

Variable Orifice Balancing Valve

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Function

Caleffi 142 series low lead manual balancing valves are used to measure and adjust the fluid flow rate in hydronic or plumbing circuits. Characterized flow plug which provides precise system balancing valves and highly accurate flow compared to other setters with ball valve control. Turning the knob moves a plug within the fluid stream which varies the flow rate. The flow rate is determined according to the pressure drop value measured by a differential pressure meter connected to the pressure test ports, included. The flow rate is directly determined from the pressure differential created across the two test ports as fluid passes the adjustment plug. The valve design is variable orifice with pressure ports located upstream and downstream of the adjustment plug. Compared to fixed orifice designs where both test ports are located upstream of the adjustment plug, for a given size and flow rate, the variable orifice design produces a greater differential pressure value. In very low flow rate applications and with good fluid quality, this larger differential pressure signal can result in more accurate balancing. A memory stop feature allows the valve to be closed, and later reopened to the original set position. Insulation shells are available, purchase separately.

Product Range

142



	Cv	Insulation code:
142241A 1/2" NPT Female	3.4	CBN142241A
142251A 3/4" NPT Female	5.0	CBN142251A
142261A 1" NPT Female	7.5	CBN142261A
142271A 1 1/4" NPT Female	12.9	CBN142271A
142281A 1 1/2" NPT Female	16.8	CBN142281A
142291A 2" NPT Female	22.0	

Technical Specifications



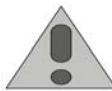
Material:	Body:	DZR low-lead brass
Bonnet:		DZR low-lead brass
Control stem:		DZR low-lead brass
Hydraulic seals:		EPDM
Knob:		PA6G30
Pressure test ports:		DZR low-lead brass body, EPDM seal elements
Reduction of Lead in Drinking Water Act Compliant:	0.25% Max. weighted average lead content.	Reduction of Lead in Drinking Water Act Certified by IAPMO R&T.

Performance

Suitable fluids:	Water and glycol solutions
Max. percentage of glycol:	50%
Maximum working pressure:	232 psi (16 bar)
Working temperature range:	14–250°F (-10–120°C)
Accuracy:	±15%
Number of adjustment turns:	4
Number of regulating positions:	8
Connections: Main:	1/2"-2" NPT female
Valve body pressure test ports:	1/4" NPT female

Technical specifications of insulation

Material:	EPP
Thickness:	1/2 inch (15 mm)
Density:	2.8 lb/ft ³ (45 kg/m ³)
Thermal conductivity (ISO 2581):	- at 50°F (10°C): 0.257 BTU-in/hr-ft ² ·°F (0.037 W/(m·K))
Working temperature range:	23 - 250°F (-5 - 120°C)
Reaction to fire (UL 94):	Class HBF



SAFETY INSTRUCTION

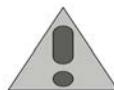
This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.**



CAUTION: All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.



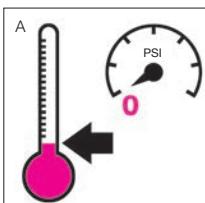
CAUTION: Over-tightening and breakage can occur with the use of Teflon® pipe joint compounds. Teflon® provides lubricity so that care must be exercised not to over-tighten joints. Failure to follow these instructions could result in property damage and /or personal injury.



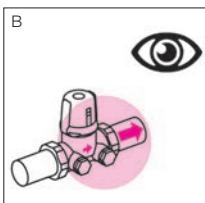
WARNING: System fluids are under pressure or temperature can be hazardous. Be sure the pressure has been reduced to zero and the system temperature is below 100°F (38°C). Failure to follow these instructions could result in property damage and/or personal injury.

Caleffi shall not be liable for damages resulting from stress corrosion, misapplication or misuse of its products.

Installation

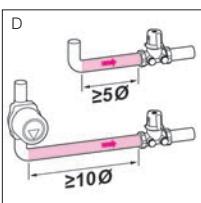
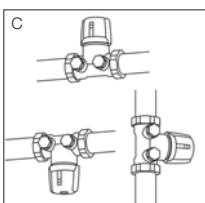


Assembly and disassembly of the valves should always be conducted while the system is cold and not pressurized (fig. A).



Install according to the flow direction indicated by the arrow on the valve body (fig. B).

Can be installed in any orientation (fig. C).



In order to ensure measuring accuracy, the balancing valve must be installed by keeping an upstream straight section of at least five diameters, increased to at least ten diameters if the nearest device upstream is a pump (fig. D).

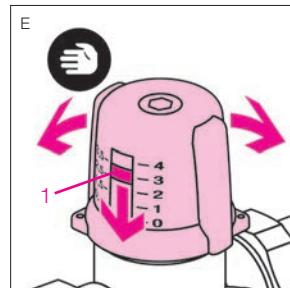
Operating Principle

The 142 series balancing valve is a hydraulic device that controls the flow rate of a fluid. Turning the knob moves a plug within the fluid stream which varies the flow rate. The flow rate is determined according to the pressure drop value measured by a differential pressure meter connected to the pressure test ports.

The opening position is indicated by the numbered indicator (fig. E):

- The turn indicator (1) shows a regulating scale from 0 to 4 (0 closure, 4 complete opening).

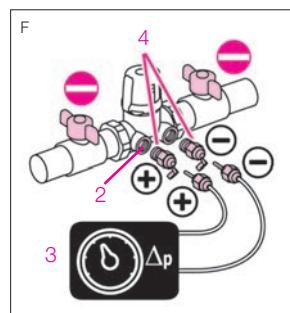
Turning the knob manually through 360° causes the indicator to move by one unit.



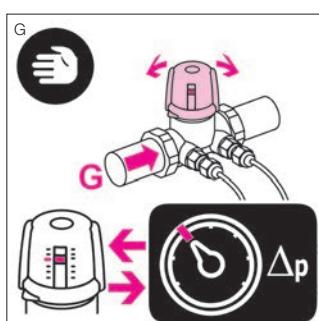
Use of the balancing valve: setting the flow rate (fig F-G)

NOTE: the indications + and - on the drawings refer to the pressure upstream and downstream of the component whose pressure differential is to be measured.

For the connection of the pressure test ports of the valve (2) with a differential pressure measuring device (3), use a pair of fittings with a measuring probe (fig. F).



- As the thermal fluid passes, measure the Δp of the valve with any suitable differential pressure measuring device (fig. G);
- Using the "Hydraulic characteristics" sheet (sheet code 18203 supplied in the pack), find the flow rate value that is passing through the valve, consulting the diagram "Δp-flow rates" corresponding to the size of the valve used.
- Turn the knob and repeat steps a) and b) until you reach the desired value.



Correction for liquids of different densities

If using liquids with a density different from water at 70°F (20°C)

$\rho \approx 62.4 \text{ lb/ft}^3 (\approx 1 \text{ kg/dm}^3)$, correct the value of the measured head loss Δp using the following formula:

$$\Delta p^1 = \Delta p \cdot \frac{\rho}{\rho_{\text{water}}}$$

where:

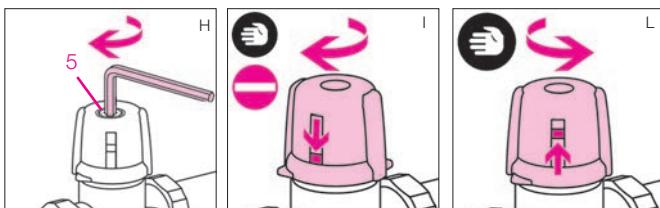
Δp^1 = reference head loss in (psid(kPa))

Δp = measured head loss in (psid(kPa))

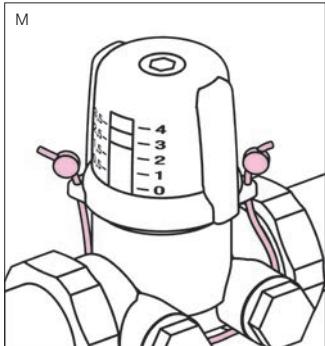
ρ = fluid density in lb/ft³ (kg/dm³)

Memory Stop on the 142 series balancing valve

Once you have balanced the flow rate, insert a 2.5 mm hexagonal key into the hole (5) in the balancing valve and fully turn it clockwise without forcing it. This sets the valve's maximum stroke position: if necessary, it is possible to shut off the balancing valve in the circuit by turning the knob fully clockwise manually. To restore the valve to its preset position, turn the adjustment knob fully counter-clockwise (fig. L).

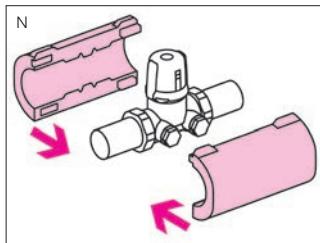


Locking/sealing the setting position (fig. M)



Installing Insulation

Join the size-specific insulation shells on the 142 series balancing valve, sold under separate code number.



CAUTION: If the balancing valve valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.



CAUTION: Make sure that all the connecting pipework is water tight.

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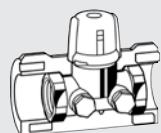
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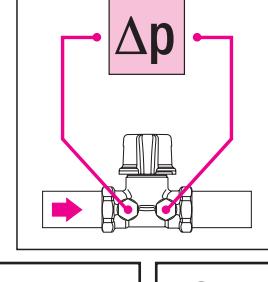


18203

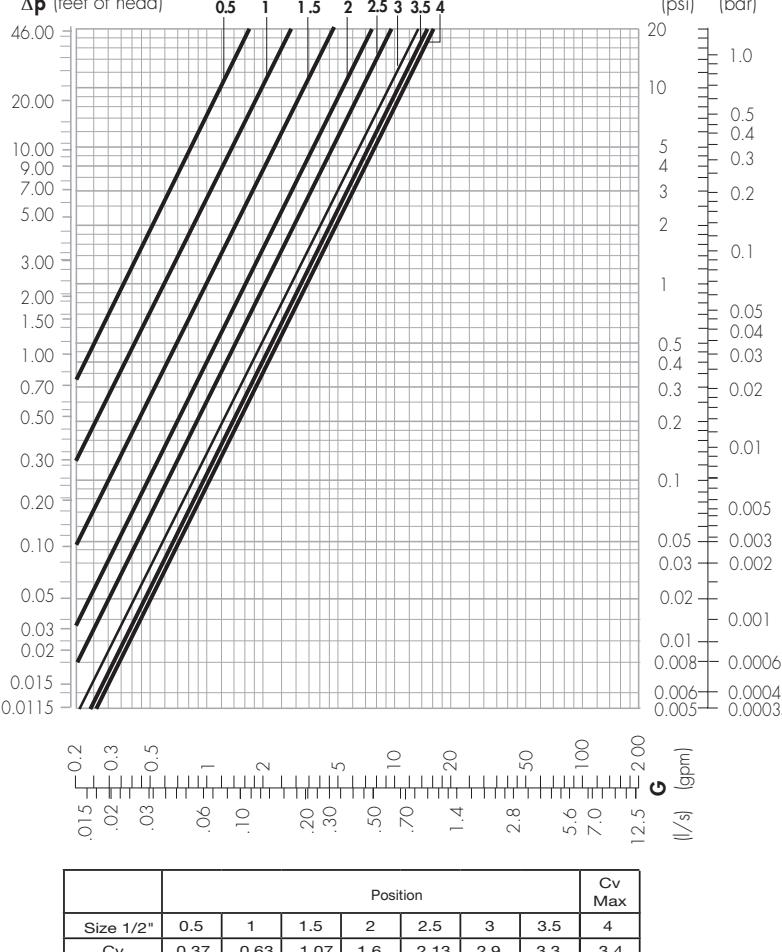
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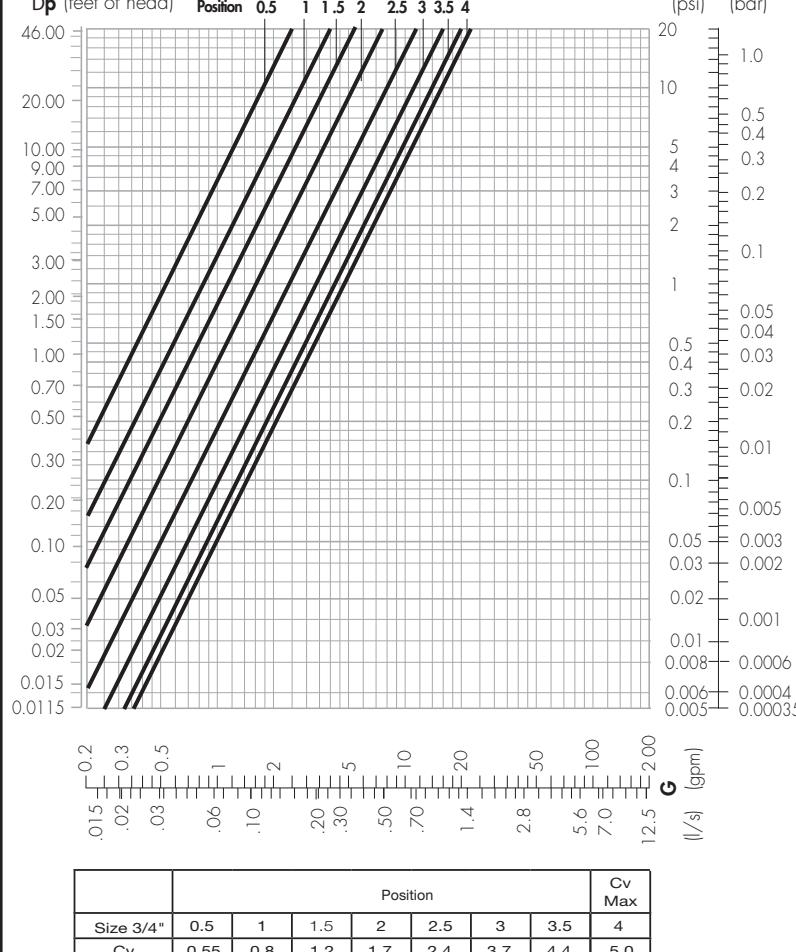
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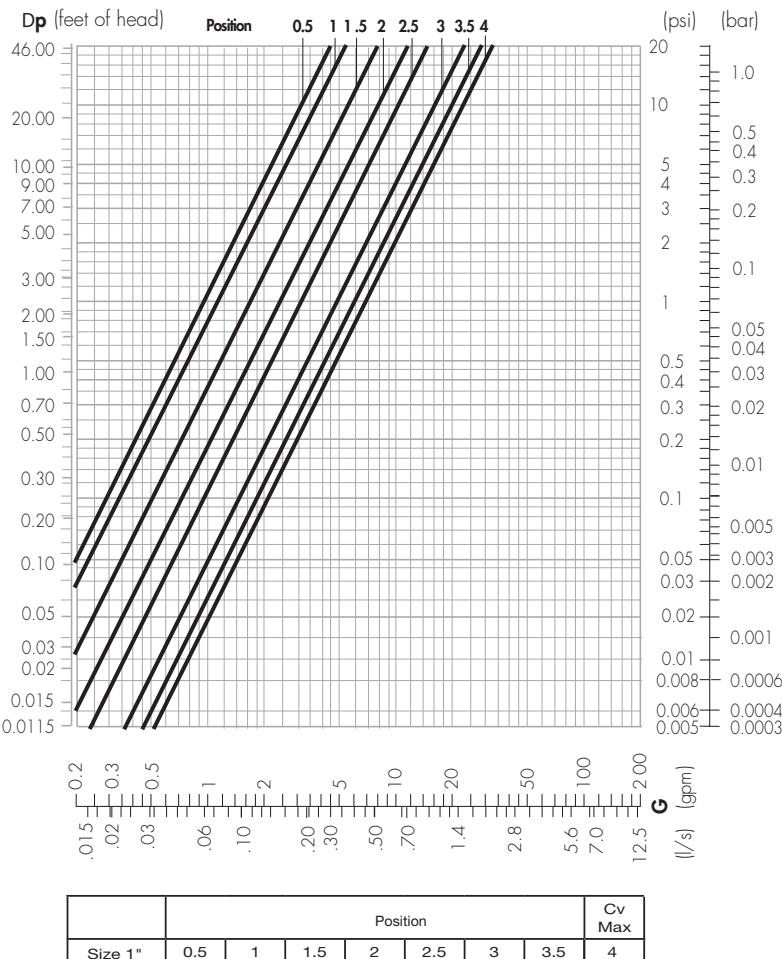
Code 142241A 1/2"



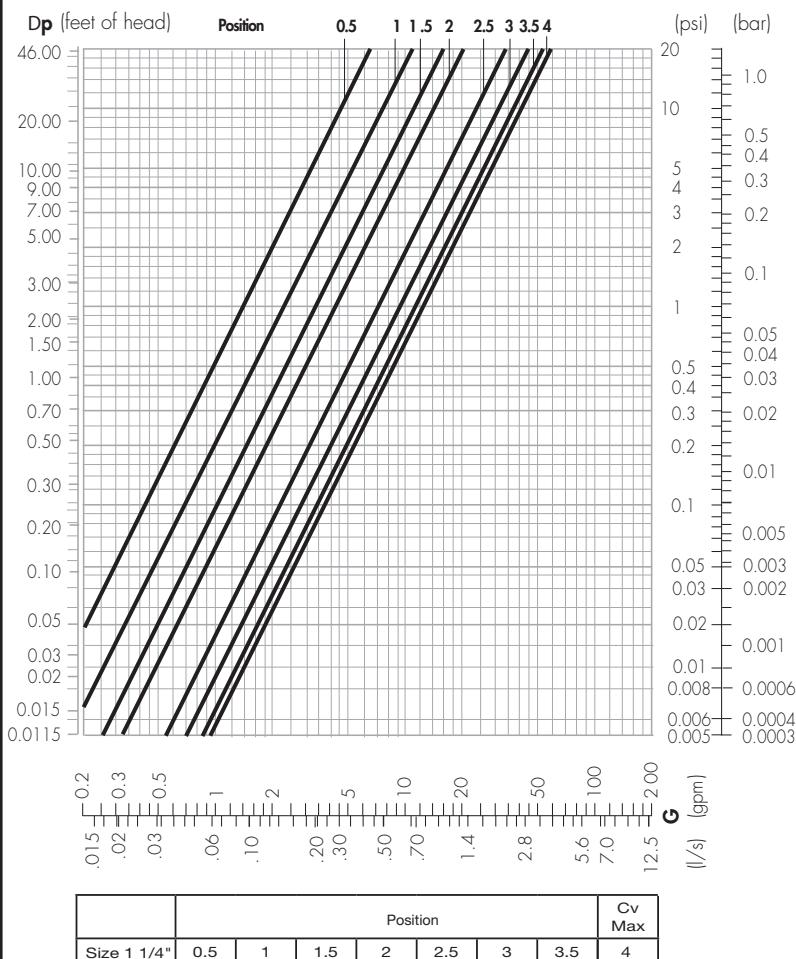
Code 142251A 3/4"

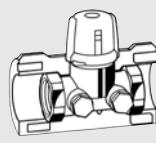


Code 142261A 1"



Code 142271A 1 1/4"



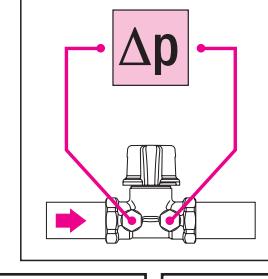


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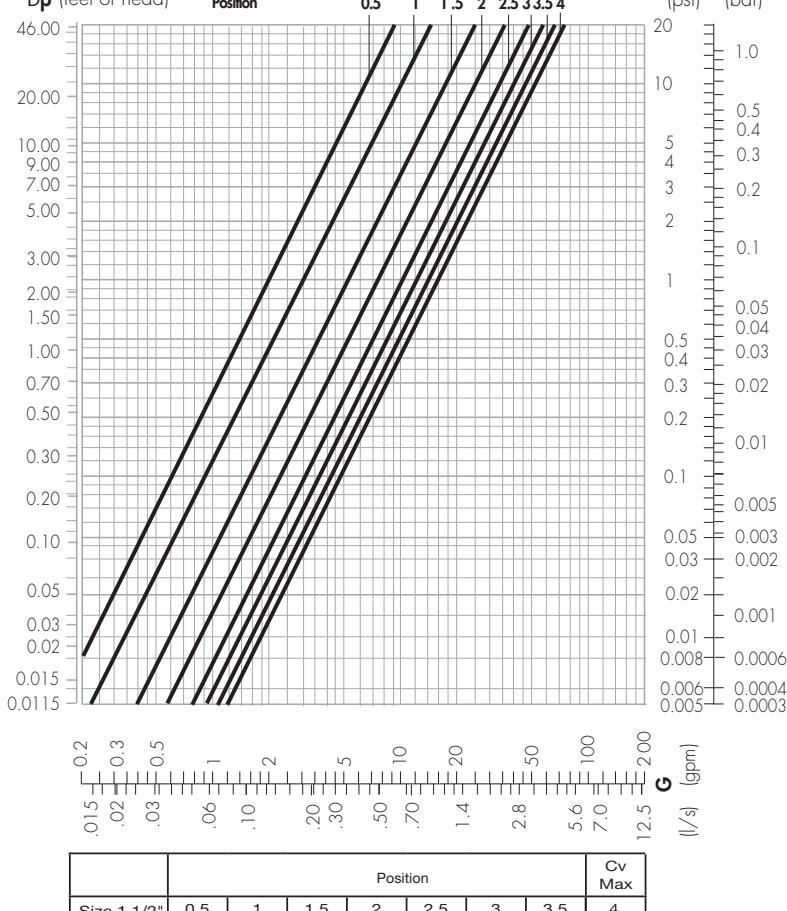


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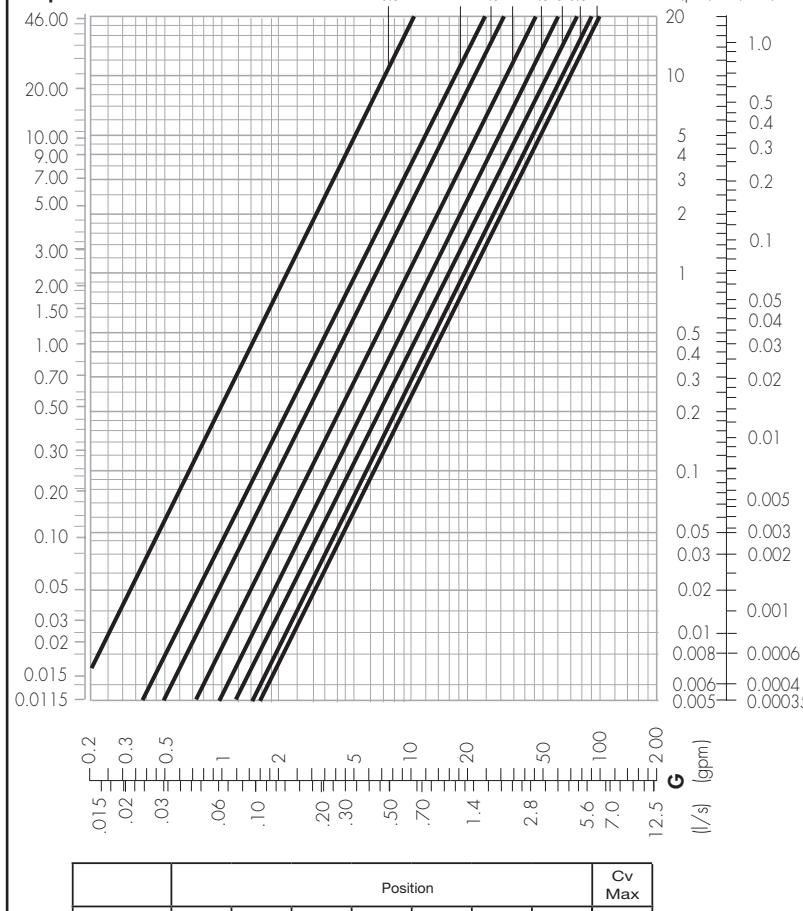


Code 142281A 1 1/2"



	Position							Cv Max
Size 1 1/2"	0.5	1	1.5	2	2.5	3	3.5	4
Cv	2.0	3.3	5.6	8.1	10.9	13.4	14.9	16.8

Code 142291A 2"



	Position							Cv Max
Size 2"	0.5	1	1.5	2	2.5	3	3.5	4
Cv	2.3	5.5	7.2	10.2	13.2	17.1	20.0	22.0