Hypertherm[®]

XPR170™

Replacement Part Procedures

Field Service Bulletin

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One of Hypertherm's long-standing core values is a focus on minimizing our impact on the environment. Doing so is critical to our, and our customers', success. We are always striving to become better environmental stewards; it is a process we care deeply about.



ENGLISH

WARNING! Before operating any Hypertherm equipment, read the safety instructions in your product's manual, the Safety and Compliance Manual (80669C), Waterjet Safety and Compliance Manual (80943C), and Radio Frequency Warning Manual (80945C). Failure to follow safety instructions can result in personal injury or in damage to equipment.

Copies of the manuals can come with the product in electronic and printed formats. Electronic copies are also on our website. Many manuals are available in multiple languages at www.hypertherm.com/docs.

BG (БЪЛГАРСКИ/BULGARIAN)

ПРЕДУПРЕЖДЕНИЕ! Преди да работите с което и да е оборудване Нуреrtherm, прочетете инструкциите за безопасност в ръководството на вашия продукт, "Инструкция за безопасност и съответствие" (80669C), "Инструкция за безопасност и съответствие на Waterjet" (80943C) и "Инструкция за предупреждение за радиочестота" (80945C).

Продуктът може да е съпроводен от копия на ръководствата в електронен и в печатен формат. Тези в електронен формат са достъпни също на уебсайта ни. Много ръководства са налице на няколко езика на адрес www.hypertherm.com/docs.

CS (ČESKY/CZECH)

VAROVÁNÍ! Před uvedením jakéhokoli zařízení Hypertherm do provozu si přečtěte bezpečnostní pokyny v příručce k produktu a v Manuálu pro bezpečnost a dodržování předpisů (80669C), Manuálu pro bezpečnost a dodržování předpisů při řezání vodním paprskem (80943C) a Manuálu varování ohledně rádiových frekvencí (80945C).

Kopie příruček mohou být součástí dodávky produktu, a to v elektronické i tištěné formě. Elektronické kopie jsou k dispozici i na našich webových stránkách. Mnoho příruček je k dispozici v různých jazycích na stránce www.hypertherm.com/docs.

DA (DANSK/DANISH)

ADVARSEL! Inden Hypertherm udstyr tages i brug skal sikkerhedsinstruktionerne i produktets manual og i *Manual om sikkerhed og overholdelse af krav* (80669C), *Manual om sikkerhed og overholdelse af krav for vandstråleskæring* (80943C), og *Manual om radiofrekvensadvarsel* (80945C), gennemlæses.

Kopier af manualerne kan leveres med produktet i elektronisk og trykt format. Elektroniske kopier findes også på vores hjemmeside. Mange manualer er tilgængelige på flere sprog på www.hypertherm.com/docs.

DE (DEUTSCH/GERMAN)

WARNUNG! Bevor Sie ein Hypertherm-Gerät in Betrieb nehmen, lesen Sie bitte die Sicherheitsanweisungen in Ihrer Bedienungsanleitung, das Handbuch für Sicherheit und Übereinstimmung (80669C), das Handbuch für Sicherheit und Compliance bei Wasserstrahl-Schneidanlagen (80943C) und das Handbuch für Hochfrequenz-Warnung (80945C).

Bedienungsanleitungen und Handbücher können dem Gerät in elektronischer Form oder als Druckversion beiliegen. In elektronischer Form liegen sie auch auf unserer Website vor. Viele Handbücher stehen in verschiedenen Sprachen auf www.hypertherm.com/docs zur Verfügung.

ES (ESPAÑOL/SPANISH)

IADVERTENCIA! Antes de operar cualquier equipo Hypertherm, lea las instrucciones de seguridad del manual de su producto, del Manual de seguridad y cumplimiento (80669C), del Manual de seguridad y cumplimiento en corte con chorro de agua (80943C) y del Manual de advertencias de radiofrecuencia (80945C).

El producto puede incluir copias de los manuales en formato digital e impreso. Las copias digitales también están en nuestra página web. Hay diversos manuales disponibles en varios idiomas en www.hypertherm.com/docs.

ET (EESTI/ESTONIAN)

HOIATUS! Enne Hyperthermi mis tahes seadme kasutamist lugege läbi toote kasutusjuhendis olevad ohutusjuhised ning Ohutus- ja vastavusjuhend (80669C), Veejoa ohutuse ja vastavuse juhend (80943C) ja Raadiosageduse hoiatusjuhend (80945C). Ohutusjuhiste eiramine võib põhjustada vigastusi ja kahjustada seadmeid.

Juhiste koopiad võivad tootega kaasas olla elektrooniliselt või trükituna. Elektroonilised koopiad on saadaval ka meie veebilehel. Paljud kasutusjuhendid on erinevates keeltes saadaval veebilehel www.hypertherm.com/docs.

FI (SUOMI/FINNISH)

VAROITUS! Ennen minkään Hypertherm-laitteen käyttöä lue tuotteen käyttöoppaassa olevat turvallisuusohjeet, turvallisuuden ja vaatimustenmukaisuuden käsikirja (80669C), vesileikkauksen turvallisuuden ja vaatimustenmukaisuuden käsikirja (80943C) ja radiotaajuusvaroitusten käsikirja (80945C).

Käyttöoppaiden kopiot voivat olla tuotteen mukana sähköisessä ja tulostetussa muodossa. Sähköiset kopiot ovat myös verkkosivustollamme. Monet käyttöoppaat ovat myös saatavissa useilla kieliillä www.hypertherm.com/docs.

FR (FRANÇAIS/FRENCH)

AVERTISSEMENT! Avant d'utiliser tout équipement Hypertherm, lire les consignes de sécurité du manuel de votre produit, du Manuel de sécurité et de conformité (80669C), du Manuel de sécurité et de conformité du jet d'eau (80943C) et du Manuel d'avertissement relatif aux radiofréqunces (80945C).

Les exemplaires des manuels qui accompagnent le produit peuvent être sous forme électronique ou papier. Les manuels sous forme électronique se trouvent également sur notre site Internet. Plusieurs manuels sont offerts en plusieurs langues à www.hypertherm.com/docs.

GR (EAAHNIKA/GREEK)

ΠΡΟΕΙΔΟΠΟΙΗΣΗ! Πριν θέσετε σε λειτουργία οποιονδήποτε εξοπλισμό της Hypertherm, διαβάστε τις οδηγίες ασφαλείας στο εγχειρίδιο του προϊόντος και στο εγχειρίδιο ασφάλειας και συμμόρφωσης (80669C), στο εγχειρίδιο ασφάλειας και συμμόρφωσης του waterjet (80943C) και στο εγχειρίδιο προειδοποιήσεων για τις ραδιοσυχνότητες (80945C).

Το προϊόν μπορεί να συνοδεύεται από αντίγραφα των εγχειριδίων σε ηλεκτρονική και έντυπη μορφή. Τα ηλεκτρονικά αντίγραφα υπάρχουν επίσης στον ιστότοπό μας. Πολλά εγχειρίδια είναι διαθέσιμα σε διάφορες γλώσσες στο www.hypertherm.com/docs.

HU (MAGYAR/HUNGARIAN)

VIGYÁZAT! Mielőtt bármilyen Hypertherm berendezést üzemeltetne, olvassa el a biztonsági információkat a termék kézikönyvében, a Biztonsági és szabálykövetési kézikönyvben (80669C), a Vizsugaras biztonsági és szabálykövetési kézikönyvben (80943C) és a Rádiófrekvenciás figyelmeztetéseket tartalmazó kézikönyvben (80945C).

A termékhez a kézikönyv példányai elektronikus és nyomtatott formában is mellékelve lehetnek. Az elektronikus példányok webhelyünkön is megtalálhatók. Számos kézikönyv áll rendelkezésre több nyelven a www.hypertherm.com/docs weboldalon.

ID (BAHASA INDONESIA/INDONESIAN)

PERINGATAN! Sebelum mengoperasikan peralatan Hypertherm, bacalah petunjuk keselamatan dalam manual produk Anda, Manual Keselamatan dan Kepatuhan (80669C), Manual Keselamatan dan Kepatuhan Jet Air (80943C), dan Manual Peringatan Frekuensi Radio (80945C). Kegagalan mengikuti petunjuk keselamatan dapat menyebabkan cedera pribadi atau kerusakan pada peralatan.

Produk mungkin disertai salinan manual atau petunjuk dalam format elektronik maupun cetak. Salinan elektronik juga tersedia di situs web kami. Berbagai manual tersedia dalam beberapa bahasa di www.hypertherm.com/docs.

IT (ITALIANO/ITALIAN)

AVVERTENZA! Prima di usare un'attrezzatura Hypertherm, leggere le istruzioni sulla sicurezza nel manuale del prodotto, nel Manuale sulla sicurezza e la conformità (80669C), nel Manuale sulla sicurezza e la conformità Waterjet (80943C) e nel Manuale di avvertenze sulla radiofreguenza (80945C).

Copie del manuale possono accompagnare il prodotto in formato cartaceo o elettronico. Le copie elettroniche sono disponibili anche sul nostro sito web. Molti manuali sono disponibili in diverse lingue all'indirizzo www.hypertherm.com/docs.

JA (日 本語/JAPANESE)

警告! Hypertherm 機器を操作する前に、この製品説明書にある安全情報、「安全とコンプライアンスマニュアル」(80669C)、「ウォータージェットの安全とコンプライアンス」(80943C)、「高周波警告」(80945C) をお読みください。

説明書のコピーは、電子フォーマット、または印刷物として製品に同梱されています。電子コピーは当社ウェブサイトにも掲載されています。説明書の多くは www.hypertherm.com/docs にて複数の言語でご用意しています。

KO (한국어/KOREAN)

경고! Hypertherm 장비를 사용하기 전에 제품 설명서와 안전 및 규정 준수 설명서(80669C), 워터젯 안전 및 규정 준수 설명서(80943C) 그리고 무선 주파수 경고 설명서(80945C)에 나와 있는 안전 지침을 읽으십시오.

전자 형식과 인쇄된 형식으로 설명서 사본이 제품과 함께 제공될 수 있습니다. 전자 사본도 Hypertherm 웹사이트에서 보실 수 있으며 설명서 사본은 www.hypertherm.com/docs 에서 여러 언어로 제공됩니다.

NE (NEDERLANDS/DUTCH)

WAARSCHUWING! Lees voordat u Hypertherm-apparatuur gebruikt de veiligheidsinstructies in de producthandleiding, in de Veiligheids- en nalevingshandleiding (80669C) in de Veiligheids- en nalevingshandleiding voor waterstralen (80943C) en in de Waarschuwingshandleiding radiofrequentie (80945C).

De handleidingen kunnen in elektronische en gedrukte vorm met het product worden meegeleverd. Elektronische versies zijn ook beschikbaar op onze website. Veel handleidingen zijn in meerdere talen beschikbaar via www.hypertherm.com/docs.

NO (NORSK/NORWEGIAN)

ADVARSEL! Før du bruker noe Hypertherm-utstyr, må du lese sikkerhetsinstruksjonene i produktets håndbok, håndboken om sikkerhet og samsvar (80669C), håndboken om vannjet sikkerhet og samsvar (80943C), og håndboken om radiofrekvensadvarsler (80945C).

Eksemplarer av håndbøkene kan følge med produktet i elektronisk og trykt form. Elektroniske eksemplarer finnes også på nettstedet vårt. Mange håndbøker er tilgjengelig i flere språk på www.hypertherm.com/docs.

PL (POLSKI/POLISH)

OSTRZEŻENIE! Przed rozpoczęciem obsługi jakiegokolwiek systemu firmy Hypertherm należy się zapoznać z instrukcjami bezpieczeństwa zamieszczonymi w podręczniku produktu, w podręczniku bezpieczeństwa i zgodności (80669C), podręczniku bezpieczeństwa i zgodności systemów strumienia wody (80943C) oraz podręczniku z ostrzeżeniem o częstotliwości radiowej (80945C).

Do produktu mogą być dołączone podręczniki użytkownika w formie elektronicznej i drukowanej. Kopie elektroniczne znajdują się również w naszej witrynie internetowej. Wiele podręczników jest dostępnych w różnych językach pod adresem www.hypertherm.com/docs.

PT (PORTUGUÊS/PORTUGUESE)

ADVERTÊNCIA! Antes de operar qualquer equipamento Hypertherm, leia as instruções de segurança no manual do seu produto, no Manual de Segurança e de Conformidade (80669C), no Manual de Segurança e de Conformidade do Waterjet (80943C) e no Manual de Advertência de radiofrequência (80945C).

Cópias dos manuais podem vir com o produto nos formatos eletrônico e impresso. Cópias eletrônicas também são encontradas em nosso website. Muitos manuais estão disponíveis em vários idiomas em www.hypertherm.com/docs.

RO (ROMÂNĂ/ROMANIAN)

AVERTIZARE! Înainte de utilizarea oricărui echipament Hypertherm, citiți instrucțiunile de siguranță din manualul produsului, manualul de siguranță și conformitate (80669C), manualul de siguranță și conformitate Waterjet (80943C) și din manualul de avertizare privind radiofrecvența (80945C).

Produsul poate fi însoțit de copii ale manualelor în format tipărit și electronic. Exemplarele electronice sunt disponibile și pe site-ul nostru web. Numeroase manuale sunt disponibile în mai mult limbi la adresa: www.hypertherm.com/docs.

RU (РУССКИЙ/RUSSIAN)

БЕРЕГИСЬ! Перед работой с любым оборудованием Hypertherm ознакомьтесь с инструкциями по безопасности, представленными в руководстве, которое поставляется вместе с продуктом, в Руководстве по безопасности и соответствию (80669С), в Руководстве по безопасности и соответствию для водоструйной резки (80943С) и Руководстве по предупреждению о радиочастотном излучении (80945С).

Копии руководств, которые поставляются вместе с продуктом, могут быть представлены в электронном и бумажном виде. Электронные копии также доступны на нашем веб-сайте. Целый ряд руководств доступны на нескольких языках по ссылке www.hypertherm.com/docs.

SK (SLOVENČINA/SLOVAK)

VÝSTRAHA! Pred použitím akéhokoľvek zariadenia od spoločnosti Hypertherm si prečítajte bezpečnostné pokyny v návode na obsluhu vášho zariadenia a v Manuáli o bezpečnosti a súlade s normami (80669C), Manuáli o bezpečnosti a súlade s normami pre systém rezania vodou (80943C) a v Manuáli s informáciami o rádiofrekvencii (80945C).

Návod na obsluhu sa dodáva spolu s produktom v elektronickej a tlačenej podobe. Jeho elektronický formát je dostupný aj na našej webovej stránke. Mnohé z návodov na obsluhu sú dostupné vo viacjazyčnej mutácii na stránke www.hypertherm.com/docs.

SL (SLOVENŠČINA/SLOVENIAN)

OPOZORILO! Pred uporabo katerekoli Hyperthermove opreme preberite varnostna navodila v priročniku vašega izdelka, v *Priročniku za varnost in skladnost* (80669C), v *Priročniku za varnost in skladnost sistemov rezanja z vodnim curkom* (80943C) in v *Priročniku Opozorilo o radijskih frekvencah* (80945C).

Izvodi priročnikov so lahko izdelku priloženi v elektronski in tiskani obliki. Elektronski izvodi so na voljo tudi na našem spletnem mestu. Številni priročniki so na voljo v različnih jezikih na naslovu www.hypertherm.com/docs.

SR (SRPSKI/SERBIAN)

UPOZORENJE! Pre rukovanja bilo kojom Hyperthermovom opremom pročitajte uputstva o bezbednosti u svom priručniku za proizvod, *Priručniku o bezbednosti i usaglašenosti* (80669C), *Priručniku o bezbednosti i usaglašenosti Waterjet tehnologije* (80943C) i *Priručniku sa upozorenjem o radio-frekvenciji* (80945C).

Уз производ се испоручују копије приручника у електронском или штампаном формату. Електронске копије су такође доступне на нашем веб-сајту. Многи приручници су доступни на више језика на адреси www.hypertherm.com/docs.

SV (SVENSKA/SWEDISH)

VARNING! Läs häftet säkerhetsinformationen i din produkts säkerhets- och efterlevnadsmanual (80669C), säkerhets- och efterlevnadsmanualen för Waterjet (80943C) och varningsmanualen för radiofrekvenser (80945C) för viktig säkerhetsinformation innan du använder eller underhåller Hypertherm-utrustning. Kopior av manualerna kan medfölja produkten i elektroniskt och tryckt format. Elektroniska kopior finns också på vår webbplats. Många manualer finns på flera språk på www.hypertherm.com/docs.

TH (ภาษาไทย/THAI)

คำเตือน! ก่อนการใช้งานอุปกรณ์ของ Hypertherm ทั้งหมด โปรดอ่านคำแนะนำด้านความ ปลอดภัยในคู่มือการใช้สินค้า คู่มือด้านความปลอดภัยและการปฏิบัติตาม (80669C), คู่มือ ด้านความปลอดภัยและการปฏิบัติตามสำหรับการใช้หัวตัดระบบวอเตอร์เจ็ต (80943C) และ คู่มือคำเตือนเกี่ยวกับความถี่วิทยุ (80945C) การไม่ปฏิบัติตามคำแนะนำด้านความ ปลอดภัยอาจส่งผลให้เกิดการบาดเจ็บหรือเกิดความเสียหายต่ออุปกรณ์

สำเนาคู่มือทั้งในรูปแบบอิเล็กทรอนิกส์และแบบสิ่งพิมพ์จะถูกแนบมาพร้อมกับ ผลิตภัณฑ์ สำเนาคู่มือในรูปแบบอิเล็กทรอนิกส์ของผลิตภัณฑ์และสำเนาคู่มือต่าง ๆ ในหลากหลายภาษานั้นยังมีให้บริการบนเว็บไซต์ www.hypertherm.com/docs ของเราอีกด้วย

TR (TÜRKÇE/TURKISH)

UYARI! Bir Hypertherm ekipmanını çalıştırmadan önce, ürününüzün kullanım kılavuzunda, Güvenlik ve Uyumluluk Kılavuzu'nda (80669C), Su Jeti Güvenlik ve Uyumluluk Kılavuzu'nda (80943C) ve Radyo Frekansı Uyarısı Kılavuzu'nda (80945C) yer alan güvenlik talimatlarını okuyun.

Kılavuzların kopyaları, elektronik ve basılı formatta ürünle birlikte verilebilir. Elektronik kopyalar web sitemizde de yer alır. Kılavuzların birçoğu www.hypertherm.com/docs adresinde birçok dilde mevcuttur.

VI (TIẾNG VIỆT/VIETNAMESE)

CẢNH BÁO! Trước khi vận hành bất kỳ thiết bị Hypertherm nào, hãy đọc các hướng dẫn an toàn trong hướng dẫn sử dụng sản phẩm của bạn, *Sổ tay An toàn và Tuân thủ* (80669C), *Sổ tay An toàn và Tuân thủ Tuân thủ* (80943C), và *Hướng dẫn Cảnh báo Tần số Vô tuyến* (80945C). Không tuân thủ các hướng dẫn an toàn có thể dẫn đến thương tích cá nhân hoặc hư hồng thiết bị.

Bản sao của sổ tay có thể đi kèm với sản phẩm ở định dạng điện tử và in. Bản điện tử cũng có trên trang web của chúng tôi. Nhiều sổ tay có sẵn bằng nhiều ngôn ngữ tại www.hypertherm.com/docs.

ZH-CN (简 体中文/CHINESE SIMPLIFIED)

警告! 在操作任何海宝设备之前,请阅读产品手册、《安全和法规遵守手册》 (80669C)、《水射流安全和法规遵守手册》(80943C)以及《射频警告手册》 (80945C) 中的安全操作说明。

随产品提供的手册可提供电子版和印刷版两种格式。电子版本同时也在我们的网站上提供。很多手册有多种语言版本,详见 www.hypertherm.com/docs.

ZH-TW (繁體中文/CHINESE TRADITIONAL)

警告!在操作任何 Hypertherm 設備前,請先閱讀您產品手冊內的安全指示,包括 《安全和法規遵從手冊》(80669C)、《水刀安全和法規遵從手冊》 (80943C),以及 《無線電頻率警示訊號手冊》(80945C)。

電子版和印刷版手冊複本可能隨產品附上。您也可以前往我們的網站下載電子版手冊。我們的網站上還以多種語言形式提供多種手冊,請造訪www.hypertherm.com/docs。

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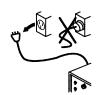
Plasma Power Supply

A WARNING



ELECTRIC SHOCK CAN KILL

Disconnect electric power before doing installation or maintenance. You can get a serious electric shock if electric power is not disconnected. Electric shock can seriously injure or kill you.

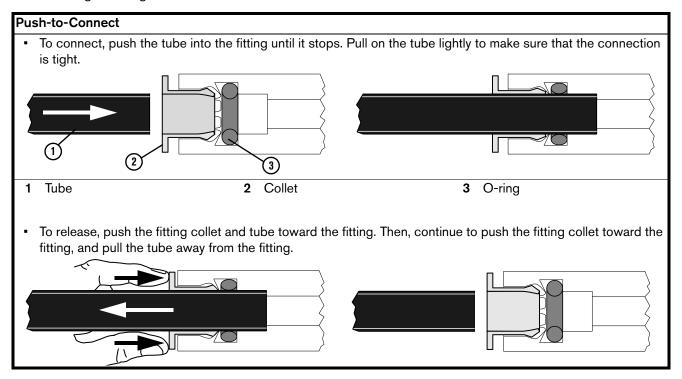


All work that requires removal of the plasma power supply outer cover or panels must be done by a qualified technician.

Refer to the *Safety and Compliance Manual* (80669C) for more safety information.

How to use push-to-connect fittings

Some replacement procedures in the plasma power supply require you to use push-to-connect fittings. This procedure explains how to use push-to-connect fittings without causing damage to the tubing or fitting.



- Replace any tubing that is damaged. If you reuse damaged tubing, it can result in leaks.
- Used tubing can have an indentation on the end that can cause leaks. To prevent leaks, trim the tubing to remove the indentation.

Front parts

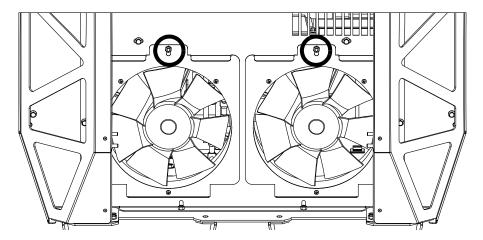
Replace the magnetics fans



Refer to Fans on page 133 for location and part number.

Remove the magnetics fans

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the front panel on page 61.
 - Keep all nuts and screws that you remove.
- 2. Use a 10 mm, hexagonal-socket wrench to remove the nut from the top of the fan bracket.



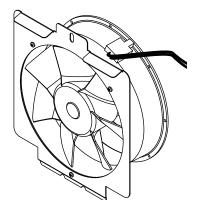
- 3. Tilt the top of the bracket towards you until you can get to the fan wire connector.
- 4. Disconnect the fan wire connector.
- 5. Remove the fan and bracket assembly.
- **6.** Use a 4 mm, hexagonal-socket wrench to remove the 3 nuts from the fan.
- 7. Remove the fan from the bracket.

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Install the magnetics fans

- 1. Put the fan on the bracket as shown.
- **2.** Use a 4 mm, hexagonal-socket wrench to install the 3 nuts to attach the new magnetics fan to the bracket.
- **3.** Put the bottom of the fan and bracket assembly into the sheet metal tab.
- 4. Connect the fan wire connector.
- **5.** Use a 10 mm, hexagonal-socket wrench to install the nut.
- **6.** Install the front panel.



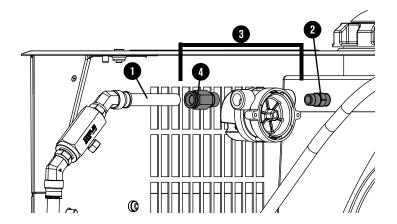
Right-side (liquid-cooling-side) parts

Replace the flow meter



Refer to Coolant system on page 134 for location and part number.

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** To make removing the flow meter easier, you can remove the top panel. Refer to Remove the top panel on page 65.
 - **d.** Drain the coolant until the level is below the coolant tank fitting **2**.
 - Keep all nuts and screws that you remove.
- 2. Disconnect the tube 1 from the push-to-connect fitting in the flow meter. Refer to How to use push-to-connect fittings on page 12.
- **3.** Hold the coolant tank fitting **2** with a 9/16-inch, open-ended wrench.
- 4. Turn the flow meter counter-clockwise to remove the flow meter and outside fitting 3 from the coolant tank fitting.



- **5.** Use a 13/16-inch, open-ended wrench to remove the fitting **4** from the flow meter.
- **6.** Apply liquid thread sealant to the fitting threads.

A NOTICE

PTFE TAPE CAN CAUSE CLOGGED VALVES, REGULATORS, AND TORCHES

Never use PTFE tape on any joint preparation. Use only a liquid or paste thread sealant on male thread ends.

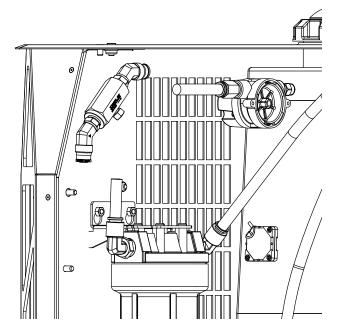
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Plasma Power Supply

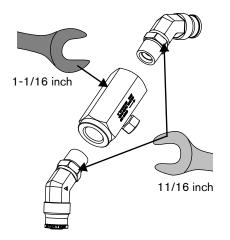
- 7. Use a 13/16-inch, open-ended wrench to install the fitting on the new flow meter. Tighten to 2.8 N·m (25 in·lbf).
 - Do not overtighten.
- **8.** Hold the coolant tank fitting with a 9/16-inch, open-ended wrench.
- **9.** Install the flow meter on the coolant tank fitting. Tighten to finger-tight, plus one turn, plus point the larger part of the flow meter up, as shown.
- **10.** Connect the tube to the push-to-connect fitting in the flow meter. Refer to How to use push-to-connect fittings on page 12.
- 11. Install all of the panels.
- 12. Add coolant to fill the tank.

Replace the coolant check valve

- Refer to Coolant system on page 134 for location and part number.
- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - b. Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - c. Drain the coolant until the level is below the coolant tank fitting.
 - Keep all nuts and screws that you remove.
- 2. Disconnect the tubes from the push-to-connect fittings on the coolant check valve. Refer to How to use push-to-connect fittings on page 12.



3. Use 2 open-ended wrenches to remove the 45-degree swivel fittings from the coolant check valve.



Plasma Power Supply

4. Apply liquid thread sealant to the fitting threads.

A NOTICE

PTFE TAPE CAN CAUSE CLOGGED VALVES, REGULATORS, AND TORCHES

Never use PTFE tape on any joint preparation. Use only a liquid or paste thread sealant on male thread ends.

- **5.** Use a 1-1/16 inch, open-ended wrench on the coolant check valve and an 11/16 inch, open-ended wrench on the 45-degree swivel fittings to install the 45-degree swivel fittings on the coolant check valve. Tighten to 8.5 N·m 9.5 N·m (75 in·lbf 84 in·lbf).
 - Do not overtighten.
- 6. Do not adjust the nut on the coolant check valve.
- 7. Make sure that the arrow on the coolant check valve points to the coolant flow meter.
- **8.** Connect the tubes to the push-to-connect fittings on the coolant check valve. Refer to How to use push-to-connect fittings on page 12.
- 9. Install all of the panels.
- 10. Add coolant to fill the tank.

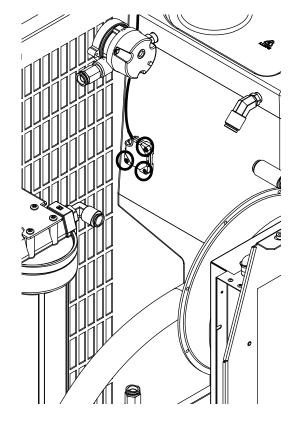
Replace the coolant level sensor



Refer to Coolant system on page 134 for location and part number.

- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- **2.** Use a 3 mm, hexagonal-key wrench to remove the 3 screws.
- 3. Remove J5 from the control PCB.
- 4. Remove the wire from the wire clips.
 - Note where the wire is routed.
- **5.** Use the 3 screws to install the coolant level sensor. Tighten to 6.9 kg·cm (6 in·lbf).
- **6.** Route the wire in the same path that you removed the wire.
- 7. Connect J1.5 to J5 on the control PCB.
- 8. Install all of the panels.
- **9.** Use the XPR web interface to make sure that the coolant sensor operates correctly.

For more information on the XPR web interface, refer to the *Connect for Communication* in the *XPR170 Instruction Manual* (810060).



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Replace a heat-exchanger fan



Refer to Fans on page 133 for location and part number.

Remove a heat-exchanger fan

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Refer to Remove the top panel on page 65.
 - ∯ Ke

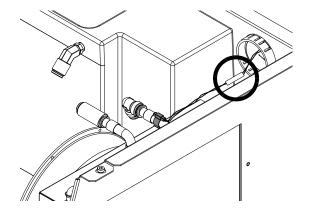
Keep all nuts and screws that you remove.

2. Use tape to attach protective material, such as cardboard, onto the rear of the heat-exchanger assembly to protect the cooling fins.

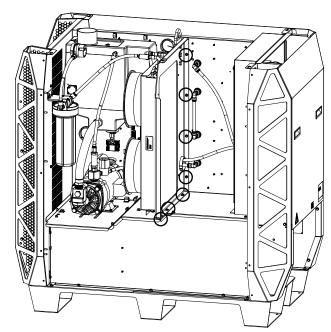
A CAUTION

Sharp cooling fins can cause cuts. Use caution when you work near the cooling fins.

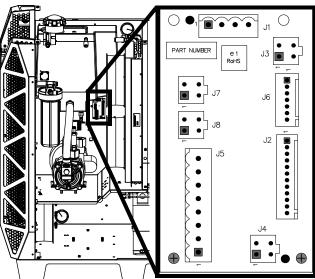
- **3.** Remove the push-to-connect fittings from the inlet and the outlet of the heat-exchanger assembly, and immediately put the ends of the hoses in a container.
- **4.** Disconnect the wire connector for the coolant thermistor.



5. Use a 10 mm, hexagonal-socket wrench to remove the 7 nuts that attach the heat-exchanger panel.



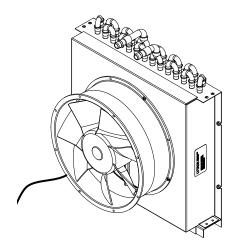
- **6.** Disconnect the connectors for the fan wires from the fan power distribution PCB, J3.
- **7.** Pull the heat-exchanger panel away from the center panel.
- **8.** Remove the 4 screws that connect the fan to the heat-exchanger assembly.
 - Repeat this step for both fans, if applicable.
- 9. Remove the fan.



1

Install a heat-exchanger fan

- 1. Use the 4 screws to install the new fan so that the wires point to the lower left (as shown) and the flow of air is towards the heat-exchanger assembly.
- 2. Push the heat-exchanger panel back into position.
- **3.** Connect the wires for the fan to the fan power distribution PCB, J3.
- **4.** Use a 10 mm, hexagonal-socket wrench to install the 7 nuts that attach the heat-exchanger panel to the center panel and bottom panel.
- **5.** Connect the coolant hose fittings to the heat-exchanger assembly.
- **6.** Pull back on the fittings to make sure the connection is tight.
- 7. Remove the tape and protective material from the rear panel of the heat-exchanger assembly.
- 8. Add coolant to fill the tank.
- 9. Install all of the panels.



Replace the heat-exchanger assembly

Refer to Fans on page 133 for location and part number.

Remove the heat-exchanger assembly

- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Refer to Remove the top panel on page 65.

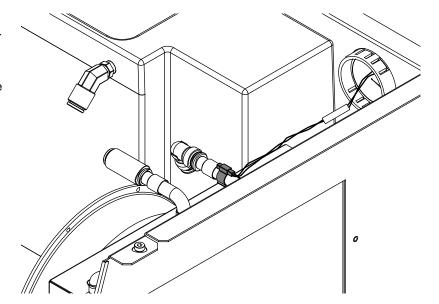
Keep all nuts and screws that you remove.

A CAUTION

Sharp cooling fins can cause cuts. Use caution when you work near the cooling fins.

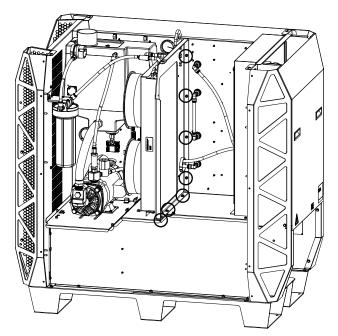
- **2.** Remove the push-to-connect fittings from the inlet and the outlet of the heat-exchanger assembly, and immediately put the ends of the hoses in a container.
- **3.** Carefully remove the copper clip and thermistor from the pipe.

Do not deform the copper clip.

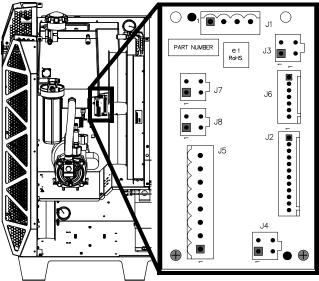


Plasma Power Supply

4. Use a 10 mm, hexagonal-socket wrench to remove the 7 nuts that attach the heat-exchanger panel.



- **5.** Disconnect the connectors for the fan wires from the fan power distribution PCB, J3.
- **6.** Pull the heat-exchanger panel away from the center panel.
- 7. Use a 10 mm, hexagonal-socket wrench to remove the nuts that connect the heat-exchanger assembly to the heat-exchanger panel.
- **8.** Remove the heat-exchanger assembly and fans from the plasma power supply.
- **9.** Remove the 4 screws from each fan to remove the fans from the heat-exchanger assembly.



Install the heat-exchanger assembly

- 1. Use tape to attach protective material, such as cardboard, onto the rear of the new heat-exchanger assembly to protect the cooling fins.
- 2. Use 4 screws to install each fan onto the new heat-exchanger assembly.
- **3.** Use the nuts to install the new heat-exchanger assembly onto the heat-exchanger panel in the plasma power supply.
- **4.** Push the heat-exchanger panel back into position.
- 5. Connect the wires for the fan to the fan power distribution PCB, J3.

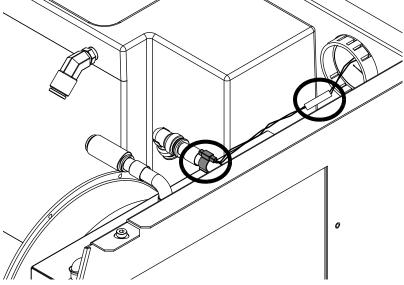
- **6.** Use a 10 mm, hexagonal-socket wrench to install the 7 nuts that attach the heat-exchanger panel to the center panel and bottom panel.
- 7. Install the coolant thermistor. Refer to Replace the coolant thermistor, step 5 on page 26.
- **8.** Connect the coolant hose fittings to the heat-exchanger assembly.
- **9.** Remove the tape and protective material from the rear panel of the heat-exchanger assembly.
- 10. Add coolant to fill the tank.
- 11. Install all of the panels.

Replace the coolant thermistor



Refer to Coolant system on page 134 for location and part number.

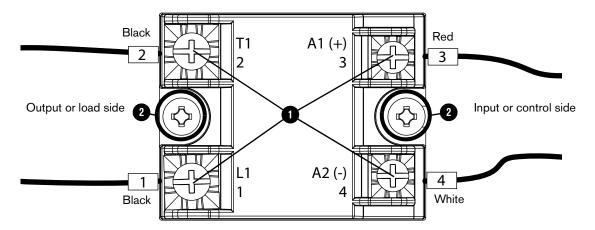
- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** To make removing the thermistor easier, you can remove the top panel. Refer to Remove the top panel on page 65.
 - Keep all nuts and screws that you remove.
- 2. Disconnect the thermistor wire connector (J5).
- **3.** Remove the wires from the wire clip.
- **4.** Carefully remove the copper clip from the pipe.
- 5. Use the new copper clip to install the coolant thermistor onto the straight part of the pipe with the wires going toward the heat-exchanger panel.
 - Make sure that the copper clip fits tightly around the pipe.
 - Make sure that the concave side of the coolant thermistor is toward the pipe.
 - Do not put the coolant thermistor on the fittings of the heat-exchanger assembly.
- **6.** Connect the thermistor wire connector (J5).
- 7. Install the liquid-cooling side panel.
- 8. Use the XPR web interface to make sure that there are no coolant temperature errors.
 - For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).



Replace the solid state relay

Refer to Fans on page 133 for location and part number.

- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - Keep all nuts and screws that you remove.
- 2. Loosen the wire screws 1 and remove the wires.



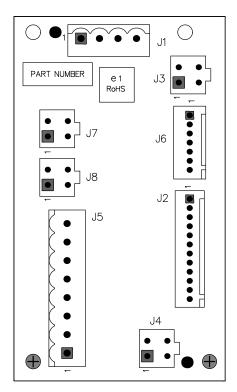
- **3.** Remove the 2 mounting screws **2**.
- 4. Remove the solid state relay.
- **5.** Use the 2 mounting screws to install the solid state relay with T1, 2 in the upper-left corner, as shown.
- **6.** Install the wires as shown and tighten the wire screws.
- 7. Install the right side panel.

Replace the fan power distribution PCB



Refer to Fans on page 133 for location and part number.

- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - Keep all nuts and screws that you remove.
- 2. Disconnect all of the wire connectors.
- **3.** Remove 2 screws **•** from the bottom of the PCB.
- 4. Pull the PCB off of the 2 push connectors.
- **5.** Align the new PCB with the studs and push it in until you hear a click.
- 6. Install the 2 screws.
- 7. Connect the wires:
 - J1 for the 48 V power source
 - J2 for the control PCB
 - J3 for the top heat-exchanger fan
 - J5 for the magnetics fan
 - J6 for the control PCB
 - J7 for the top control-side fan
 - J8 for the bottom control-side fan
- 8. Install the right-side (liquid-cooling-side) panel.



Replace the coolant pump, solenoid valve, and motor assembly



Refer to Coolant system on page 134 for location and part number.

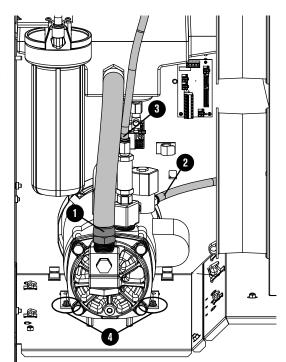
Remove the coolant pump, solenoid valve, and motor assembly

- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).



Keep all nuts and screws that you remove.

- 2. Disconnect the power connector (J21) from the wire harness.
- **3.** Disconnect the solenoid valve connector (J7) from the motor.
- **4.** Use a 1-1/2 inch, open-ended wrench to remove the 1 inch hose **1** from the pump.
- **5.** Disconnect the tube from the push-to-connect fitting on the solenoid valve ②. Refer to How to use push-to-connect fittings on page 12.
- **6.** Disconnect the tube from the push-to-connect fitting on the coolant bypass check valve **3**.
- 7. Use a 10 mm, hexagonal-socket wrench to remove the 2 screws a from the pump-motor bracket.
- **8.** Pull the pump out from the tabs in the sheet metal.



A CAUTION

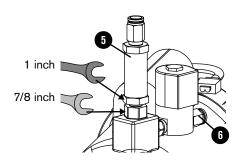


This equipment is heavy.

Use a 2-person lift.

Plasma Power Supply

- **9.** Use 2 open-ended wrenches to remove the coolant bypass valve **5**.
- **10.** Hold the solenoid valve, and remove the fitting **6** from the solenoid valve.



Install the coolant pump, solenoid valve, and motor assembly





This equipment is heavy.

Use a 2-person lift.

1. Put thread sealant on the threads of the coolant bypass valve.

A NOTICE

PTFE TAPE CAN CAUSE CLOGGED VALVES, REGULATORS, AND TORCHES

Never use PTFE tape on any joint preparation. Use only a liquid or paste thread sealant on male thread ends.

- 2. Use a 1 inch and 7/8 inch, open-ended wrench to install the coolant bypass valve onto the new coolant pump. Tighten to 14.7 N·m (130 in·lbf).
- 3. Install the fitting for the solenoid valve onto the new pump. Tighten to 14.7 N·m (130 in·lbf).
- 4. Slide the new coolant pump and motor assembly into the plasma power supply.
 - Make sure that the bracket goes under the tabs in the sheet metal.
- **5.** Align the holes in the pump-motor bracket with the holes in the sheet metal.
- 6. Install the 2 screws.
- 7. Connect the tube to the push-to-connect fitting on the bypass check valve. Refer to How to use push-to-connect fittings on page 12.
- **8.** Connect the tube to the push-to-connect fitting on the solenoid valve.
- **9.** Use a 1-1/2 inch, open-ended wrench to install the 1 inch hose to the pump fitting. Tighten the fitting to 47 N·m (416 in·lbf).
- **10.** Connect the solenoid valve connector (J7) to the wire harness.

- 11. Connect the power connector (J21) to the motor.
- 12. Install the liquid-cooling-side panel.
- **13.** Install the coolant. Refer to the Coolant Installation section in the XPR170 Instruction Manual (810060).
- **14.** Use the XPR web interface to make sure that the coolant pump and motor assembly operates correctly.
 - For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).

Left-side (control-side) parts

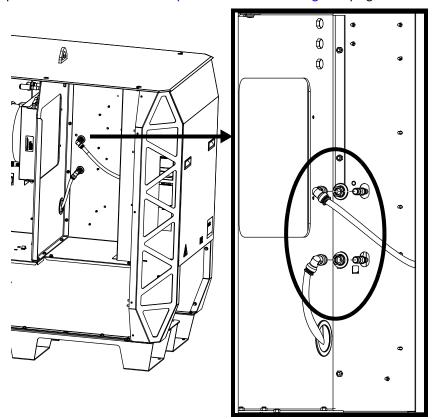
Replace the chopper



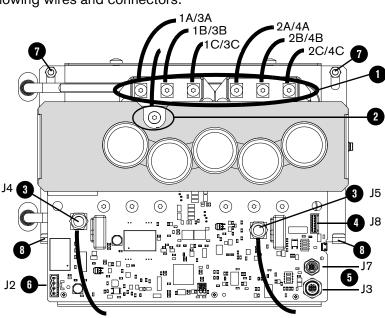
Refer to Control side – view 2 on page 139 for locations and part numbers.

Remove the chopper

- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - c. Refer to Remove the left-side (control-side) panel on page 63.
 - **d.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).
 - Keep all nuts and screws that you remove.
- **2.** Use tape to attach protective material, such as cardboard, onto the rear of the heat-exchanger assembly to protect the cooling fins.
- **3.** Remove the push-to-connect fittings and retaining nuts from the rear of the chopper that you want to replace. Refer to How to use push-to-connect fittings on page 12.



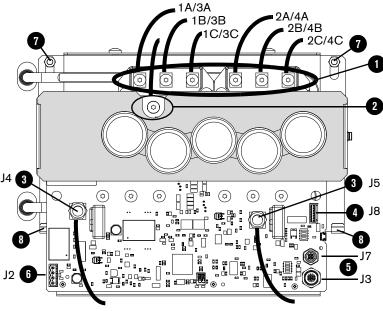
4. Remove the following wires and connectors:



- 1 3-phase wires. Use a T20 driver.
- 2 Positive lead. Use a 7/16 inch wrench with a T20 driver.
- 3 Inductor leads (J4, J5). Use a 16 mm wrench.
- 4 Chopper ID key (J8)
- 6 CAN leads (J3, J4)
- Power lead (J2)
- **5.** Use a 10 mm, hexagonal-socket wrench to remove the 2 nuts **7**.
- **6.** Lift the chopper up and out of the tabs **3**, then remove the chopper from the plasma power supply.

Install the chopper

- 1. Align the coolant pipes on the new chopper at the top of the holes in the center panel and move the chopper down into the sheet metal tabs 3.
- 2. Use a 10 mm, hexagonal-socket wrench to install the 2 nuts 1.
- **3.** Connect the following wires and connectors:



- 1 3-phase wires. Use a T20 driver to tighten to 4 N·m (35 in·lbf).
- 2 Positive lead.* Use a 7/16 inch wrench with a T20 driver to tighten to 4 N·m (35 in·lbf).
- 3 Inductor leads Use a 16 mm wrench to tighten to 48 N·m (425 in·lbf).
- Chopper ID key
- 6 CAN leads
- Power lead

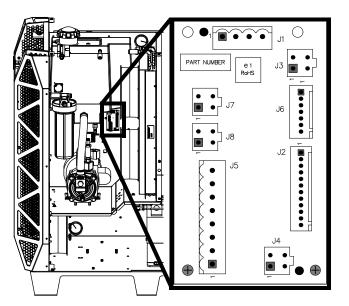
- **4.** Install the plastic retaining nuts and push-to-connect fittings on the rear of the chopper. Refer to How to use push-to-connect fittings on page 12.
- 5. If you spilled any coolant inside the plasma power supply, clean inside the plasma power supply.
- **6.** Remove the tape and protective material from the rear panel of the heat-exchanger assembly.
- 7. Install the side panels.
- **8.** Install the coolant. Refer to the Coolant Installation section in the XPR170 Instruction Manual (810060).

^{*} Do not put the positive lead between the phase wires.

Replace the control-side fans

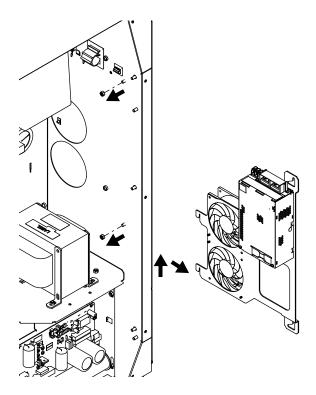
Remove the control-side fans

- Refer to Fans on page 133 for location and part number.
- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. On the liquid-cooling side of the plasma power supply, remove J7 and J8 from the fan power distribution PCB.



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- **3.** On the control side, use a 10 mm, hexagonal-socket wrench to remove the 2 nuts from the bracket assembly.
- **4.** Remove the bracket assembly from the plasma power supply.
- **5.** Remove the 2 screws from the control-side fan that you want to replace.



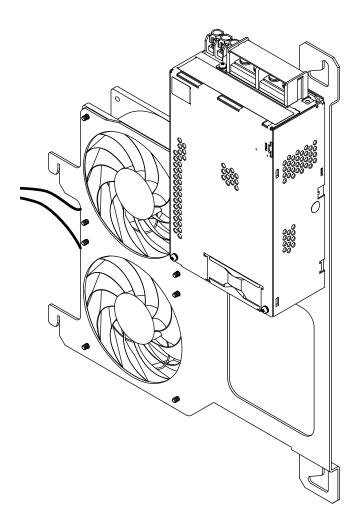
Install the control-side fans

1. Put the new control-side fan on the bracket so that the flow of air goes into the plasma power supply and the wires are as shown.



There is an arrow on the fan housing. The arrow must point to the inside of the plasma power supply.

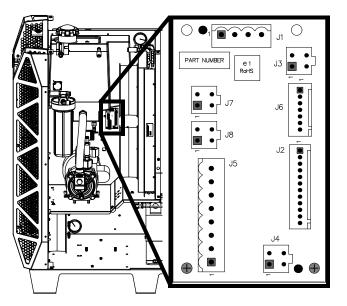
- **2.** Use the 2 screws to install the fan onto the bracket.
- **3.** Align the bracket assembly with the studs in the front sheet metal panel and the slots in the center panel.
- **4.** Use a 10 mm, hexagonal-socket wrench to install the 2 nuts.
- **5.** Route the fan wires through the center panel of the plasma power supply.
- **6.** Connect the control-side fans to the fan power distribution PCB:
 - □ J7 for the top fan
 - J8 for the bottom fan
- 7. Install the side panels.



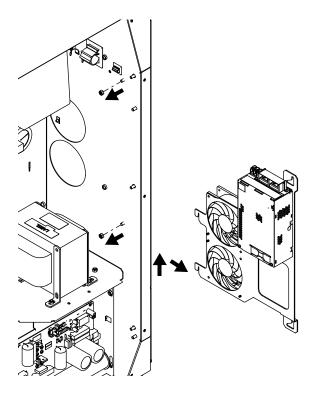
Replace the 48 V power source

Remove the 48 V power source

- Refer to Control side view 1 on page 138 for location and part number.
- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. On the liquid-cooling side of the plasma power supply, remove J7 and J8 from the fan power distribution PCB.
- **3.** On the control side, remove the connector covers from the power source.
- **4.** Loosen the 4 screws to remove the wires.



- **5.** Use a 10 mm, hexagonal-socket wrench to remove the 2 nuts from the bracket assembly.
- **6.** Remove the bracket assembly from the plasma power supply.
- **7.** Remove the 4 screws from the back of the bracket to remove power source.

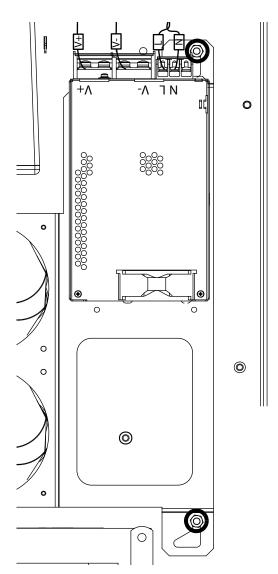


Install the 48 V power source

- 1. Use the 4 screws to install the power source onto the bracket.
 - The wire connections must point to the top of the plasma power supply.
- **2.** Align the bracket assembly with the studs in the front sheet metal panel and the slots in the center panel.

Plasma Power Supply

- **3.** Use a 10 mm, hexagonal-socket wrench to install the 2 nuts.
- 4. Install the wires as shown and tighten the screws.
- **5.** Install the connector covers.
- **6.** Route the fan wires through the center panel of the plasma power supply.
- **7.** Connect the control-side fans to the fan power distribution PCB:
 - □ J7 for the top fan
 - □ J8 for the bottom fan
- 8. Install the control-side panel.

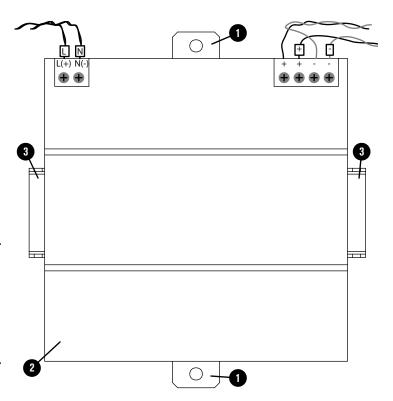


Replace the 24 V power source



Refer to Control side – view 2 on page 139 for location and part number.

- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. Remove all of the wires.
- **3.** Use a blade screwdriver to pull out the plastic tabs ① on the power source to release the power source from the rail.
- **4.** Remove the power source **2**.
- **5.** Align the new power source on the rail **3**.
- **6.** Push in the plastic tabs **1** to attach the power source to the rail.
- 7. Install the wires L, N, +, -. Tighten the screws.
- Install the unlabeled wires.
 Connect the red wire to + and white wire to -. Tighten the screws.
- **9.** Install the control-side panel.



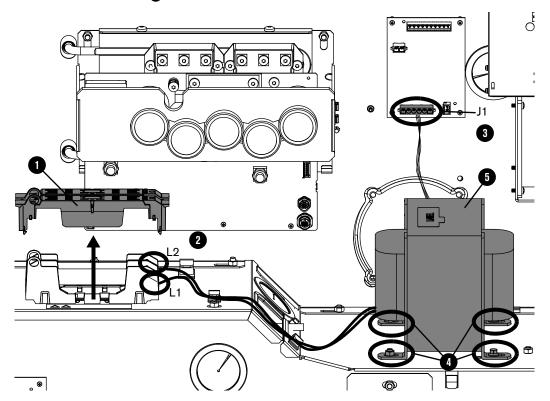
Replace the control transformer



Refer to Control side - view 1 on page 138 for location and part number.

Remove the control transformer

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. Remove the fuse covers 1.



- **3.** Loosen screws to remove the L1 and L2 wires **2** from the fuse holder.
- 4. Remove J1 3 from the power distribution PCB.
- **5.** Use a 10 mm, hexagonal-socket wrench to remove the nuts and screws **4** from the bracket on the control transformer.
- **6.** Remove the control transformer **5**.

Install the control transformer

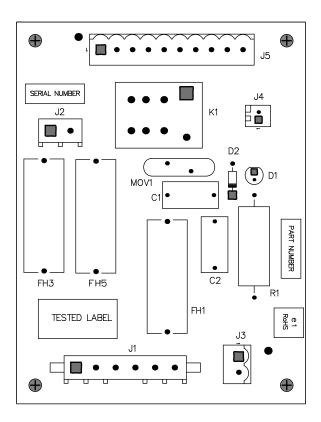
- 1. Align the holes in the control transformer bracket with the sheet metal.
- 2. Use a 10 mm, hexagonal-socket wrench to install the nuts and screws. Tighten to 9.6 N·m (85 in·lbf).
- **3.** Connect J1 to the power distribution PCB.
- **4.** Connect L1 to the front fuse and L2 to the back fuse and tighten the screws. Tighten to hand-tight.
- 5. Install the fuse covers.
- **6.** Install the control-side panel.

Replace the power distribution PCB



Refer to Control side – view 1 on page 138 for location and part number.

- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - b. Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. Disconnect the wire connectors from the PCB.
- **3.** Remove the 4 screws +.
- 4. Align the new PCB with the studs.
- **5.** Install the 4 screws.
- 6. Connect the wire connectors.
- 7. Install the control-side panel.

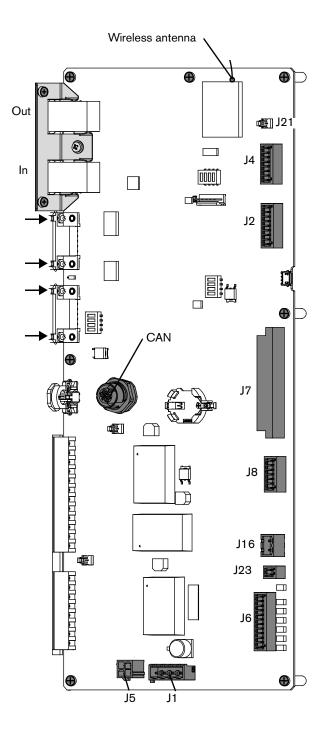


Replace the control PCB



Refer to Control side - view 2 on page 139 for location and part number.

- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the left-side (control-side) panel on page 63.
 - **c.** Refer to Remove the rear panel on page 64.
 - Keep all nuts and screws that you remove.
- **2.** Disconnect the communication interface cables (discrete, serial, or EtherCAT®).
- **3.** Disconnect the wireless antenna.
- 4. Disconnect the CAN cable.
- **5.** Disconnect all of the wire connectors.
- **6.** Use a 3/16 inch, hexagonal-socket wrench to remove the 4 screws and nuts from the serial RS-422 connectors.
- **7.** Remove the 2 screws from the bracket found near the EtherCAT connectors.
- 8. Remove the 7 screws from the PCB.
- **9.** Move the PCB to the right to release the PCB from the external CAN connector.
- **10.** Use the 7 screws to install the new PCB.
- **11.** Install the 2 screws on the bracket found near the EtherCAT connectors.
- **12.** Use a 3/16 inch, hexagonal-socket wrench to install the 4 screws and nuts on the serial RS-422 connectors on the rear panel side.
- 13. Make sure that J21 is in the OFF position.



Plasma Power Supply

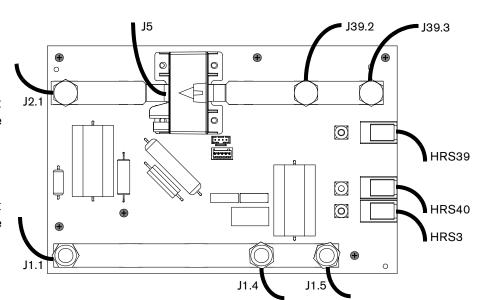
- 14. Connect all of the wire connectors.
- 15. Connect the CAN cable.
- **16.** Connect the wireless antenna.
- 17. Connect the communication interface cables.
 - Make sure that you connect the in and out cables to the correct locations.
- **18.** Install the new MAC address label from the kit on top of the old MAC address label on the rear of the plasma power supply.
 - When you replace the control PCB, the information stored on the PCB changes. This includes the MAC address that is on the new MAC address label.
- 19. Install the control-side panel.
- **20.** Install the rear panel.
- **21.** If necessary, update the firmware in the system. Refer to the *XPR Firmware Updates Field Service Bulletin* (809820).

Replace the I/O PCB



Refer to Control side – view 2 on page 139 for location and part number.

- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. Disconnect HRS39, HRS40, HRS3, and J5.
- 3. Use a 17 mm, hexagonal-socket wrench to remove J2.1, J39.2, and J39.3.
- **4.** Use a 17 mm, hexagonal-socket wrench to remove J1.1, J1.4, and J1.5.
- **5.** Remove the 6 screws **1**.



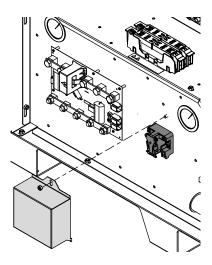
- 6. Use the 6 screws to install the new I/O PCB.
- **7.** Apply thread locker to the threads.
- 8. Use a 17 mm, hexagonal-socket wrench to install J1.1, J1.4, and J1.5. Tighten to 13 N·m (115 in·lbf).
- **9.** Use a 17 mm, hexagonal-socket wrench to install J2.1, J39.2, and J39.3. Tighten to 13 N·m (115 in·lbf).
- 10. Connect HRS39, HRS40, HRS3, and J5.
- **11.** Install the control-side panel.

Replace the pilot arc relay

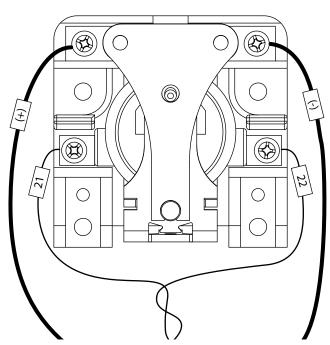


Refer to Control side - view 2 on page 139 for location and part number.

- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- 2. Remove the cover.



- **3.** Remove the screw from the positive (+) and negative (-) wires.
- **4.** Remove the screw from wire 21 and wire 22.
- **5.** Remove the pilot arc relay.
- 6. Align the new pilot arc relay.
- Use the 2 screws in the middle to install wire 21 and wire 22 as shown. Tighten the screws to 1 N·m (10 in·lbf).
- **8.** Use the 2 screws on the top to install the + and wires as shown. Tighten the screws to 1 N·m (10 in·lbf).
- 9. Install the cover.
- 10. Install the control-side panel.

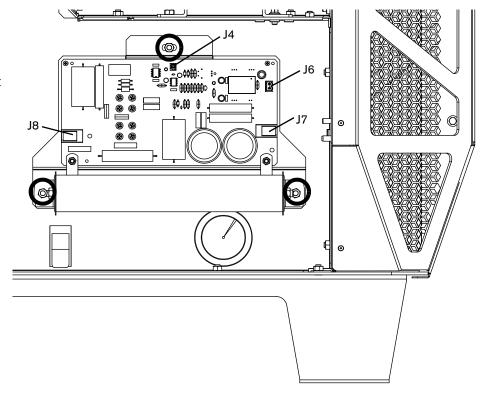


Replace start circuit assembly



Refer to Control side - view 1 on page 138 for location and part number.

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - b. Refer to Remove the left-side (control-side) panel on page 63.
 - Keep all nuts and screws that you remove.
- **2.** Disconnect J4, J6, J7, and J8.
- 3. Use a 10 mm, hexagonal-socket wrench to remove the 3 nuts.
- **4.** Pull the assembly straight out.
- **5.** Align the heatsink of the new PCB with the hole in the sheet metal.
- **6.** Align the new PCB with the mounting studs.
- 7. Install the 3 nuts. Tighten to 9 N·m (80 in·lbf).
- 8. Connect J4, J6, J7, and J8.
- **9.** Install the control-side panel.



Bottom-compartment parts

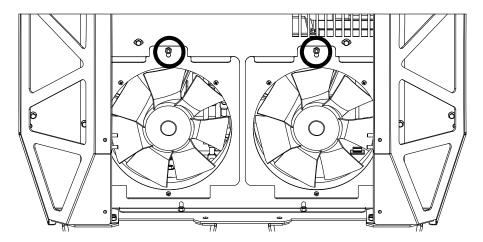
Replace an inductor



Refer to Transformer and inductor on page 137 for location and part number.

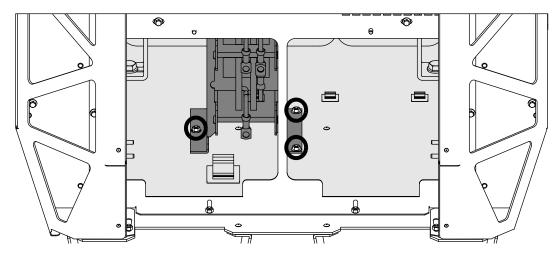
Remove an inductor

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - c. Refer to Remove the front panel on page 61.
 - Keep all nuts and screws that you remove.
- 2. Use a 10 mm, hexagonal-socket wrench to remove the nut from the top of the fan bracket.

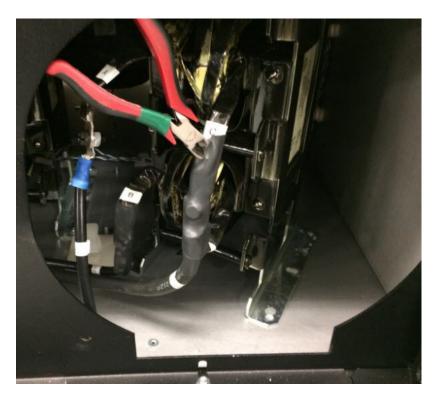


- 3. Tilt the top of the bracket towards you until you get access to the fan-wire connector.
- 4. Disconnect the fan-wire connector.
- **5.** Remove the fan and bracket assembly.





- 7. Move the inductor towards the fan opening.
- 8. Carefully remove the black heatshrink from the 3 terminals of the inductor.



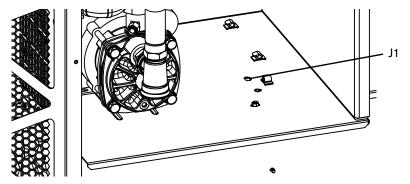
9. Remove the 3 inductor wires from the cable holder.

Plasma Power Supply

- 10. Use a 10 mm, hexagonal-socket wrench to remove the 3 screws from the inductor terminal.
 - Take a picture of the order of the wiring terminals to help when you install the new inductor.

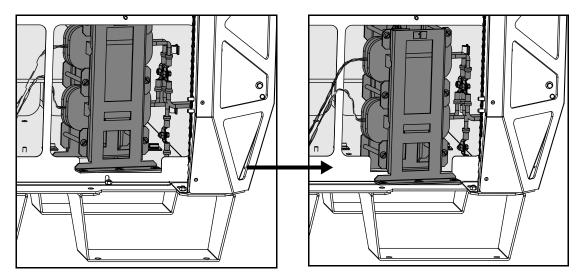


- 11. Remove the blue/white twisted pair wires from the cable holders.
- **12.** Push the 2 side bars and then push the connector through the hole in the sheet metal to disconnect the connector for the thermal switches on the inductor.



■ J1 for Inductor 1 (L1)

13. After you disconnect all of the wires, rotate the inductor 90 degrees so that the bracket points towards the fan opening.



14. Lift the inductor slightly so that the bracket goes through the bottom of the fan opening.

Install an inductor

- 1. Slide the inductor into the plasma power supply through the fan opening.
- 2. Connect the thermal switches on the inductor through the hole in the sheet metal.
 - J1 for Inductor 1 (L1)
- 3. Install the blue/white twisted pair wires into the cable holders.
- **4.** Use a 10 mm, hexagonal-socket wrench to install the 3 screws on the inductor terminal. Tighten to 10 N·m (90 in·lbf).
 - Use the picture that you took in step 10 on page 52.
- **5.** Install the 3 inductor wires into the cable holder.
- **6.** Install heatshrink on the 3 terminals of the inductor. Make sure that the heatshrink completely covers the inductor terminals.
- 7. Align the inductor bracket with the stude in the plasma power supply.
- 8. Use a 10 mm, hexagonal-socket wrench to install the 3 nuts on the inductor bracket.
- **9.** Put the bottom of the fan and bracket assembly into the sheet metal tab.
- 10. Connect the fan-wire connector.
- 11. Use a 10 mm, hexagonal-socket wrench to install the nut.
- **12.** Install the liquid-cooling-side panel.
- **13.** Install the front panel.

Rear-compartment parts

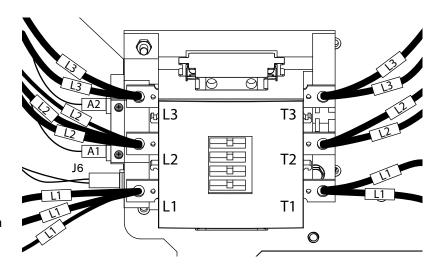
Replace the main contactor



Refer to Rear compartment of the plasma power supply on page 140 for location and part number.

Remove the main contactor

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Refer to Remove the rear panel on page 64.
 - Keep all nuts and screws that you remove.
- 2. Remove all of the wires from T3, T2, T1, L3, L2, and L1.
- **3.** Remove the wires from A1 and A2.
- 4. Disconnect J6.
- **5.** Use a 10 mm, hexagonal-socket wrench to remove the nut and screw that attach the main contactor to the sheet metal.
- 6. Remove the main contactor.



Install the Siemens® main contactor

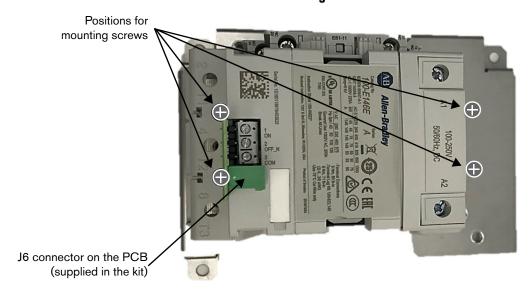
Figure 1



- 1. Make sure that the switch on the new main contactor is set to PLC mode (ON).
- 2. Use a 10 mm, hexagonal-socket wrench to install the nut on the upper left corner and the screw on the lower right corner of the new main contactor. Tighten the nut and screw to 9 N·m (80 in·lbf).
- 3. Connect J6.
- 4. Install A1 and A2. Tighten the screws to 1 N·m (10 in·lbf).
- **5.** Use 2 wrenches to install the L1, L2, and L3 wires on the left and right side of the main contactor. Tighten to 13 N·m (115 in·lbf).
- **6.** Make sure that the wires with the L1, L2, and L3 labels on the right side of the main contactor align with the wires with the L1, L2, and L3 labels on the left side of the main contactor.
- 7. Install the rear panel.

Install the Allen-Bradley® or ABB® main contactor

Figure 2



- 1. Put the new main contactor (003294) in a horizontal position into the provided mounting bracket (104962).
 - Only older XPR cutting systems, those without a mounting bracket already installed, need the provided mounting bracket.
- 2. Make sure that the main contactor is in the correct, horizontal position within the mounting bracket, as shown in Figure 2.
- **3.** Use the 4 Phillips mounting screws to attach the main contactor to the supplied mounting bracket (Figure 2). The mounting screws are inside the box with the main contactor. Tighten to 1.5 N·m (15 in·lbf).
- **4.** Use a 10 mm, hexagonal-socket wrench to install the nuts on the top left and right corners. Tighten to 9 N·m (80 in·lbf).
- **5.** Use a 10 mm, hexagonal-socket wrench to install the screw on the lower left corner of the mounting bracket. Tighten to 9 N·m (80 in·lbf).
- **6.** Insert the PCB into the terminal block at the top of the contactor, as shown in Figure 2. The board is in a bag that comes with the contactor kit.
- 7. Use a small, flat screwdriver to tighten the 3 terminal block screws onto the 3 PCB pins.
- 8. Connect J6 into the PCB connector.
- 9. Install A1 and A2. Tighten the screws to 1 N·m (10 in·lbf).

Plasma Power Supply

10. Use a long, 5 mm hexagonal-socket wrench and the hardware that comes with the contactor kit to install the L1, L2, and L3 wires on the left and right side of the main contactor. Tighten to 9 N·m (80 in·lbf).

11. Make sure that the wires with the L1, L2, and L3 labels on the right side of the main contactor align with the wires with the L1, L2, and L3 labels on the left side of the main contactor.

12. Install the rear panel.

Replace the inrush resistor assembly



Refer to Rear compartment of the plasma power supply on page 140 for location and part number.

- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Refer to Remove the right-side (liquid-cooling-side) panel on page 62.
 - **c.** Refer to Remove the rear panel on page 64.
 - ₽ Ke

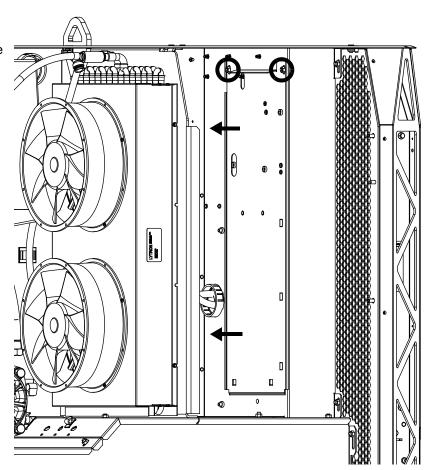
Keep all nuts and screws that you remove.

2. Use tape to attach protective material, such as cardboard, onto the rear of the heat-exchanger assembly to protect the cooling fins.

A CAUTION

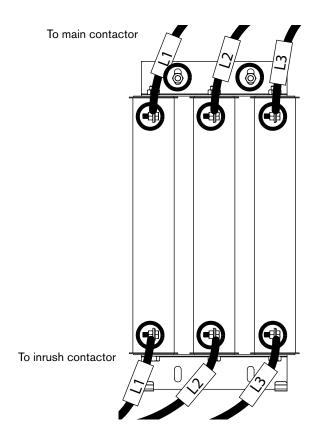
Sharp cooling fins can cause cuts. Use caution when you work near the cooling fins.

- **3.** Use a 10 mm, hexagonal-socket wrench to remove the 2 nuts on the internal sheet metal.
- **4.** Pull in the sheet metal to access the inrush resistor.



Plasma Power Supply

- **5.** Use 2 wrenches to remove the L1, L2, and L3 wires.
- **6.** Remove the 2 nuts to remove the assembly from the sheet metal.
- 7. Use the 2 nuts to install the inrush resistor. Tighten to 3 N·m (25 in·lbf).
- **8.** Use 2 wrenches to install the wires. Tighten to 3 N·m (25 in·lbf).
- **9.** Align the sheet metal panel with the studs.
- 10. Use the 2 nuts to install the sheet metal.
- 11. Install the rear and control-side panel.



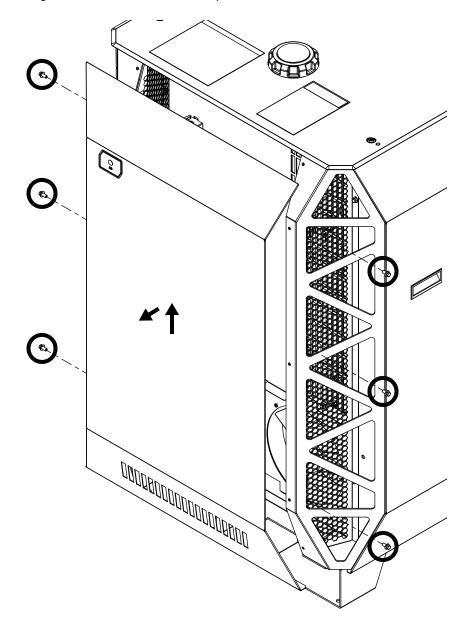
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Plasma power supply panels

Keep all nuts and screws that you remove.

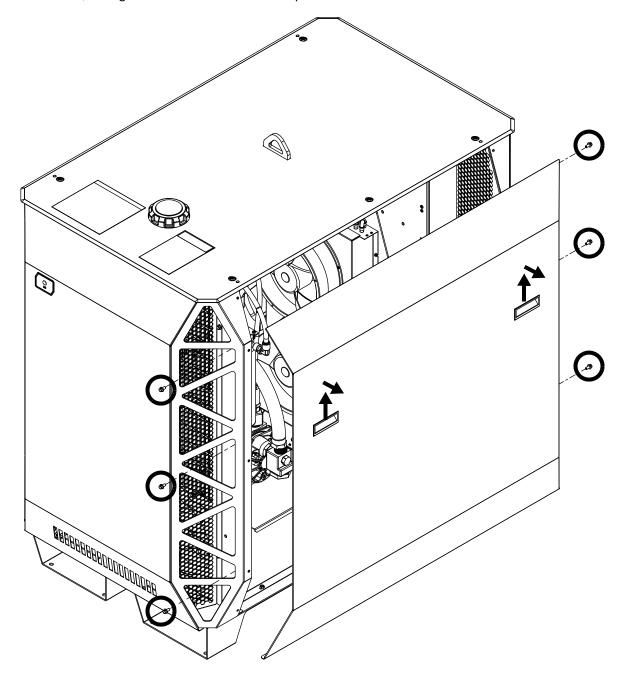
Remove the front panel

Use a 10 mm, hexagonal-socket wrench on the panel screws.



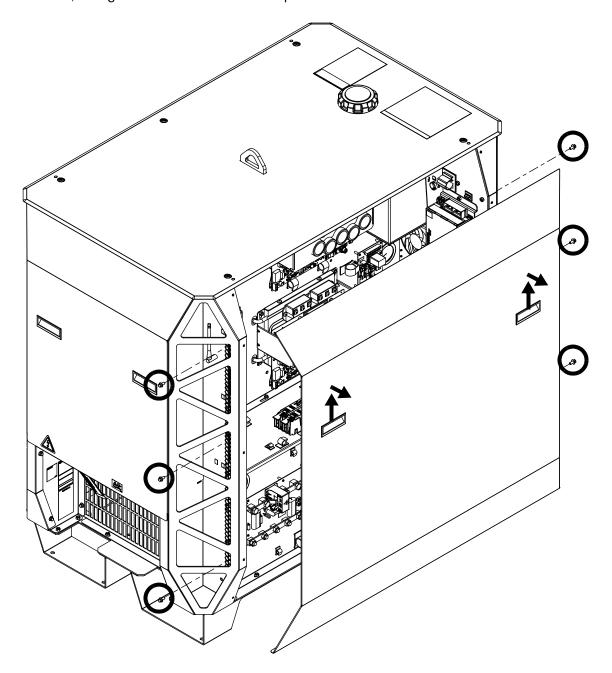
Remove the right-side (liquid-cooling-side) panel

Use a 10 mm, hexagonal-socket wrench on the panel screws.



Remove the left-side (control-side) panel

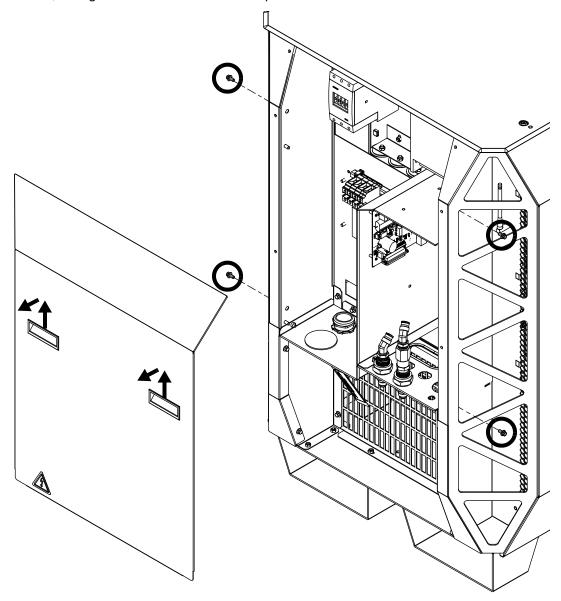
Use a 10 mm, hexagonal-socket wrench on the panel screws.



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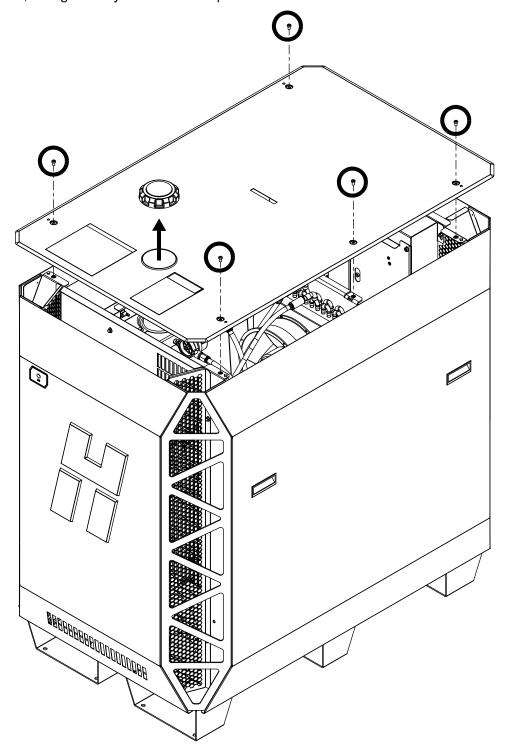
Remove the rear panel

Use a 10 mm, hexagonal-socket wrench on the panel screws.



Remove the top panel

Use a 4 mm, hexagonal-key wrench on the panel screws.



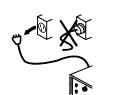
Gas Connect Consoles

A WARNING



ELECTRIC SHOCK CAN KILL

Disconnect electric power before doing installation or maintenance. You can get a serious electric shock if electric power is not disconnected. Electric shock can seriously injure or kill you.

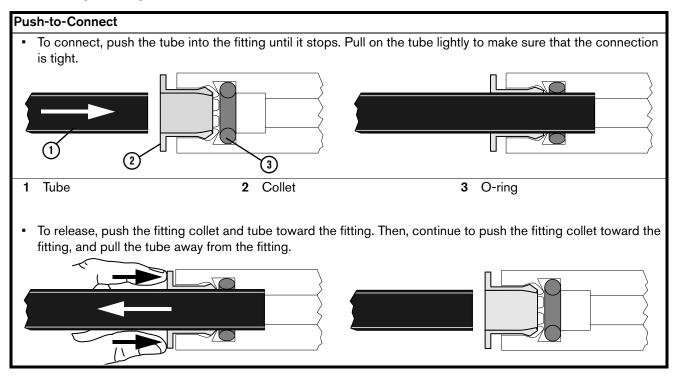


All work that requires removal of the gas connect console panels must be done by a qualified technician.

Refer to the *Safety and Compliance Manual* (80669C) for more safety information.

How to use push-to-connect fittings

Some replacement procedures in the gas connect consoles require you to use push-to-connect fittings. This procedure explains how to use push-to-connect fittings without causing damage to the tubing or fitting.



- Replace any tubing that is damaged. If you reuse damaged tubing, it can result in leaks.
- Used tubing can have an indentation on the end that can cause leaks. To prevent leaks, trim the tubing to remove the indentation.

Replace the high-frequency, high-voltage transformer

A WARNING



ELECTRIC SHOCK

Stored voltages in capacitors can exceed 20,000 V.

All work must be done by a qualified technician.



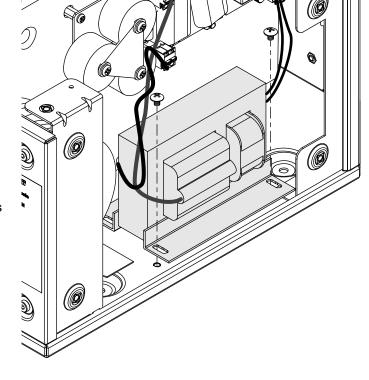
Refer to Gas connect console high-voltage side parts on page 142 for location and part number.

- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the top panel.
 - c. Remove the insulator.
 - **d.** Remove the high-voltage-side panel.
 - - Refer to Gas connect console panels on page 100.
- Keep all nuts and screws that you remove.
- 2. Disconnect the wire connectors from J1, J2, and J3 from the high-frequency, high-voltage PCB.
- **3.** Remove the wire for the coil from pin 2 on J2.

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Gas Connect Consoles

- 4. Remove the 2 screws.
- **5.** Remove the transformer.
- **6.** Use the screws to install the transformer.
- 7. Install the wire from the coil to pin 2 on J2.
- **8.** Twist the red transformer wires twice.
- **9.** Connect the following connectors to the high-frequency, high-voltage PCB:
 - J1 The wire from the high-frequency, high-voltage transformer.
 - J2 The wire from the high-frequency, high-voltage transformer and wire from the coil assembly.



- J3 The wire to the primary input of the high-frequency, high-voltage transformer.
- 10. Install the insulator panel.
- 11. Install the high-voltage-side panel.
- **12.** Install the top panel.

Replace the high-frequency, high-voltage PCB

WARNING



ELECTRIC SHOCK

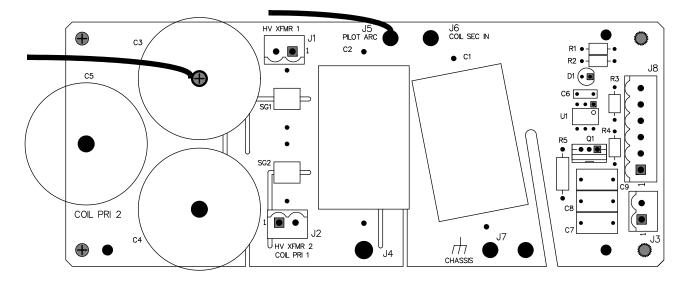
Stored voltages in capacitors can exceed 20,000 V.

All work must be done by a qualified technician.



Refer to Gas connect console high-voltage side parts on page 142 for location and part number.

- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the top panel.
 - c. Remove the insulator.
 - **d.** Remove the high-voltage-side panel.
 - Refer to Gas connect console panels on page 100.
 - Keep all nuts and screws that you remove.
- 2. Disconnect J1, J2, J3, J5, J7, J8, and the wire to the capacitor.
- 3. Remove the 2 screws.
- 4. Remove the 2 thumb screws.



5. Use the screws to install the PCB.

2 Gas Connect Consoles

- 6. Connect J8.
- 7. Install the wire to the capacitor, J7, and J5. Angle the connector for J5 to the right.
- 8. Connect the following connectors:
 - J1 The wire from the high-frequency, high-voltage transformer.
 - J2 The wire from the high-frequency, high-voltage transformer and wire from the coil assembly.
 - J3 The wires to the primary input of the high-frequency, high-voltage transformer.
- **9.** Install the high-voltage-side panel.
- 10. Install the insulator panel.
- 11. Install the top panel.

Replace the coil assembly

WARNING



ELECTRIC SHOCK

Stored voltages in capacitors can exceed 20,000 V.

All work must be done by a qualified technician.



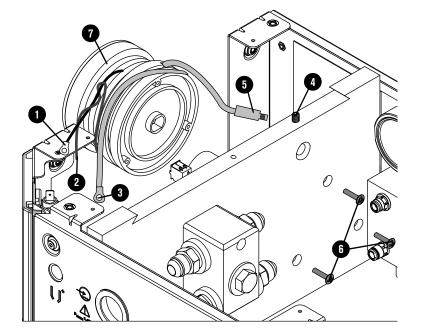
Refer to Gas connect console high-voltage side parts on page 142 for location and part number.

Remove the coil assembly

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).
 - **c.** Remove the top panel.
 - **d.** Remove the insulator.
 - e. Remove the high-voltage-side panel.
 - Refer to Gas connect console panels on page 100.
 - Keep all nuts and screws that you remove.
- 2. Disconnect the coolant hoses and pilot arc lead.

2 Gas Connect Consoles

- 3. On the high-frequency, high-voltage PCB, remove the following wires:
 - The wire from the capacitor
 - The wire from pin 2 of J2 2
 - The wire from J5 3
- **4.** Remove the 3 mm set screw **4**.
- **5.** Remove the pilot lead connection **5** from the insulator panel.
- **6.** Use a short Phillips screwdriver to remove 3 screws **6**.
- **7.** Remove the coil assembly **7**.



Install the coil assembly

- 1. Use the screws to install the coil assembly.
- 2. Install the pilot arc lead connection through the insulator panel.
- 3. Install the set screw.
- 4. Twist the wire for the capacitor and the wire for pin 2 of J2.
- **5.** Connect the following wires to the high-frequency PCB:
 - The wire to J5
 - The wire to pin 2 of J2
 - The wire to the capacitor
- 6. Install the gas connect console to torch connect console coolant lead assembly.
- 7. Install the high-voltage-side panel.
- **8.** Install the insulator panel.
- **9.** Install the top panel.
- **10.** Install the coolant. Refer to the *Coolant Installation* section in the *XPR170 Instruction Manual* (810060).

Replace the EMI filter



Refer to Gas connect console high-voltage side parts on page 142 for location and part number.

- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the top panel.
 - c. Remove the insulator.
 - **d.** Remove the high-voltage-side panel.



Refer to Gas connect console panels on page 100.

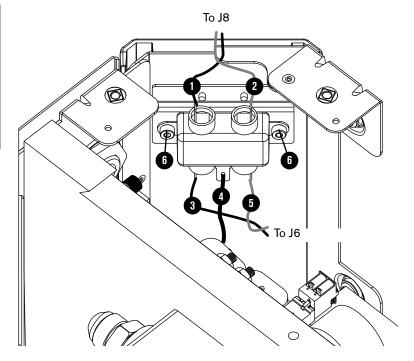


Keep all nuts and screws that you remove.

2. Remove the wires.

Wire number	Wire color
0	red/black
2	red
8	red/black
4	green/yellow
•	red

- 3. Use a 3 mm, hexagonal-key wrench to remove the 2 screws 6.
- **4.** Use the 2 screws to install the EMI filter.
- **5.** Install the wires as shown.
- **6.** Install the high-voltage-side panel.
- 7. Install the insulator panel.
- **8.** Install the top panel.

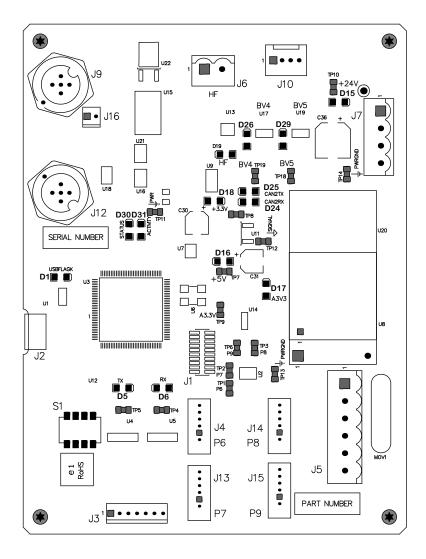


Replace the control PCB



Refer to Core, VWI, and OptiMix gas connect console manifold side on page 143 for location and part number.

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the top panel.
 - **c.** Remove the manifold-side panel.
 - Refer to Gas connect console panels on page 100.
 - Keep all nuts and screws that you remove.
- **2.** Disconnect all of the wire connectors.
- **3.** Use a T15 driver to remove the 4 screws.
- **4.** Use the 4 screws to install the PCB.
- **5.** Connect the wire connectors to the PCB.
 - Make sure that the pressure transducer wires goes to the correct pressure transducer
 - connector.
- **6.** Install the manifold-side panel.
- 7. Install the top panel.



Replace the 24 V power source



Refer to Core, VWI, and OptiMix gas connect console manifold side on page 143 for location and part number.

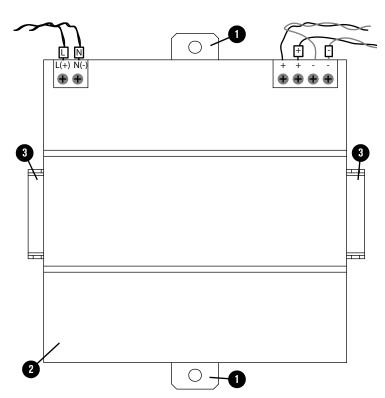
- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the top panel
 - **c.** Remove the manifold-side panel.

Refer to Gas connect console panels on page 100.



Keep all nuts and screws that you remove.

- 2. Remove all of the wires.
- **3.** Use a blade screwdriver to pull out the plastic tabs **1** on the power source.
- 4. Remove the power source 2.
- **5.** Align the new power source on the rail **3**.
- **6.** Push in the plastic tabs **1** to attach the power source to the rail.
- 7. Install the wires L, N, +, -. Tighten the screws.
- Install the unlabeled wires.
 Connect the red wire to + and white wire to -. Tighten the screws.
- **9.** Install the control-side panel.



Replace the air filter assembly



Refer to Core, VWI, and OptiMix gas connect console manifold side on page 143 for location and part number.

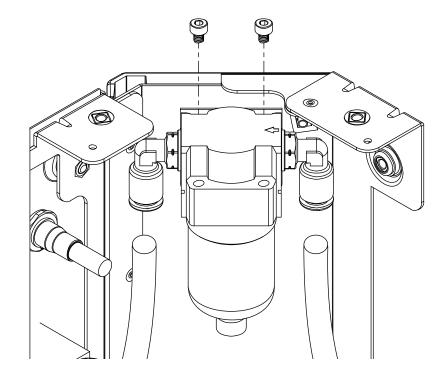
- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Remove the top panel.

Refer to Gas connect console panels on page 100.



Keep all nuts and screws that you remove.

- 2. Disconnect the hoses from the push-to-connect fittings. Refer to How to use push-to-connect fittings on page 68.
- **3.** Use a 3 mm, hexagonal-key wrench to remove the 2 screws.
- **4.** Remove the air filter assembly.
- **5.** Remove the 2 fittings.
- **6.** Install the 2 fittings onto the new air filter assembly.
- 7. Use the 2 screws to install the air filter assembly.



- **8.** Connect the hoses to the push-to-connect fittings. Refer to How to use push-to-connect fittings on page 68.
- **9.** Install the top panel.

Replace a pressure transducer



Refer to VWI and OptiMix gas connect console mixer, transducers, and valves on page 150 for location and part number.

- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas and fluid pressure from the cutting system.
 - c. Remove the top panel
 - **d.** Remove the manifold-side panel.



Refer to Gas connect console panels on page 100.

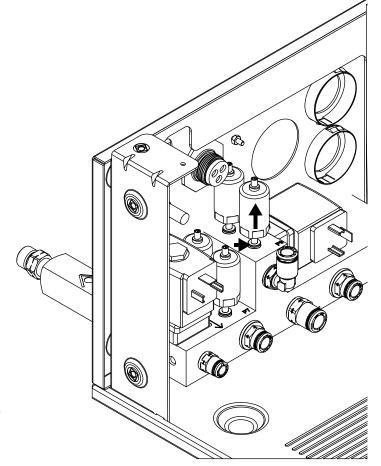


Keep all nuts and screws that you remove.

2. Disconnect the pressure transducer wire connector from the control PCB.



A small amount of pressure can release when you remove the pressure transducer.



- **3.** Use a blade screwdriver to push the connector down. At the same time, use your fingers to push the pressure transducer down slightly.
- 4. Continue to hold the connector down, and pull the pressure transducer up to remove it.
- **5.** Push the new pressure transducer into the manifold.
- **6.** Connect the pressure transducer wire connectors.



Make sure that you connect the correct pressure transducer to the correct connector on the control PCB. For example, connect pressure transducer P7 to connector P7.

- 7. Install the top panel.
- **8.** Install the side panel.
- **9.** Supply the gas and fluid pressure to the cutting system.
- **10.** Use the XPR web interface to make sure that the pressures are in the acceptable ranges.
 - For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).

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Replace a proportional valve



Refer to VWI and OptiMix gas connect console mixer, transducers, and valves on page 150 for location and part number.

Remove a proportional valve

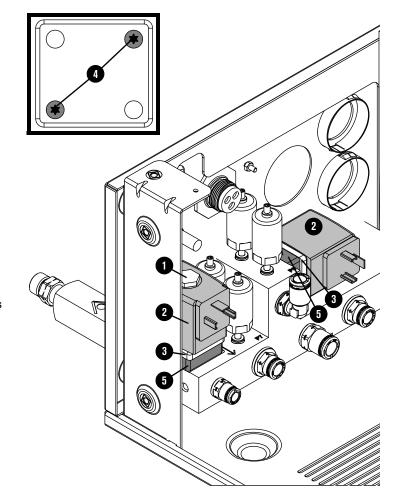
- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas and fluid pressure from the cutting system.
 - **c.** Remove the top panel.
 - **d.** Remove the manifold-side panel.

Refer to Gas connect console panels on page 100.



Keep all nuts and screws that you remove.

- **2.** Remove the screw from connector (not shown).
- **3.** Remove the connector (not shown).
- **4.** Use a 14 mm socket wrench to remove the nut **1**.
- **5.** Remove the coil/solenoid **2**.
- **6.** Remove the base cover **3**.
- 7. Use a T20 screwdriver to remove the 2 screws (a).
- **8.** Remove the base **6.**



Install a proportional valve

- 1. On the new base make sure that the 2 small O-rings are in the new base.
- **2.** Align the arrow on the top of the base with the arrow on the manifold.
- **3.** Use the 2 screws to install the base. Tighten to 1.6 N·m (14 in·lbf).
 - Make sure that the stem O-ring is against the brass piece. If not, you can damage the O-ring.
- 4. Install the base cover.
- 5. Install the coil/solenoid.
- 6. Install the nut. Tighten to 3.3 N·m (29 in·lbf).
- 7. Install the connector.
- 8. Install the screw.
- **9.** Install the side panel.
- 10. Install the top panel
- **11.** Supply the gas and fluid pressure to the system.
- 12. Use the XPR web interface tool to do a leak test.
- 13. Use the XPR web interface to make sure that the pressures are in the acceptable ranges.
 - For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).

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Replace the mixer module



Refer to VWI and OptiMix gas connect console mixer, transducers, and valves on page 150 for location and part number.

Remove the mixer module

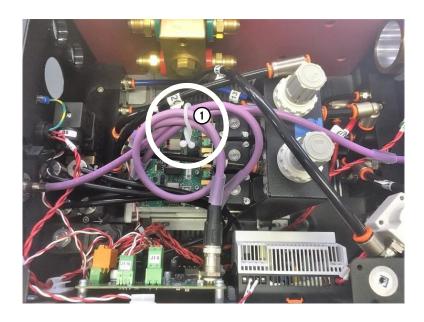
A CAUTION

HEARING LOSS CAN OCCUR FROM EXPOSURE TO LOUD NOISES

High-pressure gas in a supply-gas line can cause a loud noise when the line is disconnected.

Use hearing protection when you disconnect the air-gas line in the gas connect console. You can lose your hearing from exposure to loud noises.

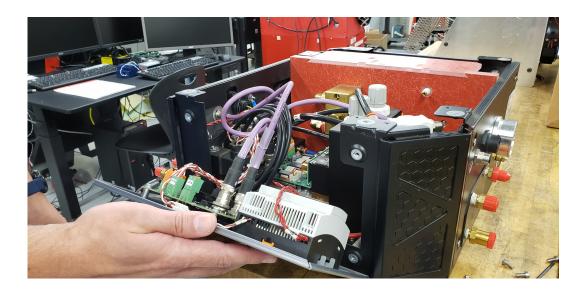
- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas and fluid pressure from the cutting system.
 - **c.** Remove the top panel.
 - Refer to Gas connect console panels on page 100.
 - Keep all nuts and screws that you remove.
- 2. If you find a cable tie (1) holding the CAN cables, remove the cable tie.



3. Disconnect the 2 CAN cables ② from the mixer module. Move the disconnected cables away from the mixer module. It is not easy to remove the manifold-side panel if the CAN cables are not disconnected.



4. Remove the manifold-side panel to get access to the mixer module (229703). This manifold-side panel has the 24 V power supply (229640) and control PCB (141375) attached. Refer to Gas connect console panels on page 100.



5. Disconnect the SV100 connector ③ from the mixer module.



A CAUTION

HEARING LOSS CAN OCCUR FROM EXPOSURE TO LOUD NOISES

High-pressure gas in a supply-gas line can cause a loud noise when the line is disconnected.

Use hearing protection when you disconnect the air-gas line in the gas connect console. You can lose your hearing from exposure to loud noises.

- **6.** Put on hearing protection.
- 7. Use a blade screwdriver to push-to-disconnect the air-gas line connector, as shown in Figure 3 (left). Pressure from the screwdriver can make it easier to disconnect the connector. Push-to-disconnect the air-gas line from the air filter inlet (Figure 3, right).

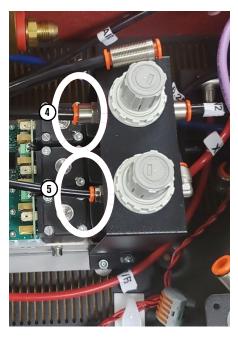
Figure 3



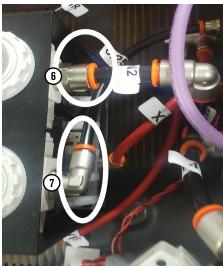


8. Move the air-gas line away from the mixer module.

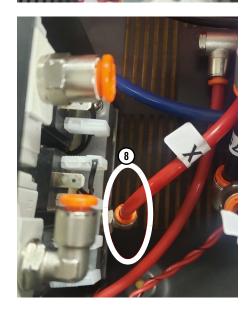
9. Push-to-disconnect the N₂ ① and Ar ⑤ gas lines from the inlet-side of the gas regulator. Refer to How to use push-to-connect fittings on page 68.



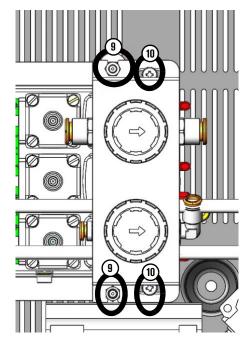
10. Push-to-disconnect the N₂ **(f)** and Ar **(7)** gas lines from the outlet-side of the gas regulator. Refer to How to use push-to-connect fittings on page 68.

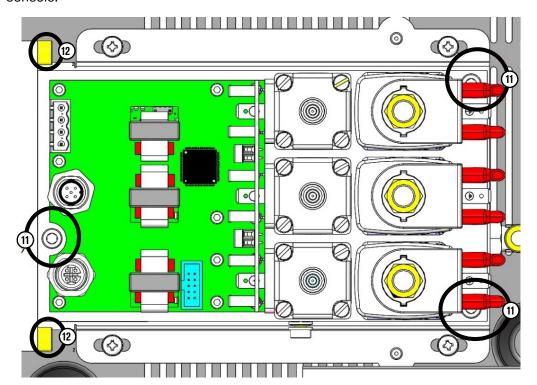


- **11.** Push-to-disconnect the mixed-fuel gas line ® from the outlet-side of the mixer module. Refer to How to use push-to-connect fittings on page 68.
- **12.** Move all disconnected gas lines away from the mixer module.

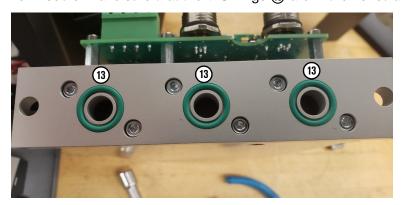


- **13.** Do the following steps to remove the gas regulators-bracket assembly from the manifold:
 - **a.** Use an 8 mm nut driver or wrench to remove the 2 M5 nuts (9) that attach the bracket to the manifold.
 - **b.** Use a #2 Phillips screwdriver to remove the 2 M4 screws (11) that attach the bracket to the manifold.
 - **c.** Remove the gas regulators-bracket assembly from the gas connect console.
- **14.** Do the following steps to disconnect the mixer module from the manifold:
 - **a.** Use a 4 mm, hexagonal-key wrench to remove the 3 cap screws (11) that attach the mixer module to the bracket.
 - **b.** Use a 5 mm, hexagonal-key wrench to remove the 2 cap screws (2) that attach the bracket to the manifold.
 - **c.** Remove the mixer module from the gas connect console.

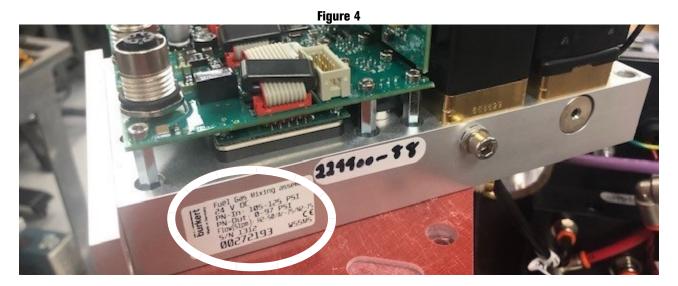




15. Examine the mixer module. Make sure that the 3 O-rings (3) are in their circular grooves.



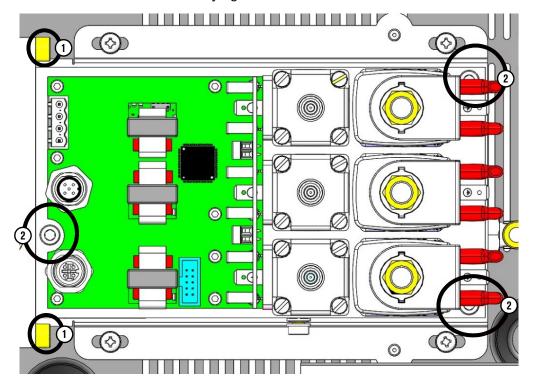
- **16.** If the O-rings stay attached to the manifold when the mixer module is removed, carefully remove the O-rings from the manifold and insert them into the circular grooves on the mixer module. Do not use damaged O-rings. Replacement O-rings are available from Hypertherm.
- 17. If technical service tells you that the serial number (S/N) for the old mixer module is necessary, look for this number on the side of the mixer-module assembly, as shown in Figure 4. If the S/N is not necessary, continue to the next step.



18. Examine the manifold. Look for dust or debris. Use a clean, lint-free cloth to remove all contamination. Do **not** use compressed air, which can push dust and debris into the manifold openings.

Install the mixer module

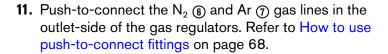
- 1. Put the mixer module in the gas connect console.
- 2. Connect the mixer module-bracket assembly to the manifold:
 - **a.** Use a 5 mm, hexagonal-key wrench to install the 2 cap screws ① that attach the bracket to the manifold. Do **not** fully tighten the screws.
 - **b.** Use a 4 mm, hexagonal-key wrench to install the 3 cap screws ② that attach the mixer module to the bracket. Do **not** fully tighten the screws.



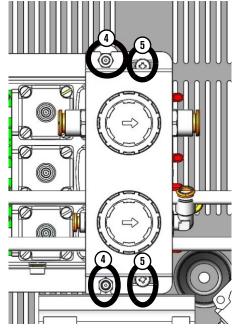
- **3.** Put the mixer module and bracket on the manifold. Adjust the mixer module and bracket as necessary for good alignment.
- **4.** Tighten the following screws to 2.3 N·m (20 in·lbf):
 - **a.** Use a 5 mm, hexagonal-key wrench to tighten the 2 cap screws ① that attach the bracket to the manifold.
 - **b.** Use a 4 mm, hexagonal-key wrench to tighten the 3 cap screws ② that attach the mixer module to the bracket.

If the 3 screws on top are tightened first, the seal between the 2 manifolds can be bad. Make sure to tighten the 2 screws that use the 5 mm wrench before the 3 screws that use the 4 mm wrench.

- **5.** Push-to-connect the mixed-fuel gas line ③ to the outlet-side of the mixer module. This connection is easier to make if done before regulator installation. Refer to How to use push-to-connect fittings on page 68.
- **6.** Put the regulator on top of the manifold. Make sure that the regulators-bracket assembly is correctly installed:
 - The 2 slots on the bracket are near the output-side of the gas connect console.
 - The regulator fitting that has the 90-degree angle is behind the gas connect console.
- 7. Use an 8 mm nut driver or socket wrench to install the 2 nuts on the 2 swage-nut studs (a) on the mixer module.
- **8.** Use a #2 Phillips screwdriver to install the 2 screws on the bracket (5). Do **not** fully tighten the screws.
- **9.** Put the mixer module bracket-assembly on the manifold. Adjust the mixer module bracket-assembly as necessary for good alignment. It can be necessary to loosen the 2 screws on the inlet-side to make adjustments.
- 10. Tighten the 2 screws on the bracket.



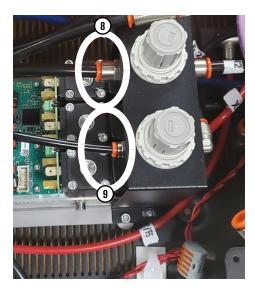






2

12. Push-to-connect the N₂ ® and Ar ⑨ gas lines in the inlet-side of the gas regulators. Refer to How to use push-to-connect fittings on page 68.



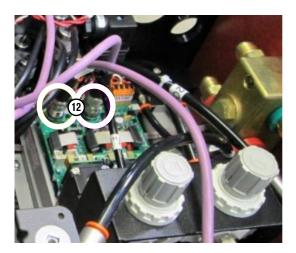
- **13.** Push-to-connect the air-gas line ①. Refer to How to use push-to-connect fittings on page 68.
- **14.** Make sure that all push-to-connect fittings are correctly installed. A connection is good if you **cannot** see the silver ring around the gas line.



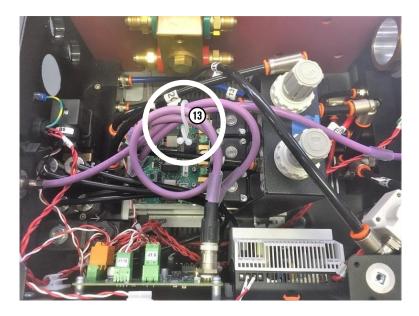
15. Connect the SV100 (1) connector to the mixer module.



16. Install the 2 CAN cables ② on the mixer module. Use your fingers to tighten these connections. Do not use tools. Tools can damage these connectors. Do not cross-thread the CAN cable connectors. If these connections are cross-threaded, they are not easy to remove.



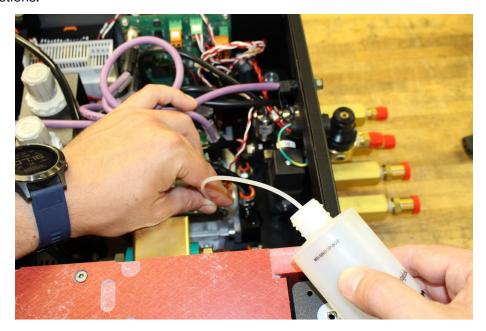
- **17.** Install the manifold-side panel on the gas connect console. Make sure to not pinch the wires. Refer to Gas connect console panels on page 100.
- **18.** Use the cable tie (3) to hold the CAN cables in position.



19. Supply gas pressure to the cutting system.

2 Gas Connect Consoles

20. Use a solution of soap and water or another liquid leak detector to look for gas leaks along the mixer module gas lines. If you find a leak, disconnect and connect the bad connection or connections.



- 21. Install the top panel.
- **22.** Supply the power to the cutting system.
- **23.** Do a system-wide test for gas leaks. If you find a leak, repeat the steps to install the replacement mixer module. Refer to Install the mixer module on page 90. Repeat the installation steps and test for system leaks until there are no leaks.

If a leak cannot be found or stopped, contact your cutting machine supplier or regional Hypertherm Technical Service Team.

Replace a regulator



Refer to VWI and OptiMix gas connect console mixer, transducers, and valves on page 150 for location and part number.

Remove a regulator

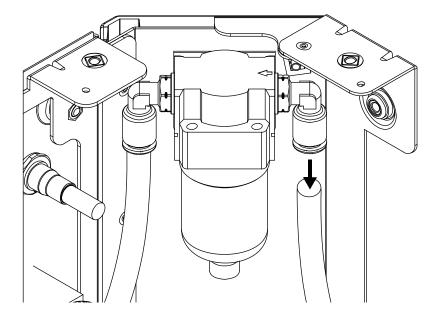
- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas and fluid pressure from the cutting system.
 - **c.** Remove the top panel.
 - **d.** Remove the manifold-side panel.

Refer to Gas connect console panels on page 100.



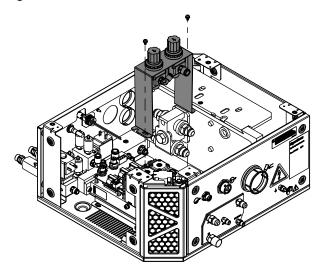
Keep all nuts and screws that you remove.

- **2.** Disconnect the hoses from the push-to-connect fittings on the regulators.
- 3. Disconnect the 2 CAN cables from the mixer.
- **4.** Disconnect the air hose from the push-to-connect fitting on the inlet side of the air filter.

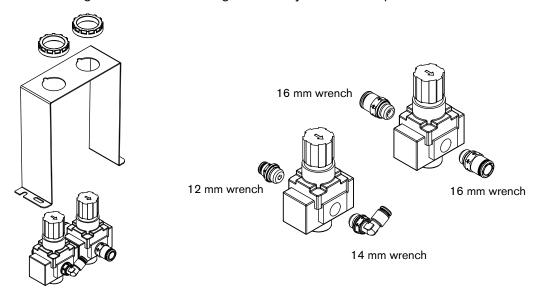


2

- **5.** Do one of the following:
 - Use a Phillips screwdriver to remove the 2 mounting screws from the regulator bracket.
 - Use an 8 mm, hexagonal-socket wrench to remove the 2 nuts from the regulator bracket.



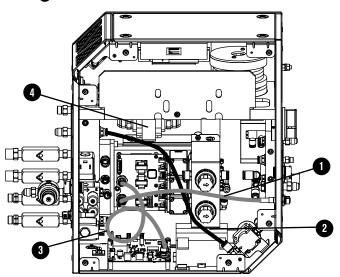
- **6.** Remove the regulator and bracket assembly.
- 7. Remove the regulator nut from the regulator that you want to replace.



- **8.** Remove the regulator from the bracket.
- **9.** Remove the fittings from the regulator.
 - Keep the fittings.

Install a regulator

- 1. On the new regulator, install the push-to-connect fittings. Tighten to 8 N·m (70.8 in·lbf).
- **2.** Use the regulator nut to install the regulator into the bracket.
- 3. Install the regulator and bracket assembly into the gas connect console.
- 4. Connect the air hose to the push-to-connect fitting on the inlet side of the air filter.
- **5.** Carefully connect the 2 CAN cables to the mixer.
 - Make sure that the CAN cable 1 from the outlet panel goes above the air hose 2.
 - Create a loop in the CAN cable 3 to keep the cable away from the coolant manifold 4.



- **6.** Connect the hoses to the regulators.
- 7. Install the side panel.
- **8.** Install the top panel.
- **9.** Supply the gas and fluid pressure to the cutting system.
- 10. Use the XPR web interface to make sure that the pressures are in the acceptable ranges. If the pressures are not in the acceptable ranges, refer to How to set the regulators on page 98 to calibrate the regulators.
 - For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).

How to set the regulators

This procedure is for when the regulators need to be adjusted in the field.

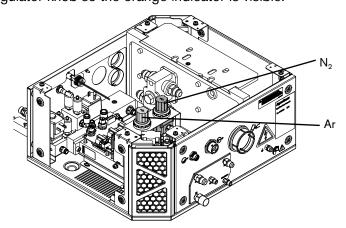
The N_2 and Ar OptiMix gas connect console (078633) regulators are set at Hypertherm before the regulators are installed into the gas connect console. The regulators are set in a dynamic condition, when gas is flowing, with 7.9 bar - 8.6 bar (115 psi - 125 psi) on the inlet and 6.9 bar (100 psi) on the outlet. There is a 1.6 mm (0.063 inch) orifice downstream.

When to adjust regulators:

- If your N₂ Shield inlet (P4) pressure is above 7.5 bar (110 psi) or below 6.2 bar (90 psi).
- If your Ar Shield Inlet (P4) pressure is above 7.5 bar (110 psi) or below 6.2 bar (90 psi).

Set the N₂ regulator

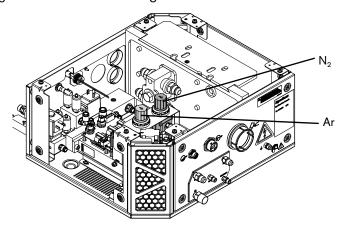
- 1. Install one of the following sets of consumables:
 - 300 A O₂/Air
 - 300 A N₂/N₂
 - 300 A Mix/N₂
 - 170 A O₂/Air
 - 170 A N₂/N₂
 - 170 A Mix/N₂
- **2.** Use the XPR web interface to load one of the following processes:
 - 2100 for the 300 A consumables
 - 2057 for the 170 A consumables
- **3.** Remove the cover from OptiMix gas connect console.
- **4.** Lift the N₂ regulator knob so the orange indicator is visible.



- **5.** Go to **Gas System** in the XPR web interface.
- 6. Choose TEST PREFLOW.
- 7. Adjust the regulator until the Line B inlet sensor (P1) reads 6.9 bar (100 psi) on the XPR web interface.

Set the Ar regulator

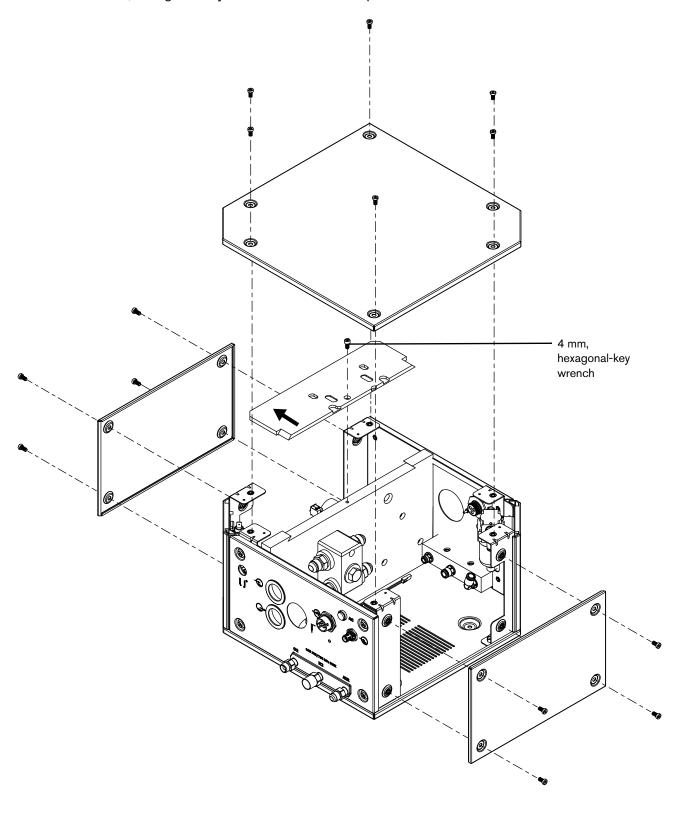
- 1. Load one of the following sets of consumables:
 - 300 A O₂/Air
 - 170 A O₂/Air
- **2.** Use the XPR web interface to load one of the following processes:
 - 1205 for the 300 A consumables
 - 1157 for the 170 A consumables
- 3. Remove the cover for OptiMix gas connect console.
- **4.** Lift the Ar regulator knob so the orange indicator is visible.



- **5.** Go to **Gas System** in the XPR web interface.
- 6. Choose TEST PIERCEFLOW.
- 7. Adjust the regulator until the shield inlet sensor (P4) reads 6.9 bar (100 psi) on the web interface.

Gas connect console panels

Use a 3 mm, hexagonal-key wrench on all external panel screws.



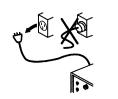
Torch Connect Console

WARNING



ELECTRIC SHOCK CAN KILL

Disconnect electric power before doing installation or maintenance. You can get a serious electric shock if electric power is not disconnected. Electric shock can seriously injure or kill you.

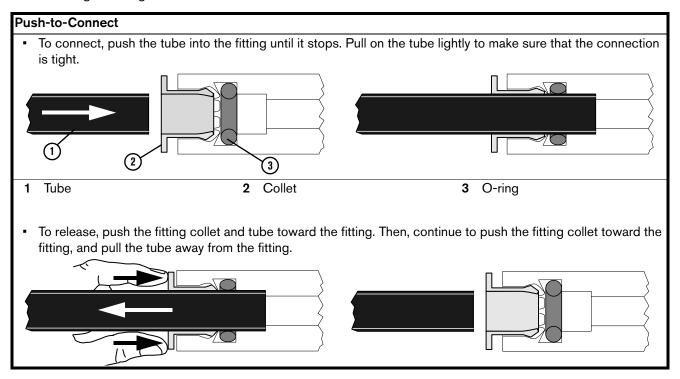


All work that requires removal of the torch connect console panels must be done by a qualified technician.

Refer to the *Safety and Compliance Manual* (80669C) for more safety information.

How to use push-to-connect fittings

Some replacement procedures in the torch connect console require you to use push-to-connect fittings. This procedure explains how to use push-to-connect fittings without causing damage to the tubing or fitting.



- Replace any tubing that is damaged. If you reuse damaged tubing, it can result in leaks.
- Used tubing can have an indentation on the end that can cause leaks. To prevent leaks, trim the tubing to remove the indentation.

Replace the ohmic PCB



Refer to Torch connect console Easy Connect side on page 152 for location and part number.

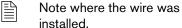
- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the top panel.
 - c. Remove both side panels.

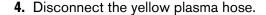
Refer to Torch connect console top panel and side panels on page 126.



Keep all nuts and screws that you remove.

- **2.** Remove the wire connectors from the PCB.
- 3. Remove the ohmic wire from the PCB.









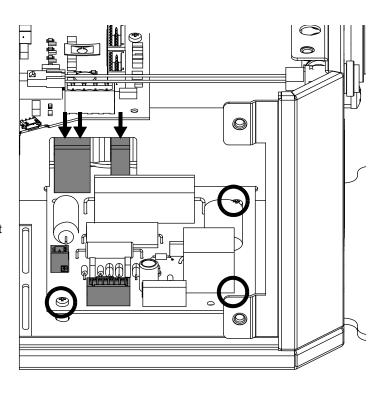
6. Make sure that the tabs for J3 and J4 are down



- 7. Tilt the PCB up and slide the PCB through the center panel to remove the PCB.
- **8.** Slide the new PCB through the center panel.
- 9. Use the 3 screws to install the PCB. Tighten to 6.9 kg·cm (6 in·lbf).
- 10. Connect the wires J1, J2, J3, and J4. Make sure that you connect the ohmic wires to where you removed them. The location of the ohmic wires varies by system setup.



Ohmic PCBs with a revision letter of F or later have 2 parallel connectors for the ohmic relay (J2 and J2A). Make sure to use the ohmic PCB connector that corresponds with the ohmic relay connector.



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Torch Connect Console

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- 11. Connect the yellow plasma hose.
- 12. Install the side panels.
- **13.** Install the top panel.

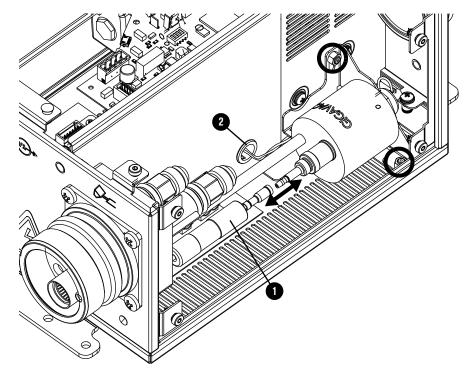
Replace the ohmic relay and bracket



Refer to Torch connect console Easy Connect side on page 152 for location and part number.

Remove the ohmic relay and bracket

- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).
 - **c.** Remove the top panel.
 - **d.** Remove the torch-side panel.
 - Refer to Torch connect console top panel and side panels on page 126.
 - Keep all nuts and screws that you remove.
- **2.** Remove the pilot arc lead, coolant hoses, and water hose from the torch connector.
- 3. Unscrew the connector and pull the electrical wire to disconnect it.
- **4.** Disconnect the wires from J3 and J4 on the ohmic PCB.
- **5.** Remove the wires from J2 on the ohmic PCB and pull the connector through the grommet **2**.
- **6.** Use an 8 mm, hexagonal-socket wrench to remove the 2 nuts.
- **7.** Remove the ohmic relay and bracket.



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Install the ohmic relay and bracket

- 1. Use the 2 nuts to install the ohmic relay and bracket. Tighten to 3.3 N·m (29 in·lbf).
- 2. Push J2 through the grommet and connect it to J2 on the ohmic PCB.
- **3.** Connect the ohmic wires to J3 or J4 where you removed them from.
 - The location of the ohmic wires varies by system setup.
- **4.** Push the electrical wires together and tighten the connector.
- **5.** Install the water hose, coolant hoses, and pilot arc lead.
- **6.** Install the torch-side panel.
- **7.** Install the top panel.
- **8.** Install the coolant. Refer to the Coolant Installation section in the XPR170 Instruction Manual (810060).

Replace a pressure transducer



Refer to Torch connect console manifold side – view 1 on page 153 for location and part number.

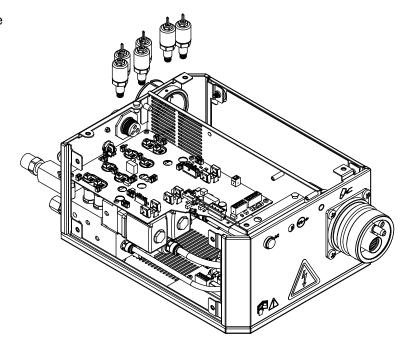
- **1.** Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Remove the top panel.
 - **d.** Remove the manifold-side panel.

Refer to Torch connect console top panel and side panels on page 126.



Keep all nuts and screws that you remove.

- 2. Disconnect the wire connector that goes to the pressure transducer that you want to replace.
- **3.** Use a 10 mm open-ended wrench to remove the pressure transducer.
- Use a 10 mm open-ended wrench to install the pressure transducer. Tighten to 2.3 N·m (20 in·lbf).



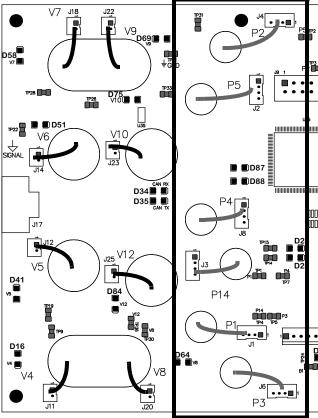
5. Connect the wire connector.

Transducer	Connector
P3	J6
P1	J1
P14	J3
P4	J8
P5	J2
P2	J4

- **6.** Install the manifold-side panel.
- 7. Install the top panel.
- **8.** Supply the gas pressure to the cutting system.
- **9.** Use the XPR web interface to make sure that the pressures are in the acceptable ranges.



For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).



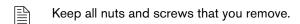
Replace a solenoid valve (V4-V10, V12)



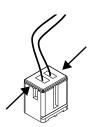
Refer to Torch connect console manifold side – view 2 on page 154 for location and part number.

- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Remove the top panel.





- 2. Use the edge of the connector to disconnect the wire from the control PCB.
 - Be careful not to pull the wires out of the solenoid valve connector.



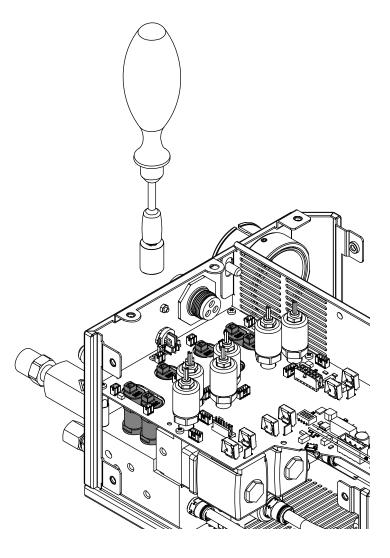
Torch Connect Console

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- **3.** Use the tool (229917) to remove the solenoid valve that you want to replace.
 - Make sure that the
 O-rings on the new
 solenoid valve are clean
 and that the hole in the

manifold is clear of debris.

- **4.** Use the tool (229917) to install the new solenoid valve. Tighten to 2.5 N·m (22.1 in·lbf).
 - Rotate the valve as you install it to prevent the O-rings from rolling.
- **5.** Install the top panel.
- **6.** Supply the gas pressure to the cutting system.



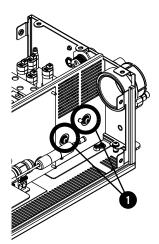
Replace the solenoid valve (V11)



Refer to Torch connect console manifold side – view 2 on page 154 for location and part number.

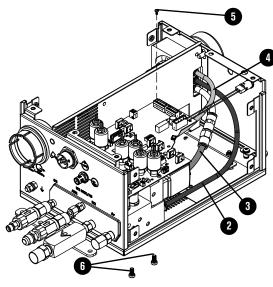
Remove the solenoid valve (V11)

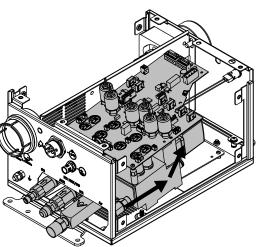
- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).
 - **d.** Remove the top panel.
 - **e.** Remove the side panels.
 - Refer to Torch connect console top panel and side panels on page 126.
 - Keep all nuts and screws that you remove.
- 2. Remove the gas supply hoses.
- Remove the ohmic relay and bracket. Refer to Remove the ohmic relay and bracket on page 105.
- **4.** Remove the 2 screws **1** that hold the manifold assembly in from the side.
- **5.** Remove the power connector (J19), ohmic board connector (J27) and V1 connector (J7) from the control PCB.



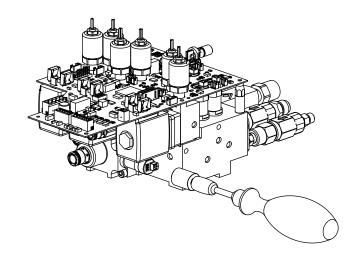
3 Torch Connect Console

- 6. Disconnect the yellow 2, blue 3, and black 4 tubes from the push-to-connect fittings on the manifold assembly. Refer to How to use push-to-connect fittings on page 102.
- 7. Use a Phillips screwdriver to remove the screw **5** from the control PCB.
- **8.** Use a 3 mm, hexagonal-key wrench to remove the 2 screws that hold the manifold assembly in the bottom of the torch connect console.
- **9.** Slide the manifold assembly with control PCB back and lift out.





- **10.** Use the edge of the connector to disconnect the wire for V11 from the control PCB.
 - Be careful not to pull the wires out of the solenoid valve connector.
- **11.** Use the tool (229917) to remove the solenoid valve.



Install the solenoid valve (V11)

- 1. Use the tool (229917) to install the new solenoid valve. Tighten to 2.5 N·m (22.1 in lbf).
- 2. Connect the wire connector for V11 to the control PCB.
- **3.** Slide the manifold assembly with control PCB through the hole in the panel and into the torch connect console.
 - Do not pinch the wires for V11 between the PCB and sheet metal.
- 4. Use a 3 mm, hexagonal-key wrench to install the 2 screws that hold the manifold assembly.
- **5.** Use a Phillips screwdriver to install the screw on the control PCB.
- **6.** Connect the black, blue, and yellow tubes to the push-to-connect fittings on the manifold assembly. Refer to How to use push-to-connect fittings on page 102.
- 7. Install the 2 screws on the ohmic relay side.
- 8. Install the ohmic relay and bracket. Refer to Install the ohmic relay and bracket on page 106.
- **9.** Install the power connector (J19), ohmic board connector (J27) and V1 connector (J7) on the control PCB.
- 10. Connect the gas supply hoses.
- 11. Install the side panels.

Torch Connect Console

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- **12.** Install the top panel.
- **13.** Install the coolant. Refer to the *Coolant Installation* section in the *XPR170 Instruction Manual* (810060).

14. Supply the gas pressure to the cutting system.

Replace the control PCB



Refer to Torch connect console manifold side – view 1 on page 153 for location and part number.

Remove the control PCB

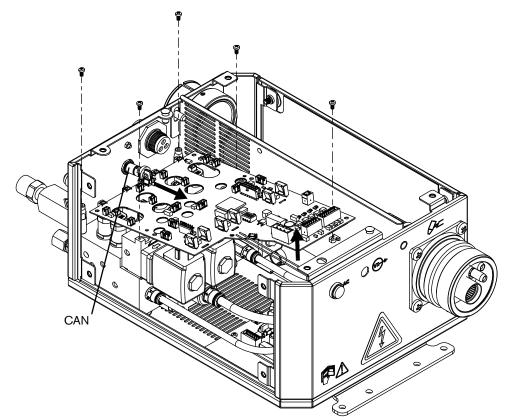
- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Remove the top panel.
 - **d.** Remove the control-side panel.
 - Re

Refer to Torch connect console top panel and side panels on page 126.



Keep all nuts and screws that you remove.

- **2.** Disconnect and remove the pressure transducers. Refer to Replace a pressure transducer on page 107.
- **3.** Disconnect all of the wires from the PCB.
- **4.** Remove the 5 screws from the PCB.
- 5. Tilt the end of the PCB up and pull the PCB out.



Install the control PCB

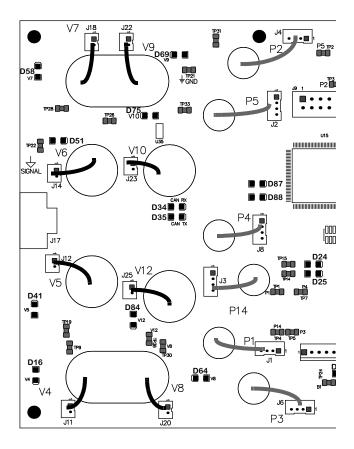
- 1. Tilt the PCB and align the CAN connector with the hole in the panel.
- 2. Push the CAN connector through the hole in the panel as you push the board down.
- 3. Use the screws to install the PCB. Tighten to 1.1 N·m (10 in·lbf).
- 4. Install the pressure transducers. Refer to Replace a pressure transducer on page 107.
- **5.** Connect all of the wires. Refer to Table 1 and Table 2 on page 117.
- **6.** Install the top panel.
- 7. Install the manifold-side panel.
- **8.** Supply the gas pressure to the cutting system.
- 9. Use the XPR web interface to make sure that the pressures are in the acceptable ranges.
 - For more information on the XPR web interface, refer to the Connect for Communication in the XPR170 Instruction Manual (810060).

Table 1 – Solenoid valve connectors

Valve	Connector
V4	J11
V8	J20
V5	J12
V12	J25
V6	J14
V10	J23
V9	J22
V7	J18

Table 2 – Pressure transducer connectors

Transducer	Connector
P3	J6
P1	J1
P14	J3
P4	J8
P5	J2
P2	J4



Replace a proportional valve



Refer to Torch connect console manifold side – view 2 on page 154 for location and part number.

Remove a proportional valve

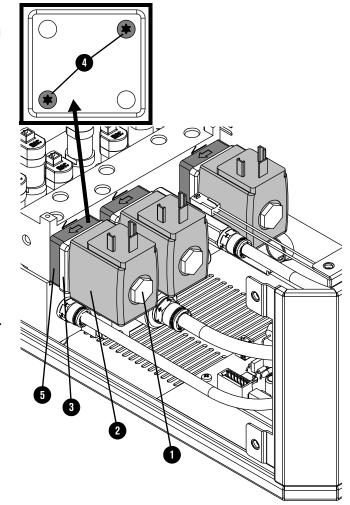
- **1.** Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Remove the top panel.
 - **d.** Remove the control-side panel.

Refer to Torch connect console top panel and side panels on page 126.



Keep all nuts and screws that you remove.

- 2. Remove the control PCB. Refer to Remove the control PCB on page 115.
- **3.** Remove the screw from the connector (not shown).
- **4.** Remove the connector (not shown).
- **5.** Use a 14 mm, hexagonal-socket wrench to remove the nut **1**.
- **6.** Remove the coil/solenoid **2**.
- 7. Pull the base cover 3 to remove.
- 8. Use a T20 screwdriver to remove the 2 screws (a).
- **9.** Pull the base **5** to remove.



Install a proportional valve

- 1. Make sure that the 2 small O-rings are in the new base.
- 2. Align the arrow on the top of the base with the arrow on the manifold.
- 3. Use the 2 screws to install the base. Tighten to 1.6 N·m (14 in·lbf).
 - Make sure that the stem O-ring is against the brass piece. If not, you can damage the O-ring.
- 4. Install the base cover.
- **5.** Install the coil/solenoid.
- 6. Install the nut. Tighten to 3.3 N·m (29 in·lbf).
- 7. Install the connector.
- 8. Install the screw.
- 9. Install the control PCB. Refer to Install the control PCB on page 116.
- 10. Install the manifold-side panel.
- **11.** Install the top panel.

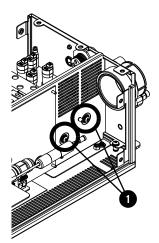
Replace the manifold assembly



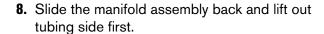
Refer to Torch connect console manifold side – view 2 on page 154 for location and part number.

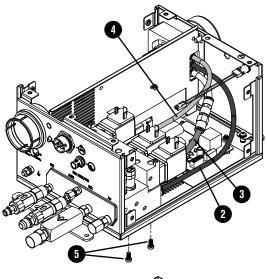
Remove the manifold assembly

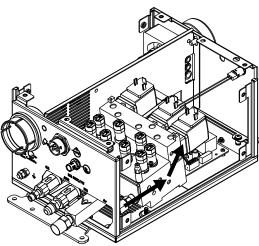
- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).
 - **d.** Remove the top panel.
 - **e.** Remove the side panels.
 - Refer to Torch connect console top panel and side panels on page 126.
 - Keep all nuts and screws that you remove.
- 2. Remove the gas supply hoses.
- **3.** Remove the control PCB. Refer to Remove the control PCB on page 115.
- Remove the ohmic relay and bracket. Refer to Remove the ohmic relay and bracket on page 105.
- **5.** Remove the 2 screws 1 that hold the manifold in from the side.



- 6. Disconnect the yellow 2, blue 3, and black 4 tubes from the push-to-connect fittings on the manifold assembly. Refer to How to use push-to-connect fittings on page 102.
- 7. Use a 3 mm, hexagonal-key wrench to remove the 2 screws (5) that hold the manifold assembly.







Install the manifold assembly

- 1. Slide the new manifold assembly through the hole in the panel and into the torch connect console.
- 2. Use a 3 mm, hexagonal-key wrench to install the 2 screws that hold the manifold assembly.
- **3.** Connect the black, blue, and yellow tubes to the push-to-connect fittings on the manifold assembly. Refer to How to use push-to-connect fittings on page 102.
- 4. Install the 2 screws on the ohmic relay side.
- 5. Install the ohmic relay and bracket. Refer to Install the ohmic relay and bracket on page 106.
- 6. Install control PCB. Refer to Install the control PCB on page 116.
- 7. Connect the gas supply hoses.

Torch Connect Console

3

- 8. Install the side panels.
- 9. Install the top panel.
- **10.** Install the coolant. Refer to the *Coolant Installation* section in the *XPR170 Instruction Manual* (810060).

11. Supply the gas pressure to the cutting system.

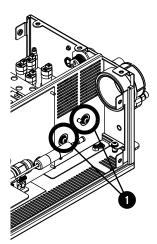
Replace the bottom manifold assembly



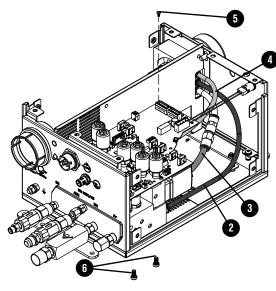
Refer to Torch connect console manifold side – view 2 on page 154 for location and part number.

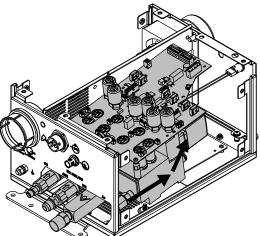
Remove the bottom manifold assembly

- 1. Complete the following procedures:
 - **a.** Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
 - **c.** Drain the coolant. Refer to *Remove old coolant from the coolant system* in the *Maintenance* section in the *XPR170 Instruction Manual* (810060).
 - **d.** Remove the top panel.
 - **e.** Remove the side panels.
 - Refer to Torch connect console top panel and side panels on page 126.
 - Keep all nuts and screws that you remove.
- 2. Remove the gas supply hoses.
- Remove the ohmic relay and bracket. Refer to Remove the ohmic relay and bracket on page 105.
- **4.** Remove the 2 screws **1** that hold the manifold assembly in from the side.
- **5.** Remove the power connector (J19), ohmic board connector (J27) and V1 connector (J7) from the control PCB.



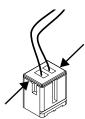
- 3
- 6. Disconnect the yellow 2, blue 3, and black 4 tubes from the push-to-connect fittings on the manifold assembly. Refer to How to use push-to-connect fittings on page 102.
- 7. Use a Phillips screwdriver to remove the screw from the control PCB.
- **8.** Use a 3 mm, hexagonal-key wrench to remove the 2 screws **6** that hold the manifold assembly in the bottom of the torch connect console.
- **9.** Slide the manifold assembly with control PCB back and lift out.



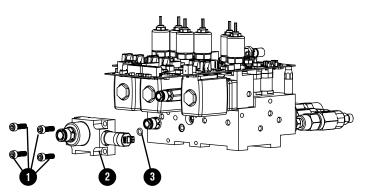


- **10.** Use the edge of the connector to disconnect the wire for V11 from the control PCB.

Be careful not to pull the wires out of the solenoid valve connector.



- 11. Use a 5 mm, hexagonal-key wrench to remove the 4 screws 1 from the bottom manifold assembly.
- **12.** Remove the bottom manifold assembly **2**.
- **13.** Remove the O-ring **3** from the inlet manifold.

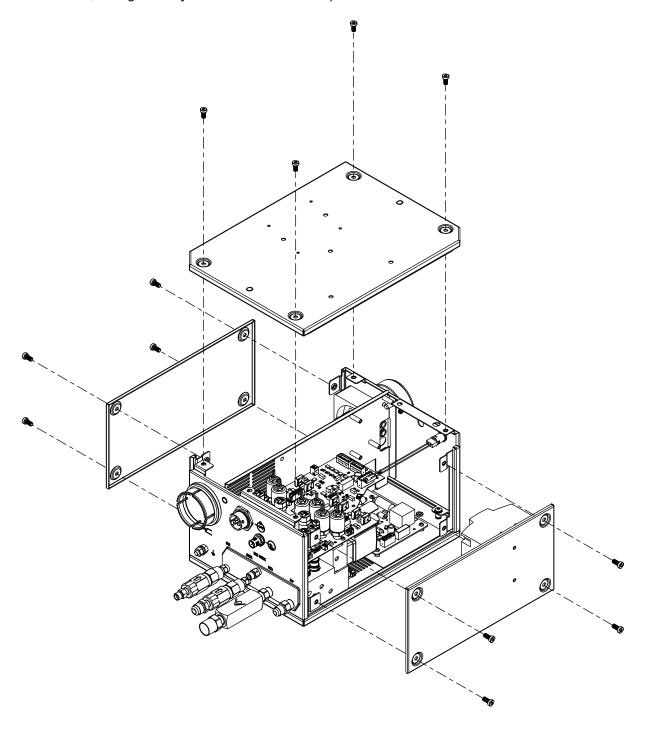


Install the bottom manifold assembly

- 1. Install the O-ring in the groove in the inlet manifold.
- 2. Align the new bottom manifold assembly with the inlet manifold.
- **3.** Use a 5 mm, hexagonal-key wrench to install the 4 screws.
- **4.** Connect the wire connector for V11 to the control PCB.
- **5.** Slide the manifold assembly with control PCB through the hole in the panel and into the torch connect console.
 - Do not pinch the wires for V11 between the PCB and sheet metal.
- **6.** Use a 3 mm, hexagonal-key wrench to install the 2 screws that hold the manifold assembly.
- 7. Connect the black, blue, and yellow tubes to the push-to-connect fittings on the manifold assembly. Refer to How to use push-to-connect fittings on page 102.
- 8. Install the 2 screws on the ohmic relay side.
- 9. Install the ohmic relay and bracket. Refer to Install the ohmic relay and bracket on page 106.
- **10.** Install the power connector (J19), ohmic board connector (J27) and V1 connector (J7) on the control PCB.
- 11. Install the side panels.
- **12.** Install the top panel.
- **13.** Install the coolant. Refer to the *Coolant Installation* section in the *XPR170 Instruction Manual* (810060).
- **14.** Supply the gas pressure to the cutting system.

Torch connect console top panel and side panels

Use a 3 mm, hexagonal-key wrench on all external panel screws.

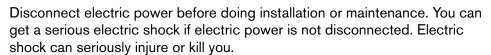


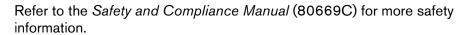
Torch

WARNING



ELECTRIC SHOCK CAN KILL



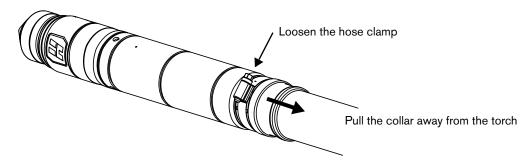




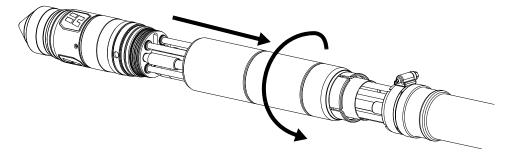
Replace the solenoid valve

Refer to Torch assembly on page 156 for location and part number.

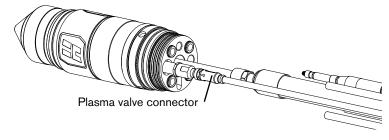
- 1. Complete the following procedures:
 - a. Remove the power from the cutting system.
 - **b.** Remove the gas pressure from the cutting system.
- 2. Remove the collar on the torch-end of the torch lead:
 - **a.** Loosen the hose clamp that holds the collar in position.
 - **b.** Pull the collar away from the torch-end of the torch lead assembly.



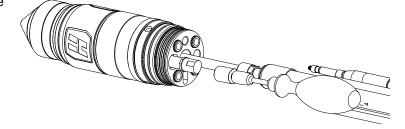
- **3.** Remove the torch mounting sleeve:
 - a. Loosen the torch mounting sleeve.
 - **b.** Pull the torch mounting sleeve away from the torch.



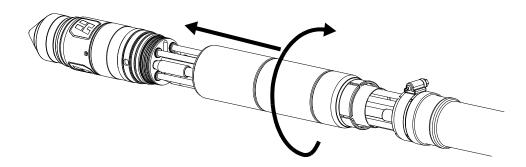
4. Disconnect the plasma valve connector.



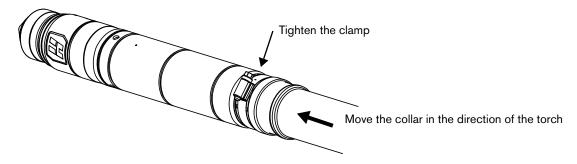
- **5.** Use the tool (229918) to remove the solenoid valve.
- **6.** Use the tool (229918) to install the solenoid valve.
- **7.** Connect the plasma valve connector.



- 8. Install the torch mounting sleeve:
 - **a.** Move the torch mounting sleeve in the direction of the torch.
 - **b.** Use your hands to tighten the torch mounting sleeve connection.
 - A spanner wrench (104879) comes with all 4 of the consumable parts kits (428616, 428617, 428618, 428619). Do **not** over tighten the torch mounting sleeve if you use the spanner wrench to stabilize the torch during mounting sleeve installation.



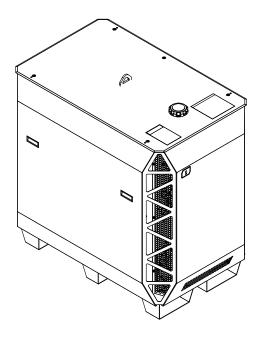
- **9.** Reposition the collar on the torch-end of the torch lead:
 - **a.** Move the collar in the direction of the torch-end of the torch lead assembly.
 - **b.** Tighten the hose clamp that holds the collar in position.



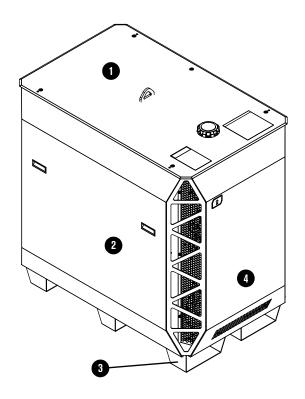


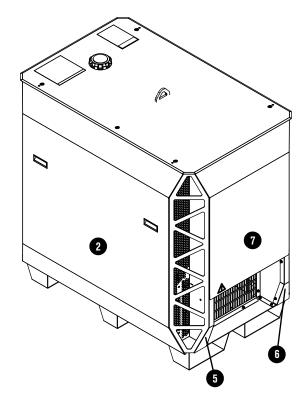
Plasma power supply

Part number	Voltage (AC)
078640	200
078641	208
078642	220
078643	240
078644	380
078645	400
078646	415
078647	440
078648	480
078649	600



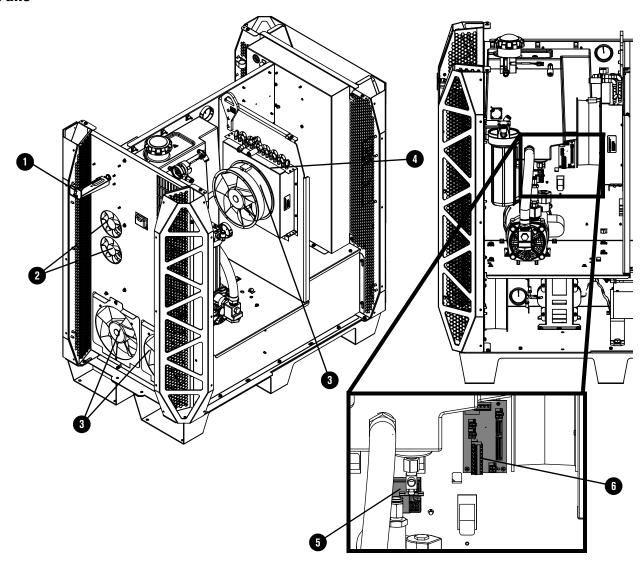
Outer panels





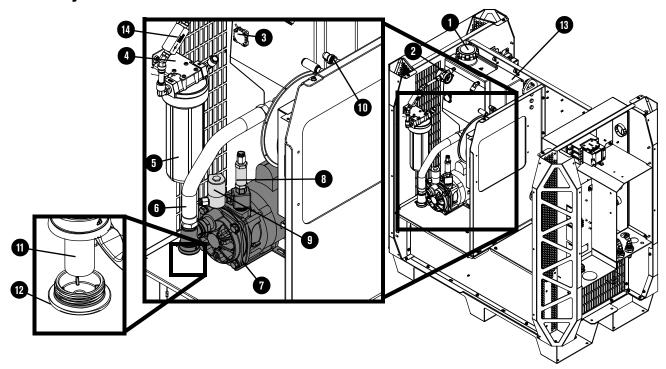
	Part number	Description	Quantity
1	428728	Top panel with labels	1
2	428838	Side panel with labels and handles	2
3	101300	Base	1
4	428725	Front panel with "H" (not shown) and power-indicator LED label	1
5	101314	Lower right (liquid-cooling) rear corner panel	1
6	101307	Lower left (control) rear corner panel	1
7	428726	Rear panel with label and handles	1

Fans



	Part number	Description	Designator	Quantity
1	429002	Power-indicator LED	_	1
2	229821	Fan: 292 cfm, 48 VDC,120 mm (4.7 inch) diameter	CAB FAN3, CAB FAN4	2
3	229822	Fan: 890 cfm, 48 VDC, 254 mm (10 inch) diameter	HX FAN1, MAG FAN1, MAG FAN2	3
4	229924	Heat-exchanger only	_	1
5	003266	Solid state relay	_	1
6	141384	Fan power distribution PCB	PCB6	1

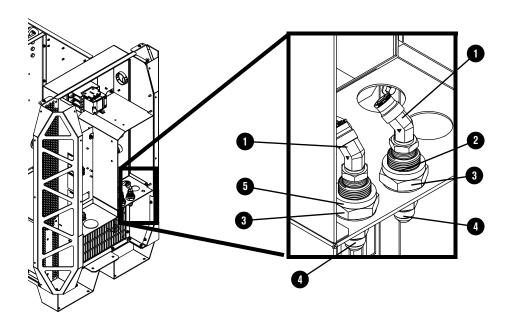
Coolant system



	Part number	Description	Quantity
1	127014	Coolant reservoir cap	1
2	229741	Coolant flow meter	1
3	229775	Coolant level sensor	1
4	101281	Coolant filter bracket	1
5	127344	Coolant filter housing	1
	027005	Coolant filter (fine)	1
6	229777	Coolant hose (1 inch)	1
7	428729	Coolant pump and motor assembly: Adapter: 1-5/8 inch X 1 inch NPT X #16 JIC Plug with O-ring Coolant pump screen (coarse) Pump and motor Adapter: 1 inch MNPT X 1 inch MNPT hexagonal collar Adapter: 1 inch MNPT X 3/8 inch FNPT X 1/4 inch FNPT Adapter: 3/8 inch hexagonal Coolant solenoid valve assembly	1
8	006132	Coolant bypass check valve	1
9	229721	Coolant solenoid valve assembly	1
10	229654	Thermistor: Copper pipe clip with electrical connector (hidden behind panel)	1
11	127559	Coolant pump screen (coarse)	1

	Part number	Description	Quantity
12	229843	Plug and O-ring	1
13	002561	Coolant reservoir	1
14	006113	Coolant check valve	1
	428766	Kit: Tubing (1 inch hose not included)	1

${\bf Coolant\ adapters\ in\ the\ rear\ compartment}$

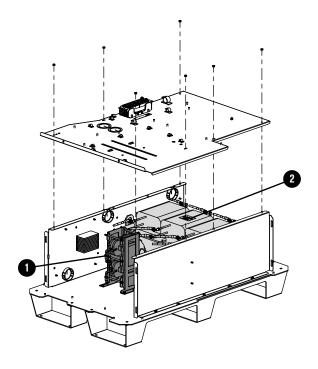


	Part number	Description	Quantity
1	015889	Elbow adapter: 1/2 inch NPT X 1/2 inch tube, 45° swivel	2
2	015903	Red ring: 1.13 inches inner diameter	1
3	015888	Adapter: 1/2 inch FNPT X 1-1/2 inch length bulkhead	2
	015899	Red ring: 0.87 inch inner diameter (not shown)	1
4	015029	Adapter: 1/2 inch NPT X #8 male	2
	015898	Green ring: 0.87 inch inner diameter (not shown)	1
5	015902	Green ring: 1.13 inch inner diameter	1

Other adapters not shown

Part number	Description	Location	Quantity
015669	Male adapter: 3/8 inch NPT X 1/2 inch tube	in coolant solenoid valve	1
006099	Coolant drain valve: 1/4 inch NPT X 3/8 inch tube	in the bottom of the coolant reservoir	1
015073	Adapter: 1/4 inch NPT X 1/4 FPT	in the bottom of the coolant reservoir	1
015738	Elbow adapter: 1/4 inch NPT X 1/2 inch tube, 45° swivel	in the top of the coolant reservoir	1
015510	Adapter: 1/4 inch X hexagonal collar	between the flow meter and coolant reservoir	1
015663	Adapter: 1/4 inch NPT X 1/2 inch tube	in the flow meter and coolant bypass check valve	2
015668	Elbow adapter: 1/2 inch NPT X 1/2 inch tube, 90°	in the coolant filter (fine) assembly	2
104807	Nut for chopper fitting	on the back of chopper	2
015815	Elbow fitting: 1/2 inch tube X 1/2 inch tube, 90°	on the back of the chopper (2) and the heat-exchanger inlet (1)	3
015820	Fitting: 1/2 inch tube X 1/2 inch tube	heat-exchanger outlet	1

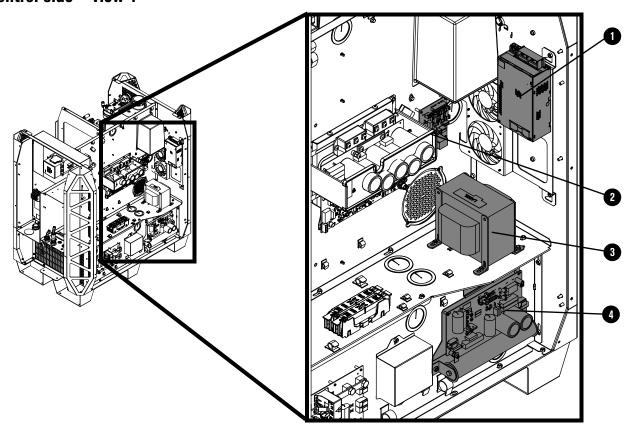
Transformer and inductor



	Part number	Description	Designator	Quantity
1	428844	Kit: Inductor 1A (top)/1B (bottom)	L1	1
	Transformer, horizon	tal, 35.7 kW, 3-phase*		
	_	200 V, 50 Hz – 60 Hz		
	_	208 V, 60 Hz		
	_	220 V, 50 Hz – 60 Hz		
	_	240 V, 60 Hz		
2	_	380 V, 50 Hz – 60 Hz	T2	4
	_	400 V, 50 Hz	12	1
	_	415 V, 50 Hz		
	_	440 V, 50 Hz – 60 Hz		
	_	480 V, 60 Hz		
	_	600 V, 60 Hz		

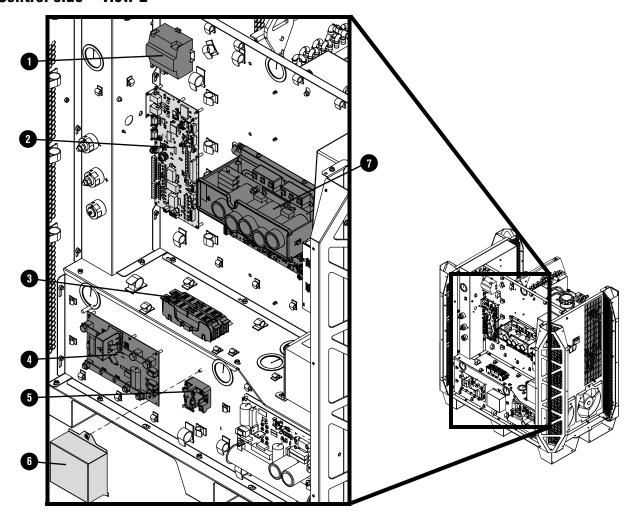
^{*} You cannot purchase this part. Shown for reference only.

Control side – view 1



	Part number	Description	Designator	Quantity
1	229671	Power source: 88 VAC - 264 VAC to 48 VDC, 600 W	PS2	1
2	141425	Power distribution PCB	PCB7	1
	108709	Fuse: 10 A, 250 VAC, time delay (on PCB7)	F3, F4, F5	3
	Control transforme	r assembly, 3 kVA		
	229809	200 V, 50 Hz – 60 Hz		
	229810	208 V, 60 Hz, 3 kVA		1
	229811	220 V, 50 Hz – 60 Hz	T1	
	229812	240 V, 60 Hz		
3	229813	380 V, 50 Hz		
	229814	400 V, 50 Hz		
	229815	415 V, 50 Hz		
	229816	440 V, 50 Hz – 60 Hz		
	229794	480 V, 60 Hz		
	229817	600 V, 60 Hz		
4	229678	Start circuit assembly	PCB4	1

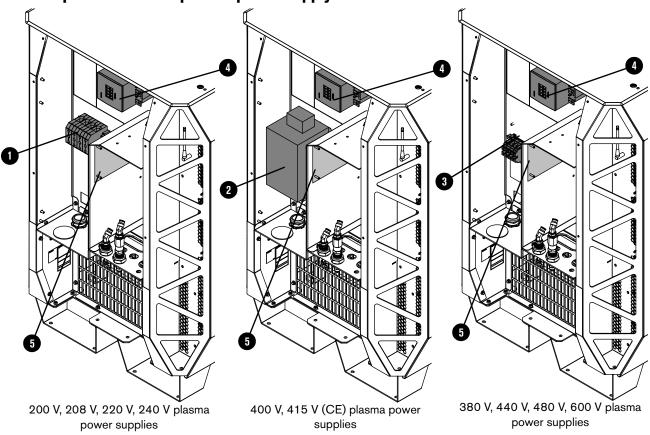
Control side - view 2



	Part number	Description	Designator	Quantity
1	229640	Power source: 88 VAC - 264 VAC to 24 VDC	PS1	1
2	428750	Control PCB	PCB1	1
3	208394	Fuse holder: 2P, 30 A, 600 V	_	1
	208395	Fuse: 8 A, 600 V, Class R (used in 380 V, 400 V, 415 V, 440 V, 480 V, 600 V)	F1, F2	2
	208397	Fuse: 15 A, 600 V, Class R (used in 200 V, 208 V, 220 V, 240 V)		
4	141371	I/O PCB	PCB5	1
5	003277	Pilot arc relay: 24 VDC, coil, 60 A 28 VDC contacts	CR1	1
6	101316	Pilot arc relay cover	_	1

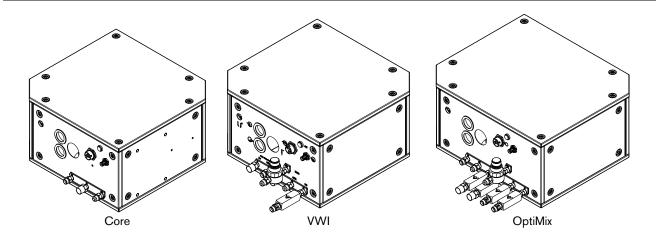
	Part number	Description	Designator	Quantity
7	229679	Chopper assembly	Chopper 1	1
	229956	XPR170 wire harness	_	1
	223400	CAN cable 1 m (3.3 ft) (not shown) Located between the control PCB and Chopper 1.	_	1

Rear compartment of the plasma power supply



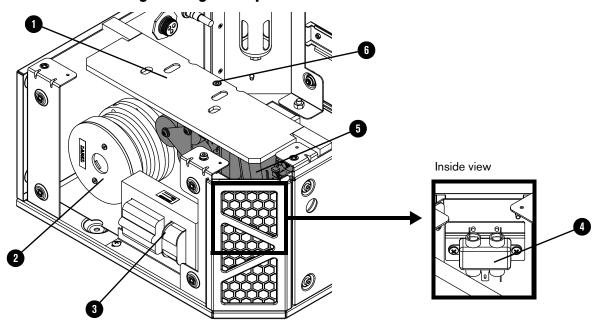
	Part number	Description	Designator	Quantity
1	229033	Terminal block 600 V, 200 A (200 V, 208 V, 220 V, 240 V)		1
2	209453	EMI filter with terminal block (400 V, 415 V CE)	TB1	
3	029316	Terminal block 600 V, 140 A (380 V, 440 V, 480 V, 600 V)		
	003276	Main contactor (200 V, 208 V, 220 V, 240 V)		
4	429060	Main contactor assembly (380 V, 400 V, 415 V, 440 V, 480 V, 600 V)	M_CON	
5	141511	VDC3 PCB (Optional, for use with RS-422 and discrete cutting systems)	_	1

Gas connect consoles



Part number	Description
078631	Core gas connect console
078632	VWI gas connect console
078633	OptiMix gas connect console

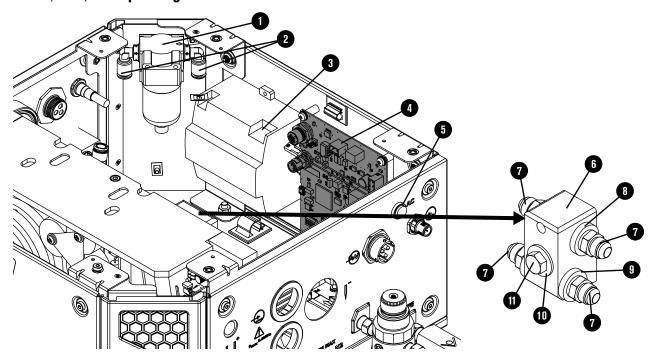
Gas connect console high-voltage side parts



	Part number	Description	Console	Designator	Quantity
1	002570	Insulator	Core, VWI, OptiMix	_	1
2	229837	Coil assembly	Core, VWI, OptiMix	T2	1
3	229838	High-frequency, high-voltage transformer	Core, VWI, OptiMix	T1	1
4	009045	EMI filter	Core, VWI, OptiMix	_	1
5	141354	High-frequency, high-voltage ignition PCB	Core, VWI, OptiMix	PCB2	1
6	075678	Socket head cap screw: M5 - 0.8 X 10 mm hexagonal	Core, VWI, OptiMix	_	1

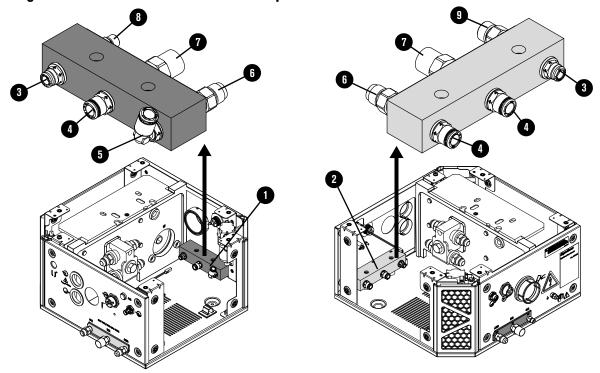
Gas connect console manifold side parts

Core, VWI, and OptiMix gas connect console manifold side



	Part number	Description	Console	Designator	Quantity
1	011151	Air filter assembly	Core, VWI, OptiMix	_	1
	011110	Air filter element	Core, VWI, OptiMix	_	1
2	015853	Male elbow adapter: 1/4 inch NPT X 5/16 inch tube	Core, VWI, OptiMix	_	2
3	229640	Power source: 88 VAC - 264 VAC to 24 VDC	VWI, OptiMix only	-	1
4	141375	Control PCB	Core, VWI, OptiMix	PCB1	1
5	229825	Green power-indicator LED assembly	Core, VWI, OptiMix	-	1
6	104757	Coolant manifold	Core, VWI, OptiMix	_	1
7	015029	Adapter: 1/2 inch NPT X #8 male	Core, VWI, OptiMix	-	4
8	015898	Green ring: 0.87 inches inner diameter	Core, VWI, OptiMix	_	2
9	015899	Red ring: 0.87 inches inner diameter	Core, VWI, OptiMix	-	2
10	075218	Washer	Core, VWI, OptiMix	_	1
11	075140	Bolt	Core, VWI, OptiMix	_	1

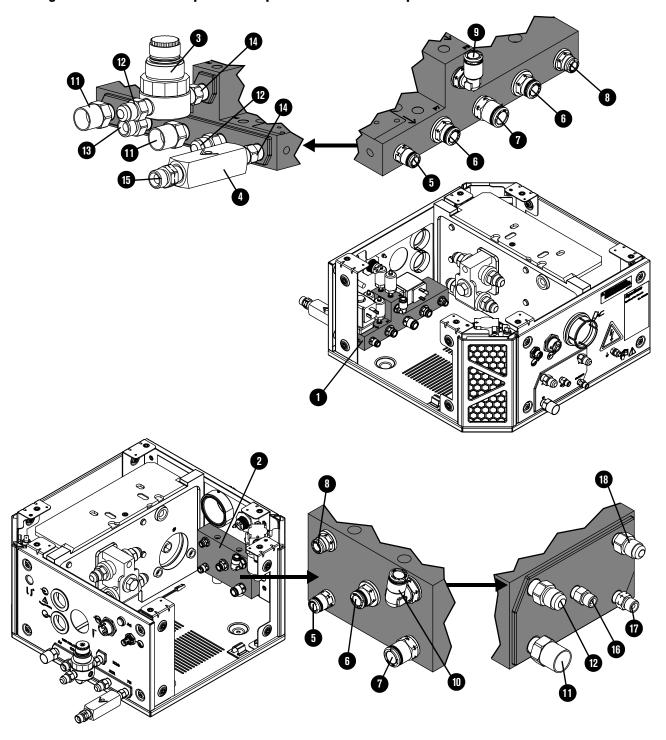
Core gas connect console manifolds and adapters



	Part number	Description	Quantity		
1	104806	Manifold: Gas output (no adapters)	1		
2	104802	Manifold: Gas input (no adapters)	1		
	Push-to-connect adapters				
3	015876	1/4 inch NPT X 1/4 inch tube	2		
4	015811	1/4 inch NPT X 8 mm tube			
5	015853	Male elbow: 1/4 inch NPT X 5/16 inch tube	1		
	Threaded adapters with thread sealant applied				
6	015012	5012 1/4 inch NPT X #6 male (air output and input)			
7	015103	15103 1/4 inch NPT X RH 'B' inert female (nitrogen output and input)			
8	015116	15116 1/8 inch NPT X RH 'A' male (oxygen output)			
9	015009	1/4 inch NPT X RH 'B' male (oxygen input)			

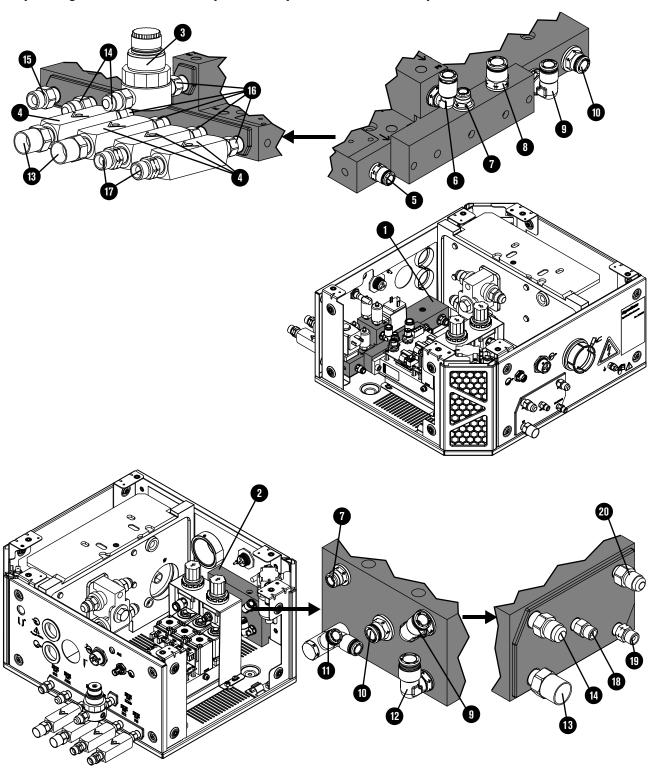
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VWI gas connect console input and output manifolds and adapters



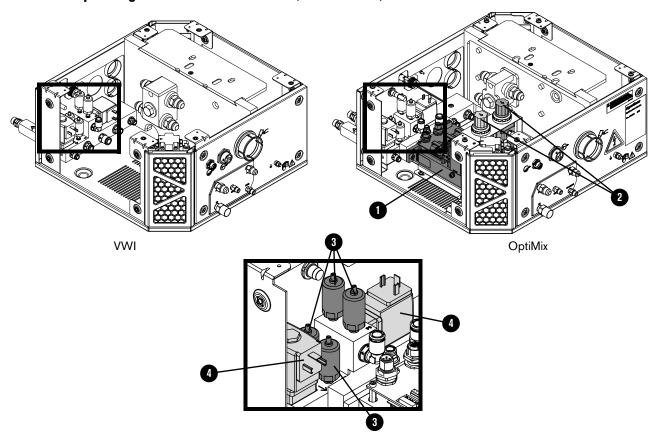
	Part number	Description	Quantity
1	229898	Manifold: Gas input (no adapters)	1
2	104843	Manifold: Gas output (no adapters)	1
3	229844	Water regulator	1
4	006157	Check valve	1
-	Push-to-connect ac		•
5	015905	1/8 inch NPT X 1/4 inch tube	2
6	015910	3/8 inch NPT X 5/16 inch tube	2
7	015907	1/4 inch NPT X 3/8 inch tube	1
8	015876	1/4 inch NPT X 1/4 inch tube	1
9	015853	Elbow: 1/4 inch NPT X 5/16 inch tube, 90°	
10	015909	Elbow: 3/8 inch NPT X 5/16 inch tube, 90°	
	Threaded adapters with thread sealant applied		
11	015103	1/4 inch NPT X RH 'B' inert female	3
12	015012	1/4 inch NPT X #6 male	3
13	015009	1/4 inch NPT X RH 'B' male	1
14	015922	1/4 inch X hexagonal collar	2
15	015230	1/4 inch NPT X LH 'B'	1
16	015116	Adapter: 1/8 inch NPT X RH 'A' (oxygen outlet)	1
17	015210	Adapter: 1/8 inch NPT X LH 'A' male (hydrogen mix outlet)	1
18	015197	Adapter: 1/8 inch NPT X #5 male (argon outlet)	1

OptiMix gas connect console input and output manifolds and adapters



	-		
	Part number	Description	Quantity
1	229898	Manifold: Gas input (no adapters)	1
2	104843	Manifold: Gas output (no adapters)	1
3	229844	Water regulator	1
4	006157	Check valve	4
	Push-to-connect ac	dapters	
5	015905	1/8 inch NPT X 1/4 inch tube	1
6	015853	Elbow: 1/4 inch NPT X 5/16 inch tube	1
7	015876	1/4 inch NPT X 1/4 inch tube	1
8	015907	1/4 inch NPT X 3/8 inch tube	1
9	015909	Elbow: 3/8 inch NPT X 5/16 inch tube	1
10	015910	3/8 inch NPT X 5/16 inch tube	1
11	015906	Dual connection: 1/8 inch NPT X 1/4 inch tube	1
12	015908	Elbow: 1/4 inch NPT X 3/8 inch tube	1
	Threaded adapters	with thread sealant applied	
13	015103	1/4 inch NPT X RH 'B' inert female	3
14	015012	1/4 inch NPT X #6 male	3
15	015009	1/4 inch NPT X RH 'B' male	1
16	015922	1/4 inch X hexagonal collar	5
17	015230	1/4 inch NPT X LH 'B'	1
18	015116	1/8 inch NPT X RH 'A'	1
19	015210	1/8 inch NPT X LH 'A'	1
20	015197	1/8 inch NPT X #5	1

VWI and OptiMix gas connect console mixer, transducers, and valves

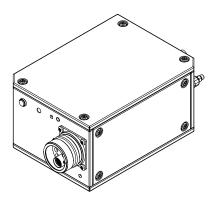


	Part number	Description	Console	Designator	Quantity
1	229703	Mixer module	OptiMix	_	1
	528057	Kit: Mixer module and cable ties	OptiMix	_	1
2	011101	Regulator	OptiMix	_	2
3	223398	Pressure transducer	VWI and OptiMix	P6 – P9	4
4	006167	Solenoid valve	VWI and OptiMix	B4, B5	2

Gas connect console wire harness, hose kit, and CAN cables

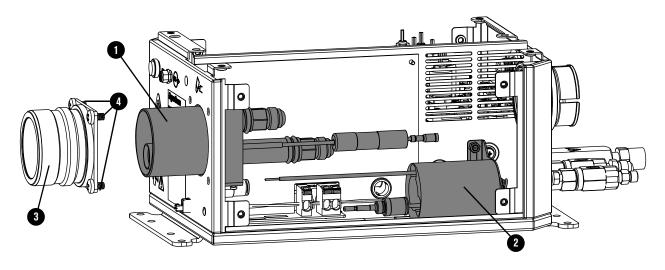
Part number	Description	Console	Quantity
229718	Wire harness	Core	
229719	Wire harness	VWI	1
229720	Wire harness	OptiMix	
428490	Kit: Tubing	Core	
428491	Kit: Tubing	VWI	1
428492	Kit: Tubing	OptiMix	
223709	CAN cable 0.38 m (1.2 ft) to external connector	Core, VWI, OptiMix	1
223710	CAN cable 0.48 m (1.6 ft) male-female	Core, VWI	1
223711	CAN cable 0.5 m (1.6 ft) male-female	OptiMix	1
223712	CAN cable 0.39 m (1.3 ft) male-female	OptiMix	1

Torch connect console



Part number	Description
078618	Torch connect console

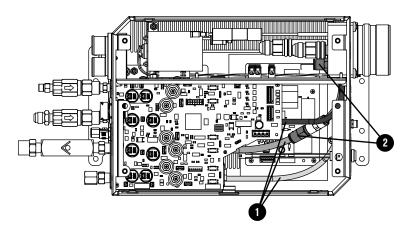
Torch connect console Easy Connect side



	Part number	Description	Designator	Quantity
1	428730	Torch receptacle block	_	1
2	229882*	Ohmic relay and bracket	_	1
3	420376	Torch lead connector	_	1
4	075544	Machine screw: M6 X 10 mm Phillips, pan head	_	4 (3 shown)

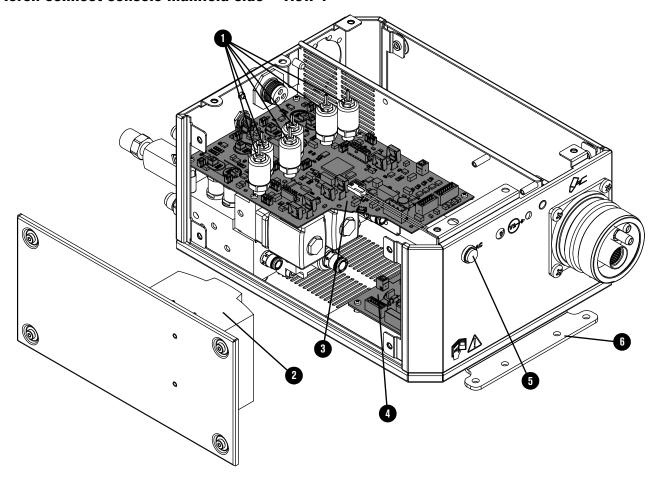
^{*} Includes the ohmic contact PCB (141368)

Torch connect console - top



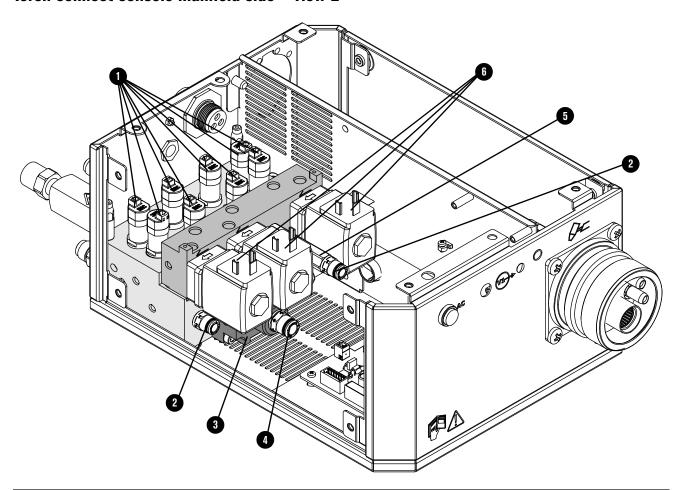
	Part number	Description	Designator	Quantity
1	428338	Kit: Tubing	_	1
2	006152	Check valve	_	2

Torch connect console manifold side - view 1



	Part number	Description	Designator	Quantity
1	223477	Pressure transducer with wire and connector	P1 – P5, P14	6
2	229640	Power source: 88 VAC – 264 VAC to 24 VDC	PS1	1
3	141334	Control PCB	PCB1	1
4	141368	Ohmic contact PCB	PCB2	1
5	229825	Green power-indicator LED assembly	_	1
6	101366	Bracket	_	2 (1 shown)
	229780	Valve cable 40 mm (1.6 inches)	_	8
	229800	Valve cable 279.4 mm (11 inches)	_	1
	229655	Wire harness	_	1

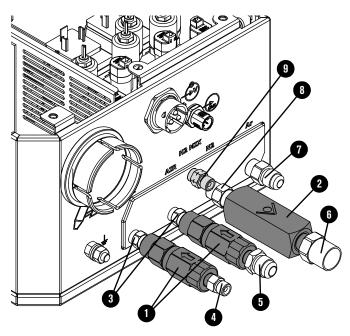
Torch connect console manifold side - view 2



	Part number	Description	Designator	Quantity
	229895	Manifold assembly: Solenoid valves Proportional valves All manifolds All fittings		1
1	229965	Solenoid valve	V4 – V12	9 (8 shown)
	229917	Solenoid valve (229965) tool	_	
2	015905	Adapter: 1/8 inch NPT O-ring seal X 1/4 inch tube	_	2
3	428756	Bottom manifold assembly: Bottom manifold Adapter Critical orifice Solenoid valve		1
4	015811	Adapter: 1/4 inch NPT O-ring seal X 8 mm tube	_	1

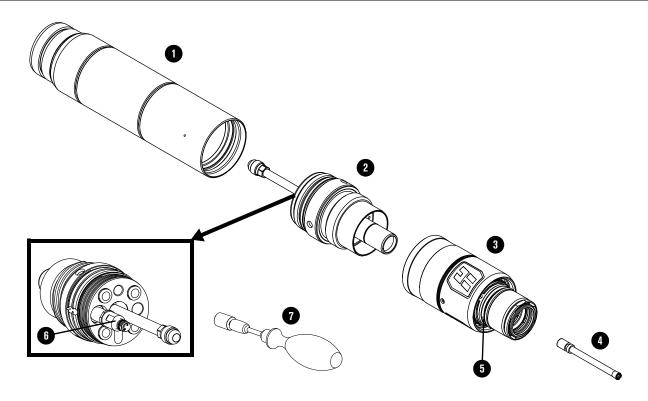
	Part number	Description	Designator	Quantity
5	104406	Adapter: 1/8 inch FPT X1/8 inch NPT X1-5/8 inch	_	1
6	006167	Proportional valve	B1 – B3	3
	044508	O-ring		7

Front adapters and valves



	Part number	Description	Designator	Quantity
1	006077	Check valve: 1/8 inch FPT	_	2
2	006157	Check valve: 1/4 inch NPT female	_	1
	Threaded adapters	with thread sealant applied		
3	015517	1/8 inch hexagonal collar	_	2
4	015116	1/8 inch NPT X RH 'A' – 1		1
5	015226	/8 inch NPT X #6 male -		1
6	015103	1/4 inch NPT X RH 'B' inert female	_	1
7	015007	1/4 inch NPT X #5 male	_	1
8	015922	1/4 inch hexagonal collar	_	1
9	015210	1/8 inch NPT X LH 'A' male	_	1

Torch assembly



	Part number	Description
1	420500	Torch mount sleeve assembly: Standard
	420501	Torch mount sleeve assembly: Short
	420502	Torch mount sleeve assembly: Extended
2	420220	Quick-disconnect/torch receptacle
3	420221	Quick-disconnect torch
4	420368	Water tube
5	044028	O-ring for quick-disconnect torch (Refer to Preventive maintenance kits on page 171.)
6	006155	Torch solenoid valve (V1)
7	229918	Torch solenoid valve (V1) tool
	006169	Torch solenoid valve connector
	428846	Torch assembly, 170 A mild steel consumables
	104879	2.25 inch spanner wrench

Torch bracket

Part number	Description
428646	Torch lifter bracket: 2.25 inch diameter sleeve

Consumable starter kits

Mild steel consumable starter kit (428840)

Part number	Description	Quantity
420231	Electrode: 50 A	1
420234	Nozzle: 50 A	1
420237	Shield: 50 A	1
420233	Swirl ring: 50 A	1
420240	Electrode: 80 A	3
420243	Nozzle: 80 A	3
420246	Shield: 80 A	2
420242	Swirl ring: 80 A - 130 A	2
420249	Electrode: 130 A	3
420252	Nozzle: 130 A	3
420255	Shield: 130 A	2
420261	Nozzle: 170 A	4
420258	Electrode: 170 A	4
420513	Shield: 170 A	3
420260	Swirl ring: 170 A	1
420276	Electrode: 220 A	3
420270	Nozzle: 220 A	3
420273	Shield: 220 A	2
420406	Swirl ring: 220 A	1
420368	Water tube	1
420200	Shield retaining cap	1
420365	Nozzle retaining cap	1
104879	2.25 inch spanner wrench	1
104119	Consumable tool	1
027055	Silicone lubricant, 1/4 ounce	1

Stainless steel and aluminum consumable starter kit (428843)

Part number	Description	Quantity
420288	Nozzle: 40 A	3
420291	Shield: 40 A	2
420297	Nozzle: 60 A	2
420296	Nozzle: 60 A H ₂ O	1
420306	Nozzle: 80 A	2
420290	Nozzle: 80 A H ₂ O	2
420469	Shield: 130 A H ₂ O	2
420356	Electrode: 130 A - 300 A	3
420315	Nozzle: 130 A	3
420318	Shield: 130 A	2
420472	Shield: 170 A H ₂ O	1
420324	Nozzle: 170 A	3
420327	Shield: 170 A	1
420303	Electrode: 40 A - 80 A	3
420309	Shield: 60 A - 80 A	2
420294	Electrode: 40 A - 80 A aluminum air/air	2
420300	Shield: 60 A - 80 A H ₂ O	2
420314	Swirl ring: 40 A - 170 A multiple processes	1
420323	Swirl ring: 60 A - 300 A multiple processes	2
420368	Water tube	1
420200	Shield retaining cap	1
420365	Nozzle retaining cap	1
104879	2.25 inch spanner wrench	1
104119	Consumable tool	1
027055	Silicone lubricant, 1/4 ounce	1

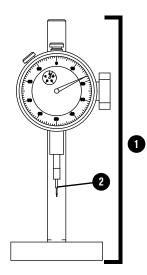
Mild steel consumable starter kit with torch (428842)

Part number	Description	Quantity
420221	Quick-disconnect torch head	1
420231	Electrode: 50 A	1
420234	Nozzle: 50 A	1
420237	Shield: 50 A	1
420233	Swirl ring: 50 A	1
420240	Electrode: 80 A	3
420243	Nozzle: 80 A	3
420246	Shield: 80 A	2
420242	Swirl ring: 80 A - 130 A	2
420249	Electrode: 130 A	3
420252	Nozzle: 130 A	3
420255	Shield: 130 A	2
420261	Nozzle: 170 A	4
420258	Electrode: 170 A	4
420513	Shield: 170 A	3
420260	Swirl ring: 170 A	1
420368	Water tube	2
420200	Shield retaining cap	2
420365	Nozzle retaining cap	2
104879	2.25 inch spanner wrench	1
104119	Consumable tool	1
027055	Silicone lubricant, 1/4 ounce	1

Stainless steel and aluminum consumable starter kit with torch (428841)

Part number	Description	Quantity
420221	Quick-disconnect torch head	1
420288	Nozzle: 40 A	3
420291	Shield: 40 A	2
420297	Nozzle: 60 A	2
420296	Nozzle: 60 A H ₂ O	1
420306	Nozzle: 80 A	2
420290	Nozzle: 80 A H ₂ O	2
420469	Shield: 130 A H ₂ O	2
420356	Electrode: 130 A - 300 A	3
420315	Nozzle: 130 A	3
420318	Shield: 130 A	2
420472	Shield: 170 A H ₂ O	1
420324	Nozzle: 170 A	3
420327	Shield: 170 A	1
420303	Electrode: 40 A - 80 A	3
420309	Shield: 60 A - 80 A	2
420294	Electrode: 40 A - 80 A aluminum air/air	2
420300	Shield: 60 A - 80 A H ₂ O	2
420314	Swirl ring: 40 A - 170 A multiple processes	1
420323	Swirl ring: 60 A - 300 A multiple processes	2
420368	Water tube	2
420200	Shield retaining cap	2
420365	Nozzle retaining cap	2
104879	2.25 inch spanner wrench	1
104119	Consumable tool	1
027055	Silicone lubricant, 1/4 ounce	1

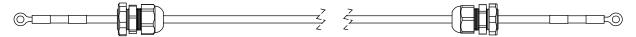
Other consumable and torch parts



	Part number	Description	
1	004630	Pit depth gauge	
2	004629	Gauge point	
	027055	Silicone lubricant, 1/4 ounce	
	104119	Consumable tool	
	428764	XPR robotic torch teach accessory	
	429013	XPR electrode torque tool	

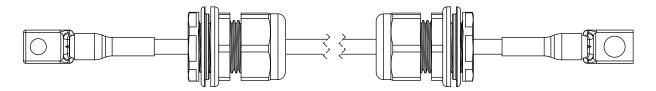
Plasma power supply to gas connect console connections

Pilot arc lead with strain relief



Part number	Length	Part number	Length
223529	3 m (9.8 feet)	223535	25 m (82 feet)
223530	4.5 m (14.8 feet)	223536	35 m (114.8 feet)
223531	7.5 m (24.6 feet)	223537	45 m (147.6 feet)
223532	10 m (32.8 feet)	223538	60 m (196.9 feet)
223533	15 m (49.2 feet)	223539	75 m (246.1 feet)
223534	20 m (65.6 feet)	_	-

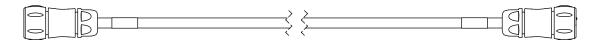
Negative lead with strain relief



Part number	Туре	Length	Part number	Туре	Length
223584	1/0	3 m (9.8 feet)	223745*	1/0	3 m (9.8 feet)
223585	1/0	4.5 m (14.8 feet)	223746*	1/0	4.5 m (14.8 feet)
223586	1/0	7.5 m (24.6 feet)	223747*	1/0	7.5 m (24.6 feet)
223587	1/0	10 m (32.8 feet)	223748*	1/0	10 m (32.8 feet)
223588	1/0	15 m (49.2 feet)	223749*	1/0	15 m (49.2 feet)
223589	1/0	20 m (65.6 feet)	223750*	1/0	20 m (65.6 feet)
223590	1/0	25 m (82 feet)	223751*	1/0	25 m (82 feet)
223580	2/0	35 m (114.8 feet)	223558*	2/0	35 m (114.8 feet)
223581	2/0	45 m (147.6 feet)	223559*	2/0	45 m (147.6 feet)
223582	2/0	60 m (196.9 feet)	223560*	2/0	60 m (196.9 feet)
223583	2/0	75 m (246.1 feet)	223561*	2/0	75 m (246.1 feet)

^{*} Leads labeled with CCC mark only.

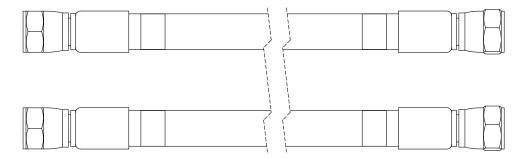
Power cable



Description: 3-position, male-female

Part number	Length	Part number	Length
223436	3 m (9.8 feet)	223446	25 m (82 feet)
223437	4.5 m (14.8 feet)	223447	35 m (114.8 feet)
223439	7.5 m (24.6 feet)	223448	45 m (147.6 feet)
223441	10 m (32.8 feet)	223449	60 m (196.9 feet)
223444	15 m (49.2 feet)	223450	75 m (246.1 feet)
223445	20 m (65.6 feet)	_	-

Coolant hose set



Description: 1.27 cm (0.50 inch) internal diameter

Part number	Length	Part number	Length
428475	3 m (9.8 feet)	428481	25 m (82 feet)
428476	4.5 m (14.8 feet)	428482	35 m (114.8 feet)
428477	7.5 m (24.6 feet)	428483	45 m (147.6 feet)
428478	10 m (32.8 feet)	428484	60 m (196.9 feet)
428479	15 m (49.2 feet)	428485	75 m (246.1 feet)
428480	20 m (65.6 feet)	_	_

CAN cable

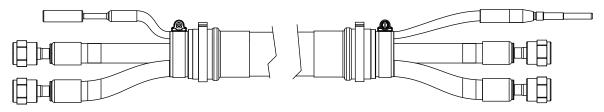


Description: 5-position, male-female

Part number	Length	Part number	Length
223417	3 m (9.8 feet)	223427	25 m (82 feet)
223418	4.5 m (14.8 feet)	223428	35 m (114.8 feet)
223420	7.5 m (24.6 feet)	223429	45 m (147.6 feet)
223422	10 m (32.8 feet)	223430	60 m (196.9 feet)
223425	15 m (49.2 feet)	223431	75 m (246.1 feet)
223426	20 m (65.6 feet)	_	-

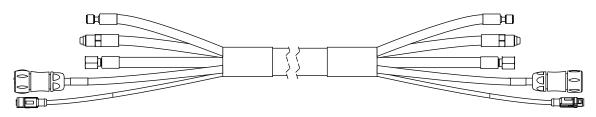
Gas connect console to torch connect console connections

Pilot arc and coolant hose set assembly (Core)



Part number	Length	Part number	Length
428454	3 m (9.8 feet)	428458	10 m (32.8 feet)
428455	4.5 m (14.8 feet)	428459	15 m (49.2 feet)
428456	6 m (19.7 feet)	428083	18 m (59.1 feet)
428457	7.5 m (24.6 feet)	_	-

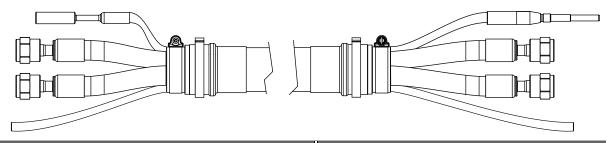
Power, CAN, and 3-gas assembly (Core)



Part number	Length	Part number	Length
428464	3 m (9.8 feet)	428468	10 m (32.8 feet)
428465	4.5 m (14.8 feet)	428469	15 m (49.2 feet)
428466	6 m (19.7 feet)	428082	18 m (59.1 feet)*
428467	7.5 m (24.6 feet)	-	-

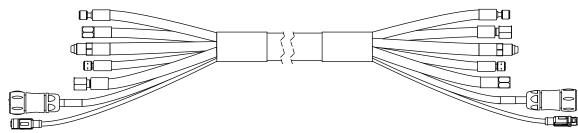
^{*} The 18 meter (59.1 feet) assembly is compatible only with the 2 meter (6.6 feet) or 2.5 meter (8.2 feet) torch lead.

Pilot arc, coolant hose set, and shield water assembly (VWI or OptiMix)



Part number	Length	Part number	Length
428353	3 m (9.8 feet)	428357	10 m (32.8 feet)
428354	4.5 m (14.8 feet)	428358	15 m (49.2 feet)
428355	6 m (19.7 feet)	428981	18 m (59.1 feet)
428356	7.5 m (24.6 feet)	-	-

Power, CAN, and 5-gas assembly (VWI or OptiMix)

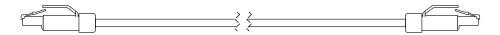


Part number	Length	Part number	Length
428363	3 m (9.8 feet)	428367	10 m (32.8 feet)
428364	4.5 m (14.8 feet)	428368	15 m (49.2 feet)
428365	6 m (19.7 feet)	428980	18 m (59.1 feet)*
428366	7.5 m (24.6 feet)	_	_

^{*} The 18 meter (59.1 feet) assembly is compatible only with the 2 meter (6.6 feet) or 2.5 meter (8.2 feet) torch lead.

Plasma power supply to CNC connections

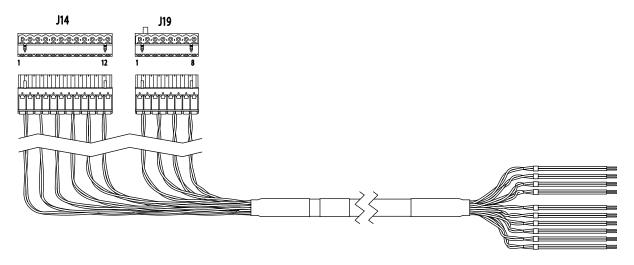
EtherCAT CNC interface cable



Description: RJ-45 connector, male-male, SF/UTP shield, 2 twisted pairs, 22 AWG

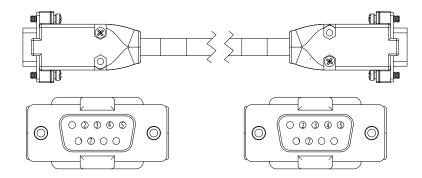
Part number	Length	Part number	Length
223506	0.3 m (1 foot)	223512	10 m (32.8 feet)
223507	0.6 m (2 feet)	223513	15 m (49.2 feet)
223508	1.5 m (4.9 feet)	223514	22.5 m (73.8 feet)
223672	2.5 m (8.2 feet)	223515	30 m (98.4 feet)
223509	3 m (9.8 feet)	223516	45 m (147.6 feet)
223510	6 m (19.7 feet)	223517	60 m (196.9 feet)
223511	7.5 m (24.6 feet)	223714	75 m (246.1 feet)

Discrete CNC interface cable



Part number	Length	Part number	Length
223691	3 m (9.8 feet)	223700	20 m (65.6 feet)
223692	4.5 m (14.8 feet)	223701	22.5 m (73.8 feet)
223693	6 m (19.7 feet)	223702	25 m (82 feet)
223694	7.5 m (24.6 feet)	223703	30 m (98.4 feet)
223695	10 m (32.8 feet)	223704	35 m (114.8 feet)
223696	12 m (39.4 feet)	223705	37.5 m (123 feet)
223697	13.5 m (44.3 feet)	223706	45 m (147.6 feet)
223698	15 m (49.2 feet)	223707	60 m (196.9 feet)
223699	16.5 m (54.1 feet)	223708	75 m (246.1 feet)

Serial CNC interface cable

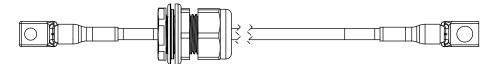


Description: 9-position, D-subminiature (D-sub) connector, male-male, RS-422

Part number	Length	Part number	Length
223673	3 m (9.8 feet)	223682	20 m (65.6 feet)
223674	4.5 m (14.8 feet)	223683	22.5 m (73.8 feet)
223675	6 m (19.7 feet)	223684	25 m (82.0 feet)
223676	7.5 m (24.6 feet)	223685	30 m (98.4 feet)
223677	10 m (32.8 feet)	223686	35 m (114.8 feet)
223678	12 m (39.4 feet)	223687	37.5 m (123 feet)
223679	13.5 m (44.3 feet)	223688	45 m (147.6 feet)
223680	15 m (49.2 feet)	223689	60 m (196.9 feet)
223681	16.5 m (54.1 feet)	223690	75 m (246.1 feet)

Plasma power supply to cutting table connection

Work lead

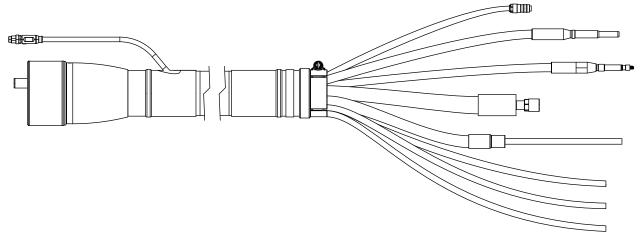


Part number	Туре	Length	Part number	Туре	Length
223617	1/0	3 m (9.8 feet)	223650*	1/0	3 m (9.8 feet)
223618	1/0	4.5 m (14.8 feet)	223651*	1/0	4.5 m (14.8 feet)
223619	1/0	7.5 m (24.6 feet)	223652*	1/0	7.5 m (24.6 feet)
223620	1/0	10 m (32.8 feet)	223653*	1/0	10 m (32.8 feet)
223621	1/0	15 m (49.2 feet)	223654*	1/0	15 m (49.2 feet)
223622	1/0	20 m (65.6 feet)	223655*	1/0	20 m (65.6 feet)
223623	1/0	25 m (82 feet)	223656*	1/0	25 m (82 feet)
223635	2/0	35 m (114.8 feet)	223668*	2/0	35 m (114.8 feet)
223636	2/0	45 m (147.6 feet)	223669*	2/0	45 m (147.6 feet)
223637	2/0	60 m (196.9 feet)	223670*	2/0	60 m (196.9 feet)
223638	2/0	75 m (246.1 feet)	223671*	2/0	75 m (246.1 feet)

^{*} Leads labeled with CCC mark only.

Torch connect console to torch receptacle connection

Torch lead



Part number	Length	Part number	Length
428383	2 m (6.6 feet)	428386	3.5 m (11.5 feet)
428384	2.5 m (8.2 feet)	428824	4 m (13.1 feet)
428385	3 m (9.8 feet)	428387	4.5 m (14.8 feet)

Bevel torch lead

Part number	Lead length	Strain relief length	Part number	Lead length	Strain relief length
428825	2 m (6.6 feet)		428831	2 m (6.6 feet)	
428826	2.5 m (8.2 feet)		428832	2.5 m (8.2 feet)	
428827	3 m (9.8 feet)		428833	3 m (9.8 feet)	
428828	3.5 m (11.5 feet)	0.5 m (20 inches)	428834	3.5 m (11.5 feet)	1.2 m (48 inches)
428829	4 m (13.1 feet)		428835	4 m (13.1 feet)	
428830	4.5 m (14.8 feet)		428836	4.5 m (14.8 feet)	
428978	6 m (20 feet)*		428979	6 m (20 feet)*	

^{*} The 6 meter (20 feet) lead is compatible only with gas assemblies that are 7.5 meters (24.6 feet) or less.

Supply hoses

Oxygen hose (blue)

Fittings: RH type "B" female



Part number	Length	Part number	Length
124003	3 m (9.8 feet)	124009	25 m (82 feet)
124004	4.5 m (14.8 feet)	124107	30 m (98.4 feet)
124005	7.5 m (24.6 feet)	124010	35 m (114.8 feet)
124006	10 m (32.8 feet)	124011	45 m (147.6 feet)
124007	15 m (49.2 feet)	124012	60 m (196.9 feet)
124008	20 m (65.6 feet)	124013	75 m (246.1 feet)

Nitrogen or Argon hose (black)

Fittings: RH type "B" male



Part number	Length	Part number	Length
124014	3 m (9.8 feet)	124020	25 m (82 feet)
124015	4.5 m (14.8 feet)	124108	30 m (98.4 feet)
124016	7.5 m (24.6 feet)	124021	35 m (114.8 feet)
124017	10 m (32.8 feet)	124022	45 m (147.6 feet)
124018	15 m (49.2 feet)	124023	60 m (196.9 feet)
124019	20 m (65.6 feet)	124024	75 m (246.1 feet)

Air hose (black)

Fittings: JIC-6 female



Part number	Length	Part number	Length
124025	3 m (9.8 feet)	124031	25 m (82 feet)
124026	4.5 m (14.8 feet)	124109	30 m (98.4 feet)
124027	7.5 m (24.6 feet)	124032	35 m (114.8 feet)
124028	10 m (32.8 feet)	124033	45 m (147.6 feet)
124029	15 m (49.2 feet)	124034	60 m (196.9 feet)
124030	20 m (65.6 feet)	124035	75 m (246.1 feet)

Hydrogen or nitrogen-hydrogen (F5) (red)

Fittings: LH type "B" female



Part number	Length	Part number	Length
124036	3 m (9.8 feet)	124042	25 m (82 feet)
124037	4.5 m (14.8 feet)	124110	30 m (98.4 feet)
124038	7.5 m (24.6 feet)	124043	35 m (114.8 feet)
124039	10 m (32.8 feet)	124044	45 m (147.6 feet)
124040	15 m (49.2 feet)	124045	60 m (196.9 feet)
124041	20 m (65.6 feet)	124046	75 m (246.1 feet)

Water (optional shield fluid) (blue)

Fittings: JIC-6 female



Part number	Length	Part number	Length
124047	3 m (9.8 feet)	124053	25 m (82 feet)
124048	4.5 m (14.8 feet)	124111	30 m (98.4 feet)
124049	7.5 m (24.6 feet)	124054	35 m (114.8 feet)
124050	10 m (32.8 feet)	124055	45 m (147.6 feet)
124051	15 m (49.2 feet)	124056	60 m (196.9 feet)
124052	20 m (65.6 feet)	124057	75 m (246.1 feet)

Preventive maintenance kits

Part number	Description
428639	Kit: Filter, torch rebuild without coolant
428640	Kit: Filter, torch rebuild with coolant
428920	Kit: Shield-fluid treatment
428878	Kit: Electronics (200 V - 240 V)
428879	Kit: Electronics (380 V - 600 V)

Tools

Part number	Description
229917	Torch connect console solenoid valve tool
229918	Torch solenoid valve tool
104879	2.25 inch spanner wrench
004629	Pit depth gauge
104119	Consumable tool
1-13897 (Hypertherm Waterjet part number)	TDS meter

Recommended spare parts

Plasma power supply - recommended spare parts

Part number	Description	Designator	Quantity
428810	Shield-fluid treatment filter	_	1
027005	Coolant filter (fine)	_	1
006113	Coolant check valve	_	1
229640	Power source: 88 VAC - 264 VAC to 24 VDC	PS1	1
229671	Power source: 88 VAC - 264 VAC to 48 VDC, 600 W	PS2	1
229679	Chopper assembly	Chopper 1	1
428750	Control PCB	PCB1	1
141371	I/O PCB	PCB5	1
141384	Fan power distribution PCB	PCB6	1
141425	Power distribution PCB	PCB7	1
108709	Fuse:10 A, 250 VAC, time delay (on PCB7)	F3, F4, F5	2
208397*	Fuse: 15 A, 600 V, Class R (used in 200 V, 208 V, 220 V, 240 V)	F1, F2	2
208395*	Fuse: 8 A, 600 V, Class R (used in 380 V, 400 V, 415 V, 440 V, 480 V, 600 V)	11,12	2
003277	Pilot arc relay	CR1	1
003276*	Main contactor (200 V, 208 V, 220 V, 240 V)	M_CON	1
429060*	Main contactor assembly (380 V, 400 V, 415 V, 440 V, 480 V, 600 V)		1

^{*} Voltage dependent - Select accordingly

Gas connect consoles – recommended spare parts

Part number	Description	Designator	Quantity
011110	Air filter element	_	1
223398	Pressure transducer (VWI and OptiMix only)	P6 – P9	1
006167	Solenoid valve (VWI and OptiMix only)	B4 – B5	1
141354	High-frequency, high-voltage ignition PCB	PCB2	1

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Torch connect console - recommended spare parts

Part number	Description	Designator	Quantity
141368	Ohmic contact PCB	PCB2	1
223477	Pressure transducer with wire and connector	P1 – P5, P14	1
006167	Solenoid valve	B1 – B3	1
229965	Solenoid valve	V4 – V12	1

Torch – recommended spare parts

Part number	Description	Designator	Quantity
420220	Quick-disconnect/torch receptacle	_	1
420221	Quick-disconnect torch	_	1
420368	Water tube	_	1
006155	Torch solenoid valve	_	1

Descriptions of warning label icons

This warning label is affixed to some power supplies. It is important that the operator and maintenance technician understand the intent of these warning symbols as described. The numbered text corresponds to the numbered boxes on the label.



- Cutting sparks can cause explosion or fire.
- 1.1 Do not cut near flammables.
- 1.2 Have a fire extinguisher nearby and ready to use.
- 1.3 Do not use a drum or other closed container as a cutting table.
- Plasma arc can injure and burn; point the nozzle away from yourself. Arc starts instantly when triggered.
- 2.1 Turn off power before disassembling torch.
- 2.2 Do not grip the workpiece near the cutting path.
- 2.3 Wear complete body protection.
- Hazardous voltage. Risk of electric shock or burn.
- 3.1 Wear insulating gloves. Replace gloves when wet or damaged.
- 3.2 Protect from shock by insulating yourself from work and ground.
- 3.3 Disconnect power before servicing. Do not touch live parts.
- 4. Plasma fumes can be hazardous.
- 4.1 Do not inhale fumes.
- 4.2 Use forced ventilation or local exhaust to remove the fumes.
- 4.3 Do not operate in closed spaces. Remove fumes with ventilation.
- 5. Arc rays can burn eyes and injure skin.
- 5.1 Wear correct and appropriate protective equipment to protect head, eyes, ears, hands, and body. Button shirt collar. Protect ears from noise. Use welding helmet with the correct shade of filter.
- Become trained. Only qualified personnel should operate this equipment. Use torches specified in the manual. Keep non-qualified personnel and children away.
- 7. Do not remove, destroy, or cover this label. Replace if it is missing, damaged, or worn.