

AS-5414 Bushfire – Roof Periphery Nozzle

K28 (21+7) – Flat Spray – radiation and ember protection

Description

The GW AS-5414 nozzle is developed specifically to meet the performance requirements of Australian Standard AS 5414 - *Bushfire Water Spray Systems*.

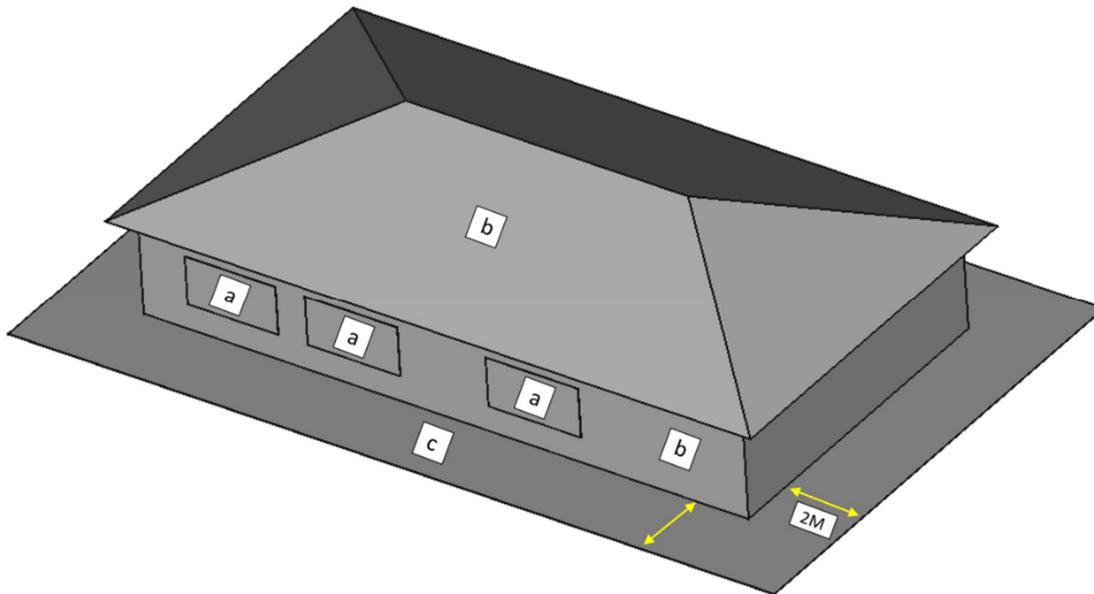
For external fire protection of property, AS 5414 outlines the following main performance criteria relevant to design and installation of water spray nozzles:

- Nozzles with water ways smaller than Ø10 mm shall incorporate strainers.
- Unless otherwise protected against insect blockage, nozzles shall be fitted with blow-off caps, which shall detach at no more than 100kPa (1 bar).
- Minimum operating pressure: 160kPa (1,6 bar).
- Moving (sliding/rotating) parts in the nozzle design should be avoided (due to risk of sticking).

Water application rates required by AS5414:

AS 5414: Design flow from spray nozzles	
Hazard area	Water application rate
a) on windows	10 litres/m ² per minute
b) on roofs, decks and other surfaces	5 litres/m ² per minute
c) on perimeter* ground surfaces	1 litre/m ² per minute
* 0 - 2m from building walls	

Hazard areas illustrated:



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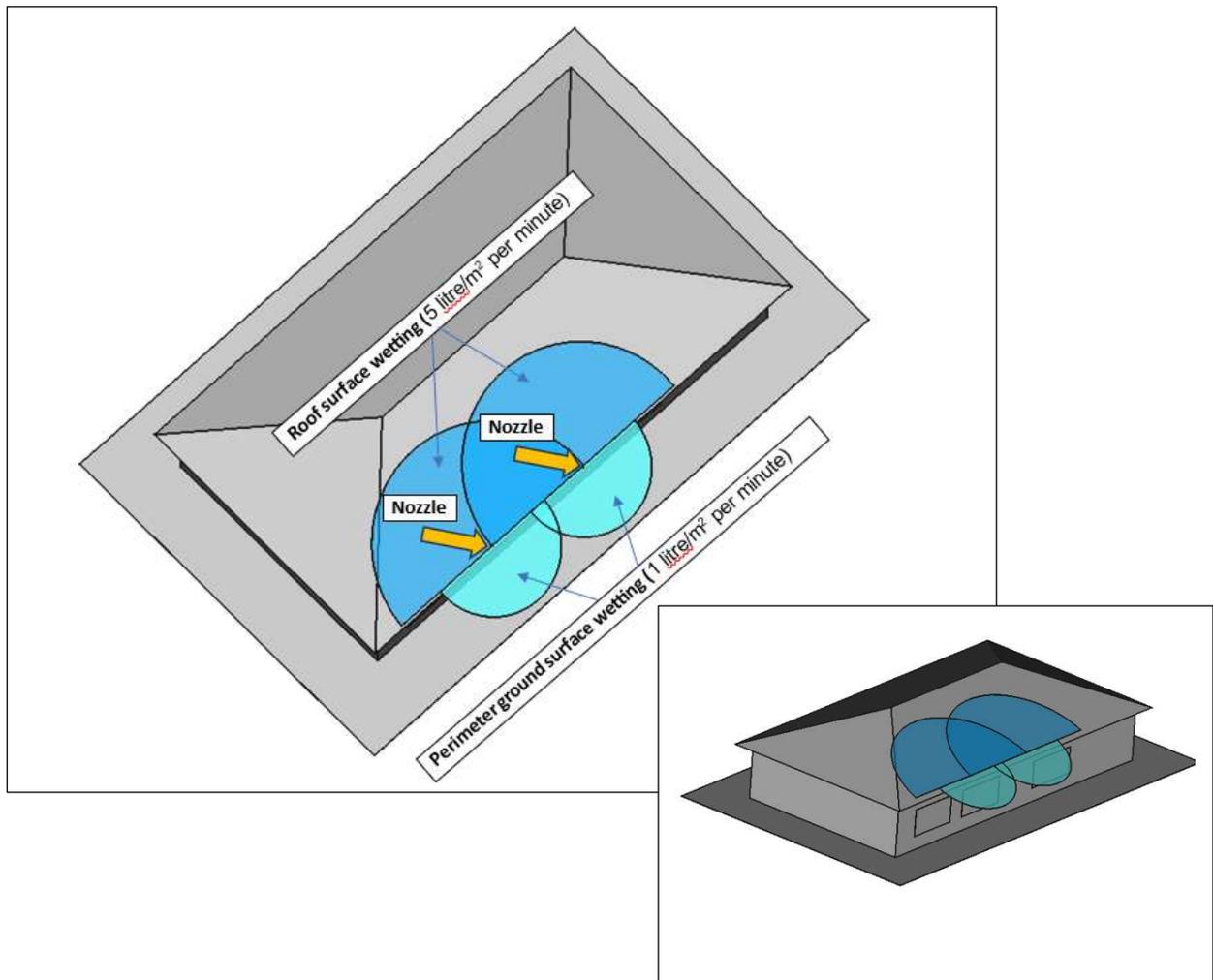
K28 (21+7) – Flat Spray – radiation and ember protection **GW SPRINKLER A/S**

Principle of operation

The nozzle is a robust non-corrosive one-piece brass construction generating 2 x 180° wide flat-spray. The nozzle orifices are protected from damage and blockage by a stainless steel (SS316) blow-off cap, sealing on a PTFE o-ring to ensure a non-sticking and reliable cap release. The blow-off cap is secured to the nozzle body with a stainless steel (SS316) wire, for easy re-fitting after release.

The nozzle is installed in a dry pipe system, and when water pressure is applied, the blow-off cap is ejected, followed by an even distribution of flat fan water spray.

The nozzle is designed to meet both the requirement for roof wetting (5 litres/m² per minute) and perimeter ground surface wetting (1 litre/m² per minute) when installed along the gutter – or on the roof periphery. The unique dual-orifice construction of the nozzle makes it possible to distribute the water with different intensity (density) in two directions – thus both **optimizing water consumption** and meeting AS-5414 water application requirements.



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Application

The GW AS-5414 nozzle is designed for applications according to the specifications set out in AS-5414 for wetting and cooling of building exterior surfaces, and wetting of perimeter ground surfaces.

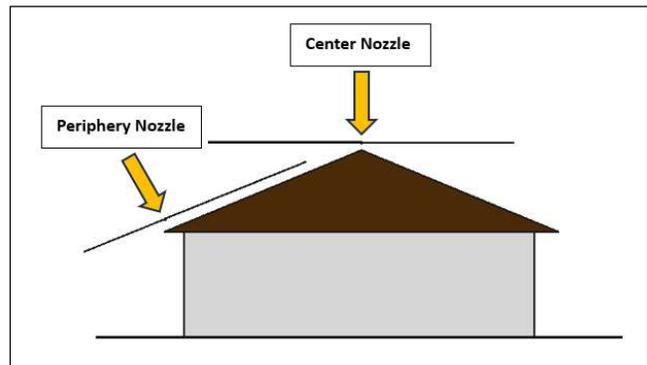
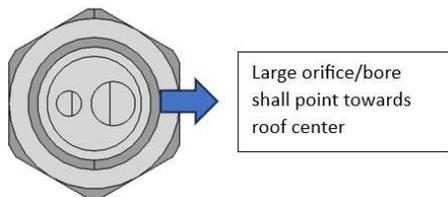
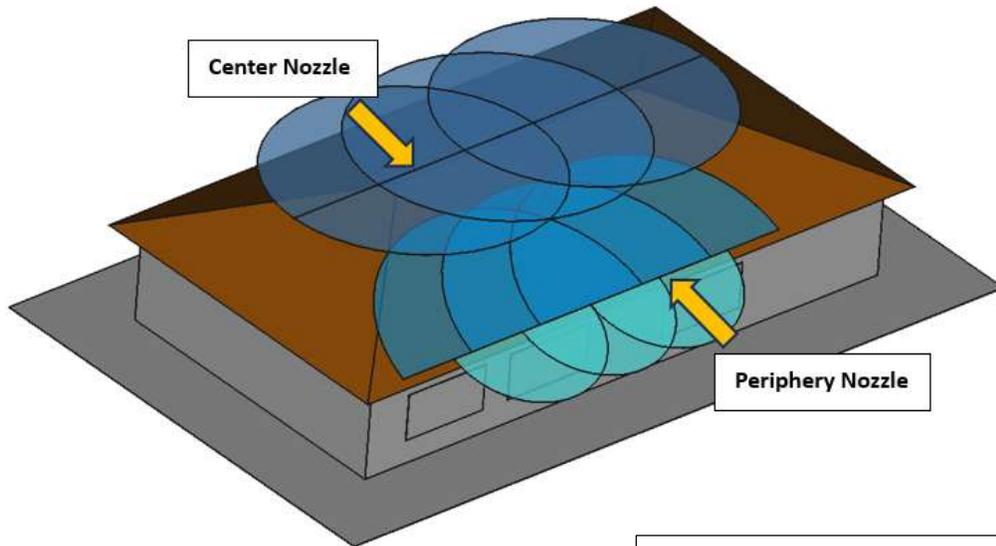
Installation (roof protection)

The nozzle is **typically** installed in the upright position in pipe work along the periphery of the roof, and angled so that the nozzle top face is in parallel with the roof surface. The large orifice (bore) shall point towards the roof centre/top, and the small orifice shall point away from the roof (towards perimeter ground surface) – see figure below.

- Max. nozzle spacing (distance between nozzles) = **2m**
- Outer (end) nozzle distance to roof edge = max. **1m** (= ½ spacing)
- Nozzle top elevation (stand-off) from roof surface = **300 - 600mm** (0,3 – 0,6m)

Note:

For roof areas outside the coverage of the Periphery Nozzle it is recommended to install the **Centre Nozzle (K42)**, that provides a full 360° water coverage with 5 litres/m² per minute application rate.



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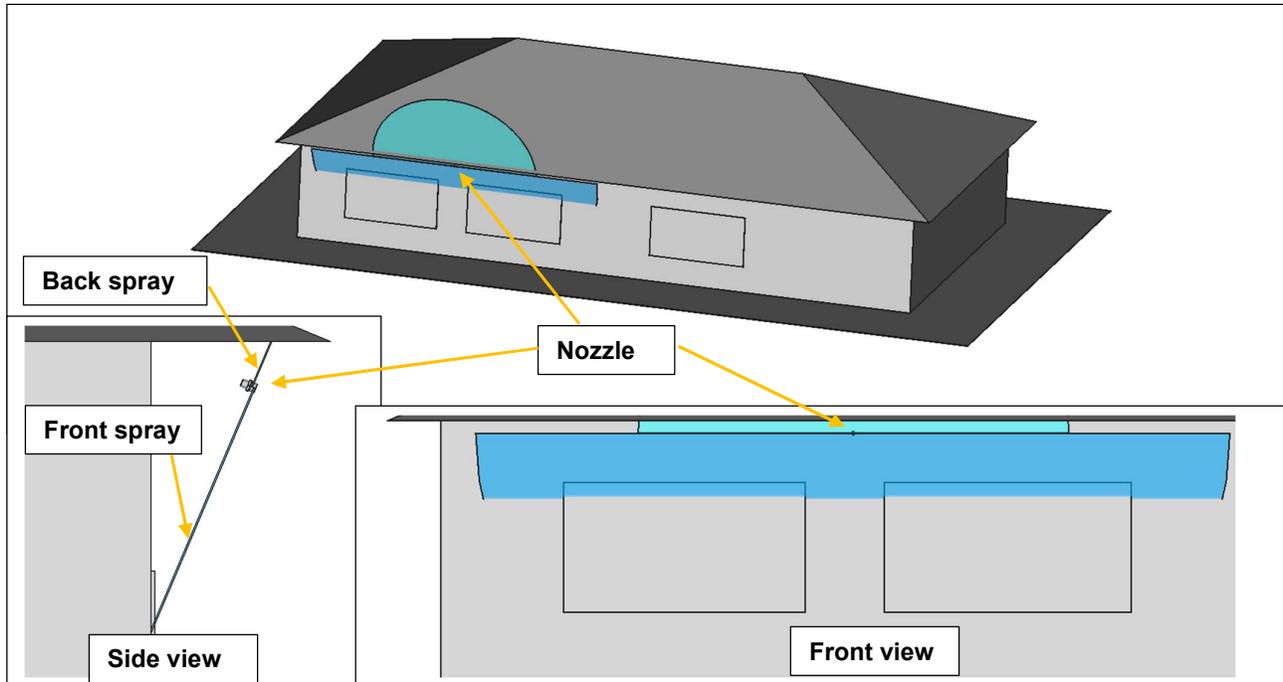
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Installation (window protection)

For the protection of window openings (glazing) a water application rate of 10 litres/m² per minute is required. For such hazard protection the nozzle can be installed in the pendent position under the roof overhang, and angled such that the water spray **hits the top of the window glazing**, allowing for maximum water volume to engage with the window glass surface, for optimum cooling and window/wall protection by impingement and “run-down”. **It is very important that there is an even water “run-down” over the entire glass surface !!** When angled in the downwards position the nozzle back spray will be directed upwards to form a water curtain that protects the surface above the window and the underside of the roof overhang.



Installation (general)

Nozzles shall only be installed in clean, corrosion-free pipework to prevent clogging of the nozzle orifices. Only non-corroding pipe material (e.g. copper or stainless steel) shall be used to avoid any formation of corrosion products inside the pipe.

The water shall be free from any impurities larger than 3mm in length or diameter. A strainer with max. mesh size of 3mm should be installed at the fire pump intake to rinse the system water before entering the nozzle pipe work.

When installed and operated as specified, i.e., 2m spacing, 0,3-0,6m stand-off and min. operating pressure of 1,6 bar, the AS 5414 nozzles will distribute a flat spray water curtain with robust overlap, thus providing both an airborne water shield, and surface wetting/cooling by direct impingement, and subsequent water “run-down”.

The flat, at low-level, water distribution significantly reduces the risk/effects of wind diverting the water spray from the target, thus ensuring optimized usage of the (limited) water resources. After installation of the nozzles, a full-scale spray test shall be conducted to verify that the spray coverage is satisfactory.

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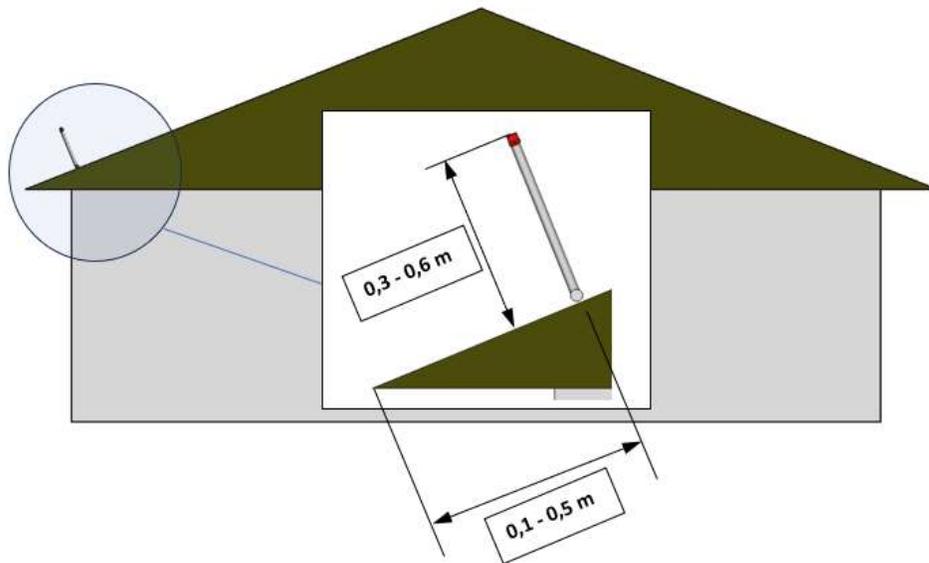
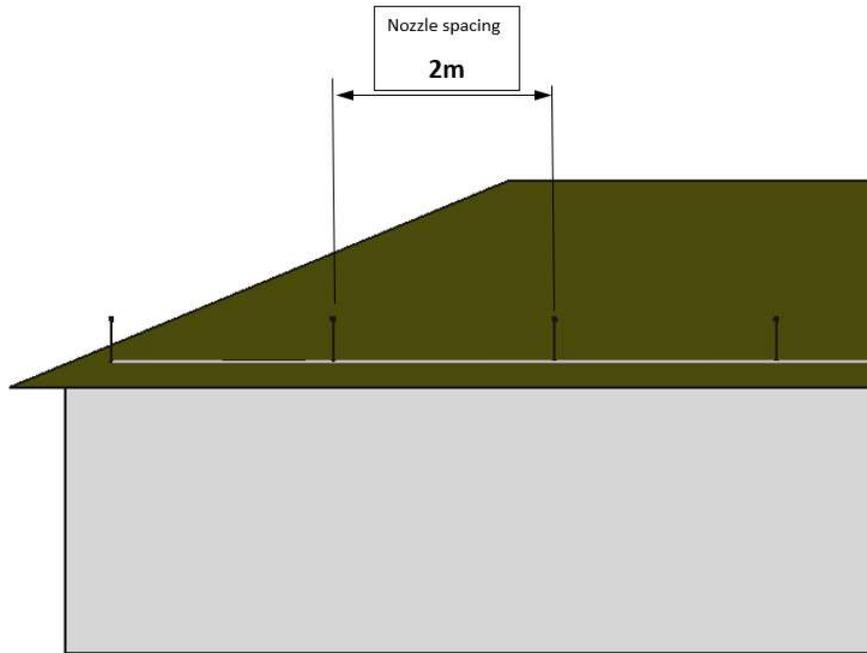
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Roof Protection:



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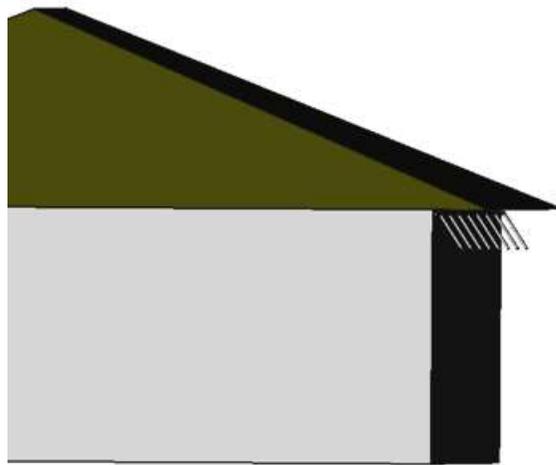
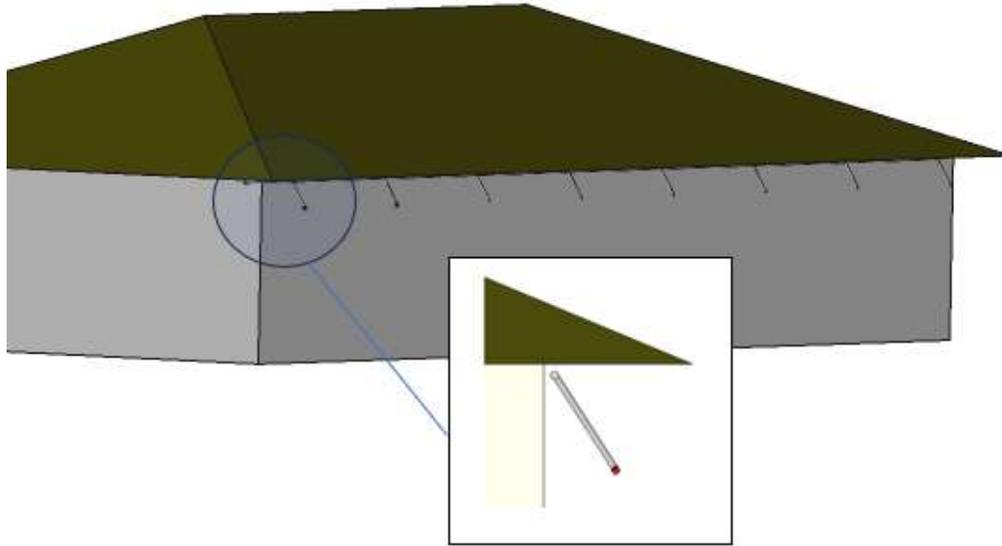
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Wall and Window Protection:



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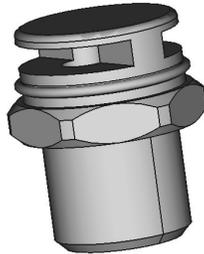
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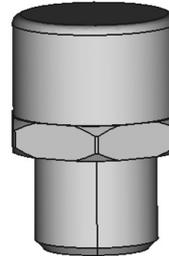
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Material

All components are selected from non-corrosive materials to support a robust and reliable performance in most environments. Standard material is brass, but other materials are available on request.



AS-5414 Nozzle

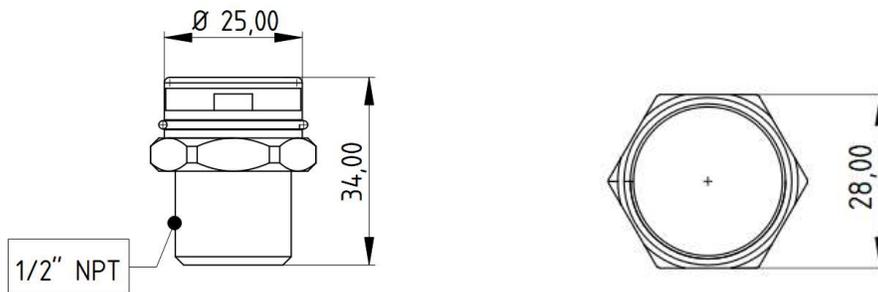


AS-5414 Nozzle w. Blow-Off Cap

Technical data

Material: Body	Brass
Material: O-ring	PTFE
Material: Blow-Off Cap + wire	Stainless steel (SS316)
K-factor (metric)	28 (21 (front) + 7 (back))
K-factor (U.S)	2 (1.4 + 0.6)
AS-5414 min. operating pressure*	1,6 bar (160 kPa)
Flow Rate @ 1,6 bar	35,4 LPM (9,4 GPM)
Spray Angle	2 x 180° (front and back)
Min. operating pressure	1,6 bar
Max. operating pressure	8 bar
Threaded connection (body)	1/2" NPT (male)
Wrench Flat dimension (hex)	28 mm (AF)
* measured at the hydraulically most unfavourable nozzle.	

Dimensions (mm)



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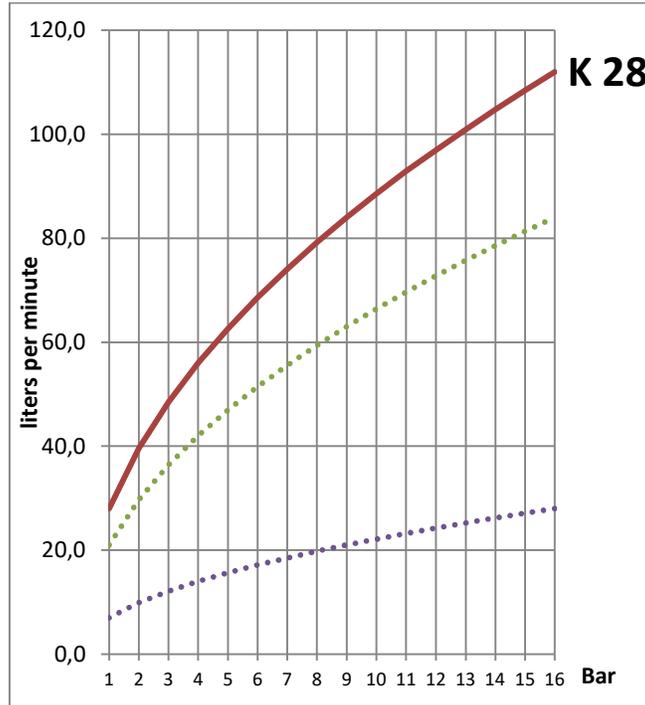
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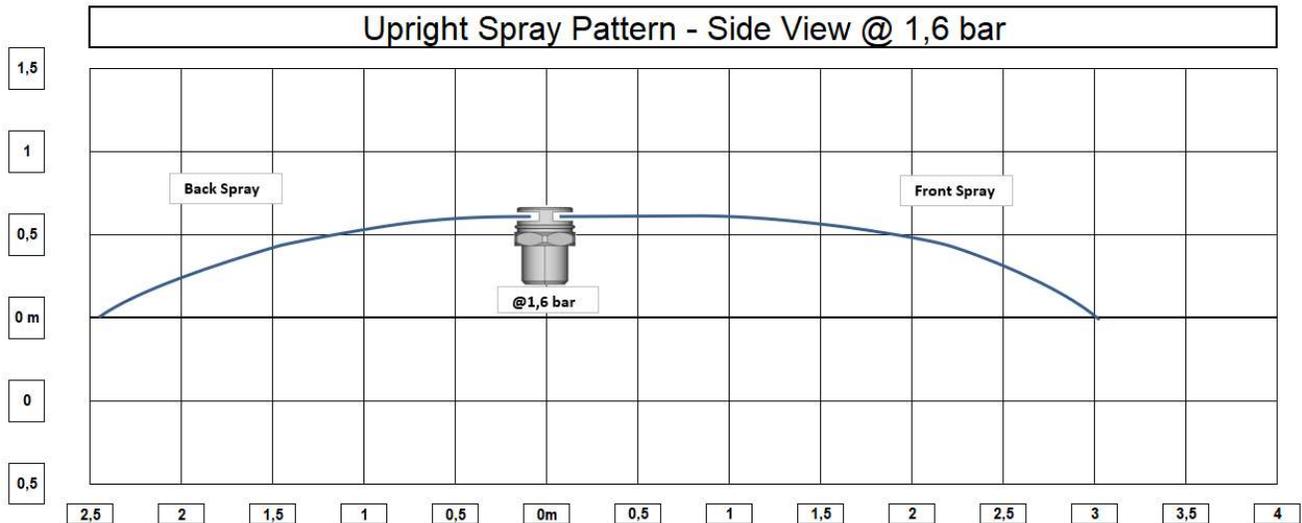
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Flow vs. Pressure



Spray Pattern



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