3M V-Series Air Control Devices

User Instructions for 3M™ Vortex Cooling Assembly V-100 and V-100SS (Stainless Steel), 3M™ Vortemp™ Heating Assembly V-200 and V-200SS (Stainless Steel), 3M™ Air Regulating Valve Assembly V-300 and V-300SS (Stainless Steel), 3M™ Low Pressure Connector Assembly V-400.

Important: Keep these instructions for reference.

⚠WARNING

This product helps protect against certain airborne contaminants. **Misuse may result in sickness or death.** For proper use, see supervisor, or *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

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SAVE THESE USER INSTRUCTIONS AND KEEP THEM WITH THE PRODUCT.

GENERAL SAFETY INFORMATION

Intended Use

The 3M™ Air Regulating Valves are used in conjunction with any one of the 3M™ Supplied Air Helmets, Loose Fitting Facepieces or Hoods as specified in the NIOSH approval. When used as directed by the NIOSH approval, these systems can provide positive pressure, supplied air respiratory protection.

List of Warnings and Cautions within these *User Instructions*

⚠WARNING

This product helps protect against certain airborne contaminants. **Misuse may result in sickness or death.** For proper use, see supervisor, or *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

The length of compressed air hose W-3020 used depends on the specifications of the low-pressure air pump utilized. Some pumps specify a minimum of 50 or 100 feet of hose to allow adequate cooling of the air heated by the pump's mechanism. Read the pump's instructions thoroughly before selecting the compressed air hose W-3020 length that will be used. NO PUMP IS TO BE USED WHICH COULD CAUSE AIR HOTTER THAN 160º F (71º C) TO ENTER THE COMPRESSED AIR HOSE W-3020. Air hotter than 160º F (71º C) will cause the hose to degrade, which would adversely affect respirator performance **and result in sickness or death.**

To meet the NIOSH requirement in 42 CFR 84, subpart 84.150 for minimum and maximum airflow (6 to 15 scfm, 170 to 425 lpm), the air control valves approved for use with the 3M headgear respirators must be operated within the supply pressure ranges and hose lengths stated in the Specifications Section. Failure to do so may adversely affect respirator performance and **result in sickness or death**.

You must comply with OSHA Standard 29 CFR 1910.134, which states that, "Airline couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of airline respirators with nonrespirable gases or oxygen." In Canada, refer to the requirements of CSA Standard Z180.1. **Failure to do so may result in sickness or death.**

Your employer must provide breathing air that meets at least the requirements of the specification for Grade D breathing air, as described in the Compressed Gas Association Commodity Specification G-7.1-1997 in the United States. In Canada, refer to CSA Standard Z180.1, table for the quality of compressed breathing air. **Failure to do so may result in sickness or death.**

The line pressure must be kept within safe limits, 125 psig (8.75 kg/cm^2) maximum. Dirt, oil and water, unless trapped or filtered out, may continue downstream in concentrated form and adversely affect the performance of the respirator and **may result in sickness or death**.

Use of equipment described in these *User Instructions* must be in accordance with applicable health and safety standards, respirator selection tables contained in such publications as ANSI Z88.2-1992, CSA Standard Z94.4, or pursuant to the recommendations of an industrial hygienist. The employer must have a written respirator program in place which is in accordance with the OSHA respiratory protection standard found in 29 CFR 1910.134 prior to using any respirator. In Canada, follow CSA Standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Before use the wearer must be trained by the employer in the proper use and maintenance of the 3M™ Air Control Devices, and only in accordance with these operating and maintenance instructions. Each person using this respirator must first read and understand these *User Instructions*.

Use of this respirator by untrained or unqualified persons, or use not in accordance with these *User Instructions* may adversely affect product performance and **result in sickness or death.**

Do not use if any parts are missing or damaged.

Do not use with parts or accessories other than those approved by 3M as described in these *User Instructions* or on the NIOSH approval label for the respirator that you are using. **Failure to do so may result in sickness or death**.

Do not use for respiratory protection when atmospheric concentrations of contaminants are unknown or immediately dangerous to life or health.

Leave work area immediately if:

– Any part of the system becomes damaged

– Airflow into respirator stops

– Breathing becomes difficult

– Dizziness or other distress occurs; or

– You taste or smell contaminants or an irritation occurs.

Never alter or modify this assembly.

Air supply piping, fittings, and compressors must have the capacity to deliver sufficient air volume (6 to 15 scfm, 170 to 425 lpm) to operate the air regulating valve at the recommended pressure.

Description

The 3M™ Air Regulating Valve Assembly V-300 and V-300SS, when used in conjunction with a 3M helmet, loose fitting facepiece, or hood, creates a slight positive pressure atmosphere. The slight positive pressure helps to prevent airborne contaminants from entering the helmet, loose fitting facepiece or hood. The gentle airflow around the head, neck, and chest adds to the comfort of the wearer.

The 3M™ Vortex Cooling Assembly V-100 and V-100SS also provides the ability to cool the compressed air supply by as much as 50º F (28º C).

The 3M™ Vortemp™ Heating Assembly V-200 and V-200SS also provides the ability to warm the compressed air supply by as much as 50º F (28º C).

The 3M™ Low Pressure Connector Assembly V-400 is used with the 3M™ Low Pressure Hose W-3020. This allows function with a low-pressure supply, such as an ambient air pump.

These air regulating valves when used in a complete system (supplied air hose, air regulating valve, breathing tube and helmet, loose fitting facepiece or hood) are classified as a Type C or CE supplied-air respirator by NIOSH.

NIOSH Approval

Any NIOSH approval appearing on these air regulating valves is strictly limited to its use in an approved 3M system only in full accordance with the specifications and limitations under said approval.

These air regulating valves are used with a 3M hood, loose fitting facepiece or helmet, breathing tube, and compressed air hose to provide a NIOSH approved system. Please refer to the enclosed NIOSH approval label for model numbers.

NIOSH Cautions and Limitations

B– Not for use in atmospheres immediately dangerous to life or health.

C– Do not exceed maximum use concentrations established by regulatory standards.

D– Air-line respirators can be used only when the respirators are supplied with respirable air meeting the requirements of CGA G-7.1 Grade D or higher quality.

E– Use only the pressure ranges and hose lengths specified in the User's Instructions.

J– Failure to properly use and maintain this product could result in injury or death.

M– All approved respirators shall be selected, fitted, used, and maintained in accordance with MSHA, OSHA, and other applicable regulations.

N– Never substitute, modify, add, or omit parts. Use only exact replacement parts in the configuration as specified by the manufacturer.

O– Refer to User's Instructions, and/or maintenance manuals for information on use and maintenance of these respirators.

SPECIFICATIONS

V-300 and V-300SS (stainless steel)

The 3M™ Air Regulating Valve Assembly V-300 and V-300SS is designed to provide those 3M helmets, loose fitting facepieces and hoods, which are approved for use with it, a continuous airflow of 6 to 15 scfm (170 to 425 lpm). The control knob (airflow) is set manually between upper and lower limits to suit the comfort requirements of the user.

3M™ Supplied Air Hose and Pressure Requirements with V-300/V-300SS			
W-9435, W-9435SS, W-9445	**W-2929 (Coiled)**	**W-2929SS (Coiled)**	**Supply Pressure Range**
25 ft. (7.6 m)	25 ft. (7.6 m)	25 ft (7.6 m)	25-30 psig (1.75-2.1 kg/cm^2)
50 ft (15.2 m)	50 ft (15.2 m)	N/A	30-35 psig (2.1-2.45 kg/cm^2)
100 ft. (30.5 m)	100 ft. (30.5 m)	N/A	35-40 psig (2.45-2.8 kg/cm^2)
200 ft. (61 m)	N/A	N/A	45-50 psig (3.15-3.5 kg/cm^2)
300 ft. (91.4 m)	N/A	N/A	50-55 psig (3.5-3.85 kg/cm^2)

V-100 and V-100SS (stainless steel)

The 3M™ Vortex Cooling Assembly V-100 and V-100SS is designed to provide those 3M helmets, loose fitting facepieces and hoods, which are approved for use with it, a continuous airflow of 6 to 15 scfm (170 to 425 lpm). The control knob is set manually between upper and lower limits to suit the cooling comfort requirements of the user.

3M™ Supplied Air Hose and Pressure Requirements with V-100/V-100SS			
W-9435, W-9435SS, W-9445	**W-2929 (Coiled)**	**W-2929SS (Coiled)**	**Supply Pressure Range**
25 ft. (7.6 m)	25 ft. (7.6 m)	25 ft (7.6 m)	60-65 psig (4.2-4.6 kg/cm^2)
50 ft. (15.2 m)	50 ft. (15.2 m)	N/A	65-70 psig (4.6-4.9 kg/cm^2)
100 ft. (30.5 m)	100 ft. (30.5 m)	N/A	70-75 psig (4.9-5.25 kg/cm^2)
200 ft. (61 m)	N/A	N/A	80-85 psig (5.6-5.95 kg/cm^2)
300 ft. (91.4 m)	N/A	N/A	85-90 psig (5.95-6.3 kg/cm^2)

V-200 and V-200SS (stainless steel)

The 3M™ Vortemp™ Heating Assembly V-200 and V-200SS is designed to provide those 3M helmets, loose fitting facepieces and hoods, which are approved for use with it, a continuous airflow of 6 to 15 scfm (170 to 425 lpm). The control knob is set manually between upper and lower limits to suit the warming comfort requirements of the user.

3M™ Supplied Air Hose and Pressure Requirements with V-200/V-200SS			
W-9435, W-9435SS, W-9445	**W-2929 (Coiled)**	**W-2929SS (Coiled)**	**Supply Pressure Range**
25 ft. (7.6 m)	25 ft (7.6 m)	25 ft (7.6 m)	60-65 psig (4.2-4.6 kg/cm^2)
50 ft (15.2 m)	50 ft (15.2 m)	N/A	60-68 psig (4.2-4.75 kg/cm^2)
100 ft (30.5 m)	100 ft (30.5 m)	N/A	70-72 psig (4.9-5 kg/cm^2)
200 ft (61 m)	N/A	N/A	75-80 psig (5.25-5.6 kg/cm^2)
300 ft (91.4 m)	N/A	N/A	85-90 psig (5.95-6.3 kg/cm^2)

V-400

The 3M™ Low Pressure Connector Assembly V-400 is designed to provide those 3M helmets, loose fitting facepieces and hoods, which are approved for use with it, a continuous airflow of 6 to 15 scfm (170 to 425 lpm). When used as part of an approved system with the 3M™ Supplied Air Hose W-3020, it will provide airflow within the specified range when the air pressure at the point of connection for the hose is between 4 and 15 psig (0.28 to 1.05 kg/cm^2), dependent on the hose length.

Supply Air Temperature Minimum: Worker Comfort
Maximum: 160º F (71º C)

3M™ Low Pressure Supplied Air Hose Requirements with V-400	
W-3020	**Supply Pressure Range**
25 ft. (7.6 m)	6-11 psig (0.42-0.77 kg/cm^2)
50 ft. (15.2 m)	7-13psig (0.49-0.91 kg/cm^2)
100 ft. (30.5 m)	8-15psig (0.56-1.05 kg/cm^2)

⚠WARNING

The length of compressed air hose W-3020 used depends on the specifications of the low-pressure air pump utilized. Some pumps specify a minimum of 50 or 100 feet of hose to allow adequate cooling of the air heated by the pump's mechanism. Read the pump's instructions thoroughly before selecting the compressed air hose W-3020 length that will be used. NO PUMP IS TO BE USED WHICH COULD CAUSE AIR HOTTER THAN 160º F (71º C) TO ENTER THE COMPRESSED AIR HOSE W-3020. Air hotter than 160º F (71º C) will cause the hose to degrade, which would adversely affect respirator performance and **result in sickness or death.**

It is recommended that the air entering the breathing zone be no hotter than 110º F (43.3º C).

Compressor Volume

Requirements – Approx. 15 CFM per valve

Noise Level – Less than 80 dBA within the headgear; excluding external noise

Combining 3M™ Supplied Air Hoses (compressed air)

3M™ Supplied Air Respirator System approvals allow you to combine two or three 100-foot length W-9435, W-9435SS (stainless steel) or W-9445 hoses for each positive pressure respirator. You may not combine 25 or 50-foot lengths of the W-9435, W-9435SS or W-9445 hoses.

The W-3020 and W-2929 (coiled) hose can only be used in single lengths of 25, 50, or 100 feet (7.62, 15.24, or 30.48 meters). No connections are allowed.

The W-2929SS-25 (stainless steel) is only available in a 25-foot length and can only be used in the 25-foot length. No connections are allowed.

SYSTEM COMPONENTS AND REPLACEMENT PARTS

3M™ V-300/V-300SS Illustrated Parts List

Item Number	Part Number	Description	Quantity Required
1	V-211	Muffler tube assembly, short	1
2	---	Retainer (included in item 1)	1
3	---	Retaining ring	1
4	---	Screen	1
5	W-3135-10	Disc-muffler	2
6	---	Nut	1
7	---	O-ring	1
8	---	O-ring	1
9	W-1279-2	Plug-quick disconnect (Ind. Interchange)	
	W-3186-2	Plug-quick disconnect (Schrader)	
	W-3274-2	Plug-quick disconnect (Duff-Norton)	
	---	Plug-quick disconnect (Stainless Steel)	
10	W-2963	Waist belt	1
11	V-350/350SS	Air regulating valve (no belt)	
---	W-3036	Spare parts kit-includes Item 3, 4, 5, 6, 7, 8	

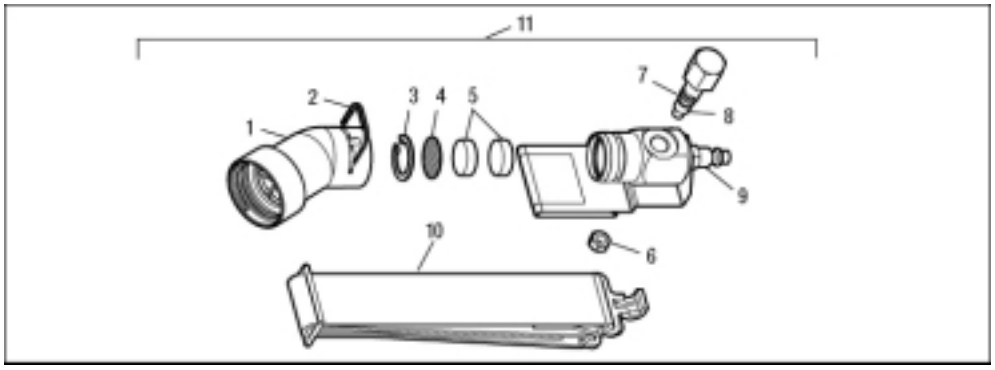

Fig. 1: V-300/V300SS

3M™ V-100/V-100SS Illustrated Parts List

Item Number	Part Number	Description	Quantity Required
1	V-111	Muffler tube assembly, long	1
2	---	Retainer (included in item 1)	1
3	---	Turbine cap	1
4	---	O-ring	1
5	---	Special washer	1
6	---	Generator	1
7	---	Screw 6/32 x 3/16	1
8	---	Washer-lock #6	1
9	W-1279-2	Plug-quick disconnect (Ind. Interchange)	
	W-3186-2	Plug-quick disconnect (Schrader)	
	W-3274-2	Plug-quick disconnect (Duff-Norton)	
	---	Plug-quick disconnect (Stainless Steel)	
10	W-1403	Elbow connector	1
11	---	Foam pad and fastener	1
12	---	Body tube	1
13	W-3153	Control knob	1
14	---	Tube assembly**	1
15	---	O-ring	1
16	W-2963	Waist belt	1
17	---	Holder	1
18	---	Cable tie	1
19	---	Slide	1
20	---	O-ring	1
21	V-150/150SS	Vortex cooling tube (no belt)	
---	V-115	Spare parts kit- includes item 4, 5, 6, 7, 8, 11, 15	

**Cannot be ordered. Must be returned to distributor for factory repair.

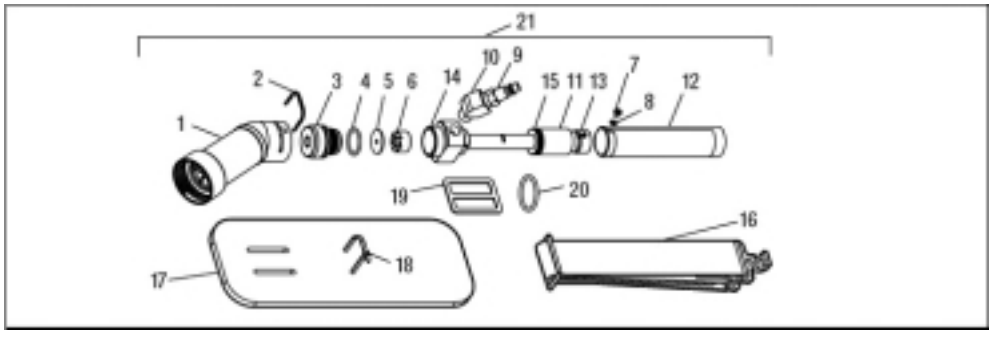

Fig. 2: V-100/V-100SS

3M™ V-200/V-200SS Illustrated Parts List

Item Number	Part Number	Description	Quantity Required
1	V-211	Muffler tube assembly, short	1
2	---	Retainer (included in item 1)	1
3	---	Tube housing	1
4	---	Screw 6/32 x 3/16	1
5	---	Washer - lock #6	1
6	---	O-ring	1
7	---	Tube assembly**	1
8	W-1403	Elbow connector	1
9	W-1279-2	Plug-quick disconnect (Ind. Interchange)	
	W-3186-2	Plug-quick disconnect (Schrader)	
	W-3274-2	Plug-quick disconnect (Duff-Norton)	
	---	Plug-quick disconnect (Stainless Steel)	
10	---	Generator	1
11	---	Special washer	1
12	---	O-ring	1
13	---	Turbine cap	1
14	---	Valve-ball	1
15	---	Vortemp™, cold muffler	1
16	W-2963	Waist belt	1
17	---	Holder	1
18	---	Cable tie	1
19	---	Slide	1
20	V-250/250SS	Vortemp heating tube (no belt)	
---	V-215	Spare parts kit- includes item 4, 5, 6, 10, 11, 12, 15	

**Cannot be ordered. Must be returned to distributor for factory repair.

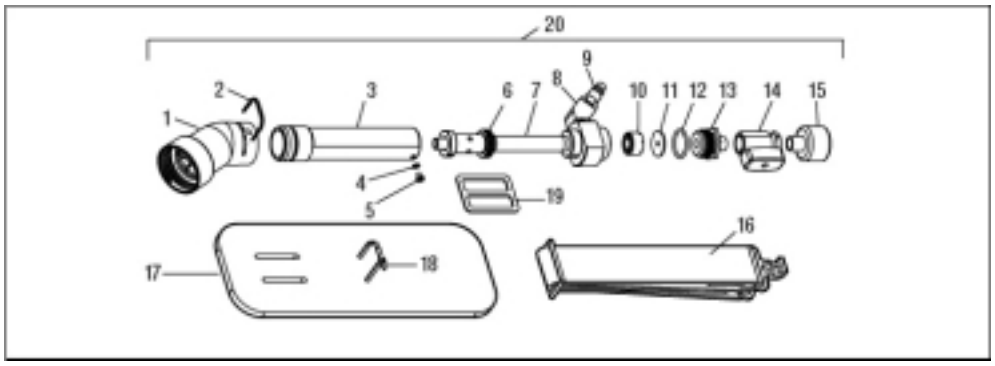

Fig. 3: V-200/200SS

3M™ V-400 Illustrated Parts List

Item Number	Part Number	Description	Quantity Required
1	V-211	Muffler tube assembly, short	1
2	---	Retainer (included in item 1)	1
3	---	Retaining Ring	1
4	---	Screen	1
5	W-3135-10	Disc (10 pk)	2
6	W-3252-2	Plug-quick disconnect (Ind. Interchange)	
	W-3251-2	Plug-quick disconnect (Schrader)	
7	W-2963	Waist belt	1
8	---	Low pressure connector (no belt)	
---	W-3036	Spare parts kit-includes item 3, 4, 5	

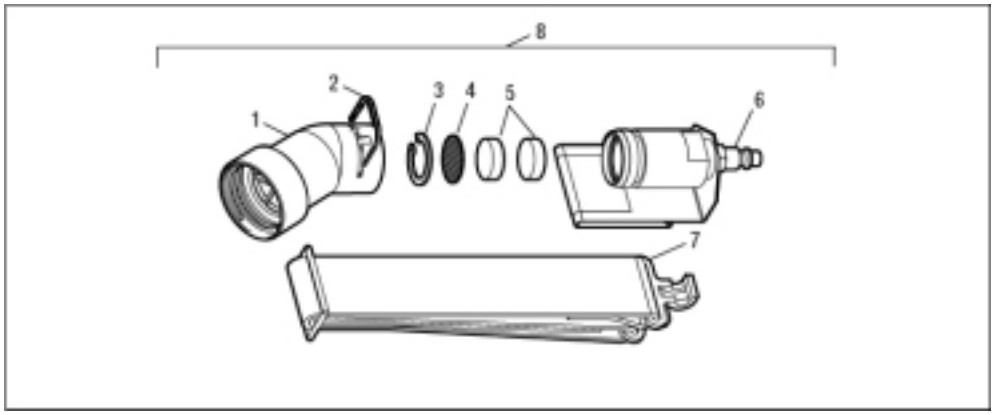

Fig. 4: V-400

Discussion on Respirable Air

Many older compressed air systems may have air that is unfit for human use without secondary air treatment. This is due largely to the presence of objectionable oil vapors and odors. Rules and regulations governing air quality when using compressed air for respiration are quite specific.

Precautions must be observed when using compressed air for breathing purposes.

⚠WARNING

To meet the NIOSH requirement 42 CFR 84, subpart 84.150 for minimum and maximum airflow (6 to 15 scfm, 170 to 425 lpm), the air control valves approved for use with the 3M headgear respirators must be operated within the supply pressure ranges and hose lengths stated in the Specifications Section. Failure to do so **may adversely affect respirator performance and result in sickness or death.**

⚠WARNING

You must comply with OSHA standard 29 CFR 1910.134, which states that, "Airline couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of airline respirators with nonrespirable gases or oxygen." In Canada, refer to the requirements of CSA Standard Z180.1. **Failure to do so may result in sickness or death.**

⚠WARNING

Your employer must provide breathing air that meets at least the requirements of the specification for Grade D breathing air, as described in the Compressed Gas Association Commodity Specification G-7.1-1997 in the United States. In Canada, refer to CSA standard Z180.1, table for the quality of compressed breathing air. **Failure to do so may result in sickness or death.**

⚠WARNING

The line pressure must be kept within safe limits, 125 psig (8.75 kg/cm^2) maximum. Dirt, oil and water, unless trapped or filtered out, may continue downstream in concentrated form and adversely affect the performance of the respirator and **may result in sickness or death**.

Oil mist from the compressor lubricating oil must not be present when the air reaches the air control device. Excessive amounts of water vapor and any particulate matter should also be removed as they may affect performance of the air control devices. The schematic diagram of the air purifier and pressure regulator equipment shows what should be installed in the main airline ahead of the connection for the breathing air hoses. (Fig. 5)

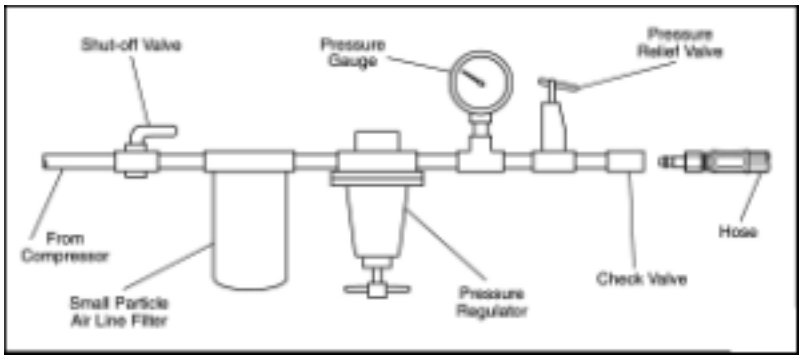

Fig. 5

If a pre-assembled air filtering and regulating device is desired, 3M offers several compressed air filter and regulator panel assemblies. These assemblies contain a specially designed filter cartridge to help remove oil mist and vapors, condensed moisture, particulates, odors and vapors. They come completely assembled and are ready for connection between the compressor and supplied air respirator system.

Note: Carbon monoxide- Although it is theoretically possible that oil lubricated compressors can create carbon monoxide (CO) if the compressor overheats, studies have shown that the location of the compressor's air intake is the most likely source of carbon monoxide contamination.[1] According to OSHA regulation [29 CFR (1910.134)(i)], periodic CO monitoring, rather than continuous CO monitoring with an alarm, is acceptable if the oil lubricated compressor is equipped with a high temperature alarm and automatic shut-down. In Canada, follow CSA Z180.1 regarding oil lubricated compressors.

[1]Formation of carbon monoxide in air compressors, Am. Ind. Hyg. Assoc. J (40), June 1979, pp. 548-551

OPERATING INSTRUCTIONS

⚠WARNING

Use of equipment described in these *User Instructions* must be in accordance with applicable health and safety standards, respirator selection tables contained in such publications as ANSI Z88.2-1992, CSA Standard Z94.4, or pursuant to the recommendations of an industrial hygienist. The employer must have a written respirator program in place which is in accordance with the OSHA respiratory protection standard found in 29 CFR 1910.134 prior to using any respirator. In Canada, follow CSA Standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Before use the wearer must be trained by the employer in the proper use and maintenance of the 3M™ Air Control Devices, and only in accordance with these operating and maintenance instructions. Each person using this respirator must first read and understand these *User Instructions*.

Use of this respirator by untrained or unqualified persons, or use not in accordance with these *User Instructions* may adversely affect product performance and **result in sickness or death.**

Do not use if any parts are missing or damaged.

Do not use with parts or accessories other than those approved by 3M as described in these *User Instructions* or on the NIOSH approval label for the respirator that you are using. **Failure to do so may result in sickness or death**.

Do not use for respiratory protection when atmospheric concentrations of contaminants are unknown or immediately dangerous to life or health.

Leave work area immediately if:

- Any part of the system becomes damaged
- Airflow into respirator stops
- Breathing becomes difficult
- Dizziness or other distress occurs; or
- You taste or smell contaminants or an irritation occurs.

Never alter or modify this assembly.

Air supply piping, fittings, and compressors must have the capacity to deliver sufficient air volume (6 to 15 scfm, 170 to 425 lpm) to operate the air regulating valve at the recommended pressure.

If you have any doubts about the applicability of the equipment to your job situation, consult an industrial hygienist or call 3M's Occupational Health and Environmental Safety Division Technical Service Department at 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

V-300 and V-300SS, V-100 and V-100SS, V-200 and V-200SS

To use these 3M air regulating valves with a 3M helmet, loose fitting facepiece, or hood proceed as follows:

1. Connect one end of the breathing tube to the helmet, loose fitting facepiece, or hood. (Follow the directions in the helmet, loose fitting facepiece, or hood User's Instructions.)
2. Adjust and buckle the waist belt with air regulating valve comfortably around your waist.
3. Connect the compressed air hose between the optional 3M filter and regulator panel W-2806 and the air regulating valve. Adjust the air pressure as per the appropriate valve type description in the Specifications Section.
4. Set the air regulating valve for minimum airflow.
5. Connect the breathing tube from the hood, loose fitting facepiece or helmet to the air regulating valve. Screw the tube into the threaded connector on the outlet of the valve.
6. Put on the helmet, loose fitting facepiece, or hood, and adjust for maximum comfort.
7. Recheck the air pressure setting to ensure it is still in the acceptable range.
8. Adjust the airflow or air temperature with the control valve on the air regulating valve for maximum comfort.

V-400

To use the 3M™ Low Pressure Assembly V-400 with a 3M helmet, loose fitting facepiece, or hood proceed as follows:

1. Connect one end of the breathing tube to the helmet, loose fitting facepiece, or hood.
   (Follow the directions in the helmet, loose fitting facepiece, or hood User's Instructions.)
2. Adjust and buckle the waist belt with low pressure assembly comfortably around your waist.
3. Connect the compressed air hose W-3020 between the air pump and the low pressure assembly. Adjust the pressure to within the acceptable range (See the Specifications Section).
4. Connect the breathing tube from the hood, loose fitting facepiece or helmet to the air regulating valve. Screw the tube into the threaded connector on the outlet of the valve.
5. Put on the helmet, loose fitting facepiece, or hood and adjust for maximum comfort.
6. Recheck the air pressure setting to ensure it is still in the acceptable range.

CLEANING AND INSPECTION

These air regulating valves have no moving parts except the control valve, so there is little to wear out or maintain. If proper filtration of compressed air is maintained, the muffler will stay clean and maintain its acoustic efficiency.

Additional maintenance and care of respirators should be followed per ANSI Standard Z88.2-1992, Practices for Respiratory Protection. In Canada, follow CSA Standard Z94.4 or the requirements of the authority having jurisdiction in your region.

Cleaning

Waist Belt (W-2963)

The waist belt may be hand laundered with a mild detergent, a clean rinse and air-drying.

V-300/V-300SS and V-400

Daily cleaning should be performed on the exterior of the air regulating valve. Blow clean with compressed air.

V-100 and V-100SS

DUE TO THE NEED FOR INSTRUMENTATION TO CALIBRATE FOR PROPER AIRFLOW, THE VORTEX AIR COOLER IS TO BE DISASSEMBLED ONLY TO THE EXTENT SHOWN IN FIGURE 2. DO NOT LOOSEN OR REMOVE THE SETSCREWS IN THE CONTROL KNOB (ITEM 13) BECAUSE OF CRITICAL POSITIONING OF THE VALVE AND THE NEED TO USE INSTRUMENTATION FOR PROPER ADJUSTMENT OF THE AIRFLOW. RETURN TO THE FACTORY FOR REPAIR IF THE KNOB COMES OFF.

To clean the tube assembly, simply flush with soap and water followed with a water rinse. Do not insert a brush in the tube.

It is important to keep the slots of the generator (item 6) clean.

Over tightening of the turbine cap (item 3) on re-assembly can cause the generator slots to restrict, thereby reducing airflow.

To replace the acoustic foam pad (item 11) proceed as follows:

– Remove the machine screw (item 7) and slide off the body tube (item 12) from the vortex air cooler with a slight twisting motion.

– Remove the acoustic foam pad (item 11).

– Position one end of new acoustic foam pad halfway between the exhaust holes and wrap it around the 3M™ Scotchmate™ strips. Make sure that the ends of the acoustic foam pad do not overlap, but rather form a snug butt fit.

– Holding the acoustic foam pad in place with two fingers of one hand, using the other hand, carefully slide the body tube over acoustic foam and the tube assembly with a slight twisting motion. Secure with the machine screw.

V-200 and V-200SS

DUE TO THE NEED FOR INSTRUMENTATION TO CALIBRATE FOR PROPER AIRFLOW, THE VORTEMP™ HEATING TUBE IS TO BE DISASSEMBLED ONLY TO THE EXTENT SHOWN IN FIGURE 3. DO NOT LOOSEN OR REMOVE THE SETSCREWS IN THE AIRFLOW OF THE TUBE ASSEMBLY (ITEM 7) BECAUSE OF CRITICAL POSITIONING OF THE VALVE AND THE NEED TO USE INSTRUMENTATION FOR PROPER ADJUSTMENT OF THE AIRFLOW. RETURN TO THE FACTORY FOR REPAIR.

To clean the tube assembly, simply flush with soap and water followed with a water rinse. Do not insert a brush in the tube.

It is important to keep the slots of the generator (item 10) clean.

Over tightening of the turbine cap (item 13) on reassembly can cause the generator slots to restrict, thereby reducing airflow.

V-400

The two disks (item 5, Fig. 4) inside of the low pressure adapter may become dirty after extended use from contaminants in the compressed air supply. They may be replaced by removing the retaining ring with the proper tool.

Storage

The assembly should be stored at ambient temperature in a dry environment that is protected against atmospheric contaminants.

TROUBLESHOOTING

Troubleshooting Chart V-300 and V-300SS

Symptom	Possible Causes	Remedy
Inadequate Airflow	Compressor Filters Plugged	Change Filters
	Muffler Plugged with Oil	Replace Muffler Discs
	Air Pressure Too Low	Increase Air
	F&R Panel Filer Plugged	Change Filter
	Kink in Air Hose	Straighten Hose Out
Comfort Control Knob Won't Turn	Valve Mechanism Dirty	Clean with Blast of Air
No Airflow	Compressor Off	Turn Compressor On
	F&R Panel Valve Closed	Open F&R Panel Valve
	F&R Panel Closed	Open F&R Panel Regulator
	Compressed Air Hose Not Connected	Connect Compressed Air Hose

Troubleshooting Chart V-100/V-100SS and V-200/V-200SS

Symptom	Possible Causes	Remedy
Vortex Freezes up	Excessive Water in Compressor Air Line	Add Air Drier to Compressor
Inadequate Airflow	Not Enough Air Pressure	Increase Air Pressure
Inadequate Warming or Cooling	Dirty on Inside	Clean and Provide Adequate Filtration of Supplied Air
	Compressed Airline Pipe too Small	Increase Airline Pipe Size
		Use Larger Compressor
	Compressor Has Insufficient Capacity	Check Compressor for Overheating
	Incoming Air Temperature too High or too Low	Insulate or Move Any Hoses or
		Pipes, which are heating up Due to Ambient Conditions.
Too Much Warming or Cooling	Control Knob not Adjusted	Adjust Control Knob
	Air Pressure too High	Lower Air Pressure
Excessive Airflow to Headgear	Air Pressure too High	Lower Air Pressure

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