

MANUAL



HYSTEC
THE SAFETY COMPANY

SCBA

Self-Contained Breathing Apparatus

OPERATING & MAINTENANCE INSTRUCTIONS

Shanghai Hanyu Safety Technology Co., Ltd.

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I. PRODUCT OVERVIEW

“Hystec” self-contained positive pressure breathing apparatus as the advanced SCBA is approved to EN14594-2005 / EN137-2006 and EC certified according to 2016/425 PPE Directive(s), which is designed to be versatile, comfortable and affordable and be widely used in some complex performance and hazardous environments such as firefighting, chemical, oil&gas industry, smelting, warehousing and mining .

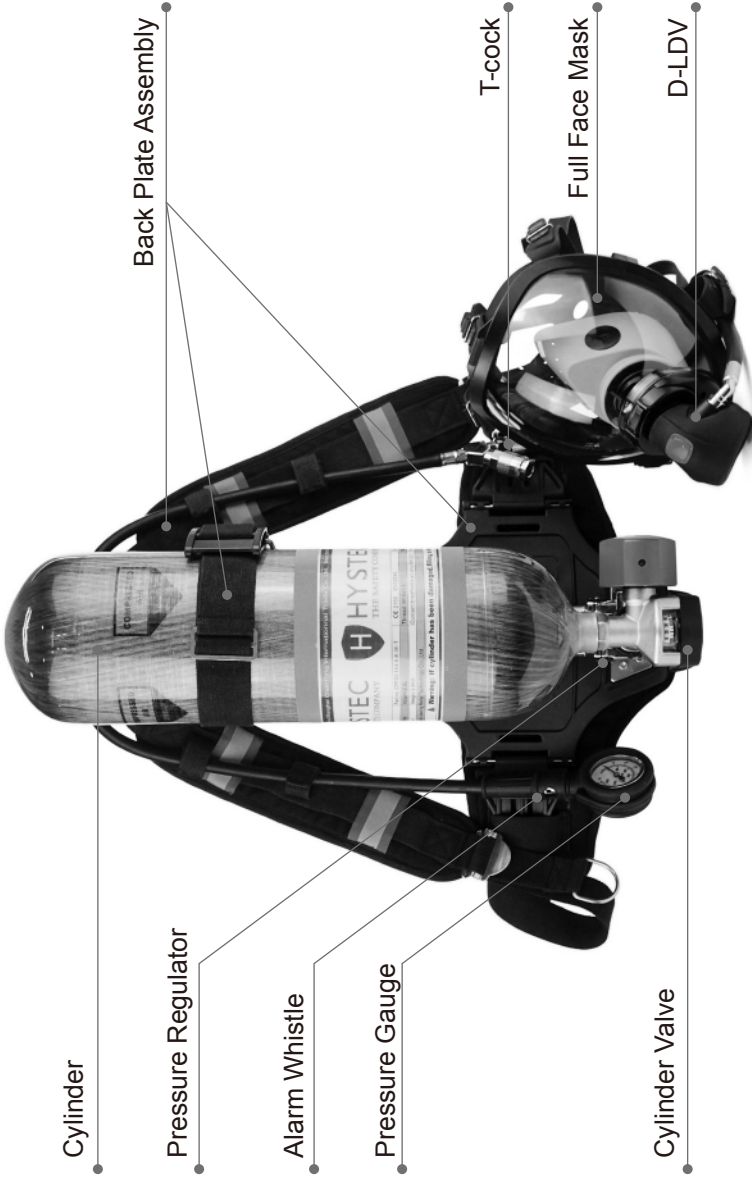
HYSTEC offers the range of high quality products which designs to address all of users concerns and specific concentrates on producing the durable, dependable Self Contained Breathing Apparatus to fulfill the multiple fields needs, as well as to offer users ease of use, comfort and low through life costs

“This manual make reference to SAI Global NB 2056 which located in Partis House, Davy Ave, Milton Keynes MK5 8FP.

The E-version of this manual can be downloaded by the link:
<http://www.hystecsafety.com/Download.asp>

II. FIGURE

2.1 TYPICAL SCBA RESPIRATOR



HY01AG01-6.8

2.2 COMPONENTS

2.2.1 FULL FACE MASK



- The apparatus is connected to the demand valve through the fast plug-in interface and the unilateral exhalation valve can significantly reduce exhalation resistance.
- The head net is provided with a fast release buckle for flexible length adjustment.
- The mask features anti-fog structure design.
- The silicon mouth-nose mask is soft and comfortable without unpleasant smell. The silicon face ring is comfortable to wear with good air tightness and the polycarbonate spherical window presents good view.

2.2.2 DEMAND VALVE



- Light weight, compact structure, fireproof and impact-resistance. Fast connection with mask realized by fast interface. The demand valve is connected to the pressure regulator through the medium-pressure hose.

2.2.3 BACK PLATE



- Ergonomic design, optimum fit to back curve, so with larger contact surface and comfortable to wear. A simple adjustment of back plate' s contact to back is available just by adjusting the harness. The impact-resistant and anti-corrosive back pack is made of one-piece injection-molded lightweight and flame-retardant nylon material, which is easy for disinfection and cleaning. Outer components free of sharp edges will do no harm to human body. Flame-retardant fabric adds a comfort to the harness assembly and durable nylon material enables an easy adjustment of waist belt buckle.

2.2.4 CYLINDER



- High-strength aluminum alloy liner plus full wrapped carbon fiber composite ensure high strength and light weight.

Cylinder	Carbon Fiber Composite Cylinder		
Cylinder Volume	6.8 L	4.7 L	3.0 L
Outside Diameter	157 MM	137 MM	114 MM
Outside Length	530 MM	492 MM	446 MM
Net Weight	3.9 KG	3.0 KG	2.1 KG
Filling Medium	Air (EN12021:1998)		
Material	Liner: Aluminum Alloy; Interlayer: Carbon Fiber; Outer Layer: Glass Fiber		
Working Pressure	300 Bar / 4500 Psi		
Test Pressure	450 Bar / 6750 Psi		
Thread Size	M18×1.5		
Maximum Service Life	15 Year		
Re-test Period	3 Year		
Working Temperature	-30~60 °C		

2.2.5 PRESSURE REGULATOR

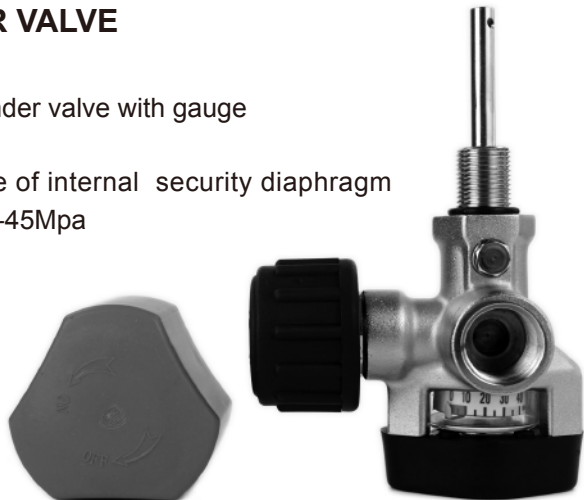
- No matter how the air pressure inside the cylinder and the respiratory rate of the user change, the pressure regulator can ensure stable output pressure.



- When the pressure inside the cylinder is between 20-300Bar, the output pressure of the pressure regulator will be 6-9Bar.
- The safety valve will be enabled for pressure release when the output pressure of the pressure regulator is over 9.9-15.3Bar.
- When the pressure inside the cylinder drops to 55 ± 5 Bar, the residual pressure alarm whistle will send alarms.
- Breathable air can be supplied for others by connecting the T-cock fast plug-in interface to the mask of others.

2.2.6 CYLINDER VALVE

- 90° Self-lock cylinder valve with gauge
- Blasting pressure of internal security diaphragm should be 37Mpa-45Mpa



2.2.7 PRESSURE GAUGE



- The pressure gauge shall always indicate the pressure in the cylinder at a scope of 0~400Bar.
- The pressure gauge has a fluorescent surface (luminous function) and the external rubber can absorb vibration.

2.2.8 ALARM WHISTLE



- When the pressure in the cylinder drops to 55 ± 5 Bar, an alarm whistle of 90dB shall be sent from the alarm whistle pipe

2.2.9 AIR SOURCE SHARING



- Compared with traditional fast interface, the T-cock can additionally connect a mask assembly/escape hood and use the same apparatus to supply breathable air for two users

III. APPLICATION STEPS

3.1 CHECK BEFORE USE

- 1 Check all components of the full face mask for integrity and each component of the full face mask must be cleaned to ensure no contamination of dust, acid, alkaline, oil and hazardous substance.
- 2 Press the “OFF Button” and “ON Button” on the demand valve to confirm the condition of the apparatus and check if the demand valve is securely connected to the full face mask and the medium pressure air ducts.
- 3 Check if the full face mask matches with the demand valve. Press “OFF Button” of the demand valve to switch off the air inlet valve of the demand valve, put on the full face mask and take a deep breath. If a “boo” sound is heard and the air flows in, it means the air inlet valve of the demand valve opens automatically.
- 4 Check if the cylinder is securely connected to the cylinder valve which is securely connected to the pressure regulator.
- 5 Open the cylinder valve, and with the rising pressure in the pipe and pressure relief system, a short alarm sound shall be heard from the residual pressure alarming whistle. After the cylinder is fully opened, check if the pointer of the pressure gauge points at the normal indicative air source pressure (not under 200Bar as recommended).
- 6 Check the air tightness of the apparatus, switch on the cylinder and switch off the cylinder after 2 min and the pressure drop in the pressure gauge shall not be greater than 40Bar (600 Psi) within 5 min.
- 7 Check the above items regularly based on the service condition. The above items shall be checked again each month if the apparatus is not in use.

**** The pressure gauge must be subject to routine inspection and maintenance by professional personnel on a regular basis.***

3.2 APPLICATION STEPS

3.2.1 PREPARATION



1. Lay the back plate harness assembly flat, confirm the integrity of O-ring on the pressure regulator valve, align the cylinder valve with the pressure regulator valve, and turn the pressure regulator wheel until the two valves are connected securely.



2. Fasten the cylinder strap up and adjust the strap length to a proper degree of tightness.



3. Fasten the cylinder strap buckle to connect the demand valve with the pressure regulator. Flip up and fasten up the cylinder strap buckle.



4. Put the apparatus overhead so that the shoulder strap is on the shoulder.



5. Insert the waistband buckle and adjust the waistband to a proper degree of tightness. Put on the assembled apparatus and adjust the harness to a proper position. Buckle up the waistband bayonet and adjust the length of the waistband to a proper position.



6. Press the "OFF" button of the demand valve to turn off the demand valve.

3.2.1 PREPARATION



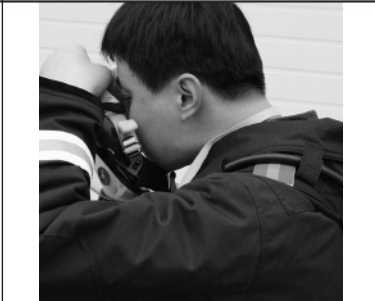
7. Open the cylinder valve and then close it.



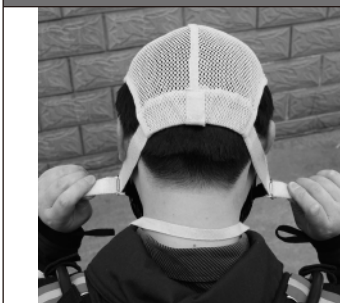
8. Check air source and observe the gauge reading which shall be greater than 260Bar. Check alarming pressure, lightly press "ON" button of the demand valve for slow air discharge. Observe the air source pressure gauge, and when the alarm whistle blows, the pointer shall be between 50-60Bar.



9. Put on the neck strap of the mask.



10. Put on the mask.



11. Adjust the head net to the head center and adjust the lower jaw, temple and head straps to a proper degree of tightness.



12. Open the cylinder valve again.

3.2.1 PREPARATION



13. Connect the demand valve with the mask. Align the bayonet of the mask with the interface of the demand valve and press hard. The demand valve is securely connected with the mask when a “click” is heard.



14. Take a deep breath to open the demand valve and enter the work place.

3.3.2 END TO USE

Ensure staying breathing environment


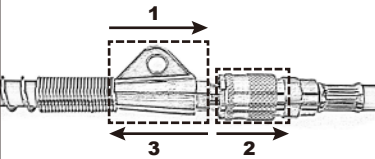


1. Loosen the Neck strap and Head band ,put off the mask from down to up.

2. Press the red “OFF” button of the demand valve to turn off the demand valve. By the time ,there should be no air flow inside the mask.

3.3.2 END TO USE

Ensure staying breathing environment

	<p>4. Turn off the cylinder valve.</p> <p>5. Open the supply air valve, release all excess air which in the pipeline off air breathing apparatus.</p>
<p>3. Loosen the belt lock, take off the apparatus from shoulder-back.</p>	 <p>6. Push forward the female connector of the fast interface to release the fast interface.</p>

WARNING

- **Once you hear the alarm whistle, you should immediately end the operations in hazardous areas and leave as soon as possible.**
- **The pressure gauge is fixed on the shoulder strap of the apparatus and the residual air inside the cylinder can be known by looking at the pressure readings at any time during work.**

3.3 DAILY MAINTENANCE

3.3.1 CYLINDER AND CYLINDER VALVE

- The cylinder shall be void of collision, scratch and knocking and not be exposed to high temperature, freezing cold and blazing sunlight.
- The cylinder shall be used before expiration date and subject to regular inspection. Only use cylinders that are qualified after hydrostatic test every three years.

After disassembly and maintenance, the cylinder can only be reused after 280 Bar-300 Bar air-tightness test.

3.3.2 PRESSURE REGULATOR ASSEMBLY

- The pressure reducer can only be disassembled by professional personnel to prevent potential safety hazard.

3.3.3 FULL FACE MASK

- When the SCBA is not in use, the full mask shall be stored in clean, shady and dry environment that avoids of sunlight, poisonous gas and dust.

3.3.4 DEMAND VALVE

- The demand valve shall only be disassembled by professional personnel. In case of any fault, do not use the demand valve before it is proved qualified after inspection.

3.4 STORAGE

- The SCBA shall be stored at 5 °C - 30 °C with relative humidity between 40% and 80% and at least 1.5 m away from heating equipment, if any. The air shall be free of corrosive acid or alkaline gas, or smoke.
- Finished product and parts shall not be exposed to sunlight to prevent rubber and plastic components from aging.
- The storage place shall be clean and free of dirt, grease and dust for the SCBA has direct contact with respiratory organs.
- If not used for a long time, the rubber components shall be coated with a layer of talcum powder to avoid aging and to extend service life. Wash the talcum powder off with clean water before use.

IV. TECHNICAL PARAMETER

Cylinder Volume	6.8 L	4.7 L	3.0 L
Working Pressure	≤ 300 Bar / 4500 Psi	≤ 300 Bar / 4500 Psi	≤ 300 Bar / 4500 Psi
Max Storage Volume	2040 L	1410 L	900 L
Service Time (At 40 Lpm)	50 Min	30 Min	20 Min
Working Temperature	-30~60 °C	-30~60 °C	-30~60 °C
Alarming Pressure	55±5 Bar / 825±75 Psi	55±5 Bar / 825±75 Psi	55±5 Bar / 825±75 Psi
Net Weight	8.5 KG	7.6 KG	6.7 KG
Inhalation Resistance	≤ 500 Pa		
Exhalation Resistance	≤ 1000Pa		

V. TROUBLESHOOTING

FAULT	CAUSE	TROUBLESHOOTING METHODS
Air leakage in the mask	There is a gap between the mask and face	Keep the face smooth and clean Put on the mask again and adjust the fixing strap
	Air leakage at the junction between the mask and demand valve	1.Clean the junction of fast interface 2.Reconnect 3.Send the cylinder to a designated service center for repair
	Cylinder switch is not turned on	Fully open the cylinder switch
No air entry or overlarge resistance during breathing	Demand valve fault	Use a functional demand valve for replacement
	Pressure regulator fault	Use a functional pressure regulator for replacement
	Exhalation valve is insensitive	Check and clean exhalation valve module
	Air leakage at the junction between cylinder valve and nozzle	1.Reconnect or clean 2.Send the cylinder to a designated service center for repair
Air leakage in the cylinder valve	Air leakage in the cylinder	Send the cylinder to a designated service center for repair

Part 1

V. TROUBLESHOOTING

FAULT	CAUSE	TROUBLESHOOTING METHODS
Air leakage in the system	Air leakage at the junction of the pressure regulator and the cylinder switch	<ol style="list-style-type: none"> 1. Tighten the connection between the pressure regulator and the cylinder switch 2. Clean the O-ring inside the movable joint of the pressure regulator 3. Send the cylinder to a designated service center for repair
	Air leakage at the junction between medium-pressure air duct and pressure regulator	<ol style="list-style-type: none"> 1. Reconnect 2. Send the cylinder to a designated service center for repair
	Air leakage at the quick coupler kit	Send the cylinder to a designated service center for repair
	Air leakage at the junction between high-pressure air duct and pressure regulator	Send the cylinder to a designated service center for repair
	Air leakage at the junction of high-pressure air duct of the pressure gauge	Send the cylinder to a designated service center for repair
Pressure gauge does not return to zero	The cylinder switch loosens or the pressure gauge is damaged	<ol style="list-style-type: none"> 1. Shut off the cylinder switch 2. Send the cylinder to a designated service center for repair
Residual pressure alarm whistle disabled	Dust and dirt in the whistle	Clean
	Alarming pressure changes	Send the cylinder to a designated service center for repair

Risk assessment referred PEE regulation

No.	Risk	Effect	Measure
1	Allergic reactions	Possible allergic reactions or affections of the user	Testing of harmful substances (REACH); Use of skin-friendly materials
2	Flammability	Injuries to the user, if the PPE burn	Flammability test
3	Dysfunction of protective effect	Insufficient protection, diseases are possible due to false usage, consequential damages are possible	Testing follow EN137
4	Incorrect Fitting	Insufficient protection or Failure	Detailed refer to " II "
5	Incorrect Use	Insufficient protection or Failure	Detailed refer to " III "
6	Improper storage	Insufficient protection	Detailed refer to " III "
7	Improper Cleaning	Insufficient protection	Detailed refer to " III "

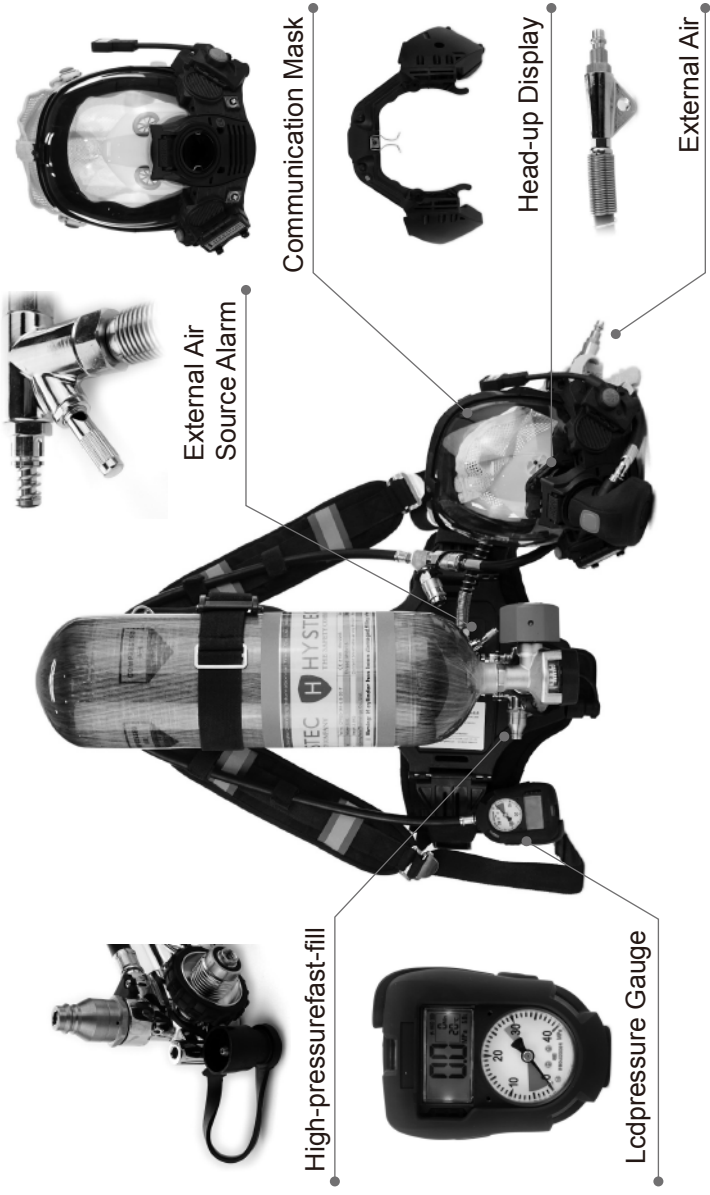
**** Please return the cylinder to the factory for repair if there is failure not mentioned in this table or if the failure cannot be solved by using the methods provided in this table.***

**** We shall assume no liability for any failure resulting from repair not conducted in a designated service center.***

VI. APPENDIX

6.1 SERIES PRODUCT CONFIGURATION

Product Model	Product Function							Approved 1 EN137:2006 (Type1&Type2) 2 EN 136:1998+AC:2003 3 EN 14594:2005/AC:2005
	External Air Source	External Air Source Alarm	High-pressure Fast-fill	Digital Pressure Gauge	Head-up Display	Communication Mask		
HY01AG01-6.8								1 2 3
HY01BG03-6.8						✓		1 2 3
HY01CG02-6.8				✓	✓			1 2 3
HY01CG04-6.8				✓	✓			1 2 3
HY02AG01-3.0	✓							2 3
HY02AG03-3.0	✓					✓		2 3
HY02AG01-6.8	✓							1 2 3
HY02AG03-6.8	✓					✓		1 2 3
HY02CG04-3.0	✓			✓	✓			2 3
HY02CG02-6.8	✓			✓	✓			1 2 3
HY02CG04-6.8	✓			✓	✓			1 2 3
HY02AG01-4.7	✓							1 2 3
HY03AG01-3.0	✓	✓						2 3
HY03AG01-4.7	✓	✓						2 3
HY04AG01-6.8	✓	✓	✓					1 2 3
HY04CG04-6.8	✓	✓	✓	✓	✓			1 2 3
HY09AG01-6.8			✓					1 2
HY09AG03-6.8			✓				✓	1 2



External Air Source Alarm

Communication Mask

Head-up Display

External Air

High-pressure fast-fill

Lcd pressure Gauge

HY04CG04-6.8

- External gas source: supply air for the user by connecting the fast interface to an external gas source.
- External gas source alarm: when the air pressure of the external gas source is under 4Bar, the on-board external gas source alarm whistle will send alarms to warn the user.
- High pressure fast-fill: the high pressure gas source fast interface can realize high-pressure fast gas filling at 300Bar at maximum.
- LCD pressure gauge: compared with traditional pointer type pressure gauge, digital-display pressure gauge is more intuitive and can also display ambient temperature.
- Head-up display: the user will be reminded of the residual pressure in the cylinder in sound and light form through the head-up display module. Please refer to the instructions of head-up display device for details.
- Communication mask: the mask can provide long-distance intercom communication function for the user. Please refer to the instructions of communication mast for details.



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