

3M Science.
Applied to Life.™

3M™ Versaflo™ BT-60 Series Tight Fitting

Breathing Tubes

User Training



Opening Points

- This presentation is based on current CE requirements. Always consult User Instructions and follow local laws and regulations.
- This presentation contains an overview of general information and should not be relied upon to make specific decisions. Completing this program does not certify proficiency in Safety and Health.
- Information is current as of 3rd March, 2020 and requirements can change in the future.
- This presentation should not be relied upon in isolation, as the content is often accompanied by additional and/or clarifying information or discussion.
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BT-60 Series Technical Training

Anatomy and Physiology of a Tight Fitting PAPR System



3M Versaflo Product Range



Versaflo S-Series Hoods and Headcovers



Versaflo M-Series Faceshields and Helmets



3M Reusable Respirators



Versaflo BT-20 Light Duty



Versaflo BT-30 Length Adjusting



Versaflo BT-40 Heavy Duty



BT-63/BT-64 'Y' Tube



Versaflo V-Series Supplied Air Valves



Versaflo TR-300 Part. PAPR



Versaflo TR-600 P/G&V PAPR



Versaflo TR-800 R/G&V PAPR - IS



3M™ Versaflo™ BT-60 Series Tight Fitting Breathing Tubes



3M™ Versaflo™ BT-60 Series Tight Fitting Breathing Tubes and Components

BT-63



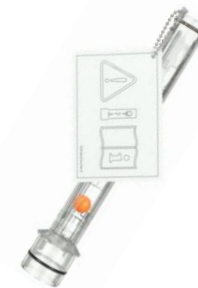
BT-63 Length-Adjusting
Tight Fitting Breathing Tube

+



BT-953
Cleaning and Storage Kit

+



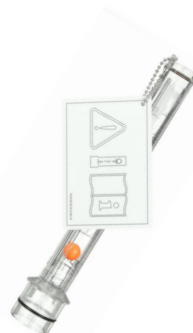
TR-973 Tight Fitting
Airflow Indicator

BT-64



BT-64 Heavy Duty
Tight Fitting Breathing Tube

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TR-973 Tight Fitting
Airflow Indicator

Cleaning & Storage Kit

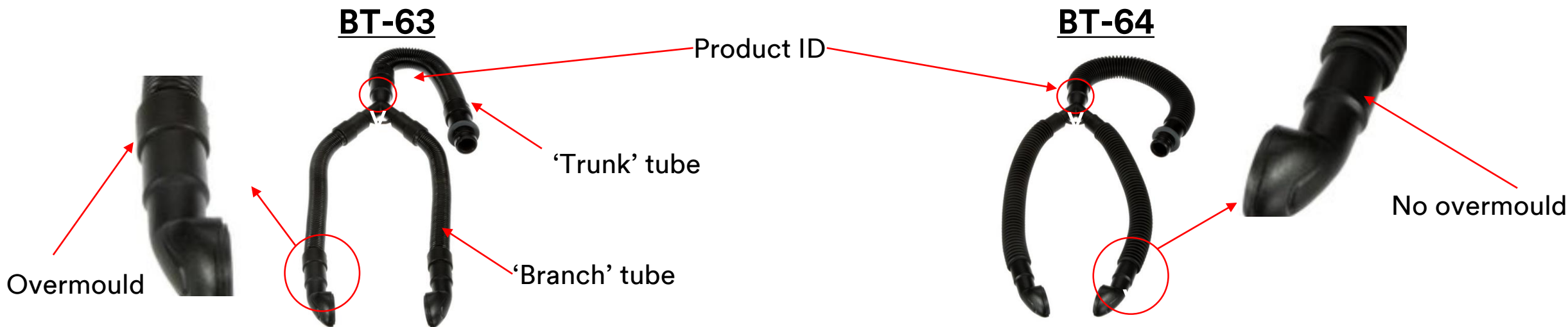


BT-953
Cleaning and Storage Kit



BT-957 Versaflo™
Storage Plugs

Materials/lengths/construction differences/weight



Tube = Polyurethane with ABS helix
 Trunk tube length = approx 500mm 'stretched'
 Trunk tube diameter inner/outer = 32mm/35mm
 Branch tube length = approx 500mm 'stretched'
 Branch tube diameter inner/outer = 23mm/26mm

Weight = 300g

Tube = Chloroprene rubber
 Trunk tube length = 400mm (approx 440mm stretched)
 Trunk tube diameter inner/outer = 30mm/41mm
 Branch tube length = 357mm (approx 400mm stretched)
 Branch tube diameter inner/outer = 22mm/33mm

Weight = 400g

Features & Benefits



Low profile tight fitting powered air solution compared to loose fitting headtops that provide protection against particulates, gases and vapour or combination of these.

Specific combinations of facepiece may offer higher respiratory protection factors (depending on country)

Allows for all of the benefits of the TR-600/TR-800 systems e.g. multiple flow rates, ATEX approval with a range of facepieces

Performance and Protection

All systems tested to EN 12942:1998 + A2:2008

Systems classified according

	6000FF	7907S	7500HM	S-Series/ M-Series
TM Classification	TM3	TM3	TM2	EN 12941 TH3
Nominal Protection Factor	2000	2000	200	500
UK Assigned Protection Factor	40	40	20	40
DE Assigned Protection Factor	500	500	100	100

Flow rates and Durations

	Flowrate (l/min)
Manufacturer's Minimum Design Flow Rate (MMDF)	115
Standard	135
Medium	150
High	170

TR-600/TR-800 automatically selects to 'tight-fitting' flowrates when BT-63/BT-64 connected (see later)

Flow rates are lower than 'loose fitting' flowrates for user comfort

	Standard Flow	Medium Flow	High Flow
TR-630	9-12	7-11	6-9
TR-632	12-18	11-16	8-14
TR-830	5.5-8	5-6	4-5

Pressure drop of tight-fitting facepieces is greater than loose fitting headtops.

Even though flow rates are lower, turbo has to work harder so durations are shorter compared to 'loose fitting durations.

Durations expressed as range x – y. Affected by filter selection more than facepiece. TR-6580E (ABE2K1HgP) towards 'x' value. TR-6710E at 'y' value.

Affected by other factors e.g. battery condition, particulate loading

Use in potentially explosive/ATEX areas with TR-800

BT-63, BT-64 and associated facepieces are considered 'simple objects' as per the ATEX Directive guidelines and covered in Non-Electrical ATEX Technical Bulletin (April 2019)

BT-63, BT-64 and 6000FF, 7907S and 7500HM can all be used with TR-800 in ATEX areas covered by the TR-800 classifications

Facial hair and Fit Testing

6000FF, 7907S and 7500HM with TR-600/TR-800 are still tight fitting respirator systems so users will need to be clean shaven

Fit testing recommended and required where national legislation applies.

If no national legislation applies, 3M recommends users follow a recognised, agreed protocol such as EN ISO 16975-3 or follow employee's company protocol

Note: Fit testing should be of the mask rather than the system:

- (1) Fit testing of a mask fitted with filters is a more stringent test under negative pressure
- (2) If user has already been tested on a mask, they do not need to be refit tested when using BT-63/BT-64

6000FF and 7907S must be fit tested via Quantitative method

7500HM can be fit tested by either Quantitative or Qualitative method

Inspection

Check apparatus is complete, undamaged and correctly assembled. Any damaged or defective parts must be replaced with original 3M spare parts before use. Undertake pre-use checks on Fullface or Half Mask and TR-602E/TR-802E Powered Air Turbo as outlined in the appropriate user instruction.

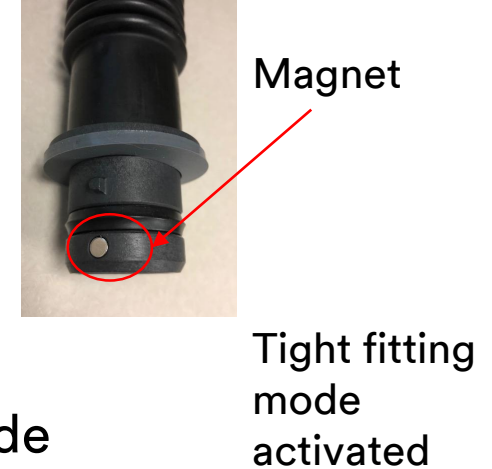
Breathing Tube

Inspect the breathing tube for tears, holes or cracks. Bend the tube to verify it is flexible. Inspect the two bayonets that connect to the Fullface or Half Mask for damage. Ensure two gaskets are present at the end of the breathing tube that connects to the TR-602E/TR-802E Powered Air Turbo and ensure they are not damaged. The breathing tube should fit firmly into the Powered Air Turbo and should attach securely to the Fullface or Half Mask.



Activating Tight Fitting Mode

BT-63 and BT-64 9 (and TR-973 Airflow Indicator) have a magnet in the end that connects to the TR-600/TR-800 Powered Air Turbo.



The BT-63, BT-64 or TR-973 Airflow Indicator **must be connected** to the motor/blower **prior to powering on** the turbo in order to activate tight-fitting mode (shown by tight fitting icon illuminated green).

If they are inserted after the turbo is switched on, then turbo will run in loose fitting mode with higher flowrates.

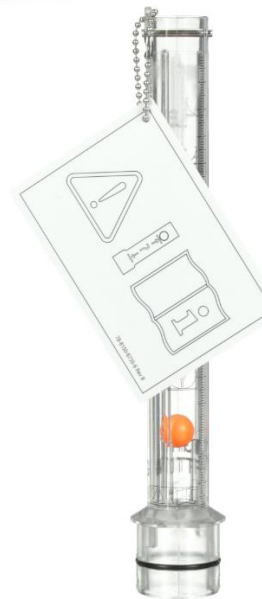


Once the turbo is running in tight-fitting mode it will remain in tight-fitting mode, even if the breathing tube is removed, as long as the turbo is not powered down.

Airflow Check Using TR-973 Airflow Indicator

The 3M™ Tight-fitting Airflow Indicator TR-973 must be used to verify minimum required airflow is attained prior to each day's use.

- Insert the TR-973 into the outlet of the turbo and turn the unit on. **Run the turbo for up to 1 minute to allow the airflow to stabilize.**
- Ensure the turbo is operating in tight fitting mode (icon is lit).
- With the airflow indicator in a vertical position, ensure that the bottom of the floating ball rests at, or above, the minimum flow mark for the 'letter' representing your 'zone'.
- To determine your zone, determine the elevation and temperature for the environment where you are conducting the airflow check. Find the zone where your elevation and temperature intersect on the chart supplied with the airflow indicator

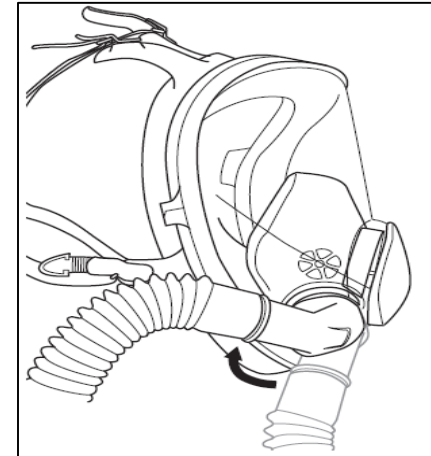
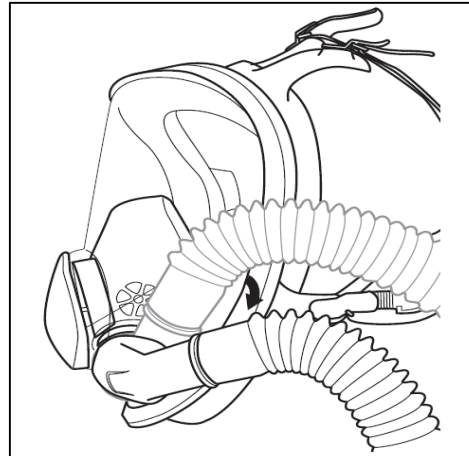


		°C							
		-10	0	10	20	30	40	50	
m	ft	°F	14	32	50	68	86	104	122
-305	-1000	A	B	C	D	E	F	G	
0	0	B	C	D	E	F	G	H	
305	1000	C	D	E	F	G	H	I	
610	2000	D	E	F	G	H	I	J	
915	3000	E	F	G	H	I	J	K	
1219	4000	F	G	H	I	J	K	L	
1524	5000	G	H	I	J	K	L	M	
1829	6000	H	I	J	K	L	M	N	
2134	7000	I	J	K	L	M	N	O	
2439	8000	J	K	L	M	N	O	P	
2744	9000	K	L	M	N	O	P	Q	
3048	10000	L	M	N	O	P	Q	R	
3353	11000	M	N	O	P	Q	R	S	
3658	12000	N	O	P	Q	R	S	T	
3963	13000	O	P	Q	R	S	T	U	
4268	14000	P	Q	R	S	T	U	V	
4573	15000	Q	R	S	T	U	V	W	
4877	16000	R	S	T	U	V	W	X	
5182	17000	S	T	U	V	W	X	Y	

Assembly of the Breathing Tube to the Facepiece

1. Align the two branches of the breathing tube over the two bayonet mounts on the facepiece. Ensure the one small slot on the breathing tube bayonet aligns with the one small lug on the facepiece bayonet mount.
2. Twist each branch of the breathing tube clockwise a quarter turn until it meets the internal stop and is firmly seated on the bayonet. Do not forcibly overturn, as the bayonet could be damaged

Note: The bayonet connectors of the BT-60 Series breathing tubes are identical, and can be used on either side.



System donning - overview

1. Don the facepiece (with BT-63/BT-64 attached to facepiece)

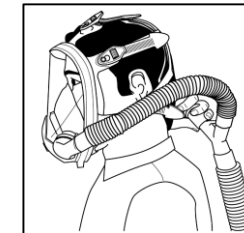
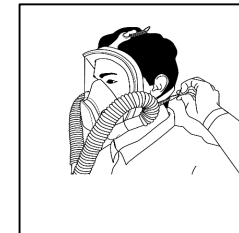
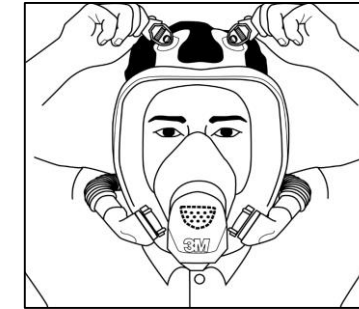
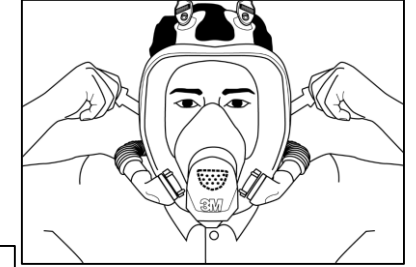
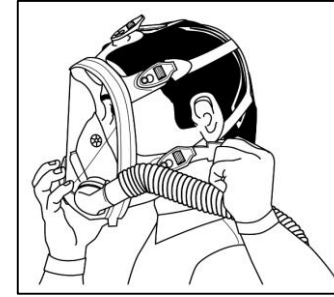
Note: BT-63/BT-64 is not connected to TR-600/TR-800 to allow seal check below

2. Perform positive pressure and negative pressure seal check – checks seal of mask and confirms not disturbed by attachment of the BT-63/BT-64
3. Connect BT-63/BT-64 into TR-600/TR-800 and power unit on. Check that unit is running in 'tight-fitting mode' with green icon illuminated.

System Donning and Performing User Seal Checks

Donning the Full Face Respirator

- Fully loosen all headstraps.
- Lift the BT-60 Series tube along with the facepiece over your head so the Y-branches of the breathing tube are resting on your shoulders and the facepiece of the respirator is in front of you.
- Place the nose in the nose cup and chin in the chin cup area then press the facepiece firmly and evenly against the face.
- Tighten the bottom straps one at a time first and work your way to the top straps. Be careful to tighten both sides equally.
- Repeat this sequence twice.
- Recheck all straps to ensure that they are tight and evenly tensioned. Ensure that the straps and tabs lay flat against your head. If possible, have a partner verify that you have donned your respirator properly.
- Note: Alternatively, you may find it easier to lift the breathing tube over the head so it rests at the front of the body, which allows the bottom straps to be tightened more easily. After tightening the straps, lift the breathing tube over the head so it rests at your back.



System Donning and Performing User Seal Checks

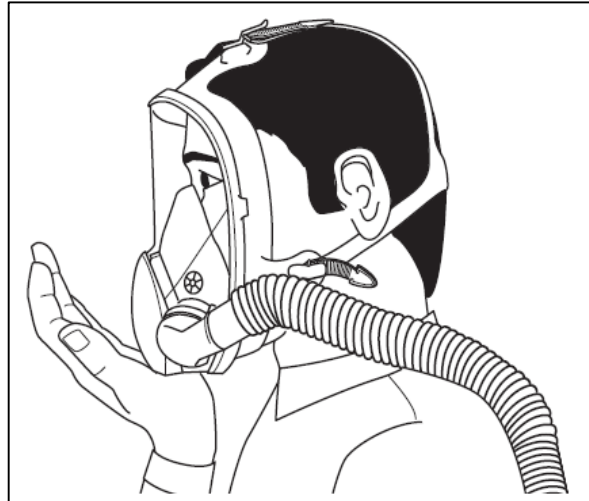
Positive Pressure User Seal Checks

Always read and follow User Instructions.

Always check the seal of the respirator on your face before entering a contaminated area according to the instructions provided below. You must pass either the positive pressure user seal check or the negative pressure user seal check (or both) prior to using the respirator in a contaminated area. If you cannot achieve a proper fit, DO NOT enter contaminated area.

Place the palm of your hand over the exhalation valve cover and exhale gently. If facepiece bulges slightly and no air leaks are detected between your face and the facepiece, a proper fit has been obtained.

If facesal air leakage is detected, reposition the facepiece on your face and/or readjust tension of the straps to eliminate the leakage. Repeat the positive pressure user seal check.

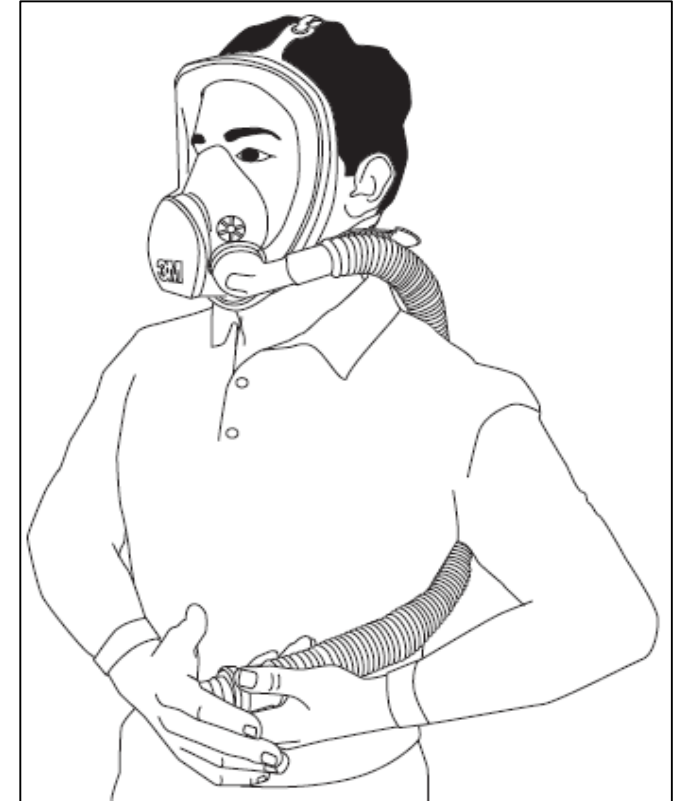


System Donning and Performing User Seal Checks

Negative Pressure User Seal Check

Always read and follow User Instructions

1. Completely plug the blower end of the breathing tube with the palm of your hand.
2. Inhale gently and hold your breath for 5 to 10 seconds. If the facepiece collapses slightly, a proper fit has been obtained.
3. If air leakage is detected, reposition the facepiece on your face and/or readjust the tension of the straps to eliminate the leakage. Repeat steps 1-2.



Cleaning and Storing BT-63/BT-64

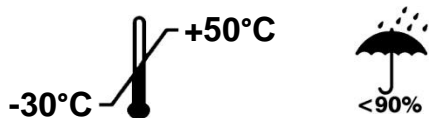


Cleaning:

- Wipe with a soft wet cloth
- Rinse or immerse in warm water to clean outside and inside (the tube must be completely dried prior to use or storage)
- If use cleaning plugs, breathing tube has an IP x5 rating (protection from water jets) so can be rinsed or showered and inside of tube will remain clean
- Temperature not to exceed 49°C.
- Scrub with a soft brush until clean, if needed.
- Add neutral detergent if necessary.
- Do not use cleaners containing lanolin or other oils.
- Rinse in fresh, warm water and air dry in non-contaminated atmosphere.

Storage:

- Store away from contaminated areas when not in use.
- Use Cleaning and Storage Plugs.



BT-957 Storage Plug

- Replacement part for storage plug in BT-953 Cleaning & Storage Kit
- Can be used to plug the bayonet end of any BT-Series hose



Can be hung up to
dry after cleaning

- Note: Can BT-20S/L, BT-30 and BT-40 can also be looped back to seal both ends for cleaning purposes



The background is a complex, abstract geometric pattern composed of numerous overlapping triangles. The color palette is warm, featuring various shades of yellow and orange, creating a vibrant and dynamic visual effect.

Thank You