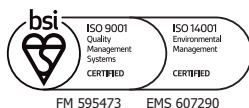


Foam Top Pourer Set Mk5

Features

- ✓ Robust, integral design with easy mounting kit
- ✓ Reliable graphite bursting disc assembly, leak-free until operation
- ✓ Delivers foam to slide down gently onto fuel surface



All Angus TPS Mk5 sets (standard flange mounted and split flange option) are listed by Underwriters Laboratory (UL) using Angus foams at the standard foam inlet tube length (E) shown previously. Angus Fire is a company assessed to ISO 9001.

The Angus Fire Top Pourer Set (TPS) Mk5 is designed for use in foam systems for the protection of fixed roof flammable liquid atmospheric storage tanks where internal pressures will not exceed 0.1bar g. (1.5psi).

The TPS Mk 5 combines foam generation, vapour sealing and foam pouring in a robust, integral, low-maintenance design, representing over 35 years of product development and operating expertise

Each unit is factory calibrated to deliver a fixed flow at a specific pressure point meeting the precise site requirements plus NFPA 11 and Underwriters Laboratories (UL162) Standards.

Four basic body sizes cover foam solution flow ranges from 74 l/min (20 US gal/min) to 3,274 l/min (865 US gal/min) at inlet pressures between 3 bar (43.5 psi) and 10 bar (145 psi). Expansion ratios vary with pressure and concentrate type, typically around 5:1 to 7:1.

Reliable low maintenance unit

Foam discharge is enhanced by a deflector plate fitted to the outlet reducing application velocity and dispersing the finished foam against the tank shell to slide gently down and across the fuel surface, minimising splashing, plunging or mixing with the fuel. This ensures a rapid and effective spread across the surface of the flaming liquid.

Higher Pressure Tanks

Where nitrogen inerting or internal vapour pressures reach up to 0.35bar (5psi) during normal operation, the Angus TPS Mk4 is recommended (see data sheet 2202).

Open Top Floating Roof tanks

Similarly designed units are also available without any vapour sealing disc for full surface flooding of open top floating roof tanks (OTFR) see Full Surface Pourers (Data sheet 2201).

Foam Tube Length Option

The minimum standard length of the foam dispersal tube projecting into the tank interior is shown in the table below under "E". It is designed for pourers mounted using the easy Angus Fire mounting kit directly on to the tank shell, avoiding confined space access inside the tank during installation. This

locates the deflector plate at the optimum position inside the tank to spread the foam evenly and gently across the interior shell and minimise adverse plunging effects.

Other lengths of separate foam dispersal tube can be specified to special order, where existing tank penetrations are being used.

Graphite Vapour Seal Disc

TPS Mk5 units are fitted with a unique vapour seal bursting disc made from impregnated graphite, increasing reliability of sealing the tank and preventing vapour escaping, during normal operation, including filling and discharging. Graphite is used to ensure that the disc will precisely burst when subjected to the pressure of expanded foam entering the top chamber.

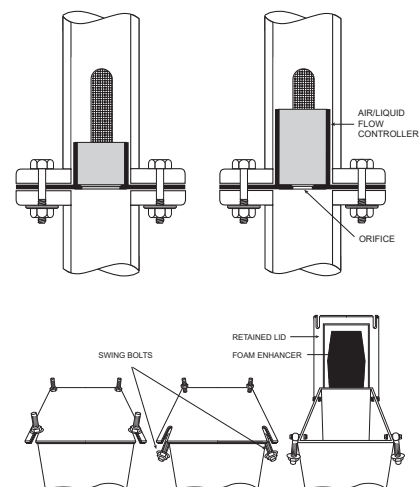
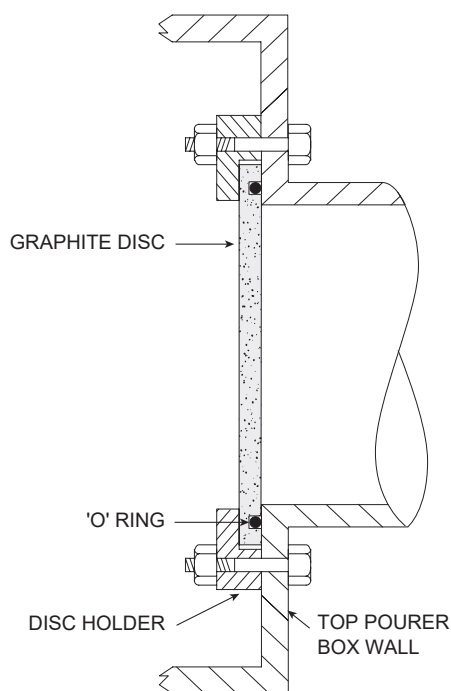
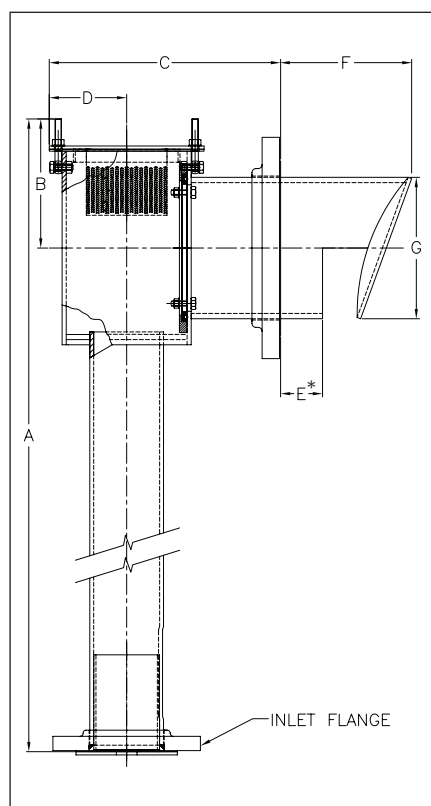
The disc holder can be re-used for replacement graphite discs.

The use of graphite enables the bursting pressure to be held within tolerances of $\pm 0.05\text{bar}$ ($\pm 0.75\text{psi}$). Holders can be simply replaced by unfastening the captive lid and re-inserting replacements after use. The disc holder can be re-used for replacement graphite discs.



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TPS Mk5 Dimensions (mm)



* It is important that the pourer opening defined by dimension 'E' sits within 10mm of the inside of the tank shell. This maximises the amount of foam hitting the inside of the tank shell.

ANSI RF #150 inlet / outlet flange sizes*

	Inlet	Outlet
TPS 50	2"	4"
TPS 80	3"	6"
TPS 100	4"	8"
TPS 150	6"	10"

TPS Mk5 Dimensions (mm)

	A	B	C	D	E (Min)	F	G	Weight (kg)
TPS 50	950	150	320	120	50	122	114.3	27
TPS 80	1100	200	320	120	50	156	168.3	53
TPS 100	1350	200	395	120	65	203	219.1	75
TPS 150	1700	250	495	195	65	237	273.0	112



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Foam Box and Bursting Disc Access

To allow access to the foam generating box for test purposes, and to inspect or replace the graphite disc, the box lid has been designed to allow quick and easy access. Four retained stainless steel bolts swing away to allow the captive lid to pivot giving access without the risk of any components falling from the unit to the ground below, delivering increased safety.

Control of the Foam/Air Mixture

To provide precise control over the ratio of foam and air, the TPS Mk5 is fitted with a unique captive air/liquid flow controller to deliver optimum foam quality.

In addition, a stainless steel sleeve, above the orifice, controls the air inlet duct ensuring the correct amount of air is drawn in for the quantity of foam solution being supplied.

Each orifice control assembly is specifically designed and calibrated to allow the correct

amount of foam solution and air into the foam-making tube after taking into account the supply pressure at the inlet flange, the foam type and concentration to deliver optimum expanded foam into the tank, at the required flow and pressure.

This unique combination of orifice and control sleeve ensures optimum expansion is achieved and all the foam supplied is fully utilised in the event of a fire.

Foam expansion and drainage rates

The properties of finished foam achieved will be dependent upon the concentrate chosen and the operating pressures used. Expansion ratios of between 5:1 and 7:1 are generally achieved.

Recommended application rates will vary depending on the specific concentrate chosen and fuels involved.

Angus Foam

With the correct choice of Fluorine Free Angus foam concentrate, these Mk4 Top Pourer Sets can be highly effective for applications involving either hydrocarbon or water miscible fuels.

For more information please contact Angus Fire or visit: www.angusfire.co.uk

Materials and Finish

Standard TPS Mk5 bodies are fabricated from heavy duty carbon steel construction to minimise distortion during operation. The orifice plates, internal parts and all fixings are manufactured from A2 or SS316 stainless steel for reliable operation.

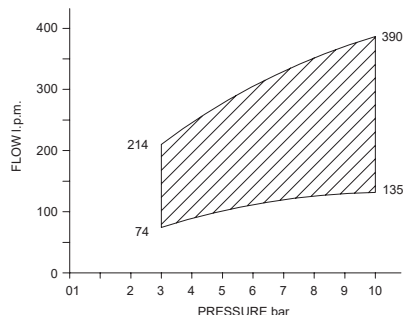
Component	Material	Options
Body and foam generator tube	Carbon steel to EN10025	Stainless steel SS316
Air/liquid flow controller	Stainless steel SS316	
High performance bursting disc	Impregnated Graphite	
Reusable bursting disc holder	Zinc plated steel	Stainless steel SS316
Bursting disc "O" ring seal	Nitrile rubber (for hydrocarbons)	Viton (for polar solvents)
Captive foam enhancer	Stainless steel SS316	
Fixings (nuts, bolts, washers)	Stainless steel 304, A2	Stainless steel SS316
Outlet flange gasket	Neoprene rubber	PTFE

Supplied as standard with a unique yellow thermoplastic powder paint finish (RAL1006), suitable for most operating conditions. Alternative in red colour (REL3020) available to special order.

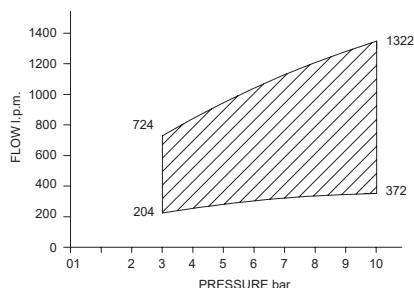


Performance Envelope

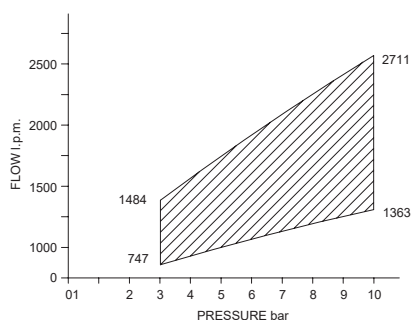
TPS 50



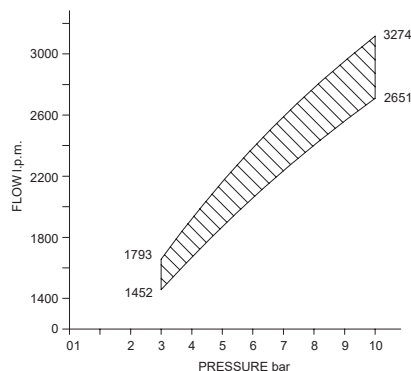
TPS 80



TPS 100



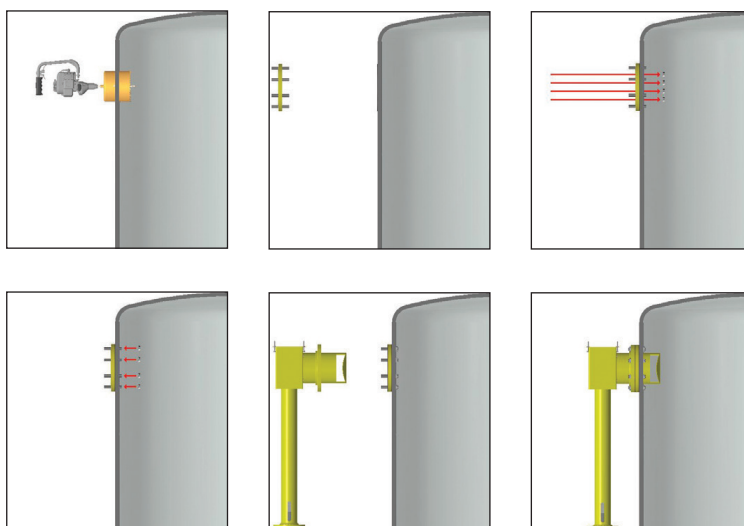
TPS 150



Installation Options

The easy to use Angus mounting kit allows the TPS Mk5 to be installed without the need for any confined space access inside the tank.

A hole is cut into the tank shell at the desired TPS Mk5 mounting point. Then the Angus mounting kit (double studded flange) is secured from outside by passing the stud nuts through the TPS access hole. They are then tightened on the inside by reaching through the access hole safely from outside the tank, removing the need for any confined space access inside the tank. The integral TPS Mk5 body with its foam deflector is then bolted on to the mounting kit flange in the normal way and fully tightened. The specific orifice disc is inserted at the TPS Mk5 inlet before connecting the unit to its flanged supply pipework.



Warning: Before any cutting work is done to the tank shell, site risk assesment should take place.

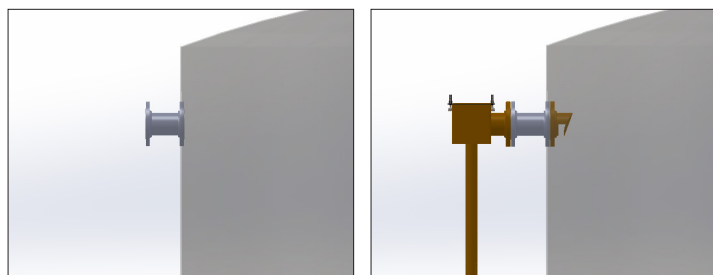
Split Flange Installation Options

Angus TPS Mk5 units can be supplied with a separate flanged deflector to enable each unit to be fitted to existing flanged tank penetrations. This is intended particularly for retro-fits to existing tanks.

Existing flanges can be used or new flanges are welded outside and inside the new tank penetration through the shell in accordance with API standards. The separate flanged deflector is passed into the tank and bolted to the internal flange, tightening appropriately.

The main TPS Mk5 body can then be mounted on to the external flange and tightened accordingly. Ensure each specific orifice disc is inserted at the TPS Mk5 inlet before connecting each unit to its flanged supply pipework.

For detailed installation information refer to technical drawings detailed below:



NOTE: The pourer opening must be mounted within 10mm of the inner tank shell.

Adaptor Kit Datasheet Reference

(Require for standard TPS Mk5 installation. But not required for separate flanged deflector installation). For detailed installation information refer to technical drawing:

Datasheet Reference

	ANSI Flange	DIN Flange
TPS 50	D-A3C7729	D-A3C8721
TPS 80	D-I5833	D-A3C8704
TPS 100	D-I5829	D-A3C8723
TPS 150	D-I6057	D-A3C8725

Technical Drawing

	Standard	Split
TPS 50	B4624C1	B4632C1
TPS 80	B4625C1	B4637C1
TPS 100	B4623C1	B4640C1
TPS 150	B4626C1	B4642C1

Number of pourers/ tank diameter

Tank Diameter (m)	Minimum number of foam top pourers (NFPA 11 & EN13565-2 requirements)
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	Add one inlet for each additional 465m ² of exposed fuel surface area (exceeding 2827m ²)

Notes:

- Sufficient inlets should be positioned equally around the circumference of each tank, in accordance with current NFPA 11 and EN 13565-2 requirements.
- Consideration may have to be given to ensuring the foam application adequately covers the centre of large cone roof tanks.

Angus Fire operates a continuous programme of product development. The right is therefore reserved to modify any specification without prior notice and Angus Fire should be contacted to ensure that the current issues of all technical data sheets are used.