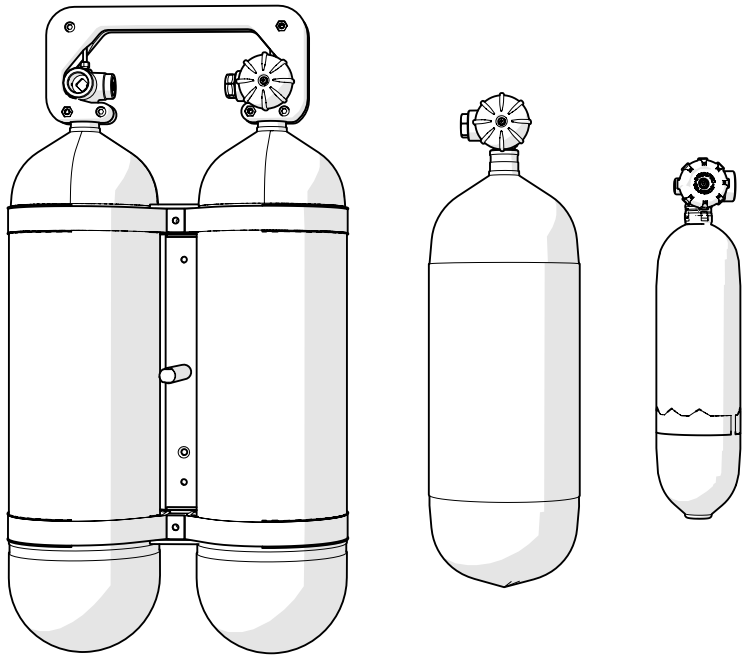
INTERSPIRO
Keeps You Breathing

ENGLISH



Cylinders

General description for service and repair

34795C01
Module 1

Table of Contents

Introduction

This document contains information relevant to the following products:

- Spirolite cylinders 3.4 L / 6.7 L / 2x3.4 L / 2x6.7 L (surface use)
- Divator Lite cylinders 2x3.4 L / 2x5.0 L / 2x6.7 L (underwater use)
- IS-Mix cylinders 1.0 L / 5.0 L (underwater use)
- Identification of cylinder valve types IS-Mix / Type I / Type II

Important information

WARNING
This chapter must be read completely and the regulations described here must be followed when doing any kind of service, tests or repair on the apparatus. Failure to comply to this instructions may lead to serious damage to the equipment, serious injury or death.

WARNING
The technicians performing any service or repair work on any Interspiro breathing apparatus, must be trained and certified by Interspiro to the appropriate level on the specific apparatus. Unauthorized service may result in malfunction and users relying thereon could sustain severe injury or death.

WARNING
Every time an apparatus is dismantled and assembled it must be subjected to a performance test on calibrated test equipment. Failure to comply may cause the breathing apparatus to malfunction and persons relying on the equipment could sustain severe injury or death.

Changes to this document - necessitated by typographical errors, inaccuracies of current information or improvements and changes of equipment - may be made at any time without prior notice.

Always check www.interspiro.com for important notices in the "Service & support" section.

NOTE
Never let locking compound come in contact with plastic or rubber parts. Never use compressed air for cleaning or for removal of residues since particles and moisture could be pushed into the parts and affect the function of the unit.

NOTE
The only approved lubricant for use on the IS-Mix is Krytox 205 (Order number 460200058). The use of any other lubricant may cause explosion in the apparatus.

Parts that are secured with locking compound must be well-cleaned and free from grease before the locking compound is applied again. It is advisable to use an alcohol based degreasing agent free from oil on a lint-free cloth. Follow the instructions for use and the safety precautions specified for each product.

Make sure that there is no lubricant on the connection threads when assembling parts in the apparatus, because this may cause the connections to become loose due to reduced friction.

Cleanliness requirements - Rebreather service

During service and inspection of cylinder and cylinder valves on the IS-Mix and Ox10 you need to:

- wear clean clothes
- have a clean work desk, the workbench should be washed with cleaning and degreasing spray agent before every work session
- use clean tools
- have clean hands that are free of grease/hand cream
- preferably wear lint-free and powder-free gloves
- not have long hair hanging free
- cover the dismantled parts with plastic if work is interrupted
- store the tools that are not used in clean boxes

Parts that are exposed to pressure above ambient pressure (in addition to requirements above):

- must be cleaned in an ultra sonic cleaner when they are contaminated
- always wear lint-free and powder-free examination gloves
- must be stored in sealed plastic bags when dismantled.

Example of procedure for oxygen cleaning in an ultrasonic washer

Detergent: Galvaclean 41 (powder)

Example of supplier: Henkel Norden AB

Concentration: 5 dl per 10 L water

1. Pre-wash dirty parts in hot water and detergent Galvaclean.
2. Rinse in hot water 50 ± 5°C by dipping the part up and down for about one minute. Change water often.
3. Ultrasonic wash for 3 minutes in temperature 55-60°C. Make sure that the liquid is running back into the water from all holes in the parts. Change the water frequently, it should be no skin or film on the surface or particles floating in the water.
4. Rinse according point 2 above.
5. Blow dry with air compatible with EN12021:2014 chapter 6.3.2 "Oxygen compatible air".
6. Check that the washed parts are free from particles and grease using a magnifier.
7. It is recommended to check all parts in UV light for impurities.

Storage of spare parts

These guidelines apply in particular to soft material parts:

- Temperature between 5°C and 25°C.
- Relative humidity around 55%. Avoid very moist or very dry conditions.
- Protect from light, in particular sunlight and artificial light with a high ultra-violet content.
- Store in relaxed condition free from tension, compression or other deformation.
- Make sure not to come into contact with solvents, oil, greases or any other semi-solid materials at any time during storage.
- Protected from circulating air by wrapping or storage in bags. Storage rooms should not contain any equipment that generates ozone, such as mercury vapor lamps, high voltage electrical equipment, electric sparks or silent electrical discharges.

Shelf life recommendations for soft material parts:

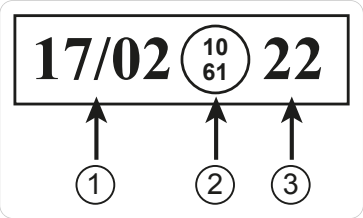
Material	Description	Shelf life
NR	Natural rubber	5 years
NBR	Nitrile rubber	5 years
U	Urethane rubber	5 years
EPDM	Ethylene propylene rubber	10 years
CR	Chloroprene rubber	15 years
FPM	Fluoro rubber	20 years
Q	Silicone rubber	20 years

Cylinder information

Periodic inspection

Cylinders shall be inspected regularly according to national regulations and be performed by a qualified party.

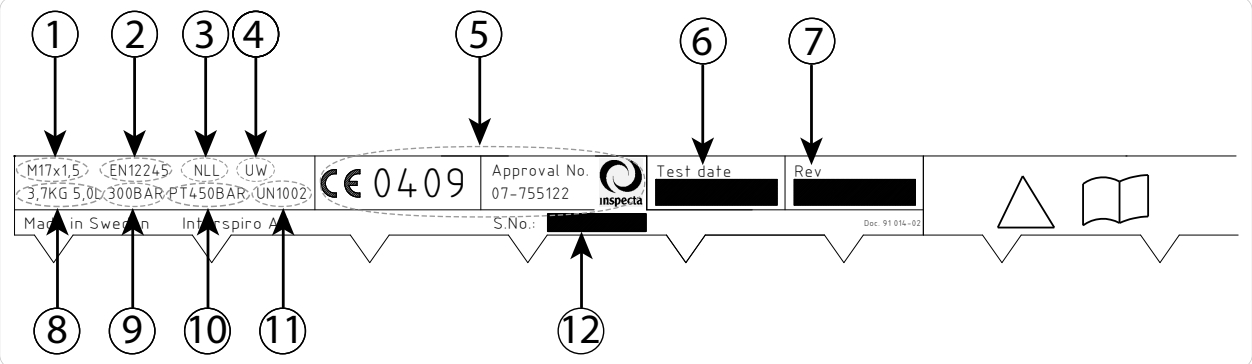
Markings:



1. Date of inspection Year/Month.
2. ID of inspection body.
3. Year for next inspection.

Example of label

Cylinder label



1. Neck thread
2. Standard
3. Service life of cylinder (NLL = Non-limited life)
4. Underwater approval
5. Inspection body and approval information
6. Date of first pressure test
7. Next inspection date (Not used)
8. Weight and volume

9. Working pressure
10. Test pressure
11. Gas code:
    a. UN1002 Breathing Air
    b. UN3156 Nitrox
    c. UN1072 Oxygen
12. Serial number of the cylinder shell

Empty the cylinder

RISK OF HEARING DAMAGE
Always use hearing protection when discharging high pressure air.

1. Before any work on the cylinder valve the cylinder must be fully discharged. Use the discharge plug (460190770 for G5/8 or 51074-51 for M26x2) for a controlled discharge of the high pressure.
2. Fit the discharge plug to the cylinder valve.
3. Open the cylinder valve slowly and let the high pressure in the cylinder discharge.
4. The discharge plug will automatically switch off when approx. 3 bar pressure remains in the cylinder.
5. Close the cylinder valve and remove the discharge plug.
6. Open the cylinder valve to discharge the remaining pressure.

Filling of the cylinder

WARNING
Make sure to follow applicable regulations when filling cylinders with oxygen compatible air.

Gas quality

- The breathing gas used to fill cylinders must be carefully monitored and classified according to EN12021:2014. For IS-Mix, chapter 6.3.2 in EN12021:2014 "Oxygen compatible air" apply.

WARNING
When filling Spirolite / Divator Lite / IS-Mix cylinders that contains breathing air/Nitrox with less pressure than 30 bar, arrangement shall be made to limit the filling rate to approximately 30 bar per minute. If there is no flow restriction in the compressor system it is recommended to use the Interspiro Filling adapter.

Use of the filling adapter

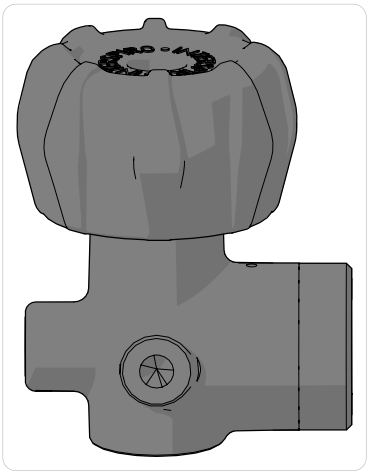
1. Use the correct filling adapter:
   - 99369-01 Divator Lite / Spirolite cylinder pack, G5/8
   - 99369-02 Single cylinder 3.4 L / 5.0 L / 6.7 L, G5/8
   - 99369-12 Single cylinder 5.0 L, M26x2
   - 99369-03 Single cylinder 1.0 L, G5/8
2. Disconnect the pressure regulator from the cylinder valve and connect the Filling Adapter to the cylinder valve. Tighten the hand wheel of the adapter to prevent any leakage.
3. Connect the filling hose to the Filling Adapter and tighten the connection to avoid leakage.
4. Open the cylinder valve and start filling.

Storage of cylinders

1. Before long-term storage the cylinder should be:
   a. charged with protective pressure of approximately 3 bar.
   b. provided with tightened protectiv plug with O-ring (use a 23 mm U-spanner to tighten the plug moderately).
2. Make sure that necessary warning signs have been put up at the storage room entrance in accordance with local regulations.

Type identification of cylinder valve

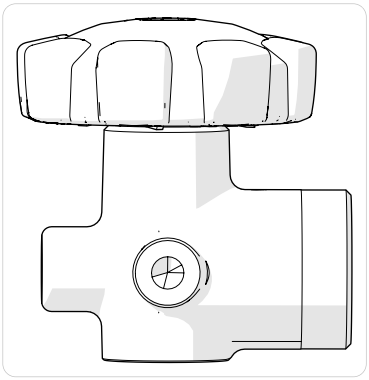
IS-Mix cylinder valve



1. Black cylinder valve housing
2. Hand wheel type according to image in color black, red, green, blue or brown.

SCUBA Type I cylinder valve

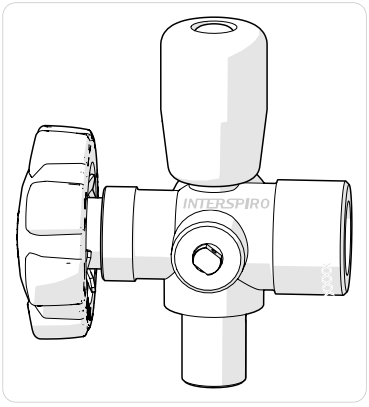
Image shows an example of a Type I cylinder valve.



1. "IS" logo
2. Different markings, but never markings that begins with 98xxx.

SCUBA Type II cylinder valve

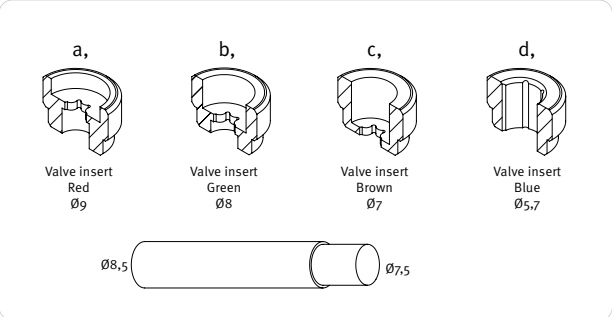
Image shows an example of a Type II cylinder valve.



1. Interspiro logo
2. Markings that begins with 98xxx
3. Delivering of this type started in July 2005.

Keying of cylinder valve

- IS-Mix cylinder valves can be equipped with a valve insert providing keying for different gas mixtures, the type of keying corresponds to the colour of the hand wheel according the table below. The wide end (Ø8.5 mm) and the narrow end (Ø7.5 mm) of test pin 88223-51 is used to check the keying:
  a. Red: Both ends fit the hole
  b. Green: Only narrow end fits the hole
  c. Brown: No end fits the hole, "star shaped" hole in the bottom of valve insert
  d. Blue: No end fits the hole, "star shaped" hole starts at top of valve insert



Service overview

Documents

It is also necessary to have the relevant user manual(s) and, if applicable, separate cleaning instructions available. If using mechanical test equipment the relevant test instruction(s) and test protocol(s) are needed.

When performing periodic inspection it is necessary to have the relevant standards available.

Service intervals

The recommended time between services, including replacement of service parts, is based on international standard requirements as well as on Interspiro's experiences and tests.

For relevant service intervals check the "Service and testing schedule" on www.interspiro.com in the "Service & support" section. Doc.no. 30500 for Diving breathing apparatus and doc.no. 97307 for SCBA equipment.

Local requirements may be different from Interspiro's minimum recommendations. Contact your local Interspiro representative for guidance in case of doubt.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