



eReam

First fully electric driven torch cleaning system

cutting | centering | clamping | reaming | spraying

Pure
electric.



eReam – Torch Cleaning System

Efficient cleaning of gas nozzles with eReam

The task:

Affordable, reliable and easy to handle cleaning of gas nozzles, easy system integration and uncomplicated implementation of safety guidelines.

Our solution:

An electric motor-driven cleaning system with exchangeable reamer blades.

The functional principle:

In a comparison of the different cleaning methods, cleaning with cutters proved as the best solution from the point of costs, reliability and manageability. The decision to use an electric motor rather than pneumatic opened various possibilities concerning control and sensor technology. Thus, the cleaning process runs automatically programmed. In addition, electricity is more efficient instead of air because the installation, operation and associated costs are extremely low. High reliability and availability, long life and low LCC (Life Cycle Cost) ensure the efficiency in the long run. The integration of electrically-controlled systems into communication networks is future-proof and easy to implement.

In contrast to air-powered torch cleaning stations the jaws of the cutter and its hub as well as the anti-spatter liquid pump are controlled electronically and electrically operated. All functional controls are controlled by a microcontroller independently of the welding system; the robot starts the process with a single signal. The communication can be realized via PLC (digital I/Os).

The cleaning process:

The robot moves the torch to the eReam. With a centering ring the torch is placed for optimal cleaning. The gas nozzle is clamped by the electric motorized clamping jaws. The material removal is force-dependent rather than fixed while milling. As a control variable the torque of the cutter is used. The cutting depth is determined by measurement of way. For air blast, eReam can control the air blast valve of the robot directly. The air flows programmed only during the time needed to blow out. The same principle applies for anti-spatter liquid of the injection system. The electronics measures the used liquid and signals a needed change of the canister (in preparation). Instead of manually refill the operator simply changes the externally-mounted canister. If required, an electric motor-driven automated wire cutter unit supplements the eReam torch cleaning station.

Customer benefits:

Purchase/Investment:

- saves additional safety equipment and need for less safety precautions in the welding cell for the compressed air operation, some of which are more expensive than the torch cleaning station
- saving costs for the supply of compressed air
- works without additional components or software with all common welding robots and automation systems that have a digital electronic control system

Technical benefits:

- easy installation / integration
- High reliability, availability and lifetime results in a low LCC
- Centering of the gas nozzle ensures a reference height for cleaning
- Intuitive operation and programming
- Safety TCP inspection-tip integrated
- Handshake with robot
- Intelligent cleaning: process is completely realized by eReam

eReam – Example calculation of yearly operation costs

Basics for calculation

Time per cleaning cycle:	5 s
Cleaning cycles per year:	300.000 (approx. 1.200 daily cycles at 250 days of production)
Yearly middle standby time:	6000 h/year (at 250 days of production)
Compressed air flow rate:	0,007 m³/s
Standby rate:	0,0036 kWh (3,6 W)
Energy cost:	0,155 €/kWh
CO ₂ emission:	559g CO ₂ /kWh (german energymix)

Operating numbers for calculation of compressed air costs

Compressor operating numbers:	0,13 kWh/m ³ (average good adjusted system)
Average leakage loss:	25% of compressed air costs
Energy costs for compressed air:	approx. ~78% of total costs for compressed air

Operation numbers for calculation of eReam energy consumption

Assembly	Voltage [V]	Power rating [W]	Time per cycle [s]	Nominal generation [W*s]
Clamping unit	24	12,7	1,4*	17,78
Motor reamer	24	34,7	1,7*	58,99
Motor reamer lift	24	34,7	1,23*	42,681
Wire cutter	24	34,7	1,9*	65,93
Spray unit	24	45	0,15*	6,75
External options	-	8	1,7*	13,6
Electronic	-	2	72*	144
Total nominal generation [W*s/cycle]				349,731
Total nominal generation [kWh/cycle]				0,000971475

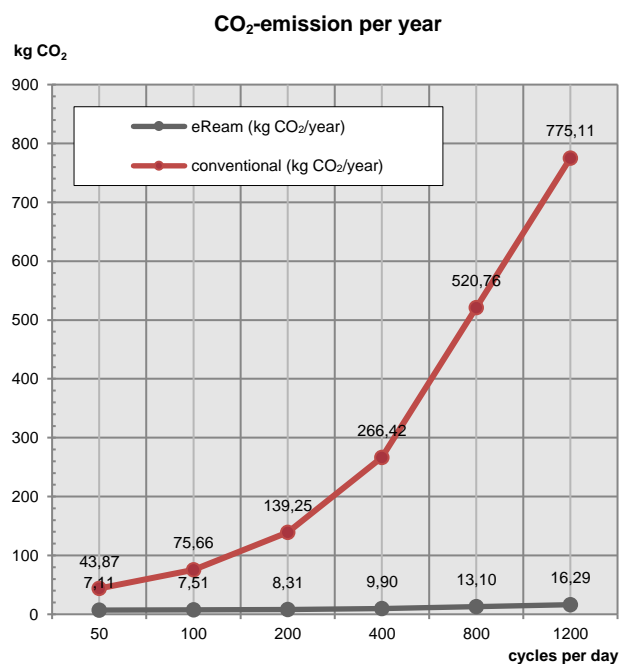
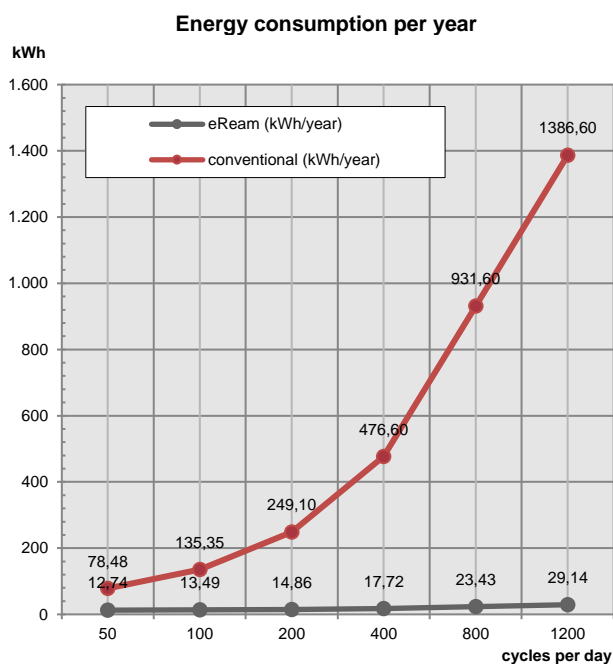
* overlap of assembly working times during cleaning process

Calculated yearly consumption values

Cleaning cycles / day	50	100	200	400	800	1.200
Cleaning cycles / year	12.500	25.000	50.000	100.000	200.000	300.000

Energy consumption per year	conventional (kWh)	78,475	135,350	249,100	476,600	931,600	1.386,600
	eReam (kWh)	12,741	13,492	14,857	17,715	23,430	29,144

CO ₂ emission per year	conventional (kg CO ₂ /year)	43,868	75,661	139,247	266,419	520,764	775,109
	eReam (kg CO ₂ /year)	7,107	7,507	8,305	8,305	13,097	16,292



eReam – Overview of functions



eReam – Overview of functions

- 1 Cutting**
 - Exact cutting through motor driven cutter-blades
 - All cutter-blades multiple usable (multi-side sharpened)

- 2 Centering**
 - Optimal centering of the gas nozzle due to gas nozzle specific centering ring
 - Mechanical Gas Nozzle immersion depth limitation (Protection of the gas nozzle)

- 3 Clamping**
 - Optimized centering and clamping (mechanical immersion depth stop)

- 4 Reaming**
 - Programmable positioning of reamer lifting (protection of consumables)
 - Way and force supervision of cleaning process (damage protection)

- 5 Spraying**
 - Pulse-triggered spray (exact dosage of anti-spatter spray)
 - Level supervision of anti-spatter spray (in preparation)

- 6 Intuitive**
 - Big display shows actual status and information
 - Intuitive usage (quick menu navigation and programing)
 - Status supervision of all functions (directly at the unit or via digital I/O)
 - Fully integratable into safety circuit
 - Local Mode (Setup mode with minimum speed of all motors)
 - Control of air-blast valves directly through eReam (optional)
 - Supervision of all service doors (door-open-check)
 - RS232 connection (service connection)

- 7 Functional**
 - Safety tip for TCP inspection

- 8 Modular**
 - Mounting threads for custom addons
 - Controlling of external blow-out valves directly through eReam (optional)

eReam – Versions



Part number: 67-2-200
centering - clamping - reaming - spraying

eReam main unit
including spray unit | without wire cutter



Part number: 67-2-400
cutting - centering - clamping - reaming - spraying

eReam main unit
including spray unit | including wire cutter

eReam – Accessories

Stand for eReam and holder for anti spatter spray canister

Part number	Description
67-2-18-750	Stand for eReam, H=750mm (including dripping pan)
67-2-18-4	Holder for canister for mounting on eReam stand (spare part)



Spray Kit for eReam (consisting of mount for canister, suction probe and canister) – starter set

Part number	Description
67-2-29-1	Spray Kit eFC10 Canister (5 Liter / 1.321 US Gallon)



Anti spatter spray – replacement canister

Part number	Description
91-102-2-5	Anti spatter spray eReam Cleaning Fluid 10 canister (5 Liter / 1.321 US Gallon)
91-102-2-5	Anti spatter spray eReam Cleaning Fluid 10 canister (20 Liter / 5.283 US Gallon)



Signal cable for signal transmission between eReam and controller

Part number	Description
On request	Signal cable 12-pin M12 socket (12x0.14mm ² / open ends) 5m
91-38-19341-7061000	Signal cable 12-pin M12 socket (12x0.14mm ² / open ends) 10m
On request	Signal cable 12-pin M12 socket (12x0.14mm ² / open ends) 15m
91-38-19341-7062000	Signal cable 12-pin M12 socket (12x0.14mm ² / open ends) 20m



Cable for power supply

Part number	Description
91-58-12200055	Supply cable 4-pin M12 socket (4x1.50mm ² / open ends) 3m
On request	Supply cable 4-pin M12 socket (4x1.50mm ² / open ends) 5m
91-58-12200052	Supply cable 4-pin M12 socket (4x1.50mm ² / open ends) 10m
On request	Supply cable 4-pin M12 socket (4x1.50mm ² / open ends) 15m
On request	Supply cable 4-pin M12 socket (4x1.50mm ² / open ends) 20m



External power supply

Part number	Description
91-38-85303	External power supply 24VDC / 5A for top-hat rail mount IN: 90-132 VAC / 173-264 VAC OUT: 24VDC/5A
91-08-2512-H12473459	Schuko Cable with angle plug, 3-pin, cable end sleeves

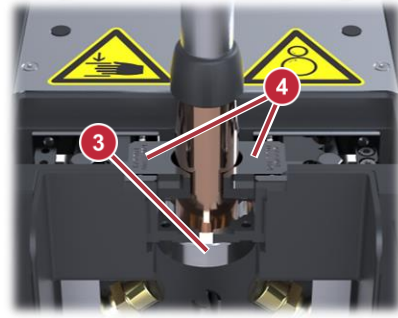
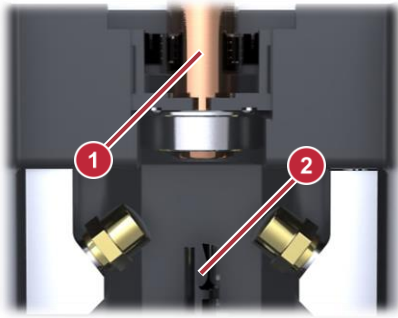


Control cable for external air-blast valve (max. 2 possible per eReam)

Part number	Description
541042705	Control cable 5-pin M12 plug and socket (5x0.14mm ²) 5m
541042707	Control cable 5-pin M12 plug and socket (5x0.14mm ²) 7m
541042710	Control cable 5-pin M12 plug and socket (5x0.14mm ²) 10m
541042712	Control cable 5-pin M12 plug and socket (5x0.14mm ²) 12m
541042715	Control cable 5-pin M12 plug and socket (5x0.14mm ²) 15m
541042720	Control cable 5-pin M12 plug and socket (5x0.14mm ²) 20m



eReam – Dressing Parts (Power Lock Consumables Series)



1

Gas Nozzle In Use



2

Reamer Blade



3

Centering Ring



4

Clamping Bracket
(2 pcs. needed)



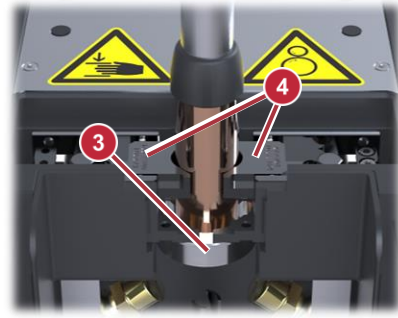
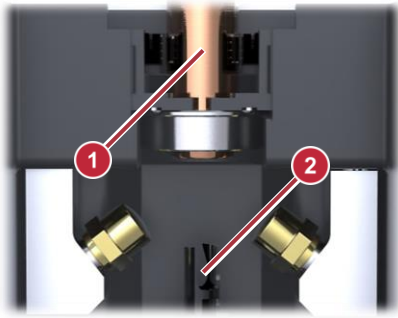
2-4

Dress-Kit



Part Number	Part Number	Part Number	Part Number	Part Number
41-19-13-BS	67-13-S	67-2-21-7	67-2-20-1	67-2-32-2
41-19-13-BF	67-13-F	67-2-21-7	67-2-20-1	67-2-32-3
41-19-13-BR	67-13-R	67-2-21-8	67-2-20-1	67-2-32-4
41-19-13-TS	67-13-S	67-2-21-1	67-2-20-1	67-2-32-5
41-19-13-TF	67-13-F	67-2-21-1	67-2-20-1	67-2-32-6
41-19-13-TR	67-13-R	67-2-21-4	67-2-20-1	67-2-32-7
41-20-13-BF	67-13-F	67-2-21-10	67-2-20-3	67-2-32-8
41-20-13-TR	67-13-R	67-2-21-4	67-2-20-3	67-2-32-9
41-19-15-BS	67-15-S	67-2-21-9	67-2-20-1	67-2-32-10
41-19-15-BF	67-15-F	67-2-21-9	67-2-20-1	67-2-32-11
41-19-15-BR	67-15-R	67-2-21-9	67-2-20-1	67-2-32-12
41-19-16-TS	67-16-S	67-2-21-2	67-2-20-1	67-2-32-13
41-19-16-TF	67-16-F	67-2-21-2	67-2-20-1	67-2-32-14
41-19-16-TR	67-16-R	67-2-21-2	67-2-20-1	67-2-32-15
41-20-16-TS	67-16-S	67-2-21-3	67-2-20-3	67-2-32-16
41-20-16-TF	67-16-F	67-2-21-3	67-2-20-3	67-2-32-17
41-20-16-TR	67-16-R	67-2-21-3	67-2-20-3	67-2-32-18
41-21-13-BS	67-13-S	67-2-21-5	67-2-20-1	67-2-32-19
41-21-13-BF	67-13-F	67-2-21-5	67-2-20-1	67-2-32-20
41-22-13-TF	67-13-F	67-2-21-1	67-2-20-3	67-2-32-21
41-21-15-BS	67-15-ZK-S	67-2-21-6	67-2-20-1	67-2-32-22
41-21-15-BF	67-15-ZK-F	67-2-21-6	67-2-20-1	67-2-32-23
41-22-15-TF	67-15-ZK-F	67-2-21-4	67-2-20-3	67-2-32-24

eReam – Dressing Parts (Power Lock Plus Consumables Series)



1

Gas Nozzle In Use



2

Reamer Blade



3

Centering Ring



4

Clamping Bracket
(2 pcs. needed)



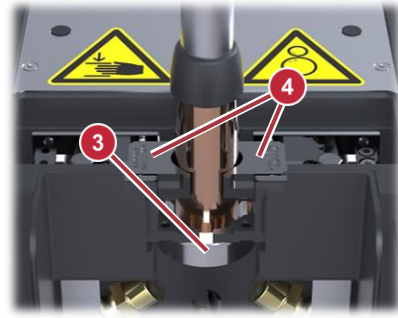
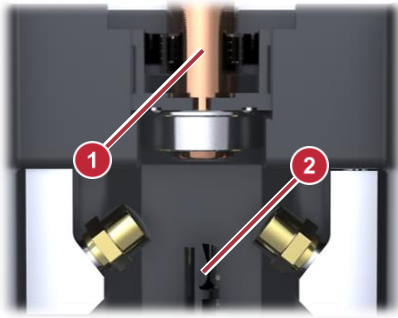
2-4

Dress-Kit



Part Number	Part Number	Part Number	Part Number	Part Number
41-19-13-BS	69-13-S	67-2-21-7	67-2-20-1	69-2-32-1
41-19-13-BF	69-13-F	67-2-21-7	67-2-20-1	69-2-32-3
41-19-13-BR	69-13-R	67-2-21-8	67-2-20-1	69-2-32-4
41-19-13-TS	69-13-S	67-2-21-1	67-2-20-1	69-2-32-5
41-19-13-TF	69-13-F	67-2-21-1	67-2-20-1	69-2-32-6
41-19-13-TR	69-13-R	67-2-21-4	67-2-20-1	69-2-32-7
41-20-13-BF	69-13-F	67-2-21-10	67-2-20-3	69-2-32-8
41-20-13-TR	69-13-R	67-2-21-4	67-2-20-3	69-2-32-9
41-19-15-BS	69-15-S	67-2-21-9	67-2-20-1	69-2-32-10
41-19-15-BF	69-15-F	67-2-21-9	67-2-20-1	69-2-32-11
41-19-15-BR	69-15-R	67-2-21-9	67-2-20-1	69-2-32-12
41-19-16-TS	69-16-S	67-2-21-2	67-2-20-1	69-2-32-13
41-19-16-TF	69-16-F	67-2-21-2	67-2-20-1	69-2-32-14
41-19-16-TR	69-16-R	67-2-21-2	67-2-20-1	69-2-32-15
41-20-16-TS	69-16-S	67-2-21-3	67-2-20-3	69-2-32-16
41-20-16-TF	69-16-F	67-2-21-3	67-2-20-3	69-2-32-17
41-20-16-TR	69-16-R	67-2-21-3	67-2-20-3	69-2-32-18
41-21-13-BS	69-13-S	67-2-21-5	67-2-20-1	69-2-32-19
41-21-13-BF	69-13-F	67-2-21-5	67-2-20-1	69-2-32-20
41-22-13-TF	69-13-F	67-2-21-1	67-2-20-3	69-2-32-21
41-21-15-BS	69-15-ZK-S	67-2-21-6	67-2-20-1	69-2-32-22
41-21-15-BF	69-15-ZK-F	67-2-21-6	67-2-20-1	69-2-32-23
41-22-15-TF	69-15-ZK-F	67-2-21-4	67-2-20-3	69-2-32-24
41-16-16-BS	69-16-HD-S	67-2-21-22	67-2-20-3	69-2-32-29
41-16-16-TF	69-16-HD-F	67-2-21-19	67-2-20-3	69-2-32-30
41-16-16-TR	69-16-HD-R	67-2-21-19	67-2-20-3	69-2-32-31
41-16-16-TS	69-16-HD-S	67-2-21-19	67-2-20-3	69-2-32-32
41-17-16-TF	82-8-2-16-F	67-2-21-26	67-2-20-1	69-2-32-34
41-17-16-TR	82-8-2-16-R	67-2-21-26	67-2-20-1	69-2-32-35

eReam – Dressing Parts (Dual Wire 2.0)



1

Gas Nozzle in Use



2

Reamer Blade



3

Centering Ring



4

Clamping Bracket
(2 pcs. needed)



2-4

Dress-Kit

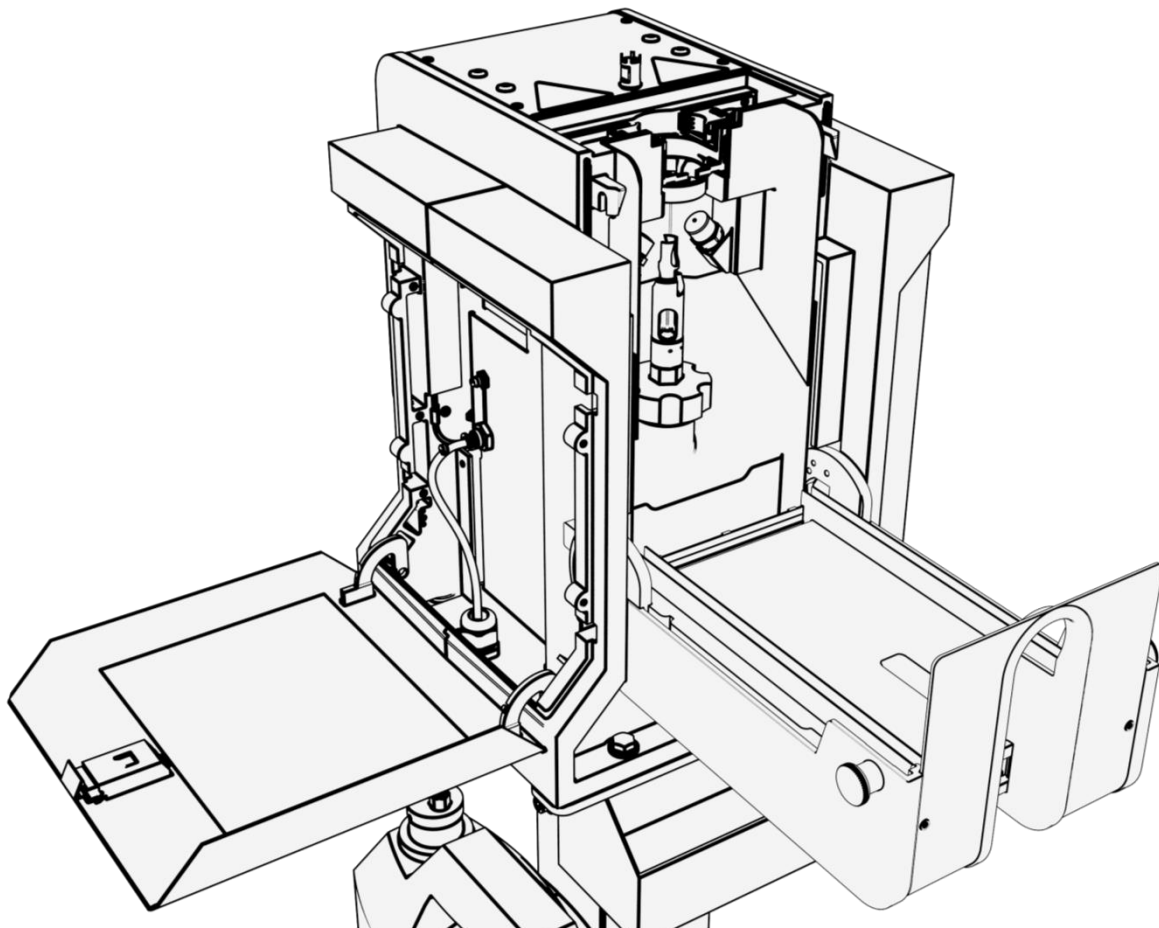


Part Number	Part Number	Part Number	Part Number	Part Number
54-10-18-TF	67-18-F	67-2-21-11	67-2-20-4	67-2-32-34
54-10-18-TR	67-18-R	67-2-21-11	67-2-20-4	67-2-32-35
54-11-18-TR	67-18-R	67-2-21-11	67-2-20-5	67-2-32-36
54-11-20-TR	67-20-R	67-2-21-12	67-2-20-5	67-2-32-37

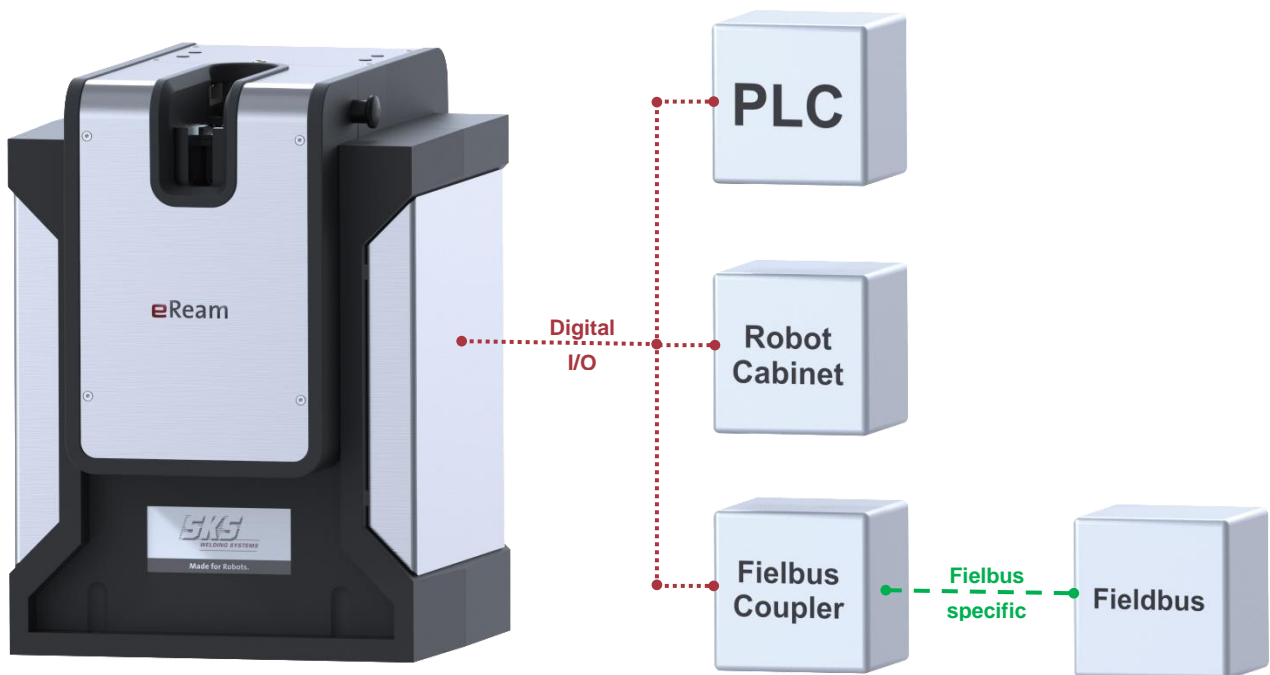


NOTE

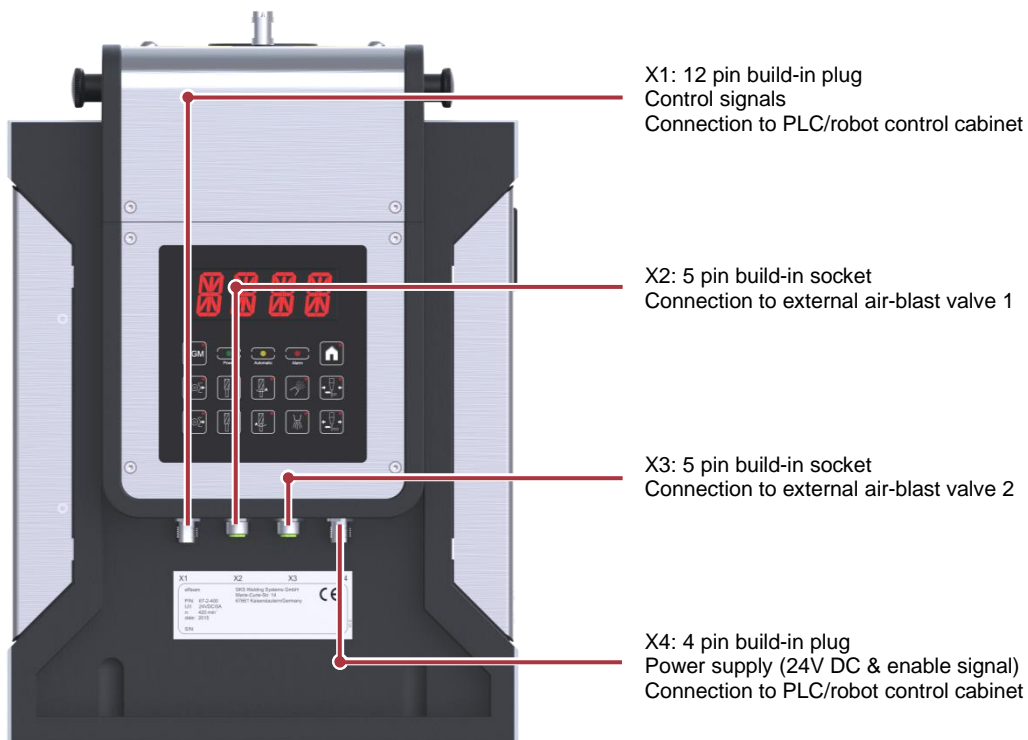
Cleaning of gas nozzles from other manufacturers by eReam is possible, too. Please get in contact with SKS for this matter.



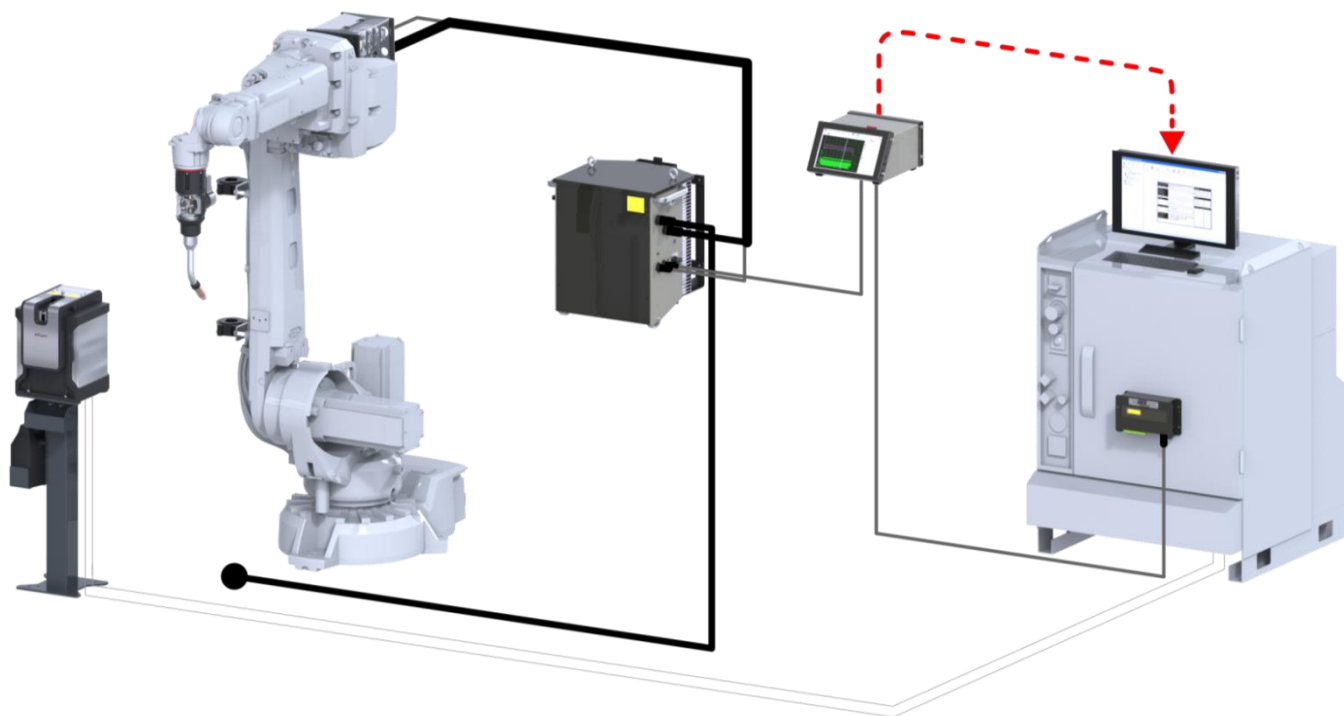
eReam – Integration



eReam is ready for integration with its diverse programming options and its open interface for robot and fieldbus environments.



eReam – Technical specifications



Main specifications

Description	Content
Dimensions (H x W x D in mm) including checking tip	387.5 x 270 x 310
Weight without wire cutter (in kg)	11.5
Weight including wire cutter (in kg)	13.25
Cycle time without wire cutting (in sec.)	~ 4
Cycle time including wire cutting (in sec.)	~ 5
Dimension of mounting holes (W x D in mm)	160 x 220 (4x Ø9)
Max. possible gas-nozzle outer diameter (in mm)	≤ 34
Max. possible wire diameter (in mm)	≤ 1.6
Compatible anti-spatter fluid	request data sheet from SKS
Feeding of anti-spatter fluid	External (self-priming)
Ejection of cleaning remains and wire cuttings	On bottom side
Performance level	PLd C

Energy

Description	Content
Power supply	External (power supply cable)
Main voltage	24 VDC
Power consumption (with / without wire cutter)	max. 125 W

Connections on back side

Description	Function
Plug 12-pin M12	Control cable digital I/Os
Socket 5-pin M12	Control of external air-blast valve 1
Socket 5-pin M12	Control of external air-blast valve 2
Plug 5-pin M12	Power supply

