



WELD PACKAGE POWER JOINT

The **Weld Package** for your Welding Tasks
from the Power Source to the Contact Tip

AIR-COOLED

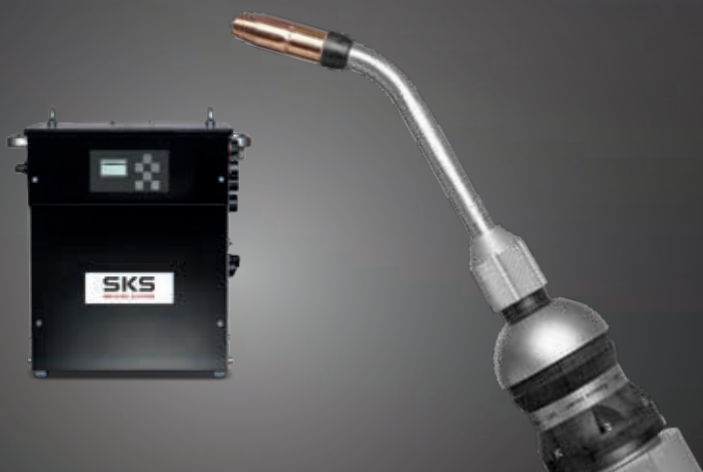


CONTENT

Power Source • Weld Process
Controller • Software •
Interface • Wire Feeder Unit •
Wire Guidance •
Cable Bundle • Control Cable •
Torch System • Torch Necks •
Consumables

WELDING PROCESSES

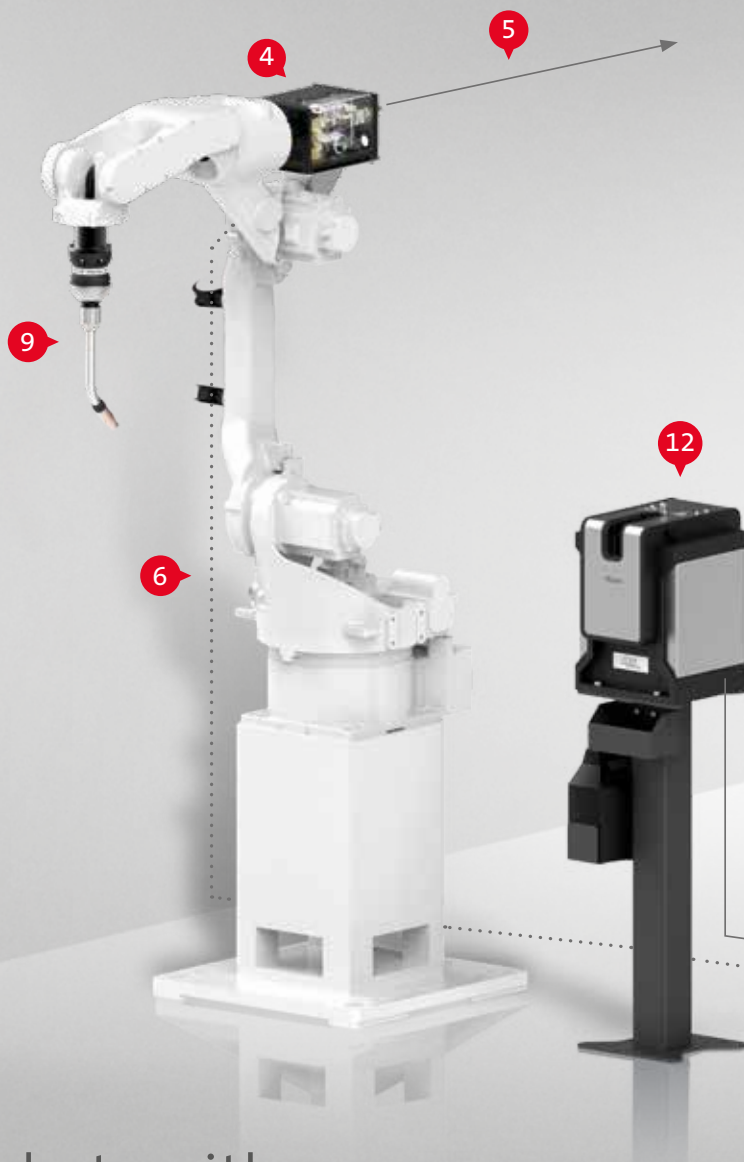
GMAW
Pulse
MIG-Brazing
microMIG
microMIG-cc



STEEL

SKS Weld Package: System design

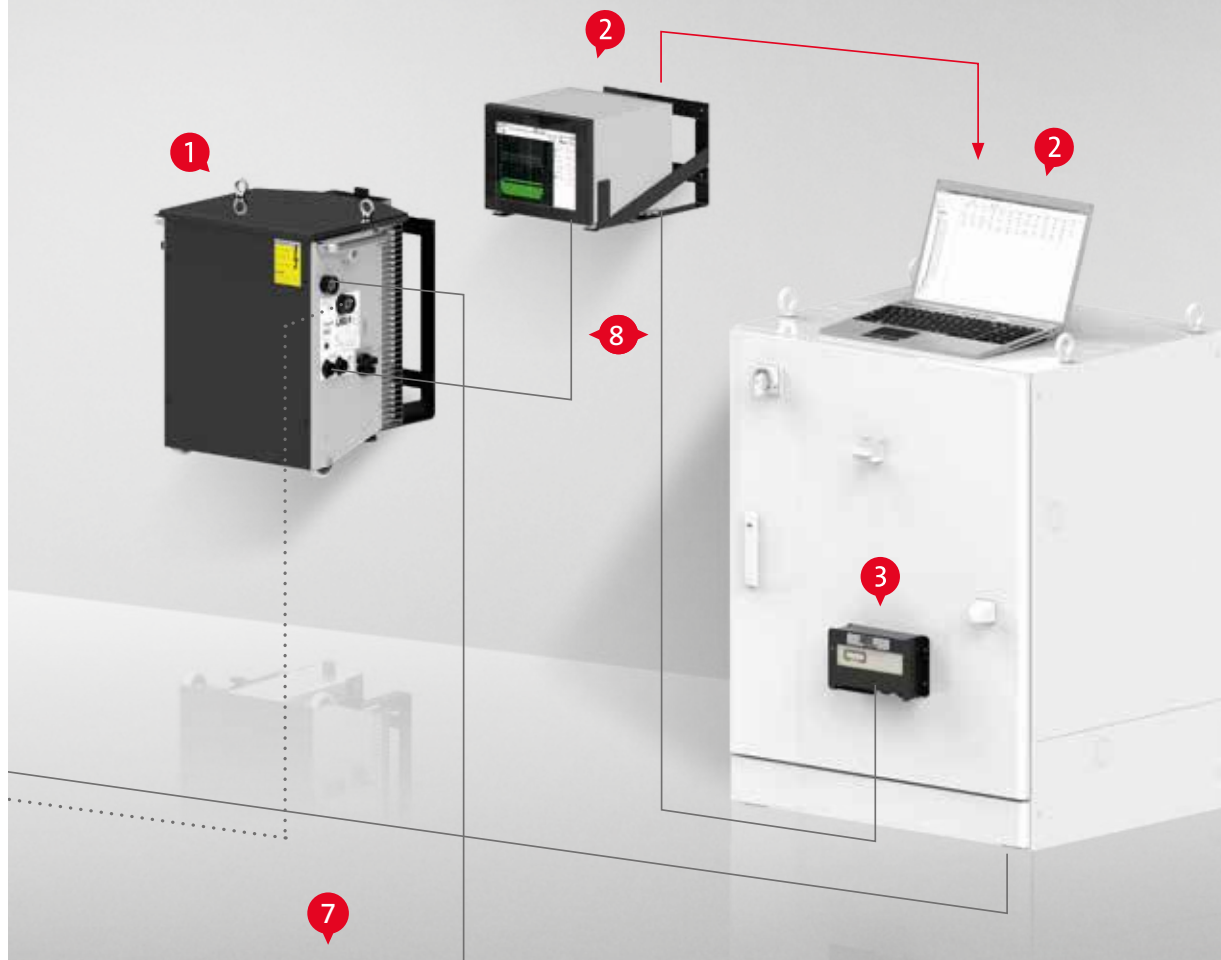
- 1 DCT power source
- 2 Weld process controller + Software
- 3 Robot interface
- 4 Wire feeder
- 5 Wire guidance
- 6 Cable bundle
- 7 Ground cable
- 8 Control cable
- 9 Torch system Power Joint
- 10 Torch necks/ Consumables
- 11 Gas nozzles/ Reamer blades
- 12 TCP dimensions/Checking fixtures/ eReam



For all industrial robots with inner cable dress.

This brochure contains information about the SKS Weld Package, the torch system **Power Joint**, as well as consumables and spare parts. There are various features of the welding machine components and torch systems available depending on the robot system and the welding task.

The **Power Joint Weld Package** can be used with common industrial robots, such as **ABB, FANUC, KUKA** and **YASKAWA/MOTOMAN**.



The complete SKS Power Joint Weld Package is designed for the following welding processes, materials and power range:



Processes: MIG/MAG (GMAW), Pulse, MIG Brazing

Wire materials: High-alloy steels, low-alloy steels, aluminum and copper alloys, nickel-based materials

Wire diameter: 0.8-1.6 mm

Max. power: 420 A - 60 % duty cycle/40 °C, air-cooled

1 Power source



Power source LSQ5

ALTERNATIVE



Power source LSQ3

OPTION



Accessories: Wall mount for LSQ5

Space-saving design that makes for easy cleaning/maintenance.

LSQ5 power source with Direct Control Technology DCT

The LSQ5 ensures the optimum arc energy. It uniquely adjusts to different weld processes. Unlike conventional power sources with inverter technology, the LSQ5 with Direct Control Technology controls its switching transistors without any fixed clock frequency according to the needs of the weld process. Without any delay, the energy needed for the process is provided instantly. The flexible fine tuning is done by a central processor. The CPU continuously analyzes the weld process and current/voltage values on the basis of data obtained and optimally drives the switching transistors of the power section. This results in an extremely high efficiency and a low temperature development.

The power source can be configured with only two buttons and four LED indicators. For world-wide usage, voltages can be configured without opening the power source.

LSQ3 power source with Direct Control Technology (DCT)

The LSQ3 offers enough power reserves for special weld tasks like chassis and exhaust parts and other thin sheet metal applications.

LSQ3: 340 A at 60 % duty cycle, 3 x 400 V

LSQ3A: 340 A at 60 % duty cycle, 3 x 480 V

Overview of power sources

DESCRIPTION	PART-NO.
LSQ5	77-1185-00
LSQ3	77-1184-00
LSQ3A	77-1184-10
LSQ5-CCC	77-1185-60
LSQ3-CCC	77-1184-40

The main benefits are:

- DCT provides a speed regulation up to ten times higher compared to conventional inverter technology. This leads to excellent control behavior and shorter response times.
- The weld properties are substantially improved. Software replaces hardware: Fewer components also increase the reliability in continuous operation.

Specifications:

DESCRIPTION	LSQ5(-CCC)	LSQ3(-CCC)	LSQ3A
Performance	420 A - 60% duty cycle/40 °C (400 A)	340 A - 60% duty cycle/40 °C	340 A - 60% duty cycle/40 °C
Processes	MIG/MAG (GMWA), Pulse, MIG Brazing		
Weight	49 kg	37 kg	37 kg
Primary voltage	3 x 400 (480) V	3 x 400 V	3 x 480 V
Wall mounting	Yes (optional)	Yes (integrated)	Yes (integrated)
Conformities	CE, CSA, UL (CCC)	CE (CCC)	CE
Dimensions	450 x 400 x 540 mm	450 x 330 x 540 mm	450 x 330 x 540 mm

Wall mount

DESCRIPTION	PART-NO.
Wall mount for LSQ5	77-1180-01
Wall mount for LSQ3	integrated
Wall mount for LSQ3 A	integrated

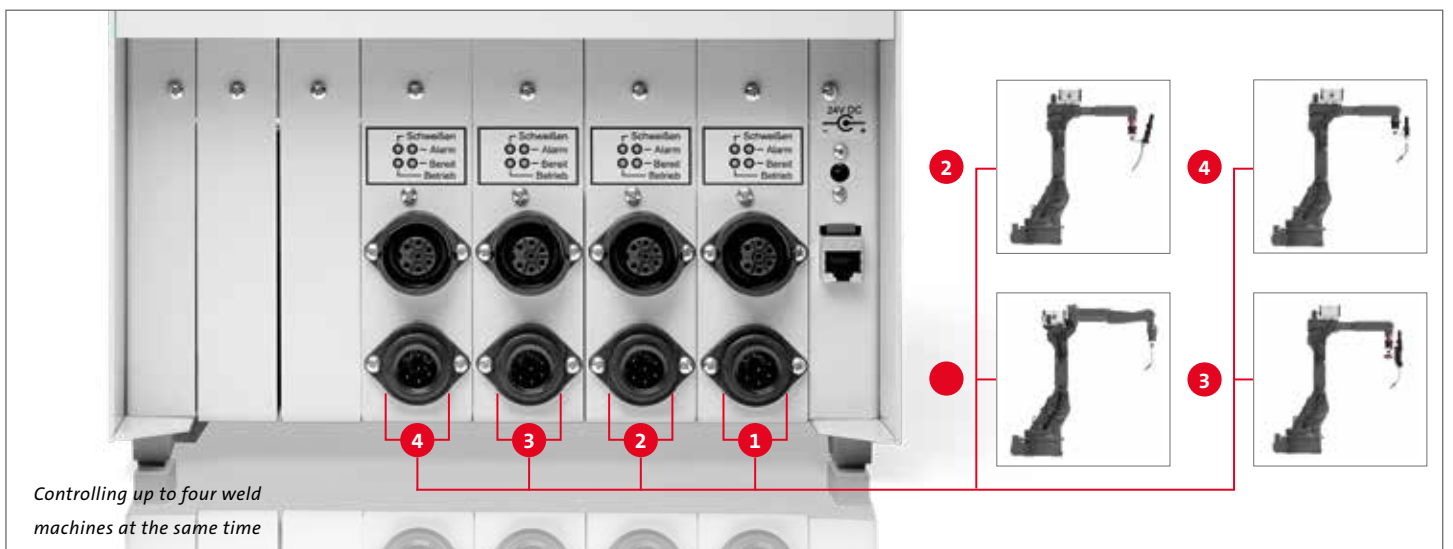
2 Weld process controller

Innovative Control Concepts with Touch Screen.

With the new Q84r and the compact Q84s up to four weld machines can be controlled centrally.



The new Q84r and Q84s are equipped with a touch screen, an innovative usability concept and an advanced visualization technology for much easier operating. The user interfaces have the look and feel of the Q8Tool4 software. Individual weld process controllers are in card slots in the Q84r/s. This new weld process controller concept can host up to four weld process controller cards. Each card independently controls a weld machine. As an alternative to the Q84r/s weld process controllers, the Q80 has been developed to control a single weld machine.



Controlling up to four weld machines at the same time

2 Weld process controller



Weld process controller Q84r



Weld process controller Q84s

Please note:

The Q84r/s can be equipped with up to four weld process controller cards.

Weld process controller Q84r/s

The universal weld process controllers Q84r and Q84s calculate the optimal parameters for each welding process. Only basic data such as material, wire type, wire feed speed and type of gas must be entered. The Q84r is equipped with a 10" touch screen, the space-saving Q84s with a 7" touch screen. For wall mounting the display of the Q84s can be rotated by an angle of 180°.

- Processes/features: MIG/MAG (GMAW), I-Pulse, U-Pulse, KF-Pulse, Synchroweld, RWDE, NWDE
- Programs: 992 (x4)
- General functions: Display and saving of readings, alarms
- Monitoring functions: Weld current monitoring, auto compensation, arc and ignition monitoring, motor current, gas and water monitoring
- Easy to network via Ethernet: Traceability
- Ports: RJ45-Ethernet, SPW-Bus, SD card slot
- Remote Control/Administration: Q8Tool, VNC client

Overview weld process controller

DESCRIPTION	PART-NO. (Q84s)	PART-NO. (Q84r)
Q84r/s with one weld card	77-7410-00	77-7310-00
Q84r/s with two weld cards	77-7420-00	77-7320-00
Q84r/s with three weld cards	77-7430-00	77-7330-00
Q84r/s with four weld cards	77-7440-00	77-7340-00

Overview Q84r/s mounting kits

DESCRIPTION	PART-NO.
Bracket for Q84r for mounting onto power source LSQ5	77-7240-01
Bracket for Q84s for mounting onto power source LSQ5	77-7240-06
Bracket for Q84r for wall mounting	77-7240-02
Bracket for Q84r mounting in the robot cabinet	77-7240-05

Overview Q84r/s replacement parts and accessories

DESCRIPTION	PART-NO.
Touchpen for Q80 / Q84r/s weld process controller (replacement part)	77-7240-03
Connection cable for Q84r/s 5m with open end for external power supply (option)	77-3305-00
Plug for external power supply of Q84r/s (replacement part)	77-7240-96
SD card for Q80 / Q84r/s weld process controller (replacement part)	91-8-6
USB adapter for SD cards for Q80 / Q84r/s weld process controller	91-8-1

ALTERNATIVE



Weld process controller Q80 front view



Weld process controller Q80 back view

Weld process controller Q80

The Q80 is the alternative to the Q84r/s. It has the same functionality/features as a single weld card of the Q84r/s - optimized for a single weld machine. With the universal Q80 all parameters and values needed for the weld task can be optimally calculated.

- Processes/features/general functions see Q84r/s
- Easy to network via Ethernet: up to traceability
- Ports: RJ45-Ethernet, SPW-Bus, SD card slot
- Wall mounting capability
- Remote Control / Administration: Q8Tool

Overview weld process controller

DESCRIPTION	PART-NO.
Q80	77-7260-00

Overview Q80 mounting kits

DESCRIPTION	PART-NO.
Bracket for mounting onto power source LSQ5	77-7240-06

Overview Q80 replacement parts and accessories

DESCRIPTION	PART-NO.
Touchpen for Q80 / Q84r/s weld process controller (replacement part)	77-7240-03
SD card for Q80 / Q84r/s weld process controller (replacement part)	91-8-6
USB adapter for SD cards for Q80 / Q84r/s weld process controller	91-8-1

2 Weld process controller

ALTERNATIVE



Weld process controller Q6pw



Weld process controller Q4

Weld process controller Q4 as integrated solution into the power source

Weld process controller Q6pw and Q4

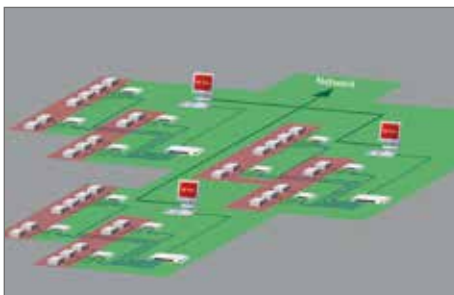
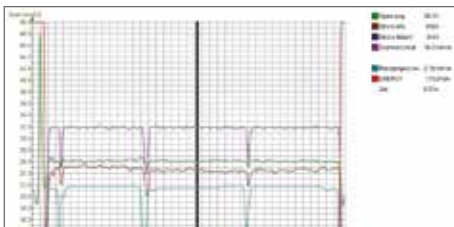
The perfect solution for local administration – the weld process controllers Q6pw and Q4 provide all basic functions of the Q80. The controllers can be administrated over the USB port with the Q8TOOL4 software. As a small and compact solution for the cost-optimized application, the Q4 is integrated into the power sources LSQ3 or LSQ5.

- Processes/features: MIG/MAG (GMAW), I-Pulse, U-Pulse, KF-Pulse
- Programs: 186
- General functions: Display and saving of readings, alarms
- Monitoring functions: Weld current monitoring, auto compensation, arc and ignition monitoring, motor current, gas and water monitoring
- Ports: RS232 (Q6pw only), SPW-Bus (Q6pw only), USB

Overview weld process controller

DESCRIPTION	PART-NO.	Please note:
Q6pw	77-7230-00	The Q4 weld process controller is integrated into the front of the power source and is delivered with the power source.
Q4/LSQ5	77-1185-20	
Q4/LSQ3	77-1184-20	
Q4/LSQ3A	77-1184-30	
Q4/LSQ5-CCC	77-1185-21	
Q4/LSQ3-CCC	77-1184-21	

2a Software/IT



Q8Tool software

The Q8Tool software provides accurate and comprehensive process monitoring. The user can store weld parameters for documentation on a PC and/or administrate them. It offers basic functions such as reading, modifying and documenting of weld parameters. Additionally, new weld parameters can be created and transferred to the universal weld process controllers. The weld data is portable and the installation of further control units on new equipment is easy. Also, the software allows reading and exporting of measurements and alarms. Graphical and numerical recording of measures helps defining and optimizing parameters for new parts. Users have a powerful tool for analyzing and documenting their weld results.

Network

The weld process controller units can easily be networked via Ethernet ports: Time savings through centralized administration of all controllers within the corporate network. There is a central backup of all welding parameters, management of user rights and access, process monitoring up to traceability. The Q8Tool software is provided free of charge with the weld process controller. No additional hardware or software is required.

3 Robot interface

Perfect integration.

Interfacing all industrial robot types.



With the universal interface solution, weld process controllers can be connected with all industrial robot types. Users basically have two options for connecting robots with weld process controllers: The connection can be realized with the interface UNI 5 or by integrating into a given field bus environment with a field bus solution.

Standard application

Robot controllers or overall system controllers (e.g. PLC) use digital or analog signals to communicate with the weld process controller. The interface UNI 5 translates these signals for the welding machine. With just one interface, a variety of digital encodings and analog levels can be processed. The interface UNI 5 comes with a preconfigured connection kit for easy installation.

Field bus application

Field bus systems exchange signals via serial communication. The field bus master, usually the robot controller or overall system controller, bundles and processes the signals of the connected field bus, including the welding machine. Standard field bus systems are e.g., Interbus-S, Profibus DP or DeviceNet. The field bus interface FB5 translates the field bus signals for the welding machine using a standardized protocol. It makes no difference which type of field bus system is used. The signals are always at the same place on the field bus. This makes the preparation of the robot or system controller much easier.

3 Robot interface

A



Robot interface UNI 5

The interface connects the welding equipment with all industrial robot types. With its high degree of standardization, the UNI 5 is the perfect choice for connecting the weld process controller (e.g. Q80) with an industrial robot. The UNI 5 comes preprogrammed and configured for different robot types. Configuration to a particular robot type is handled easily by programming the interface with two buttons for the given robot type.

Overview of robot interfaces

DESCRIPTION	PART-NO.
For robot type-ABB	
UNI 5A for IRC5	77-8011-08
For robot type-FANUC	
UNI 5A for RJ3iC	77-8001-84
For robot type-KUKA	
UNI 5A for KR C2	77-8011-08
For robot type-YASKAWA/MOTOMAN	
UNI 5C (Synchroweld over RS232) for NX 100 / DX 100 / DX 200	77-8013-00

ALTERNATIVE

B



Field bus application

Various field bus types are supported (e.g. Profibus DP, DeviceNet). The field bus interface has drilled bore holes for flexible mounting within the weld cell. Two additional mounting kits provide easy installation at the power source or into the cabinet. Additionally, external power can be connected to the interface. More details on solutions for the specific field bus types are available on request.

Overview FB5 interfaces

DESCRIPTION	PART-NO.
Interbus-S (copper line)	77-3-1
Profibus DP	77-3-2
DeviceNet	77-3-3
EtherCAT	77-3-4
Profinet IRT (copper line)	77-3-5
Profinet IRT (LWL 2 ports)	77-3-6
Interbus-S (LWL FSMA)	77-3-7
Ethernet/IP	77-3-8

Cabinet mounting

DESCRIPTION	PART-NO.
Mounting kit for cabinet	77-1182-02
Control cable with bracket	77-3102-02

Power source mounting

DESCRIPTION	PART-NO.
Mounting kit for power source	77-1182-03

Optional power supply (24V)

DESCRIPTION	PART-NO.
Connection cable 2.0 m (with open end)	77-1182-04

OPTION

SYNCHROWELD

Synchroweld unites the weld system and robot by a communication protocol (RWDE). This technology allows the weld system to get the actual robot speed and automatically adjusts the weld parameters accordingly. The result is a constant energy per unit length. At the same time, the programming effort can be significantly reduced.

Please note:

Further information on Synchroweld with ABB, Fanuc, KUKA, Yaskawa/Motoman can be found in our Synchroweld brochure.

4 Wire feeder

Strong, lightweight and precise.

The PF5 wire feeder.



Smaller and with less weight accompanied by improved efficiency over conventional wire feeders the PF5 goes along with the steady development of arc welding robots.



ALTERNATIVE



PF5 with integrated gas flow sensor



Power Feeder PF5

Modern motor, gear and control technology provide a strong performance and highest possible precision. The robust plastic housing is electrically insulated. As a "lightweight" the PF5 is the perfect choice for the new generation of robots with inner cable dress.

The industrial proven Power Feeder PF5 is available with an additional monitoring functionality: an integrated gas-flow sensor. The weld process controller displays the gas flow values, and can also be triggered to an alarm, in case of a non-defined gas flow rate.

Overview PF5

DESCRIPTION	PART-NO.
PF5 LEA	10-2-9
PF5 LEA with integrated gas flow sensor	10-2-109

Technical data

Weight	3.8 kg
Motor	70W
Wire feeding speed	2.5 - 25 m/min
Roll diameter	0.8 - 1.6 mm

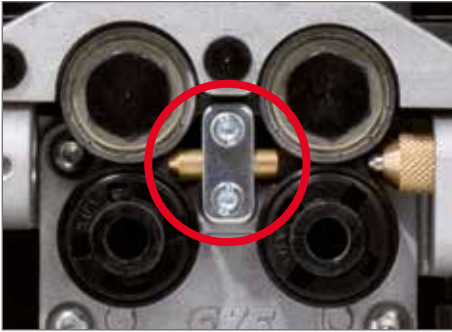
Shielding Gas Saver

The benefit of the shielding gas saver is its pre-regulated working pressure of 1.2 bar / 17 psi (common 4.5 bar / 65 psi). Therefore the ram pressure is reduced, i.e. there are key benefits of the shielding gas saver at ignition of the welding torch and an improved gas saving. The shielding gas saver ensures a constant gas flow during the welding task.

Shielding Gas Saver

DESCRIPTION	PART-NO.
Shielding Gas Saver	93-62-5

4 Wire feeder



Center guides

Available in two versions: For steel or aluminum wires

Overview of center guides

DESCRIPTION	PART-NO.
Wire- $\varnothing$ mm for steel wire	12-2-1-15
Wire- $\varnothing$ mm for aluminum	12-2-1-19



Please note:

Two drive rolls per system are needed.



Please note:

Two pressure rolls and two locating bolts are needed per system.

Drive roll for wire feeder

For wire diameters 0.8-1.6 mm (V-groove for steel and U-groove for aluminum)

Overview of four roller drive rolls

DESCRIPTION	PART-NO.	Wire- $\varnothing$ 1.4 mm, V-groove	12-2-3-14
Wire- $\varnothing$ 0.8 mm, V-groove	12-2-3-08	Wire- $\varnothing$ 1.6 mm, V-groove	12-2-3-16
Wire- $\varnothing$ 0.9 mm, V-groove	12-2-3-09	Wire- $\varnothing$ 1.2 mm, U-groove	12-2-3-112
Wire- $\varnothing$ 1.0 mm, V-groove	12-2-3-10	Wire- $\varnothing$ 1.6 mm, U-groove	12-2-3-116
Wire- $\varnothing$ 1.2 mm, V-groove	12-2-3-12		

Pressure roll

Pressure roll for wire feeder.

Pressure roll

DESCRIPTION	PART-NO.
Pressure roll	12-2-3-0
Locating bolt for pressure roll	12-13-5
Pressure roll for aluminum wire, U-groove 1.2 mm	12-2-5-112
Pressure roll for aluminum wire, U-groove 1.6 mm	12-2-5-116
Locating bolt for pressure roll U-groove	12-2-1-23
Knurled screw for pressure roll U-groove	12-2-1-24



Please note:

Wire feeder brackets for further robot types are available on request.

Wire feeder brackets

Wire feeder bracket for PF5 with holes and screws for installation

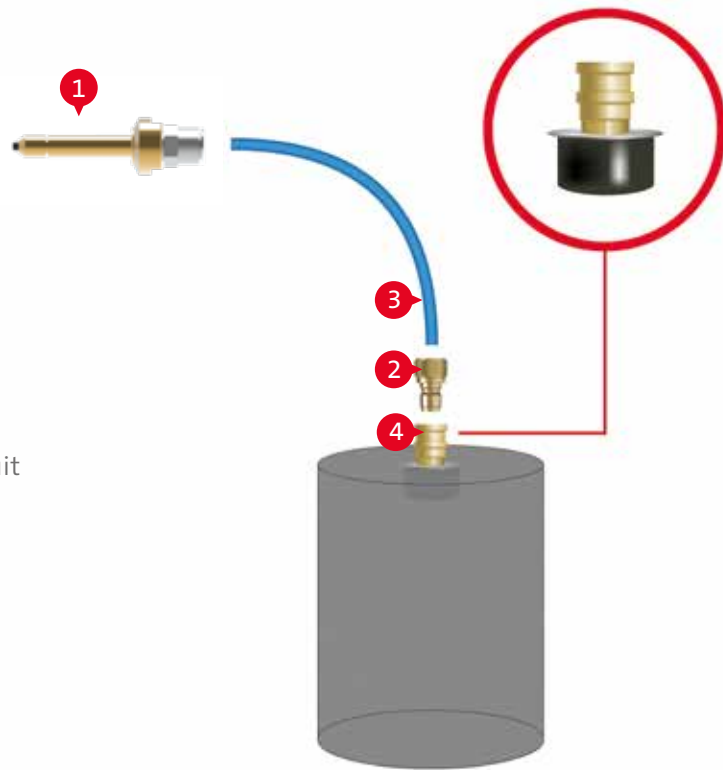
Overview of wire feeder brackets

DESCRIPTION	PART-NO.
For robot type-ABB	
IRB 1600iD / IRB 1660iD	14-2-5
IRB 2600iD 15/1.85	14-2-10
IRB 2600iD 8/2.00	14-2-10
For robot type-FANUC	
M-10iA/6L	14-4-4
M-10iA/8L	14-4-4
M-10iA/12	on request
M-10iA/12s	on request
For robot type-KUKA	
KR6 R1820 arc HW / KR8 R1420 arc HW / KR8 R1620 arc HW	14-3-8
KR8 R2100 arc HW	14-3-9
For robot type-YASKAWA/MOTOMAN	
MA 1440 / MA 2010 / GP 12 / GP 25	14-1-25

5 Wire guidance polymer for aluminum wires



- 1 Wire inlet body with quick coupling
- 2 Connection nipple for polymer conduit
- 3 Polymer conduit
- 4 Drum connector with ceramic inlay



Please note:

Further information can be found in our brochure "Wire guidance" (DOC-0193EN).

With the new SKS polymer guidance, the high efficiency of the whole system extends up to the drum.

Advantages of polymer wire guidance

- Extraordinary good glide properties reduces motor load
- Minimized abrasive wear and reduced dirt in wire feeder and torch system
- Lightweight design and a high inherent stability for easy installation
- Length can be freely chosen by the customer
- Cost optimized exchange: only the polymer conduit must be changed, connectors are reuseable.
- Optimized materials for longer life and reduced downtimes

Wire inlet body, Connection nipple, Polymer conduit and Connection for wire drum

Wire inlet body with quick coupling

DESCRIPTION	PART-NO.
Wire Inlet body with quick lock and polymeric inlet	10-2-0-63
Polymeric inlet (spare part)	10-2-0-63-2
Inset for aluminum wire	10-2-0-57-3

Connection nipple for polymer conduit

DESCRIPTION	PART-NO.
Connection nipple	44-40-3

Polymer wire conduit

DESCRIPTION	PART-NO.
Polymer wire conduit, blue, per meter	44-9-1

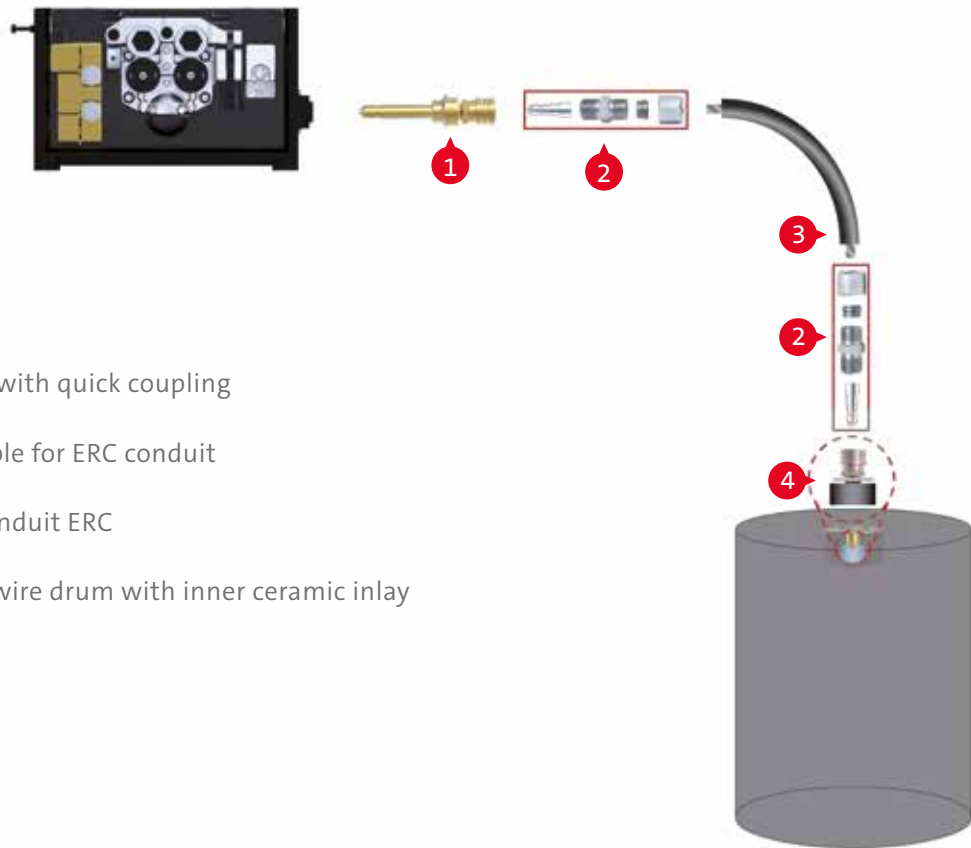
Connection for wire drum

DESCRIPTION	PART-NO.
Drum connector with ceramic inlay	44-40-1

OPTION

DESCRIPTION	PART-NO.
Strain-Relief for wire guidance	14-10-7

5 Wire guidance ERC for steel and stainless steel wire materials



- 1 Wire inlet body with quick coupling
- 2 Connection nipple for ERC conduit
- 3 Polymer wire conduit ERC
- 4 Connection for wire drum with inner ceramic inlay

With the ERC wire guidance for steel/stainless steel, the high efficiency of the whole system extends up to the drum.

Advantages

- Very good inherent stability due to thick polyethylene insulating jacket
- Good sliding properties
- Reduced wear by using flat wire for monocoil core
- Suitable for steel and stainless steel wires

Wire guidance ERC

DESCRIPTION	PART-NO.
Wire inlet body with quick coupling	10-2-0-61
Connection nipple for ERC conduit	44-70-2
Polymer wire conduit ERC / per meter	44-70-1
Drum connector with ceramic inlay	44-40-1

OPTION

DESCRIPTION	PART-NO.
Strain Relief for wire guidance	14-10-7
Strain Relief spring for wire guidance	44-70-3

Please note:

Two connection nipples are necessary.

ALTERNATIVE



Wire inlet bodies for additional systems

Beside the wire inlet body for the SKS wire guidance, inlet bodies for additional systems are available.

Overview of wire inlet bodies for additional systems

DESCRIPTION	PART-NO.
M10 with internal thread for ESAB	10-2-0-50
with 9.6 mm bore hole	10-2-0-52
with 13 mm bore hole	10-2-0-53
with PG9 thread	10-2-0-56
with 1/4" internal thread	10-2-0-60

Aluminum inlets for wire inlet bodies

DESCRIPTION	PART-NO.
for types 50/52/53/54/59/60/61	10-2-0-57-3
for types 51/55/56	10-2-0-58-3

6 Cable bundles



Cable bundles: Power source to wire feeder PF5

Coaxial power cable 72 mm² with internal gas flow, control cable L700, disconnect cable, corrugated tube and cable holder. Air-cooled version.

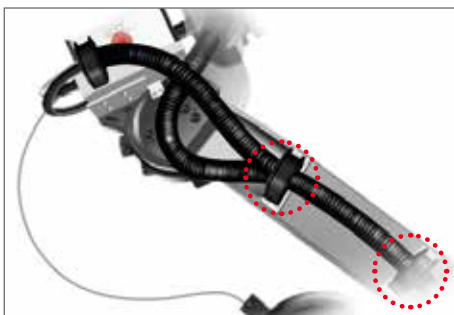
Overview of cable bundles

Length	PART-NO.
5 m	20-4-5
7 m	20-4-7
10 m	20-4-10

Please note:

Further lengths available on request

6a Cable bundles: Clamping set



Mounting cable bundle: Clamping set

Provides perfect installation of the cable bundle for all different robot types. Undesired cable movements are prevented. This results in higher lifetime.

Overview of cable bundle clamping sets

DESCRIPTION	PART-NO.
For robot type-ABB	
IRB 1600iD / IRB 1660iD	91-3-0-41-10
IRB 2600iD 15/1.85	91-3-0-41-11
IRB 2600iD 8/2.00	

DESCRIPTION	PART-NO.
For robot type-KUKA	
KR6 R1820 arc HW	91-3-0-41-17
KR8 R1420 arc HW	
KR8 R1620 arc HW	
KR8 R2100 arc HW	91-3-0-41-12

DESCRIPTION	PART-NO.
For robot type-FANUC	
M-10iA/6L	91-3-0-41-6
M-10iA/8L	91-3-0-41-15
M-10iA/12 / M-10iA/12S	on request

DESCRIPTION	PART-NO.
For robot type-YASKAWA/MOTOMAN	
MA 1440	91-3-0-41-14
MA 2010	91-3-0-41-14
GP 12	91-3-0-41-22
GP 25	91-3-0-41-22

Please note:

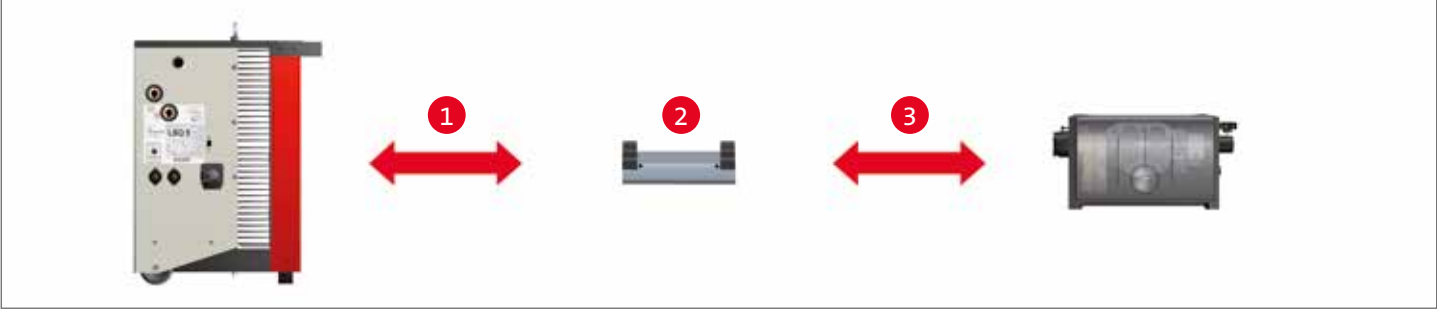
Clamping sets for further robot types are available on request.

ALTERNATIVE

DESCRIPTION	PART-NO.
Mounting for WF-bracket for external guided cable bundle	14-10-10

Dividable cable bundles

ALTERNATIVE

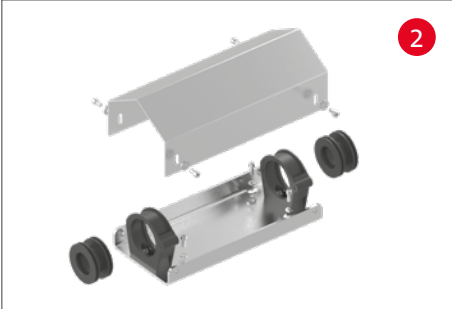


PARTS OF THE DIVIDABLE CABLE BUNDLE



Connection from power source to connection bracket

LENGTH	PART-NO.
5 m	20-7-5
7 m	20-7-7
10 m	20-7-10



Connection bracket

DESCRIPTION	PART-NO.
Connection bracket	20-6-0-3



Connection from connection bracket to wire feeder PF5

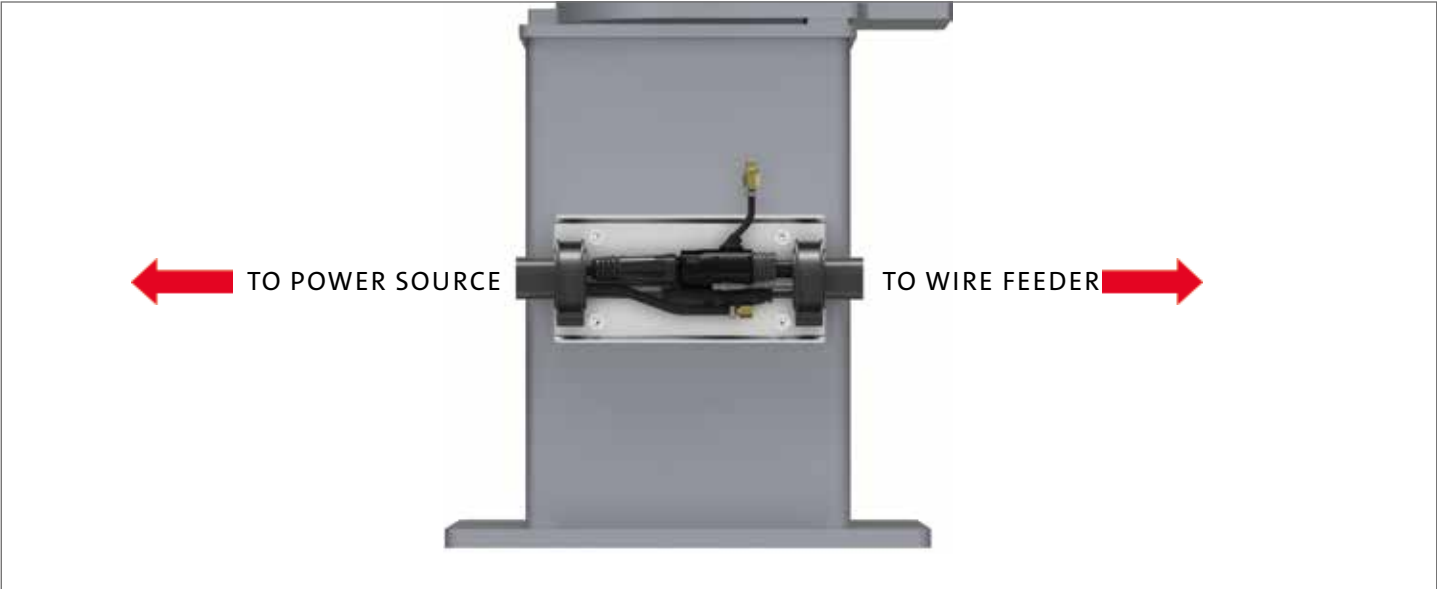
LENGTH	PART-NO.
3 m	20-6-3
5 m	20-6-5
7 m	20-6-7

Please note:

Further lengths available on request

Cable bundle with separation between power source and wire feeder PF5

The moving parts of the cable bundle (next to the robot) are separated from the non-moving parts (power source). In case of maintenance work, only the moving parts have to be changed. The quick and easy replacement concept results in time and cost savings.



7 Ground cable



Please note:

Further lengths available on request

Ground cable with 70 mm² connector and cable plug

Cables with larger diameters are available on request

Overview of ground cables

LENGTH	PART-NO.
6 m	228078106
10 m	228078100

8 Control cable



Please note:

For the Power Joint system three control cables are needed. One control cable is already included in the cable bundle.

Control cable: L700/SPW-bus

Standard control cable to connect the components:
Weld process controller, power source, robot interface, wire feeder.

Overview of control cables

LENGTH	PART-NO.
0.5 m	541031050
1 m	541031001
2 m	541031002
3 m	541031003
5 m	541031005
7 m	541031007
10 m	541031000
12 m	541031012
15 m	541031015

Please note:

Further lengths available on request

PLUG & PLAY: CONTROL CABLE L700

The advantages of a system concept are revealed by its details: One standard control cable (L700) connects all system components (power source, robot interface, weld process controller and wire feeder) within the welding system.

The system is expandable: Other components can be integrated at any time into an existing system. New devices are automatically detected.



POWER SOURCE



ROBOT INTERFACE



WELD PROCESS CONTROLLER



WIRE FEEDER

9 Torch system Power Joint

The new freedom of motion.

Power Joint for hollow wrist robots with inner torch cable.



The Power Joint torch system perfects the interaction of welding machines and robots with inner cable dress. A single rotary joint, endlessly rotatable, transmits electrical energy and all media such as gas, air and wire. This reduces torch cable movement (no twisting/no torsional strain) and therefore increases the lifetime of the torch cable. The lack of reorientations also saves airtime because the torch reaches every position in the shortest possible path.

The complete SKS Power Joint Weld Package is designed for the following welding processes, materials and power range:



Processes: MIG/MAG (GMAW), Pulse, MIG Brazing

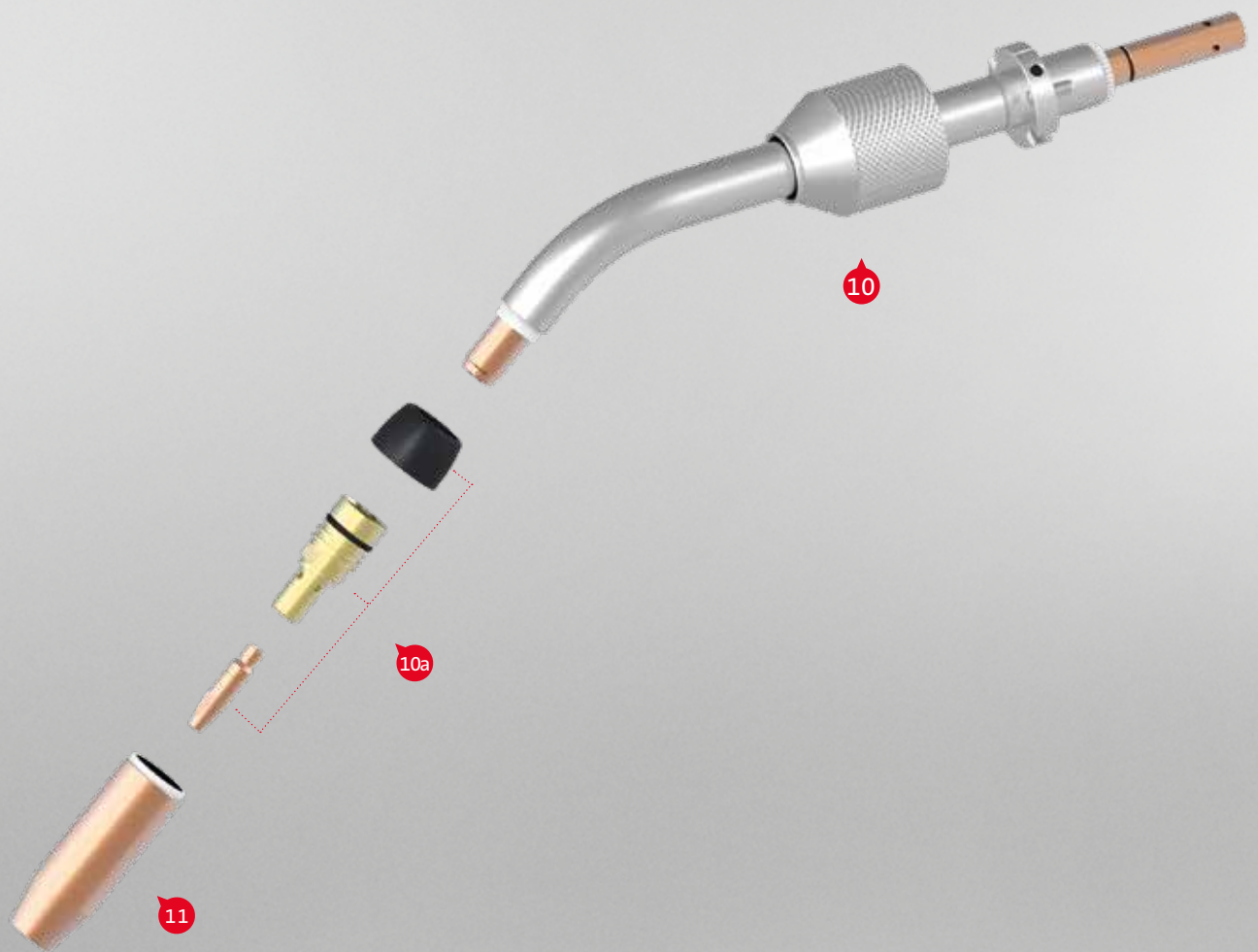
Wire materials: High-alloy steels, low-alloy steels, aluminum and copper alloys,
nickel-based materials

Wire diameter: 0.8-1.6 mm

Max. power: 420 A - 60 % duty cycle/40 °C, air-cooled

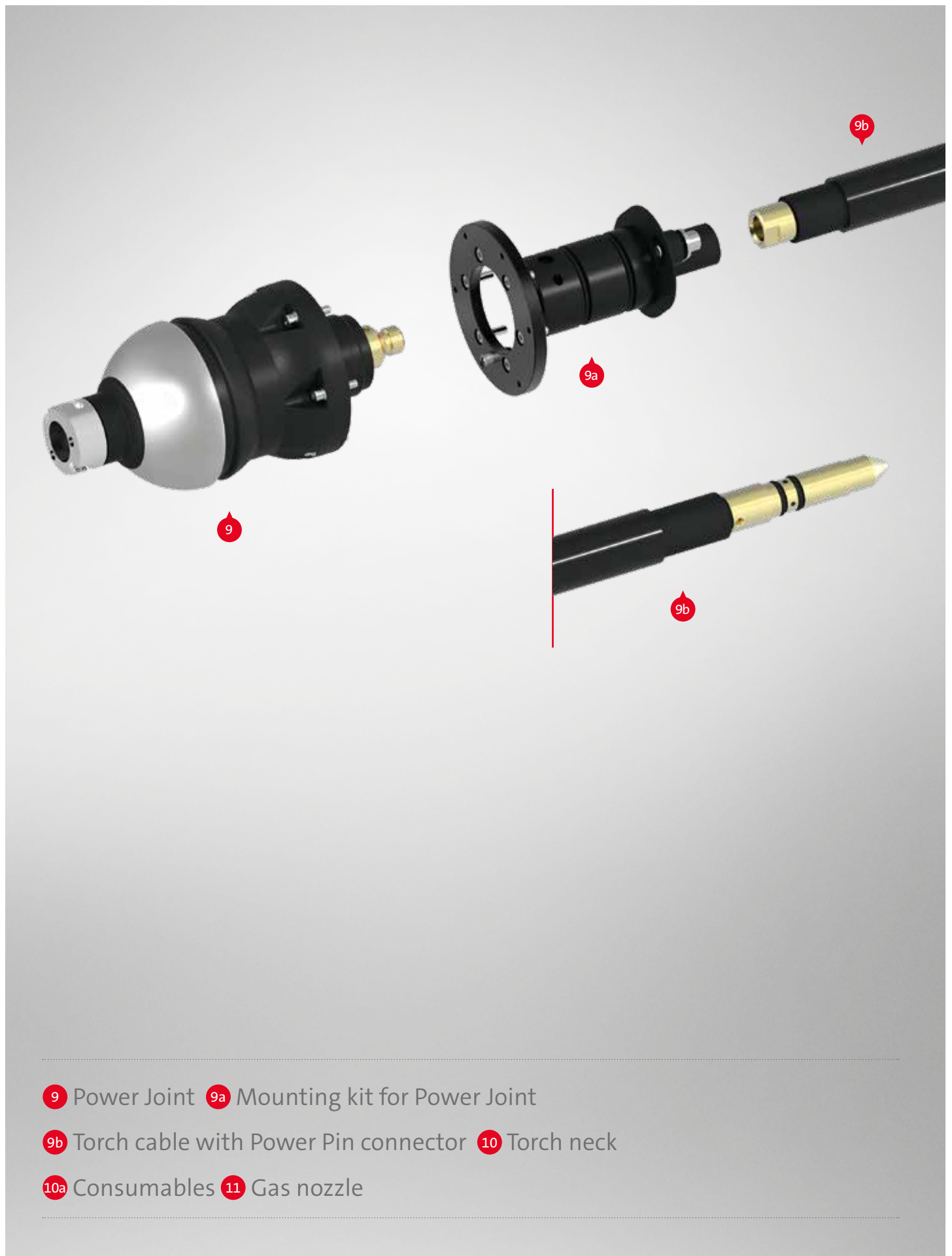
9 Torch system Power Joint: Parts overview

Power Joint torch system parts overview



The Power Joint torch system can be configured with different gas nozzles for standard applications or heavy duty applications.

9 Torch system Power Joint: Parts overview



9 Power Joint 9a Mounting kit for Power Joint

9b Torch cable with Power Pin connector 10 Torch neck

10a Consumables 11 Gas nozzle

9 Torch system



Power Joint for all industrial robots with inner cable dress

A single rotary joint, endlessly rotatable, transmits electrical energy and all media such as gas, air and wire. This reduces torch cable movement (no twisting/no torsional strain) and therefore increases the lifetime of the cable. The lack of reorientations also saves airtime because the torch reaches every position in the shortest possible path.

Power Joint

DESCRIPTION	PART-NO.
Power Joint	71-9-0

Technical data

Welding current	420 A - 60 % ED
Switch-Off automatic system	Deflection 10°
Reset accuracy	± 0.2 mm with TCP 400 mm
Weight	1,8 kg

9a Torch system: Installation



Mounting kit for Power Joint

Kit includes: Fixing cover, connecting flange, clamping bush, sealing grommet and mounting material for the specific robot type

Overview of mounting kits

DESCRIPTION	PART-NO.
For robot type-ABB	
IRB 1600iD	71-9-0-3
IRB 1660iD	71-9-0-9
IRB 2600iD 15/1.85	71-9-0-9
IRB 2600iD 8/2.00	71-9-0-9

For robot type-FANUC

M-10iA/6L	71-9-0-14
M-10iA/8L	71-9-0-14
M-10iA/12	on request
M-10iA/12S	on request

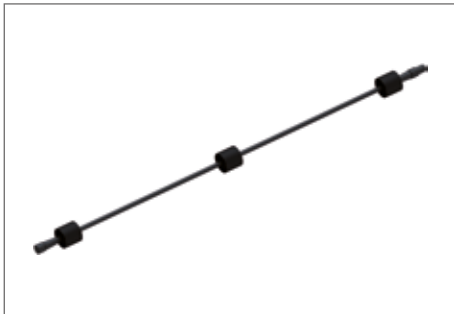
For robot type-KUKA

KR6 R1820 arc HW	71-9-0-17
KR8 R1420 arc HW	71-9-0-17
KR8 R1620 arc HW	71-9-0-17
KR8 R2100 arc HW	71-9-0-17

For robot type-YASKAWA/MOTOMAN

MA 1440	71-9-0-16
MA 2010	71-9-0-16
GP 12	71-9-0-16
GP 25	71-9-0-16

9b Torch system: Torch cable/Accessories



Please note:

Torch cables for further robot types are available on request.



Torch cable

High flexible coaxial cable 72 mm² with Power Pin connector.

Overview of torch cable

DESCRIPTION	PART-NO.
For robot type-ABB	
IRB 1600iD	61-9-1800
IRB 1660iD	61-9-100-6
IRB 2600iD 15/1.85	61-9-2600-15
IRB 2600iD 8/2.00	61-9-2600-8

For robot type-FANUC

M-10iA/6L	61-9-100-6
M-10iA/8L	61-9-100-8
M-10iA/12	on request
M-10iA/12S	on request

For robot type-KUKA

KR6 R1820 arc HW	61-9-MH24
KR8 R1420 arc HW	61-9-1420
KR8 R1620 arc HW	61-9-1420
KR8 R2100 arc HW	61-9-120

For robot type-YASKAWA/MOTOMAN

MA 1440	61-9-1440
MA 2010	61-9-2010
GP 12	61-9-1440
GP 25	61-9-MH24

Liner for torch cable

For the following diameters and filler materials:

Quick load liner:

Steel, bronze (wire- $\varnothing$ 0.8 - 1.0 mm)

LENGTH	PART-NO.
1.8 m	415-35-6Q
3.0 m	415-35-10Q

Quick load liner:

Steel, bronze (wire- $\varnothing$ 1.2 - 1.6 mm)

1.8 m	415-116-6Q
3,0 m	415-116-10Q

Aluminum (wire- $\varnothing$ 1.2 - 1.6 mm)

per meter	91-68-47025-25E
Sleeve	44-30-7
Power Pin cap	61-2-0-2-7

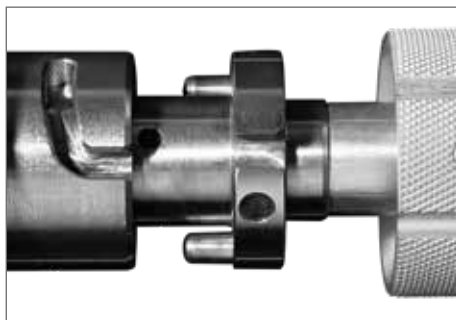
Sleeve for quick load liner

Fixates the liner in the torch cable

Sleeve for quick load liner

DESCRIPTION	PART-NO.
Sleeve for quick load liner	415-26

10 standard Torches: Torch necks/Accessories



Torch necks for Power Joint

With the innovative bayonet lock system, the SKS torch neck can be replaced quickly. This unique tool-free quick change system is also highly precise with TCP accuracy of ± 0.2 mm.

Overview torch necks

Overview torch necks				Application recommendations	
Type	PART-NO.	TCP length [mm]	angle [°]	Steel/CrNi	Al*
standard dressing air-cooled	58-1-00-400-1	400.0	0	✓	✓
	58-1-22-350-1	350.0	22	✓	✓
	58-1-22-400-1	400.0	22	✓	✓
	58-4-330-500-1	438.5	30	○	○
	58-1-130-450-1	450.0	30	○	○
	58-1-35-400-1	400.0	35	✓	✗
	58-1-45-350-1	350.0	45	✓	✗
	58-1-45-400-1	400.0	45	✓✓	✗
	58-1-45-450-1	450.0	45	✓	✗
	58-4-345-450-1	388.5	45	✓	✓
	58-4-345-567-1	505.5	45	✓	✓
Type	PART-NO.	TCP length [mm]	angle [°]	Steel/CrNi	Al
ZK	58-1-245-400-1	400.0	45	✓	✗

- ✓✓ Recommended standard torch neck
- ✓ Recommended
- Special design: application specific
- ✗ Not recommended

* Please note:

For aluminum applications SKS recommends a Frontpull torch system

INFO: TORCH NECK

SKS offers a special torch neck (up to 250 A, ZK-HeavyDuty up to max. 300 A) for welding components with tight accessibility. The special torch neck needs a smaller insulator (ZK) and a more compact gas nozzle (ZK). Standard Power Lock contact tips can be used.

TCP drawings can be found on the next to last page (torch necks).

Clamping cap for SKS single wire torch necks

Tool-free assembly with bayonet quick-change system

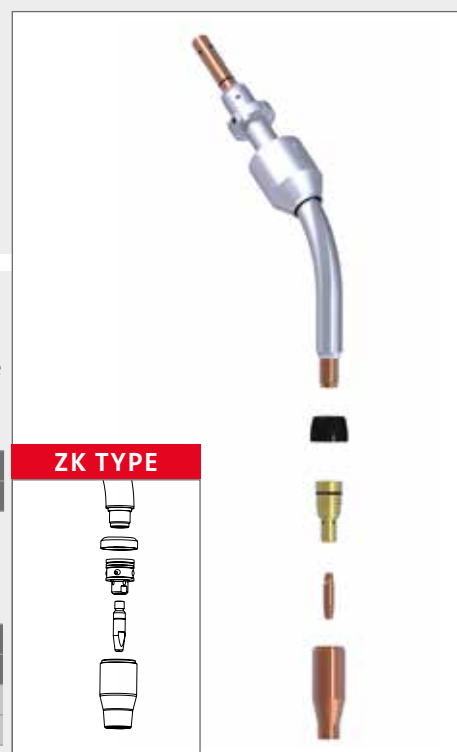
Clamping cap

DESCRIPTION	PART-NO.
Clamping cap	71-3-25

Insulator for SKS torch necks

Overview insulator

DESCRIPTION	PART-NO.
Standard	58-1-5
ZK type	43-6-4-2
ZK heavy duty type	43-6-4-3



10 HQX Torches: Torch necks/Accessories



Torch necks for Power Joint

Overview torch necks

Type	PART-NO.	TCP length [mm]	angle [°]	Application recommendations	
HQX-dressing air-cooled	58-1-622-350-1	350.0	22	✓	✓
	58-1-622-400-1	400.0	22	✓	✓
	58-1-635-400-1	400.0	35	✓	✗
	58-1-645-350-1	350.0	45	✓	✗
	58-1-645-400-1	400.0	45	✓ ✓	✗
	58-4-6345-450-1	388.5	45	✓	✓
	58-4-6345-567-1	505.5	45	✓	✓

- ✓ ✓ Recommended standard torch neck
- ✓ Recommended
- Special design: application specific
- ✗ Not recommended

* Please note:

For aluminum applications
SKS recommends a Frontpull
torch system



Insulator for SKS torch necks

Insulator

DESCRIPTION	PART-NO.
HQX Insulator for single wire torch necks	58-1-14

10a Torches: Consumables



Lock: Retaining head

Retaining heads for heavy duty applications with thread for threaded gas nozzles for simple and safe installation

Overview of retaining heads

DESCRIPTION	PART-NO.
High performance retaining head Power Lock standard	43-9-2
High performance retaining head Power Lock with 6 holes (AL-application)	43-9-4
High performance retaining head HQX Power Lock Plus with 6 holes (Fe-/Al-application)	43-20-3
High performance retaining head Power Lock (ZK-Version)	43-8-6
High performance retaining head Power Lock Plus	43-16-2
High performance retaining head Power Lock Plus (ZK-Version)	43-24-1



Power Lock: Contact tips

- Tapered design for high TCP reproducibility
- Improved heat transfer extends lifetime
- Improved power transition: constant arc quality

Overview of contact tips (also for ZK type)

Wire-Ø	Steel applications		Stainless steel applications		Aluminum applications	
	Power Lock	Power Lock Plus	Power Lock	Power Lock Plus	Power Lock	Power Lock Plus
0.8 mm	40-4-5-0.8E	40-6-5-0.8E	40-4-7-0.8S	40-6-7-0.8S	—	—
0.9 mm	40-4-5-0.9E	40-6-5-0.9E	40-4-7-0.9S	40-6-7-0.9S	—	—
1.0 mm	40-4-5-1.0E	40-6-5-1.0E	40-4-7-1.0S	40-6-7-1.0S	—	—
1.2 mm	40-4-5-1.2E	40-6-5-1.2E	40-4-7-1.2S	40-6-7-1.2S	40-4-7-1.2AL	40-6-7-1.2AL
1.4 mm	—	—	40-4-7-1.4S	40-6-7-1.4S	—	—
1.6 mm	—	—	40-4-7-1.6S	40-6-7-1.6S	40-4-7-1.6AL	40-6-7-1.6AL

Please note:

An overview of gas nozzles with dimensions can be found on the next pages.

10a Torches: Consumables



Please note:

An overview of gas nozzles with dimensions can be found on the next page.

Please note:

Further information can be found in our brochure "Consumables" (DOC-0135EN).

Gas nozzles with thread

Standard gas nozzles

13 mm bottle shaped	PART-NO.
short	41-19-13-BS
flush	41-19-13-BF
long	41-19-13-BR
13 mm tapered	PART-NO.
short	41-19-13-TS
flush	41-19-13-TF
long	41-19-13-TR
15 mm bottle shaped	PART-NO.
short	41-19-15-BS
flush	41-19-15-BF
long	41-19-15-BR
16 mm tapered	PART-NO.
short	41-19-16-TS
flush	41-19-16-TF
long	41-19-16-TR

Heavy Duty gas nozzles

13 mm	PART-NO.
flush, bottle shaped	41-20-13-BF
long, tapered	41-20-13-TR
16 mm tapered	PART-NO.
short	41-20-16-TS
flush	41-20-16-TF
long	41-20-16-TR

ZK type

13 mm bottle shaped	PART-NO.
short	41-21-13-BS
flush	41-21-13-BF
15 mm bottle shaped	PART-NO.
short	41-21-15-BS
flush	41-21-15-BF
13+15 mm Heavy Duty/tapered	PART-NO.
13 mm, flush	41-22-13-TF
15 mm, flush	41-22-15-TF



Gas nozzles with thread (HQX)

HQX gas nozzles

16 mm bottle shaped	PART-NO.
short	41-16-16-BS
16 mm tapered	PART-NO.
short	41-16-16-TS
flush	41-16-16-TF
long	41-16-16-TR



Tool for contact tips

For replacement of contact tips: Fast exchange of contact tip without removing the gas nozzle

contact tips

DESCRIPTION	PART-NO.
Mounting tool SW6 for contact tips (Power Lock)	51-9001-00
Mounting tool SW7 for contact tips (Power Lock Plus)	51-9002-00



Programming tips

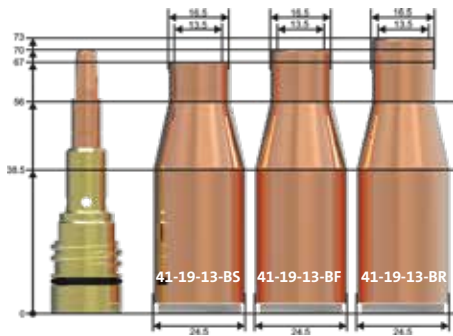
Power Lock programming tips for precise seam programming

Overview of programming tips

Stickout	PART-NO.
12 mm (Power Lock)	65-6
15 mm (Power Lock)	65-7
20 mm (Power Lock)	65-8
12 mm (Power Lock Plus)	65-11
15 mm (Power Lock Plus)	65-12

11 Gas nozzles: Overview dimensions

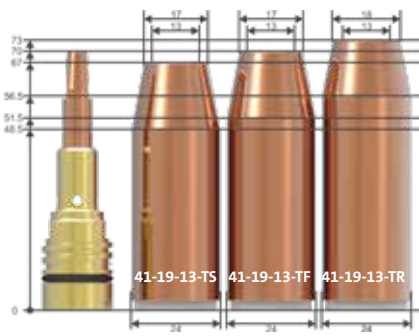
13 mm bottle-shaped



Gas nozzle PART-NO. 41-19-13-BS 41-19-13-BF 41-19-13-BR

Reamer Blade:			
Power Lock			
(UNF 3/8" x 24) PART-NO.	66-13-S	66-13-F	66-13-R
(M10 x 1) eReam PART-NO.	67-13-S	67-13-F	67-13-R
Power Lock Plus			
(UNF 3/8" x 24) PART-NO.	68-13-S	68-13-F	68-13-R
(M10 x 1) eReam PART-NO.	69-13-S	69-13-F	69-13-R

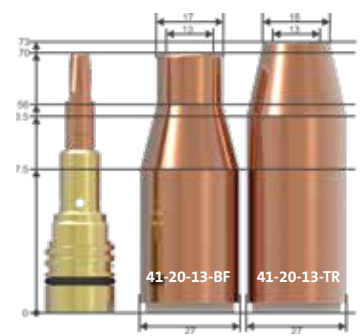
13 mm tapered



41-19-13-TS 41-19-13-TF 41-19-13-TR

	66-13-S	66-13-F	66-13-R
	67-13-S	67-13-F	67-13-R
	68-13-S	68-13-F	68-13-R
	69-13-S	69-13-F	69-13-R

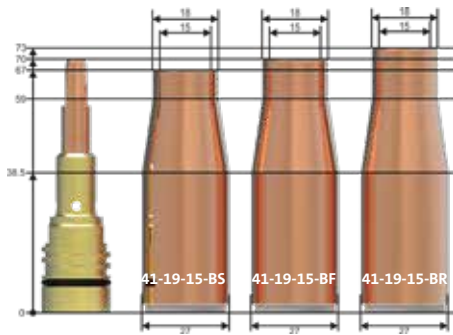
13 mm Heavy Duty



41-20-13-BF 41-20-13-TR

	66-13-F	66-13-R
	67-13-F	67-13-R
	68-13-F	68-13-R
	69-13-F	69-13-R

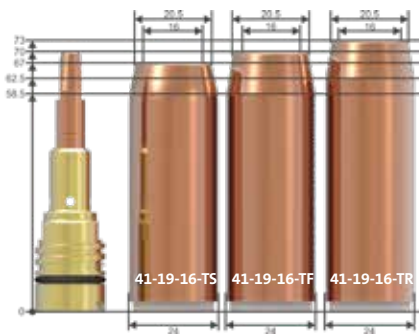
15 mm bottle-shaped



Gas nozzle PART-NO. 41-19-15-BS 41-19-15-BF 41-19-15-BR

Reamer Blade:			
Power Lock			
(UNF 3/8" x 24) PART-NO.	66-15-S	66-15-F	66-15-R
(M10 x 1) eReam PART-NO.	67-15-S	67-15-F	67-15-R
Power Lock Plus			
(UNF 3/8" x 24) PART-NO.	68-15-S	68-15-F	68-15-R
(M10 x 1) eReam PART-NO.	69-15-S	69-15-F	69-15-R

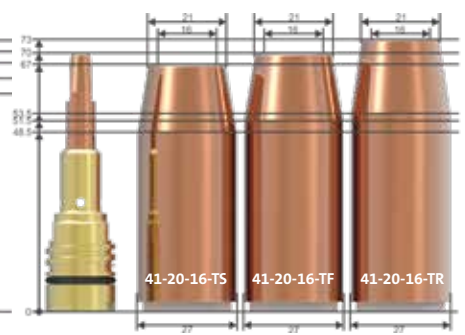
16 mm tapered



41-19-16-TS 41-19-16-TF 41-19-16-TR

	66-16-S	66-16-F	66-16-R
	67-16-S	67-16-F	67-16-R
	68-16-S	68-16-F	68-16-R
	69-16-S	69-16-F	69-16-R

16 mm Heavy Duty

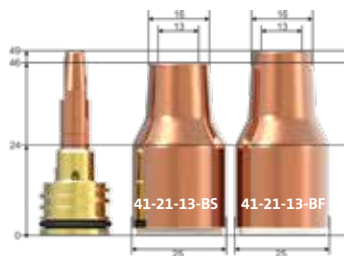


41-20-16-TS 41-20-16-TF 41-20-16-TR

	66-16-S	66-16-F	66-16-R
	67-16-S	67-16-F	67-16-R
	68-16-S	68-16-F	68-16-R
	69-16-S	69-16-F	69-16-R

ZK type:

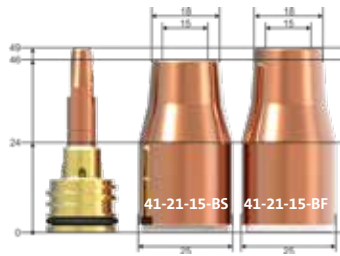
13 mm bottle-shaped



Gas nozzle PART-NO. 41-21-13-BS 41-21-13-BF

Reamer Blade:		
Power Lock		
(UNF 3/8" x 24) PART-NO.	66-13-ZK-S	66-13-ZK-F
(M10 x 1) eReam PART-NO.	67-13-S	67-13-F
Power Lock Plus		
(UNF 3/8" x 24) PART-NO.	68-13-ZK-S	68-13-ZK-F
(M10 x 1) eReam PART-NO.	69-13-S	69-13-F

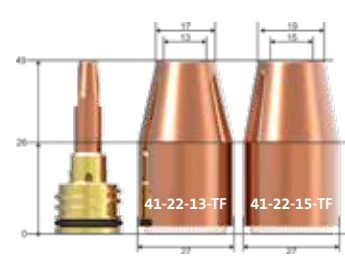
15 mm bottle-shaped



41-21-15-BS 41-21-15-BF

	66-15-ZK-S	66-15-ZK-F
	67-15-ZK-S	67-15-ZK-F
	68-15-ZK-S	68-15-ZK-F
	69-15-ZK-S	69-15-ZK-F

13+15 mm Heavy Duty/tapered



41-22-13-TF 41-22-15-TF

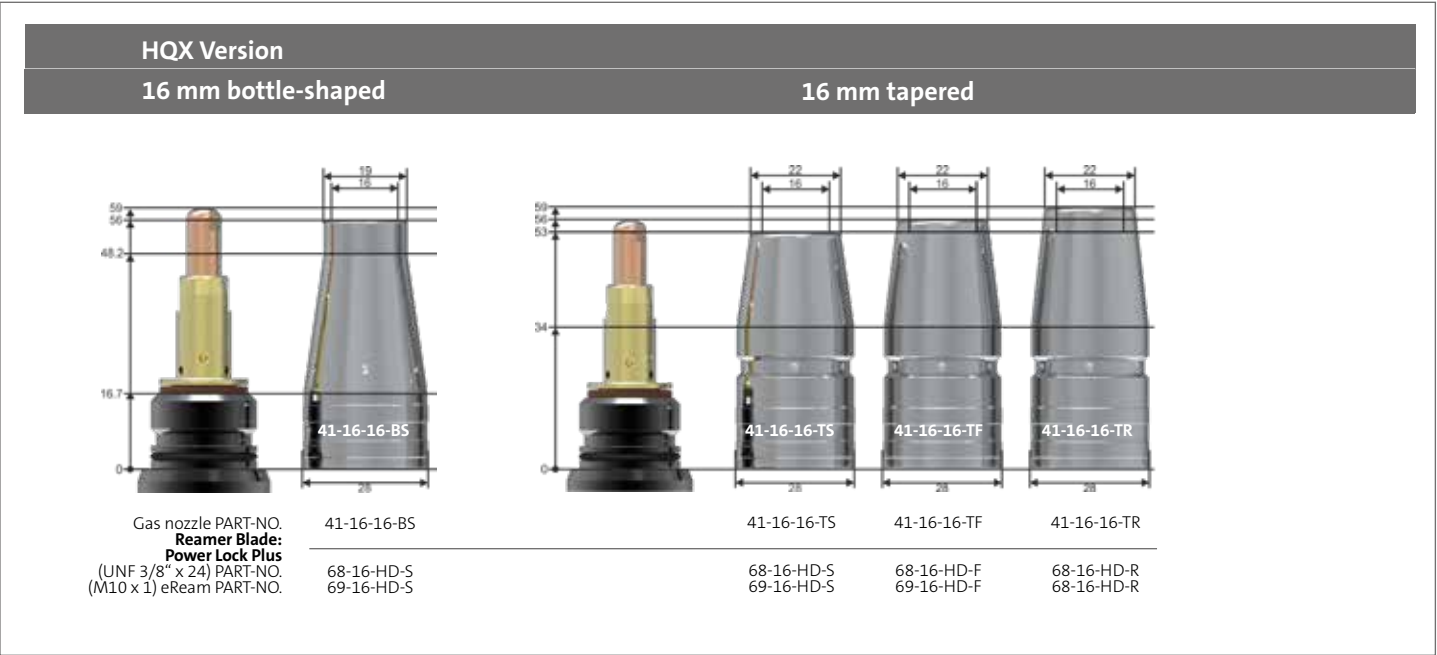
	66-13-ZK-F	66-15-ZK-F
	67-13-F	67-15-ZK-F
	68-15-ZK-F	68-15-ZK-F
	69-15-F	69-15-ZK-F

Dimensions in mm.

Further gas nozzles, reamer blades and torch necks can be found in our consumables brochure.

11

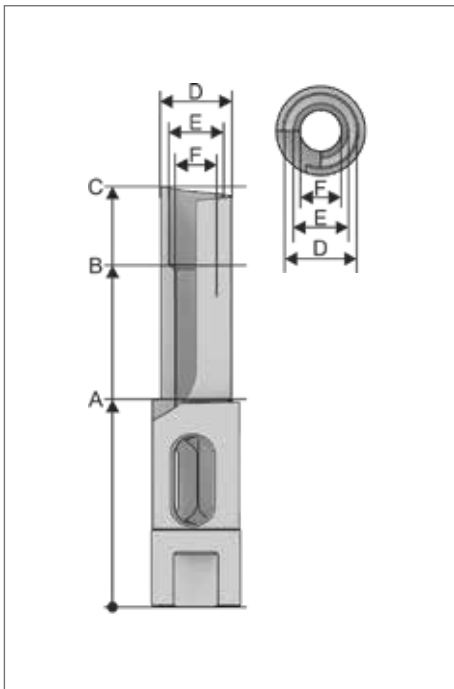
Gas nozzles: Overview dimensions



Dimensions in mm.

Further gas nozzles, reamer blades and torch necks can be found in our consumables brochure.

11a Gas nozzles: Reamer blades



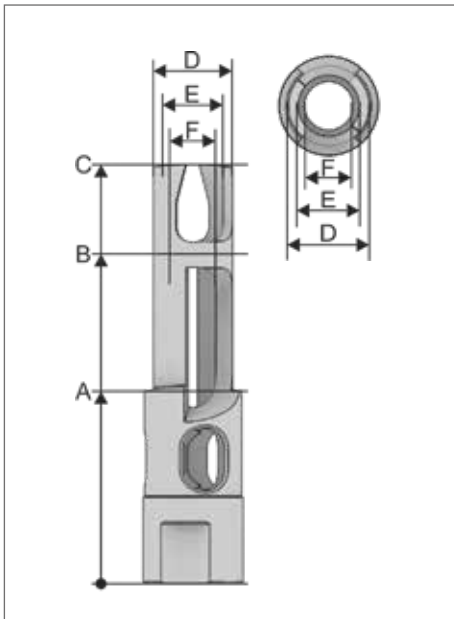
Standard torch neck – Power Lock

Reamer blade (internal thread UNF 3/8" x 24)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	66-13-S	66-13-F	66-13-R
15 mm	66-15-S	66-15-F	66-15-R
16 mm	66-16-S	66-16-F	66-16-R

Dimensions

A	B	C	D	E	F	PART-NO.
44	-	67	12.5	9	-	66-13-S
44	-	70	12.5	9	-	66-13-F
44	-	73	12.5	9	-	66-13-R
45	68	85	14.5	11.8	9	66-15-S
45	71	88	14.5	11.8	9	66-15-F
45	74	91	14.5	11.8	9	66-15-R
45	68	85	15.5	11.8	9	66-16-S
45	71	88	15.5	11.8	9	66-16-F
45	74	91	15.5	11.8	9	66-16-R

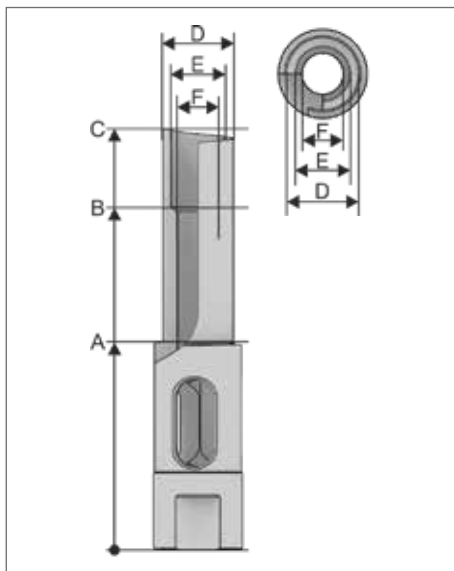


Reamer blade (internal thread M10 x 1 – eReam)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	67-13-S	67-13-F	67-13-R
15 mm	67-15-S	67-15-F	67-15-R
16 mm	67-16-S	67-16-F	67-16-R

Dimensions

A	B	C	D	E	F	PART-NO.
55	-	78	12.5	9	-	67-13-S
55	-	81	12.5	9	-	67-13-F
55	-	84	12.5	9	-	67-13-R
38	61	78	14.5	11.8	9	67-15-S
38	64	81	14.5	11.8	9	67-15-F
38	67	84	14.5	11.8	9	67-15-R
38	61	78	15.5	11.8	9	67-16-S
38	64	81	15.5	11.8	9	67-16-F
38	67	84	15.5	11.8	9	67-16-R



Standard torch neck – Power Lock Plus

Reamer blade (internal thread UNF 3/8" x 24)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	68-13-S	68-13-F	68-13-R
15 mm	68-15-S	68-15-F	68-15-R
16 mm	68-16-S	68-16-F	68-16-R

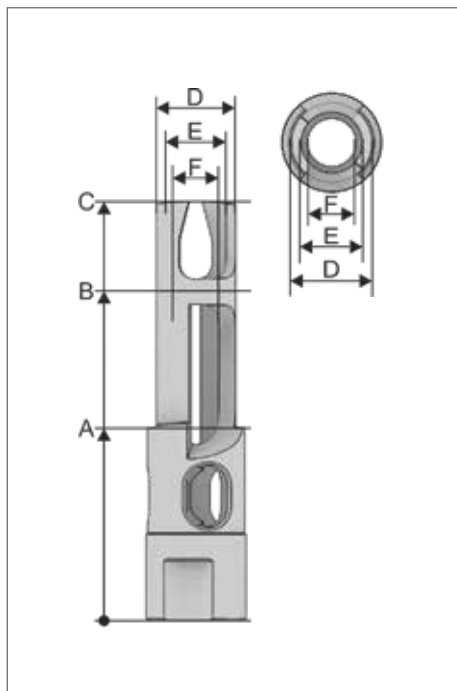
Dimensions

A	B	C	D	E	F	PART-NO.
55.5	-	67	12.5	9	-	68-13-S
52.5	-	67	12.5	9	-	68-13-F
49.5	-	67	12.5	9	-	68-13-R
51	63	91	14.5	11.8	9	68-15-S
48	63	91	14.5	11.8	9	68-15-F
45	63	91	14.5	11.8	9	68-15-R
51	63	91	15.5	11.8	9	68-16-S
48	63	91	15.5	11.8	9	68-16-F
45	63	91	15.5	11.8	9	68-16-R

Please note:

Dimensions in mm.

11a Gas nozzles: Reamer blades



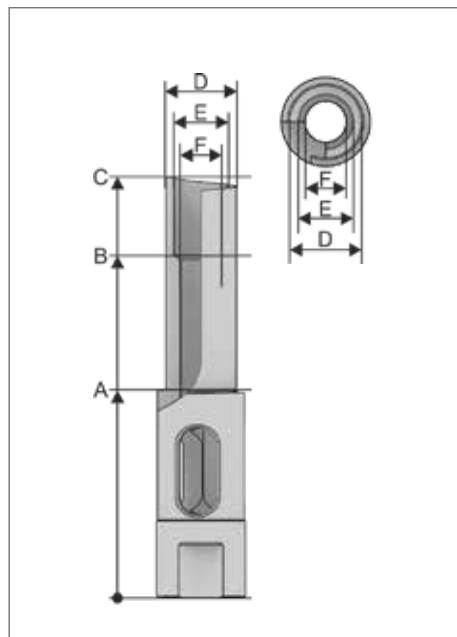
Standard torch neck – Power Lock Plus

Reamer blade (internal thread M10 x 1 – eReam)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	69-13-S	69-13-F	69-13-R
15 mm	69-15-S	69-15-F	69-15-R
16 mm	69-16-S	68-16-F	68-16-R

Dimensions

A	B	C	D	E	F	PART-NO.
66.5	-	78	12.5	9	-	69-13-S
66.5	-	81	12.5	9	-	69-13-F
66.5	-	84	12.5	9	-	69-13-R
38	50	78	14.5	11.8	9	69-15-S
38	53	81	14.5	11.8	9	69-15-F
38	56	84	14.5	11.8	9	69-15-R
38	50	78	15.5	11.8	9	69-16-S
38	53	81	15.5	11.8	9	69-16-F
38	56	84	15.5	11.8	9	69-16-R



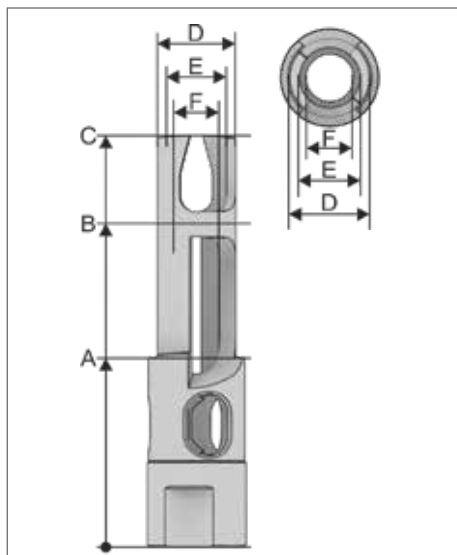
ZK-Series – Power Lock

Reamer blade (internal thread UNF 3/8" x 24)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	66-13-ZK-S	66-13-ZK-F	-
15 mm	66-15-ZK-S	66-15-ZK-F	-

Dimensions

A	B	C	D	E	F	PART-NO.
54	-	77	12.5	9	-	66-13-ZK-S
51	-	77	12.5	9	-	66-13-ZK-F
45	68	77	14.5	11.8	9	66-15-ZK-S
42	68	77	14.5	11.8	9	66-15-ZK-F



Reamer blade (internal thread M10 x 1 – eReam)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	67-13-S	67-13-F	-
15 mm	67-15-ZK-S	67-15-ZK-F	-

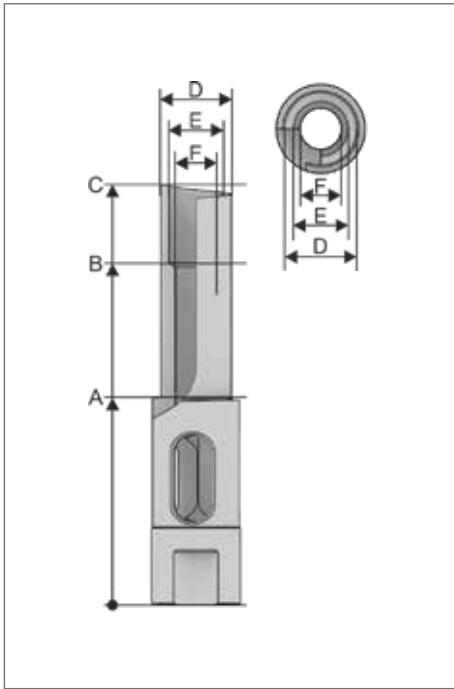
Dimensions

A	B	C	D	E	F	PART-NO.
55	-	78	12.5	9	-	67-13-S
55	-	81	12.5	9	-	67-13-F
46	69	78	14.5	11.8	9	67-15-ZK-S
46	72	81	14.5	11.8	9	67-15-ZK-F

Please note:

Dimensions in mm.

11a Gas nozzles: Reamer blades

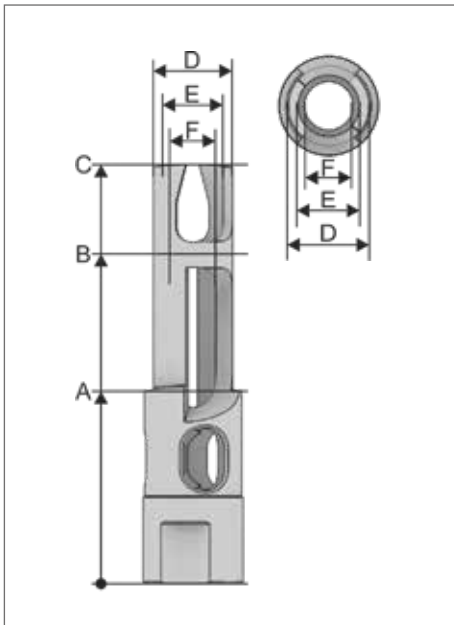


ZK-Series – Power Lock Plus

Reamer blade (internal thread UNF 3/8" x 24)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	68-13-ZK-S	68-13-ZK-F	-
15 mm	68-15-ZK-S	68-15-ZK-F	-

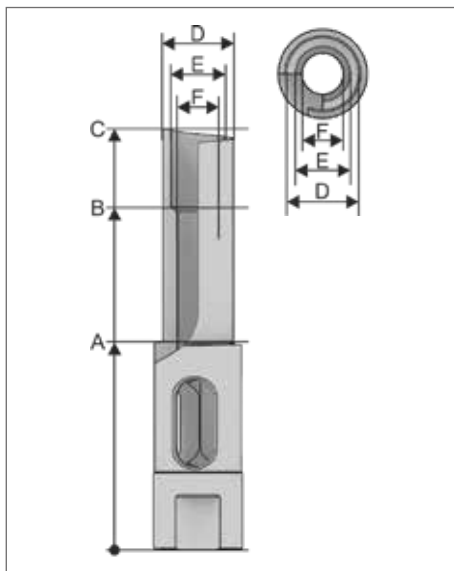
Dimensions						
A	B	C	D	E	F	PART-NO.
65.5	-	77	12.5	9	-	68-13-ZK-S
62.5	-	77	12.5	9	-	68-13-ZK-F
45	58	77	14.5	11.8	9	68-15-ZK-S
42	58	77	14.5	11.8	9	68-15-ZK-F



Reamer blade (internal thread M10 x 1 – eReam)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
13 mm	69-13-S	69-13-F	-
15 mm	69-15-ZK-S	69-15-ZK-F	-

Dimensions						
A	B	C	D	E	F	PART-NO.
66.5	-	78	12.5	9	-	69-13-S
66.5	-	81	12.5	9	-	69-13-F
46	59	78	14.5	11.8	9	69-15-ZK-S
46	62	81	14.5	11.8	9	69-15-ZK-F



HQX-Series – Power Lock Plus

Reamer blade (internal thread UNF 3/8" x 24)

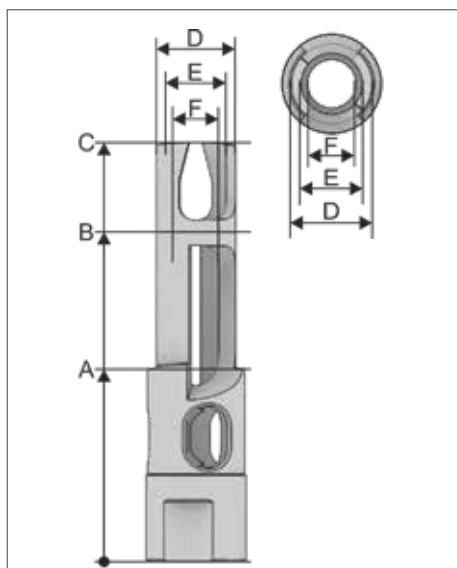
Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
16 mm	68-16-HD-S	68-16-HD-F	68-16-HD-R

Dimensions						
A	B	C	D	E	F	PART-NO.
49.5	62	85	15.5	12.8	9	68-16-HD-S
46.5	62	85	15.5	12.8	9	68-16-HD-F
43.5	62	85	15.5	12.8	9	68-16-HD-R

Please note:

Dimensions in mm.

11a Gas nozzles: Reamer blades



Please note:

Dimensions in mm.

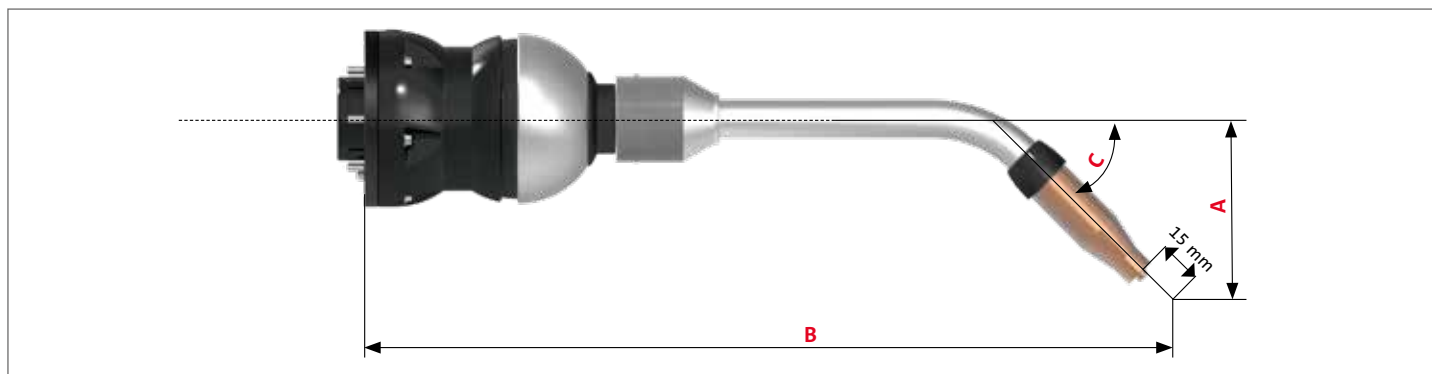
HQX-Series – Power Lock Plus

Reamer blade (internal thread M10 x 1 – eReam)

Reamer blade	short	flush	long
Inner diameter of the gas nozzle	PART-NO.	PART-NO.	PART-NO.
16 mm	69-16-HD-S	69-16-HD-F	69-16-HD-R

Dimensions						PART-NO.
A	B	C	D	E	F	
38	50.5	73.5	15.5	12.8	9	69-16-HD-S
38	53.5	76.5	15.5	12.8	9	69-16-HD-F
38	56.5	79.5	15.5	12.8	9	69-16-HD-R

12 Torches: TCP dimensions



Overview of air cooled torch necks

Standard dressing	HQX	A (distance in mm)	B (TCP length in mm)	C (angle in °)
PART-NO.	PART-NO.			
58-1-00-400-1	on request	0	400.0	0
58-1-22-350-1	58-1-622-350-1	45	350.0	22
58-1-22-400-1	58-1-622-400-1	45	400.0	22
58-4-330-500-1	on request	120	438.5	30
58-1-130-450-1	on request	0	450.0	30
58-1-35-400-1	58-1-635-400-1	70	400.0	35
58-1-45-350-1	58-1-645-350-1	90	350.0	45
58-1-45-400-1	58-1-645-400-1	90	400.0	45
58-1-45-450-1	on request	90	450.0	45
58-4-345-450-1	58-4-6345-450-1	120	388.5	45
58-4-345-567-1	58-4-6345-567-1	120	505.5	45

Overview torch necks ZK type

Standard dressing	A (distance in mm)	B (TCP length in mm)	C (angle in °)
PART-NO.			
58-1-245-400-1	62	400,0	45

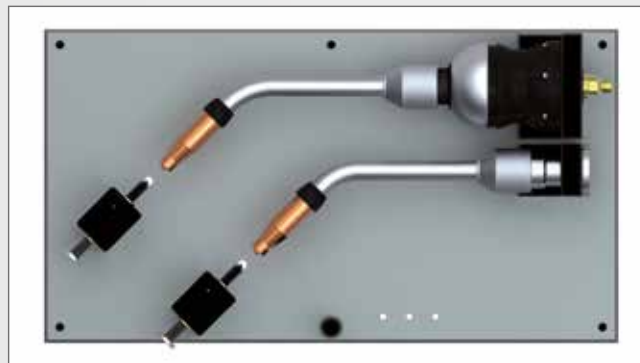
Please note:

Dimensions in mm.

12a Torches: Checking fixtures

To check TCP of torch necks and complete torch.

Checking fixtures are provided for all listed torch necks with Power Joint torch system. Please contact us for detailed information.



Top view checking fixture



Please note:

Further information can be found in our brochure "Checking fixtures" (DOC-0137EN).

eReam

for a precise cleaning
of the torch frontend



Pure
Electric.

For further information
please visit
www.eReam.de

Please note:

Further information can be found in our eReam brochure (DOC-0184EN).

SKS

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