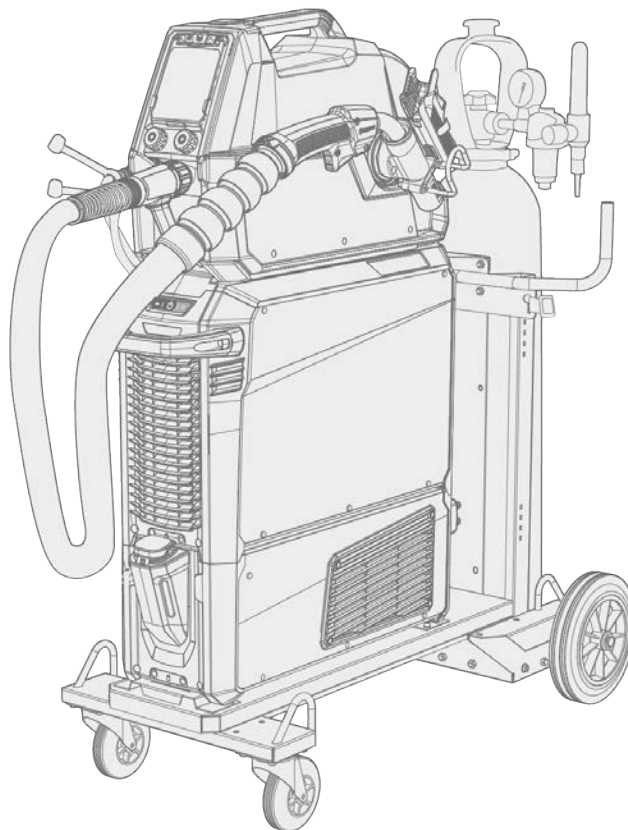


X5 FastMig

X5 FastMig Pulse



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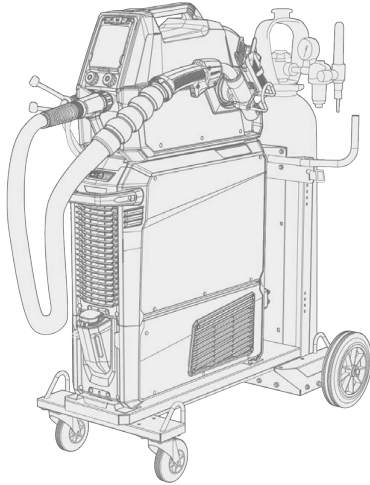
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1. GENERAL

These instructions describe the use of Kemppi's X5 FastMig equipment. X5 FastMig consists of multi-purpose welding power sources, wire feeders and cooling unit (optional) designed for demanding professional use in both, normal and pulsed MIG/MAG welding.



The X5 FastMig equipment range includes automatic 1-MIG control capabilities with X5 Wire Feeder Auto/Auto+, X5 Wire Feeder 300 AP/APC and X5 Wire Feeder HD300 AP/APC. The 1-MIG process is accompanied by welding programs and advanced software features as well as Wise and MAX processes as optional. By default, basic welding program work packs are included with the automatic 1-MIG- and pulse-enabled equipment.

APC wire feeder models have also wireless connectivity features built in allowing digital Welding Procedure Specification (dWPS) and WeldEye ArcVision use as optional.

X5 FastMig is designed to be used together with Kemppi's Flexlite GX MIG welding guns.

X5 FastMig can be used also for MMA welding, gouging and, with X5 Wire Feeder Auto/Auto+, X5 Wire Feeder 300 AP/APC or HD300 AP/APC, for TIG welding. Note that TIG welding requires the use of dedicated Flexlite TX TIG torches.

System configurations

X5 FastMig allows different system configurations for different purposes of use. All X5 power source and wire feeder model combinations are possible and allow welding, but to access all of the features of each system configuration option, the configuration guidelines presented in the table below are to be followed.

Table. X5 FastMig minimum configuration requirements for each system (Manual/Auto/Pulse):

	X5 FastMig Manual ⁽¹⁾	X5 FastMig Auto ⁽²⁾	X5 FastMig Pulse ⁽³⁾
Wire Feeder:	X5 Wire Feeder 200 Manual	X5 Wire Feeder 300 Auto	X5 Wire Feeder 300 Auto
	X5 Wire Feeder 300 Manual	X5 Wire Feeder 300 Auto+	X5 Wire Feeder 300 Auto+
	X5 Wire Feeder HD300 M	X5 Wire Feeder 300 AP	X5 Wire Feeder 300 AP
		X5 Wire Feeder 300 APC	X5 Wire Feeder 300 APC
		X5 Wire Feeder HD300 AP	X5 Wire Feeder HD300 AP
		X5 Wire Feeder HD300 APC	X5 Wire Feeder HD300 APC
Power Source:	X5 Power Source 400	X5 Power Source 400	X5 Power Source 400 Pulse
	X5 Power Source 500	X5 Power Source 500	X5 Power Source 400 Pulse+
			X5 Power Source 500 Pulse
			X5 Power Source 500 Pulse+
			X5 Power Source 400 MV Pulse+

¹⁾ X5 FastMig Manual equipment is meant for welding with manual controls.

²⁾ X5 FastMig Auto equipment allows also automatic 1-MIG welding featuring additional welding processes as optional.

³⁾ X5 FastMig Pulse equipment allows also automatic 1-MIG and pulse welding featuring additional welding processes as optional.

For more information on the individual X5 FastMig devices, refer to the "Equipment description" on the next page chapter.

Important notes

Read the instructions through carefully. For your own safety, and that of your working environment, pay particular attention to the safety instructions delivered with the equipment.

Items in the manual that require particular attention in order to minimize damage and harm are indicated with the below symbols. Read these sections carefully and follow their instructions.

 *Note: Gives the user a useful piece of information.*

 *Caution: Describes a situation that may result in damage to the equipment or system.*

 *Warning: Describes a potentially dangerous situation. If not avoided, it will result in personal damage or fatal injury.*

Kemppi symbols: [Userdoc.](#)

General notices: [Userdoc.](#)

DISCLAIMER

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Kemppi reserves the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission from Kemppi.

1.1 Equipment description

X5 FastMig has several power source and wire feeder options to choose from. The control panel is always fixed to the wire feeder.

X5 FastMig supports welding cable calibration without an additional voltage sensing cable.

By default, the X5 FastMig power sources come with a standard set of welding programs (work pack) that are available with 1-MIG and pulse processes as applicable. The equipment technical data and welding programs included in the X5 FastMig work packs are shown here: "Technical data" on page 158 and "Welding program work packs" on page 184.

X5 power sources (400 A):

- X5 Power Source 400
 - >> Standard power source with support for automatic 1-MIG process as well as MAX Speed and MAX Cool processes
- X5 Power Source 400 Pulse
 - >> Pulse power source with support for automatic 1-MIG process as well as all MAX processes
- X5 Power Source 400 Pulse+
 - >> Pulse power source with support for automatic 1-MIG process as well as all Wise and MAX processes
- X5 Power Source 400 MV Pulse+
 - >> Multi-voltage pulse power source with support for automatic 1-MIG process as well as all Wise and MAX processes.

For the power source part descriptions, refer to "X5 Power Source 400 and 500" on page 12.

X5 power sources (500 A):

- X5 Power Source 500
 - >> Standard power source with support for automatic 1-MIG process as well as MAX Speed and MAX Cool processes
- X5 Power Source 500 Pulse
 - >> Pulse power source with support for automatic 1-MIG process as well as all MAX processes
- X5 Power Source 500 Pulse+
 - >> Pulse power source with support for automatic 1-MIG process as well as all Wise and MAX processes.

For the power source part descriptions, refer to "X5 Power Source 400 and 500" on page 12.

X5 wire feeders (Manual):

- X5 Wire Feeder 200 Manual
 - >> Includes 2-knob membrane control panel (Manual control panel)
 - >> Maximum wire spool diameter 200 mm
 - >> Stackable with X5 power source only when the additional steel pipe frame is used
 - >> Optional model version with built-in rotameter for gas available.
- X5 Wire Feeder 300 Manual
 - >> Includes 2-knob membrane control panel (Manual control panel)
 - >> Maximum wire spool diameter 300 mm
 - >> Includes subfeeder support.

For the X5 Wire Feeder 200 part descriptions, refer to "X5 Wire Feeder 200" on page 14, "Wire spool and hub (200)" on page 15 and "Wire feed mechanism" on page 26.

For the X5 Wire Feeder 300 part descriptions, refer to "X5 Wire Feeder 300" on page 18, "Wire spools and hubs (300)" on page 20 and "Wire feed mechanism" on page 26.

For the control panel descriptions, refer to "Manual control panel" on page 17 (WF 200) and "Manual control panel" on page 27 (WF 300).

X5 wire feeders (Auto/Auto+)

- **X5 Wire Feeder 300 Auto**
 - >> Includes 2-knob 5.7" TFT/LCD control panel (Auto control panel)
 - >> Includes automatic 1-MIG process that supports welding programs as well as Wise/MAX features & processes
 - >> Maximum wire spool diameter 300 mm
 - >> Includes subfeeder support.
- **X5 Wire Feeder 300 Auto+**
 - >> Includes 2-knob 5.7" TFT/LCD control panel (Auto control panel)
 - >> Includes automatic 1-MIG process that supports welding programs as well as Wise/MAX features & processes
 - >> Maximum wire spool diameter 300 mm
 - >> Includes additional voltage sensing cable support
 - >> Includes subfeeder support
 - >> Includes built-in rotameter for gas.

For the X5 Wire Feeder 300 part descriptions, refer to "X5 Wire Feeder 300" on page 18, "Wire spools and hubs (300)" on page 20 and "Wire feed mechanism" on page 26.

For the control panel descriptions, refer to "Auto control panel" on page 22.

X5 wire feeders (AP/APC)

- **X5 Wire Feeder 300 APC**
 - >> Includes 2-knob 5.7" TFT/LCD control panel (APC control panel)
 - >> Includes automatic 1-MIG process that supports welding programs as well as Wise/MAX features & processes
 - >> Includes wireless connectivity features (for Digital Welding Procedure Specification (dWPS) and WeldEye ArcVision)
 - >> Includes Weld Assist
 - >> Maximum wire spool diameter 300 mm
 - >> Includes subfeeder support
 - >> Includes additional voltage sensing cable support
 - >> USB backup feature.
- **X5 Wire Feeder 300 AP**
 - >> Includes 2-knob 5.7" TFT/LCD control panel (AP control panel)
 - >> Includes automatic 1-MIG process that supports welding programs as well as Wise/MAX features & processes
 - >> Includes Weld Assist
 - >> Maximum wire spool diameter 300 mm
 - >> Includes subfeeder support
 - >> Includes additional voltage sensing cable support
 - >> USB backup feature.

For the X5 Wire Feeder 300 part descriptions, refer to "X5 Wire Feeder 300" on page 18, "Wire spools and hubs (300)" on page 20 and "Wire feed mechanism" on page 26.

For the control panel descriptions, refer to "AP/APC control panel" on page 27.

X5 wire feeders (HD)

- **X5 Wire Feeder HD300 M**
 - >> Heavy-duty wire feeder for more demanding environments
 - >> Includes 2-knob membrane control panel (Manual control panel)
 - >> Maximum wire spool diameter 300 mm
 - >> Built-in LED work lights with battery (charged when connected to mains)
 - >> Includes subfeeder support.
- **X5 Wire Feeder HD300 APC**
 - >> Heavy-duty wire feeder for more demanding environments
 - >> Includes 2-knob 5.7" TFT/LCD control panel (APC control panel)

- >> Includes automatic 1-MIG process that supports welding programs as well as Wise/MAX features & processes
- >> Includes wireless connectivity features (for Digital Welding Procedure Specification (dWPS) and WeldEye ArcVision)
- >> Includes Weld Assist
- >> Built-in LED work lights with battery (charged when connected to mains)
- >> Maximum wire spool diameter 300 mm
- >> Includes subfeeder support
- >> Includes additional voltage sensing cable support
- >> USB backup feature.
- **X5 Wire Feeder HD300 AP**
 - >> Heavy-duty wire feeder for more demanding environments
 - >> Includes 2-knob 5.7" TFT/LCD control panel (AP control panel)
 - >> Includes automatic 1-MIG process that supports welding programs as well as Wise/MAX features & processes
 - >> Includes Weld Assist
 - >> Built-in LED work lights with battery (charged when connected to mains)
 - >> Maximum wire spool diameter 300 mm
 - >> Includes subfeeder support
 - >> Includes additional voltage sensing cable support
 - >> USB backup feature.

For the X5 Wire Feeder HD300 part descriptions, refer to "X5 Wire Feeder HD300" on page 24 and "Wire feed mechanism" on page 26.

For the control panel descriptions, refer to "AP/APC control panel" on page 27 and "Manual control panel" on page 27.

X5 cooling units:

- X5 Cooler, 1 kW
- X5 Cooler MV, 1 kW, multi-voltage.

For the cooling unit part descriptions, refer to "X5 cooling unit (optional)" on page 32.

MIG welding guns:

- Flexlite GX welding guns.

For more information on the Flexlite GX welding guns, refer to [Kempfi Userdoc](#).

Welding programs:

 *Welding programs and Wise features are available with the automatic, 1-MIG-enabled wire feeders. WiseRoot+, WiseThin+ and MAX Position processes require a pulse welding system (with the Wise processes specifically a Pulse+ power source is required).*

- Welding program work pack (factory installed by default)
- 1-MIG Wise features: WiseSteel and WiseFusion (with work pack equipment version)
- 1-MIG Wise features: WisePenetration+ (on-demand / at the time of purchase)
- Additional 1-MIG welding programs (on-demand / at the time of purchase)
- Additional advanced welding processes: WiseThin+, WiseRoot+, MAX Cool, MAX Speed and MAX Position (on-demand / at the time of purchase).

For more information on acquiring welding programs and additional welding processes, contact your local Kempfi dealer.

Subfeeders:

 *Subfeeder support is available with all new X5 Wire Feeder 300 models.*

- SuperSnake GTX subfeeder.

For more information on the SuperSnake GTX subfeeder, refer to [Kemppi Userdoc](#).

Optional accessories:

	X5 PS X5 CU	X5 WF 300 AP/APC	X5 WF 300 Manual	X5 WF 200 Manual	X5 WF HD300 AP/APC	X5 WF HD300 M
4-wheel cart with gas bottle rack ¹	●	●	●	o	●	●
2-wheel cart ¹	●	●	●	o	●	●
Remote control HR40 (2-knob control)	-	●	●	●	●	●
Remote control HR43 (1-knob control)	-	●	●	●	●	●
Accessory rack	●	-	-	-	-	-
Wire feeder cabinet heater	-	●	●	●	●	●
Built-in rotameter for gas	-	●	●	●	●	●
SuperSnake GTX subfeeder	-	●	●	-	●	●
Wire feeder cart, 4-wheel	-	●	●	o	●	●
Wire feeder cart, 2-wheel	-	-	-	-	●	●
Wire feeder rotating plate, single and double	-	●	●	o	●	●
Wire feeder hanger for boom, single and double ²	-	●	●	o	●	●
Wire feeder counterbalance arm	-	●	●	o	●	●
Gun holder	-	●	●	-	-	-
Wire drum kit	-	●	●	-	●	●
Additional steel pipe frame	-	-	-	●	-	-

● = Available

o = Can be used with the additional steel pipe frame (applicable with X5 Wire Feeder 200 only)

- = Not available or not applicable

¹⁾ Designed to be used with a full system (equipment stacked on top of each other).

²⁾ Double wire feeder hanger for boom not available with X5 Wire Feeder HD300 models.

For more information on optional accessories, contact your local Kemppi dealer.

For installing the optional accessories, refer to the corresponding equipment installation instructions and "Other optional accessories" on page 82.

EQUIPMENT IDENTIFICATION

Serial number

Serial number of the device is marked on the rating plate or in another distinctive location on the device. It is important to make correct reference to the serial number of the product when ordering spare parts or making repairs for example.

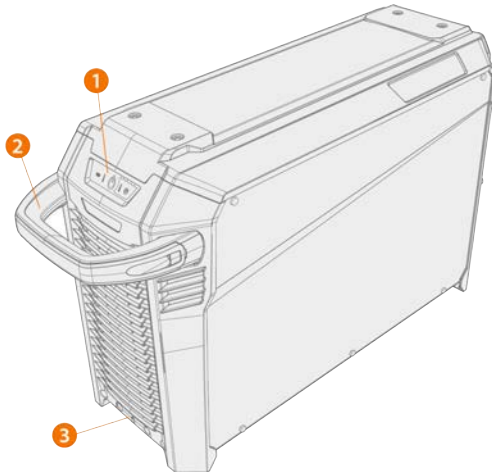
Quick Response (QR) code

The serial number and other device-related identification information may also be saved in the form of a QR code (or a barcode) on the device. Such code can be read by a smartphone camera or with a dedicated code reader device providing fast access to the device-specific information.

1.2 X5 Power Source 400 and 500

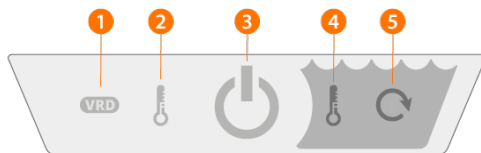
This section describes the structure of X5 Power Source 400 and X5 Power Source 500 models.

Front:



1. Indicator panel *
2. Transportation handle (not intended for mechanical lifting)
3. Front locking interface (locking on top of the cooling unit or on the cart)

* Indicator panel



1. VRD (Voltage Reduction Device) indicator

- >> The LED is green when VRD is switched on and the no-load voltage is under 35 V.
- >> The LED blinks red when VRD is switched on and the no-load voltage is above 35 V.
- >> The LED is off when VRD is switched off or during welding.
- >> The LED blinks green when the MMA or Gouging power save mode is on (the power save mode is automatically applied after 15 minutes of idling).

 VRD is in use with MMA and Gouging modes only.

2. High temperature indicator (overheating)

- >> The LED is yellow when the unit is overheating.

 If the power source overheats, a thermal cutoff switches the unit off and does not allow it to be used until it has cooled down.

3. Power on/off indicator

- >> The LED is green when the unit is on.

4. Coolant temperature warning

- >> The LED is yellow when the cooler is overheating.

 If the coolant liquid overheats, a thermal cutoff switches the welding system off and does not allow it to be used until the coolant liquid has cooled down.

5. Coolant circulation warning

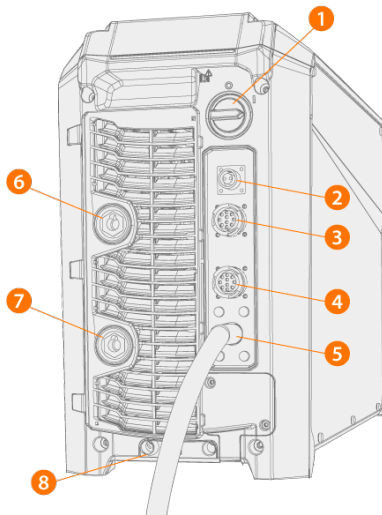
>> The LED is green when the coolant circulation is working normally.

>> The LED is red when there is a problem in the coolant circulation.



If the circulation of the coolant liquid is obstructed, a thermal cutoff switches the welding system off. Check and fix the error before using the welding system again.

Rear:



1. Power switch
 2. Voltage sensing cable connector (Pulse+ power sources only)
 3. Control cable connector
 4. Control cable connector
 5. Mains cable
 6. Welding current cable connector, plus (+) connector
 7. Earth return cable connector, minus (-) connector
 8. Rear locking interface
- >> For locking on top of the cooling unit or on the cart.

1.3 X5 Wire Feeder 200

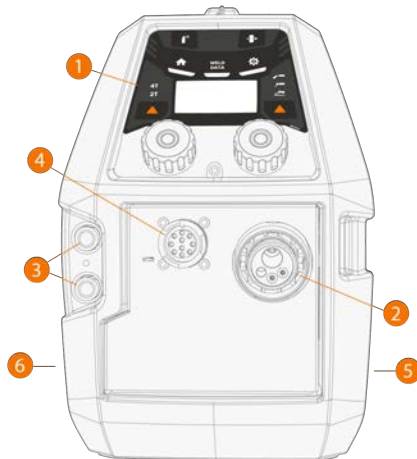
This section describes the structure of the X5 Wire Feeder 200 Manual.



Keep the wire feeder covers closed during welding to reduce the risk of injury or an electric shock. Keep the covers closed also at other times to keep the inside of the wire feeder clean.



The handle is intended for short distance manual carrying. Suspending the equipment temporarily from the handle with slings (e.g. for moving) is allowed.

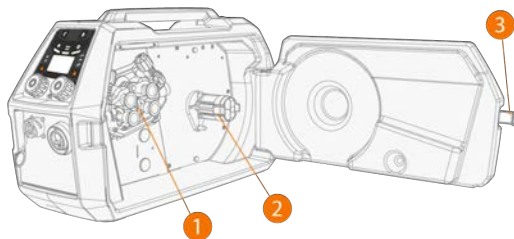


1. Control panel

>> For more information on the X5 Wire Feeder 200 Manual control panel, refer to "Manual control panel" on page 17.

2. Euro connector for welding cable connection
3. Coolant inlet and outlet connectors (color-coded)
4. Control cable connector
5. Wire feed cabinet side
6. Interconnection cable cabinet side

Inside wire feeder (wire feed cabinet)

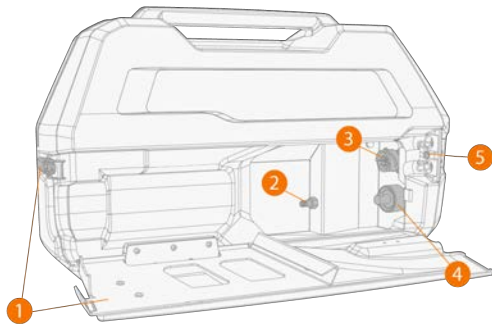


1. Wire feed roll mechanism
2. Wire spool hub

>> For more information on the wire spools, refer to "Wire spool and hub (200)" on the next page.

3. Wire feeder cabinet door latch

Inside wire feeder (interconnection cable cabinet)



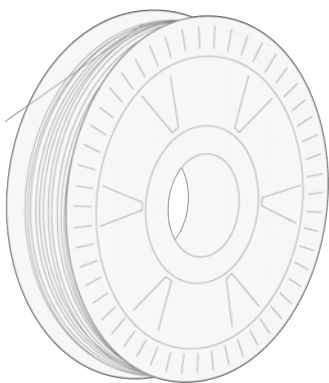
1. Interconnection cable cabinet hatch and locking latch
>> The rear section of the hatch acts also as a strain relief for the cable
2. Shielding gas hose connector
3. Control cable connector
4. Welding current cable connector
5. Coolant hose mounting slot

For installing and connecting the cables, refer to "X5 interconnection cable" on page 29 and "Installing cables" on page 50.

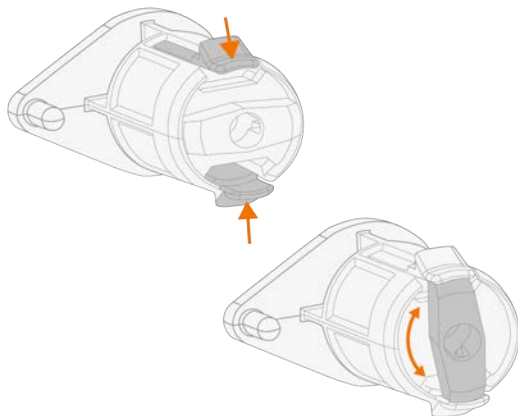
Wire feeder fixing accessories

X5 Wire Feeder 200 can be equipped with a steel pipe frame for additional protection and installation options. When the steel pipe frame is used, X5 Wire Feeder 200 can also be installed on top of the X5 power sources using the same optional fixing accessory sets than with the X5 Wire Feeder 300.

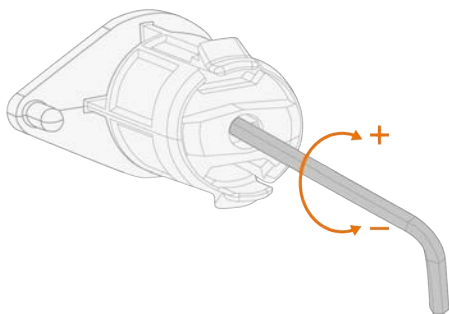
1.3.1 Wire spool and hub (200)



The wire spool can be released and removed by opening the lock and pushing the locking clips towards the center. The locking clips are locked by turning the lock knob between the locking levers:

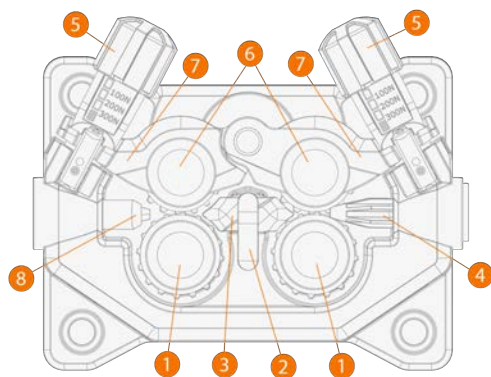


Spool brake adjustment:



1.3.2 Wire feed mechanism

X5 Wire Feeder 200 wire feed mechanism:



1. Drive rolls and drive roll mounting caps
2. Middle guide tube locking clip
3. Middle guide tube
4. Inlet guide tube
5. Pressure handles
6. Pressure rolls and pressure roll mounting pins

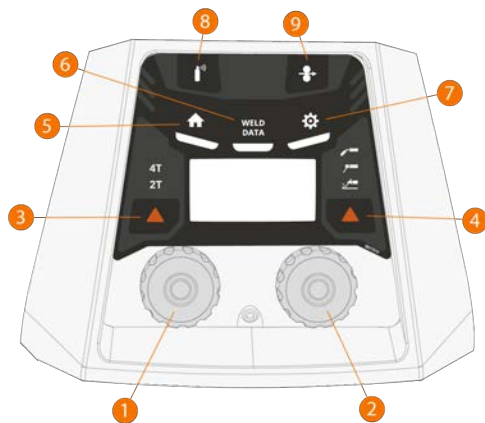
7. Pressure roll locking arms
8. Outlet guide tube.

For replacing the wire feed rolls, refer to "Installing and replacing feed rolls" on page 74.

For replacing the wire guide tubes, refer to "Installing and replacing wire guide tubes" on page 77

1.3.3 Manual control panel

This section describes the controls and features of the X5 Wire Feeder 200 Manual control panel (X5 FP 200R).



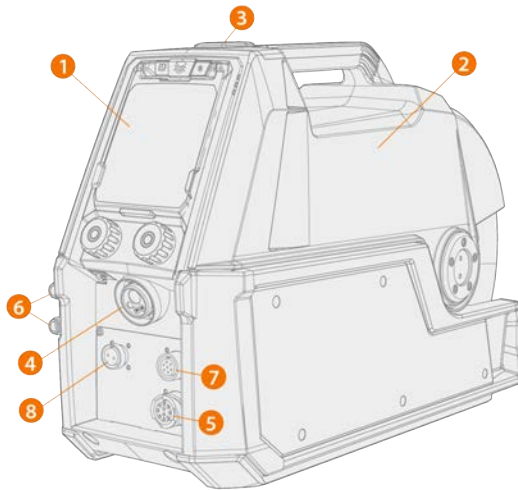
1. Left control knob
2. Right control knob
3. Trigger logic selection (2T/4T)
4. Process selection (MIG/MMA/Gouging)
5. Home button (default welding mode)
6. Weld data button
7. Settings button
8. Gas test button
9. Wire inch button

For using the control panel, refer to "Using X5 Manual control panel" on page 90.

1.4 X5 Wire Feeder 300

This section describes the structure of the X5 Wire Feeder 300 Manual, 300 Auto/Auto+ and 300 AP/APC.

 *Model-specific variations may occur.*



1. Control panel (and hinged control panel cover)

- >> For more information on the X5 Wire Feeder 300 AP/APC control panel, refer to "AP/APC control panel" on page 27.
- >> For more information on the X5 Wire Feeder 300 Manual control panel, refer to "Manual control panel" on page 27.
- >> For more information on the X5 Wire Feeder 300 Auto/Auto+ control panel, refer to "Auto control panel" on page 22.

2. Top cover

- >> Wire feeder cabinet door
- >> Handle

 *Keep the wire feeder top cover closed during welding to reduce the risk of injury or an electric shock. Keep the top cover closed also at other times to keep the inside of the wire feeder clean.*

 *The handle is intended for short distance manual carrying. Suspending the equipment temporarily from the handle with slings (e.g. for moving) is allowed.*

3. Top cover latch

4. Euro connector for welding cable connection

5. Control cable connector

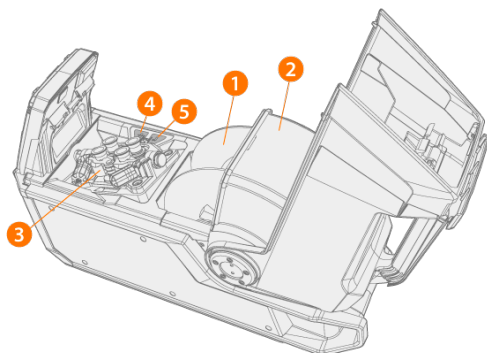
6. Coolant inlet and outlet connectors (color-coded)

7. Subfeeder synchronization connector

8. X5 Wire Feeder 300 AP/APC/Auto+ only: Voltage sensing cable connector

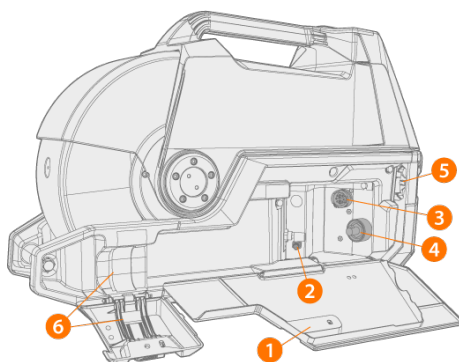
 *Refer to the control panel settings for the supported subfeeders.*

Inside wire feeder (wire feeder cabinet)

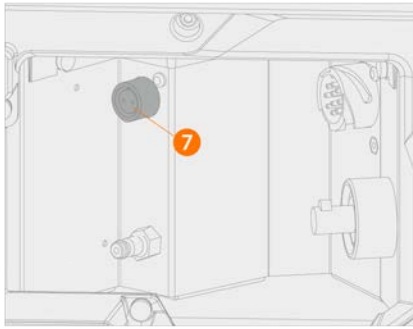


1. Wire spool
 >> For more information on the wire spools, refer to "Wire spools and hubs (300)" on the next page.
2. Wire spool locking cover
3. Wire feed roll mechanism
4. Wire inch button
 >> Drive the filler wire forward (with arc off).
5. Gas test button
 >> Test the shielding gas flow and flush the gas line.

Inside wire feeder (interconnection cable cabinet)



1. Interconnection cable cabinet door and latch
2. Shielding gas hose connector
3. Control cable connector
4. Welding current cable connector
5. Coolant hose mounting slot
6. Interconnection cable strain relief



7. X5 Wire Feeder 300 AP/APC/Auto+ : Voltage sensing cable connector for interconnection cable

For installing and connecting the cables, refer to "X5 interconnection cable" on page 29 and "Installing cables" on page 50.

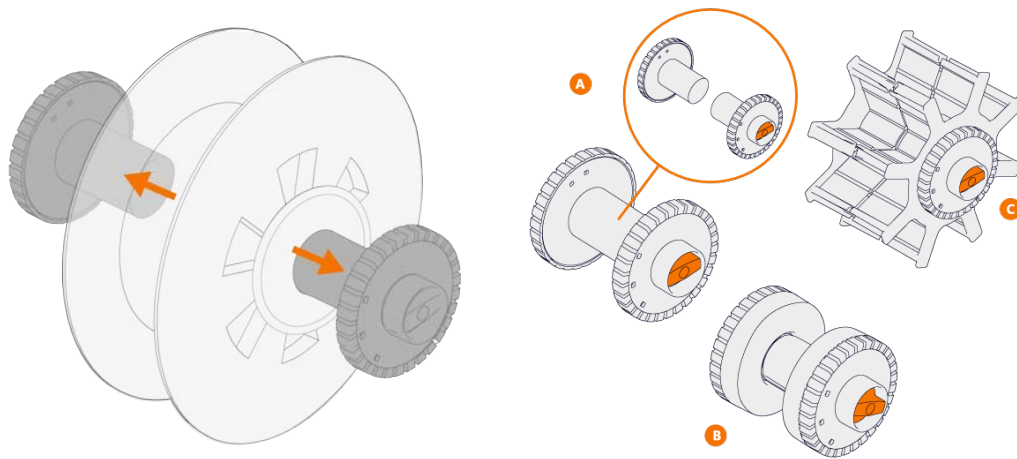
If the built-in rotameter for gas is included, it is also located in the interconnection cable cabinet.

Wire feeder fixing accessories

X5 Wire Feeder 300 can be installed on top of an X5 power source with the following optional fixing accessory sets:

- Fixed fixing plates and locking mechanism for one wire feeder
- Rotating plate with locking mechanism for one wire feeder
- Double rotating plate with two locking mechanisms for two wire feeders
- Rotating plate with counter-balance arm for one wire feeder.

1.4.1 Wire spools and hubs (300)



X5 Wire Feeder 300 has three different wire spool hub options available for different wire spools:

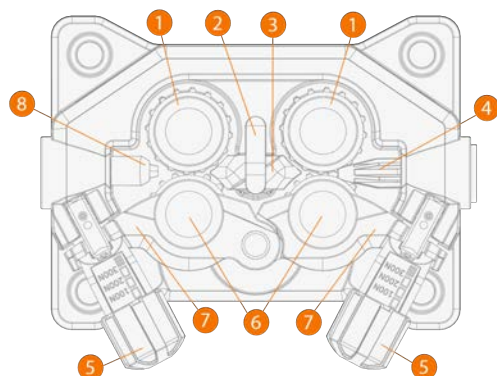
- Standard spool (A)
- Spool hub for the small wire spool (B)
>> Attach the extension pieces to the standard spool halves.
- Spool hub for the wire spool with a large center hole (C)

All parts are delivered with the wire feeder.

Loosen and pull the spool hub halves apart to detach them.

1.4.2 Wire feed mechanism

X5 Wire Feeder 300 wire feed mechanism:



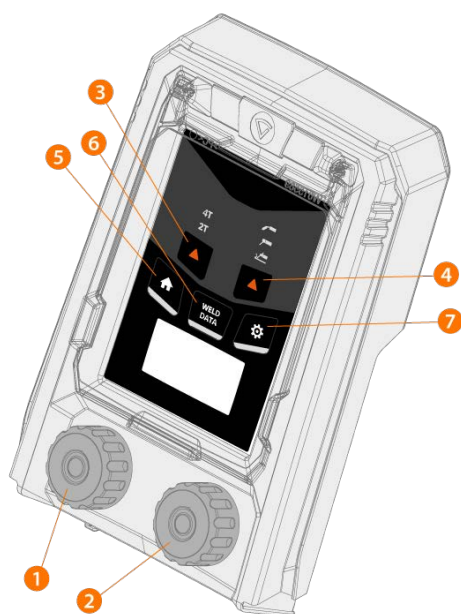
1. Drive rolls and drive roll mounting caps
2. Middle guide tube locking clip
3. Middle guide tube
4. Inlet guide tube
5. Pressure handles
6. Pressure rolls and pressure roll mounting pins
7. Pressure roll locking arms
8. Outlet guide tube.

For replacing the wire feed rolls, refer to "Installing and replacing feed rolls" on page 74.

For replacing the wire guide tubes, refer to "Installing and replacing wire guide tubes" on page 77

1.4.3 Manual control panel

This section describes the controls and features of the X5 Wire Feeder 300 Manual control panel (X5 FP 300R).



1. Left control knob
2. Right control knob
3. Trigger logic selection (2T/4T)
4. Process selection (MIG/MMA/Gouging)
5. Home button (default welding mode)
6. Weld data button
7. Settings button

For using the control panel, refer to "Using X5 Manual control panel" on page 90.

1.4.4 Auto control panel

This section describes the controls and features of the X5 Wire Feeder 300 Auto control panel (X5 FP 300).



1. Left control knob (with push button function)
2. Right control knob (with push button function)
3. Memory channel selection (shortcut button)
4. View selection (shortcut button)
5. Welding parameters view (shortcut button).

For using the control panel, refer to "Using X5 Auto control panel" on page 96.

1.4.5 AP/APC control panel

This section describes the controls and features of the X5 Wire Feeder 300 AP/APC control panel (X5 FP 300AP/APC).

The AP/APC control panel of the X5 Wire Feeder 300 on the left and the AP/APC control panel of the X5 Wire Feeder HD300 on the right:



1. Left control knob (with push button function)
2. Right control knob (with push button function)
3. Memory channel selection (shortcut button)
4. View selection (shortcut button)
5. Welding parameters view (shortcut button).

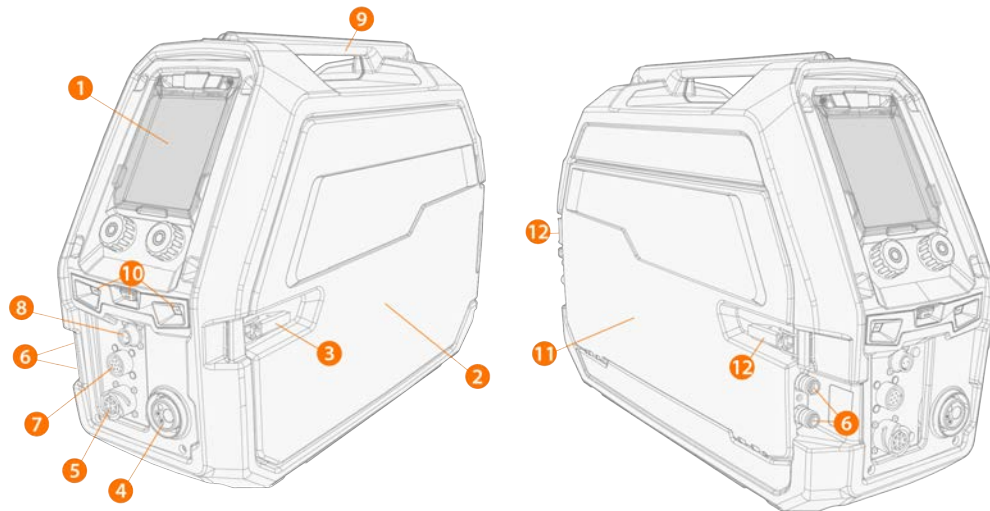
For using the control panel, refer to "Using X5 AP/APC control panel" on page 111.

1.5 X5 Wire Feeder HD300

This section describes the structure of the X5 Wire Feeder HD300.

 *Model-specific variations may occur.*

X5 Wire Feeder HD300:



1. Control panel (and hinged control panel cover)

>> For more information on the X5 Wire Feeder 300 Manual control panel, refer to "Manual control panel" on page 27.

>> For more information on the X5 Wire Feeder 300 AP/APC control panel, refer to "AP/APC control panel" on page 27.

2. Wire feeder cabinet door

 *Keep the wire feeder cabinet door closed during welding to reduce the risk of injury or an electric shock. Keep the cabinet door closed also at other times to keep the inside of the wire feeder clean.*

3. Wire feeder cabinet door latch

4. Euro connector for welding cable connection

5. Control cable connector

6. Coolant inlet and outlet connectors (color-coded)

7. Subfeeder synchronization connector

 *Refer to "AP/APC control panel: Device settings" on page 126 for the full list of supported subfeeders.*

8. AP/APC models only: Voltage sensing cable connector

9. Handle

 *Suspending the equipment from the handle with dedicated suspension accessories (i.e. for lifting or moving) is possible.*

10. LED work lights with light switch in the middle

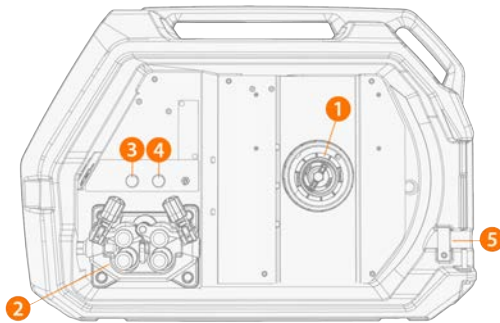
>> Light switch: First press turns the lights on (full brightness), second press dims the lights (medium brightness), third press turns the lights off

>> Includes a built-in battery (the battery is charged when the equipment is connected to mains).

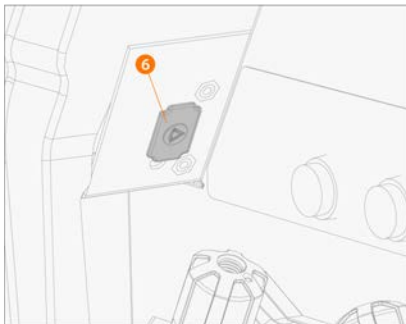
11. Interconnection cable cabinet hatch

12. Interconnection cable cabinet hatch latches

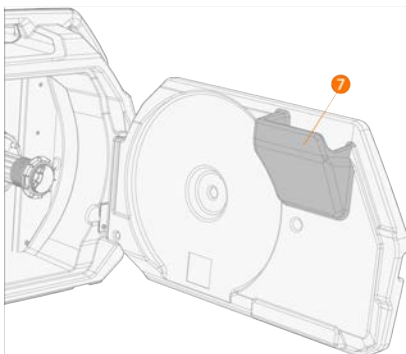
Inside wire feeder (wire feeder cabinet)



1. Wire spool hub
>> For more information on the wire spool, refer to "Installing and changing wire (X5 WF HD300)" on page 70.
2. Wire feed roll mechanism
3. Gas test button
>> Test the shielding gas flow and flush the gas line.
4. Wire inch button
>> Drive the filler wire forward (with arc off).
5. Aperture for wire drum kit conduit (optional)
6. USB connector
>> For updating software/firmware.

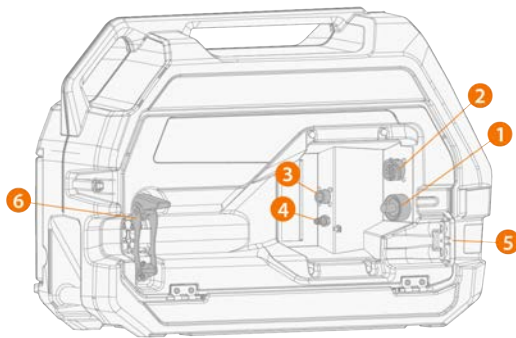


7. Parts storage
>> For temporarily storage of smaller items.



If the optional built-in rotameter for gas is used, it is also located in the wire feeder cabinet.

Inside wire feeder (interconnection cable cabinet)



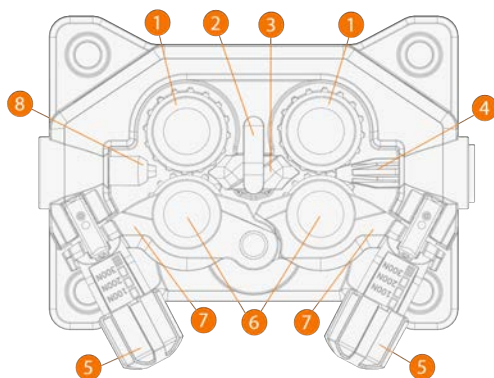
1. Welding current cable connector
2. Control cable connector
3. Voltage sensing cable connector
4. Shielding gas hose connector
5. Coolant hose mounting slot
6. Interconnection cable strain relief (adjustable)

For installing and connecting the cables, refer to "X5 interconnection cable" on page 29 and "Installing cables" on page 50.

 With X5 Wire Feeder HD300, the wire feeder cabinet door opens on the side. This should be noted when considering installing a double wire feeder setup on a double rotating plate.

1.5.1 Wire feed mechanism

X5 Wire Feeder 300 wire feed mechanism:



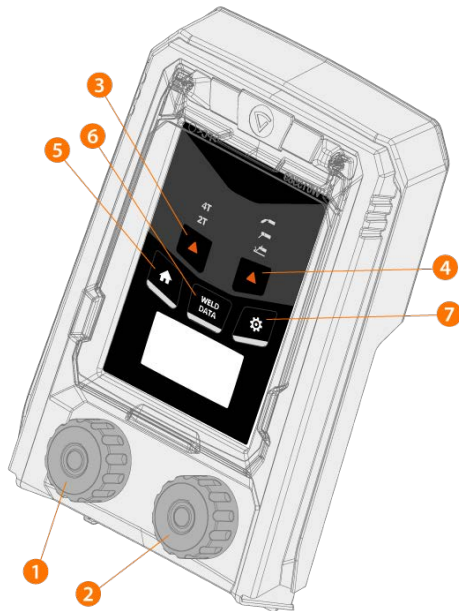
1. Drive rolls and drive roll mounting caps
2. Middle guide tube locking clip
3. Middle guide tube
4. Inlet guide tube
5. Pressure handles
6. Pressure rolls and pressure roll mounting pins
7. Pressure roll locking arms
8. Outlet guide tube.

For replacing the wire feed rolls, refer to "Installing and replacing feed rolls" on page 74.

For replacing the wire guide tubes, refer to "Installing and replacing wire guide tubes" on page 77

1.5.2 Manual control panel

This section describes the controls and features of the X5 Wire Feeder 300 Manual control panel (X5 FP 300R).



1. Left control knob
2. Right control knob
3. Trigger logic selection (2T/4T)
4. Process selection (MIG/MMA/Gouging)
5. Home button (default welding mode)
6. Weld data button
7. Settings button

For using the control panel, refer to "Using X5 Manual control panel" on page 90.

1.5.3 AP/APC control panel

This section describes the controls and features of the X5 Wire Feeder 300 AP/APC control panel (X5 FP 300AP/APC).

The AP/APC control panel of the X5 Wire Feeder 300 on the left and the AP/APC control panel of the X5 Wire Feeder HD300 on the right:



1. Left control knob (with push button function)
2. Right control knob (with push button function)
3. Memory channel selection (shortcut button)
4. View selection (shortcut button)
5. Welding parameters view (shortcut button).

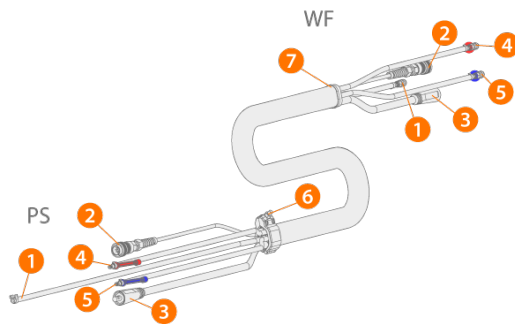
For using the control panel, refer to "Using X5 AP/APC control panel" on page 111.

1.6 X5 interconnection cable

The X5 FastMig interconnection cables come in multiple different lengths and configurations to suit your equipment setup.

For installing the interconnection cable, refer to "Installing cables" on page 50.

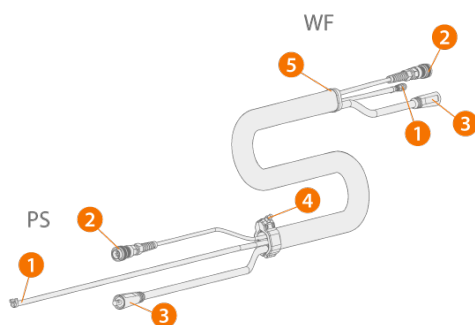
With water-cooling



(PS = Power source end of the interconnection cable, WF = Wire feeder end of the interconnection cable.)

1. Shielding gas hose
2. Control cable
3. Welding current cable
4. Coolant hose (outlet/inlet, color-coded)
5. Coolant hose (outlet/inlet, color-coded)
6. Strain relief collar (at the power source end)
7. Strain relief block (at the wire weeder end).

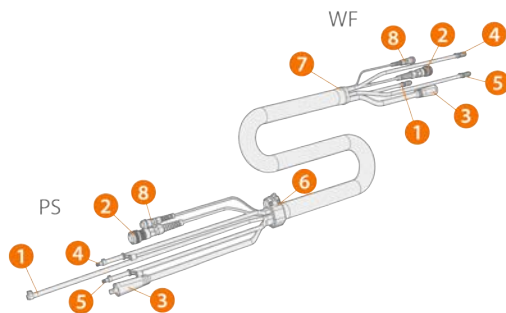
Without water-cooling



(PS = Power source end of the interconnection cable, WF = Wire feeder end of the interconnection cable.)

1. Shielding gas hose
2. Control cable
3. Welding current cable
4. Strain relief collar (at the power source end)
5. Strain relief block (at the wire weeder end).

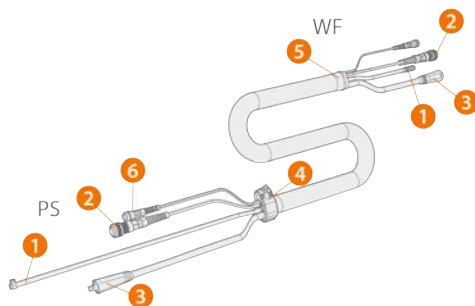
With voltage sensing cable and water-cooling



(PS = Power source end of the interconnection cable, WF = Wire feeder end of the interconnection cable.)

1. Shielding gas hose
2. Control cable
3. Welding current cable
4. Coolant hose (outlet/inlet, color-coded)
5. Coolant hose (outlet/inlet, color-coded)
6. Strain relief collar (at the power source end)
7. Strain relief block (at the wire feeder end)
8. Voltage sensing cable.

With voltage sensing cable, without water-cooling

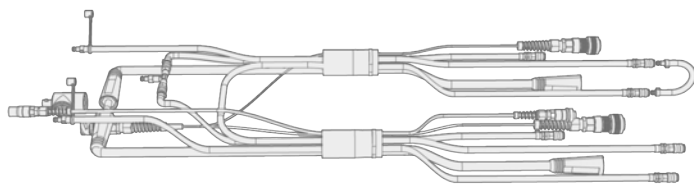


(PS = Power source end of the interconnection cable, WF = Wire feeder end of the interconnection cable.)

1. Shielding gas hose
2. Control cable
3. Welding current cable
4. Strain relief collar (at the power source end)
5. Strain relief block (at the wire feeder end)
6. Voltage sensing cable.

Adapter cable for double wire feeder installation

The adapter cable for a double wire feeder installation divides one interconnection cable for two wire feeders.



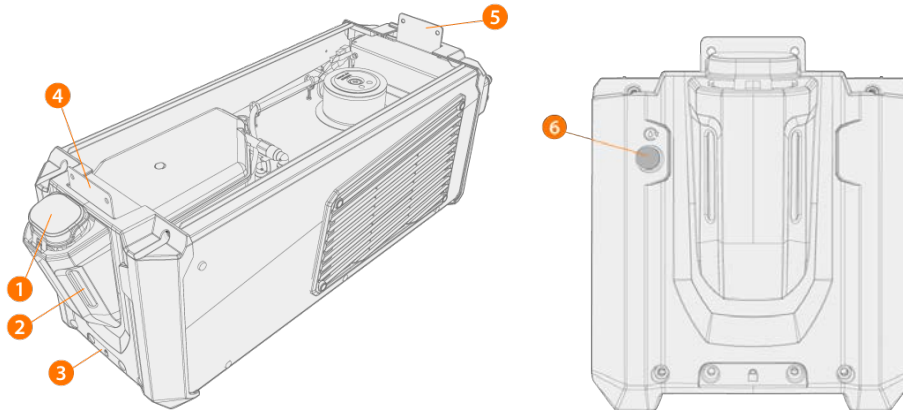
Interconnection cable specifications

Cable	Cable type*	Cable length	Cooling	Connector types
X57002MW	70 mm ²	2 m	Water-cooled	10-pin (control), snap (water/gas), DIX (current)
X57005MW	70 mm ²	5 m	Water-cooled	10-pin (control), snap (water/gas), DIX (current)
X57010MW	70 mm ²	10 m	Water-cooled	10-pin (control), snap (water/gas), DIX (current)
X57020MW	70 mm ²	20 m	Water-cooled	10-pin (control), snap (water/gas), DIX (current)
X57030MW	70 mm ²	30 m	Water-cooled	10-pin (control), snap (water/gas), DIX (current)
X57002MG	70 mm ²	2 m	Gas-cooled	10-pin (control), snap (water/gas), DIX (current)
X57005MG	70 mm ²	5 m	Gas-cooled	10-pin (control), snap (water/gas), DIX (current)
X57010MG	70 mm ²	10 m	Gas-cooled	10-pin (control), snap (water/gas), DIX (current)
X57020MG	70 mm ²	20 m	Gas-cooled	10-pin (control), snap (water/gas), DIX (current)
X57030MG	70 mm ²	30 m	Gas-cooled	10-pin (control), snap (water/gas), DIX (current)
X59502MW	95 mm ²	2 m	Water-cooled	10-pin (control), snap (water/gas), DIX (current)

* Welding current cable

1.7 X5 cooling unit (optional)

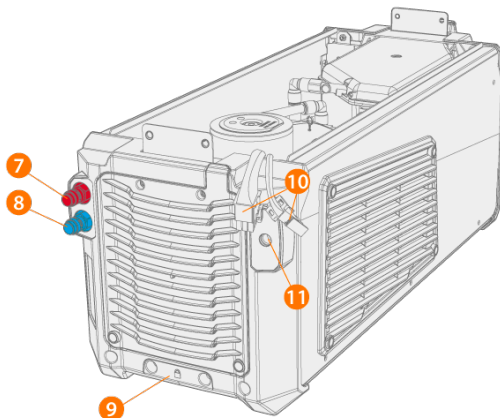
Front:



1. Cooler container cap
2. Cooling liquid level indicator
3. Front locking interface (for locking on the cart)
4. Front locking interface (for locking to the power source)
5. Rear locking interface (for locking to the power source)
6. Cooling liquid circulation button

>> Keeping the button pressed activates the pump and circulates the cooling liquid throughout the system. Once released, the pump stops.

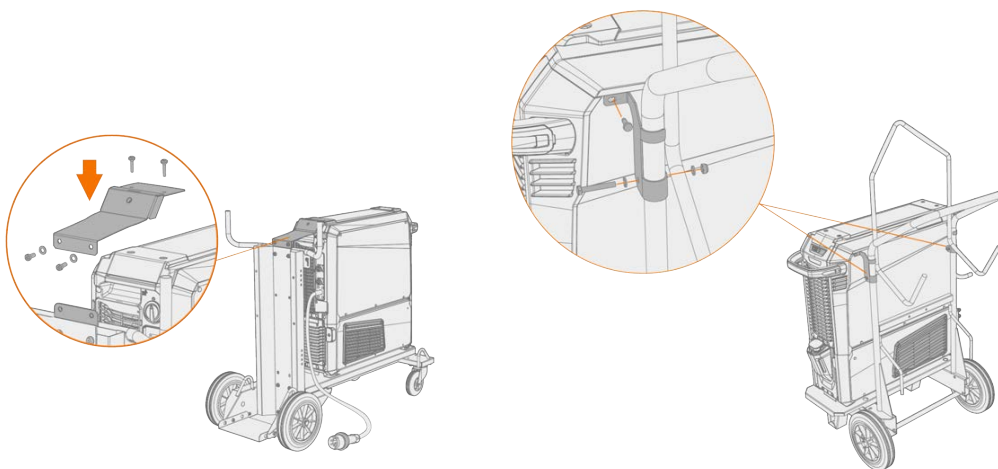
Rear:



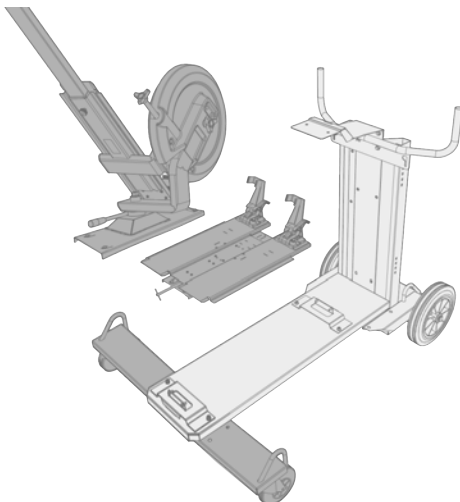
7. Coolant inlet/outlet connector (color-coded)
8. Coolant inlet/outlet connector (color-coded)
9. Rear locking interface (for locking on the cart)
10. Cooling unit to power source connectors
11. Additional strain relief mount.

2. INSTALLATION

-  Do not connect the equipment to the mains before the installation is complete.
-  Do not modify the welding equipment in any way, except for the changes and adjustments covered in the manufacturer's instructions.
-  Do not attempt to move or hang the equipment mechanically (e.g. with a hoist) from the handle on the power source unit or on the wire feeder unit. The handles are for manual moving only.
-  When installing the full set of equipment stacked as a tower – water cooler at the bottom, power source in the middle and wire feeder at the top – always install and secure the equipment onto a Kemppi cart compatible with X5 FastMig or secure the equipment to other adequate support on site.



-  When installing the full set of equipment stacked as a tower and using the double wire feeder rotating plate or counterbalance arm, always use the broader front roller support plate delivered with the equipment. This applies to the 4 wheel cart.



-  Place the machine on a horizontal, stable and clean ground. Protect the machine from rain and direct sunshine. Check that there is enough space for cooling air circulation in the machine vicinity.

Before installation

- Make sure to acknowledge and follow the local and national requirements regarding installation and use of high voltage units.
- Check the contents of the packages and make sure the parts are not damaged.
- Before you install the power source on site, see the requirements for the mains cable type and fuse rating.

Distribution network



This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated radio-frequency disturbances.



Provided that the short circuit power of public low voltage system at the point of common coupling is higher than mentioned in the table below (), the equipment is compliant with IEC 61000-3-11:2017 and IEC 61000-3-12:2011 and can be connected to public low voltage systems. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the system impedance complies with the impedance restrictions.*

Equipment	*
X5 power source 400A:	5.8 MVA
X5 power source 500A:	6.4 MVA
X5 pulse power source 400A:	6.3 MVA
X5 pulse power source 500A:	6.7 MVA

2.1 Installing power source mains plug

 Only an authorized electrician is allowed to install the mains cable and plug.

 Only connect the welding machine to an earthed electric network.

 Do not connect the machine to the mains before the installation is complete.

Install the 3-phase plug according to the X5 FastMig power source and site requirements. Refer also to "Technical data" on page 158 for power source specific technical information.

The mains cable includes the following wires:

1. Brown: L1
2. Black: L2
3. Grey: L3
4. Yellow-green: Protective earth

Table. Cable type and fuse rating requirements:

Unit amperage	High voltage version (380-460V)	
	Cable type	Fuse rating
400 A	4 mm ²	25 A
500 A	6 mm ²	32 A

Unit amperage	Multi-voltage version (380-460V / 220-230V)	
	Cable type	Fuse rating
400 A MV	6 mm ²	32 A / 25 A

**MV = Multi-voltage*

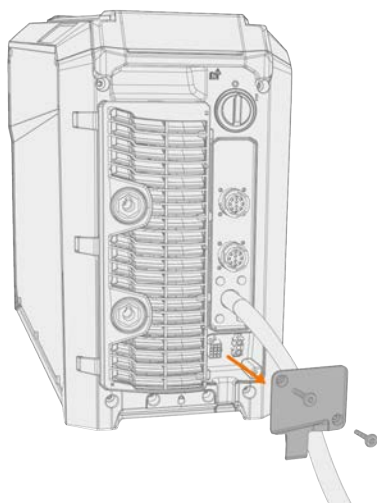
2.2 Installing cooling unit (optional)

 *The X5 cooling unit must be installed by authorized service personnel.*

Tools needed:

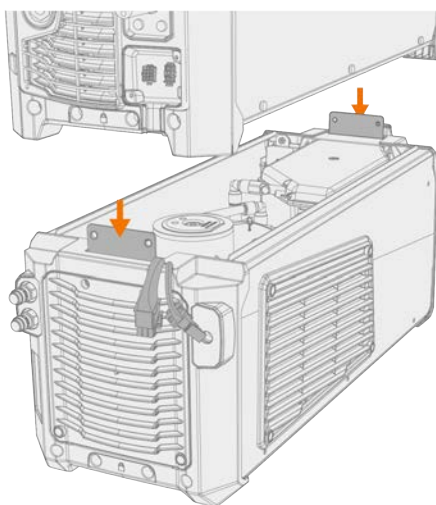


1. Remove the small connector cover in the rear of the power source.

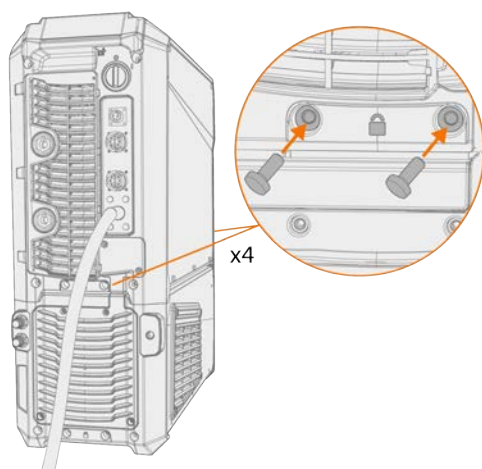


2. Route the cooling unit's connection cables so that they remain accessible through the next steps.
3. Lift the power source on top of the cooling unit so that the fixing plates align and go into their slots.

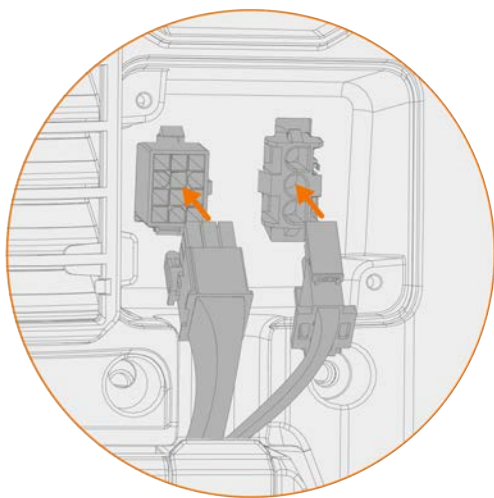
 *Ensure that the cooling unit's connection cables are not caught and/or damaged between the edges.*



4. Fix the units together with two screws (M5x12) in the front and two screws (M5x12) in the rear.



5. Connect the cooling unit cables.



Do not use force, but make sure the connectors are properly connected.

6. Replace the small connector cover.

2.3 Installing equipment on cart (optional)

The X5 FastMig has two transport unit options: a 4-wheel cart with gas bottle rack and a 2-wheel cart without gas bottle rack. The X5 FastMig equipment can be installed on the cart with or without the cooling unit.

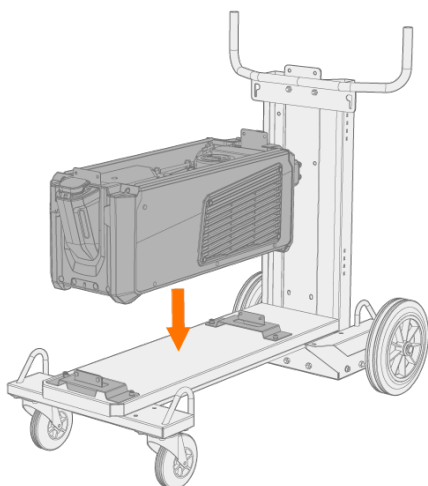
For more information on the connection interface and installing the power source on top of the cooling unit, refer to "Installing cooling unit (optional)" on page 36.

 *The equipment installation principle and the bottom securing interface is the same with both carts. Only the top cart connection bracket installation is different.*

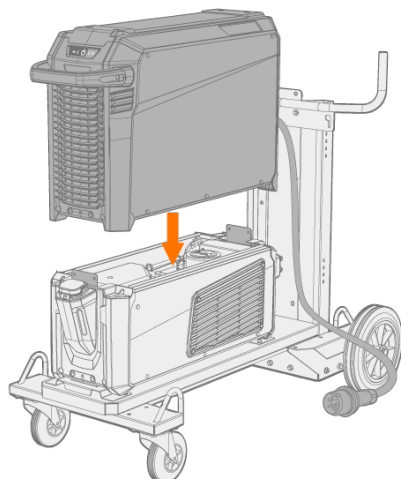
Tools needed:



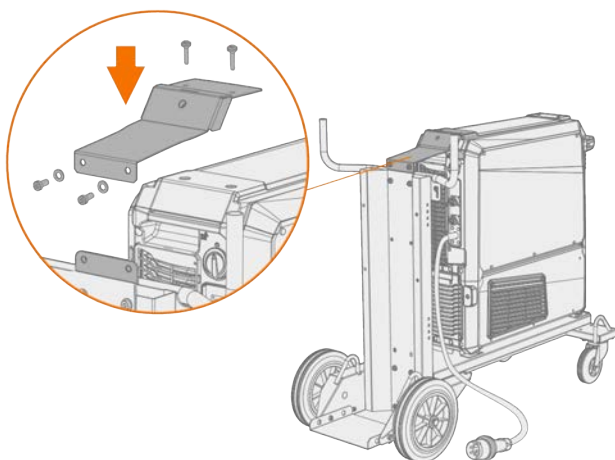
1. Install the cooling unit on the cart.



2. Fix the cooling unit to the cart with two screws (M5x12) in the front and two screws (M5x12) in the rear.
3. Install the power source on top of the cooling unit. Refer to "X5 cooling unit (optional)" on page 32 for installation details.



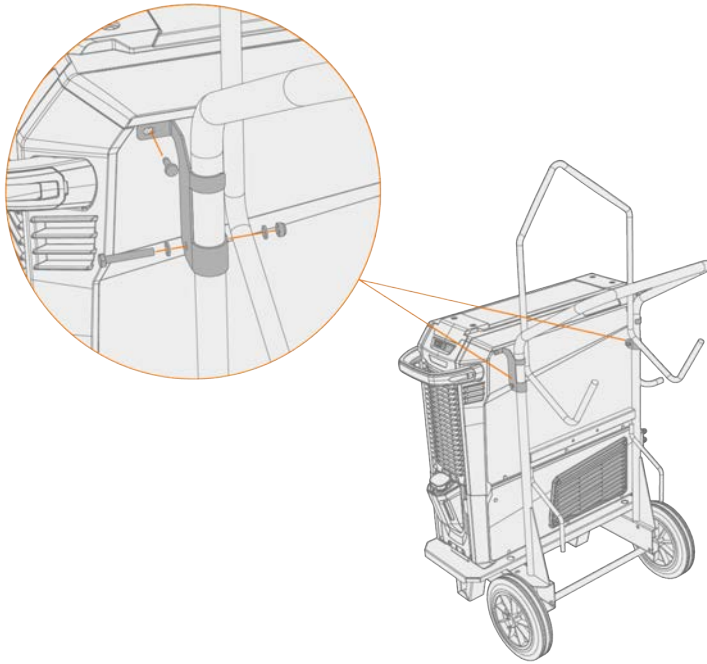
4. 4-wheel cart: Secure the equipment to the cart with the rear connection bracket (rear fixing plate, long). Rear screws: M8x16, top screws: M6x30.



5. 2-wheel cart: Secure the equipment to the cart with the two side connection brackets.



The 2-wheel cart's side connection brackets use the X5 power source's side plate top screw holes for securing. Replace the side plate top screws with the ones delivered with the 2-wheel cart side connection brackets.



For more information on fixing plates and wire feeders, refer to "Installing wire feeder with fixed plate" on the next page.

For lifting the equipment, refer to "Lifting equipment" on page 145.

2.4 Installing wire feeder with fixed plate

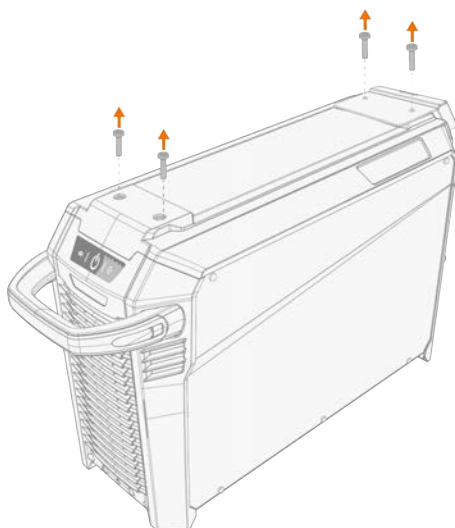
This section describes the fixed installation of X5 Wire Feeder 300 (on top of the power source).

 For stacked installation, additional support is required. Read the installation notes here: "Installation" on page 33.

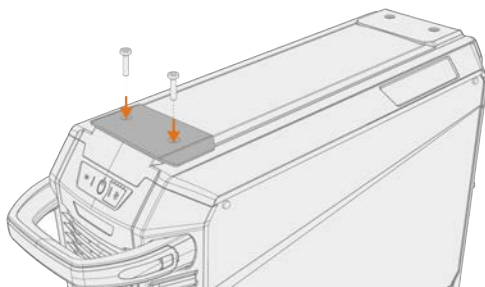
Tools needed:



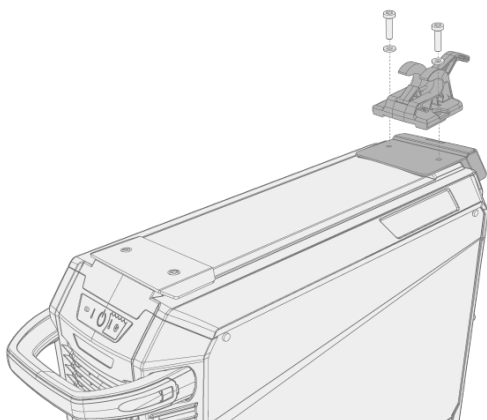
1. Temporarily remove the power source top cover screws.



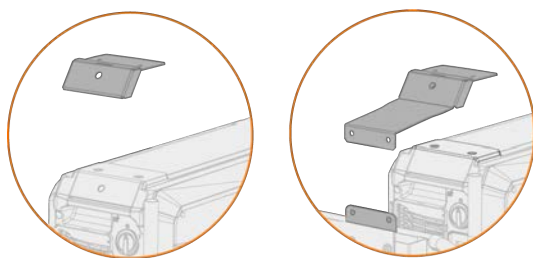
2. Place the front fixing plate on the power source and secure it in place using two of the power source top cover screws (M6x30).



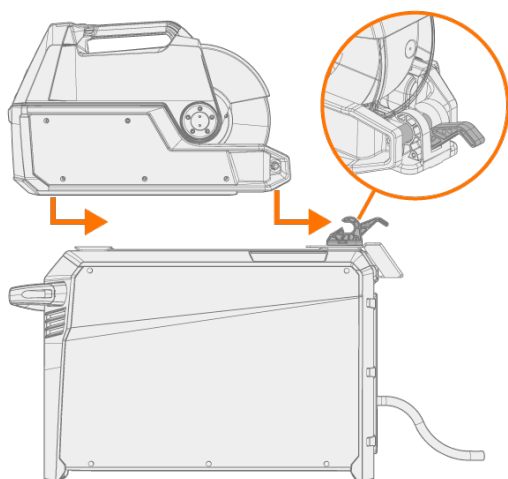
3. Place the rear fixing plate and the wire feeder locking mechanism on the power source. Secure them in place with the two screws (M6x40) provided with the locking mechanism.



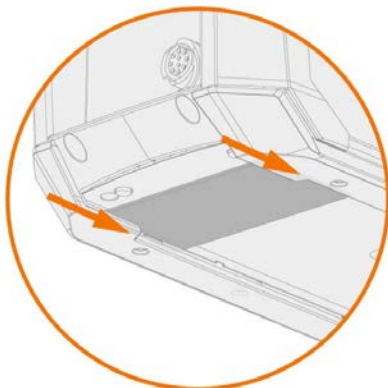
Depending on your X5 FastMig setup, two different rear fixing plate options are available. Both include an interface for the interconnection cable strain relief mechanism, but the longer one acts also as a cart connection bracket.



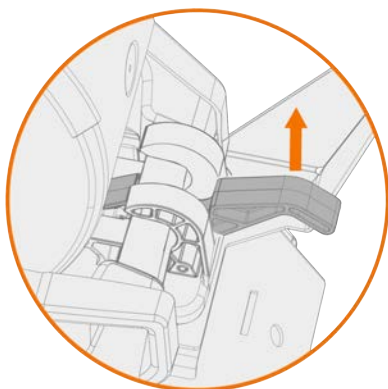
4. Slide the wire feeder from front to back until the bar in the back locks into the locking mechanism on the power source.



5. Ensure that also the front of the wire feeder is locked in position (to the front fixing plate edge).



The rear locking is released by pulling the locking mechanism lever:



2.5 Installing wire feeder with standard rotating plate

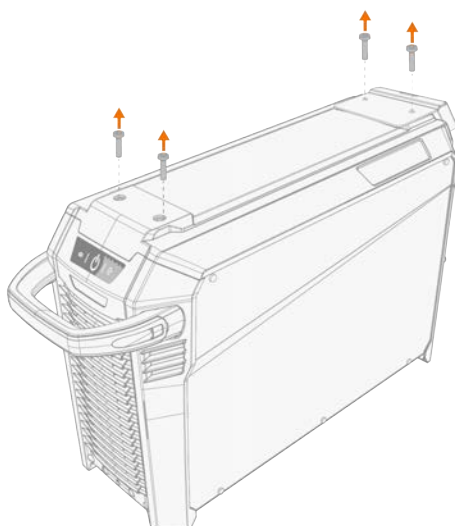
This section describes the installation of X5 Wire Feeder 300 (on top of the power source) with the standard rotating plate. Refer also to the installation instructions delivered with the rotating plate.

 For stacked installation, additional support is required. Read the installation notes here: "Installation" on page 33 and "Other optional accessories" on page 82.

Tools needed:



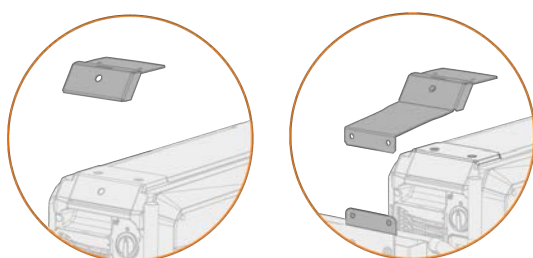
1. Temporarily remove the power source top cover screws.



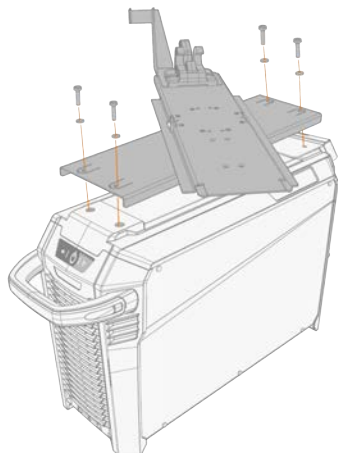
2. Place the wire feeder rotating plate on top of the power source.

 If the rear fixing plate was not yet installed at this stage, install it together with the rotating plate.

 Depending on your X5 FastMig setup, two different rear fixing plate options are available. Both include an interface for the interconnection cable strain relief mechanism, but the longer one acts also as a cart connection bracket.

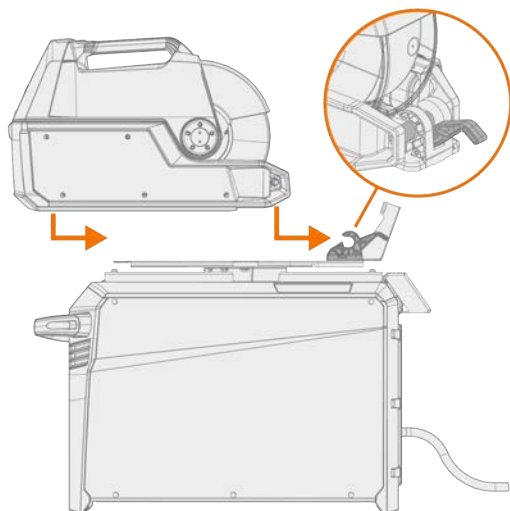


3. Secure the rotating plate in place (together with the rear fixing plate) using the power source top cover screws (M6x30).

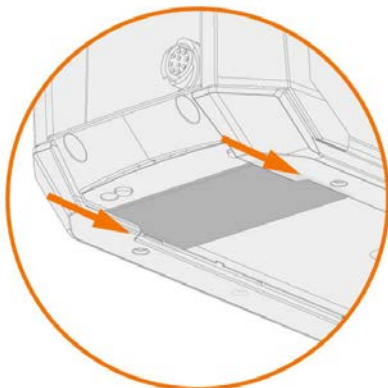


Tip: To gain access to the fixing holes in the lower plate, turn the top plate.

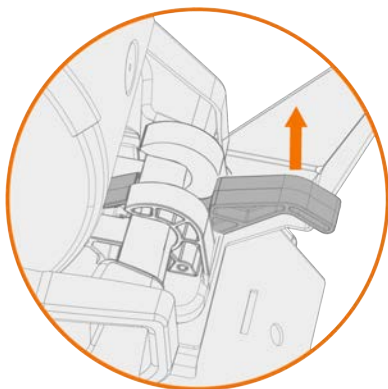
4. Slide the wire feeder from front to back until the bar in the back of the unit locks into the locking mechanism on the rotating plate.



5. Ensure that the front of the unit has also locked in position (to the front edge of the rotating plate).



The rear locking is released by pulling the locking mechanism lever:



2.6 Installing wire feeder with lockable rotating plate

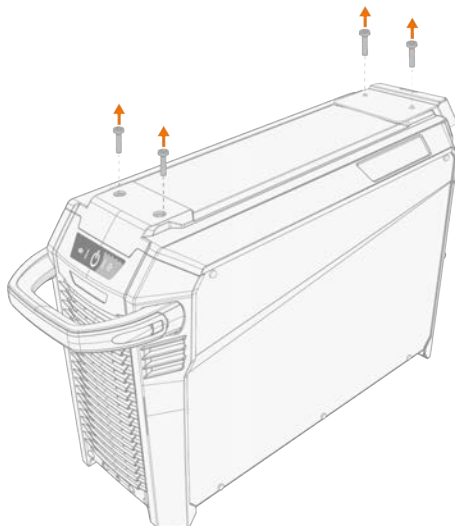
This section describes the installation of X5 Wire Feeder 300 (on top of the power source) with the lockable rotating plate. Refer also to the installation instructions delivered with the rotating plate.

i The installation of the wire feeder rotating plate and the wire feeder double rotating plate on top of the power source is identical. However, for stacked installation, additional support is required. Read the installation notes here: "Installation" on page 33 and "Other optional accessories" on page 82.

Tools needed:



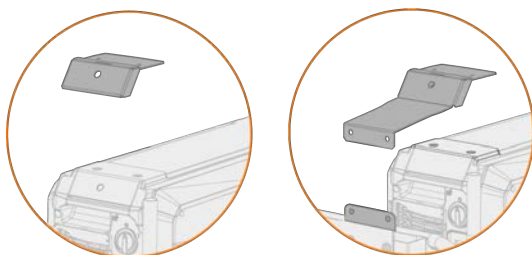
1. Temporarily remove the power source top cover screws.



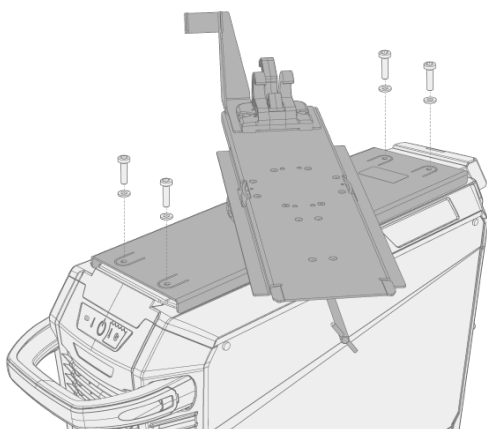
2. Place the wire feeder rotating plate on top of the power source.

i If the rear fixing plate was not yet installed at this stage, install it together with the rotating plate.

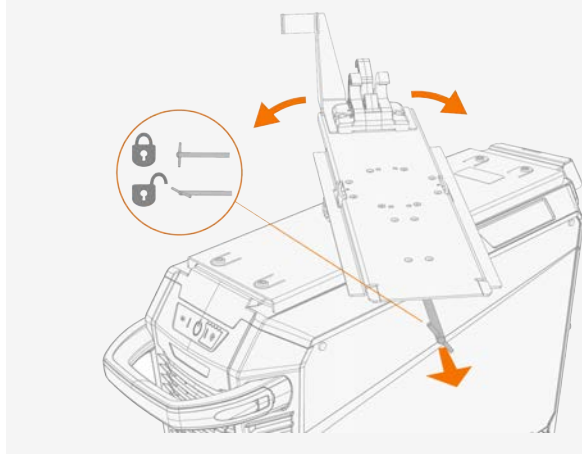
i Depending on your X5 FastMig setup, two different rear fixing plate options are available. Both include an interface for the interconnection cable strain relief mechanism, but the longer one acts also as a cart connection bracket.



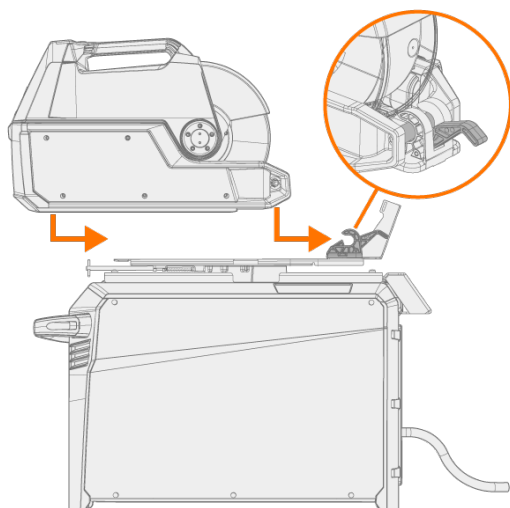
3. Secure the rotating plate in place (together with the rear fixing plate) using the power source top cover screws (M6x30).



Tip: To gain access to the fixing holes in the lower plate, and to turn the rotating plate, pull the release lever under the front edge of the wire feeder rotating plate and turn the top plate:



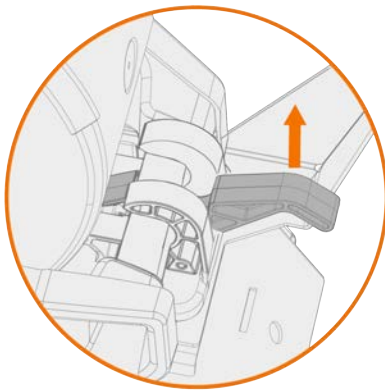
4. Slide the wire feeder from front to back until the bar in the back of the unit locks into the locking mechanism on the rotating plate.



5. Ensure that the front of the unit has also locked in position (to the front edge of the rotating plate).



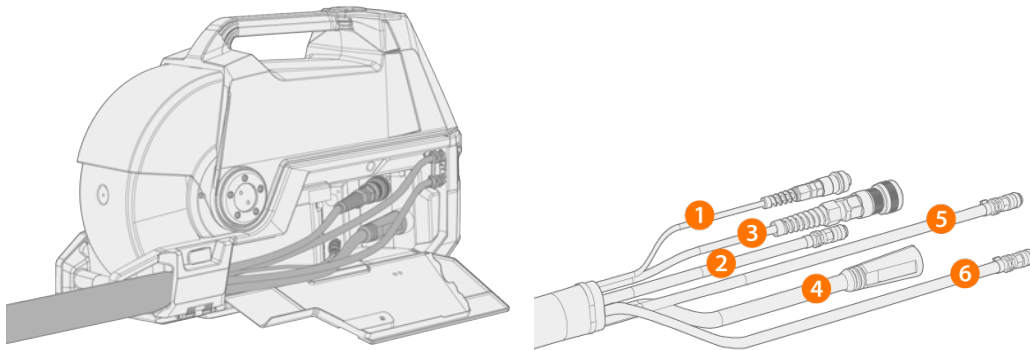
The rear locking is released by pulling the locking mechanism lever:



2.7 Installing cables

Connect the interconnection cable first to the wire feeder and then to the power source. For the connector descriptions and their locations, refer to "X5 Wire Feeder 200" on page 14, "X5 Wire Feeder 300" on page 18 or "X5 Wire Feeder HD300" on page 24 (depending on your wire feeder model).

Connecting interconnection cable to wire feeder



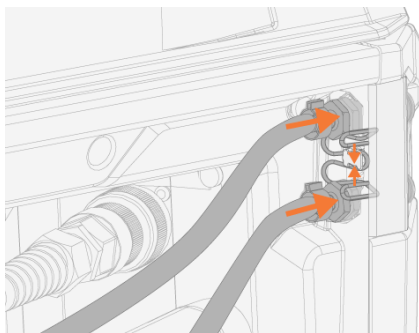
1. Open the cable cabinet hatch to reveal the connectors.
2. Connect the welding current cable (4) to the wire feeder. Push the cable as far as it goes and turn the connector clockwise to tighten the cable to its place.



Tighten the welding current cable as much as you can by hand. If the welding current cable connection is loose, it may overheat.

3. Push the shielding gas hose (2) to the shielding gas hose connector so that it locks down.
4. Connect the control cable (3) to the connector. Rotate the collar clockwise to lock it in place.
5. If you have the optional cooling unit, place the cooling liquid hose connectors (5, 6) into the slot and through the aperture.

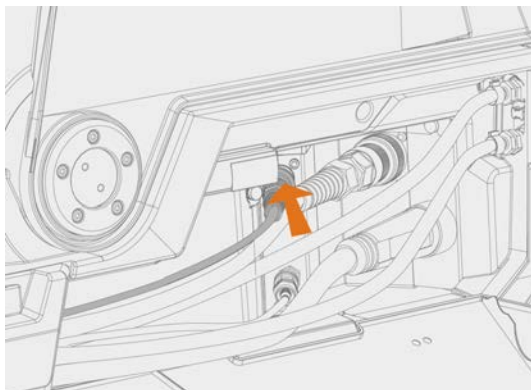
>> Compress the spring fastener to get the hose connectors in place. Once released, ensure that the spring fastener locks in place into the hose connector grooves.



6. If you have the voltage sensing cable (1) in use, connect it to the voltage sensing cable connector inside the cabinet.

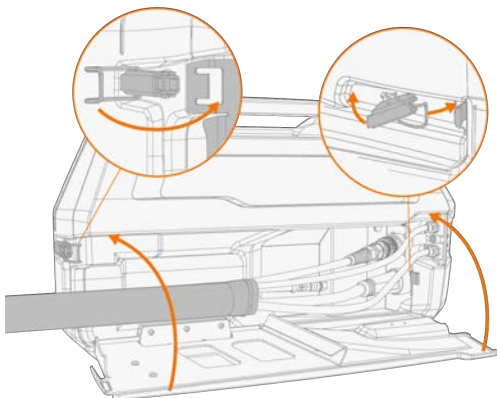


The separate voltage sensing cable is supported by Pulse+ power sources only.

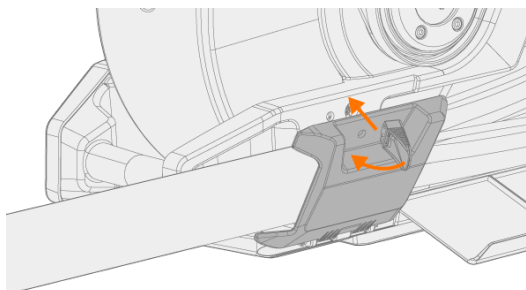
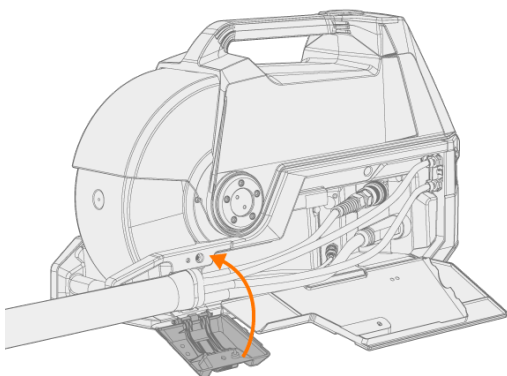


7. Secure cable strain relief.

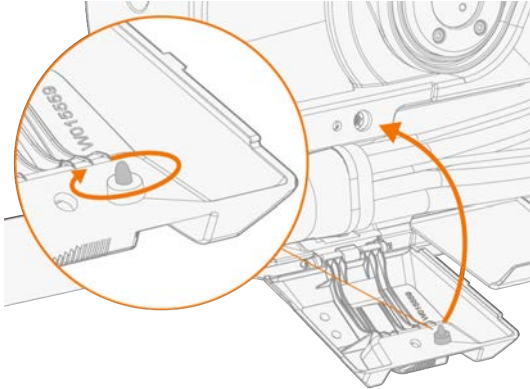
>> X5 Wire Feeder 200: Place the cable to the slot on the wire feeder and secure it in place by closing the hatch and locking the latches.



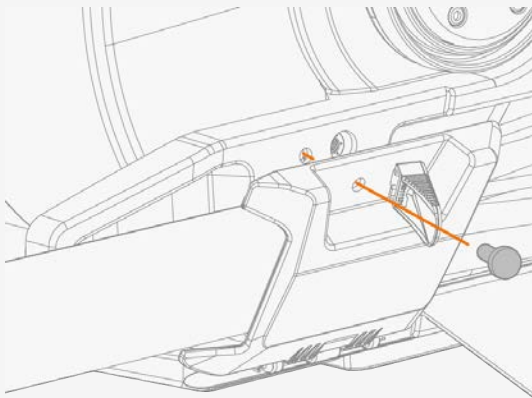
>> X5 Wire Feeder 300: Place the cable's strain relief block to the slot on the wire feeder and secure it in place by closing and locking the strain relief latch.



-  Check the expanding locking knob tightness and tighten if necessary:



Tip: Additional X5 Wire Feeder 300 strain relief fixing (M6x16 screw), optional:

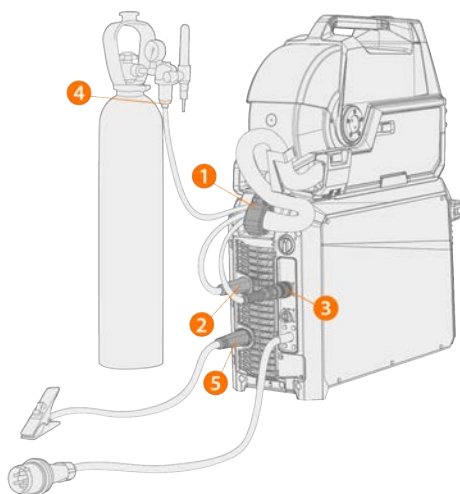


- 8.** X5 Wire Feeder 300: Close and lock the cable cabinet door.

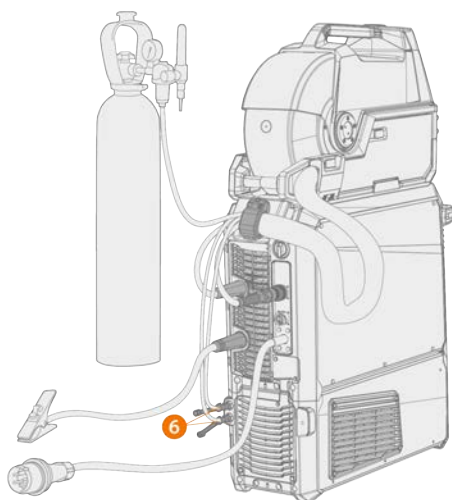
 When connecting the cables to the wire feeder, route the cables neatly so that the cable cabinet door closes properly.

 The interconnection cable heats up during welding. The wire feeder's cable cabinet door must be kept closed when welding, and the cables must be handled with caution if the cabinet door is opened right after welding.

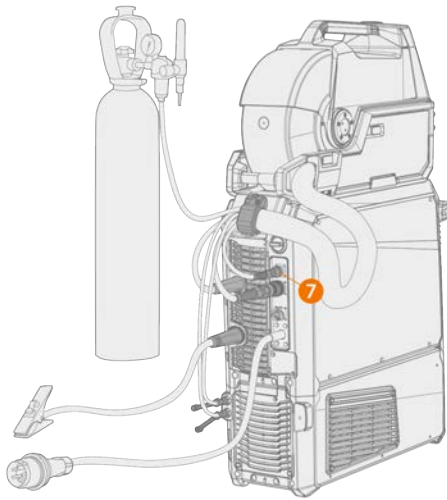
Connecting interconnection cable and earth return cable to power source



1. Attach the cable's strain relief (1) to the rear fixing plate.
2. Connect the welding current cable to the plus (+) connector (2) on the power source.
3. Connect the earth return cable to the minus (-) connector (5) on the power source.
4. Connect the control cable (3) to the power source.
5. Connect the shielding gas hose (4) to the gas bottle.
6. If you have the optional cooling unit, connect the cooling liquid hoses (6). The hoses are color-coded.



7. Pulse+ power source only: If you have the voltage sensing cable in use, connect it to the connector (7) on the rear of the power source.

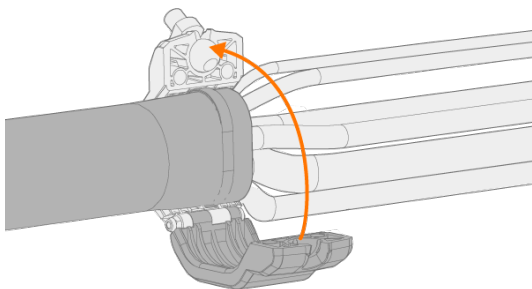


-  Most MIG/MAG applications and filler wires run the wire feed unit's welding current cable connected to the positive terminal of the power source. The polarity can be selected by connecting the welding current cable and earth return cable accordingly to either the positive or negative connectors on the power source.
-  TIG welding is possible with X5 Wire Feeder 300 AP/APC and a dedicated Flexlite TX welding torch model. For TIG welding, the polarity (+/-) must be switched. The polarity can be selected by connecting the welding current cable and earth return cable accordingly to either the positive or negative connectors on the power source.
-  For double wire feeder installation, use the interconnection cable designed for two wire feeders.
-  Ensure that you have connected and tightened all the cables properly.

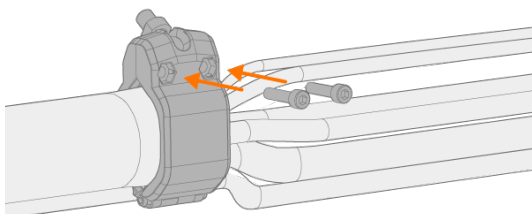
Strain relief replacement

Removing and replacing the strain relief at the power source end of the interconnection cable:

1.



2.



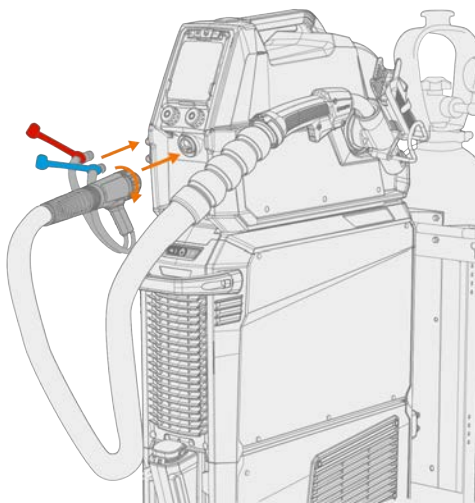
2.8 Connecting welding gun

X5 FastMig is designed to be used with the Kemppi Flexlite GX welding guns. For the Flexlite GX operating instructions, refer to userdoc.kemppi.com.

 Always check that the wire liner, contact tip and gas nozzle are suitable for the job.

To connect the gun to the X5 wire feeder, proceed as follows:

1. Push the welding gun connector into the wire feeder's gun connector and hand-tighten the collar.
2. If your setup includes a water-cooled gun, connect the cooling liquid hoses to the wire feeder. The hoses are color-coded.



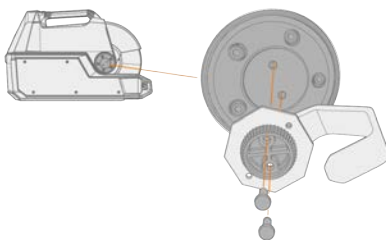
3. Install and load the filler wire as described in "Installing and changing wire (X5 WF 300)" on page 64 and "Installing and changing wire (X5 WF 200)" on page 59.
4. Check the gas flow. Refer to "Installing gas bottle and testing gas flow" on page 79 for more information.

Tip: When not using the gun, keep it in the welding gun holder on the wire feeder. Refer to "Installing welding gun holder" below for more information.

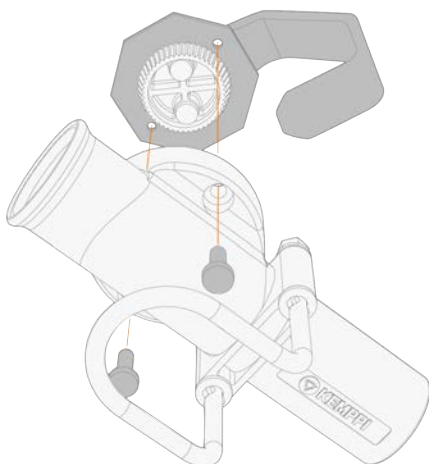
2.8.1 Installing welding gun holder

X5 Wire Feeder 300 can be equipped with a gun holder for holding the welding gun when not welding.

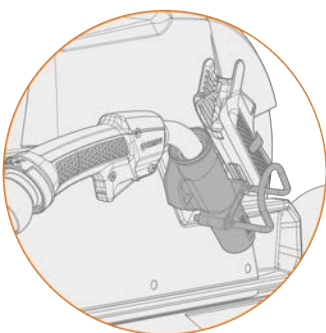
1. Attach the pistol grip handle holder with the cogged center hub and screws to the wire feeder.



2. Attach the gun holder to the pistol grip handle holder with screws.



-  You can adjust the angle of the gun holder before tightening the screws.

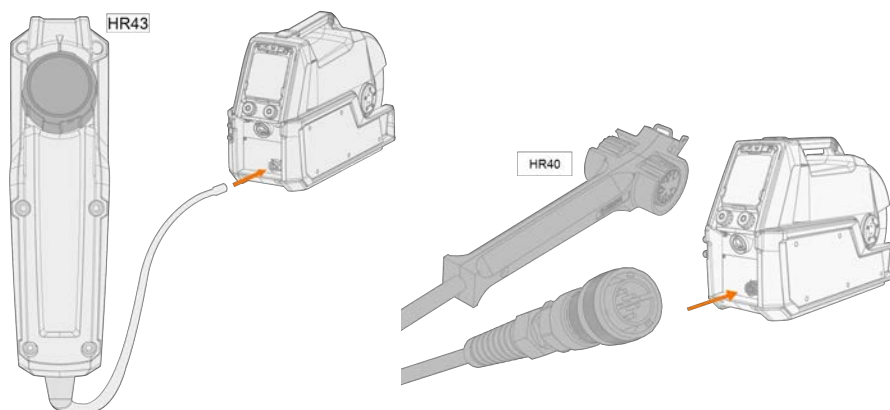


2.9 Installing remote control

Remote controls are optional. To enable remote operation, connect the remote control device to the X5 FastMig welding equipment. The remote control mode can also be set and adjusted in the control panel settings ("AP/APC control panel: Device settings" on page 126 or "Manual control panel: Settings" on page 92).

Remote control HR43/HR40

1. Connect the remote control cable to the wire feeder's control cable connector.



2. To adjust the remote control parameters, refer to the control panel settings.

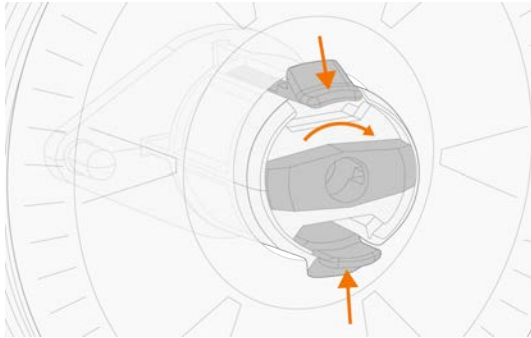
2.10 Installing and changing wire (X5 WF 200)

This section describes how to install the wire and spool on X5 Wire Feeder 200.

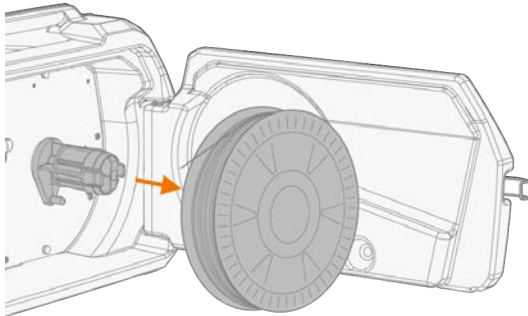
-  *Install the welding gun to the wire feeder before installing the wire spool.*
-  *When changing the wire spool, remove the remaining filler wire from the welding gun and wire feed mechanism before removing the wire spool.*
-  *Always ensure that the feed rolls are suitable for the filler wire (diameter and material) in question. Refer also to "Installing and replacing feed rolls" on page 74.*

To remove the wire spool:

1. Open the wire feeder side hatch.
2. Release the hub's lock and push the wire spool locking clips towards the center.

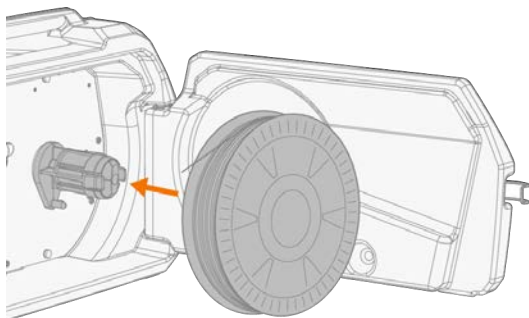


3. Remove the wire spool from the wire feeder.



To install a new wire spool:

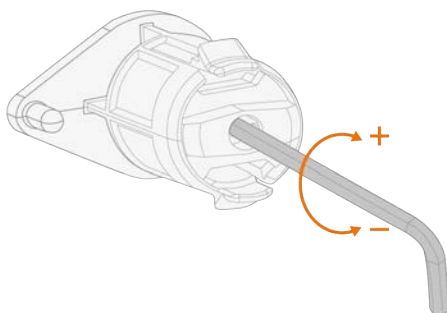
1. Open the wire feeder side hatch.
 2. If not already, release the hub's lock so that the locking clips can move towards the center.
 3. Insert the wire spool onto the hub in the wire feeder.
-  *Ensure that the wire spool is facing the right direction, the filler wire running from the top of the spool to the feed rolls.*
 -  *Ensure that the hub locking clips lock once the wire spool is in place.*



4. Secure the wire spool in place by turning to lock knob in closed position.



If needed, adjust the spool brake by turning the screw (with Allen key) in the center of the hub locking mechanism.



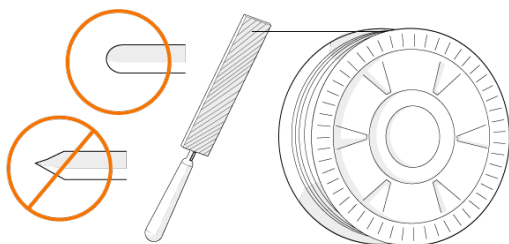
To install the filler wire:

1. Release the filler wire end from the spool and cut off any deformed section so that the end is straight.



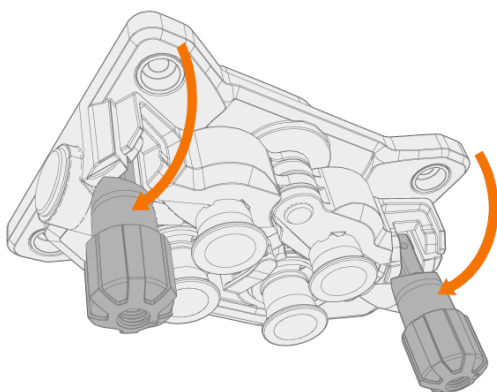
Ensure that the filler wire does not spill from the spool when it is released.

2. File the tip of the filler wire smooth.

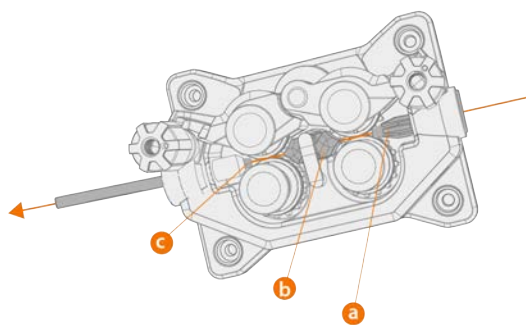


 Sharp edges on the filler wire tip may damage the wire liner.

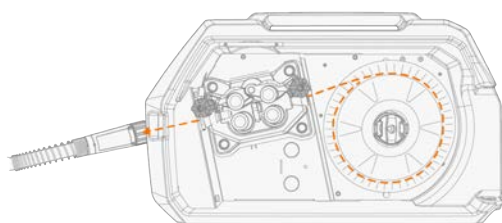
3. Release the pressure arms to move the feed rolls apart.



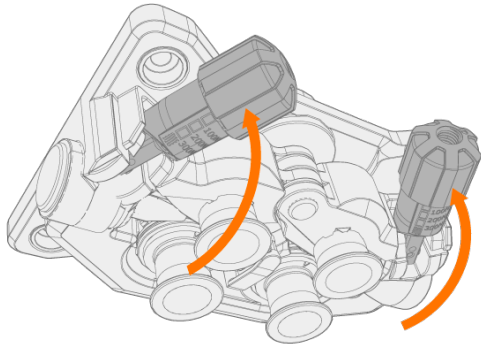
4. Guide the filler wire through the inlet tube (a) and middle wire guide tube (b) and into the outlet tube (c), which feeds the filler wire to the welding gun.



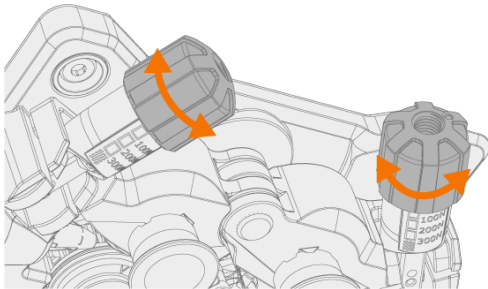
5. Push the filler wire by hand into the gun so that the wire reaches the wire liner (approx. 20 cm).



6. Close the pressure arms so that the filler wire is locked between the feed rolls. Ensure that the filler wire sits in the feed roll grooves.



7. Adjust the pressure of the feed rolls with the pressure adjustment wheels. The pressure is the same for both feed roll pairs.



The graduated scales on the pressure handle indicate the pressure applied to the feed rolls. Adjust the pressure of the feed rolls according to the table below.

Filler wire	Feed roll profile	Filler wire diameter (mm)	Adjustment (x100N)
Fe/Ss solid	V-groove V	0.8–1.0	1.5–2.0
		≥ 1.2	2.0–2.5
Metal and flux cored	V-groove, knurled V≡	≥ 1.2	1.0–2.0
Self-shielded (gasless)	V-groove, knurled V≡	≥ 1.6	2.0–3.0
Aluminum	U-groove U	1.0	0.5–1.0
		1.2	1.0–1.5
		1.4	1.5–2.0
		≥ 1.6	2.0–2.5



Excessive pressure flattens the filler wire and may damage coated or cored filler wires. Excessive pressure also unnecessarily wears the feed rolls and increases gearbox load.

8. Press the wire inch button to drive the filler wire into the welding gun. Stop when the wire reaches the welding gun's contact tip.

>> In X5 Wire Feeder 200 the wire inch button is located in the control panel.



 *Watch out for the wire when it reaches the contact tip and exits the gun.*

9. Before welding, ensure that the welding parameters and settings on the control panel conform to your welding setup.

>> Refer to "Using X5 Manual control panel" on page 90 and "Using X5 AP/APC control panel" on page 111 for more information.

"Wire spool and hub (200)" on page 15

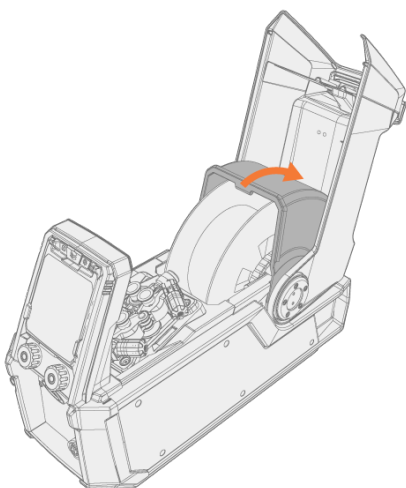
2.11 Installing and changing wire (X5 WF 300)

This section describes how to install the wire and spool on X5 Wire Feeder 300.

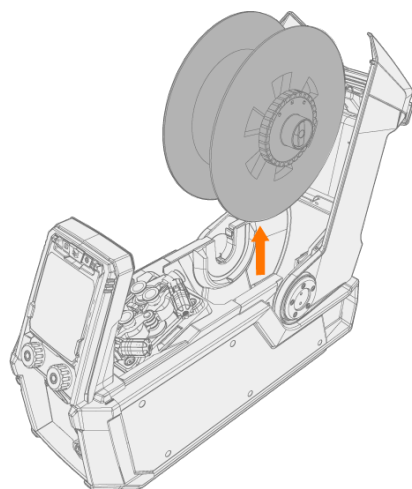
-  *Install the welding gun to the wire feeder before installing the wire spool.*
-  *When changing the wire spool, remove the remaining filler wire from the welding gun and wire feed mechanism before removing the wire spool.*
-  *Always ensure that the feed rolls are suitable for the filler wire (diameter and material) in question. Refer also to "Installing and replacing feed rolls" on page 74.*

To remove the wire spool:

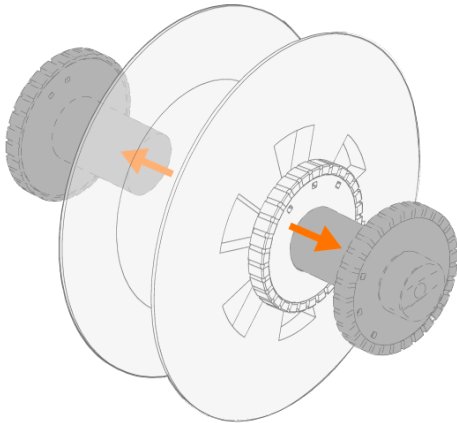
1. Open the wire feeder top cover.
2. Push the wire spool locking cover to the rear.



3. Remove the wire spool from the wire feeder.



4. To remove the spool brake hub, release the spool brake tightening knob in the brake center and pull the brake halves apart.



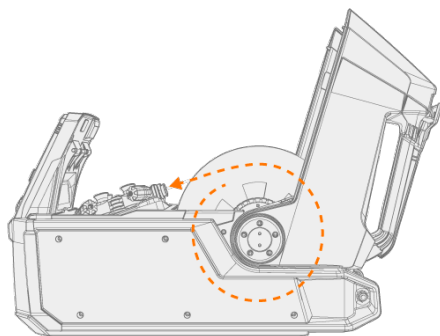
To install a new wire spool:

1. Open the wire feeder top cover and the wire spool locking cover.
2. Attach the wire spool brake halves to the new wire spool by pushing them together inside the wire spool. Secure them together by turning the tightening knob in the brake center.

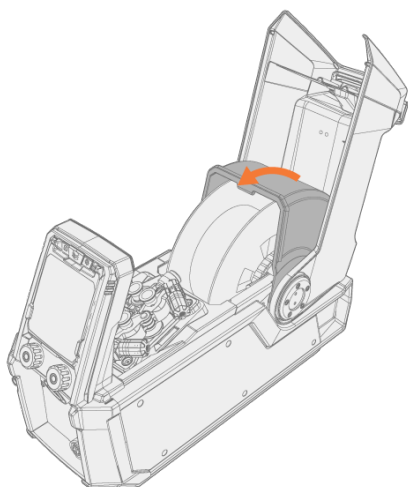
 *Attach the spool brake hub to the wire spool so that the tightening knob is on the right, seen from the front.*

3. Place the wire spool into its socket.

 *Ensure that the wire spool is facing the right direction, the filler wire running from the top of the spool to the feed rolls.*



4. Secure the wire spool in place by closing the wire spool locking cover.

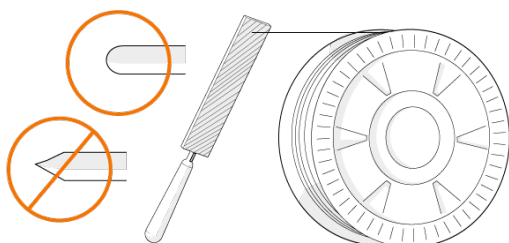


To install the filler wire:

1. Release the filler wire end from the spool and cut off any deformed section so that the end is straight.

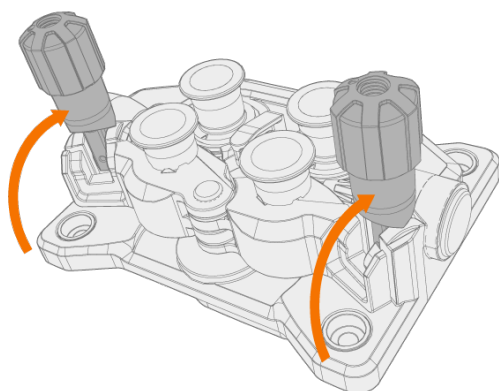
 Ensure that the filler wire does not spill from the spool when it is released.

2. File the tip of the filler wire smooth.

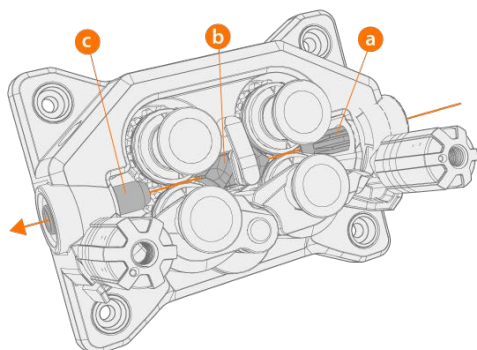


 Sharp edges on the filler wire tip may damage the wire liner.

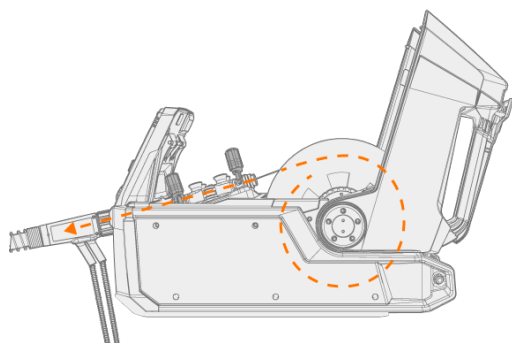
3. Release the pressure arms to move the feed rolls apart.



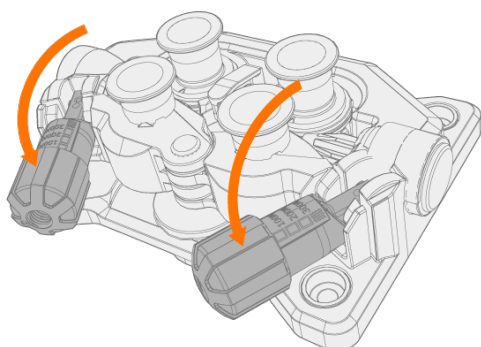
4. Guide the filler wire through the inlet tube (a) and middle wire guide tube (b) and into the outlet tube (c), which feeds the filler wire to the welding gun.



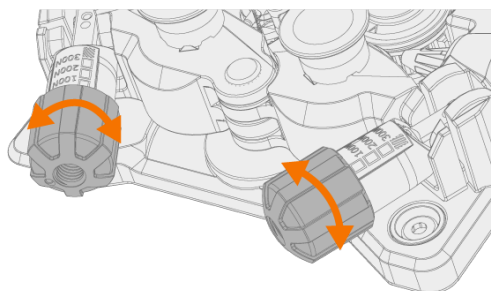
5. Push the filler wire by hand into the gun so that the wire reaches the wire liner (approx. 20 cm).



6. Close the pressure arms so that the filler wire is locked between the feed rolls. Ensure that the filler wire sits in the feed roll grooves.



7. Adjust the pressure of the feed rolls with the pressure adjustment wheels. The pressure is the same for both feed roll pairs.

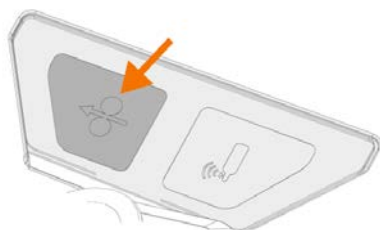


The graduated scales on the pressure handle indicate the pressure applied to the feed rolls. Adjust the pressure of the feed rolls according to the table below.

Filler wire	Feed roll profile	Filler wire diameter (mm)	Adjustment (x100N)
Fe/Ss solid	V-groove V	0.8–1.0	1.5–2.0
		≥ 1.2	2.0–2.5
Metal and flux cored	V-groove, knurled V≡	≥ 1.2	1.0–2.0
Self-shielded (gasless)	V-groove, knurled V≡	≥ 1.6	2.0–3.0
Aluminum	U-groove U	1.0	0.5–1.0
		1.2	1.0–1.5
		1.4	1.5–2.0
		≥ 1.6	2.0–2.5

 Excessive pressure flattens the filler wire and may damage coated or cored filler wires. Excessive pressure also unnecessarily wears the feed rolls and increases gearbox load.

8. Press the wire inch button to drive the filler wire into the welding gun. Stop when the wire reaches the welding gun's contact tip.



 Watch out for the wire when it reaches the contact tip and exits the gun.

9. Before welding, ensure that the welding parameters and settings on the control panel conform to your welding setup.

>> Refer to "Using X5 Manual control panel" on page 90 and "Using X5 AP/APC control panel" on page 111 for more information.

"Wire spools and hubs (300)" on page 20

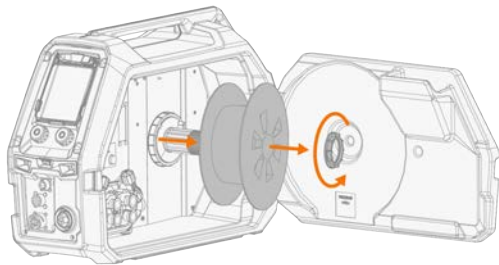
2.12 Installing and changing wire (X5 WF HD300)

This section describes how to install the wire and spool on X5 Wire Feeder HD300.

-  *Install the welding gun to the wire feeder before installing the wire spool.*
-  *When changing the wire spool, remove the remaining filler wire from the welding gun and wire feed mechanism before removing the wire spool.*
-  *Always ensure that the feed rolls are suitable for the filler wire (diameter and material) in question. Refer also to "Installing and replacing feed rolls" on page 74.*

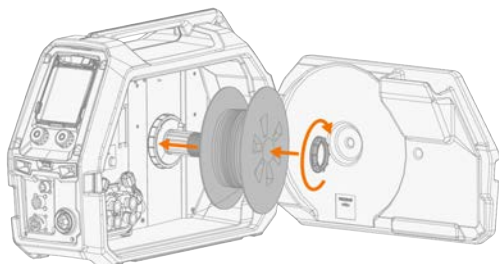
To remove the wire spool:

1. Open the wire feed cabinet door.
2. Loosen and remove the spool fastener and remove the wire spool.



To install a new wire spool:

1. Open the wire feed cabinet door.
 2. Insert the wire spool onto the spool hub. Secure the wire spool in place by inserting and tightening the spool fastener.
-  *Ensure that the wire spool is facing the right direction, the filler wire running from the bottom of the spool to the feed rolls.*



3. If needed, adjust the spool brake by turning the spool brake tightening knob in the center of the spool hub.

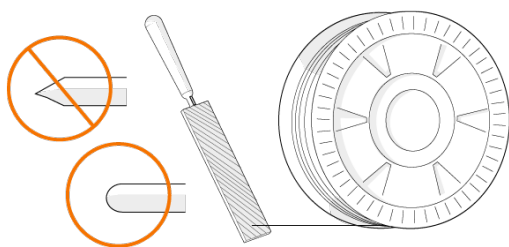


To install the filler wire:

1. Release the filler wire end from the spool and cut off any deformed section so that the end is straight.

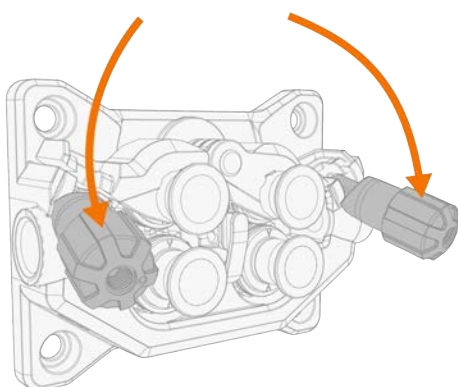
 *Ensure that the filler wire does not spill from the spool when it is released.*

2. File the tip of the filler wire smooth.

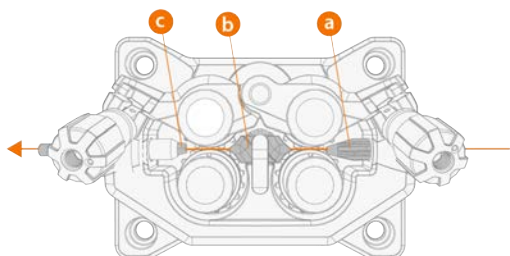


 *Sharp edges on the filler wire tip may damage the wire liner.*

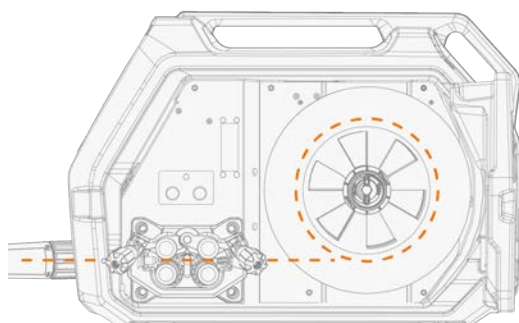
3. Release the pressure arms to move the feed rolls apart.



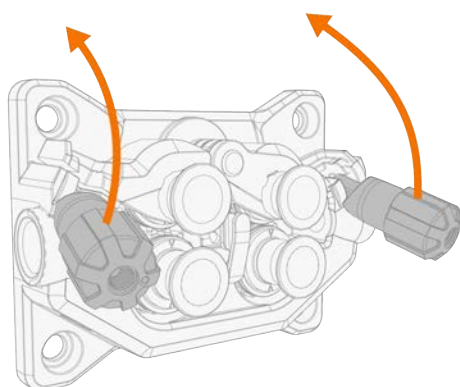
4. Guide the filler wire through the inlet tube (a) and middle wire guide tube (b) and into the outlet tube (c), which feeds the filler wire to the welding gun.



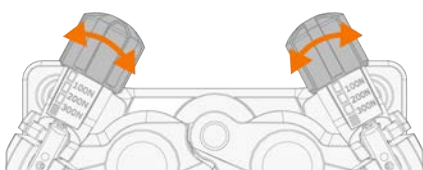
5. Push the filler wire by hand into the gun so that the wire reaches the wire liner (approx. 20 cm).



6. Close the pressure arms so that the filler wire is locked between the feed rolls. Ensure that the filler wire sits in the feed roll grooves.



7. Adjust the pressure of the feed rolls with the pressure adjustment wheels. The pressure is the same for both feed roll pairs.



The graduated scales on the pressure handle indicate the pressure applied to the feed rolls. Adjust the pressure of the feed rolls according to the table below.

Filler wire	Feed roll profile	Filler wire diameter (mm)	Adjustment (x100N)
Fe/Ss solid	V-groove 	0.8–1.0	1.5–2.0
		≥ 1.2	2.0–2.5
Metal and flux cored (MC/FC)	V-groove, knurled 	≥ 1.2	1.0–2.0
Self-shielded (gasless)	V-groove, knurled 	≥ 1.6	2.0–3.0
Aluminum	U-groove 	1.0	0.5–1.0
		1.2	1.0–1.5
		1.4	1.5–2.0
		≥ 1.6	2.0–2.5



Excessive pressure flattens the filler wire and may damage coated or cored filler wires. Excessive pressure also unnecessarily wears the feed rolls and increases gearbox load.

8. Press the wire inch button to drive the filler wire into the welding gun. Stop when the wire reaches the welding gun's contact tip.



Watch out for the wire when it reaches the contact tip and exits the gun.

9. Before welding, ensure that the welding parameters and settings on the control panel conform to your welding setup.

>> Refer to "Using X5 AP/APC control panel" on page 111 for more information.

2.13 Installing and replacing feed rolls

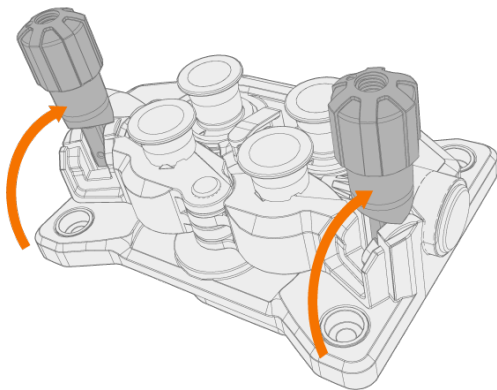
 The installation method described here is the same with both X5 Wire Feeder 200 and X5 Wire Feeder 300. Model-specific variations in the visual appearance and positioning may occur.

Replace the wire feed rolls when the material and diameter of the filler wire changes.

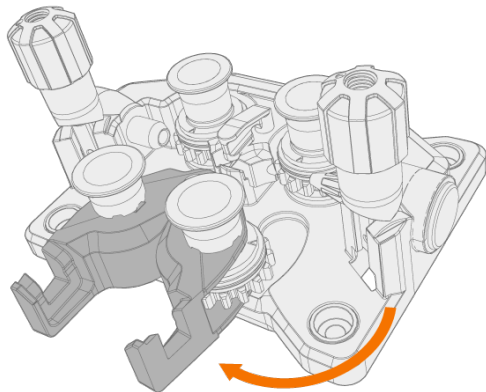
Select the new wire feed rolls according to the tables here: "Wire feeder consumables" on page 181.

To replace the wire feed rolls:

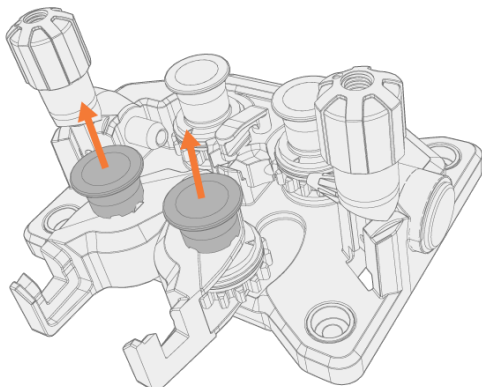
1. Open the wire feeder cabinet.
2. Release the pressure handles on the wire feed mechanism.



3. Open the locking arms to release the feed rolls.

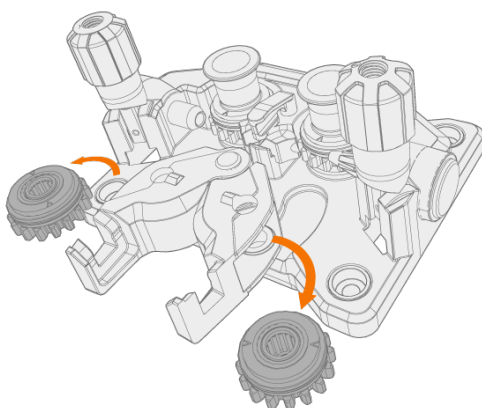


4. Pull the pressure roll mounting pins off.

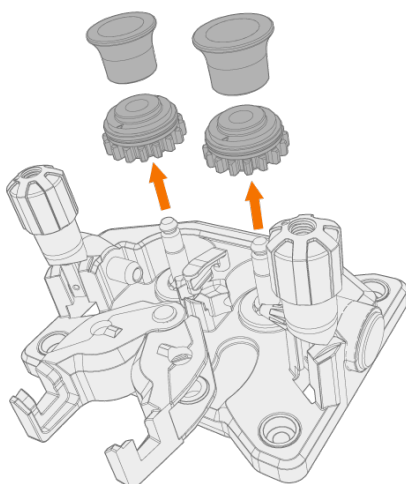


 The pressure rolls' mounting pins have central axles attached to them, whereas the drive rolls' central axles act as drive shafts attached directly to the wire feed mechanism/motor.

5. Remove the pressure rolls.



6. Pull the drive roll mounting caps off and remove the drive rolls.

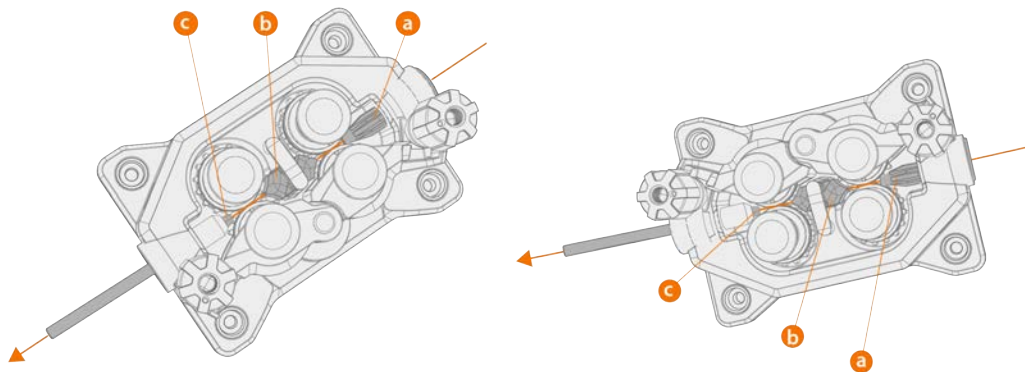


7. Follow the previous steps in reverse to install the wire feed rolls. Align the cut on the drive rolls' bottom with the pin on the drive shaft.
8. Reattach the mounting caps and mounting pins to lock the drive and pressure rolls into their places.
9. Close the locking arms and lower the pressure handles on the feed rolls. Refer to "Installing and changing wire (X5 WF 300)" on page 64 and "Installing and changing wire (X5 WF 200)" on page 59 for more information on the wire installation.
10. Close the wire feeder cabinet.

2.14 Installing and replacing wire guide tubes

The wire feed mechanism includes three wire guide tubes. Replace them when the filler wire diameter grows or the material changes.

 When replacing the outlet guide tube, the welding gun must be detached.

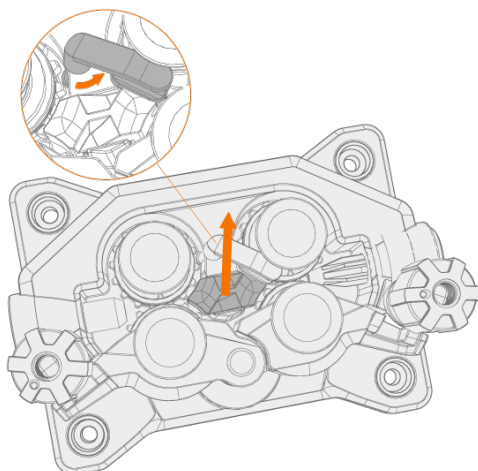


- a.** Inlet guide tube
- b.** Middle guide tube
- c.** Outlet guide tube

Select the new wire guide tubes according to the tables here: "Wire feeder consumables" on page 181.

To replace the wire guide tubes:

- 1.** Release the pressure arms and remove the filler wire from the system.
- 2.** Pull out the inlet guide tube (a) and insert a new one in its place.
- 3.** Turn the locking clip aside to free the middle guide tube (b) for replacement.
- 4.** Insert a new middle guide tube in its slot and push it properly in place. Ensure that the mark arrow points to the wire running direction.
- 5.** Turn locking clip back to lock down the new middle tube.



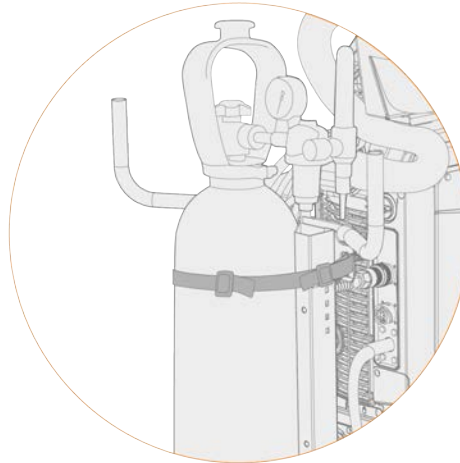
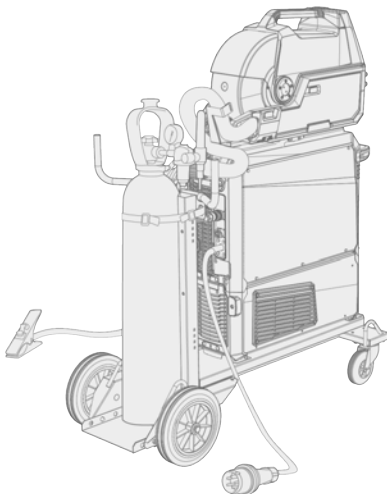
6. Replace the outlet guide tube (c) by pushing the old outlet tube out from either direction.

2.15 Installing gas bottle and testing gas flow

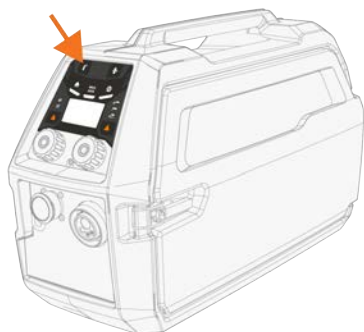
-  *Handle gas bottles with care. There is a risk of injury if the gas bottle or the bottle valve is damaged!*
-  *Always secure the gas bottle properly in an upright position to a special holder on the wall or on the welding equipment cart. Always keep the gas bottle valve closed when not welding.*
-  *- If a transport unit with a gas bottle rack is used, install the gas bottle on the transport unit first, then make the connections.*
 - Install the welding gun to the wire feeder before installing and testing the gas bottle.*
 - Do not use the whole contents of the bottle.*
 - Always use an approved and tested regulator and flow meter.*

Contact your local Kemppi dealer for choosing the gas and the equipment.

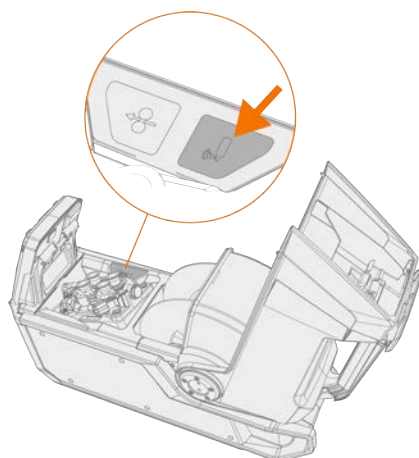
1. Without gas bottle cart: Place the gas bottle in a suitable, secure location.
2. With gas bottle cart: Move the gas bottle on the transport unit's gas bottle rack and secure it in place with the straps and fixing points provided.



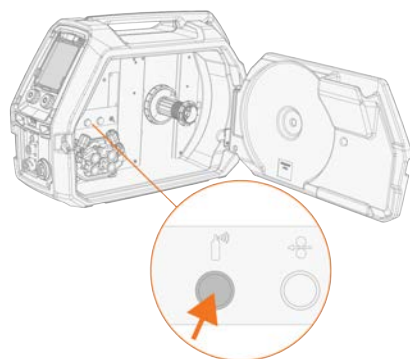
3. If not already, connect the welding gun to the wire feeder.
4. Connect the gas hose to the wire feeder.
-  *In a standard setup, the gas hose is included in the interconnection cable bundle (for more information, refer to "Installing cables" on page 50).*
5. Open the gas bottle valve.
6. Press the Gas test button in the wire feed cabinet to flush the previous shielding gas and to run the new gas into the system.
 - >> With X5 Wire Feeder 200 Manual the Gas test button is located on the control panel:



>> With X5 Wire Feeder 300 the Gas test button is located in the wire feed cabinet:



>> With X5 Wire Feeder 300 HD the Gas test button is located in the wire feed cabinet:



7. Press the Gas test button again to adjust the gas flow. Use either the built-in rotameter or an external flow meter and regulator for measuring and adjustment.

 Use the Gas test button also to test that the gases flow through the system properly.

Recommended gas flow rates (for general guidance only):

	TIG*	MIG**
Argon	5...15 l/min	10...25 l/min
Helium	15...30 l/min	-

Argon + 18-25% CO2	-	10...25 l/min
CO2	-	10...25 l/min

** Depending on the gas nozzle size.*

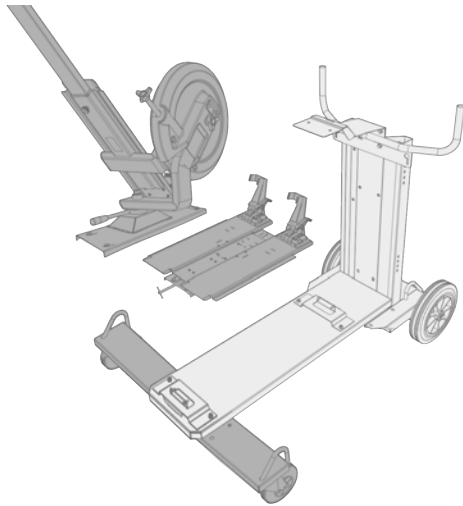
*** Depending on the gas nozzle size and welding current.*

2.16 Other optional accessories

In addition to the accessories covered in the installation chapters, X5 FastMig has also several other accessories to facilitate its use and improve welding quality.



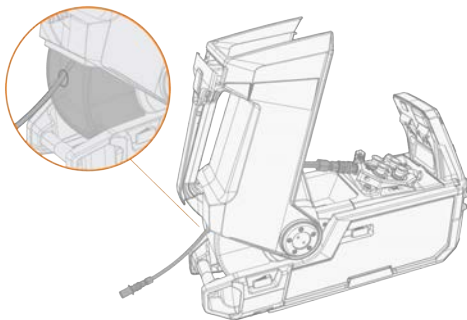
When installing the full set of equipment stacked as a tower and using the double wire feeder rotating plate or counterbalance arm, always use the broader front roller support plate delivered with the equipment. This applies to the 4 wheel cart.



Read also the installation notes here: "Installation" on page 33.

Wire drum kit (for X5 WF 300)

To use the wire drum kit, drill a hole at the back of X5 Wire Feeder 300 transparent cover.

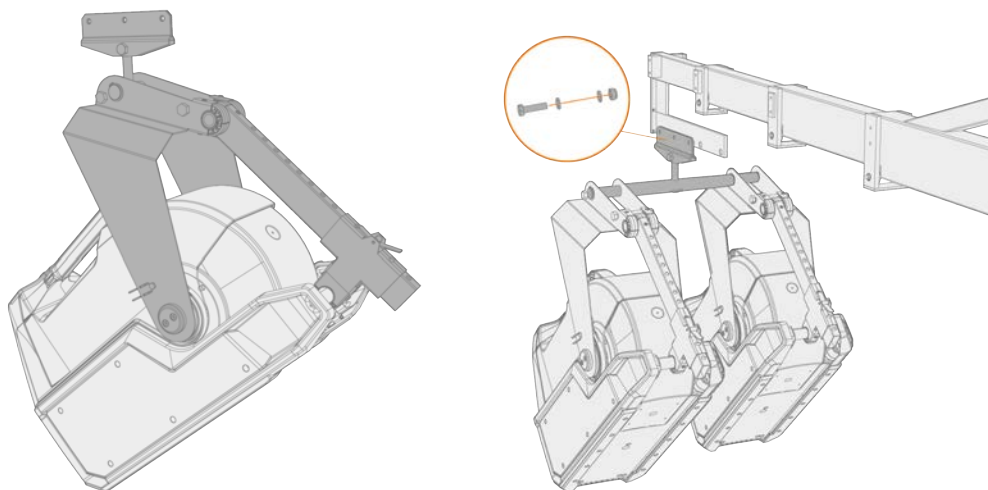


Wire feeder hanger for boom (for X5 WF 300)

The wire feeder hanger for boom facilitates welding where it is difficult to bring the full X5 FastMig welding system.

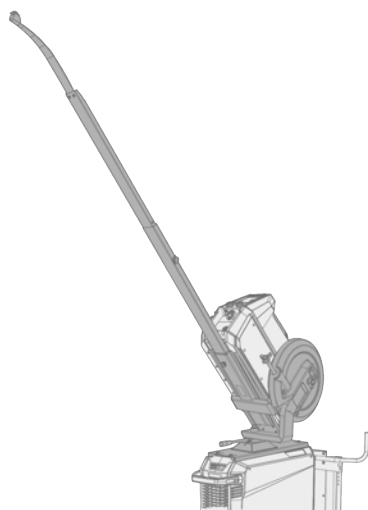


Do not hang the wire feeder from the handle. Use the wire feeder hanger for boom instead.



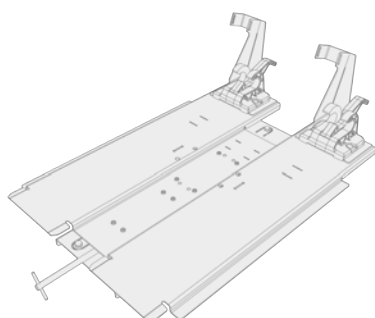
Wire feeder counterbalance arm (for X5 WF 300)

The wire feeder counterbalance arm reduces the weight of the cable bundle over the working area.



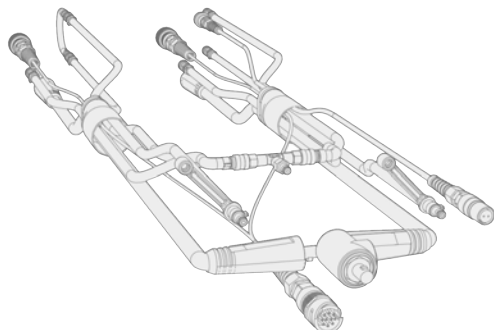
Double wire feeder rotating plate (for X5 WF 300)

The double wire feeder rotating plate allows the use of two wire feeders on one power source.



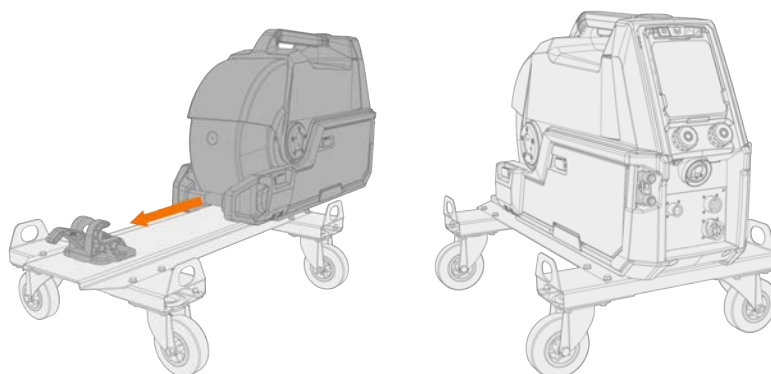
Double interconnection cable adapter

The double interconnection cable adapter allows to connect two wire feeders to one power source.



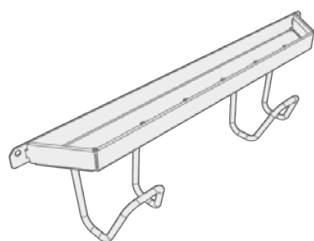
Wire feeder cart (for X5 WF 300)

The wire feeder cart allows more convenient wire feeder movement on site.



Accessory rack

The accessory rack holds the small parts and tools needed for welding. Install it on the side of the welding machine.



Wire feeder cabinet heater (for X5 WF 300)

The wire feeder cabinet heater keeps the temperature higher to prevent moisture from condensing inside the cabinet.

2.17 How to get welding programs



The use of welding programs and Wise and MAX features and processes is possible with the X5 FastMig Auto and Pulse system configurations (see "General" on page 5). WiseRoot+, WiseThin+ and MAX Position processes require a pulse welding system (with the Wise processes specifically a Pulse+ power source is required).

By default, the equipment comes with a welding program work pack preinstalled. These work packs cover the basic welding tasks with the automatic 1-MIG and pulsed welding processes.

The additional welding programs, Wise processes (WiseRoot+, WiseThin+) and MAX processes (MAX Cool, MAX Speed, MAX Position) for each individual X5 FastMig equipment are installed at the time of purchase according to your specific welding requirements. This can be done by your local Kemppi dealer. Welding programs as well as the advanced welding features can also be added later on.

For more information on the available X5 FastMig welding program options and installing the welding programs or software updates, contact your local Kemppi dealer or go to [Kemppi.com](https://kemppi.com).

The manual MIG process doesn't require additional welding programs.

For applying the welding programs installed on your X5 FastMig equipment, refer to "AP/APC control panel: Applying welding programs" on page 129 (AP/APC) or "Auto control panel: Applying welding programs" on page 108 (Auto/Auto+).

The list of installed welding programs on your equipment can be seen in the control panel's info view under **Welding software**.

The welding programs included in the X5 FastMig work packs are shown here: Technical data > "Welding program work packs" on page 184.

3. OPERATION

Before using the equipment, ensure that all the necessary installation actions have been completed according to your equipment setup and instructions.



Only connect the welding machine to an earthed electric network.



Welding is forbidden in places where there is an immediate fire or explosion hazard!



The interconnection cable heats up during welding. The wire feeder's cable cabinet door must be kept closed when welding, and the cables must be handled with caution if the cabinet door is opened right after welding.



Check that there is enough space for cooling air circulation in the machine vicinity.



If the welding equipment is left unused for a longer period, disconnect the mains plug from the mains.



Always check before use that interconnection cable, shielding gas hose, earth return cable and clamp and mains cable are in serviceable condition. Ensure that the connectors are correctly fastened. Loose connectors can impair welding performance and damage connectors.

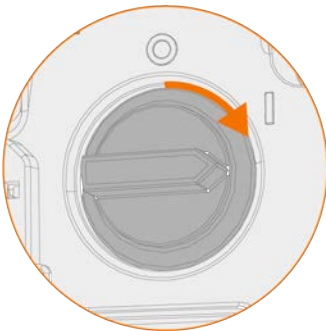
3.1 Preparing welding system for use

Before starting the use of the welding equipment

- Ensure the installation has been completed
- Switch the welding equipment on
- Prepare the cooler
- Connect the earth return cable to the work piece
- Connect the voltage sensing cable to the work piece if applicable (available with Pulse+ power source)
- Calibrate the welding cable (in MIG operation mode only)
 - >> Refer to "Calibrating welding cable" on the next page for instructions.

Turning on welding system

To turn on the welding equipment, turn the power source main switch to ON (I).



Turn the main switch to start and shut down the welding equipment. Do not use the mains plug as a switch.

 If the welder is left unused for a longer period, detach the mains plug to disconnect it from the mains.

Preparing cooler

Fill the coolant container inside the cooler with Kemppi cooling liquid. For instructions on filling the cooler, refer to "Filling cooler and circulating coolant" on the next page. To weld, you must pump the coolant through the system by pressing the coolant circulation button in the front panel of the cooling unit.

Connecting earth return cable

 Keep the welding piece connected to earth to reduce the risk of injury to users or damage to electrical equipment.

Attach the earth return cable clamp on the welding piece.

Ensure that the surface contact to the table is clean of metal oxide and paint and that the clamp is firmly secured.

Selecting operation mode and process

To select the operation mode (MIG/TIG/MMA/Gouging), refer to "Using X5 Manual control panel" on page 90 or "AP/APC control panel: Device settings" on page 126, depending on your equipment setup.

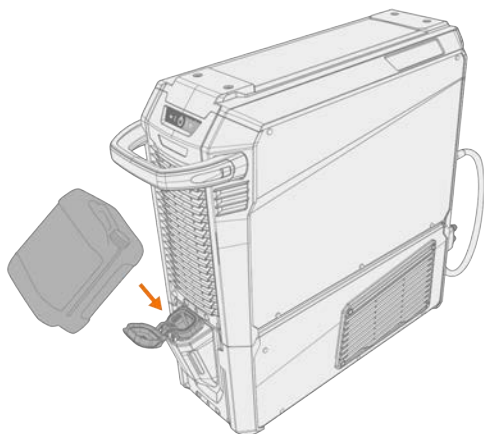
 Replace also the welding cable accordingly, and remove or replace the filler wire in the wire feeder.

 TIG welding is possible with X5 FastMig Auto and Pulse equipment and a dedicated Flexlite TX welding torch model. For TIG welding, the polarity (+/-) must be switched. The polarity can be selected by connecting the welding current cable and earth return cable accordingly to either the positive or negative connectors on the power source.

3.1.1 Filling cooler and circulating coolant

Fill the cooler with 20-40 % coolant solution, for example, Kemppi cooling liquid.

1. Open the cooler cap.
2. Fill the cooler with coolant. Do not fill over the max. marking.



3. Close the cooler cap.

To circulate the coolant:

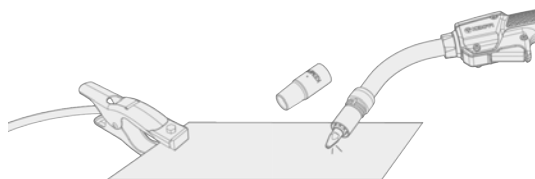
Press the coolant circulation button in the cooler front panel. It activates the motor, which pumps the coolant to the hoses and to the welding gun.

Complete the coolant circulation operation after each time you change the welding gun.

3.1.2 Calibrating welding cable

With X5 FastMig, the welding cable resistance can be measured using the built-in cable calibration function without additional measurement cable. This calibration function is available only in MIG operation mode.

1. Connect the earth return cable between the power source and work piece.
2. Remove the welding gun gas nozzle.
3. Connect the welding gun to the wire feeder.
4. Turn the welding equipment on.
5. On the control panel, go to settings and enable cable calibration.
 - >> For more information, refer to "Manual control panel: Settings" on page 92 or "AP/APC control panel: Device settings" on page 126.
6. Touch the cleaned work piece briefly with the welding gun contact tip.



 *There is no need to pull the trigger. Trigger function is disabled at this stage.*

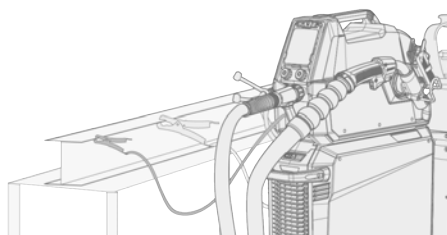
- 7.** Using the control panel, confirm the measured values.

3.2 Using voltage sensing cable

Available with Pulse+ power sources.

While the continuous use of the separate voltage sensing cable is not necessary with X5 FastMig, the voltage sensing cable is required with the advanced WiseRoot+ and WiseThin+ processes. These processes are based on the accurate measurement of arc voltage.

Before welding with WiseRoot+ or WiseThin+ process, connect the voltage sensing cable to the workpiece. For optimal voltage measurement, connect the earth return cable and the voltage sensing cable close to each other and away from the other welding units' cables.

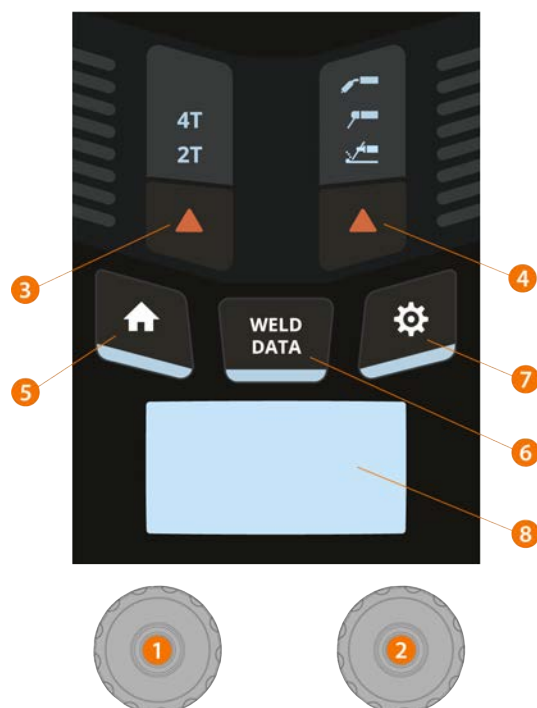


If the voltage sensing cable is not connected or it is broken, an error message is displayed.

3.3 Using X5 Manual control panel

The X5 Wire Feeder 200 Manual and 300 Manual control panels include the most essential features and functions for MIG welding with the option to use the X5 FastMig also for MMA welding and gouging.

X5 Wire Feeder 300 Manual control panel (X5 FP 300R)



1. Left control knob

>> In MIG mode: Wire feed speed

- >> In MMA mode: Welding current adjustment
- >> In Gouging mode: Current adjustment
- 2. Right control knob**
 - >> In MIG mode: Welding voltage adjustment
 - >> In MIG mode (push button): Switch between welding voltage and dynamics adjustment
 - >> In MMA mode: Dynamics adjustment
- 3. Trigger logic selection**
 - >> Switches between 2T and 4T trigger logic modes
- 4. Welding process / operation mode selection**
 - >> Switches between MIG, MMA and Gouging modes
- 5. Home button**
 - >> Switches to the default welding view/mode
- 6. Weld data button**
 - >> Shows the duration, current and voltage of the last weld
- 7. Settings menu button**
- 8. Main display**
 - >> Shows the wire feed speed, current and/or voltage (content shown depends on the welding process selected).

To change the control panel settings and welding parameters, refer to "Manual control panel: Settings" on the next page.

X5 Wire Feeder 200 Manual control panel (X5 FP 200R)



- 1. Left control knob**
 - >> In MIG mode: Wire feed speed
 - >> In MMA mode: Welding current adjustment
 - >> In Gouging mode: Current adjustment
- 2. Right control knob**
 - >> In MIG mode: Welding voltage adjustment
 - >> In MIG mode (push button): Switch between welding voltage and dynamics adjustment
 - >> In MMA mode: Dynamics adjustment
- 3. Trigger logic selection**
 - >> Switches between 2T and 4T trigger logic modes
- 4. Welding process / operation mode selection**
 - >> Switches between MIG, MMA and Gouging modes
- 5. Home button**
 - >> Switches to the default welding view/mode
- 6. Weld data button**
 - >> Shows the duration, current and voltage of the last weld

7. Settings menu button
8. Gas test button
>> Tests the shielding gas flow and flushes the gas line
9. Wire inch button
>> Drives the filler wire forward (with arc off)
10. Main display
>> Shows the wire feed speed, current and/or voltage (content shown depends on the welding process selected).

To change the control panel settings and welding parameters, refer to "Manual control panel: Settings" below.

3.3.1 Manual control panel: Settings

To enter and use Settings menu:

1. Press the Settings menu button.
2. Switch between the menu items by turning the control knob.
3. Select a menu item for adjustment by pressing the control knob button.
4. Adjust the parameter value (or other settings value) by turning the control knob.
5. Exit the adjustment dialog by pressing the control knob button again.



Rarely used settings items are hidden by default. Those are available in the advanced settings menu. To enter the advanced Settings menu, press the Settings button for approx. 5 seconds.

Welding parameters, settings and feature descriptions

MIG settings

The parameters listed here are available for adjustment with the MIG process.

Parameter	Parameter value	Description
Pre gas	Min/Max = 0 ... 9.9 s, step 0.1 s 0 = OFF Default = auto	Welding function that starts the shielding gas flow before the arc ignites. This ensures that the metal does not come into contact with air at the start of the weld. Time value is preset by the user. Used for all metals, but especially for stainless steel, aluminum and titanium.
Post gas	Min/Max = 0 ... 9.9 s, step 0.1 s 0 = OFF Default = auto	Welding function that continues the shielding gas flow after the arc has extinguished. This ensures that the hot weld does not come into contact with air after the arc is extinguished, protecting the weld and also the electrode. Used for all metals. Especially stainless steel and titanium require longer post gas times.
Creep start level	Min/Max = 10 ... 90 %, step 1 % Default = auto	The Creep start function defines the wire feed speed before the welding arc ignites, that is, before the filler wire comes in contact with the workpiece. When the arc ignites, the wire feed speed is automatically switched to the normal user-set speed. The Creep start function is always on.

Touch Sense Ignition	ON/OFF Default = OFF	Touch Sense Ignition delivers minimum spatter and stabilizes the arc immediately after ignition.
Crater fill	ON/OFF Default = OFF	When welding with high power, a crater is usually formed at the end of the weld. The Crater fill function decreases the welding power / wire feed speed at the end of the welding job so that the crater can be filled using a lower power level. The Crater fill level, voltage and time (only in 2T trigger mode) are preset by the user.
- Crater fill time	Min/Max = 0.1 ... 5 s, step 0.1 s Default = 1.0 s	
- Crater fill wire feed speed	Min/Max = 0.5 ... 25 m/min Step: 0.05 (if wire feed speed < 5 m/min), 0.1 (if wire feed speed ≥ 5 m/min) Default: 5 m/min	
- Crater fill voltage	Min/Max = 8 ... 60 V, step 0.1 V Default = 18 V	
WF end step	ON/OFF Default = OFF	Wire feed end step. This feature prevents the filler wire from sticking to the work piece when the welding ends. This is accomplished by pulling the wire back briefly.
Dynamics	Min/Max = -10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.
Post current	-30 ... +30, step 1 Default = 0	Post current setting affects the wire length at the weld end. This also enables the optimum wire length for the start of the next weld.
Wire feed speed min	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 0.5 m/min	Minimum and maximum limits for the wire feed speed adjustment.
Wire feed speed max	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 25 m/min	
Voltage min	Min/Max = According to welding equipment specifications, step 0.1	Minimum and maximum limits for the welding voltage adjustment.
Voltage max	Min/Max = According to welding equipment specifications, step 0.1	
Remote mode	OFF/Remote/Gun Default = OFF	If remote controller is not connected, this selection is not available.
Water cooler	OFF/Auto/ON Default = OFF	
Wire retract	OFF/ON	This is an automatic wire retract feature. Once the arc is extinguished, the wire is retracted for additional safety. The user can change the wire retract delay and length settings.
- Retract delay	2...10 s, step 1 Default = 5 s	
- Retract length	1...10 cm, step 1 Default = 2 cm	

Weld data averages	Without slopes / Entire weld Default = Without slopes	This feature allows the user to change how the weld data averages are calculated: with or without the slope phases in the beginning and in the end of the weld. This setting affects the calculation of the averages for the following: welding voltage (terminal and arc voltage), welding current, welding power and wire feed speed.
Voltage display mode	Terminal voltage / Arc voltage Default = Arc voltage	This defines which is shown on the control panel display, terminal or arc voltage.
Safe wire inch	ON/OFF Default = OFF	When ON, and the arc doesn't ignite, the filler wire is fed 5 cm. When OFF, 5 m of filler wire is fed.
Cable calibration	Calibrate/Cancel	The date and time and the calibration information of the previous calibration is also shown. Refer to "Calibrating welding cable" on page 88 for cable calibration.
Subfeeder (with X5 Wire Feeder 300 only)	Subfeeder model / OFF Default = OFF	If a compatible subfeeder is connected, select the subfeeder from the list. Compatible subfeeders: <i>SuperSnake GTX /GT02S(10m, 15m, 20m, 25m), Binzel PP401D, Binzel PP36D.</i> Note: With SuperSnake GT02S models, only motor synchronization is supported.

MMA settings

The parameters listed here are available for adjustment with the MMA process.

Parameter	Parameter value	Description
Hot start	Min/Max = -30 ... +30, step 1 Default = 0	Welding function that uses higher or lower welding current at the start of the weld. During the Hot start period the current changes to the normal welding current level. The Hot start value affects the current level and duration. Use it to prevent the electrode from sticking to the work piece.
VRD	OFF/12V/24V Default = OFF	Voltage reduction device (VRD) reduces the open-circuit voltage to maintain below a certain voltage value.
Current limit min	Min/Max = 10 ... machine size A, step 1 Default = 10 A	Minimum and maximum limits for the current adjustment.
Current limit max	Min/Max = 10 ... machine size A, step 1 Default = 10 A	

Common settings

The parameters listed here are common system settings.

Parameter	Parameter value	Description
-----------	-----------------	-------------

Weld data	Min/Max = 0 ... 10 s, step 1 0 = OFF Default = 5 s	This defines how long the weld data summary is shown after each weld.
Display off	Min/Max = 5 ... 120 min, step 1 Default = 5 min	Not available with MMA or gouging.
Date	Current date	Adjusting date: Select day by pressing the knob key Adjust day by rotating the knob (Min/Max = 1...28/29/30/31) Select month by pressing the knob key Adjust month by rotating the knob (Min/Max = 1...12) Select year by pressing the knob key Adjust year by rotating the knob (Min/Max = 2000...2099) Press the knob key to end adjustment.
Time	Current time	Adjusting time: Select hours by pressing the knob key Adjust hours by rotating the knob (Min/Max = 0...23) Select minutes by pressing the knob key Adjust minutes by rotating the knob (Min/Max = 0...59) Press the knob key to end adjustment.
Time counter total	>>>	This shows the total arc time and power on time.
Time counter since	>>>	This shows the total arc time and power on time since the last reset.
Reset time counter	Reset	This resets the time counter.
Language	Available languages	
Help	>>>	Panel display shows QR code for quick access to Kemppi Userdoc on a mobile device.
Error log *	>>>	Shows error code, date & time and short description of the error.
Info *	>>>	Displays the serial numbers of the wire feeder and the power source connected.
Software version *	>>>	Displays the software version numbers.
Factory reset *	Reset/Cancel Default = Cancel	This performs a full reset to factory settings.

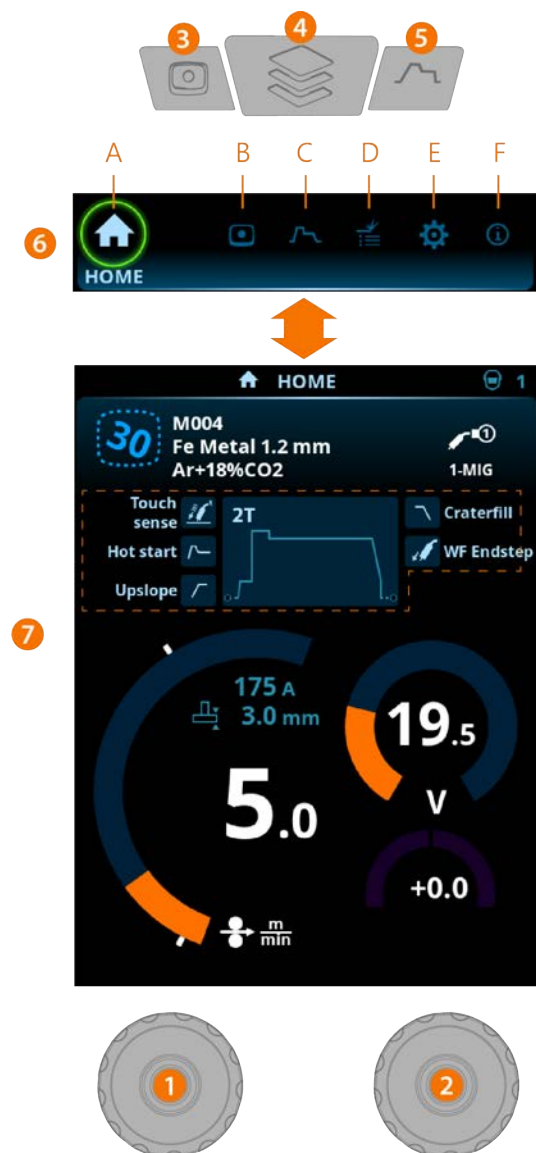
* These are available in the advanced settings menu.

3.4 Using X5 Auto control panel

The X5 Wire Feeder 300 Auto/Auto+ wire feeder and control panel include advanced features and functions for MIG welding with the option to use the X5 FastMig also for TIG (DC) and MMA welding and gouging.

The automatic 1-MIG process is available along with the Kemppi welding programs as well as Wise and MAX features and processes (optional). For more information, refer to "How to get welding programs" on page 85.

X5 Wire Feeder 300 Auto/Auto+ control panel (X5 FP 300)



General

1. Left control knob
>> Adjustment and selection
2. Right control knob
>> Adjustment and selection
3. Memory channels button
>> Shortcut to the memory channel selection

>> Changed welding parameters can be quickly saved onto the active memory channel by keeping the Memory channels button pressed for approx. 2 seconds. This works in any view.

4. View menu button

>> Enter view selection

>> Long press of the button returns to Home view, or if already in Home view, to the last used view.

5. Welding parameters button

>> Shortcut to the welding parameters view

6. View selection

>> Change view by turning the control knob (2)

>> Confirm view change by pressing the control knob (2).

Views (7)

- A. [Home view](#)
- B. [Channels view](#)
- C. [Welding parameters view](#)
- D. [Weld history view](#)
- E. [Device settings view](#)
- F. [Info view.](#)

 After each weld, a weld summary ([Weld data](#)) is displayed briefly.

3.4.1 Auto control panel: Home view

X5 Wire Feeder 300 Auto control panel's home view is also the main welding view.



1. Channel (and welding program if in use)
2. Applied welding parameters and functions
3. Wire feed speed
4. Welding process
5. Applied device settings
6. Welding voltage
7. Welding voltage fine tuning

>> With Wise program features a corresponding Wise parameter adjustment is displayed.

Control knob functions in Home view

Left control knob:

- In MIG mode: Wire feed speed adjustment
- In 1-MIG mode: Wire feed speed adjustment
- In TIG/MMA mode: Welding current adjustment
- In Gouging mode: Current adjustment.

Right control knob:

- In MIG mode: Welding voltage adjustment
- In 1-MIG mode: Fine tuning of welding voltage (the welding voltage is defined by the active welding program)
- In 1-MIG mode with Wise feature: Wise parameter adjustment (the welding voltage is defined by the active welding program)
- In MMA mode: Dynamics adjustment.

3.4.2 Auto control panel: Channels

The memory channel view can be accessed either via the panel's view selection or by pressing the physical memory channel shortcut button above the display (refer to "Using X5 Auto control panel" on page 96 for more information).

The amount of available memory channels differs between different operation modes: MIG (100 channels), TIG (10 channels), MMA (10 channels) and gouging (10 channels).

 The operation mode set in the panel [Settings](#) determines for which main welding process the memory channels are shown.



Changing memory channel

Turn the right control knob to highlight the desired memory channel. The highlighted memory channel is automatically activated.

Managing memory channels

The memory channels are managed through the Actions menu.

1. Enter the actions menu by pressing the right control knob.
2. Turn the control knob to highlight the desired action.
3. Select the action by pressing the right control knob.
4. Make further selections as required.

Available actions are:

- **Save changes:** Save changes to the currently selected channel
- **Save to...:** Save the current settings to another channel
- **Delete:** Delete the currently selected channel
- **Create channel:** Create a new channel based on the welding program(s)
 - >> MIG only: Welding programs can be filtered by base material, wire material, wire diameter, shielding gas and process. For more information, refer to "Auto control panel: Applying welding programs" on page 108.
- **Create all:** Create new channels based on all of the unused welding programs available (in MIG mode only)
- **Delete all:** Delete all channels.

The skewed channel number in the top left corner of the channel selection indicates that the set welding parameters are different from the ones currently saved on the active memory channel:

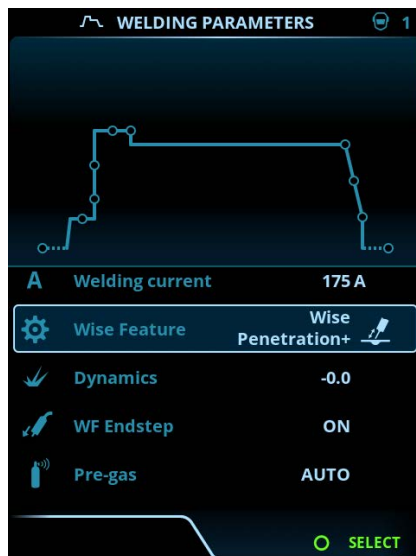


Tip: Changed welding parameters can be quickly saved onto the active memory channel by keeping the Memory channels button pressed for approx. 2 seconds. This works in any view.

3.4.3 Auto control panel: Welding parameters

The Welding parameters view includes a start and stop curve for adjusting the most essential parameters for a weld. The bottom section of the view lists the available adjustments for the selected welding process. The welding process selection is based on the active memory channel and its settings.

 *Many of the welding parameters are welding process specific and are visible and available for adjustment accordingly.*



Adjusting welding parameters

1. Turn the right control knob to highlight the desired welding parameter.
2. Press the right control knob to select the welding parameter for adjustment.
3. Turn the right control knob to adjust welding parameter value.
>> Depending on the parameter to be adjusted, refer also to the Welding parameters table below for more details.
4. Confirm the new value / selection and close the adjustment view by pressing the right control knob.

Saving welding parameters for later use

A work channel is automatically created for the changed welding parameters. To save the set welding parameters on a memory channel, do one of the following:

- Quick active channel option: Keep the Channels shortcut button pressed for approximately 2 seconds.
>> This will save the parameter settings onto the currently active channel replacing its previous parameter settings.
- Channels view option: Go to the Channels view and save the parameter settings onto a new channel.
>> Refer to "Auto control panel: Channels" on page 98 for more information.

Welding parameters and feature descriptions

MIG and 1-MIG welding parameters

The parameters listed here are available for adjustment with the MIG and 1-MIG processes.

Parameter	Parameter value	Description
Trigger logic	2T, 4T	Welding guns can have several alternative trigger operation modes (trigger logics). Most common are 2T and 4T. In 2T mode you hold the trigger down while welding. In 4T mode you press and release the trigger to start or to stop welding. For more information, refer to "Trigger logic functions" on page 132.
Touch Sense Ignition	AUTO/ON	Touch Sense Ignition delivers minimum spatter and stabilizes the arc immediately after ignition.

Post current	-30 ... +30	Post current setting affects the wire length at the weld end, for example to prevent the wire from stopping too close to the weld pool. This also enables the optimum wire length for the start of the next weld.
Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc. (Not available with WiseRoot+, MAX Cool and MAX Speed.)
WF end step	OFF/ON Default = OFF	Wire feed end step feature prevents the filler wire from sticking to the contact tip when the welding ends.
Pre gas	0.0 ... 9.9 s, step 0.1 0.0 = OFF	Welding function that starts the shielding gas flow before the arc ignites. This ensures that the metal does not come into contact with air at the start of the weld. Time value is preset by the user. Used for all metals, but especially for stainless steel, aluminum and titanium.
Creep start	10...90 %, step 1	The Creep start function defines the wire feed speed before the welding arc ignites, that is, before the filler wire comes in contact with the workpiece. When the arc ignites, the wire feed speed is automatically switched to the normal user-set speed. The Creep start function is always on.
Crater fill	ON/OFF	When welding with high power, a crater is usually formed at the end of the weld. The Crater fill function decreases the welding power / wire feed speed at the end of the welding job so that the crater can be filled using a lower power level. With MIG process, Crater fill duration, wire feed speed and voltage are preset by the user.
- Crater fill time	0.0 ... 10.0 s, step 0.1 Default = 1.0 s	When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1. For 1-MIG process, refer to the 1-MIG parameter table.
- Crater fill wire feed speed	0.5 ... 25.0 m/min, step 0.05 or 0.1 Default = 5 m/min	
- Crater fill voltage	400A: 8 ... 45 V 500A: 8 ... 50 V Step 0.1 V Default = 18V	
Post gas	0.0 ... 9.9 s, step 0.1 0.0 = OFF	Welding function that continues the shielding gas flow after the arc has extinguished. This ensures that the hot weld does not come into contact with air after the arc is extinguished, protecting the weld and also the electrode. Used for all metals. Especially stainless steel and titanium require longer post gas times.

Wire feed speed	0.50 ... 25 m/min, step 0.05 or 0.1 Default = 5.00 m/min	Wire feed speed adjustment. When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1.
Wire feed speed min	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 0.5 m/min	Minimum and maximum limits for the wire feed speed adjustment.
Wire feed speed max	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 25 m/min	
Voltage min	Min/Max = According to welding equipment specifications, step 0.1	Minimum and maximum limits for the welding voltage adjustment. These parameters are available for adjustment in MIG only. In 1-MIG the voltage is defined by welding program.
Voltage max	Min/Max = According to welding equipment specifications, step 0.1	

1-MIG welding parameters

The parameters listed here are available for adjustment with the 1-MIG process.

Parameter	Parameter value	Description
Upslope	ON/OFF	Upslope is a welding function that determines the time, during which the welding current gradually increases to the desired welding current level at the start of the weld. The upslope start level and time are preset by the user.
- Upslope start level	10 ... 100 %, step 1 Default = 50	
- Upslope time	0.1 ... 5 s, step 0.1 Default = 0.10	
Hot start	ON/OFF	Welding function that uses higher or lower wire feed speed and welding current at the start of the weld. After the Hot start period the current changes to normal welding current level. This facilitates the start of the weld especially with aluminum materials. The Hot start level and time (only in 2T trigger mode) are preset by the user.
- Hot start level	-50 ... +200 %, step 1 Default = 40	
- Hot start time	0.0 ... 9.9 s, step 0.1 Default = 1.2 s	
Crater fill	ON/OFF	When welding with high power, a crater is usually formed at the end of the weld. The Crater fill function decreases the welding power / wire feed speed at the end of the welding job so that the crater can be filled using a lower power level. With 1-MIG process, Crater fill start level, duration and end level are preset by the user.
- Crater fill start level	10 ... 150 %, step 1 Default = 100	
- Crater fill time	0.0 ... 10.0 s, step 0.1 Default = 1.0 s	
- Crater fill end level	10 ... 150 %, step 1 Default = 30	
Current	10 ... machine size A, step 1 Default = 50 A	Welding current adjustment. With WisePenetration+ only.
Fine tuning	Example: -10.0 ... +10.0 V * Step 0.1 V	Fine tuning of the welding voltage. * The voltage range for fine tuning is defined by the active welding program.
Wise feature	None, WiseFusion, WisePenetration+, WiseSteel	When selected, a list of available Wise features is opened for selection.

Wire feed speed limit min	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 0.5 m/min	Minimum and maximum limits for the wire feed speed adjustment.
Wire feed speed limit max	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 25 m/min	

Pulse/DPulse welding parameters

The parameters listed here are available for adjustment in addition to the MIG and 1-MIG welding parameters when an X5 pulse power source is connected. DPulse = Double pulse process.

Parameter	Parameter value	Description
Pulse current %	-10 ... +15 %, step 1	The pulse current fine tuning relative to the current with Pulse and DPulse welding processes.
DPulse ratio	10 ... 90 %, step 1	This adjusts the double pulse time percentage, i.e. how long the double pulse is at the first pulse level. The second pulse level is determined in relation to the first level setting.
DPulse frequency	0.4 ... 8.0 Hz, Auto, step 0.1	This adjusts the double pulse frequency. How long it takes from the start of 1st level to the end of 2nd level.
DPulse level 1: Wire feed speed	0.50 ... 25 m/min, step 0.05 or 0.1	First double pulse level wire feed speed (and minimum / maximum values for wire feed speed). When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1.
DPulse level 1: Fine tuning	-10 ... +10, step 1	Fine tuning of the welding voltage.
DPulse level 1: Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.
DPulse level 2: Wire feed speed	0.50 ... 25 m/min, step 0.05 or 0.1	Second double pulse level wire feed speed. The DPulse level 2 wire feed speed changes automatically when the DPulse level 1 wire feed speed setting is adjusted. When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1.
DPulse level 2: Fine tuning	-10 ... +10, step 1	Fine tuning of the welding voltage.
DPulse level 2: Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.

MAX Speed parameters

The parameters listed here are MAX Speed process specific.

Parameter	Parameter value	Description
MAX Speed frequency	100 ... 800 Hz, Auto step 10	MAX Speed frequency setting.

MAX Position parameters

The parameters listed here are MAX Position process specific.

Parameter	Parameter value	Description
MAX Position frequency	-0.5 ... +0.5 Hz, step 0.1 Default = 0	MAX Position frequency fine tuning.
Pulse current %	-10 ... 15 %, step 1 Default = 0	MAX Position pulse current adjustment.
Plate thickness	3.0 ... 12.0 mm	MAX Position plate thickness setting.

TIG welding parameters

The parameters listed here are available for adjustment with the TIG process.

Parameter	Parameter value	Description
Trigger logic	2T, 4T	Welding guns can have several alternative trigger operation modes (trigger logics). Most common are 2T and 4T. In 2T mode you hold the trigger down while welding. In 4T mode you press and release the trigger to start or to stop welding.
Post gas	0.0 ... 9.9 s, step 0.1 0.0 = OFF	Welding function that continues the shielding gas flow after the arc has extinguished. This ensures that the hot weld does not come into contact with air after the arc is extinguished, protecting the weld and also the electrode. Used for all metals. Especially stainless steel and titanium require longer post gas times.
Current	10 ... machine size A, step 1 Default = 50 A	Welding current adjustment.

MMA welding parameters

The parameters listed here are available for adjustment with the MMA process.

Parameter	Parameter value	Description
Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.
Hot start level	-30 ... +30 Default = 0	Welding function that uses higher or lower wire feed speed and welding current at the start of the weld. After the Hot start period the current changes to normal welding current level. This facilitates the start of the weld especially with aluminum materials. In MMA the Hot start level is preset by the user.
Current	10 ... machine size A, step 1 Default = 50 A	Welding current adjustment.

Gouging parameters

The parameters listed here are available for adjustment with the gouging process.

Parameter	Parameter value	Description
Current	10 ... machine size A, step 1 Default = 50 A	Current adjustment.
Hot start level	-30 ... +30 Default = 0	Welding function that uses higher or lower wire feed speed and welding current at the start of the weld.

For more information on the additional welding features and functions, refer to "Additional guidance to functions and features" on page 132.

3.4.4 Auto control panel: Weld history

The Weld history view collects the information of the past welds (the last 10) into one view for later checking. To change how the weld data averages are calculated (with or without slope phases) refer to "Auto control panel: Settings" on the next page.



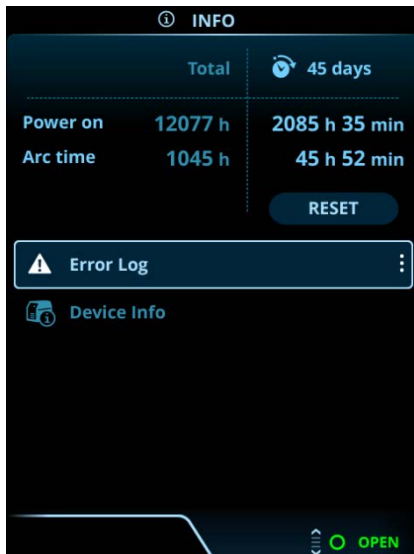
Heat input calculation in weld history view

The heat input of a weld can be calculated by entering the weld length into the weld's history entry.

1. Select 'Set length' by pressing the right control knob button.
2. Set the weld length by turning the right control knob.
3. Confirm the weld length for calculation by pressing the control knob button.

3.4.5 Auto control panel: Info view

The Info view shows information on the device usage. Through this view it is also possible to access the error logs, list of installed welding programs, additional operating information and device info, such as the software version and equipment serial numbers.



3.4.6 Auto control panel: Settings



Changing settings

1. Turn the right control knob to highlight the desired settings parameter.
2. Press the right control knob to select the settings parameter for adjustment.
3. Turn the right control knob to select the settings value.
 >> Depending on the settings parameter to be adjusted, refer also to the Settings table below for more details.
4. Confirm the new value / selection and close the adjustment view by pressing the right control knob.

Users

The system settings can be customized for up to 10 different users. In addition to the system settings, the memory channels are user-specific. Each user can have up to 100 MIG channels, 10 TIG channels, 10 MMA channels and 10 gouging channels. The memory channel and system settings are saved automatically for the logged-in user.

Settings

Parameter	Parameter value	Description
User	Current user	There is always a logged-in user in the system. When a new user logs in, the previous user is automatically logged out. In case of a mixed double wire feeder installation (Manual+Auto), user 1 is automatically applied and user change is disabled.
Operation mode	MIG/TIG/MMA/Gouging	
Remote control	OFF/Remote/Gun Default = OFF	If remote controller is not connected, this selection is not available.
Remote mode (with 1-knob remote control)	<i>Wire feed speed or Current / Channel</i>	This determines what is changed with the remote, welding parameter or memory channel (available channels: 1...5). The adjusted parameters are process-specific.
Remote mode (with 2-knob remote control)	<i>Welding parameters / Channel</i>	If remote controller is not connected and remote not selected, this selection is not available. Note (2-knob remote): When the remote mode is set to 'Channel', only the left remote control knob is in use.
Water cooler	OFF/Auto/ON Default = Auto	When ON is selected, the coolant is circulated continually, and when Auto is selected, the coolant is circulated only during welding.
Voltage display mode	Terminal voltage / Arc voltage Default = Arc voltage	This defines which is shown on the control panel display, terminal or arc voltage
Wire retract	OFF/ON	This is an automatic wire retract feature. Once the arc is extinguished, the wire is retracted for additional safety. The user can change the wire retract delay and length settings.
- Retract delay	2...10 s, step 1 Default = 5 s	Note: Wire retract function is disabled if a subfeeder is connected.
- Retract length	1...10 cm, step 1 Default = 2 cm	
Subfeeder type (in MIG mode and with X5 Wire Feeder 300 only)	<i>Subfeeder model / OFF</i> Default = OFF	If a compatible subfeeder is connected, select the subfeeder from the list. Compatible subfeeders: <i>SuperSnake GTX/GT02S (10m, 15m, 20m, 25m), Binzel PP401D, Binzel PP36D.</i> Note: With SuperSnake GT02S models, only motor synchronization is supported.
Weld data duration	0...30 s, step 1 0 = OFF Default = 5 s	This defines if and how long the weld data summary is shown after each weld.

Weld data averages	Without slopes / Entire weld Default = Without slopes	This feature allows the user to change how the weld data averages are calculated: with or without the slope phases in the beginning and in the end of the weld. This setting affects the calculation of the averages for the following: welding voltage (terminal and arc voltage), welding current, welding power and wire feed speed.
Date	Current date	
Time	Current time	
Language	Available languages	
Factory reset	Reset/Cancel Default = Cancel	
Safe wire inch (with MIG only)	OFF/ON	When ON, and the arc doesn't ignite, the filler wire is fed 5 cm. When OFF, 5 m of filler wire is fed.
Cable calibration (with MIG only)	Start/Cancel	The date and time and the calibration information of the previous calibration is also shown. Refer to "Calibrating welding cable" on page 88 for cable calibration.
VRD (with MMA and gouging only)	OFF/12V/24V Default = OFF	Voltage reduction device (VRD) reduces the open-circuit voltage to maintain below a certain voltage value.

3.4.7 Auto control panel: Applying welding programs

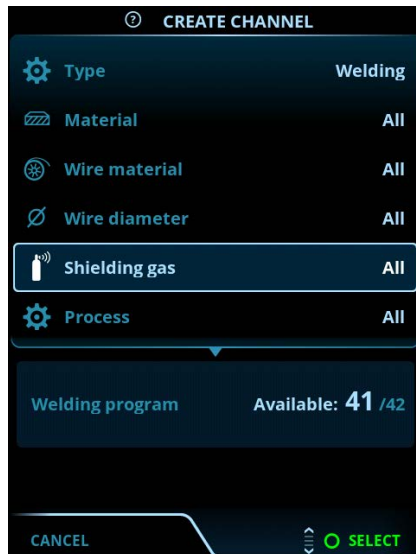
To select and apply a different MIG welding process and program, a corresponding memory channel must be created.

When creating the memory channel for a particular MIG welding process, the selection of welding programs can be narrowed down based on the available MIG welding processes: Manual, 1-MIG, MAX Speed (optional), MAX Position (optional), MAX Cool (optional), WiseRoot+ (optional) and WiseThin+ (optional).

Use the welding program that is in accordance with your welding setup (e.g. welding wire and gas properties).

 *The use of additional welding programs and Wise and MAX features is possible with the X5 FastMig Auto equipment in MIG operation mode. Pulse power source is required for the MAX Position (optional) process and Pulse+ power source for the WiseRoot+ (optional) and WiseThin+ (optional) processes.*

1. Go to the Memory channels view. (Refer to "Auto control panel: Channels" on page 98 for more information.)
2. Enter the actions menu.
3. Select **Create channel**.
 >> A filter view opens.



4. MIG only: Use the filter options (e.g. material, wire material or wire diameter) to find the welding programs best suited for the purpose.

 The operation mode set in the panel [Settings](#) determines for which main welding process the programs here are shown. In MIG mode, the **Process** selection in the Create channel view allows to narrow down the search more specifically to different MIG processes.

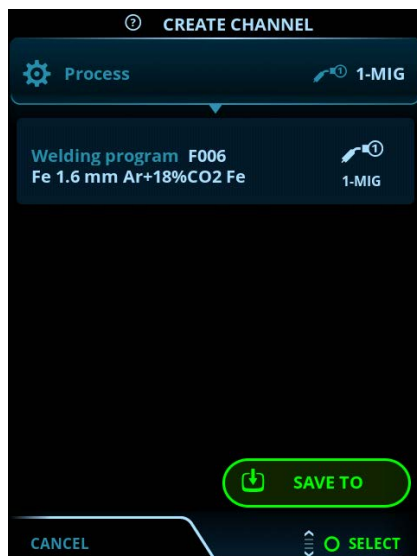
5. MIG only: Once ready, go to the **Welding program** selection at the bottom to view the suitable welding programs.



6. MIG only: Select a welding program.

>> The selected welding program is now shown in the filter view.

7. To save, scroll down to **Save to** and select it.



8. Select the memory channel slot for saving and confirm.

Once ready, you can continue to the Welding parameters view to adjust the welding settings for the new channel, create a new channel or go back to the Channels view.

Tip: It is also possible to create new channels based on all of the unused welding programs available for the selected operation mode by selecting **Create all** in the Channel view's actions menu. This option uses the available memory channel slots.

3.4.8 Auto control panel: Weld data view

After each weld, a weld summary is displayed briefly. To change the weld data view duration or how the weld data averages are calculated (with or without slope phases) refer to "Auto control panel: Settings" on page 106.



3.5 Using X5 AP/APC control panel

The X5 Wire Feeder 300 AP/APC wire feeder and control panel include advanced features and functions for MIG welding with the option to use the X5 FastMig also for TIG (DC) and MMA welding and gouging.

The automatic 1-MIG process is available along with the Kemppi welding programs as well as Wise and MAX features and processes (optional). For more information, refer to "How to get welding programs" on page 85.

X5 Wire Feeder 300 AP/APC control panel



General

1. Left control knob
>> Adjustment and selection
2. Right control knob
>> Adjustment and selection
3. Memory channels button
>> Shortcut to the memory channel selection
>> Changed welding parameters can be quickly saved onto the active memory channel by keeping the Memory channels button pressed for approx. 2 seconds. This works in any view.
4. View menu button
>> Enter view selection

>> Long press of the button returns to Home view, or if already in Home view, to the last used view.

5. Welding parameters button

>> Shortcut to the welding parameters view

6. View selection

>> Change view by turning the control knob (2)

>> Confirm view change by pressing the control knob (2).

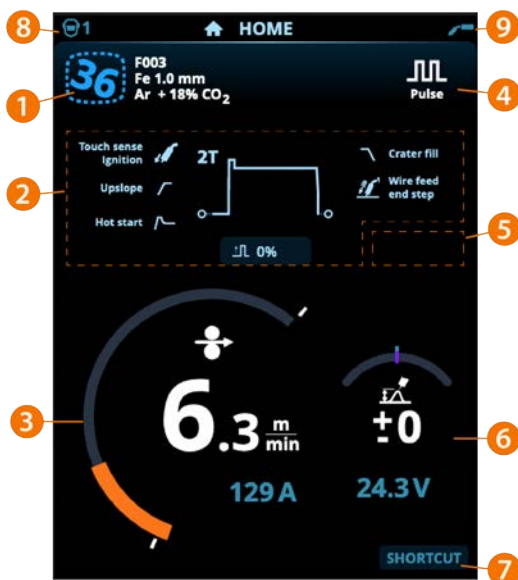
Views (7)

- A. [Home view](#)
- B. [Weld Assist view](#)
- C. [Memory channels view](#)
- D. [WPS view](#) (available with APC model)
- E. [Welding parameters view](#)
- F. [Weld history view](#)
- G. [System settings view](#)
- H. [WLAN view](#) (available with APC model)
- I. [Info view](#).

 After each weld, a weld summary ([Weld data](#)) is displayed briefly.

3.5.1 AP/APC control panel: Home view

X5 Wire Feeder 300 AP/APC control panel's home view is also the main welding view.



1. Memory channel information
2. Applied welding parameters and functions
3. Wire feed speed (MIG) or current (TIG, MMA, Gouging)
4. Active welding process
5. Applied device settings (e.g. remote control or subfeeder)
6. Welding voltage
 - >> With 1-MIG process voltage fine tuning is displayed
 - >> With Wise/MAX process a corresponding Wise/MAX parameter adjustment is displayed.

7. Configurable function for the right control knob button

- >> To define a shortcut, keep the right control knob button pressed for 3 seconds and select the shortcut function from the list of available options.
- >> Once defined, the shortcut is used by short press of the right control knob button when in Home view.

8. Active user**9. Active operation mode.****Control knob functions in Home view**

Left control knob:

- Manual MIG: Wire feed speed adjustment
- 1-MIG: Wire feed speed adjustment
- Pulse MIG: Wire feed speed adjustment
- DPulse MIG: Wire feed speed adjustment and switching between pulse levels with control knob button
- TIG/MMA: Welding current adjustment
- Gouging: Current adjustment.

Right control knob:

- Manual MIG: Welding voltage adjustment
- 1-MIG: Fine tuning of welding voltage or Wise/MAX parameter adjustment
- Pulse MIG: Fine tuning of welding voltage or Wise/MAX parameter adjustment
- DPulse MIG: Fine tuning of welding voltage
- MMA: Dynamics adjustment.

 *With Wise features, Wise processes or MAX processes turned on, the control knob functions in Home view and during welding may differ from the above. For more information on these features and processes, refer to "Additional guidance to functions and features" on page 132.*

3.5.2 AP/APC control panel: Weld Assist

Weld Assist is available with X5 Wire Feeder AP/APC.

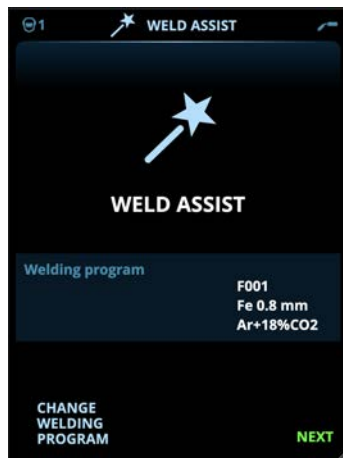
Weld Assist is a wizard-like utility for easy selection of welding parameters. The utility walks the user step-by-step through the selection of required parameters.

In Weld Assist, the selections are made with the two control knobs.

To use Weld Assist with MIG welding:

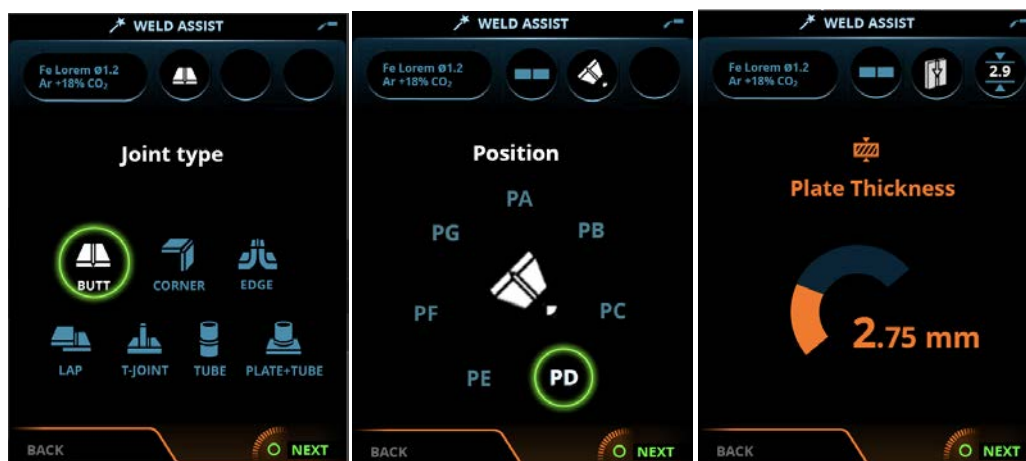
-  *The currently selected welding program, including filler wire and shielding gas information, is shown and used as a basis in Weld Assist. If necessary, the welding program can be changed before continuing by selecting 'Change welding program'.*
-  *If the currently selected welding program (on the active memory channel) is not supported by Weld Assist, the user is guided to change the welding program.*

1. To start, go to the **Weld Assist** view and select 'Next' with the control knob button.



2. Select:

- >> The welding joint type: butt joint / corner joint / edge joint / lap joint / T-joint / tube joint / tube+plate joint.
- >> The welding position: PA / PB / PC / PD / PE / PF / PG
- >> The plate thickness (1...10 mm). Note: With PG position, the maximum plate thickness is 3 mm.



3. Weld Assist gives you a recommendation for these welding parameters:

- >> Welding process
- >> Wire feed speed
- >> Gas flow rate
- >> Travel speed
- >> Separate values for root and fill passes (where applicable).

4. Save the Weld Assist's recommendation for welding settings by selecting 'Save'.



5. Select the memory channel slot for saving.
6. Once saved, the memory channel can be taken into use by selecting **Use** in Weld Assist, or later in the **Memory channels** view.

The welding parameters created with Weld Assist are still adjustable as per normal.

Tip: You can go back step by step in Weld Assist by pressing the left control knob button.

3.5.3 AP/APC control panel: Channels

The memory channel view can be accessed either via the panel's view selection or by pressing the physical memory channel shortcut button above the display (refer to "Using X5 AP/APC control panel" on page 111 for more information).

The amount of available memory channels differs between different operation modes: MIG (100 channels), TIG (10 channels), MMA (10 channels) and gouging (10 channels).

 The operation mode set in the control panel [Settings](#) determines for which main welding process the memory channels are shown.



Changing memory channel

Turn the right control knob to highlight the desired memory channel. The highlighted memory channel is automatically activated.

Managing memory channels

The memory channels are managed through the **Actions** menu.

1. Enter the actions menu by pressing the right control knob.
2. Turn the control knob to highlight the desired action.
3. Select the action by pressing the right control knob.
4. Make further selections as required.

Available actions are:

- **Save changes:** Save changes to the currently selected channel
- **Save to:** Save the current settings to another channel
- **Delete:** Delete the currently selected channel
- **Link to WPS:** Link the currently selected channel to a weld pass on a digital welding procedure specification (dWPS) document. (Optional. The WPS feature is available with X5 Wire Feeder APC.)
- **Create channel:** Create a new channel based on the welding program(s)
 - >> MIG only: Welding programs can be filtered by base material, wire material, wire diameter, shielding gas and process. For more information, refer to "AP/APC control panel: Applying welding programs" on page 129.
- **Create from programs:** Create new channels based on all of the unused welding programs available (in MIG mode only)
- **Delete all:** Delete all channels.

The skewed channel number in the top left corner of the channel selection indicates that the set welding parameters are different from the ones currently saved on the active memory channel:



Tip: Changed welding parameters can be quickly saved onto the active memory channel by keeping the Memory channels button pressed for approx. 2 seconds. This works in any view.

3.5.4 APC control panel: WPS view

The use of digital WPS (Welding Procedure Specification, dWPS) and WeldEye cloud service require X5 Wire Feeder 300 APC and a valid Kemppi WeldEye subscription with the Welding Procedures module. The X5 equipment includes a link to a free trial registration – featuring also a free trial option for WeldEye ArcVision. For more information on WeldEye, refer to weldeye.com or contact your Kemppi representative.

To take the digital WPS feature in use, the equipment must be connected to the internet via the built-in wireless connection (WLAN). Refer to "Wireless connection (WLAN)" on page 138 for instructions.

Trial registration

The X5 FastMig with X5 Wire Feeder 300 APC comes preinstalled with a trial license for the WeldEye Welding Procedures module. The trial license can be activated by following these steps:

1. On the X5 Wire Feeder 300 APC control panel, go to the **WPS view**.
2. Use a QR code reader on your mobile device to open the WeldEye web link or navigate to 'https://register.weldeye.io/weldeye' on your web browser.



3. Complete the registration process as instructed on the registration page.

- You will be required to fill in the serial number and four-digit security pin of your X5 power source. These can be found on the power source rating plate.*
- The free trial registration includes both the WeldEye Welding Procedures and WeldEye ArcVision modules.*

Using dWPS

The **WPS view** shows the digital WPSs with one or more weld passes assigned to the welder or welding station in the Kemppi WeldEye cloud service.

To take a dWPS in use:

1. Select the desired dWPS for viewing and for selecting a weld pass by turning the right control knob and pressing the right control knob button.



- If a dWPS and weld pass have already before been linked to the active memory channel, the **WPS view** opens directly to that WPS. To open the list of available dWPSs, select 'Change WPS'.*

2. Select a weld pass on the dWPS by turning the right control knob and enter the actions menu by pressing the right control knob button.



>> The linked memory channel set as default is emphasized (in brighter blue) for each weld pass.

3. If a memory channel has already been linked to the weld pass, you can activate the selected weld pass and the default memory channel by selecting 'Activate'.



4. If a memory channel has not been linked to the weld pass previously, you can link the weld pass to an existing memory channel ('Select linked channel').

 A memory channel can also be linked to a weld pass on a dWPS through the **Memory channels view** by selecting 'Link to WPS' in the memory channel's actions menu.

Once a weld pass on a dWPS is activated, the default memory channel linked to it is automatically selected. This is indicated also in the home view and on screen during welding.

The welding parameters are still manually adjustable, but the adjustment ranges defined on the active WPS are indicated on the screen (1). If you adjust the welding parameters outside the WPS adjustment range, the control panel shows a warning (2) on the screen:



The active WPS can be deactivated by selecting 'Stop using' in the WPS's weld pass actions menu.

More feature descriptions here:

>> "Digital Welding Procedure Specification (dWPS)" on page 139

>> "WeldEye ArcVision" on page 139

3.5.5 AP/APC control panel: Welding parameters

The Welding parameters view includes a start and stop curve for visualizing and adjusting the most essential parameters for a weld. The bottom section of the view lists the available adjustments for the selected welding process. The welding process selection is based on the active memory channel and its settings.

 Many of the welding parameters are welding process specific and are visible and available for adjustment accordingly.



Adjusting welding parameters

1. Turn the right control knob to highlight the desired welding parameter.
2. Press the right control knob to select the welding parameter for adjustment.
3. Turn the right control knob to adjust welding parameter value.
>> Depending on the parameter to be adjusted, refer also to the Welding parameters table below for more details.
4. Confirm the new value / selection and close the adjustment view by pressing the right control knob.

Saving welding parameters for later use

A work channel is automatically created for the changed welding parameters. To save the set welding parameters on a memory channel, do one of the following:

- Quick active channel option: Keep the Channels shortcut button pressed for approximately 2 seconds.
>> This will save the parameter settings onto the currently active channel replacing its previous parameter settings.
- Channels view option: Go to the Channels view and save the parameter settings onto a new channel.
>> Refer to "AP/APC control panel: Channels" on page 115 for more information.

Welding parameters and feature descriptions

MIG and 1-MIG welding parameters

The parameters listed here are available for adjustment with the MIG and 1-MIG processes.

Parameter	Parameter value	Description
Process	MIG, 1-MIG, Pulse, DPulse, WiseRoot+, WiseThin+, MAX Cool, MAX Speed, MAX Position	This MIG welding process selection depends on the active welding program as well as the equipment type used. For more information on the additional processes, refer to "Additional guidance to functions and features" on page 132.
Trigger logic	2T, 4T	Welding guns can have several alternative trigger operation modes (trigger logics). Most common are 2T and 4T. In 2T mode you hold the trigger down while welding. In 4T mode you press and release the trigger to start or to stop welding. For more information, refer to "Trigger logic functions" on page 132.
Pre gas	0.0 ... 9.9 s, Auto, step 0.1 0.0 = OFF	Welding function that starts the shielding gas flow before the arc ignites. This ensures that the metal does not come into contact with air at the start of the weld. Time value is preset by the user. Used for all metals, but especially for stainless steel, aluminum and titanium.
Creep start	10...90 %, Auto, step 1	The Creep start function defines the wire feed speed before the welding arc ignites, that is, before the filler wire comes in contact with the workpiece. When the arc ignites, the wire feed speed is automatically switched to the normal user-set speed. The Creep start function is always on.

Touch Sense Ignition	AUTO/ON/OFF	Touch Sense Ignition (TSI) delivers minimum spatter and stabilizes the arc immediately after ignition.
Wire feed speed	0.50 ... 25 m/min, step 0.05 or 0.1 Default = 5.00 m/min	Wire feed speed adjustment. When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1.
Wire feed speed min	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 0.5 m/min	Minimum and maximum limits for the wire feed speed adjustment.
Wire feed speed max	Min/Max = 0.5 ... 25 m/min, step 0.1 Default = 25 m/min	
Voltage	Min/Max = According to welding equipment specifications, step 0.1	Welding voltage adjustment and the minimum and maximum limits for the welding voltage adjustment. These parameters are available for adjustment in MIG only. In 1-MIG the voltage is defined by welding program.
Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc. (Not available with WiseRoot+, MAX Cool and MAX Speed.)
Crater fill	ON/OFF	When welding with high power, a crater is usually formed at the end of the weld. The Crater fill function decreases the welding power / wire feed speed at the end of the welding job so that the crater can be filled using a lower power level. With MIG process, Crater fill duration, wire feed speed and voltage are preset by the user.
- Crater fill time	0.0 ... 10.0 s, Auto, step 0.1 Default = 1.0 s	When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1. For 1-MIG process, refer to the 1-MIG parameter table.
- Crater fill wire feed speed	0.5 ... 25.0 m/min, Auto, step 0.05 or 0.1 Default = 5 m/min	
- Crater fill voltage	400A: 8 ... 45 V, Auto 500A: 8 ... 50 V, Auto Step 0.1 V Default = 18 V	
Post current	-30 ... +30	Post current setting affects the wire length at the weld end, for example to prevent the wire from stopping too close to the weld pool. This also enables the optimum wire length for the start of the next weld.
Wire feed end step (WF end step)	OFF/ON Default = OFF	Wire feed end step feature prevents the filler wire from sticking to the contact tip when the welding ends.

Post gas	0.0 ... 9.9 s, Auto, step 0.1 0.0 = OFF	Welding function that continues the shielding gas flow after the arc has extinguished. This ensures that the hot weld does not come into contact with air after the arc is extinguished, protecting the weld and also the electrode. Used for all metals. Especially stainless steel and titanium require longer post gas times.
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1-MIG welding parameters

The parameters listed here are available for adjustment with the 1-MIG process.

Parameter	Parameter value	Description
Trigger logic	2T, 4T, Powerlog (2 levels or 3 levels)	Welding guns can have several alternative trigger operation modes (trigger logics). Most common are 2T and 4T. In 2T mode you hold the trigger down while welding. In 4T mode you press and release the trigger to start or to stop welding. Note that enabling Powerlog opens additional Powerlog settings in the Welding parameters view. For more information, refer to "Trigger logic functions" on page 132.
Upslope	ON/OFF	Upslope is a welding function that determines the time, during which the welding current gradually increases to the desired welding current level at the start of the weld. The upslope start level and time are preset by the user.
- Upslope start level	10 ... 100 %, Auto, step 1 Default = 50	
- Upslope time	0.1 ... 5 s, Auto, step 0.1 Default = 0.10	
Hot start	ON/OFF	Welding function that uses higher or lower wire feed speed and welding current at the start of the weld. After the Hot start period the current changes to normal welding current level. This facilitates the start of the weld especially with aluminum materials. The Hot start level and time (only in 2T trigger mode) are preset by the user.
- Hot start level	-50 ... +200 %, Auto, step 1 Default = 40	
- Hot start time	0.0 ... 9.9 s, Auto, step 0.1 Default = 1.2 s	
Wise feature	None, WiseFusion, WisePenetration+, WiseSteel	When selected, a list of available Wise features is opened for selection. For more information on these features, refer to "Additional guidance to functions and features" on page 132. (Not available with WiseRoot+, WiseThin+, MAX Cool, MAX Speed and MAX Position.)
Fine tuning	Example: -10.0 ... +10.0 V * Step 0.1 V	Fine tuning of the welding voltage. * The voltage range for fine tuning is defined by the active welding program.

Crater fill	ON/OFF	When welding with high power, a crater is usually formed at the end of the weld. The Crater fill function decreases the welding power / wire feed speed at the end of the welding job so that the crater can be filled using a lower power level. With 1-MIG process, Crater fill start level, duration and end level are preset by the user.
- Crater fill start level	10 ... 150 %, Auto, step 1 Default = 100	
- Crater fill time	0.0 ... 10.0 s, Auto, step 0.1 Default = 1.0 s	
- Crater fill end level	10 ... 150 %, Auto, step 1 Default = 30	
Current	10 ... machine size A, step 1 Default = 50 A	Welding current adjustment with WisePenetration+ only.

Pulse/DPulse welding parameters

The parameters listed here are available for adjustment in addition to the MIG and 1-MIG welding parameters when an X5 pulse power source is connected. DPulse = Double pulse process.

Parameter	Parameter value	Description
Pulse current %	-10 ... +15 %, step 1	The pulse current fine tuning relative to the current with Pulse and DPulse welding processes.
DPulse ratio	10 ... 90 %, step 1	This adjusts the double pulse time percentage, i.e. how long the double pulse is at the first pulse level. The second pulse level is determined in relation to the first level setting.
DPulse frequency	0.4 ... 8.0 Hz, Auto, step 0.1	This adjusts the double pulse frequency. How long it takes from the start of 1st level to the end of 2nd level.
DPulse level 1: Wire feed speed	0.50 ... 25 m/min, step 0.05 or 0.1	First double pulse level wire feed speed (and minimum / maximum values for wire feed speed). When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1.
DPulse level 1: Fine tuning	-10 ... +10, step 1	Fine tuning of the welding voltage.
DPulse level 1: Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.
DPulse level 2: Wire feed speed	0.50 ... 25 m/min, step 0.05 or 0.1	Second double pulse level wire feed speed. The DPulse level 2 wire feed speed changes automatically when the DPulse level 1 wire feed speed setting is adjusted. When the wire feed speed is less than 5 m/min, the adjustment step is 0.05 and when the wire feed speed is 5 m/min or more, the adjustment step is 0.1.
DPulse level 2: Fine tuning	-10 ... +10, step 1	Fine tuning of the welding voltage.
DPulse level 2: Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.

MAX Speed parameters

The parameters listed here are MAX Speed process specific.

Parameter	Parameter value	Description
MAX Speed frequency	100 ... 800 Hz, Auto step 10	MAX Speed frequency setting.

MAX Position parameters

The parameters listed here are MAX Position process specific.

Parameter	Parameter value	Description
MAX Position frequency	-0.5 ... +0.5 Hz, step 0.1 Default = 0	MAX Position frequency fine tuning.
Pulse current %	-10 ... 15 %, step 1 Default = 0	MAX Position pulse current adjustment.
Plate thickness	3.0 ... 12.0 mm	MAX Position plate thickness setting.

TIG welding parameters

The parameters listed here are available for adjustment with the TIG process.

Parameter	Parameter value	Description
Trigger logic	2T, 4T	Welding guns can have several alternative trigger operation modes (trigger logics). Most common are 2T and 4T. In 2T mode you hold the trigger down while welding. In 4T mode you press and release the trigger to start or to stop welding.
Post gas	0.0 ... 30.0 s, step 0.1 0.0 = OFF	Welding function that continues the shielding gas flow after the arc has extinguished. This ensures that the hot weld does not come into contact with air after the arc is extinguished, protecting the weld and also the electrode. Used for all metals. Especially stainless steel and titanium require longer post gas times.
Current	10 ... machine size A, step 1 Default = 50 A	Welding current adjustment.

MMA welding parameters

The parameters listed here are available for adjustment with the MMA process.

Parameter	Parameter value	Description
Dynamics	-10.0 ... +10.0, step 0.2 Default = 0	Controls the short circuit behavior of the arc. The lower the value the softer the arc, the higher the value the rougher the arc.

Hot start level	-30 ... +30 Default = 0	Welding function that uses higher or lower wire feed speed and welding current at the start of the weld. After the Hot start period the current changes to normal welding current level. This facilitates the start of the weld especially with aluminum materials. In MMA the Hot start level is preset by the user.
Current	10 ... machine size A, step 1 Default = 50 A	Welding current adjustment.

Gouging parameters

The parameters listed here are available for adjustment with the gouging process.

Parameter	Parameter value	Description
Current	10 ... machine size A, step 1 Default = 50 A	Current adjustment.
Hot start level	-30 ... +30 Default = 0	Welding function that uses higher or lower wire feed speed and welding current at the start of the weld.

For more information on the additional welding features and functions, refer to "Additional guidance to functions and features" on page 132.

3.5.6 AP/APC control panel: Weld history

The Weld history view collects the information of the past welds (the last 10) into one view for later checking. To change how the weld data averages are calculated (with or without slope phases) refer to "AP/APC control panel: Device settings" on the next page.



Heat input calculation in weld history view

The heat input of a weld can be calculated by entering the weld length into the weld's history entry.

1. Select 'Set length' by pressing the right control knob button.
2. Set the weld length by turning the right control knob.
3. Confirm the weld length for calculation by pressing the control knob button.

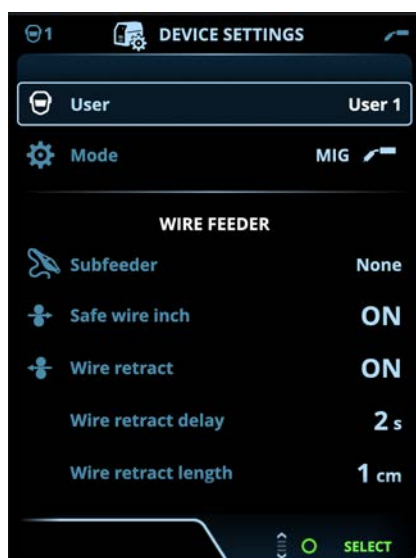
3.5.7 AP/APC control panel: Info view

The **Info** view shows information on the device usage.

Through this view it is also possible to access the error logs, list of installed welding programs, processes and features as well as additional operating information and device info, such as the software version and equipment serial numbers.



3.5.8 AP/APC control panel: Device settings



Changing settings

1. Turn the right control knob to highlight the desired settings parameter.
2. Press the right control knob to select the settings parameter for adjustment.
3. Turn the right control knob to select the settings value.
 >> Depending on the settings parameter to be adjusted, refer also to the Settings table below for more details.
4. Confirm the new value / selection and close the adjustment view by pressing the right control knob.

Users

The system settings can be customized for up to 10 different users. In addition to the system settings, the memory channels are user-specific. Each user can have up to 100 MIG channels, 10 TIG channels, 10 MMA channels and 10 gouging channels. The memory channel and system settings are saved automatically for the logged-in user.

Settings

Parameter	Parameter value	Description
User	Current user	There is always a logged-in user in the system. When a new user logs in, the previous user is automatically logged out. In case of a mixed double wire feeder installation where the other wire feeder is a Manual model, user 1 is automatically applied and user change is disabled.
Mode	MIG/TIG/MMA/Gouging	Note: For TIG welding the polarity (+/-) must be switched. For more information, refer to "Installing cables" on page 50.
Remote control	OFF/Remote/Gun Default = OFF	If remote controller is not connected, this selection is not available.
Remote mode (with 1-knob remote control)	Wire feed speed or current / Channel	This determines what is changed with the remote, welding parameter or memory channel (available channels: 1...5). The parameters are process-specific.
Remote mode (with 2-knob remote control)	Welding parameters / Channel	If remote controller is not connected and remote not selected, this selection is not available. Note (2-knob remote): When the remote mode is set to 'Channel', only the left remote control knob is in use.
Subfeeder (in MIG mode and with X5 Wire Feeder 300 only)	Subfeeder model / None Default = None	If a compatible subfeeder is connected, select the subfeeder from the list. Compatible subfeeders: <i>SuperSnake GTX (10m, 15m, 20m, 25m), Binzel PP401D, Binzel PP36D.</i>
Safe wire inch (with MIG only)	OFF/ON	When ON, and the arc doesn't ignite, the filler wire is fed 5 cm. When OFF, 5 m of filler wire is fed.

Wire retract	OFF/ON	This is an automatic wire retract feature. Once the arc is extinguished, the wire is retracted for additional safety. The user can change the wire retract delay and length settings.
- Wire retract delay	2...10 s, step 1 Default = 5 s	
- Wire retract length	1...10 cm, step 1 Default = 2 cm	Note: Wire retract function is disabled if a subfeeder is connected.
Language	Available languages	This allows the user to select the control panel language from a list of available languages.
Voltage display mode	Terminal / Arc Default = Arc	This defines which is shown on the control panel display, terminal voltage or arc voltage.
Weld data time	0...30 s, step 1 0 = OFF Default = 5 s	This defines if and how long the weld data summary is shown after each weld.
Weld data average	Without slopes / Entire weld Default = Without slopes	This feature allows the user to change how the weld data averages are calculated: with or without the slope phases in the beginning and in the end of the weld. This setting affects the calculation of the averages for the following: welding voltage (terminal and arc voltage), welding current, welding power and wire feed speed.
Brightness	1...10	The control panel display brightness.
Date	Current date	Date setting.
Time (24h)	Current time	Time setting in 24h format.
Screensaver	OFF/1...120 min, step 1 Default = 5 min	The screensaver image is shown on display after the set time period. By default, the Kemppi logo is shown. To change the screensaver image, refer to "USB update" on page 142.
Display off	OFF/1...120 min, step 1 Default = 5 min	The control panel display is turned off after the set time period. The right control knob light is lit when the display is off.
Cable calibration (with MIG only)	Start/Cancel	The date and time and the calibration information of the previous calibration is also shown. Refer to "Calibrating welding cable" on page 88 for cable calibration.
Water cooling	OFF/Auto/ON Default = Auto	When ON is selected, the coolant is circulated continuously, and when Auto is selected, the coolant is circulated only during welding.

VRD (with MMA and gouging only)	OFF/12V/24V Default = OFF	Voltage reduction device (VRD) reduces the open-circuit voltage to maintain below a certain voltage value.
Backup	(Selection)	This allows the settings to be saved on a connected USB memory stick.
Restore	(Selection)	This allows the settings to be restored from a connected USB memory stick.
Factory reset	Start/Cancel Default = Cancel	This resets the equipment to factory settings.

3.5.9 AP/APC control panel: Applying welding programs

To select and apply a MIG welding process and program, a corresponding memory channel must be created.

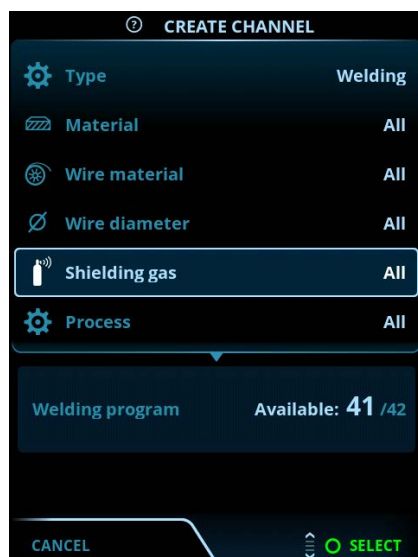
When creating the memory channel for a particular MIG welding process, the selection of welding programs can be narrowed down based on the available MIG welding processes: Manual, 1-MIG, MAX Speed (optional), MAX Position (optional), MAX Cool (optional), WiseRoot+ (optional) and WiseThin+ (optional).

 The use of additional welding programs and Wise and MAX features is possible with the X5 FastMig Auto equipment in MIG operation mode. Pulse power source is required for the MAX Position (optional) process and Pulse+ power source for the WiseRoot+ (optional) and WiseThin+ (optional) processes.

Use the welding program that is in accordance with your welding setup (e.g. welding wire and gas properties).

1. Go to the Memory channels view. (Refer to "AP/APC control panel: Channels" on page 115 for more information.)
2. Enter the actions menu.
3. Select **Create channel**.

>> A filter view opens:



4. Use the filter options (e.g. material, wire material or wire diameter) to find the welding programs best suited for the purpose.

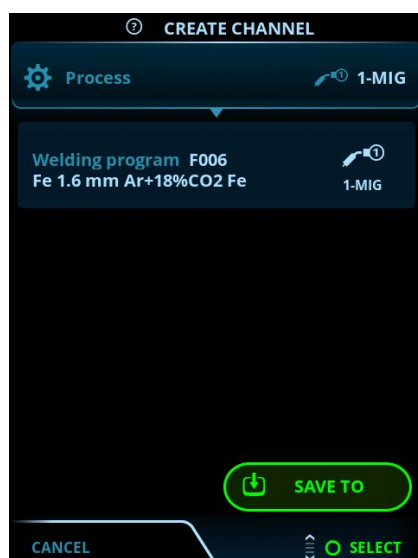
 The operation mode set in the panel [Settings](#) determines for which main welding process the programs here are shown. In MIG mode, the process selection in the Create channel view allows to narrow down the search more specifically to different MIG processes.

 If manual MIG is selected as the process, other filter and welding program selections are disabled.

5. Once ready, go to the **Welding program** selection at the bottom to view the suitable welding programs.



6. Select a welding program.
>> The selected welding program is now shown in the filter view.
7. To save, scroll down to **Save to** and select it.



8. Select the memory channel slot for saving and confirm.

Once ready, you can continue to the Welding parameters view to adjust the welding settings for the new channel, create a new channel or go back to the Channels view.

Tip: It is also possible to create new channels based on all of the unused welding programs available for the selected operation mode by selecting **Create all** in the Channel view's actions menu. This option uses the available memory channel slots.

3.5.10 AP/APC control panel: Weld data view

After each weld, a weld summary is displayed briefly. To change the weld data view duration or how the weld data averages are calculated (with or without slope phases) refer to "AP/APC control panel: Device settings" on page 126.



3.6 Additional guidance to functions and features

This section describes the advanced X5 FastMig functions and features and how to use them.

i Many of the features described here are optional and available with the X5 FastMig Auto and Pulse system configurations only (see "General" on page 5). Refer to the feature-specific descriptions for more information on each feature and function.

When the feature is device model or equipment configuration specific, the emphasized X5 equipment information in the beginning of the section tells its availability: X5 example .

3.6.1 Trigger logic functions

With X5 Wire Feeder 200 Manual, 300 Manual and HD300 M you can select the trigger logic by pressing the trigger logic selection button in the control panel ("Using X5 Manual control panel" on page 90).

With X5 Wire Feeder 300 AP/APC or 300 Auto/Auto+ you can select the trigger logic in the Welding parameters view ("AP/APC control panel: Welding parameters" on page 119 or "Auto control panel: Welding parameters" on page 99).

2T

In 2T, pressing the trigger ignites the arc. Releasing the trigger switches the arc off.



4T

In 4T, pressing the trigger starts the pre gas, and releasing the trigger ignites the arc. Pressing the trigger again switches the arc off. Releasing the trigger ends the post gas.



Powerlog

X5 WF AP/APC

Powerlog trigger logic function allows the user to switch between two or three different power levels. In Powerlog, pressing the trigger starts the pre gas, and releasing the trigger ignites the arc. A quick press of the trigger during welding switches between levels (after the last defined power level the first level is selected). Long-pressing the trigger at any of the levels during welding switches the arc off.



To take Powerlog into use, go to the control panel's [Welding parameters view](#) and select Powerlog as the trigger logic. Once selected, choose whether 2 or 3 power levels are used. Still in the Welding parameters view, set up the power levels for this function. The parameters available for adjustment are:

- Wire feed speed and its minimum and maximum values
- Voltage / Fine tuning
- Dynamics (not available with MAX Cool).

The wire feed speed of each level can also be adjusted in the Home view. Pressing the left control knob button changes between levels. Green color indicates the selected Powerlog level:



- Powerlog trigger logic is not available with manual MIG, MAX Speed, MAX Position or DPulse processes.*
- Powerlog trigger logic cannot be used together with a remote control. If a Powerlog memory channel is selected when a remote control is in use, the trigger logic is automatically switched to 4T.*

3.6.2 1-MIG

X5 WF Auto/Auto+ X5 WF AP/APC

1-MIG or "Auto" is a MIG/MAG welding process where the welding voltage is defined automatically when you adjust the wire feed speed. The voltage is calculated based on the welding program in use. The process is suitable for all materials, shielding gases and welding positions. 1-MIG supports WiseSteel, WisePenetration+ and WiseFusion features, as well as various optimized welding programs.

>> To take 1-MIG into use, go to the [Memory channels view](#) and select an existing memory channel with 1-MIG process.

If there aren't any 1-MIG memory channels available, create a new one for 1-MIG process by selecting an available 1-MIG welding program for the channel. Follow the instructions in "AP/APC control panel: Applying welding programs" on page 129 (AP/APC) or "Auto control panel: Applying welding programs" on page 108 (Auto/Auto+).

- When the X5 equipment is in MIG mode, the '0' memory channel is always reserved for the manual MIG process. All other memory channels are available for any process.*

3.6.3 WiseFusion feature



X5 WF Auto/Auto+ X5 WF AP/APC

The WiseFusion welding feature enables adaptive arc length control, which keeps the arc optimally short and focused. WiseFusion increases the welding speed and penetration and decreases heat input. WiseFusion can be used throughout the power range (short arc, globular arc and spray arc). WiseFusion is compatible with 1-MIG, MAX Position and pulsed MIG welding processes.

- >> To take WiseFusion into use, go to the control panel's **Welding parameters view** and apply the WiseFusion feature.
- >> To adjust the welding power/wire feed speed, in the control panel's **Home view**, turn the left control knob.
- >> To fine-tune the heat output while welding, in the control panel's **Home view**, turn the right control knob.

For more information on Wise products, visit www.kemppi.com.

3.6.4 WisePenetration+ feature



X5 WF Auto/Auto+ X5 WF AP/APC

In standard MIG/MAG welding, changes in stick-out length cause welding current to fluctuate. WisePenetration+ feature maintains constant welding current by controlling the wire feed speed according to the stick-out length. This ensures stable and effective penetration and prevents burn through. WisePenetration+ also adjusts the voltage adaptively, which keeps the arc focused and optimally short. WisePenetration+ enables welding with Reduced Gap Technology (RGT) and is compatible with 1-MIG welding process.

- >> To take WisePenetration+ into use, go to the control panel's **Welding parameters view** and apply the WisePenetration+ feature.
- >> To adjust the welding current while welding, in the control panel's **Home view**, turn the left control knob.
- >> To fine-tune the heat output while welding, in the control panel's **Home view**, turn the right control knob.

For more information on Wise products, visit www.kemppi.com.

3.6.5 WiseSteel feature



X5 WF Auto/Auto+ X5 WF AP/APC

The WiseSteel welding feature is based on modifying the conventional MIG/MAG arcs to enable higher quality of welds. WiseSteel improves the arc control, reduces spatter and helps create an optimally-formed weld pool.

- >> To take WiseSteel into use, go to the control panel's **Welding parameters view** and apply the WiseSteel feature.
- >> To adjust the welding power/wire feed speed while welding, in the control panel's **Home view**, turn the left control knob.
- >> To fine-tune the heat output while welding, in the control panel's **Home view**, turn the right control knob.

When using WiseSteel, different adjustment methods are applied at different power ranges (different arcs). The wire feed speed / current indicator shows the arc range: Short arc — Globular arc — Spray arc.

Short arc range:

- WiseSteel is based on adaptive short arc control; that is, the process adjusts the short circuit ratio. This creates an easily-adjustable arc and less spatter. Within the short arc range, the shape of the current is similar to the traditional short arc welding. When a short arc is used in vertical up welding where weaving motion is applied, WiseSteel ensures good quality through adapting to the changes in the stick-out length.

Globular arc range:

- Globular arc means that WiseSteel fluctuates the power between short arc and spray arc at a low frequency, so that the average power stays within the globular arc range. This results in less spatter than conventional globular arc welding, and a welding pool that enables excellent structural durability.

Spray arc range:

- Within the spray arc range, WiseSteel is based on adaptive arc length control, which keeps the arc optimally short. WiseSteel also utilizes micro-pulsed welding current. This creates a well-formed weld pool that enables excellent bead geometry and optimal penetration with smooth and durable joints, and speeds up the work. The pulsing is not noticeable to the welder. The shape and control of the current are close to the conventional spray arc welding.

WiseSteel feature is available with selected welding programs. For more information on Wise products, visit www.kemppi.com.

3.6.6 Pulse welding

X5 PS Pulse/Pulse+ X5 WF Auto/Auto+ X5 WF AP/APC

The advantages of pulse welding are a higher welding speed and deposition rate compared to short-arc welding, lower heat input compared to spray-arc welding, a spatter-free globular arc and smooth appearance of the weld. Pulse is suitable for all position welding. It is excellent for welding aluminum and stainless steel, especially when the material thickness is small.

Pulse



Pulse is a synergic MIG/MAG welding process where the current is pulsed between the base current and the pulse current.

>> To take Pulse welding process into use, go to **Memory channels** view and select an available Pulse channel.

If there aren't any Pulse memory channels available, create a new one for Pulse process by selecting an available Pulse welding program for the channel. Follow the instructions in "AP/APC control panel: Applying welding programs" on page 129.

>> Once selected, the corresponding Pulse welding process parameters become available for adjustment in the **Welding parameters** view. For more information, refer to the pulse welding parameters in "AP/APC control panel: Welding parameters" on page 119 or "Auto control panel: Welding parameters" on page 99.

DPulse



DPulse is a double-pulse MIG/MAG welding process with two separate power levels. The welding power varies between these two levels. With X5 FastMig, the parameters of each level are controlled independently.

>> To take DPulse welding process into use, go to **Memory channels** view and select an available DPulse channel.

If there aren't any DPulse memory channels available, create a new one for DPulse process by selecting an available DPulse welding program for the channel. Follow the instructions in "AP/APC control panel: Applying welding programs" on page 129.

- >> Once selected, the corresponding DPulse welding process parameters become available for adjustment in the **Welding parameters** view. For more information, refer to the pulse welding parameters in "AP/APC control panel: Welding parameters" on page 119 or "Auto control panel: Welding parameters" on page 99.

3.6.7 WiseRoot+ process

X5 PS Pulse+ X5 WF Auto/Auto+ X5 WF AP/APC

The additional voltage sensing cable is required.

The WiseRoot+ welding process improves the quality of root pass welds. WiseRoot+ is based on accurate measurement of arc voltage.

Before welding, attach the voltage sensing cable to the workpiece. For optimal voltage measurement, connect the earth return cable and the voltage sensing cable close to each other and away from the other welding units' cables.

WiseRoot+ is a synergic MIG/MAG process optimized for open-gap root pass welding. The process is based on precise measurement of voltage between the welding gun nozzle and the workpiece. The measurement data serves as input for the current control. The process is suitable for root pass welding in all positions, and provides a smooth and spatter-free arc.

- >> To take WiseRoot+ into use, go to the control panel's **Welding parameters view** and apply WiseRoot+. Optionally, go to the **Memory channels view** and create a new memory channel with WiseRoot+ process.
- >> To adjust the wire feed speed, turn the left knob when in the main welding view (Home view).
- >> To fine-tune the heat output while welding, turn the right knob when in the main welding view (Home view).

3.6.8 WiseThin+ process

X5 PS Pulse+ X5 WF Auto/Auto+ X5 WF AP/APC

The additional voltage sensing cable is required.

WiseThin+ is a synergic MIG/MAG process whose short-arc features are optimal for welding sheet metals (plate thickness 0.8 - 3.0 mm). It is based on precise measurement of voltage between the welding gun nozzle and the workpiece.

Before welding, attach the voltage sensing cable to the workpiece. For optimal voltage measurement, connect the earth return cable and the voltage sensing cable close to each other and away from the other welding units' cables.

The measurement data serves as input for the voltage control. The process reduces heat input, deformation and spatter. WiseThin+ is also optimal for position welding with thicker plates.

- >> To take WiseThin+ into use, go to the control panel's **Welding parameters view** and apply WiseThin+. Optionally, go to the **Memory channels view** and create a new memory channel with WiseThin+ process.
- >> To adjust the wire feed speed, turn the left knob when in the main welding view (Home view).
- >> To fine-tune the heat output while welding, turn the right knob when in the main welding view (Home view).

3.6.9 MAX Cool process

X5 WF Auto/Auto+ X5 WF AP/APC

MAX Cool is a synergic MIG/MAG welding process that is designed for root pass welds and sheet metal applications. MAX Cool is suitable for all welding positions and provides a smooth arc, reducing spatter.

- >> To take MAX Cool into use, go to the control panel's **Welding parameters view** and apply MAX Cool. Optionally, go to the **Memory channels view** and create a new memory channel with MAX Cool process.
- >> To adjust the wire feed speed while welding, or in the control panel's **Home view**, turn the left control knob. The adjustment's effect on the plate thickness is also shown.
- >> To fine-tune the heat output while welding, or in the control panel's **Home view**, turn the right control knob.

MAX Cool supports these filler wire and shielding gas combinations:

- Fe solid & Ar + 8...25 % CO₂ (1.0 mm, 1.2 mm)

- Fe solid & CO₂ (1.0 mm, 1.2 mm)
- Ss solid & Ar + 2 % CO₂ (1.0 mm, 1.2 mm)
- CuSi3 & Ar (1.0 mm)
- CuAl8 & Ar (1.0 mm).

3.6.10 MAX Position process

X5 PS Pulse/Pulse+ X5 WF Auto/Auto+ X5 WF AP/APC

MAX Position is a synergic MIG/MAG welding process optimized for vertical fillet welds (position: PF). MAX Position automatically switches between two separate power levels. The two power levels can use the same welding process or two different welding processes.

- >> To take MAX Position into use, go to the control panel's **Welding parameters view** and apply MAX Position. Optionally, go to the **Memory channels view** and create a new memory channel with MAX Position process.
- >> In **Welding parameters view**, MAX Position frequency can be adjusted and the optional WiseFusion feature can be applied. The ratio of the two power levels is preset.
- >> To adjust the average wire feed speed while welding, or in the control panel's **Home view**, turn the left control knob. The adjustment's effect on the plate thickness is also shown.
- >> To fine-tune the welding voltage while welding, or in the control panel's **Home view**, turn the right control knob.

MAX Position supports these filler wire and shielding gas combinations:

- Fe solid & Ar + 18% CO₂ (1.0 mm, 1.2 mm)
- Fe solid & Ar + 8% CO₂ (1.0 mm, 1.2 mm)
- Fe MC & Ar + 18% CO₂ (1.2 mm)
- Ss solid & Ar + 2% CO₂ (1.0 mm, 1.2 mm)
- AlMg & Ar (1.0 mm, 1.2 mm)

MAX Position supports these plate thicknesses:

- 3...12 mm

MAX Position utilizes also other welding processes, depending on the material and equipment type:

- Fe & Fe MC: 1-MIG (with low power) and Pulse MIG (with high power)
- Ss & Al: Pulse MIG (throughout the power range).

3.6.11 MAX Speed process

X5 WF Auto/Auto+ X5 WF AP/APC

MAX Speed is a synergic pulsed MIG/MAG welding process. It is designed to maximize the welding speed and to minimize the heat input by modifying the conventional MIG/MAG arcs. MAX Speed is designed for steel and stainless steel welding applications mainly in the PA and PB positions. It is suitable for plate thicknesses above 2.5 mm, the ideal maximum plate thickness being approximately 6 mm.

MAX Speed operates within the spray arc range. Welding current is pulsed with constant frequency and amplitude. Arc length is controlled with the normal voltage control. MAX Speed's low-amplitude pulsing enables an effective transfer mode with lower wire feed speed than with conventional MIG/MAG arc. The pulsing is not noticeable to the welder.

- >> To take MAX Speed into use, go to the control panel's **Welding parameters view** and apply MAX Speed. Optionally, go to the **Memory channels view** and create a new memory channel with MAX Speed process.
- >> To adjust the wire feed speed while welding, or in the control panel's **Home view**, turn the left control knob. The adjustment's effect on the plate thickness is also shown.
- >> To fine-tune the welding voltage while welding, or in the control panel's **Home view**, turn the right control knob.

MAX Speed supports these filler wire and shielding gas combinations:

- Fe solid & Ar + 18% CO₂ (1.0 mm, 1.2 mm)

- Fe solid & Ar + 8% CO₂ (1.0 mm, 1.2 mm)
- Fe MC & Ar + 18% CO₂ (1.2 mm)
- Ss solid & Ar + 2% CO₂ (1.0 mm, 1.2 mm).

3.6.12 Wireless connection (WLAN)

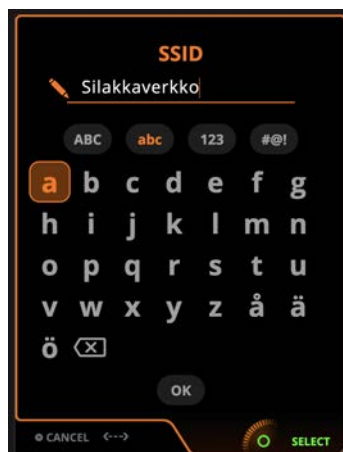
X5 WF APC

To connect the welding equipment to your local wireless network:

1. On the control panel, go to the **WLAN view**.
2. Turn the WLAN feature on by turning and pressing the right control knob.

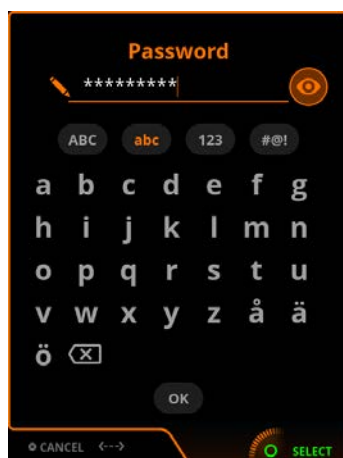


3. Enter your local wireless network's SSID (Service Set Identifier), i.e. the name of your WLAN network.



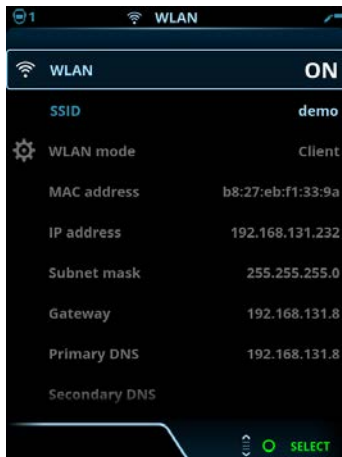
>> Use the right control knob to select letters.

4. Enter your WLAN password.



>> Use the right control knob to select letters.

When connected, the WLAN status information is shown.



 The WLAN mode is set to 'Client' by default and it cannot be changed.

3.6.13 Digital Welding Procedure Specification (dWPS)

X5 WF APC

Digital Welding Procedure Specification (dWPS) is a WPS in digital format that can be set to observe the welding parameters of the supported X5 FastMig equipment. The **WPS view** shows the digital WPSs with one or more weld passes assigned to the welder or welding station in the Kemppi WeldEye cloud service.

The use of digital WPS (Welding Procedure Specification, dWPS) and WeldEye cloud service require X5 Wire Feeder 300 APC and a valid Kemppi WeldEye subscription with the Welding Procedures module. The X5 equipment includes a link to a free trial registration – featuring also a free trial option for WeldEye ArcVision. For more information on WeldEye, refer to weldeye.com or contact your Kemppi representative.

The WPSes can be read on the control panel display and/or a memory channel can be linked with a WPS. X5 Wire Feeder 300 APC control panel provides a couple of ways to do this:

- >> In the main **WPS view**: Follow the more detailed steps in "APC control panel: WPS view" on page 116.
- >> In the **Memory channels view** via activating an existing memory channel: Open the memory channel 'Actions' and choose to link it with a WPS. In the view that opens, select the WPS and weld pass information to be linked with the memory channel. More detailed information on memory channels is in "AP/APC control panel: Channels" on page 115.

Once a WPS is linked to a memory channel, the welding parameters are still manually adjustable, but the adjustment ranges defined on the active WPS are indicated on the screen.

3.6.14 WeldEye ArcVision

X5 WF APC

The use of WeldEye cloud service requires X5 Wire Feeder 300 APC and a valid Kemppi WeldEye subscription. The X5 equipment includes a link to a free trial registration – featuring also a free trial option for WeldEye ArcVision. For more information on WeldEye, refer to weldeye.com or contact your Kemppi representative.

The WeldEye's ArcVision module (optional) is intended for cloud-based tracking of the welding operations carried out with the welding equipment. The ArcVision on the welding device itself is a connection feature for connecting to the WeldEye cloud service. The actual welding information gathered by the welding equipment is passed on to the WeldEye cloud where it can be accessed using a desktop computer and an internet browser.

To take the WeldEye ArcVision feature in use, the equipment must be connected to the internet via the built-in wireless connection (WLAN). Refer to "Wireless connection (WLAN)" on the previous page for instructions.

The X5 FastMig with X5 Wire Feeder 300 APC comes preinstalled with a trial license for ArcVision. The trial license can be activated by following these steps:

1. On the X5 Wire Feeder 300 APC control panel, go to the **WPS view**.
2. Use a QR code reader on your mobile device to open the WeldEye web link or navigate to 'https://register.weldeye.io/weldeye' on your web browser.



3. Complete the registration process as instructed on the registration page. Once finished, the equipment is connected to WeldEye ArcVision.

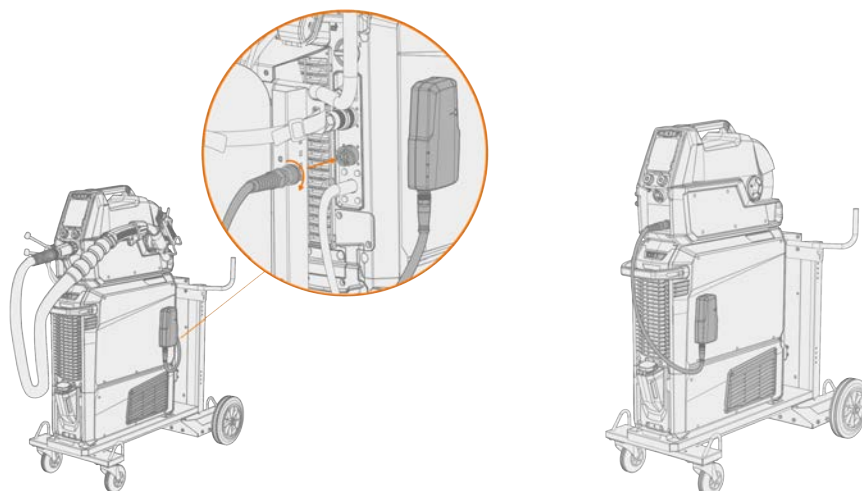
-  You will be required to fill in the serial number and four-digit security pin of your X5 power source. These can be found on the power source rating plate.
-  The free trial registration includes both the WeldEye Welding Procedures and WeldEye ArcVision modules.

3.6.15 WeldEye with DCM

Kemppi's WeldEye welding management software (optional) is also available for use with X5 FastMig.

With X5 Wire Feeder 300 APC, the WeldEye connection option is built-in.

With other X5 FastMig models, an additional Digital Connectivity Module (DCM) device is required. DCM is connected directly to the X5 FastMig's control connection with the cables and adapters delivered with the DCM device. DCM can be connected either to the wire feeder's or to the power source's control connection.



For more information on installing and using the DCM device, refer to userdoc.kemppi.com (DCM/WeldEye).

Discover WeldEye – universal welding management software

WeldEye is your primary tool and storage space for keeping your welding-related documents in order. WeldEye is a universal solution for managing welding production.

WeldEye's modular structure is based on various useful functions that serve the needs of wide-ranging industries and welding-related tasks:

- **Welding procedures**
>> Includes the digital library and management of pWPS, WPQR and WPS templates according to the most important welding standards.
- **Personnel and qualifications**
>> Includes the management and renewal processes of all personnel - welders and inspectors - qualification certificates.
- **Quality management**
>> Includes quality verification functionalities with digital WPS and qualification compliance control against automatically collected digital welding data.
- **Welding management**
>> Includes document register functionalities and features for comprehensive welding project documentation and management.

For more information on WeldEye, refer to www.weldeye.com.

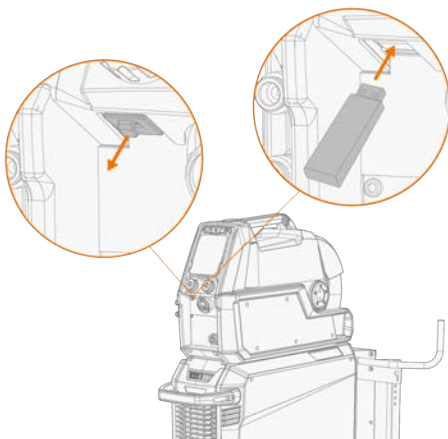
3.6.16 USB backup and restore

X5 WF AP/APC

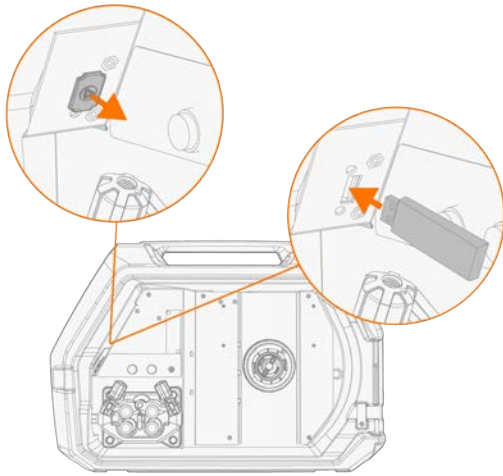
This feature allows the current welding parameters, memory channels and other settings to be backed up on a USB memory stick. These can be restored later on the same welding equipment or other compatible X5 FastMig equipment.

1. Turn the welding equipment on.
2. If creating a backup, go to the device settings and select **Backup**.
3. If restoring from a backup, go to the device settings and select **Restore**.
4. Open the USB connector cover and connect the USB memory stick to the X5 control panel.

>> X5 Wire Feeder 300:



>> X5 Wire Feeder HD300:



5. Follow the steps on the control panel screen to complete the backup/restore operation.

3.6.17 USB update

The USB update feature allows the firmware to be updated as well as welding programs, processes and features to be installed using a USB memory stick.

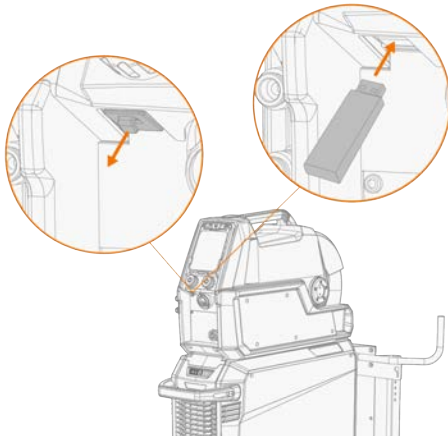
 *There can be only one ZIP file on the USB memory stick inserted into the welding system at once. This can be either a dedicated firmware pack for this welding system or a welding program and license pack (matching the power source serial number). For more information on the available software and compatibility, contact your local Kemppi representative.*

 *In a double wire feeder setup, the update must be performed on both wire feeders separately.*

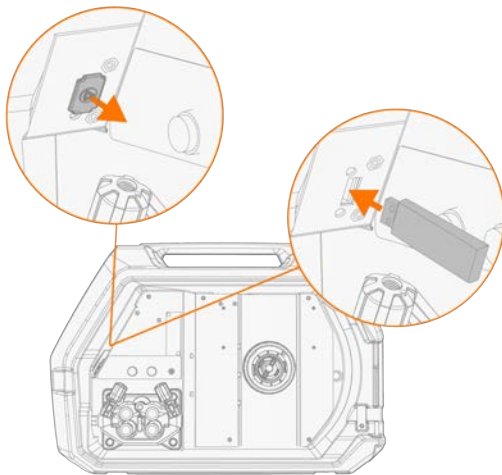
Firmware and welding software

1. Ensure you have the correct firmware/software ZIP package saved on your computer for the welding equipment in question.
2. Connect the USB memory stick to the computer.
3. Prepare the USB memory stick by copying the firmware/software ZIP file into the root folder of the memory stick.
4. Turn the welding equipment on.
5. Open the USB connector cover and connect the USB memory stick to the X5 wire feeder.

>> X5 Wire Feeder 300:



>> X5 Wire Feeder HD300:



6. The update process starts automatically. Follow the on-screen instructions.

Custom screensaver image

X5 WF AP/APC

This screensaver feature is available with X5 Wire Feeder 300 AP/APC and X5 Wire Feeder HD300 AP/APC.

The custom screensaver image must first be prepared at <https://kemp.cc/screensaver> and then copied onto the USB memory stick. The supported image file formats are JPG, PNG and GIF.

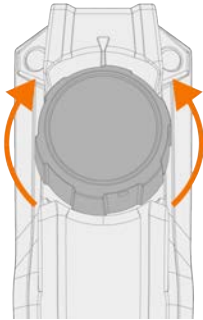
1. On your computer web browser, go to <https://kemp.cc/screensaver>.
2. Following the on-screen instructions, upload, edit and download the new screen saver image onto a USB memory stick.
3. Connect the USB memory stick to the X5 control panel following the same principle than with the software updates (previous chapter) and the on-screen instructions.

The screensaver image is shown during start-up and when the control panel has been idle for a predefined time. The screensaver settings can be adjusted in "AP/APC control panel: Device settings" on page 126.

3.7 Using remote control

Remote control HR43

To adjust the wire feed speed, turn the knob on the remote control.

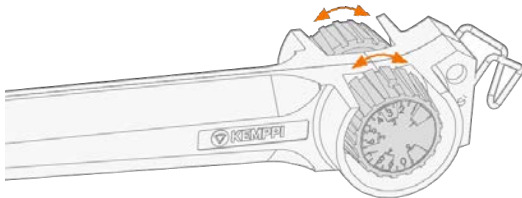


Auto/AP/APC control panel: To change the memory channel instead of the wire feed speed with the remote, change the setting in the control panel settings.

Remote control HR40

To adjust the welding parameters, turn the knobs on the remote control.

In the automatic 1-MIG mode the HR40 control knob functions are defined by the selected 1-MIG process and reflect the adjustments of the control panel's two control knobs.



In the manual MIG mode the adjustments on the remote control as well as the minimum and maximum values for the adjusted parameters can be set in the control panel settings.

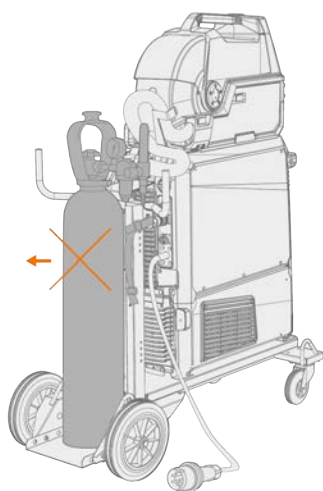
-  With HR40 remote control, the minimum and maximum values affect also the resolution of the remote control adjustment.
-  For the HR40 remote control, welding equipment firmware version 1.30 or newer is required. Check the currently installed version in the Auto/AP/APC control panel's **Info** view (select 'Device info') or in the Manual control panel's advanced settings (select 'Info'). For more information on firmware updates, contact your local Kemppi dealer.

3.8 Lifting equipment

If you need to lift X5 FastMig equipment, pay special attention to the safety measures. Also follow the local regulations. The X5 FastMig equipment can be lifted with a mechanical hoist as a whole only when the equipment is installed securely on a dedicated transport unit.

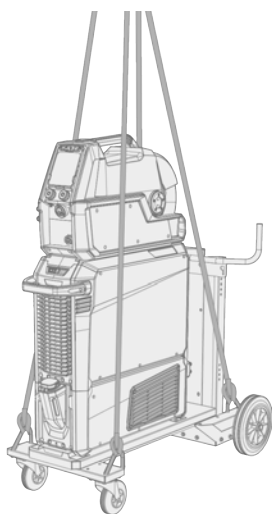
 **DO NOT** attempt to lift the equipment with a hoist from the handle.

 **DO NOT** attempt to lift the cart with the gas bottle in place.



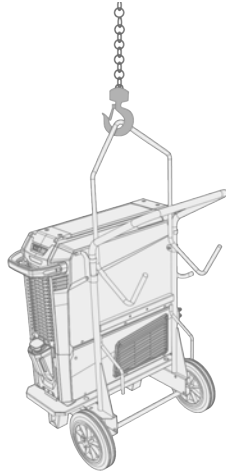
4 wheel cart:

1. Ensure that the welding equipment is properly secured to the cart.
2. Connect the 4-legged chain or straps from the hoist hook to the four lifting points on the cart on both sides of the welding equipment.



2 wheel cart:

1. Ensure that the welding equipment is properly secured to the cart.
2. Connect the hoist hook to the lifting handle on the cart.



4. MAINTENANCE

When considering and planning routine maintenance, consider the operating frequency of the welding system and the working environment.

Correct operating of the welding machine and regular maintenance helps you avoid unnecessary downtime and equipment failure.

4.1 Daily maintenance



Disconnect the power source from the mains before handling electrical cables.

Maintenance of power source and wire feeder

Follow these maintenance procedures to maintain the proper functioning of the welding system:

- Check that all covers and components are intact.
- Check all the cables and connectors. Do not use them if they are damaged and contact service for replacements.
- Check the wire feeder's feed rolls and the pressure handle. Clean and lubricate with a small quantity of light machine oil if needed.

For repairs, contact KempPi at www.kemppi.com or your dealer.

Welding gun maintenance

For Flexlite GX MIG gun instructions, refer to userdoc.kemppi.com.

4.2 Periodic maintenance



Only qualified service personnel is allowed to carry out periodic maintenance.



Only an authorized electrician is allowed to carry out electrical work.



Before removing the cover plate, disconnect the power source from the mains and wait for about 2 minutes before discharging the capacitor.

Check the electric connectors of the unit at least every six months. Clean oxidized parts and tighten loose connectors.



Where applicable, use the correct tension torque when fastening loose parts.

Clean the outside parts of the unit from dust and dirt, for example, with a soft brush and vacuum cleaner. Also clean the ventilation grill at the back of the unit. Do not use compressed air, there is a risk that the dirt will compact even more tightly into gaps of cooling profiles.



Do not use pressure washing devices.

Update the wire feeder to the latest firmware version and load new welding software.

4.3 Service workshops

Kemppi Service Workshops complete the welding system maintenance according to the Kemppi service agreement.

The main aspects in the service workshop maintenance procedure are:

- Cleanup of the machine
- Maintenance of the welding tools
- Checkup of the connectors and switches
- Checkup of all electric connections
- Checkup of the power source mains cable and plug
- Repair of defective parts and replacement of defective components
- Maintenance test
- Test and calibration of operation and performance values when needed

Find your closest service workshop at [Kemppi website](#).

4.4 Troubleshooting



The problems listed and the possible causes are not definitive, but suggest some typical situations that may turn up during normal use of the welding system.

Welding system:

Problem	Recommended actions
The welding system does not power up	Check that the mains cable is plugged in properly.
	Check that the mains switch of the power source is at the ON position.
	Check that the mains power distribution is on.
	Check the mains fuse and/or the circuit breaker.
	Check that the interconnection cable between the power source and the wire feeder is intact and properly attached.
	Check that the earth return cable is connected.
The welding system stops working	Gas-cooled gun may have overheated. Wait for it to cool down.
	Check that none of the cables is loose.
	The wire feeder may have overheated. Wait for it to cool down and see that the welding current cable is properly attached.
	The power source may have overheated. Wait for it to cool down and see that the cooling fans work properly and the air flow is unobstructed.

Wire feeder:

Problem	Recommended actions
The filler wire on the spool unravels	Check that the spool locking cover is closed.
The wire feeder does not feed the filler wire	Check that the filler wire has not run out.
	Check that the filler wire is properly routed through the feed rolls to the wire liner.
	Check that the pressure handle is properly closed.
	Check that the feed roll pressure is adjusted correctly for the filler wire.
	Check that the welding cable is properly connected to the wire feeder.
	Blow compressed air through the wire liner to check that it is not blocked.

Weld quality:

Problem	Recommended actions
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Dirty and/or poor quality weld	Check that the shielding gas has not run out.
	Check that the shielding gas flow is unobstructed.
	Check that the gas type is correct for the application.
	Check the polarity of the gun/electrode.
	Check that the welding procedure is correct for the application.
Varying welding performance	Check that the wire feed mechanism is adjusted properly.
	Blow compressed air through the wire liner to check that it is not blocked.
	Check that the wire liner is correct for the selected wire size and type.
	Check the welding gun contact tip's size, type and wear.
	Check that the welding gun is not overheating.
	Check that the earth return clamp is properly attached to a clean surface of the workpiece.
High spatter volume	Check the welding parameter values and welding procedure.
	Check the gas type and flow.
	Check the polarity of the gun/electrode.
	Check that the filler wire is correct for the current application.

"Error codes" on the next page

4.5 Error codes

In error situations, the control panel displays the number and title of the error. The X5 Wire Feeder 300 Auto control panel also shows the possible cause and a proposed action to fix the issue.

Error			
Code	Title	Possible cause	Proposed action
1	Power source not calibrated	Power source calibration has been lost.	Restart the power source. If problem persists, contact Kemppi service.
2	Too low mains voltage	Voltage in mains network is too low.	Restart the power source. If problem persists, contact Kemppi service.
3	Too high mains voltage	Voltage in mains network is too high.	Restart the power source. If problem persists, contact Kemppi service.
4	Power source is overheated	Too long welding session with high power.	Do not shut down, let the fans cool the machine. If fans are not running, contact Kemppi service
5	Internal 24V voltage is too low	Power source contains an inoperative 24V power supply unit .	Restart the power source. If problem persists, contact Kemppi service.
7	Wire feeder not found	Wire feeder is not connected to power source or connection is faulty.	Check the control cable and its connectors.
8	Initialization error in FPGA card	Control card is faulty or software fails in power source.	Restart the power source. If problem persists, contact Kemppi service.
9	Measurement cable failure	Voltage sensing cable is not connected to the work piece or measurement cable connection is faulty.	Connect voltage sensing cable to the work piece and check the measurement cable and its connectors.
11	FET unit failure	Power source contains an inoperative FET unit.	Restart the power source. If problem persists, contact Kemppi service.
12	Welding cable failure	Plus and minus cables are connected together.	Check the connections of welding cable and earth return cable.
13	IGBT overcurrent	Inoperative mains transformer in power source.	Restart the power source. If problem persists, contact Kemppi service.
14	IGBT overheated	Too long welding session with high power or high ambient temperature.	Do not shut down, let the fans cool the machine. If fans are not running, contact Kemppi service.
17	Phase is missing from mains supply	One or more phases are missing from the mains supply.	Check the mains cable and its connectors. Check the voltage of mains supply.
20	Power source cooling failure	Cooling capacity is reduced in the power source.	Clean the filters and clear any dirt from the cooling channel. Check that the cooling fans are running. If not, contact Kemppi service.
24	Cooling liquid overheated	Too long welding session with high power or high ambient temperature.	Do not turn off the cooler. Let the liquid circulate until the fans cool it down. If fans are not running, contact Kemppi service.
26	Cooling liquid not circulating	No cooling liquid or circulation is blocked.	Check the liquid level in the cooler. Check hoses and connectors for blockage.
27	Cooler not found	Cooling is turned on in the settings menu, but cooler is not connected to power source or cabling is faulty.	Check the cooler connections. Ensure that the cooling is turned off in the settings menu, if the cooler is not in use.

33	Welding cable calibration failure	Welding cable calibration failed.	Check the welding system cables and their connections.
40	VRD error	Open circuit voltage exceeds the VRD limit.	Restart the power source. If problem persists, contact Kemppi service.
42	High current in wire feeder motor	There may be too much pressure in the wire feed rolls or dirt in the wire line.	Adjust the feed roll pressure. Clean the wire line. Change worn parts in the welding gun.
43	Overcurrent in wire feeder motor	There may be too much pressure in the wire feed rolls or dirt in the wire line.	Adjust the feed roll pressure. Clean the wire line. Change worn parts in the welding gun.
44	Wire speed measurement is missing	Faulty sensor or wiring in wire feeder.	Restart the welding system. If problem persists, contact Kemppi service.
50	Welding program error	Required welding program is not installed.	Contact Kemppi service for installing welding programs.
61	Operation not allowed	Subfeeder is connected, but it has not been selected in the system settings.	Go to the system settings menu on the control panel and select your subfeeder model and type.
62	Power source not found	No power source is connected to the wire feeder, or connection is faulty.	Check the control cable and its connectors.
81	Welding program data missing	Welding program data has been lost.	Restart the power source. If problem persists, contact Kemppi service.
238	Power source serial number is missing	Communication to serial number card failed.	Restart welding system. If problem persists, contact Kemppi service.
244	Internal memory failure	Initialization failed (%sub:%device).	Restart welding system. If problem persists, contact Kemppi service.
250	Internal memory failure	Memory communication failed (%sub:%device).	Restart welding system. If problem persists, contact Kemppi service.

4.6 Installing and cleaning power source air filter

An optional power source air filter can be purchased separately. The air filter comes with a fixed casing designed to be mounted directly onto the power source air intake.

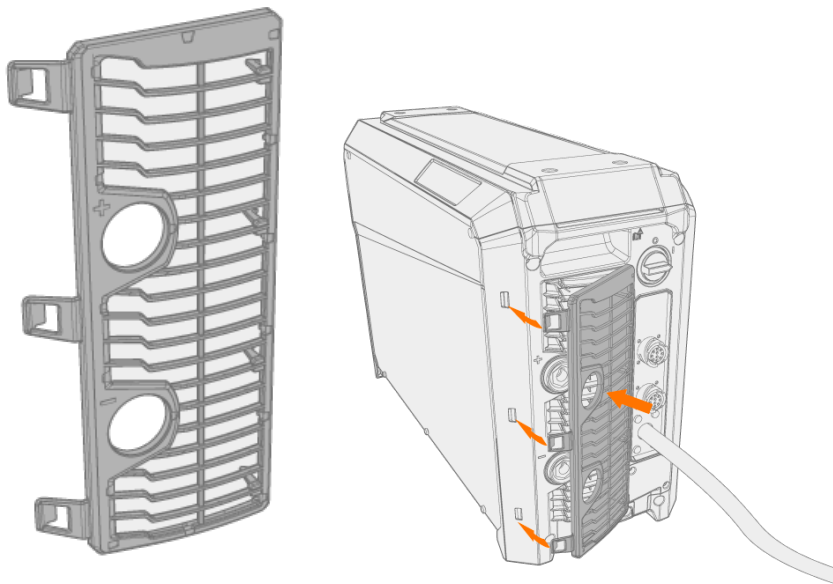
 Using the optional air filter decreases the rated power levels of the power source as follows (output 40 °C): 60% >>> 45% and 100% >>> 100%-20A. This is due to the slightly reduced cooling air intake.

Tools needed:



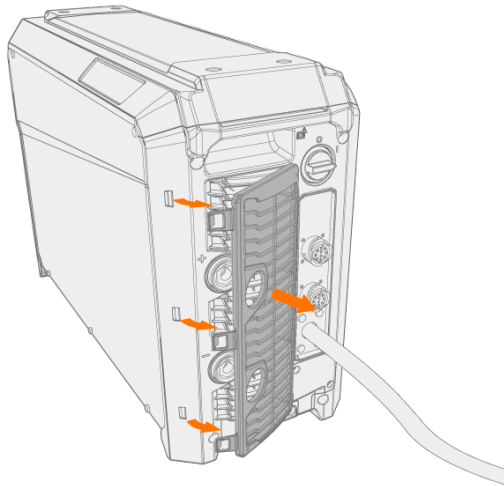
Installation and replacement

1. Place the air filter assembly onto the power source air intake, and lock it in place with the clips on the edge of the casing.

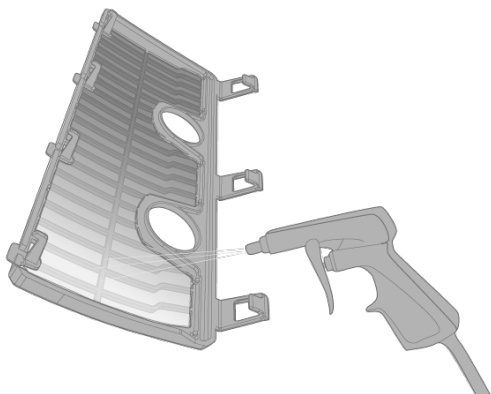


Cleansing

1. Remove the air filter from the power source by releasing the clips on the edge of the air filter casing.



2. Blow the air filter clean with compressed air.



4.7 Disposal



Do not dispose of any electrical equipment with normal waste!

In observance of WEEE Directive 2012/19/EU on waste of electrical and electronic equipment and European Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and their implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and taken to an appropriate environmentally responsible recycling facility. The owner of the equipment is obliged to deliver a decommissioned unit to a regional collection center, as per the instructions of local authorities or a Kemppi representative. By applying these European Directives you improve the environment and human health.

5. TECHNICAL DATA

Technical data:

- For X5 power source technical data, refer to "X5 power sources" on the next page.
- For X5 wire feeder technical data, refer to "X5 wire feeders" on page 173.
- For X5 cooling unit technical data, refer to "X5 cooling unit" on page 179.

Additional information:

- For ordering information, refer to "X5 ordering info" on page 180.

5.1 X5 power sources

X5 Power Source 400

X5 Power Source 400			
Feature			Value
Mains connection voltage 3~50/60 Hz			380...460 V ±10 %
Mains connection cable	H07RN-F		4 mm ²
Input power at rated maximum current			20 kVA
Maximum supply current	@ 380...460 V	I_{1max}	28...24 A
Effective supply current	@ 380...460 V	I_{1eff}	24...21 A
Idle state power consumption	MIG, TIG @ 400 V	P_{1idle}	30 W
No-load state power consumption	MMA (power save) @ 400 V		30 W
	MMA (fans ON) @ 400 V		175 W
No-load voltage	@ 380...460 V	U_0	52...67 V
Open circuit voltage	@ 380...460 V	U_{av}	52...67 V
Fuse	Slow		25 A
Output at +40 °C	60 %		400 A
	100 %		350 A
Welding current and voltage range	MIG		15 A / 12 V ... 400 A / 42 V
	MMA		15 A / 10 V ... 400 A / 42 V
	TIG		15 A / 1 V ... 400 A / 42 V
Voltage adjustment range	MIG		8...45 V
Power factor at rated maximum current	@ 400 V	λ	0.88
Efficiency at rated maximum current	@ 400 V	η	90 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	5.8 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm
Weight			39 kg
Voltage supply for auxiliary devices			12 V, 48 V

Voltage supply for cooling unit			380...460 V, 24 V
Recommended minimum generator power	@ 400 V	S_{gen}	25 kVA
Wired communication type			CAN bus
Standards			IEC 60974-1, -10

X5 Power Source 400 Pulse

X5 Power Source 400 Pulse			
Feature			Value
Mains connection voltage 3~50/60 Hz			380...460 V ±10 %
Mains connection cable	H07RN-F		4 mm ²
Input power at rated maximum current			20 kVA
Maximum supply current	@ 380...460 V	I_{1max}	28...26 A
Effective supply current	@ 380...460 V	I_{1eff}	24...22 A
Idle state power consumption	MIG, TIG @ 400 V	P_{idle}	31 W
No-load state power consumption	MMA (power save) @ 400 V		32 W
	MMA (fans ON) @ 400 V		230 W
No-load voltage	@ 380...460 V	U_0	76...94 V
Open circuit voltage	@ 380...460 V	U_{av}	76...94 V
Fuse	Slow		25 A
Output at +40 °C	60 %		400 A
	100 %		350 A
Welding current and voltage range	MIG		15 A / 10 V ... 400 A / 50 V
	MMA		15 A / 10 V ... 400 A / 50 V
	TIG		15 A / 1 V ... 400 A / 50 V
Voltage adjustment range	MIG		8...50 V
Power factor at rated maximum current	@ 400 V	λ	0.85
Efficiency at rated maximum current	@ 400 V	η	89 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	6.3 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm
Weight			39.5 kg
Voltage supply for auxiliary devices			12 V, 48 V
Voltage supply for cooling unit			380...460 V , 24 V

Recommended minimum generator power	@ 400 V	S_{gen}	25 kVA
Wired communication type			CAN bus
Standards			IEC 60974-1, -10

X5 Power Source 400 Pulse+

X5 Power Source 400 Pulse+			
Feature			Value
Mains connection voltage 3~50/60 Hz			380...460 V ±10 %
Mains connection cable	H07RN-F		4 mm ²
Input power at rated maximum current			20 kVA
Maximum supply current	@ 380...460 V	$I_{1\max}$	28...26 A
Effective supply current	@ 380...460 V	$I_{1\text{eff}}$	24...22 A
Idle state power consumption	MIG, TIG @ 400 V	P_{idle}	33 W
No-load state power consumption	MMA (power save) @ 400 V		34 W
	MMA (fans ON) @ 400 V		230 W
No-load voltage	@ 380...460 V	U_0	76...94 V
Open circuit voltage	@ 380...460 V	U_{av}	76...94 V
Fuse	Slow		25 A
Output at +40 °C	60 %		400 A
	100 %		350 A
Welding current and voltage range	MIG		15 A / 10 V ... 400 A / 50 V
	MMA		15 A / 10 V ... 400 A / 50 V
	TIG		15 A / 1 V ... 400 A / 50 V
Voltage adjustment range	MIG		8...50 V
Power factor at rated maximum current	@ 400 V	λ	0.86
Efficiency at rated maximum current	@ 400 V	η	89 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	6.3 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm
Weight			39.5 kg
Voltage supply for auxiliary devices			12 V, 48 V
Voltage supply for cooling unit			380...460 V , 24 V

Recommended minimum generator power	@ 400 V	S_{gen}	25 kVA
Wired communication type			CAN bus
Standards			IEC 60974-1, -10

X5 Power Source 400 MV Pulse+

X5 Power Source 400 MV Pulse+			
Feature			Value
Mains connection voltage 3~50/60 Hz			220...230 V ±10 % 380...460 V ±10 %
Mains connection cable	H07RN-F		6 mm ²
Input power at rated maximum current			19 kVA
Maximum supply current	@ 220...230 V	I_{1max}	47 A
	@ 380...460 V	I_{1max}	28...24 A
Effective supply current	@ 220...230 V	I_{1eff}	30 A
	@ 380...460 V	I_{1eff}	22...19 A
Idle state power consumption	MIG, TIG @ 400 V	P_{idle}	33 W
No-load state power consumption	MMA (power save) @ 400 V		34 W
	MMA (fans ON) @ 400 V		230 W
No-load voltage	@ 220...230 V	U_0	72 V
	@ 380...460 V	U_0	76...94 V
Open circuit voltage	@ 380...460 V	U_{av}	76...94 V
Fuse	Slow, @ 220...230 V		25 A
	Slow, @ 380...460 V		32 A
Output at +40 °C	40 % @ 220...230 V		400 A
	60 % @ 380...460 V		400 A
	100 %		350 A
Welding current and voltage range	MIG		15 A / 10 V ... 400 A / 45 V
	MMA		15 A / 10 V ... 400 A / 45 V
	TIG		15 A / 1 V ... 400 A / 45 V
Voltage adjustment range	MIG		8...45 V
Power factor at rated maximum current	@ 400 V	λ	0.89
Efficiency at rated maximum current	@ 400 V	η	89 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	5.3 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm

Weight	43.5 kg
Voltage supply for auxiliary devices	12 V, 48 V
Voltage supply for cooling unit	220...230 V, 24 V 380...460 V, 24 V
Recommended minimum generator power @ 400 V S_{gen}	25 kVA
Wired communication type	CAN bus
Standards	IEC 60974-1, -10

X5 Power Source 500

X5 Power Source 500			
Feature			Value
Mains connection voltage 3~50/60 Hz			380...460 V ±10 %
Mains connection cable	H07RN-F		6 mm ²
Input power at rated maximum current			27 kVA
Maximum supply current	@ 380...460 V	$I_{1\max}$	38...33 A
Effective supply current	@ 380...460 V	$I_{1\text{eff}}$	31...27 A
Idle state power consumption	MIG, TIG @ 400 V	P_{idle}	30 W
No-load state power consumption	MMA (power save) @ 400 V		30 W
	MMA (fans ON) @ 400 V		195 W
No-load voltage	@ 380...460 V	U_0	59...75 V
Open circuit voltage	@ 380...460 V	U_{av}	59...75 V
Fuse	Slow		32 A
Output at +40 °C	60 %		500 A
	100 %		430 A
Welding current and voltage range	MIG		15 A / 10 V ... 500 A / 47 V
	MMA		15 A / 10 V ... 500 A / 47 V
	TIG		15 A / 1 V ... 500 A / 47 V
Voltage adjustment range	MIG		8...50 V
Power factor at rated maximum current	@ 400 V	λ	0.88
Efficiency at rated maximum current	@ 400 V	η	90 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	6.4 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm
Weight			39,5 kg
Voltage supply for auxiliary devices			12 V, 48 V
Voltage supply for cooling unit			380 ... 460 V , 24V

Recommended minimum generator power	@ 400 V	S_{gen}	35 kVA
Wired communication type			CAN bus
Standards			IEC 60974-1, -10

X5 Power Source 500 Pulse

X5 Power Source 500 Pulse			
Feature			Value
Mains connection voltage 3~50/60 Hz			380...460 V ±10 %
Mains connection cable	H07RN-F		6 mm ²
Input power at rated maximum current			27 kVA
Maximum supply current	@ 380...460 V	$I_{1\max}$	39...34 A
Effective supply current	@ 380...460 V	$I_{1\text{eff}}$	30...27 A
Idle state power consumption	MIG, TIG @ 400 V	$P_{1\text{idle}}$	31 W
No-load state power consumption	MMA (power save) @ 400 V		32 W
	MMA (fans ON) @ 400 V		240 W
No-load voltage	@ 380...460 V	U_0	76...94 V
Open circuit voltage	@ 380...460 V	U_{av}	76...94 V
Fuse	Slow		32 A
Output at +40 °C	60 %		500 A
	100 %		400 A
Welding current and voltage range	MIG		15 A / 10 V ... 500 A / 50 V
	MMA		15 A / 10 V ... 500 A / 50 V
	TIG		15 A / 1 V ... 500 A / 50 V
Voltage adjustment range	MIG		8...50 V
Power factor at rated maximum current	@ 400 V	λ	0.89
Efficiency at rated maximum current	@ 400 V	η	89 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	6.7 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm
Weight			39,5 kg
Voltage supply for auxiliary devices			12 V, 48 V
Voltage supply for cooling unit			380 ... 460 V , 24V

Recommended minimum generator power	@ 400 V	S_{gen}	35 kVA
Wired communication type			CAN bus
Standards			IEC 60974-1, -10

X5 Power Source 500 Pulse+

X5 Power Source 500 Pulse+			
Feature			Value
Mains connection voltage 3~50/60 Hz			380...460 V ±10 %
Mains connection cable	H07RN-F		6 mm ²
Input power at rated maximum current			27 kVA
Maximum supply current	@ 380...460 V	I_{1max}	39...34 A
Effective supply current	@ 380...460 V	I_{1eff}	30...27 A
Idle state power consumption	MIG, TIG @ 400 V	P_{1idle}	33 W
No-load state power consumption	MMA (power save) @ 400 V		34 W
	MMA (fans ON) @ 400 V		240 W
No-load voltage	@ 380...460 V	U_0	76...94 V
Open circuit voltage	@ 380...460 V	U_{av}	76...94 V
Fuse	Slow		32 A
Output at +40 °C	60 %		500 A
	100 %		400 A
Welding current and voltage range	MIG		15 A / 10 V ... 500 A / 50 V
	MMA		15 A / 10 V ... 500 A / 50 V
	TIG		15 A / 1 V ... 500 A / 50 V
Voltage adjustment range	MIG		8...50 V
Power factor at rated maximum current	@ 400 V	λ	0.89
Efficiency at rated maximum current	@ 400 V	η	88 %
Operating temperature range			-20...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Minimum short-circuit power of supply network		S_{SC}	6.7 MVA
Degree of protection			IP23S
External dimensions	$L \times W \times H$		750 x 263 x 456 mm
Package external dimensions	$L \times W \times H$		785 x 285 x 505 mm
Weight			39,5 kg
Voltage supply for auxiliary devices			12 V, 48 V
Voltage supply for cooling unit			380 ... 460 V , 24V

Recommended minimum generator power	@ 400 V	S_{gen}	35 kVA
Wired communication type			CAN bus
Standards			IEC 60974-1, -10

5.2 X5 wire feeders

X5 Wire Feeder 200 Manual

X5 Wire Feeder 200 Manual		
Feature		Value
Supply voltage		48 V
Supply current at maximum load		6.3 A
Idle power		6 W
Idle power with cabinet heater		30 W
Welding current	60 %	500 A
	100 %	430 A
Gun connection		Euro
Wire feed mechanism		4-roll, single-motor
Diameter of feed rolls		32 mm
Filler wires	Fe	0.8 ... 1.6 mm
	Ss	0.8 ... 1.6 mm
	MC/FC	0.8 ... 2.0 mm
	Al	0.8 ... 2.4 mm
Wire feed speed		0.5 ... 25 m/min
Maximum wire spool weight		5 kg
Maximum wire spool diameter		200 mm
Maximum shielding gas pressure		0.5 MPa
Operating temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
EMC class		A
Degree of protection		IP23S
External dimensions	<i>L x W x H</i>	565 x 218 x 339 mm
Package external dimensions	<i>L x W x H</i>	598 x 258 x 371 mm
Weight		9.7 kg
Control panel *	Built-in	X5 Feeder Panel 200R (Manual control panel) *
Wired communication type		CAN bus
Standards		IEC 60974-5, 10

* See "Control panel information:" on page 177 for more details.

X5 Wire Feeder 300 Manual

X5 Wire Feeder 300 Manual		
Feature		Value
Supply voltage		48 V

Supply current at maximum load		6.3 A
Idle power		6 W
Idle power with cabinet heater		30 W
Welding current	60 %	500 A
	100 %	430 A
Gun connection		Euro
Wire feed mechanism		4-roll, single-motor
Diameter of feed rolls		32 mm
Filler wires	Fe	0.8 ... 2.0 mm
	Ss	0.8 ... 2.0 mm
	MC/FC	0.8 ... 2.4 mm
	Al	0.8 ... 2.4 mm
Wire feed speed		0.5 ... 25 m/min
Maximum wire spool weight		20 kg
Maximum wire spool diameter		300 mm
Maximum shielding gas pressure		0.5 MPa
Operating temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
EMC class		A
Degree of protection		IP23S
External dimensions	<i>L x W x H</i>	650 x 230 x 410 mm
Package external dimensions	<i>L x W x H</i>	730 x 300 x 520 mm
Weight		10.9 kg
Control panel *	Built-in	X5 Feeder Panel 300R (Manual control panel) *
Wired communication type		CAN bus
Standards		IEC 60974-5, 10

* See "Control panel information:" on page 177 for more details.

X5 Wire Feeder 300 AP/APC

X5 Wire Feeder 300 AP/APC		
Feature		Value
Supply voltage		48 V
Supply current at maximum load		6.3 A
Idle power		6 W
Idle power with cabinet heater		30 W
Welding current	60 %	500 A
	100 %	430 A
Gun connection		Euro

Wire feed mechanism		4-roll, single-motor
Diameter of feed rolls		32 mm
Filler wires	Fe	0.8 ... 2.0 mm
	Ss	0.8 ... 2.0 mm
	MC/FC	0.8 ... 2.4 mm
	Al	0.8 ... 2.4 mm
Wire feed speed		0.5 ... 25 m/min
Maximum wire spool weight		20 kg
Maximum wire spool diameter		300 mm
Maximum shielding gas pressure		0.5 MPa
Operating temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
EMC class		A
Degree of protection		IP23S
External dimensions	<i>L x W x H</i>	650 x 230 x 410 mm
Package external dimensions	<i>L x W x H</i>	730 x 300 x 520 mm
Weight		10.9 kg
Wired communication type		CAN bus
Control panel *	Built-in	X5 Wire Feeder 300 AP or APC control panel *
Standards		IEC 60974-5, 10

* See "Control panel information:" on page 177 for more details.

X5 Wire Feeder HD300 AP/APC/M

X5 Wire Feeder HD300 AP/APC/M		
Feature		Value
Supply voltage		48 V
Supply current at maximum load		6.3 A
Idle power		6 W
Idle power with cabinet heater		11 W
Welding current	60 %	500 A
	100 %	430 A
Gun connection		Euro
Wire feed mechanism		4-roll, single-motor
Diameter of feed rolls		32 mm
Filler wires	Fe	0.8 ... 2.0 mm
	Ss	0.8 ... 2.0 mm
	MC/FC	0.8 ... 2.4 mm
	Al	0.8 ... 2.4 mm

Wire feed speed		0.5 ... 25 m/min
Maximum wire spool weight		20 kg
Maximum wire spool diameter		300 mm
Maximum shielding gas pressure		0.5 MPa
Operating temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
EMC class		A
Degree of protection		IP23S
External dimensions	<i>L x W x H</i>	670 x 240 x 465 mm
Package external dimensions	<i>L x W x H</i>	730 x 300 x 520 mm
Weight		14.4 kg
Wired communication type		CAN bus
Rechargeable battery	Built-in, for LED work lights	LG CHEM: ICR18650HE4; Li-ion, 3.6 V, 2500 mAh Samsung SDI: INR18650-26J; Li-ion, 3.6 V, 2600 mAh
Control panel *	Built-in	X5 Wire Feeder 300 AP, APC or Manual control panel *
Standards		IEC 60974-5, 10

* See "Control panel information:" on the next page for more details.

X5 Wire Feeder 300 Auto/Auto+

X5 Wire Feeder 300 Auto/Auto+		
Feature		Value
Supply voltage		48 V
Supply current at maximum load		6.3 A
Idle power		6 W
Idle power with cabinet heater		30 W
Welding current	60 %	500 A
	100 %	430 A
Gun connection		Euro
Wire feed mechanism		4-roll, single-motor
Diameter of feed rolls		32 mm
Filler wires	Fe	0.8 ... 2.0 mm
	Ss	0.8 ... 2.0 mm
	MC/FC	0.8 ... 2.4 mm
	Al	0.8 ... 2.4 mm
Wire feed speed		0.5 ... 25 m/min
Maximum wire spool weight		20 kg
Maximum wire spool diameter		300 mm

Maximum shielding gas pressure	0.5 MPa
Operating temperature range	-20...+40 °C
Storage temperature range	-40...+60 °C
EMC class	A
Degree of protection	IP23S
External dimensions <i>L x W x H</i>	650 x 230 x 410 mm
Package external dimensions <i>L x W x H</i>	730 x 300 x 520 mm
Weight	10.9 kg
Wired communication type	CAN bus
Control panel * Built-in	X5 Wire Feeder 300 Auto control panel
Standards	IEC 60974-5, 10

* See "Control panel information:" below for more details.

Control panel information:

X5 Wire Feeder 200 Manual control panel

X5 Wire Feeder 200 Manual control panel	
Feature	Value
Model designation	X5 Feeder Panel 200R
Type of installation	Built-in / preinstalled
Controls	- 2 control knobs with push button function - Membrane push buttons
Display	Black&white OLED
Rating	12 V DC, 100 mA (Host device power output to control panel shall not exceed 15W)

X5 Wire Feeder 300 Manual control panel

X5 Wire Feeder 300 Manual control panel	
Feature	Value
Model designation	X5 Feeder Panel 300R
Type of installation	Built-in / preinstalled
Controls	- 2 control knobs with push button function - Membrane push buttons
Display	Black&white OLED
Rating	12 V DC, 100 mA (Host device power output to control panel shall not exceed 15W)

X5 Wire Feeder 300 APC control panel

X5 Wire Feeder 300 APC control panel	
Feature	Value
Model designation	X5 Feeder Panel 300 APC

Type of installation	Built-in / preinstalled
Controls	- 2 control knobs with push button function - 3 shortcut buttons
Display	5.7" LCD
Rating	12 V DC ($\pm 10\%$) (Host device power output to control panel shall not exceed 15W)
Wireless communication type	Internal wireless WLAN/Bluetooth module: WUBT-236ACN(BT)
- Wireless local area network (WLAN) standard	IEEE 802.11 ac/a/b/g/n
- Bluetooth version	4.2 (LE)
- Transmitter frequency and power, WLAN	2.412...2.484 GHz, 5.150...5.850 GHz; 9...16 dBm
- Transmitter frequency and power, Bluetooth	2.4 GHz; 4 dBm

X5 Wire Feeder 300 AP control panel

X5 Wire Feeder 300 AP control panel	
Feature	Value
Model designation	X5 Feeder Panel 300 AP
Type of installation	Built-in / preinstalled
Controls	- 2 control knobs with push button function - 3 shortcut buttons
Display	5.7" LCD
Rating	12 V DC ($\pm 10\%$) (Host device power output to control panel shall not exceed 15W)

X5 Wire Feeder 300 Auto control panel

X5 Wire Feeder 300 Auto control panel	
Feature	Value
Model	X5 Feeder Panel 300
Type of installation	Built-in / preinstalled
Controls	- 2 control knobs with push button function - 3 shortcut buttons
Display	5.7" TFT/LCD
Rating	12 V DC, 100 mA (Host device power output to control panel shall not exceed 15W)

5.3 X5 cooling unit

X5 Cooler

X5 Cooler			
Feature			Value
Supply voltage		U_1	380...460 V +/- 10 %
Maximum supply current	@ 380...460 V	I_{1max}	0.7 A
Cooling power	@ 1 l/min		1.1 kW
Recommended coolant			MGP 4456 (Kemppi mixture)
Maximum coolant pressure			0.4 MPa
Tank volume			4 l
Operating temperature range	With recommended coolant		-10...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Degree of protection	When mounted		IP23S
Package external dimensions	$L \times W \times H$		790 x 300 x 320 mm
Weight	Without accessories		14.3 kg
Standards			IEC 60974-2, -10

X5 Cooler MV

X5 Cooler MV			
Feature			Value
Supply voltage		U_1	220...230 V +/- 10 % 380...460 V +/- 10 %
Maximum supply current	@ 220...230 V	I_{1max}	1.0 A
	@ 380...460 V	I_{1max}	0.7 A
Cooling power	@ 1 l/min		1.0 kW
Recommended coolant			MGP 4456 (Kemppi mixture)
Maximum coolant pressure			0.4 MPa
Tank volume			4 l
Operating temperature range	With recommended coolant		-10...+40 °C
Storage temperature range			-40...+60 °C
EMC class			A
Degree of protection	When mounted		IP23S
Package external dimensions	$L \times W \times H$		790 x 300 x 320 mm
Weight	Without accessories		15.7 kg
Standards			IEC 60974-2, -10

5.4 X5 ordering info

For X5 FastMig ordering information and optional accessories, refer to [Kempfi.com](https://kempfi.com).

5.5 Wire feeder consumables

This section lists the feed rolls and wire guide tubes available both separately and in consumable kits. The consumable kits contain recommended feed roll and wire guide tube combinations for selected filler wire materials and diameters. The wire feeder consumables can be ordered in [Configurator.kemppi.com](https://configurator.kemppi.com).

In the tables, *standard* refers to plastic feed rolls and *heavy-duty* refers to metal feed rolls. The materials mentioned first refer to primary suitability and the materials mentioned inside brackets refer to secondary suitability.

Wire feeder consumable kits

The table below lists the recommended consumable kits for selected filler wire materials and diameters.

Wire feeder consumable kits				
Filler wire material	Feed roll profile	Filler wire diameter (mm)	Consumable kit code, standard	Consumable kit code, heavy-duty
Fe (MC/FC)	V-groove	0.8–0.9	F000488	F000492
		1.0	F000489	F000493
		1.2	F000490	F000494
		1.6	F000491	F000495
Ss (Fe, Cu)	V-groove	0.8–0.9	F000455	-
		1.0	F000456	-
		1.2	F000457	-
		1.4	F000496	-
		1.6	F000497	-
Ss (Fe)	V-groove	0.8–0.9	-	F000458
		1.0	-	F000459
		1.2	-	F000460
		1.6	-	F000498
MC/FC	V-groove, knurled	1.0	F000499	F000502
		1.2	F000500	F000503
		1.4–1.6	F000501	F000504
		2.0	-	F000505
Al	U-groove	1.0	F000461	-
		1.2	F000462	-
		1.6	F000506	-

Wire guide tubes

The table below lists the wire guide tubes available.

Wire guide tubes					
Filler wire material	Filler wire diameter (mm)	Feed roll identification	Inlet tube	Middle tube	Outlet tube

Al, Ss (Fe, MC, FC)	0.6		SP007293	SP007273	SP016608
	0.8–0.9		SP007294	SP007274	SP011440
	1.0		SP007295	SP007275	SP011441
	1.2		SP007296	SP007276	SP011442
	1.4		SP007297	SP007277	SP016609
	1.6		SP007298	SP007278	SP016610
	2.0		SP007299	SP007279	SP016611
	2.4		SP007300	SP007280	SP016612
Fe, MC, FC	0.6		(SP007293)	(SP007273)	SP016613
	0.8–0.9		SP007536	(SP007274)	SP016614
	1.0		SP007537	(SP007275)	SP016615
	1.2		SP007538	(SP007276)	SP016616
	1.4		(SP007297)	(SP007277)	SP016617
	1.4–1.6		SP007539	(SP007278)	SP016618
	2.0		SP007540	(SP007279)	SP016619
	2.4		SP007541	(SP007280)	SP016620

Feed rolls

The table below lists the standard feed rolls available.

Wire feed rolls, standard					
Filler wire material	Feed roll profile	Filler wire diameter (mm)	Feed roll identification	Drive roll code	Pressure roll code
Fe, Ss, Cu (Al, MC/FC)	V-groove V	0.6		W001045	W001046
		0.8–0.9		W001047	W001048
		1.0		W000675	W000676
		1.2		W000960	W000961
		1.4		W001049	W001050
		1.6		W001051	W001052
		2.0		W001053	W001054
		2.4		W001055	W001056

MC/FC (Fe)	V-groove, knurled V	1.0		W001057	W001058
		1.2		W001059	W001060
		1.4–1.6		W001061	W001062
		2.0		W001063	W001064
		2.4		W001065	W001066
Al (MC/FC, Ss, Fe, Cu)	U-groove U	1.0		W001067	W001068
		1.2		W001069	W001070
		1.4		W008974	W008975
		1.6		W001071	W001072

The table below lists the heavy-duty feed rolls available.

Wire feed rolls, heavy-duty				
Filler wire material	Feed roll profile	Filler wire diameter (mm)	Drive roll code	Pressure roll code
Fe, Ss (MC/FC)	V-groove V	0.8–0.9	W006074	W006075
		1.0	W006076	W006077
		1.2	W004754	W004753
		1.6	W006078	W006079
MC/FC (Fe)	V-groove, knurled V	1.0	W006080	W006081
		1.2	W006082	W006083
		1.4–1.6	W006084	W006085
		2.0	W006086	W006087
(MC/FC, Ss, Fe)	U-groove U	1.0	W006088	W006089
		1.2	W006090	W006091
		1.6	W006092	W006093

5.6 Welding program work packs

Welding program work packs include a set of standard welding programs to allow welding with e.g. automatic 1-MIG and pulse processes. For more information on the available X5 FastMig welding program options and installing the welding programs or software updates, contact your local Kemppi dealer or go to Kemppi.com.

1-MIG work pack:

Welding program	Process	Wire material	Wire diameter	Shielding gas	Description
A01	1-MIG	AlMg5	1.0	Ar	Standard
A02	1-MIG	AlMg5	1.2	Ar	Standard
A11	1-MIG	AlSi5	1.0	Ar	Standard
A12	1-MIG	AlSi5	1.2	Ar	Standard
C01	1-MIG	CuSi3	0.8	Ar	Standard: Brazing
C03	1-MIG	CuSi3	1.0	Ar	Standard: Brazing
C11	1-MIG	CuAl8	0.8	Ar	Standard: Brazing
C13	1-MIG	CuAl8	1.0	Ar	Standard: Brazing
F01	1-MIG	Fe	0.8	Ar+18%CO ₂	Standard
F02	1-MIG	Fe	0.9	Ar+18%CO ₂	Standard
F03	1-MIG	Fe	1.0	Ar+18%CO ₂	Standard
F04	1-MIG	Fe	1.2	Ar+18%CO ₂	Standard
F06	1-MIG	Fe	1.6	Ar+18%CO ₂	Standard
F11	1-MIG	Fe	0.8	Ar+8%CO ₂	Standard
F12	1-MIG	Fe	0.9	Ar+8%CO ₂	Standard
F13	1-MIG	Fe	1.0	Ar+8%CO ₂	Standard
F14	1-MIG	Fe	1.2	Ar+8%CO ₂	Standard
F21	1-MIG	Fe	0.8	CO ₂	Standard
F22	1-MIG	Fe	0.9	CO ₂	Standard
F23	1-MIG	Fe	1	CO ₂	Standard
F24	1-MIG	Fe	1.2	CO ₂	Standard
F26	1-MIG	Fe	1.6	CO ₂	Standard
M04	1-MIG	Fe Metal	1.2	Ar+18%CO ₂	Standard
M06	1-MIG	Fe Metal	1.6	Ar+18%CO ₂	Standard
R04	1-MIG	Fe Rutil	1.2	Ar+18%CO ₂	Standard
R06	1-MIG	Fe Rutil	1.6	Ar+18%CO ₂	Standard
S01	1-MIG	Ss	0.8	Ar+2%CO ₂	Standard
S02	1-MIG	Ss	0.9	Ar+2%CO ₂	Standard
S03	1-MIG	Ss	1.0	Ar+2%CO ₂	Standard
S04	1-MIG	Ss	1.2	Ar+2%CO ₂	Standard
S82	1-MIG	FC-CrNiMo	0.9	Ar+18%CO ₂	Standard
S84	1-MIG	FC-CrNiMo	1.2	Ar+18%CO ₂	Standard

Pulse work pack:

The Pulse work pack includes also all 1-MIG work pack welding programs.

Welding program	Process	Wire material	Wire diameter	Shielding gas	Description
A01	Pulse	AlMg5	1.0	Ar	Standard
A02	Pulse	AlMg5	1.2	Ar	Standard
A11	Pulse	AlSi5	1.0	Ar	Standard
A12	Pulse	AlSi5	1.2	Ar	Standard
C01	Pulse	CuSi3	0.8	Ar	Standard: Brazing
C03	Pulse	CuSi3	1.0	Ar	Standard: Brazing
C11	Pulse	CuAl8	0.8	Ar	Standard: Brazing
C13	Pulse	CuAl8	1.0	Ar	Standard: Brazing
F01	Pulse	Fe	0.8	Ar+18%CO ₂	Standard
F02	Pulse	Fe	0.9	Ar+18%CO ₂	Standard
F03	Pulse	Fe	1.0	Ar+18%CO ₂	Standard
F04	Pulse	Fe	1.2	Ar+18%CO ₂	Standard
F11	Pulse	Fe	0.8	Ar+8%CO ₂	Standard
F12	Pulse	Fe	0.9	Ar+8%CO ₂	Standard
F13	Pulse	Fe	1.0	Ar+8%CO ₂	Standard
F14	Pulse	Fe	1.2	Ar+8%CO ₂	Standard
M04	Pulse	Fe Metal	1.2	Ar+18%CO ₂	Standard
S01	Pulse	Ss	0.8	Ar+2%CO ₂	Standard
S02	Pulse	Ss	0.9	Ar+2%CO ₂	Standard
S03	Pulse	Ss	1.0	Ar+2%CO ₂	Standard
S04	Pulse	Ss	1.2	Ar+2%CO ₂	Standard