

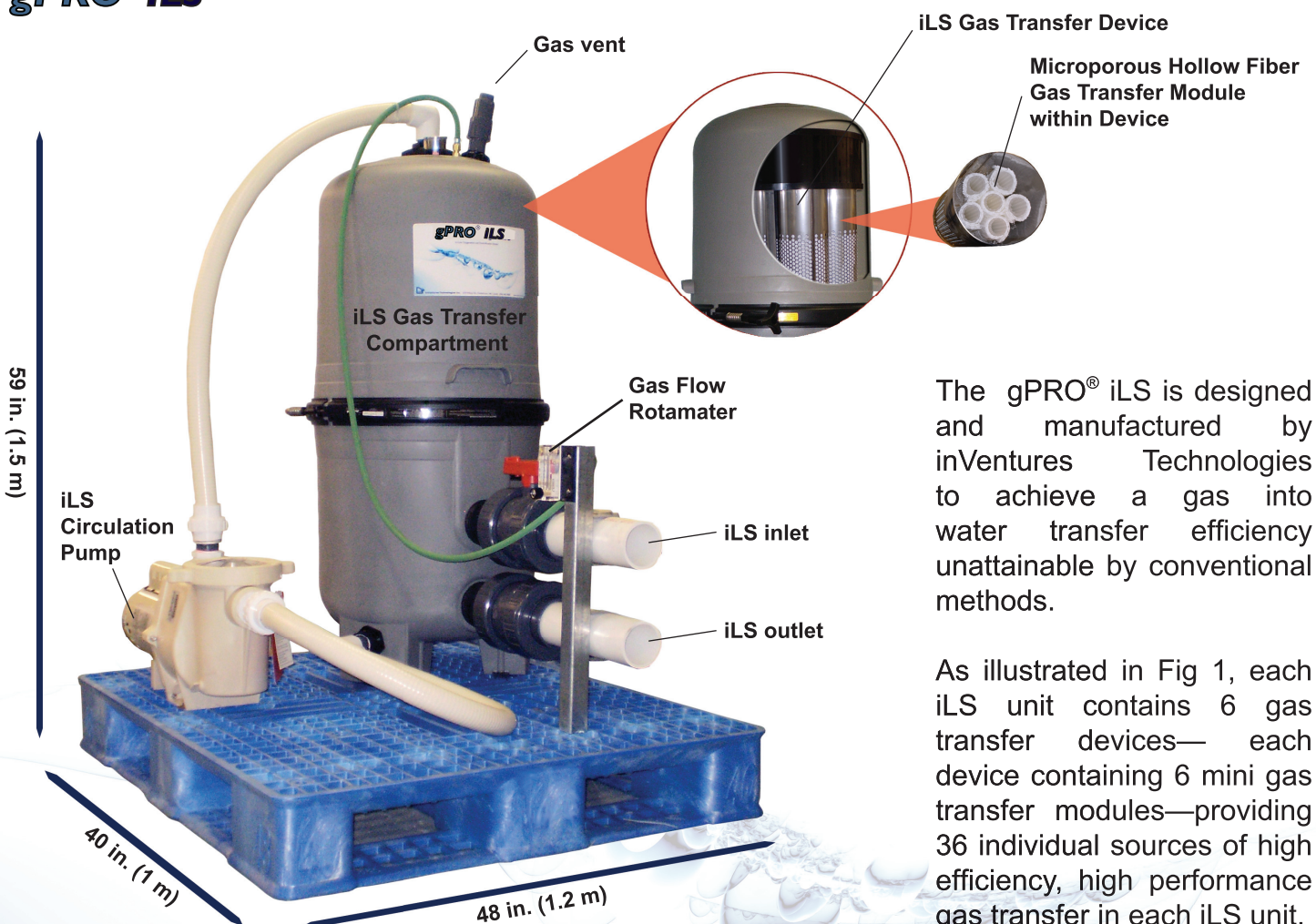
gPRO[®] iLS Controlled Atmosphere

The gPRO[®] iLS gas transfer system is unique in its ability to create and maintain stable “controlled atmospheres” in water. This patented system and technology deliver significant levels of dissolved gases for various remediation action plans.

Where oxygen is the source gas, gPRO[®] iLS creates and maintains an atmosphere in fresh and salt water of stable dissolved oxygen, at normal total gas pressures. Unlike more conventional forms of oxygenation, gPRO[®] iLS is temperature independent, and actually delivers more oxygen with higher water temperatures.

As oxygen is transferred to the water flowing through the iLS, nitrogen and other noxious gases are simultaneously removed and vented from the process. This provides more “room” for dissolved oxygen without raising the total gas pressure. gPRO[®] iLS achieves both oxygenation and nitrogen removal in one operation.

gPRO[®] iLS



The gPRO[®] iLS is designed and manufactured by inVentures Technologies to achieve a gas into water transfer efficiency unattainable by conventional methods.

As illustrated in Fig 1, each iLS unit contains 6 gas transfer devices—each device containing 6 mini gas transfer modules—providing 36 individual sources of high efficiency, high performance gas transfer in each iLS unit.

Fig 1: gPRO[®] iLS Transfer Illustration

gPRO® iLS gas transfer devices use a specially formulated microporous hollow fibre (MHF) to achieve up to 7,000 square units of gas transfer surface area per 1 cubic unit of fibre— 50 to 100 times the gas transfer ability of conventional packed towers, much higher when compared to ceramic diffusers—all without bubbles, all stable at atmospheric pressure, and all through rugged, small, in-line units.

Each iLS unit incorporates a small 240 V recirculation pump that maintains a constant flow of water across the gas transfer fibre, thus increasing transfer efficiency. This is the only power requirement as the iLS is installed in-line with process piping. The iLS will operate at the available line pressure from as little as 1 or 2 psi to ~50 psi with flows up to 200 GPM (800 LPM). The pressure drop across the iLS unit is minimal so the volume of water passing through to the receiving tanks will not be significantly affected. The higher the pressure and flow rate, the higher the oxygen transfer, as long as line pressure does not exceed 50 psi. Optimum operating pressure depends on specific operation conditions, and is determined by the balance between oxygenation and nitrogen removal, the resulting total gas pressure (TGP).

The source of oxygen can be from compressed cylinders or an oxygen generator at a pressure to the iLS of 5 to 10 psi above the maximum expected process operating pressure. The iLS comes with a gas flow rotameter to control and monitor oxygen feed to the iLS unit. A built-in, proprietary controller equalizes the gas pressure and distribution to each of the internal gas transfer devices.

Gas removed from the water by the iLS, including dissolved nitrogen, is discharged through a vent in the unit.

gPRO® iLS Performance Chart

iLS head	6ft (2m), 2.6 psi		
Temperature	10° C	N2 Inlet	
O2 Inlet	8 % sat.	O2 Usage	
Unit	kg/day	lb./day	iLS vessel
Throughput	oxygen	nitrogen	dissolved
LPM	dissolved	removed	Oxygen (DO)
800	7.81	2.79	68.83
600	7.54	2.68	86.27
400	7.04	2.48	117.65
200	5.82	1.95	189.19
100	4.35	1.47	278.93
50	2.88	0.98	367.04

Fig 2: gPRO® iLS Performance Chart

The performance chart illustrates the performance of a single iLS unit when fed water from two different sources with different operating parameters as indicated. The choice of head pressure at which the iLS is operated is controlled by the operator. The iLS creates higher oxygen output with higher pressure—however the iLS will not deliver water at a pressure higher than the feed water.

The resulting atmosphere is easily controlled to meet changing process demands by “dialing-in” one or more iLS system parameters.

There are three simple control methods for the gPRO® iLS:

Throttle back pressure with a line reduction/resistance

Pump to a higher elevation

To install a water leg, reference should be made to the “iLS System Integration” document in all cases.

gPRO® iLS Specifications

iLS recirculation pump requirements

Pentair Model #	WFE-6
Part #	011514
Voltage	208-240v 1 phase
Max Current	9.6-8.8 amps
HP	1.5 hp
O/L protection	Thermal

Water Plumbing size requirements

Inlet	3 in. (75 mm) PVC sch. 80 female socket
Outlet	3 in. (75 mm) PVC sch. 80 female socket

Regulated oxygen gas supply (O₂)

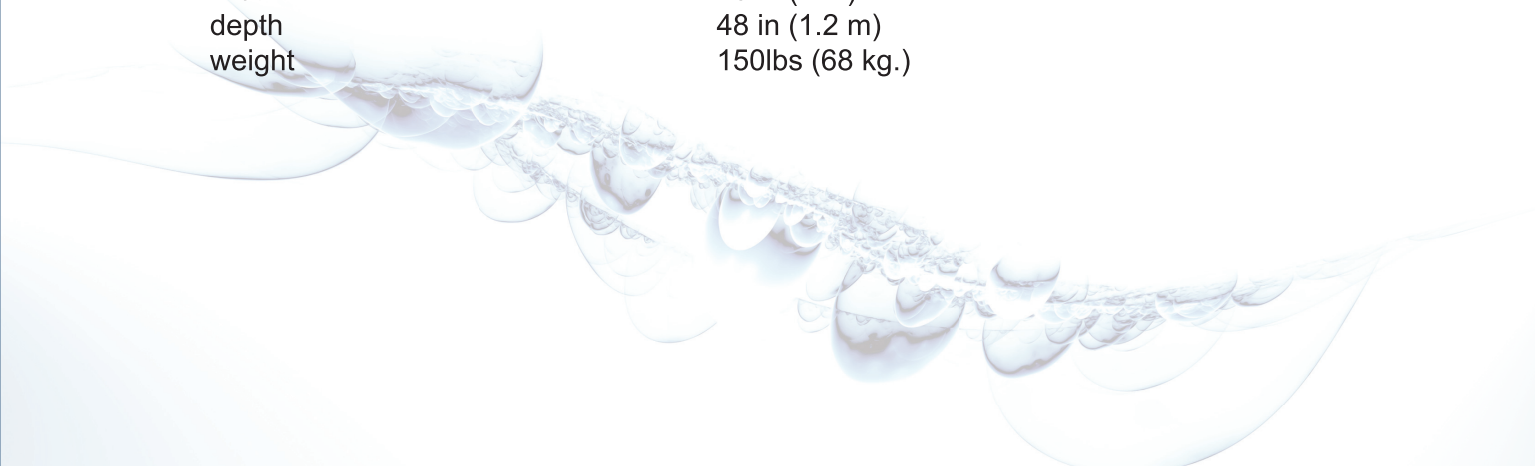
O ₂ Supply hose size	0.25 in. (6 mm) ID. Goodyear (or equivalent) grade “R”
Pressure rating	200 psig
Connection type	9/16-18 r/h oxygen type “B” male.
O ₂ regulator setting	Operational range 20-50 psi
O ₂ flow rotameter setting	Operational range 6-10 LPM.

iLS Vessel

operating pressure	0-50 psig, 15-50 psig optimum
(max container rated pressure=50 psig)	
Max Design water flow rate	200 US gpm, 800 LPM





Physical size

Height	59 in (1.5 m)
width	40 in (1 m)
depth	48 in (1.2 m)
weight	150lbs (68 kg.)

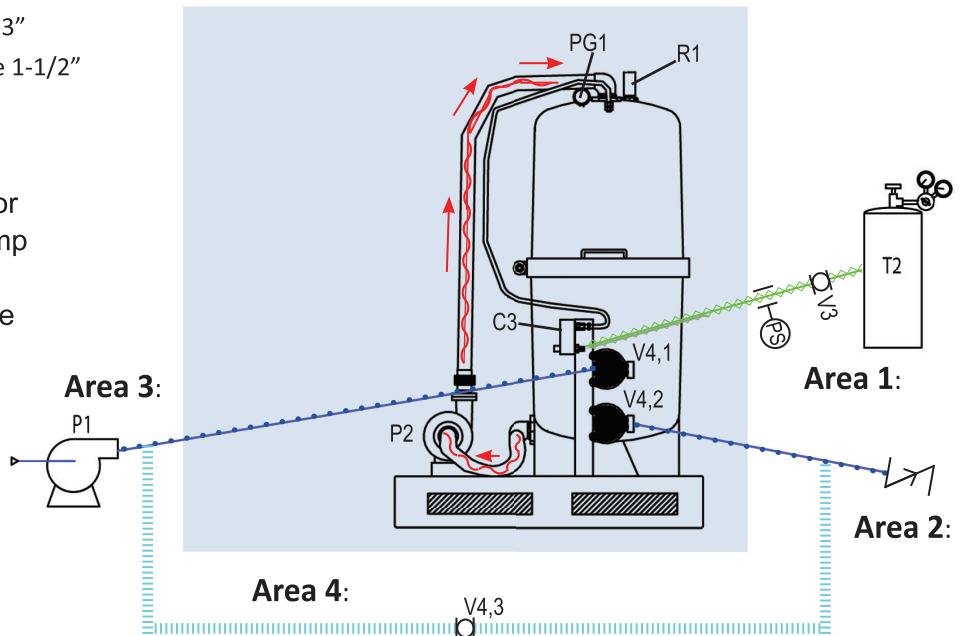


gPRO[®] iLS Specifications

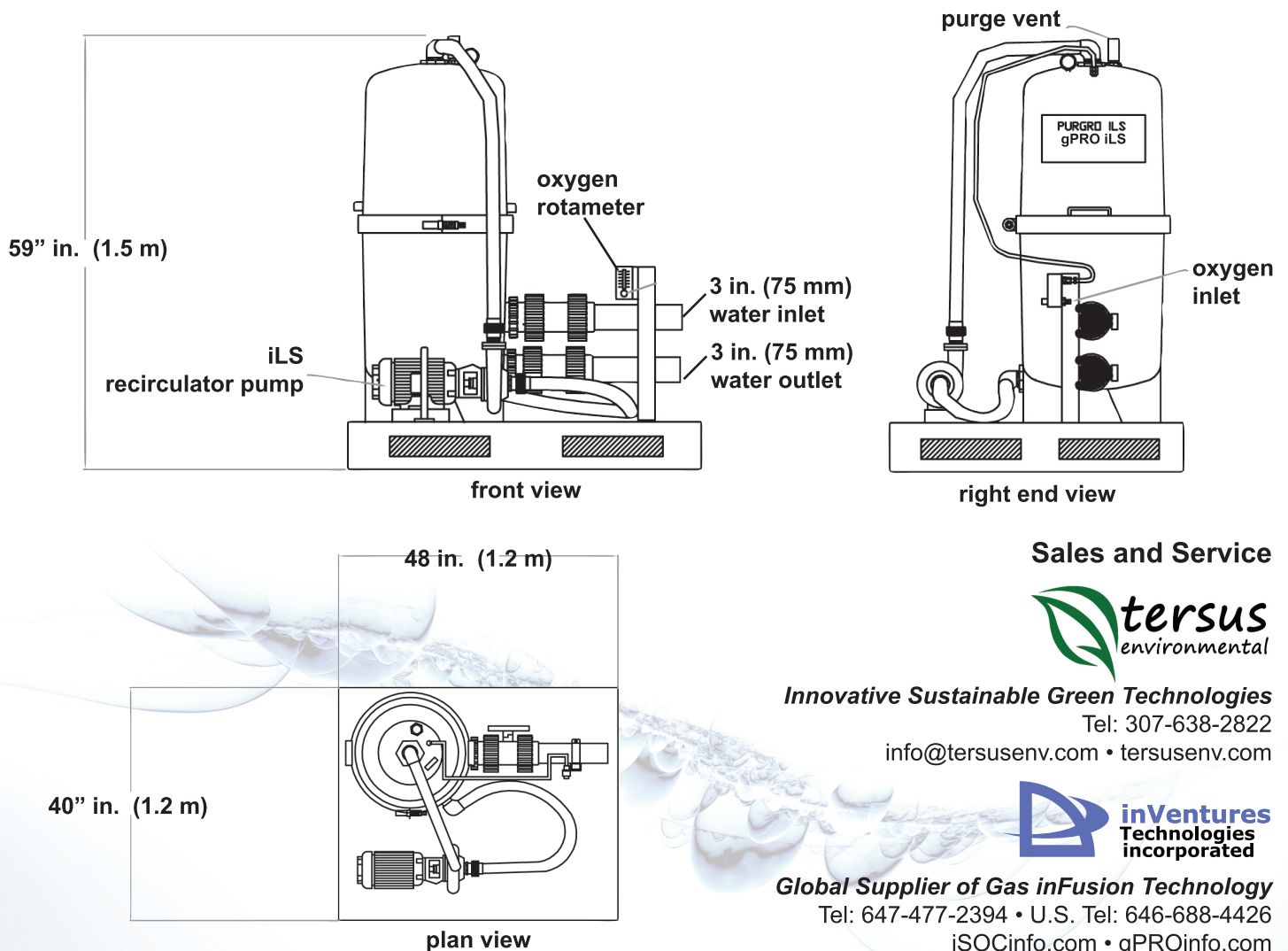
Legend

-  Process water lines 3"
-  iLS recirculation line 1-1/2"
-  gas line
-  bypass line

- T2. gas cylinder and regulator
- P1. system water supply pump
- P2. iLS recirculation pump
- PG1. operating pressure guage
- C3. rotameter w/valve
- V4. ball valve 3 in. (75 mm)
- R1. air vent valve
- PS. 20 psi pressure switch
- V3. gas shut off valve



 Unit includes everything in shaded area



Sales and Service



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