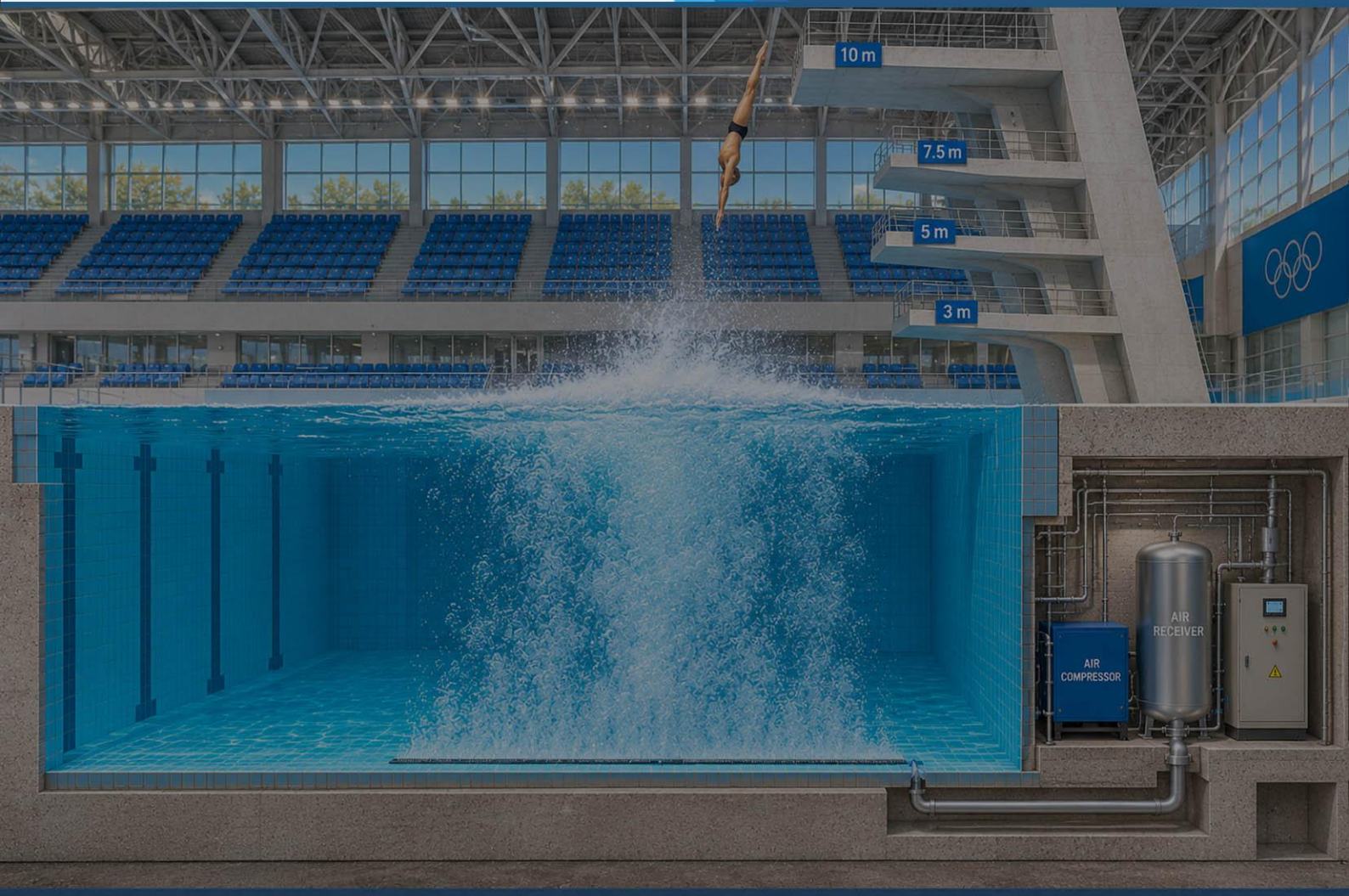
artemis
Sparger Air Systems

SAFER DIVES / SOFTER ENTRIES
DIVE SAFE / ENTER SOFT



PRODUCT CATALOGUE · DIVING POOL SAFETY SYSTEMS

Sparger Air System

Pool Floor Air System · Air Cushion Safety System

A custom-engineered safety system that releases controlled air bubbles from the pool floor, reducing the impact on the diver at the moment of water entry.

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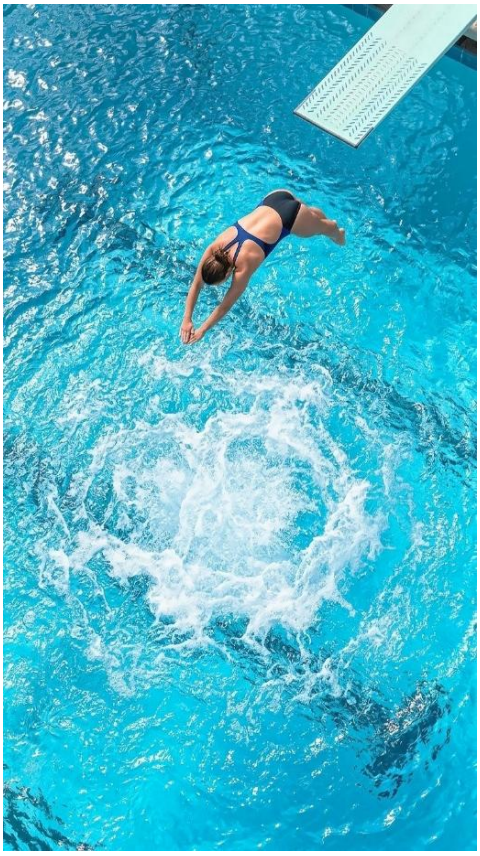
01 · SYSTEM OVERVIEW

What Is a Sparger Air System?

A sparger air system is a system that creates an **air cushion** in the water by releasing high-pressure air through stainless steel diffusers installed in the floor of the diving pool, directly beneath the springboards and platforms.

Compressed air produced by the compressor is stored in tanks in the plant room. As the diver leaves the platform, the coach or the diver triggers the system; air is delivered to the diffusers through proportional valves and a dense column of bubbles rises beneath the entry point. Because the density of the aerated water drops, water entry becomes softer and a white, foamy cushion forms on the water surface.

Internationally, the system is used as standard safety equipment in Olympic venues, national training centres and university aquatic complexes, especially in training sessions where new and difficult dives are learned. In diving pools built to World Aquatics (formerly FINA) facility rules, surface agitation and air cushion systems are an important design element.



Features and Benefits

Air Cushion Effect
Water aerated with bubbles significantly reduces the impact on the diver at the moment of entry and lowers the risk of injury from poor entries.

Psychological Confidence
Reduces the fear of injury, so divers learn new and complex dive techniques with more comfort and speed. Training efficiency increases.

Water Surface Perception
The foam and agitation on the surface give the diver a clear visual reference, especially during rotating dives.

Easy Operation
Operated with a single touch from the touch screen on the tower or the handheld remote. No special training is required.

Custom Design
Calculated separately for each facility, taking into account pool depth, tower/springboard heights and positions, the number of diffusers and the interval between dives.

Long Service Life
AISI 316 stainless steel diffusers operate trouble-free for many years in chemically treated pool water; the in-pool components require no maintenance.

02 · OPERATING PRINCIPLE

How Does the System Work?

The system consists of four main sections: air generation, storage, control and distribution. All mechanical equipment is located in the plant room outside the pool; only the floor-embedded diffusers are inside the pool.

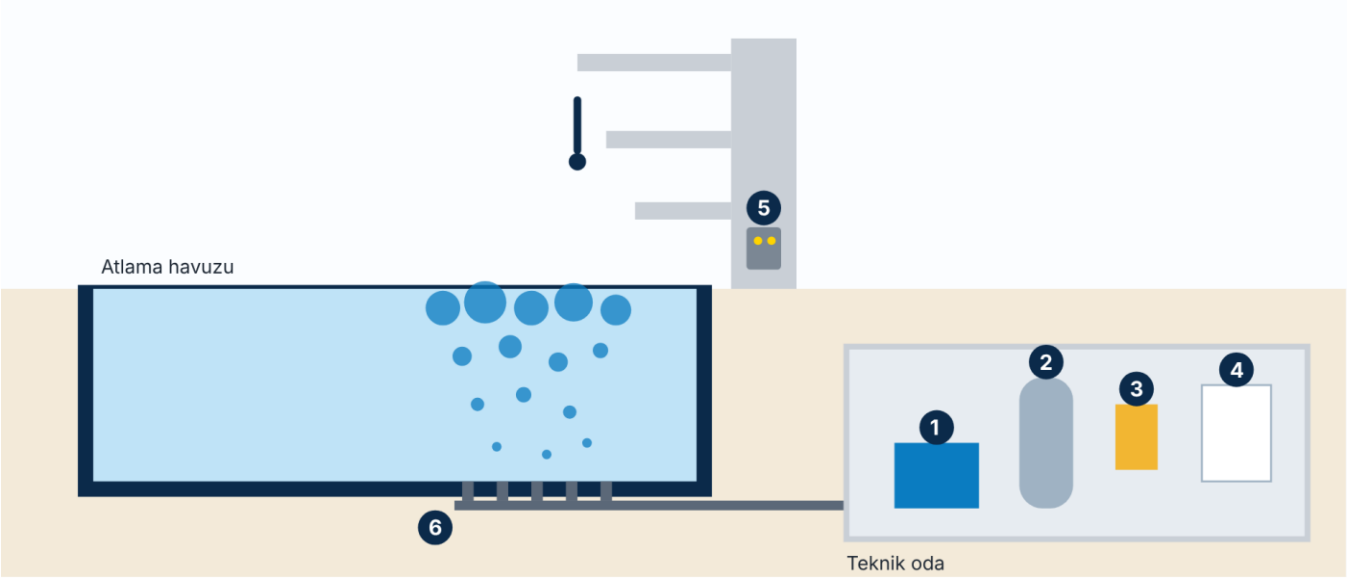


Figure 1 – Schematic diagram: (1) rotary screw air compressor, (2) compressed air tank, (3) proportional valve / distribution manifold, (4) automation panel, (5) touch screen on the tower, (6) stainless steel diffusers embedded in the pool floor.

Operating Cycle

1	2	3	4	5
Storage	**Preparation**	**Triggering**	**Air Cushion**	**Stop**
The compressor produces the air, filters it and stores it in the pressure tank.	The diver climbs to the platform; bubble duration and intensity are selected on the panel.	As the diver takes off, the system is started from the touch screen or remote control.	The valve opens; bubbles rising from the diffusers form a cushion at the entry point.	At the end of the set time the valve closes; the tank refills for the next dive.

Control Options

- **Touch screen at each platform:** An HMI panel at every tower/springboard level that divers can operate themselves.
- **Wireless remote control:** Lets the coach trigger the system from the poolside, in sync with the dive.
- **Password-protected use:** Access with a user password to prevent unauthorised use.
- **Surface agitation mode:** Continuous low-flow air to improve visibility of the water surface (optional).

03 · SYSTEM COMPONENTS

Required System Equipment

All components are sized according to the facility's diving layout and usage intensity and are integrated into a single automation infrastructure.



01 Air Compressor System

High-capacity, quiet rotary screw compressor. It is selected with the capacity to refill the tank quickly between dives and provides an uninterrupted air supply even during intensive training.

With its dryer, filters and automatic drain equipment it produces clean, oil-free air, protecting the diffusers and pool water from oil and moisture. Installed in the plant room, it creates no noise in the pool hall.

02 Compressed Air Tank

Vertical, CE-certified tank made of P265GH steel, from 1,000 to 10,000 litres. It stores the compressed air produced by the compressor and acts as an “air reservoir” that meets the sudden, high air demand at the moment of the dive.

This ensures that plenty of evenly distributed air reaches the diffusers, forming a strong air cushion, even when the compressor's instantaneous flow is not sufficient. Tank capacity is calculated according to the required bubble duration and the waiting time between dives. Its internal and external surfaces are protected against corrosion; it operates safely with a safety valve, pressure gauge and automatic drain.





03 Automation Panel

PLC-controlled panel that manages the compressor, valves and user screens. Pressure monitoring, fault alerts, and duration and intensity settings are handled from the panel.

Schneider or equivalent switchgear is used.

03 · SYSTEM COMPONENTS

04 Touch Screen (HMI)

User panel housed in a water- and moisture-resistant enclosure installed at the tower and springboard levels. Bubble duration, intensity and active zone are selected from a single screen.

Since divers can start the system themselves before leaving the platform, no separate operator is needed. Its simple, intuitive interface can be used easily by divers and coaches of all ages. It is password-protected to prevent unauthorised use.





05 Stainless Steel Diffuser

Diffusers made of AISI 316 stainless steel, embedded in the pool floor. Their number and layout are calculated according to the entry area of each diving point.

Internal air channels ensure balanced air distribution in the pool, and a sufficient number of air holes ensures contact between the bubbles and the water. Depending on size, a diffuser may have one or more air inlets. Each unit is custom-designed and manufactured for the project.

06 Actuated Proportional Valve

Precisely controls the air flow to the floor diffusers and the bubble intensity with stepped opening adjustment from 1 to 100.

Compact design with a PVC body. Depending on the project, it can be supplied for 12, 24, 48 or 220 V. A 4–20 mA feedback (position switch) is provided for open/closed position information.



05 · APPLICATION

Sample Project Section

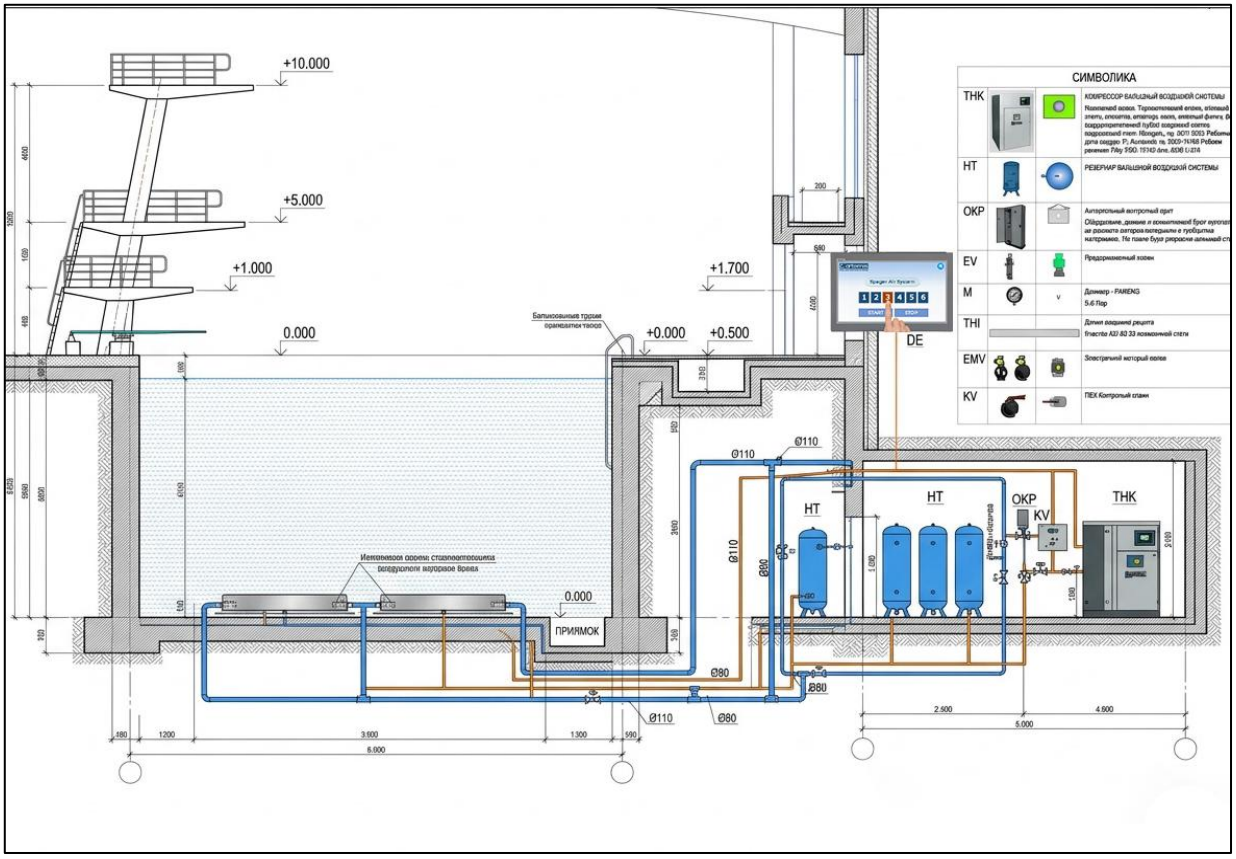


Figure 2 – Sample diving pool section: tower heights, floor-embedded diffusers, and the compressor, air tanks and automation panel in the plant room.

Design Principles

Custom Design
The number, size and layout of the diffusers are calculated according to pool depth, platform height and position.

Remote Plant Room
Compressors and tanks are located in a separate mechanical room away from the pool hall to reduce noise.

Fast Refill
Compressor and tank capacity determine the waiting time between consecutive dives.

Zone-Based Control
A separate valve for each diving point; air is released only beneath the platform in use.

New and Existing Pools
Floor-embedded diffusers are preferred for new builds, surface-mounted models for renovation projects.

Turnkey Delivery
Design, manufacturing, installation, commissioning and user training from a single source.

06 · TECHNICAL DATA

Technical Specifications

The values below are for a sample project; final values are determined at the design stage according to the pool and tower characteristics.

Air Compressor (sample)

Parameter	Value
Type	Rotary screw, tank-mounted
Motor power	30 HP / 22 kW
Free air delivery	3,220 l/min · 193 m³/h · 114 cfm
Working pressure	10 bar / 140 psi
Voltage	380 V / 3 phase / 50 Hz
Screw speed	2,945 rpm
Noise level	69 dB(A)
Connection size	1"

Compressed Air Tank

Parameter	Value
Volume	1,000 – 10,000 l
Type	Vertical
Material	P265GH steel
Standards	EN 286-1, EN 13445, 2014/68/EU (PED)
Finish	Electrostatic powder coating
Connection size	1½"
Certificate	CE

Diffuser and Valve

Parameter	Value
Diffuser material	AISI 316 stainless steel
Installation	Floor-embedded / surface-mounted
Valve type	Actuated proportional
Adjustment range	1 – 100 (stepped)
Power supply	12 / 24 / 48 / 220 V
Feedback	4 – 20 mA

Control and Operation

Parameter	Value
Control	PLC + HMI touch screen
Switchgear	Schneider or equivalent
Bubble duration	10 – 120 s adjustable
Operation	Platform screen / remote control
Security	Password-protected access

Design Criteria

- Pool depth and floor structure
- Tower and springboard heights (1 m – 10 m)
- Number and position of diving points
- Number and layout of diffusers
- Required bubble duration and interval between dives

The specifications given here are for general information; they may vary according to the project design.



07 · SUMMARY

System Summary

A single-source, custom solution for the safety of your diving pool and the development of your divers.

Feature	artemis Sparger Air System
Bubble duration	10 – 120 s adjustable
Intensity control	Actuated proportional valve, 1 – 100 steps
User interface	Platform touch screen + wireless remote control
Diffuser material	AISI 316 stainless steel
Installation	Floor-embedded (new build) / surface-mounted (renovation)
Control infrastructure	PLC + HMI, password-protected access
Design	Custom-designed, turnkey



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POOL AND FOUNTAINS SYSTEMS

SWIMMING POOL AND FOUNTAIN SYSTEMS

DESIGNED FOR EXCELLENCE. BUILT TO LAST A LIFETIME.

SPARGER AIR SYSTEMS

SAFE DIVING · SOFT WATER ENTRY

A custom sparger air system for your diving pool

Share your facility's pool dimensions, tower and springboard heights and usage intensity with us; we will calculate the diffuser layout, compressor and tank capacity and automation infrastructure for you, and install the system on a turnkey basis.

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