CHAPTER 2

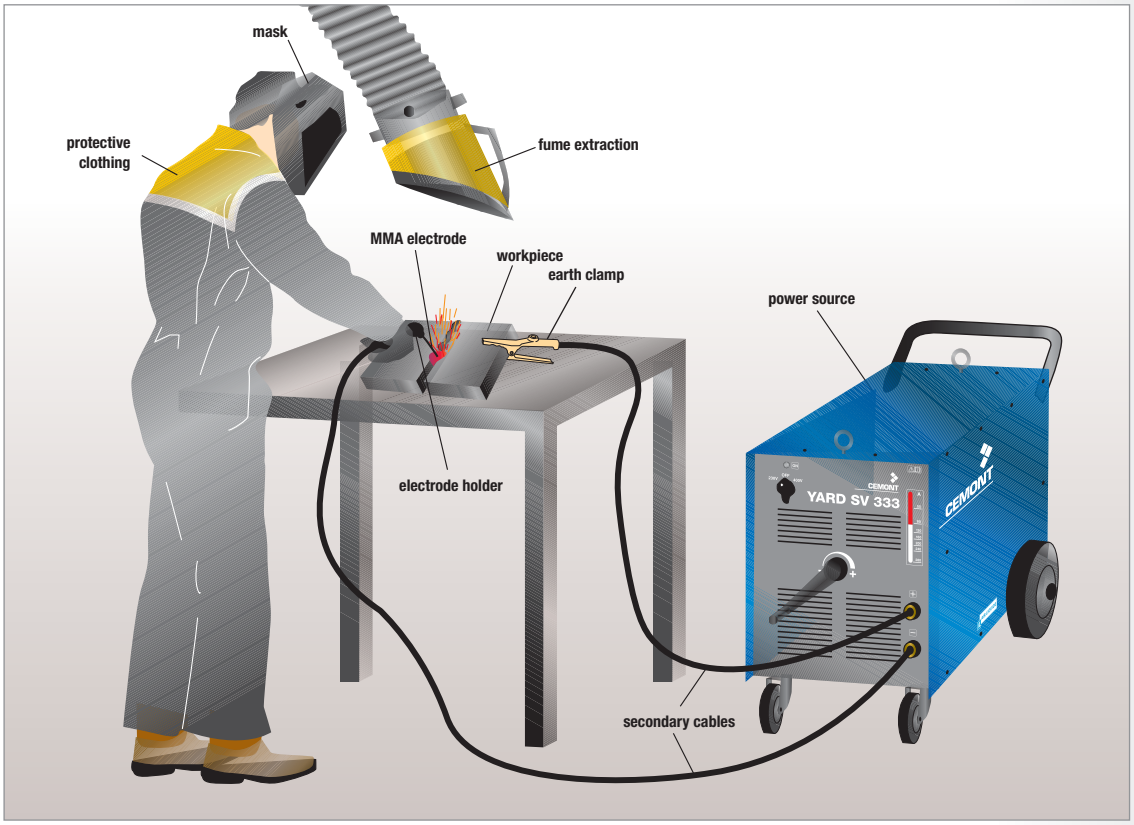
MMA welding power sources

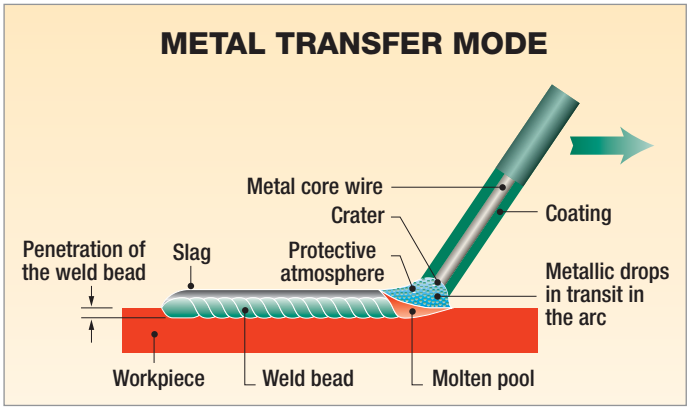
For all accessories and protection products, consult our WELDLINE catalogue and visit our website **www.weldline-alw.com.**

CEMONT

MMA - electrode welding

A TYPICAL MANUAL METAL ARC ELECTRODE WELDING INSTALLATION





Process principles

The filler metal is transferred by an electric arc between the core wire of the coated electrode and the work piece.

The heat emitted by the electric arc simultaneously melts the base metal (work piece), the metal core wire and the coating of the electrode, thus creating the weld pool that receives the droplets of melted filler metal and slag transferred into the plasma of the arc.

Constituents of the electrode coating are volatilised, thus helping to create the arc atmosphere. The low-density melted coating covers the weld pool and forms the slag that protects the deposited metal during and after solidification.

TECHNICAL FILE

AIR LIQUIDE WELDING

Duty cycle

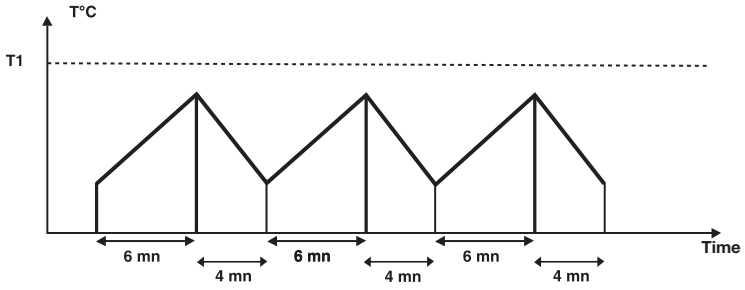
Defined by standard EN 60974-1

Working cycle ..... 10 minutes
At ambient temperature ..... 40 °C

Example: 250 A at 60% means that in a temperature-stabilised cycle, the current source can supply 250 A with a cycle of 6 minutes of welding and 4 minutes of stoppage.

With a 100% duty cycle, the source of current can continuously supply the corresponding intensity with an ambient temperature of 40 °C.

T1: Temperature of triggering by the thermal safety system



Protection index IP

Meaning: IP 2 3 or 2 1

2 means that an object of more than 12.5 mm diameter cannot enter or come into contact with an internal element with a hazardous voltage.

3 means that the current source is protected from all damage during use by water falling at a maximum angle of 60°.

1 means that the current source is protected from vertical falling water.

MMA electrodes

MMA electrodes are made up of a metal wire called the core wire and a ceramic coating.

Role of the coating:

- Encouraging electrode striking.
- Protecting the deposited metal from oxidation by the ambient air (formation of slag).
- Controls the deposited metal mechanical properties.

The two most common types of coating:

- Rutile
- Basic

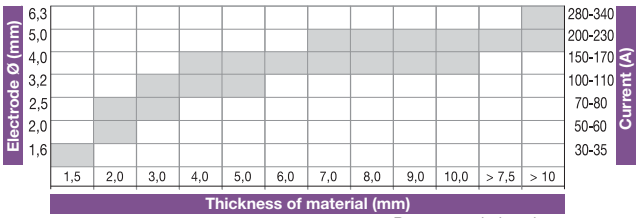
Rutile electrodes:

- **These work with all types of power source, using:**

- **Alternating current (AC),** if the open-circuit voltage of the machine (Uo) is above 65 V - 70 V.
- **Direct current (DC),** if the electrode is connected to the - pole.

Basic electrodes:

- **Applications:** Work requiring welding metal that needs to have high mechanical characteristics, particularly toughness, i.e. resistance to impact and fracture at low temperatures.



Recommended settings

Example: *construction of bridges, wagons, structures, pressure devices etc., all assemblies subject to high stress. The use of basic coated electrodes may require re-drying the electrodes at 350 °C for two hours in order to eliminate as much of the moisture in the coating as possible, which generates the release of hydrogen during use, which can lead to cracking.*

LEXICON

ARC WELDING

Hot Start: Makes striking easier with over-intensity upon starting up. It may be automatic or adjustable from the front of the unit.

Arc Force: Prevents sticking in the bath during welding. An electronic system detects abnormal closeness between the metal core and the work piece and provides extra energy to return to normal conditions.

U0 no-load voltage: That is the voltage between the welding and earth terminals of the power source. It must be greater than the electrode striking voltage (indicated on each electrode pack).

Electrode efficiency: The addition of iron powder to the coating makes it possible to increase the efficiency of the deposited metal.

Example:

• Electrode with conventional coating A 100-g core deposits 100 g of bead.

• Electrode with 120% efficiency A 100-g core deposits 120 g of bead.

Recommended settings: Formula for approximating the correct intensity setting depending on the diameter of the electrodes:

(Ø - 1) x 50 = Welding intensity.

Example: with an electrode with a 2.5-mm diameter (2.5 - 1) x 50 = 75 A.

The CEMONT offer, inverter technology

	80 A	125 A	130 A	150 A / 160A	180 A	220 A
PUMA GC				SX 1700 GC		SX 2200 GC
PUMA G				S 1700G		
PUMA S			S 1400	S 1600	SX 2000	
COLT		130		150		
SPEEDY	100		130	150		

The CEMONT offer, traditional technology

	140 A	160 A	195 A	220 A	260 A	350 A	400 A	630 A
YARD STC							STC 400	650 SX
YARD SV				SV 263	SV 333	SV 403	SV 443	
PRATIKA AC/DC			261 AC/DC					
PRATIKA	1810 TS	2160 T 2110 TS	2660 TS					

Single-phase

Three-phase

SPEEDY 100 / 130 / 150

Electronic portable ultra-light power sources for MMA electrode welding. Single-phase units with 16 A “domestic plug”. The new SPEEDY range is the easiest, the safest and the most convenient way to weld all types of MMA electrode. This range is suitable for light duty and maintenance activities. The intelligent Inverter Power Microcontroller (I.P.M.) technology makes it extremely easy to weld in all positions at a competitive price. For electrodes up to 4.0 mm (SPEEDY 150).

WARRANTY 2 YEARS

Standards
EN 60974-1
EN 60974-10

Features and product advantages:

- Compatible with use in the domestic environment due to reduced electromagnetic emissions: the “cleanest” unit in its category.
- 2 years warranty. Safe and reliable.
- Excellent starting and arc stability due to the IPM technology with Arc Force and Hot Start linked to the welding current. Easy to use and high quality.
- Single-phase 230 V unit, extra light: < 3.8 kg.

EN 60974-10

Accessories
see page 2-14

TECHNICAL CHARACTERISTICS:

		SPEEDY 100	SPEEDY 130	SPEEDY 150
Single-phase input voltage		230 - 50/60 Hz		
Effective input current		5 A	10 A	11 A
Open circuit voltage		69 V		
Welding current range		5 - 80 A	10 - 130 A	10 - 150 A
Duty cycle at 40°C (EN 60974-1)	at 10%	80 A	130 A	150 A
	at 60%	35 A	60 A	70 A
	at 100%	30 A	45 A	55 A
Connector size		9 mm		
Protection index		IP 21		
Dimensions		220 x 120 x 320 mm		
Weight		3.5 kg	3.8 kg	3.8 kg

Starting kit SPEEDY*
Cat. nr: W 000 272 759

** Mask, chipping hammer, electrode small pack, electrode holder and earth clamp with cables and connectors.*

TO ORDER:

Power source only	**W 000 271 549**	**W 000 271 546**	**W 000 271 545**
Option			
Kit arc 16C25 (electrode holder + earth clamp)	**W 000 260 680**		
Starting kit SPEEDY *	**W 000 272 759**		

Delivered equipped with:

- primary cable with 16 A plug,
- safety instructions,
- user manual.

COLT 130G / 150G

WARRANTY 2 YEARS

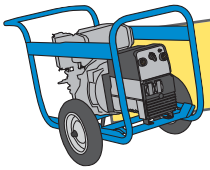
The range of COLT power sources, known all around the world for its exceptional power to weight ratio, now with full generator compatibility due to its new I.P.M. technology (Inverter Power Microcontroller).
This professional range is suitable for light duty and maintenance activities.

ULTRA-MOBILE READY TO USE

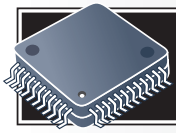
Standards
EN 60974-1
EN 60974-10

Features and product advantages:

- Compatible with motor-generators.
- Delivered ready to use in a plastic case with all accessories: Plug & Weld.
- Compatible with use in the domestic environment due to reduced electromagnetic emissions: the cleanest unit in its category.
- 2 years warranty. Safe and reliable.
- Excellent starting and arc stability due to the IPM technology with Arc Force and Hot Start linked to the welding current. Easy to use and high quality.
- Single-phase 230 V unit, extra light: < 3.8 kg.



GENERATOR COMPATIBLE



INVERTER POWER MICROCONTROLER I.P.M. TECHNOLOGY

TECHNICAL CHARACTERISTICS:

		COLT 130G	COLT 150G
Single-phase input voltage		230 V – 50/60 Hz	
Power		5.9 kVA	
Effective input current		12 A	
Open circuit voltage		69 V	
Welding current range		10 - 120 A	10 - 140 A
Duty cycle at 40 °C (EN 60974-1)	at 15%	120 A	140 A
	at 60%	60 A	70 A
	at 100%	45 A	55 A
Connector size		9 mm	
Protection index		IP 23	
Dimensions		220 x 120 x 320 mm	
Weight		3.5 kg	3.8 kg

TO ORDER:

Power source only	W 000 271 548	W 000 271 547

Accessories
see page 2-14

Delivered equipped with:

- primary cable,
- welding cable with electrode holder,
- welding cable equipped with earth clamp,
- hammer / brush / helmet,
- pack of rutile electrodes,
- safety instructions,
- user manual,
- PVC case for transportation.

PUMA S 1400 / 1600 1700G / SX 2000

WARRANTY 2 YEARS

HEAVY DUTY

Standards
EN 60974-1
EN 60974-10

The PUMA power sources are for MMA coated electrode welding for both industrial and daily use.
A special version compatible with generators is available (1700G).
The PUMA range has been designed for on site use.

Features and product advantages:

- **Light weight:** less than 7 kg.
- **Versatile:** able to weld all types of MMA electrodes (steel / stainless steel etc…).
- **User friendly:** Hot Sart / anti-stick device.
- **Powerful:** high duty cycle at 40 °C.
- **Transportable:** using the shoulder strap.
- Generator compatability only PUMA 1700G.

2006-616

2006-614

1 Power potentiometer.
2 Switch on/off.
3 Warning light.
4 Power borders.

TECHNICAL CHARACTERISTICS:

		PUMA S 1400	PUMA S 1600	PUMA S 1700G	PUMA SX 2000
Single-phase input voltage		230 V			
Power		3.8 kVA	4.5 kVA	4.5 kVA	6 kVA
Effective input current		15 A	16 A	19 A	19 A
Open circuit voltage		85 V			82 V
Welding current range		5 - 130 A	5 - 150 A	5 - 150 A	5 - 180 A
Duty cycle	at 35%	130 A	150 A (25%)	150 A	180 A (30%)
	at 60%	100 A	120 A	120 A	140 A
	at 100%	80 A	100 A	100 A	110 A
Connector size		9 mm			13 mm
Protection index		IP 23			
Dimensions		145 x 230 x 365 mm			185 x 310 x 440 mm
Weight		7 kg			10 kg

Accessories
see page 2-14

Delivered equipped with:

- primary cable,
- safety instructions,
- user manual.

TO ORDER:

Power source only	W 000 263 627	W 000 263 636	W 000 263 650	W 000 263 686

PUMA SX 1700 GC
PUMA SX 2200 GC

WARRANTY 2 YEARS

+ CELLULOSIC APPLICATIONS

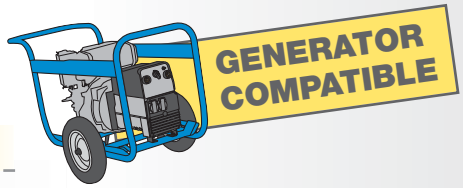
Standards
EN 60974-1
EN 60974-10

The PUMA SX family is specially designed for heavy duty applications and features new functions such as the advanced TIG LIFT mode with control of slope up and down (SX 2200 GC). The digital display allows the setting of Arc dynamism for improved arc stability in all welding applications. The GC range is an industrial range, compatible with the use of motor-generators and for welding with all types of MMA electrodes including cellulosic.

Features and product advantages:

- Compatible with motor-generators.
- 2 years warranty. Safe and reliable.
- Digital display: precise adjustment and reading of the parameters (SX 2200 GC).
- Comfortable: over-intensity when starting and anti-stick device (adjustable on SX 2200 GC).
- Suitable for welding with cellulosic electrodes.

1. Switch on/off.
2. Power potentiometer.
3. Thermical safety indicator.
4. Selection MMA / TIG DC.



TECHNICAL CHARACTERISTICS:

		PUMA SX 1700 GC	PUMA SX 2200 GC
Input voltage 50/60 Hz		230 V Single-phase	400 V Three-phase
Power		4.5 kVA	7.2 kVA
Effective input current		19 A	9 A
Open circuit voltage		108 V	105 V
Welding current range		5 - 160 A	5 - 220 A
Duty cycle	at 30%	160 A	220 A (40%)
	at 60%	130 A	190 A
	at 100%	100 A	150 A
Connector size		13 mm	
Protection index		IP 23	
Dimensions		180 x 250 x 400 mm	250 x 470 x 450 mm
Weight		8 kg	18 kg

TO ORDER:

Power source only	**W 000 263 662**	**W 000 263 688**
Option		
Remote control	-	**W 000 242 069**

Delivered equipped with:

- primary cable,
- safety instructions,
- user manual.

AIR LIQUIDE WELDING

PRATIKA 1810 TS / 2110 TS
PRATIKA 2160 T / 2660 T

PRATIKA are transformer technology air cooled power sources. The welding current can be adjusted using the shunt. AC current output (T and TS ranges) for easy welding with rutile electrodes. PRATIKA is your daily welding set.

TRANSFORMER

Standards
EN 60974-1
EN 60974-10

Features and product advantages:

- **Input voltage:** 230 V single-phase or 230 V – 400 V single-phase.
- **Simple:** adjustment by shunt with visualisation of the current.
- **Ready-to-use:** delivered with welding accessories (TS).
- **Professional:** robust transformer, air cooled.
- **Safety:** with integrated thermical security.

2007-234

2007-233

1 Welding current display.
2 Switch on/off.
3 Adjustment setting.
4 Primary cable.

Accessories
see page 2-14

TECHNICAL CHARACTERISTICS:

	PRATIKA 1810 TS	PRATIKA 2110 TS	PRATIKA 2160 T	PRATIKA 2660 T
Single-phase input voltage	230 V (50 Hz)		230 V - 400 V (50 Hz)	
Power	4.2 kVA	5.4 kVA	5.4 kVA	6.2 kVA
Effective input current	12 A	13 A	15 A (230 V)	19 A - 12 A
Open circuit voltage	48 V			
Welding current range	40 - 140 A	55 - 160 A		40 - 195 A
Connector size	9 mm			
Protection index	IP 21			
Dimensions (mm)	220 x 400 x 230	240 x 550 x 410	240 x 560 x 445	240 x 640 x 445
Weight	13.4 kg	17 kg	16.5 kg	20 kg

Delivered equipped with:

- primary cable,
- welding cables equipped with earth clamp and electrode holder (TS models),
- safety instructions,
- user manual.

TO ORDER:

Power source only	**W 000 264 088**	**W 000 264 091**	**W 000 264 094**	**W 000 263 672**

PRATIKA 261 AC/DC

WARRANTY 2 YEARS

PRATIKA AC/DC are transformer technology air cooled power sources. The welding current can be adjusted using the shunt. AC or DC current output for welding with all types of coated electrodes.
PRATIKA is the power source for all applications.

TRANSFORMER FOR ALL TYPES OF ELECTRODES

Standards
EN 60974-1
EN 60974-10

Features and product advantages:

- **Input voltage:** 230 V – 400 V single-phase.
- **Simple:** adjustment by shunt with indication of the current.
- **Versatility:** AC/DC for all types of coated electrodes.
- **Powerful:** welding current up to 215 A.
- **Professional:** robust transformer air cooled.
- **Safety:** with integrated thermical security.

2007-369

1. Welding current display.
2. Thermical safety light.
3. Switch on/off.
4. Welding cables connectors.
5. Adjustment setting.
6. Primary cable.

2007-371

TECHNICAL CHARACTERISTICS:

		PRATIKA 261 ACDC
Single-phase input voltage		230 - 400 V
Power		14.2 kVA
Effective input current		20 A - 12 A
Open circuit voltage		95 V
Welding current range	AC	50 - 220 A
	DC	25 - 160 A
Electrode diameters		2 to 5 mm
Duty cycle at 40 °C	at 10%	205 A
	at 60%	80 A
Connector size		9 mm
Protection index		IP 21
Dimensions		360 x 300 x 460 mm
Weight		33.5 kg

Accessories
see page 2-14

TO ORDER:

Power source only	**W 000 264 096**

Delivered equipped with:

- primary cable,
- handle and wheels,
- safety instructions,
- user manual.

AIR LIQUIDE WELDING

YARD SV 263 / SV 333 SV 403 / SV 443

WARRANTY 2 YEARS

YARD power sources are rectifiers for MMA coated electrode welding. They are well suited for both workshop and outdoor working conditions. Easy to use with adjustment using the shunt, they are for professional and intensive applications.

POWERFUL ROBUST

Standards
EN 60974-1
EN 60974-10

Features and product advantages:

- **Input voltage:** bi-tension 230 V – 400 V three-phase.
- **Simple:** power adjustment by shunt.
- **Easy to set:** linear control.
- **Cooling:** forced air cooling fan.
- **Practical:** due to the large diameter wheels and handle.
- **Versatile:** able to weld all types of electrodes (including cellulosics).

1. Switch on/off and primary voltage selection.
2. Current adjustment.
3. Welding current indicator.
4. Welding cables connectors.

TECHNICAL CHARACTERISTICS:

		YARD SV 263	YARD SV 333	YARD SV 403	YARD SV 443
Three-phase input voltage		230 - 400 V triphasé			
Power		14.5 kVA	16.9 kVA	22.8 kVA	31.2 kVA
Effective input current		21.5 A - 12.5 A	25 A - 15.5 A	34 A - 19.5 A	52 A - 30 A
Open circuit voltage		62 V - 66 V	61 V - 66 V	63 V - 70 V	71 V - 79 V
Welding current range		45 - 220 A	55 - 260 A	50 - 325 A	60 - 400 A
Duty cycle at 40 °C	at 35%	220 A	260 A	325 A	400 A (45%)
	at 60%	170 A	200 A	250 A	345 A
	at 100%	130 A	155 A	190 A	265 A
Connector size		13 mm			
Protection index		IP 21			
Dimensions (mm)		450 x 620 x 890	560 x 730 x 1080		
Weight		57 kg	83 kg	107 kg	123 kg

Accessories
see page 2-14

TO ORDER:

Power source only	**W 000 263 691**	**W 000 263 693**	**W 000 263 695**	**W 000263 686**

Delivered equipped with:

- primary cable,
- safety instructions,
- user manual.

YARD STC 400

WARRANTY 2 YEARS

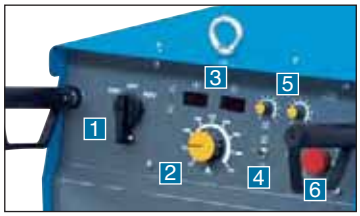
HEAVY DUTY - VERSATILE (MMA welding/gouging/TIG DC)

Standards
EN 60974-1
EN 60974-10

YARD STC 400 power source is built using thyristor technology, known as robust, successful and reliable all over the world.
The YARD STC 400 has already been approved in all types of environments such as transport equipment, manufacturing, shipyards, repair, etc…
The YARD STC 400 is the solution for intensive welding with coated electrodes (including cellulosic) and for gouging.

Features and product advantages:

- **Input voltage:** dual-voltage 230 V – 400 V three-phase.
- **Current adjustment:** electronic.
- **Display:** digital A / V.
- **Versatility:** coated electrodes / TIG DC lift / gouging.
- **Flexible:** possibility to adjust Hot Start and Arc force.
- **Professional:** steel case equipped with wheels and slinging eyes.
- **Remote control:** remote adjustment flexibility.



1. Switch on/off and primary voltage selection.
2. Regulation potentiometer.
3. Digital display A/V.
4. Selection: coated electrode / TIG.
5. Hot Start / Arc Force adjustment.
6. Remote control connection.

Remote control

TECHNICAL CHARACTERISTICS:

		YARD STC 400
Three-phase input voltage		230 - 400 V
Power		33 kVA
Open circuit voltage		80 V
Welding current range		10 - 400 A
Duty cycle at 40 °C	at 35%	400 A
	at 60%	300 A
	at 100%	230 A
Connector size		13 mm
Electrode diameters		1.6 to 6.3 mm
Protection index		IP 23
Dimensions		970 x 670 x 730 mm
Weight		146 kg

Accessories
see page 2-14

TO ORDER:

Power source only	**W 000 263 712**
Option	
Remote control	**W 000 219 557**

Delivered equipped with:

- primary cable,
- safety instructions,
- user manual.

AIR LIQUIDE WELDING

YARD 650 SX

WARRANTY 2 YEARS

The new YARD 650 SX uses electronic regulation for control of the welding current. Designed for adverse conditions, the YARD 650 SX is reliable and sturdy, dedicated to heavy duty applications from steel construction to shipyards. An 8-bit processor controls the welding process, protects the equipment and informs the welder of the current state. The YARD 650 SX is the solution for MMA welding, TIG lift welding and ARCAIR gouging.

MULTI PURPOSE APPLICATIONS ROBUST AND POWERFUL

Standards
EN 60974-1
EN 60974-10

Features and product advantages:

- Digital display for precise parameter regulation and monitoring.
- Process selector: MMA, TIG lift, gouging, MIG/MAG welding.
- 42 V DC current up to 150 A available.
- 48 V AC auxiliary current available as an option (up to 32 A).
- Remote control (option).
- Compensation of input voltage variations.
- Hot start and Arc Force regulation available for improved arc starting and stability.

1 Switch on/off and primary voltage selection.
2 Regulation knob.
3 Digital display A/V.
4 Hot Start / Arc Force adjustment.
5 Remote control connection.

TECHNICAL CHARACTERISTICS:

		YARD 650 SX
Three-phase input voltage		230 V - 400 V - 50/60Hz
Effective input current		61.5 A (230 V) - 35.4 A (400 V)
Open circuit voltage		68 - 75 V
Welding current range		10 A - 630 A
Duty cycle at 40 °C	at 35%	630 A
	at 60%	470 A
	at 100%	370 A
Connector size		13 mm
Protection index		IP 23
Dimensions		1000 x 600 x 600 mm
Weight		176 kg

Accessories
see page 2-14

TO ORDER:

Power source only	**W 000 272 669**
Option	
Remote control	**W 000 219 557**
48 V socket for auxiliary services	**W 000 260 682**
MIG wire feeder DEVIDARC	**W 000 305 090**

Delivered equipped with:

- primary cable,
- safety instructions,
- user manual.

MMA WELDING KIT (ELECTRODE HOLDER + EARTH CLAMP)

ACCESSORIES KITS					
Name	**16C25**	**25C25+**	**35C50**	**50C50**	**50C50+**
Connector size	Ø 9 mm²	Ø 9 mm²	Ø 13 mm²	Ø 13 mm²	Ø 13 mm²
SPEEDY	W 000 260 680 W 000 272 759*	-	-	-	-
COLT*	W 000 260 680	-	-	-	-
PUMA / PRATIKA AC/DC	-	W 000 011 138 W 000 268 854*	-	-	-
PUMA SX / YARD SV 263	-	-	W 000 011 139 W 000 268 856*	-	-
PRATIKA T *with cable lugs*	-	W 000 271 486	-	-	-
YARD SV	-	-	-	W 000 260 681	-
YARD STC / YARD 650SX	-	-	-	-	W 000 260 682

** with welding mask + hammer and brush*

MMA OPTIONS:

	COLT	PUMA	PUMA SX	YARD STC
Remote control	-	-	W 000 242 069*	W 000 215 557
TIG torch with valve	WTT 9 V - 4 m W 000 266 434		WTT 26 V - 4 m W 000 266 573	

** PUMA SX 2200 GC only*

Complete range
on page 6-2 to 6-13

MMA ELECTRODES (SELECTION):

Diameter	Rutile	Basic	Stainless steel	Cast iron
	SPEEDARC	**RESISTARC**	**INOXARC 316 L**	**CASTARC**
2.0 mm	W 000 287 021	-	W 000 287 083	-
2.5 mm	W 000 287 024	W 000 287 055	W 000 287 084	W 000 287 098
3.2 mm	W 000 287 025	W 000 287 056	W 000 287 085	W 000 287 099
4.0 mm	W 000 287 027	W 000 287 059	-	W 000 287 100