

SECTION TWO: CONCEPT AND INTENDED USE

Intermediate Surface Supply Concept:

XLDS operates as an intermediate compensated system. The XLDS system uses a specially designed 1/4" main gas umbilical assembly that reduces the weight and bulk of the umbilicals to approximately half that of the lightest assemblies normally used for surface supply diving. The umbilicals are supplied air from the RDC-2 or RDC-3 control console at pressures between 350-375 PSIG (24-26 bar) to a volume compensated pressure control system worn by the diver known as the diver worn intermediate manifold compensating regulator system (ICS). The manifold is integrated with a .8 liter accumulator and a manifold / regulator system that reduces high velocity medium pressure breathing air (350 PSIG) from the umbilical to between 155-165 PSIG and supplies it to the helmet or full face mask being used.

During inhalation, the ICS delivers breathing air to the demand helmet or full-face mask with minimal pressure drop, allowing for low inhalation effort. During the exhalation cycle, the system quickly builds pressure for the next inhalation cycle. Breathing performance of the system allows breathing rates of up to 90 RMV to depths of 100 FSW, and up to 75 RMV to depths of 132 FSW with all KMDSI helmets and band masks, and at 75 RMV to 165 FSW when using the KMDSI EXO- 26 BR. Both the positive and non-positive pressure AGA™ FFM (MK-20) can be used at work rates of 75 RMV to depths of 150 FSW.

Conventional Surface Supplied Diving:

The surface air control consoles (RDC-2 and RDC-3) can also be used as conventional air control console for demand mode surface supplied diving, with demand mode Helmets and Masks. When reference to conventional surface supplied diving is given, it refers to the RDC-2 or RDC-3 console used with standard umbilicals and over bottom tracking of supply pressures, no more than 200-250 PSIG OB. When the RDC-2 or RDC-3 consoles are used for

conventional air diving, they can regulate and control air supplies to each diver IAW the operational pressure and supply requirements dictated by the performance certified UBA being used, and IAW the recommended performance specifications as outlined in this user guide. When using with conventional 3/8" umbilicals, the RDC relief valves should be reset to relieve between 290-300 psig vice the 390-400 psig setting when using with the XLDS system.

Currently, the RDC-2 and RDC-3 are certified by Dive Lab for use with all properly maintained current production models of KMDSI Band Masks, Helmets, and Full Face Masks properly configured for conventional surface supplied diving.

When the RDC-2 or RDC-3 is used as the XLDS, the Consoles must be configured and operated with the complete XLDS system only, and only within the guidelines operational specifications of this User Guide. Only demand mode Helmets and Mask models that have been **Certified by Dive Lab** for use with the complete system should be used.

XLDS Major Subsystems:

Both the XLDS RDC-2 and RDC-3 share the same basic subsystems and components laid out in a similar fashion. These include:

- High Pressure Supply System
- Rapid Deployment Control Console (RDC)
- 1/4" Ultra Light Umbilicals
- Intermediate Manifold Compensating System (ICS)
- Emergency Gas System (EGS)
- Performance Certified UBA Helmet / Full Face Mask System

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Danger: All Divers using the XLDS and associated man worn equipment must be medically fit. All users must have a current diving medical exam by a physician knowledgeable in the requirements of diving physicals.

Danger: The XLDS, RDC-2 and RDC-3 must only be configured, and used as outlined in this Guide. Failure to follow the instructions in the Guide may result in serious injury or death.

Warning: The Lightweight System must only be used with properly maintained and serviced Helmets, Masks, and **Emergency Gas Systems** and support equipment as outlined in this User Guide.

Danger: Only persons properly trained in the practice of surface supplied diving and surface supplied diving operations should use this equipment. Failure to have proper training and experience could result in injury or death.

Danger: The XLDS-RDC-2, and XLDS-RDC-3 high-pressure systems should not be used with pure oxygen or oxygen enriched breathing gases with an oxygen percentage greater than 21% by volume. Use of oxygen or oxygen enriched breathing gases in the high-pressure systems may result in fire or explosion resulting in serious injury or death.

High Pressure Supply:

The High-Pressure Supply System is for air diving only and is not designed or intended for breathing gases with an oxygen content greater than 21% oxygen by volume, however, the System has provisions for integration of pure oxygen for in water decompression using a separate oxygen regulated System (optional) that can be interfaced with the reduced pressure Manifold. The Oxygen System is intended for use to a maximum depth of 50 FSW for decompression purposes only.

The HP air supply system can use a variety of supply sources but should only be supplied with breathing quality air via high-pressure Cylinders or breathing air sources at supply pressures of 400 PSIG or greater, capable of supplying the HP Regulators with at least 500 LPM. Typical air supply sources include standard single or double SCUBA Cylinders, Fire Fighting Cylinders and/or any high-pressure supply up to 4350 psig if DIN fittings are in use.

The standard High-Pressure Air Supply System for both the RDC-2 and RDC-3 for each diver circuit consists of two SCUBA "A" Yokes or DIN connections with Bleed Valves and short (12"-18") Whips. Each set of Yokes sends air via the short Whips to a isolation valve on a small Junction Block used for supply, isolation, and air switching. From the Junction Block, air travels via a 6' to 25' long Whip to the console pressure Regulators. On the RDC-3 the third diver, (Yellow Diver) is the standby.

Each HP supply system quickly connects to the Regulator Inlets through the use of 72" long Whips using either O-ring fittings, or #4 37° AN fittings. All standard high-pressure air control components with the exception of the SCUBA Yokes and DIN fittings are rated for 5000 PSIG service. The SCUBA Yokes have a maximum working pressure of 3500 psig and the DIN fittings are rated for 4350 psig. Other configurations of supply whips, and fittings are available. The flow capability of the high-pressure system enables standard SCUBA Cylinders to be

used as low as 380 PSIG before Cylinder switch-out is necessary. Other supply whips and configurations can be used providing they can provide the proper volume.

Typical High Pressure Assemblies



Special Purpose High Pressure Assembly



High Pressure Assembly with gas storage cylinders



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