

TIG welding

Introduction

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WELDING POWER SOURCES

DC power sources

- SMARTY TX 150
- SMARTY 180 / 220 XL
- SMARTY TX 250

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AC/DC power sources

- SMARTY TX 160 Alu
- SMARTY TX 220 Alu

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TORCHES

- WTT2 TIG welding torches
- Wear parts for TIG torches

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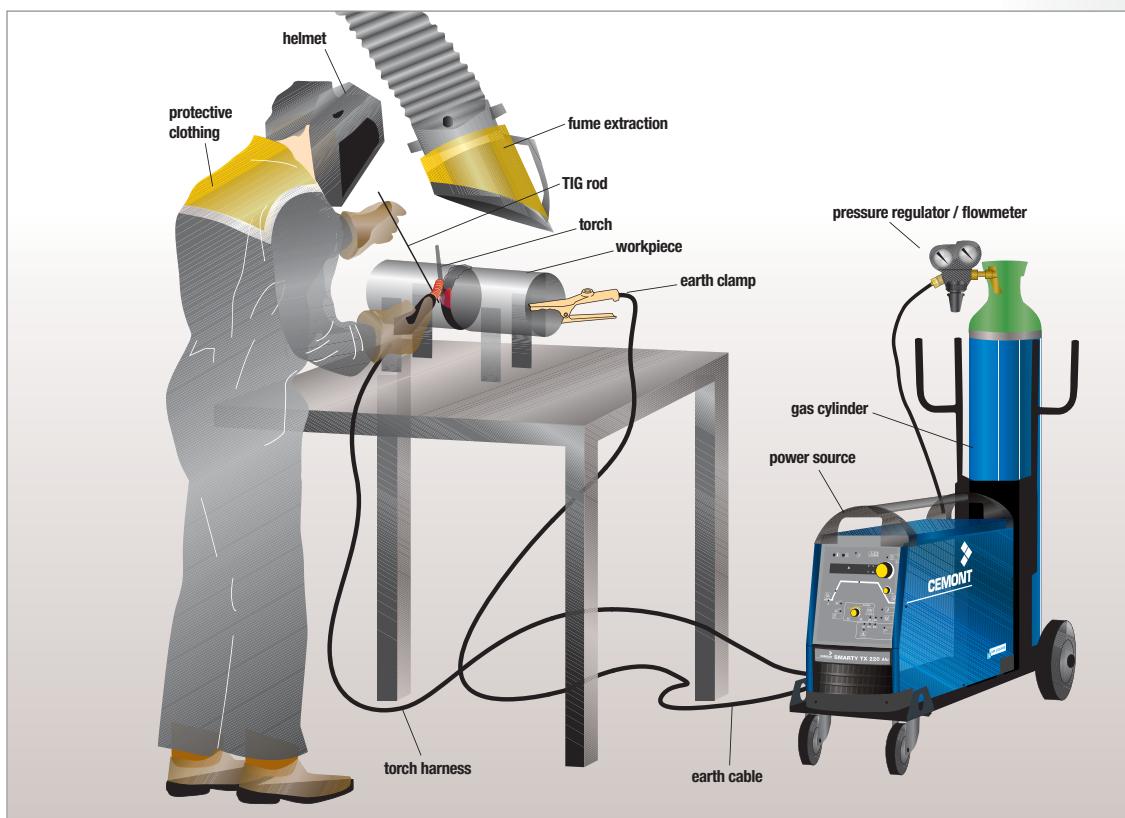
Options and accessories for TIG welding

- Tungsten electrodes, Remote control, Trolleys, MMA accessories

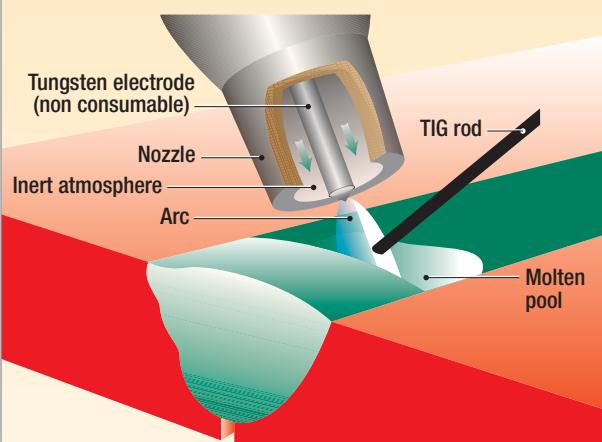
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TIG welding

A TYPICAL MANUAL TIG WELDING INSTALLATION



METAL TRANSFER MODE



TIG Welding Process

An electric arc is created between a non consumable tungsten electrode and the piece to be welded.

The electrode, the filler metal, the molten pool and the neighbouring zones are protected against atmospheric oxygen and nitrogen by an inert gas shield, generally argon.

Usually, this process is called "Tungsten Inert Gas or TIG". It is also known as "Gas Tungsten Arc Welding or GTAW".

LEXICON

TIG WELDING

Pre-gas:

Torch and harness are purged before striking.

Up slope function:

Allows a progressive increase of the welding current.

Down slope function:

Prevents a crater at the end of the welding cycle and prevents the risk of cracking particularly light alloys.

Post-gas:

Protection of the work piece and the electrode after welding is completed.

Balance:

Improves, the penetration during AC welding or the cleaning phase.

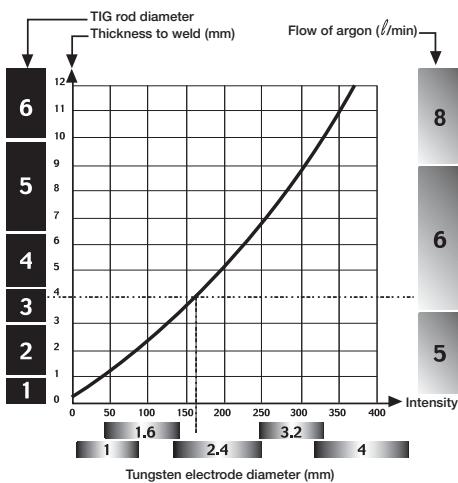
Pulsed Welding:

Makes positional welding and welding of thin plate easier, and prevents the collapse of the molten pool. Allows a regular deposit of filler metal and improves the penetration.

Tacking:

Allows quick tacking of the joint before welding.

Welding selection table TIG stainless steel



Example on Fig. 1

Thickness to weld: 4 mm

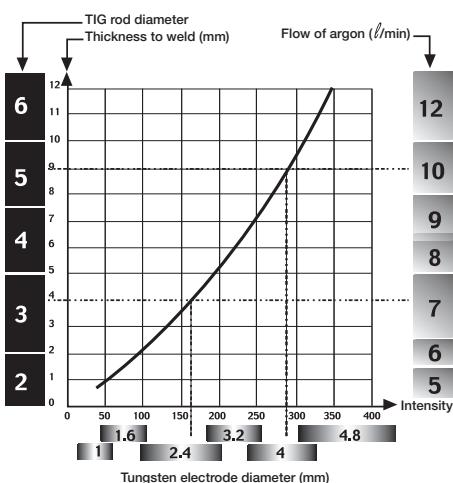
TIG rod diameter: 3 mm

Electrode diameter: 2.4 mm

Welding current: 160 A

Flow of argon: 6 l/min

Welding selection table TIG aluminium



Example on Fig. 2

Thickness to weld: 9 mm

TIG rod diameter: 5 mm

Electrode diameter: 4 mm

Welding current: 280 A

Flow of argon: 10 l/min

TIG range

	Steel & Stainless steel				Steel, Stainless steel + Aluminium	
	3 ph	1 ph			DC	AC/DC
SMARTY						
SMARTY XL						
SMARTY						
SMARTY						
Welding current	150 A	160 A	220 A	250 A	150 A	200 A



SMARTY TX 150

The SMARTY TX 150 is a TIG power source specially designed for maintenance welding on steel and stainless steel.

Features and product advantages:

- **Input voltage:** 230 V single-phase.
- **Light and compact:**
easy transport and storage.
- **Simple:** simple welding cycle (pre-gas / down slope / post-gas).
- **Powerful:** duty cycle at 60% at 40 °C.
- **Inverter technology:** precise adjustment of the welding current.
- **Versatile:** for both TIG and MMA electrode welding.
- **Practical:** due to HF starting and the 2T / 4T mode.



TIG POWER SOURCES

Standards

EN 60974-1
EN 60974-10

TIG WELDING EQUIPMENT

- 2006-340
- 1 Welding process selection TIG 2T / TIG 4T / MMA.
 - 2 For welding current adjustment.
 - 3 Switch on / off.
 - 4 Pre-gas adjustment.
 - 5 Down slope adjustment.
 - 6 Post-gas adjustment.

TECHNICAL CHARACTERISTICS:

	SMARTY TX 150
Input voltage	230 V single-phase
Input power	6.2 kVA - 4.5 kW
Max input current	19 A (TIG)
Effective input current	12 A (TIG)
Open circuit voltage	85 V
Welding current range	5 - 150 A
Duty cycle at 40 °C	150 A 120 A 100 A
Protection index	IP 23
Dimensions	400 x 190 x 300 mm
Weight	10 kg
Torch connection	S



• For torches
see pages 4-10 & 4-11

TO ORDER:

Power source only

W000056033

Delivered equipped with:

- electric primary cable,
- earth cable with clamp,
- gas hose,
- safety instructions,
- user manual.

SMARTY 180 / 220 XL

The SMARTY 180 XL and 220 XL stations are portable generators for TIG welding at direct current, for professional use.

These stations can serve many applications thanks mainly to the "pulse" functions for working thin surfaces and "2 current levels" for work in position.

The stations use 70 m primary cables.

Features and product advantages:

- **Power supply:** 230 V single-phase - 12 A.
- **Tolerant to power oscillations:** 230 V ± 20%.
- **Digital display:** % / Hz / Sec / A.
- **Yield:** duty ratio 60% at 40 °C.
- **Versatile:** TIG DC / TIG DC pulse/ EE.
- **Technology:** use at 2 current levels.
- **Professional:** protection class IP 23.
- **Remote control:** easy control from a distance.
- Provided with 16 A plug.
- Can store 30 programs.



- 1 Complete welding cycle.
- 2 Digital display.
- 3 Cycle navigator.
- 4 Control knob.
- 5 Mode: EE / TIG HF / TIG LIFT.
- 6 2T / 4T / Point selector.
- 7 Process selection: TIG DC/Pulse.
- 8 Remote/pedal control switch.

TECHNICAL CHARACTERISTICS:

	SMARTY 180 XL	SMARTY 220 XL
Power supply	230 V single-phase	
Input power	3.2 kVA - 3.1 kW (TIG)	4.9 kVA - 4.8 kW (TIG)
Max input current	14 A (TIG)	21 A (TIG)
Effective input current	11 A (TIG)	12 A (TIG)
Open circuit voltage	50 V	50 V
Welding current range	5 - 160 A	5 - 220 A
Duty cycle at 40 °C	at 35% 160 A at 60% 140 A at 100% 130 A	220 A 180 A 150 A
Torch connector	S	
Size of connector	13 mm	
Protection class	IP 23	
Dimensions	205 x 345 x 460 mm	
Weight	9.5 kg	

TO ORDER:

Power source only	W000273985	W000273987
Options		
Remote control		W000242069
Pedal		W000241602



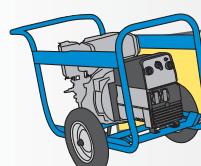
NEW
SEPTEMBER 2010



Standards

EN 60974-1
EN 60974-10

TECHNOLOGY



GENERATOR
COMPATIBLE



• For torches
see pages 4-10
& 4-11

Delivered equipped with:

- a power cable,
- a fitted earth cable,
- a gas pipe,
- a safety, user and maintenance manual.

SMARTY TX 250

The SMARTY TX 250 is a portable TIG DC power source designed for light and industrial applications; with "pulsed" function for welding thin plate and also "2 current levels" mode for welding in position.

Features and product advantages:

- **Powerful:** 250 A at 40% duty cycle at 40 °C.
- **Digital display:** A / V / Sec / %.
- **Versatile:** TIG DC / pulsed TIG DC / MMA.
- **Technical:** complete TIG welding cycle.
- **Safe:** protection class IP23.
- **Remote control:** remote adjustment flexibility (option).



TIG POWER SOURCES



- 1 Complete welding cycle.
- 2 Digital display.
- 3 Cycle selection.
- 4 Parameter adjustment.
- 5 Modes: MMA/TIG HF/TIG LIFT.
- 6 Selection: 2T/4T/Point.
- 7 TIG current: smooth or pulsed.
- 8 Selection for local / remote control.

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TIG WELDING EQUIPMENT

TECHNICAL CHARACTERISTICS:

SMARTY TX 250	
Input voltage	400 V three-phase (50/60 Hz)
Input power	8.7 kVA - 6.2 kW (TIG)
Max input current	13 A (TIG)
Effective input current	10 A (TIG)
Open circuit voltage	107 V
Welding current range	5 - 250 A
at 40%	250 A
Duty cycle at 40 °C	210 A
at 60%	180 A
Connector size	9 mm
Protection index	IP 23
Dimensions	250 x 460 x 450 mm
Weight	18 kg
Torch connection	S



- For torches see pages 4-10 & 4-11

TO ORDER:

Power source only	W000260031
Options	
Remote control	W000242069
Foot control	W000241602

Delivered equipped with:

- primary cable 5 m,
- earth cable 3 m,
- gas hose 2 m,
- safety instructions,
- user manual.

SMARTY TX 160 Alu

The SMARTY TX 160 Alu is a TIG power source specially designed for maintenance welding on steel, stainless steel and aluminium.

Features and product advantages:

- **Input voltage:** 230 V single-phase.
- **Light and compact:** easy transport and storage.
- **Simple:** clear welding cycle (pre-gas / down slope / post-gas).
- **Powerful:** duty cycle at 60% at 40 °C.
- **Inverter technology:** precise adjustment of the welding current.
- **Versatile:** for TIG AC/DC and MMA electrode welding.
- **Practical:** easy adjustment.

Remote control.



2006-403



2010-404

GENERAL PURPOSE



Standards

EN 60974-1
EN 60974-10

TECHNICAL CHARACTERISTICS:

	SMARTY TX 160 Alu
Input voltage	230 V single-phase (50/60 Hz)
Max input current	23 A (TIG)
Effective input current	13 A (TIG)
Open circuit voltage	85 V
Welding current range	5 - 150 A
Duty cycle at 30%	150 A (TIG) - 130 A (MMA)
at 60%	120 A (TIG) - 100 A (MMA)
at 100%	100 A (TIG) - 80 A (MMA)
Connector size	13 mm
Protection index	IP 23
Dimensions	260 x 460 x 450 mm
Weight	22 kg
Torch connection	S



• For torches
see pages 4-10
& 4-11

TO ORDER:

Power source only	W000056036
Options	
Remote control	W000242069
Foot control	W000241602

Delivered equipped with:

- electric primary cable,
- earth cable with clamp,
- gas hose,
- safety instructions,
- user manual.

SMARTY TX 220 Alu



TIG POWER SOURCES

Designed for both workshop and outdoor working conditions, the SMARTY TX 220 Alu meets the most demanding applications on site and in workshop (maintenance) for all kinds of materials.

Features and product advantages:

- **Single-phase input voltage:** 230 V ± 10%.
- **Inverter technology:** precise adjustment of the welding current.
- **Large digital display:** for accurate adjustment and clarity.
- **Powerful:** duty cycle 60% at 40 °C.
- **Compact:** for outdoor applications.
- **Intelligent balance:** for aluminium applications, simplified adjustment of cleaning and penetration steps, according to the tungsten electrode diameter.



- 1 Digital display (U/I).
- 2 Pre-gas adjustment.
- 3 Selection mode 2T / 4T.
- 4 Cleaning / penetration balance (AC).
- 5 HF TIG / LIFT starting.
- 6 Pulsed frequency (AC).
- 7 Selection MMA (with DC+ / DC- / AC / intermittent arc).
- 8 Parameter adjustment.

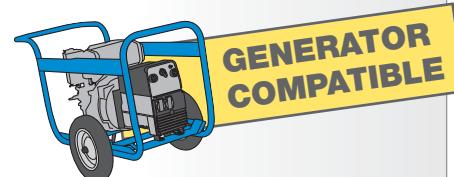


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Standards

EN 60974-1
EN 60974-10

TIG WELDING EQUIPMENT



TECHNICAL CHARACTERISTICS:

		SMARTY TX 220 Alu
Input voltage		230 V single-phase (50/60 Hz)
Max input current		19 A
Effective input current		16 A
Open circuit voltage		70 V
Welding current range		3-200 A DC - 10-200 A AC
Duty cycle at 30%		200 A
at 40 °C		150 A
Connector size		9 mm
Protection index		IP 23
Dimensions		540 x 260 x 510 mm
Weight		30 kg
Torch connection		S or C5B



- For torches see pages 4-10 & 4-11

To ORDER:

Power source only		W000263003
Options		
Remote control	5 m	W000263312
	10 m	W000270325
Foot control		W000263314
Trolley		W000263308

Delivered equipped with:

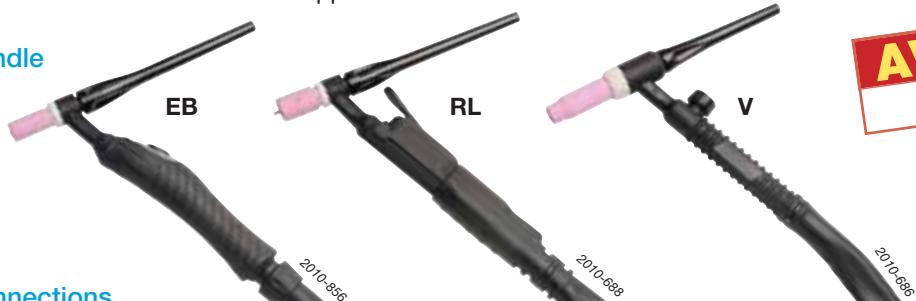
- electric primary cable,
- earth cable with clamp,
- gas hose with quick couplings,
- safety instructions,
- user manual.

WTT2 TIG torches

Simplicity and reliability

TIG torches which are reliable, flexible and use common wear parts.
 Connections and handles for all applications.

Handle



Connections

	C5B	S	V
Air cooled			
Water cooled			

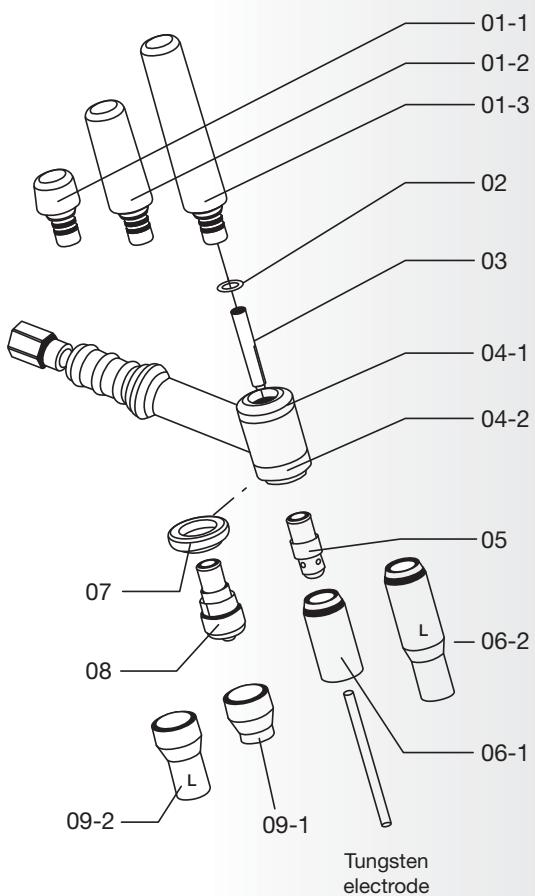
TO ORDER:

			Air cooling					
			WTT2 9		WTT2 17		WTT2 26	
Duty cycle at 40 °C		60%	80 A	100 A	130 A			
		35%	110 A	135 A	180 A			
Fitted with		Cap	Medium		Medium		Medium	
		Nozzle	Ø 10 mm		Ø 10 mm		Ø 12 mm	
		Electrode	Ø 1.6 mm		Ø 2.0 mm		Ø 2.4 mm	
Handle	RL	Connection	4 m	8 m	4 m	8 m	4 m	8 m
			W000278878	W000278923	W000278883	W000278918	W000278888	W000278914
	C5B	W000278879	W000278922	W000278884	W000278917	W000278890	W000278913	
	EB	S	W000278877	W000278929	W000278881	W000278920	W000278886	W000278916
		C5B	W000278875	W000278926	W000278882	W000278919	W000278887	W000278915
	V	W000278876	-	W000278880	-	W000278885	-	

			Water cooling				
			WTT2 20 W		WTT2 18 W		
Duty cycle at 40 °C		100%	200 A	320 A			
		60%	250 A	350 A			
Fitted with		Cap	Medium		Medium		
		Nozzle	Ø 12 mm		Ø 12 mm		
		Electrode	Ø 2.4 mm		Ø 2.4 mm		
Handle	RL	Connection	4 m	8 m	4 m	8 m	
			W000278893	W000278906	W000278897	W000278900	
	C5B	W000278894	W000278905	W000278898	W000278899		
	EB	S	W000278891	W000278911	W000278895	W000278902	
		C5B	W000278892	W000278909	W000278896	W000278901	

WTT2 TIG torches wear parts

		Ø	REP	WTT 9 / 9 V WTT 20 W	WTT 17 / 17 V WTT 26 / 26 V WTT 18 W
Back cap	short		01	W000306398	W000306399
	medium			W000306400	-
	long			W000306402	W000306403
Back cap O-ring		02		W000306404	W000306405
Sealing ring		04-2		W000306396	W000306397
Insulating ring		04-1		W000270780	W000306395
Collet	1.0	03		W000306406	W000306411
	1.6			W000306407	W000306412
	2.0			W000306408	W000306413
	2.4			W000306409	W000306414
	3.2			W000306410	W000306415
	4.0			-	W000306416
Collet body	1.0	05		W000306376	W000306380
	1.6			W000306377	W000306381
	2.0			W000306378	W000270781
	2.4			W000306455	W000306382
	3.2			W000306379	W000306383
	4.0			-	W000306384
Nozzle	6.4	06-1		W000306417	W000306423
	8.0			W000306418	W000306424
	9.6			W000306419	W000306425
	11.2			W000306420	W000306426
	12.8			W000306421	W000306427
	16.0			W000306422	W000306428
	19.2			-	W000306461
	4.8			W000306456	-
Long nozzle	6.4	06-2		W000306457	W000306462
	8.0			W000306458	W000306463
	9.6			W000306459	W000306464
	11.2			-	W000306465
Gas L. sealing ring		07		-	W000306466
G.L. collet body	1.0	08		W000306385	W000306389
	1.6			W000306386	W000306390
	2.0			W000306460	-
	2.4			W000306387	W000306391
	3.2			W000306388	W000306392
	4.0			-	W000306393
Gas L. nozzle	6.4	09-1		W000306429	W000306434
	8.0			-	W000306435
	9.6			W000306431	W000306436
	11.2			W000306432	W000306437
	12.8			W000306433	W000306438
	16.0			-	W000306439
Long G.L. nozzle	8.0	09-2		-	W000306467
	9.6			-	W000306468
	11.2			-	W000306469
	12.8			-	W000306470



TIG WELDING TORCHES

TIG WELDING EQUIPMENT

TUNGSTEN ELECTRODES

Warning: before use, carefully read
the material safety data sheet on
www.safety-welding.com

Electrode type	Metal type	Arc stability	Arc starting	Electrode lifetime	Thermal resistance
WP pure	Light alloy	**	*	*	*
WT 20 Thorium 2%	Steel and stainless steel	*	***	**	**
WC 20 Cerium 2%	Steel and stainless steel	**	*	**	**
WL 20 Lanthanum 2%	Steel and stainless steel	**	***	***	***

*** Excellent ** Good * Suitable

TIG OPTIONS

Standards

ISO 6848
EN 26848

2006-528



Pack of 10, length 150 mm

	WP - Pure tungsten Light alloy (green end)		WT 20 - 2% thorium tungsten Steel and stainless steel (red end)		WC 20 - 2% cerium tungsten Steel and stainless steel (grey end)		WL 20 - 2% lanthanum tungsten Light alloy AC - Steel, stainless steel DC	
Ø	AC current (A)	Cat. nr	DC current (A)	Cat. nr	DC current (A)	Cat. nr	Current (A)	Cat. nr
1.0 mm	10-50	W000010009	10-80	W000010002	10-84	W000010022	10-80	W000010373
1.6 mm	40-80	W000010010	50-130	W000010003	52-136	W000010023	60-150	W000010016
2.0 mm	60-110	W000010011	90-190	W000010004	94-199	W000010024	100-200	W000010017
2.4 mm	60-140	W000010012	130-250	W000010005	136-262	W000010025	150-250	W000010018
3.0 mm	90-180	W000010013	170-300	W000010006	178-315	W000010026	210-310	W000010019
3.2 mm	90-180	W000010014	170-300	W000335156	178-315	W000335150	210-310	W000010020
4.0 mm	140-240	W000010015	250-400	W000010008	262-420	W000010028	350-480	W000010021

REMOTE CONTROL BOXES - TROLLEYS

	SMARTY 180 / 220 XL	SMARTY TX 160 ALU	SMARTY TX 220 ALU
Remote control 10 m length	W000242069	W000242069	W000270325
Remote control pedal 10 m length	W000241602	W000241602	W000263314
Trolley	-	-	W000263308

MMA ACCESSORIES

Accessories	Length 3 m (25C50)	Length 4 m (35C50)
Arc kit 300 A	W000260 684	W000011139

Connection Ø 13 mm



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