

User Guide For SuperFlow® Second Stage & Non-Balanced Scuba Regulator Assemblies



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WARRANTY

<https://www.kirbymorgan.com/support/warranty>

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Definitions of Signal Words Used in this Guide

The original language of the Kirby Morgan Manuals is English. Translation into other languages will be provided upon request. KMDSI may charge a fee for these services.

Throughout this user guide we will use certain words to call your attention to conditions, practices or techniques that may directly affect your safety. Pay particular attention to information introduced by the following signal words:

DANGER

This word indicates an imminently hazardous situation, which if not avoided, could result in death or serious injury.

WARNING

This word indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION

This word indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

This word is used to address practices not related to personal injury.

This operation user guide contains important safety information and should always be available to those personnel operating this equipment. Read, understand, and retain all instructions before operating this equipment to prevent injury or equipment damage.

If you sell or loan this equipment to another person, be sure that this user guide accompanies the gear when you transfer possession to them.

It is important for the user of this equipment to understand that we at Kirby Morgan consider ourselves to be only a part of the process of

diving equipment design. We welcome and encourage all input from our customers. Our goal is to provide the highest quality diving equipment and service possible. If you have any questions or comments, please feel free to contact us at (805) 928-7772 or visit our web site at www.kirbymorgan.com.

CAUTION

By using this equipment the diver acknowledges that he has read and completely understands the instruction manual provided with it, and hereby agrees to hold harmless Kirby Morgan Dive Systems, inc. from any accident, malfunction, or other event arising from the misuse of the equipment, or from any lack of, or incomplete understanding of its operation and function.

CAUTION

This regulator assembly should be used only with breathing air meeting requirements of the EN12021

Product Changes

Following publication of this booklet, certain changes in standard equipment, options, prices and the like may have occurred which would not be included in these pages. Your Authorized KMDSI dealer is your best source for up-to-date information on any of these products. Kirby Morgan Dive Systems Inc. reserves the right to change product specifications at any time without incurring obligations.

In order to use this regulator assembly, it is essential to complete a training course and receive certification, issued by a recognized national scuba training organization, confirming your ability to dive.

⚠ WARNING



The first stage scuba regulator has not been designed or tested for use with breathing gas mixtures containing greater than 23% oxygen.

Do not use the first stage or the regulator assembly with second stage with breathing gases containing more than 23% oxygen. Use with gas mixtures containing in excess of 23% oxygen could lead to fires or explosions.

⚠ WARNING

The maximum approved depth for the use of this equipment is 50 meters (164 FSW) @ 62.5 RMV (heavy work load). Do not exceed this limit. The use of open circuit scuba at depths below 164 FSW poses extreme risks including out-of-air emergencies and decompression sickness, which can lead to serious personal injury or death.

⚠ DANGER



Never use solvents or aerosol sprays on or around the regulator assembly. Certain solvents and propulsion agents attack and damage rubber and certain plastics. This could lead to regulator failure. Drowning could result.

This user guide gives basic daily operational information for the Kirby Morgan SuperFlow® 2nd Stage Scuba Regulator assemblies (non-balanced).

Before each use the regulator assembly should be carefully checked and submitted to the operational tests. Never dive with a regulator showing any signs of deterioration or a below normal performance.

The hoses fitted to the regulator assembly, and supplied by KMDSI meet the requirements of the EN250 standard concerning the connection of components. Only original Kirby Morgan hoses should be used as replacements.

- HP thread $\frac{7}{16}$ " - 20 UNF
- LP thread $\frac{3}{8}$ " - 24 UNF

⚠ CAUTION

Always allow pressure to build up slowly in the regulator by turning on the cylinder valve slowly.

Never grease the parts of your regulator with a lubricant containing hydrocarbons, household oil, or motor oil.

Cold Water Diving

Before diving in cold water (water temperature below 10 °C/50 °F), the diver should be trained and have mastered the techniques of cold water diving, learning techniques and all precautions necessary to avoid freezing of the regulator. All of this is included in the training programs of organizations offering courses in diving in cold water or under ice. You should also use equipment intended for this purpose.

In order to reduce the risks of regulator freezing when diving in cold water (below 10 °C / 50 °F), consider doing the following:

1. Protect your regulators from any water entering the first or second stages.
2. Protect your equipment from cold before the dive. Keep your regulator and all its accessories in a warm dry place.
3. Carry out all pre-dive checks of your equipment in a warm dry place if necessary, before going to the dive site.
4. Avoid breathing through the regulator or pressing the purge button in very cold air before entering the water.
5. Check that the air used to fill your cylinder is dry. The water vapor contained in this air should have a condensation point below -54 °C / 65.2 °F. Excess water vapor can freeze, causing a free flow, or blocking the air flow completely.

1st Stage Scuba Regulator and 2nd Stage Regulator Maximum Work Pressure

REGULATORS	PSI	BAR
1st Stage	145	9.99
2nd Stage	150	10.34

Divers Work Rate Expressed as Respiratory Minute Volume (RMV)*

WORK LOAD	RMV	CUBIC FEET/ MINUTE (CFM)	EQUIVALENT LAND BASED EXERCISE
Rest	7-10 RMV	0.2 - 0.35 CFM	
Light Work	10-20 RMV	0.35 - 0.7 CFM	Walking 2 miles per hour
Moderate Work	20-37 RMV	0.7 - 1.3 CFM	Walking 4 miles per hour
Heavy Work	37-54 RMV	1.3 - 1.9 CFM	Running 8 miles per hour
Severe Work	55-100 RMV	1.94 - 3.5 CFM	

* source: U.S. Navy Diving Manual

Regulator Transport and Storage

Second Stage Plastic P/N 305-166:

The kind of package is a plastic bag that is sealed;
 The weight of the bag is usually .75 pounds (.35 Kg);
 The package dimension is 8 × 10 inches (203.2 × 254 mm);
 One regulator is packed per bag;

The regulators are sent to dealers by plane and truck. Depending on how the dealer wants it sent.

Second Stage Metal P/N 305-175:

The kind of package is a plastic bag that is sealed;

The weight of the bag is usually 1 pound (.45 Kg);

The package dimension is 8 × 10 inches (203.2 × 254 mm);

One regulator is packed per bag;

The regulators are sent to dealers by air or truck, depending on dealer request.

First and Second Stage Regulators when purchased as assemblies (P/Ns 300-266, 300-276, 300-286):

The kind of package is a cardboard box with cardboard inserts to stabilize the regulators;

The weight of the box is usually 3.7 pound (1.67 Kg);

The package dimension is 13 × 9 ½ × 4 ¼ inches (330.2 × 241.3 × 107.95 mm);

One First Stage and one Second Stage regulator is packed per box;

The regulators are sent to dealers by plane and truck. Depending on how the dealer wants it sent.



Packaging Step 1



Packaging Step 2



Packaging Step 3



Packaging Step 4



Packaging Step 5

Regulator Serial Number Location

On both the 305-166 Adjustable and the 305-171 Non-Adjustable Plastic Second Stage regulators the serial number is printed on the top part, near the mouth piece. On the 305-175 Metal Adjustable (shown below) the serial number is laser etched on the top of the metal body.



The 305-175 adjustable Metal SuperFlow® second stage regulator.

Definitions

Second Stage Water Temperature >10 °C (50 °F)

Cold Water Diving - water temperature below +10 °C (50 °F)

Warm Water Diving - water temperature over +10 °C (50 °F)

Maximum Depth: 50 m / 164 feet.

Storage Temperatures: +70 °C / +158 °F (max) -30 °C / -22°F (min)

Kirby Morgan SuperFlow® Second Stage Scuba Regulators

Thank you for choosing a Kirby Morgan regulator.

Your new second stage regulator has been designed and manufactured with pride, according to Kirby Morgan's world renowned exacting standards for quality and performance. The Kirby Morgan SuperFlow® Regulators are high performance and designed for the professional scuba diver. The second stages are modified versions of the same regulator used on the Kirby Morgan® SuperLite® 17B Helmet. Many of the parts used in the SuperFlow® are identical to those used on our helmet and BandMask® regulators. This is helpful to dealers in stocking parts for service and repair.

Provided it has been purchased new from an Authorized KMDSI Dealer, your regulator assembly is covered by KMDSI's Limited Warranty. Be sure to read the warranty and register your purchase online at www.kirbymorgan.com within ten (10) days of purchase. Also save your sales receipt. A copy of your receipt must be presented whenever obtaining warranty service.

Perhaps more than any other piece of diving equipment, your regulator's function and performance relies greatly on the care and maintenance it receives, in addition to regularly scheduled dealer service. Before you dive with your new Kirby Morgan regulator, it is important to read this guide in its entirety; to become familiar with its features, as well as the correct procedures for setup, pre-dive inspection, and post-dive maintenance.

General Precautions and Warnings

Before using this regulator assembly, you must have successfully received training and certification in the technique of scuba diving from a recognized certification agency (or any U.S. Military or government operated diving school).

Use of this equipment by a person who is not certified by a recognized agency shall render all warranties, express or implied, null and void. Use of scuba equipment by uncertified, or untrained persons, is dangerous and can result in serious injury or death.

WARNING

Never lubricate any part of the regulator or cylinder valve with any lubricant. Lubrication must only be performed by a KMDSI factory trained technician. Improper lubrication can lead to regulator malfunction. Drowning can result.

WARNING

Factory prescribed service for this regulator assembly must be performed at least once each year by a factory trained technician. Repair, service, disassembly, adjustment and reassembly must not be attempted by persons who are not factory trained and authorized by KMDSI. Attempted servicing or repairs by untrained / unauthorized personnel can lead to mistakes and/or use of incorrect parts, which can cause regulator malfunction, resulting in serious injury or death.

Preparation and Setup

KMDSI recommends that you bring your regulator assembly to your Authorized KMDSI Dealer for the installation of any accessory items, including instrumentation, LP quick disconnect hoses, and alternate air sources. Your dealer can also answer any questions you may have pertaining to the information in this guide.

1. (Adjustable Second Stages) If the adjustment knob has been turned “out” (counter-clockwise), gently turn it “in” (clockwise), only until it stops. Do not apply excessive pressure.
2. If you are using a standard cylinder with a yoke connector valve, inspect the cylinder valve O-ring for any wear or damage.

Pre-Dive Checkout

Before each use, the regulator assembly must be given a thorough visual inspection and functional test. NEVER dive with a regulator that shows signs of damage, or provides substandard performance until it has received a complete inspection and service from an Authorized KMDSI repair technician.

Inspection Checklist

1. With the cylinder valve facing away from you, release a small amount of air from the cylinder. When air is heard exiting, immediately close the valve. This will clear any moisture or debris that may be inside the cylinder valve outlet opening.
2. Prior to each use, the regulator assembly must be given a thorough visual inspection and functional test. Carefully inspect all hoses at their fittings to ensure they are securely connected into their respective ports on the first stage. If using with a KMDSI M-48 full face mask, ensure the regulator is properly installed and secured into the pod.

If hose protectors are present, slide the protectors back to expose the hose fittings, and inspect the fittings. Inspect the length of each hose to ensure that the hoses are not blistered, cut, or otherwise damaged.

3. Visually inspect the second stage regulator (and first stage if present) for any signs of external damage.
4. Partially unscrew the yoke screw of the first stage regulator so that the dust cap can be removed from the filter and air inlet.
5. Place the first stage regulator over the cylinder valve so that the inlet fitting aligns with the O-ring of the cylinder valve and the LP hose of the primary second stage will be routed over the right shoulder. While holding the first stage in place, turn the yoke screw clockwise. Ensure that the yoke screw mates into the small dimple on the backside of the cylinder valve, and tighten finger tight only.
6. **Negative pressure test.** Inhale from the second stage regulator. Resistance should be met when inhaling and no air should enter or be heard entering into the second stage regulator.
7. If a submersible pressure gauge, instead of a wireless transmitter, is attached to the first stage, ensure that the gauge is facing away from you. Pressurize the regulator by slowly turning the cylinder valve handwheel counter-clockwise. Continue turning the cylinder valve hand wheel counter-clockwise until it is fully open.
8. Listen near the first stage to check for any leakage. If leakage is detected, immerse the first stage and cylinder valve while pressurized to determine the source.
9. If leakage has been detected, follow the procedure for removing the regulator from the cylinder valve. If air was leaking between the first stage and cylinder valve, replace or reseal the cylinder valve O-ring as needed and repeat the above procedure. If leakage persists, do not dive with the regulator! Return the regulator to a KMDSI Dealer.
10. Slowly back out on the second stage regulator adjustment knob (coun-

ter clockwise until a slight free flow develops, then slowly rotate the adjustment knob in (counterclockwise) until the free flow stops. At this point the regulator is set for the least amount of breathing effort. Test breathe by taking several shallow and deep breaths to ensure the regulator breathes properly.

11. Purge test. With a finger over the mouthpiece, press in on the purge button. The purge button should travel between $\frac{1}{8}$ " to $\frac{1}{8}$ " inch before air starts flowing. When depressing the purge button all the way in, a strong surge of air should be felt. If the purge button travel is greater than $\frac{1}{8}$ ", the regulator should be re-adjusted by a KMDSI certified technician.

During the Dive

1. The SuperFlow[®] Second Stage regulators P/Ns 305-166 and 305-175 can be adjusted by the diver during the dive by simply rotating the spring bias adjustment knob OUT (counter clockwise) to make the demand valve more sensitive, or IN (clockwise) to make the demand valve less sensitive. In normal operation the regulator adjustment should be set at the easiest breathing setting by rotating the adjustment knob OUT (counterclockwise) until a slight free flow develops and then rotate it in until the free flow stops. At this point the diver will be taking full advantage of the regulator's performance.



NOTE

Prior to entering the water or removing the regulator from your mouth, the regulator adjustment knob should be rotated IN (clockwise about 1-1 ½ turns) to keep the regulator from free flowing when the mouthpiece is exposed to the surrounding water. As soon as the regulator is placed back in the mouth and breathing resumes, the knob should be readjusted for minimal breathing effort

⚠ WARNING

Diving an adjustable demand regulator that is adjusted to breathe with heavy resistance could cause the diver to become exhausted. This could lead to serious injury or death by drowning. Always adjust the demand regulator for the easiest breathing.

After the Dive

If fresh water is available, rinse your second stage regulator completely while it is still connected to the tank before depressurizing it. This helps to prevent any contaminants from entering sealing surfaces inside the regula-

tor. If this is not possible, follow the procedure for removing the regulator assembly from the cylinder valve (below) and then rinse.

Removal of the Regulator Assembly from the Cylinder Valve

1. Shut off the cylinder air supply by turning the cylinder valve hand wheel clockwise until it stops.
2. While observing the submersible pressure gauge, depress the purge button of the second-stage. When the gauge reads zero and airflow can no longer be heard from the second stage, release the purge button.
3. Turn the yoke screw counter-clockwise to loosen it and remove the first stage from the cylinder valve.
4. Dry the dust cap.
5. Place the dust cap over the first stage inlet fitting and seal it securely in place by tightening down the yoke screw. Do not overtighten the cap.

Safety Precautions

⚠ WARNING

Use only genuine Kirby Morgan replacement parts. Parts manufactured by third party companies can malfunction and cause accidents, leading to serious injury or death.

To ensure the best possible regulator performance and to avoid damage to regulator components, use only KMDSI original factory replacement parts.

To avoid damage to regulator components, only the correct size and types of tools should be used. The use of adjustable wrenches should be avoided whenever possible to avoid damage to soft brass parts.

Should you encounter technical difficulties in servicing a Kirby Morgan regulator, please contact Kirby Morgan or Dive Lab directly for assistance.

Specifications

305-166 Plastic SuperFlow® Scuba Regulator:

Type: Bias Adjustable, Downstream Demand, Non-Balanced.

Adjustable range: 70-180 psi, Optimum: 140 psi.

Inlet fitting threads: $\frac{3}{16}$ -18 UNF-2A

Body Material: Modified PPO plastic.

Routine Maintenance

Diaphragm, Exhaust valve, Mouthpiece: Silicone.
O-Rings: BUNA-N (Nitrile).
Exhaust T: Thermoplastic Elastomer (polymer).
Total Weight: 11.5 ounces.

305-175 Metal SuperFlow® Scuba Regulator:

Type: Bias Adjustable, Downstream Demand, Non-Balanced.
Adjustable range: 70-180 psi, Optimum: 140 psi.
Inlet fitting threads: $\frac{9}{16}$ -18 UNF-2A
Body Material: Chrome plated Brass.
Diaphragm, Exhaust valve, Mouthpiece: Silicone.
O-Rings: BUNA-N (Nitrile).
Exhaust T: Thermoplastic Elastomer (polymer).
Total Weight: 15.4 ounces.

305-171 SuperFlow® Scuba Non-Adjustable Regulator (Octopus):

Type: Non-Adjustable, Downstream Demand, Non-Balanced.
PSI: 140 psi Optimal.
Inlet fitting threads: $\frac{9}{16}$ -18 UNF-2A
Body Material: Modified PPO plastic.
Diaphragm, Exhaust valve, Mouthpiece: Silicone.
O-Rings: BUNA-N (Nitrile).
Exhaust T: Thermoplastic Elastomer (polymer).
Total Weight: 9 ounces.

Routine Maintenance

Routine maintenance is the best way to ensure long regulator assembly life and optimum performance. All end users should be instructed in the proper procedures for regulator care.

Daily Pre-Dive Inspection Checklist

1. Check the maintenance log to ensure the regulator has been overhauled within the past 12 months.
2. Visually inspect the first and second stage to insure all ports are plugged and the diaphragm cover and exhaust tee are secure.
3. Visually inspect all hoses for signs of damage such as cracking, fitting slippage, cuts or abrasions. Replace if these signs of damage are present.
4. Visually inspect all regulator components including submersible pressure gage, inflator hose and other components.
5. Visually inspect the first stage filter in the yoke for signs of dirt and corrosion.

6. **Negative pressure test.** Inhale from the second stage regulator. Resistance should be met when inhaling and no air should enter or be heard entering into the second stage regulator.
7. Rotate the adjustment knob in clockwise, then attach the regulator to a fully charged scuba cylinder and slowly open the cylinder valve.
8. Check for proper demand function and purge operation listen for the sounds of air leaks. Perform accessory checks as necessary for the equipment in use.

Post Dive Maintenance

1. Secure the cylinder valve, depressurize the regulator assembly and remove it from the cylinder.
2. Whenever the Regulator is removed from the scuba cylinder, the Dust Cap should be dried and installed over the First Stage Inlet Port. It is very important to dry the Dust Cap to prevent water from the cap from entering the First Stage. Screw the regulator yoke screw down until snug and the rubber dust cap is slightly compressed.
3. At a minimum, the entire regulator should be thoroughly rinsed with fresh clean water after every dive. Mild hand washing type dish soap can be used to remove grime.

CAUTION

During rinsing, do not depress the Purge Button on the Second Stage. Pressing the Purge Button can allow water to enter the Inlet Valve.

4. If possible, the entire regulator should be soaked in fresh warm water, between 70–120 °F, for 15 minutes or longer. Soaking in warm water will remove salt and mineral deposits more effectively than a fresh water rinse alone.
5. **Allow the regulator to dry completely before storage.** Do not leave the regulator sitting in direct sunlight. Shake the second stage to help remove water trapped inside. The cover and diaphragm can be removed to facilitate drying. Clean, oil-free, low-pressure (< 30 psig) (1.8 bar) air can be directed into the first stage sensing holes to help displace water. This is helpful if the regulator is to be packed for travel.
6. Screw the second stage regulator adjustment knob all the way out, away from the second stage body. This will lengthen the life of the regulator seat considerably.

7. **Ensure the regulator is completely dry before storing.** Store only in a clean, cool, dry place.

⚠ CAUTION

Never store the Regulator while still connected to a scuba cylinder. This could lead to damage to the regulator, causing it to malfunction, leading to serious injury or death.

⚠ WARNING

DO NOT carry a scuba cylinder by the regulator or hose. This abuse will lead to damage of the regulator or hose failure. Hose failure can result in personal injury.

⚠ WARNING

DO NOT use cleaning solvents on any parts or components of this Regulator. The use of solvents may lead to failure of the Regulator parts.

⚠ WARNING

NEVER pressurize the First Stage Regulator without having a Second Stage attached.

Scheduled Maintenance

Do not assume that a Regulator is in good working order because of infrequent use. Prolonged or improper storage can still result in O-ring deterioration or internal corrosion that could result in poor performance.

1. The minimum maintenance suggested for all regulators is an annual inspection/soft goods overhaul by a qualified KMDSI technician. However, regulators that are used more than 20 times a month or under severely harsh environmental conditions should be serviced more often. For example, a regulator used as a rental or for training purposes may require service every two to three months or more. Whenever a regulator has been inactive for longer than three months, it should be carefully inspected and surface function checked prior to use.
2. The first stage sintered filter, located in the yoke assembly, should be visually inspected on a regular basis. If a visual inspection reveals discoloration or obvious signs of dirt or corrosion, the regulator should

be thoroughly serviced. In addition, the scuba cylinders used must be internally inspected and cleaned if necessary.

Maintenance Record

DATE	DEALER NAME	TECHNICIAN

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