



Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	
afp - 1144	2-Jun-1998	Number 13	Issue date 26-Apr-2019	30-Apr-2020

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Product designation

Grinnell/Gem, Model F540, 25mm/50mm, Automatic Residential Shutoff Valves

(Refer to the Schedule/enclosures for further specified details)

Agent/distributor

Tyco Fire Protection Products
Level 3, 95 Coventry Street, SOUTHBANK, VIC, AUSTRALIA, 3006

Registrant

Tyco Fire Protection Products
Level 3, 95 Coventry Street, SOUTHBANK, VIC, AUSTRALIA, 3006

Producer

Tyco Fire Protection Products
8902 North Interstate 27, LUBBOCK, TX, UNITED STATES, 79403

Conformance criteria and evaluation

The Grinnell/Gem, Model F540, 25mm/50mm, Automatic Residential Shutoff Valves have been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. Underwriters Laboratories - Evaluation and listing, 'UL listing'.

Limitations/conditions of conformance

Limitations/conditions of conformance, where identified on this certificate, are derived from qualifications from evaluation(s) for conformity and/or other related technical documentation. All details with respect to design, assembly and installation instructions and restrictions should be checked against the producer's current technical manual/data sheets and the requirements of the Authority having Jurisdiction.

Specified limitations/conditions, determined from the evaluation for conformity, include the following.

- i. For use only where the water supply pressure at the valve inlet will not exceed 1210 kPa.
- ii. The valves are installed vertically with the supply port at the bottom, and where contaminants and particles in the water supplied to the valve do not exceed 3.2 mm in size.

This certification is issued within the scope of CSIRO Verification Services – Rules governing ActivFire Scheme and is valid only for the product(s) as submitted for evaluation and verification of conformity, subject to the following conditions.

- Reference to details, limitations and requirements, where documented as a schedule/enclosure with this certificate.
- The Registrant is responsible for their attestation of conformity and ensuring that on-going production complies with the conformance criteria defined in this certificate.
- This certificate will not be valid if any changes or modifications are made to the product which have not been notified and validated by CSIRO Verification Services.
- This certificate is subject to periodical re-validation upon verification that all requirements, as determined by the conformity assessment body, continue to be satisfactorily met by the Registrant.
- This certificate may only be reproduced in its published form, without modification and inclusive of all schedules/enclosures.
- Any changes, errors or omissions, must be submitted in writing and if necessary or requested, substantiated with relevant evidence.
- Any representations, such as advertising or other marketing related activities or articles shall reflect the correct contents of this certificate and conform with all relevant trade practices and consumer protection legislation and regulations.
- Any terms or conditions of use as applicable to content and documentation as published or accessed through web sites administered by the CSIRO Verification Services.

Issued by

David Whittaker
Executive Officer – ActivFire Scheme



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Producer's description

The Grinnell/Gem, Model F540, 25mm/50mm, Automatic Residential Shutoff Valves are devices which are intended to automatically shut off flow to a domestic potable water reticulation system and divert all available water supply flow to an interconnected fire sprinkler system on fall in sprinkler system pressure following activation of sprinkler heads. They also function as a means of preventing back-flow of water from the sprinkler system into the water supply or domestic reticulation pipework should the pressure in those systems fall below that of the sprinkler system. The shutoff valves are suitable for use in dual-purpose water supply piping that serves the needs of a domestic potable water supply system and an AS 2118.4 (Residential) or AS 2118.5 (Domestic) fire protection sprinkler system.

Although differing somewhat in internal construction, both sizes of the F540 valve are spring-biased bi-stable devices which have a "tee" configuration and are intended to be installed with the "through" axis vertical. All connection ports are screwed NPT female thread. The side outlet of both sizes of valve is for connection of the potable water reticulation pipe, the bottom port being for connection of the water supply pipe and the top port for the sprinkler water reticulation main. The 25 mm valve has a vertical-sliding spring-loaded "dumbbell-shaped" "poppet assembly", the spring serving to hold the upper end of the poppet assembly sealed against the sprinkler check seat which is integral with the valve main casting. If the pressure within the sprinkler pipework exceeds the potable water pressure, this pressure difference acting on the upper poppet valve seat area is added to the spring force, thus serving to keep the sprinkler check valve even more tightly seated. At the same time, the lower end of the poppet assembly is held away from the potable water shut-off seat, allowing the water supply to feed the building's potable water reticulation system. When one or more sprinkler heads activate, the sprinkler system pressure falls to somewhat less than the supply pressure, allowing the pressure at the upper check seat to lift the poppet assembly sufficiently to cause the lower end of the poppet assembly to seal against the lower check seat, causing shut-off of flow to the domestic reticulation system (except for flow via the domestic seat bypass restriction - a very small milled-away portion of the domestic seat having a K_M of about 0.06). Any draw-off of water from the domestic system causes tighter seating of the lower check valve, and ensures that the spring can not move the poppet assembly downwards and allow water to exit the valve via the domestic water piping. The poppet assembly automatically resets when the water supply isolating valve is closed, and will remain reset when water supply is restored, providing that the activated sprinkler heads have been replaced.

The 50 mm valve operates in a similar manner to the 25 mm valve, but has a vertical-sliding hollow cylindrical spring-loaded piston which permits water to flow only via ports in its cylindrical wall. Depending on whether the piston is in its highest or lowest position, the water supply is connected to the domestic water piping or the sprinkler piping respectively. The bi-stable nature of the piston ensures that it is always at one extreme of its stroke or the other. Piston leakage is prevented by means of three proprietary moulded silicone 'U'-packing type sliding seals which operate against the piston's smooth cylindrical external surface. The 'U'-packings are located in square-section grooves in the valve body, one being located so as to prevent leakage from the water supply inlet to the domestic water outlet, the other two being in "tandem" and located to prevent leakage from the sprinkler water outlet to the domestic water outlet.

The internal construction of the valves is as illustrated in the Grinnell technical data sheets TD195 (25 mm valve) and TD 196 (50 mm valve).

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Technical specification

The following details are a representative extract of the technical specification for the Grinnell/Gem, Model F540, 25mm/50mm, Automatic Residential Shutoff Valves and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

The basic technical characteristics of the Grinnell/Gem, Model F540, 25mm/50mm, Automatic Residential Shutoff Valves as follows:

Technical characteristic	25 mm Valve	50 mm Valve
Supply Water Inlet	1" NPT Female	2" NPT Female
Sprinkler Water Outlet	1" NPT Female	2" NPT Female
Domestic Water Outlet	1" NPT Female	2" NPT Female
Overall Height	208.0 mm	233.4 mm
Body Diameter	92.1 mm	136.5 mm
Width Over Domestic Outlet	106.4 mm	163.5 mm
K(Metric) - Flow to Spklr. Outlet	25.24	51.0
K(Metric) - Flow to Dom. Outlet	33.74	131.2
Maximum Rated Supply Pressure	1210 kPa	1210 kPa

Materials of construction:

Item	25 mm Valve	50 mm Valve
Main Body	Bronze, ASTM B62	Bronze, ASTM B62
Top Cover	Bronze, ASTM B62	Bronze, ASTM B62
Bottom Cover	Bronze, ASTM B62	Bronze, ASTM B62
Biasing Spring	302 Stainless Steel	302 Stainless Steel
Bi-stable Piston	n/a	Teflon-coated Bronze, ASTM 62
Bi-stable Poppet	G.R. Polyphenylene Oxide	n/a
Differential Ring (poppet)	G.R. Polyphenylene Oxide	n/a
Poppet Sleeve	G.R. Polyphenylene Oxide	n/a
Upper Cap (poppet)	Brass, ASTM B16 or B36	n/a
Upper Seal (poppet)	EPDM Rubber	n/a
Lower Seal (poppet)	EPDM Rubber	n/a
Body 'O' Rings	Buna-N	Buna-N
Piston Seals	n/a	Silicone