



## **LMV**

### **Linear Control Valves**

3/4" ...3"

N Version for the North American Market

# LMV

## Linear Control Valves

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### Description

LMV modulating valves are used for linear adjustment of gas or air flow in combustion applications. Flow through the valve varies proportionally to the opening angle of the internal mechanism. LMV is driven by MZ3 (3-point step control) or MZ5 (continuous control via analogue signals).

### Features

Valve housing is made of aluminum alloy, with a range of pipe connections from 3/4" to 3".

Suitable for use with air and non-aggressive gases. Special versions available for aggressive gases (Biogas or COG).

Linear ratio of opening angle to flow capacity.

The maximum working ratio is 25:1. LMV has a low pressure drop and limited gas leakage when in the minimum position.

Full and reduced gas orifices available for each size, to meet specific plant requirements.

Max. flow adjustment is standard.

An inlet mesh filter helps protect LMV from debris.

An adjustable bypass is available as an option to allow precise setting of the minimum flow.

Designed for MZ3 and MZ5 actuators.

LMV + MZx are direct coupled for a compact assembly.

All components are designed to withstand any mechanical, chemical, and/or thermal condition occurring during typical service. Effective impregnation and surface treatments have been used to improve mechanical sturdiness, sealing, and resistance to corrosion of the components.

Valves are 100% tested and fully warranted.

## Functioning and Application

A two-cylinder mechanism allows LMV to deliver linear variation of flow. Flow varies according to the position of the inner cylinder (the outer cylinder is fixed). The actuator rotates the inner cylinder, opening or closing the gas passage created by the specifically shaped orifice in each cylinder. The max. flow adjustment is located on the bottom of the LMV and is set using an Allen key. Materials and mechanical tolerances are designed to assure low leakage, repeatability of the performance, and reliability.

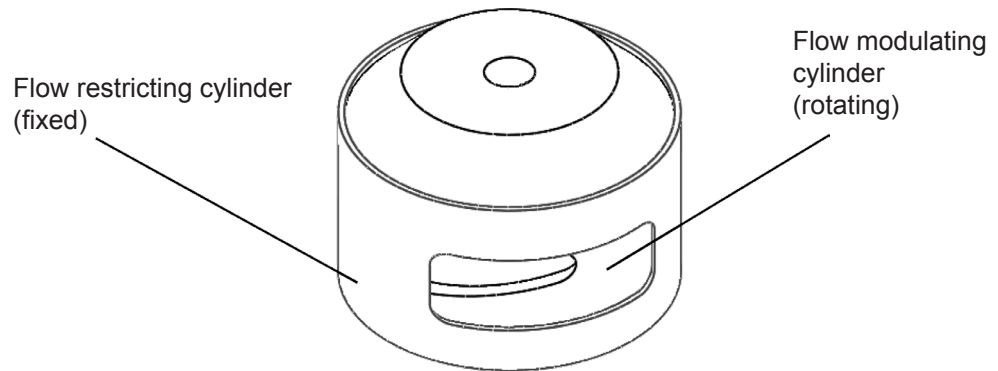


Fig. 1

Figure 2 shows an example of an installation.

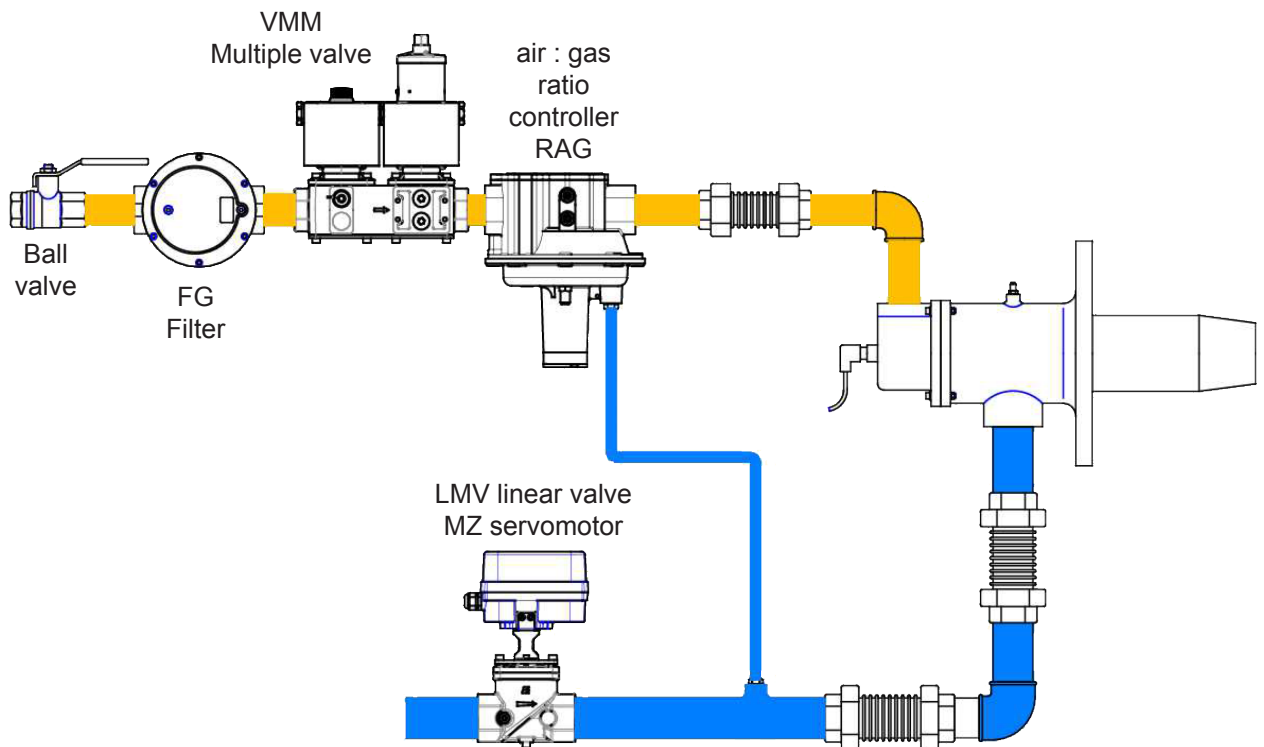


Fig. 2

## Technical Specifications

Tab. 1

<b>Connections</b>	Internal threaded ANSI-ASME B1.20 from 3/4NPT to 2½NPT Flanged ANSI-ASA-ASME B16.5 class 150 2" ANSI to 3" ANSI
<b>Control Ratio</b>	25:1
<b>Ambient Temperature</b>	5°F / +140°F (-15°C / +60°C)
<b>Max Working Pressure</b>	7.25 PSI (500 mbar)
<b>Flow Capacity</b>	See flow chart
<b>Leakage Rate</b>	< 2% of maximum capacity
<b>Filtering Element</b>	600 µm
<b>Materials in Contact With Gas</b>	Aluminum alloy Brass Stainless steel Plated steel Anaerobic adhesive Nitrile rubber (NBR) Fluoro elastomer (FPM) Acetal resin (POM)
<b>Voltage Rate - Servomotor MZ</b>	230 VAC 50/60 Hz 110 VAC 50/60 Hz 24 VAC/DC (depending on servomotor type)
<b>90° Opening / Closing Time</b>	7.5 - 60 sec (depending on servomotor type)

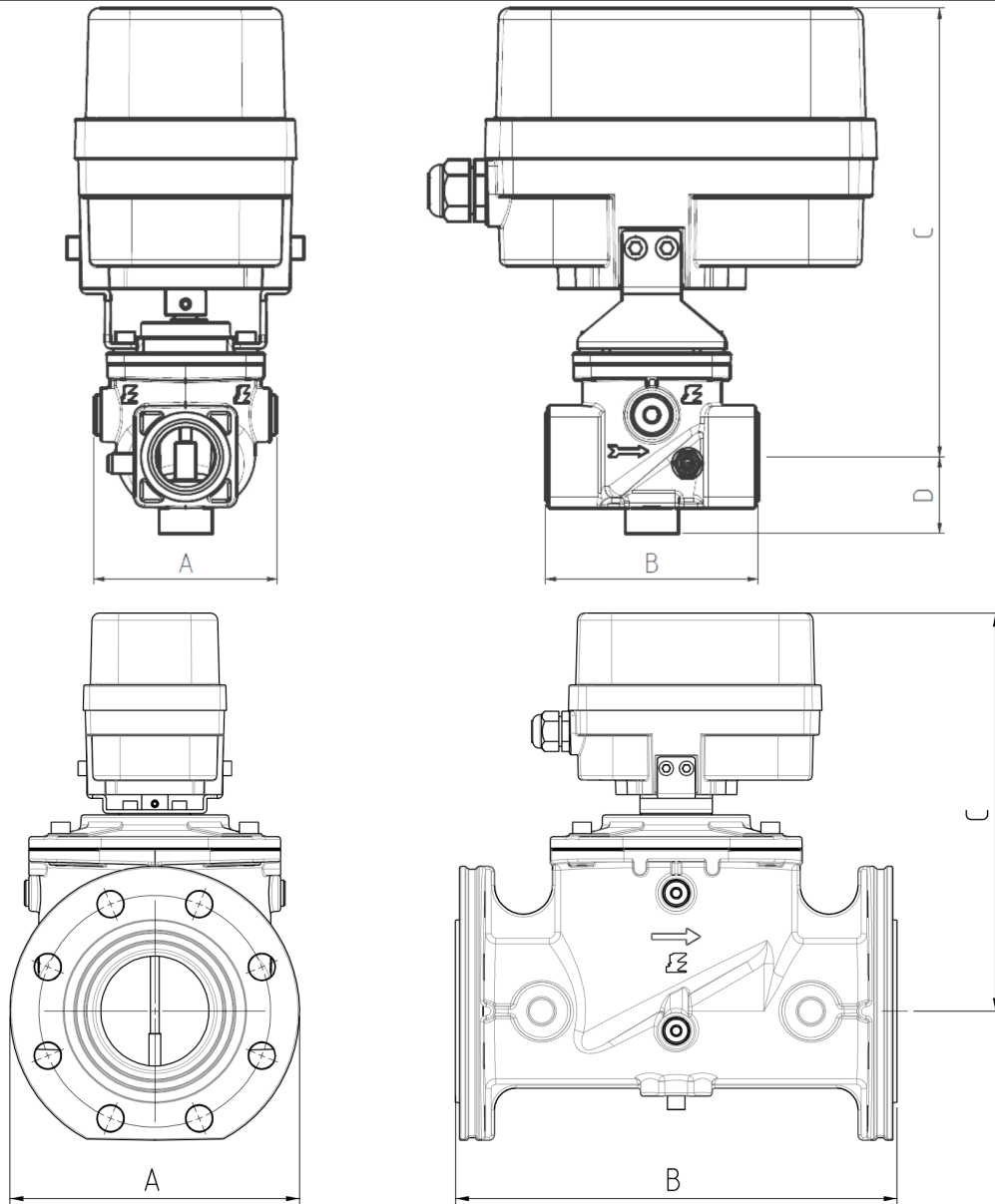


Fig. 3

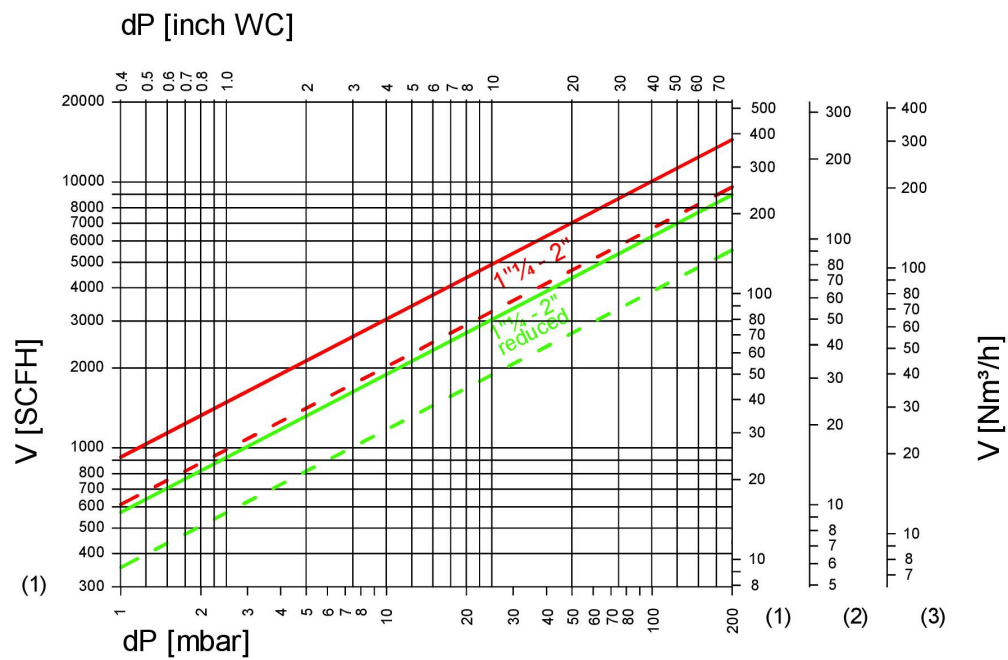
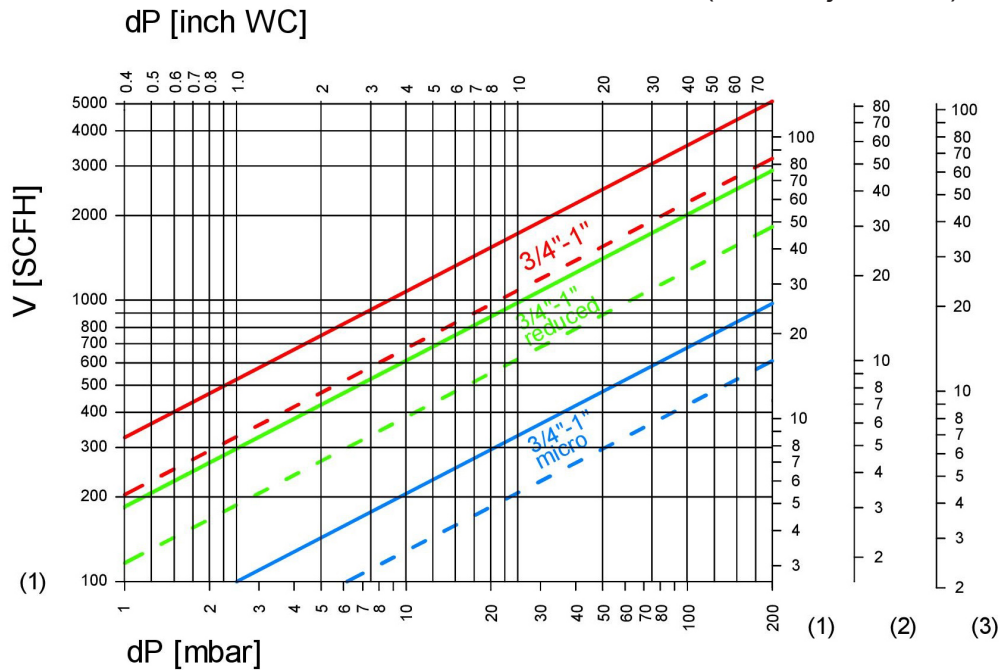
Tab. 2

Conn.	Overall dimensions (inches)						Flow capacity Kv (m <sup>3</sup> /h)		
	A	B	C <sup>(1)</sup>	D	Int	h	Full orifice	Reduced orifice (LMV..1.)	Micro orifice (LMV..2.)
3/4" NPT	3.5	3.8	7.9	1.3	-	-	8.06	4.35	1.58
1" NPT	3.5	3.8	7.9	1.3	-	-	8.06	4.35	1.58
1 1/4" NPT	4.7	6	9.3	1.7	-	-	23.5	14.0	-
1 1/2" NPT	4.7	6	9.3	1.7	-	-	23.5	14.0	-
2" NPT	4.2	6.1	9.4	1.9	-	-	23.5	14.0	-
2 1/2" NPT	7	8.6	10.3	2.2	-	-	56.6	28.5	-
1 1/2" ANSI	6.4	7.7	9.4	3	4.3	0.2x0.7	23.5	14.0	-
2" ANSI	6.4	7.7	9.4	3	4.9	0.2x0.7	23.5	14.0	-
2 1/2" ANSI	7	12	10.8	3.5	5.7	0.2x0.7	56.6	28.5	-
3" ANSI	7	12	10.8	3.5	6.3	0.3x0.7	56.6	28.5	-

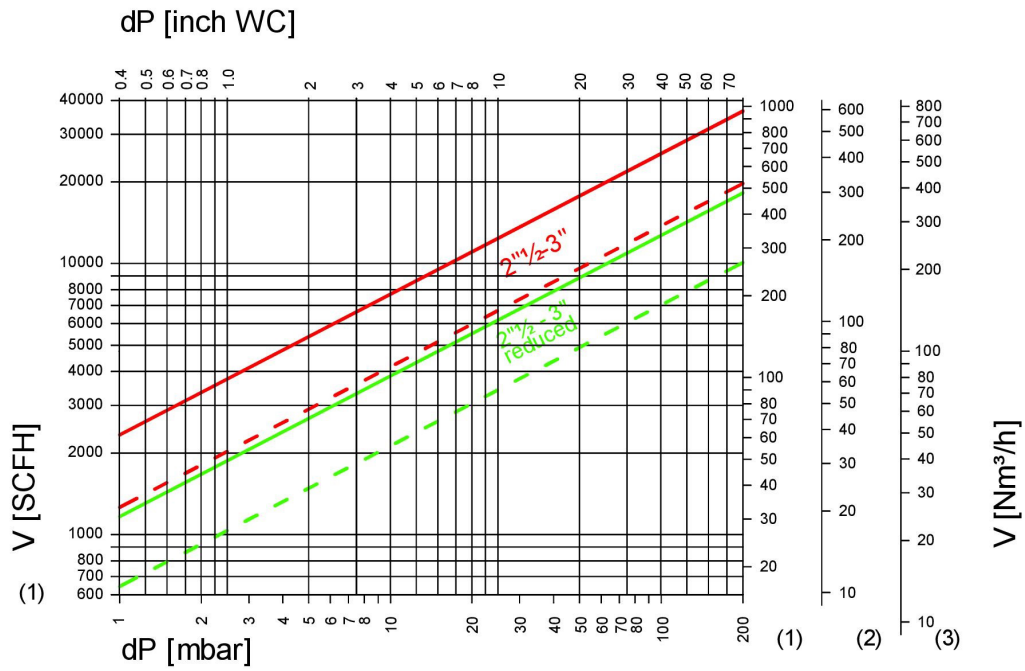
(<sup>1</sup>) when a lever joint is installed, add 1.1"

# Gas Flow Chart

— Max (Flow Adjustment)  
 --- Min (Flow Adjustment)



Gas type	Density $\rho$ [Kg/m <sup>3</sup> ]
(1) Natural gas	0.80
(2) LPG	2.08
(3) Air	1.25
15°C, 1013 mbar, dry	



A pressure drop ( $\Delta p$ ) ~30% of the inlet pressure ( $p_1$ ) is advised for the best linear flow and control.

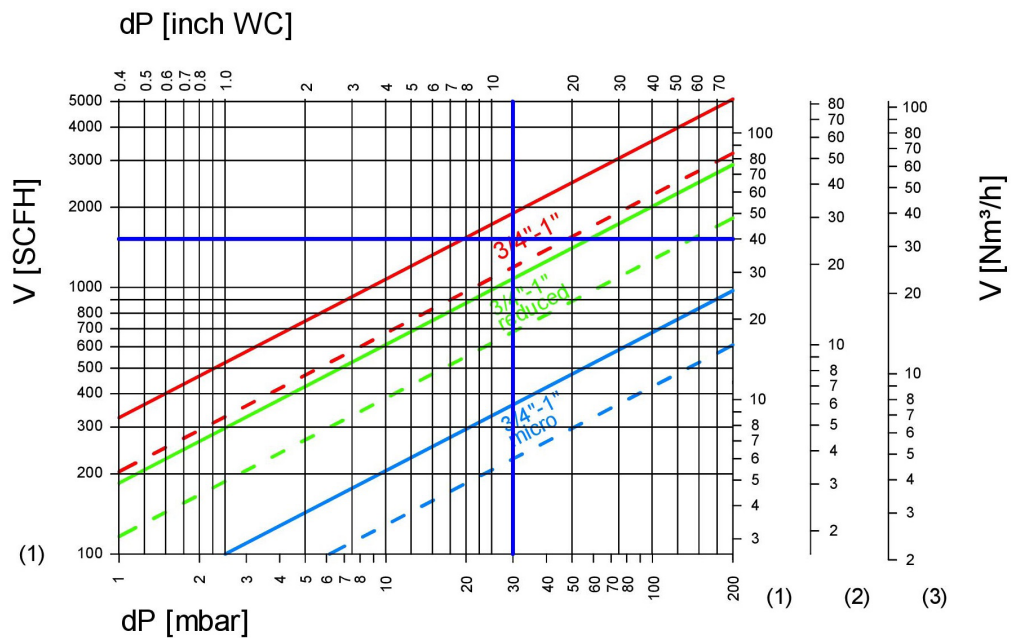
*Example:*

Select a valve for a natural gas flow  $Q_n = 40 Nm^3/h$  and a pressure  $p_2 = 70 mbar$

$$\Delta p = \left( \frac{0.3}{1 - 0.3} \right) p_2 = 30 mbar$$

From the diagrams of the LMV type valves, the size that can guarantee the required flow rate is the 3/4" - 1" with full passage (Fig. 4).

(The working point has to be between Max. and Min. flow - See picture below).



# Ordering Information

	LMV	3	N	1	M	C
<b>Model</b>	LMV					
<b>Connection</b>	2 3/4" 3 1" 35 1¼" 4 1½" 6 2" 7T 2½" 6F 2" 78 2½-3"					
	N USA version (NPT: 3/4" - 2½"; ANSI: 2" - 3")					
<b>Gas orifice</b>	_ Full gas orifice 1 Reduced gas orifice 2 Micro gas orifice (only 3/4" - 1")					
<b>Pressure test ports and bypass</b>	_ Pressure test port at the inlet A Additional pressure test ports at the outlet (Not applicable for 3/4" and 1"; or for N versions) M Adjustable bypass (Not applicable 2½" and 3")					
<b>Actuator connection</b>	_ without connection kit (□8 square shaft) C standard connection, for MZ L connection, for MZ with lever R connection for MZ with special lever for connecting remote actuators or manual lever					

Order LMV already coupled to an MZ by adding the MZ product code to the end of the LMV code. See the MZ technical literature for more information.

## Special versions and options

- NPT versions always include 1/4" test ports at outlet (1¼" and above).
- Adjustable bypass suitable for setting up a very low minimum flow rate.
- Connection with lever to connect multiple LMV to the same MZ. (NOTE: C dimension is increased in this case by ~1").
- Special connection to connect a remote MZ actuator.
- Special versions for aggressive gas (J version), manufactured without brass and supplied with special sealing.



The manufacturer reserves the right to make technical changes and/or update this document without prior notice.

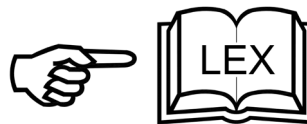
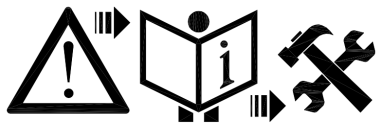


## Design, installation, and servicing

To ensure proper and safe operation, and long service life of the valve, consider the following recommendations during system design:



- Ensure that all the features of your system comply with the specifications of the valve (gas type, operating pressure, flow rate, ambient temperature, electrical voltage, etc.).
- Valve may be mounted with actuator in horizontal or vertical position, not upside down. Actuator may be oriented 360 degrees in any direction.
- In the event of vertical pipe, the flow direction should be from bottom to top.
- After removing the end caps, make sure no foreign body enters the valve during installation (e.g. metal shavings or excessive sealing agent).
- A gas filter should always be installed upstream of the valve.
- Ensure that the installation area is protected from rain and water splashes or drops.
- Perform leak and functional tests after mounting.
- Never install the valve close to walls or other equipment.
- Perform maintenance according to service instructions at least once a year (more often for aggressive gases).
- Valve seals age. To ensure safe operation, we recommend the valve is replaced 10 years from the date of manufacture (stamped on the product label). Heavy cycle operation may reduce the expected lifetime.
- This control must be installed in compliance with the rules in force.
- Make sure all work is performed by qualified technicians only and in compliance with local and national codes.
- To prevent product damage and dangerous situations, carefully read the instructions supplied with the product before use.



## Standards and approvals

LMV valves are designed according to EN13611.

Quality Management System is certified according to UNI EN ISO 9001 and the monitoring is carried out by the notified body:

Kiwa Cermet Italia S.p.a.



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The information in this document contains general descriptions of technical options available and based on current specifications.

The company reserves the right to make changes in specifications and models as design improvements are introduced, without prior notice.



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