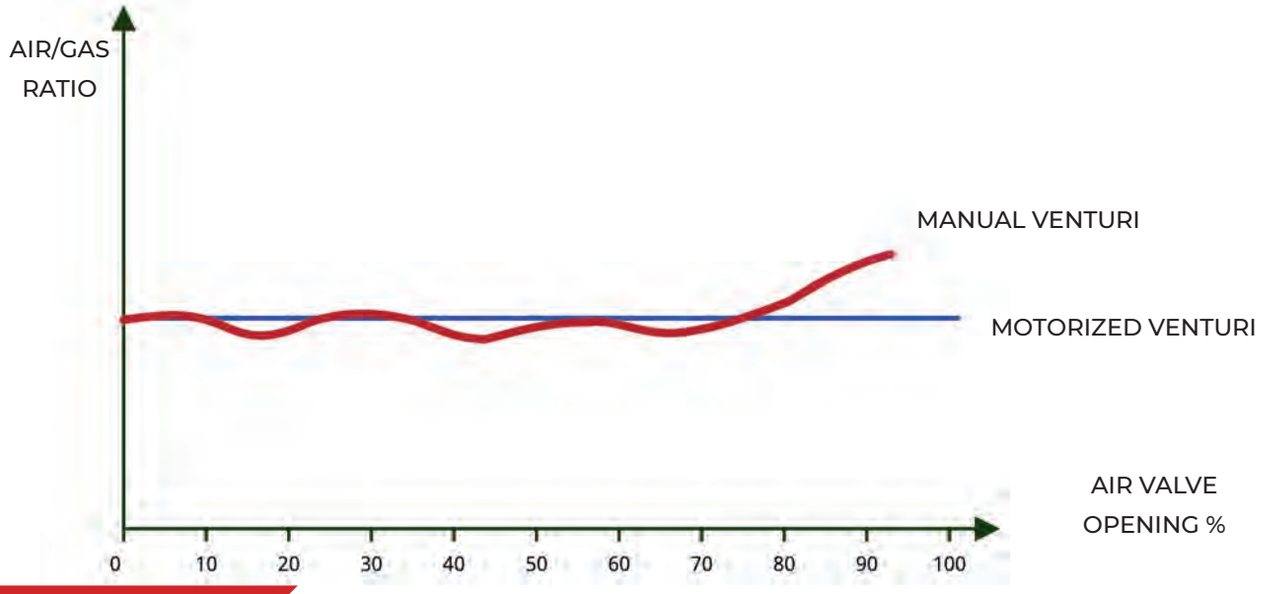
glass

VMA
MOTORIZED VENTURI MIXER
Electronically Controlled Air/Gas Ratio Mixer

In industrial glass production, process stability is essential to ensure consistent combustion performance and uniform thermal conditions. When operating conditions require higher precision and automated control, the standard Glass Service Venturi mixer can be integrated with, or upgraded to, an **Electronic Air/Gas Regulation System**

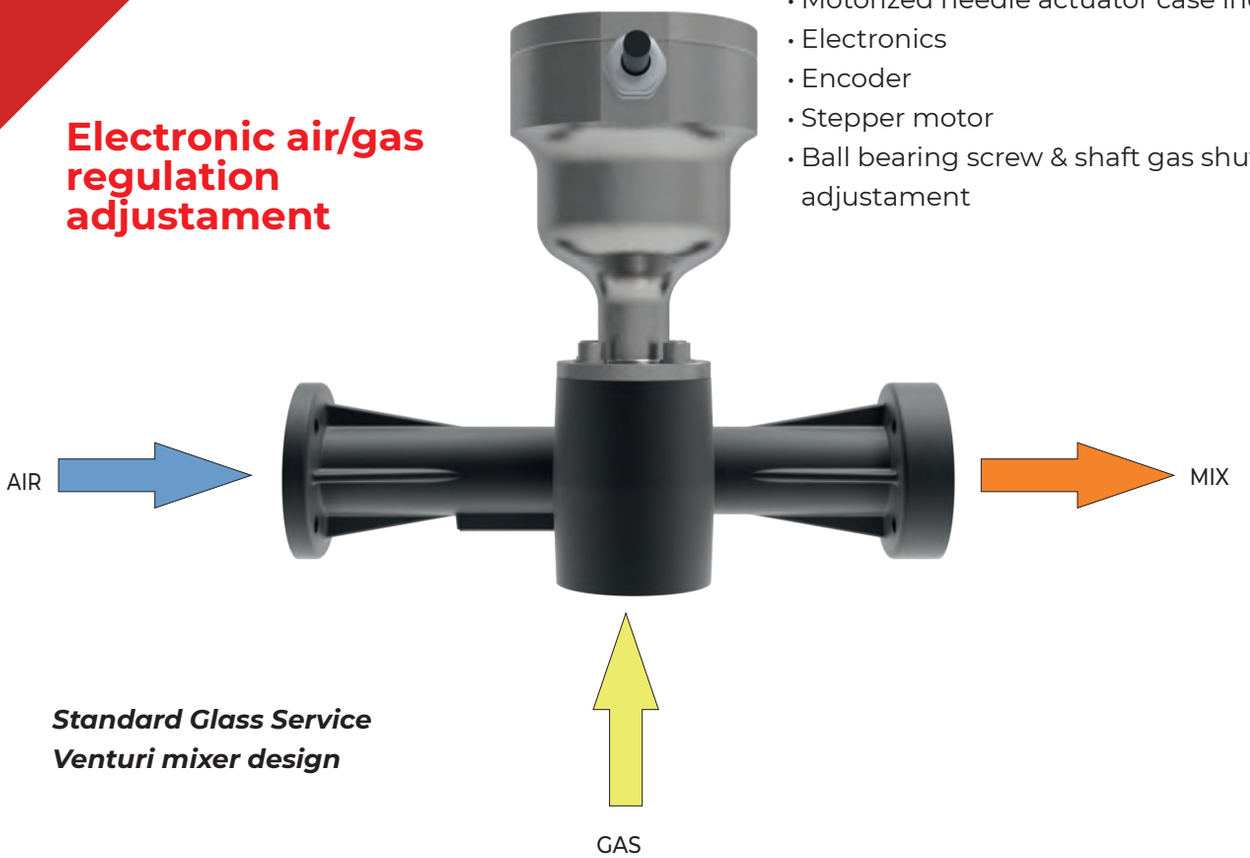
OPERATIONAL CHALLENGE

In distributor and forehearth premixed air/gas combustion systems, the primary objective is to maintain a constant combustion ratio under all operating conditions



Electronic air/gas regulation adjustament

- Motorized needle actuator case including:
- Electronics
- Encoder
- Stepper motor
- Ball bearing screw & shaft gas shutter adjustament



Standard Glass Service
Venturi mixer design

MAIN BENEFICT

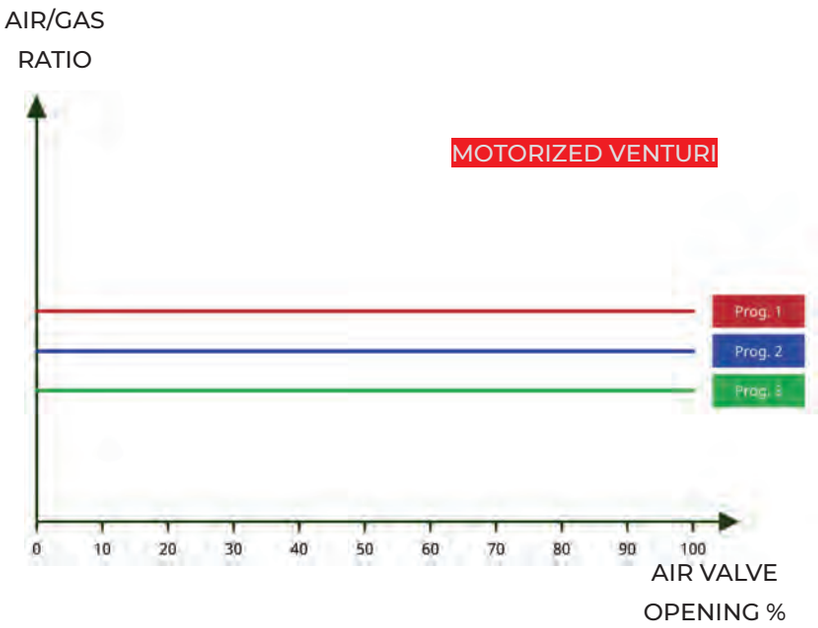
- Stable air/gas combustion ratio throughout the entire power range.
- Reduced energy consumption.
- Lower CO_2 emissions.
- Improved glass colour stability through enhanced Redox stability at the glass surface.

ADDITIONAL BENEFICT

While traditional mechanical regulation systems operate with a fixed shutter position and therefore a fixed combustion ratio, the new electronic technology enables real-time adjustment of the combustion ratio during operation

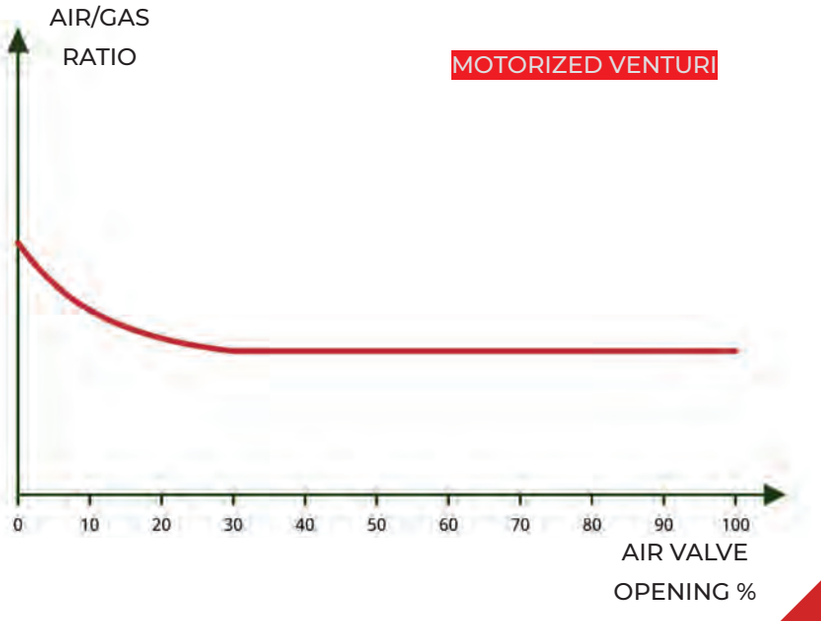
FLEXIBLE REDOX MANAGEMENT

For each combustion zone, operators can select different Redox control curves using up to seven (7) shutter-position programs stored in the Venturi memory and activated directly by the process control PLC. This feature is particularly beneficial for colored glass production and colored forehearth applications.



ENHANCED COOLING PERFORMANCE

In addition to combustion control, the motorized Venturi mixer can be effectively used to regulate glass cooling.
By dynamically controlling both the air/gas ratio and the total flow rate, the system allows operators to increase the air flow when specific thermal conditioning adjustments are required. For forehearth zones requiring high cooling performance, the Venturi can operate with a variable combustion ratio and increased airflow at low firing rates. This capability significantly improves cooling efficiency in low-power operating conditions.



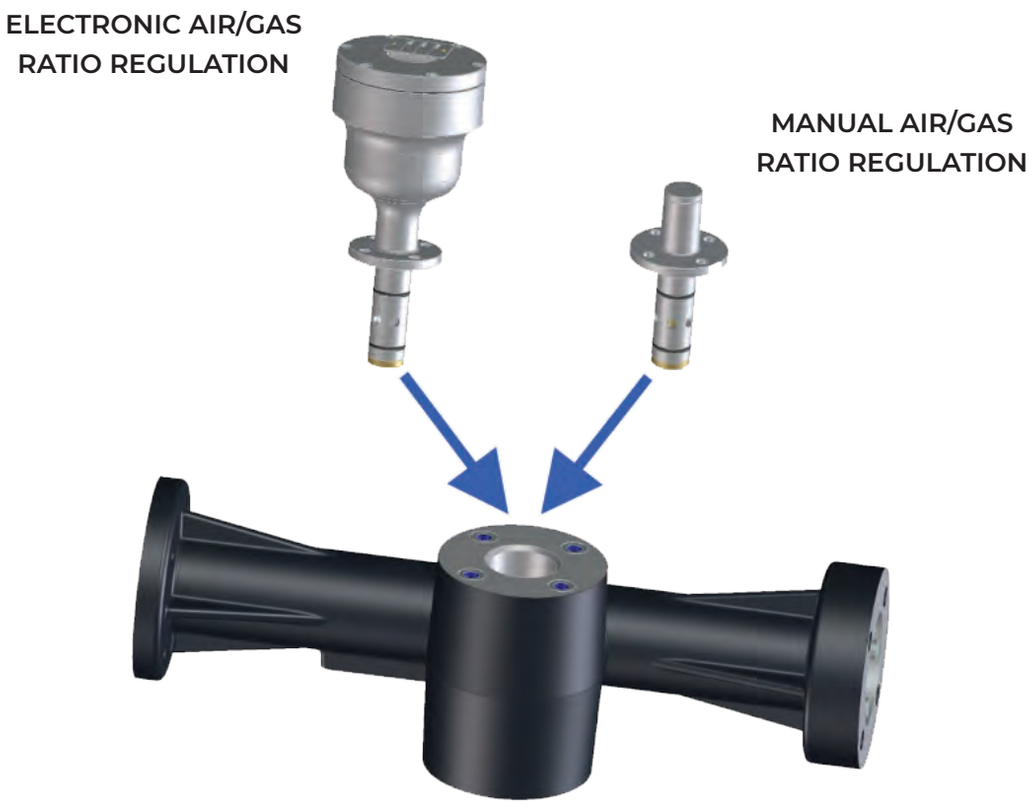
PRODUCT OVERVIEW

The motorized Venturi maintains the same robust Venturi tube design and structural configuration as the manual model. This ensures seamless integration into existing installations without requiring replacement of the existing piping system

· Motorized shutter Actuator Case: The electronic unit houses advanced components designed for demanding industrial environments, including onboard electronics, an integrated encoder, a high-precision stepper motor, and a ball bearing screw & shaft mechanism ensure an high precision position of the gas shutter.

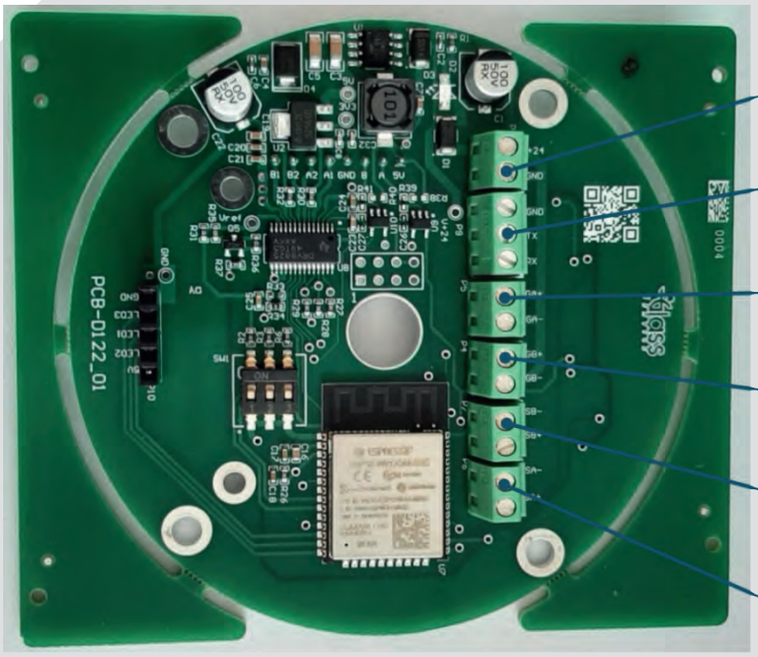
· Complete Interchangeability: The manual air/gas ratio regulation system and the electronic/automatic regulation system are fully interchangeable. The motorized actuator assembly can be installed directly onto the standard mixer body using the pre-machined mounting interface. The installation of electronic shutter could be retrofit on existing venturi.

THE MANUAL AND ELECTRONIC/AUTOMATIC AIR/GAS RATIO REGULATION SYSTEM ARE COMPLETELY INTERGHANGE



PRODUCT OVERVIEW

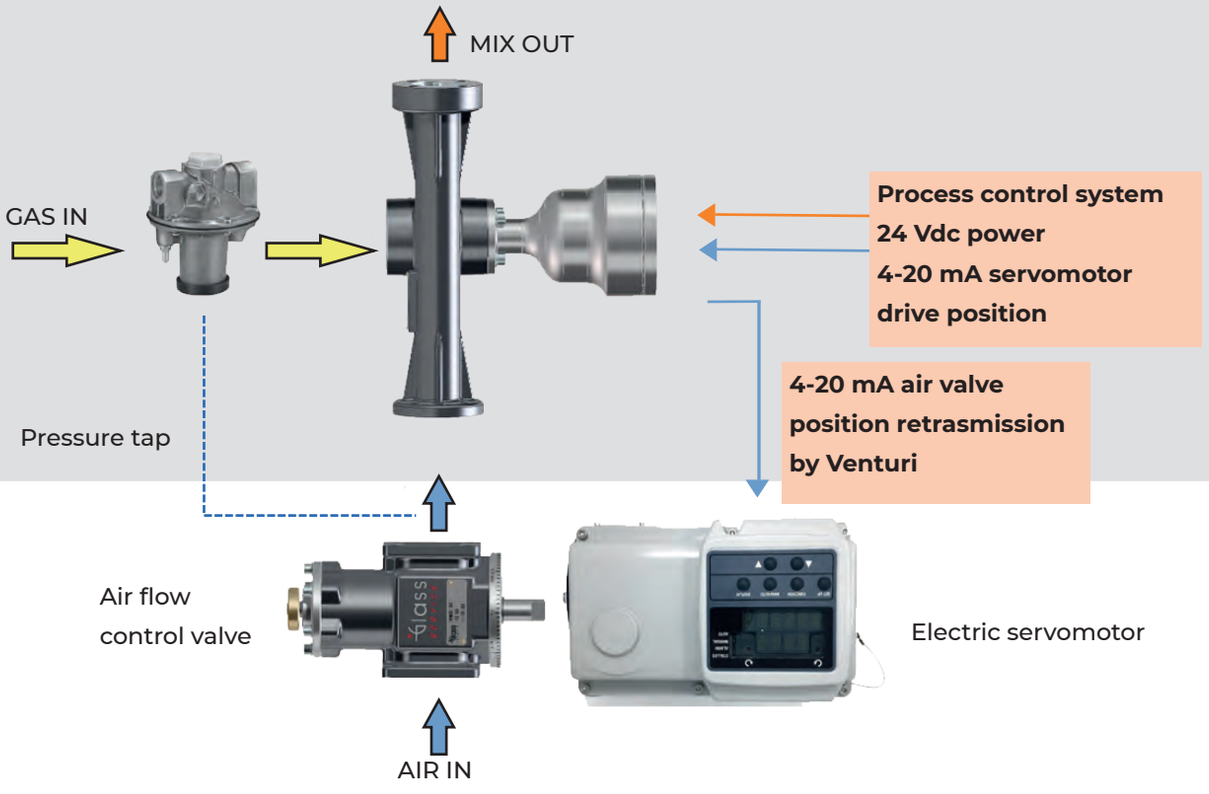
To facilitate integration into different plant control architectures, the motorized Venturi mixer supports multiple electrical connection configurations powered by a 24 VDC supply.



- 24 Vdc power supply
- Serial Link
- OUT 4-20 mA shutter position
- OUT 4-20 mA retrasmission
- IN 4-20 mA additional configurable E.g. table selection
- IN 4-20 mA additional position shutter selector & air valve opening

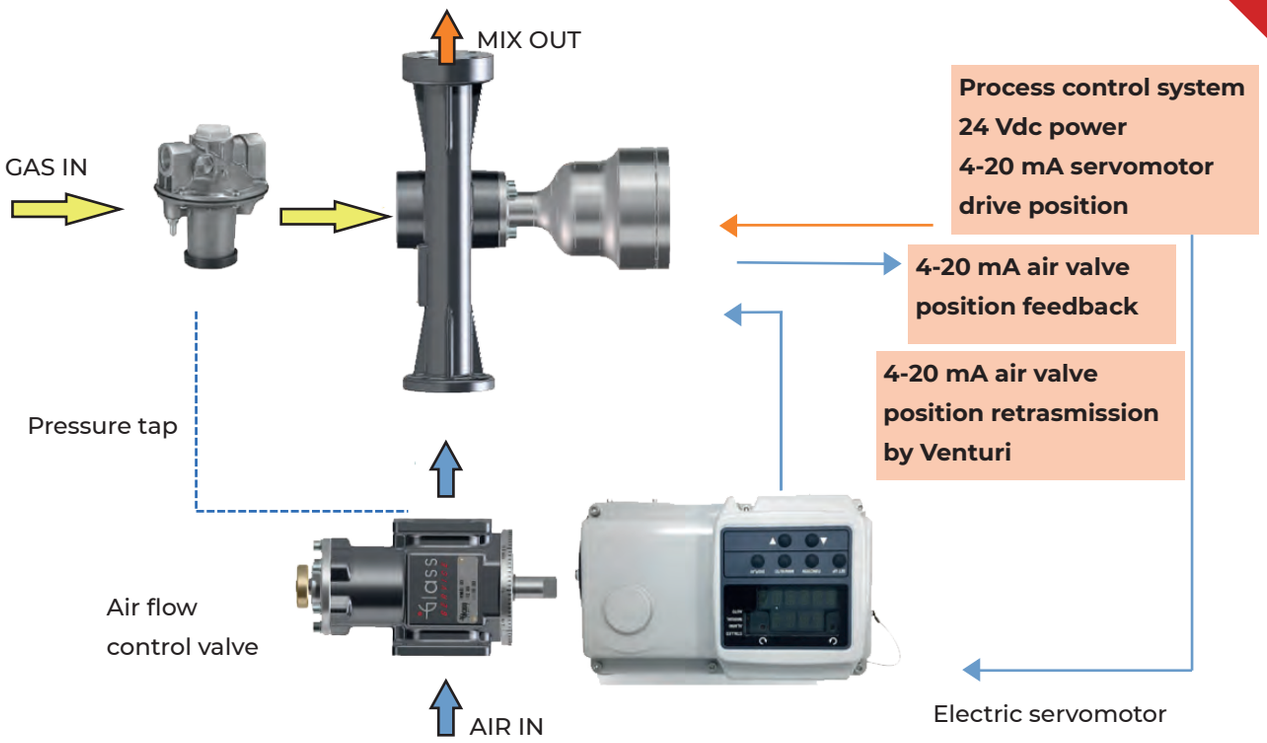
ELECTRICAL CONNECTION MODE 1:

- 24 VDC power supply from the process control system.
- 4-20 mA air valve position signal transmitted to the Venturi.
- 4-20 mA output from the Venturi to the servo actuator controlling gas shutter position



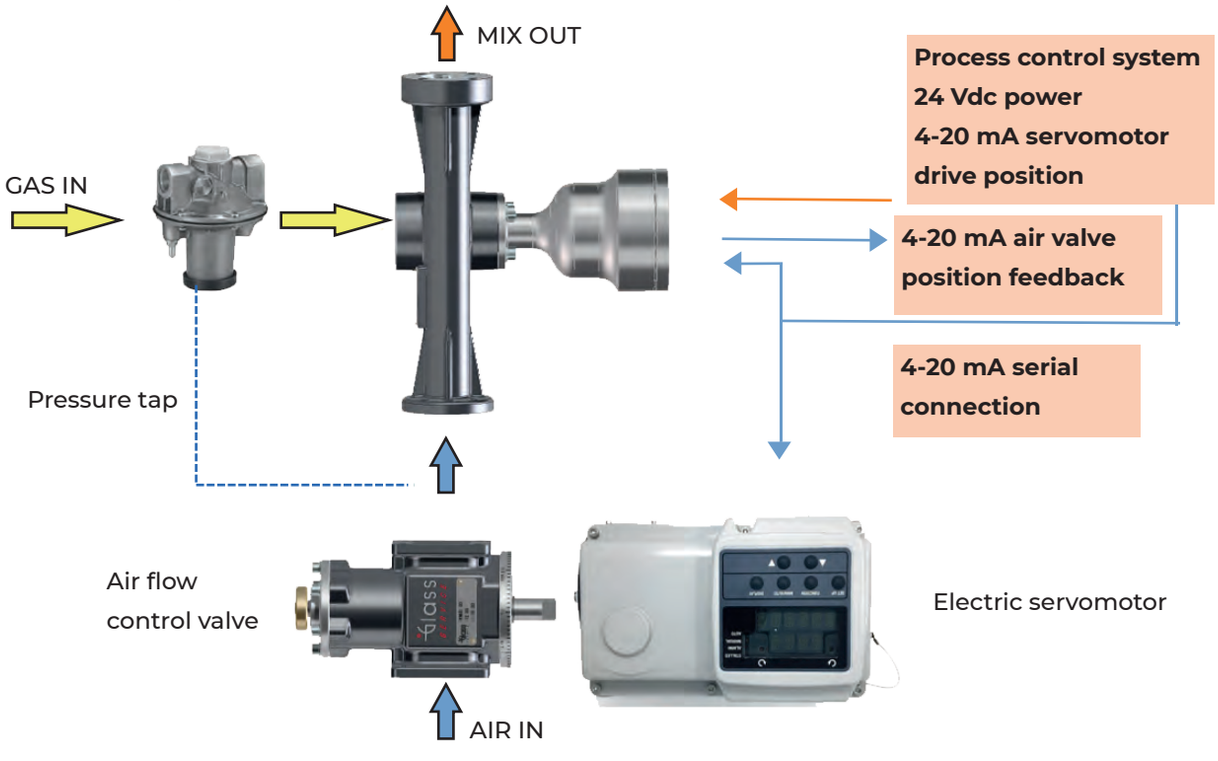
ELECTRICAL CONNECTION MODE 2:

- 24 VDC power supply from the process control system.
- 4-20 mA control signal driving the air-valve servo actuator.
- 4-20 mA servo feedback signal transmitted to the Venturi.
- 4-20 mA air-valve position feedback available for monitoring and diagnostics.



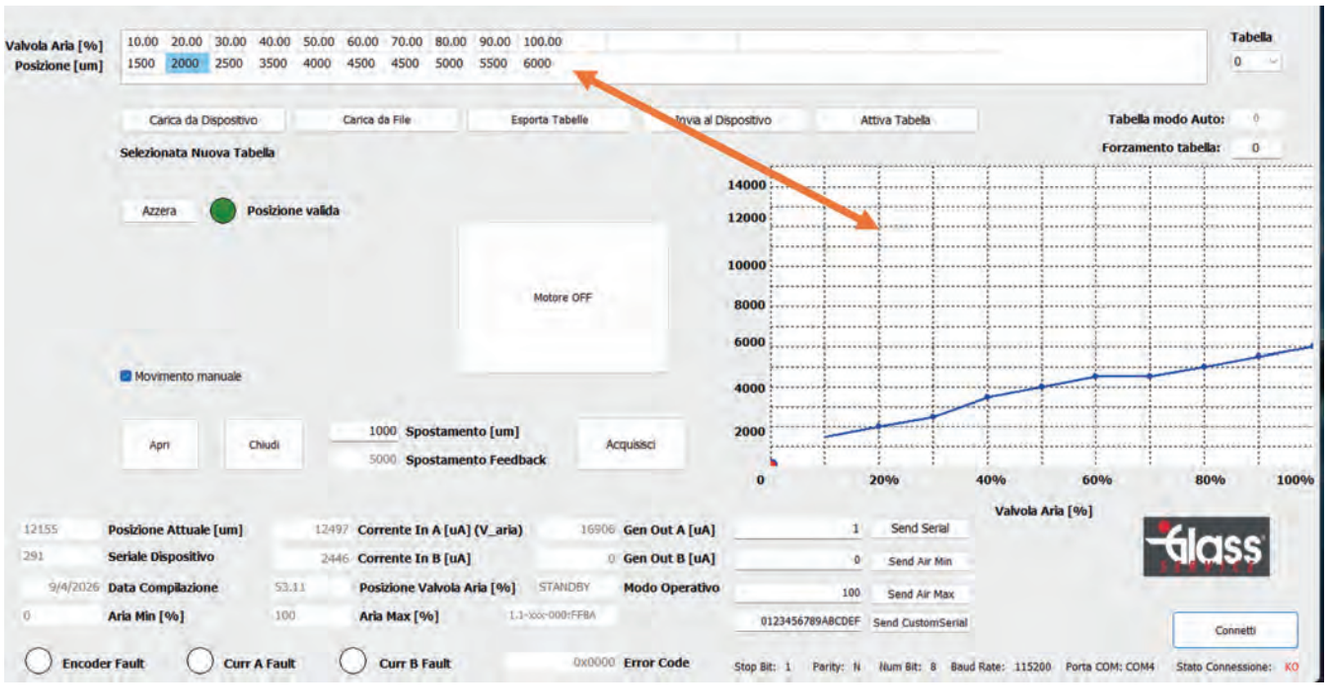
ELECTRICAL CONNECTION MODE 3:

- 24 VDC power supply from the process control system.
- 4-20 mA serial connection used to control the servo actuator shutter motor and transmit air-valve position
- 4-20 mA air-valve position feedback available



SOFTWARE PROGRAMMING

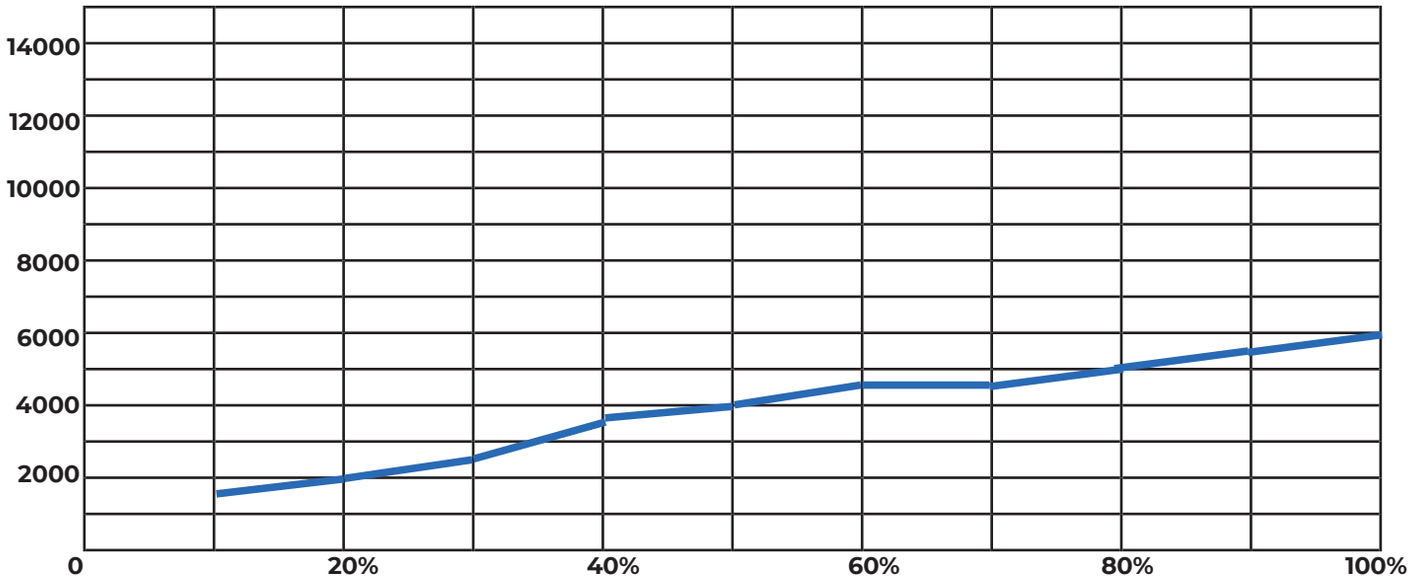
The Venturi motor position table can be configured using dedicated Glass Service software running on a Windows PC



The primary function of the software is to define the gas shutter position as a function of air-valve opening.

The Venturi electronic controller automatically positions the shutter according to the programmed table

AIR VALVE (%)	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
Posizione [um]	1500	2000	2500	3500	4000	4500	4500	5000	5500	6000



The position table can be configured with 1 to 20 setpoints across the full 4-20 mA signal range, with a minimum adjustable span of 1%. Intermediate points are calculated using linear interpolation

SOFTWARE FEATURES

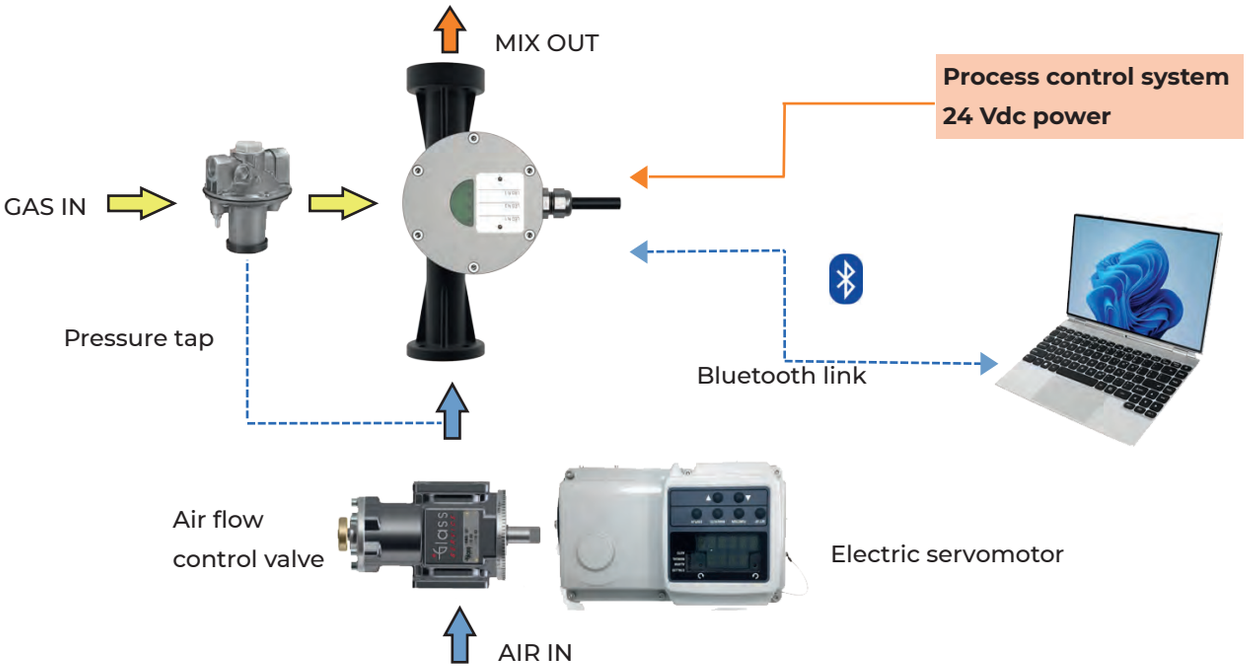
- Gas shutter position table editing (1 to 20 setpoints).
- Storage of up to 7 independent position tables in internal memory.
- Selection of active tables via dedicated 4-20 mA input signal.
- Table saving, upload, download, and file management.
- Shutter motor zero-position calibration.
- Manual shutter movement control.
- Real-time shutter position monitoring.
- Diagnostic and troubleshooting functions.

PC CONNECTION OPTIONS

The Venturi controller supports multiple communication methods for connection to a Windows PC

MODE 1

The simplest solution is wireless communication via a Bluetooth connection.



MODE 2

An RS-232 serial communication interface is also available

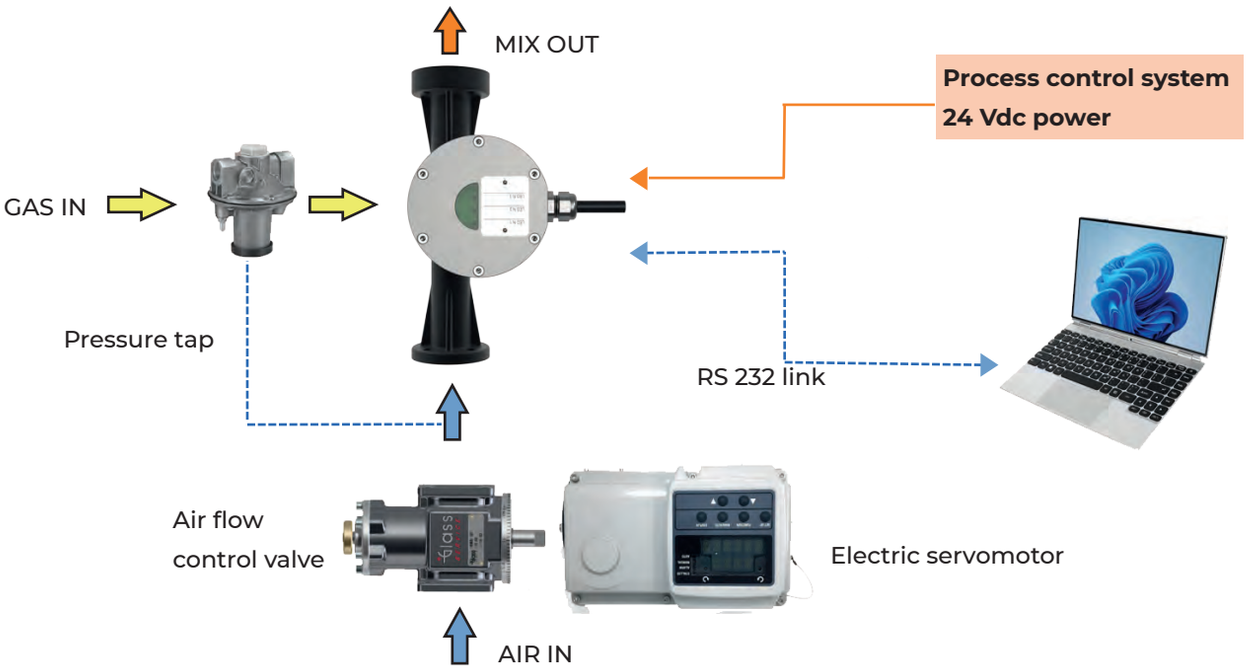
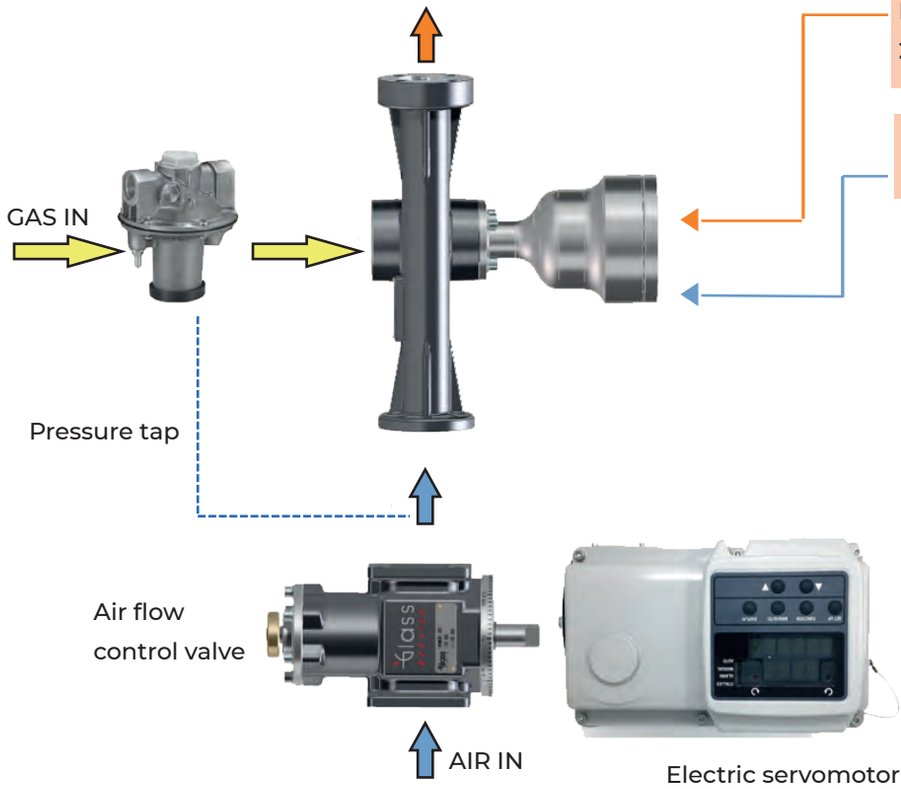


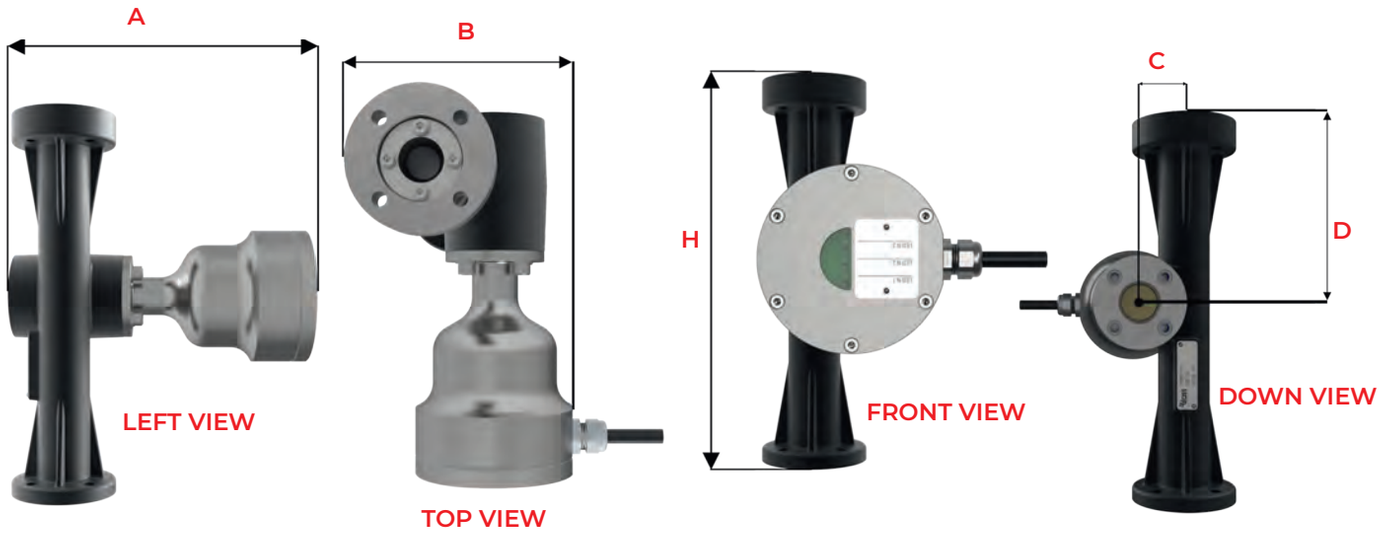
TABLE SELECTION MODE (7 OPERATING PROFILES)

Available with all electrical connection configurations, the Table Selection Mode allows operators to manage up to seven pre-configured operating curves through a dedicated 4-20 mA input signal. This feature enables rapid switching between predefined combustion and process-control strategies without requiring manual reconfiguration.



4-20 mA value	Table selected
0,5 mA	Main Table
5-7,5 mA	Table 0
7,5-10 mA	Table 1
10-12,5 mA	Table 2
12,5-15 mA	Table 3
15-17,5 mA	Table 4
17,5-20 mA	Table 5

The table selection mode is available in all Venturi Electrical connection, by dedicated 4-20 mA input



	DN	H	A	B	C	D
MV2-40-A	40 mm	325 mm	254,5 mm	98 mm	40 mm	170 mm
MV2-50-A	50 mm	375 mm	255,5 mm	106 mm	48 mm	195 mm
MV2-65-A	65 mm	425 mm	260 mm	114 mm	56 mm	220 mm
V2-80-A	80 mm	605 mm	270 mm	118 mm	60 mm	321 mm