



Regulator User's Guide

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Hollis Regulator Users' Guide, Doc. No. 12-4014
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PATENT NOTICE

U.S. Patents have been issued to protect the following design features: Orthodontic Mouthpiece (U.S. Patent No. 4,466,434) and Second Stage Regulator Depth Compensating Adjustment Mechanism (U.S. Patent No. 5,660,502).

LIMITED WARRANTY

For details, refer to the Product Warranty section on the Hollis web site:

www.hollisgear.com

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Introduction

This User's Guide describes the unique functions and features of Hollis Regulators and various optional accessories. The more acquainted that you become with your new regulator, the more you will enjoy your diving experience. By following the instructions in this guide, you will understand how your Hollis Regulator works, how to make best use of its features and how to ensure it is set up best for your needs.

All Hollis products are constructed with the highest quality materials and utilize the latest computer aided design and manufacturing techniques to ensure their highest performance and reliability.



WARNING: This indicates a potential hazardous situation which, if not avoided, may result in serious injury or death.



CAUTION: This denotes instances that if not handled properly could result in damage to the equipment.

NOTE: Represents important information.



WARNINGS:

- **It is essential that the diver read this guide to familiarize themselves with the proper setup, care, and use of any Hollis Regulator models. If the instructions given in this guide are not understood and followed, possible injury or death may result.**
- This regulator product is intended for use by divers who have successfully completed a nationally recognized course in scuba diving.
- It must not be used by untrained persons who may not have knowledge of the potential risks and hazards of scuba diving.
- This Regulator must be used together with an instrument that measures and indicates the user's air supply pressure.
- As with all underwater life support equipment, improper use or misuse of this product can cause serious injury or death.
- Read and understand this User's Guide completely before diving with any Hollis regulator.
- If you do not fully understand how to use your new Hollis Regulator, or if you have any questions, you should seek instruction in its use from your Authorized Hollis Dealer before using.
- Before each dive inspect and test this regulator for proper operation. If any part does not function properly, **DO NOT USE!**
- Air Supplies used with the regulators must meet requirements for breathable air Grade E in the U.S.A. or EN 12021 Annex A standards in Europe.

NOTE:

For English Speaking European Countries (Only)

- Regulator Serial Numbers give indication of the Year of Manufacture
- Regulator Second Stage Mouthpiece material is not known to cause adverse effects.

Hollis promotes responsible diving practices and does not advocate diving beyond the limits of one's training and experience level, Hollis regulator equipment is designed to offer continued safe and reliable performance in the event the need arises and the recreational diving limits are exceeded. Hollis regulators are CE certified.

Statement For Hollis Regulator Equipment Compatibility for Use with Nitrox and O₂

Accept for specifically designed and labeled models, Hollis Regulator equipment is classified as being suitable for use with nitrogen-oxygen (Nitrox) breathing gas mixtures containing up to 40% oxygen by volume without the need for special preparation, cleaning, or component parts.

If Hollis Regulator equipment is subsequently used with equipment, or connected to an air supply system, that is not rated for Oxygen Service, it can subsequently be used with Nitrox (up to 40% O₂) as long as it is maintained in accordance with the procedures and parts specified in the Hollis Product Service Guide.

NOTE: (for EEC Countries)

Hollis offers regulators designed for dedicated enriched air use above 40 % oxygen by volume as well as for 100% oxygen that meets the requirements of EN 144-3 and EN 134949.



WARNINGS:

Hollis Regulators are not intended to be used by untrained persons who may not know the inherent risks and hazards of SCUBA diving.

Prior to use of Hollis Regulator equipment with nitrogen-oxygen (Nitrox) breathing gas mixtures that contain a higher fraction of oxygen than 21%, the user must have received, or must first obtain, certification in diving with Nitrox from a recognized training agency.

Diving high oxygen by volume mixtures without appropriate knowledge or practices can be extremely harmful and may lead to death.

A Hollis Regulator is not a medical device. It is not intended and must not be used to supply treatment oxygen in a medical emergency.

SCUBA complying with EN 250 is not intended for more than one user to breathe from at a time.

If SCUBA is configured and used by more than one diver at the same time, then cold water and breathing performance may not fulfill the requirements of EN 250.

Hollis 210 Oxygen with HO2 Regulator

The Hollis 210 Oxygen with HO2 Regulator is designed for use with nitrogen-oxygen breathing gas mixtures (nitrox) that can contain up to 99% oxygen by volume as well as for 100% oxygen. Divers who intend to use breathing gases containing high levels of oxygen by volume must have appropriate technical training in Enriched Gas diving beyond that of Recreational Nitrox use from a nationally recognized training agency (i.e. training in Advanced Nitrox Diving) .

Hollis 210 Oxygen with HO2 Regulators are prepared for Oxygen Service when sealed and shipped from the factory. If Hollis 210 Oxygen with HO2 Regulators are subsequently used with equipment, or connected to an Air supply system, that is not rated for Oxygen Service, it cannot subsequently be used with Nitrox breathing gases containing more than 40% oxygen by volume unless it is again prepared for Oxygen Service by a Qualified Hollis Dealer Facility who is certified in and follows Hollis Oxygen Service Procedures.

NOTE:

The term breathing gas used throughout this owner's guide applies to enriched nitrogen-oxygen (Nitrox) mixtures, compressed Air, and/or Oxygen (for select models).

When using Air with this regulator equipment, the Air supply must meet the requirements of EN 12021

Statement for Cold Water Diving



WARNINGS:

Failure to obtain proper training in the specialized techniques required for diving in cold water environments and failure to apply such techniques to situations that could result in Regulator freezing will place you in risk of serious injury or death.

Failure to use a First Stage that is properly prepared for use in harsh environmental conditions, such as the possible buildup of ice, may result in serious injury or death.

Hollis Diaphragm Regulators

Due to operational limits, use in waters having extremely cold temperatures below 38°F (3.3 °C) requires Hollis Diaphragm style First Stages fitted with an Environmental Protection Kit to prevent the possible buildup of ice crystals in the Spring Cavity. The Environmental Protection Kit (standard on all Hollis Diaphragm Regulators) seals all sensitive components from icing.



WARNING:

Removal or installation of an Environmental Protection Kit must be performed by an Authorized Hollis Dealer. Improper Installation may cause First Stage failure while underwater resulting in serious injury or death.

Hollis Piston Regulators

Hollis Piston regulators are CE certified for use in 38°F (3.3 °C) water. Due to the inherent design of Hollis Piston style First Stages, they cannot be specially prepared to accommodate the operational limits imposed by waters having extremely cold temperatures below 38°F (3.3 °C). Hollis therefore recommends the use of Diaphragm style First Stages fitted with Environmental Protection Kits when diving in extremely cold water.

First Stage Recommendations

Regulator	Above 38°F / 3.3°C	Below 38°F / 3.3°C
Diaphragm with Environmental Protection Kit	YES	YES
Unbalanced Piston	YES	NO

NOTE on Second Stages:

Specialized training and skill's required for cold water diving can reduce effects that cold water temperatures can impose upon the operation of Hollis Regulator Second Stage(s).

First Stage Prep and Attachment



WARNING:

Under no circumstances should adjustment of a Hollis first stage regulator be performed by anyone other than an Authorized Hollis Regulator Technician. Doing so will void the warranty and may cause failure underwater, resulting in serious injury or death.

Attachment of Hoses:

Low pressure (LP) and high pressure (HP) port thread sizes are different, making incorrect installation of hoses unlikely. However, to avoid damage or personal injury that may occur due to incorrect installation, Hollis strongly recommends having hoses installed professionally by an Authorized Hollis Dealer. If this is not possible, proceed as follows.

Type of Hose Being Connected:

Determine whether the hose that you are installing requires connection to an HP port (for a pressure gauge or breathing gas integrated computer), or to an LP port (for an octopus second stage, BC, or dry suit inflator). Be sure that you only place high pressure accessory hoses in ports specifically marked with the letters 'HP', or '4500 psi / 300 BAR'.



WARNING:

Only attach hoses and accessories that are properly prepared for oxygen service to a Hollis O2 Regulator First Stage when being used with nitrox breathing gases containing more than 40% oxygen by volume. Using hoses and accessories not properly prepared for such use may result in combustion, equipment damage, and personal injury.

Orientation (positioning):

Hollis has a variety of regulator First Stage designs. Each of these offer many positioning options in terms of hose routing and body orientation. Models with hose ports designated with an "R" offer the best air flow and are intended for use with the primary second stage. Choose the orientation that best suits your needs and preference. As experience and gear configurations change, you may find new hose positioning to be optimal for the style of diving being pursued.

Installing Hoses:

After having determined the type of hose and preferred orientation –

- Remove the port plugs from those ports to be used by turning them counter clockwise with a 5/32" hex key. Save the port plugs for possible future use.
- Lightly lubricate the hose-end threads and o-ring with Tribolube 71 or Christo-Lube MCG111 lubricant (silicone grease is acceptable only if the regulator is not intended for use with nitrox).
- Thread the hose clockwise into the port until secure, and then tighten it with an open end wrench of the appropriate size to a torque of 40 in-lbs.
 1. Second stage - 9/16" wrench
 2. LP inflator - 9/16" (or 1/2") wrench
 3. HP gauge or integrated computer - 5/8" wrench
- After all hoses are connected, test the complete regulator assembly by attaching it to an appropriate tank, pressurizing the system, and carefully listening for leakage of breathing gas.

Removal of Hoses:



At least one second stage must be connected to the first stage to facilitate purging of breathing gas from the first stage whenever the first stage is attached to a tank. Do not attempt to remove the first stage, any port plugs, or hoses before purging the regulator of pressure. Doing so may cause bodily harm, damage to the equipment, and/or damage to other property.

To remove a hose from the first stage -

- Loosen and remove the hose by turning it in the counter clockwise direction with an open end wrench of the appropriate size.
- Lightly lubricate the threads and o-ring of the port plug.
- Thread the port plug clockwise into the port and tighten to a torque of 40 in-lbs using a 5/32" hex key.
- Test the assembly by attaching it to an appropriate tank, pressurizing the system, and listening for leakage.

Regulator Attachment to a Tank:



Maximum working pressure for a Hollis Yoke Style Connector is 3500 PSI / 232 BAR and for a DIN style connector is 4500 PSI / 300 BAR.

Yoke Style Connector



Fig. 1.1 Yoke Style Connector

Before attaching the Regulator to the tank:

- Slowly open then close the tank valve for a second to allow a momentary flow of breathing gas to blow any moisture or contaminants from the breathing gas opening in the tank valve.
- Examine the sealing o-ring located on the tank valve to ensure that it is not cut, frayed, or deteriorated. Replace the o-ring if it is damaged.

To attach the Regulator to the tank:

- Remove the dust protector from the yoke by turning the easy-grip yoke knob in a counter clockwise direction.
- Place the yoke connector over the tank valve, positioned with the seating surface against the valve o-ring.
- Turn the easy-grip yoke knob clockwise until secure (see Fig. 1.1). **DO NOT** over tighten!
- Slowly open the tank valve (with the pressure gauge facing away from you).
- Momentarily purge the second stage, and then listen to ensure that no breathing gas is leaking from the regulator/tank connection.
- If any leakage is observed, repeat the attachment procedure and inspect the sealing o-ring. If gas still leaks, **DO NOT USE!** Take the regulator and tank to an Authorized Hollis Dealer for inspection and service.

If you wish to use your regulator on a DIN tank, have your Authorized Hollis Dealer convert the first stage with a Hollis DIN Conversion Kit following the procedures given for the specific regulator first stage in the current Hollis Product Service Guide.

To remove the Regulator from the tank:

- Close the tank valve and purge all breathing gas from the regulator system by depressing the purge button of the second stage regulator. Ensure that all pressure has been purged.
- Turn the easy-grip yoke knob counter clockwise to loosen and lift the first stage off the tank valve (see fig. 1.1).
- Prevent water from entering the first stage. **DO NOT** blow breathing gas near a first stage that does not have the dust protector in place.
- Dry the dust protector, position it within the yoke, and secure it by tightening the yoke knob.

DIN Wheel Style Connector

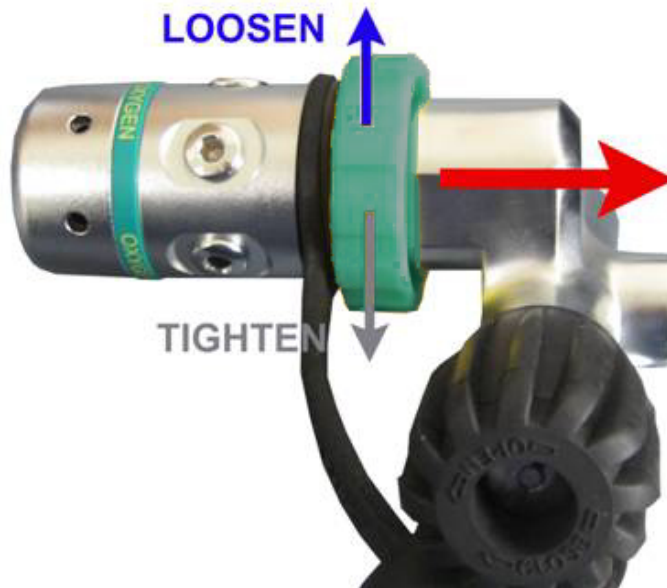


Fig. 2.1 DIN Wheel Connector

Before attaching the regulator to the tank:

- Slowly open then close the tank's valve for a second to allow a momentary flow of breathing gas to blow any moisture or contaminants from the gas opening in the tank valve.
- Examine the threads in the valve to ensure they are clean and free of burrs or defects that could damage the threads of your regulator DIN fitting.

To Attach the Regulator to the tank:

- Remove the protector cap from the threads of the regulator DIN connector wheel, and examine the threads and sealing o-ring. Replace the o-ring if it is damaged.
- Using care not to cross the threads, thread the DIN connector wheel clockwise into the cavity of the tank valve until it is secure (see fig. 2.1).
- Slowly open the tank valve (with the pressure instrument facing away from you) and listen to ensure that no breathing gas is leaking from the regulator/tank connection.
- If any leakage is observed, repeat the attachment procedure and inspect the sealing o-ring. If breathing gas still leaks, **DO NOT USE!** Take the regulator and tank to an Authorized Hollis Dealer for inspection and service.

To remove the Regulator from the tank:

- Close the tank valve and purge all breathing gas from the regulator system by depressing the purge button of the second stage regulator. Ensure that all pressure has been purged.
- Turn the DIN connector wheel counter clockwise to loosen and remove the first stage from the tank valve (see fig. 2.1).

- Prevent water from entering the first stage. **DO NOT** blow breathing gas near a first stage that does not have the dust protector in place.
- Dry the dust protector and place the protector cap on the threads of the regulator DIN connector wheel.

If you wish to use your regulator on a standard tank, have your Authorized Hollis Dealer convert the first stage with a Hollis USA Yoke Conversion Kit following the procedures given for the specific regulator first stage in the current Hollis Product Service Guide; or install a Hollis DIN to USA Converter Yoke.

Hollis DIN to USA Yoke Converter

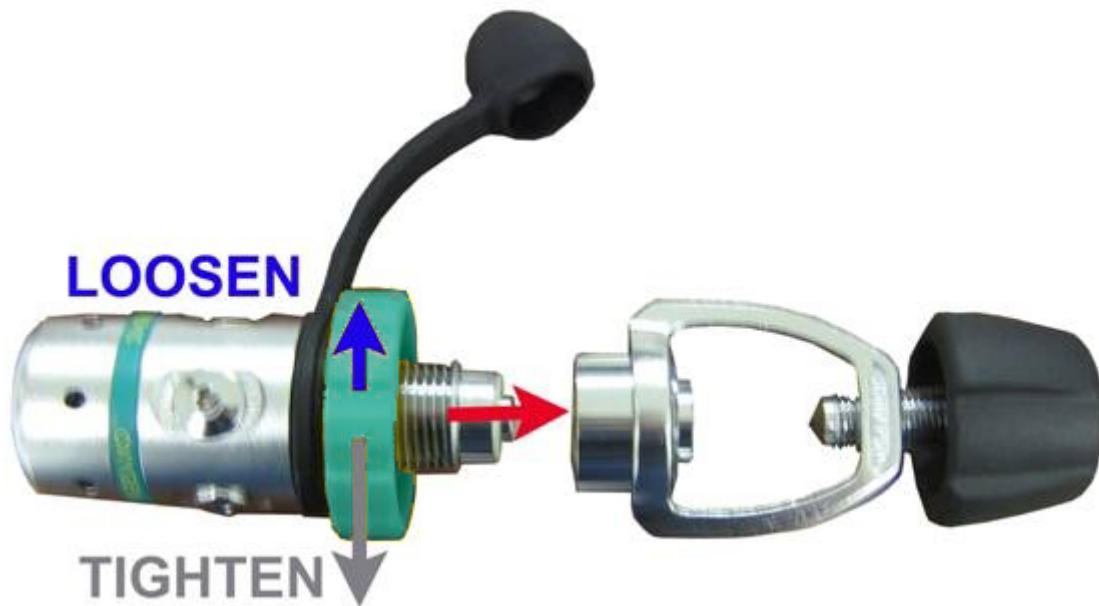


Fig. 3.1 DIN to USA Yoke Converter



WARNING:

The DIN to USA Converter is specifically designed for use with Hollis brand first stages. Although it may fit other brand first stages, it was not designed to do so or tested for use with other brands. Under no circumstances should the Hollis DIN to USA Converter be used with any other first stage than a Hollis model.

To install the DIN to USA Yoke Converter:

- Remove the protector cap from the threads of the regulator DIN connector wheel and examine the threads and sealing o-ring. Replace the o-ring if it is damaged.
- Using care not to cross the threads, thread the DIN to USA Yoke Converter clockwise onto the first stage DIN connector wheel until it is secure (see fig. 3.1).

DO NOT use tools to tighten. The DIN to USA Yoke Converter should thread without resistance and needs only to be finger tight.

Before attaching the Regulator to the tank:

- Slowly open then close the tank's valve for a second to allow a momentary flow of breathing gas to blow any moisture or contaminants from the gas opening in the tank valve.
- Examine the threads in the valve to ensure they are clean and free of burrs or defects that could damage the threads of your regulator DIN fitting.

To attach the Regulator to the tank:

- Remove the dust protector from the yoke by turning the easy-grip knob in a counter clockwise direction.
- Place the yoke connector over the tank valve, positioned with the seating surface against the valve o-ring (see fig. 1.1).
- Turn the easy-grip yoke knob clockwise until secure.
- Slowly open the tank valve (with the pressure gauge facing away from you) and listen to ensure that no breathing gas is leaking from the regulator/tank connection.
- If any leakage is observed, repeat the attachment procedure and inspect the sealing o-ring. If breathing gas still leaks, DO NOT USE! Take the regulator and tank to an Authorized Hollis Dealer for inspection and service.

To remove the Regulator from the tank:

- Close the tank valve and purge all breathing gas from the regulator system by depressing the purge button of the second stage regulator. Ensure that all pressure has been purged.
- Turn the easy-grip yoke knob counter clockwise to loosen and lift the first stage off the tank valve (see fig. 1.1).
- Prevent water from entering the first stage. **DO NOT** blow breathing gas near a first stage that does not have the dust protector in place.
- Dry the dust protector, position it within the DIN to USA Yoke Converter, and secure it by tightening the yoke knob.

To remove the DIN to USA Converter:

- While holding the DIN connector wheel firmly, turn the DIN to USA Yoke Converter counter clockwise off the threads of the first stage DIN connector (see fig. 3.1). DO NOT use tools to remove.
- Place the protector cap on the threads of the regulator DIN connector wheel.

Regulator Second Stage Use and Operation



WARNING:

Even if your First Stage is properly prepared for use in harsh environmental conditions, only proper training will protect your Second Stage from the effects of the environment.

Features and Operation

The Second Stage of the regulator assembly receives breathing gas at an intermediate pressure of approximately 140 psi (9.7 bar) from the first stage and delivers it to you at ambient pressure during inhalation. When you stop inhaling, it then shuts off the flow of breathing gas and provides a path for exhaled gas. All Second Stage regulators have a level of sensitivity that can result in excess breathing gas being expelled when the Second Stage is not in your mouth while in the water. When this occurs, it is usually during entry or when on the surface. This condition, referred to as free-flow, can usually be stopped by turning the Second Stage so the mouthpiece is pointing down and the purge button is pointing up. It is recommended to carry an Octopus with the mouthpiece facing down when not in use, or to use a mouthpiece plug or cover to prevent free-flow in the event that it is bumped.

During normal use underwater, a small amount of water can collect inside the body of a standard regulator in a natural reservoir near the bottom. This is normal for most second stages, and the water is held away from your mouth naturally and will go unnoticed unless you become inverted or do subaquatic somersaults at which time you may experience temporary 'wet breathing'. Water can be purged from the small internal air space of most second stages by exhaling a small puff of breathing gas into the mouthpiece, or by blocking the mouthpiece with your tongue and pressing the front mounted purge button to initiate a flow of breathing gas.

Hollis 212 Series (with Dynamic Adjustment and Venturi Assist)



Fig. 4.1 212 Series

Pre-Dive Switch:

The Hollis 212 Series features a Pre-Dive / Dive switch is located on the side of the body.

- Placing the switch in the forward (“-” / Pre-Dive) position reduces, or eliminates, the possibility of high volume free-flow when the mouthpiece is not in your mouth.
- Placing the switch in the backward (“+” / Dive) position provides optimum performance during a dive.

Dynamic Adjustment Knob:

The 212 Series provides a breathing effort adjustment (knob on the side of the body) that enables you to adapt breathing performance to different diving conditions.

- By turning the adjustment knob 'clockwise' breathing resistance (effort) is increased. This is done to prevent undesirable loss of breathing gas (free flowing) that often occurs when a high performance regulator second stage is connected as an octopus second stage, or when the primary second stage is not in the diver's mouth, such as when surface snorkeling.
- Turning the adjustment knob 'counter clockwise' decreases breathing resistance and reduces work of breathing.



WARNING:

Adjustment should be used to improve performance; it should not be used as a method to use less breathing gas. Attempting to do so will increase the urge to breathe more frequently, interfere with proper respiration, and may lead to hyperventilation, or injury. During periods of heavy exertion underwater, and to compensate for the effects of depth, it is advantageous to have a regulator that is properly maintained and set to provide minimal inhalation resistance and optimal performance when desired.

Guidelines for 212 adjustments (Dynamic adjustment knob):

Normal Pre Dive Setting -

- To set the 212 to an average breathing resistance, 1 to 1 1/2 column inches of water (common factory setting), attach the first stage to an appropriate cylinder and open the valve to pressurize the regulator.
- Rotate the adjustment knob 'counter clockwise' until leakage is heard, then rotate the knob clockwise 1/2 to 1 turn.

High Flow Setting -

- When diving deep or during other periods of heavy exertion, it is desirable to make the 212 breathe as easy as possible. This setting should be used only when necessary to avoid loss of air that may occur due to the 212's extra sensitivity at this setting.
- To adjust the 212 for minimum breathing resistance, rotate the adjustment knob 'counter clockwise' until a slight flow of air begins, then rotate the knob 'clockwise' until the flow stops.
- Frequently monitor your air supply when the 212 is adjusted for maximum flow.

Preventing Air Loss -

- To prevent free-flow when the 212 is out of your mouth, or when connected as an octopus second stage, rotate the adjustment knob 'clockwise' several turns. At the surface, place the 212's Pre-Dive / Dive switch in the left (-) position (Pre-Dive) to reduce, or eliminate, free-flow.
- Remember, increasing inhalation resistance can prevent undesirable air loss. It will not conserve air while you are breathing from the 212.

Storage Setting -

- At the conclusion of a diving day, or when storing the 212 for any length of time, rotate the adjustment knob 'counter clockwise' until it stops. This relieves excess spring pressure from the poppet seat increasing its service life.
- Immediately prior to the next dive, reset the adjustment to the normal pre dive setting by turning the adjustment knob 'clockwise' 1/2 to 1 turn.

Hollis 221/321 Series (with Venturi Assist)

These models are downstream demand valve second stage regulators. They provide breathing gas as you demand it with low inhalation resistance. Breathing effort is factory set to the average performance level required by most divers. They are provided with front-mounted purge buttons, orthodontic designed mouthpieces, and a Pre-Dive / Dive Switch.

Pre-Dive Switch:

The Hollis 221/321 Series features a Pre-Dive / Dive switch located on the side of the body (see image of the same feature on the 212 fig. 4.1).

- Placing the switch in the forward (“-“ / Pre-Dive) position reduces, or eliminates, the possibility of high volume free-flow when the mouthpiece is not in your mouth.
- Placing the switch in the backward (“+” / Dive) position provides optimum performance during a dive.

NOTE:

If these second stages are shipped from the factory specifically as an Octopus, the inhalation effort is set slightly higher to reduce sensitivity.

Hollis 210 Oxygen Series

These models are downstream demand valve second stage regulators that are lighter and smaller than most other primary second stages. They provide breathing gas as you demand it with low inhalation resistance. Breathing effort is factory set to the average performance level required by most divers. This eliminates any need for knobs or switches to adjust breathing inhalation. They are provided with front-mounted purge buttons and orthodontically designed mouthpieces. These regulators were designed specifically for Decompression Tank Rigs, and as such are prepared for use with breathing gas mixtures (nitrox) that can contain up to 99% oxygen by volume as well as for 100% oxygen. Please see “Statement For Hollis Regulator Equipment Compatibility for Use with Nitrox and O₂” section of this guide for further details.

NOTE:

These Second stages are shipped from the factory specifically for use as Decompression Regulators and their Inhalation effort is precisely set at the factory to balance good breathing characteristics while at the same time preventing loss of gas from over sensitivity.



WARNING:

Hollis O₂ Service Regulators must be maintained in an oxygen clean state for safe use with gasses containing more than 40% oxygen by volume. Refer to the “Statement for Hollis Regulator Equipment Compatibility for Use with Nitrox and O₂” for more details.

Hollis 410 Series (Alternate / Inflator)



Fig. 5.1 Hollis 410

The Hollis 410 Series works as both a secondary regulator and a BC power inflator.



WARNING:

The operation and protocol of use of the Hollis 410 is different than a standard BC power inflator and standard alternate/octo regulator. Be sure to read and understand the instructions in this guide describing how the Hollis 410 system operates before attempting to dive with it. If you do not fully understand its proper use after reading this guide, DO NOT USE, consult your Authorized Hollis Dealer for further instruction before use. Improper use could lead to injury or death.

DO NOT attempt to remove (or install) the Hollis 410 from (on) a BC. Improper installation may cause misoperation or BC failure underwater, possibly resulting in serious injury or death. It will also void the warranty.

Compatibility and Installation:

The Hollis 410 Series Regulator/Inflator System is designed for-

- Minimum working pressures of 120 PSI (8.3 BAR)
- Nominal working pressures of 140 PSI (9.5 BAR)
- Maximum working pressures of 160 PSI (11 BAR)

The Hollis 410's low pressure inflator hose is compatible with all Hollis first stage regulators. It may not be compatible with other manufacturers' first stages (thread size = 3/8-24 UNF). Have your Hollis 410 installed on your BC, and the low pressure inflator hose attached to your regulator first stage, by an Authorized Hollis Dealer.

Connect the quick disconnect (QD) end of the inflator hose to the Hollis 410 using the QD coupling. To attach it, grasp the coupling on the end of the inflator hose between the palm of your hand and fingers, and pull back the coupling release with your thumb and forefinger. While holding back the coupling release, press it onto the quick release fitting

on the Hollis 410, and let go of the coupling release while continuing to hold the hose onto the quick release fitting. Ensure they are firmly attached prior to pressurizing the regulator/inflator system.

Operating Buttons:

The three operating buttons, one located on each side of the mouthpiece and one above the mouthpiece, can be differentiated by look, position, and tactile feel. Become familiar with their use to minimize the possibility of confusion (see fig. 5.1).

- Top-regulator purge button (purges water from regulator when pressed)
- Left-power inflator button (inflates Buoyancy Device)
- Right-manual inflator/deflator button

Corrugated Hoses/Pull Connector:

Two corrugated hoses are joined by a Pull Connector. By pulling on the rounded Pull Connector you can operate the Rapid Exhaust Valve located in the upper (shoulder) unit while you are using the 410 Regulator without having to remove the regulator from your mouth. The extended length of the Hose Assembly prevents any resistance during head movement.

Inflator Overpressure Relief Valve (OPV):

The 410's integrated OPV, located in the upper (shoulder) unit, automatically vents excess pressure from the BC during ascent or if over pressurized with the Power Inflator. This component of the 410 operates automatically so no instructions for its use are necessary.



WARNING:

The OPV integrated into the upper (shoulder) unit is set to operate at a lower relief pressure than the OPV located on the back of the BC to prevent damage to the material of the BC air cell. It is imperative that only Hollis inflator assemblies be used with Hollis BCs.

Quick Disconnect Cap:

The rubber cap secured to the corrugated hose is provided to cover the quick release inlet fitting of the 410 Power Inflator Assembly. The cap must be installed any time the Inflator Hose is disconnected to prevent entry of contaminants.

Inflator Operation



WARNING:

If you ever hear air, or see bubbles, escaping from the area around any of the 410's connectors, or if the BC fails to hold air, immediately terminate or postpone the dive until the BC and 410 can be serviced by an Authorized Hollis Dealer. You must not dive with a 410 or BC that exhibits any signs or symptoms of leakage.

BC Inflation Using the Power Inflator:

With the regulator connected to an appropriate cylinder, slowly open the cylinder valve to pressurize the Regulator/Inflator system. Press the Power Inflator Button, located on the left side of the 410 Mouthpiece, until you hear air flowing into the BC. Minor compressions of the Power Inflator Button will initiate airflow into the BC and allow small adjustments in buoyancy.



WARNING:

If you depress the Power Inflator Button fully, the BC will inflate rapidly. Be careful not to over inflate the BC during a dive causing an unwanted rapid rise toward the surface.

Test the Power Inflator and Overpressure Relief Valve (OPV) prior to each dive to ensure they are functioning properly. Depress the Power Inflator until the BC fills completely, forcing the OPV in the upper (shoulder) unit to open. You will hear the sound of air venting from the OPV, indicating that it is working properly. While the BC is still inflated, listen for any undesired air leakage around the 410. The BC should stay inflated until you deflate it manually.

BC Deflation Using the Rapid Exhaust Valve (REV):

The Rapid Exhaust Valve (REV) is located inside the upper (shoulder) unit of the Inflator Assembly. It is connected to the lower (power) unit by two cables located inside the Corrugated Hose and coupled together inside the Pull Connector.

The REV is operated by grasping the Pull Connector or the lower (power) unit and pulling it down (away) from the upper (shoulder) unit. The Cables pull the exhaust Valve open, venting air from the BC through the vents of the upper unit of the Inflator Assembly. The amount of air vented depends on how far open the exhaust Valve is, the distance you pull the inner Cable, and how long the Exhaust Valve is open. Short tugs vent small amounts of air for minor changes in buoyancy, and a long pull will vent the entire BC in a matter of seconds.

Use of the REV eliminates water entry even if the Exhaust Valve remains open after after all air is vented from the BC.

BC Inflation Using the Manual Inflate/Deflate Button:

The Round Button located on the right side of the Mouthpiece is an Inflate/Deflate manual actuator that allows air flow in to, or out of, the BC. To inflate orally, place the Mouthpiece in your mouth, and once you begin (and continue) to blow in, press the button with your thumb. This procedure purges the mouthpiece cavity of water, resulting in less water entering the BC, prolonging Bladder life. Once the water is purged be sure to depress the button completely to prevent further air loss through the regulator's exhaust valve.

Some air may continue to leak in to the surrounding water when you are orally inflating the BC, even after you have released the Inflate/Deflate Button. This is considered normal and will not impede the efficient oral inflation of the BC.

BC Deflation Using the Manual Inflator/Deflator Button:

To deflate the BC through the Mouthpiece, hold the lower (power) unit higher than the top of the BC and depress the Round Button located on the right side of the Mouthpiece to vent the air from the BC.

To ensure complete deflation of the BC, the Mouthpiece must be held higher than the top of the BC. While underwater, you will hear the air as it bubbles out through the Mouthpiece.

To prevent entry of water into the BC, be sure to release the Button before all bubbles stop flowing. To help eliminate unwanted water entry, use the Rapid Exhaust Valve method of deflation.

410 Regulator Operation:

In the event that it is necessary for you to share air with another diver, you should offer your Primary Second Stage to the diver and you should use the 410 Regulator. Although the 410 Regulator works properly with the Purge Button facing up or down, Hollis recommends an operational position with the Purge Button facing up, similar to other Second Stage positioning.

Operation of your 410 Regulator is similar to most other Second Stages. It provides air on demand with low inhalation resistance and it has a convenient Purge Button located on the top of the unit's housing and a comfortable Mouthpiece.

As with most other Second Stages, purging the 410 Regulator of water can be accomplished in two ways. First, one may press the Purge Button to initiate the flow of air and expulsion of water. The second option is to exhale a small puff of air into the mouthpiece to expel the water.

Care and Maintenance

Transport and Storage

If possible, transport your regulator assembly (preferably dry) in a padded carrying case or equipment bag separated from sharp items (i.e., dive knife, spear gun, etc.) that might damage or scratch the components. You should also protect the second stages from damage from heavy objects (i.e., dive light, first stage, etc.).

As soon as possible at the end of each day of diving:

- Install the first stage protector cap and tighten the yoke knob (or install the DIN thread protector cap).
- If possible, immerse the entire regulator assembly in a warm fresh water bath and soak for one hour, preferably while pressurized. **DO NOT** depress the second stage purge button while the regulator is soaking. Doing so will allow water to flow into the sealed portion of the first stage.
- Remove from the bath and rinse all components of the assembly with slow running fresh water. **DO NOT** use full water pressure.
- Flush the ambient openings of the first stage and the exterior of all components thoroughly to remove dissolved salt and other contaminants.
- If the first stage is configured with a rubber-like boot, direct rinse water through the flow-through slots.
- Flush the second stage by running water into the mouthpiece and out the exhaust ports. **DO NOT** depress the purge button while rinsing, doing so will allow water to enter the first stage.
- If possible, lay the complete assembly flat in a cool, dry place (out of direct sunlight) and allow the components to dry naturally.
- **DO NOT** inject or spray lubricants into or onto the first and second stages. Doing so can attract contamination that may subsequently interfere with proper operation.



WARNING:

DO NOT remove the Purge Cover yourself. Improper replacement of the Cover could result in an unexpected undesirable shut off of air delivery while underwater.

Prior to storing your regulator:

- Ensure that the complete regulator is clean and dry.
- If you were unable to clean the regulator prior to transport, or if it became exposed to other equipment that was not thoroughly cleaned prior to transport (such as a BC or wet suit), clean it thoroughly and allow it to dry naturally as previously described.

Repairs and Service



WARNING:

Do not Attempt to disassemble or repair the first or second stages, or to adjust the first stage. Doing so could cause malfunction while underwater resulting in serious injury or death. It will also void the regulator's limited warranty.

In the event that any component of your regulator assembly requires any form of repair or service, return it to your local Authorized Hollis Dealer for professional service by a trained technician authorized to perform Hollis factory authorized service. Once each year your complete regulator assembly should be inspected and serviced by an Authorized Hollis Dealer. More frequent service is recommended if you dive in severe conditions or more frequently than an average diver (see guidelines on page 26).

Annual Service consists of:

- Inspection
- Complete disassembly
- Thorough cleaning and evaluation of reusable parts
- Replacement of non-reusable parts
- Complete reassembly
- Final adjustment and testing

Costs for routine inspection and Annual Service are understood to be a normal part of operation, and are not covered by the regulator's limited warranty.

If **Warranty Service** is requested, or routine service parts are requested in accordance with a Registered Service Agreement, present the appropriate documents (i.e., card, receipts, and service records) to the Authorized Hollis Dealer when the regulator is delivered for service.

For details, refer to the Product Warranty section on the Hollis web site:
www.hollisgear.com

Additional Specifications for Connecting Components to Hollis Regulator First Stages

Second Stage (Primary or Octopus):

- Nominal Source Pressure = 140 psi (9.5 BAR) \pm 5 psi (.5 BAR)
- Maximum Source Pressure = 155 psi (11 BAR)
- Thread Size = 3/8 - 24 UNF
- Work of Breathing is equal to or better than U.S. Navy and CEN

Pressure Gauge or Pressure Transmitter:

- Maximum Source Pressure = 5000 psi (350 BAR)
- Thread Size = 7/16 - 20 UNF

Guideline for Hollis Regulator Equipment Minimum Service Intervals

Due to variations of use and storage time that Hollis Regulator equipment may be subjected to, the Guidelines and defined Intervals given herein are subject to the discretion of the owner of the specific product. Inspection and/or service indicated must be performed only by an Authorized Hollis Dealer.

Personally owned equipment used for recreational diving activity:

Equipment used 100 dives or less per year should be serviced at least once per year.

Equipment used more than 100 dives per year should be serviced after 100 dives prior to further use.

Equipment stored more than 6 months should be inspected/serviced as required, prior to use.

Equipment used for dive training and/or consumer rental activities:

Equipment should be inspected prior to every use.

Equipment should be serviced at least once every 6 months regardless of use.

Equipment should be serviced after 100 dives prior to further use.

Equipment stored for more than 3 months should be inspected / serviced as required, prior to use.

Regardless of ownership or intended use:

Equipment should be inspected/serviced if it displays any signs of leakage, malfunction, free flowing, any signs of deterioration, or improper performance or breathing effort.

Equipment should be inspected / serviced if the first stage inlet filter shows any sign of residue or discoloration.

RECORDS

First Stage Model(s):

First Stage Serial No.(s):

Second Stage Model(s):

Second Stage Serial No.(s):

Date of Purchase:

Hollis Dealer:

Dealer Phone No.:

Inspections & Service

Date	Service Performed	Dealer / Technician

NOTES:

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