AUTOMATIC PUMP AND STEAM TRAP
ADCAMAT APST
DN40 – DN50

DESCRIPTION

The ADCAMAT APST (Automatic Pump and Steam Trap) fabricated in carbon steel or stainless steel is specially recommended where a stall condition may occur due to poor steam trap condensate discharge, caused by temporary insufficient differential pressure.
The equipment has the features of a float steam trap, combined with a pressure operated pump, in the same unit.
Whenever the steam trap function it's not enough to drain the condensate, the pump function is activated (using external steam pressure) before water logging may occur, lifting the condensate to the condensate return system, avoiding water hammer and consequent noise and equipment damage corrosion, unstable temperature control, etc,
Connections are flanged

FUNCTION

During the start-up, the pump ball float mechanism is in the closed position (bottom position) and the motive steam valve is closed, while the vent line is open.
The steam trap mechanism is at this stage modulating the condensate flow as it increases, but if the differential pressure decreases and the condensate level goes up, the pump mechanism starts to work and at the upper level the steam motive valve opens, closing at the same time the vent valve and consequently pressing the condensate to the outlet through the steam trap mechanism.
After the pump cycle, if the necessary differential pressure is available again the steam trap will restart the operation, otherwise the pump option will remain active.

MAIN FEATURES:	Non-electric requirements. No NPSH issues Operation under vacuum conditions Closed loop system, no motive or flash steam is lost.
OPTIONS:	Stainless steel construction. Level gauge.
USE:	Drain and lift condensate from heat exchangers (among others)
AVAILABLE MODELS:	ADCAMAT APST-S - Carbon steel construction ADCAMAT APST-SS – Stainless steel construction (Carbon steel version is sandblasted, metalized and black painted).
SIZES:	DN40 x 40; DN50 x 50; DN11/2 x 11/2"; DN2" x 2"
CONNECTIONS:	Flanged EN1092-1 PN16. Special flanges upon request.
INSTALLATION:	Horizontal installation. See IMI installation and maintenance instructions.
MOTIVE GAS:	Saturated steam

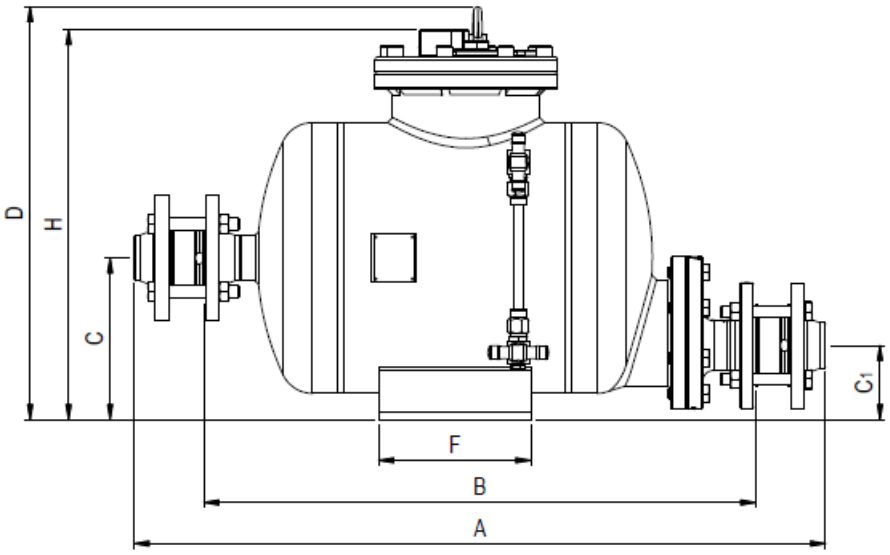
CE Marking: This product has been designed for use on water, steam, air and other gases which are in Group 2 of the European PED-Pressure Equipment Directive in use and it complies with those requirements.
The product carries the CE mark when falling in category 1 and above.
All the sizes fall within category 2.
The product carries the CE mark.

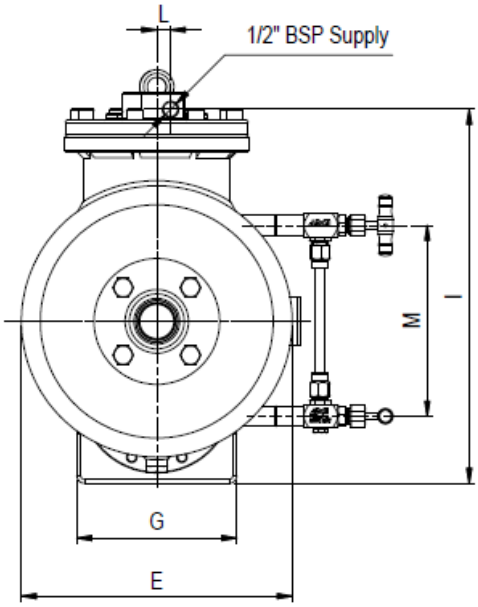
APPLICATION LIMITS	
Minimum density	0,80 kg/dm3
Maximum viscosity	5º Engler
Maximum motive pressure	10 bar
Minimum motive pressure	0,5 bar
Pump discharge per cycle	22 l

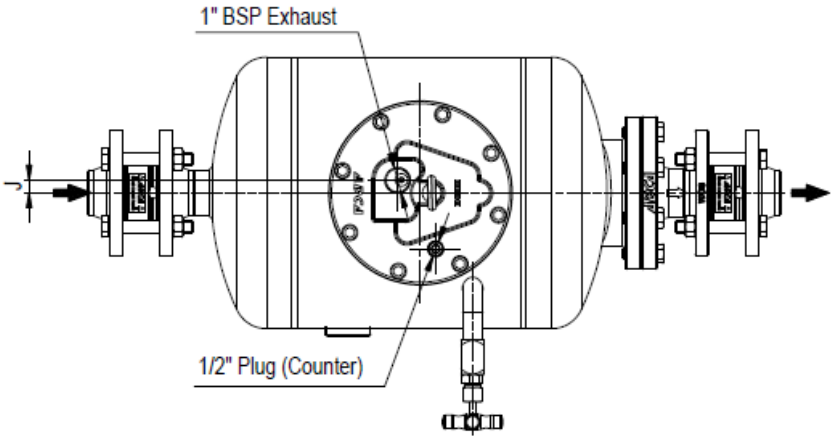
LIMITING CONDITIONS *					
APST-S			APST-SS		
	Press. bar	Temp. ºC		Press. bar	Temp. ºC
PN16	16	50	PN16	16	50
	14	100		16	100
	13	195		13	195
	12	250		12	250
ANSI Cl.150	16	50	ANSI Cl.150	16	50
	13	195		13	195

Minimum operating temp.: -10ºC; Design code: AD-Merkblatt

* Rating according to EN1092:2007

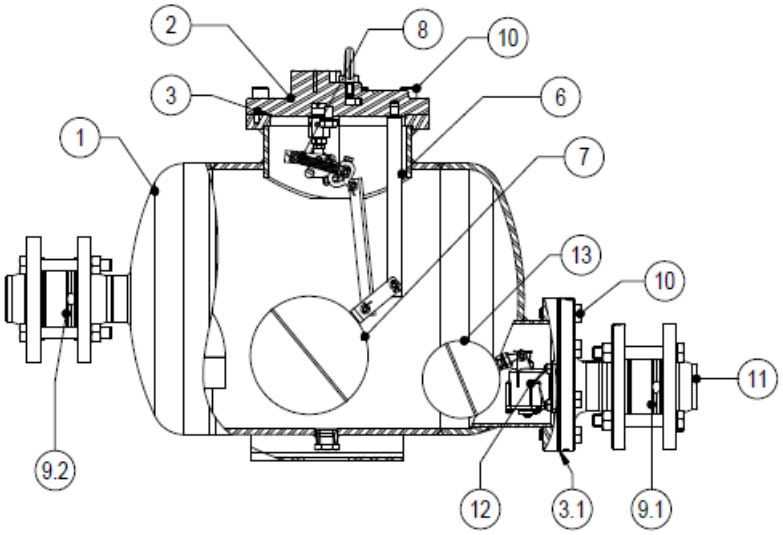


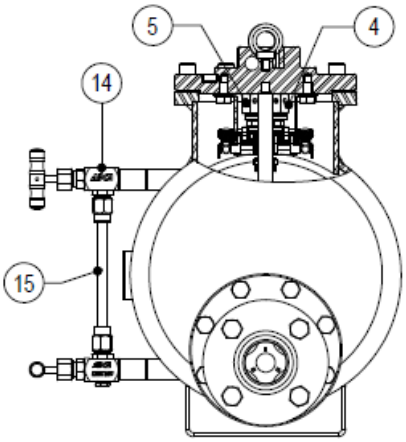




DIMENSIONS (mm)															
DN	*A **	*B*	*C*	*C1*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*L*	*M*	*Weight Kgs*	*VOL. dm3*
40 x 40	883	721	212	97	542	356	200	210	512	490	17	18	250	81	57
50 x 50	910	726	212	97	542	356	200	210	512	490	17	18	250	84	57

* A - with welding neck EN 1092-1 flanges





MATERIALS			
POS.	***DESIGNATION***	***MATERIAL - APST-S***	***MATERIAL - APST-SS***
1	PUMP BODY	P265GH / 1.0425 ; P235GH / 1.0345 S235JR / 1.0038	AISI316 / 1.4401 ; AISI316L / 1.4406
2	TOP COVER	GJS-400-15 / 0.7040	CF8M / 1.4408
3	*COVER GASKET	NON ASBESTOS	NON ASBESTOS
3.1	*OUTLET COVER GASKET	NON ASBESTOS	NON ASBESTOS
4	*INLETVALVE/SEAT ASSY.	STAINLESS STEEL	STAINLESS STEEL
5	*EXHAUST VALVE/SEAT ASSY.	STAINLESS STEEL	STAINLESS STEEL
6	INTERNAL MECHANISM	STAINLESS STEEL	STAINLESS STEEL
7	*PUMP FLOAT	STAINLESS STEEL	STAINLESS STEEL
8	*SPRING ASSY.(2PCS)	INCONEL	INCONEL
9.1	*RD40 OUTLET CHECK VALVE	CF8M / 1.4408	CF8M / 1.4408
9.2	*RD40 INLET CHECK VALVE	CF8M / 1.4408	CF8M / 1.4408
10	BOLTS	STEEL 8.8	A2 - 70
11	**PN16 EN 1092-1 FLANGES	P250GH / 1.0460	AISI316 / 1.4401
12	*FLOAT TRAP MECHANISM	STAINLESS STEEL	STAINLESS STEEL
13	*STEAM TRAP FLOAT	STAINLESS STEEL	STAINLESS STEEL
14	LEVEL GAUGE COCKS	BRONZE / STAINLESS STEEL	STAINLESS STEEL
15	TUBE GLASS	BOROSILICATE	BOROSILICATE

* Available spare parts

** Welding neck EN 1092-1 flanges. Threaded flanges on request.

APST PUMP CAPACITY

Motive Pressure bar	Total Lift bar	FLOW RATE IN Kg/h Installation with 300 mm filling head above the pump cover.	
		DN 40 x DN 40	DN 50 x DN 50
1	0,35	820	2290
2		**1050**	3130
3		1100	3530
4		1150	3810
5		**1210**	3880
6		1250	3910
8		1290	3960
10		**1300**	3970
2	1	**800**	2520
3		940	2960
4		1080	3130
5		**1110**	3170
6		1140	3220
8		1180	3250
10		**1200**	3290
3	2	790	2440
4		900	2590
5		**1000**	2800
6		1140	2830
8		1200	2850
10		**1220**	2870
4	3	750	2330
5		**860**	2510
6		910	2530
8		970	2560
10		**980**	2620
5	4	**730**	2250
6		840	2430
8		920	2470
10		**940**	2510
6	5	710	2050
8		770	2150
10		**880**	2190
7	6	730	1850
8		790	1910
10		**880**	2120

Based on liquid specific gravity 0,9 - 1,0

CAPACITY MULTIPLYING FACTORS FOR OTHER FILLING HEADS

PUMP SIZE	*FILLING HEAD mm*			
	150	*300*	*600*	*900*
ALL	0,7	1	1,2	1,35

Filling head measured from the bottom of the receiver or centreline of the heat exchanger,to the top of the cover mechanism.
Consult factory for receiver sizing.

APST STEAM TRAP FLOW RATE CAPACITY IN Kgs/h

MODEL	*SIZE*	*DIFFERENTIAL PRESSURE (bar)*									
		0,1	*0,3*	*0,5*	*0,7*	*1*	*1,5*	*2*	*4,5*	*7*	*10*
APST-10	**40 x 40**	900	1500	1900	2300	2700	3100	3600	5000	6900	8100
APST-10	**50 x 50**	1800	3000	3900	4450	5000	6100	7100	10000	13750	16000
APST-4,5	**50 x 50**	2400	5900	7550	9050	11000	14000	15500	22500		

Important: motive pressure should not exceed the maximum rated differential pressure at any circunstancies.
Lower steam trap discharge capacity available on request.

e.g. APST-10, the motive pressure ≤10barg. If the APST-4,5, the motive pressure ≤4,5barg.

Sizing and Installation

SIZING

For correct sizing, please provide:

1.Condensate load (maximum steam load).....Kg/h
2.The pressure of operating motive steam ……..barg
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 (0.0981bar/m of lift),plus pressure in the return piping, plus the pressure drop in bar caused by pipe friction, and any other system component pressure drop the pump exhaust will have to overcome.
4.Installation head available from the base of the pump to the axis of equipment condensate outlet, if horizontal, or to the face of the outlet / bottom receiver , in case of vertical condensate outlet .
5.Maximum steam pressure on the process equipment (heat exchanger, for example) ……barg
6.Minimum temperature of the medium to be heated..ºC
7.Controlled temperature of medium to be heated…...ºC

Calculation methods : see IS 9.085 E

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 can be used.

INSTALLATION – Closed loop system

Fig.1 shows a typical installation example of ADCAMAT APST (Automatic Pump & Steam Trap) applied to a large capacity skid mounted ADCATHERM PWHU (Packaged Water Heating Unit).

Fig.1

S – Steam inlet
C – Condensate return
CW – Cold water inlet
HW – Hot water delivery