



## OXY-FUEL EQUIPMENT

### CONDENSED OPERATIONAL GUIDE

Read manufacturer's complete instructions before using equipment. There are important additional sources, information and warnings provided.

**▽ WARNING: DO NOT OPERATE EQUIPMENT UNLESS THE USER IS FULLY TRAINED IN THE SAFE USE AND OPERATION OF OXY-FUEL CUTTING AND WELDING EQUIPMENT.**

Equipment should not be operated if the user is under the influence of any controlled substances, including but not limited to, alcohol or drugs. The safe and effective use of equipment depends on following practical time-tested safety and operating instructions to prevent and avoid unnecessary painful injuries, costly property damages and losses due to improper equipment use.

**Uniweld Authorized Distributor**

**WELD/BRAZE TIP DATA**

IMPORTANT: USE PROPER TYPE OF TIP FOR EACH TYPE TORCH.

▽ **WARNING:** USE PROPER TIP SIZE, PRESSURES AND FLAME SIZE TO AVOID BACKFIRE AND FLASHBACK.

Weld/Braze Tips Metal Thickness	V-Style Type Tip	N U M B E R	D E C I M A L	H-Style Type Tip	N U M B E R	D E C I M A L	A-Style Type Tip	N U M B E R	D E C I M A L	Pressure*		
	Type 1, 4, 13,17	Drill		Type 43, 79	Drill		Type 370, 730 330, 98	Drill		Oxy PSIG	Acet PSIG	Acet* SCFH
	Size	Size	Size	Size	Size	Size	Size	Size	Size	Size	Size	Size
Up to 1/32"	000	75	(.021)	0	70	(.028)	00	76	(.020)	3-5	3-5	1-2
1/16" - 3/64"	00	70	(.028)	1	67	(.032)	0	72	(.025)	3-5	3-5	1.5-3
1/32" - 5/64"	0	65	(.035)	2	62	(.038)	1	68	(.031)	3-5	3-5	2-4
3/64" - 3/32"	1	60	(.040)	3	57	(.043)	2	62	(.038)	3-5	3-5	3-6
1/16" - 1/8"	2	56	(.0465)	4	56	(.0465)	3	56	(.0465)	3-5	3-5	5-10
1/8" - 3/16"	3	53	(.0595)	5	55	(.052)	4	54	(.055)	4-7	3-6	8-18
3/16" - 1/4"	4	49	(.073)	6	53	(.0595)	5	51	(.067)	5-10	4-7	10-25
1/4" - 1/2"	5	43	(.089)	7	50	(.070)	6	48	(.076)	6-12	5-8	15-35
1/2" - 3/4"	6	36	(.1065)	8	47	(.0785)	7	45	(.082)	7-14	6-9	25-45
3/4" - 1-1/4"	7	30	(.1285)	9	43	(.089)	8	40	(.098)	8-16	8-10	30-60
1-1/4" - 2"	8	29	(.136)	10	40	(.098)	9	35	(.110)	10-19	9-12	35-75
2-1/2" - 3"	10	27	(.144)				10	30	(.1258)	12-24	12-15	50-100
3-1/2" - 4"	12	25	(.1495)							18-28	12-15	80-160

\* **NOTE:** When acetylene welding tips are used with fuel gases, use one size larger tip and maximum pressures to obtain proper heat.

See CHART below for approximate torch oxygen consumption with a neutral flame ratio for various gases:

1.1	Oxygen	to	1	Acetylene
2	Oxygen	to	1	Mapp® / Natural gas
4	Oxygen	to	1	Propane / Propylene

\* **NOTE:** Gas consumption data is merely for estimating purposes. It will vary due to the material, skill of the operator and the working conditions. Pressures are approximate for hose length up to 25ft. Increase pressure for longer lengths about 3 PSIG per 25ft.- increase working pressure 2-4 PSIG for check valves. Acetylene delivery pressure should not exceed 15 PSIG under flow conditions.

▽ **WARNING:** The withdrawal rate of an individual acetylene cylinder should not exceed 1/7 (approx. 15%) of the cylinder contents per hour. If additional flow capacity is required, use manifold systems of sufficient size to supply the necessary volume. To avoid dangerous reverse flow of gases due to unbalanced pressures, **do not** allow cylinders (especially oxygen) to become completely empty while in use. Check for adequate gas supplies before starting work (order gas when cylinder contents are at 1/4 capacity), especially with larger heating tips. Purge all hoses and torch passages **before** each torch lighting and use to vent out mixed gases which can cause a flashback if ignited (**VENT GASES SAFELY**). **DO NOT BREATHE FUMES**

**INFORMATION:** NOTE: Approximate gross BTU Contents Per Cubic Foot (after vaporization or gasification)

Acetylene	- 1470	Methane/ Natural Gas	- 1000
Butane	- 3374	Propylene	- 2371
Propane	- 2498	Mapp®*	- 2406

PSIG - Pounds per Square Inch Gauge

SCFH - Standard Cubic Feet per Hour

**HEATING TIP DATA**

Heating Tips Oxyacetylene or Fuel Gas	Tip Size	Acet./Fuel Gas Pressure *** Range PSIG	Oxygen Pressure *** Range PSIG	Acetylene SCFH	Oxygen SCFH
<b>Type 11, 12**</b> V-Style Type Tip - or -	5	7-10	10-15	6-20	7-25
	6	7-10	10-15	14-40	15-45
<b>Type 11- H+</b> H-Style Type Tip - or -	8	10-15	20-30	30-80	35-90
	10*	12-15	25-40	40-100	45-115
<b>Type 911</b> A-Style Type Tip	12*	12-15	40-60	60-150	70-170
	15*	12-15	40-60	90-220	100-250
<b>Type 28,29</b> V-Style Type Tip - or -	2	5-7	5-8	3-9	4-10
	4	5-7	8-12	7-20	10-20
<b>Type 7928-79+</b> 7928-43 H-Style Type Tip - or -	6	8-12	10-15	14-40	15-45
	8	10-15	20-30	30-80	35-90
<b>Type 37</b> A-Style Type Tip					
<b>Type 13, 17</b> V-Style Type Tip	15,30	8-12	10-20	15,30	17,33

+ Equal acetylene and oxygen pressures

NOTE: When tips are used with fuel gas, use higher pressures and one size larger.

\* Use 3/8" hose on large tips for more gas flow.

\*\* Type 12 for fuel gas only (Not Acetylene).

\*\*\* **IMPORTANT:** Increase fuel gas pressures to obtain proper gas flow and avoid backfire and flashback. An acetylene flame must have excessive smoking cleared to provide adequate gas flow - increase fuel regulator pressure enough to clear smoke from flame. Provide and monitor adequate gas supplies.

**DO NOT allow cylinders to become completely empty.**

Heating Tips Fuel Gas Only (Not Acetylene)	Tip Size	Oxygen Pressure PSIG	Fuel Gas Pressure PSIG	Consumption, SCFH		
				Oxygen	Fuel Gas	
<b>TYPE 45</b> V-Style Type Tip - or -	10*	70-100	15-25	350-480	150-200	
	15*	90-120	20-35	600-800	250-350	
	20*	100-150	30-50	900-1150	400-500	
<b>2290 - H</b> H-Style Type Tip 1/2" x 25 (F) Thread	2290 - 1H	2290 - 1V	10-25	4-12	160-320	40-80
	2290 - 2H*	2290 - 2V*	15-45	7-22	220-520	55-130
	2290 - 3H*	2290 - 3V*	25-70	8-25	340-920	85-230
V-Style Type Tip 1/4" x 18 NPT (F) Thread	2290 - 4H*	2290 - 4V*	50-110	10-30	640-1300	160-325
	2290 - 5H*	2290 - 5V*	60-135	14-40	720-1600	180-400

NOTE: Data is based on 25ft. of 1/4" hose and PSIG reading on regulators; increase for longer lengths about 3 PSIG per 25ft.; increase working pressure 2-3 PSIG for check valves and flash back arrestors. 3/8" hose is recommended for large tips. Manifolding of cylinders may be required for high demand operations to provide adequate volume. See warning, re: acetylene cylinder withdrawal rate.

### CUTTING TIP DATA CHART

**IMPORTANT:** Use cutting tips with proper type seats for each type torch and fuel gas. (See CHART below.) Use proper tips for fuel gases or acetylene. See manufacturer's chart for proper tip selection. Use proper tip size, pressures and flame size to avoid backfire and flashback.

Metal Thickness	TORCH & TIP TYPES			Oxygen PSIG	Acet./Fuel gas PSIG	Speed IPM
	V-Style Type Seat-2 Taper Tube Mix	A-Style Type Seat-3 Taper Tip Mix	H-Style Type Seat-2 Flat Head Mix			
	1-101, 3-101 5-101, GPM-N-P, 1-303 MP	144 164	Use upper PSIG 6290			
1/8"	000	00	000	20-25	5	28-32
1/4"	00	0	00	20-25	5	25-30
3/8"	0	1	00	25-30	5	24-28
1/2"	0	1	0	30-35	5	20-24
3/4"	1	2	1	30-40	8	17-20
1"	2	2	1	35-50	8	15-20
1 - 1/2"	2	3	2	40-50	8	12-17
2"	3	3	3	40-55	10	12-15
2 - 1/2"	3	4	3	45-55	10	10-13
3"	4	5	4	45-60	10	9-12
4"	5	5	4	45-60	12	8-11
5"	5	6	4	50-70	12	7-9
6"	6	6	5	50-75	12	6-8
8"	6	7	5	55-80	15	5-6
10"	7	7	6	55-85	15	4-5
12"	8	8	6	55-95	15	3-5

#### INFORMATION:

##### CUTTING OXYGEN TIP AND TORCH GUIDE

**Type 101 etc.**, V-style type tip, tube mix, use lower PSIG range (oxygen)\*.  
**Type 144 etc.**, A-style type tip, tip mix, use mid PSIG range (oxygen).  
**Type 6290 etc.**, H-style type tip, head mix, use upper PSIG range (oxygen).

**NOTE:** Data is based on 25ft. of 1/4" hose up to size 4 tip (3/8" hose may be required for size 5 and larger); increase pressures approximate 3 PSIG per 25 ft. of hose added and increase working pressure 2-4 PSIG for check valves and flashback arrestors. Acetylene delivery pressure should not exceed 15 PSIG under flow conditions.

\* **NOTE:** Series 62 & 67 machine torches use upper psig range for type 101 tips etc., same as 6290 tips

#### GUIDE FOR SAFE EFFECTIVE USE OF EQUIPMENT

⚠ **WARNING: DO NOT OPERATE EQUIPMENT UNLESS THE USER IS FULLY TRAINED IN THE SAFE USE AND OPERATION OF OXYFUEL CUTTING AND WELDING EQUIPMENT.** Equipment should not be operated if the user is under the influence of any controlled substances, including but not limited to alcohol or drugs. The safe and effective use of equipment depends on the technician fully understanding and carefully following practical time-tested safety and operating instructions. These instructions will help to prevent and avoid unnecessary painful injuries, as well as possible costly property damages or losses due to improper equipment use. **Read instruction sheets** supplied with equipment for complete information **before using equipment.** **SAFETY PRECAUTIONS** to take BEFORE STARTING WORK: Proper personal protection - Adequate, proper ventilation - Fire prevention protection, and Prevention measures (Equipment must be kept CLEAN and OIL FREE)

⚠ **WARNING: DO NOT LIGHT OR USE A TORCH IN A GAS OR VAPOR LEAK AREA. NEVER USE A TORCH ON ANY KIND OF CONTAINER OR PIPE UNTIL IT IS PROPERLY CLEANED, PURGED, AND VENTED COMPLETELY OF ALL FLAMMABLE GASES AND VAPORS WHICH CAN EXPLODE WHEN IGNITED.**

**CYLINDERS:** Must be secured upright. It is necessary to have an adequate gas supply to avoid dangerous reverse flow of gases (due to cylinder emptying in use) - MONITOR CYLINDER SUPPLIES DURING USE. **DO NOT ALLOW CYLINDERS TO BECOME EMPTY.** Safely **crack** oxygen cylinder valve to blow out any debris; then do the same for the fuel gas. Always blow gas away from you, making sure there are **no sources of ignition.**

**REGULATORS:** Before attaching the regulators properly to the equipment, make sure that the regulators are clean (The oxygen regulator inlet must be absolutely oil and dirt free). All connections must be wrench tight with regulators turned OFF. Remember to **ALWAYS open the oxygen cylinder valve SLOWLY** while standing with the cylinder valve between you and the regulator. Open the oxygen valve slowly (crack it) until the contents gauge stops moving; then fully open. Acetylene or fuel gas cylinder valves should only be opened 3/4 of a turn. Valve key or wrench, if used, should always be on the cylinder valve stem while cylinder is in use. This provides for quick shut-off, should the need arise. Then, after the completion of the work, **CLOSE** cylinder valves to avoid leaks. Release tension on pressure adjusting screw(s).

**PURGING:** The system needs to be **PURGED BEFORE** each lighting. Proper purging removes mixed gases, if present, from system. To purge - open the torch acetylene valve for approximately five (5) seconds, then close. Then repeat the procedure for the torch oxygen preheat and cutting valves. Always vent gases safely away from flames or sources of ignition. Proper ventilation is very important. Never use equipment in confined spaces. When purging cutting attachments or straight cutting torches, purge acetylene valve first using the above procedure, then open the cutting oxygen valve briefly while purging the preheat oxygen valve.

**WELDING TORCHES:** Torch inlet hose connections must be wrench tight and leak free before using equipment. Welding Tip O-Rings should be visually checked for nicks, damage or deterioration and replaced, if necessary, before tightening tip to welding handle. Position tip elbow in desired location, then tighten tip nut firmly hand tight.

**CUTTING ATTACHMENTS:** Before installing the cutting attachment on the welding handle, the adaptor O-Rings should be inspected as with the welding tip above. Cutting Attachments should be firmly hand tightened to the proper welding handle to prepare for use. Cutting Tips are metal to metal seats. They must be clean and damage free to seal correctly. A wrench must be used to firmly tighten the cutting tip nut. Check leaks by pressurizing system. **CHECK FOR LEAKS**, by using proper leak testing solution at all joints and correct ALL leaks **before** lighting. **DO NOT BREATHE FUMES.**

**CUTTING TORCHES and TIPS:** Make all the connections **WRENCH TIGHT** and leak-tested before using the equipment. Use and maintain proper operating pressures and clean, efficient tips. Check pressures with gas flow conditions and follow purging instructions printed above. **PURGE OXYGEN PASSAGES BEFORE EACH TORCH LIGHTING AND USE TO EXPEL MIXED GASES WHICH CAN CAUSE A FLASHBACK WHEN IGNITED.** Use proper size and type of tip to fit the torch, job, and fuel gas. **DO NOT** use damaged or plugged tips or off-standard tips which can affect torch safety and performance. Use proper flame size to avoid backfire and flashback. (burning in the torch). Cutting tips must be firmly **WRENCH TIGHT.**

▽ **WARNING: DO NOT USE EQUIPMENT UNTIL ALL CONNECTIONS ARE LEAK FREE.**

**CHECK YOUR PRESSURES.** It is very important to set the regulator pressures high enough to supply the torch with the proper pressure for safe, efficient performance and results. Set the correct regulator pressures for each gas. (EXAMPLE: Not less than 5-7 PSIG acetylene or fuel gas and 25-35 PSIG oxygen for tip size 0 or 1 with approximately 25ft. of hose.) See appropriate charts on reverse side. Turn pressure adjusting screw clockwise to increase pressure and counter clockwise to reduce pressure and to shut off.

**NOTE:** The correct pressure settings are "working pressures" needed at the torch. Compensate for pressure drops by increasing regulator pressure as necessary. Acetylene delivery pressure should **NOT** exceed 15 PSIG under flow conditions. Hoses over 25 ft. require increased pressure (about 3 PSIG per 25ft. of hose). Splices also cause pressure drops. Check pressures with gas flow conditions; then purge system before lighting torch.

**Vent gases safely.**

▽ **CAUTION:** Purge fuel gas/ acetylene, the cutting oxygen and the preheat oxygen valves before each torch lighting and also **purge** the torch and hoses after a cylinder change to vent out possible mixed gases. Keep the hose clear of sparks and hot metal. **Vent gases safely.**

▽ **WARNING: Read manufacturer's complete instructions BEFORE using equipment.** It is very important to light the torch with a "NO SMOKE" yellow acetylene flame to assure full gas flow to avoid backfire, flashback and poor performance from gas-starved tips. Soot and carbon clogged gas passages can result from backfire which can also cause flashback (burning in the torch).

**TO SHUT DOWN:**

FIRST, close the preheat oxygen valve and then the fuel valve.

▽ **WARNING:** If the **ACETYLENE** is shut off first, a backfire can cause soot and carbon buildup in the gas passages. If a flashback occurs, turn off oxygen immediately; then turn off acetylene. A flashback is characterized by a whistling noise as the flame burns inside the torch. The flame cannot burn inside the torch without oxygen.

NEXT, cool the torch and check the pressure and flows before relighting.

If the problem continues, contact your Supplier or an Authorized Uniweld Repair Station. **NOTE:** Always leave the tip in the torch to be checked and repaired because the tip may be the problem.

▽ **WARNING:** To prevent and avoid injuries, death, property damages and destruction, the user must be fully alert and aware of hazardous conditions and must at all times practice good, reasonable common sense safety procedures when using gas torch equipment. This equipment should not be operated if the user is under the influence of any controlled substances, including but not limited to, alcohol or drugs.

▽ **WARNING:** Uniweld warns Purchaser of the potential hazards resulting from the use and especially the improper use of Uniweld products. It is the responsibility of the purchaser to warn personnel of the hazards of use and improper use of products. Purchaser also assumes all responsibility for the suitability and the results of using Uniweld products alone or in combination with other articles or substances and in any manufacturing, service or other process or procedure. Determination of the suitability of any Uniweld products furnished for the use proposed by the Purchaser is the responsibility of Purchaser and Uniweld shall have no responsibility in that use.

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MON. - FRI. (excluding holidays) 8:15 AM to 4:45 PM EST.

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Additional technical information is available from the American Welding Society, Box 351040, 550 N.W. LeJeune Road, Miami, FL 33126; Rubber Manufacturer's Association (Hoses), 1400 K Street N.W., Washington, D.C. 20005; National Fire Protection Association, 470 Atlantic Ave., Boston, MA 02210; American National Standards Institute, 1430 Broadway, New York 10018; Compressed Gas Association, 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102; and Code of Federal Regulations 29 1910.251 through 1910.257.



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