

# Thermostatic Mixing Valve

## Model TMV5211 – Low Headloss - Datasheet - Page 1 of 2

### Description

TMVs blend hot and cold water at point of use to provide warm water to basins, showers, baths etc. When installed and maintained correctly, the TMV will fulfil the Duty of Care requirements against scalding. Legionella bacteria breed in warm water (20-45°C), so to avoid this condition hot water should be stored at 60-65°C and distributed at not less than 55°C. The cold water should be supplied below 20°C. *Legionella bacteria die within 32 mins in water @ 60°C.*

Model 5211 is designed for standard risk applications, such as private houses, holiday homes, rented accommodation, hostels, guest houses and hotels etc. Model 5213 is intended for high risk applications (vulnerable users) such as hospitals and nursing homes. Model 5211 does not have DO8 approval or tamperproof temperature adjustment<sup>4</sup> and its performance differs. However model 5211 has much lower head loss compared with model 5213 and is therefore better suited to gravity and multiple outlet applications.

Proportional control on both the hot and cold provides an accurate ( $\pm 2^\circ\text{C}$ ) outlet temperature, which is adjustable between 30–65°C by means of an external graduated dial. Low head loss check valves are incorporated into the hot and cold tails, which provide the necessary backflow protection against hot water (Fluid Category 2). *Note – when used for a bath with a shower hose additional backflow protection is necessary, see tutorial # 8 on the Arrow Valves website [www.arrowvalves.co.uk](http://www.arrowvalves.co.uk)*

Flat-faced unions enable the TMV to be easily removed if required. Servicing Valves should be fitted to the hot and cold supplies to aid maintenance (Clause G11.1). The Arrow Valves TMV is normally supplied with AFL (Automatic Flow Limiting) Servicing Valves – see AFL Data Sheet. These valves enable a strainer only or combined strainer and Automatic Flow Limiting cartridge to be fitted and removed through the side port without disconnecting pipes. The AFL valves are supplied with serviceable 260  $\mu\text{m}$  strainers. In **addition** the cartridges can incorporate an Automatic Flow Limiting facility to assist with water conservation and unbalanced supply pressures. TMVs perform best with equal supply pressures e.g. unvented hot and cold.

### Specification

|                            |                                                          |
|----------------------------|----------------------------------------------------------|
| Outlet Temperature         | 30–65°C (Tamperproof adjuster)                           |
| Accuracy                   | $\pm 2^\circ\text{C}$                                    |
| Max. Hot Temperature       | 85°C <sup>note 1</sup>                                   |
| Supply Temp. Hot           | 52–65°C <sup>note 1</sup>                                |
| Supply Temp. Cold          | 5–20°C                                                   |
| Min Supply Pressure        | 0.2 bar dynamic (see flow chart)                         |
| Max Supply Pressure        | 14 bar static, 5 bar dynamic                             |
| Maximum Dynamic $\Delta P$ | 2 bar (between hot and cold) <sup>note 2</sup>           |
| Strainer                   | 600 $\mu\text{m}$ (0.6 mm) hot & cold inlets             |
|                            | 260 $\mu\text{m}$ <sup>note 3</sup> (AFL Service Valves) |
| Approval                   | 1708701                                                  |

#### Notes

1. To enable isolation should the cold water supply be isolated, the hot supply should be more than 15°C hotter than the desired outlet temperature.
2. Where static  $\Delta P$  is >2 bar, dynamic pressure balance can be achieved with AFL cartridge in high pressure (typically cold) AFL Service Valve.
3. The standard strainer supplied in AFL valves is 260  $\mu\text{m}$ , 570  $\mu\text{m}$  optional, the 600  $\mu\text{m}$  strainer is removed. If using combined strainer and flow limiting cartridges, specify colour – see table on right. Note mixed flow = Hot + Cold.
4. The dial may be locked by removing and refitting with the notch between the “min/max” marks.



### Water Regulations

Clause G 18.5 states the requirement for Thermostatic Mixing Valves –

*“Terminal fittings or communal showers in schools or public buildings, and in other facilities used by the public, should be supplied with water through Thermostatic Mixing Valves so that the temperature of the water discharged at the outlets does not exceed 43°C”.*

Generally TMVs should be fitted at points of use, i.e. one TMV per outlet. However where a number of outlets are in the same area – e.g. three hand wash basins, these can be served from one TMV – 22 mm). This “group” mixing is **not** recommended for high risk applications – see TMVA code of practice. The mixed outlet should be as short as possible to conform to G18.4 and to minimise the legionella risk. Clause G 18.4 states – *“Where practicable the hot water distribution system should be designed and installed to provide the required flow of water at the terminal fittings to sanitary and other appliances at a water temperature of not less than 50°C (see note) and within 30 seconds after fully opening the tap. This criteria may not be achievable where the hot water is provided by instantaneous or combination boilers”.*

Note – for public buildings the outlet temperature is 43°C max.

### Applications & Temperatures

Once installed, the outlet temperature must be set. By default use the TMVA Code of Practice.

TMVs perform best with equal supply pressures of 1–3 bar. Above 3 bar use Automatic Flow Limiting cartridge in both Servicing Valves – see table for colour.

For unbalanced supplies - e.g. gravity hot, mains/boosted cold – fit an AFL cartridge in high pressure (cold) Servicing Valve only.

| Description     | Temp Standard Risk | Dial Setting Approx. | Suggested AFL Cartridge (has strainer too) |
|-----------------|--------------------|----------------------|--------------------------------------------|
| Wash hand basin | 40°C               | 2.5                  | 2 x Pink (0.07 Lt/s)                       |
| Shower          | 41°C               | 2.6                  | 2 x Pink (0.07 Lt/s)                       |
| Bidet           | 37°C               | 1.9                  | 2 x Pink (0.07 Lt/s)                       |
| Bath            | 43°C               | 2.9                  | 2 x Yellow (0.17 Lt/s)                     |

### Arrow Valves Ltd

Tel: 01442 823123

Fax: 01442 823234

[www.arrowvalves.co.uk](http://www.arrowvalves.co.uk)

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All unit-less dimensions in mm.

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### Cont.

### Materials

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| Body              | DZR brass - chrome plated                                        |
| Seat              | Hot seat incorporates an EPDM washer enabling drop-tight closure |
| Springs, Strainer | Stainless steel                                                  |

### Connection Pipes

|         |                                               |
|---------|-----------------------------------------------|
| Copper  | – 15 and 22 mm compression fittings           |
| Plastic | – Fittings available for most plastic systems |
| Steel   | – ½" or ¾" FBSPP                              |

### Installation

The TMV should be used at points of use and as close as possible to the hot outlet (outlet should reach desired temperature within 30 seconds). Generally use one TMV per outlet, although if sufficient pressure and an AFL valve used for each outlet, one TMV (e.g. 22 mm inlet version) could be used for two or three outlets – see head loss graph. The TMV can be installed in any orientation (e.g. outlet at top).

A Servicing Valve (excluded from kit) should be fitted to the cold tap such as another AFL valve – which can accept an Automatic Flow Limiting cartridge if required. Additional flexible hoses are available to facilitate installation to the cold tap.

The pipe should be thoroughly flushed and disinfected before installing the TMV. Once installed, the TMV must be commissioned to set appropriate outlet temperature.

### Temperature Measurement

A probe digital thermometer with a minimum refresh rate of 4 times a second is recommended.

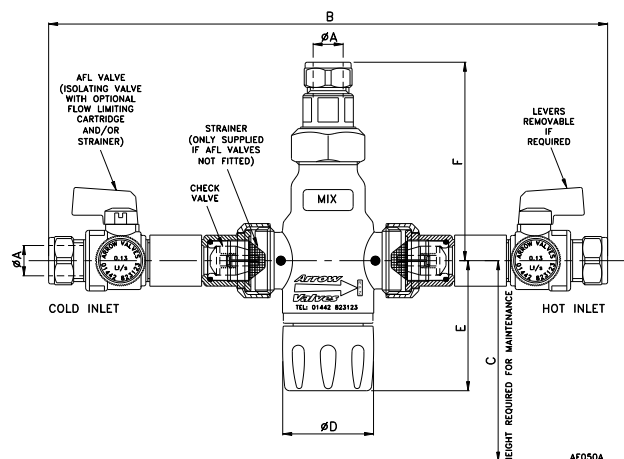
**Cold** - the cold temperature can be measured at the cold tap. This should be below 20°C.

**Hot** - insert the probe into the test point (only on 15 mm Kit version). This should be above 55°C.

**Mixed** - the mixed temperature at the "hot" tap should be set slightly below the maximum permissible temperature – use values in table on p.1 if no other specification is provided.

To adjust the temperature, rotate the large dial. To lock, remove and replace dial between the "min/max" marks.

Go to this link for TMVA code of practice  
[www.tmva.org.uk/pdfs/A5guide.pdf](http://www.tmva.org.uk/pdfs/A5guide.pdf)

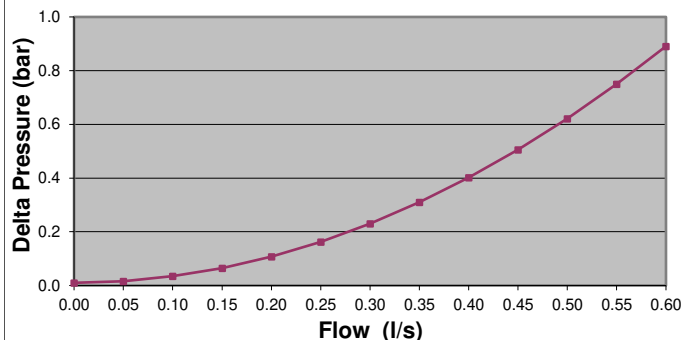


TMV with AFL Servicing Valves - 15 or 22 mm connections

| ØA | B <sub>AFL</sub> | B <sub>No AFL</sub> | C  | ØD | E  | F               |
|----|------------------|---------------------|----|----|----|-----------------|
| 15 | 272              | 160                 | 90 | 46 | 72 | 98              |
| 22 | 264              | 164                 | 90 | 46 | 72 | 66 <sup>A</sup> |

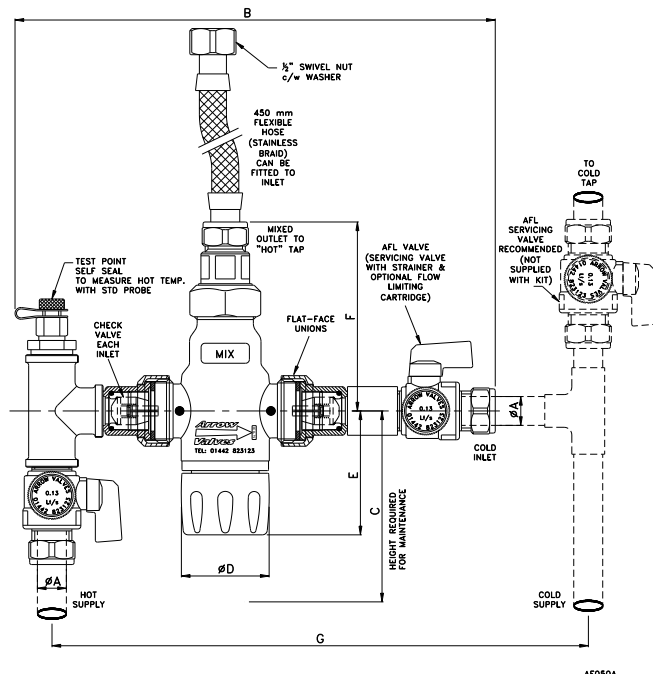
Note A - 22 mm outlet has compression connection – no union

Head Loss / Flow Chart  
 model 5211 - 15 mm & 22 mm



Note – 0.2 bar (2 m) minimum supply pressure.  
 Pressure drop includes check valves and strainers.  
 Check valves require 0.013 bar to open.

Flow rate is combined mixed flow with equal hot and cold pressures.  
 15 mm suggested max. flow 0.44 l/s (= 3 m/s).  
 22 mm suggested max. flow 0.64 l/s (= 2 m/s).



TMV Kit – 15 mm

Contents – TMV, AFL Service Valves, Test Point (Hot), 1 Hose

| ØA | B   | C  | ØD | E  | F  | G <sub>min</sub> |
|----|-----|----|----|----|----|------------------|
| 15 | 240 | 90 | 46 | 72 | 98 | 250              |

### Codes and Descriptions

| Size  | Code          | Description                                      |
|-------|---------------|--------------------------------------------------|
| 15 mm | TMV15C5211K1  | Thermostatic Mixing Valve TMV – Kit 1            |
| 15 mm | TMV15C5211K2  | Thermostatic Mixing Valve TMV – Kit 2            |
| 15 mm | TMV15C5211AFL | Thermostatic Mixing Valve c/w AFL Valves         |
| 22 mm | TMV22C5211AFL | Thermostatic Mixing Valve c/w AFL Valves         |
| 15 mm | TMV15C5211    | Thermostatic Mixing Valve – No Serv. Valves      |
| 22 mm | TMV22C5211    | Thermostatic Mixing Valve – No Serv. Valves      |
| 15 mm | FH15SSN450    | Flexible Hose ½" Swivel Nut x Male Spigot 450 mm |
| 15 mm | AFL15CL       | AFL Valve Compression Nickel c/w Lever           |

Factory fitted fittings for range of plastic pipe systems available.

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