

# Foam Top Pourer Set Mk4



The Angus Fire Top Pourer Set (TPS) Mk4 is designed for use in foam systems for the protection of fixed roof flammable liquid storage tanks with Nitrogen inerted blankets or where tank internal pressures may reach 0.35 bar (5 psi). The Mk4 combines foam generation, vapour sealing and foam pouring in a robust, low-maintenance design and represents over 35 years of product development and operating experience. Each unit is factory calibrated to perform at a fixed flow and pressure point and can perform to the precise pressure and flow standards laid down by Underwriters Laboratories (UL) and NFPA.

Units without a vapour seal are available for total flooding of open roof tanks.

Four basic body sizes cover flow ranges from 75 l/min (20 US gal/min) to 3,300 l/min (870 US gal/min) at inlet pressures between 3 bar (45 psi) and 10 bar (150 psi).

The discharge is enhanced by a deflector plate fitted to the outlet which disperses the finished foam against the tank wall. This ensures a rapid spread across the surface of the fuel, whilst lowering the application velocity, reducing contamination of the foam by the fuel and minimising splash.

## Foam Tube Length

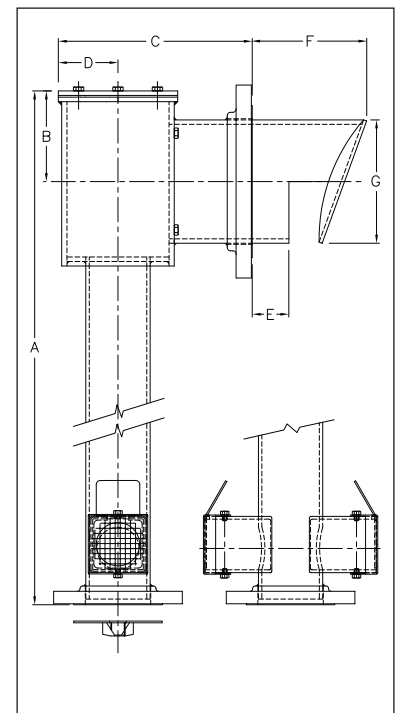
The standard or minimum length of the foam dispersal tube projecting into the tank interior is shown in the below table under "E". It is designed for pourers mounted (usually using the Angus Fire mounting kit) directly on to the tank wall. This positions the deflector plate at the optimum position inside the tank to spread the foam evenly around the interior. Other lengths of the foam dispersal tube can be specified by the customer.

## Glass Vapour Seal Disc

TPS Mk4 units are fitted with a replaceable glass bursting disc suitable for tank internal pressures up to 0.34 bar (5psi).

## Positive Bursting Disc Mechanism

When the Mk4 TPS is activated, the liquid foam and water mixture is driven up the pourer inlet pipe under full operating pressure. The liquid pressure causes the air inlet flap valves at the base of the pourer to close. The liquid, still under full pressure, travels up the tube, past the foam maker and bursts the heavy duty glass vapour seal disc, allowing access to the tank interior.



## ANSI RF #150 inlet / outlet flange sizes\*

	Inlet	outlet
TPS 50	2"	4"
TPS 80	3"	6"
TPS100	4"	8"
TPS150	6"	10"

\*ISO and DIN flanges also available

## TPS Mk4 Dimensions (mm)

	A	B	C	D	E (Min)	F	G	Weight (kg)
TPS 50	917	117	306	106	50	122	114.3	33
TPS 80	1,067	167	306	106	50	156	168.3	55
TPS 100	1,318	168	381	106	65	203	219.1	82
TPS 150	1,667	217	475	175	65	237	273.0	130

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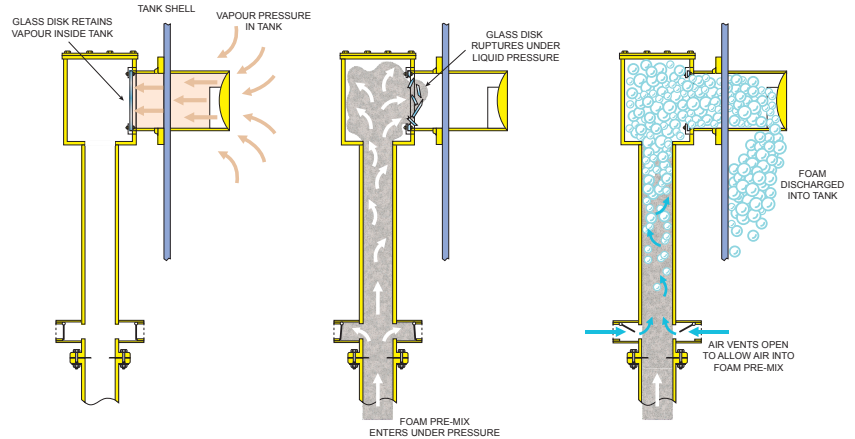
Once the vapour seal disc is burst, pressure on the liquid foam mixture is relieved. This causes the air inlet valves to open and allows air to mix with the liquid travelling up the inlet tube. When the air/liquid mixture reaches the foam maker, at the top of the inlet tube, high quality foam is produced. This is guided onto the tank liquid surface via the deflector plate, which ensures that the foam flows down the tank wall and onto the liquid surface without splashing.

## Angus Foam

With the correct foam concentrate, Top Pourer Sets can be used in applications involving either hydrocarbon or water miscible fuels. Angus Tankmaster foam is recommended for hydrocarbon fuels and Angus Alcolseal or Tridol ATF for polar solvent chemicals.

## Foam expansion and drainage rates

When a suitable foam concentrate is selected, the TPS can be used in applications involving either hydrocarbons or water miscible fuels. The properties of the finished foam will be dependent upon the concentrate used, but typically Angus Tankmaster, FP70, Alcolseal or Tridol ATF show expansion ratios of between 5:1 and 7:1 and a 25% drainage time of around 3 minutes at 3 bar inlet pressure up to around 8 minutes at 10 bar inlet pressure.



For applications involving water miscible fuels, Alcolseal at 6% or Tridol ATF produces a 25% drainage time of around 8 – 10 minutes at 5 bar inlet pressure to the TPS unit.

Recommended application rates will vary depending on the specific water miscible product(s) involved.

## Approvals

All Angus flange mounted and split flange TPS Mk4 sets are Underwriters Laboratory (UL) listed using Angus foam at the minimum length of foam inlet tube (E) shown above.

## Low Pressure Tanks

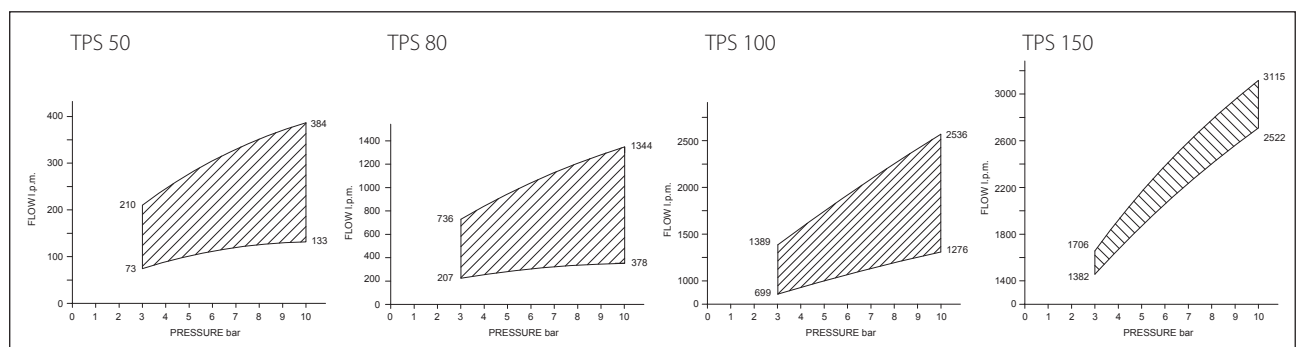
The Angus Fire TPS Mk5 is designed for tanks where the internal pressures will not exceed 0.1 bar (1.5 psi) and uses a graphite bursting disc to achieve accurate pressure control of the vapour seal.

## Materials and Finish

Standard bodies are fabricated from carbon steel and the orifice plate, internal parts and all fixings are manufactured from A2 or SS316 stainless steel.

Component	Material	Options
Body and foam generator tube	Carbon steel to EN10025	Stainless steel SS316
Orifice plate flow controller	Stainless steel SS316	
Heavy duty bursting disc	Glass	
Bursting disc holder	Zinc plated steel	
Bursting disc holder gasket	Cork	
Foam enhancer	Stainless steel SS316	
Fixings (nuts, bolts, washers)	Stainless steel 304, A2	Stainless steel SS316
Outlet flange gasket	Neoprene rubber	PTFE

## Performance Envelope



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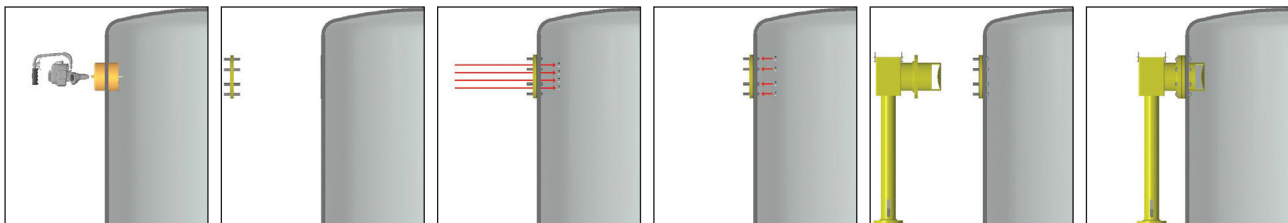
## Installation Options

The Angus mounting kit allows the TPS to be sited without the need for access from inside the tank.

**WARNING:** Before any cutting work is done to the tank wall, which could cause sparks and hot spots, it must be ensured that the tank is empty and purged of any flammable vapour.

A hole is cut into the tank side. Then the Angus mounting kit flange is secured from outside by passing the stud nuts through the access hole. They are then tightened on the inside by reaching through the access hole from outside the tank, removing

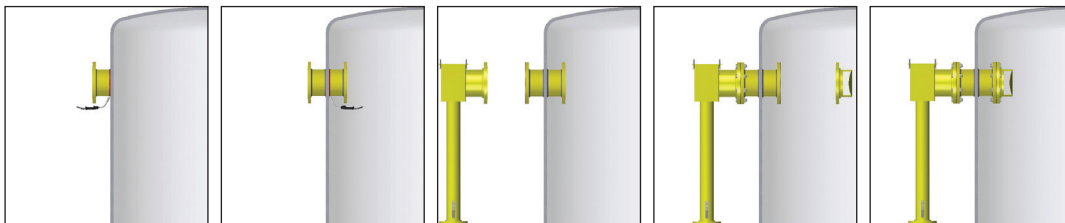
the need for access to the inside of the tank. The TPS body with its foam deflector is then bolted on to the adapter kit flange in the normal way.



## Split Flange Installation Options

Angus TPS units can be supplied with a split flange layout to enable the unit to be mounted away from the tank side. This is intended as an option for a new tank under construction, due to the requirement to work inside the tank.

Flanges are welded outside and inside the tank wall. The TPS body and foam generator are mounted on to the external flange and the foam deflector on to the internal flange.



Tank Diameter (m)	Minimum number of foam top pourers (NFPA11:2010 & EN13565-2:2009)
Up to 24	1
24 to 36	2
36 to 42	3
42 to 48	4
48 to 54	6
54 to 60	6
Over 60 m	add one inlet for each additional 465m <sup>2</sup> of exposed fuel surface area (exceeding 2827m <sup>2</sup> )

## Adaptor Kit Datasheet Reference

(for standard TPS installation. Not required for split flange installation as described below)

	Datasheet Reference	
	ANSI Flange	DIN Flange
TPS 50	D-A3C7729	D-A3C8721
TPS 80	D-15833	D-A3C8704
TPS 100	D-15829	D-A3C8723
TPS 150	D-16057	D-A3C8725

For detailed installation information refer to technical drawing:

	Technical Drawing	
	Standard	Split
TPS 50	B4627C1	B4644C1
TPS 80	B4628C1	B4646C1
TPS 100	B4629C1	B4648C1
TPS 150	B4630C1	B4650C1

## Notes:

- All inlets should be positioned equally around the circumference of the tank, but the distance between any 2 pourers should not exceed 30m on fixed cone roof tanks.
- Consideration may have to be given to ensuring the foam application does reach the centre of large tanks.

Angus Fire is a company assessed to ISO 9001.



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