TTB 80 G, TTB 160 G, TTB 220 G
TTB 260 G
TTB 180 W, TTB 300 W, TTB 400 W
TTB 500 W
THP 160i G, THP 220i G
THP 260i G
THP 300i W, THP 400i W
THP 500i W
HPT 220i G
HPT 400i W

DE
Bedienungsanleitung

WIG Hand-Schweißbrenner

EN-US
Operating instructions

TIG manual welding torch

ES-MX
Manual de instrucciones

Antorcha manual TIG

FR
Instructions de service

Torche de soudage manuelle TIG

NO
Bruksanvisning

TIG manuell sveisepistol

PT-BR
Manual de instruções

Tocha de solda manual para soldagem TIG

42,0410,2233 011-01042021

Inhaltsverzeichnis

Sicherheit

Sicherheit

⚠ WARNUNG!

Gefahr durch Fehlbedienung und fehlerhaft durchgeführte Arbeiten.
Schwerwiegende Personen- und Sachschäden können die Folge sein.
- ▶ Alle in diesem Dokument beschriebenen Arbeiten und Funktionen dürfen nur von geschultem Fachpersonal ausgeführt werden.
- ▶ Dieses Dokument lesen und verstehen.
- ▶ Sämtliche Bedienungsanleitungen der Systemkomponenten, insbesondere Sicherheitsvorschriften lesen und verstehen.

⚠ WARNUNG!

Gefahr durch elektrischen Strom und Verletzungsgefahr durch austretende Drahtelektrode.
Schwerwiegende Personen- und Sachschäden können die Folge sein.
- ▶ Netzschalter der Stromquelle in Stellung - O - schalten.
- ▶ Stromquelle vom Netz trennen.
- ▶ Sicherstellen, dass die Stromquelle bis zum Abschluss aller Arbeiten vom Netz getrennt bleibt.

⚠ WARNUNG!

Gefahr durch elektrischen Strom.
Schwerwiegende Personen- und Sachschäden können die Folge sein.
- ▶ Sämtliche Kabel, Leitungen und Schlauchpakete müssen immer fest angeschlossen, unbeschädigt, korrekt isoliert und ausreichend dimensioniert sein.

⚠ VORSICHT!

Verbrennungsgefahr durch heiße Schweißbrenner-Komponenten und heißes Kühlmittel.
Schwere Verbrühungen können die Folge sein.
- ▶ Vor Beginn aller in dieser Bedienungsanleitung beschriebenen Arbeiten sämtliche Schweißbrenner-Komponenten und das Kühlmittel auf Zimmertemperatur (+25 °C, +77 °F) abkühlen lassen.

⚠ VORSICHT!

Beschädigungsgefahr durch Betrieb ohne Kühlmittel.
Schwerwiegende Sachschäden können die Folge sein.
- ▶ Wassergekühlte Schweißbrenner nie ohne Kühlmittel in Betrieb nehmen.
- ▶ Für hieraus entstandene Schäden haftet der Hersteller nicht, sämtliche Gewährleistungsansprüche erlöschen.

⚠ **VORSICHT!**

Gefahr durch Kühlmittelaustritt.
Schwerwiegende Personen- und Sachschäden können die Folge sein.

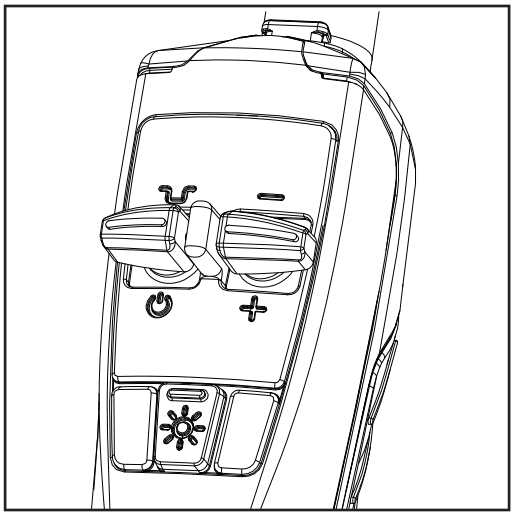
▶ Die Kühlmittel-Schläuche der wassergekühlten Schweißbrenner immer mit dem darauf montierten Kunststoff-Verschluss verschließen, wenn diese vom Kühlgerät oder vom Drahtvorschub getrennt werden.

Allgemeines

Allgemein

Die WIG-Schweißbrenner sind besonders robust und verlässlich. Die ergonomisch geformte Griffschale und eine optimale Gewichtsverteilung ermöglichen ein ermüdungsfreies Arbeiten.
Die Schweißbrenner stehen in gas- und wassergekühlter Ausführung zur Verfügung und lassen sich an die unterschiedlichsten Aufgabenstellungen anpassen.
Die Schweißbrenner eignen sich vor allem für die manuelle Serien- und Einzelfertigung sowie für den Werkstättenbereich.

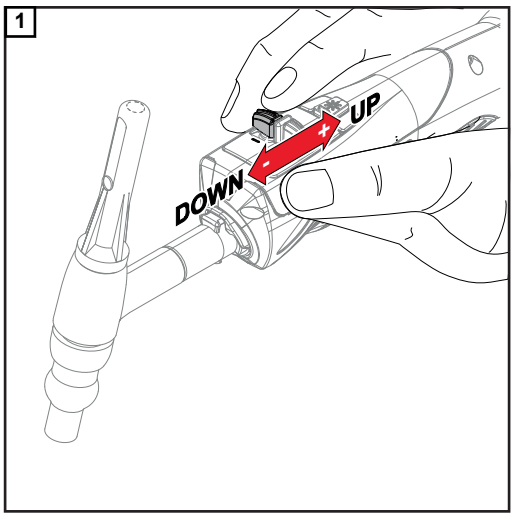
Up/Down-Schweißbrenner



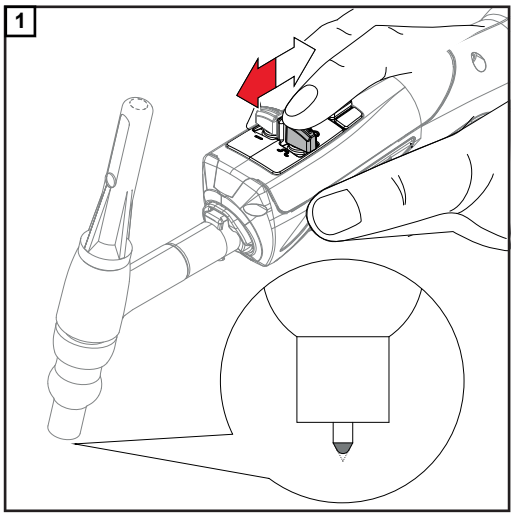
Der Up/Down-Schweißbrenner verfügt über folgende Funktionen:

- Veränderung der Schweißleistung mittels Up/Down-Taste (+/-)
- Beleuchtung der Schweißstelle via LED:
  Taste 1 x drücken - LED leuchtet für 5 s
  Taste gedrückt halten - LED leuchtet dauernd
- Kalottenbildung in Verbindung mit dem Schweißverfahren WIG AC
- Zwischenabsenkung in Verbindung mit der Betriebsart 4-Takt ($I_1 > I_2$)

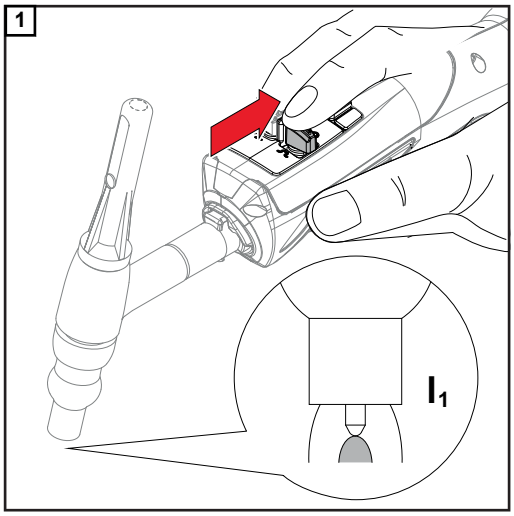
Veränderung der Schweißleistung

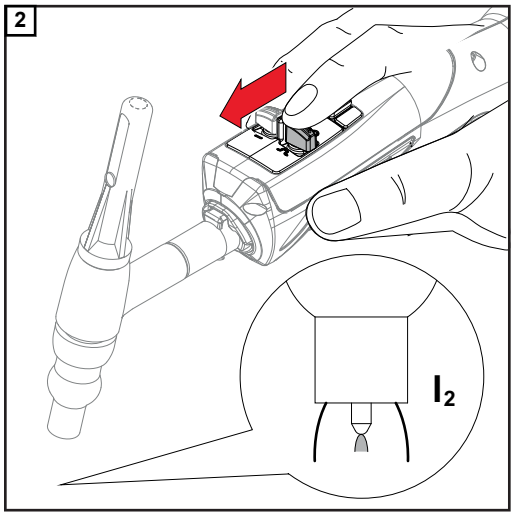


Kalottenbildung

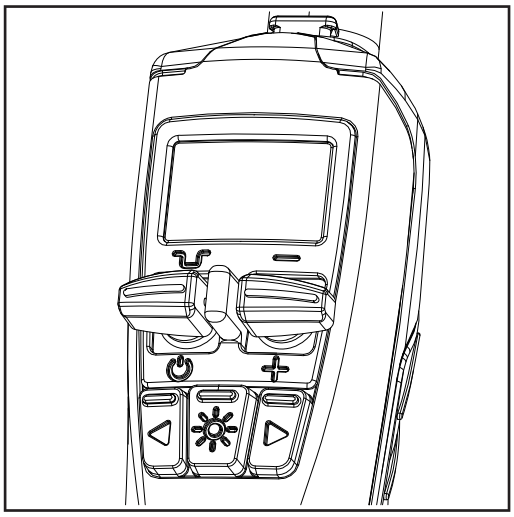


Zwischenabsenkung





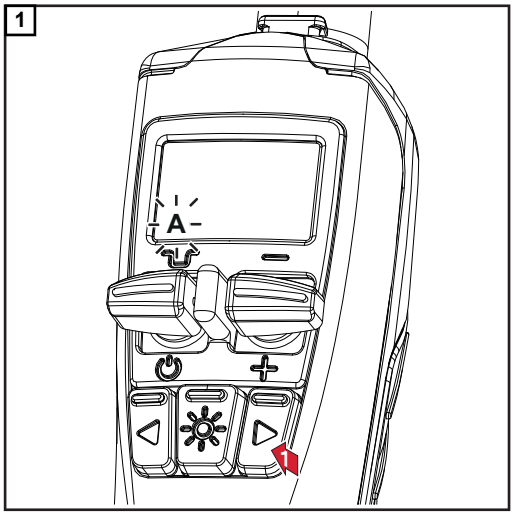
JobMaster-Schweißbrenner

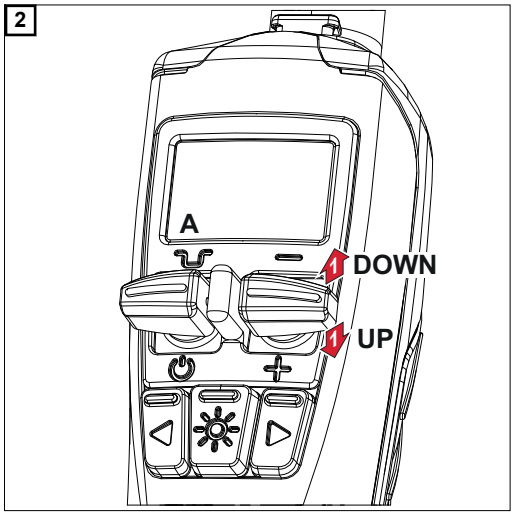


Der JobMaster-Schweißbrenner verfügt über folgende Funktionen:

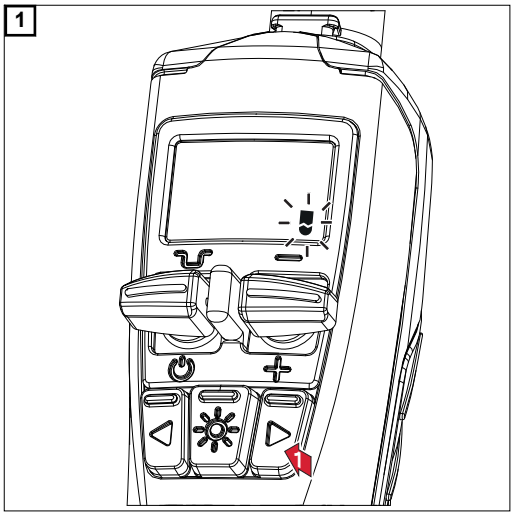
- Ergonomisches Ablesen und Anpassen wesentlicher Parameter direkt am Schweißbrenner
- Optimale Kontrolle des Schweißprozesses ohne Einschränkung der Handhabung
- Veränderung der Schweißleistung mittels Up/Down-Taste (+/-)
- Beleuchtung der Schweißstelle via LED:
  Taste 1 x drücken - LED leuchtet für 5 s
  Taste gedrückt halten- LED leuchtet dauernd
- Kalottenbildung in Verbindung mit dem Schweißverfahren WIG AC
- Zwischenabsenkung in Verbindung mit der Betriebsart 4-Takt ($I_1 > I_2$)

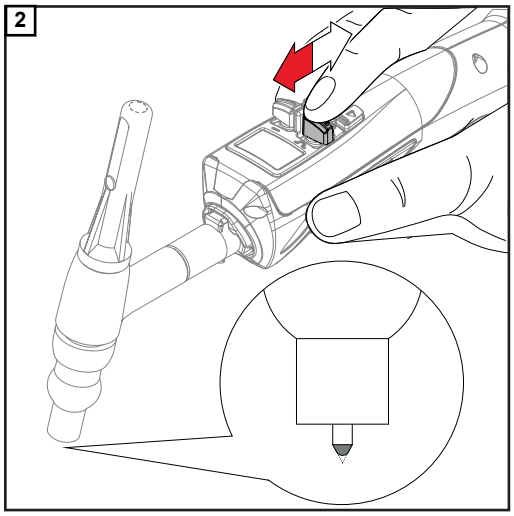
Veränderung der Schweißleistung



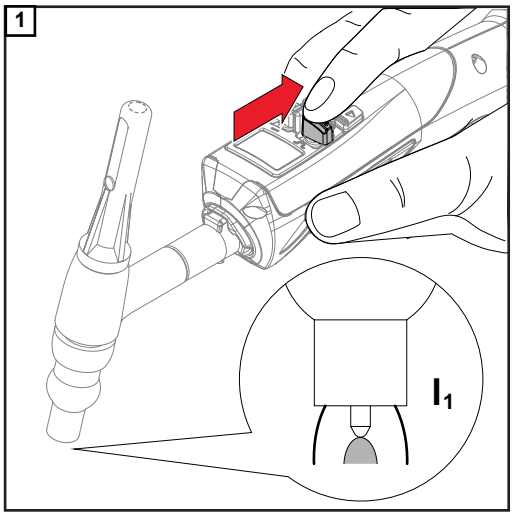


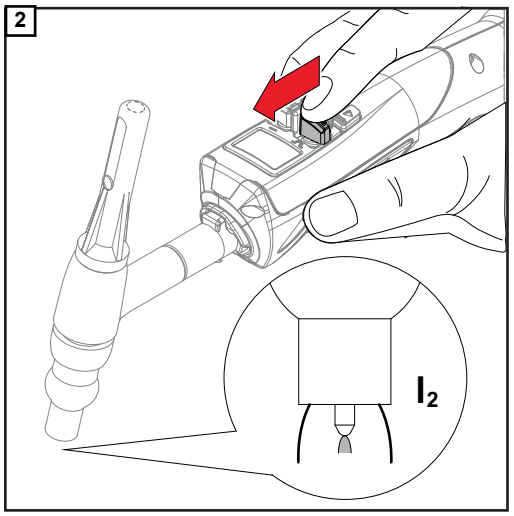
Kalottenbildung





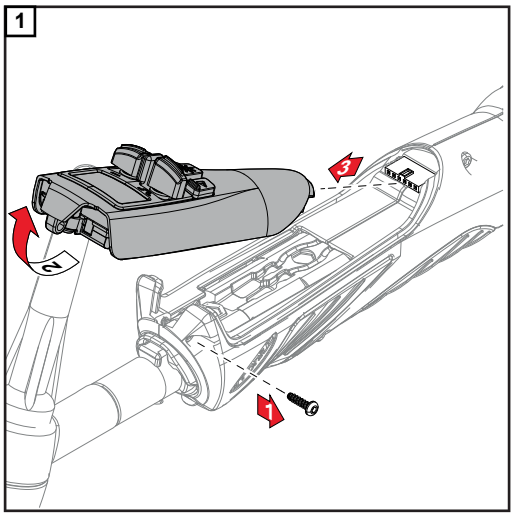
Zwischenabsenkung





User-Interface austauschen

1



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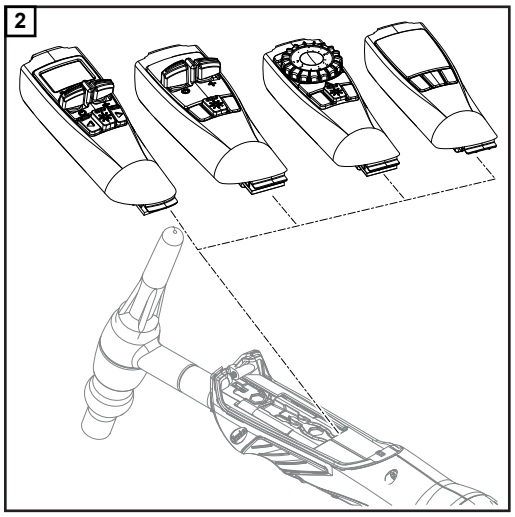

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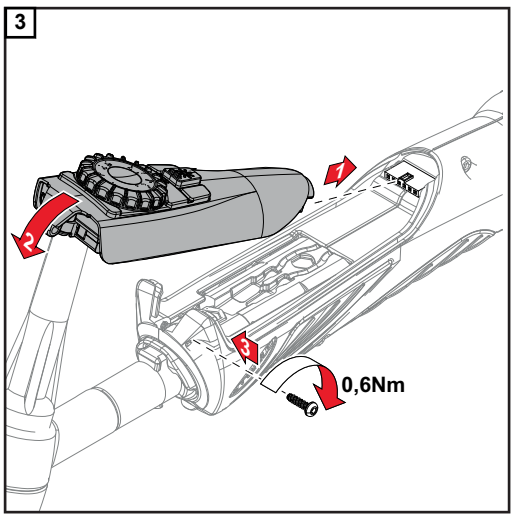
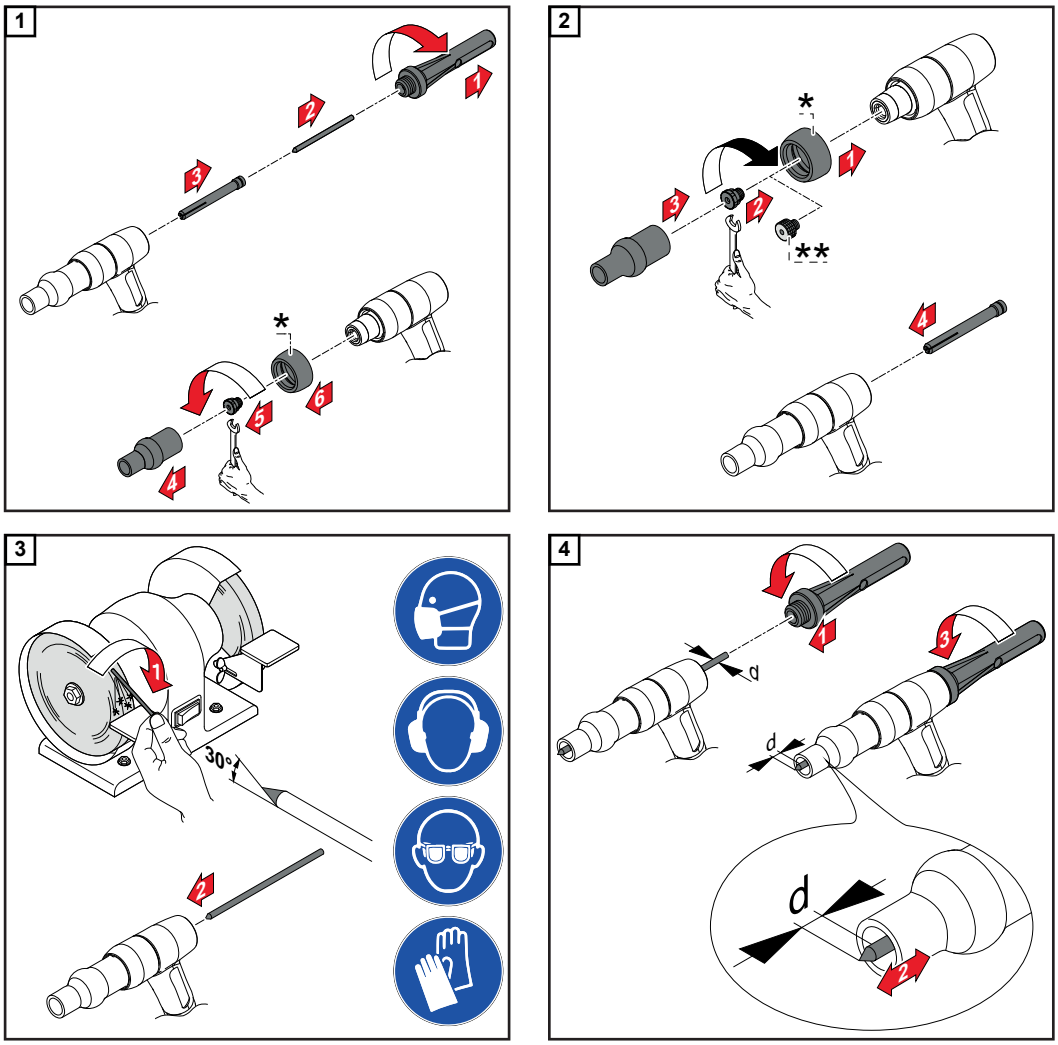


Verschleißteile montieren

Verschleißteile System A montieren

Verschleißteil-System A mit gesteckter Gasdüse



HINWEIS!

Brennerkappe nur so fest anziehen, dass sich die Wolframelektrode händisch nicht mehr verschieben lässt.

* Austauschbare Gummi-Dichthülse nur für TTB 220 G/A

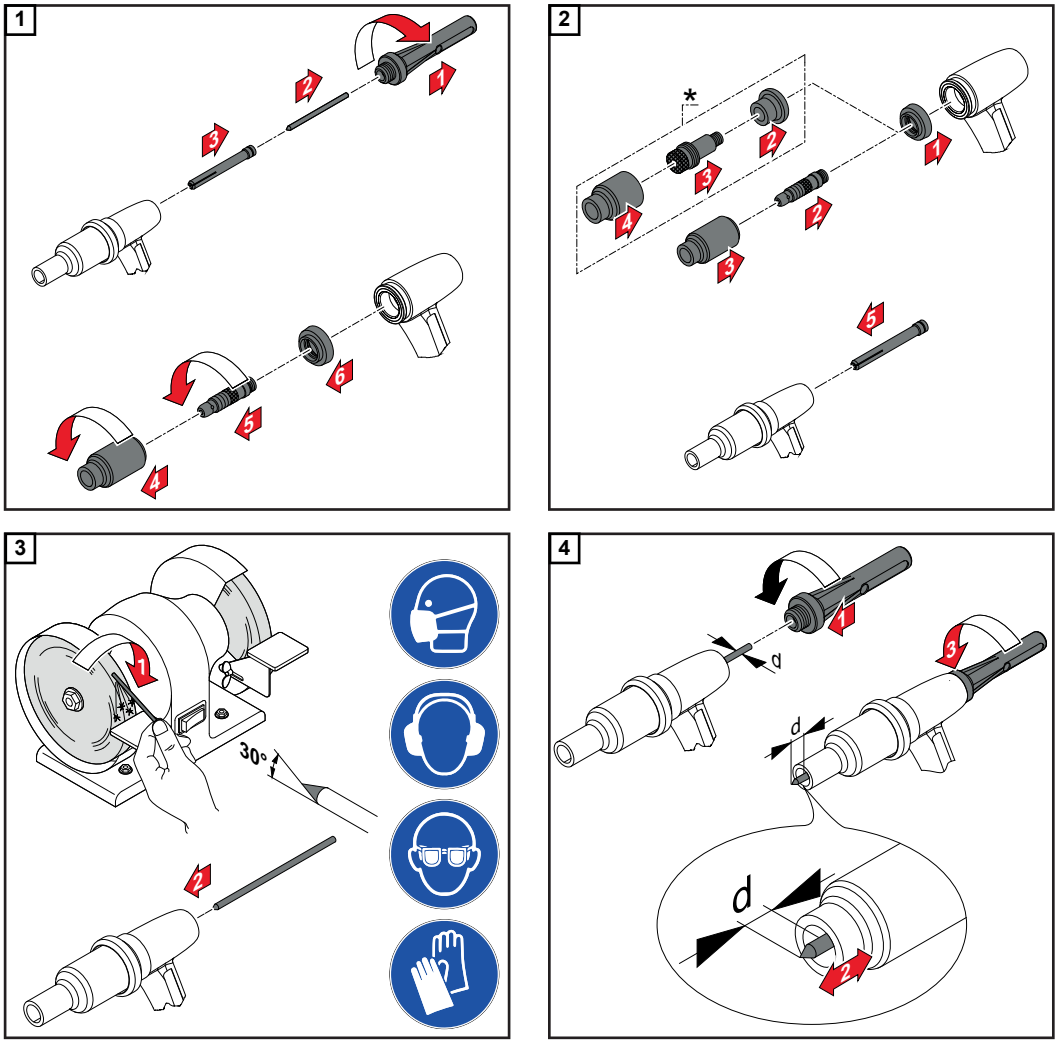
** Je nach Ausführung des Schweißbrenners kann anstelle der Spannmutter eine Gaslinse zum Einsatz kommen.

⚠ **VORSICHT!**

Beschädigungsgefahr durch zu hohes Anzugsmoment!
Eine Beschädigung des Gewindes kann die Folge sein.
▶ Spannmutter oder Gaslinse nur leicht festziehen.

Verschleißteile System P montieren

Verschleißteil-System P mit geschraubter Gasdüse



HINWEIS!

Brennerkappe nur so fest anziehen, dass sich die Wolframelektrode händisch nicht mehr verschieben lässt.

* Austauschbare Gummi-Dichthülse nur für TTB 220 G/P

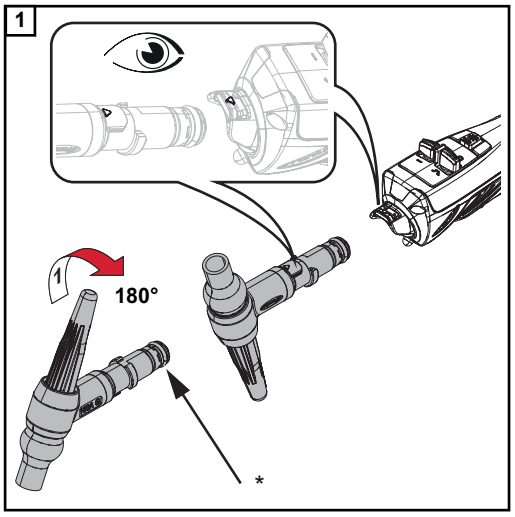
** Je nach Ausführung des Schweißbrenners kann anstelle der Spannmutter eine Gaslinse zum Einsatz kommen.

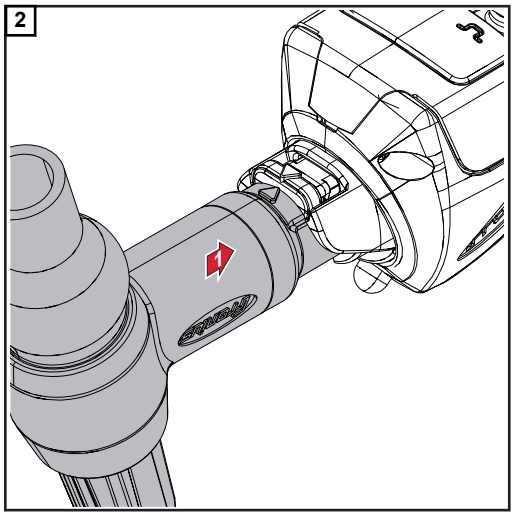
⚠ **VORSICHT!**

Beschädigungsgefahr durch zu hohes Anzugsmoment!
Eine Beschädigung des Gewindes kann die Folge sein.
▶ Spannmutter oder Gaslinse nur leicht festziehen.

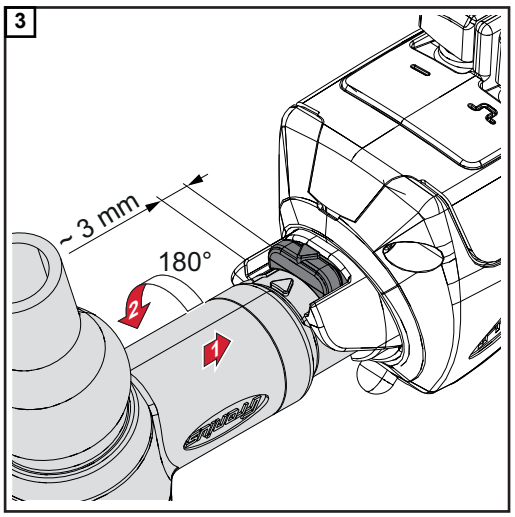
Installation und Inbetriebnahme

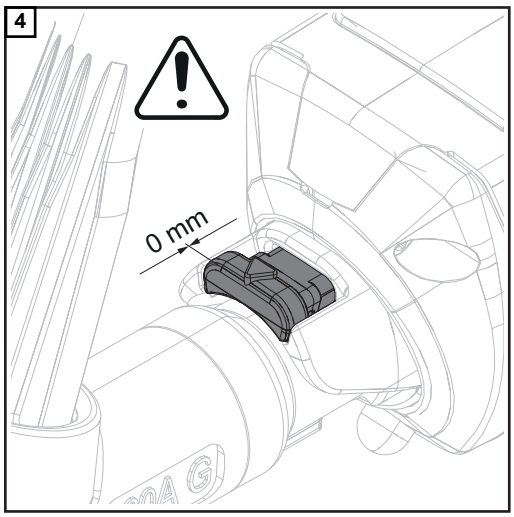
Brennerkörper montieren





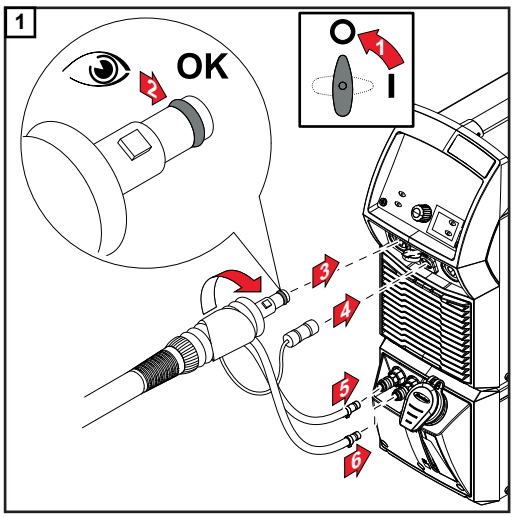
** O-Ring vor der Montage einfetten!*





WICHTIG! Beim Montieren des Brennerkörpers darauf achten, dass dieser bis auf Anschlag eingeschoben und eingerastet ist.

Schweißbrenner an Stromquelle und Kühlgerät anschließen



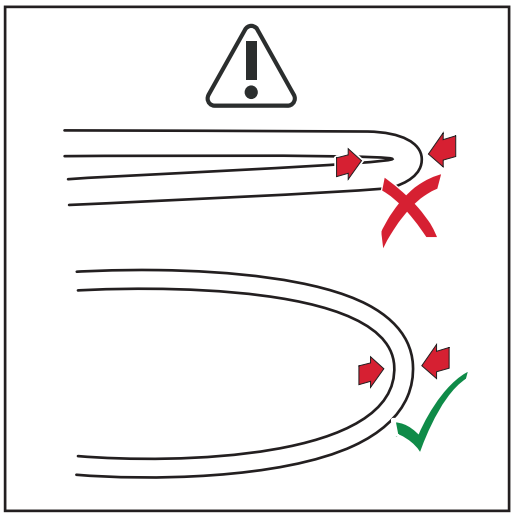
HINWEIS!

Vor jeder Inbetriebnahme den Dichtring am Anschluss Schweißbrenner und den Kühlmittelstand kontrollieren!

Während des Schweißbetriebes Kühlmittel-Durchfluss in regelmäßigen Abständen kontrollieren.

Verlängerungs-Schlauchpaket anschließen

Das Verlängerungs-Schlauchpaket wird mit einer Schutztasche ausgeliefert, in die die Kuppelstelle zwischen Verlängerungs-Schlauchpaket und Schweißbrenner-Schlauchpaket verlegt werden muss.



HINWEIS!

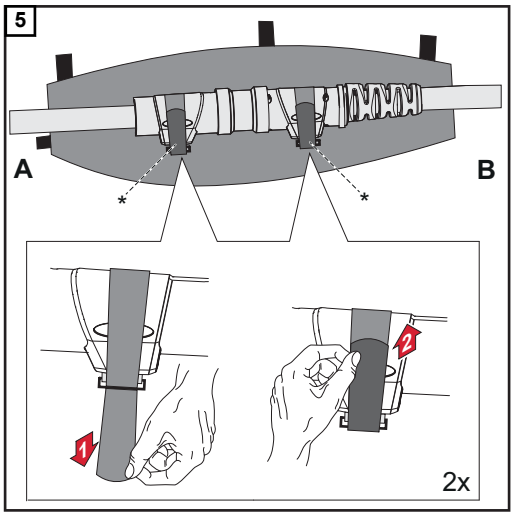
Bei den folgenden Tätigkeiten darauf achten, dass Schläuche und Kabel nicht geknickt, eingeklemmt, abgeschert oder sonst irgendwie beschädigt werden.

1 Schutztasche so positionieren, dass das Fronius-Logo zu sehen ist und dass die Schlaufen oben sind:
links = Stromquellen-seitig (A)
rechts = Schweißbrenner-seitig (B)

2 Schutztasche öffnen:
- Beide Reißverschluss-Schieber rechts bis auf Anschlag positionieren
- Unteres Zahnband aus den Reißverschluss-Schiebern ziehen

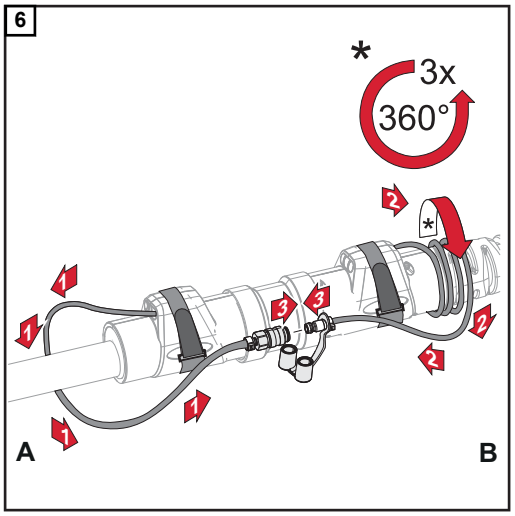
3 Strom-/Gas-Anschlüsse von Verlängerungs-Schlauchpaket und Schweißbrenner-Schlauchpaket miteinander verbinden (Bajonettverschluss)

4 Kuppelstelle in die Innentasche der Schutztasche verlegen



** Klettstreifen an der Innentasche (Innentasche nicht abgebildet)*

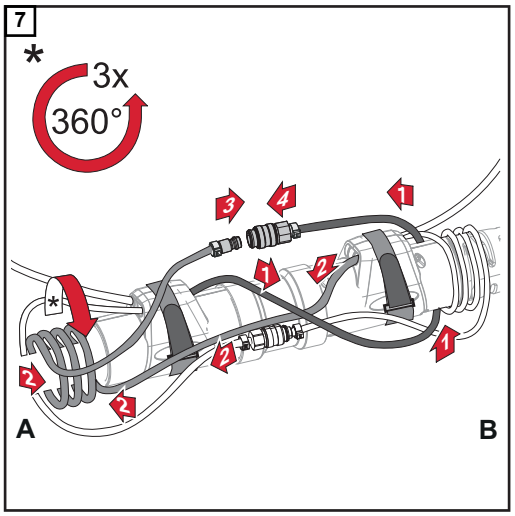
Kuppelstelle mit 2 Klettstreifen in der Innentasche fixieren



Kühlmittelschlauch vom Verlängerungs-Schlauchpaket gemäß Abbildung zur Kuppelstelle verlegen

Kühlmittelschlauch vom Schweißbrenner-Schlauchpaket 3x um das Schweißbrenner-Schlauchpaket wickeln und zur Kuppelstelle verlegen

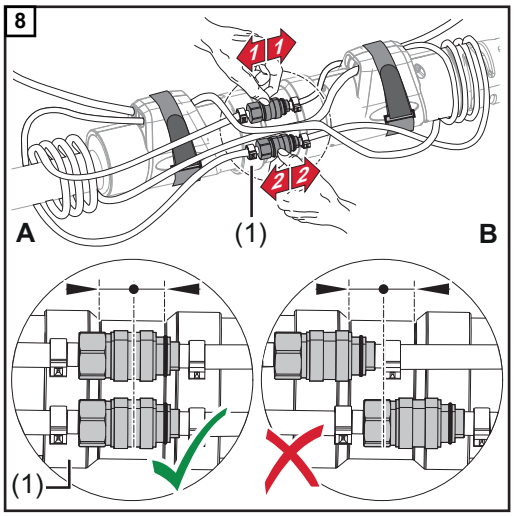
Kühlmittelschläuche verbinden



Den zweiten Kühlmittelschlauch vom Schweißbrenner-Schlauchpaket gemäß Abbildung zum Verlängerungs-Schlauchpakt verlegen, 3x um das Verlängerungs-Schlauchpaket wickeln und zurück zur Kuppelstelle verlegen

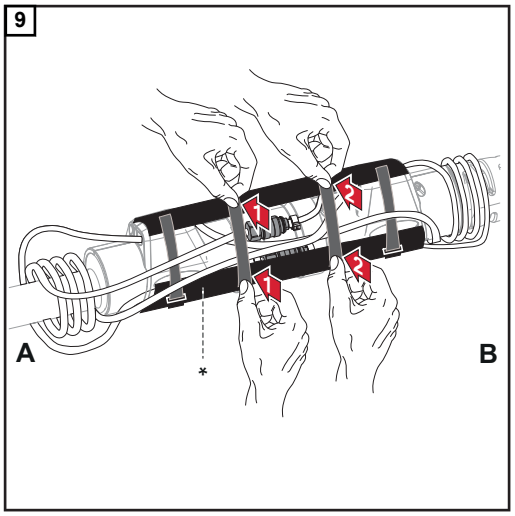
Den zweiten Kühlmittelschlauch vom Verlängerungs-Schlauchpaket gemäß Abbildung um das Schweißbrenner-Schlauchpaket zur Kuppelstelle verlegen

Kühlmittelschläuche verbinden



Kühlmittelanschlüsse untereinander und mittig des Isolierrohres (1) ausrichten

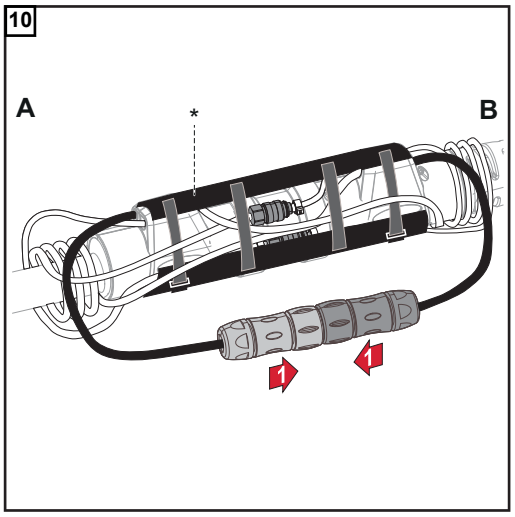
9



Die beiden mitgelieferten Klettstreifen an der Innentasche anbringen

** Innentasche*

10



TMC-Steuerleitungsstecker zusammenstecken und neben der Innentasche positionieren

** Innentasche*

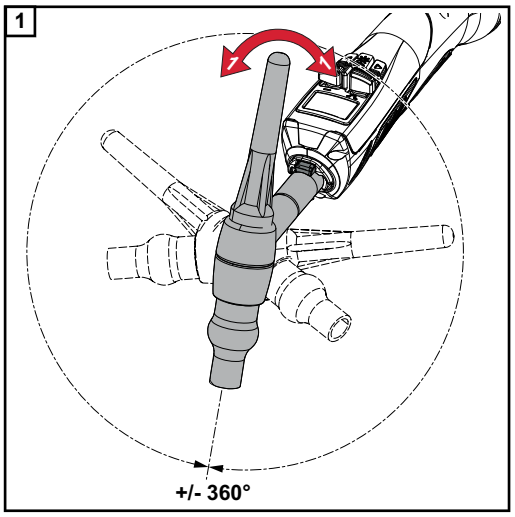
11 Schutztasche schließen

HINWEIS!

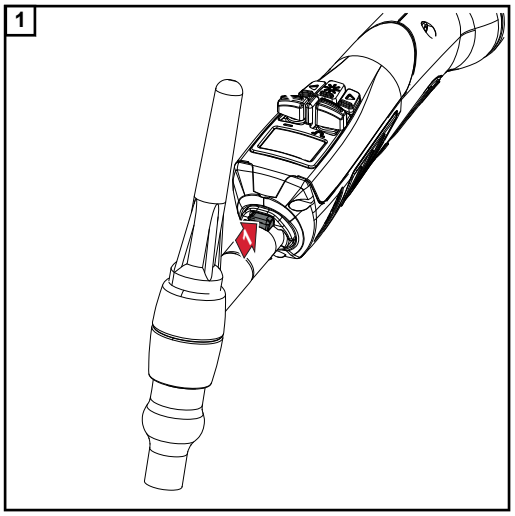
Beim Betrieb mit wassergekühlten Verlängerungs-Schlauchpaketen beachten:

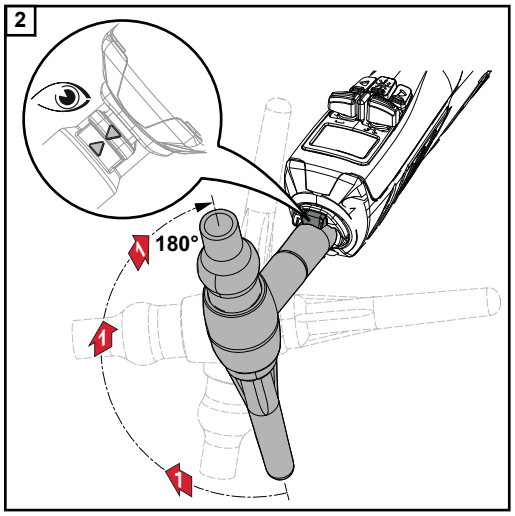
- ▶ Sobald nach Inbetriebnahme der Stromquelle im Kühlmittel-Behälter des Kühlgerätes ein einwandfreier Rückfluss ersichtlich ist, sicherstellen, dass sich ausreichend Kühlmittel im Kühlgerät befindet.
- ▶ In Verbindung mit einem MultiControl-Kühlgerät kann beim Entleeren des Schlauchpaketes ein voll gefüllter Kühlmitteltank überlaufen - Rutschgefahr!
- ▶ Bedienungsanleitung des Kühlgerätes beachten!

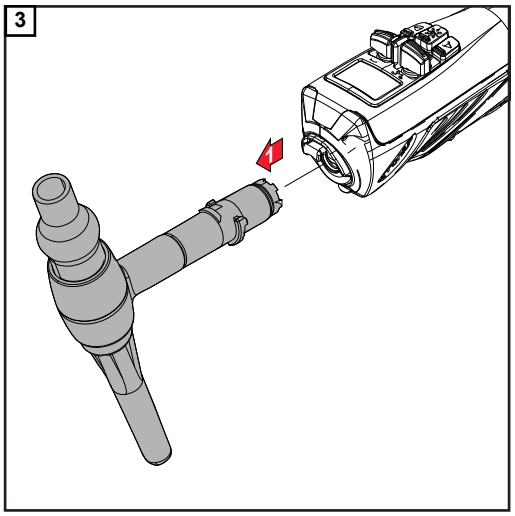
Brennerkörper verdrehen



Brennerkörper wechseln - gas-gekühlte Schweißbrenner



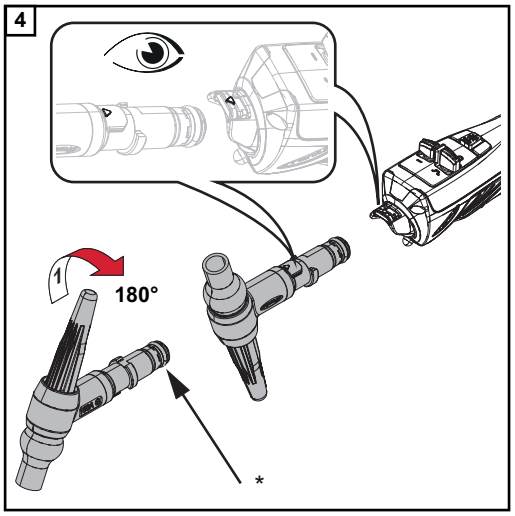


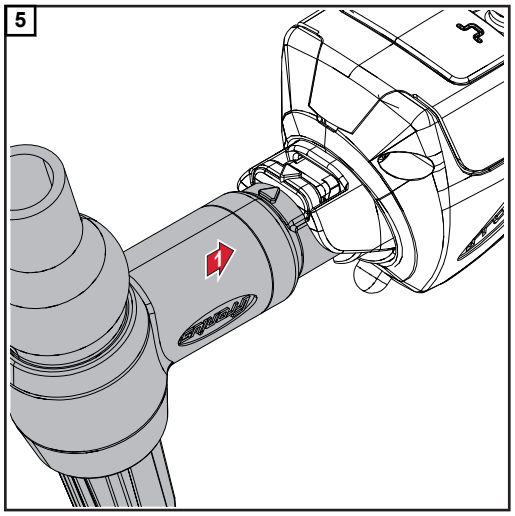


HINWEIS!

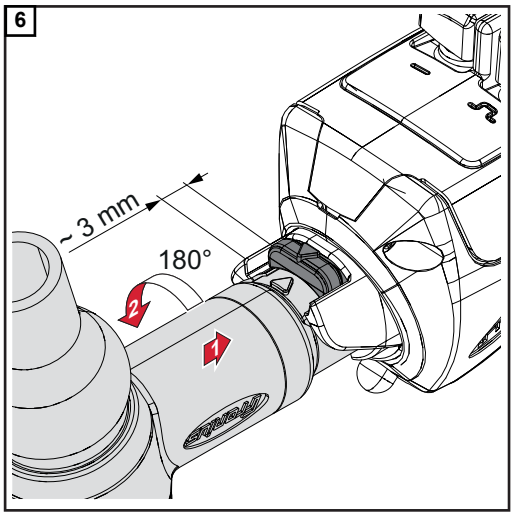
Beim Wechseln des Brennerkörpers darauf achten, dass nur zusammengehörende Systeme montiert werden.

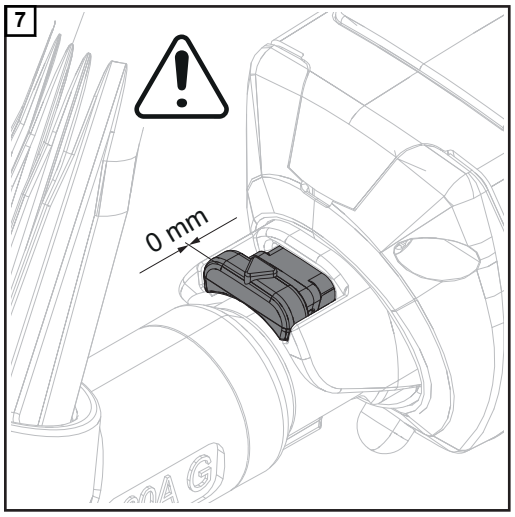
▶ Keine gasgekühlten Brennerkörper auf wassergekühlte Schlauchpakete montieren und umgekehrt!





** O-Ring vor der Montage einfetten!*





WICHTIG! Beim Montieren des Brennerkörpers darauf achten, dass dieser bis auf Anschlag eingeschoben und eingerastet ist.

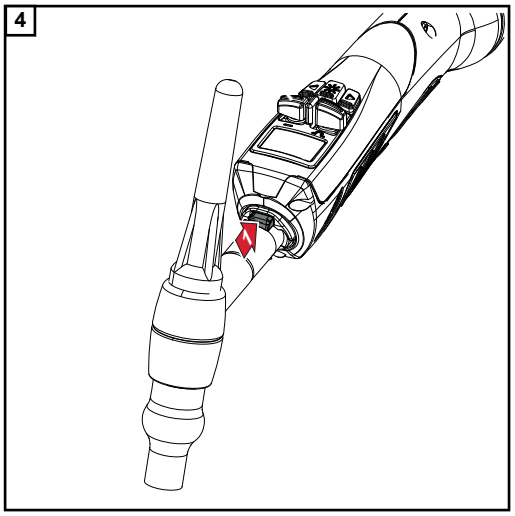
Brennerkörper wechseln - wassergekühlte Schweißbrenner

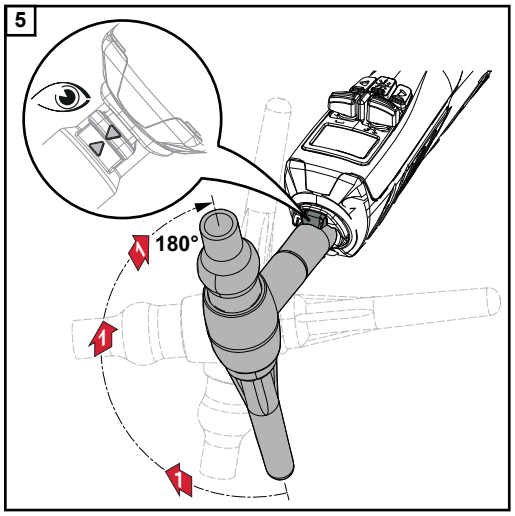
1 Stromquelle abschalten und vom Stromnetz trennen;
Nachlaufphase des Kühlsystems abwarten

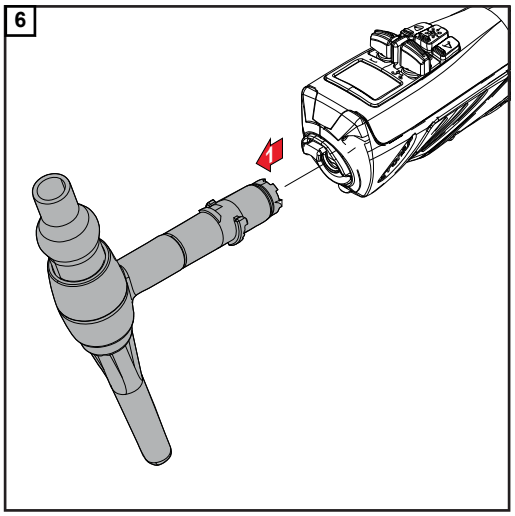
2 Bei vorhandenem Kühlgerät CU 600 MC:
Schweißbrenner-Schlauchpaket mittels Stromquelle oder Schweißbrenner entleeren

Bei anderen Kühlgeräten:
Schlauch für Kühlmittel-Vorlauf am Kühlgerät abschließen

3 Schlauch für Kühlmittel-Vorlauf mit max. 4 bar Druckluft ausblasen, sodass ein Großteil des Kühlmittels zurück in den Kühlmittelbehälter fließt







7 Kuppelstelle am Schlauchpaket mit Druckluft reinigen

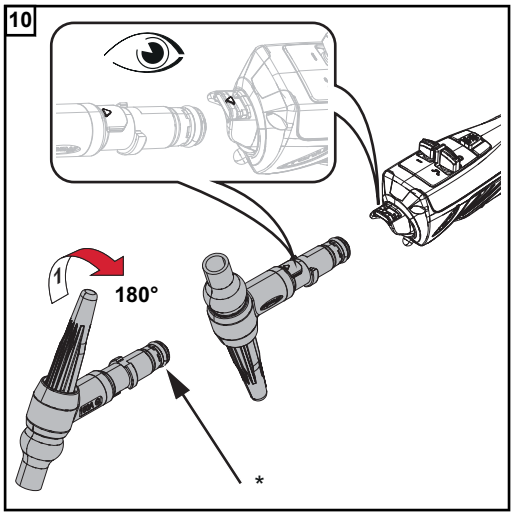
8 Brennerkörper mit einem Tuch abtrocknen

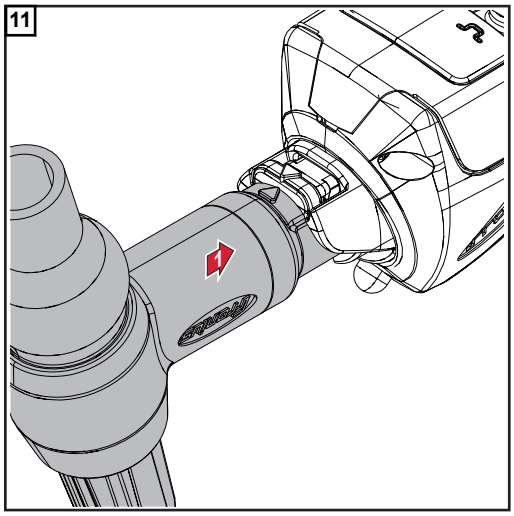
9 Schutzkappe am Brennerkörper anbringen

HINWEIS!

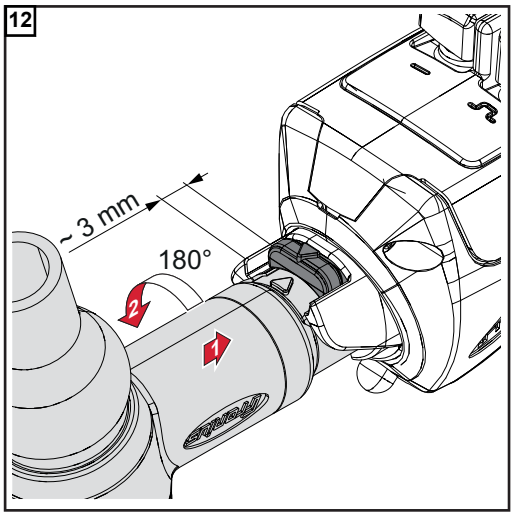
Beim Wechseln des Brennerkörpers darauf achten, dass nur zusammengehörende Systeme montiert werden.

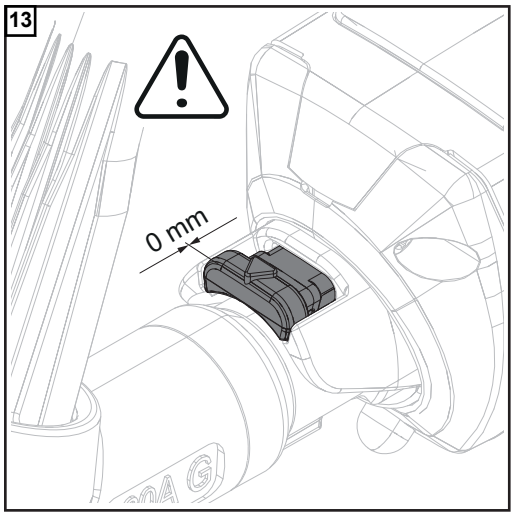
▶ Keine gasgekühlten Brennerkörper auf wassergekühlte Schlauchpakete montieren und umgekehrt!





** O-Ring vor der Montage einfetten!*





WICHTIG! Beim Montieren des Brennerkörpers darauf achten, dass dieser bis auf Anschlag eingeschoben und eingerastet ist.

14 Stromquelle am Netz anschließen und einschalten

15 An der Stromquelle die Taste Gasprüfen drücken

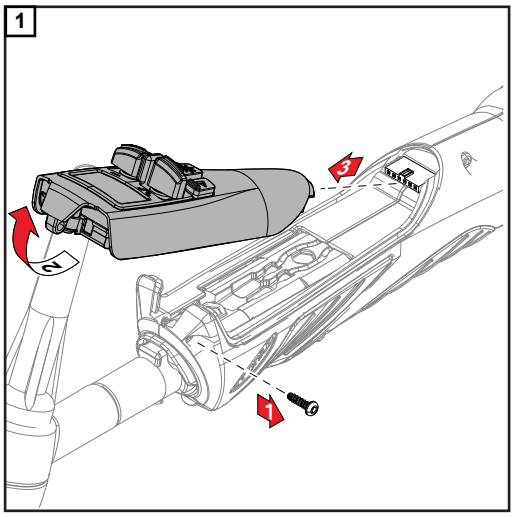
Für 30 s strömt Schutzgas aus.

16 Kühlmittel-Durchfluss überprüfen:
Im Kühlmittel-Behälter muss ein einwandfreier Kühlmittel-Rückfluss ersichtlich sein.

17 Probeschweißung durchführen und die Qualität der Schweißnaht prüfen

Wechseln des Brennerkörpers sperren

1



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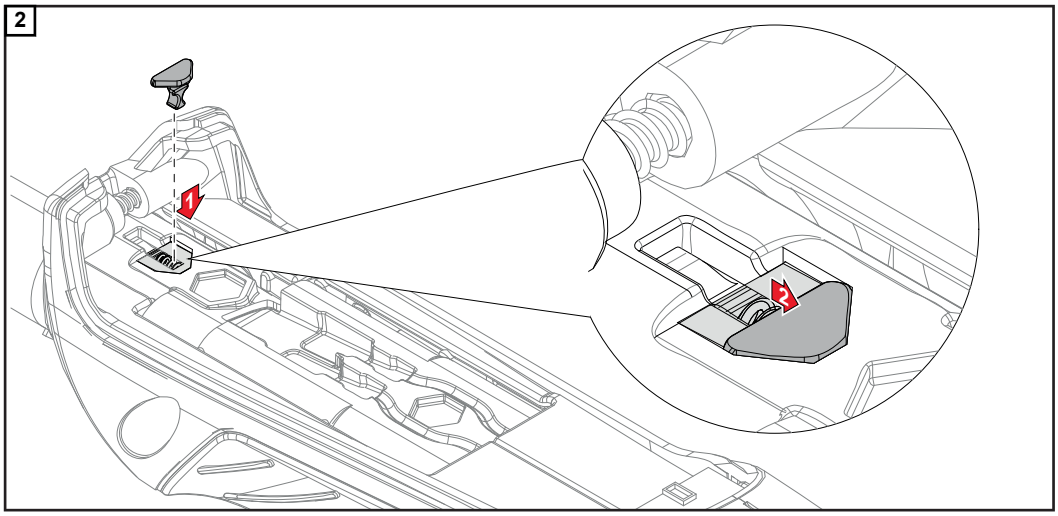

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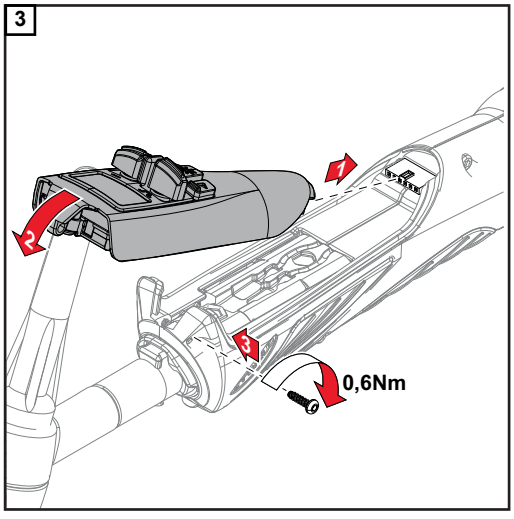


Hinweise zu flexiblen Brennerkörpern

Allgemeines

Die flexiblen WIG-Brennerkörper lassen sich in alle Richtungen verbiegen und so individuell an unterschiedlichste Situationen und Anwendungen anpassen.
Flexible Brennerkörper kommen beispielsweise bei eingeschränkten Bauteil-Zugänglichkeiten oder schwierigen Schweißposition zum Einsatz.
Mit jeder Formänderung wird jedoch das Material eines flexiblen Brennerkörpers geschwächt, daher ist auch die Anzahl der Biegungen begrenzt.

Biegung und Anzahl der Biegungen werden in den folgenden Abschnitten erklärt.

Definition der Brennerkörper-Biegung

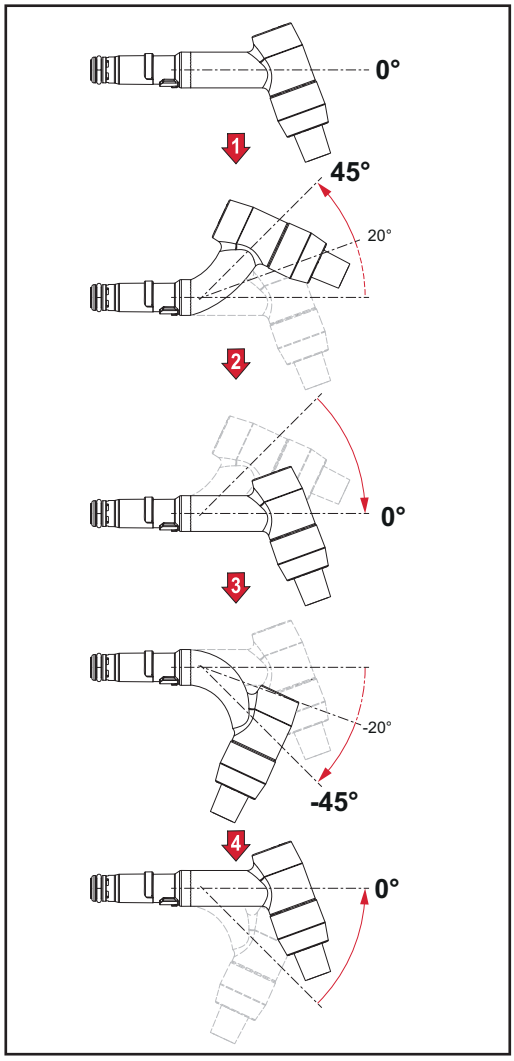
Eine Biegung ist eine einmalige, von der Ausgangsform um mindestens 20° abweichende Formänderung.

Damit die Biegung nicht punktuell sondern über eine lange Länge möglichst gleichförmig erfolgt, wurde ein kleinstmöglicher Biegeradius definiert.
Der Biegeradius darf nicht unterschritten werden.
Der kleinstmögliche Biegeradius beträgt 25 mm / 1 inch.

Eine Biegung darf über einen maximalen Biegewinkel nicht hinausgehen.
Der maximale Biegewinkel beträgt 45°.

Das Zurückbiegen in die Ausgangsform gilt als eigene Biegung.

Beispiel: 45°-Biegungen



Ausgangssituation: 0°

Bewegung von 0° auf 45° nach oben
= 1. Biegung

Bewegung von 45° zurück auf 0°
= 2. Biegung

Bewegung von 0° auf 45° nach unten
= 3. Biegung

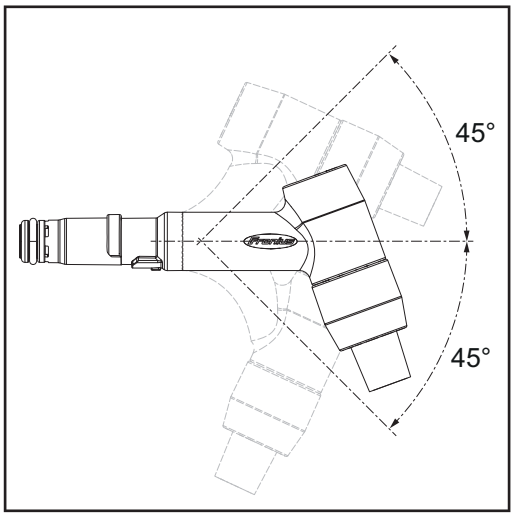
Bewegung von 45° zurück auf 0°
= 4. Biegung

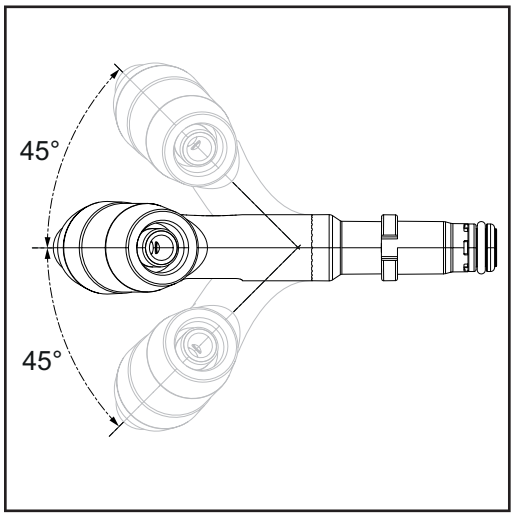
Maximale Anzahl der Brennerkörper-Biegungen

Unter Berücksichtigung eines Biegeradius ≥ 25 mm / 1 inch und eines maximalen Biegewinkels = 45° können

- gasgekühlte Schweißbrenner mindestens 1000 Mal gebogen werden,
- wassergekühlte Schweißbrenner mindestens 200 Mal gebogen werden.

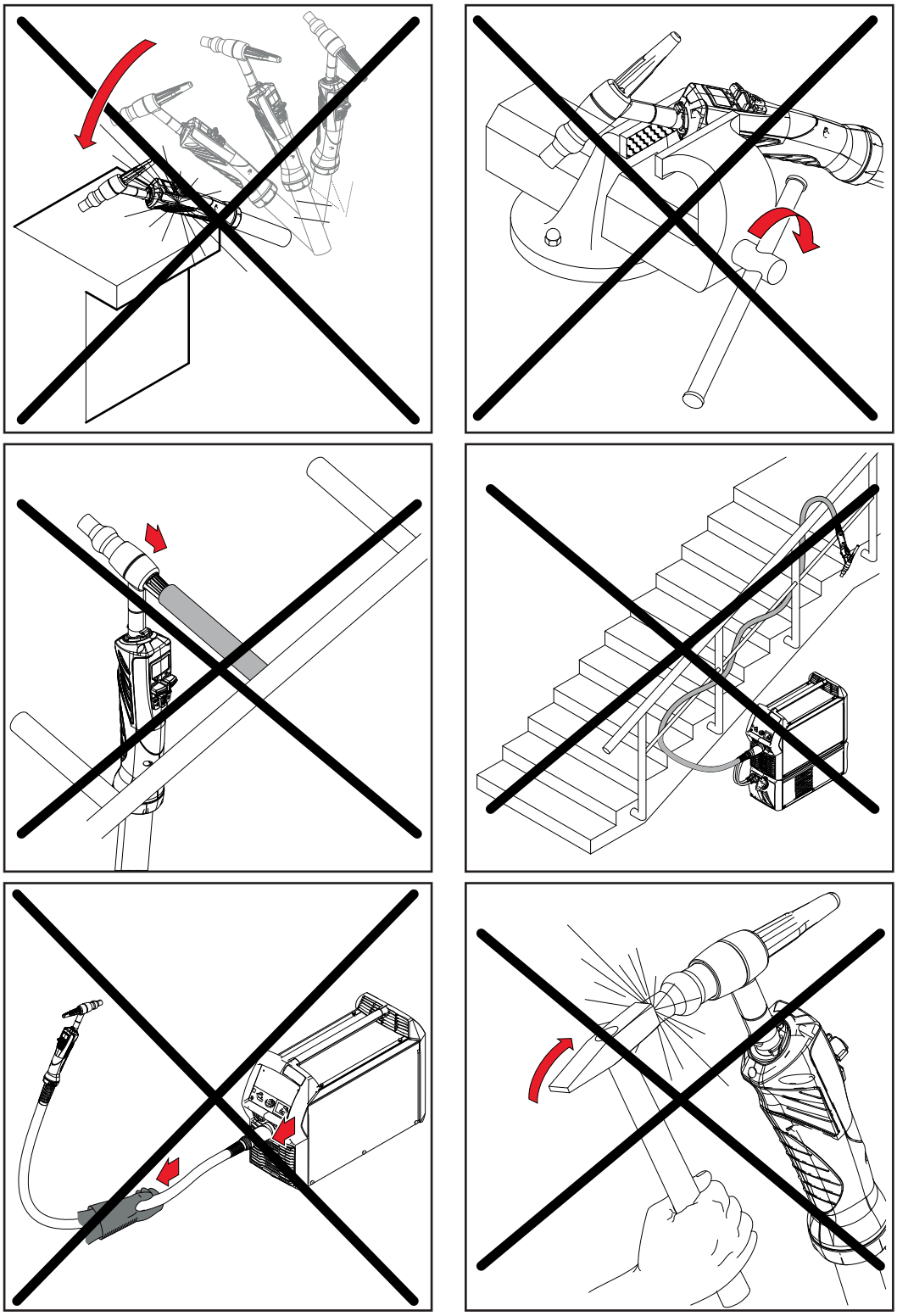
Biegemöglichkeiten





Pflege, Wartung und Entsorgung

Allgemeines



Wartung bei jeder Inbetriebnahme

- Verschleißteile kontrollieren, defekte Verschleißteile austauschen
- Gasdüse von Schweißspritzern befreien

Zusätzlich bei jeder Inbetriebnahme, bei wassergekühlten Schweißbrennern:

- sicherstellen, dass alle Kühlmittel-Anschlüsse dicht sind
- sicherstellen, dass ein ordnungsgemäßer Kühlmittel-Rückfluss gegeben ist

Entsorgung

Die Entsorgung nur gemäß den geltenden nationalen und regionalen Bestimmungen durchführen.

Fehlerdiagnose, Fehlerbehebung

Fehlerdiagnose, Fehlerbehebung

Schweißbrenner lässt sich nicht anschließen

Ursache: Bajonett-Verriegelung verbogen

Behebung: Bajonett-Verriegelung austauschen

Kein Schweißstrom

Netzschalter der Stromquelle eingeschaltet, Anzeigen an der Stromquelle leuchten, Schutzgas vorhanden

Ursache: Masseanschluss falsch

Behebung: Masseanschluss ordnungsgemäß herstellen

Ursache: Stromkabel im Schweißbrenner unterbrochen

Behebung: Schweißbrenner austauschen

Ursache: Wolframelektrode lose

Behebung: Wolframelektrode mittels Brennerkappe festziehen

Ursache: Verschleißteile lose

Behebung: Verschleißteile festziehen

keine Funktion nach Drücken der Brennertaste

Netzschalter eingeschaltet, Anzeigen an der Stromquelle leuchten, Schutzgas vorhanden

Ursache: Steuerstecker nicht eingesteckt

Behebung: Steuerstecker einstecken

Ursache: Schweißbrenner oder Schweißbrenner-Steuerleitung defekt

Behebung: Schweißbrenner tauschen

Ursache: Steckerverbindungen „Brennertaste / Steuerleitung / Stromquelle“ fehlerhaft

Behebung: Steckerverbindung überprüfen / Stromquelle oder Schweißbrenner zum Service

Ursache: Print im Schweißbrenner defekt

Behebung: Print austauschen

HF-Überschlag am Anschluss Schweißbrenner

Ursache: Anschluss Schweißbrenner undicht

Behebung: O-Ring an der Bajonett-Verriegelung austauschen

HF-Überschlag an der Griffschale

Ursache: Schlauchpaket undicht

Behebung: Schlauchpaket austauschen

Ursache: Schutzgas-Schlauchanschluss zum Brennerkörper undicht

Behebung: Schlauch nachsetzen und abdichten

Kein Schutzgas

alle anderen Funktionen vorhanden

Ursache: Gasflasche leer

Behebung: Gasflasche wechseln

Ursache: Gas-Druckminderer defekt

Behebung: Gas-Druckminderer austauschen

Ursache: Gasschlauch nicht montiert, geknickt oder schadhaft

Behebung: Gasschlauch montieren, gerade auslegen. Defekten Gasschlauch austauschen

Ursache: Schweißbrenner defekt

Behebung: Schweißbrenner austauschen

Ursache: Gas-Magnetventil defekt

Behebung: Service-Dienst verständigen (Gas-Magnetventil austauschen lassen)

schlechte Schweißeigenschaften

Ursache: falsche Schweißparameter

Behebung: Einstellungen überprüfen

Ursache: Masseanschluss falsch

Behebung: Masseanschluss und Klemme auf Polarität überprüfen

Schweißbrenner wird sehr heiß

Ursache: Schweißbrenner zu schwach dimensioniert

Behebung: Einschaltdauer und Belastungsgrenzen beachten

Ursache: nur bei wassergekühlten Anlagen: Wasserdurchfluss zu gering

Behebung: Wasserstand, Wasserdurchfluss-Menge, Wasserverschmutzung, etc. kontrollieren, Kühlmittel-Pumpe blockiert: Welle der Kühlmittel-Pumpe mittels Schraubendreher an der Durchführung andrehen

Ursache: nur bei wassergekühlten Anlagen: Parameter „Strg. Kühlgerät“ befindet sich auf „OFF“.

Behebung: Im Setup-Menü den Parameter „Strg. Kühlgerät“ auf „Aut“ oder „ON“ stellen.

Porosität der Schweißnaht

Ursache: Spritzerbildung in der Gasdüse, dadurch unzureichender Gasschutz der Schweißnaht

Behebung: Schweißspritzer entfernen

Ursache: Löcher im Gasschlauch oder ungenaue Anbindung des Gasschlauches

Behebung: Gasschlauch austauschen

Ursache: O-Ring am Zentralanschluss ist zerschnitten oder defekt

Behebung: O-Ring austauschen

Ursache: Feuchtigkeit / Kondensat in der Gasleitung

Behebung: Gasleitung trocknen

Ursache: Zu starke oder zu geringe Gasströmung

Behebung: Gasströmung korrigieren

Ursache: Ungenügende Gasmenge zu Schweißbeginn oder Schweißende

Behebung: Gas-Vorströmung und Gas-Nachströmung erhöhen

Ursache: Zu viel Trennmittel aufgetragen

Behebung: Überschüssiges Trennmittel entfernen / weniger Trennmittel auftragen

Schlechte Zündeigenschaften

Ursache: Ungeeignete Wolframelektrode (beispielsweise WP-Elektrode beim DC-Schweißen)

Behebung: Geeignete Wolframelektrode verwenden

Ursache: Verschleißteile lose

Behebung: Verschleißteile festschrauben

Gasdüse bekommt Risse

Ursache: Wolframelektrode ragt nicht weit genug aus der Gasdüse

Behebung: Wolframelektrode weiter aus der Gasdüse ragen lassen

Technische Daten

Allgemeines

Das Produkt entspricht den Anforderungen laut Norm IEC 60974-7.

HINWEIS!

Die angegebenen Leistungsdaten gelten nur bei Verwendung von serienmäßigen Verschleißteilen.
Bei Verwendung von Gaslinsen und kürzeren Gasdüsen reduzieren sich die Schweißstrom-Angaben.

HINWEIS!

Für die gasgekühlten Brennerkörper gelten die Schweißstrom-Angaben nur ab einer Brennerkörper-Länge L ≥ 65 mm.
Bei Verwendung von kürzeren Brennerkörpern reduzieren sich die Schweißstrom-Angaben um 30 %.

HINWEIS!

Beim Schweißen an der Leistungsgrenze des Schweißbrenners entsprechend größere Wolfram-Elektroden und Gasdüsen-Öffnungsdurchmesser verwenden, um die Standzeit der Verschleißteile zu erhöhen.
Stromstärke, AC-Balance und AC-Strom-Offset als Leistungs-bildende Faktoren berücksichtigen.

Brennerkörper gasgekühlt - TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G / F	TTB 220 G
DC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1] / 80 A 60 % ED[1] / 60 A 100 % ED[1] / 50 A	35 % ED[1] / 160 A 60 % ED[1] / 120 A 100 % ED[1] / 90 A	35 % ED[1] / 220 A 60 % ED[1] / 170 A 100 % ED[1] / 130 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1] / 30 A	35 % ED[1] / 120 A 60 % ED[1] / 90 A 100 % ED[1] / 70 A	35 % ED1) / 180 A 60 % ED1) / 130 A 100 % ED1) / 100 A
	Argon (Norm EN 439)	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0 - 3,2 mm 0.039 - 0.126 in.	1,0 - 3,2 mm 0.039 - 0.126 in.	1,0 - 4,0 mm 0.039 - 0.158 in.

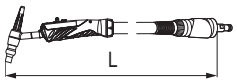
	TTB 220 A G F	TTB 220 P G F	TTB 260 G
DC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1] / 220 A 60 % ED[1] / 170 A 100 % ED[1] / 130 A	30 % ED[1]/ 220 A 60 % ED[1] / 160 A 100 % ED[1] / 130 A	35 % ED[1] / 260 A 60 % ED[1] / 200 A 100 % ED[1] / 150 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1] / 180 A 60 % ED[1]/ 120 A 100 % ED[1] / 100 A	30 % ED[1] / 170 A 60 % ED[1] / 120 A 100 % ED[1] / 100 A	35 % ED[1] / 200 A 60 % ED[1] / 160 A 100 % ED[1] / 120 A
	Argon (Norm EN 439)	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0 - 4,0 mm 0.039 - 0.158 in.	1,0 - 4,0 mm 0.039 - 0.158 in.	1,6 - 6,4 mm 0.063 - 0.252 in.

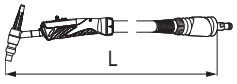
Brennerkörper wassergekühlt - TTB 180, TTB 300, TTB 400, TTB 500

	TTB 180 W	TTB 300 W
DC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1] / 180 A 100 % ED[1] / 140 A	60 % ED[1] / 300 A 100 % ED[1] / 230 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1] / 140 A 100 % ED[1] / 110 A	60 % ED[1] / 250 A 100 % ED[1] / 190 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0 - 3,2 mmn 0.039 - 0.126 in.	1,0 - 3,2 mmn 0.039 - 0.126 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

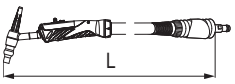
	TTB 400 W F	TTB 500 W
DC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1] / 400 A 100 % ED[1] / 300 A	60 % ED[1] / 500 A 100 % ED[1] / 400 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1] / 320 A 100 % ED[1] / 250 A	60 % ED[1] / 400 A 100 % ED[1] / 300 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0 - 4,0 mm 0.039 - 0.157 in.	1,6 - 6,4 mm 0.063 - 0.252 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

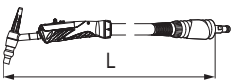
Schlauchpaket gasgekühlt - THP 160i, THP 220i, THP 260i

	THP 160i	THP 220i
DC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1)] / 160 A 60 % ED[1)] / 120 A 100 % ED[1)] / 90 A	35 % ED[1)] / 220 A 60 % ED[1)] / 170 A 100 % ED[1)] / 130 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1)] / 120 A 60 % ED[1)] / 90 A 100 % ED[1)] / 70 A	35 % ED[1)] / 180 A 60 % ED[1)] / 130 A 100 % ED[1)] / 100 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maximal zulässige Leerlaufspannung (U_0)	113 V	113 V
Maximal zulässige Zündspannung (U_P)	10 kV	10 kV

		THP 260i
Schweißstrom bei 10 min / 40°C (104°F) DC		35 % ED[1)] / 260 A 60 % ED[1)] / 200 A 100 % ED[1)] / 150 A
Schweißstrom bei 10 min / 40°C (104°F) AC		35 % ED[1)] / 200 A 60 % ED[1)] / 160 A 100 % ED[1)] / 120 A
		Argon (Norm EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maximal zulässige Leerlaufspannung (U_0)		113 V
Maximal zulässige Zündspannung (U_P)		10 kV

Schlauchpaket wassergekühlt - THP 300i, THP 400i, THP 500i

	THP 300i	THP 400i
DC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1] / 300 A 100 % ED[1] / 230 A	60 % ED[1] / 400 A 100 % ED[1] / 300 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1] / 250 A 100 % ED[1] / 190 A	60 % ED[1] / 350 A 100 % ED[1] / 270 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min}  [W] [2]	650 / 650	950 / 950
Q_{min}  [l/min] [gal./min]	1 0.26	1 0.26
p_{min}  [bar] [psi]	3 43	3 43
p_{max}  [bar] [psi]	5,5 79	5,5 79
Maximal zulässige Leerlaufspannung (U_0)	113 V	113 V
Maximal zulässige Zündspannung (U_P)	10 kV	10 kV

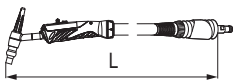
		THP 500i
DC-Schweißstrom bei 10 min / 40°C (104°F)		60 % ED[1] / 500 A 100 % ED[1] / 400 A
AC-Schweißstrom bei 10 min / 40°C (104°F)		60 % ED[1] / 400 A 100 % ED[1] / 300 A
		Argon (Norm EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min}  [W] [2]		1200 / 1750
Q_{min}  [l/min] [gal./min]		1 0.26
p_{min}  [bar] [psi]		3 43
p_{max}  [bar] [psi]		5,5 79
Maximal zulässige Leerlaufspannung (U_0)		113 V

		THP 500i
Maximal zulässige Zündspannung (U_P)		10 kV

Verlängerungs-Schlauchpaket gasgekühlt - HPT 220i G

	HPT 220i EXT G
DC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1)] / 220 A 60 % ED[1)] / 170 A 100 % ED[1)] / 130 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	35 % ED[1)] / 180 A 60 % ED[1)] / 130 A 100 % ED[1)] / 100 A
	Argon (Norm EN 439)
	10,0 m 32 + 9.70 ft. + in.
Maximal zulässige Leerlaufspannung (U_0)	113 V
Maximal zulässige Zündspannung (U_P)	10 kV

Verlängerungs-Schlauchpaket wassergekühlt - HPT 400i

	HPT 400i EXT W
DC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1)] / 400 A 100 % ED[1)] / 300 A
AC-Schweißstrom bei 10 min / 40°C (104°F)	60 % ED[1)] / 350 A 100 % ED[1)] / 270 A
	Argon (Norm EN 439)
	10,0 m 32 + 9.70 ft. + in.
P_{min} [W] [2)]	750 / 750
Q_{min} [l/min] [gal./min]	1 0.26
p_{min} [bar] [psi]	3 43
p_{max} [bar] [psi]	5,5 79
Maximal zulässige Leerlaufspannung (U_0)	113 V
Maximal zulässige Zündspannung (U_P)	10 kV

Erklärung der Fußnoten

1) ED = Einschaltdauer

2) Geringste Kühlleistung laut Norm IEC 60974-2

Table of contents

Safety

Safety

⚠ WARNING!

Danger from incorrect operation and work that is not carried out properly.
This can result in severe personal injury and damage to property.
- ▶ All the work and functions described in this document must only be carried out by trained and qualified personnel.
- ▶ Read and understand this document.
- ▶ Read and understand all the Operating Instructions for the system components, especially the safety rules.

⚠ WARNING!

Danger from electrical current and danger of injury from emerging wire electrode.
This can result in severe personal injury and damage to property.
- ▶ Switch the power switch on the power source to - O -.
- ▶ Disconnect the power source from the grid.
- ▶ Ensure that the power source remains disconnected from the grid until all work is complete.

⚠ WARNING!

Danger from electrical current.
This can result in severe personal injury and damage to property.
- ▶ All cables, leads, and hosepacks must always be securely connected, undamaged, correctly insulated, and adequately sized.

⚠ CAUTION!

Burning hazard due to hot welding torch components and coolant.
Serious burns may result.
- ▶ Allow all welding torch components and the coolant to cool down to room temperature (+25 °C or +77 °F) before starting any of the work described in these Operating Instructions.

⚠ CAUTION!

Risk of damage from operation without coolant.
Serious damage to property may result.
- ▶ Never use water-cooled welding torches without coolant.
- ▶ The manufacturer is not responsible for any damage resulting from improper use. All warranty claims are considered void in such cases.

⚠ CAUTION!

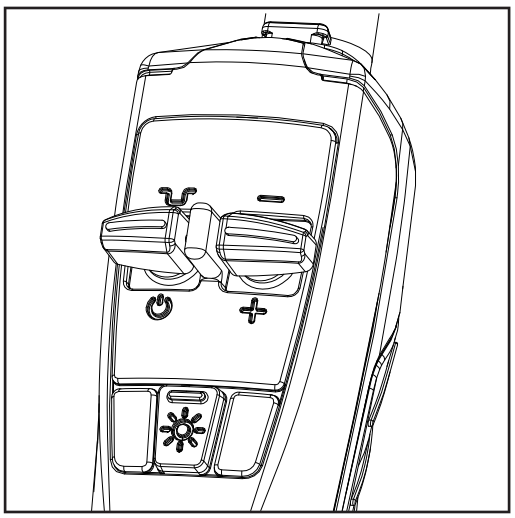
Danger from coolant escaping.
This can result in severe personal injury and damage to property.
- ▶ When disconnecting a welding torch from the cooling unit or wirefeeder, always seal the coolant hoses using the plastic seal attached to the torch.

General

General

The TIG welding torches are especially robust and reliable. The ergonomic shell-type handle and optimal weight distribution allow you to work without becoming fatigued.
The welding torches are available as gas and water-cooled units and can be adapted to suit a wide range of tasks.
The welding torches are primarily designed for manual series and single-lot production as well as for use in workshops.

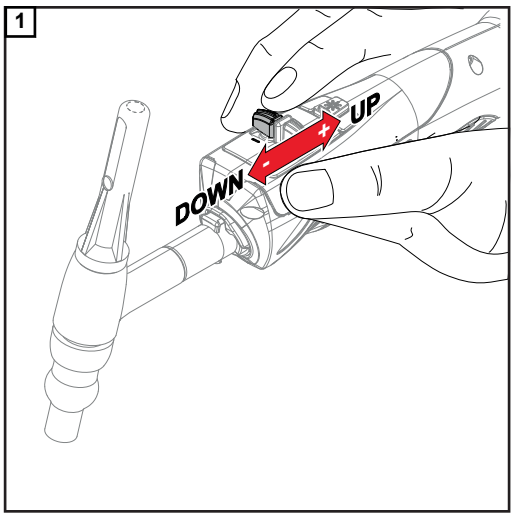
Up/Down torch



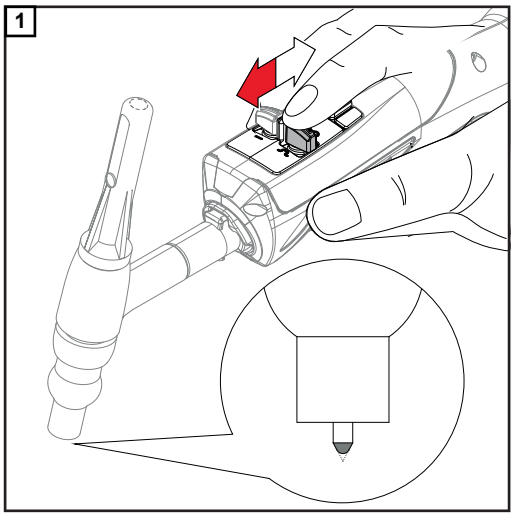
The Up/Down torch has the following functions:

- Change the welding power using the up/down key (+/-)
- Illumination of the welding area via LED:
  Press button once - LED lights up for 5 seconds
  Hold button down - LED lights up continuously
- Cap-shaping in connection with the TIG AC welding process
- Intermediate lowering in connection with 4-step operating mode ($I_1 > I_2$)

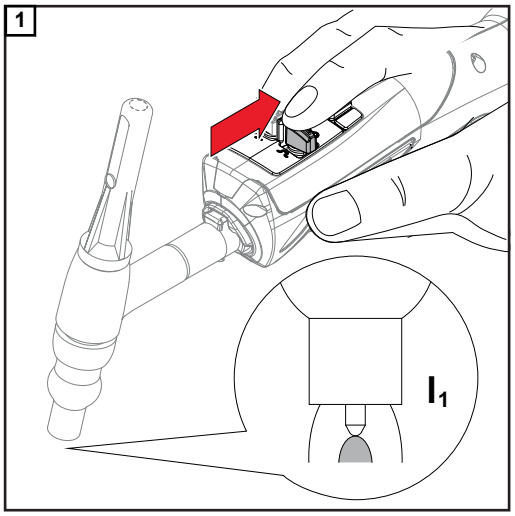
Changing the welding power

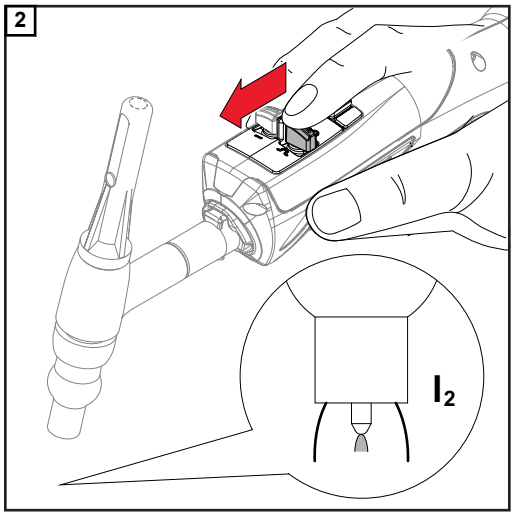


Cap-shaping

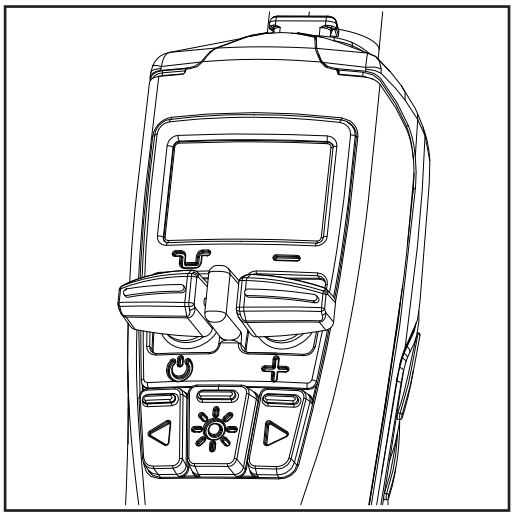


Intermediate lowering





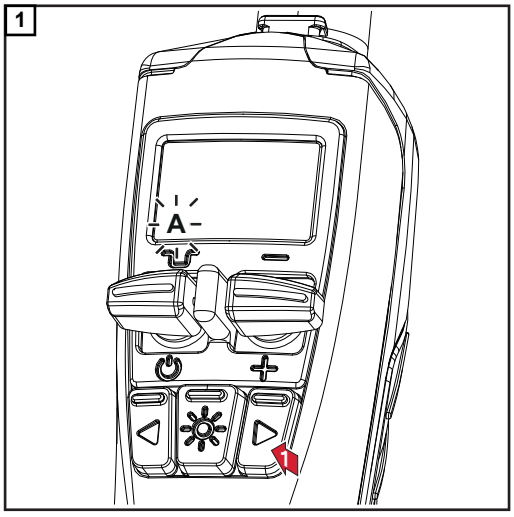
JobMaster welding torch

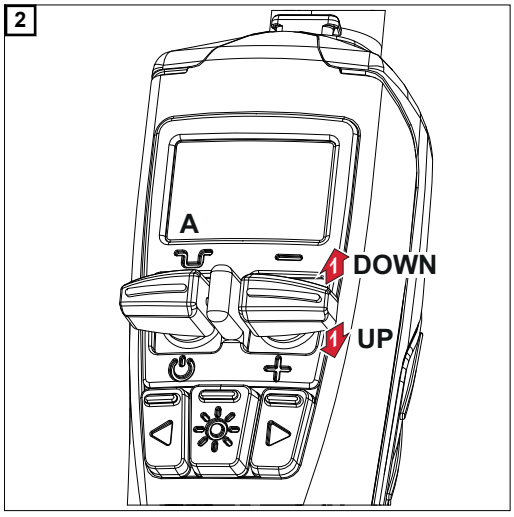


The JobMaster welding torch has the following functions:

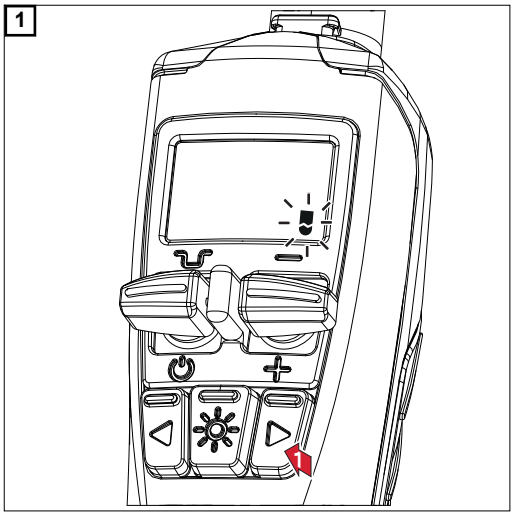
- Ergonomic display and adjustment of essential parameters directly on the welding torch
- Optimal control of the welding process without restricted handling
- Change the welding power using the up/down key (+/-)
- Illumination of the welding area via LED:
  Press button once - LED lights up for 5 seconds
  Hold button down - LED lights up continuously
- Cap-shaping in connection with the TIG AC welding process
- Intermediate lowering in connection with 4-step operating mode ($I_1 > I_2$)

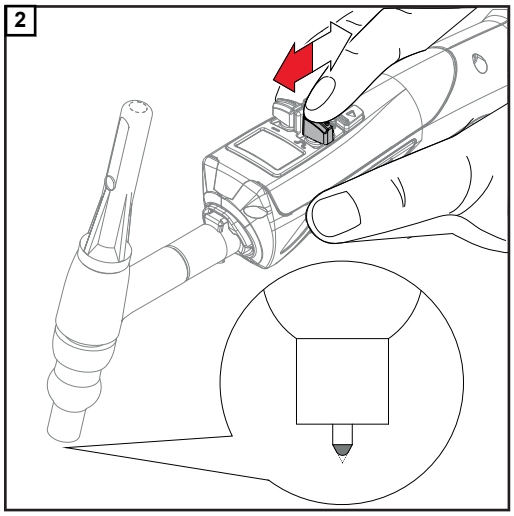
Changing the welding power



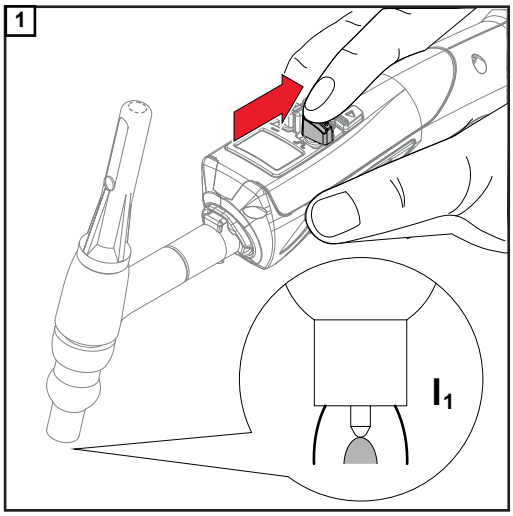


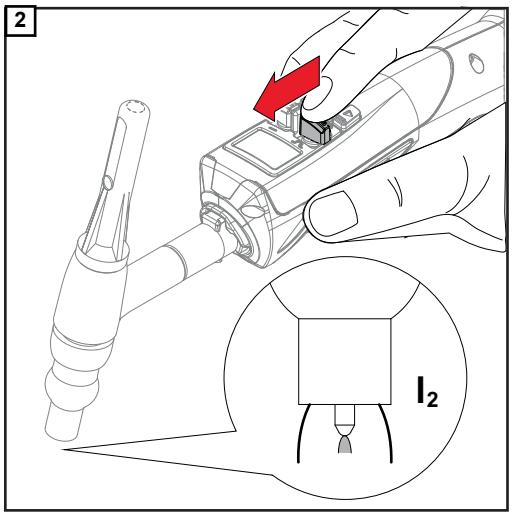
Cap-shaping



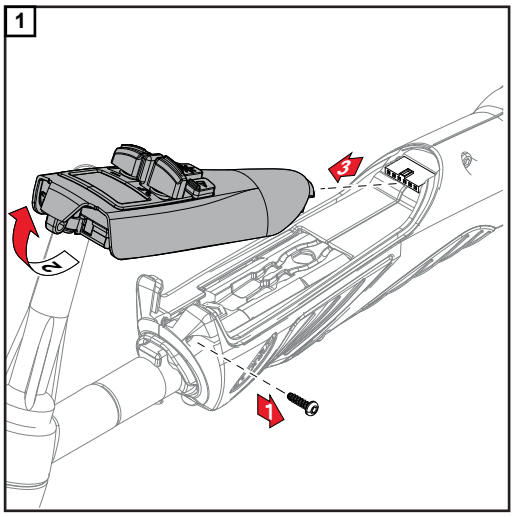


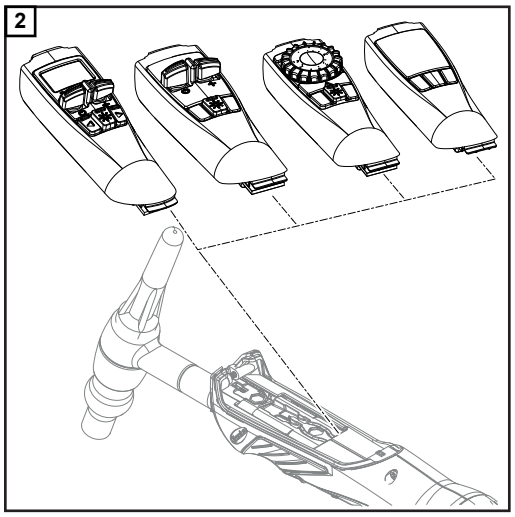
Intermediate lowering

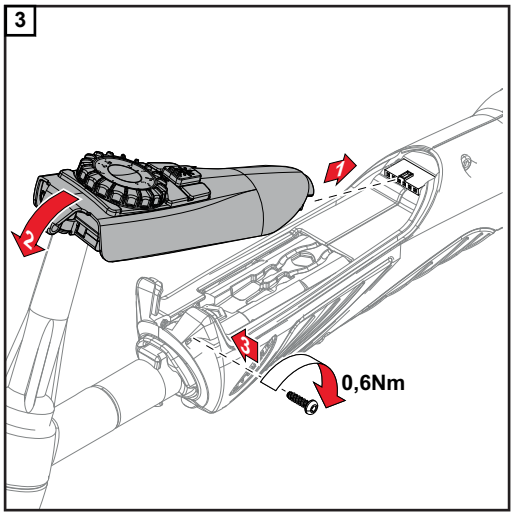




Replacing the user interface



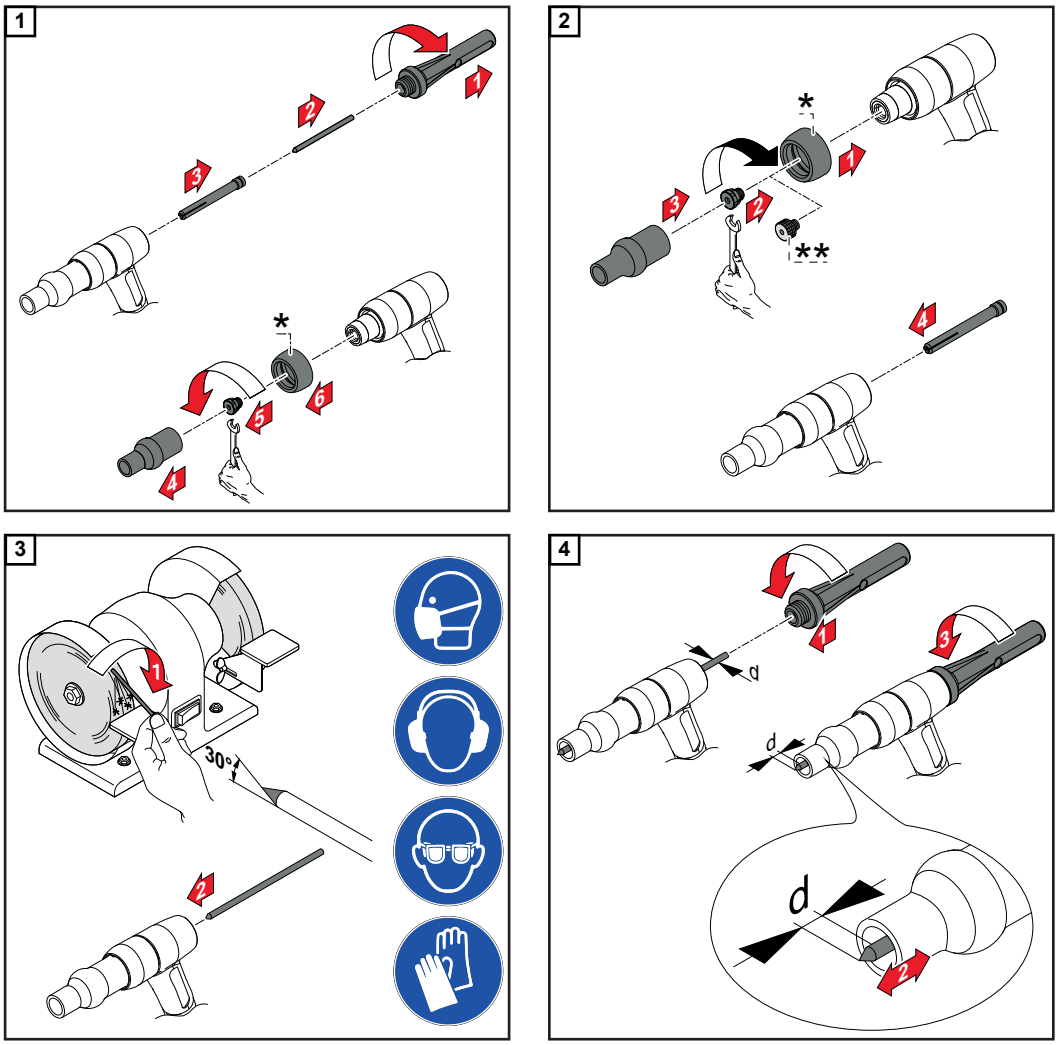




Mounting the Wearing Parts

Installing wearing parts, A-type

Wearing part set-up, A-type gas nozzle (push-on type)



NOTE!

Only tighten the torch cap enough so that the tungsten electrode can no longer be moved by hand.

* Replaceable rubber sealing sleeve only for TTB 220 G/A

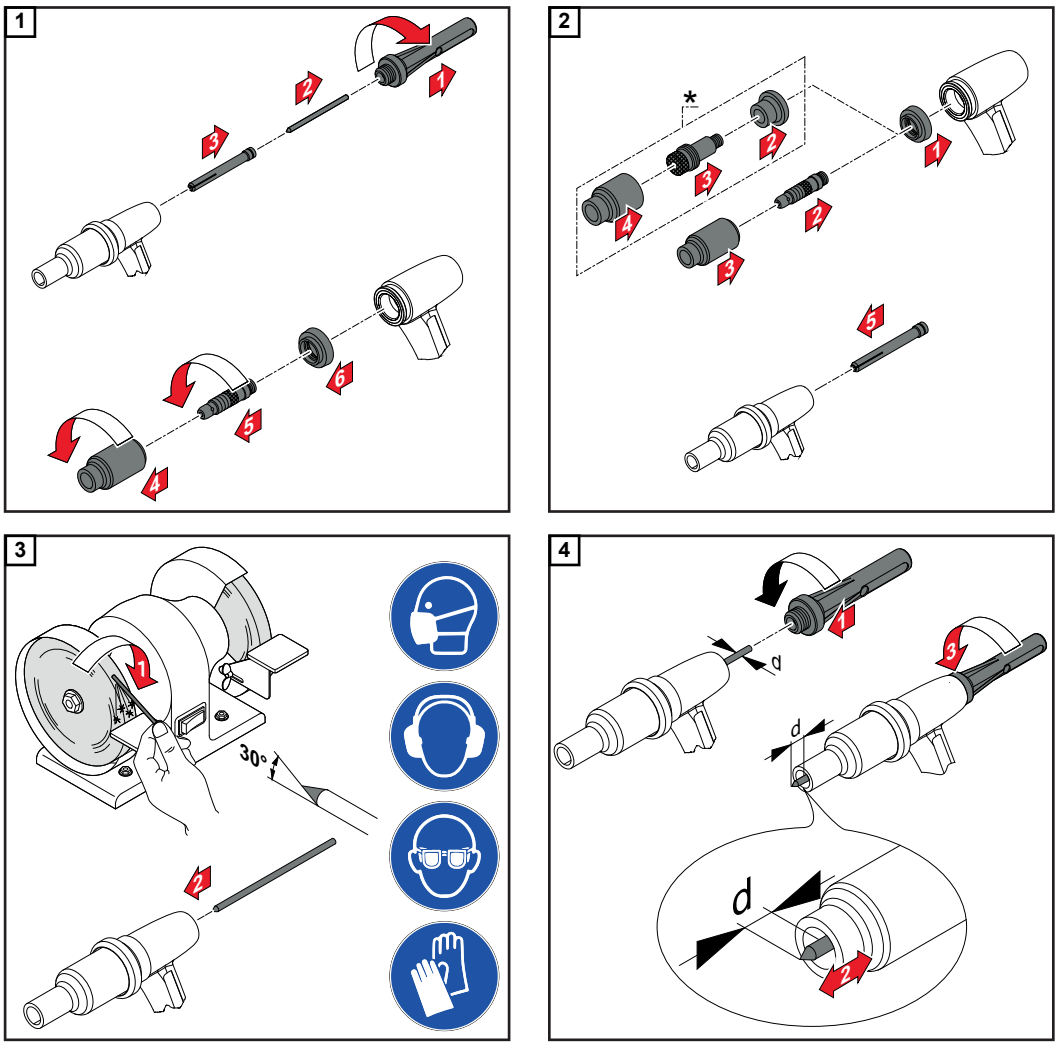
** A gas lens may be used instead of the clamping nut, depending on the type of welding torch.

⚠ **CAUTION!**

Risk of damage due to excessive tightening torque!
Damage to the thread may result.
► Only tighten the clamping nut or gas lens slightly.

Installing wearing parts, P-type

Wearing part set-up, P-type gas nozzle (screw type)



NOTE!

Only tighten the torch cap enough so that the tungsten electrode can no longer be moved by hand.

* Replaceable rubber sealing sleeve only for TTB 220 G/P

** A gas lens may be used instead of the clamping nut, depending on the type of welding torch.

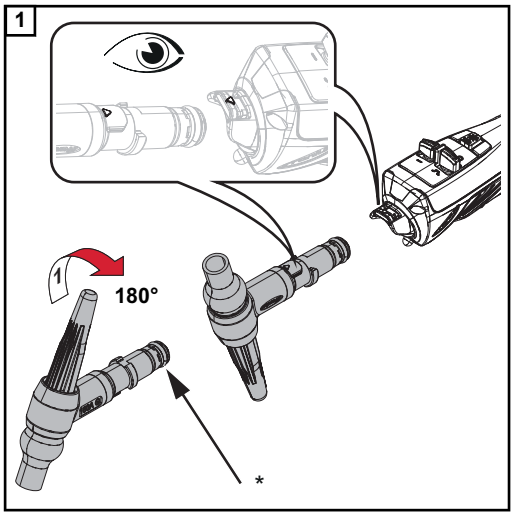
⚠ **CAUTION!**

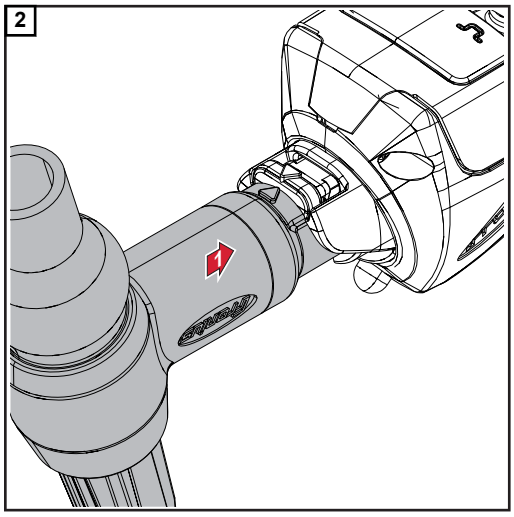
Risk of damage due to excessive tightening torque!
Damage to the thread may result.

► Only tighten the clamping nut or gas lens slightly.

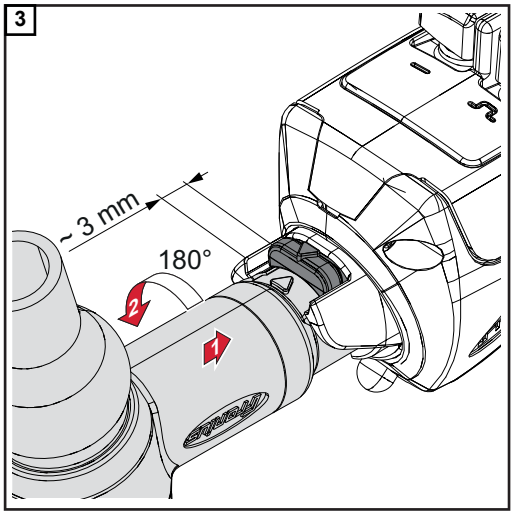
Installation and Startup

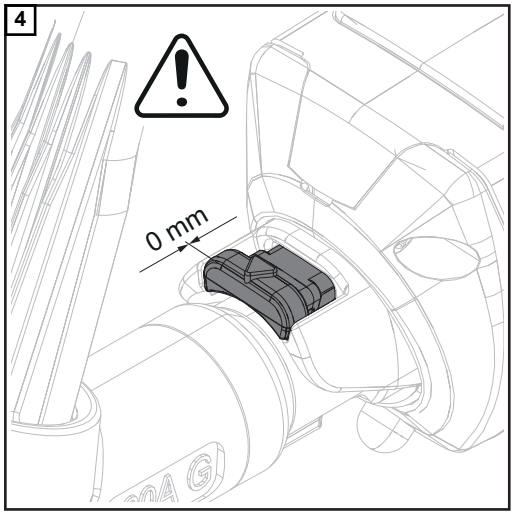
Attaching the Torch Body





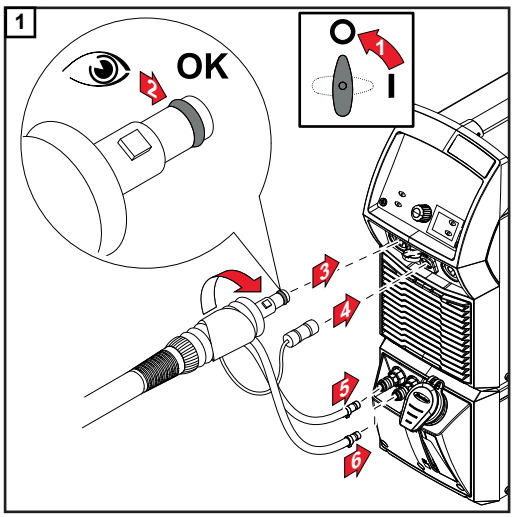
** Grease the O-ring before installation!*





IMPORTANT! When installing the torch body, ensure that it is pushed all the way in and snaps into place.

Connecting the welding torch to the power source and cooling unit



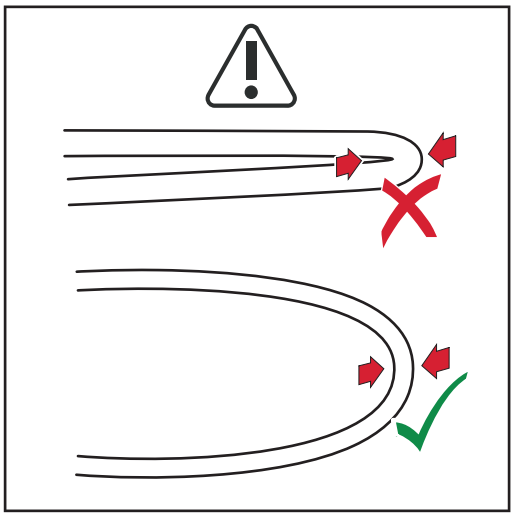
NOTE!

Before commissioning, check the sealing ring on the welding torch connection and the coolant level.

Check the coolant flow during welding operation at regular intervals.

Connecting the extension hosepack

The extension hosepack is supplied with a protective bag, in which the interface between the extension hosepack and the torch hosepack must be laid.



NOTE!

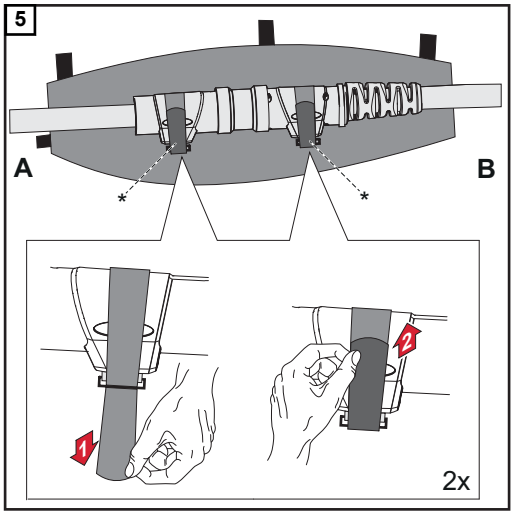
When performing the following activities, ensure that the cables and hoses are not trapped, kinked, cut, or otherwise damaged.

1 Position the protective bag so that the Fronius logo is visible and the loops are at the top:
left = power source side (A)
right = welding torch side (B)

2 Open the protective bag:
- Position both zip pulls to the right as far as they will go
- Pull the bottom tape end out of the zip pulls

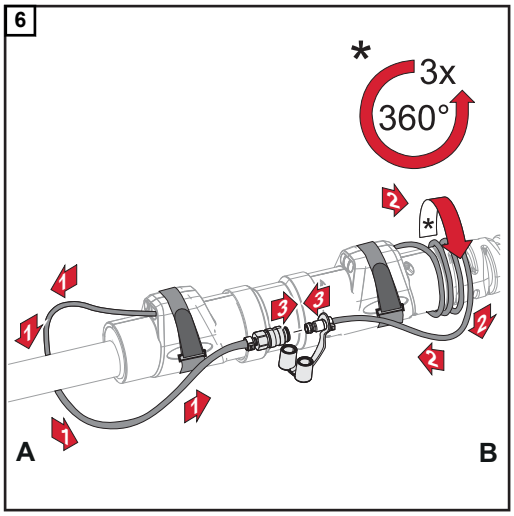
3 Connect the power/gas connections of the extension hosepack and the torch hosepack to one another (bayonet latch)

4 Place the interface in the inside pocket of the protective bag



** Velcro strips on the inside pocket (inside pocket not shown)*

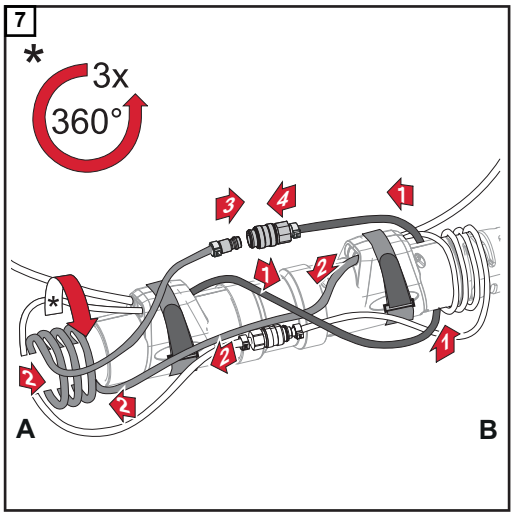
Secure the interface in the inside pocket with 2 Velcro strips



Route the coolant hose from the extension hosepack to the interface as shown

Wrap coolant hose from torch hosepack around the torch hosepack 3 times and route to interface

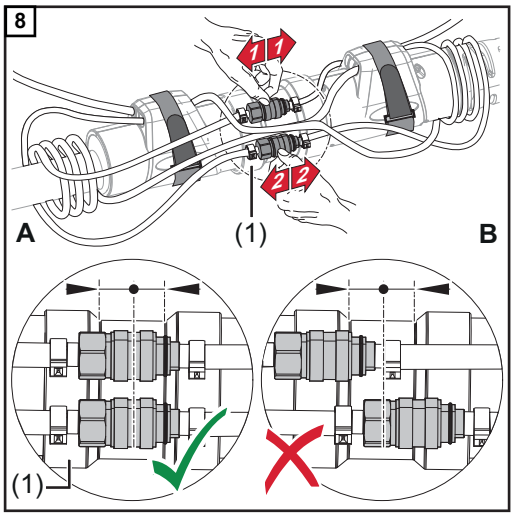
Connect the coolant hoses



Route the second coolant hose from the torch hosepack to the extension hosepack as shown, wrap around the extension hosepack 3 times and route it back to the interface

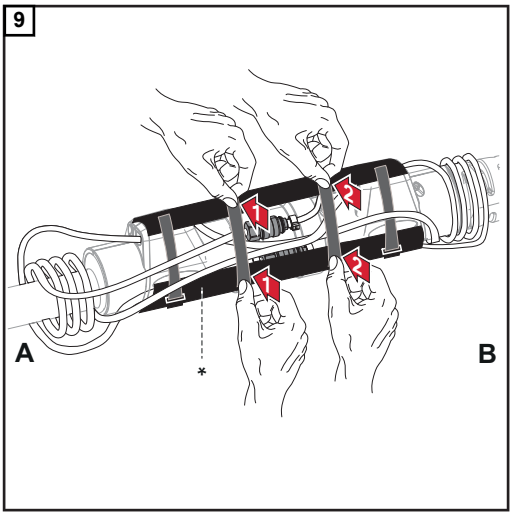
Route the second coolant hose from the extension hosepack around the torch hosepack to the interface as shown

Connect the coolant hoses



Align the coolant connections with each other and in the center of the insulating tube (1)

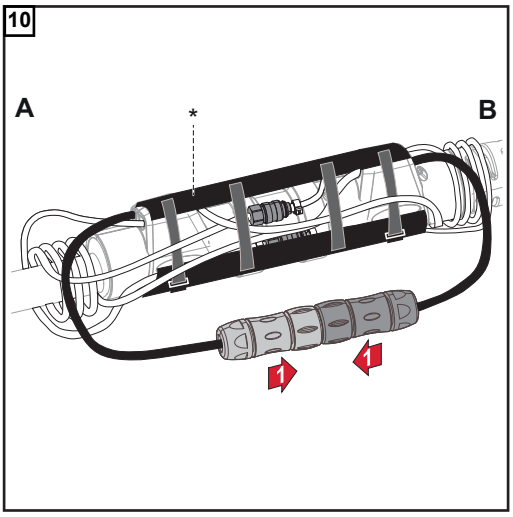
9



Attach the two Velcro strips supplied to the inside pocket

** Inside pocket*

10



Connect the TIG Multi Connector and position it next to the inside pocket

** Inside pocket*

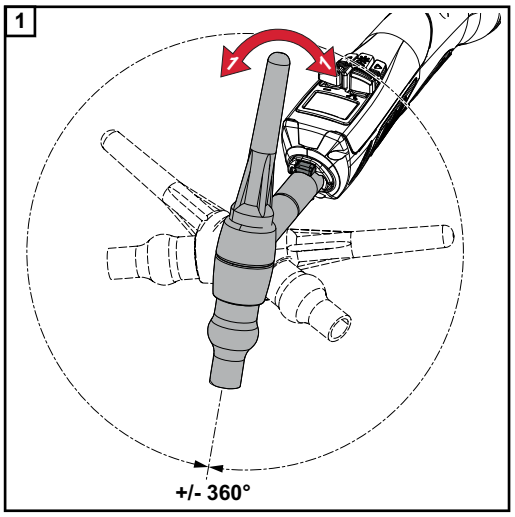
11 Close the protective bag

NOTE!

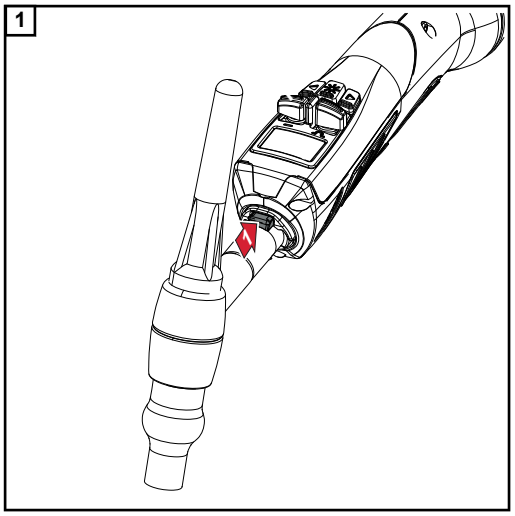
When operating with water-cooled extension hosepacks, observe the following:

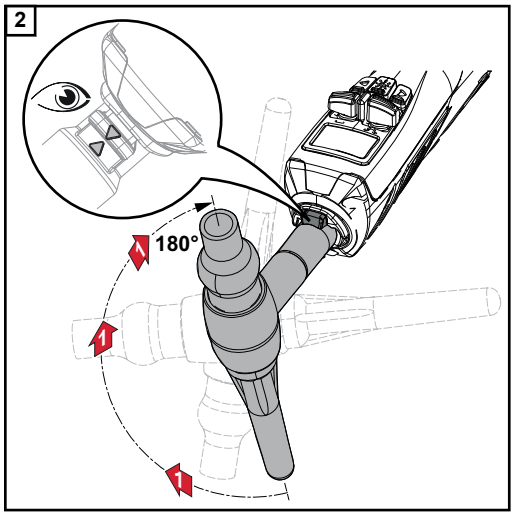
- ▶ Following commissioning, as soon as the power source in the coolant container of the cooling unit shows a good return flow, make sure that there is sufficient coolant in the cooling unit.
- ▶ In conjunction with a MultiControl cooling unit, a fully filled coolant tank can overflow when the hosepack is emptied - risk of slipping!
- ▶ Observe the Operating Instructions for the cooling unit!

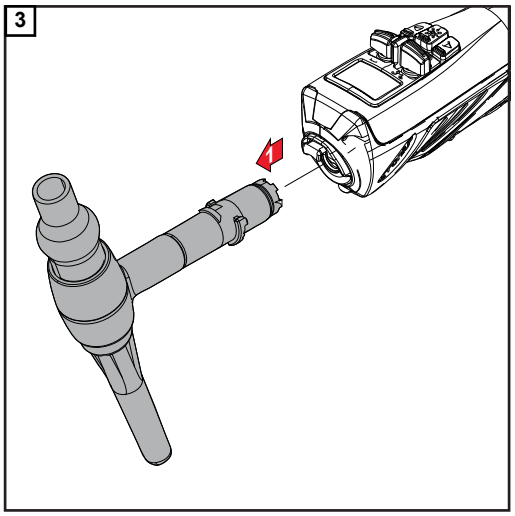
Twisting the Torch Body



Changing the torch body – gas-cooled welding torches



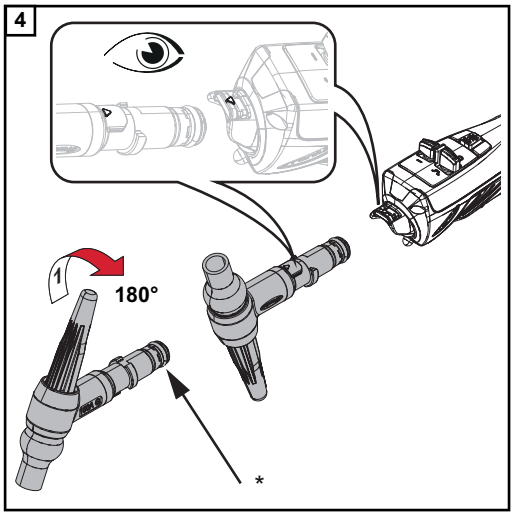


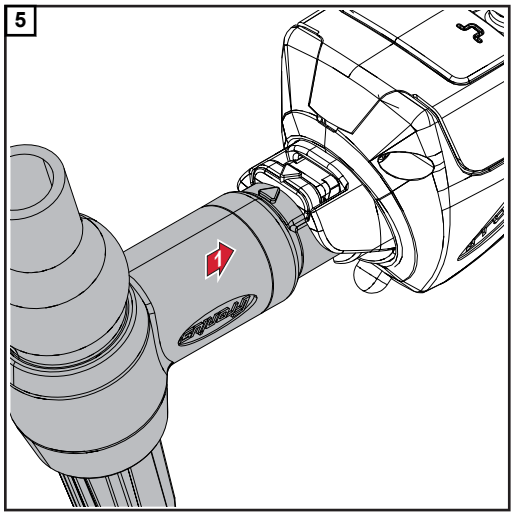


NOTE!

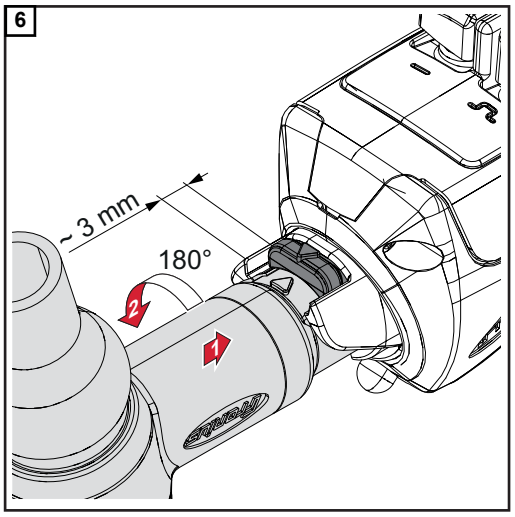
When changing the torch body, ensure that only the related systems are installed.

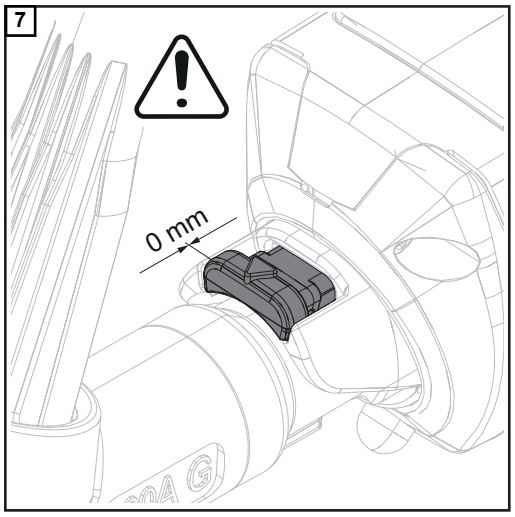
► Do not install gas-cooled torch bodies on water-cooled hosepacks or vice versa.





** Grease the O-ring before installation!*





IMPORTANT! When installing the torch body, ensure that it is pushed all the way in and snaps into place.

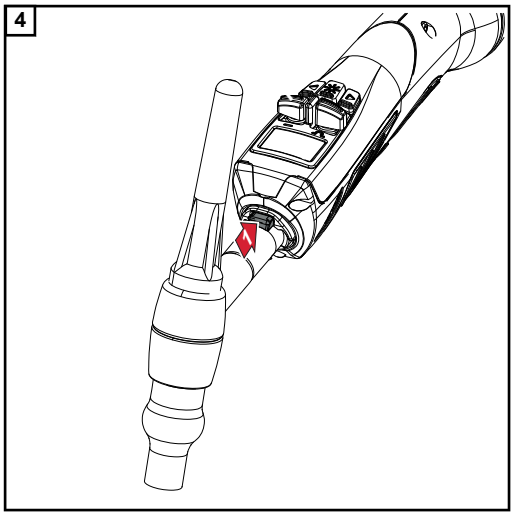
Changing the torch body – water-cooled welding torches

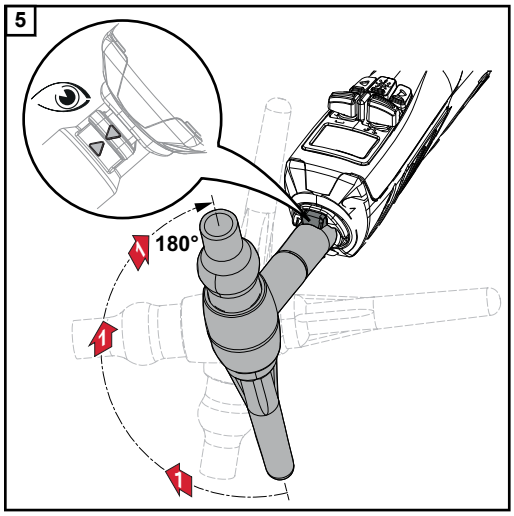
1 Switch off the power source and disconnect from the grid;
wait for the after-run phase of the cooling system

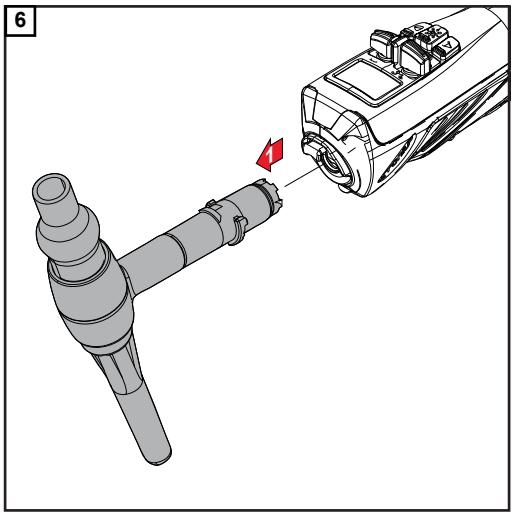
2 For a CU 600 MC cooling unit:
empty the torch hosepack using the power source or welding torch

For other cooling units:
disconnect the coolant supply hose from the cooling unit

3 Purge the coolant supply hose with max. 4 bar compressed air so that the majority of the coolant flows back into the coolant container







7 Clean the interface on the hosepack using compressed air

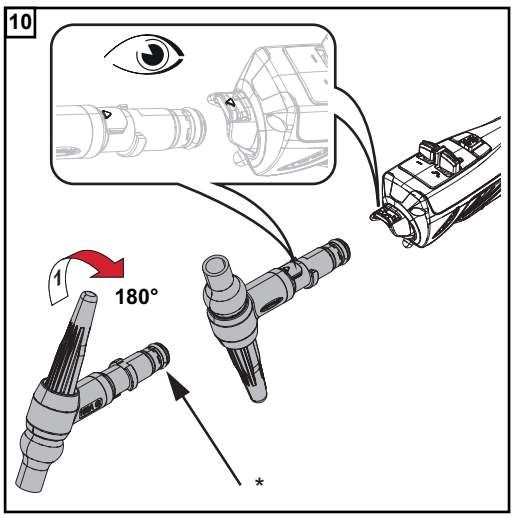
8 Dry the torch body with a cloth

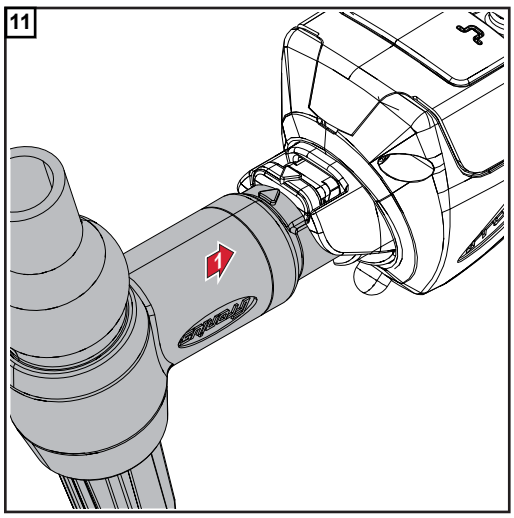
9 Attach the safety cap to the torch body

NOTE!

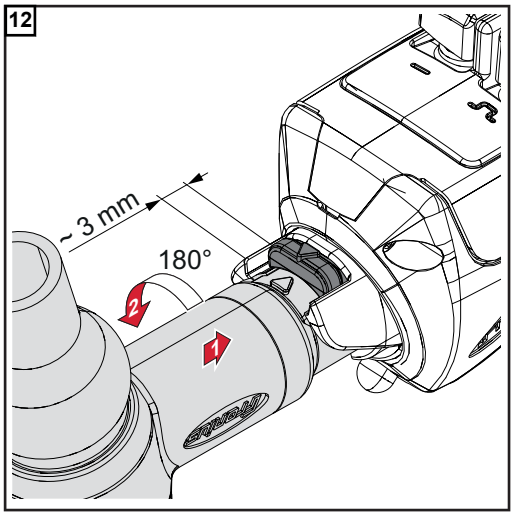
When changing the torch body, ensure that only the related systems are installed.

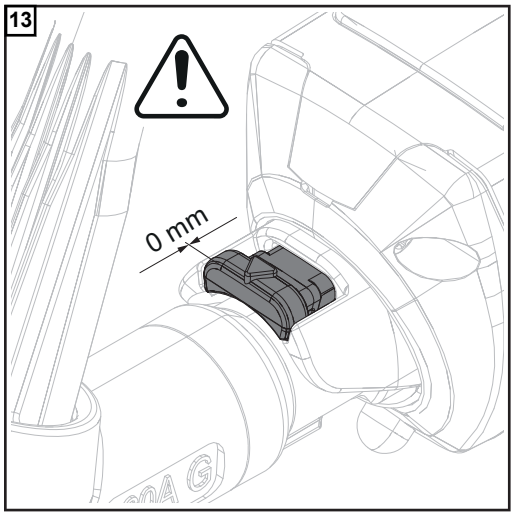
▶ Do not install gas-cooled torch bodies on water-cooled hosepacks or vice versa.





** Grease the O-ring before installation!*





IMPORTANT! When installing the torch body, ensure that it is pushed all the way in and snaps into place.

14 Connect the power source to the grid and switch on

15 Press the gas-test button on the power source

Shielding gas flows out for 30 s.

16 Check the coolant flow:
you must be able to see a strong return flow into the coolant container.

17 Perform a test weld and check the quality of the weld seam

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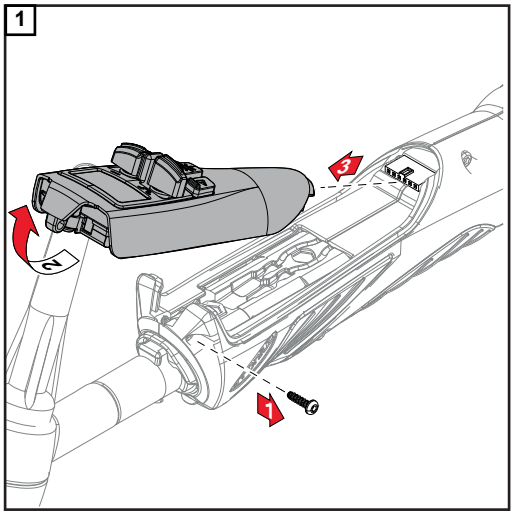
Preventing the torch body from being changed



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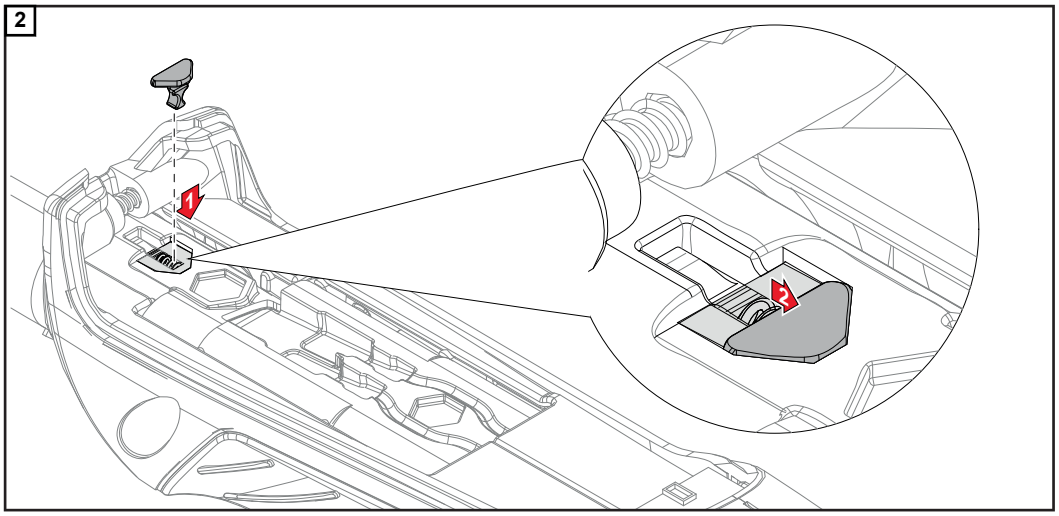

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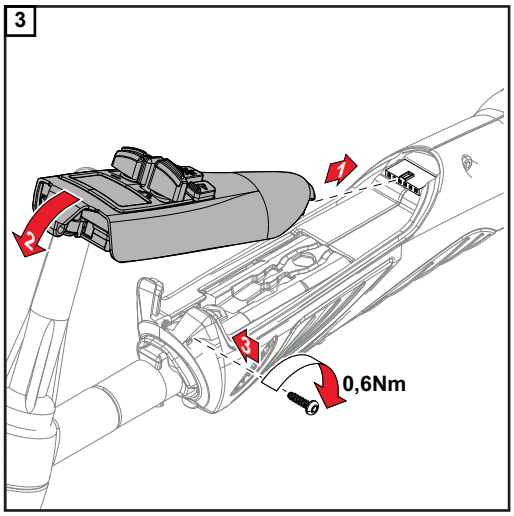


Notes on flexible torch bodies

General

The flexible TIG torch bodies can be bent in all directions and thus individually adapted to a wide variety of situations and applications.
Flexible torch bodies are used, for example, in cases of limited component accessibility or difficult welding positions.
However, the material of a flexible torch body is weakened with every change in shape, so the number of times it can be bent is also limited.

Bending and number of bends are explained in the following sections.

Definition of torch body bending

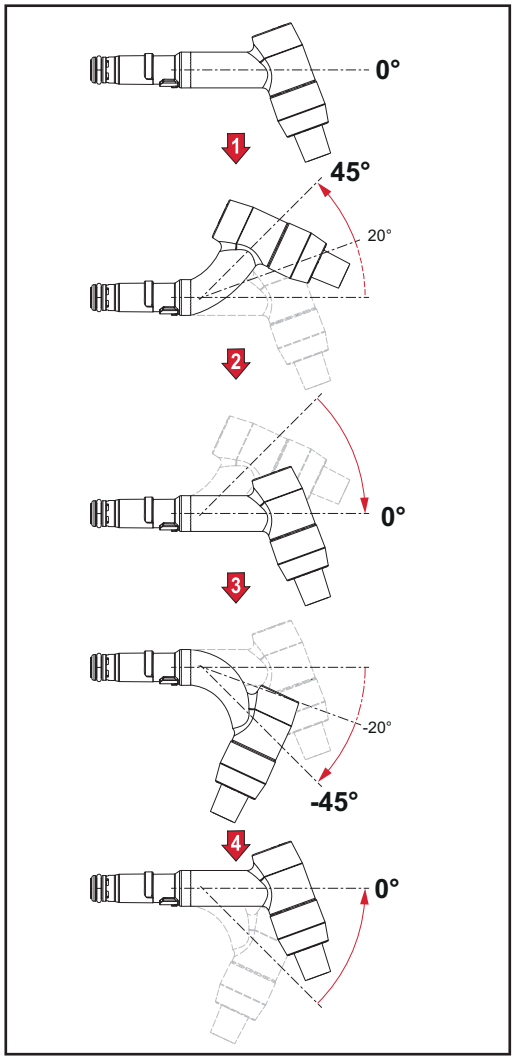
A bend is a one-time change in shape that deviates from the original shape by at least 20°.

A smallest possible bending radius has been defined so that the bending action does not occur at a few certain points but as uniformly as possible over a long length.
The bending radius must not be less than this.
The smallest possible bending radius is 25 mm / 1 inch.

A bend must not exceed a maximum bending angle.
The maximum bending angle is 45°.

Bending back to the original shape is considered a bend in its own right.

Example: 45° bends



Initial situation: 0°

Movement from 0° to 45° upwards
= First bend

Movement from 45° back to 0°
= Second bend

Movement from 0° to 45° downwards
= Third bend

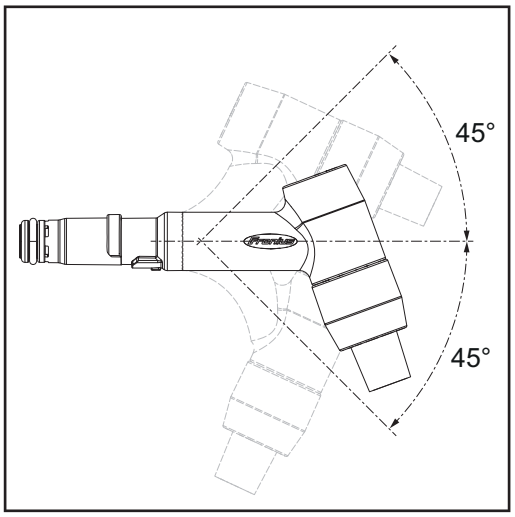
Movement from 45° back to 0°
= Fourth bend

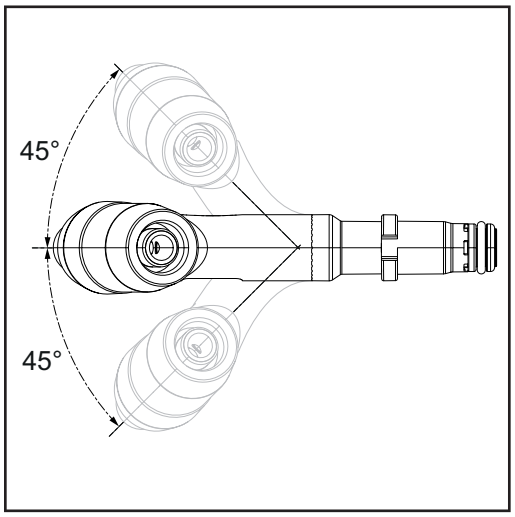
Maximum number of torch body bends

Taking into account a bending radius ≥ 25 mm / 1 inch and a maximum bending angle of 45°, the following number of bends are possible:

- Gas-cooled welding torches bent at least 1000 times
- Water-cooled welding torches bent at least 200 times

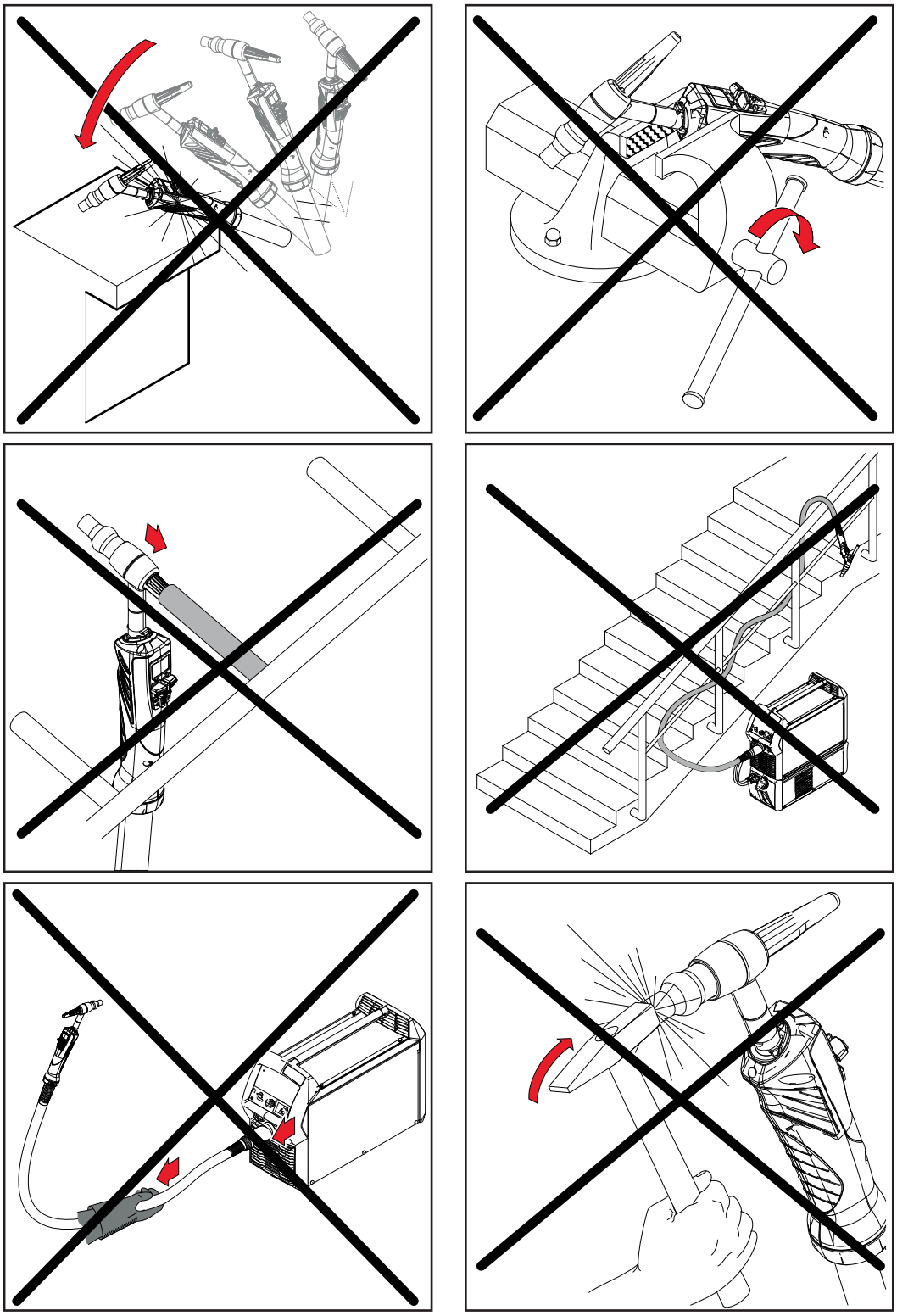
Bending possibilities





Service, maintenance and disposal

General



Maintenance at every start-up

- Check wearing parts, replace faulty wearing parts
- Purge the gas nozzle of welding spatter

In addition to the above list of steps to be carried out at every start-up, for water-cooled welding torches:

- Ensure that all coolant connections are leak-tight
- Ensure that there is a proper coolant return flow

Disposal

Materials should be disposed of according to valid local and national regulations.

Troubleshooting

Troubleshooting

Welding torch cannot be connected

Cause: Bayonet lock bent

Remedy: Replace bayonet lock

No welding current

Power source switched on, power source indication illuminates, shielding gas present

Cause: Incorrect ground connection

Remedy: Establish proper ground connection

Cause: Power cable in welding torch interrupted

Remedy: Replace welding torch

Cause: Tungsten electrode loose

Remedy: Tighten tungsten electrode using torch cap

Cause: Wearing parts loose

Remedy: Tighten wearing parts

No function after pressing torch trigger

Power source switched on, power source indication illuminates, shielding gas present

Cause: Power plug not plugged in

Remedy: Plug in power plug

Cause: Welding torch or welding torch control line faulty

Remedy: Replace welding torch

Cause: Plug connections "torch trigger/control line/power source" faulty

Remedy: Check plug connection / send power source or welding torch to service team

Cause: PCB in welding torch faulty

Remedy: Replace PCB

HF flashover at welding torch connection

Cause: Welding torch connection not sealed

Remedy: Replace O-ring on the bayonet lock

HF flashover at the shell-type handle

Cause: Hosepack is not sealed

Remedy: Replace hosepack

Cause: Shielding gas hose connection to torch body not sealed

Remedy: Adjust and seal hose

No shielding gas

All other functions present

Cause: Gas cylinder empty

Remedy: Change gas cylinder

Cause: Gas pressure regulator faulty

Remedy: Replace gas pressure regulator

Cause: Gas hose kinked, damaged, or not attached

Remedy: Attach and straighten gas hose. Replace faulty gas hose

Cause: Welding torch faulty

Remedy: Replace welding torch

Cause: Gas solenoid valve faulty

Remedy: Contact service team (have gas solenoid valve replaced)

Poor-quality weld properties

Cause: Incorrect welding parameters

Remedy: Check settings

Cause: Incorrect ground connection

Remedy: Check ground connection and terminal for polarity

Welding torch gets very hot

Cause: Welding torch is inadequately dimensioned

Remedy: Observe duty cycle and load limits

Cause: For water-cooled systems only: Coolant flow too low

Remedy: Check water level, water flow rate, water contamination, etc. Coolant pump blocked: Switch on shaft of coolant pump at the gland using a screwdriver

Cause: For water-cooled systems only: "Cooling unit Ctrl" parameter is set to "OFF".

Remedy: In the Setup menu, set the "Cooling unit Ctrl" parameter to "Aut" or "ON".

Porosity of weld seam

Cause: Spattering in the gas nozzle, causing inadequate gas shield for weld seam
Remedy: Remove welding spatter

Cause: Holes in gas hose or imprecise gas hose connection
Remedy: Replace gas hose

Cause: O-ring at central connector is cut or faulty
Remedy: Replace O-ring

Cause: Moisture/condensate in the gas line
Remedy: Dry gas line

Cause: Gas flow too strong or weak
Remedy: Correct gas flow

Cause: Inadequate quantity of gas at the start or end of welding
Remedy: Increase gas pre-flow and gas post-flow

Cause: Too much parting agent applied
Remedy: Remove excess parting agent/apply less parting agent

Poor ignition properties

Cause: Unsuitable tungsten electrode (e.g., WP electrode for DC welding)
Remedy: Use suitable tungsten electrode

Cause: Wearing parts loose
Remedy: Screw on wearing parts tightly

Gas nozzle is cracked

Cause: Tungsten electrode not protruding far enough out of the gas nozzle
Remedy: Have tungsten electrode protrude more out of the gas nozzle

Technical data

General

This product meets the requirements set out in standard IEC 60974-7.

NOTE!

The welding current specifications only apply when using the standard wearing parts.
When using gas lenses and shorter gas nozzles, the welding current is reduced.

NOTE!

For gas-cooled torch bodies, the welding current specifications only apply from a torch body length L ≥ 65 mm.
When using shorter torch bodies, the welding current is reduced by 30%.

NOTE!

When welding at the power limit of the welding torch, use larger tungsten electrodes and gas nozzle opening diameters in order to increase the service life of the wearing parts.
Take into account amperage, AC balance, and AC current offset as performance-enhancing factors.

Gas-cooled torch body - TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G / F	TTB 220 G
DC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 80 A 60% D.C.[1] / 60 A 100% D.C.[1] / 50 A	35% D.C.[1] / 160 A 60% D.C.[1] / 120 A 100% D.C.[1] / 90 A	35% D.C.[1] / 220 A 60% D.C.[1] / 170 A 100% D.C.[1] / 130 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 30 A	35% D.C.[1] / 120 A 60% D.C.[1] / 90 A 100% D.C.[1] / 70 A	35% D.C.1) / 180 A 60% D.C.1) / 130 A 100% D.C.1) / 100 A
	Argon (Standard EN 439)	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 4.0 mm 0.039 - 0.158 in.

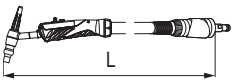
	TTB 220 A G F	TTB 220 P G F	TTB 260 G
DC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 220 A 60% D.C.[1] / 170 A 100% D.C.[1] / 130 A	30% D.C.[1]/ 220 A 60% D.C.[1] / 160 A 100% D.C.[1] / 130 A	35% D.C.[1] / 260 A 60% D.C.[1] / 200 A 100% D.C.[1] / 150 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 180 A 60% D.C.[1]/ 120 A 100% D.C.[1] / 100 A	30% D.C.[1] / 170 A 60% D.C.[1] / 120 A 100% D.C.[1] / 100 A	35% D.C.[1] / 200 A 60% D.C.[1] / 160 A 100% D.C.[1] / 120 A
	Argon (Standard EN 439)	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 4.0 mm 0.039 - 0.158 in.	1.0 - 4.0 mm 0.039 - 0.158 in.	1.6 - 6.4 mm 0.063 - 0.252 in.

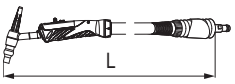
Water-cooled torch body - TTB 180, TTB 300, TTB 400, TTB 500

	TTB 180 W	TTB 300 W
DC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 180 A 100% D.C.[1] / 140 A	60% D.C.[1] / 300 A 100% D.C.[1] / 230 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 140 A 100% D.C.[1] / 110 A	60% D.C.[1] / 250 A 100% D.C.[1] / 190 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

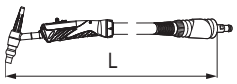
	TTB 400W F	TTB 500 W
DC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 400 A 100% D.C.[1] / 300 A	60% D.C.[1] / 500 A 100% D.C.[1] / 400 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 320 A 100% D.C.[1] / 250 A	60% D.C.[1] / 400 A 100% D.C.[1] / 300 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 4.0 mm 0.039 - 0.157 in.	1.6 - 6.4 mm 0.063 - 0.252 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

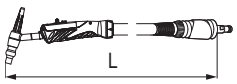
Gas-cooled hosepack – THP 160i, THP 220i, THP 260i

	THP 160i	THP 220i
DC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 160 A 60% D.C.[1] / 120 A 100% D.C.[1] / 90 A	35% D.C.[1] / 220 A 60% D.C.[1] / 170 A 100% D.C.[1] / 130 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 120 A 60% D.C.[1] / 90 A 100% D.C.[1] / 70 A	35% D.C.[1] / 180 A 60% D.C.[1] / 130 A 100% D.C.[1] / 100 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maximum permitted open circuit voltage (U_0)	113 V	113 V
Maximum permitted striking voltage (U_P)	10 kV	10 kV

		THP 260i
Welding current at 10 min / 40 °C (104 °F) DC		35% D.C.[1] / 260 A 60% D.C.[1] / 200 A 100% D.C.[1] / 150 A
Welding current at 10 min / 40 °C (104 °F) AC		35% D.C.[1] / 200 A 60% D.C.[1] / 160 A 100% D.C.[1] / 120 A
		Argon (Standard EN 439)
		4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maximum permitted open circuit voltage (U_0)		113 V
Maximum permitted striking voltage (U_P)		10 kV

Water-cooled hosepack – THP 300i, THP 400i, THP 500i

	THP 300i	THP 400i
DC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 300 A 100% D.C.[1] / 230 A	60% D.C.[1] / 400 A 100% D.C.[1] / 300 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 250 A 100% D.C.[1] / 190 A	60% D.C.[1] / 350 A 100% D.C.[1] / 270 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min} [W] [2]	650 / 650	950 / 950
Q_{min} [l/min] [gal./min]	1 0.26	1 0.26
p_{min} [bar] [psi]	3 43	3 43
p_{max} [bar] [psi]	5.5 79	5.5 79
Maximum permitted open circuit voltage (U_0)	113 V	113 V
Maximum permitted striking voltage (U_P)	10 kV	10 kV

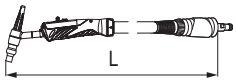
		THP 500i
DC welding current at 10 min / 40 °C (104 °F)		60% D.C.[1] / 500 A 100% D.C.[1] / 400 A
AC welding current at 10 min / 40 °C (104 °F)		60% D.C.[1] / 400 A 100% D.C.[1] / 300 A
		Argon (Standard EN 439)
		4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min} [W] [2]		1200 / 1750
Q_{min} [l/min] [gal./min]		1 0.26
p_{min} [bar] [psi]		3 43
p_{max} [bar] [psi]		5.5 79
Maximum permitted open circuit voltage (U_0)		113 V

		THP 500i
Maximum permitted striking voltage (U_P)		10 kV

Gas-cooled extension hosepack - HPT 220i G

	HPT 220i EXT G
DC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 220 A 60% D.C.[1] / 170 A 100% D.C.[1] / 130 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C.[1] / 180 A 60% D.C.[1] / 130 A 100% D.C.[1] / 100 A
	Argon (Standard EN 439)
	10.0 m 32 + 9.70 ft. + in.
Maximum permitted open circuit voltage (U_0)	113 V
Maximum permitted striking voltage (U_P)	10 kV

Water-cooled extension hosepack- HPT 400i

	HPT 400i EXT W
DC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 400 A 100% D.C.[1] / 300 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C.[1] / 350 A 100% D.C.[1] / 270 A
	Argon (Standard EN 439)
	10.0 m 32 + 9.70 ft. + in.
P_{min} [W] [2]	750 / 750
Q_{min} [l/min] [gal./min]	1 0.26
p_{min} [bar] [psi]	3 43
p_{max} [bar] [psi]	5.5 79
Maximum permitted open circuit voltage (U_0)	113 V
Maximum permitted striking voltage (U_P)	10 kV

Explanation of footnotes

1) D.C. = duty cycle

2) Lowest cooling power according to standard IEC 60974-2

Contenido

Seguridad

Seguridad

⚠ ¡PELIGRO!

Peligro por fallos del sistema y el trabajo que no es realizado de forma adecuada.
Esto puede resultar en lesiones personales graves y daños a la propiedad.
- ▶ Todo el trabajo y las funciones que se describen en este documento deben realizarse únicamente por personal calificado y capacitado.
- ▶ Lea y entienda este documento.
- ▶ Lea y entienda todo el Manual de instrucciones para los componentes del sistema, especialmente las normas de seguridad.

⚠ ¡PELIGRO!

Peligro por corriente eléctrica y peligro de lesiones provocadas por el electrodo de soldadura emergente.
Esto puede resultar en lesiones personales graves y daños a la propiedad.
- ▶ Cambie el interruptor de encendido de la fuente de corriente a - O -.
- ▶ Desconecte la fuente de corriente de la red.
- ▶ Asegúrese de que la fuente de corriente permanezca desconectada de la red hasta que haya hecho todo el trabajo.

⚠ ¡PELIGRO!

Peligro por corriente eléctrica.
Esto puede resultar en lesiones personales graves y daños a la propiedad.
- ▶ Todos los cables, plomos y juegos de cables deben siempre estar conectados de manera segura, sin daños, aislados correctamente, y debidamente dimensionados.

⚠ ¡PRECAUCIÓN!

Riesgo de quemaduras debido a los componentes de antorcha de soldadura calientes y al líquido de refrigeración.
Pueden ocurrir quemaduras graves.
- ▶ Permita que todos los componentes de la antorcha de soldadura y del líquido de refrigeración se enfríen a temperatura ambiente (+25 °C o +77 °F) antes de comenzar cualquier trabajo descrito en estos manuales de Instrucciones.

⚠ ¡PRECAUCIÓN!

Riesgo de daños por la operación sin líquido de refrigeración.
Puede resultar en daños graves a la propiedad.
- ▶ Nunca use antorchas de soldadura refrigeradas con agua sin líquido de refrigeración.
- ▶ El fabricante no es responsable por los daños que puedan provocarse por el uso inadecuado. En esos casos, todos los reclamos de garantía se consideran nulos.

⚠ **¡PRECAUCIÓN!**

Peligro por fuga del líquido de refrigeración.
Esto puede resultar en lesiones personales graves y daños a la propiedad.

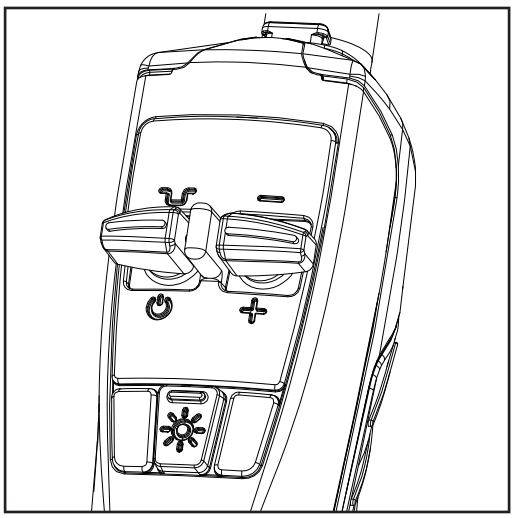
▶ Cuando se desconecta una antorcha de soldadura de una refrigeración o alimentador de alambre, siempre sellar los tubos del líquido de refrigeración usando el sello plástico fijado a la antorcha.

General

General

Las antorchas TIG son especialmente robustas y confiables. La manija tipo carcasa ergonómica y la distribución del peso óptima permite que trabaje sin cansarse.
Las antorchas de soldadura están disponibles como las unidades refrigeradas con agua y gas y pueden adaptarse para realizar una amplia variedad de tareas.
Las antorchas de soldadura están principalmente diseñadas para la producción de lote único y serie manual así como para uso en talleres.

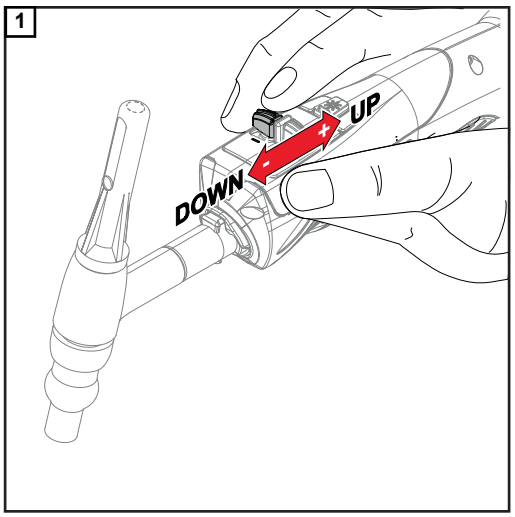
Antorcha con opción Up/Down



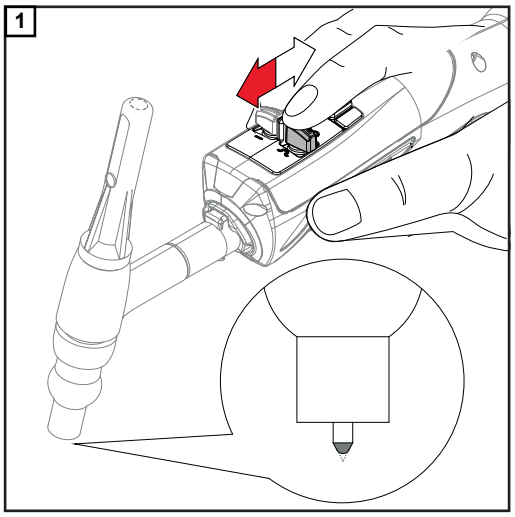
La antorcha con opción Up/Down tiene las siguientes funciones:

- Cambie la potencia de soldadura con la tecla up/down (+/-)
- Iluminación del área de soldadura a través de LED:
  Presionar el botón una vez - el LED se ilumina durante 5 segundos
  Mantener el botón presionado - el LED se ilumina continuamente
- Formación de calota en conexión con el proceso de soldadura de CA TIG
- Reducción intermedia en conexión con el modo de operación de 4 tiempos ($I_1 > I_2$)

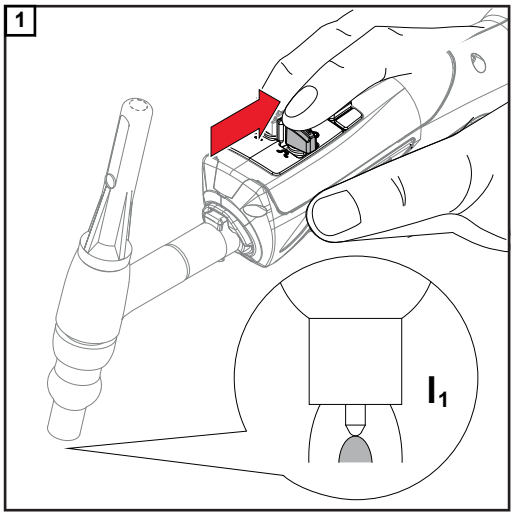
Cambiar la potencia de soldadura

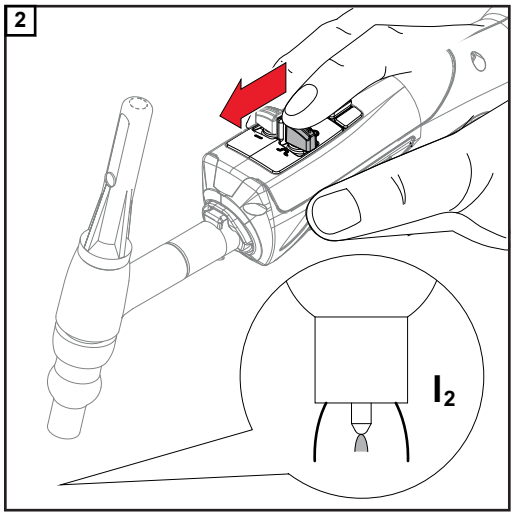


Formación de calota

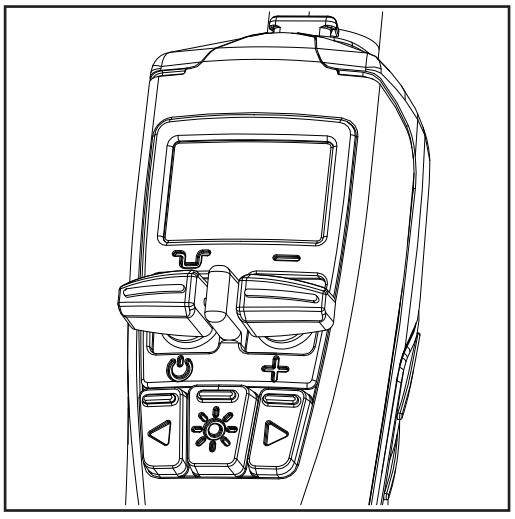


Reducción intermedia





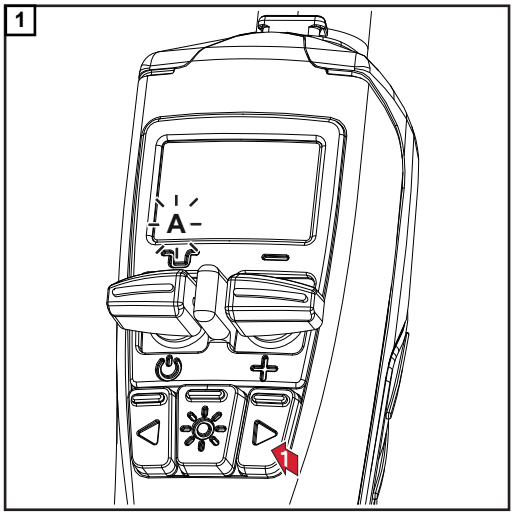
Antorcha de soldadura JobMaster

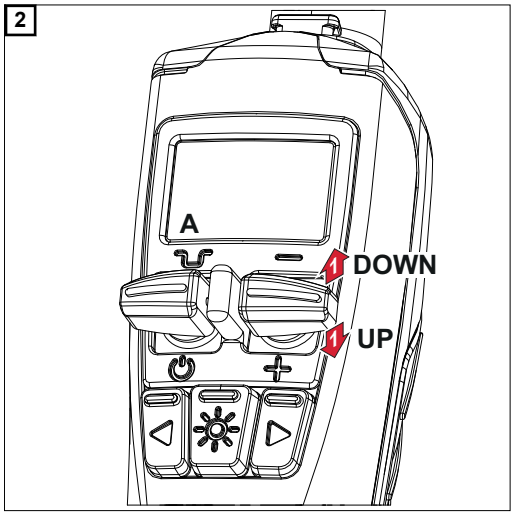


La antorcha de soldadura JobMaster tiene las siguientes funciones:

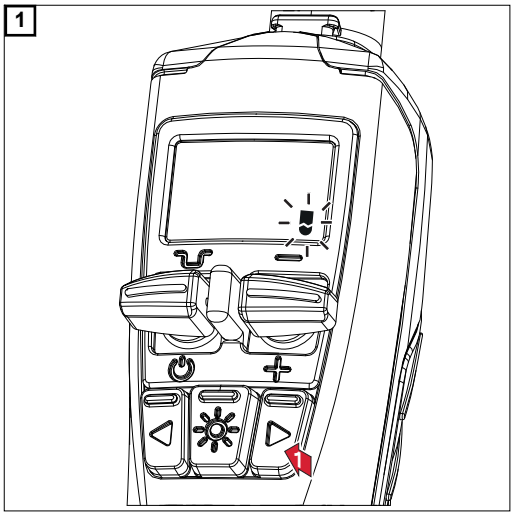
- Pantalla ergonómica y ajuste de parámetros esenciales directamente en la antorcha de soldadura
- Control óptimo del proceso de soldadura sin manipulación restringida
- Cambie la potencia de soldadura con la tecla up/down (+/-)
- Iluminación del área de soldadura a través de LED:
  Presionar el botón una vez - el LED se ilumina durante 5 segundos
  Mantener el botón presionado - el LED se ilumina continuamente
- Formación de calota en conexión con el proceso de soldadura de CA TIG
- Reducción intermedia en conexión con el modo de operación de 4 tiempos ($I_1 > I_2$)

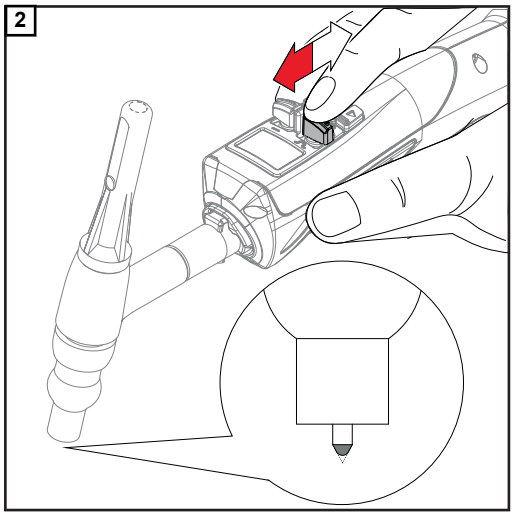
Cambiar la potencia de soldadura



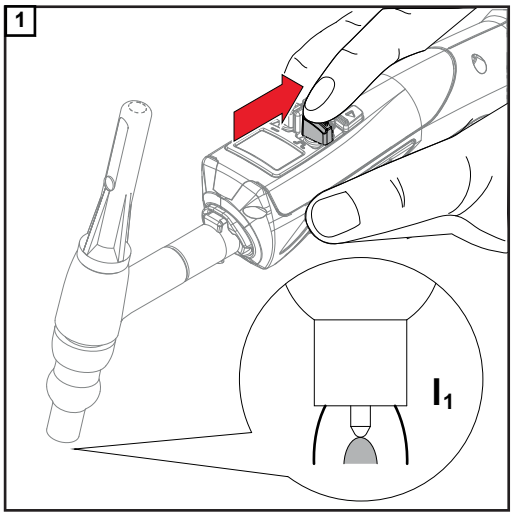


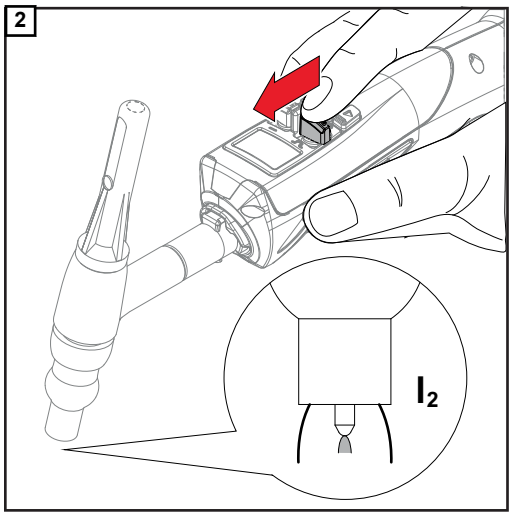
Formación de calota





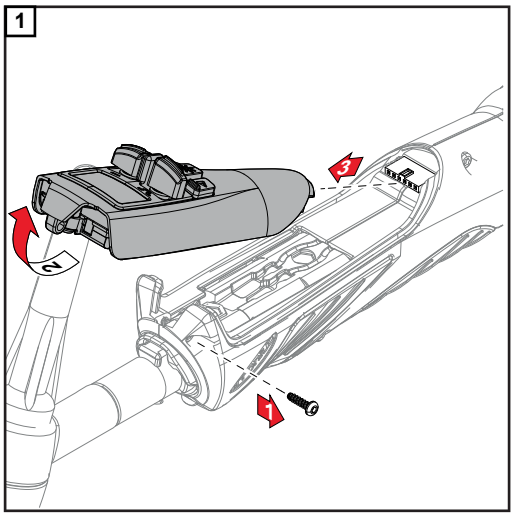
Reducción intermedia





Reemplazar la interface del usuario

1



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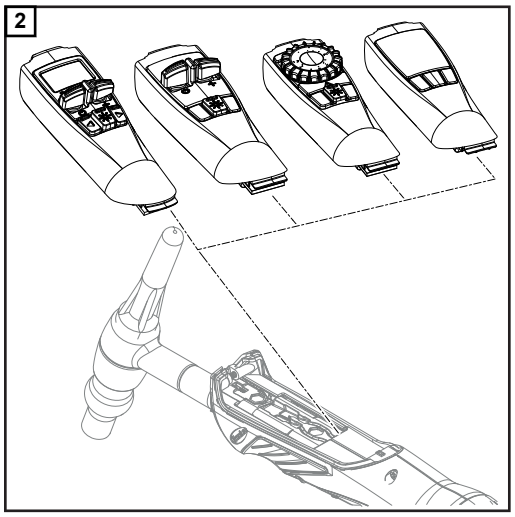

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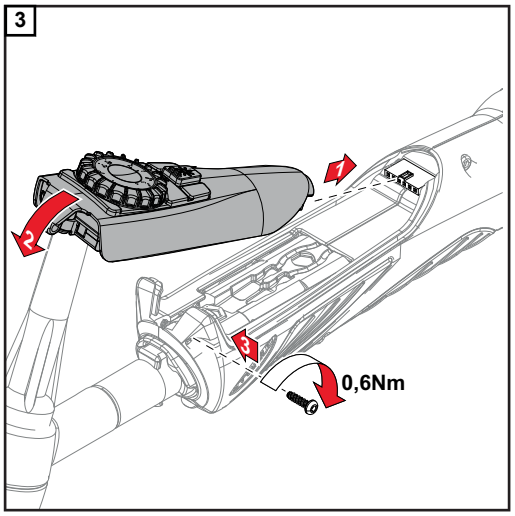
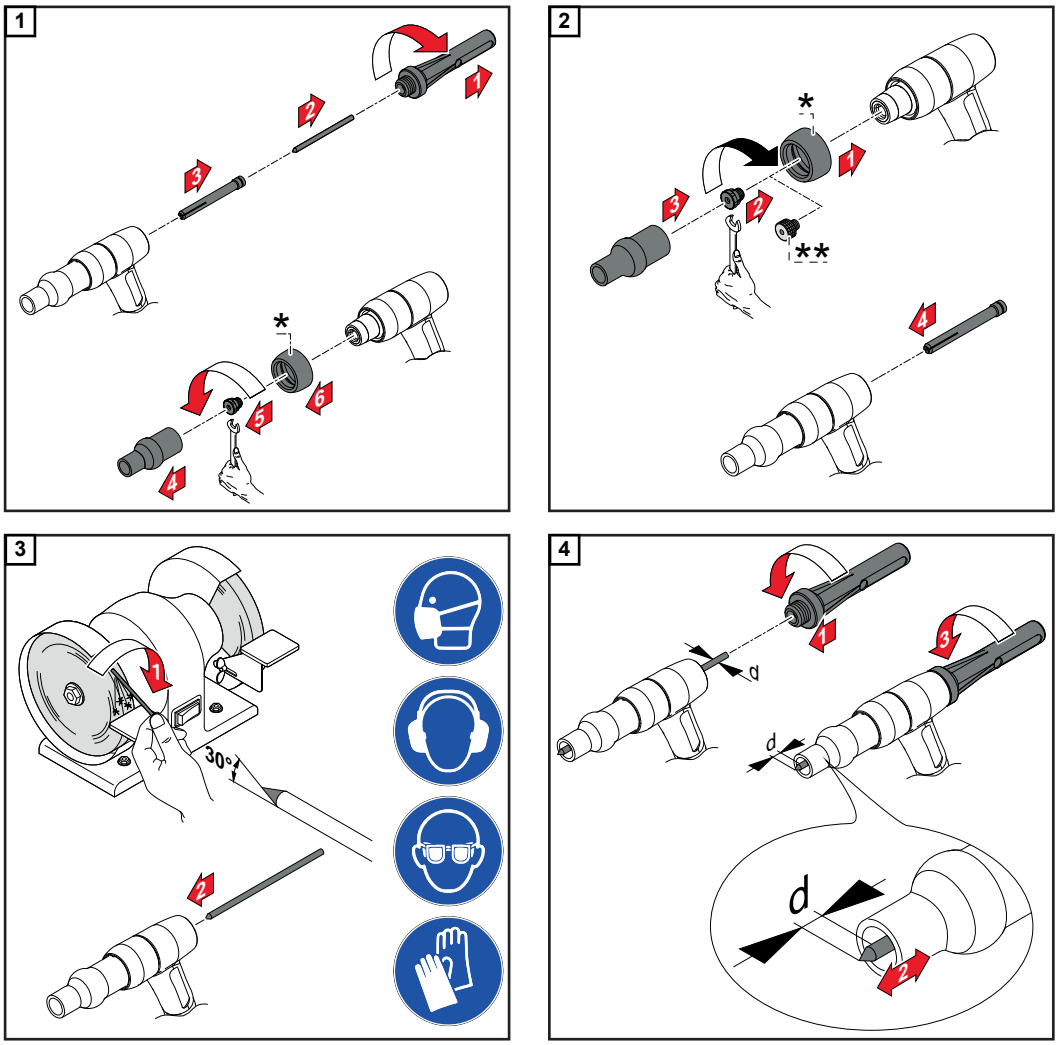


Cómo montar consumibles

Instalar consumibles, tipo A

Instalación de consumible, inyector de gas encajado tipo A



¡OBSERVACIÓN!

Solo apriete la calota de la antorcha lo suficiente para que el electrodo de tungsteno ya no se pueda mover con la mano.

* Junta de sellado de goma reemplazable solo para TTB 220 G/A

** Se pueden usar lentes de gas en vez de tuercas de retención, dependiendo del tipo de antorcha de soldadura.

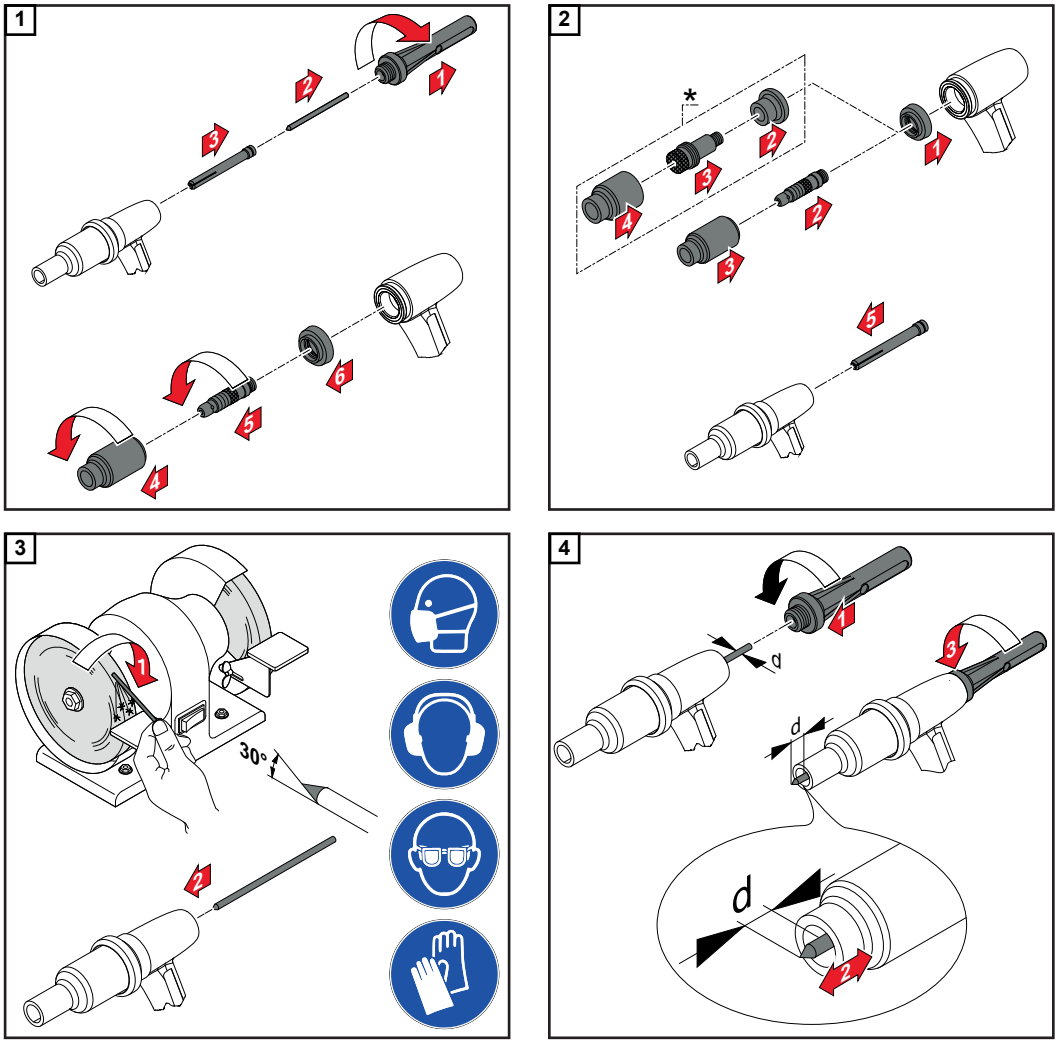
⚠ **¡PRECAUCIÓN!**

¡Riesgo de daños debido a un par de apriete excesivo!
Pueden ocasionarse daños en la rosca.

▶ Solo apriete la tuerca de retención o los lentes de gas suavemente.

Instalar consumibles, tipo P

Instalación de consumible, inyector de gas enroscado tipo P



¡OBSERVACIÓN!

Solo apriete la calota de la antorcha lo suficiente para que el electrodo de tungsteno ya no se pueda mover con la mano.

* Junta de sellado de goma reemplazable solo para TTB 220 G/P

** Se pueden usar lentes de gas en vez de tuercas de retención, dependiendo del tipo de antorcha de soldadura.

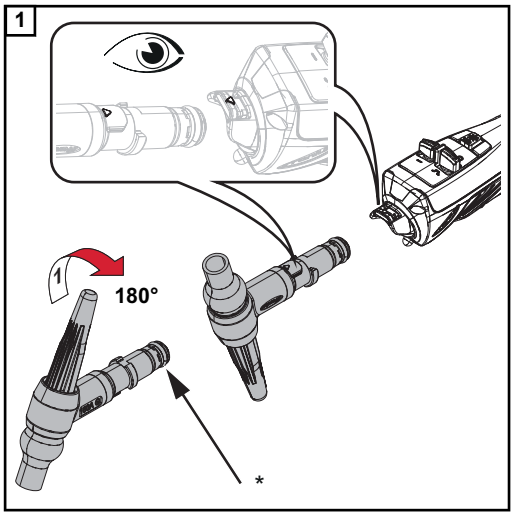
⚠ **¡PRECAUCIÓN!**

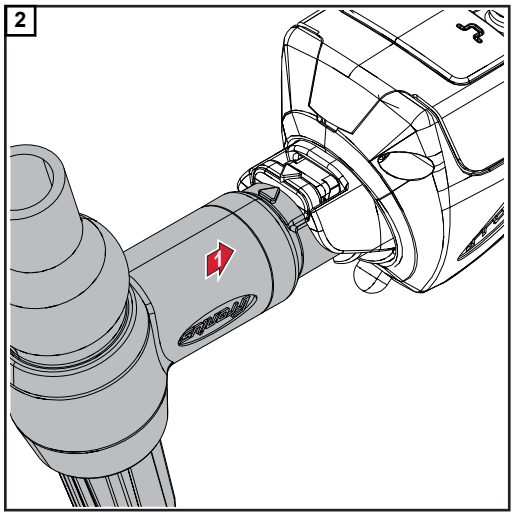
¡Riesgo de daños debido a un par de apriete excesivo!
Pueden ocasionarse daños en la rosca.

► Solo apriete la tuerca de retención o los lentes de gas suavemente.

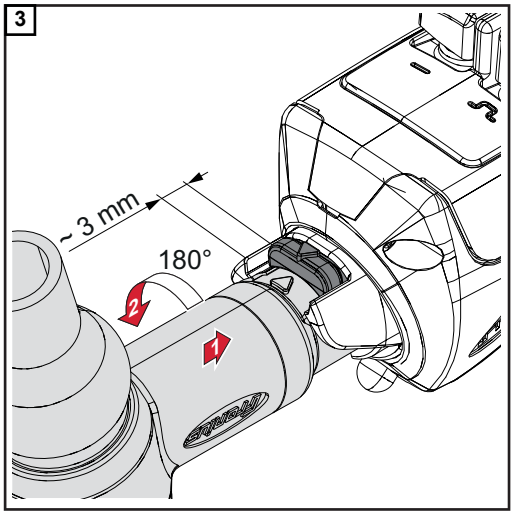
Instalación y puesta en servicio

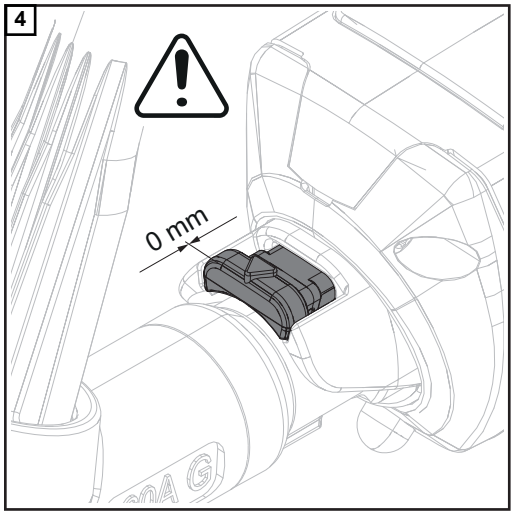
Fijar el cuello de la antorcha





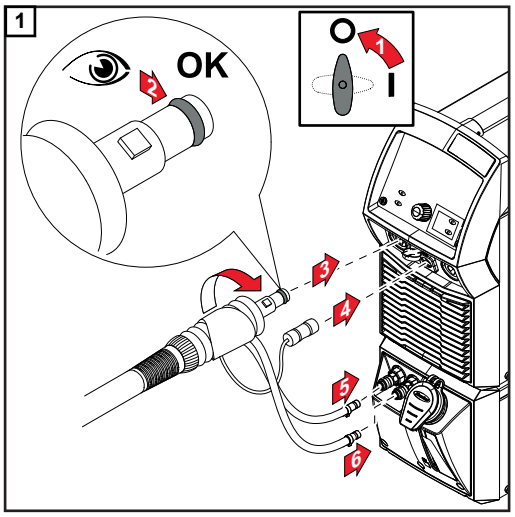
**¡Asegúrese de engrasar la junta tórica antes de la instalación!*





¡IMPORTANTE! Al instalar el cuello de la antorcha, asegúrese de empujarlo del todo hacia adentro y de que se fije en su lugar.

Conexión de la antorcha de soldadura a la fuente de poder y la unidad de enfriamiento



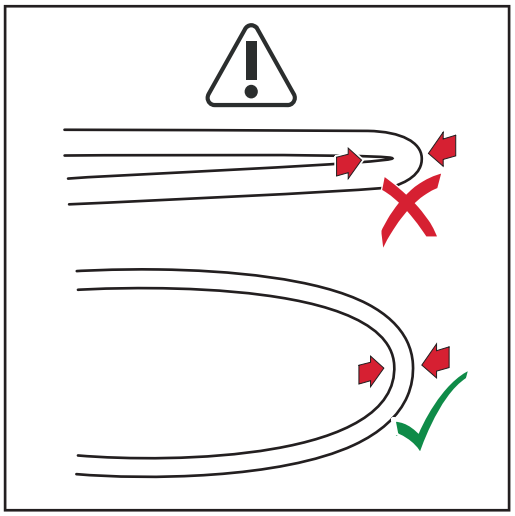
¡OBSERVACIÓN!

Antes de la puesta en servicio, revise el anillo de sellado en la conexión Euro y el nivel del líquido refrigerante.

Revise el caudal de líquido de refrigeración durante la soldadura en intervalos regulares.

Conectar la extensión juego de cables

La extensión juego de cables se proporciona con una bolsa de protección, en la cual se debe colocar la interface entre la extensión juego de cables y el juego de cables de la antorcha.



¡OBSERVACIÓN!

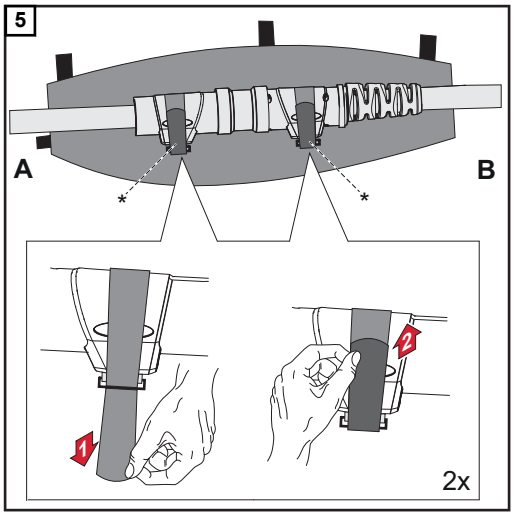
Al realizar las siguientes actividades, asegúrese de que los cables y tubos no estén atrapados, doblados, cortados o dañados de cualquier otra manera.

1 Coloque la bolsa de protección de forma que el logotipo de Fronius sea visible y que los bucles estén en la parte superior:
izquierda = lado de la fuente de poder (A)
derecha = lado de la antorcha de soldadura (B)

2 Abra la bolsa de protección:
- Coloque ambos tirones de cierre a la derecha tan lejos como lleguen
- Tire del extremo de la cinta inferior para sacarlo de los tirones de cierre

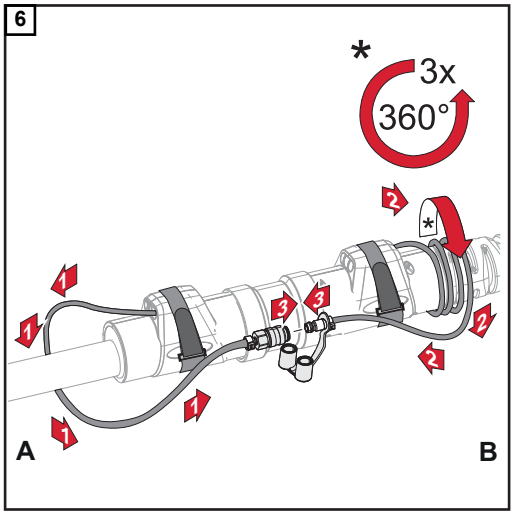
3 Enchufe las conexiones de energía/gas de la extensión juego de cables y del juego de cables de la antorcha una con otra (cierre de bayoneta)

4 Coloque la interface en el bolsillo interior de la bolsa de protección



** Tiras de velcro en el bolsillo interior (no se muestra el bolsillo interior)*

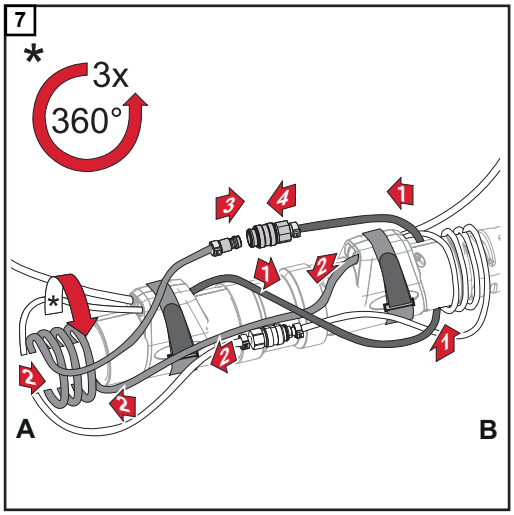
Asegure la interface en el bolsillo interior con 2 tiras de velcro



Enrute el tubo del líquido de refrigeración desde la extensión juego de cables hasta la interface como se muestra

Enrolle el tubo del líquido de refrigeración del juego de cables de la antorcha alrededor del juego de cables de la antorcha 3 veces y enrútelo hacia la interface

Conecte los tubos de líquido de refrigeración

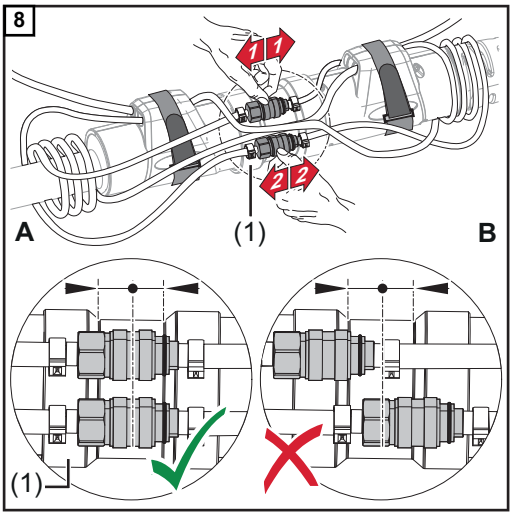


Enrute el segundo tubo de líquido de refrigeración desde el juego de cables de la antorcha hacia la extensión juego de cables como se muestra, enróllelo alrededor de la extensión juego de cables 3 veces y enrútelo de regreso a la interface

Enrute el segundo tubo del líquido de refrigeración desde la extensión juego de cables alrededor del juego de cables de la antorcha hasta la interface como se muestra

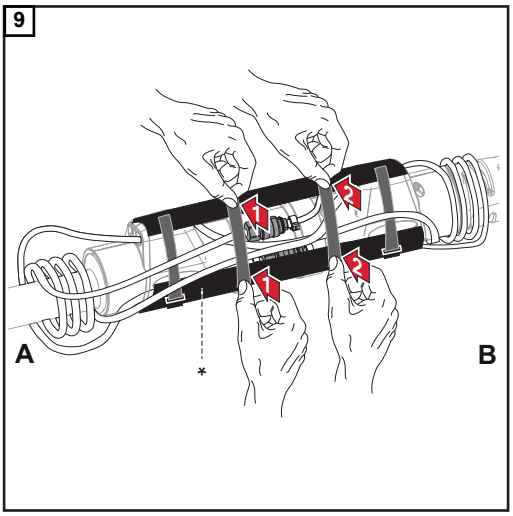
Conecte los tubos de líquido de refrigeración

8



Alinee las conexiones del líquido de refrigeración una con otra y en el centro del tubo aislante (1)

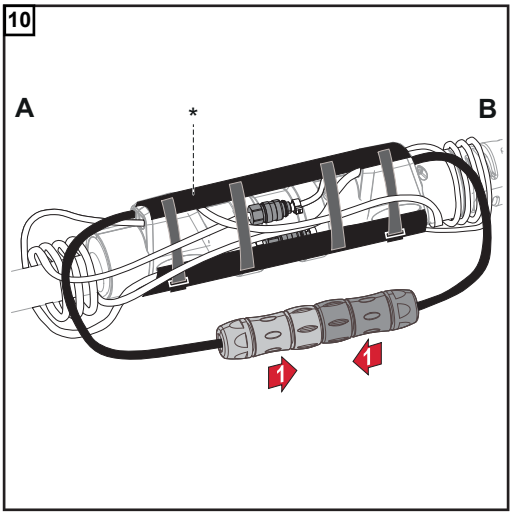
9



Fije las dos tiras de velcro proporcionadas en el bolsillo interior

** Bolsillo interior*

10



Conecte el TIG Multi Connector y colóquelo junto al bolsillo interior

** Bolsillo interior*

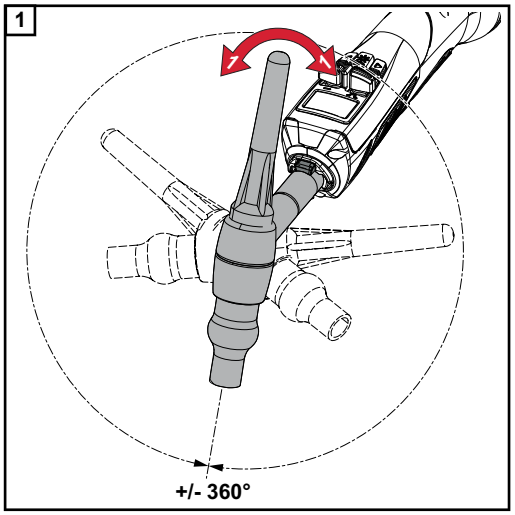
11 Cierre la bolsa de protección

¡OBSERVACIÓN!

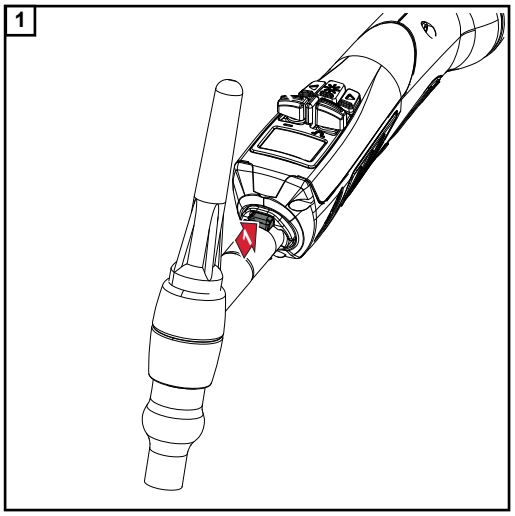
Al trabajar con extensiones juegos de cables enfriadas con agua, observe lo siguiente:

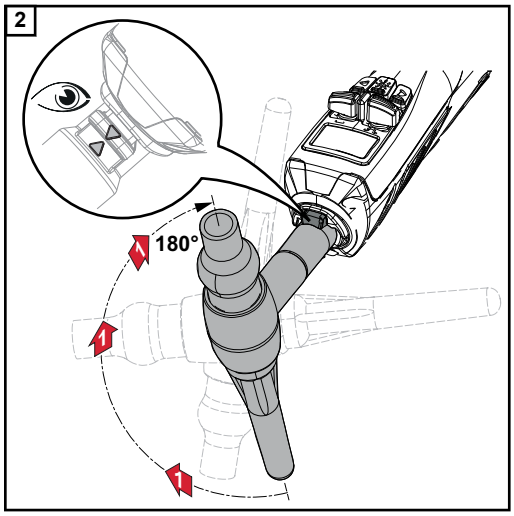
- ▶ Después de la puesta en servicio, en cuanto la fuente de poder en el depósito de refrigeración o en la unidad de enfriamiento muestre un buen flujo de retorno, asegúrese de que haya suficiente líquido de refrigeración en la unidad de enfriamiento.
- ▶ En conjunto con una unidad de enfriamiento MultiControl, un depósito de líquido de refrigeración completamente lleno puede rebalsar cuando el juego de cables se vacía, ¡lo que implica un riesgo de resbalones!
- ▶ ¡Siga el manual de instrucciones de la unidad de enfriamiento!

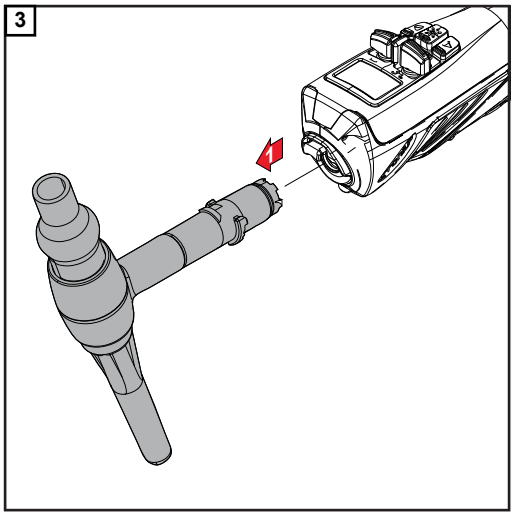
Cómo girar el cuello antorcha



Cambiar el cuello antorcha – antorchas de soldadura enfriadas con gas



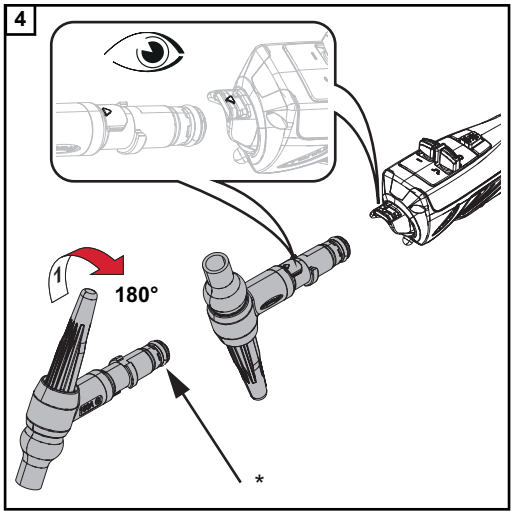


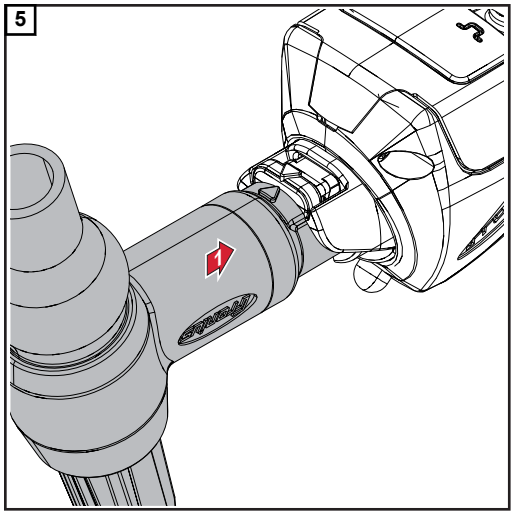


¡OBSERVACIÓN!

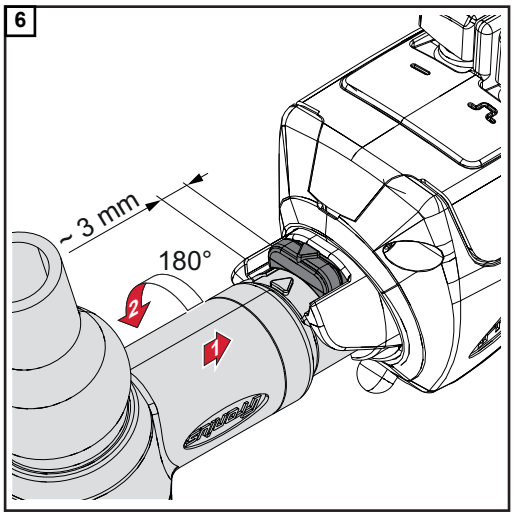
Al cambiar el cuello antorcha, asegúrese de que solo estén instalados los sistemas relacionados.

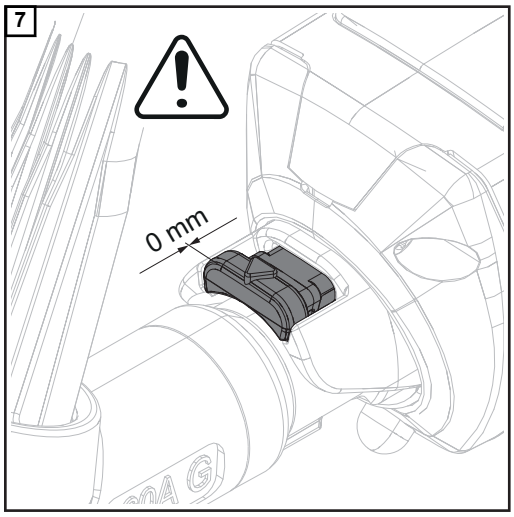
► No instale cuellos de antorcha enfriados con gas ni juegos de cables enfriados con agua o viceversa.





** ¡Asegúrese de engrasar la junta tórica antes de la instalación!*





¡IMPORTANTE! Al instalar el cuello antorcha, asegúrese de empujarlo del todo hacia adentro y de que se fije en su lugar.

Cambiar el cuello antorcha – antorchas de soldadura enfriadas con agua

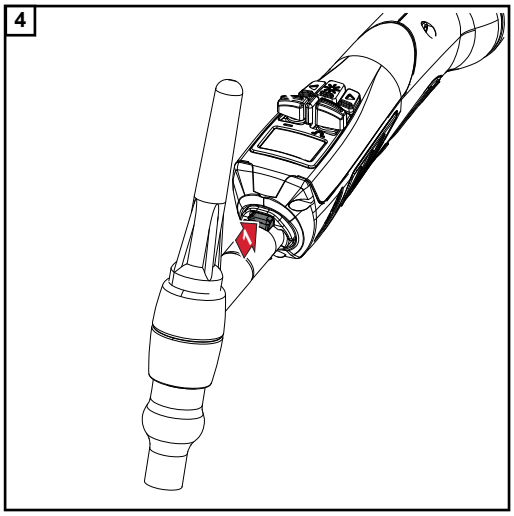
1 Apague la fuente de poder y desconéctela de la red;
espere la fase posterior al funcionamiento del sistema de refrigeración

2 Para una unidad de enfriamiento CU 600 MC:
vacíe el juego de cables de la antorcha usando la fuente de poder o la antorcha de soldadura

Para otras unidades de enfriamiento:
desconecte el tubo de suministro de líquido de refrigeración de la unidad de enfriamiento

3 Purgue el tubo de suministro del líquido de refrigeración con aire a presión de 4 bar máximo para que la mayoría del caudal líquido de refrigeración vuelva al depósito de refrigeración

4



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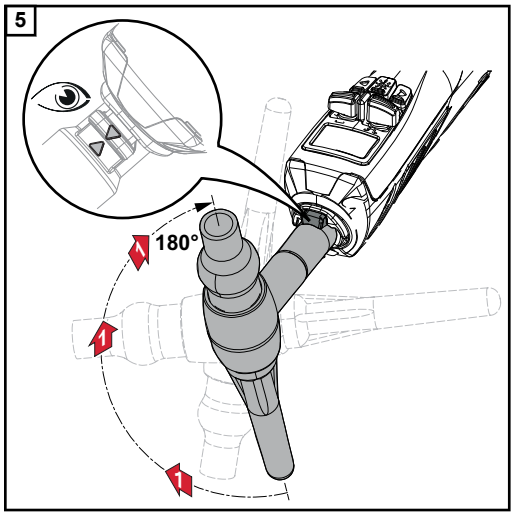

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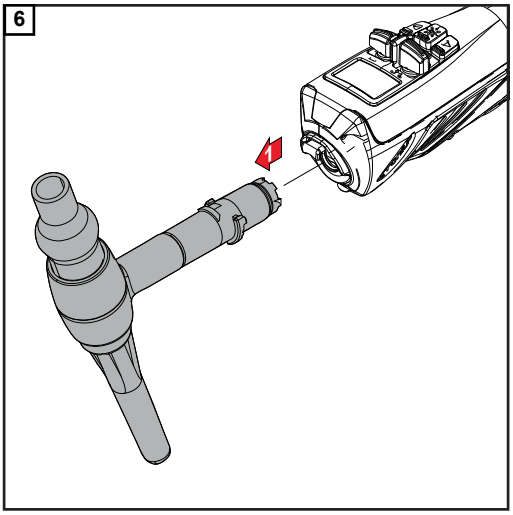


7 Limpie la interface del juego de cables con aire a presión

8 Seque el cuello antorcha con un trapo

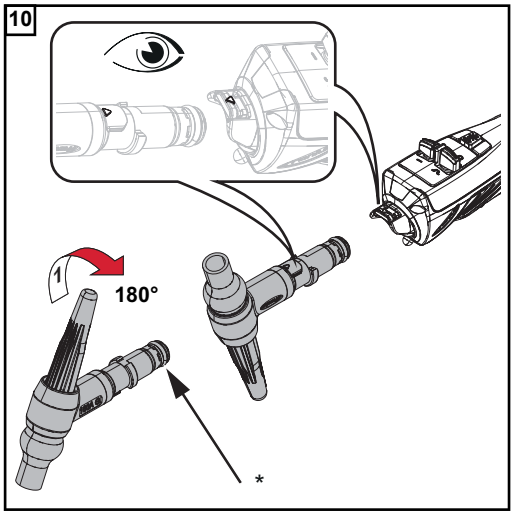
9 Fije la calota de seguridad en el cuello antorcha

¡OBSERVACIÓN!

Al cambiar el cuello antorcha, asegúrese de que solo estén instalados los sistemas relacionados.

▶ No instale cuellos de antorcha enfriados con gas ni juegos de cables enfriados con agua o viceversa.

10



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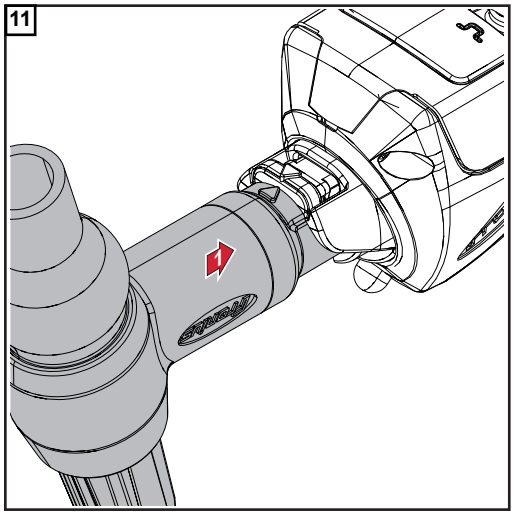
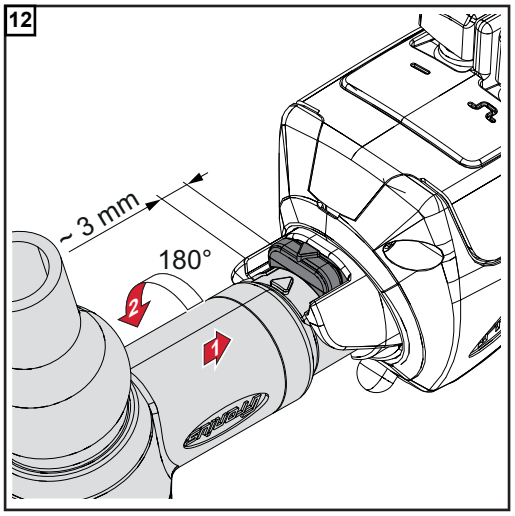


** ¡Asegúrese de engrasar la junta tórica antes de la instalación!*

12



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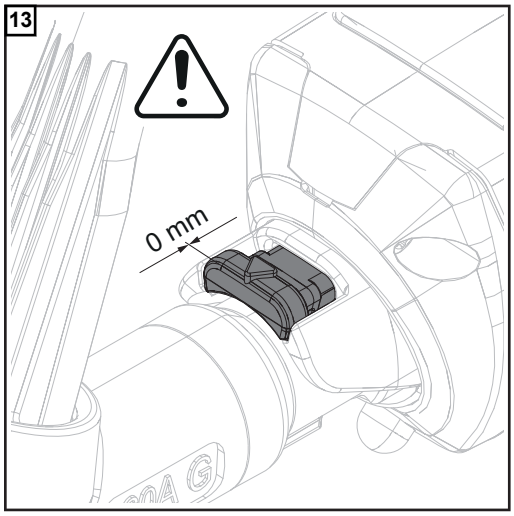


¡IMPORTANTE! Al instalar el cuello antorcha, asegúrese de empujarlo del todo hacia adentro y de que se fije en su lugar.

14 Conecte la fuente de poder a la red y enciéndala

15 Presione el botón test de gas en la fuente de poder

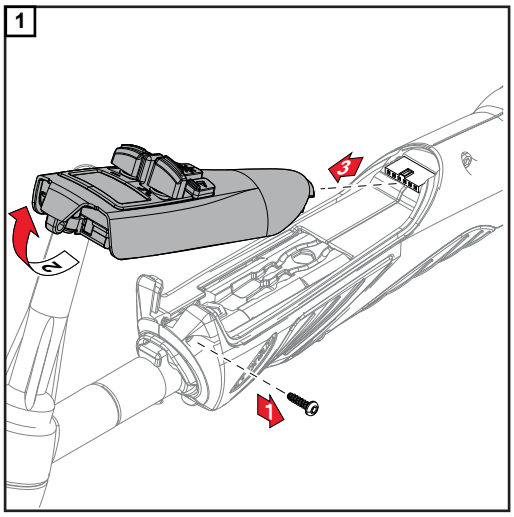
El gas protector fluye durante 30 s.

16 Revise el caudal líquido de refrigeración:
debe ser capaz de ver un caudal de retorno de líquido de refrigeración fuerte en el depósito de refrigeración.

17 Realice una soldadura de prueba y verifique la calidad del cordón de soldadura

Cómo evitar que se cambie el cuello antorcha

1



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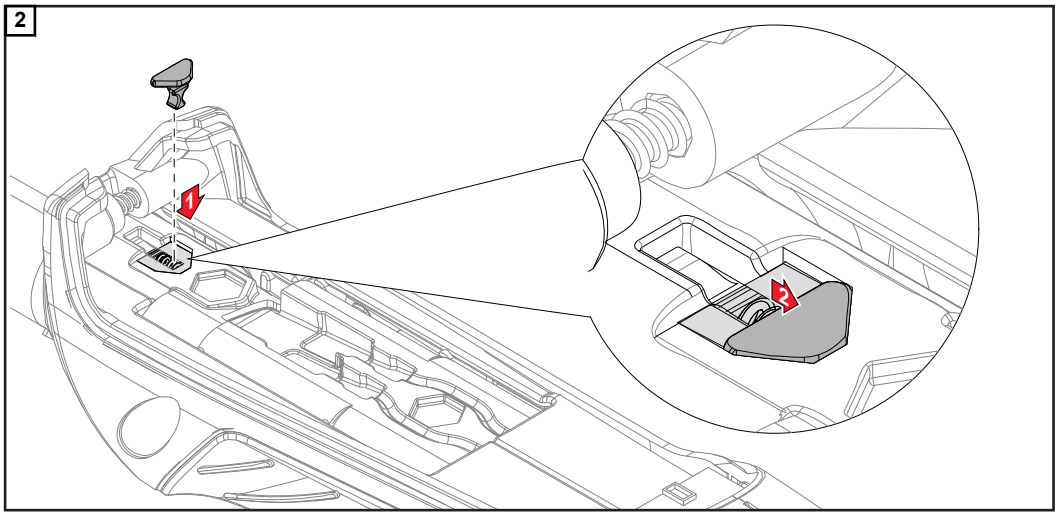

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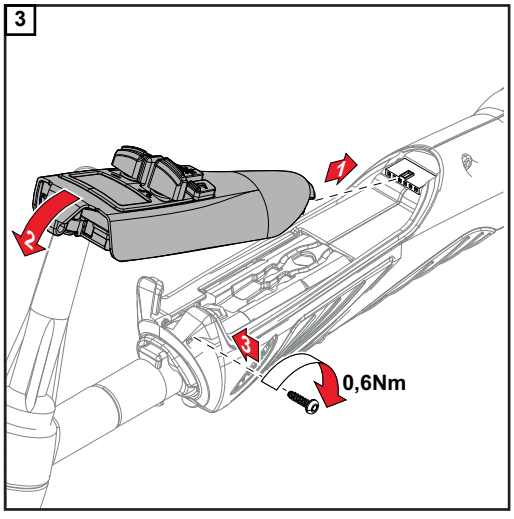


Notas sobre los cuellos de antorcha flexibles

General

Los cuellos de antorcha TIG pueden doblarse en todas las direcciones y, por ello, se adaptan individualmente a una amplia variedad de simulaciones y aplicaciones.
Por ejemplo, los cuellos de antorcha flexibles se usan en casos de accesibilidad limitada al componente o en posiciones de soldadura difíciles.
Sin embargo, el material de un cuello de antorcha flexible se debilita con cada cambio de forma, por lo que el número de veces que se puede doblar también es limitado.

La flexión y el número de flexiones se explican en las siguientes secciones.

Definición de la flexión del cuello de antorcha

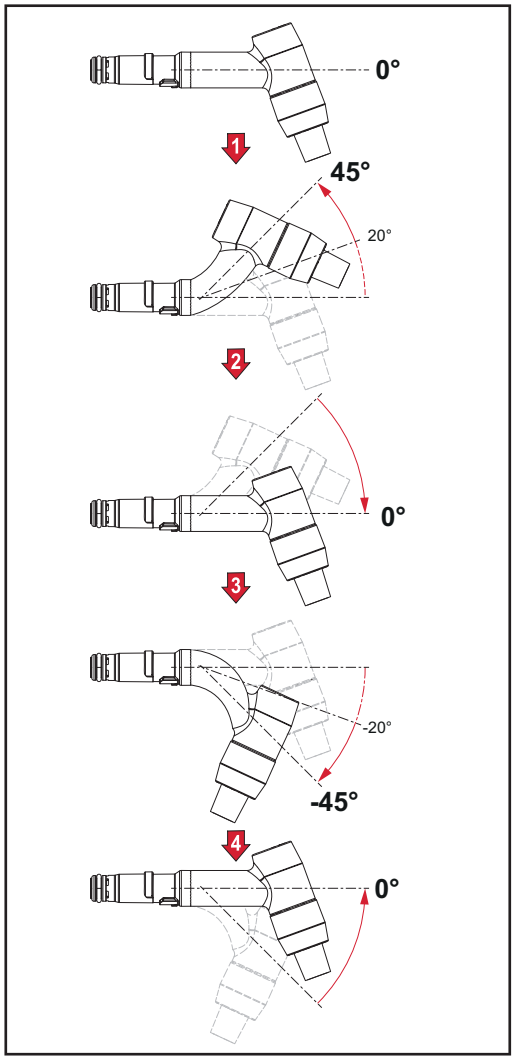
Una flexión es un cambio de forma único que se desvía de la forma original al menos 20°.

Se ha definido un radio de flexión lo más pequeño posible para que la acción de flexión no se produzca en unos pocos puntos determinados, sino de la forma más uniforme posible a lo largo de una gran longitud.
El radio de flexión no debe ser inferior a este.
El radio de flexión más pequeño posible es de 25 mm / 1 pulgada.

Una flexión no debe exceder un ángulo de flexión máximo.
El ángulo de flexión máximo es de 45°.

La flexión de nuevo a la forma original se considera una flexión en sí misma.

Ejemplo: Flexiones de 45°



Situación inicial: 0°

Movimiento de 0° a 45° hacia arriba
= Primera flexión

Movimiento de 45° de regreso a 0°
= Segunda flexión

Movimiento de 0° a 45° hacia abajo
= Tercera flexión

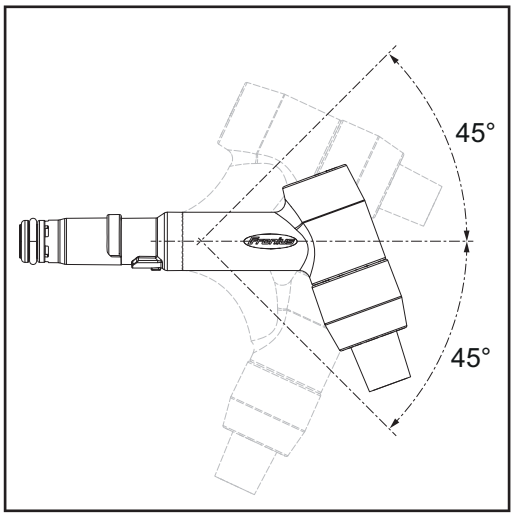
Movimiento de 45° de regreso a 0°
= Cuarta flexión

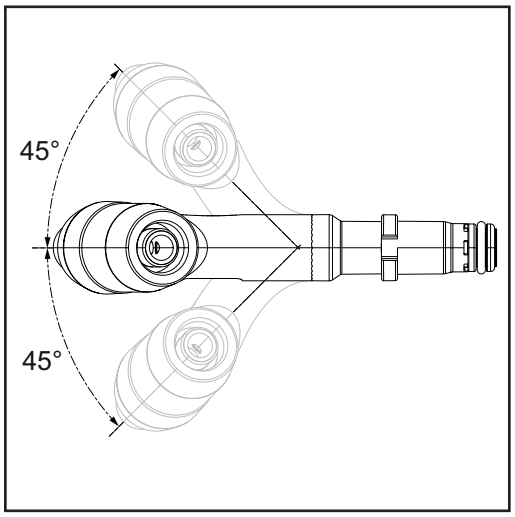
Número máximo de flexiones del cuello de antorcha

Teniendo en cuenta un radio de flexión de ≥ 25 mm / 1 pulgada y un ángulo de flexión máximo de 45°, el siguiente número de flexiones es posible:

- Antorchas de soldadura refrigeradas por gas flexionadas al menos 1000 veces
- Antorchas de soldadura refrigeradas por agua flexionadas al menos 200 veces

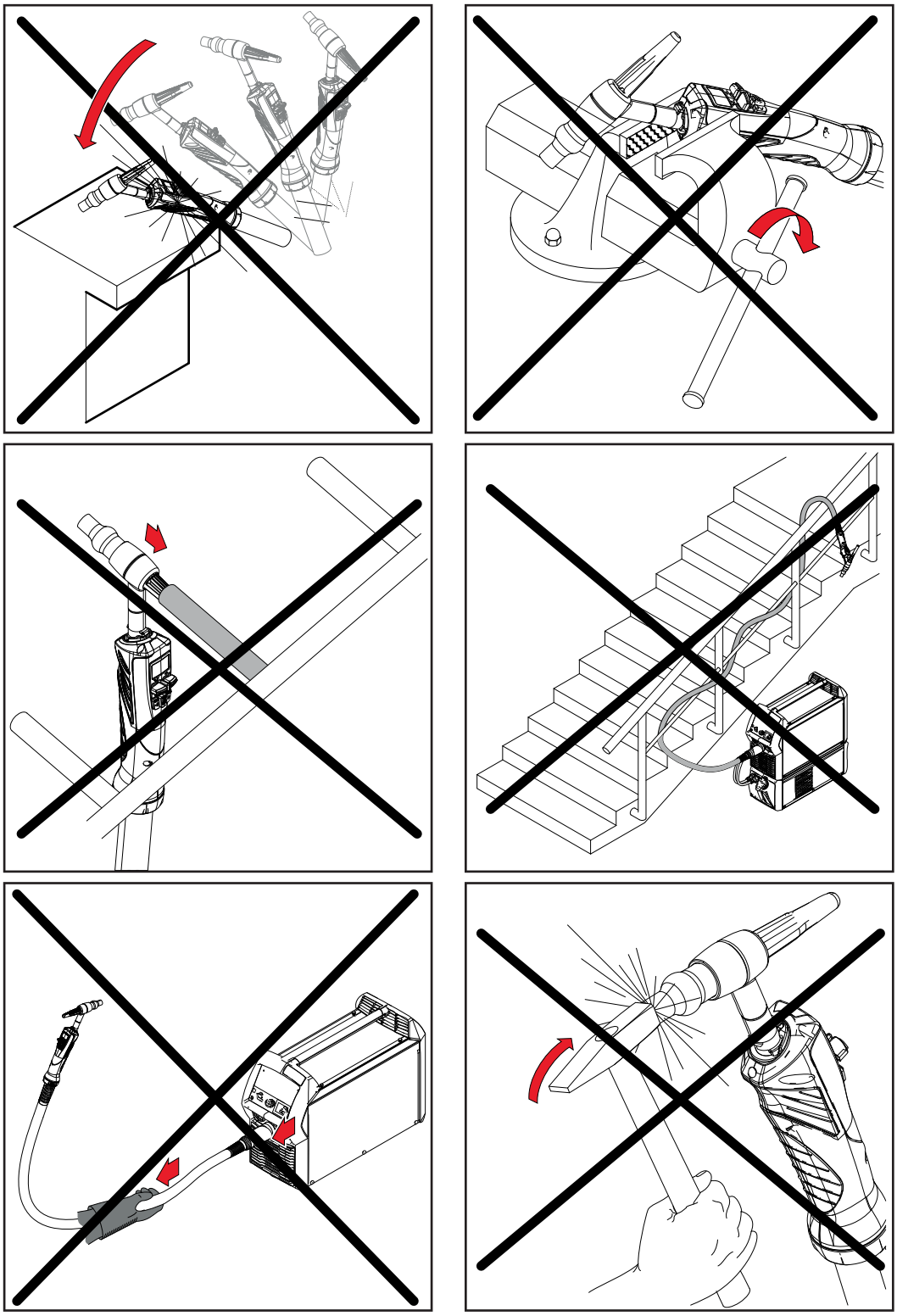
Posibilidades de flexión





Cuidado, mantenimiento y desecho

General



Mantenimiento en cada puesta en servicio

- Revise los consumibles, reemplace los consumibles dañados
- Purgue la tobera de gas de proyecciones de soldadura

Además de llevar a cabo la lista de pasos antes mencionada en cada puesta en servicio, para las antorchas de soldadura refrigeradas con agua:

- Asegúrese de que todas las conexiones estén cerradas herméticamente
- Asegúrese de que haya un caudal de retorno de líquido de refrigeración adecuado

Desecho

Los materiales deben ser desechados de acuerdo con las normativas nacionales y locales válidas.

Solución de problemas

Solución de problemas

La antorcha de soldadura no se puede conectar

Causa: Cierre de bayoneta inclinado

Solución: Reemplazar cierre de bayoneta

Sin corriente de soldadura

Fuente de corriente encendida, la indicación de fuente de corriente encendida, gas protector presente

Causa: Conexión a tierra incorrecta

Solución: Establecer conexión a tierra adecuada

Causa: Cable de alimentación en antorcha de soldadura interrumpida

Solución: Reemplazar antorcha de soldadura

Causa: Electrodo de tungsteno flojo

Solución: Apretar electrodo de tungsteno con una calota de antorcha

Causa: Consumibles flojos

Solución: Apretar consumibles

Sin función después de presionar el pulsador de la antorcha

Fuente de corriente encendida, la indicación de fuente de corriente encendida, gas protector presente

Causa: Conector de alimentación no conectado

Solución: Conectar conector de alimentación

Causa: Antorcha de soldadura o cable de control de antorcha de soldadura dañada

Solución: Reemplazar antorcha de soldadura

Causa: Conexiones “pulsador de la antorcha/cable de control/fuente de corriente” dañadas

Solución: Revisar conexión / enviar fuente de corriente o antorcha de soldadura al servicio técnico

Causa: Circuito impreso en antorcha de soldadura dañada

Solución: Reemplazar circuito impreso

Descarga disruptiva de HF en junta tórica en conexión Euro

Causa: Conexión de antorcha de soldadura sin sellar

Solución: Reemplazar junta tórica del cierre de bayoneta

Descarga de HF en manija tipo carcasa

Causa: Juego de cables sin sellar

Solución: Reemplazar el juego de cables

Causa: Conexión de tubo de gas protector al cuello antorcha sin sellar

Solución: Ajustar y sellar el tubo

Sin gas protector

Todas las otras funciones presentes

Causa: Cilindro de gas vacío

Solución: Cambiar cilindro de gas

Causa: Regulador de presión de gas dañado

Solución: Reemplazar regulador de presión de gas

Causa: Tubo de gas doblado, dañado o no vinculado

Solución: Conectar y enderezar tubo de gas. Reemplazar tubo de gas dañado

Causa: Antorcha de soldadura dañada

Solución: Reemplazar antorcha de soldadura

Causa: Electroválvula de gas dañada

Solución: Contactar al servicio técnico (una vez reemplazada la electroválvula de gas)

Propiedades de soldadura de baja calidad

Causa: Parámetros de soldadura incorrectos

Solución: Revisar parámetros

Causa: Conexión a tierra incorrecta

Solución: Revisar la polaridad de la conexión a tierra y el borne de conexión

La antorcha de soldadura se recalienta

Causa: Antorcha de soldadura dimensionada inadecuadamente

Solución: Observar la duración de ciclo de trabajo y los límites de carga

Causa: Para sistemas refrigerados con agua solamente: Caudal líquido de refrigeración demasiado bajo

Solución: Revisar el nivel de agua, el caudal líquido de refrigeración, la contaminación del agua, etc. Bomba de refrigeración bloqueada: Conecte el eje de la bomba de refrigeración en la glándula con un destornillador

Causa: Para sistemas refrigerados con agua solamente: El parámetro "Refrigeración Ctrl" está en "OFF".

Solución: En el menú Configuración, establezca el parámetro "Refrigeración Ctrl” en "Aut" o "ON".

Porosidad de cordón de soldadura

Causa: Formación de proyecciones en la tobera de gas, provoca protección de gas inadecuada para el cordón de soldadura

Solución: Remover proyecciones de soldadura

Causa: Agujeros en el tubo de gas o conexión de tubo de gas imprecisa

Solución: Reemplazar tubo de gas

Causa: Junta tórica en el conector central cortada o dañada

Solución: Reemplazar junta tórica

Causa: Humedad/condensación en la línea de gas

Solución: Secar línea de gas

Causa: Caudal de gas demasiado fuerte o débil

Solución: Corregir caudal de gas

Causa: Cantidad inadecuada de gas al comienzo o final de soldadura

Solución: Aumentar el preflujo de gas y el postflujo de gas

Causa: Se aplica demasiado líquido antiproyecciones

Solución: Eliminar exceso de líquido antiproyecciones / aplicar menos líquido antiproyecciones

Propiedades de encendido deficientes

Causa: Electrodo de tungsteno inadecuado (por ejemplo: electrodo WP para soldadura CC)

Solución: Usar electrodo de tungsteno adecuado

Causa: Consumibles flojos

Solución: Atornillar bien los consumibles

Tobera de gas rajada

Causa: El electrodo de tungsteno no está lo suficientemente afuera de la tobera de gas

Solución: Hacer que el electrodo de tungsteno esté más afuera de la tobera de gas

Datos técnicos

General

Este producto cumple con los requisitos establecidos en la norma IEC 60974-7.

¡OBSERVACIÓN!

Las especificaciones de la corriente de soldadura son aplicables únicamente utilizando los consumibles estándar.
Al usar lentes de gas y toberas de gas más cortas, la corriente de soldadura se reduce.

¡OBSERVACIÓN!

Para cuellos antorcha refrigerados con gas, las especificaciones de la corriente de soldadura son aplicables únicamente a partir de una longitud de cuello antorcha de L ≥ 65 mm.
Al utilizar cuellos antorcha más cortos, la corriente de soldadura se reduce en un 30 %.

¡OBSERVACIÓN!

Al soldar con el límite de potencia de la antorcha de soldadura, use electrodos de tungsteno y diámetros de abertura de la tobera de gas más grandes para incrementar la vida útil de los consumibles.
Tenga en cuenta la intensidad de corriente, el equilibrio de CA y la compensación de la corriente de CA como factores para mejorar el rendimiento.

Cuello antorcha refrigerado con gas - TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G / F	TTB 220 G
Corriente de soldadura de CC a 10 min / 40 °C (104 °F)	35 % C.C.[1] / 80 A 60 % C.C.[1] / 60 A 100 % C.C.[1] / 50 A	35 % C.C.[1] / 160 A 60 % C.C.[1] / 120 A 100 % C.C.[1] / 90 A	35 % C.C.[1] / 220 A 60 % C.C.[1] / 170 A 100 % C.C.[1] / 130 A
Corriente de soldadura de CA a 10 min / 40 °C (104 °F)	35 % C.C.[1] / 30 A	35 % C.C.[1] / 120 A 60 % C.C.[1] / 90 A 100 % C.C.[1] / 70 A	35 % C.C.1) / 180 A 60 % C.C.1) / 130 A 100 % C.C.1) / 100 A
	Argón (Estándar EN 439)	Argón (Estándar EN 439)	Argón (Estándar EN 439)
	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 4.0 mm 0.039 - 0.158 in.

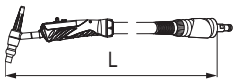
	TTB 220 A G F	TTB 220 P G F	TTB 260 G
Corriente de soldadura de CC a 10 min / 40 °C (104 °F)	35 % C.C.[1] / 220 A 60 % C.C.[1] / 170 A 100 % C.C.[1] / 130 A	30 % C.C.[1]/ 220 A 60 % C.C.[1] / 160 A 100 % C.C.[1] / 130 A	35 % C.C.[1] / 260 A 60 % C.C.[1] / 200 A 100 % C.C.[1] / 150 A
Corriente de soldadura de CA a 10 min / 40 °C (104 °F)	35 % C.C.[1] / 180 A 60 % C.C.[1]/ 120 A 100 % C.C.[1] / 100 A	30 % C.C.[1] / 170 A 60 % C.C.[1] / 120 A 100 % C.C.[1] / 100 A	35 % C.C.[1] / 200 A 60 % C.C.[1] / 160 A 100 % C.C.[1] / 120 A
	Argón (Estándar EN 439)	Argón (Estándar EN 439)	Argón (Estándar EN 439)
	1.0 - 4.0 mm 0.039 - 0.158 in.	1.0 - 4.0 mm 0.039 - 0.158 in.	1.6 - 6.4 mm 0.063 - 0.252 in.

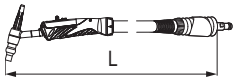
Cuello antorcha refrigerado con agua - TTB 180, TTB 300, TTB 400, TTB 500

	TTB 180 W	TTB 300 W
Corriente de soldadura de CC a 10 min / 40 °C (104 °F)	60 % C.C.[1] / 180 A 100 % C.C.[1] / 140 A	60 % C.C.[1] / 300 A 100 % C.C.[1] / 230 A
Corriente de soldadura de CA a 10 min / 40 °C (104 °F)	60 % C.C.[1] / 140 A 100 % C.C.[1] / 110 A	60 % C.C.[1] / 250 A 100 % C.C.[1] / 190 A
	Argón (Estándar EN 439)	Argón (Estándar EN 439)
	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.
$Q_{mín}$	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

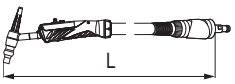
	TTB 400W F	TTB 500 W
Corriente de soldadura de CC a 10 min / 40 °C (104 °F)	60 % C.C.[1] / 400 A 100 % C.C.[1] / 300 A	60 % C.C.[1] / 500 A 100 % C.C.[1] / 400 A
Corriente de soldadura de CA a 10 min / 40 °C (104 °F)	60 % C.C.[1] / 320 A 100 % C.C.[1] / 250 A	60 % C.C.[1] / 400 A 100 % C.C.[1] / 300 A
	Argón (Estándar EN 439)	Argón (Estándar EN 439)
	1.0 - 4.0 mm 0.039 - 0.157 in.	1.6 - 6.4 mm 0.063 - 0.252 in.
$Q_{mín}$	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

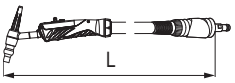
Juego de cables refrigerado por gas – THP 160i, THP 220i, THP 260i

	THP 160i	THP 220i
Corriente de soldadura DC a 10 min / 40 °C (104 °F)	35 % D.C.[1] / 160 A 60 % D.C.[1] / 120 A 100 % D.C.[1] / 90 A	35 % D.C.[1] / 220 A 60 % D.C.[1] / 170 A 100 % D.C.[1] / 130 A
Corriente de soldadura AC a 10 min / 40 °C (104 °F)	35 % D.C.[1] / 120 A 60 % D.C.[1] / 90 A 100 % D.C.[1] / 70 A	35 % D.C.[1] / 180 A 60 % D.C.[1] / 130 A 100 % D.C.[1] / 100 A
	Argón (Estándar EN 439)	Argón (Estándar EN 439)
	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft + in.	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Circuito de voltaje abierto máximo permitido (U_0)	113 V	113 V
Tensión de cebado máxima permitida (U_P)	10 kV	10 kV

		THP 260i
Corriente de soldadura a 10 min / 40 °C (104 °F) DC		35 % D.C.[1] / 260 A 60 % D.C.[1] / 200 A 100 % D.C.[1] / 150 A
Corriente de soldadura a 10 min / 40 °C (104 °F) AC		35 % D.C.[1] / 200 A 60 % D.C.[1] / 160 A 100 % D.C.[1] / 120 A
		Argón (Estándar EN 439)
		4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Circuito de voltaje abierto máximo permitido (U_0)		113 V
Tensión de cebado máxima permitida (U_P)		10 kV

Juego de cables refrigerado por agua – THP 300i, THP 400i, THP 500i

	THP 300i	THP 400i
Corriente de soldadura DC a 10 min / 40 °C (104 °F)	60 % D.C.[1] / 300 A 100 % D.C.[1] / 230 A	60 % D.C.[1] / 400 A 100 % D.C.[1] / 300 A
Corriente de soldadura AC a 10 min / 40 °C (104 °F)	60 % D.C.[1] / 250 A 100 % D.C.[1] / 190 A	60 % D.C.[1] / 350 A 100 % D.C.[1] / 270 A
	Argón (Estándar EN 439)	Argón (Estándar EN 439)
	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min}  [W] [2]	650 / 650	950 / 950
Q_{min}  [l/min] [gal./min]	1 0.26	1 0.26
p_{min}  [bar] [psi]	3 43	3 43
p_{max}  [bar] [psi]	5.5 79	5.5 79
Circuito de voltaje abierto máximo permitido (U_0)	113 V	113 V
Tensión de cebado máxima permitida (U_P)	10 kV	10 kV

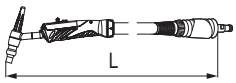
		THP 500i
Corriente de soldadura DC a 10 min / 40 °C (104 °F)		60 % D.C.[1] / 500 A 100 % D.C.[1] / 400 A
Corriente de soldadura AC a 10 min / 40 °C (104 °F)		60 % D.C.[1] / 400 A 100 % D.C.[1] / 300 A
		Argón (Estándar EN 439)
		4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min}  [W] [2]		1200 / 1750
Q_{min}  [l/min] [gal./min]		1 0.26
p_{min}  [bar] [psi]		3 43
p_{max}  [bar] [psi]		5.5 79

		THP 500i
Circuito de voltaje abierto máximo permitido (U_0)		113 V
Tensión de cebado máxima permitida (U_P)		10 kV

Extensión juego de cables refrigerado con gas - HPT 220i G

	HPT 220i EXT G
Corriente de soldadura de CC a 10 min / 40 °C (104 °F)	35 % C.C.[1] / 220 A 60 % C.C.[1] / 170 A 100 % C.C.[1] / 130 A
Corriente de soldadura de CA a 10 min / 40 °C (104 °F)	35 % C.C.[1] / 180 A 60 % C.C.[1] / 130 A 100 % C.C.[1] / 100 A
	Argón (Estándar EN 439)
	10.0 m 32 + 9.70 ft + in.
Circuito de voltaje abierto máximo permitido (U_0)	113 V
Tensión de cebado máxima permitida (U_P)	10 kV

Extensión juego de cables refrigerado con agua- HPT 400i

	HPT 400i EXT W
Corriente de soldadura de CC a 10 min / 40 °C (104 °F)	60 % C.C.[1] / 400 A 100 % C.C.[1] / 300 A
Corriente de soldadura de CA a 10 min / 40 °C (104 °F)	60 % C.C.[1] / 350 A 100 % C.C.[1] / 270 A
	Argón (Estándar EN 439)
	10.0 m 32 + 9.70 ft + in.
P_{min} [W] [2]	750 / 750
Q_{min} [l/min] [gal./min]	1 0.26
p_{min} [bar] [psi]	3 43
p_{max} [bar] [psi]	5.5 79

	HPT 400i EXT W
Circuito de voltaje abierto máximo permitido (U_0)	113 V
Tensión de cebado máxima permitida (U_P)	10 kV

Explicación de las notas al pie

1) D.C. = ciclo de trabajo

2) Capacidad de refrigeración más baja según la norma IEC 60974-2

Sommaire

Sécurité

Sécurité

⚠ AVERTISSEMENT!

Danger en cas d'erreur de manipulation et d'erreur en cours d'opération.
Cela peut entraîner des dommages corporels et matériels graves.
- ▶ Toutes les fonctions et tous les travaux décrits dans le présent document doivent uniquement être exécutés par du personnel qualifié.
- ▶ Le présent document doit être lu et compris.
- ▶ Toutes les instructions de service des composants périphériques, en particulier les consignes de sécurité, doivent être lues et comprises.

⚠ AVERTISSEMENT!

Risque d'électrocution et de blessure en cas de sortie du fil-électrode.
Cela peut entraîner des dommages corporels et matériels graves.
- ▶ Commuter l'interrupteur secteur de la source de courant en position - O.
- ▶ Débrancher la source de courant du secteur.
- ▶ S'assurer que la source de courant reste déconnectée du secteur pendant toute la durée des travaux.

⚠ AVERTISSEMENT!

Risque d'électrocution.
Cela peut entraîner des dommages corporels et matériels graves.
- ▶ Tous les câbles, conduites et faisceaux de liaison doivent toujours être solidement raccordés, intacts, correctement isolés et de capacité suffisante.

⚠ ATTENTION!

Risque de brûlure provoquée par les composants de la torche et le réfrigérant brûlants.
Cela peut entraîner de graves brûlures.
- ▶ Avant de commencer toute opération décrite dans les présentes instructions de service, laisser tous les composants de la torche de soudage et le réfrigérant refroidir à température ambiante (+25 °C, +77 °F).

⚠ ATTENTION!

Risque de dommages en cas de fonctionnement sans réfrigérant.
Cela peut entraîner des dommages matériels graves.
- ▶ Ne jamais mettre en service la torche de soudage refroidie par eau sans réfrigérant.
- ▶ Le fabricant décline toute responsabilité pour les dommages consécutifs et tous les droits à garantie sont annulés.

⚠ ATTENTION!

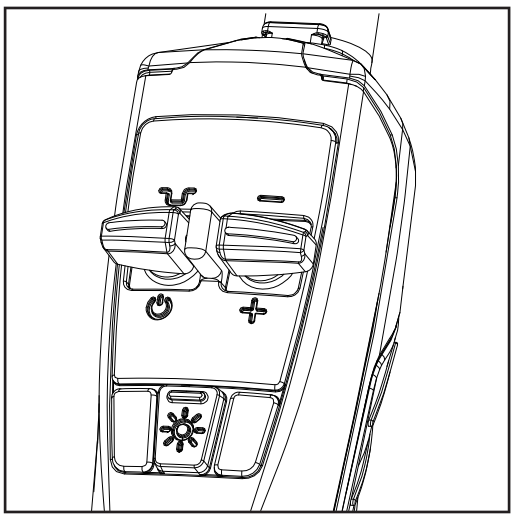
Danger en cas de fuite de réfrigérant.
Cela peut entraîner des dommages corporels et matériels graves.
- ▶ Toujours raccorder les tuyaux de réfrigérant des torches de soudage refroidies par eau avec le dispositif de fermeture en plastique monté dessus lorsque ceux-ci sont séparés du refroidisseur ou du dévidoir.

Généralités

Généralités

Les torches de soudage TIG sont particulièrement robustes et fiables. La poignée coque ergonomique et la répartition optimisée du poids permettent un travail sans fatigue.
Les torches de soudage sont disponibles en deux versions, refroidie par eau ou refroidie par gaz, et conviennent pour les tâches les plus diverses.
Les torches de soudage sont idéales pour la fabrication manuelle en série et sur commande ainsi que dans les ateliers.

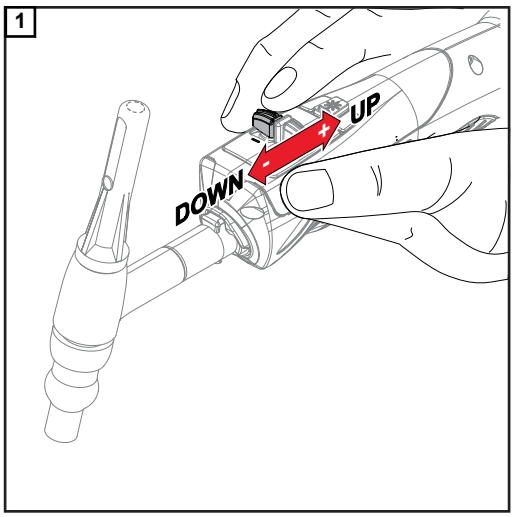
Torche de soudage Up/Down



La torche de soudage Up/Down possède les fonctions suivantes :

- Modification de la puissance de soudage à l'aide de la touche Up/Down (+/-)
- Éclairage LED du point de soudage : Appuyer une fois sur la touche - la LED s'allume pendant 5 s
  Maintenir la touche enfoncée - la LED s'allume en continu
- Formation de calottes associée au procédé de soudage TIG AC
- Abaissement intermédiaire associé au mode 4 temps($I_1 > I_2$)

Modification de la puissance de soudage



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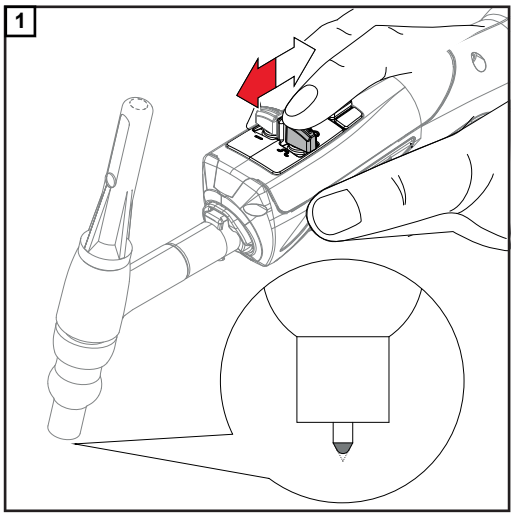
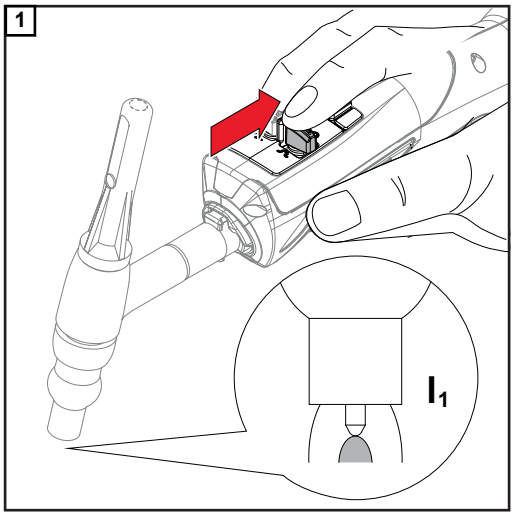
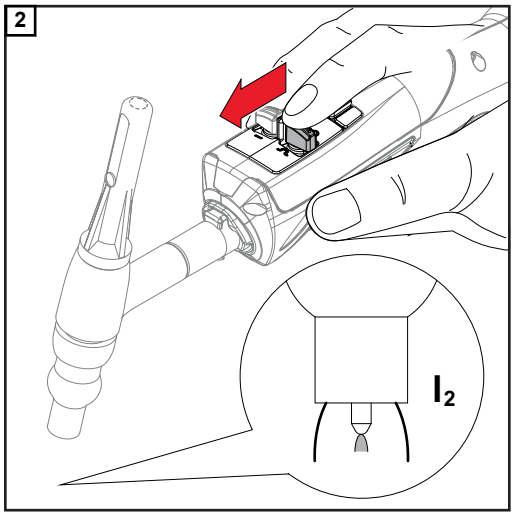
Formation de calottes

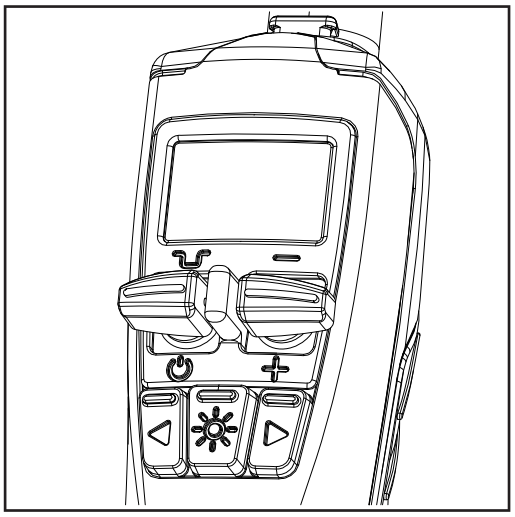


Abaissement intermédiaire





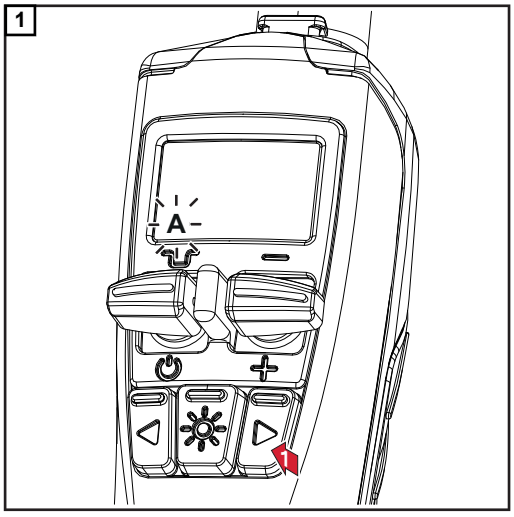
Torche de soudage JobMaster

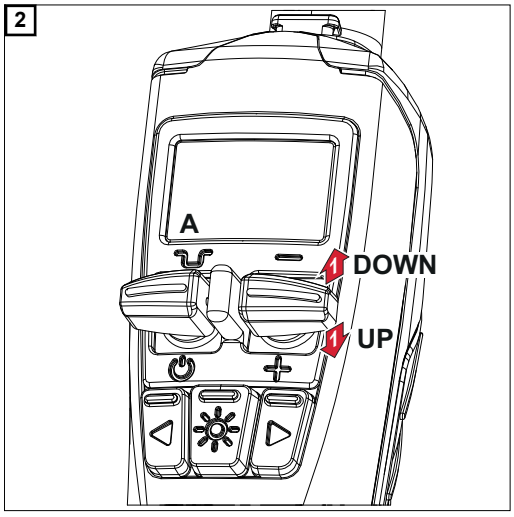


La torche de soudage JobMaster possède les fonctions suivantes :

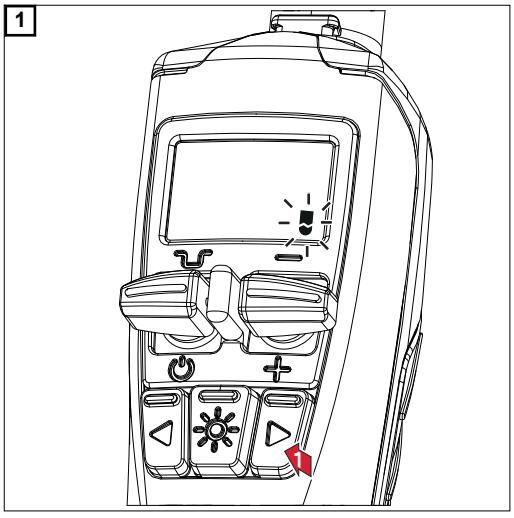
- Lecture ergonomique et ajustement de paramètres essentiels directement sur la torche de soudage
- Contrôle optimal du process de soudage sans réduire la maniabilité
- Modification de la puissance de soudage à l'aide de la touche Up/Down (+/-)
- Éclairage LED du point de soudage : Appuyer une fois sur la touche - la LED s'allume pendant 5 s Maintenir la touche enfoncée - la LED s'allume en continu
- Formation de calottes associée au procédé de soudage TIG AC
- Abaissement intermédiaire associé au mode 4 temps(I_1 > I_2)

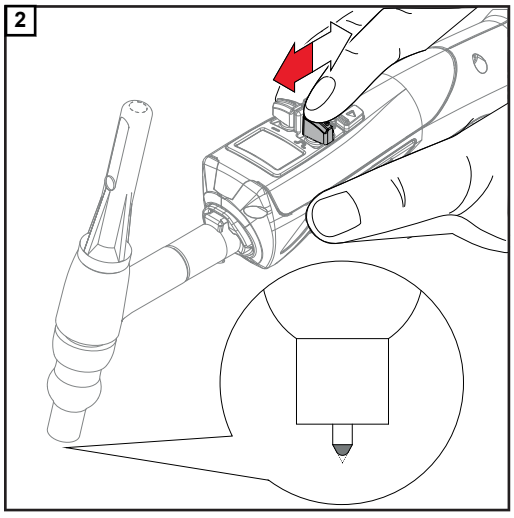
Modification de la puissance de soudage



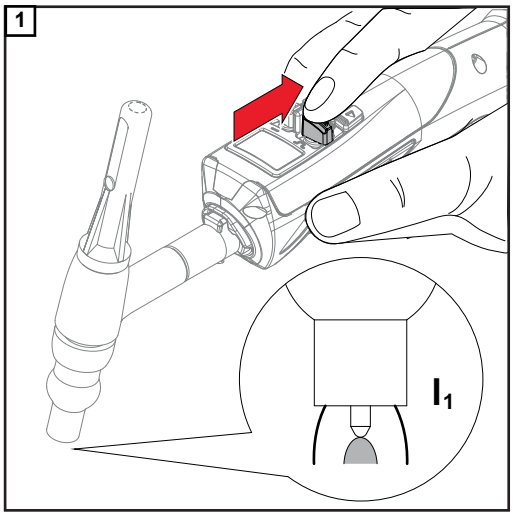


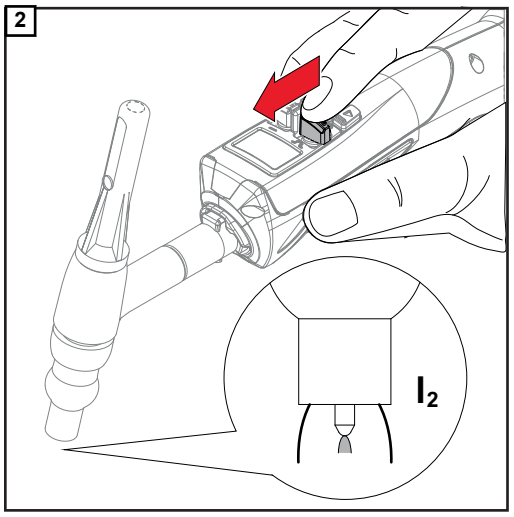
Formation de calottes





Abaissement intermédiaire





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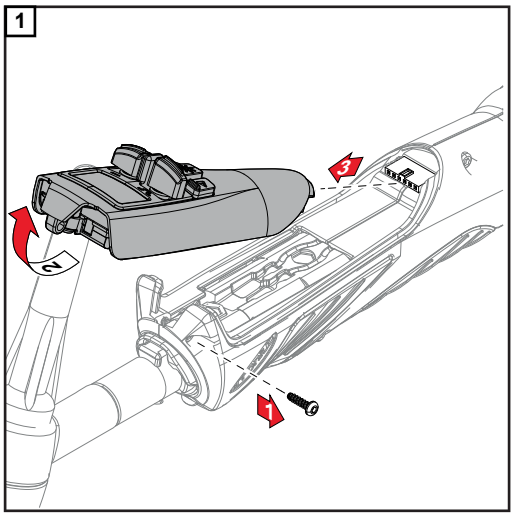
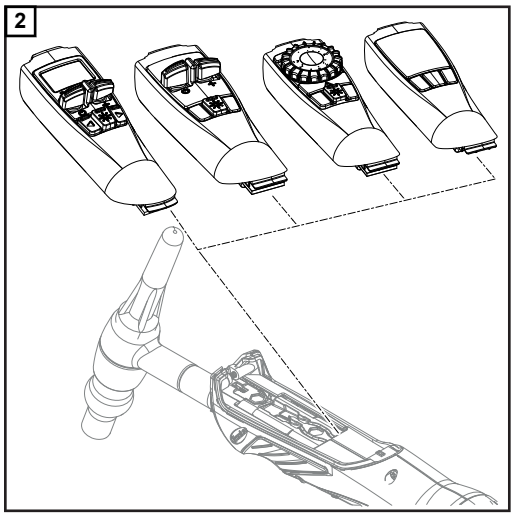
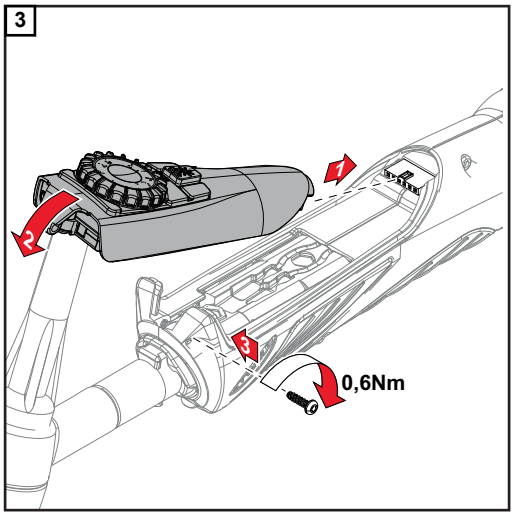
Remplacer l'interface utilisateur



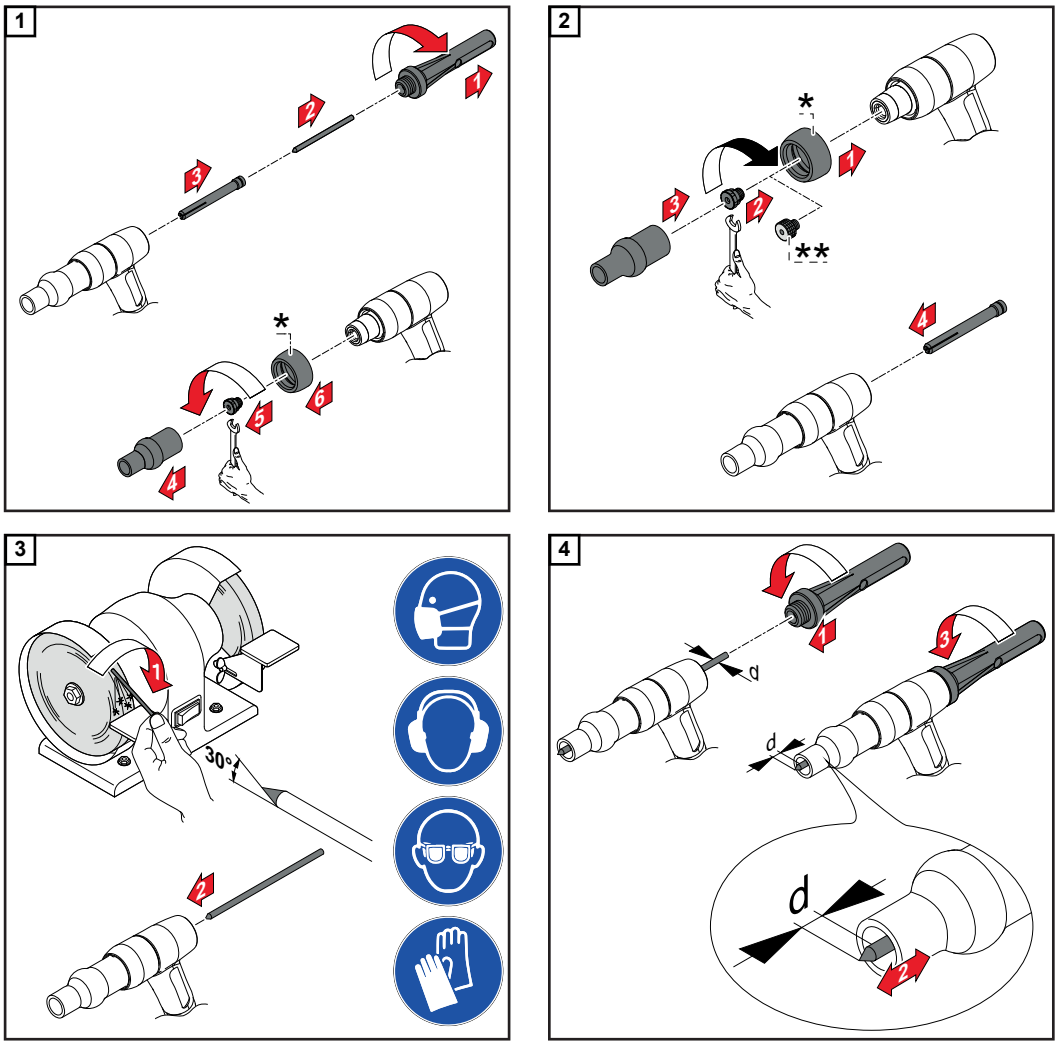




Monter les pièces d'usure

Monter le système de pièces d'usure A

Système de pièces d'usure A avec buse de gaz à enfichage



REMARQUE!

Serrer légèrement le capuchon de la torche de soudage de façon à ce que l'électrode en tungstène ne puisse plus être déplacée manuellement.

* Douille étanche en caoutchouc interchangeable, uniquement pour TTB 220 G/A

** Selon le modèle de torche de soudage, une lentille de gaz peut être utilisée au lieu d'un écrou de serrage.

⚠ **ATTENTION!**

Risque de détérioration en raison d'un couple de serrage trop élevé !
Cela peut endommager le filetage.

▶ Serrer légèrement l'écrou de serrage ou la lentille de gaz.

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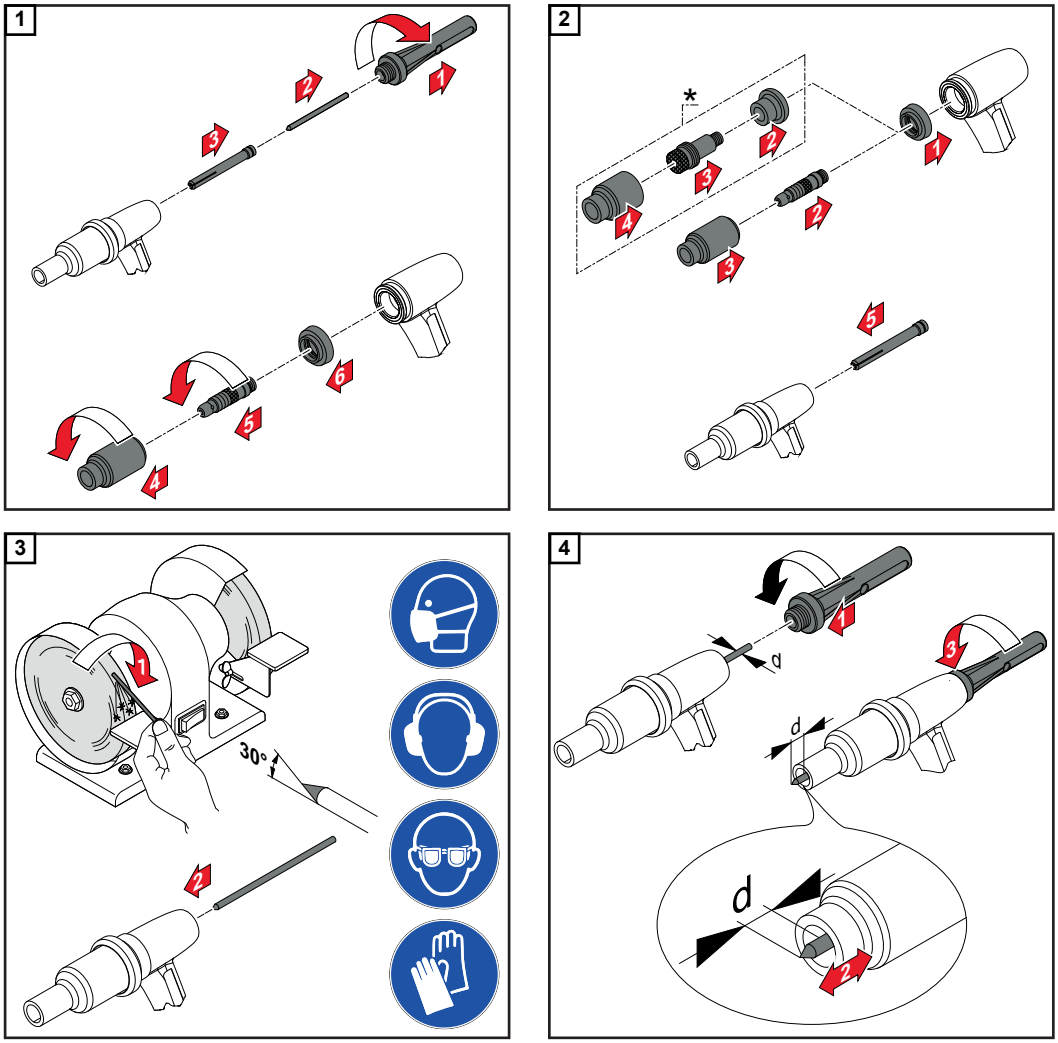
Monter le système de pièces d'usure P

Système de pièces d'usure P avec buse de gaz à vis



REMARQUE!

Serrer légèrement le capuchon de la torche de soudage de façon à ce que l'électrode en tungstène ne puisse plus être déplacée manuellement.

* Douille étanche en caoutchouc interchangeable, uniquement pour TTB 220 G/P

** Selon le modèle de torche de soudage, une lentille de gaz peut être utilisée au lieu d'un écrou de serrage.

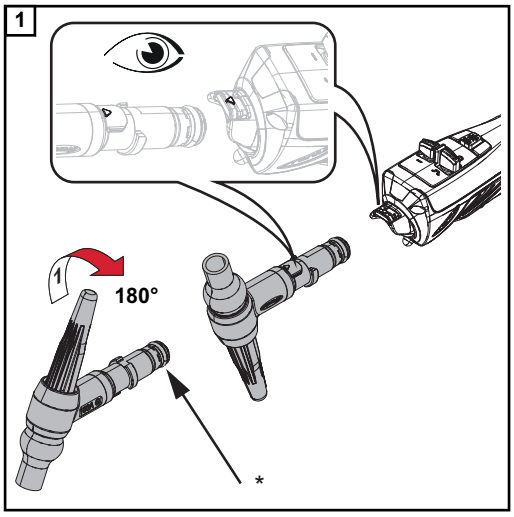
⚠ **ATTENTION!**

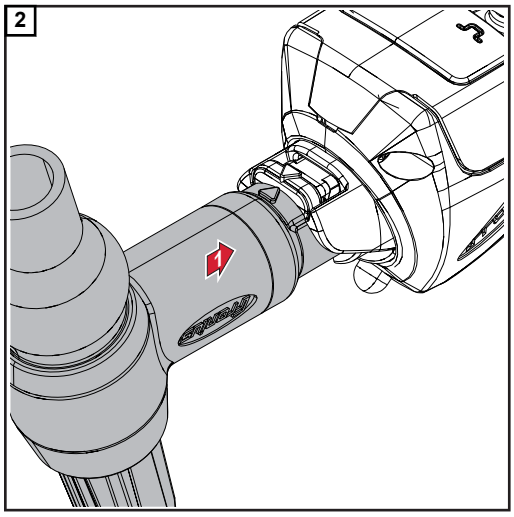
Risque de détérioration en raison d'un couple de serrage trop élevé !
Cela peut endommager le filetage.

▶ Serrer légèrement l'écrou de serrage ou la lentille de gaz.

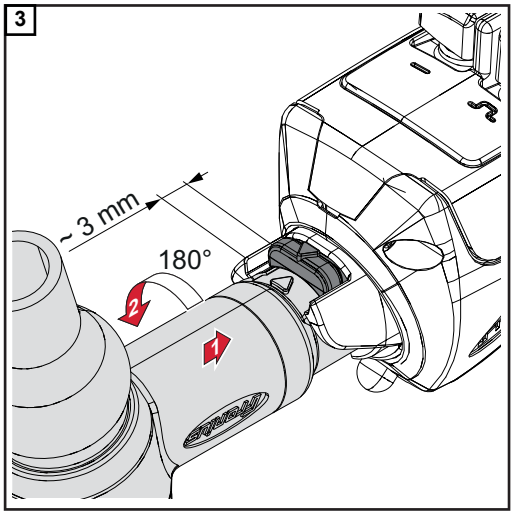
Installation et mise en service

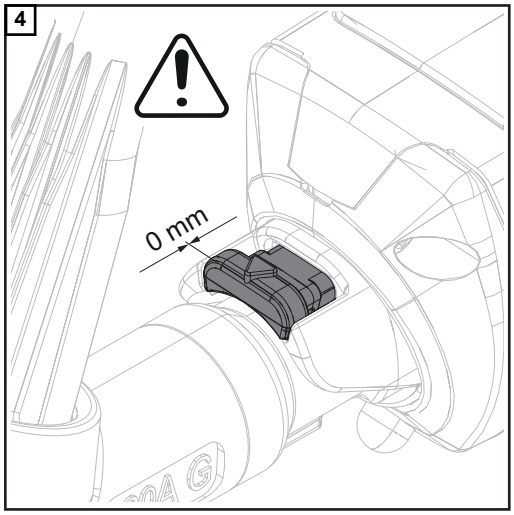
Monter le corps de torche de soudage





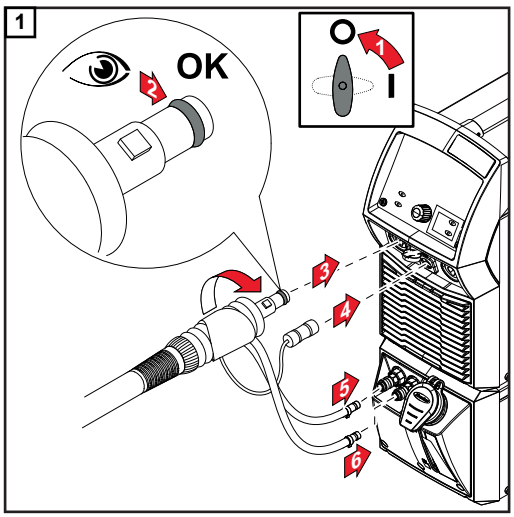
** Graisser le joint torique avant le montage !*





IMPORTANT ! Lors du montage du corps de torche de soudage, veiller à ce que celui-ci soit inséré et enclenché jusqu'à la butée.

Raccorder la torche de soudage à la source de courant et au refroidisseur



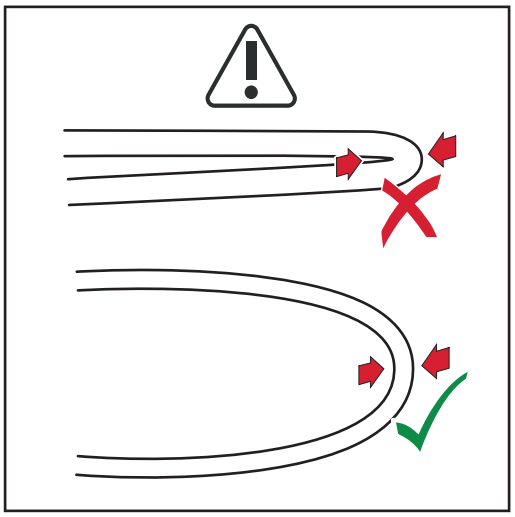
REMARQUE!

Avant toute mise en service, contrôler le niveau de réfrigérant et la bague d'étanchéité du connecteur de la torche de soudage !

Vérifier régulièrement le débit de réfrigérant pendant le soudage.

Raccorder la rallonge de faisceau de liaison

La rallonge de faisceau de liaison est livrée avec une housse de protection dans laquelle le dispositif d'accouplement entre la rallonge de faisceau de liaison et le faisceau de liaison de torche de soudage doit être placé.



REMARQUE!

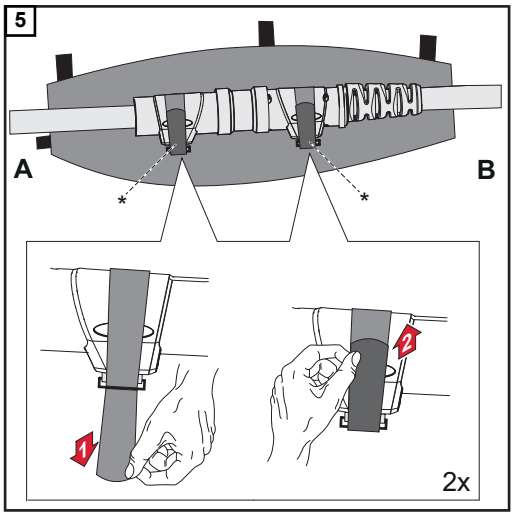
Lors des opérations suivantes, veiller à ce que le câble et les tuyaux ne soient pas coincés, coudés, cisaillés ou endommagés de toute autre manière.

1 Positionner la housse de protection de façon à ce que le logo Fronius soit visible et que les boucles soient sur le dessus :
gauche = côté source de courant (A) ;
droite = côté torche de soudage (B).

2 Ouvrir la housse de protection :
- glisser les deux curseurs de fermeture à glissière à droite jusqu'à la butée ;
- retirer la bande de dents inférieure du curseur de fermeture à glissière.

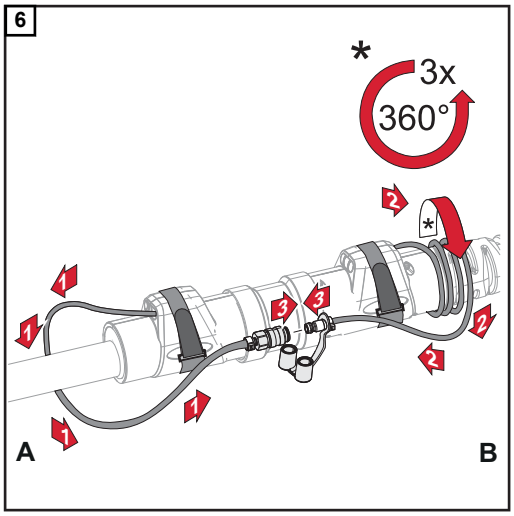
3 Raccorder les connecteurs de courant/de gaz de la rallonge de faisceau de liaison et du faisceau de liaison de torche de soudage (verrouillage à baïonnette).

4 Placer le dispositif d'accouplement dans la poche intérieure de la housse de protection.



** Bandes autoagrippantes sur la poche intérieure (poche intérieure non représentée)*

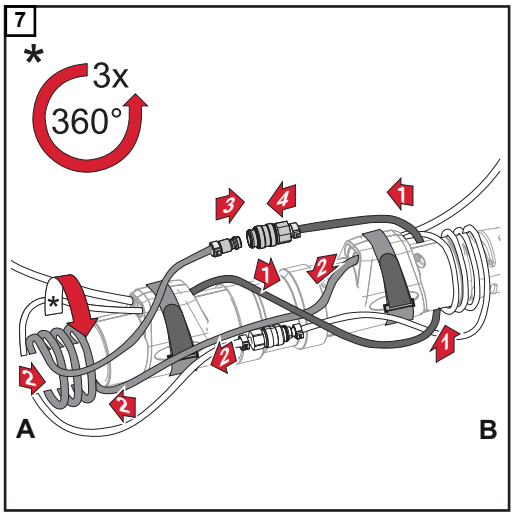
Fixer le dispositif d'accouplement avec les 2 bandes autoagrippantes sur la poche intérieure.



Placer le tuyau à réfrigérant de la rallonge de faisceau de liaison au niveau du dispositif d'accouplement conformément à l'illustration.

Enrouler 3x le tuyau à réfrigérant du faisceau de liaison de torche de soudage autour de ce dernier et le placer au niveau du dispositif d'accouplement.

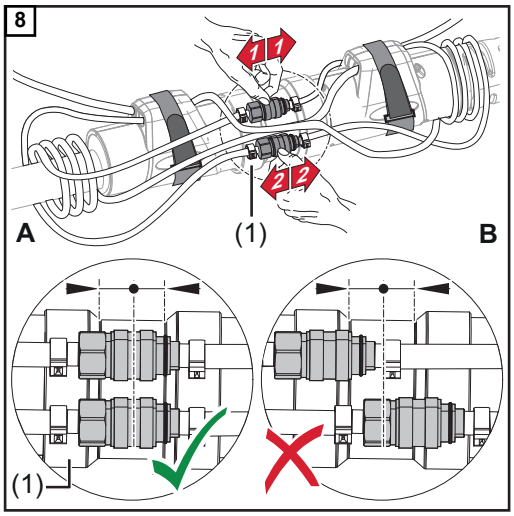
Raccorder les tuyaux à réfrigérant.



Placer le deuxième tuyau à réfrigérant du faisceau de liaison de torche de soudage au niveau de la rallonge de faisceau de liaison conformément à l'illustration, l'enrouler 3x autour de la rallonge de faisceau de liaison et le replacer au niveau du dispositif d'accouplement.

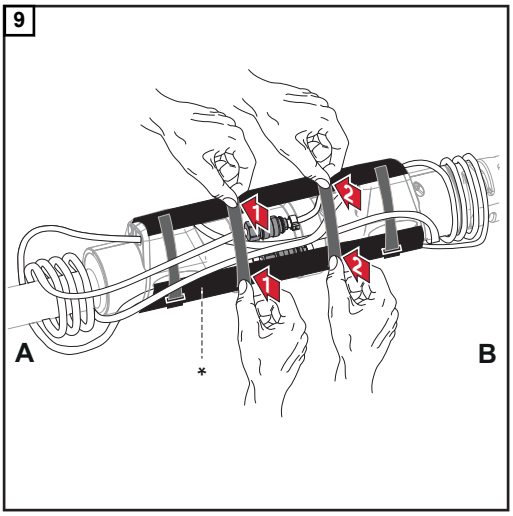
Passer le deuxième tuyau à réfrigérant de la rallonge de faisceau de liaison autour du faisceau de liaison de torche de soudage et le replacer au niveau du dispositif d'accouplement.

Raccorder les tuyaux à réfrigérant.



Positionner les connecteurs des tuyaux à réfrigérant l'un au-dessus de l'autre au milieu du tube isolant (1).

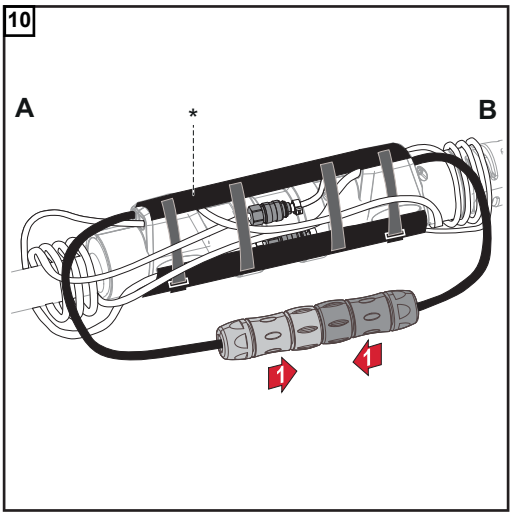
9



Attacher les deux bandes autoagrippantes fournies sur la poche intérieure.

** Poche intérieure*

10



Brancher les connecteurs de câble de commande TMC et les positionner à côté de la poche intérieure.

** Poche intérieure*

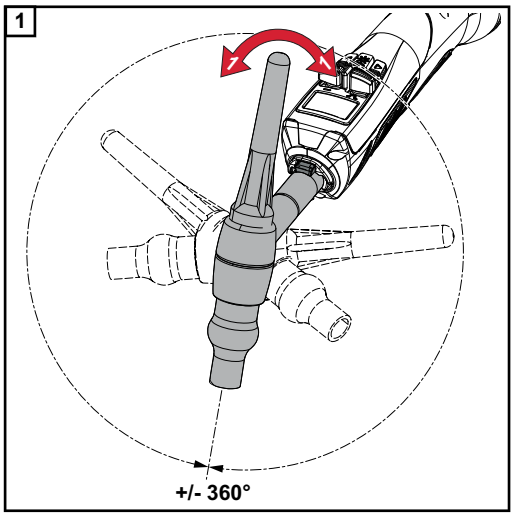
11 Fermer la housse de protection.

REMARQUE!

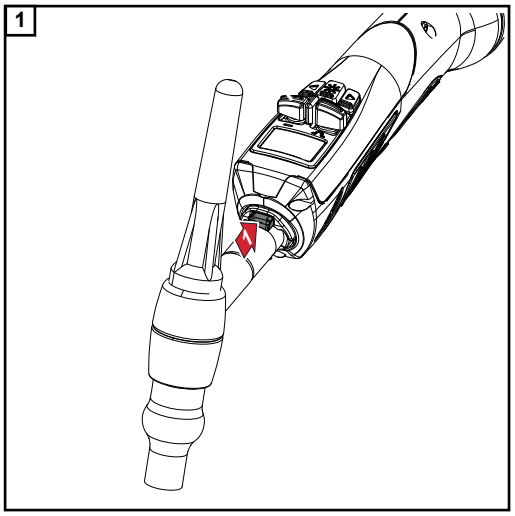
En cas d'utilisation d'une rallonge de faisceau de liaison refroidie par eau :

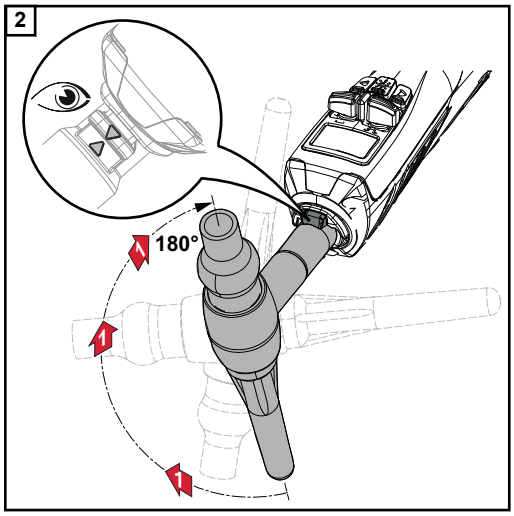
- ▶ Dès que la source de courant est mise en service et qu'un reflux parfait est visible dans le réservoir de réfrigérant du refroidisseur, s'assurer que le refroidisseur contient assez de réfrigérant.
- ▶ En association avec un refroidisseur MultiControl, un réservoir de réfrigérant plein peut déborder lors de la vidange du faisceau de liaison – Risque de glissement !
- ▶ Respecter les instructions de service du refroidisseur !

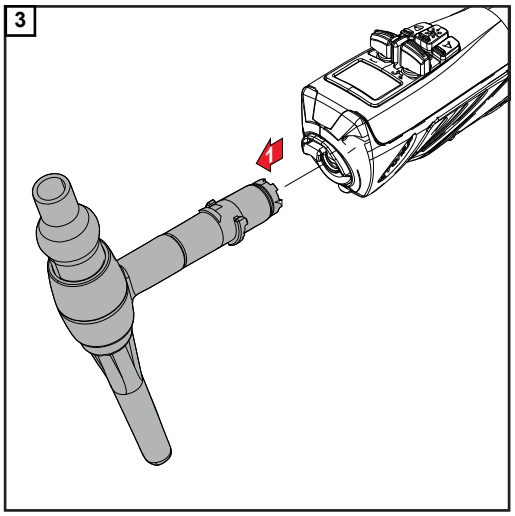
Rotation du corps de torche de soudage



Remplacer le corps de torche – torche AL



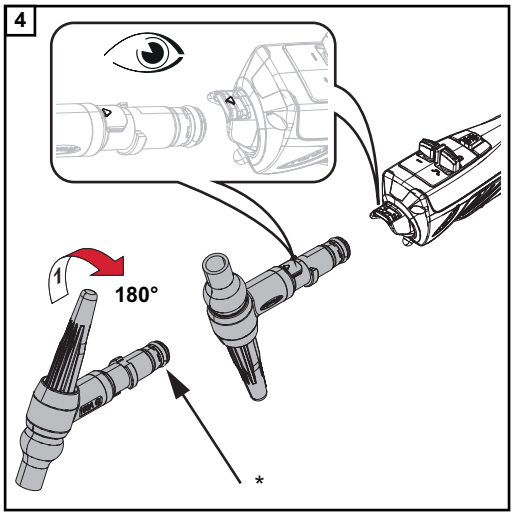


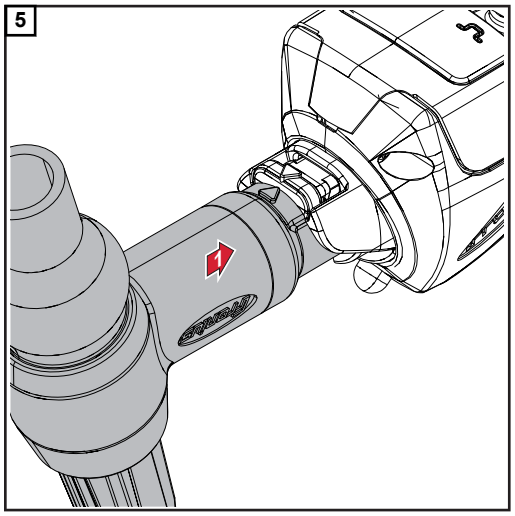


REMARQUE!

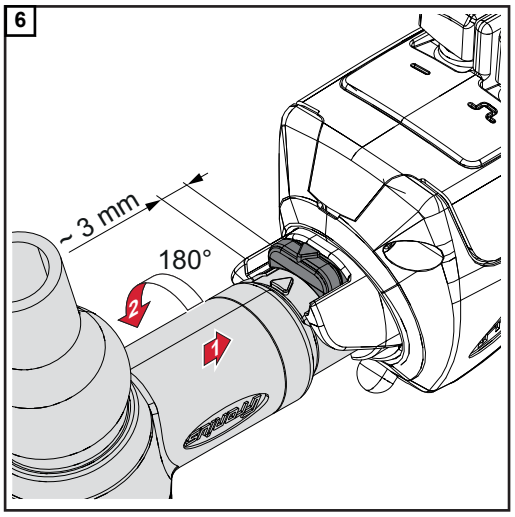
Lors du remplacement du corps de torche, veiller à ce que seuls des systèmes qui vont ensemble soient montés.

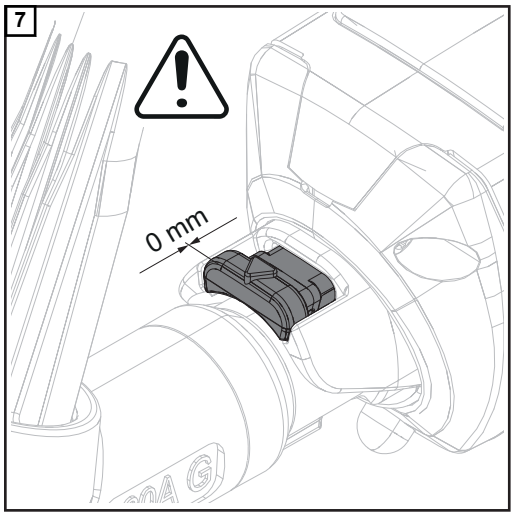
▶ Ne pas monter de corps de torche refroidi par gaz sur un faisceau de liaison refroidi par eau, et inversement !





** Graisser le joint torique avant le montage !*





IMPORTANT ! Lors du montage du corps de torche, veiller à ce que celui-ci soit inséré et enclenché jusqu'à la butée.

Remplacer le corps de torche – torche de soudage refroidie par eau

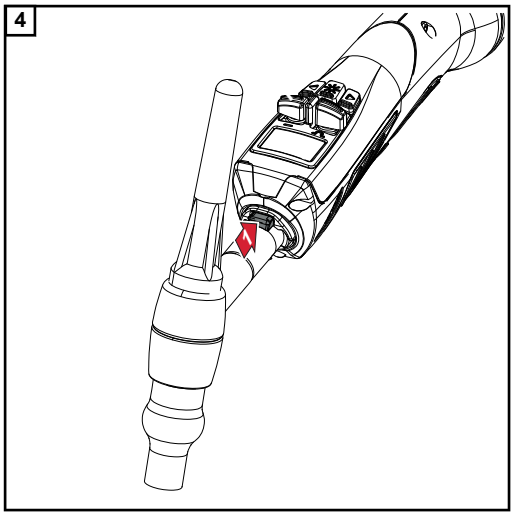
1 Désactiver la source de courant et la débrancher du réseau électrique ;
Attendre la phase d'inertie du système de refroidissement.

2 Avec refroidisseur CU 600 MC :
vider le faisceau de liaison de torche de soudage à l'aide de la source de courant ou de la torche de soudage.

Avec les autres refroidisseurs :
débrancher le tuyau d'arrivée de réfrigérant du refroidisseur.

3 Souffler de l'air comprimé à 4 bar max. au travers du tuyau d'arrivée de réfrigérant de façon à ce qu'une grande partie du réfrigérant revienne dans le réservoir de réfrigérant.

4



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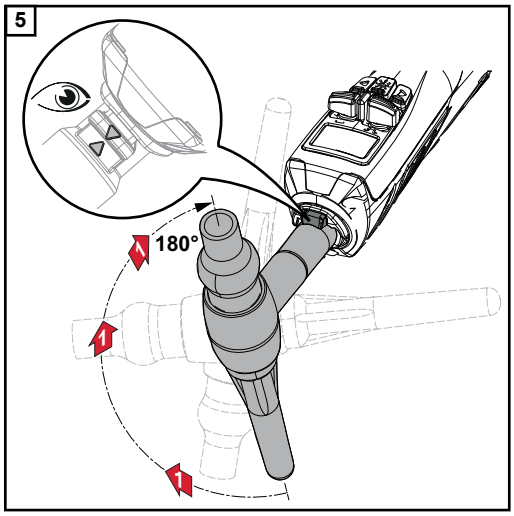

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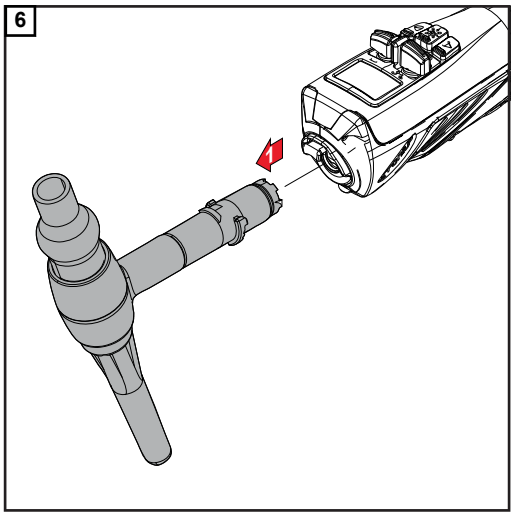


7 Nettoyer le dispositif d'accouplement du faisceau de liaison à l'air comprimé.

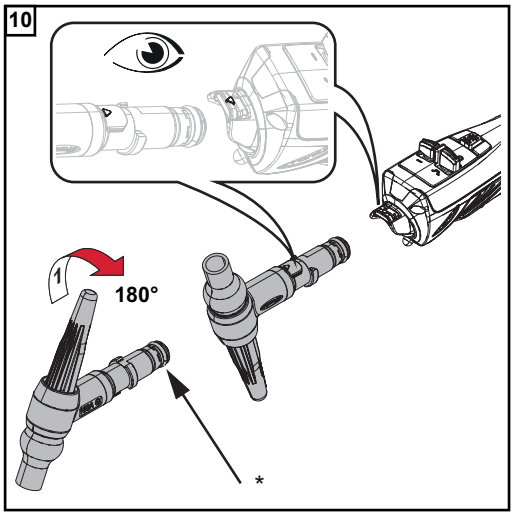
8 Essuyer le corps de torche avec un tissu

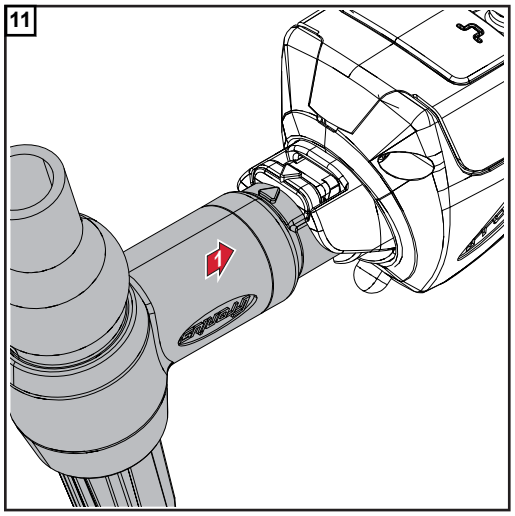
9 Placer le capot de protection sur le corps de torche

REMARQUE!

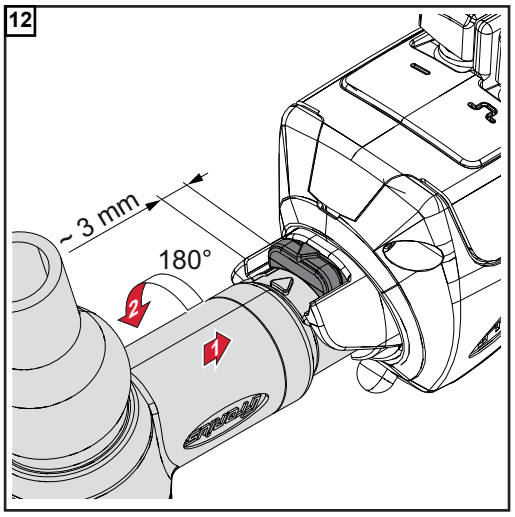
Lors du remplacement du corps de torche, veiller à ce que seuls des systèmes qui vont ensemble soient montés.

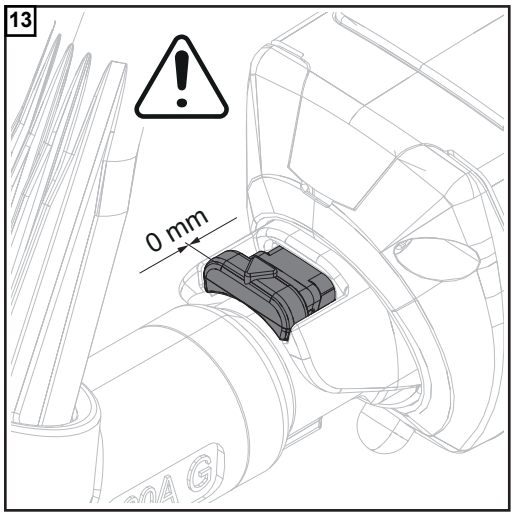
▶ Ne pas monter de corps de torche refroidi par gaz sur un faisceau de liaison refroidi par eau, et inversement !





** Graisser le joint torique avant le montage !*





IMPORTANT ! Lors du montage du corps de torche, veiller à ce que celui-ci soit inséré et enclenché jusqu'à la butée.

14 Raccorder la source de courant au réseau et l'allumer.

15 Appuyer sur la touche Contrôle gaz de la source de courant.

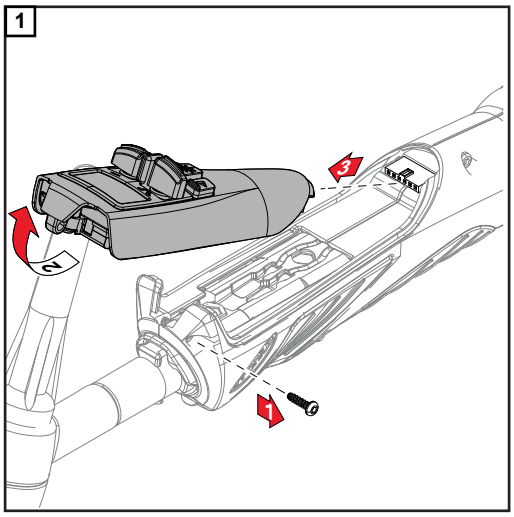
Le gaz de protection est diffusé pendant 30 s.

16 Contrôler le débit de réfrigérant :
un reflux de réfrigérant parfait doit être visible dans le réservoir de réfrigérant.

17 Procéder au soudage test et contrôler la qualité de la soudure

Verrouiller le changement de corps de torche

1



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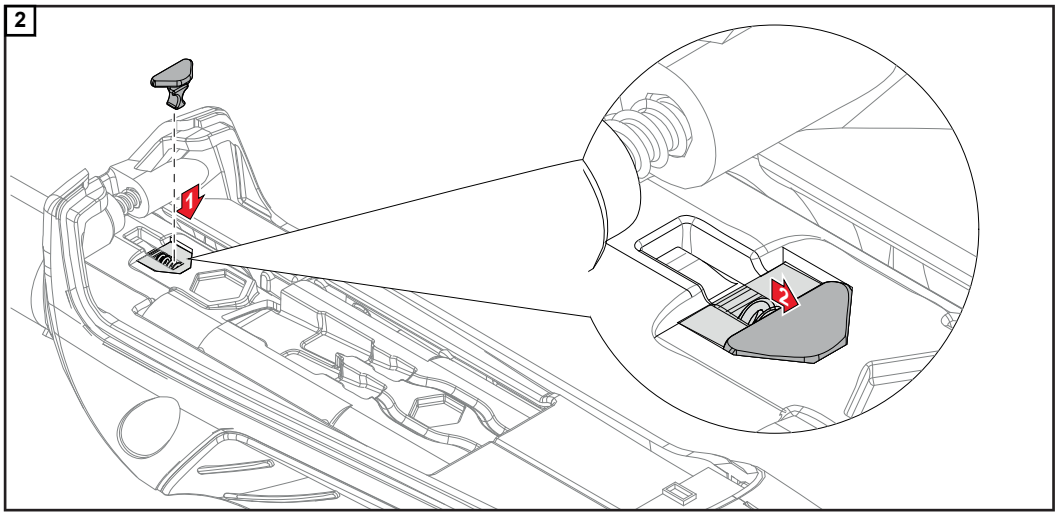
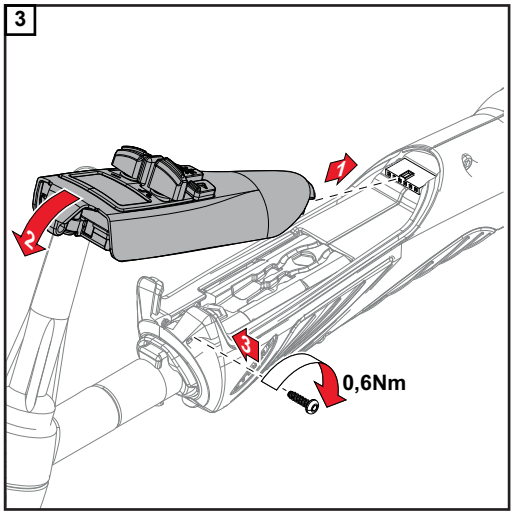


3



FR

Remarques concernant les cols de cygne flexibles

Généralités

Les cols de cygne flexibles TIG peuvent être courbés dans toutes les directions et ainsi être adaptés individuellement aux situations et aux applications les plus diverses.
Les cols de cygne flexibles sont notamment utilisés en cas d'accessibilité limitée aux composants ou de positions de soudage difficiles.
Cependant, le matériau d'un col de cygne flexible s'affaiblit à chaque déformation. C'est pourquoi le nombre de courbures est limité.

La courbure et le nombre de courbures sont expliqués dans les sections suivantes.

Définition de la courbure du col de cygne

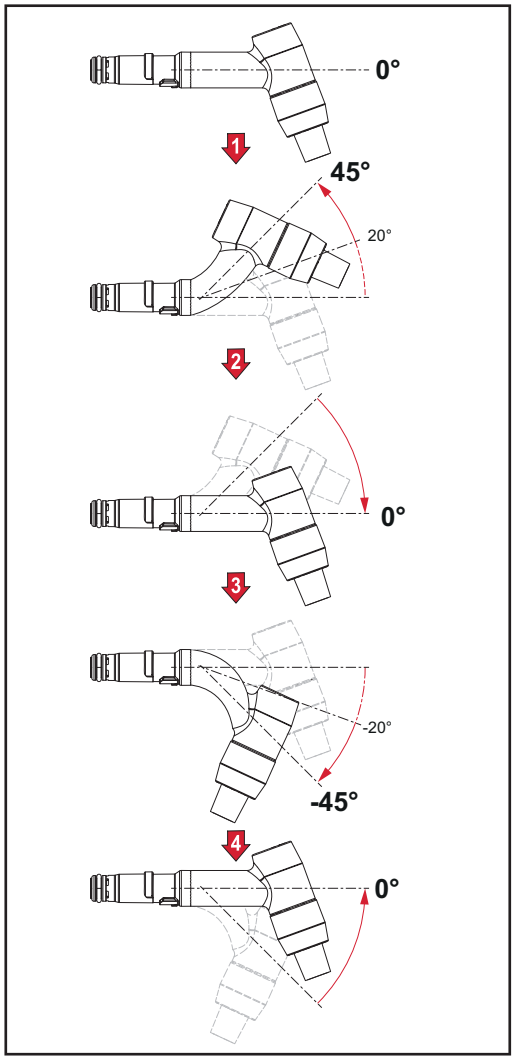
Une courbure est une déformation unique qui varie de la forme initiale d'au moins 20°.

Un rayon de courbure le plus petit possible a été défini afin que la courbure soit aussi uniforme que possible sur une grande longueur plutôt que sur un seul point.
Le rayon de courbure ne doit pas être inférieur à cette valeur.
Le plus petit rayon de courbure est de 25 mm/1 inch.

Une courbure ne doit pas dépasser un angle de courbure maximal.
L'angle de courbure maximal est de 45°.

Le retour à la forme initiale est considéré comme une courbure à part entière.

Exemple : courbures à 45°



Situation de départ : 0°

Mouvement de 0° à 45° vers le haut
= 1. Courbure

Mouvement de 45° à 0°
= 2. Courbure

Mouvement de 0° à 45° vers le bas
= 3. Courbure

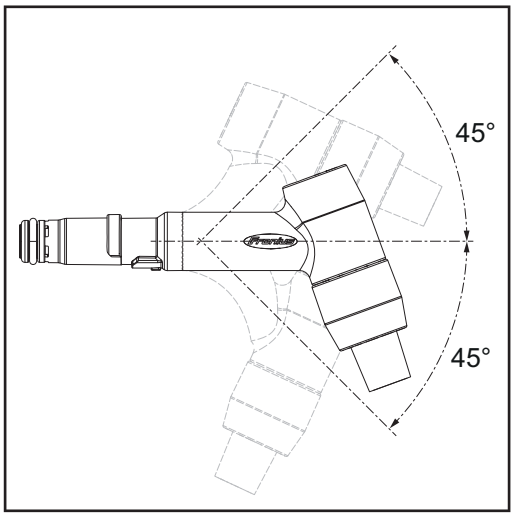
Mouvement de 45° à 0°
= 4. Courbure

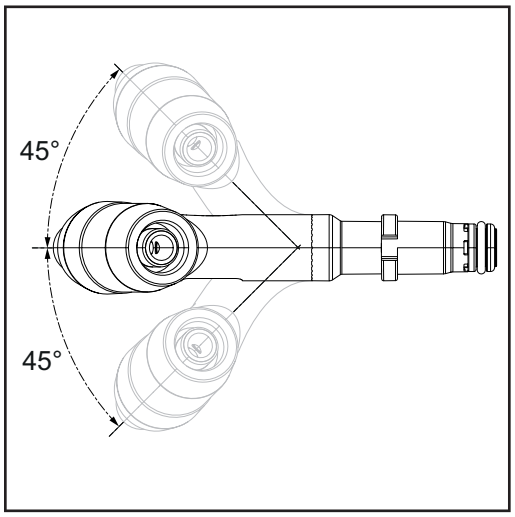
Nombre maximal de courbures du col de cygne

En tenant compte d'un rayon de courbure ≥ 25 mm/1 inch et d'un angle de courbure maximal = 45° :

- les torches AL peuvent être courbées au moins 1 000 fois ;
- les torches de soudage refroidies par eau peuvent être courbées au moins 200 fois.

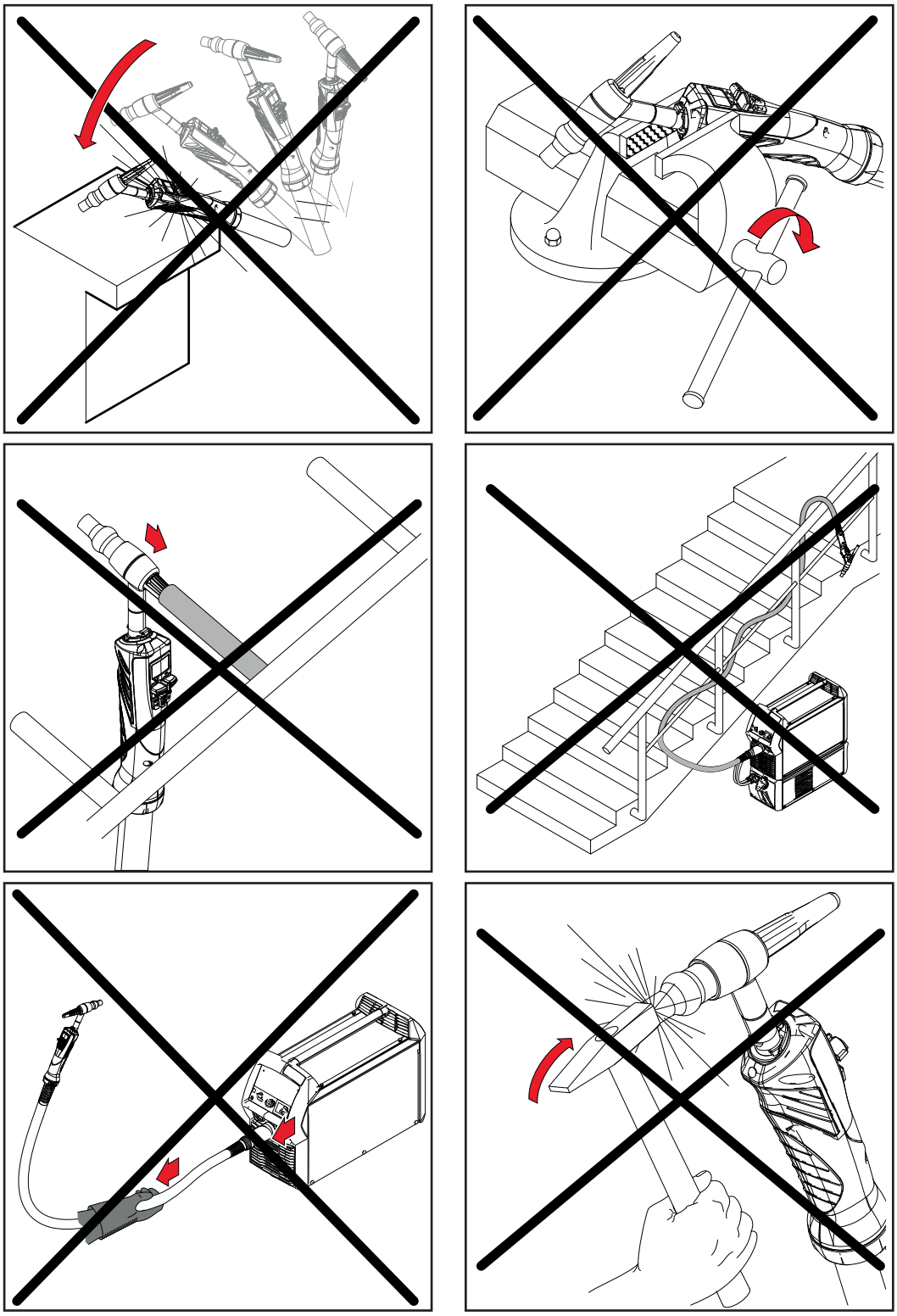
Possibilités de courbure





Maintenance, entretien et élimination

Généralités



Maintenance à chaque mise en service

- Contrôler les pièces d'usure, remplacer les pièces d'usure défectueuses
- Enlever les projections de soudure qui se trouvent sur la buse de gaz

En supplément à chaque mise en service, pour les torches de soudage refroidies par eau :

- S'assurer que tous les connecteurs de réfrigérant sont étanches
- Vérifier la présence d'un reflux de réfrigérant conforme

Élimination des déchets

L'élimination doit être réalisée conformément aux prescriptions nationales et régionales en vigueur.

Diagnostic d’erreur, élimination de l'erreur

Diagnostic d’erreur, élimination de l'erreur

Impossible de raccorder la torche de soudage

Cause: Le verrouillage baïonnette est tordu

Solution: Remplacer le verrouillage baïonnette

Pas d'intensité de soudage

Interrupteur d'alimentation de la source de courant activé, voyants allumés sur la source de courant, gaz de protection disponible

Cause : Raccordement à la masse incorrect

Solution : Établir le raccordement à la masse de manière conforme

Cause : Câble de courant interrompu dans la torche de soudage

Solution : Remplacer la torche de soudage

Cause : Électrode en tungstène lâche

Solution : Serrer l'électrode en tungstène à l'aide du cache de torche

Cause : Pièces d'usure lâches

Solution : Serrer les pièces d'usure

Pas de fonction après avoir appuyé sur la gâchette de la torche

Interrupteur d'alimentation activé, voyants allumés sur la source de courant, gaz de protection disponible

Cause : Fiche de commande non branchée

Solution : Brancher la fiche de commande

Cause : Torche de soudage ou câble de commande de la torche de soudage défectueux

Solution : Remplacer la torche de soudage

Cause : Connexions « gâchette de la torche/câble de commande/source de courant » défectueuses

Solution : Vérifier la fiche de connexion/Amener la source de courant ou la torche de soudage au S.A.V.

Cause : Circuit imprimé dans la torche défectueux

Solution : Remplacer le circuit imprimé

Rupture diélectrique HF au niveau du connecteur de la torche de soudage

Cause : Connecteur de torche de soudage non étanche

Solution : Remplacer le joint torique du verrouillage à baïonnette

Rupture diélectrique HF au niveau de la poignée coque

Cause : Faisceau de liaison non étanche

Solution : Remplacer le faisceau de liaison

Cause : Raccord du tuyau de gaz de protection du corps de torche de soudage non étanche

Solution : Réajuster le tuyau et étanchéifier

Pas de gaz de protection

Toutes les autres fonctions sont disponibles

Cause : Bouteille de gaz vide

Solution : Remplacer la bouteille de gaz

Cause : Robinet détendeur défectueux

Solution : Remplacer le robinet détendeur

Cause : Le tuyau de gaz n'est pas monté, est plié ou est endommagé

Solution : Monter, poser de manière plus rectiligne le tuyau de gaz. Remplacer le tuyau de gaz défectueux

Cause : Torche de soudage défectueuse

Solution : Remplacer la torche de soudage

Cause : Électrovanne de gaz défectueuse

Solution : Contacter le service après-vente (faire remplacer l'électrovanne de gaz)

Mauvaises caractéristiques de soudage

Cause : Paramètres incorrects

Remède : Vérifier les réglages

Cause : Connexion à la masse incorrecte

Remède : Vérifier la polarité de la connexion à la masse et de la borne

La torche de soudage devient très chaude

Cause : La torche est insuffisamment dimensionnée

Remède : Respecter la durée maximale de fonctionnement et les limites de charge

Cause : Uniquement pour les installations refroidies par eau : débit d'eau trop faible

Remède : Vérifier le niveau d'eau, le débit d'eau, l'encrassement de l'eau, etc. ; pompe de liquide de refroidissement bloquée : lancer l'arbre de la pompe de réfrigérant au moyen d'un tournevis au niveau du passage de sortie

Cause : Uniquement pour les installations refroidies par eau : La paramètre « Commande refroid. » est réglé sur « OFF ».

Remède : Placer le paramètre « Commande refroid. » sur « Aut » ou sur « ON »

Porosité de la soudure

Cause : Formation de projections dans la buse de gaz, d'où une protection gazeuse insuffisante de la soudure

Solution : Enlever les projections de soudure

Cause : Présence de trous dans le tuyau de gaz ou raccordement incorrect du tuyau de gaz

Solution : Remplacer le tuyau de gaz

Cause : Le joint torique du raccord central est entaillé ou défectueux

Solution : Remplacer le joint torique

Cause : Humidité/condensation dans la conduite de gaz

Solution : Sécher la conduite de gaz

Cause : Débit de gaz trop fort ou trop faible

Solution : Corriger le débit de gaz

Cause : Quantité de gaz insuffisante au début ou à la fin du soudage

Solution : Augmenter le prédébit de gaz et le postdébit de gaz

Cause : Agent de séparation en quantité excessive

Solution : Enlever l'agent de séparation en excès/Appliquer moins d'agent de séparation

Mauvaises caractéristiques d'amorçage

Cause : Électrode en tungstène inadaptée (p.ex. électrode en tungstène pour le soudage DC)

Solution : Utiliser une électrode en tungstène adaptée

Cause : Pièces d'usure lâches

Solution : Visser les pièces d'usure

La buse de gaz se fissure

Cause : L'électrode en tungstène ne sort pas suffisamment de la buse de gaz

Solution : Faire davantage sortir l'électrode en tungstène de la buse de gaz

Caractéristiques techniques

Généralités

Ce produit satisfait aux exigences de la norme CEI 60974-7.

REMARQUE!

Les caractéristiques de puissance indiquées ne s'appliquent qu'en cas d'utilisation de pièces d'usure de série.
Les indications d'intensité de soudage diminuent en cas d'utilisation de lentilles de gaz et de buses de gaz plus courtes.

REMARQUE!

Pour les cols de cygne refroidis par gaz, les indications d'intensité de soudage ne sont valables qu'à partir d'une longueur de col de cygne L ≥ 65 mm.
En cas d'utilisation de cols de cygne plus courts, les indications d'intensité de soudage sont réduites de 30 %.

REMARQUE!

Lors du soudage à la limite de puissance de la torche de soudage, utiliser des électrodes en tungstène et des diamètres d'ouverture de buses de gaz correspondants plus grands, afin d'accroître la durée de vie des pièces d'usure.
Tenir compte de l'intensité de courant, de la balance AC et du courant d'offset AC en tant que facteurs de génération de puissance.

Col de cygne refroidi par gaz – TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G/F	TTB 220 G
Intensité de soudage DC à 10 min/ 40 °C (104 °F)	35 % f.m.[1] / 80 A 60 % f.m.[1] / 60 A 100 % f.m.[1] / 50 A	35 % f.m.[1] / 160 A 60 % f.m.[1] / 120 A 100 % f.m.[1] / 90 A	35 % f.m.[1] / 220 A 60 % f.m.[1] / 170 A 100 % f.m.[1] / 130 A
Intensité de soudage à 10 min/ 40 °C (104 °F)	35 % f.m.[1] / 30 A	35 % f.m.[1] / 120 A 60 % f.m.[1] 90 A 100 % f.m.[1] / 70 A	35 % f.m.1) / 180 A 60 % f.m.1) / 130 A 100 % f.m.1) / 100 A
	Argon (norme NF EN 439)	Argon (norme NF EN 439)	Argon (norme NF EN 439)
	1,0 à 3,2 mm 0.039 à 0.126 in.	1,0 à 3,2 mm 0.039 à 0.126 in.	1,0 à 4,0 mm 0.039 à 0.158 in.

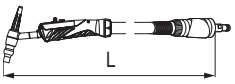
	TTB 220 A G F	TTB 220 P G F	TTB 260 G
Intensité de soudage DC à 10 min/ 40 °C (104 °F)	35 % f.m.[1] / 220 A 60 % f.m.[1] / 170 A 100 % f.m.[1] / 130 A	30 % f.m.[1] / 220 A 60 % f.m.[1] / 160 A 100 % f.m.[1] / 130 A	35 % f.m.[1] / 260 A 60 % f.m.[1] / 200 A 100 % f.m.[1] / 150 A
Intensité de soudage à 10 min/ 40 °C (104 °F)	35 % f.m.[1] / 180 A 60 % f.m.[1] / 120 A 100 % f.m.[1] / 100 A	30 % f.m.[1] / 170 A 60 % f.m.[1] / 120 A 100 % f.m.[1] / 100 A	35 % f.m.[1] / 200 A 60 % f.m.[1] / 160 A 100 % f.m.[1] / 120 A
	Argon (norme NF EN 439)	Argon (norme NF EN 439)	Argon (norme NF EN 439)
	1,0 à 4,0 mm 0.039 à 0.158 in.	1,0 à 4,0 mm 0.039 à 0.158 in.	1,6 à 6,4 mm 0.063 à 0.252 in.

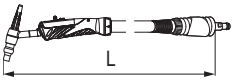
Col de cygne refroidi par eau – TTB 180, TTB 300, TTB 400, TTB 500

	TTB 180 W	TTB 300 W
Intensité de soudage DC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 180 A 100 % f.m.[1] / 140 A	60 % f.m.[1] / 300 A 100 % f.m.[1] / 230 A
Intensité de soudage AC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 140 A 100 % f.m.[1] / 110 A	60 % f.m.[1] / 250 A 100 % f.m.[1] / 190 A
	Argon (norme NF EN 439)	Argon (norme NF EN 439)
	1,0 à 3,2 mm 0.039 à 0.126 in.	1,0 à 3,2 mm 0.039 à 0.126 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

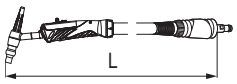
	TTB 400 W F	TTB 500 W
Intensité de soudage DC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 400 A 100 % f.m.[1] / 300 A	60 % f.m.[1] / 500 A 100 % f.m.[1] / 400 A
Intensité de soudage AC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 320 A 100 % f.m.[1] / 250 A	60 % f.m.[1] / 400 A 100 % f.m.[1] / 300 A
	Argon (norme NF EN 439)	Argon (norme NF EN 439)
	1,0 à 4,0 mm 0.039 à 0.157 in.	1,6 à 6,4 mm 0.063 à 0.252 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

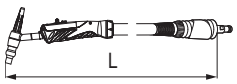
Faisceau de liaison refroidi par gaz – THP 160i, THP 220i, THP 260i

	THP 160i	THP 220i
Intensité de soudage DC à 10 min/40 °C (104 °F)	35 % f.m.[1] / 160 A 60 % f.m.[1] 120 A 100 % f.m.[1] / 90 A	35 % f.m.[1] / 220 A 60 % f.m.[1] 170 A 100 % f.m.[1] / 130 A
Intensité de soudage AC à 10 min/40 °C (104 °F)	35 % f.m.[1] / 120 A 60 % f.m.[1] 90 A 100 % f.m.[1] / 70 A	35 % f.m.[1] / 180 A 60 % f.m.[1] 130 A 100 % f.m.[1] / 100 A
	Argon (norme NF EN 439)	Argon (norme NF EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Tension à vide maximale autorisée (U_0)	113 V	113 V
Tension d'amorçage maximale autorisée (U_p)	10 kV	10 kV

		THP 260i
Intensité de soudage à 10 min/40 °C (104 °F) DC		35 % f.m.[1] / 260 A 60 % f.m.[1] 200 A 100 % f.m.[1] / 150 A
Intensité de soudage à 10 min/40 °C (104 °F) AC		35 % f.m.[1] / 200 A 60 % f.m.[1] 160 A 100 % f.m.[1] / 120 A
		Argon (norme NF EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Tension à vide maximale autorisée (U_0)		113 V
Tension d'amorçage maximale autorisée (U_p)		10 kV

Faisceau de liaison refroidi par eau – THP 300i, THP 400i, THP 500i

	THP 300i	THP 400i
Intensité de soudage DC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 300 A 100 % f.m.[1] / 230 A	60 % f.m.[1] / 400 A 100 % f.m.[1] / 300 A
Intensité de soudage AC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 250 A 100 % f.m.[1] / 190 A	60 % f.m.[1] / 350 A 100 % f.m.[1] / 270 A
	Argon (norme NF EN 439)	Argon (norme NF EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min}  [W] [2]	650/650	950/950
Q_{min}  [l/min] [gal./min]	1 0.26	1 0.26
p_{min}  [bar] [psi]	3 43	3 43
p_{max}  [bar] [psi]	5,5 79	5,5 79
Tension à vide maximale autorisée (U_0)	113 V	113 V
Tension d'amorçage maximale autorisée (U_p)	10 kV	10 kV

		THP 500i
Intensité de soudage DC à 10 min/40 °C (104 °F)		60 % f.m.[1] / 500 A 100 % f.m.[1] / 400 A
Intensité de soudage AC à 10 min/40 °C (104 °F)		60 % f.m.[1] / 400 A 100 % f.m.[1] / 300 A
		Argon (norme NF EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min}  [W] [2]		1 200/1 750
Q_{min}  [l/min] [gal./min]		1 0.26
p_{min}  [bar] [psi]		3 43
p_{max}  [bar] [psi]		5,5 79
Tension à vide maximale autorisée (U_0)		113 V

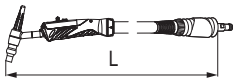
FR

		THP 500i
Tension d'amorçage maximale autorisée (U_p)		10 kV

Rallonge de faisceau de liaison refroidie par gaz – HPT 220i G

	HPT 220i EXT G
Intensité de soudage DC à 10 min/40 °C (104 °F)	35 % f.m.[1] / 220 A 60 % f.m.[1] / 170 A 100 % f.m.[1] / 130 A
Intensité de soudage AC à 10 min/40 °C (104 °F)	35 % f.m.[1] / 180 A 60 % f.m.[1] 130 A 100 % f.m.[1] / 100 A
	Argon (norme NF EN 439)
	10,0 m 32 + 9.70 ft. + in.
Tension à vide maximale autorisée (U_0)	113 V
Tension d'amorçage maximale autorisée (U_p)	10 kV

Rallonge de faisceau de liaison refroidie par gaz – HPT 400i

	HPT 400i EXT W
Intensité de soudage DC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 400 A 100 % f.m.[1] / 300 A
Intensité de soudage AC à 10 min/40 °C (104 °F)	60 % f.m.[1] / 350 A 100 % f.m.[1] / 270 A
	Argon (norme NF EN 439)
	10,0 m 32 + 9.70 ft. + in.
P_{min} [W] [2]	750/750
Q_{min} [l/min] [gal./min]	1 0.26
p_{min} [bar] [psi]	3 43
p_{max} [bar] [psi]	5,5 79
Tension à vide maximale autorisée (U_0)	113 V
Tension d'amorçage maximale autorisée (U_p)	10 kV

Explication des notes de bas de page

1) f.m. = facteur de marche

2) Puissance de refroidissement minimale conformément à la norme CEI 60974-2

Innholdsfortegnelse

Sikkerhet

Sikkerhet

⚠ FARE!

Fare på grunn av feilbetjening og mangelfullt utført arbeid.
Følgene kan bli alvorlige personskader og materielle skader.
- ▶ Alt arbeid og alle funksjonene som er beskrevet i dette dokumentet, skal utelukkende utføres av opplært fagpersonale.
- ▶ Les og forstå dette dokumentet.
- ▶ Les og forstå alle bruksanvisningene for systemkomponentene, især sikkerhetsforskriftene.

⚠ FARE!

Fare på grunn av elektrisk strøm og fare for personskader på grunn av utstikkende trådelektrode.
Følgene kan bli alvorlige personskader og materielle skader.
- ▶ Sett strømbryteren til strømkilden i stillingen - O -.
- ▶ Koble strømkilden fra nettet.
- ▶ Forsikre deg om at strømkilden er koblet fra nettet inntil alt arbeid er avsluttet.

⚠ FARE!

Fare på grunn av elektrisk strøm.
Følgene kan bli alvorlige personskader og materielle skader.
- ▶ Alle kabler, ledninger og slangepakker må alltid være sikkert tilkoblet, uskadd, korrekt isolert og tilstrekkelig dimensjonert.

⚠ FORSIKTIG!

Fare for forbrenning på grunn av varme sveisepistolkomponenter og varmt kjølemiddel.
Følgene kan bli alvorlige forbrenninger.
- ▶ Før du begynner på arbeidene som er beskrevet i denne bruksanvisningen, må du la alle sveisepistolkomponenter og kjølemiddelet avkjøles til romtemperatur (+25 °C, +77 °F).

⚠ FORSIKTIG!

Fare for materielle skader ved bruk uten kjølemiddel.
Følgene kan bli alvorlige materielle skader.
- ▶ Ta aldri i bruk vannkjølte sveisepistoler uten kjølemiddel.
- ▶ Produsentens garanti gjelder ikke for skader som oppstår ved ikke-forskriftsmessig bruk, alle garantikrav bortfaller.

⚠ FORSIKTIG!

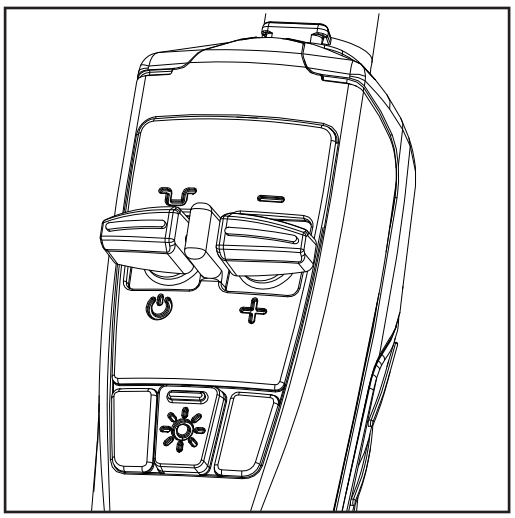
Fare på grunn av kjølemiddel som renner ut.
Følgene kan bli alvorlige personskader og materielle skader.
- ▶ Lukk alltid kjølemiddelslangene for den vannkjølte sveisepistolen med den påmonterte plastlåsen, når de kobles fra kjøleapparatet eller trådmateren.

Generelt

Generelt

TIG-sveisepistolene er spesielt robuste og pålitelige. Det ergonomiske håndtaket og optimal vektfordeling bidrar til uanstrengt arbeid.
Sveisepistolene fås i gass- og vannkjølt utførelse og kan tilpasses de mest forskjellige oppgaver.
Sveisepistolene egner seg særlig til manuell serie- og enkeltproduksjon samt på verksteder.

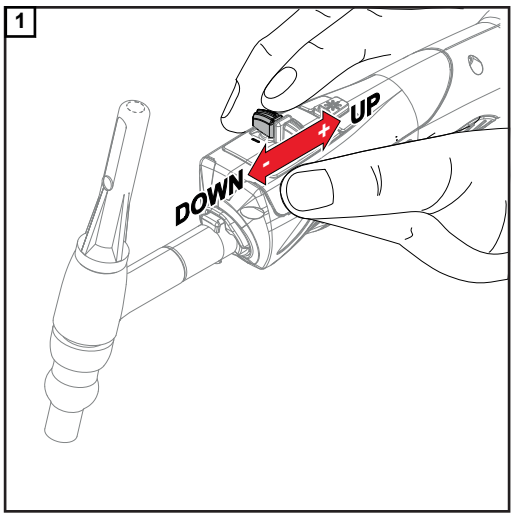
Sveisepistol med up/down-funksjon



Sveisepistolen med up/down-funksjon har følgende funksjoner:

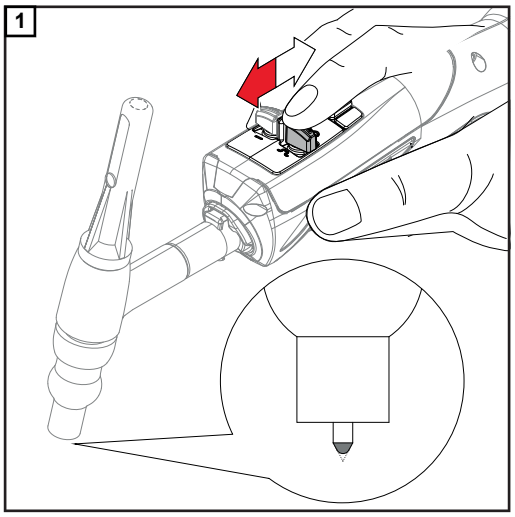
- Sveiseeffekten endres med Up/Down-tasten (+/-)
- Sveisestedet belyses med LED:
  Trykk en gang på tasten – LED lyser i 5 s
  Hold tasten inne – LED lyser konstant
- Kalottdannelse i forbindelse med sveiseprosessen TIG AC
- Mellomreduksjon i forbindelse med driftstypen 4-takt ($I_1 > I_2$)

Endring av sveiseeffekten

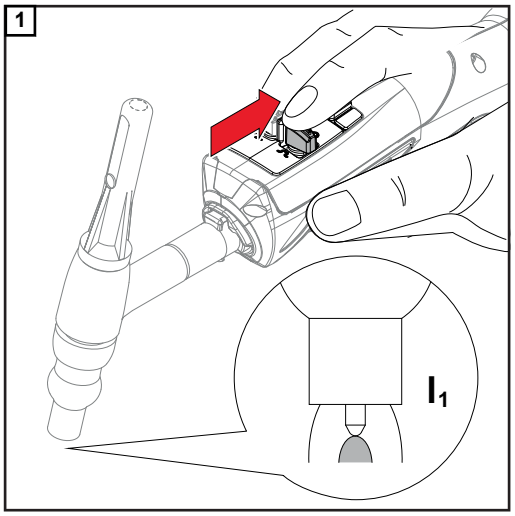


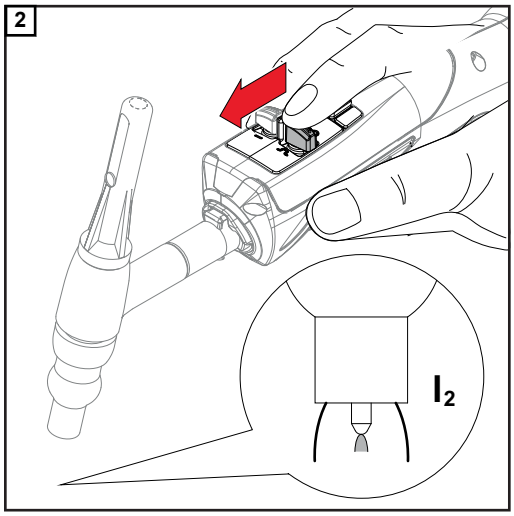
NO

Kalottdannelse

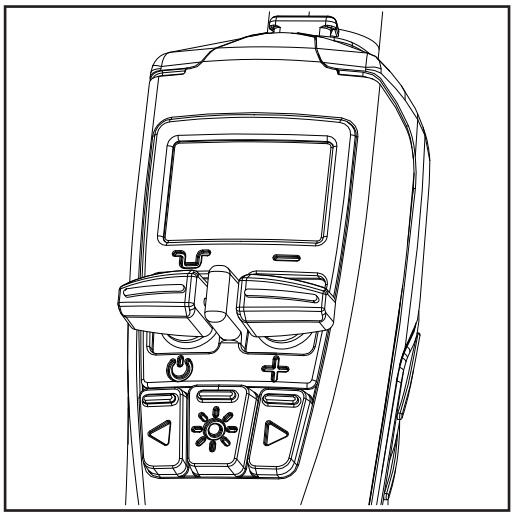


Mellomreduksjon





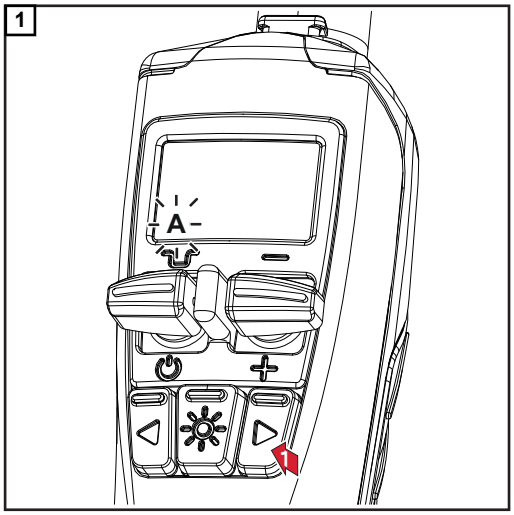
JobMaster-sveisepistol

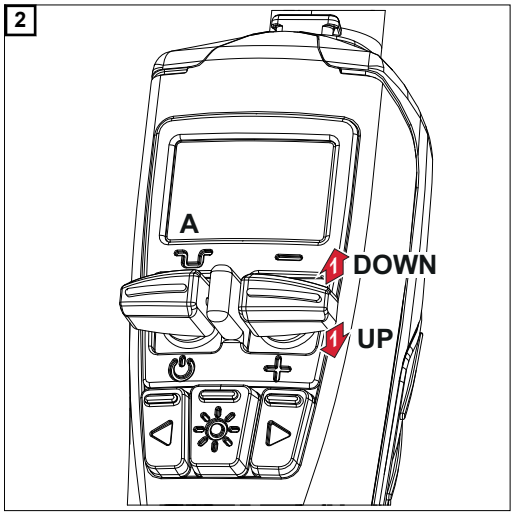


JobMaster-sveisepistolen har følgende funksjoner:

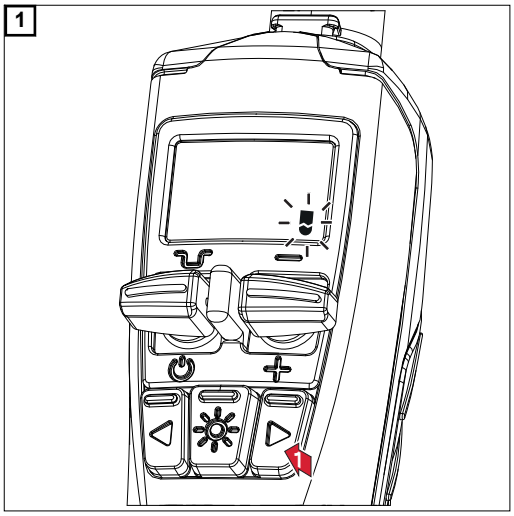
- Ergonomisk avlesning og tilpasning av essensielle parametre rett på sveisepistolen
- Optimal kontroll av sveiseprosessen uten å begrense håndteringen
- Sveiseeffekten endres med Up/Down-tasten (+/-)
- Sveisestedet belyses med LED:
  Trykk en gang på tasten – LED lyser i 5 s
  Hold tasten inne – LED lyser konstant
- Kalottdannelse i forbindelse med sveiseprosessen TIG AC
- Mellomreduksjon i forbindelse med driftstypen 4-takt ($I_1 > I_2$)

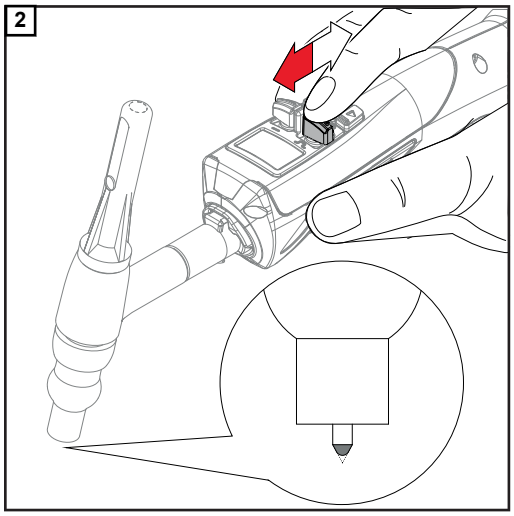
Endring av sveiseeffekten



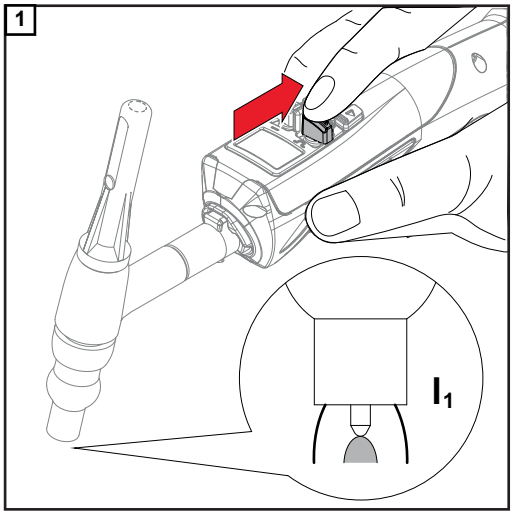


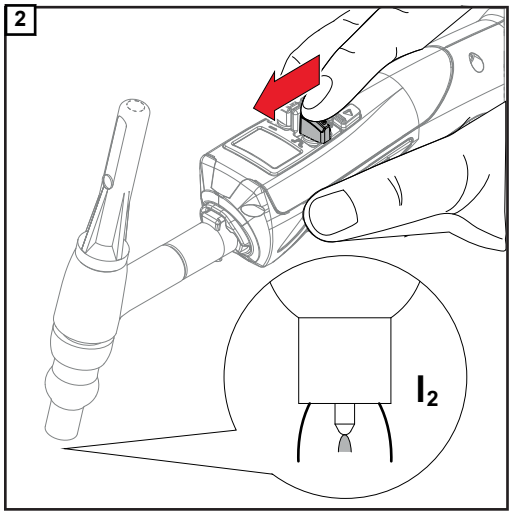
Kalottdannelse





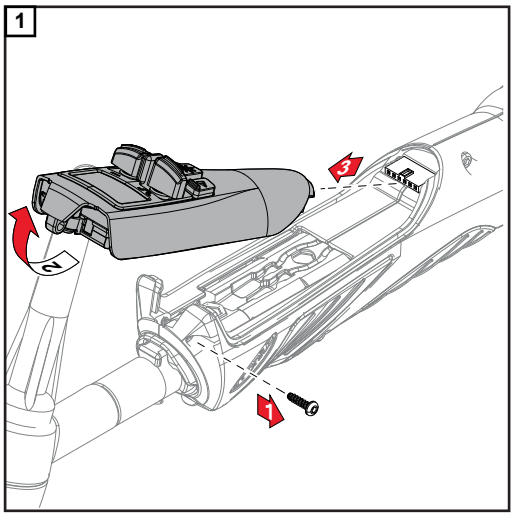
Mellomreduksjon

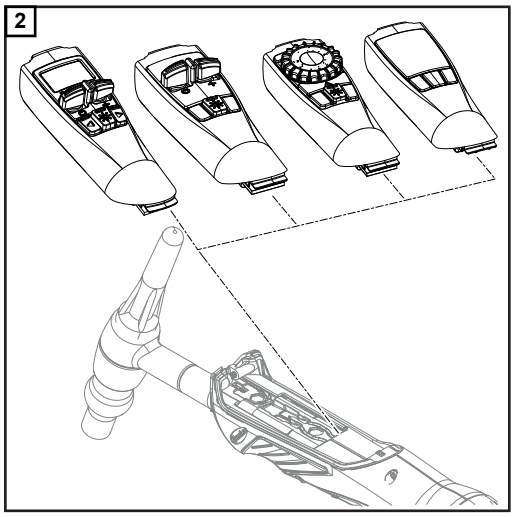


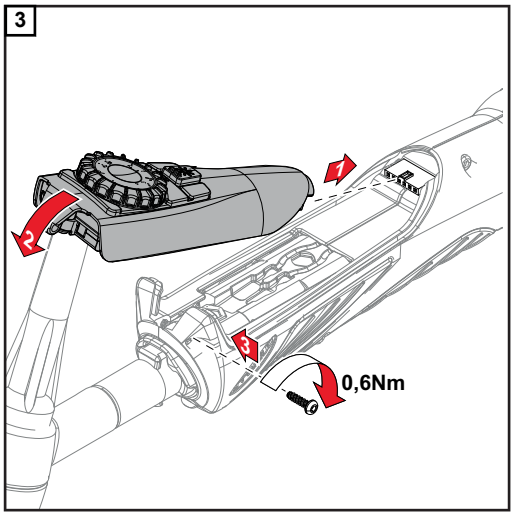


NO

Bytte grensesnitt



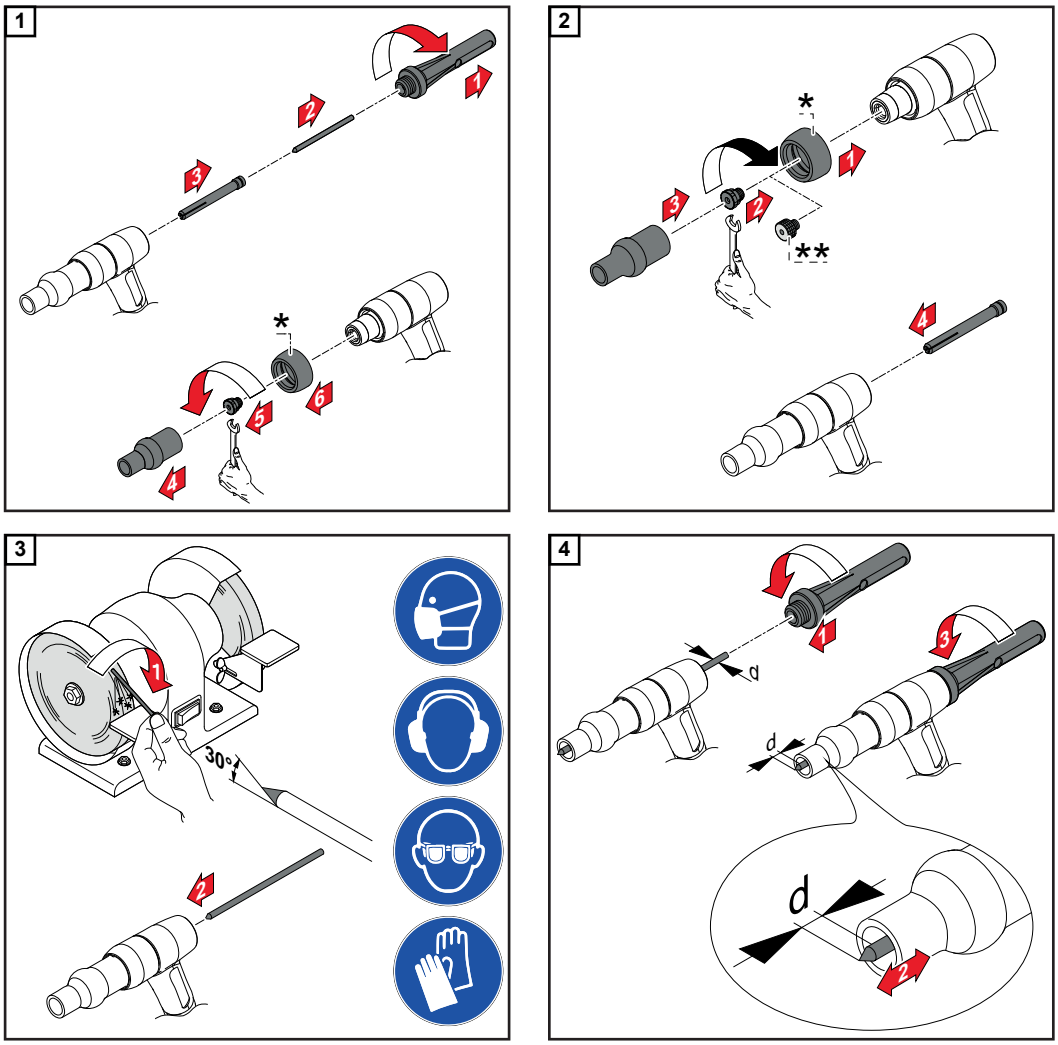




Montere forbruksdeler

Montere forbruksdeler system A

Forbruksdel-system A med gassdyse med stikkforbindelse



MERKNAD!

Pistolhetten skal kun strammes såpass at wolframelektroden ikke kan forskyves for hånd.

* Utskiftbar gummitetningshylse kun for TTB 220 G/A

** Avhengig av utførelse på sveisepistolen kan det brukes gasslinse i stedet for spennmutter.

⚠ **FORSIKTIG!**

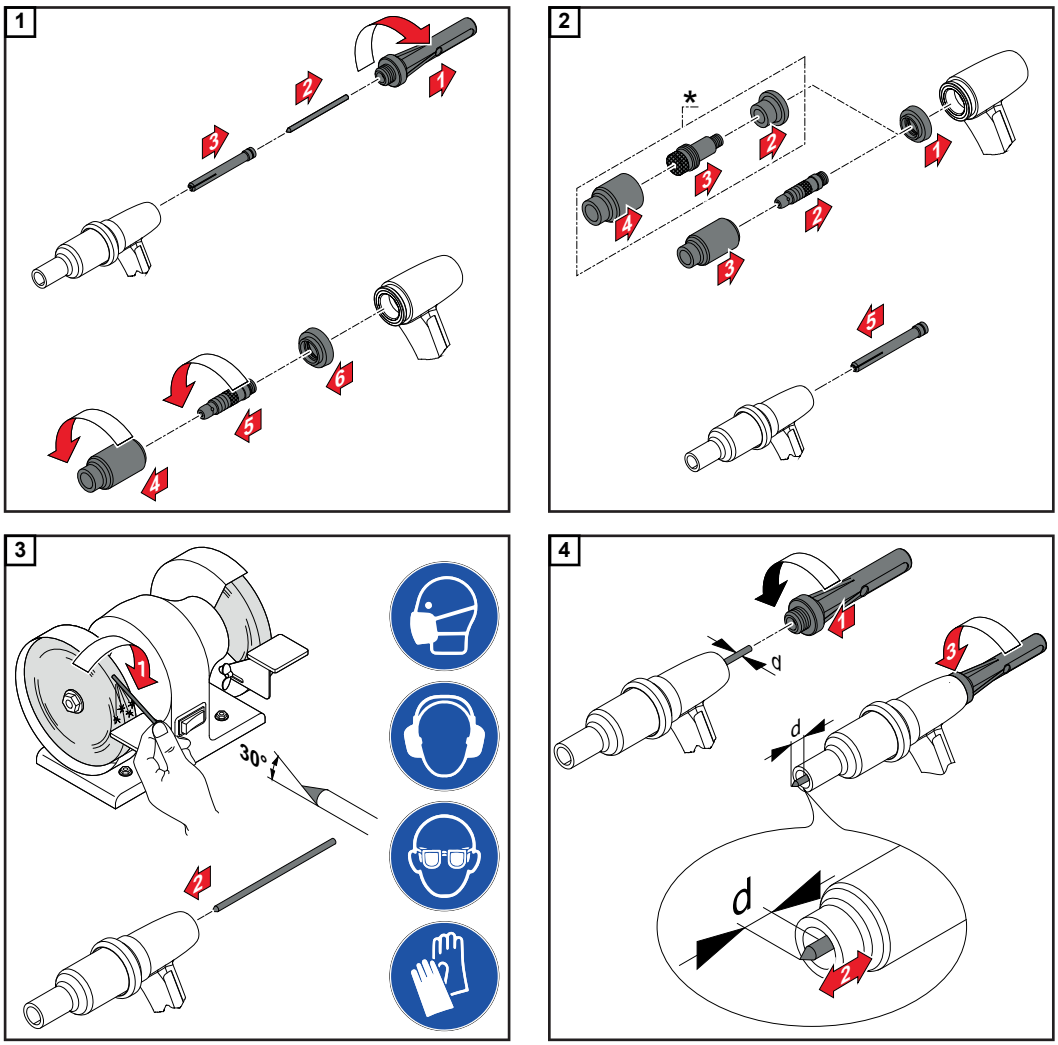
Fare for skader på grunn av for høyt tiltrekkingsmoment!
Konsekvensen kan bli skader på gjengene.

► Spennmutteren eller gasslinsen må kun strammes lett.

NO

Montere forbruksdeler system P

Forbruksdel-system P med gassdyse med skruforbindelse



MERKNAD!

Pistolhetten skal kun strammes såpass at wolframelektroden ikke kan forskyves for hånd.

* Utskiftbar gummitetningshylse kun for TTB 220 G/P

** Avhengig av utførelse på sveisepistolen kan det brukes gasslinse i stedet for spennmutter.

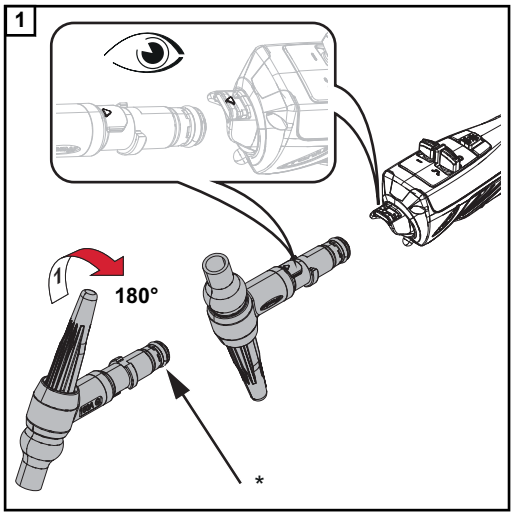
⚠ **FORSIKTIG!**

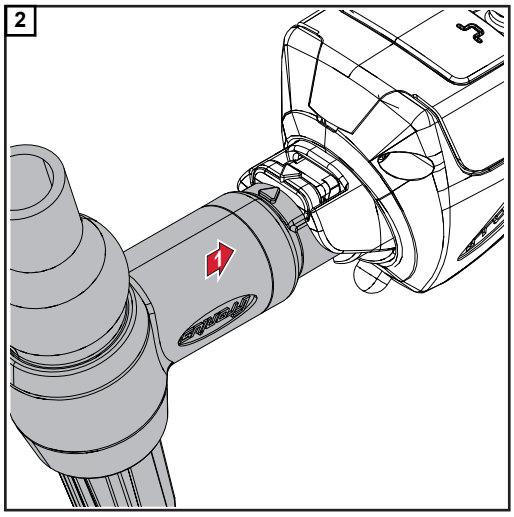
Fare for skader på grunn av for høyt tiltrekkingsmoment!
Konsekvensen kan bli skader på gjengene.

► Spennmutteren eller gasslinsen må kun strammes lett.

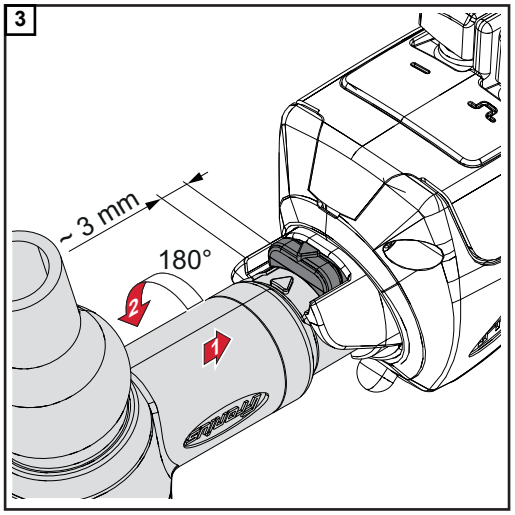
Installering og idriftsetting

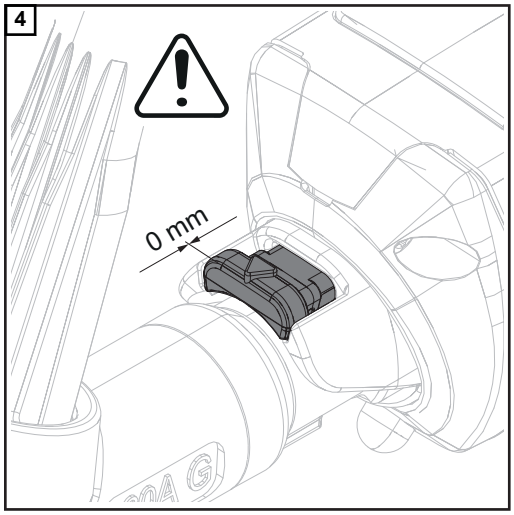
Montere sveisepistolenhet





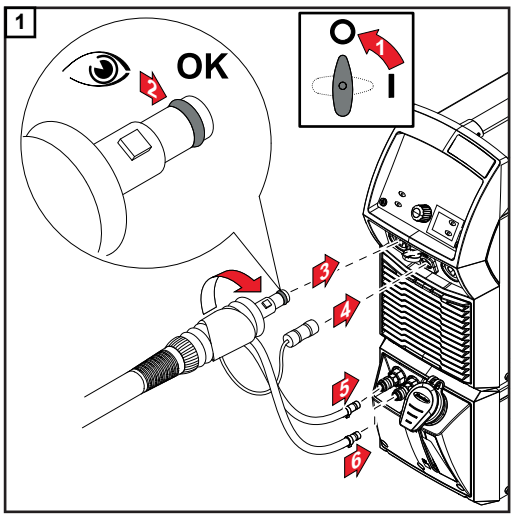
** Smør inn O-ringen før montering!*





VIKTIG! Når sveisepistolenheten monteres, må man påse at den skyves helt inn til stopp og går i inngrep!

Koble sveisepistolen til strømkilden og kjøleapparatet



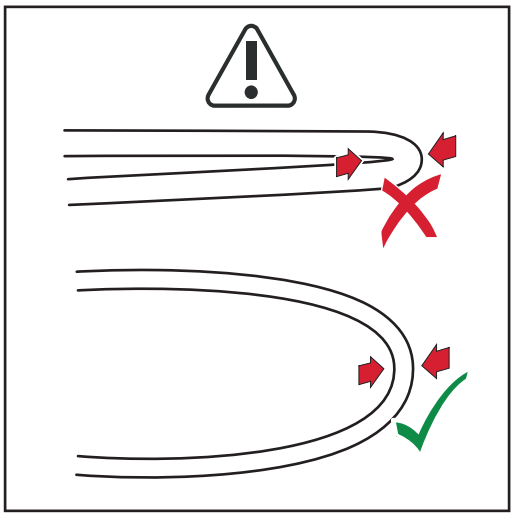
MERKNAD!

Kontroller pakningen på tilkoblingen til sveisepistolen og kjølemiddelnivået før hver start!

Kontroller kjølemiddelgjennomstrømningen med jevne mellomrom mens du sveiser.

Koble til forlengelsesslangepakke

Forlengelsesslangepakken leveres med en beskyttelsesveske som må brukes til koblingsstedet mellom forlengelsesslangepakken og sveisepistol-slangepakken.



MERKNAD!

Ved følgende aktiviteter må du sørge for at slanger og kabler ikke blir knekt, klemt, skjært av eller skadet på noen måte.

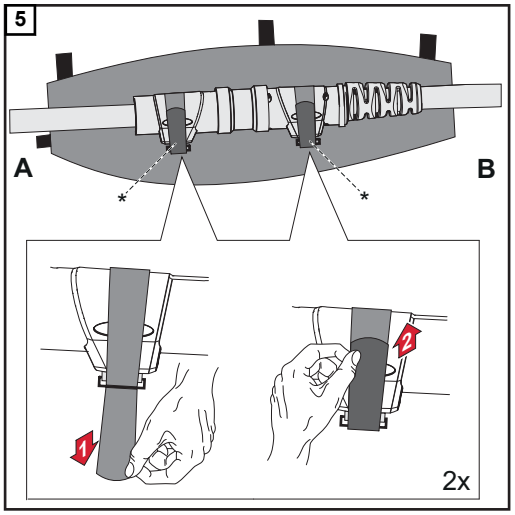
1 Posisjoner beskyttelsesvesken slik at Fronius-logoen er synlig og sløyfen er øverst:
venstre = mot strømkilden (A)
høyre = mot sveisepistolen (B)

2 Åpne beskyttelsesvesken:
- Trekk begge glidelåsene helt opp til de stopper.
- Trekk det nederste tannbeltet ut av glidelåsene.

3 Koble strøm-/gassforbindelsene til forlengelsesslangepakken og sveispistol-slangepakken (bajonettlås)

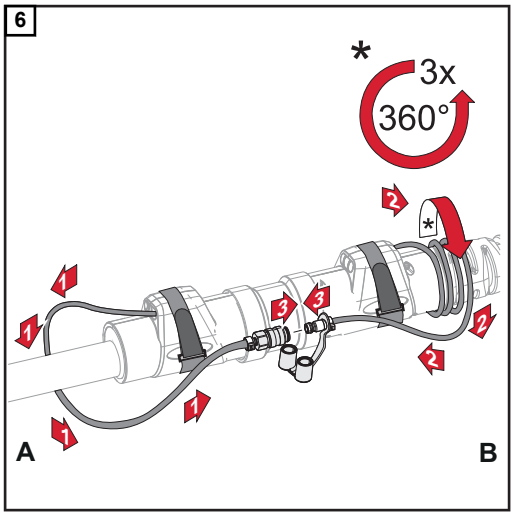
4 Legg koblingsstedet i den innvendige posen i beskyttelsesvesken

5



Fest koblingsstedet med to borrelåsbånd i den innvendige posen

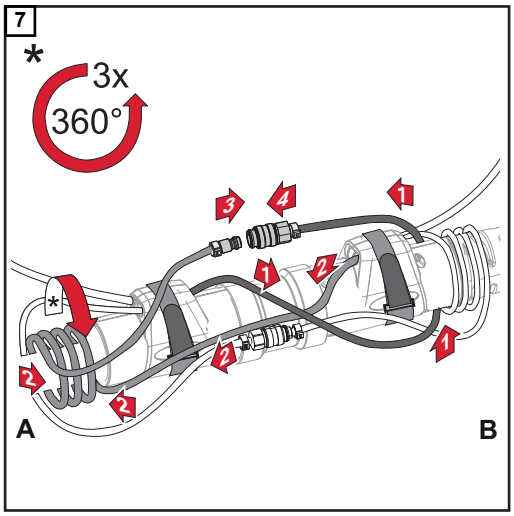
** Borrelåsbånd på den innvendige posen (innvendig pose ikke vist)*



Legg kjølemiddelslangen fra forlengelsesslangepakken slik det er vist

Vikle kjølemiddeleslangen fra sveisepistolslangepakken tre ganger rundt sveispistolslangepakken og før den til koblingsstedet

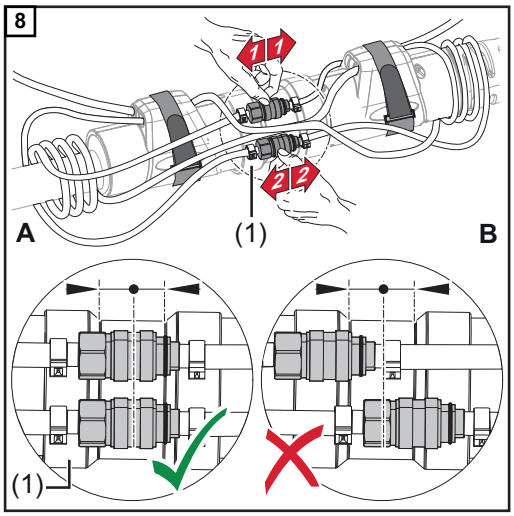
Koble til kjølemiddelslangene



Før den andre kjølemiddelslangen fra sveispistol-slangepakken (slik det er vist) til forlengelsesslangepakken, vikle den tre ganger rundt forlengelsesslangepakken og før den tilbake til koblingsstedet

Før den andre kjølemiddelslangen fra forlengelsesslangepakken rundt sveisepistolslangepakken til koblingsstedet slik det er vist

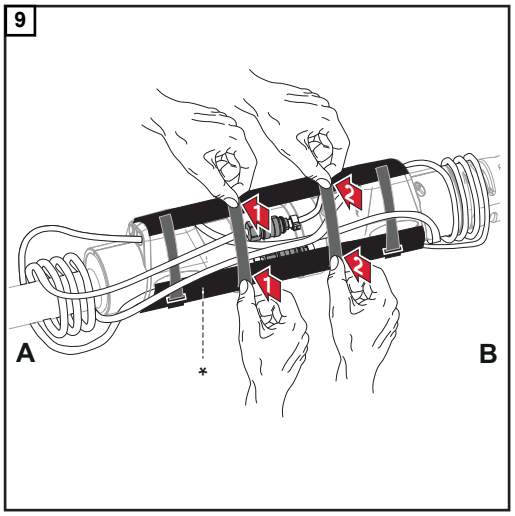
Koble til kjølemiddelslangene



Posisjoner kjølemiddeltilkoblingene under hverandre og i midten med hensyn til isoleringsrøret (1)

NO

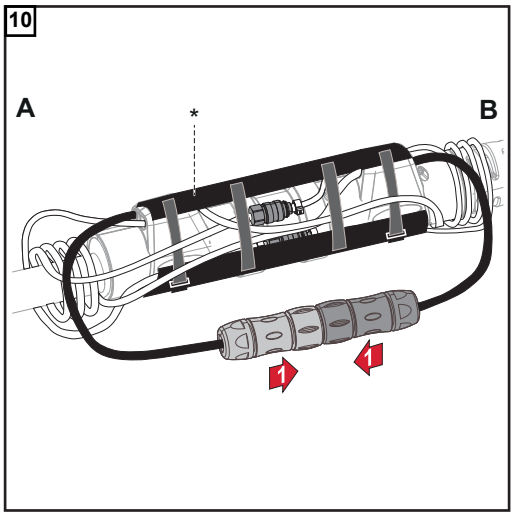
9



Fest de to vedlagte borrelåsbåndene på den innvendige posen

** Innvendig pose*

10



Koble sammen TMC-styreledningslug-gene, og posisjoner dem ved siden av den innvendige posen

** Innvendig pose*

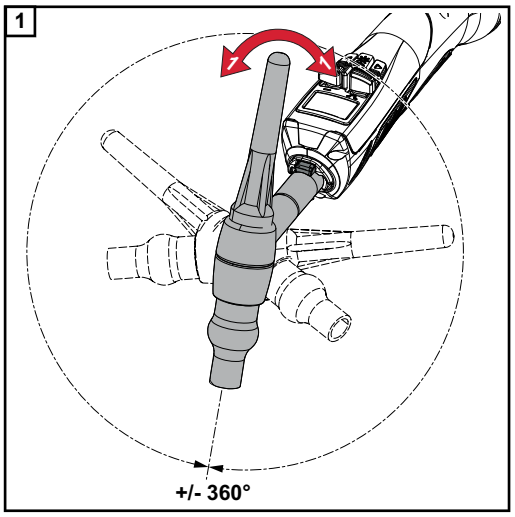
11 Lukk beskyttelsesvesken

MERKNAD!

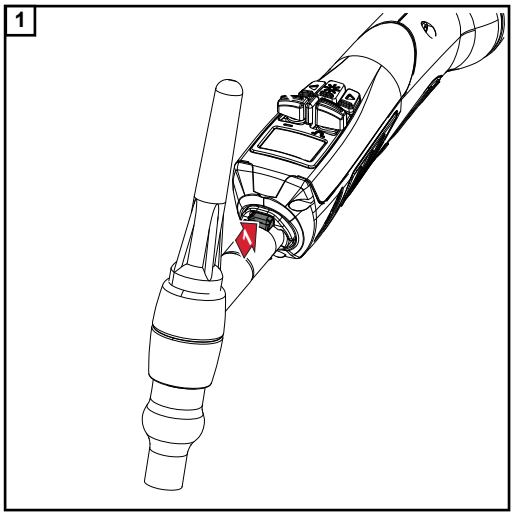
Ved bruk av vannkjølte forlengelsesslangepakker må du ta hensyn til følgende:

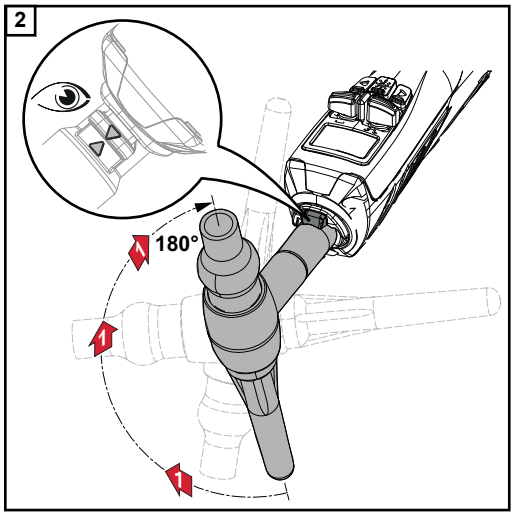
- ▶ Så snart en riktig returstrøm kan sees i kjølemiddelbeholderen til kjøleapparatet etter idriftsetting av strømkilden, må du sørge for at det er tilstrekkelig kjølemiddel i kjøleapparatet.
- ▶ Hvis det brukes et MultiControl-kjøleapparat, kan en fullstendig fylt kjølemidelbehol-der flyte over når slangepakken tømmes – sklifare!
- ▶ Ta hensyn til kjøleapparats bruksanvisning!

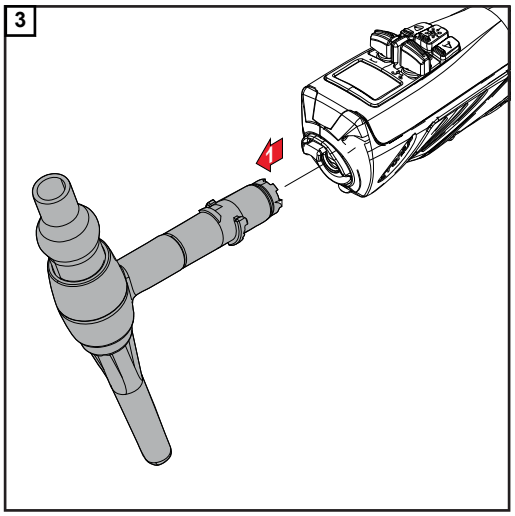
Dreie sveisepistolenhet



Bytte sveisepistolenhet - gasskjølte sveisepistoler



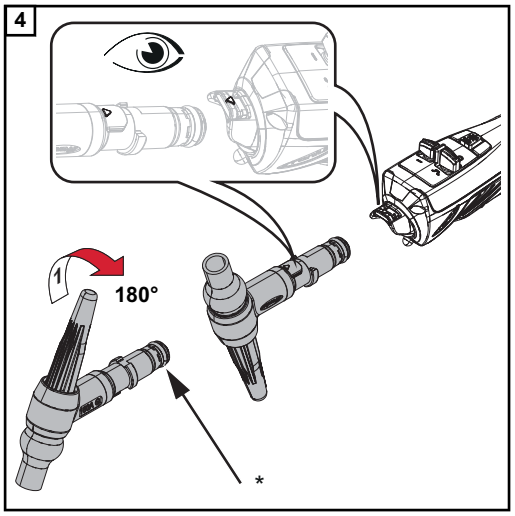


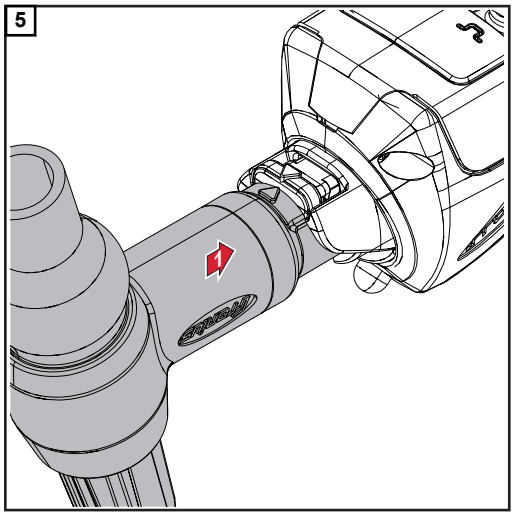


MERKNAD!

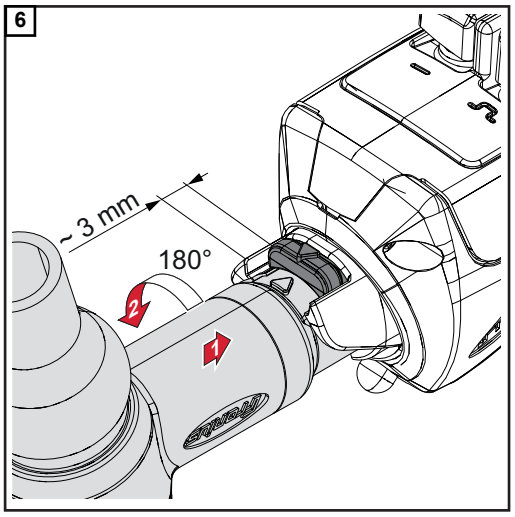
Ved bytte av sveisepistolenhet må man påse at det kun monteres systemer som hører sammen.

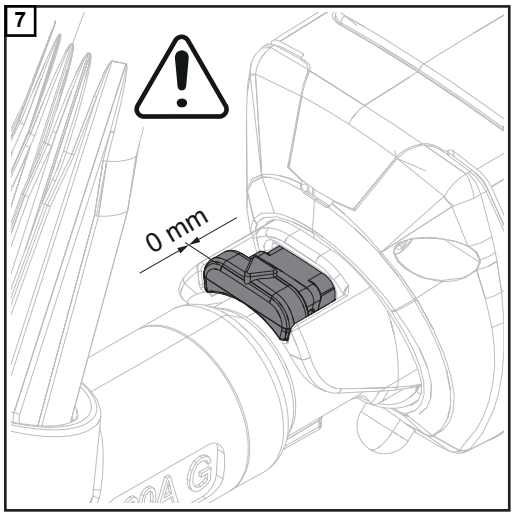
▶ Ikke monter gasskjølte sveisepistolenheter på vannkjølte slangepakker og omvendt!





** Smør inn O-ringen før montering!*





VIKTIG! Når sveisepistolenheten monteres, må man påse at den skyves helt inn til stopp og går i inngrep.

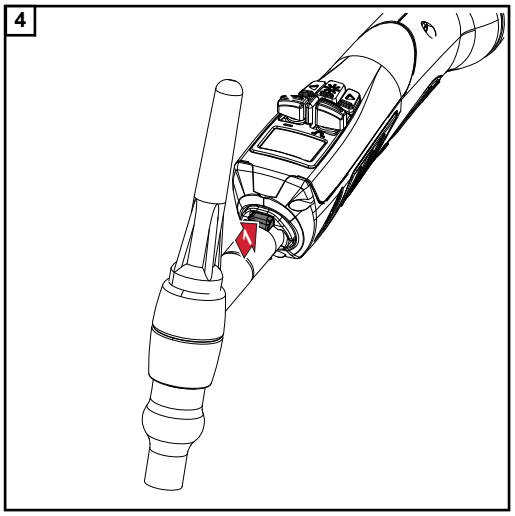
Bytte sveisepistolenhet - vannkjølte sveisepistoler

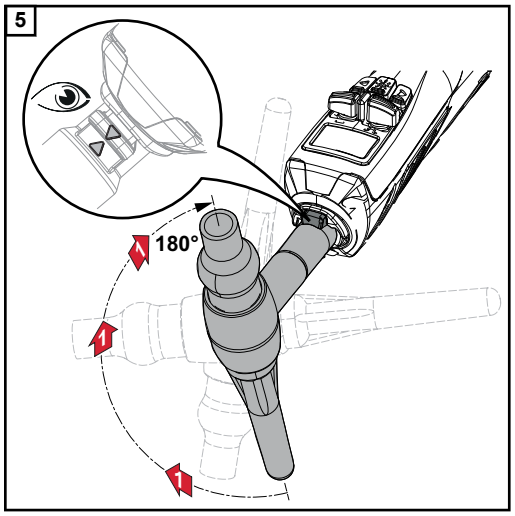
1 Slå av strømkilden og koble den fra strømnettet;
vent til etterløpsfasen til kjølesystemet er avsluttet

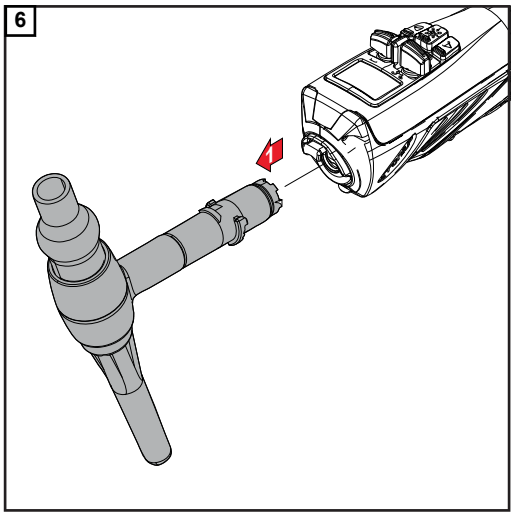
2 Ved montert kjøleapparat CU 600 MC:
Tøm sveisepistol-slangepakken ved hjelp av strømkilden eller sveisepistolen

Ved andre kjøleapparater:
Lås slangen for kjølemiddelinnløp på kjøleapparatet.

3 Blås gjennom slangen for kjølemiddelinnløp med trykkluft på maks. 4 bar, slik at en stor del av kjølemiddelet renner tilbake i kjølemiddelbeholderen.







7 Rengjør koblingsstedet på slangepakken med trykkluft

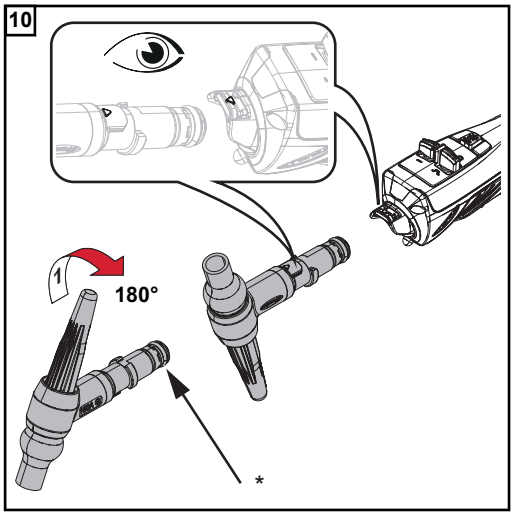
8 Tørk av sveisepistolenheten med en klut

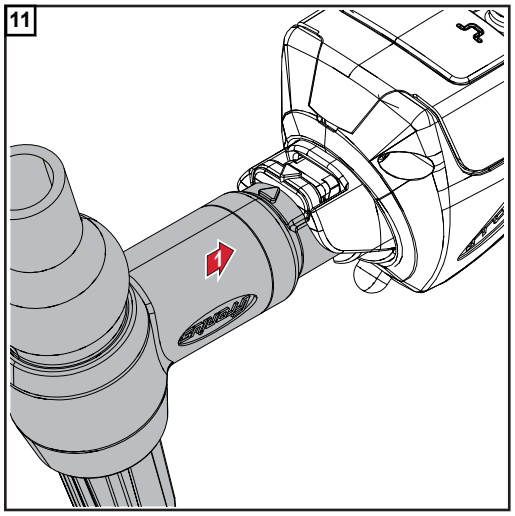
9 Sett beskyttelseshette på sveisepistolenheten

MERKNAD!

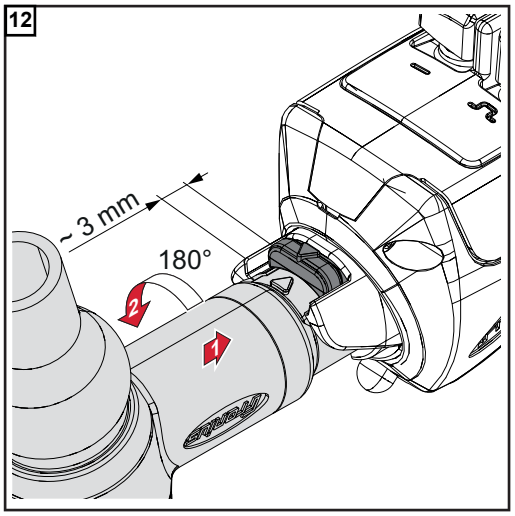
Ved bytte av sveisepistolenhet må man påse at det kun monteres systemer som hører sammen.

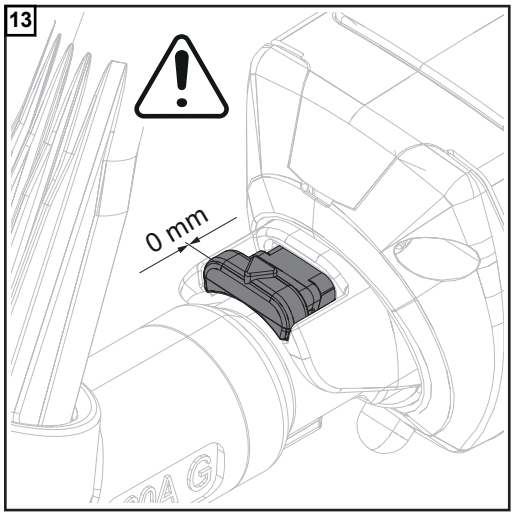
▶ Ikke monter gasskjølte sveisepistolenheter på vannkjølte slangepakker og omvendt!





** Smør inn O-ringen før montering!*





VIKTIG! Når sveisepistolenheten monteres, må man påse at den skyves helt inn til stopp og går i inngrep.

14 Koble strømkilden til strømnettet og slå den på

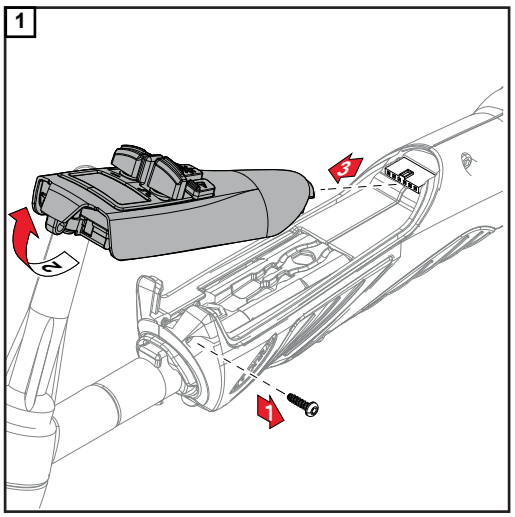
15 Trykk på tast for gassprøver på strømkilden

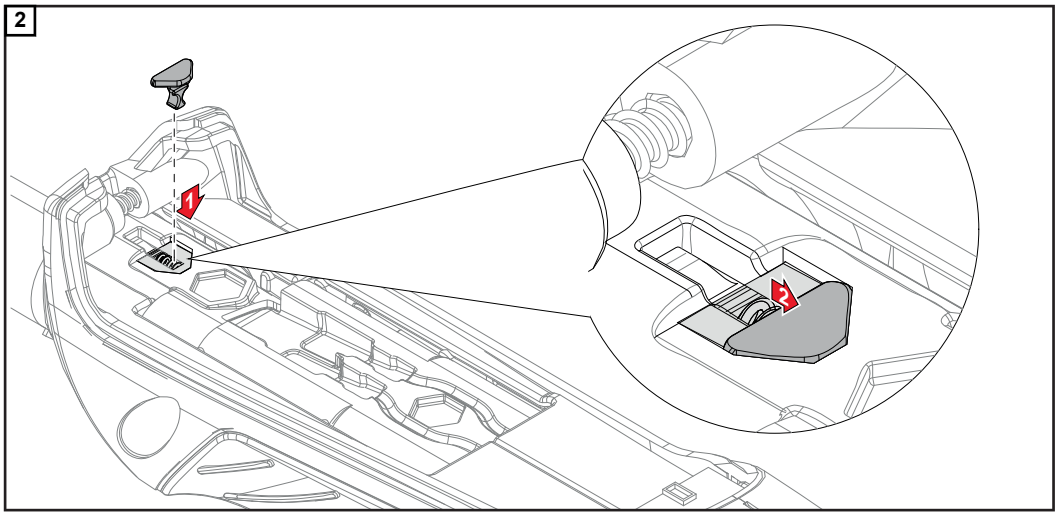
Det strømmer ut beskyttelsesgass i 30 s.

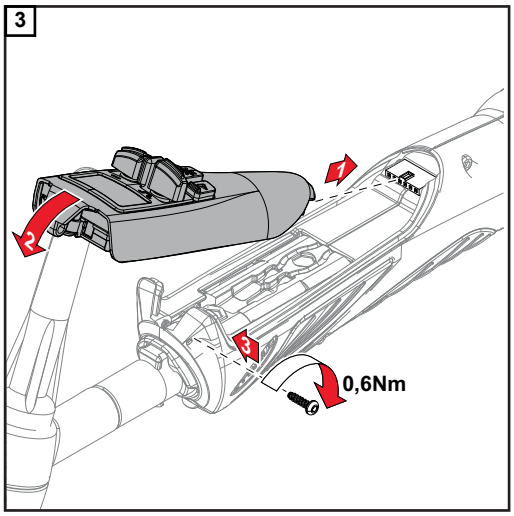
16 Kontroller kjølemiddelgjennomstrømning:
Du skal kunne se en jevn retur av kjølemiddel i kjølemiddelbeholderen.

17 Utfør en prøvesveising, og kontroller kvaliteten på sveisesømmen.

Sperre bytte av sveispistolenhet




2
1
2


3
1
2
3
0,6Nm

Informasjon om fleksible sveisepistolenheter

Generelt

De fleksible TIG-sveisepistolenhetene kan bøyes i alle retninger og dermed tilpasses individuelt til svært ulike situasjoner og bruksområder.
Fleksible sveisepistolenheter brukes for eksempel når det er begrenset tilgang til komponenter eller når sveiseposisjonen er vanskelig.
Imidlertid svekkes materialet til de fleksible sveisepistolenhetene hver gang formen endres, så antall ganger de kan bøyes, er også begrenset.

Bøyingen og antall bøyninger forklares i avsnittene nedenfor.

Definisjon – bøying av sveisepistolenheter

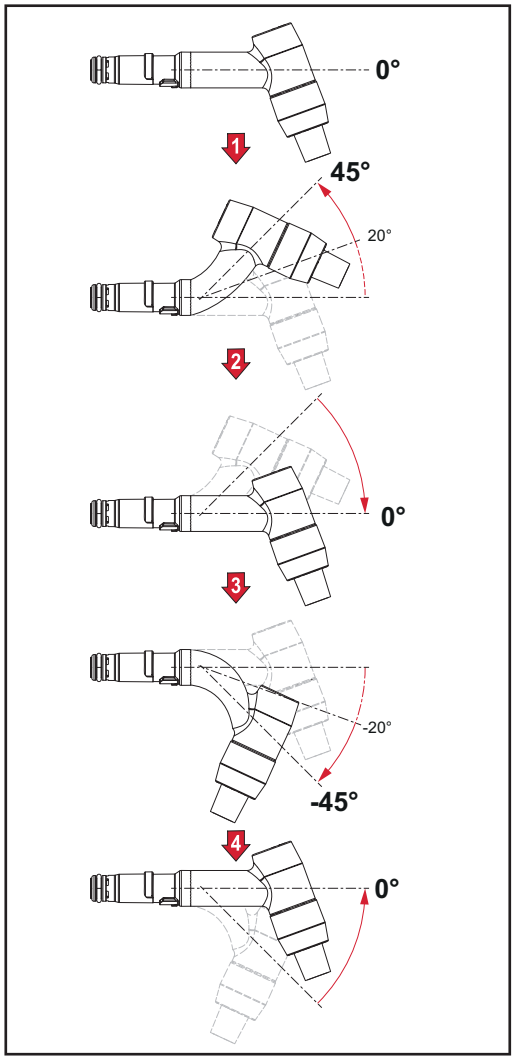
En bøying er engangsendring av den opprinnelige formen med minst 20°.

Den minste bøyeradiusen er blitt definert for at sveisepistolenhetene ikke bare skal bøyes på et punkt, men så jevnt som mulig over en lengde.
Bøyeradiusen må ikke underskrides.
Den minste bøyeradiusen er 25 mm / 1 inch.

Bøying må ikke overskride den maksimale bøyevinkelen.
Den maksimale bøyevinkelen er 45°.

Bøying tilbake til den opprinnelige formen gjelder som egen bøyning.

Eksempel: 45°-bøyning



Utgangssituasjon: 0°

Bevegelse fra 0° til 45° oppover
= 1. bøyning

Bevegelse fra 45° tilbake til 0°
= 2. bøyning

Bevegelse fra 0° til 45° nedover
= 3. bøyning

Bevegelse fra 45° tilbake til 0°
= 4. bøyning

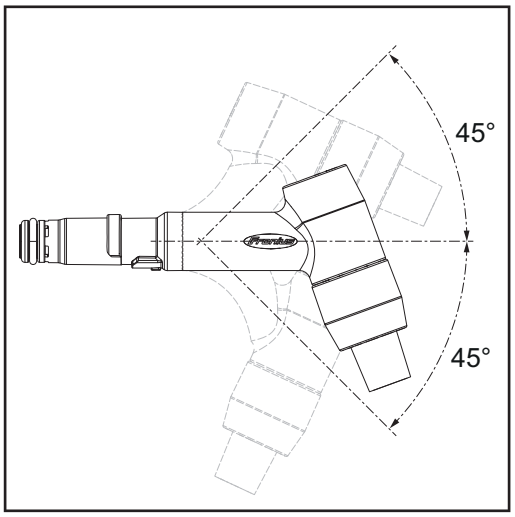
NO

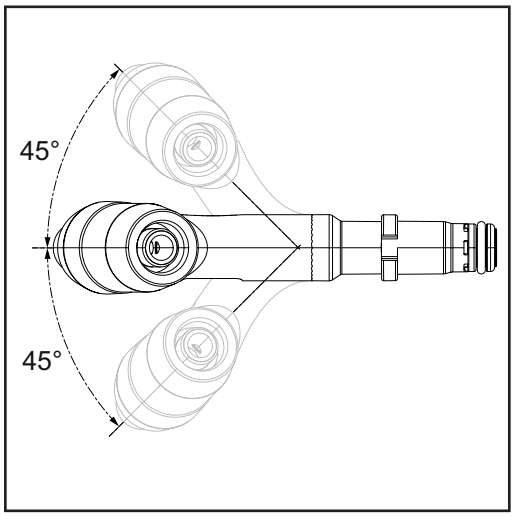
Maksimalt antall bøyninger for sveisepistolenhetene

Hvis det tas hensyn til en bøyeradius ≥ 25 mm / 1 inch og en maksimal bøyevinkel = 45°, kan

- gasskjølte sveisepistoler bøyes minst 1000 ganger
- vannkjølte sveisepistoler bøyes minst 200 ganger

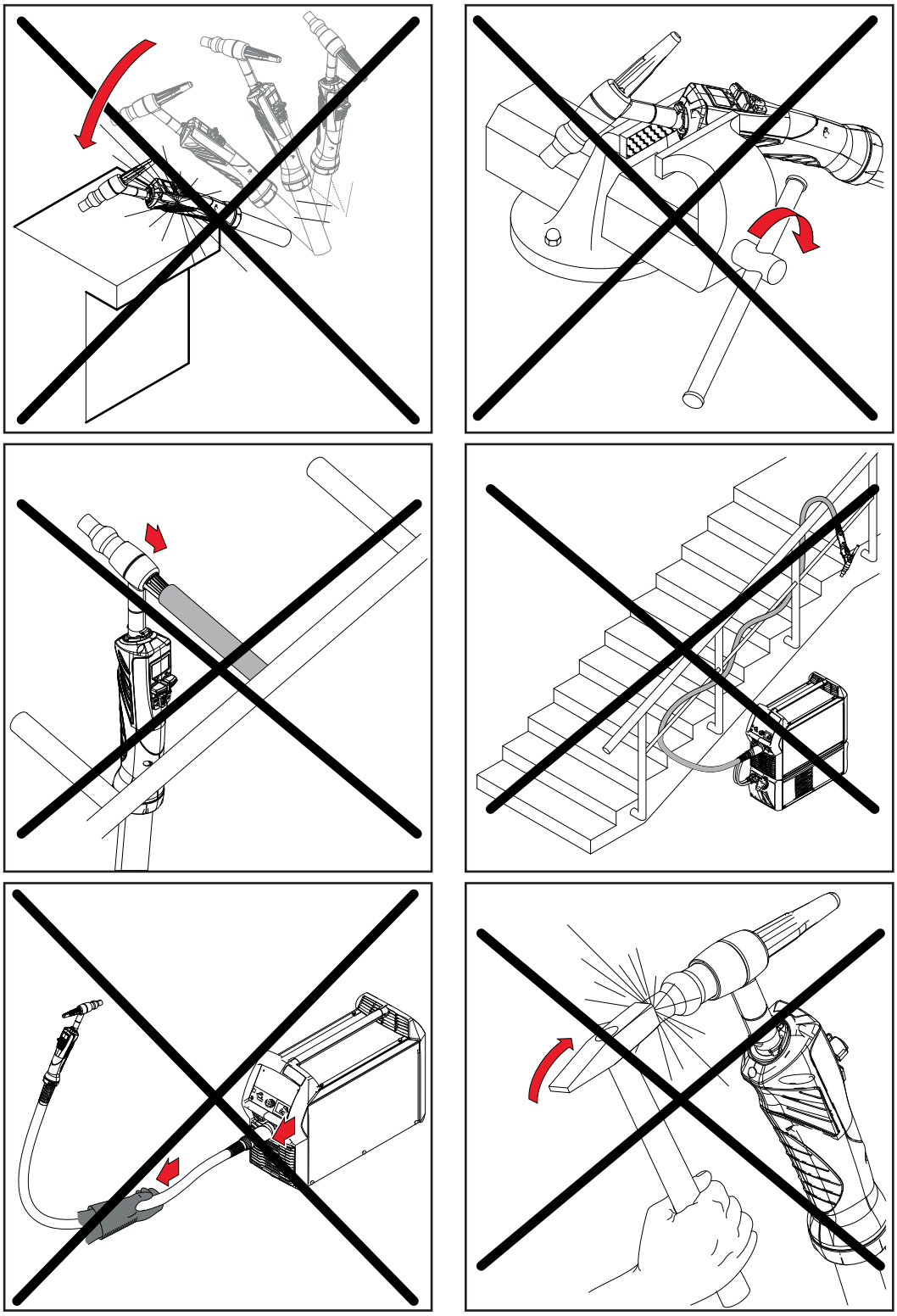
Bøyemuligheter





Pleie, vedlikehold og avhending

Generelt



Vedlikehold ved hver bruk

- Kontroller forbruksdeler, og bytt ut defekte forbruksdeler
- Rens gassdysen for sveisesprut.

I tillegg ved hver bruk av vannkjølte sveisepistoler:

- Forsikre deg om at alle kjølemiddel-tilkoblinger er tette.
- Forsikre deg om at kjølemiddelreturen fungerer.

Avhending

Ta hensyn til gjeldende nasjonale og lokale bestemmelser ved avhending.

Feildiagnose, feilutbedring

Feildiagnose, feilutbedring

Sveisepistolen lar seg ikke koble til

Årsak: Bajonettlåsen er bøyd

Utbedring: Bytt ut bajonettlåsen

Ingen sveisestrøm.

Nettbryteren på strømkilden er slått på, indikasjonene på strømkilden lyser, beskyttelsesgass tilgjengelig.

Årsak: Jordtilkoblingen er feil.

Utbedring: Opprett forskriftsmessig jordtilkobling.

Årsak: Strømledningen i sveisepistolen er brutt.

Utbedring: Bytt sveisepistolen.

Årsak: Wolframelektrode løs

Utbedring: Stram wolframelektroden med pistolhetten

Årsak: Forbruksdeler løse

Utbedring: Stram forbruksdelene

Ingen funksjon etter at det er trykt på brennertasten

Nettbryteren er slått på, indikatorene på strømkilden lyser, beskyttelsesgass tilgjengelig.

Årsak: Styreplugg er ikke satt i.

Utbedring: Sett inn styrepluggen.

Årsak: Sveisepistol eller sveisepistol-styreledning er defekt

Utbedring: Bytte sveisepistol

Årsak: Feil på gluggforbindelser “brennertast/styreledning/ strømkilde”

Utbedring: Kontroller pluggforbindelsen / strømkilden eller sveisepistolen må til service

Årsak: Printkort i sveisepistol defekt

Utbedring: Skift ut printkort

HF-overslag på tilkobling til sveisepistol

Årsak: Tilkobling til sveisepistol ikke tett

Utbedring: Bytt O-ring på bajonettlåsen

HF-overslag på håndtaket

Årsak: Slangepakke ikke tett

Utbedring: Bytt slangepakke

Årsak: Slangekobling for beskyttelsesgass til sveispistolenhet ikke tett

Utbedring: Sett på slangen på nytt og tett den

Ingen beskyttelsesgass.

Alle andre funksjoner er tilgjengelige.

Årsak: Gassflasken er tom.

Utbedring: Bytt gassflasken.

Årsak: Trykkreduksjonsventilen er defekt.

Utbedring: Bytt trykkreduksjonsventilen.

Årsak: Gasslange er ikke montert, eller den er knekt eller skadet.

Utbedring: Monter gasslangen, legg den rett. Bytt defekt gasslange.

Årsak: Sveisepistolen er defekt.

Utbedring: Bytt sveisepistolen.

Årsak: Gass-magnetventilen er defekt.

Utbedring: Ta kontakt med kundeservice (få gass-magnetventilen byttet).

Dårlige sveiseegenskaper

Årsak: Feil sveiseparameter.

Utbedring: Kontroller innstillingene.

Årsak: Jordtilkoblingen er feil.

Utbedring: Kontroller polariteten på jordtilkobling og koblingsklemme.

Sveisepistolen blir svært varm

Årsak: Sveisepistolen er for svakt dimensjonert

Utbedring: Ta hensyn til innkoblingsvarighet og belastningsgrenser

Årsak: Kun ved vannkjølte anlegg: Vanngjennomstrømning for liten

Utbedring: Kontroller vannivå, vanngjennomstrømningsmengde, vannforurensning osv., kjølemiddelpumpe blokkert: Skru akselen til kjølemiddelpumpen på gjennomføringen med skrutrekker

Årsak: Kun ved vannkjølte anlegg: Parameteren “Styring Kjøleapparat” er på “OFF”.

Utbedring: Sett parameteren “Styring kjøleapparat” på “Aut” eller “ON” i Setup-menyen.

Sveisesømmen er porøs.

Årsak: Sprutdannelse i gassdysen, dermed blir det utilstrekkelig gassbeskyttelse i sveisesømmen.

Utbedring: Fjern sveisespruten.

Årsak: Hull i gasslangen eller unøyaktig tilkobling av gasslangen.

Utbedring: Bytt gasslangen.

Årsak: O-ringen på sentraltilkoblingen er revet opp eller defekt

Utbedring: Skift ut O-ringen

Årsak: Fuktighet / kondens i gassledningen.

Utbedring: Tørk gassledningen.

Årsak: For kraftig eller for svak gass-forstrømning.

Utbedring: Korriger gass-forstrømningen.

Årsak: Utilstrekkelig gassmengde ved sveisestart eller sveiseslutt.

Utbedring: Øk gassforstrømming og gassetterstrømming

Årsak: Det er påført for mye skillemiddel.

Utbedring: Fjern overflødig skillemiddel / påfør mindre skillemiddel.

Dårlige tenningsegenskaper

Årsak: Uegnet wolframelektrode (for eksempel WP-elektrode ved DC-sveising)

Utbedring: Bruk en egnet wolframelektrode

Årsak: Forbruksdeler løse

Utbedring: Skru fast forbruksdelene

Gassdysen får sprekker

Årsak: Wolframelektroden stikker ikke langt nok ut av gassdysen

Utbedring: La wolframelektroden stikke lenger ut av gassdysen

Tekniske data

Generelt

Produktet tilsvarer kravene i standarden IEC 60974-7.

MERKNAD!

De angitte tekniske dataene gjelder kun ved bruk av standard forbruksdeler.
Ved bruk av gasslinser og kortere gassdyser reduseres sveisestrømverdiene.

MERKNAD!

For de gasskjølte sveisepistolenhetene gjelder sveisestrømverdiene kun ved bruk av en sveisepistolenhetslengde L ≥ 65 mm.
Ved bruk av kortere sveisepistolenheter reduseres sveisestrømverdiene med ca. 30 %.

MERKNAD!

Ved sveising nær effektgrensen til sveisepistolen må det brukes tilsvarende større wolframelektroder og gassdyse-åpningsdiametre for å forlenge driftstiden til forbruksdelene.
Ta hensyn til strømstyrke, AC-balanse og AC-strøm-offset som faktorer som er avgjørende for effekten.

Sveisepistolenhet gasskjølt - TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G / F	TTB 220 G
DC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1)] / 80 A 60 % ED[1)] / 60 A 100 % ED[1)] / 50 A	35 % ED[1)] / 160 A 60 % ED[1)] / 120 A 100 % ED[1)] / 90 A	35 % ED[1)] / 220 A 60 % ED[1)] / 170 A 100 % ED[1)] / 130 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1)] / 30 A	35 % ED[1)] / 120 A 60 % ED[1)] / 90 A 100 % ED[1)] / 70 A	35 % ED1) / 180 A 60 % ED1) / 130 A 100 % ED1) / 100 A
	Argon (Norm EN 439)	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0–3,2 mm 0.039–0.126 in.	1,0–3,2 mm 0.039–0.126 in.	1,0–4,0 mm 0.039–0.158 in.

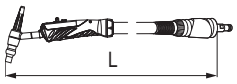
	TTB 220 A G F	TTB 220 P G F	TTB 260 G
DC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1] / 220 A 60 % ED[1] / 170 A 100 % ED[1] / 130 A	30 % ED[1]/ 220 A 60 % ED[1] / 160 A 100 % ED[1] / 130 A	35 % ED[1] / 260 A 60 % ED[1] / 200 A 100 % ED[1] / 150 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1] / 180 A 60 % ED[1]/ 120 A 100 % ED[1] / 100 A	30 % ED[1] / 170 A 60 % ED[1] / 120 A 100 % ED[1] / 100 A	35 % ED[1] / 200 A 60 % ED[1] / 160 A 100 % ED[1] / 120 A
	Argon (Norm EN 439)	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0–4,0 mm 0.039–0.158 in.	1,0–4,0 mm 0.039–0.158 in.	1,6–6,4 mm 0.063–0.252 in.

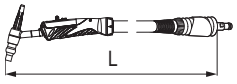
Sveisepistolenhet vannkjølt - TTB 180, TTB 300, TTB 400, TTB 500

	TTB 180 W	TTB 300 W
DC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 180 A 100 % ED[1] / 140 A	60 % ED[1] / 300 A 100 % ED[1] / 230 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 140 A 100 % ED[1] / 110 A	60 % ED[1] / 250 A 100 % ED[1] / 190 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0–3,2 mm 0.039–0.126 in.	1,0–3,2 mm 0.039–0.126 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

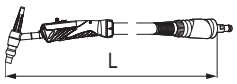
	TTB 400 W F	TTB 500 W
DC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 400 A 100 % ED[1] / 300 A	60 % ED[1] / 500 A 100 % ED[1] / 400 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 320 A 100 % ED[1] / 250 A	60 % ED[1] / 400 A 100 % ED[1] / 300 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	1,0–4,0 mm 0.039–0.157 in.	1,6–6,4 mm 0.063–0.252 in.
 Q_{min}	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

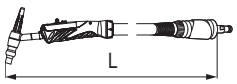
Slangepakke gas-skjølt - THP 160i, THP 220i, THP 260i

	THP 160i	THP 220i
DC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1] / 160 A 60 % ED[1] / 120 A 100 % ED[1] / 90 A	35 % ED[1] / 220 A 60 % ED[1] / 170 A 100 % ED[1] / 130 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1] / 120 A 60 % ED[1] / 90 A 100 % ED[1] / 70 A	35 % ED[1] / 180 A 60 % ED[1] / 130 A 100 % ED[1] / 100 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maks. tillatt tomgangs-spenning (U_0)	113 V	113 V
Maks. tillatt tennspenning (U_P)	10 kV	10 kV

		THP 260i
Sveisestrøm ved 10 min / 40°C (104°F) DC		35 % ED[1] / 260 A 60 % ED[1] / 200 A 100 % ED[1] / 150 A
Sveisestrøm ved 10 min / 40°C (104°F) AC		35 % ED[1] / 200 A 60 % ED[1] / 160 A 100 % ED[1] / 120 A
		Argon (Norm EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maks. tillatt tomgangs-spenning (U_0)		113 V
Maks. tillatt tennspenning (U_P)		10 kV

Slangepakke vannkjølt – THP 300i, THP 400i, THP 500i

	THP 300i	THP 400i
DC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 300 A 100 % ED[1] / 230 A	60 % ED[1] / 400 A 100 % ED[1] / 300 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 250 A 100 % ED[1] / 190 A	60 % ED[1] / 350 A 100 % ED[1] / 270 A
	Argon (Norm EN 439)	Argon (Norm EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min} [W] [2]	650 / 650	950 / 950
Q_{min} [l/min] [gal./min]	1 0.26	1 0.26
p_{min} [bar] [psi]	3 43	3 43
p_{max} [bar] [psi]	5,5 79	5,5 79
Maks. tillatt tomgangs-spenning (U_0)	113 V	113 V
Maks. tillatt tennspenning (U_P)	10 kV	10 kV

		THP 500i
DC-sveisestrøm ved 10 min / 40°C (104°F)		60 % ED[1] / 500 A 100 % ED[1] / 400 A
AC-sveisestrøm ved 10 min / 40°C (104°F)		60 % ED[1] / 400 A 100 % ED[1] / 300 A
		Argon (Norm EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min} [W] [2]		1200 / 1750
Q_{min} [l/min] [gal./min]		1 0.26
p_{min} [bar] [psi]		3 43
p_{max} [bar] [psi]		5,5 79
Maks. tillatt tomgangs-spenning (U_0)		113 V

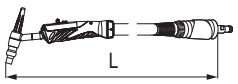
NO

		THP 500i
Maks. tillatt tennspenning (U_P)		10 kV

Forlengelsesslangepakke gasskjølt – HPT 220i G

	HPT 220i EXT G
DC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1] / 220 A 60 % ED[1] / 170 A 100 % ED[1] / 130 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	35 % ED[1] / 180 A 60 % ED[1] / 130 A 100 % ED[1] / 100 A
	Argon (Norm EN 439)
	10,0 m 32 + 9.70 ft. + in.
Maks. tillatt tomgangsspenning (U_0)	113 V
Maks. tillatt tennspenning (U_P)	10 kV

Forlengelsesslangepakke vannkjølt – HPT 400i

	HPT 400i EXT W
DC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 400 A 100 % ED[1] / 300 A
AC-sveisestrøm ved 10 min / 40°C (104°F)	60 % ED[1] / 350 A 100 % ED[1] / 270 A
	Argon (Norm EN 439)
	10,0 m 32 + 9.70 ft. + in.
P_{min} [W] [2]	750 / 750
Q_{min} [l/min] [gal./min]	1 0.26
p_{min} [bar] [psi]	3 43
p_{max} [bar] [psi]	5,5 79
Maks. tillatt tomgangsspenning (U_0)	113 V
Maks. tillatt tennspenning (U_P)	10 kV

Forklaring til fot-notene

1) ED = innkoblingsvarighet (tysk: "Einschaltdauer")

2) Laveste kjøleeffekt iht. standard IEC 60974-2

Índice

Segurança

Segurança

⚠ PERIGO!

Perigo devido a manuseio e trabalhos realizados incorretamente.
Podem ocorrer danos pessoais e materiais graves.
- ▶ Todos os trabalhos e funções descritos neste documento só podem ser realizados por pessoal especializado e treinado.
- ▶ Este documento deve ser lido e entendido.
- ▶ Todos os manuais de instruções dos componentes do sistema, especialmente as diretrizes de segurança, devem ser lidos e compreendidos.

⚠ PERIGO!

Perigo devido à corrente elétrica e perigo de lesão devido à saída do eletrodo de arame.
Podem ocorrer danos pessoais e materiais graves.
- ▶ Comutar o interruptor da rede elétrica da fonte de solda para a posição - O -.
- ▶ Desconectar a fonte de solda da rede elétrica.
- ▶ Atentar para que a fonte de solda permaneça desconectada da rede elétrica até o final de todos os trabalhos.

⚠ PERIGO!

Perigo devido à corrente elétrica.
Podem ocorrer danos pessoais e materiais graves.
- ▶ Todos os cabos, tubagens e jogos de mangueira precisam estar sempre bem conectados, intatos, corretamente isolados e com as dimensões adequadas.

⚠ CUIDADO!

Perigo de queimaduras devido aos componentes quentes da tocha de solda e ao agente refrigerador quente.
Escaldaduras graves podem ser provocadas.
- ▶ Antes de iniciar todos os trabalhos descritos neste manual de instruções, deixar todos os componentes da tocha de solda e o agente refrigerador resfriarem até a temperatura ambiente (+25 °C, +77 °F).

⚠ CUIDADO!

Perigo de danificação devido à operação sem agente refrigerador.
Danos materiais graves podem ser provocados.
- ▶ Nunca operar tochas de solda refrigeradas à água sem agente refrigerador.
- ▶ O fabricante não se responsabiliza por danos resultantes disso; ficam anuladas quaisquer reivindicações de garantia.

⚠ **CUIDADO!**

Perigo devido ao vazamento de agente refrigerador.
Podem ocorrer danos pessoais e materiais graves.

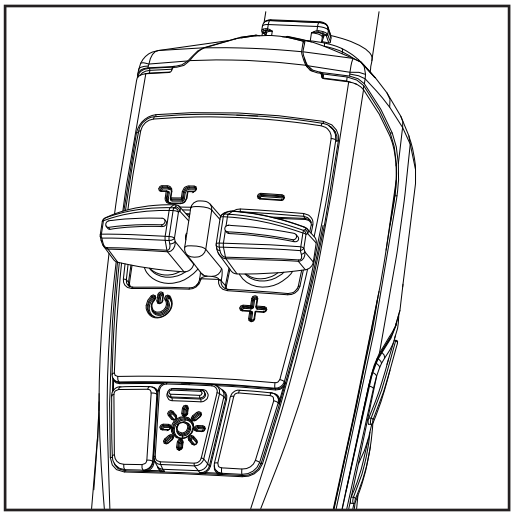
▶ Sempre fechar as mangueiras de agente refrigerador das tochas de solda refrigeradas à água com o fecho de plástico ali montado, quando elas forem desconectadas do dispositivo de refrigeração ou do avanço de arame.

Informações gerais

Geral

As tochas TIG são particularmente robustas e confiáveis. O puxador embutido em formato ergonômico e a distribuição ideal do peso possibilitam uma operação livre de fadiga.
As tochas de solda estão disponíveis na versão de refrigeração líquida e a gás e adaptam-se às diferentes tarefas.
As tochas de solda são adequadas principalmente para a fabricação manual, seja individual ou em série, como também para o setor de oficinas.

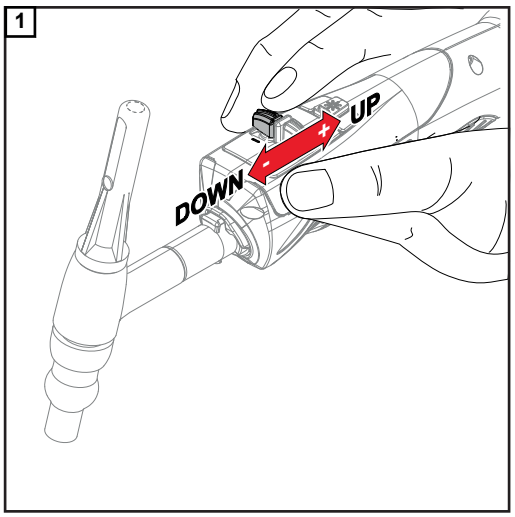
Tocha de solda cima/baixo



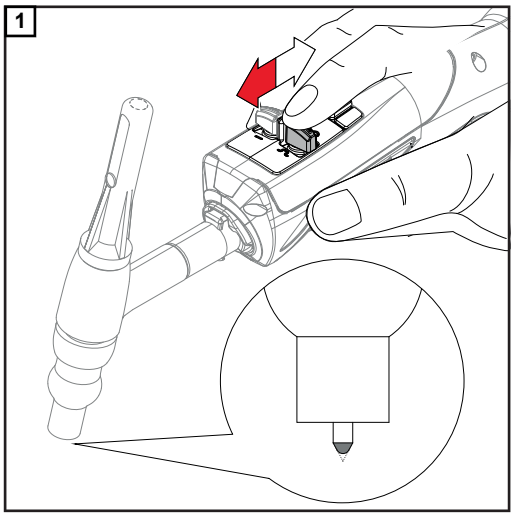
A tocha de solda cima/baixo possui as seguintes funções:

- Alteração da energia de soldagem através do botão cima/baixo (+/-)
- Iluminação do ponto de soldagem via LED:
  Pressionar tecla 1 x – LED acende por 5 s
  Manter a tecla pressionada – LED acende continuamente
- Formação de calota em conjunto com o método de soldagem TIG CA
- Redução intermediária em conjunto com o modo de operação de 4 ciclos ($I_1 > I_2$)

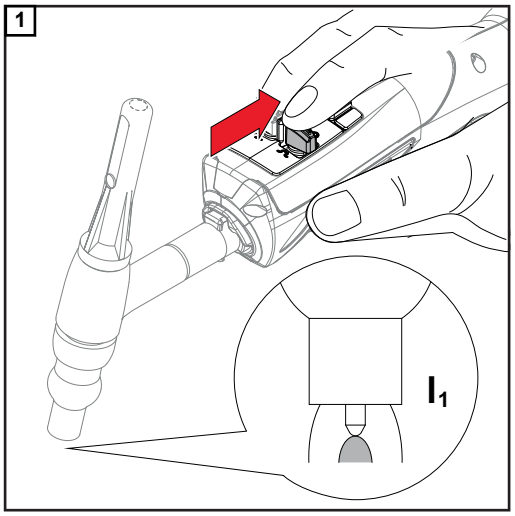
Alteração da energia de soldagem

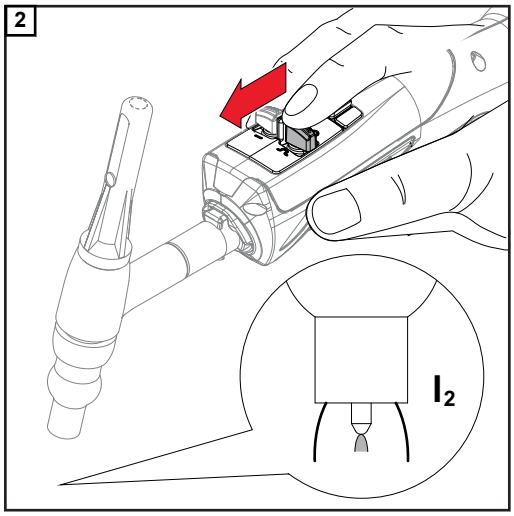


Formação de calota



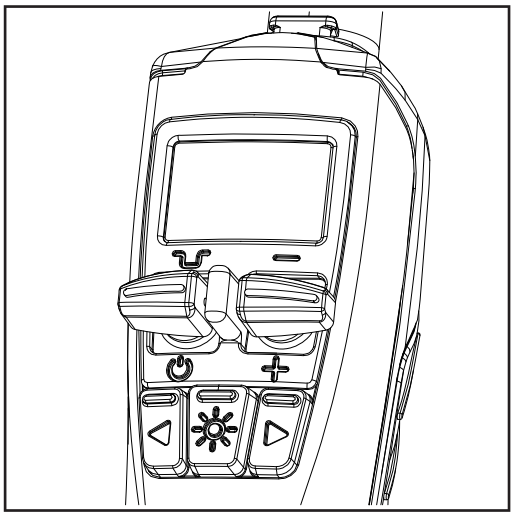
Redução intermediária





PT-BR

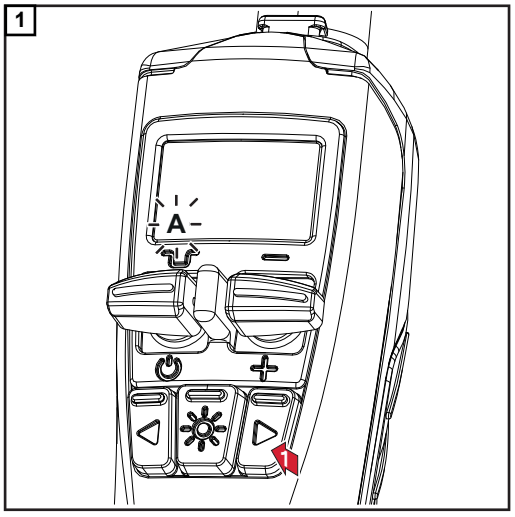
Tocha de solda JobMaster

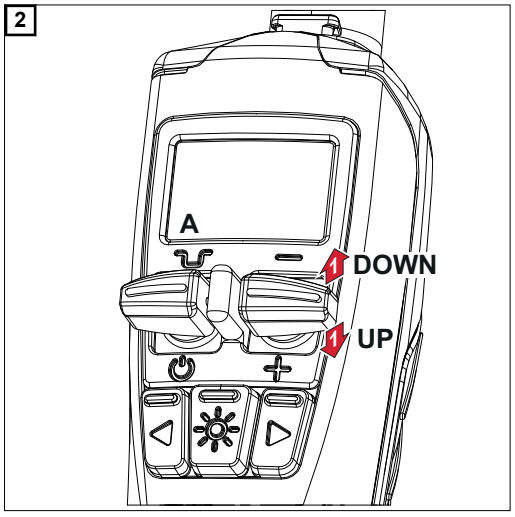


A tocha de solda JobMaster possui as seguintes funções:

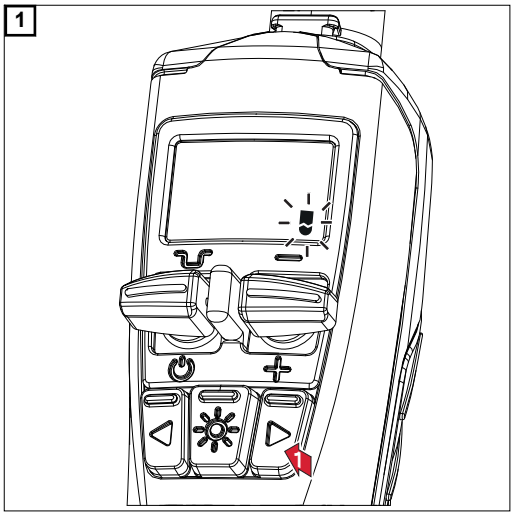
- Leitura ergonômica e adaptação dos parâmetros de soldagem essenciais diretamente na tocha de solda
- Controle ideal do processo de soldagem sem restrição no manuseio
- Alteração da energia de soldagem através do botão cima/baixo (+/-)
- Iluminação do ponto de soldagem via LED:
  Pressionar tecla 1 x – LED acende por 5 s
  Manter a tecla pressionada – LED acende continuamente
- Formação de calota em conjunto com o método de soldagem TIG CA
- Redução intermediária em conjunto com o modo de operação de 4 ciclos ($I_1 > I_2$)

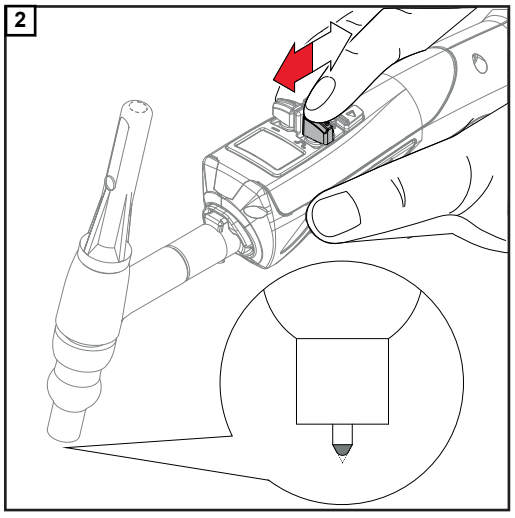
Alteração da energia de soldagem



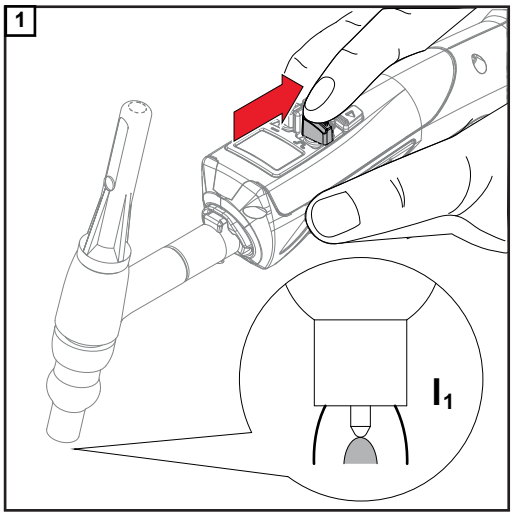


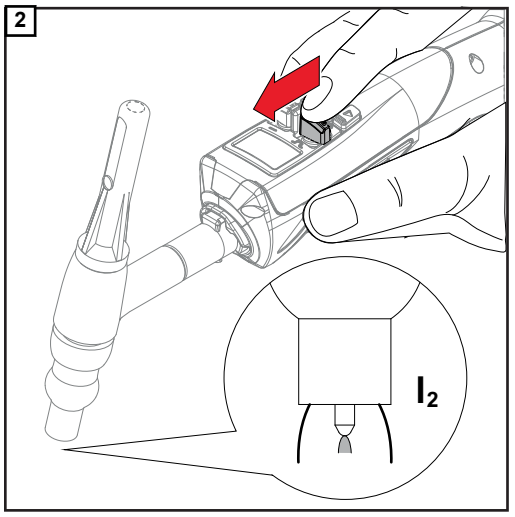
Formação de calota



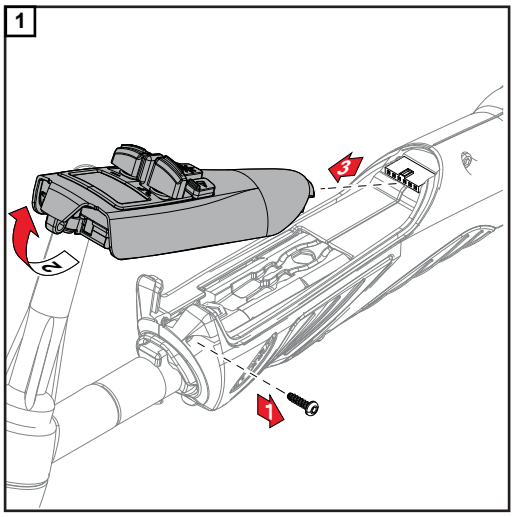


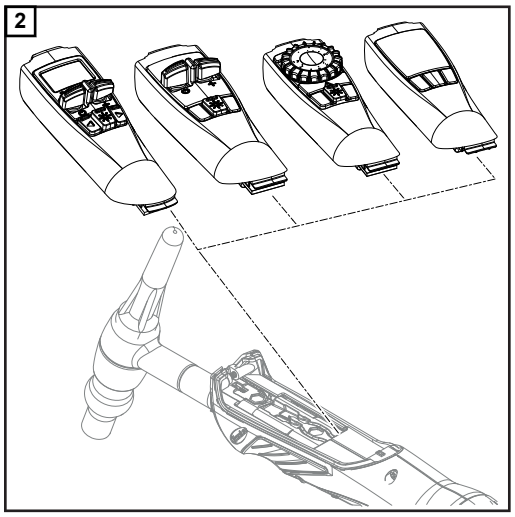
Redução intermediária

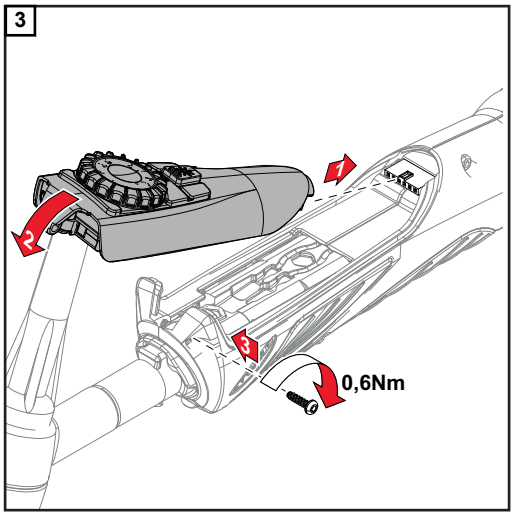




Substituir a interface do usuário





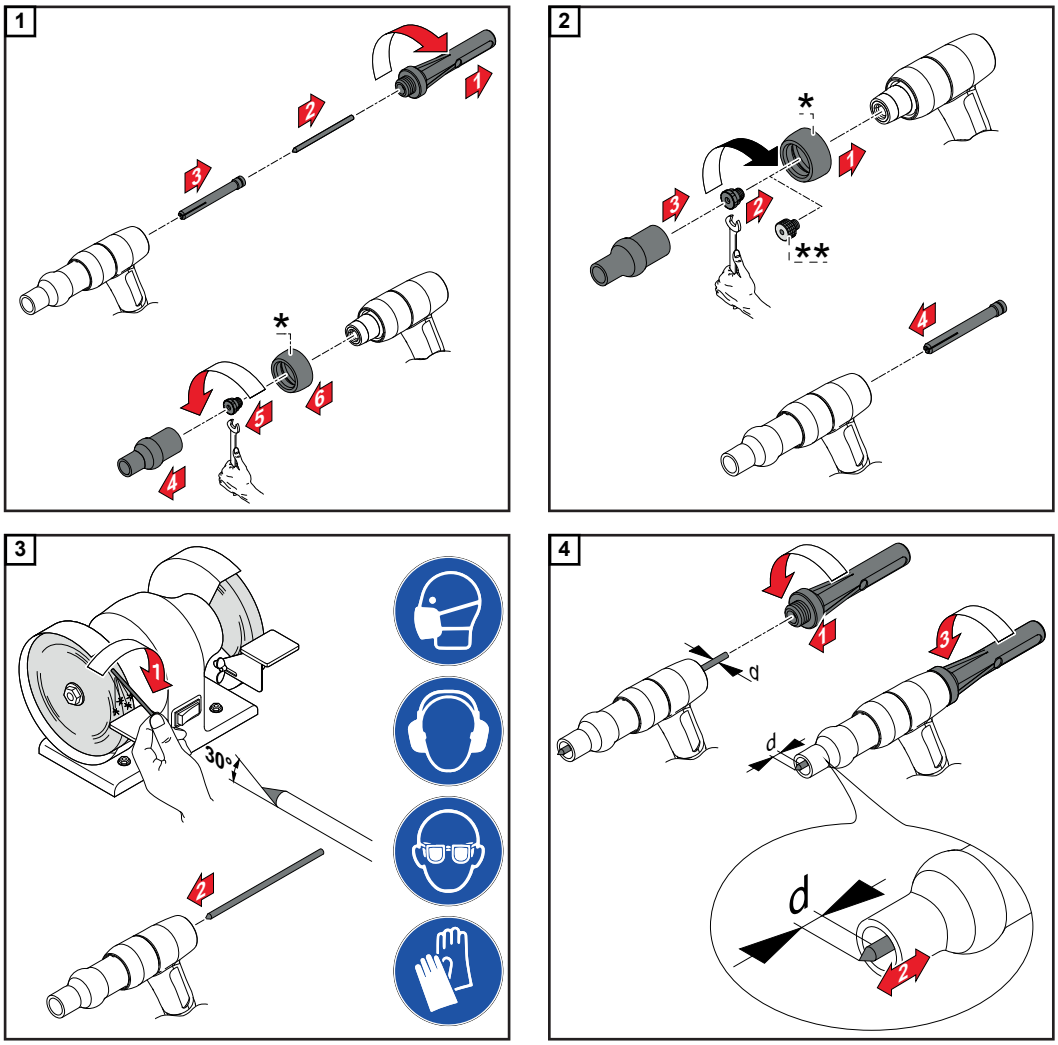


PT-BR

Montar peças de desgaste

Montar peças de desgaste do sistema A

Peças de desgaste do sistema A com bico de gás de encaixe



AVISO!

Apertar firmemente a capa da tocha, de modo que o eletrodo de tungstênio não possa mais ser movido manualmente.

* Luva de vedação de borracha substituível somente para TTB 220 G/A

** Dependendo da versão da tocha de solda, pode ser usada uma lente de gás em vez da porca de aperto.

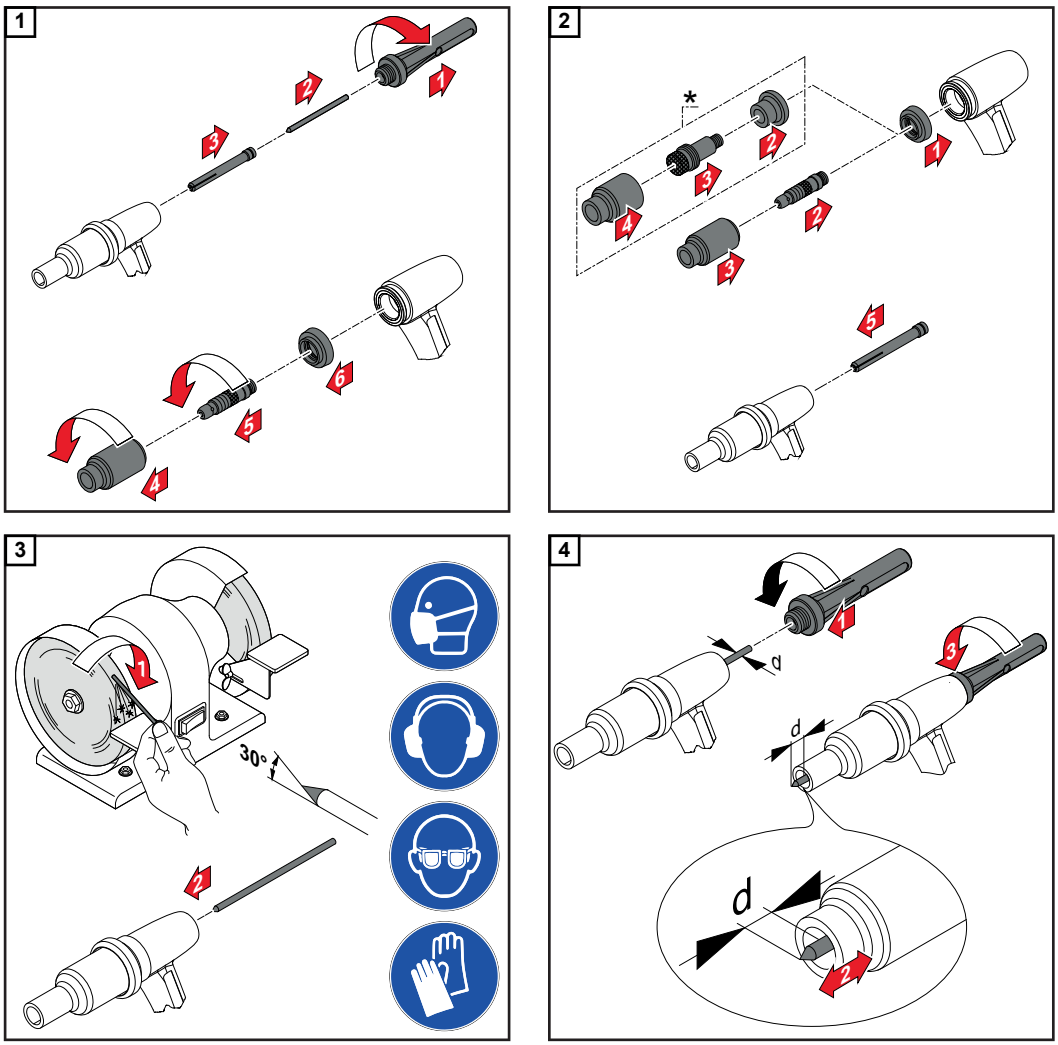
⚠ **CUIDADO!**

Perigo de danos devido a torque muito alto!
Podem ser causados danos às roscas.

► Apertar a porca de aperto ou a lente de gás levemente.

Montar peças de desgaste do sistema P

Peças de desgaste do sistema P com bico de gás parafusado



AVISO!

Apertar firmemente a capa da tocha, de modo que o eletrodo de tungstênio não possa mais ser movido manualmente.

* Luva de vedação de borracha substituível somente para TTB 220 G/P

** Dependendo da versão da tocha de solda, pode ser usada uma lente de gás em vez da porca de aperto.

⚠ **CUIDADO!**

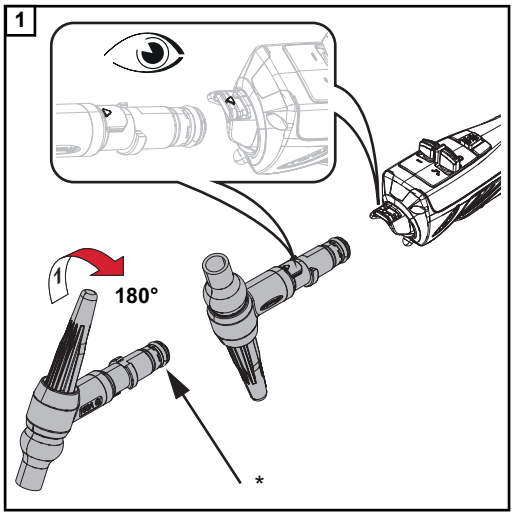
Perigo de danos devido a torque muito alto!
Podem ser causados danos às roscas.

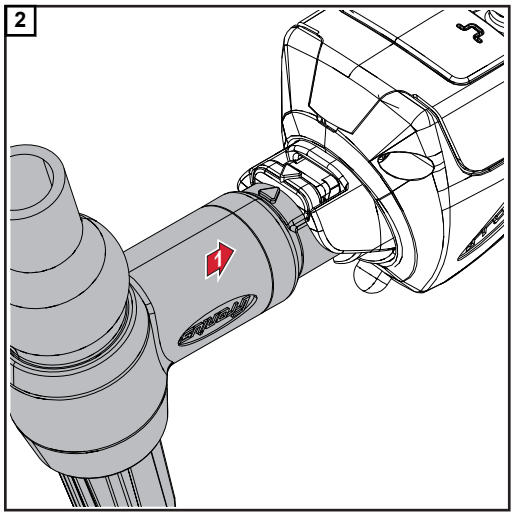
► Apertar a porca de aperto ou a lente de gás levemente.

PT-BR

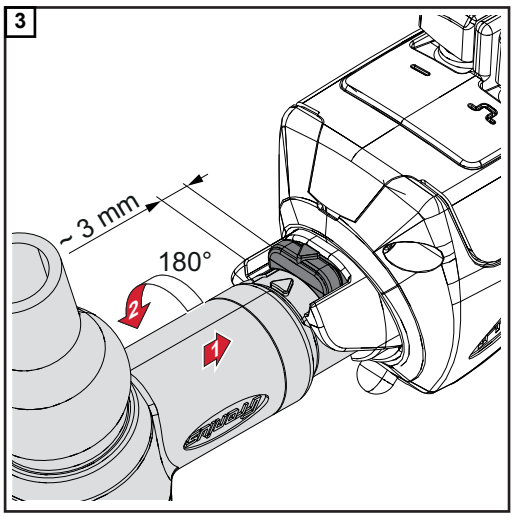
Instalação e colocação em funcionamento

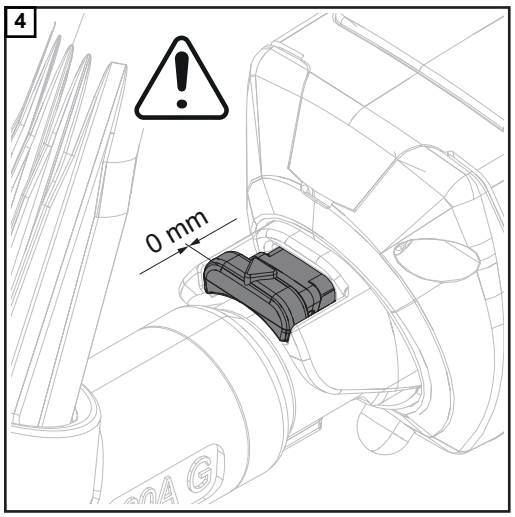
Instalar corpo da tocha de solda





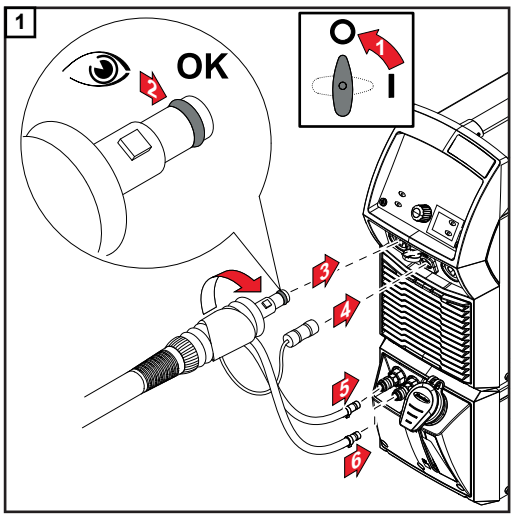
** Lubrificar o O-Ring antes da instalação!*





IMPORTANTE! Durante a montagem do corpo da tocha de solda, certificar-se de que ele será inserido e encaixado até atingir o limite.

Conectar a tocha de solda na fonte de solda e no dispositivo de refrigeração



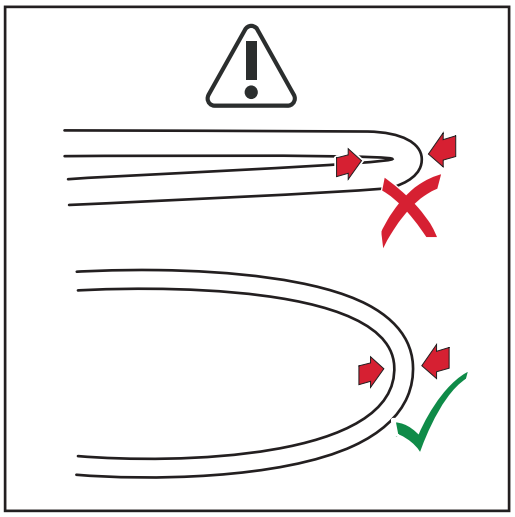
AVISO!

Antes de cada comissionamento, verificar o anel de vedação no cordão da tocha de solda e o nível do refrigerador!

Durante a operação de soldagem, verificar o fluxo do líquido para o refrigerador em intervalos regulares.

Conectar o jogo de extensão de mangueira

O jogo de extensão de mangueira é fornecido com uma bolsa de proteção, para a qual a posição de acoplamento entre o jogo de extensão de mangueira e o jogo de mangueira da tocha precisa ser transferida.



AVISO!

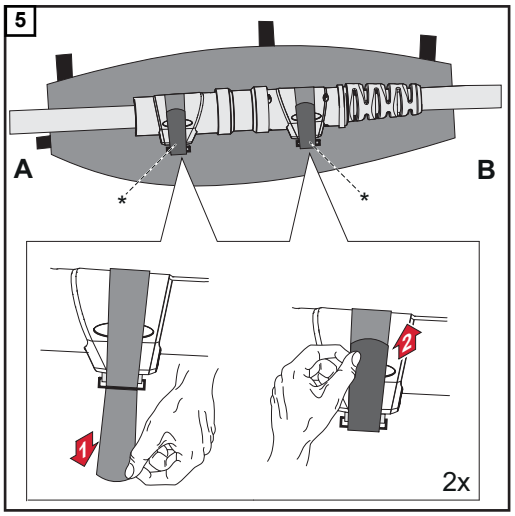
Nas atividades a seguir, deve-se prestar atenção para que as mangueiras e os cabos não dobrem, fiquem presos, sejam cortados ou sejam danificados de outra forma.

1 Posicionar a bolsa de proteção de forma que o logo da Fronius fique visível e as presilhas fiquem em cima:
esquerda = lado da fonte de solda (A)
direita = lado da tocha de solda (B)

2 Abrir bolsa de proteção:
- Posicionar os dois cursores do zíper no limite à direita
- Puxar a tira dentada inferior para fora dos cursores do zíper

3 Unir as conexões de gás/corrente do jogo de extensão de mangueira e do jogo de mangueira da tocha (fecho de baioneta)

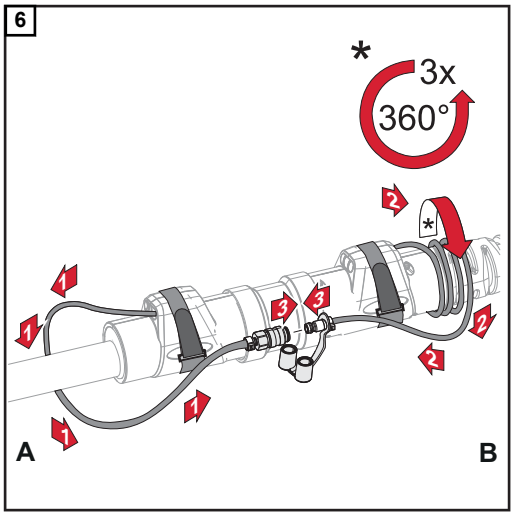
4 Colocar a posição de acoplamento na parte interna da bolsa de proteção



Fixar a posição de acoplamento com duas tiras de velcro na bolsa interna

** Tiras de velcro da bolsa interna (bolsa interna não ilustrada)*

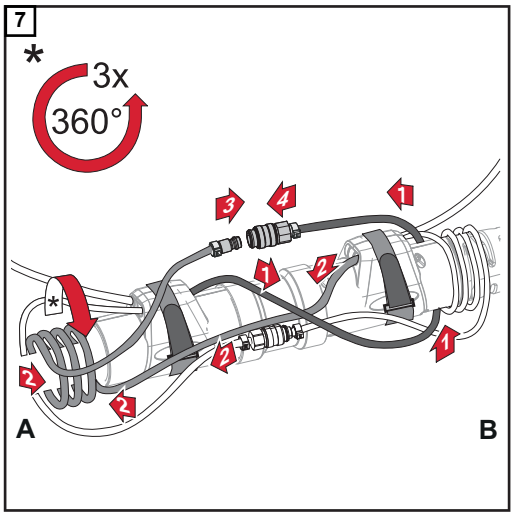
PT-BR



Colocar a mangueira do refrigerador do jogo de extensão de mangueira na posição de acoplamento, como mostrado na ilustração

Envolver a mangueira do refrigerador do jogo de mangueira da tocha 3x no jogo de mangueira da tocha e colocar na posição de acoplamento

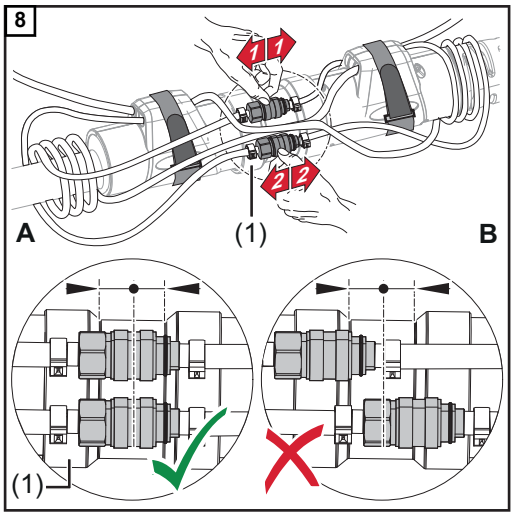
Conectar as mangueiras do refrigerador



A segunda mangueira do refrigerador do jogo de mangueira da tocha deve ser posicionada, de acordo com a ilustração, junto ao jogo de extensão de mangueira, envolvida 3x no jogo de extensão de mangueira e colocada novamente na posição de acoplamento

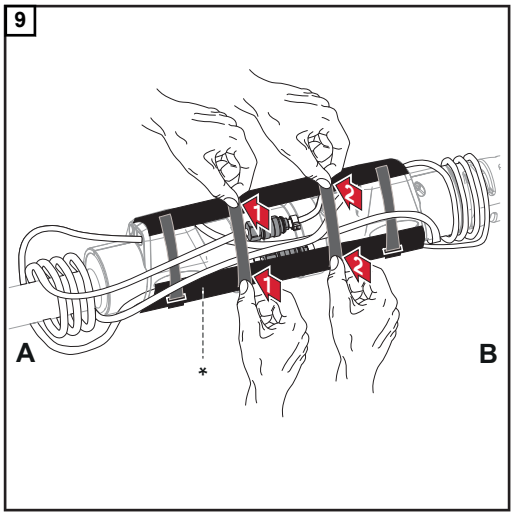
A segunda mangueira do refrigerador do jogo de extensão de mangueira deve ser posicionada, de acordo com a ilustração, em volta do jogo de mangueira da tocha na posição de acoplamento

Conectar as mangueiras do refrigerador



Conectar os refrigeradores entre si e alinhar no centro do tubo isolante (1)

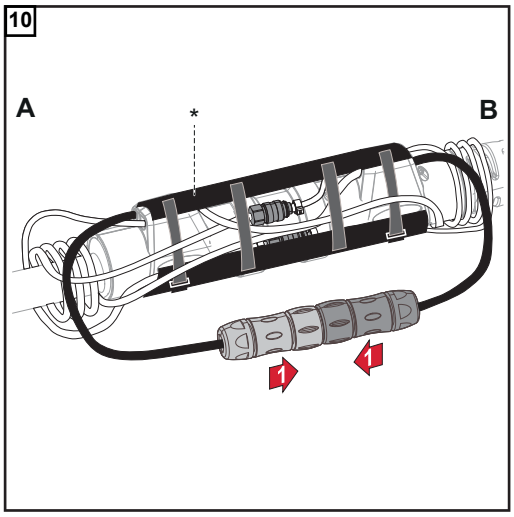
9



Colocar ambas as tiras de velcro na bolsa interna

** Bolsa interna*

10



Encaixar os conectores da linha de controle TIG Multi Connector e posicionar ao lado da bolsa interna

** Bolsa interna*

11 Fechar bolsa de proteção

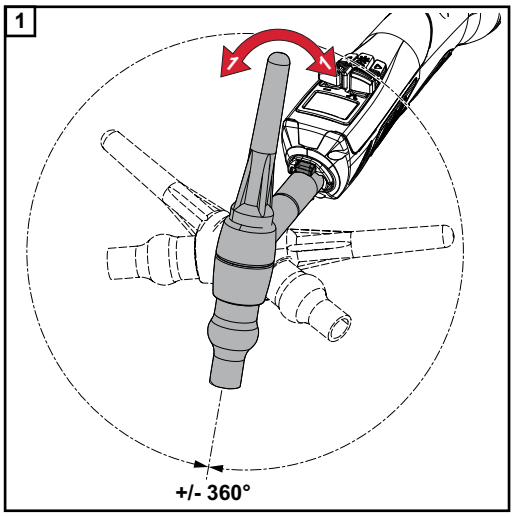
AVISO!

Observar durante a operação com os jogos de extensão de mangueira refrigerados a água:

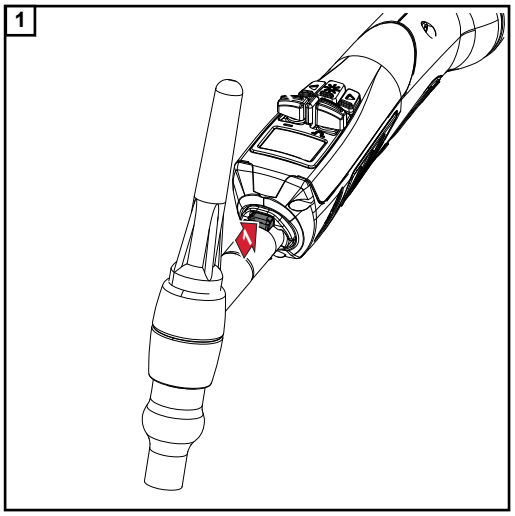
- ▶ Assim que um refluxo correto puder ser percebido no recipiente de refrigeração do dispositivo de refrigeração após o comissionamento da fonte de solda, deve-se garantir que haja refrigerador suficiente no dispositivo de refrigeração.
- ▶ Em combinação com um dispositivo do refrigerador MultiControl, um tanque de refrigerador totalmente cheio pode transbordar ao se esvaziar o jogo de mangueira. Existe risco de escorregamento!
- ▶ Observar o manual de instruções do dispositivo do refrigerador!

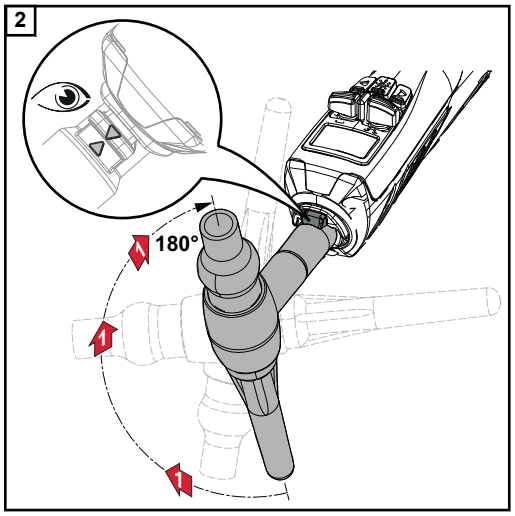
PT-BR

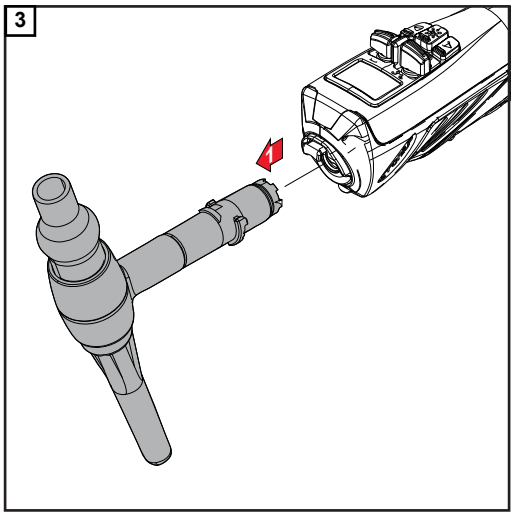
Girar o corpo da tocha de solda



Substituir o corpo da tocha de solda – tocha com refrigerador a gás



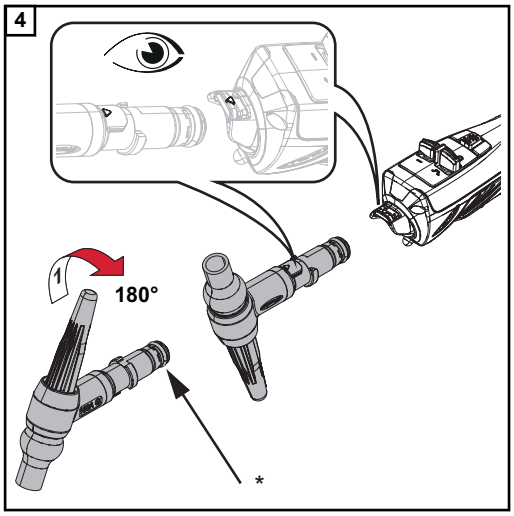


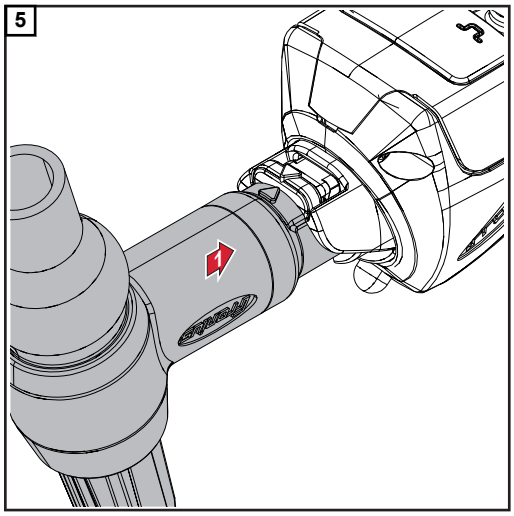


AVISO!

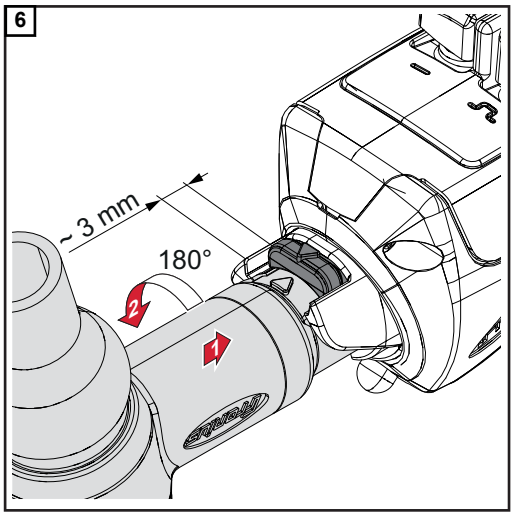
Na substituição do corpo da tocha de solda, observar para que apenas sistemas interligados sejam montados.

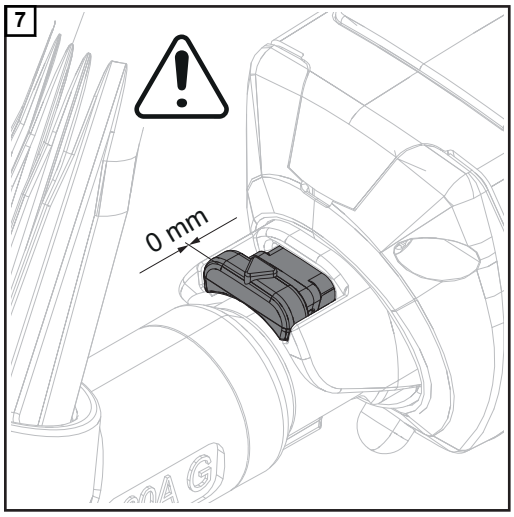
▶ Não montar corpos da tocha de solda com refrigerador a gás em jogos de mangueira com refrigerador a água nem o inverso!





** Lubrificar o O-Ring antes da montagem!*





IMPORTANTE! Durante a montagem do corpo da tocha de solda, certificar-se de que ele seja inserido e encaixado até atingir o limite.

Substituir o corpo da tocha de solda – tocha de solda com refrigerador a água

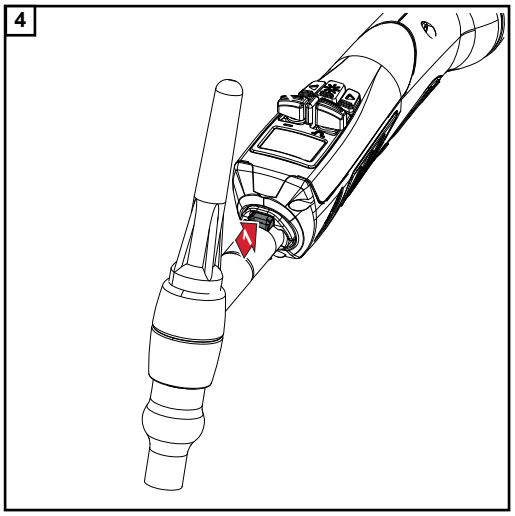
1 Desligar a fonte de solda e desconectá-la da rede de energia;
Aguardar a fase de dissipação do sistema de refrigeração

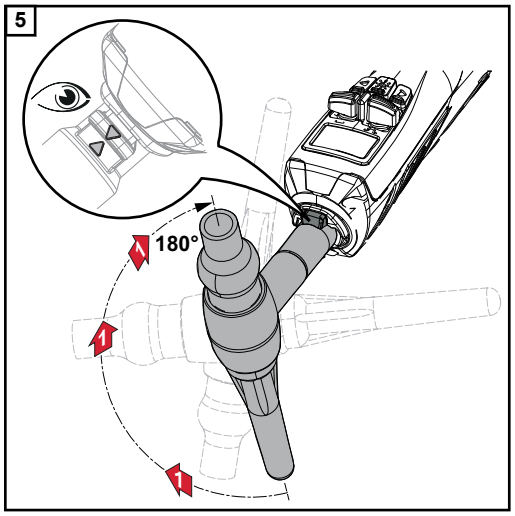
2 No caso do dispositivo de refrigeração CU 600 MC:
esvaziar o jogo de mangueira da tocha por meio da fonte de solda ou tocha de solda

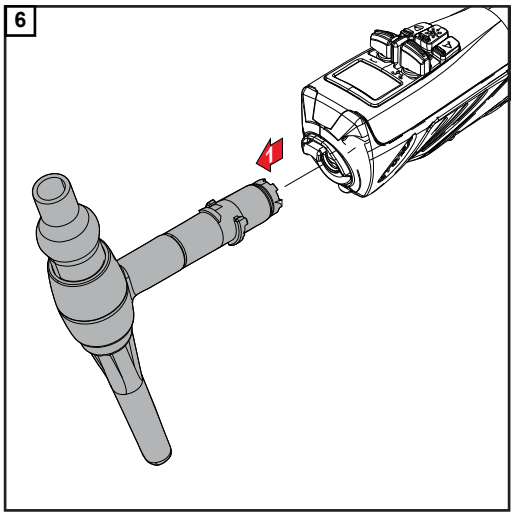
Em outros dispositivos de refrigeração:
desconectar a mangueira para pré-circulação do refrigerador no dispositivo de refrigeração

3 Purgar a mangueira para pré-circulação do refrigerador com no máx. 4 bar de ar comprimido, de modo que boa parte do refrigerador volte para o recipiente de refrigeração

PT-BR







7 Limpar a posição de acoplamento no jogo de mangueira com ar comprimido

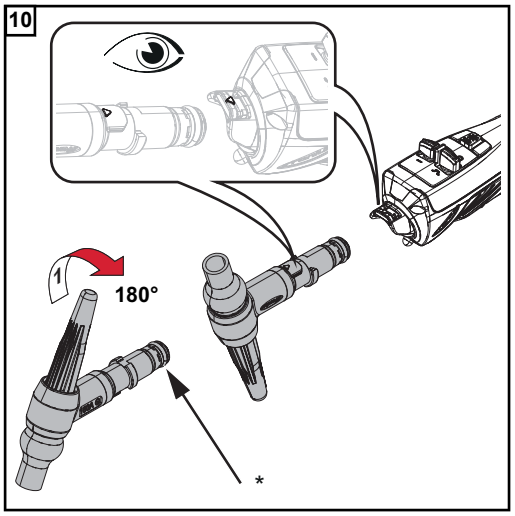
8 Secar o corpo da tocha de solda com um pano

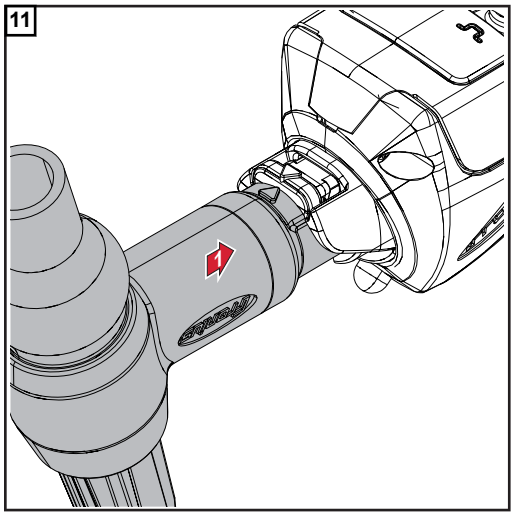
9 Inserir a tampa de proteção no corpo da tocha de solda

AVISO!

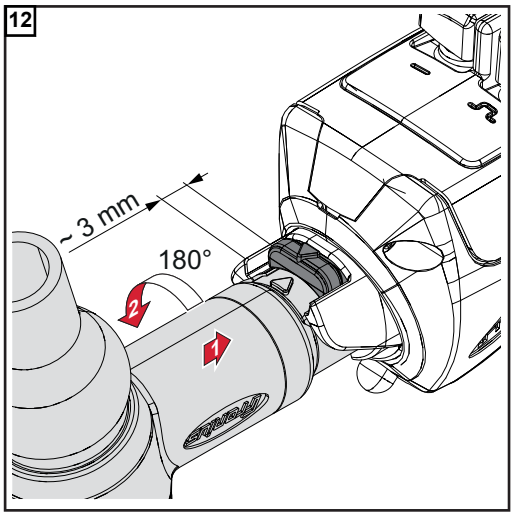
Na substituição do corpo da tocha de solda, observar para que apenas sistemas interligados sejam montados.

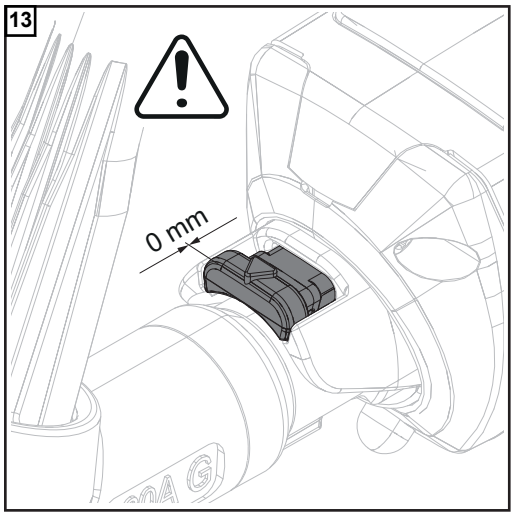
▶ Não montar corpos da tocha de solda com refrigerador a gás em jogos de mangueira com refrigerador a água nem o inverso!





** Lubrificar o O-Ring antes da montagem!*





IMPORTANTE! Durante a montagem do corpo da tocha de solda, certificar-se de que ele seja inserido e encaixado até atingir o limite.

14 Conectar a fonte de solda à rede elétrica e ligar

15 Pressionar o botão de teste de gás na fonte de solda

Durante 30 s escapará gás de proteção.

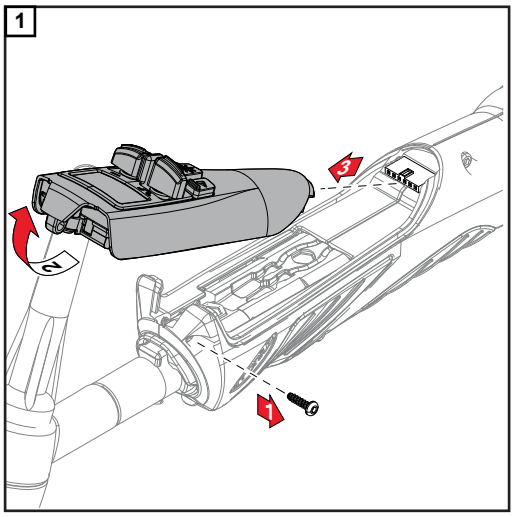
16 Verificar o fluxo do líquido para o refrigerador:
no recipiente de refrigeração, é preciso haver um fluxo de retorno de refrigerador em perfeito estado.

17 Realizar uma soldagem de teste e examinar a qualidade do cordão de soldagem

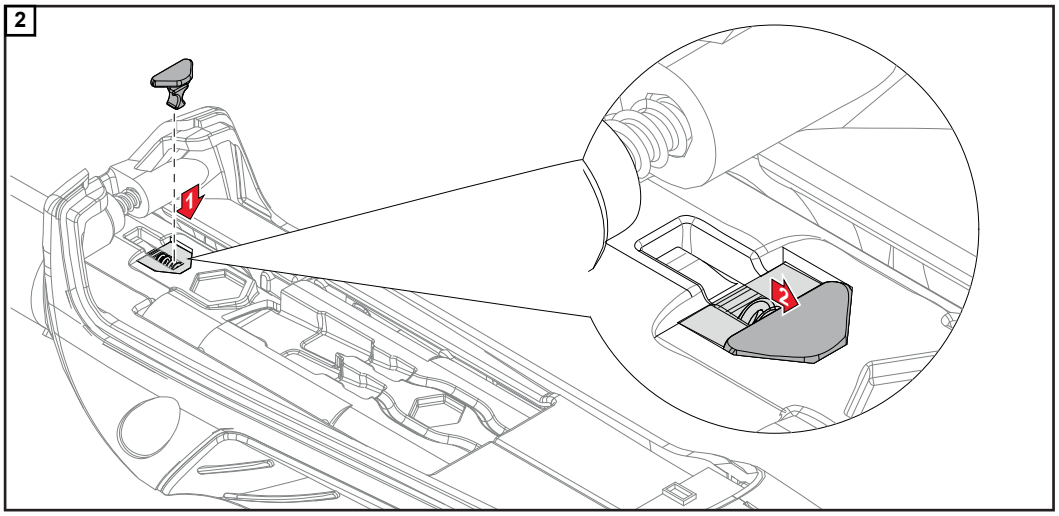
PT-BR

Bloquear a troca do corpo da tocha de solda

1



2



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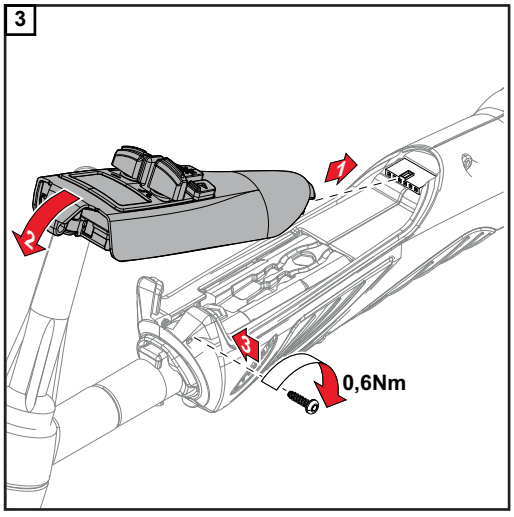


Avisos sobre corpos da tocha de solda flexíveis

Informações gerais

Os corpos da tocha de solda TIG flexíveis podem ser dobrados em todas as direções e, com isso, adaptados de forma individual às mais diferentes situações e aplicações.
Corpos da tocha de solda flexíveis podem ser usados, por exemplo, em casos de acessibilidade limitada de componentes ou posições difíceis de soldagem.
No entanto, o material de um corpo da tocha de solda flexível é enfraquecido a cada mudança de forma, por isso o número de curvaturas também é limitado.

A curvatura e o número de curvaturas são explicados nas seções seguintes.

Definição de curvatura do corpo da tocha de solda

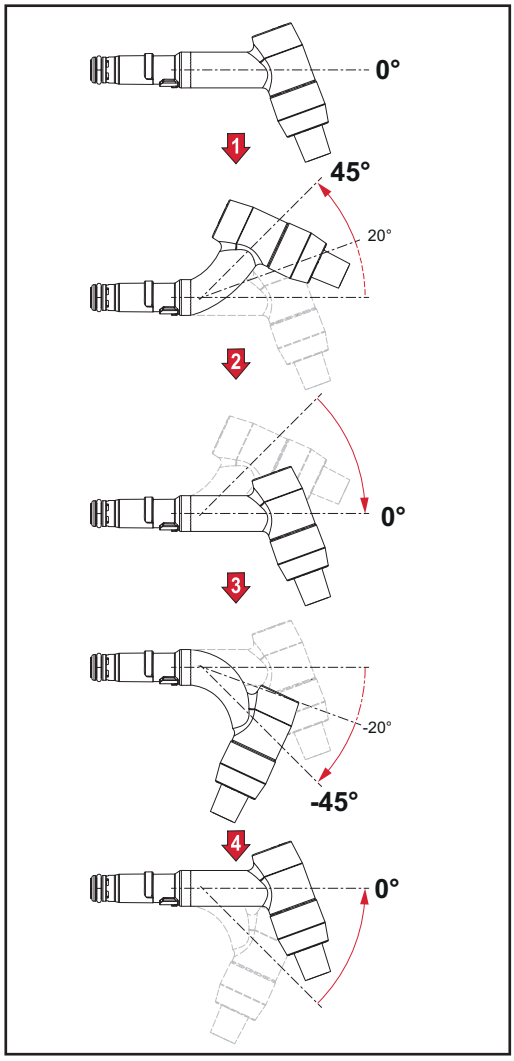
Uma curvatura é uma mudança que altera o formato original em pelo menos 20°.

O menor raio de curvatura possível foi definido para que a curvatura não ocorra de forma pontual mas da forma mais uniforme possível em um longo comprimento.
Esse raio de curvatura mínimo precisa ser atingido.
O menor raio de curvatura possível é de 25 mm / 1 inch.

Uma curvatura não pode exceder um ângulo de flexão máximo.
O ângulo de flexão máximo é de 45°.

Curvar de volta à forma original é considerada uma curvatura própria.

Exemplo: Curvaturas de 45°



Situação inicial: 0°

Movimento de 0° até 45° para cima
= 1ª curvatura

Movimento de 45° de volta para 0°
= 2ª curvatura

Movimento de 0° até 45° para baixo
= 3ª curvatura

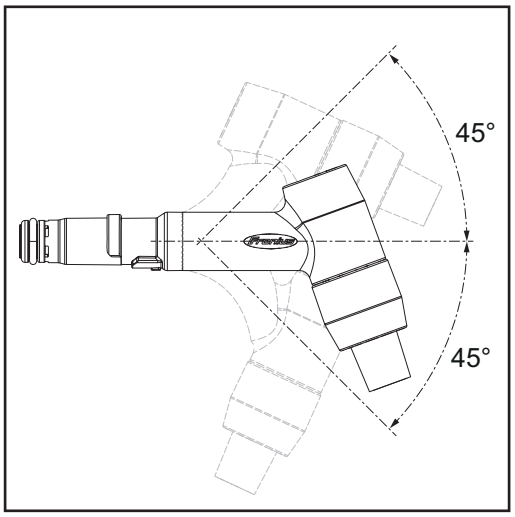
Movimento de 45° de volta para 0°
= 4ª curvatura

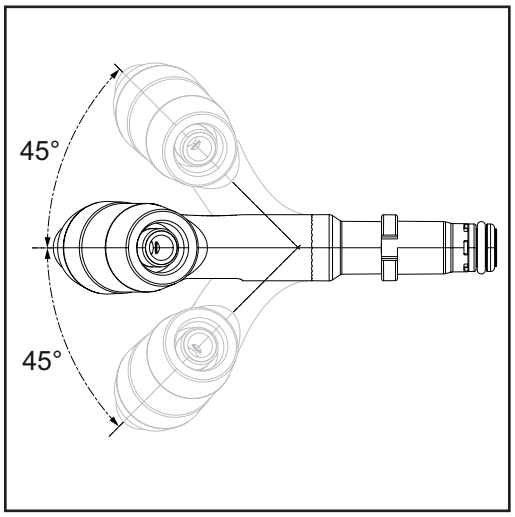
Número máximo de curvaturas do corpo da tocha de solda

Levando em conta um raio de curvatura ≥ 25 mm / 1 inch e um ângulo de flexão máximo = 45°,

- as tochas com refrigerador a gás podem ser dobradas pelo menos 1000 vezes,
- as tochas de solda com refrigeração a água podem ser dobradas pelo menos 200 vezes.

Possibilidades de flexão





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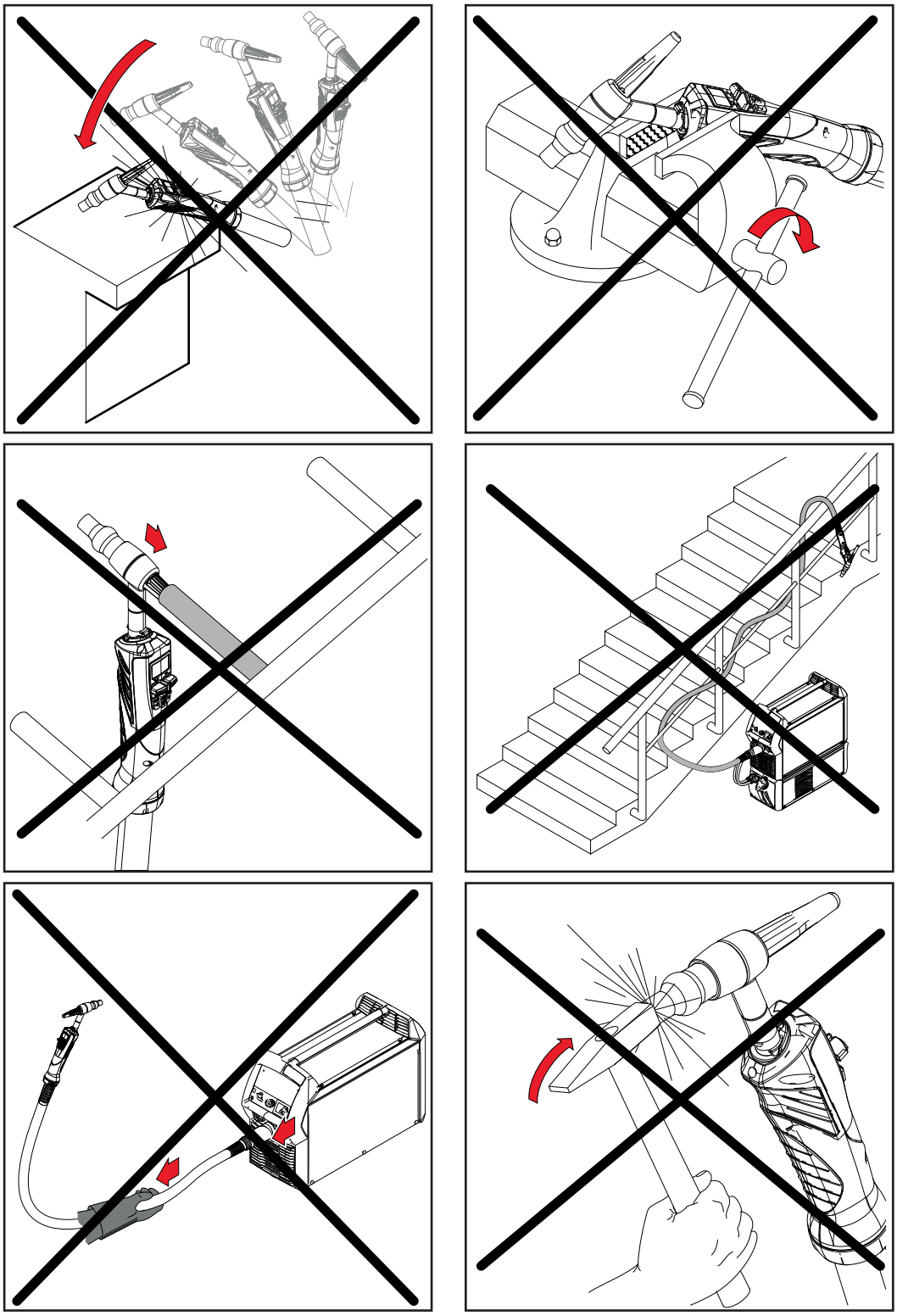
Conservação, Manutenção e Descarte

Informações gerais



Manutenção em todo comissionamento

- Verificar peças de desgaste, substituir peças de desgaste com defeito
- Deixar o bico de gás livre de respingos de solda

Além disso, em cada comissionamento, com as tochas de solda resfriadas a água:

- garantir que todas as conexões do refrigerador estejam vedadas
- garantir que haja um fluxo de retorno adequado do refrigerador

Descarte

O descarte pode ser executado somente de acordo com as determinações nacionais e regionais em vigor.

Diagnóstico de erro, eliminação de erro

Diagnóstico de erro, eliminação de erro

Não é possível conectar a tocha de solda

Causa: Fecho da baioneta dobrado

Solução: Substituir o fecho da baioneta

Sem corrente de soldagem

Interruptor da fonte de solda ligado, indicações na fonte de solda acesas, gás de proteção disponível

Causa: Conexão à terra incorreta

Solução: Estabelecer conexão à terra de forma adequada

Causa: Cabo de corrente na tocha de solda interrompido

Solução: Substituir a tocha de solda

Causa: Eletrodo de tungstênio solto

Solução: Apertar o eletrodo de tungstênio com a capa da tocha

Causa: Peças de desgaste soltas

Solução: Apertar peças de desgaste

sem função após pressionar a tecla de queima

Interruptor ligado, indicações na fonte de solda acesas, gás de proteção disponível

Causa: Plugue de comando não conectado

Solução: Inserir plugue de comando

Causa: Tocha de solda ou linha de controle da tocha de solda com defeito

Solução: Trocar a tocha de solda

Causa: Conectores da „tecla de queima/linha de controle/fonte de solda“ com defeito

Solução: Verificar conectores/fonte de solda ou tocha de solda para o serviço

Causa: Cartão na tocha de solda com defeito

Solução: Substituir cartão

Descarga de alta frequência na conexão da tocha de solda

Causa: Conexão da tocha de solda com vazamento

Solução: Trocar o o-ring no bloqueio da baioneta

Descarga de alta frequência no puxador embutido

Causa: Jogo de mangueira com vazamento

Solução: Trocar jogo de mangueira

Causa: Conexão da mangueira do gás de proteção ao corpo da tocha de solda com vazamento

Solução: Conectar e vedar a mangueira

Sem gás de proteção

todas as outras funções estão disponíveis

Causa: Cilindro de gás vazio

Solução: Substituir o cilindro de gás

Causa: Válvula redutora de pressão com defeito

Solução: Substituir válvula redutora de pressão/gás

Causa: Mangueira de gás não montada, dobrada ou danificada

Solução: Montar a mangueira de gás, colocar de forma reta. Substituir mangueira de gás defeituosa

Causa: Tocha de solda com defeito

Solução: Substituir a tocha de solda

Causa: Válvula solenoide de gás com defeito

Solução: Entrar em contato com a assistência técnica (trocar válvula solenoide de gás)

Características de soldagem ruins

Causa: Parâmetros de soldagem incorretos

Solução: Verificar os ajustes

Causa: Conexão de massa incorreta

Solução: Verificar a conexão de massa e o borne quanto à polaridade

A tocha de solda esquenta muito

Causa: Tocha de soldagem dimensionada muito fraca

Solução: Observar o tempo de inicialização e os limites de carga

Causa: Somente em instalações com refrigeração à água: Fluxo de água muito baixo

Solução: Controlar o nível de água, volume de fluxo de água, sujeira na água etc., bomba do produto de refrigeração bloqueada: Girar para frente o eixo da bomba do produto de refrigeração através de uma chave de fenda na passagem

Causa: Somente em instalações com refrigeração à água: Parâmetro 'Ctrl da Unidade de Refrigeração" encontra-se em "OFF".

Solução: No menu Setup, ajustar o parâmetro "Ctrl da Unidade de Refrigeração" para "Aut" ou "ON".

Porosidade na costura de soldagem

Causa: Formação de respingos no bico de gás, por isso a proteção de gás da costura de soldagem é insuficiente

Solução: Remover os respingos de solda

Causa: Furos ou conexão incorreta da mangueira de gás

Solução: Trocar a mangueira de gás

Causa: O o-ring na conexão central está cortado ou com defeito

Solução: Trocar o o-ring

Causa: Umidade/condensação no tubo de gás

Solução: Secar tubo de gás

Causa: Fluxo de gás muito forte ou muito fraco

Solução: Corrigir fluxo de gás

Causa: Quantidade de gás insuficiente no início ou no fim de soldagem

Solução: Aumentar o fornecimento de gás e o pós-fluxo de gás

Causa: Aplicação de agente separador em excesso

Solução: Retirar o agente separador em excesso/aplicar menos agente separador

Péssimas características de ignição

Causa: Eletrodo de tungstênio inadequado (por exemplo, eletrodo WP na solda CC)

Solução: Utilizar o eletrodo de tungstênio adequado

Causa: Peças de desgaste soltas

Solução: Prender firmemente as peças de desgaste

Rachadura no bico de gás

Causa: O eletrodo de tungstênio não está longe o suficiente do bico de gás

Solução: Afastar o eletrodo de tungstênio do bico de gás

Dados técnicos

Informações gerais

O produto está em conformidade com as exigências da norma IEC 60974-7.

AVISO!

Os dados de potência especificados só se aplicam se forem usadas peças de desgaste padrão.
No caso de uso de lentes e bicos de gás reduzidos, as indicações de corrente de soldagem diminuem.

AVISO!

Para corpos da tocha de solda refrigerados a gás, as especificações de corrente de soldagem são válidas somente para comprimentos do corpo da tocha de solda C ≥ 65 mm.
No caso de uso de corpos da tocha de solda mais curtos, as especificações de corrente de soldagem diminuem em 30%.

AVISO!

Ao soldar no limite de potência da tocha de solda, utilizar eletrodos de tungstênio e diâmetro de abertura do bico de gás proporcionalmente maiores, para aumentar a vida útil das peças de desgaste.
Levar em conta a intensidade de corrente, o balanço CA e o desvio de corrente CA como fatores formadores de potência.

Corpo da tocha de solda com refrigeração a gás – TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G / F	TTB 220 G
Corrente de soldagem CC a 10 min / 40°C (104°F)	35% CT[1)] / 80 A 60% CT[1)] / 60 A 100% CT[1)] / 50 A	35% CT[1)] / 160 A 60% CT[1)] / 120 A 100% CT[1)] / 90 A	35% CT[1)] / 220 A 60% CT[1)] / 170 A 100% CT[1)] / 130 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	35% CT[1)] / 30 A	35% CT[1)] / 120 A 60% CT[1)] / 90 A 100% CT[1)] / 70 A	35% CT1) / 180 A 60% CT1) / 130 A 100% CT1) / 100 A
	Argônio (Norma EN 439)	Argônio (Norma EN 439)	Argônio (Norma EN 439)
	1,0 - 3,2 mm 0.039 - 0.126 in.	1,0 - 3,2 mm 0.039 - 0.126 in.	1,0 - 4,0 mm 0.039 - 0.158 in.

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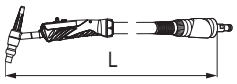
	TTB 220 A G F	TTB 220 P G F	TTB 260 G
Corrente de soldagem CC a 10 min / 40°C (104°F)	35% CT[1] / 220 A 60% CT[1] / 170 A 100% CT[1] / 130 A	30% CT[1]/ 220 A 60% CT[1] / 160 A 100% CT[1] / 130 A	35% CT[1] / 260 A 60% CT[1] / 200 A 100% CT[1] / 150 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	35% CT[1] / 180 A 60% CT[1]/ 120 A 100% CT[1] / 100 A	30% CT[1] / 170 A 60% CT[1] / 120 A 100% CT[1] / 100 A	35% CT[1] / 200 A 60% CT[1] / 160 A 100% CT[1] / 120 A
	Argônio (Norma EN 439)	Argônio (Norma EN 439)	Argônio (Norma EN 439)
	1,0 - 4,0 mm 0.039 - 0.158 in.	1,0 - 4,0 mm 0.039 - 0.158 in.	1,6 - 6,4 mm 0.063 - 0.252 in.

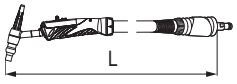
Corpo da tocha de solda com refrigeração a água – TTB 180, TTB 300, TTB 400, TTB 500

	TTB 180 W	TTB 300 W
Corrente de soldagem CC a 10 min / 40°C (104°F)	60% CT[1] / 180 A 100% CT[1] / 140 A	60% CT[1] / 300 A 100% CT[1] / 230 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	60% CT[1] / 140 A 100% CT[1] / 110 A	60% CT[1] / 250 A 100% CT[1] / 190 A
	Argônio (Norma EN 439)	Argônio (Norma EN 439)
	1,0 - 3,2 mmn 0.039 - 0.126 in.	1,0 - 3,2 mmn 0.039 - 0.126 in.
 $Q_{mín}$	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

	TTB 400 W F	TTB 500 W
Corrente de soldagem CC a 10 min / 40°C (104°F)	60% CT[1] / 400 A 100% CT[1] / 300 A	60% CT[1] / 500 A 100% CT[1] / 400 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	60% CT[1] / 320 A 100% CT[1] / 250 A	60% CT[1] / 400 A 100% CT[1] / 300 A
	Argônio (Norma EN 439)	Argônio (Norma EN 439)
	1,0 - 4,0 mm 0.039 - 0.157 in.	1,6 - 6,4 mm 0.063 - 0.252 in.
 $Q_{mín}$	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

Jogo de mangueira com refrigeração a gás – THP 160i, THP 220i, THP 260i

	THP 160i	THP 220i
Corrente de soldagem CC a 10 min / 40°C (104°F)	35% CT[1] / 160 A 60% CT[1] / 120 A 100% CT[1] / 90 A	35% CT[1] / 220 A 60% CT[1] / 170 A 100% CT[1] / 130 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	35% CT[1] / 120 A 60% CT[1] / 90 A 100% CT[1] / 70 A	35% CT[1] / 180 A 60% CT[1] / 130 A 100% CT[1] / 100 A
	Argônio (Norma EN 439)	Argônio (Norma EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Tensão de circuito aberto máxima permitida (U_0)	113 V	113 V
Tensão de ignição máxima permitida (U_P)	10 kV	10 kV

		THP 260i
Corrente de soldagem a 10 min / 40°C (104°F) CC		35% CT[1] / 260 A 60% CT[1] / 200 A 100% CT[1] / 150 A
Corrente de soldagem a 10 min / 40°C (104°F) CA		35% CT[1] / 200 A 60% CT[1] / 160 A 100% CT[1] / 120 A
		Argônio (Norma EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Tensão de circuito aberto máxima permitida (U_0)		113 V
Tensão de ignição máxima permitida (U_P)		10 kV

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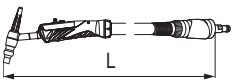
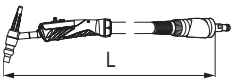
Jogo de mangueira com refrigeração a água – THP 300i, THP 400i, THP 500i

	THP 300i	THP 400i
Corrente de soldagem CC a 10 min / 40°C (104°F)	60% CT[1] / 300 A 100% CT[1] / 230 A	60% CT[1] / 400 A 100% CT[1] / 300 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	60% CT[1] / 250 A 100% CT[1] / 190 A	60% CT[1] / 350 A 100% CT[1] / 270 A
	Argônio (Norma EN 439)	Argônio (Norma EN 439)
	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min} [W] [2]	650 / 650	950 / 950
Q_{min} [l/min] [gal./min]	1 0.26	1 0,26
p_{min} [bar] [psi]	3 43	3 43
p_{max} [bar] [psi]	5,5 79	5,5 79
Tensão de circuito aberto máxima permitida (U_0)	113 V	113 V
Tensão de ignição máxima permitida (U_P)	10 kV	10 kV

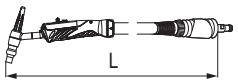
		THP 500i
Corrente de soldagem CC a 10 min / 40°C (104°F)		60% CT[1] / 500 A 100% CT[1] / 400 A
Corrente de soldagem CA a 10 min / 40°C (104°F)		60% CT[1] / 400 A 100% CT[1] / 300 A
		Argônio (Norma EN 439)
		4,0 / 8,0 m 13 + 1.48 / 26 + 2.96 ft. + in.
P_{min} [W] [2]		1200 / 1750
Q_{min} [l/min] [gal./min]		1 0,26
p_{min} [bar] [psi]		3 43
p_{max} [bar] [psi]		5,5 79

		THP 500i
Tensão de circuito aberto máxima permitida (U_0)		113 V
Tensão de ignição máxima permitida (U_P)		10 kV

Jogo de extensão de mangueira com refrigeração a gás – HPT 220i G

	HPT 220i EXT G
Corrente de soldagem CC a 10 min / 40°C (104°F)	35% CT[1)] / 220 A 60% CT[1)] / 170 A 100% CT[1)] / 130 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	35% CT[1)] / 180 A 60% CT[1)] / 130 A 100% CT[1)] / 100 A
	Argônio (Norma EN 439)
	10,0 m 32 + 9.70 ft. + in.
Tensão de circuito aberto máxima permitida (U_0)	113 V
Tensão de ignição máxima permitida (U_P)	10 kV

Jogo de extensão de mangueira com refrigeração a água – HPT 400i G

	HPT 400i EXT W
Corrente de soldagem CC a 10 min / 40°C (104°F)	60% CT[1)] / 400 A 100% CT[1)] / 300 A
Corrente de soldagem CA a 10 min / 40°C (104°F)	60% CT[1)] / 350 A 100% CT[1)] / 270 A
	Argônio (Norma EN 439)
	10,0 m 32 + 9.70 ft. + in.
P_{min} [W] [2)]	750 / 750
Q_{min} [l/min] [gal./min]	1 0.26
p_{min} [bar] [psi]	3 43
p_{max} [bar] [psi]	5,5 79

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	HPT 400i EXT W
Tensão de circuito aberto máxima permitida (U_0)	113 V
Tensão de ignição máxima permitida (U_P)	10 kV

Explicação das notas de rodapé

1) CT = Ciclo de trabalho

2) Menor capacidade de refrigeração conforme norma IEC 60974-2

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