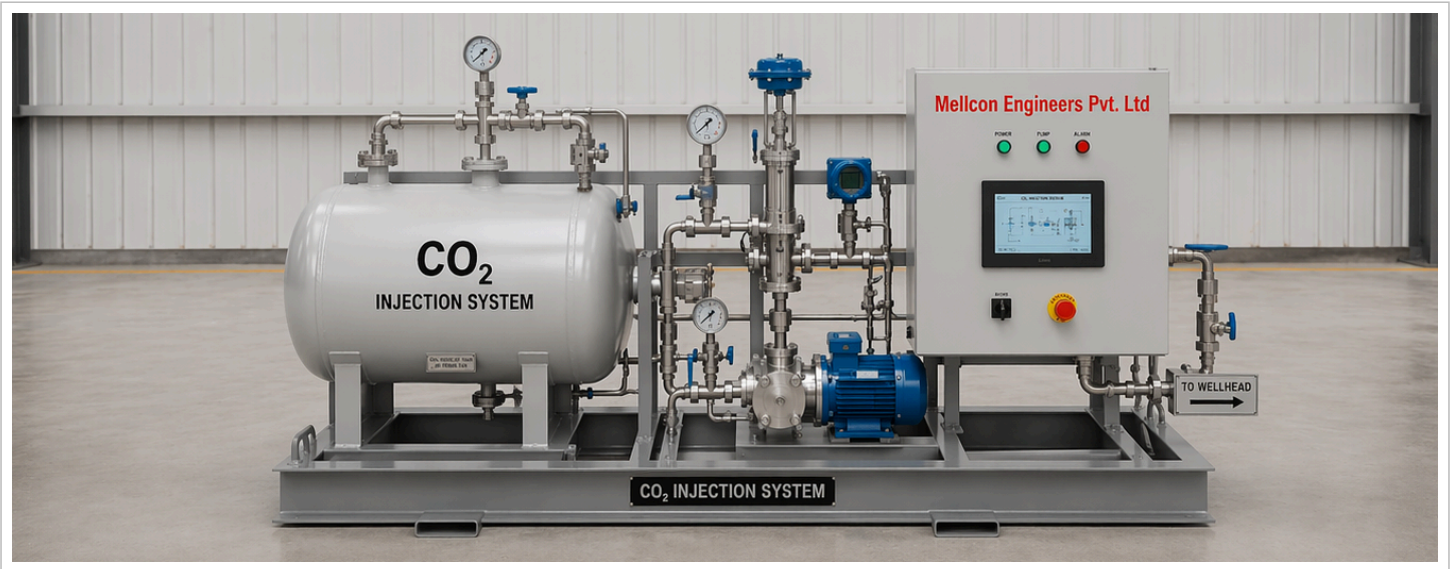


CO₂ Gas Dosing System



CO₂ Gas Injection System For Water Treatment & Neutralisation Applications

The CO₂ Gas Injection System is designed for precise introduction of carbon dioxide into water treatment processes requiring pH adjustment, remineralisation, or neutralisation control. The package is suitable for continuous industrial operation and is engineered as a compact skid-mounted assembly for simplified installation and reliable long-term service.

The system enables controlled dosing of gaseous CO₂ into side-stream or process water lines while maintaining stable operating conditions and accurate flow regulation.

Applications commonly include desalination facilities, utility water treatment systems, industrial process water conditioning, and municipal treatment installations.

Typical Applications

The CO₂ dosing package is suitable for the following process requirements:

- Post-treatment of desalinated water
- pH correction systems
- Neutralisation of alkaline water streams
- Remineralisation processes
- Industrial process water conditioning
- Boiler and utility water treatment
- Municipal water treatment plants
- Chemical and manufacturing industries

System Features

Key operational and engineering features include:

- Accurate gas dosing and stable flow control
- Stainless steel piping and structural components
- Fully skid-mounted construction
- Factory assembled and tested package
- Compact footprint for plant integration
- PLC-compatible instrumentation
- 4–20 mA signal interface for process automation
- Manual bypass arrangement for servicing
- Low maintenance requirements
- Continuous-duty industrial design
- No compressed air utility required for operation



Major Equipment & Components

- CO₂ inlet manifold
- Pressure reducing station
- Gas filtration assembly

- Flow control valve
- Automatic shut-off valve

- Manual isolation valves
- Safety relief valves
- Vent / discharge arrangement

- CO₂ flowmeter with local indication
- Digital monitoring instruments

- PLC-based control panel
- Prewired electrical cabinet
- Stainless steel tubing and process piping

- Stainless steel support frame
- Electrical protection and control devices

Optional accessories may include remote monitoring, HMI interface, redundant instrumentation, and plant communication modules.

Mixing & Gas Dissolution Arrangement

To improve gas absorption efficiency, the system can be integrated with static mixing equipment or engineered gas dispersion assemblies.

These devices are designed to promote uniform gas distribution within the water stream while minimising pressure losses and maintenance requirements.

Key advantages include:

- High CO₂ dissolution efficiency
- Uniform mixing characteristics
- Low operating energy demand
- No rotating or moving components
- Reduced maintenance requirements
- Stable long-term process performance
- Reliable operation in continuous service conditions

The injection arrangement may be configured for side-stream dosing into the primary process water line to optimise gas transfer efficiency.

Operating Conditions

Typical design conditions are as follows:

Parameter	Typical Value
Ambient temperature	>10°C
Maximum ambient temperature	45°C
Relative humidity	34% – 99%
Maximum wind speed	20 m/s
Water operating temperature	10°C – 32°C
Maximum side-stream pressure	3.5 bar

(Note: An optional low-temperature package is available.)

Final design values may vary depending on project specifications and site conditions.

Single-Line CO₂ Injection Package

The single-line configuration is intended for standard industrial applications requiring continuous and regulated CO₂ dosing. The package is delivered as a factory-integrated assembly to reduce site installation time and commissioning effort.

Standard Configuration

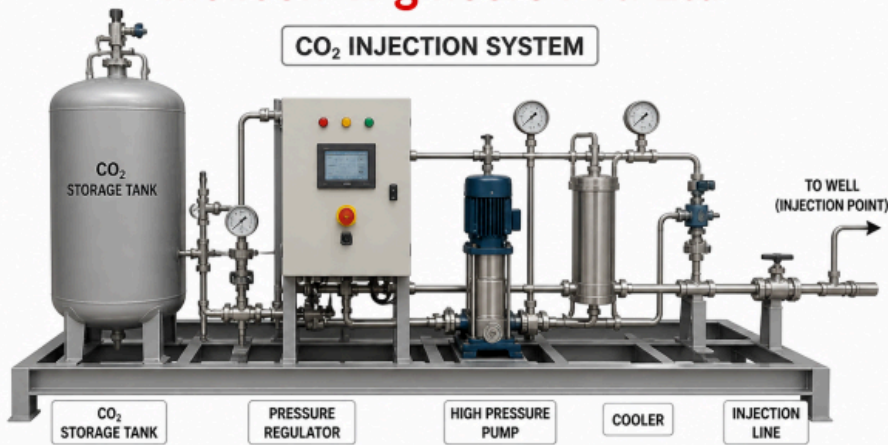
- One complete CO₂ dosing line
- Pressure regulation assembly
- Filtration section
- Flow control arrangement
- Automatic isolation valve
- CO₂ flowmeter with local display
- PLC-based control system
- Stainless steel skid structure
- Prewired electrical panel

Redundant Dual-Line Configuration

For critical processes requiring uninterrupted operation, a redundant dual-line arrangement can be provided. This configuration automatically manages system changeover and maintains continuous CO₂ supply during maintenance or equipment standby conditions.

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CO₂ INJECTION SYSTEM



Features

- Automatic duty/standby operation
- PLC and HMI-based monitoring
- Automatic load transfer functionality
- Continuous process supervision
- Alarm and status indication
- Enhanced operational reliability
- Backup dosing line capability

The system logic continuously evaluates operating conditions and controls the active dosing line accordingly.

Scope Of Supply

The complete package may include:

- CO₂ storage vessel
- Atmospheric vaporiser
- CO₂ dosing skid
- Gas flow measurement assembly
- Static mixer or gas dissolution system
- PLC control cabinet
- Stainless steel piping network
- Isolation and safety valves
- Electrical instrumentation
- Factory testing and precommissioning

Final scope shall be confirmed during detailed engineering.

Available Capacity Ranges

Model	Capacity Range	Configuration
Model 001	10 – 100 kg/h	Single Line
Model 002	50 – 500 kg/h	Single Line
Model 003	120 – 1200 kg/h	Single Line

Additional custom flow capacities can be engineered upon request.

Engineering & Custom Design

Each CO₂ dosing system is engineered according to the specific process requirements of the installation.

Parameters typically reviewed during detailed engineering include:

- Required CO₂ consumption
- Water flow characteristics
- Process pressure and temperature
- Tank sizing requirements

- Vaporiser capacity
- Mixing efficiency requirements
- Plant automation interface
- Site environmental conditions

The final design is developed to ensure operational reliability, service accessibility, process stability, and long equipment life under industrial operating conditions.