Robotic Welding

PRODUCT CATALOGUE

2023

KEMPPI

Contents

Introduction

Kemppi develops and offers cutting edge solutions for robotic and automated arc welding applications.

We offer arc welding equipment for highly efficient and cost-effective robotic welding applications, ranging from thin sheet products to heavy plates, and from mild and stainless steel to aluminum applications.

Our complete process packages consist of a modern power source, a reliable wire feeder, a robust welding gun, clever connection cable solutions and a complete offering of process related accessories.

With Kemppi's unique MAX and Wise special welding processes, you can reach new levels of productivity in robotic welding. Application specific solutions are available to help you win a competitive edge over your competitors. Our intense research and development of the welding processes guarantees the best support for every Kemppi customer today and in the future, during the entire life cycle of the robotic arc welding system.

Kemppi solutions can be selected from different technology and cost levels, and thus the solution you choose always provides the best value for the investment – without compromising quality.

Kemppi arc welding solution packages are easy to install and work perfectly with all well-known robot brands. Our solutions can utilize all common modern fieldbus protocols for communication between the robot controller and the power source. An analogue interface is also available for retrofit cases.

ABB   UNIVERSAL ROBOTS   FANUC   Kawasaki Robotics   KUKA   YASKAWA

EtherCAT Technology Group   DeviceNet   PROFIBUS   EtherNet/IP   PROFINET

Also with CANOpen and ModBus.

Kemppi
Globally local

Kemppi's business operates globally. The company headquarters and main production units are located in Finland. Kemppi sales organizations are established in Finland, Sweden, Norway, Denmark, Germany, France, United Kingdom, Netherlands, Poland, Italy, Australia, India, and China. Kemppi also has representatives in more than 60 countries who are responsible for country-based product distribution, sales, and customer service.

For a full list of Kemppi sales companies, distributors and dealers, visit www.kemppi.com

GLOBAL SERVICE NETWORK
260 PARTNERS

KEMPPI OY GROUP
SALES SUBSIDIARIES

DISTRIBUTORS

HQ HEADQUARTERS,
KEMPPI OY

HQ HEADQUARTERS,
TRAFIMET GROUP SPA

RC ROBOTIC WELDING APPLICATION CENTER

PRODUCTION PLANT

DELIVERIES TO OVER
70 COUNTRIES

OVER 30
LANGUAGES
SPOKEN AMONG
EMPLOYEES
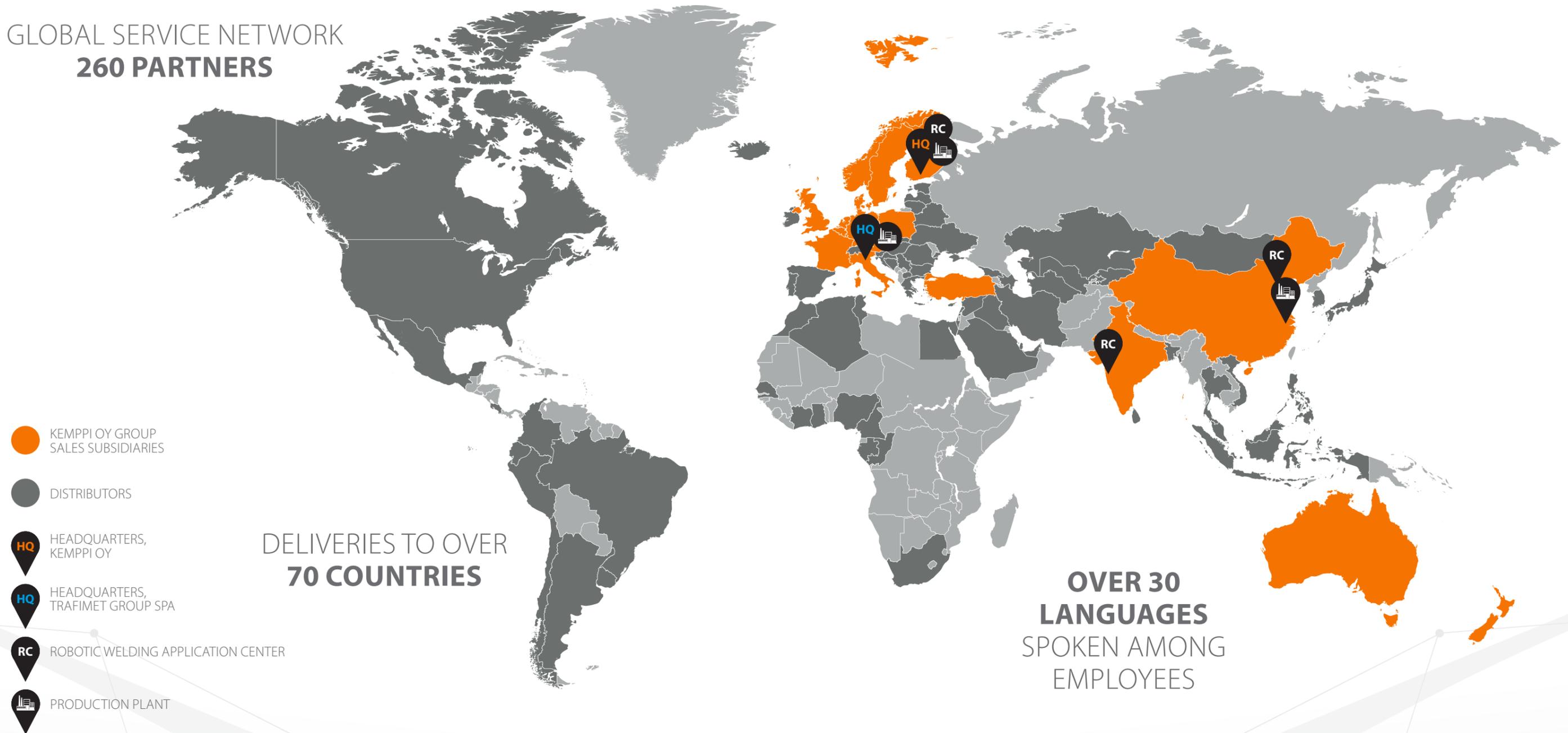
Superior arc performance

With Kemppi MAX and Wise special welding processes, you can increase quality and productivity by reducing spatter, ensuring consistent penetration, increasing speed, optimizing heat input, and preventing magnetic blow. It is the ideal solution for every application – be it steel, stainless steel or aluminum.

For more details, see the "MAX and Wise special welding processes and functions" section.

SPECIAL PROCESSES AND FUNCTIONS

WisePenetration+   WiseFusion   WiseSteel   WiseRoot+   WiseThin+

MAX SPEED   **MAX** POSITION   **MAX** COOL
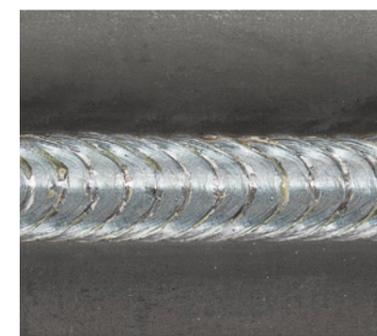
Mild steel (Fe)
Increase productivity and quality. Use the special process MAX Position for position welding, or maximize your productivity with MAX Speed. WiseSteel reduces magnetic blow and increases penetration.

Aluminum (Al)
The Kemppi's Double Pulse process is perfect for aluminum welding. High-quality welding with maximized productivity.

Stainless Steel (Ss)
MAX Speed offers excellent productivity for Ss welding. WiseThin+ is the perfect selection for thin materials.

Intuitive user interface

A new intuitive user interface gives the user a very simple way to navigate, set and alter all parameters and functions. Start your welding experience with Weld Assist to find welding parameters and optimal welding speed for the robot. Connect your device to WeldEye ArcVision and start data collection. Save dWPS to channels and monitor your weld quality in real-time during welding.

The user can use the View Menu to navigate to different sections of the user interface like Home, Memory Channels, Welding Parameters, Tools, Settings and many more. The Welding Parameters view can be used to set a wide array of welding parameters that help in achieving just the right weld. Previously completed welds can be viewed in Weld History and Logbook can be used to track the event log.

The user interface can be accessed on any device with a web browser. For example, a mobile phone, tablet, laptop, or any other industrial PC.

View the welding values and adjust the parameters while the robot is welding.
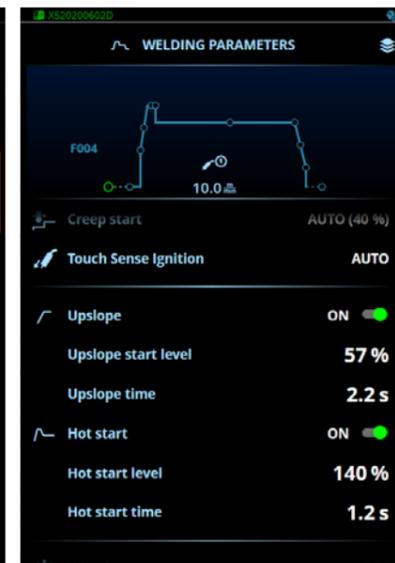
Intuitive view to adjust the parameters on welding channels.
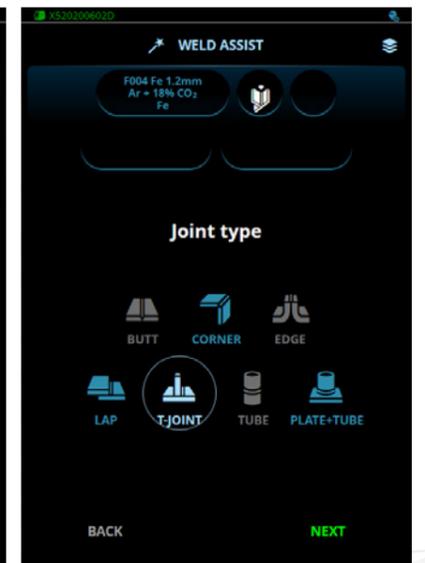
Weld Assist is an easy and fast way to find parameters while the robot is welding.

KEMPPI INDUSTRY 4.0 **WeldEye**

Traceable high-performance robotic welding

The Kemppi AX MIG Welder brings powerful performance and maximum productivity potential to your robotic welding system. Enjoy easy integration and ensure repeatable, high-quality welds with high-performance arc welding applications.

With a 400 or 500 A power source and robotic wire feeder, the AX MIG Welder thrives in 24/7 high-intensity automated welding applications. Need more? Activate MAX or Wise arc performance processes to increase speed, lower heat input, and increase penetration for challenging robotic welding applications or demanding production targets.

The AX MIG Welder is easy to integrate into your robotic welding system. With a comprehensive set of connectivity options, it offers new ways to get the most out of your arc welding robot. The AX MIG Welder has an intuitive remote control user interface designed by the world's leading UX team. It's easy to use and can be accessed anywhere on your laptop or mobile device through a web browser.

Weld Assist helps anyone find the right welding parameters quickly, and Industry 4.0 monitoring can be added for improved traceability and transparent reporting on key robotic welding performance metrics.

Ensure repeatable, high-quality welds from your arc welding robot with fine-tuned ignition and a precise seam tracking signal. Touch Sense is used to determine the location of the weld seam in relation to the robot, and the Through Arc Seam Tracking (TAST) feature helps the robotic welding system correct the welding path if there are deviations in the joint. There is also a gas flow sensor and collision detection available.

Adding an AX MIG Welder to your robotic welding system is easy. It's the best way to get high-quality automated welds and the latest welding connectivity features.

WeldEye, a universal software solution for managing welding production is available for robotic welding too. A balanced combination of software, hardware, and service meets the needs of wide-ranging industries and welding-related tasks.

WeldEye, as a cloud service, provides a simple way to control your welding production and quality anywhere in the world, regardless of your location. It reduces overhead costs by simplifying your documentation process and reducing the repair rate. The software is available globally.

Automated functions for robotic welding

AX MIG Welder is designed for automation. There are various functions to ensure smooth integration, user experience and productive high-quality welding. A seam tracking signal (TAST) helps the robot keep the arc on the seam and the touch sense function helps the robot find the workpiece or the seam. TSI ensures high-quality repeatable ignition.
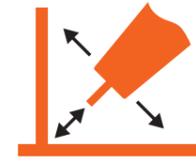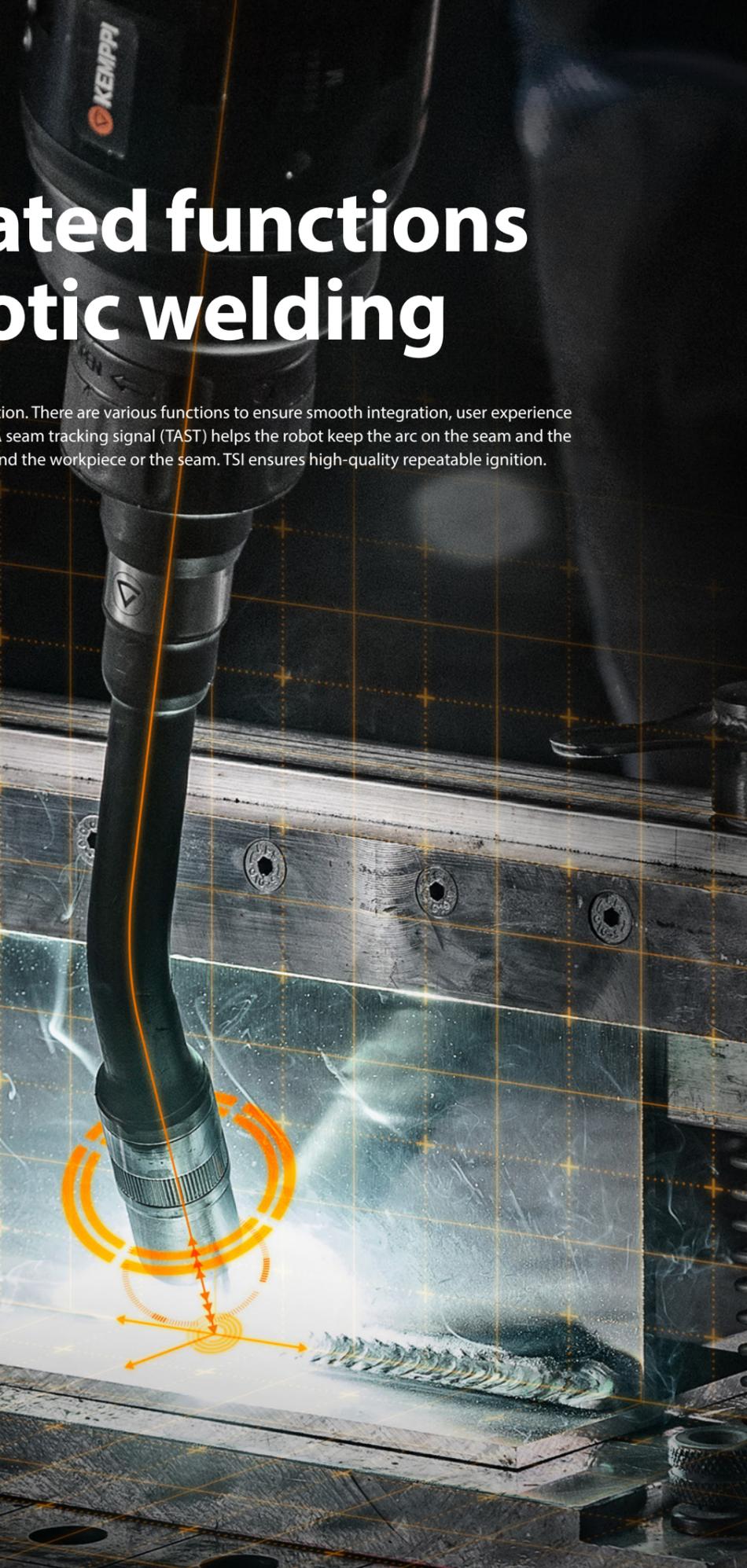
Through Arc Seam Tracking (TAST)

The power source sends arc length and stick-out length to the robot as one value. The robot uses this value to keep stick-out length stable and welding on the right path. Robot weaving is needed for seam positioning.

This function is used when taught welding path is not accurate with respect to the actual seam. For example, when welding big workpieces in shipyards, machinery industry, power plant industry, etc.

Touch Sense Ignition (TSI)

Touch Sense Ignition (TSI) enables a reliable, non-short-circuit ignition, which minimizes the amount of weld spatter and reduces the need for post-weld cleaning.
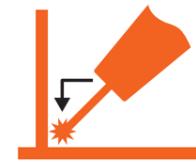
Touch Sensing

With the touch sensing function, a robot can find the start and/or end point of the seam.

The principle is that the power source directs the search voltage to the welding wire or gas nozzle (50-200V). When the wire or nozzle touches a grounded workpiece, the robot receives a message about the touch and saves the position.

Collision Detection

The Collision Detection function of the power source transmits the message from the collision detector via the connector of the wire feeder to the robot's fieldbus or I/O card, if an optional I/O card is used. This function requires a collision sensor mounted on the robot's flange.

Gas Flow measurement

The gas flow meter monitors the gas flow during welding and notifies the robot immediately if the gas flow falls below the limit value.

MAX and Wise special welding processes and functions

Achieve a competitive edge with Kemppi's welding application software. These solutions are designed to make the welding equipment perform optimally at any work, and the welding curves are optimized for robotic welding.

For automation, Kemppi offers multiple advanced functions: WiseFusion, WisePenetration+, WiseSteel and MAX Position. With these functions you can perform better on everyday welding tasks. If you like to guarantee excellent penetration and low heat input as well as speed up welding in any position, choose Wise and MAX functions.

For elimination of unwanted effects of stick-out length variations during welding, choose WisePenetration+. This function enables use of Kemppi's Reduced Gap Technology (RGT) which can reduce welding time and costs radically in thick plate welding applications.

In short-circuit transfer, WiseSteel adaptively improves the arc stability, thus providing better out-of-position welding capabilities. Moreover, micropulsing of the current and voltage in spray transfer mode constricts the arc which increases travel speed by up to 30%.

MAX Position is optimized for vertical up fillet welds with 4-12 mm plate thicknesses, and it works in high and low welding power cycles. High power ensures enough penetration and low power cooling of the weld pool. As a result, the weld pool is easier to control in challenging welding positions. In addition to functions, Kemppi offers multiple advanced Wise and MAX processes: WiseRoot+, WiseThin+, MAX Speed and MAX Cool.

WiseRoot+ is designed for welding of root passes of pipes or plates with higher speed and high quality.

WiseThin+ is developed for thin sheet applications where you get an easily controllable and stable arc as well as faster welding speed in any welding position.

MAX Cool operates in a short-circuiting range, providing accurate current control during a short circuit. After a short circuit, the forming pulse produces appropriate heat in the weld pool.

The MAX Speed welding process operates in the spray arc area and uses high frequency and low amplitude pulsing. The outcome is a short and energy-dense arc that produces clean and high-quality welds faster, elevating welding production and lowering labor and welding costs.

| Special Welding Process / Function	AX Synergic	AX Pulse	AX Pulse+
MAX Speed	•	•	•
MAX Cool	•	•	•
MAX Position		•	•
WiseSteel	•	•	•
WiseFusion	•	•	•
WisePenetration+	•	•	•
WiseThin+			•
WiseRoot+			•

WiseFusion

The WiseFusion optimized welding function produces a very narrow and energy dense welding arc, making welding faster and heat input lower. A focused penetration area allows for welding narrow and deep grooves. WiseFusion results in excellent penetration without the risk of undercut. A narrower arc also facilitates weld pool control in position welding. WiseFusion ensures optimum arc length, which eliminates the need for constant parameter settings. Adaptive and automatic arc length regulation always keeps the arc within the short circuit boundaries and raises your arc-on time.

BENEFITS

- Higher welding speed
- Lower heat input resulting in less distortion and better mechanical properties of the weld
- Possibility to weld narrower and deeper grooves
- Excellent weld pool control in position welding
- Easy to weld in all positions
- Automatic arc length control granting always the right parameters
- Easy to use
- Uniform weld quality

VS
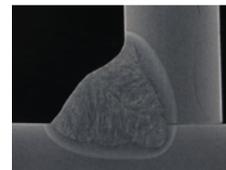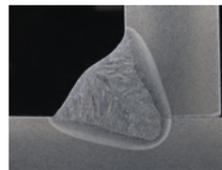
1-MIG

1-MIG with WiseFusion

25%

MORE WELD

Gives better fusion of materials resulting in proper penetration, increased welding speed and less distortion on the workpiece. Improves productivity and quality.

25%

LOWER HEAT INPUT

Than in traditional MIG/MAG welding processes, delivering savings in rework costs.

WisePenetration+

The WisePenetration+ optimized welding function is designed to keep welding current and thus penetration invariable regardless of the changes in stick-out length in manual welding. Normally in MIG/MAG welding, the power to the weld pool is changing as the welder or weld piece dictates the distance between the joint and welding gun nozzle. These deviations may result in quality issues such as lack of fusion, incomplete or inconsistent penetration, changes in weld profile and of course welding spatter. WisePenetration+ solves these issues and reduces the need for post-grinding and repair work. It prevents the current from dropping down by actively adjusting wire feeding. This helps to keep the weld mechanical properties on a desired level and prevents welding defects. The user sets the desired current level, and with the help of WisePenetration+, the current level does not drop below this level when stick-out length increases.

BENEFITS

Ensured penetration even in case of:
- Narrow structures where visibility of the arc is a problem
- Limited visibility or accessibility
- Position welding
- Difficult-to-weld joints

Stick-out length

30 mm

15 mm
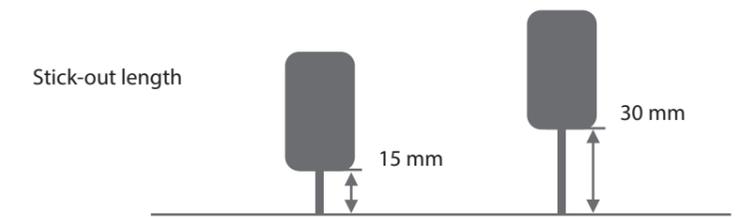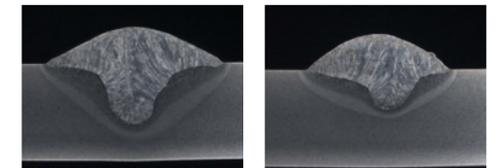
1-MIG

1-MIG with WisePenetration+

	Ordering code	Description
WiseFusion	AX30000	WiseFusion R
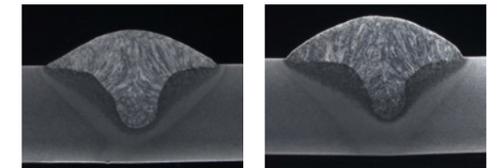
	Ordering code	Description
WisePenetration+	AX20000	WisePenetration+ R

WiseThin+

WiseThin+ is developed for faster and productive manual sheet welding for ferrous and nonferrous materials. With this process, you can weld in any position and also down hand, even with a wide gap or varying gap tolerances. Weld pool control is excellent and the amount and size of spatters is reduced. WiseThin+ even has 25% lower heat input than normal MIG/MAG welding, reducing material distortion and post weld rework.

The process offers excellent welding characteristics in plate thicknesses 0.8 - 3.0 mm, even with CO_2 shielding gas. Welding speed is higher than in traditional short arc welding. Refinement of the process is based on accurate and real-time voltage measurement and filler wire droplet detachment. Thus, droplet transfer to the weld pool is soft and controlled.

BENEFITS

- Higher welding speed than in traditional shot arc welding
- High quality welds, reduced post weld rework
- Lower heat input and thus also less deformation
- Decreased amount and size of spatters
- Stable arc for positional welding for thicker plate thicknesses
- Excellent arc ignition for tack and intermittent welds
- Savings in welding costs as you get mixed gas welding characteristics with pure CO_2
- Downhand and all positional welding
- Easy to make short welds because of accurate arc control
- Expands the parameter window and thus reduces the need to use smaller wire diameters
- Soft and pleasant arc characteristics
- Easy to use
- Suitable for brazing
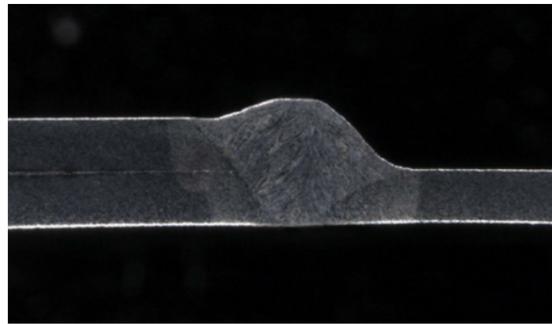
	Ordering code	Description
WiseThin+	AX50000	WiseThin+ R

WiseRoot+
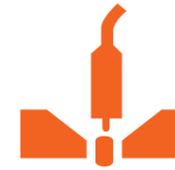
WiseRoot+ is an optimized short-circuiting process for root pass welding without backing. The process is highly effective, being significantly faster than stick (MMA), TIG and standard MIG/MAG short arc welding, yet producing high-quality welds. Welding fixed pipes is possible in any position and the groove angle can even be reduced by 40%, depending on the application.

A stable and efficient arc resulting in excellent weld quality is enabled through precise real-time voltage measuring, current control and just in time filler metal droplet releasing. Filler metal transfer is smooth and spatter-free.

BENEFITS

- Increases welding speed compared to MMA, TIG and standard MAG short arc welding
- Gives the possibility to reduce groove volume
- Allows wide range of root gaps and faces without incomplete or excessive penetration
- Easier to learn welding technique
- No need for backing ring
- Less spatter
- Allows welding of fixed pipes in all positions
- Allows welding of rotated pipes
- Allows welding with long cables
- Processes can be used with different materials; steel, stainless steels and high alloyed steels
- In WiseRoot+ excellent arc characteristic also with CO_2
- Wide selection of wire diameters (0.8–1.2)
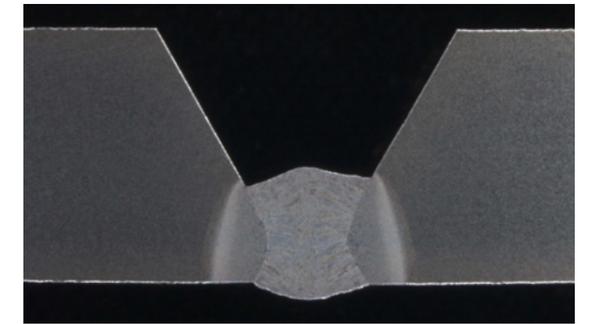
	Ordering code	Description
WiseRoot+	AX40000	WiseRoot+ R

WiseSteel

WiseSteel is a MAG welding process developed by Kemppi for the purpose of welding structural steels. The process can be used to weld solid mild steel and metal-cored filler wires of different strength grades using Ar + 8-18% CO_2 shielding gas

BENEFITS

- Easier weld pool control in the PF position and precise heat input control on the weld pool sides, enabling higher travel speeds
- Less welding spatter and higher travel speed compared to standard globular arc welding
- High-quality welds with regular fish scale pattern in globular transfer mode
- In spray transfer mode, the welding speed increases and heat input decreases compared to standard spray arc welding because of precise micropulsing of the arc

	Ordering code	Description
WiseSteel	AX10000	WiseSteel R
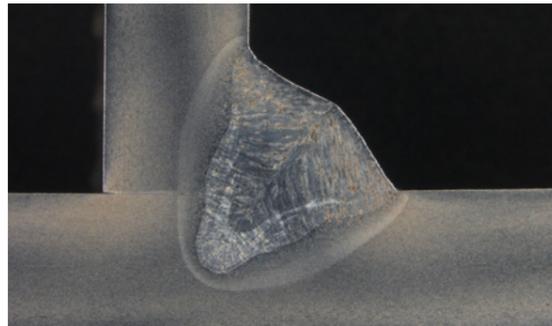
Reduced Gap Technology (RGT) solution
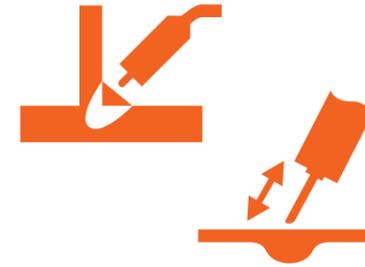
Reduced Gap Technology (RGT) solution includes: WisePenetration+

Reducing the groove angle can add significantly to the efficiency and productivity of welding of heavy metal structures. Reduced Gap Technology (RGT) allows for reliable and efficient narrow gap welding with no need for special equipment or accessories for material thicknesses of up to 30 mm. RGT combines intelligent arc control with Kemppi's high-tech power source, wire feeder and mechanization equipment.

EXAMPLE BENEFITS

- 20° Groove angle instead of 45°– 60°
- 38% savings in arc time
- 25% savings in filler material
- 5 weld passes needed instead of 7

	Ordering code	Description
RGT	AX20000	WisePenetration+ R

MAX Speed

MAX Speed increases welding travel speed by up to 70% * compared to traditional pulse or spray arc processes. MAX Speed produces clean, high-quality weld seams, which effectively reduces labor time and welding costs. MAX Speed is designed for steel and stainless steel welding applications in the PA and PB positions.

* Maximum travel speeds measured in automated and semi-automated Ss applications. Speed reductions apply in manual welding applications and Fe material.

BENEFITS

- Up to 70%* higher welding speed compared traditional pulse or spray arc process
- Clean and high-quality welds reduce the amount of after-treatment and save in welding production costs
- For steel and stainless steel applications
- Optimal fillet welds with 3-8 mm plate thicknesses
- For downhand welding applications (PB and PA positions)

	Ordering code	Description
MAX Speed	AX70000	MAX Speed R
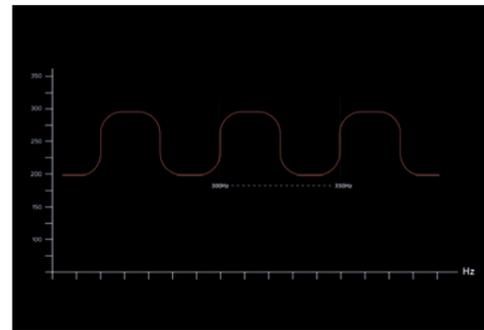
MAX Position

MAX Position helps to manage the gravitational effects on a molten weld pool. Improving control and confidence when working in position, MAX Position is excellent when filling and capping in steel, stainless steel and aluminum applications in the PF position.

BENEFITS

- Enables easier position welding
- For steel, stainless steel, and aluminum applications
- Optimized for vertical up fillet welds with 4-12 mm plate thicknesses
- Easy to use and adjust
- No weaving or triangle technique needed
- Excellent weld pool control
- Visually impressive and high-quality welds

	Ordering code	Description
MAX Position	AX60000	MAX Position R

MAX Cool

MAX Cool lowers heat input by up to 32%, improving control where excessive temperatures negatively impact weld pool stability and increase joint distortion. MAX Cool is ideal for a variety of applications, including thin sheet fabrication, root welding, gap bridging and joining thin extruded sections in solid Fe, Ss, CuAl8 and CuSi3 filler materials.

BENEFITS

- Up to 32% reduced heat input compared to traditional pulse or short arc process
- Tolerates bigger air gaps
- No need for backing in butt joints
- Excellent weld pool control with a thin sheet and root pass welding
- For steel, stainless steel, and MIG brazing applications
- For thin sheet and root pass welding
- Optimal for 1-3mm thin sheet, also root pass for thicker plates
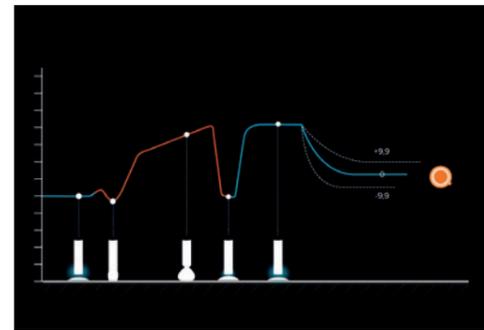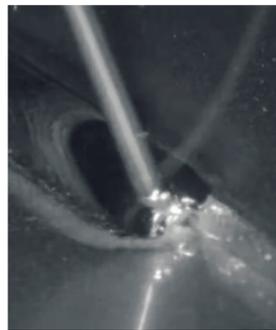
	Ordering code	Description
MAX Cool	AX80000	MAX Cool R

AX MIG Welder

Ensure repeatable high-quality welds

The AX MIG Welder is a welding solution that is easy and fast to integrate with robotic systems. It enables automated, 24/7 high-performance welding with an intuitive user interface to increase productivity and ensure top-notch welding quality.

AX MIG Welder is a modular system that works with any X5 power source model. Ensure easy access for maintenance and perfect integration with any kind of automated welding solutions.

The robot connectivity module (RCM) allows for multiple integration options. Use any fieldbus or analog interface for seamless communication between a robot or other automation device and the power source.

SIMPLE INTEGRATION, FAST SETUP

After a few hours of setup work, the AX MIG Welder is ready for welding.

EASE OF USE

60%
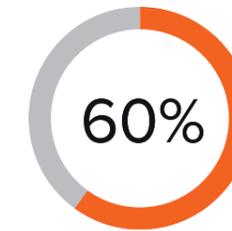
Clear and simple, web browser based user interface with Weld Assist guidance tool for up to 60% faster setup of optimal welding parameters

HIGH PERFORMANCE, LOW MAINTENANCE

430 A @ ED 100% and MAX & Wise welding processes elevate productivity.

1	Power source	5	Interconnection cables
2	Cooling unit	6	Earth return cable
3	Wire feeder	7	Wire conduit
4	Robot connectivity module	8	Wire spool holder

① POWER SOURCE

Experience next-generation industrial welding with X5 power source for steel, stainless steel, and aluminum welding applications. Designed and manufactured in Finland, X5 is developed in collaboration with professional welders so that every detail has been refined to meet the high requirements of true welding experts. Available in 400A and 500A models for synergic and pulse MIG/MIG welding. X5 power source is a versatile arc welding powerhouse built with energy-efficient inverter technology.

TECHNICAL SPECIFICATIONS

X5 Power Source		400	400 PULSE	400 PULSE+	400MV PULSE+
Ordering code		X5110400000	X5110500000	X5100400000	X5100400100
Mains connection voltage 3 ph ~ 50/60 Hz		380...460 V ±10 %	380...460 V ±10 %	380...460 V ±10 %	220...230 V ±10 %, 380...460 V ±10 %
Output at +40 °C	40 % ED	-	-	-	400 A @ 220...230 V
	60 % ED	400 A	400 A	400 A	400 A @ 380...460 V
	100 % ED	350 A	350 A	350 A	350 A
Welding current and voltage range	MIG	15 A/12 V ... 400 A/42 V	15 A/10 V ... 400 A/50V	15 A/10 V ... 400 A/50V	15 A/10 V ... 400 A/45V
Operating temperature range		-20…+40 °C	-20…+40 °C	-20…+40 °C	-20…+40 °C
Storage temperature range		-40…+60 °C	-40…+60 °C	-40…+60 °C	-40…+60 °C
EMC class		A	A	A	A
Degree of protection		IP23S	IP23S	IP23S	IP23S
External dimensions L x W x H		750 x 263 x 456 mm	750 x 263 x 456 mm	750 x 263 x 456 mm	750 x 263 x 456 mm
Weight without accessories		39.0 kg	39.5 kg	39.5 kg	39.5 kg

X5 Power Source		500	500 PULSE	500 PULSE+
Ordering code		X5110500000	X5130500000	X5100500000
Mains connection voltage 3 ph ~ 50/60 Hz		380...460 V ±10 %	380...460 V ±10 %	380...460 V ±10 %
Output at +40 °C	60 % ED	500 A	500 A	500 A
	100 % ED	430 A	400 A	400 A
Welding current and voltage range	MIG	15 A/10 V ... 500 A/47 V	15 A/10 V ... 500 A/50 V	15 A/10 V ... 500 A/50 V
Operating temperature range		-20…+40 °C	-20…+40 °C	-20…+40 °C
Storage temperature range		-40…+60 °C	-40…+60 °C	-40…+60 °C
EMC class		A	A	A
Degree of protection		IP23S	IP23S	IP23S
External dimensions L x W x H		750 x 263 x 456 mm	750 x 263 x 456 mm	750 x 263 x 456 mm
Weight without accessories		39.5 kg	39.5 kg	39.5 kg

STAND FOR POWER SOURCE

Ordering code	X5701050000	For easy transport and keeping floor free under welder

② COOLING UNIT

Quick to assemble X5 Cooler with Auto/ON/OFF operation. Easy to fill up and check the coolant level. Dynamic cooling reduces electrical power consumption and noise levels. Cooling unit has an adjustable flow sensor and filter to ensure continuous cooling.

TECHNICAL SPECIFICATIONS

	X5 Cooler 1400
Ordering code	X5620000000
Cooling power at 1 l/min	1,4 kW
Recommended coolant	MGP 4456 (Kemppi mixture)
Tank volume	3 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
Weight without accessories	15 kg

COOLING LIQUID

Ordering code	SP9810765	MGP 4456, 10 liter can

③ WIRE FEEDER

The R500 Wire Feeder is a durable and powerful 4-wheel wire feed system with two motors designed to work seamlessly with the AX MIG Welder. A separate attachment bracket is required for mounting the wire feeder on a robot.

Integrated functionalities:
- Gas test button
- Wire inch forward and backward buttons
- Integrated gas flow sensor (R500+ model only)
- Min. flow rate monitoring (R500+ model only)
- Compressed air blow valve for gun cleaning

TECHNICAL SPECIFICATIONS

	R500 Wire Feeder EUR	R500 Wire Feeder EUR+
Ordering code	RX20150025L	RX21150025L
Wire feed mechanism	4-roll, two motors	4-roll, two motors
Wire feed speed adjustment	0.5–25 m/min	0.5–25 m/min
Gun connection	Euro	Euro
Filler wire sizes (Fe solid)	0.8–1.6 mm	0.8–1.6 mm
Filler wire sizes (Fe cored)	1.0–1.6 mm	1.0–1.6 mm
Filler wire sizes (Ss)	0.8–1.6 mm	0.8–1.6 mm
Filler wire sizes (Al)	1.0–2.4 mm	1.0–2.4 mm
Filler wire sizes (CuSi)	0.8–1.2 mm	0.8–1.2 mm
Operating voltage (safety voltage)	48 V DC	48 V DC
Operating temperature range	-20...+40 °C	-20...+40 °C
External dimensions LxWxH	374 x 234 x 183	374 x 234 x 183
Weight (no accessories)	6,15 Kg	6,75 Kg
Degree of protection	IP21S	IP21S
EMC class	A	A
Storage temperature range	-40...+60 °C	-40...+60 °C

3.1 WIRE FEED ROLL KITS

FE	= Mild Steel
SS	= Stainless Steel
AL	= Aluminium
U	= U Groove
V	= Plain V Groove
VK	= Knurled V Groove
T	= Trapezoid Groove
HD	= Heavy Duty kit (contains metal feed rolls)
MC/FC	= Metal/Flux Cored

Front guide tube length is optimized for Binzel robotic welding guns.

Ordering code	Description	Ordering code	Description
F000367	FE (MC/FC) V0,8 - 0,9	F000382	SS,CU (FE) V2,4
F000368	FE (MC/FC) V1,0	F000383	SS (FE) V0,8 - 0,9 HD
F000369	FE (MC/FC) V1,2	F000384	SS (FE) V1,0 HD
F000370	FE (MC/FC) V1,4	F000385	SS (FE) V1,2 HD
F000371	FE (MC/FC) V1,6	F000386	SS (FE) V1,6 HD
F000372	FE (MC/FC) V0,8 - 0,9 HD	F000387	MC/FC VK1,0
F000373	FE (MC/FC) V1,0 HD	F000388	MC/FC VK1,2
F000374	FE (MC/FC) V1,2 HD	F000389	MC/FC VK1,4 - 1,6
F000375	FE (MC/FC) V1,6 HD	F000390	MC/FC VK1,0 HD
F000376	SS,CU (FE) V0,8 - 0,9	F000391	MC/FC VK1,2 HD
F000377	SS,CU (FE) V1,0	F000392	MC/FC VK1,4 - 1,6 HD
F000378	SS,CU (FE) V1,2	F000393	AL U1,0
F000379	SS,CU (FE) V1,4	F000394	AL U1,2
F000380	SS,CU (FE) V1,6	F000395	AL U1,4
F000381	SS,CU (FE) V2,0	F000396	AL U1,6

For Dinse robotic welding guns there is a separate plastic guide tube out.
For details – see table below.

Ordering code	Description
SP011443	GUIDE TUBE OUT 0,8 - 0,9 / 112 WH
SP011445	GUIDE TUBE OUT 1,0 / 112 RD
SP011769	GUIDE TUBE OUT 1,2 / 112 OG

3.2 WIRE FEEDER MOUNTING BRACKETS

Brackets for mounting R500 wire feeder on the robot's 3rd axis.

The set consists of two parts: top and bottom.
Top bracket is designed for the wire feeder – 2 versions.
Bottom bracket is designed for specific robot model.

Order code includes metal plates, insulation rings and screws.
Screws for robot's 3rd axis are not included.

Top bracket models

Ordering code	Description	Additional info
SP801149	R500 WireFeeder Bracket short	Needed with HW robot (T1/T3)
SP801150	R500 WireFeeder Bracket long	Needed with HW robot (T1/T3)

Bottom bracket models

You can select a robot-specific bracket (bottom bracket) from the Kemppi configurator.
Use the following QR code:

4 ROBOT CONNECTIVITY MODULE

The RCM is the heart of the robotic welding system. It is responsible for the automation's fieldbus connection, WeldEye connection, user interface (WebUI), touch sensing and many other features of a robot station. Includes LAN and WLAN connectivity. The user interface is web-based which can be used with any device with a web browser. The user interface is compatible with mobile, tablet, PC and laptop.

Ordering code	Description	Additional info
RX 301 000000	Robotic Connectivity Module	LAN connection
RX 311 000000	Robotic Connectivity Module+	LAN & WLAN (WiFi) connection

4.1 FIELDBUS INTERFACE MODULE

Fieldbus communication between power source and robot controller is enabled with modules. The protocol can be chosen based on customer preference.

The most commonly used is Ethernet IP. KUKA and Beckhoff use Ethercat. Profinet&Profibus is typical for Siemens and Modbus is being used for instance in Universal Robot. DeviceNet is a typical network protocol in older systems.

Ordering code	Description
RX 701 1200	M40 EtherNet/IP RJ45 2
RX 702 1200	M40 PROFINET RJ45 2
RX 703 1200	M40 EtherCAT RJ45 2
RX 704 1200	M40 Modbus TCP RJ45 2
RX 705 4100	M40 PROFIBUS D89 1
RX 706 3100	M40 DeviceNet 1
RX 707 2200	M40 DeviceNet M12 2

5 INTERCONNECTION CABLES

The interconnection cable set contains several cables and hoses. The cable set is used for delivering the welding power, shielding gas, cooling liquid, and control signals from the welding power source to the wire feeder.

The interconnection cable set includes a voltage sensing cable which is needed with the "+ model" of X5 power sources.

5.1 GAS COOLED CABLE SETS

Ordering code	Description	Additional info
6260458	ROBOT 70-5-GH CABLE SHOE	Set rubber protected
6260449	ROBOT 70-10-GH CABLE SHOE	Set not protected, optional ZB sold separately
6260484	ROBOT 70-15-GH CABLE SHOE	Set not protected, optional ZB sold separately
6260480	ROBOT 70-20-GH CABLE SHOE	Set not protected, optional ZB sold separately
6260486	ROBOT 95-20-GH CABLE SHOE	Set not protected, optional ZB sold separately

5.2 WATER COOLED CABLE SETS

Ordering code	Description	Additional info
6260489	ROBOT 70-2-WH CABLE SHOE	Set rubber protected
6260459	ROBOT 70-5-WH CABLE SHOE	Set rubber protected
6260460	ROBOT 70-10-WH CABLE SHOE	Set not protected, optional ZB sold separately
6260481C1	ROBOT 70-15-WH CABLE SHOE	Set not protected, optional ZB sold separately
6260481	ROBOT 70-20-WH CABLE SHOE	Set not protected, optional ZB sold separately
6260487	ROBOT 95-20-WH CABLE SHOE	Set not protected, optional ZB sold separately
6260494	ROBOT 95-25-WH CABLE SHOE	Set not protected, optional ZB sold separately
6260488	ROBOT 95-40-WH CABLE SHOE	Set not protected, optional ZB sold separately. Cables delivered separately.

5.3 PROTECTION TUBES WITH ZIPPER (ZB)

Ordering code	Description	Additional info
SP006811	ZB PROTECTION TUBE 10M	For Gas and Water cooled cable sets
SP007056	ZB PROTECTION TUBE 5M	For Gas and Water cooled cable sets

5.4 INTERCONNECTION CABLE BRACKETS

Ordering code	SP008072	Metal attachment piece, two cable ties, for zipper bag

6 EARTH RETURN CABLE

Ordering code	Description	Additional info
6184711	EARTH RETURN CABLE 70 MM² 5M	Dix connector for the power source, 5 m, 70 mm²
6184712	EARTH RETURN CABLE 70 MM² 10M	Dix connector for the power source, 10 m, 70 mm²
6184713	EARTH RETURN CABLE 70 MM² 15M	Dix connector for the power source, 15 m, 70 mm²

7 WIRE CONDUIT FOR WIRE SPOOLS

High-quality wire conduit delivers the filler wire smoothly from wire spool to wire feeder. Male connectors on both ends fit into the Kemppi feeder and Kemppi wire spool support. Order codes do not include the female snap connector for wire spool holder or wire drum. It must be ordered separately. In case of stainless steel or aluminum, a separate chili liner is required.

7.1 WIRE CONDUITS (STANDARD LENGTH)

Ordering code	Description
SP600535	WIRE CONDUIT-1.8M ROBOT
SP600536	WIRE CONDUIT-3.0M ROBOT
SP800803	WIRE CONDUIT-4.0M ROBOT
SP600537	WIRE CONDUIT-5.0M ROBOT
SP600686	WIRE CONDUIT-8.0M ROBOT
SP600731	CHILI LINER FOR SS AND AL-8.0M ROBOT

7.2 WIRE CONDUIT FOR WIRE DRUMS

Alternative solution for wire conduit when distance between wire feeder and wire drum is greater than 5 meters.

Note: When ordering SP6007xx with the desired length, you also need snap connectors: two male (W005197) and one female (W005189).

7.2.1 WIRE CONDUITS (CUSTOM LENGTH)

Ordering code	Description	Additional info
SP600780	WIRE CONDUIT-10.0M ROBOT	
SP600781	WIRE CONDUIT-15.0M ROBOT	
SP600782	WIRE CONDUIT-20.0M ROBOT	
SP600783	WIRE CONDUIT-30.0M ROBOT	

7.2.2 SNAP CONNECTOR FOR WIRE CONDUIT (MALE)

Ordering code	W005197	Male connector for wire conduit, two pieces needed per conduit

7.2.3 SNAP CONNECTOR FOR DRUM OR SPOOL HOLDER (FEMALE)

Ordering code	W005189	Female connector for the wire drum or spool holder

8 WIRE SPOOL HOLDER

Suitable for standard 15 kg wire spool. NOTE: Female connector for wire conduit not included. Must be ordered separately.

Ordering code	Description	Additional info
W007628	WIRE SPOOL SUPPORT RIGHT	Wire spool holder
W007629	WIRE SPOOL SUPPORT LEFT	Wire spool holder

8.1 PROTECTIVE COVER FOR WIRE SPOOL HOLDER

Ordering code	SP007940	Plastic cover for wire spool holder

8.2 FLOOR STAND FOR WIRE SPOOL HOLDER

Ordering code	W007356	Floor stand for wire spool holder

System configurations

AX MIG Welder is the state-of-the-art solution for robotic arc welding, ideal for integration with any robot brand. It is a complete, perfectly balanced process package that includes a power source, wire feeder, robot connectivity module and cooling unit. The equipment is designed to meet the highest Kemppi standards, which guarantee reliable welding performance with no compromises.

The AX system allows for many different system configurations for different applications.
Follow configuration guidelines (presented in the tables below) to access all the features of each configuration option.

Component	AX Synergic		AX Pulse		AX Pulse+	
Power source	X5 400	X5 500	X5 400 Pulse	X5 500 Pulse	X5 400 Pulse+	X5 500 Pulse+
Robot Connectivity Module (RCM)	RCM+ [1] RCM	RCM+ [1] RCM	RCM+ [1] RCM	RCM+ [1] RCM	RCM+ [1] RCM	RCM+ [1] RCM
Wire feeder	R500+ [2] R500	R500+ [2] R500	R500+ [2] R500	R500+ [2] R500	R500+ [2]	R500+ [2]
Cooler	X5 1400 [3]	X5 1400 [3]	X5 1400 [3]	X5 1400 [3]	X5 1400 [3]	X5 1400 [3]

Note:
[1] RCM+ incl.: WLAN (WiFi) connectivity
[2] R500+ incl.: gas flow sensor, air blow valve, arc voltage measurement cable connections for WiseRoot+ and WiseThin+
[3] X5 1400 incl.: filter, adjustable flow sensor

In addition to a power source, robot connectivity module, wire feeder and cooling unit, there are more products needed, such as a robotic welding gun, interconnection cables and other accessories. For more details check:
configurator.kemppi.com

The advanced AX MIG Welder uses the MAX and Wise processes and functions. These were developed for challenging applications and demanding production targets to increase productivity and enhance welding quality. MAX and Wise special welding processes help to make the seemingly impossible, possible.

Special Welding Process / Function	AX Synergy	AX Pulse	AX Pulse+
MAX Speed	•	•	•
MAX Cool	•	•	•
MAX Position		•	•
WiseSteel	•	•	•
WiseFusion	•	•	•
WisePenetration+	•	•	•
WiseThin+			•
WiseRoot+			•

Note: All these welding curves were optimized for robotic welding.

You can select best possible configuration using Kemppi configurator.
Use following QR code:

CONFIGURATION EXAMPLE #1
AX STEEL

Non-alloy steels are still widely used in industrial production. Currently, production of details made of mild steel can be even faster thanks to the use of robotic stations.

Moreover, it's also possible due to the use of special highly efficient welding processes implemented into welding equipment, as well as the possibility of continuous development of these units by uploading new welding curves allowing for even greater efficiency while maintaining high-quality. .

Typical industry segments:
• shipbuilding
• offshore
• general industry
• machine manufacturing
• containers manufacturing

Example of AX MIG Welder configuration for steel welding (for reference only):

Device Pack		AX 500 FE
Power Source	X5110500000	X5 500 Power Source
Cooler	X5620000000	X5 Cooler 1400
Wire Feeder	RX20150025L	R500 Euro Wire Feeder
	F000373	FE (MC/FC) V1.0 HD
	SP800714	WF Bracket ABB IRB 1600 ID
	W022035	R500 Wire Feeder Bracket, Long
Robot Connectivity Module	RX311000000	RCM+
	RX7011200	M40 EtherNet/IP RJ45 2
Interconnection Cable	6260459	Robot 70-5-WH Cable shoe
Wire Conduit	SP600535	Wire conduit-1.8M Robot
Spool	W005189	Female connector for the wire drum or spool holder
	W007629	Wire Spool Support, Left
	SP007940	Plastic cover for wire spool holder
	W007356	Floor stand for wire spool holder
Cable Assembly	SP600721	Cable Assembly T1 W ABB IRB 1660ID Euro
	SP600725	Steel Liner 1,6/4,6 2M Robot Eu
Flange	SP600581	Flange T1 ABB IRB 1600 ID
Gun Mount	SP600588	Robot Gun Mount T1 W
Gun Neck	SP600551B	Gun Neck 500-W 22°, Short

Note: For robotic welding guns and accessories – please see Kemppi "Robotic Welding Gun" product catalogue.

Welding software may be chosen from a wide range of welding curves (incl. Max and Wise processes and functions), depending on applications and production targets, in relation to used hardware configuration.

CONFIGURATION EXAMPLE #2
AX STAINLESS STEEL

The share of stainless steel in industrial production grows constantly. It is a more demanding material than mild steel, but thanks to keeping production regimes, which is much easier in robotic applications, welding of stainless steels is now extremely efficient.

The use of advanced welding equipment in robotic stations enables quick and flexible adjustment of the station to accommodate constant changes of steel grade and higher quality requirements. Welding equipment with implemented monitoring of welding parameters is a key factor in the development of this industry.

Typical industry segments:
• food industry
• chemical industry
• process industry
• pharmaceutical industry
• pipes and pipelines

Example of AX MIG Welder configuration for stainless steel welding (for reference only):

Device Pack		AX 500 P+ SS
Power Source	X5100500000	X5 500 PULSE+ Power Source
Cooler	X5620000000	X5 Cooler 1400
Wire Feeder	RX21150025L	R500+ Euro Wire Feeder
	F000384	SS (FE) V1.0 HD
	SP800714	WF Bracket ABB IRB 1600 ID
	W022035	R500 Wire Feeder Bracket, Long
Robot Connectivity Module	RX311000000	RCM+
	RX7011200	M40 EtherNet/IP RJ45 2
Interconnection Cable	6260459	Robot 70-5-WH Cable shoe
Wire Conduit	SP600535	Wire conduit-1.8M Robot
	SP600731	Chili Liner kit for Ss/Al (8m)
Spool	W005189	Female connector for the wire drum or spool holder
	W007629	Wire Spool Support, Left
	SP007940	Plastic cover for wire spool holder
	W007356	Floor stand for wire spool holder
Cable Assembly	SP600721	Cable Assembly T1 W ABB IRB 1660 ID Euro
	SP600666	Chili Liner HP 2.0/4.7 2M Robot Eu
Flange	SP600581	Flange T1 ABB IRB 1600 ID
Gun Mount	SP600588	Robot Gun Mount T1 W
Gun Neck	SP600551B	Gun Neck 500-W 22°, Short

Note: For robotic welding guns and accessories – please see Kemppi "Robotic Welding Gun" product catalogue.

Welding software may be chosen from a wide range of welding curves (incl. Max and Wise processes and functions), depending on applications and production targets, in relation to used hardware configuration.

CONFIGURATION EXAMPLE #3
AX ALUMINUM

Aluminum is a more and more common material used in production. It acts as a lightweight alternative to steel as it provides a better strength-to-weight ratio and corrosion resistance.

But this material does not behave like steel in welding applications, especially because of its high thermal conductivity and low melting point.

Efficient and high-quality aluminum welding largely depends on the right equipment and the right welding curves. These elements are very important in automated welding.

Typical industry segments:
• boat & ship building
• (e-)transportation
• trailers
• automotive
• wheel frames
• battery cell cooling

Example of AX MIG Welder configuration for aluminum welding (for reference only):

Device Pack		AX 500 P+ AL
Power Source	X5100500000	X5 500 PULSE+ Power Source
Cooler	X5620000000	X5 Cooler 1400
Wire Feeder	RX21150025L	R500+ Euro Wire Feeder
	F000393	AL U1.0
	SP800714	WF Bracket ABB IRB 1600 ID
	W022035	R500 Wire Feeder Bracket, Long
Robot Connectivity Module	RX311000000	RCM+
	RX7011200	M40 EtherNet/IP RJ45 2
Interconnection Cable	6260459	Robot 70-5-WH Cable shoe
Wire Conduit	SP600535	Wire conduit-1.8M Robot
	SP600731	Chili Liner kit for Ss/Al (8m)
Spool	W005189	Female connector for the wire drum or spool holder
	W007629	Wire Spool Support, Left
	SP007940	Plastic cover for wire spool holder
	W007356	Floor stand for wire spool holder
Cable Assembly	SP600721	Cable Assembly T1 W ABB IRB 1660 ID Euro
	SP600666	Chili Liner HP 2.0/4.7 2M Robot Eu
Flange	SP600581	Flange T1 ABB IRB 1600 ID
Gun Mount	SP600588	Robot Gun Mount T1 W
Gun Neck	SP600551B	Gun Neck 500-W 22°, Short

Note: For robotic welding guns and accessories – please see Kemppi "Robotic Welding Gun" product catalogue.

Welding software may be chosen from a wide range of welding curves (incl. Max and Wise processes and functions), depending on applications and production targets, in relation to used hardware configuration.

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Designed for welders

Kemppi is the design leader of the arc welding industry.
We are committed to boosting the quality and productivity of welding by continuous development of the welding arc and by working for a greener and more equal world. Kemppi supplies sustainable products, digital solutions, and services for professionals from industrial welding companies to single contractors. The usability and reliability of our products is our guiding principle.

We operate with a highly skilled partner network covering over 70 countries to make its expertise locally available. Headquartered in Lahti, Finland, Kemppi employs close to 800 professionals in 16 countries and has a revenue of 195 MEUR in 2022.

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