26880
10		29800
1,7	1	16630
3,5		20400
5		23050
7		25100
10		29800
2,5	1,5	13210
3,5		15150
5		17280
7		19100
10		21410
3,5	3	11860
4		12300
5		12900
7		13740
10		14980
4,5	4	11700
5		11840
7		12710
10		13760

Table 4 (based on liquid specific gravity 0,9 – 1,0).

Example:

Condensate load	8500 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 bar + (10 m x 0,0981) = 2,181 bar
Pump choice, assuming steam as motive pressure, at a pressure of 7 bar and a back pressure of 3 bar: the DN 100 pump has a capacity of 13740 kg/h, according to Table 4, so it is the one we should select.

Correction for filling Head:

With 150 mm filling head the correction factor from Table 3 is 0,7. The corrected capacity is:
13740 kg/h x 0,7 = 9618 kg/h

Correction for air as a motive fluid:

The % back pressure 2,181 bar / 7 bar = 31%
The correction factor from Table 2, is 1,08.
The corrected capacity is, 9618kg/h x 1,08 = 10387,44 kg/h, and so, a DN 100 pump is still recommended.