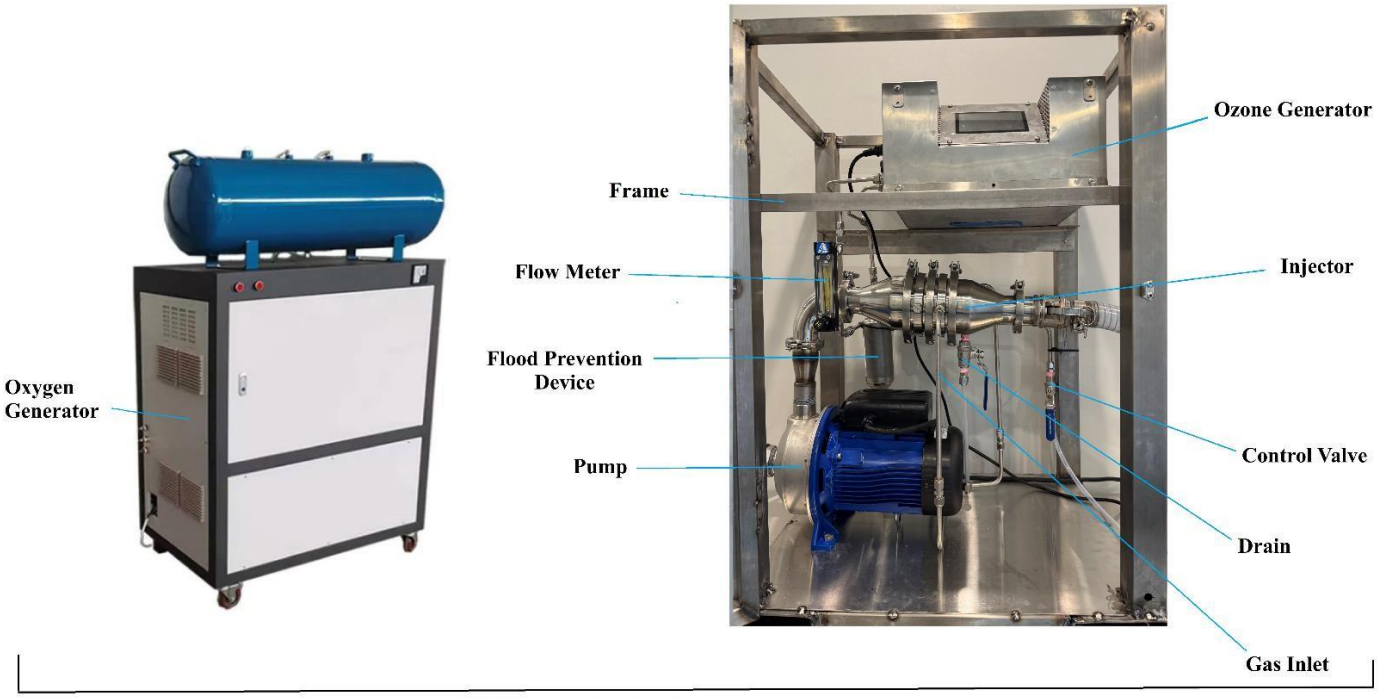
Technical Specification of the 1-Cell Nanobubble Injector Unit

Nanobubble Technologies (NBT) is a global leader in nanobubble innovation. With over 15 years of research and expertise, we have developed a new generation of nanobubble injectors (Titanium and Stainless Steel) that have been scientifically tested and validated by researchers at the University of New South Wales (UNSW) in 2024. Our innovative NB solution provides significant benefits across a range of industries, including:

Lakes & ponds	Wastewater	Agriculture	Aquaculture
			
• Increasing DO level • Reducing foul odours • Algae control • Sediment reduction • Improvement in water quality and clarity	• Increasing oxygenation • Improving coagulation and flotation • Reducing sludge volume • Decreasing chemical dosage • Increased energy efficiency	• Increasing DO level • Improving root growth and water infiltration • Increasing nutrient uptake • Reducing water usage • Pathogens Control • Increasing yields & quality	• Increasing oxygen transfer efficiency • Rearing water quality • Reducing chemical application and energy consumption • Reduction of stress in fish

The following section outlines the detailed specifications for NBT's 1-cell nanobubble injector plug-and-play unit, including its key components: the frame (316 SS), pump (Lowara), injector (NBT), flood-prevention device, oxygen generator (Vet1 OGP- stand-alone unit, optional upon customer request), ozone generator (Atlas 30, optional upon customer request), control system (Smithtek-optional upon customer request), and all associated unit connections.



NBT's 1-Cell Nanobubble Injector Plug and Play Unit

LIQUID FLOW CAPACITY (WATER)	
Flow Rate (Max)	250 L/min
Maximum Liquid Pressure	300 kPa
GAS FLOW CAPACITY (O_2, O_3)	
Flow Rate	1 L/min per Injector
Maximum Gas Pressure	400 kPa
OPERATING PARAMETERS	
Temperature Tolerance	4-65 °C
Solids	14 mm
PROCESS CAPACITY	
Water	250 L/min per injector
Oxygen Delivery	0.5 kg O_2/hour (≈ 12 kg/day) dissolved oxygen at 85% OTE
Ozone Delivery (Based on the application requirements)	30 g/h
PHYSICAL CHARACTERISTICS OF 1-CELL NANOBUBBLE INJECTOR UNIT	
Size	L = 65 cm, W = 52 cm, H = 86 cm
Mobility: portable on wheels, or containerised	Based on customer request
OXYGEN GENERATOR (Optional: Provided based on the customer request and application requirements) 	
Model	Vet1 OGP Oxygen Generator (OGP-10 LB)
Output LPM	10 LPM
Oxygen Purity %	93±3%
Power KW	1.3
Oxygen Pressure	70 psi
Working Voltage	110/220 v
Relative Humidity	≤70%±10%
Noise Db	≤ 65Db≤
Size cm	40 x 80 x 115
NW kg	55kg

* **Oxygen cylinder** can be used instead of oxygen generation when the customer requires a lower-cost or low-maintenance option for sites with limited power, space, or intermittent oxygen demand. A 10 kg oxygen cylinder contains 10,000 liters of oxygen; since a 1-cell nanobubble injector unit consumes 480 liters during 8 hours of daily operation (1 liter per minute)

OZONE (O_3) GENERATOR (Optional: Provided based on the customer request and application requirements) 	
Model	Atlas 30 (15-75 psig)
Ozone Output Capacity:	30 g/h
Working Pressure:	20 PSIG
Feed Gas (O_2) Flow Rate:	0.1-5 SLPM
Control Power Requirements:	120 V ~ +/-10%, 50/60 Hz, Single Phase, 5.5 A 230 V ~ +/-10%, 50/60 Hz, Single Phase, 2.75 A
Max Power Consumption	350W
Dimensions	35 × 38 ×17 cm (W×D×H)
Weight	35 lbs (15.88 kg)
Safety Features:	Pressure Transducer
CONTROL PANEL (Optional: Provided based on the customer request and application requirements) 	
Features	• Easy-to-use remote control, Wi-Fi-enabled control panel with cloud function • Integrated modular PLC with both digital and analog inputs, compatible with a wide range of devices such as DO sensors and pressure transducers
ELECTRICAL POWER	
Voltage	415
Phase	3 (Single-phase option available upon customer request)
Hz	50
PUMP 	
Model	ESHS 32-200/30/P25VSSA
Power	3 kW
Head/Max Operation Pressure	31.48 m/ 385.67 mbar
Voltage	220-240/380-415 V

Phase / Frequency	3/50
Casing and Impeller Material	Stainless Steel (AISI 316L)
Weight	44 kg
INJECTOR CHARACTERISTICS (Dimension & Weight, Materials, Unit Connections) 	
1. DIMENSIONS & WEIGHT	
Size	L=34 cm, W= 16 cm, H=11 cm
Weight	5.8 kg
2. MATERIALS	
Cone/ Housing	316 Stainless Steel
Membrane (Based on the application requirements)	**<u>Titanium Membrane NB Generator</u>** • *NB Size*: Mode diameter of 75 nm • *NB Concentration*:1.13 billion bubbles/mL • Gas Transfer Efficiency: 85% **<u>316 Stainless Steel Membrane NB Generator</u>** • *NB Size*: Mode diameter of 125 nm • *NB Concentration*:1.9 billion bubbles/mL • Gas Transfer Efficiency: 85%
3. UNIT CONNECTIONS	
Unit Inlet	50 mm
Unit Discharge	50 mm

Note: All specifications are subject to change