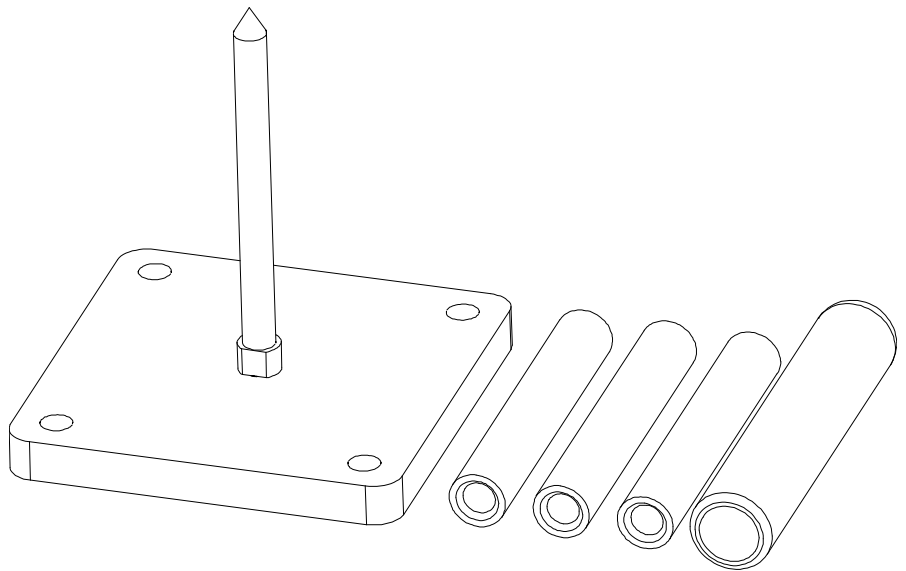


**QRP-IN**

# TCP CHECK TOOL

**English**  
**French**  
**Spanish**



# Installation and Operation Guide



## **WE APPRECIATE YOUR BUSINESS!**

Congratulations on your new Tweco® Robotics product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency, please contact a representative at the address and phone number in your area listed on the inside back cover of this manual, or visit us on the web at [www.tweco.com](http://www.tweco.com).

This Operating Manual has been designed to instruct you on the correct use and operation of your Tweco® Robotics product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore, please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

## **YOU ARE IN GOOD COMPANY!**

### **The Brand of Choice for Contractors and Fabricators Worldwide.**

Tweco® Robotics is a Global Brand of Arc Welding Products for Thermadyne Industries Inc. We manufacture and supply to major welding industry sectors worldwide including; Manufacturing, Construction, Mining, Automotive, Aerospace, Engineering, Rural and DIY/Hobbyist.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to develop technologically advanced products to achieve a safer working environment within the welding industry.



**WARNING**

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*READ AND UNDERSTAND THIS ENTIRE MANUAL AND YOUR EMPLOYER'S SAFETY PRACTICES BEFORE INSTALLING, OPERATING, OR SERVICING THE EQUIPMENT. WHILE THE INFORMATION CONTAINED IN THIS MANUAL REPRESENTS THE MANUFACTURER'S BEST JUDGMENT, THE MANUFACTURER ASSUMES NO LIABILITY FOR ITS USE.*

---

TCP Check Tool  
Installation and Operation Guide  
Instruction Manual Number SM-QRP-IN

Published by:  
Tweco® Products Inc.  
2800 Airport Road  
Denton, TX 76208  
(940) 566-2000

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Publication Date: July 1, 2006

Record the following information for Warranty purposes:

Where Purchased: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

Equipment Serial #: \_\_\_\_\_

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## SECTION 1: SAFETY INSTRUCTIONS AND WARNINGS

**WARNING**

*SERIOUS INJURY OR DEATH MAY RESULT IF WELDING AND CUTTING EQUIPMENT IS NOT PROPERLY INSTALLED, USED AND MAINTAINED. MISUSE OF THIS EQUIPMENT AND OTHER UNSAFE PRACTICES CAN BE HAZARDOUS. THE OPERATOR, SUPERVISOR AND HELPER MUST READ AND UNDERSTAND THE FOLLOWING SAFETY WARNINGS AND INSTRUCTIONS BEFORE INSTALLING OR USING ANY WELDING OR CUTTING EQUIPMENT.*

*THE WELDING AND CUTTING PROCESS IS USED IN MANY POTENTIALLY DANGEROUS ENVIRONMENTS SUCH AS ELEVATED HEIGHTS, AREAS OF LIMITED VENTILATION, CLOSE QUARTERS, AROUND WATER, IN HOSTILE ENVIRONMENTS, ETC., AND IT IS IMPORTANT THAT THE OPERATOR(S) ARE AWARE OF THE DANGERS ASSOCIATED WITH WORKING IN THESE TYPES OF CONDITIONS. BE CERTAIN THAT THE OPERATOR(S) ARE TRAINED IN SAFE PRACTICES FOR ENVIRONMENTS IN WHICH THEY ARE EXPECTED TO WORK AND UNDER COMPETENT SUPERVISION.*

*IT IS ESSENTIAL THAT THE OPERATOR, SUPERVISOR AND ALL OTHER PERSONNEL IN THE WORK AREA ARE AWARE OF THE DANGERS OF THE WELDING OR CUTTING PROCESS. TRAINING AND PROPER SUPERVISION ARE IMPORTANT FOR A SAFE WORK PLACE. KEEP THESE INSTRUCTIONS FOR FUTURE USE. ADDITIONAL RECOMMENDED SAFETY AND OPERATING INFORMATION IS REFERENCED IN EACH SECTION.*

### 1.01 Welding Hazards

**WARNING**

*ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH.*

*INSTALL AND MAINTAIN EQUIPMENT IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA 70) AND LOCAL CODES. DO NOT SERVICE OR REPAIR EQUIPMENT WITH POWER ON. DO NOT OPERATE EQUIPMENT WITH PROTECTIVE INSULATORS OR COVERS REMOVED. SERVICE OR REPAIR TO EQUIPMENT MUST BE DONE BY A QUALIFIED REPAIR TECHNICIAN, OR TRAINED PERSONNEL ONLY.*

1. **Do not** touch live electrical parts.
2. **Do not** touch an electrode with bare skin and electrical ground at the same time.
3. Always keep welding gloves dry and in good condition.

#### **NOTE**

*Aluminized protective clothing can become part of the electrical path.*

4. Keep oxygen cylinders, chains, wire ropes, cranes, hoists, and elevators away from any part of the electrical path.

5. All ground connections must be checked periodically to determine that they are mechanically strong and electrically adequate for the required current.
6. When engaged in alternating current, welding, or cutting under wet conditions or warm surroundings where perspiration is a factor, the use of reliable automatic controls for reducing the no-load voltage is recommended to reduce shock hazard.
7. When the welding or cutting process requires values of open circuit voltages in alternating current machines higher than 80 volts, and direct current machines higher than 100 volts, means must be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.
8. When welding is to be suspended for any substantial length of time, such as during lunch or overnight, all electrodes should be removed from the electrode holder and the electrode holder carefully located so that accidental contact cannot occur.
9. The holder must be disconnected from the power source when not in use.
10. **Never** immerse Mig-Guns, electrode holders, tig torches, plasma torches, or electrodes in water.

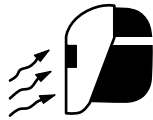
**WARNING**

*SMOKE, FUMES, AND GASES CAN BE DANGEROUS TO YOUR HEALTH.*

# TCP CHECK TOOL

---

11. Keep smoke, fumes, and gases from the breathing area.
12. Fumes from the welding or cutting process are of various types and strengths, depending on the kind of base metal being worked on. To ensure your safety, do not breathe these fumes.
13. Ventilation must be adequate to remove smoke, fumes, and gases during the operation to protect operators and other personnel in the area.
14. Vapors of chlorinated solvents can form the toxic gas "Phosgene" when exposed to ultraviolet radiation from an electric arc. All solvents, degreasers, and potential sources of these vapors must be removed from the work area.
15. Fumes produced by welding or cutting, particularly in confined places, can cause discomfort and physical harm if inhaled over an extended period of time.
16. Provide adequate ventilation in the welding or cutting area. Use air-supplied respirators if ventilation is not adequate to remove all fumes and gases. **Never ventilate with oxygen.** Oxygen supports and vigorously accelerates fire.



**WARNING**

---

*ARC RAYS, HOT SLAG, AND SPARKS CAN INJURE EYES AND BURN SKIN.*

---

17. The welding and cutting processes produces extreme localized heat and strong ultraviolet rays.
18. Never attempt to weld or cut without a welding helmet with the proper lens. Ensure that the lens complies with federal guidelines. A number 12 to 14 shade filter lens provides the best protection against arc radiation. When in a confined area, prevent the reflected arc rays from entering around the helmet.
19. Ensure all personnel in the work area are protected from arc rays and sparks. Approved shielding curtains and appropriate goggles should be used to provide protection to staff in the surrounding area and operators of nearby equipment.
20. Unprotected skin should also be covered from arc rays, heat and molten metal. Always wear protective gloves and clothing that does not allow skin to become exposed. All pockets should be closed and cuffs sewn shut. Leather aprons, sleeves, leggings, etc., should be worn for out-of-position welding and cutting or for heavy operations using large electrodes. High top work shoes provide adequate protection from foot burns. For added protection use leather spats.

21. Flammable hair preparations should not be used when welding or cutting. Wear ear plugs to protect ears from sparks.
22. Where the work area permits, the operator should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide. This is an important factor for absorbing ultraviolet radiations, and lamp black. The operator should be enclosed with non-combustible screens similarly painted.



**WARNING**

---

*WELDING SPARKS CAN CAUSE FIRES AND EXPLOSIONS.*

---

23. Causes of fire and explosion are: combustibles reached by the arc, flame, flying sparks, hot slag, or heated material. Remove combustibles from the work area and/or provide a fire watch.
24. Avoid oily or greasy clothing as sparks may ignite them. Have a fire extinguisher nearby, and know how to use it.
25. Be alert to the danger of conduction or radiation. For example, if welding or cutting is to be done on a metal wall, partition, ceiling, or roof, precautions must be taken to prevent ignition of combustibles on the other side.
26. Do not weld or cut containers that have held combustibles. All hollow spaces, cavities and containers should be vented prior to welding or cutting to permit the escape of air or gases. Purging with inert gas is recommended.
27. **Never use oxygen in a welding torch.** Use only inert gases or inert gas mixes as required by the process. Use of combustible compressed gases can cause explosions resulting in personal injury or death. Arcing against any compressed gas cylinder can cause cylinder damage or explosion.



**WARNING**

---

*NOISE CAN DAMAGE HEARING.*

---

28. Noise from the air carbon-arc process can damage your hearing. Wear protective hearing devices to ensure protection when noise levels exceed OSHA standards. Adequate hearing protection devices must be worn by operators and surrounding personnel to ensure personal protection against noise.

## 1.02 Principal Safety Standards

### SAFETY AND OPERATING REFERENCES

1. Code of Federal Regulations. (OSHA)  
Section 29 Part 1910.95, 132, 133, 134, 139, 251, 252, 253, 254 and 1000.  
U.S. Government Printing Office, Washington, DC. 20402.
2. ANSI Z49.1 "Safety In Welding and Cutting".
3. ANSI Z87.1 "Practice for Occupational and Educational Eye and Face Protection".
4. ANSI Z88.2 "Standard Practice for Respiratory Protection".  
American National Standards Institute, 1430 Broadway, New York, NY. 10018.
5. AWS F4.1 "Recommended Safe Practices for Welding and Cutting Containers".
6. AWS C5.3 "Recommended Practices for Air Carbon-Arc Gouging and Cutting".  
The American Welding Society, 550 NW Lejeune RD., P.O.Box 351040, Miami FL. 33135.
7. NFPA 51B "Fire Prevention in Cutting and Welding Processes".
8. NFPA-7 "National Electrical Code."  
National Fire Protection Association, Battery Park, Quincy, MA. 02269.
9. CSA W117.2, "Safety in Welding, Cutting and Allied Processes".  
Canadian Standards Association, 178 Rexdale Blvd., Rexdale, Ontario, Canada M9W 1R3.

## 1.03 Safety and Health

### **NOTE**

*Be sure to read and fully comprehend the safety instructions and warnings contained within section 1 of this manual before performing any welding or cutting operations.*



### **WARNING**

*SERIOUS INJURY OR DEATH MAY RESULT IF WELDING AND CUTTING EQUIPMENT IS NOT PROPERLY INSTALLED, USED AND MAINTAINED. MISUSE OF THIS EQUIPMENT, OR OTHER UNSAFE PRACTICES, CAN BE HAZARDOUS.*

- Electric shock can cause injury or death.
- Smoke, fumes, and gases can be dangerous to your health.
- Arc rays, hot slag, and sparks can injure or burn unprotected eyes and skin.
- Welding sparks can cause fires and explosions.
- Excessive noise can damage your hearing.

**SECTION 2:  
INTRODUCTION AND DESCRIPTION**

**2.01 How to Use this Manual**

To ensure safe operation, read the entire manual, including the chapters on safety instructions and warnings.

Throughout this manual, the words **WARNING**, **CAUTION**, and **NOTE** may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:



**WARNING**

A **WARNING** GIVES INFORMATION REGARDING POSSIBLE PERSONAL INJURY.



**CAUTION**

A **CAUTION** refers to possible equipment damage.

**NOTE**

A **NOTE** offers helpful information concerning certain operating procedures.

**2.02 Receipt of Equipment**

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location in your area listed in the inside back cover of this manual. Include a full description of the parts in error.

If you want additional or replacement copies of this CD, please contact Tweco® Robotics at the address and phone number in your area listed on the inside back cover of this manual. Include the Manual number (from page i) and CD part number: 64-2601.

**2.03 Introduction**

The Tweco® Robotics QRP-IN Tool Center Point (TCP) Check Tool enables you to quickly check the TCP of the conductor tube assembly without removing the conductor tube assembly from the torch and cable assembly.

The QRP-IN comes with three sleeve sizes for the Tweco Robotics 14 and 16 series contact tips.

The QRP-IN TCP check tool comes standard with the items shown in Figure 1. Before starting the installation, please read and understand the installation and operation procedures outlined in this manual.

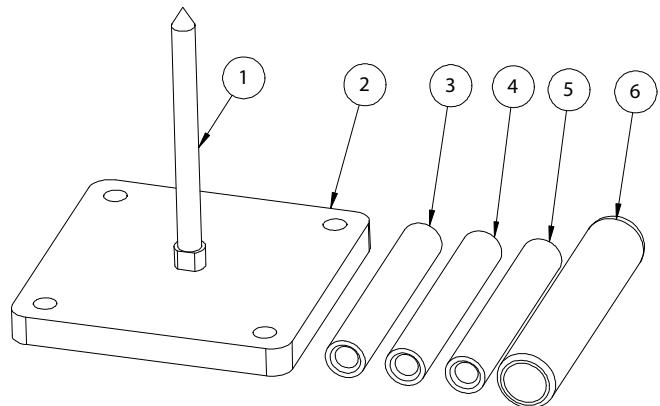


Figure 1: Packaged QRP-IN

Item No.	Description	Qty.
1	Index Shaft	1
2	Base Plate	1
3	Alignment Sleeve for EL16 Series Contact Tips	1
4	Alignment Sleeve for 14H Series Contact Tips	1
5	Alignment Sleeve for 16S Series Contact Tips	1
6	Protective Cover for Index Shaft	1

## SECTION 3: INSTALLATION AND OPERATION

1. Remove the component parts of the QRP-IN TCP Check Tool from the shipping carton.
2. Check to ensure all items shown in Figure 1 are located and identified. If any of the component parts are missing, please notify the local Tweco Welding Distributor or Tweco Products Customer Service Department at 1-800-426-1888.
3. Secure the QRP-IN check tool base to a solid worktable within the robot cell. The optimum position would be close to the work station and out of the way of any associated equipment, fixtures, and parts being welded.

The check tool base has four .281"  $\varnothing$  (7,14mm) holes allowing the use of 1/4"  $\varnothing$  (6,35mm) hex head bolts to secure the unit to the worktable. Refer to Figure 2.

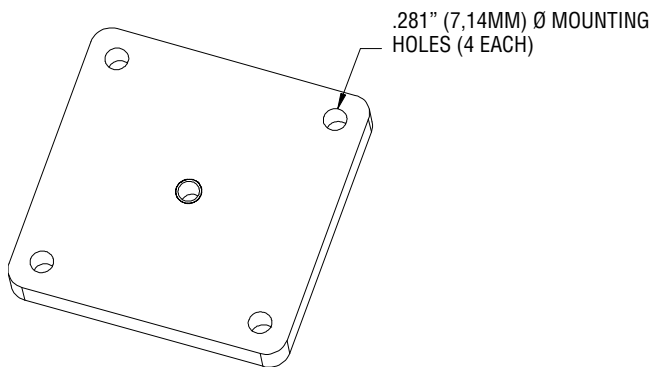


Figure 2: Tool Base

4. Thread the index shaft into the check tool base. Use a 5/16" open-end wrench to secure the index shaft to the check tool base.
5. Select the appropriate sleeve and slide it over the index shaft. Refer to Figure 3.

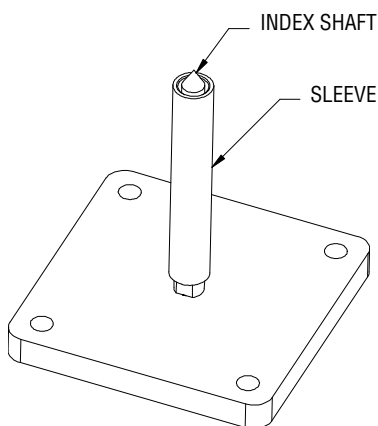


Figure 3: Sleeve Over Index Shaft

6. Position the robot arm with the conductor tube assembly directly above the index shaft. Refer to Figure 4.

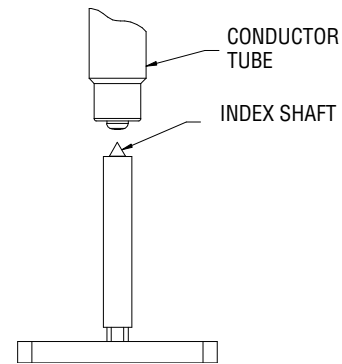


Figure 4: Conductor Tube Positioned Over Index Shaft

7. Trim the contact tip wire from the inside of the tip.
8. Lower the conductor tube so that the contact tip inside diameter (ID) is over the index shaft and aligned parallel with the index shaft.
9. Lift the sleeve up and over the contact tip — the sleeve should slide easily over the contact tip when the TCP is correct. Refer to Figure 5. If the alignment sleeve does not slide over the contact tip, remove the conductor assembly from the torch and cable assembly.

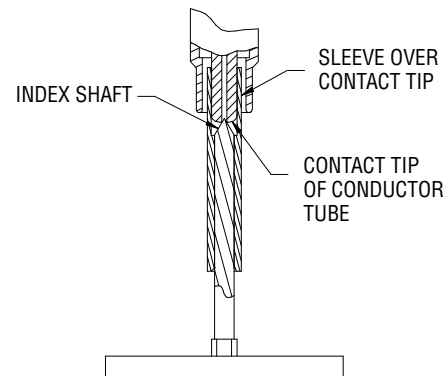
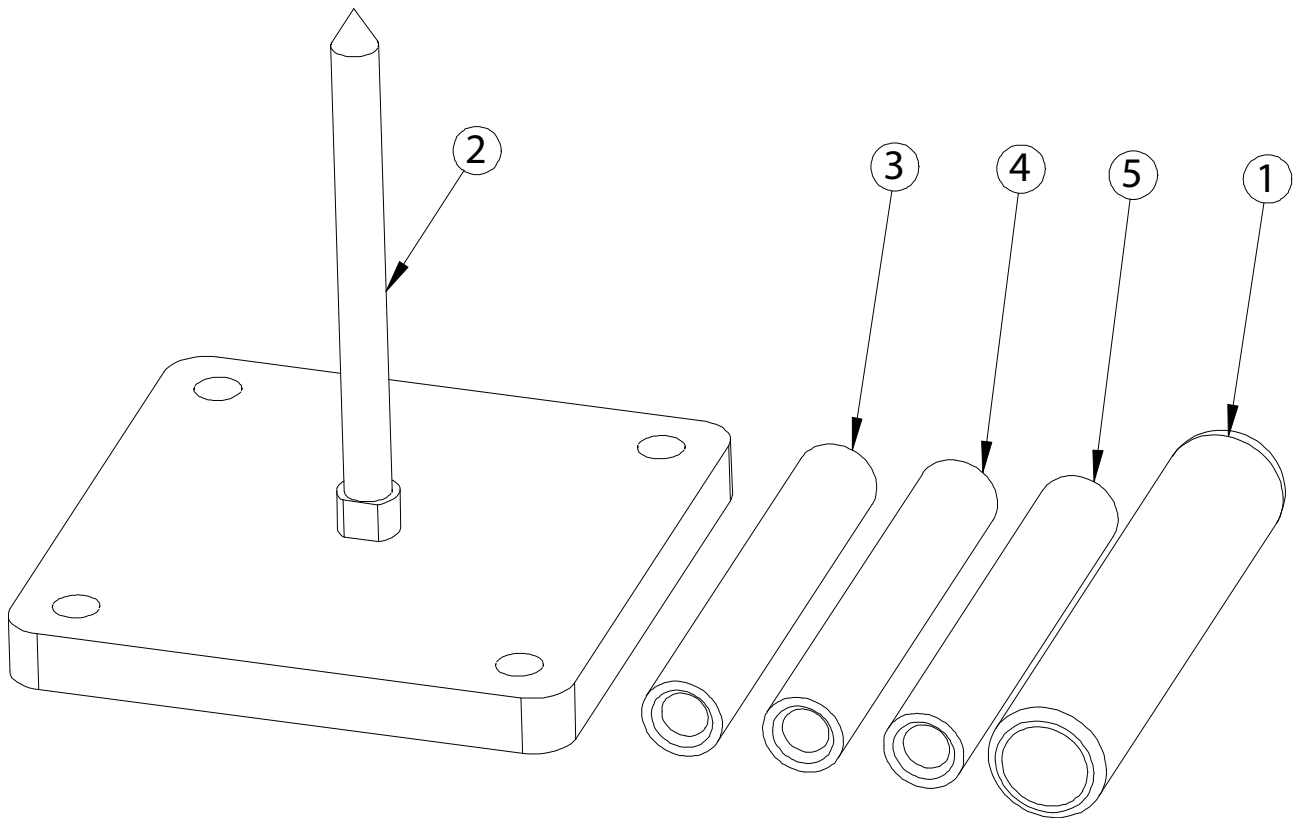


Figure 5: Sleeve Over Contact Tip

10. Use the QCT-1, Conductor Tube Alignment Fixture to manually adjust the "TCP" before and/or after a collision. Contact your local welding distributor or Tweco Customer Service Department (1-800-426-1888) for more details on the QCT-1 – (Stock No. 3500-1325).

**SECTION 4:  
REPLACEMENT PARTS**



**QRP-IN Replacement Parts**

Item No.	Part No.	Stock No.	Description
1	QRP-1	3500-1344	Protective Cover for Index Shaft
2	QRP-2	3500-1345	Index Shaft
3	QRP-EL16	3500-1342	Alignment Sleeve for EL16 Series Contact Tips
4	QRP-14H	3500-1343	Alignment Sleeve for 14H Series Contact Tips
5	QRP-16S	3500-1341	Alignment Sleeve for 16S Series Contact Tips

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## **STATEMENT OF WARRANTY**

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**LIMITED WARRANTY:** THERMADYNE® warrants that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the THERMADYNE products as stated below, THERMADYNE shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with THERMADYNE's specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at THERMADYNE's sole option, of any components or parts of the product determined by THERMADYNE to be defective.

**THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

**LIMITATION OF LIABILITY:** THERMADYNE shall not under any circumstances be liable for special or consequential damages, such as, but not limited to, damage or loss of purchased or replacement goods, or claims of customers of distributor (hereinafter the "Purchaser") for service interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of THERMADYNE with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by THERMADYNE whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.

**THIS WARRANTY BECOMES INVALID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY THERMADYNE PRODUCT.**

**THIS WARRANTY IS INVALID IF THE PRODUCT IS SOLD BY NON-AUTHORIZED PERSONS.**

This warranty is effective for the time stated in the Warranty Schedule beginning on the date that the authorized distributor delivers the products to the Purchaser.

Warranty repairs or replacement claims under this limited warranty must be submitted by an authorized THERMADYNE repair facility within thirty (30) days of the repair. No transportation costs of any kind will be paid under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the Purchaser. All returned goods shall be at the Purchaser's risk and expense. This warranty supersedes all previous THERMADYNE warranties.

# WARRANTY SCHEDULE

The warranty is effective below for the time stated in the Warranty Schedule beginning on the date that the authorized distributor delivers the products to the purchaser. THERMADYNE® reserves the right to request documented evidence of date of purchase.

Engine Driven Welders Scout®, Raider®, Explorer™	Parts / Labor
Original Main Power Stators and Inductors	3 years / 3 years
Original Main Power Rectifiers, Control P.C. Boards	3 years / 3 years
All Other Original Circuits and Components Including, but not Limited to, Relays, Switches, Contactors, Solenoids, Fans, Power Switch Semi-Conductors	1 year / 1 year
Engines and Associated Components are NOT Warranted by Thermal Arc®, Although Most are Warranted by the Engine Manufacturer. SEE THE ENGINE MANUFACTURERS' WARRANTY FOR DETAILS.	See the Engine Manufacturers' Warranty for Details
GMAW/FCAW (MIG) Welding Equipment Fabricator® 131, 181, 190, 210, 251, 281; Fabstar® 4030; PowerMaster® 350, 350P, 500, 500P; Excel-Arc® 6045; Wire Feeders: Ultrafeed®, Porta-feed®	Parts / Labor
Original Main Power Transformer and Inductor	5 years / 3 years
Original Main Power Rectifiers, Control P.C. Boards, Power Switch Semi-Conductors	3 years / 3 years
All Other Original Circuits and Components Including, but not Limited to, Relays, Switches, Contactors, Solenoids, Fans, Electric Motors	1 year / 1 year
GTAW (TIG) & Multi-process Inverter Welding Equipment 160TS, 300TS, 400TS, 185AC/DC, 200AC/DC, 300AC/DC, 400GTSW, 400MST, 300MST, 400MSTP	Parts / Labor
Original Main Power Magnetics	5 years / 3 years
Original Main Power Rectifiers, Control P.C. Boards, Power Switch Semi-Conductors	3 years / 3 years
All Other Original Circuits and Components Including, but not Limited to, Relays, Switches, Contactors, Solenoids, Fans, Electric Motors	1 year / 1 year
Plasma Welding Equipment Ultima® 150	Parts / Labor
Original Main Power Magnetics	5 years / 3 years
Original Main Power Rectifiers, Control P.C. Boards, Power Switch Semi-Conductors	3 years / 3 years
Welding Console, Weld Controller, Weld Timer	3 years / 3 years
All Other Original Circuits and Components Including, but not Limited to, Relays, Switches, Contactors, Solenoids, Fans, Electric Motors, Coolant Recirculators	1 year / 1 year
SMAW (Stick) Welding Equipment Dragster™ 85	Parts / Labor
Original Main Power Magnetics	1 year / 1 year
Original Main Power Rectifiers, Control P.C. Boards	1 year / 1 year
All Other Original Circuits and Components Including, but not Limited to, Relays, Switches, Contactors, Solenoids, Fans, Power Switch Semi-Conductors	1 year / 1 year
160S, 300S, 400S	Parts / Labor
Original Main Power Magnetics	5 years / 3 years
Original Main Power Rectifiers, Control P.C. Boards	3 years / 3 years
All Other Original Circuits and Components Including, but not Limited to, Relays, Switches, Contactors, Solenoids, Fans, Power Switch Semi-Conductors	1 year / 1 year
General Arc Equipment	Parts / Labor
Water Recirculators	1 year / 1 year
Plasma Welding Torches	180 days / 180 days
Gas Regulators (Supplied with Power Sources)	180 days / NA
MIG and TIG Torches (Supplied with Power Sources)	90 days / NA
Replacement Repair Parts	90 days / NA
MIG, TIG and Plasma Welding Torch Consumable Items	NA / NA
Gas Welding and Cutting Equipment	Parts / Labor
Victor® Professional	5 years / NA
Oxygen Conservers	2 years / NA
Aluminum Cylinders	Lifetime / NA
Cutting Machine Motors	1 year / NA
HP&I Brass Regulators/Manifolds	2 years / NA
HP&I Stainless Regulators/Manifolds	1 year / NA
HP&I Corrosive Gas Regulators/Manifolds	90 days / NA
TurboTorch®	3 years / NA
CutSkill®	2 years / NA
Steel Cylinders	1 year / NA
Victor Medical	6 years / NA
Victor VSP	2 years / NA
Firepower® MIG Welders	5-2-1 years / NA
Transformers	5 years / NA
Parts Used in Rental Applications	1 year from date sold by seller to authorized distributor
MIG Torches and Arc Accessories	Parts / Labor
Arcair® N6000	90 days / NA
Eliminator® Spool and Pull Guns	90 days / NA
Robotic Deflection Mounts	90 days / NA
QRM-100 Anti-Spatter Applicator	90 days / NA
TC and TCV Water Coolers	1 year / NA
TSC-96 Smoke Collector	1 year / NA
ESG-1, EPG-CR1, EPG-CR2 Control Boxes for Eliminator Spool & Pull Guns	1 year / NA
QRC-2000 Nozzle Cleaning Stations	1 year / 1 year
All other products 30 days from date purchaser purchases from seller.	30 days / NA
Plasma Cutting Systems	Parts / Labor
Automated Plasma	2 years / 1 year
CutMaster™	3 years / 3 years
PakMaster® XL PLUS	3 years / 1 year
Drag-Gun®	1 year / 1 year
Drag-Gun Plus	2 years / 1 year
Torches	1 year / 1 year
Consoles, Control Equipment, Heat Exchangers and Accessory Equipment	1 year / 1 year



## GLOBAL CUSTOMER SERVICE CONTACT INFORMATION

---

### **Thermadyne USA**

2800 Airport Road  
Denton, TX 76207 USA  
Telephone: (1) 800-426-1888  
Fax: (1) 800-535-0557

### **Thermadyne Canada**

2070 Wyecroft Road  
Oakville, Ontario  
Canada, L6L5V6  
Telephone: (1) 905-827-9777  
Fax: (1) 905-827-9797

### **Thermadyne Europe**

Europe Building  
Chorley North Industrial Park  
Chorley, Lancashire  
England, PR6 7Bx  
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Fax: (44) 1257-224800

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685 Ding Xi Rd  
Chang Ning District  
Shanghai, PR, 200052  
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Fax: 86 21+3226-0955

### **Thermadyne Asia Sdn Bhd**

Lot 151, Jalan Industri 3/5A  
Rawang Integrated Industrial Park - Jln Batu Arang  
48000 Rawang Selangor Darul Ehsan  
West Malaysia  
Telephone: 603+ 6092 2988  
Fax : 603+ 6092 1085

### **Cigweld Australia**

71 Gower Street  
Preston, Victoria  
Australia, 3072  
Telephone: 1300-654-674  
Fax: 613+ 9474-7391

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OCIM, S.r.L.  
Via Benaco, 3  
20098 S. Giuliano  
Milan, Italy  
Tel: (39) 02-98 80320  
Fax: (39) 02-98 281773

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Facsimile: (636) 728-3010  
[www.thermadyne.com](http://www.thermadyne.com)

***Tweco***<sup>®</sup>  
***Robotics***