



**STAR**  
INTERNATIONAL

Worldwide Marine  
and Offshore Services

# GAS AND ELECTRIC WELDING

Second Edition

NEW DEPOT  
NOW OPEN IN  
SOUTHAMPTON



**STAR**  
INTERNATIONAL





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Star International supplies all types of refrigerants, welding gases, electric welding machines,  
fire service and safety equipment to the Marine and Offshore Market.

For a complete list of our products and services please visit our website:

[www.star-international.co.uk](http://www.star-international.co.uk)

## INTRODUCTION

Star International offers a wide range of products that are intended for welding, cutting and soldering techniques, as well as the related processes using fuel gases, oxygen, shielding gases or air.

When supplying a broad line-up of welding equipment, compliance with safety regulations must be ensured in order to protect the individual working with gases.

All equipment products are designed and manufactured according to EN and CE standards with safety in focus. By purchasing Star gas equipment, you are making an investment in your future. Our premium products will help to increase your productivity in a manner that is ergonomic and user-friendly.

All Star gas regulators, torches, torch shanks and cutting attachments come with a two year conditional warranty.

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# 1 X21® Welding and cutting equipment

## X21® Welding and Cutting Set

Part No: No: 00640000

X21 Cutting Attachment 90°

Part No: 00640141

X21 Cutting Attachment 75°

Part No: 00640142



### Welding attachments

I/h	mm	Part No.
40	0.2 – 0.5	00640065
80	0.5 – 1.0	00640066
160	1.0 – 2.0	00640067
230	2.0 – 3.0	00640068
315	2.0 – 4.0	00640069
400	3.5 – 5.0	00640070
500	4.0 – 6.0	00640071
650	5.0 – 7.0	00640072
800	6.0 – 9.0	00640073
1000	7.0 – 10.0	00640074
1250	9.0 – 14.0	00640075

X21 Handle with non-return valve  
BV 12 O 6.3

Round Part No: 00640076

Oval Part No: 00640077



BV 12 G 3/8"

Non-return valves

Ø 6.3 x 6.3 mm Part No: 00640081

Ø 8.0 x 8.0 mm Part No: 00640082

Cutting attachments

0° lever Part No: 00640078

75° lever Part No: 00640079

90° lever Part No: 00640080



Cutting nozzle HA 311 Acetylene

3 – 10mm Part No: 00640083

10 – 25mm Part No: 00640084

25 – 50mm Part No: 00640085

50 – 100mm Part No: 00640086

### Regulators

Unicontrol 500 is suitable for the majority of industrial gases and can cope with all gas welding, heating and soldering, as well as the gas cutting of materials up to a thickness of 300 mm.

#### OXYGEN



Part No: 00640058



SAFE-GUARD-5 Ox  
Part No: 00640060

#### ACETYLENE



Part No: 00640061



SAFE-GUARD-5 Ac  
Part No: 00640063

	Work area (bar)	Content pressure gauge (bar)	Work pressure gauge (bar)	Connection Inlet	Thread	Outlet	Part No.
<b>HT nut*</b>							
Oxygen	0 – 10.0	0 – 315	0 – 16.0	W 21.8 x 1/14"	Int.	G 3/8"	00640058
Acetylene	0 – 1.5	0 – 40	0 – 2.5	G 3/4"	Ext.	G 3/8"LH	00640061



## Flashback Arrestor SUPER 55 - Part No: 00640064

SUPER 55 has four safety functions:

- Prevents backflow
- Stops and extinguishes back-burning
- Cuts off the supply of gas in the event of pervasive backflow
- Cuts off the supply of gas in the event of overheating

SUPER 55

Oxygen

Part No: 00640064



SUPER 55

Acetylene

Part No: 00640143



## Accessories

Description	Part No.
Radius arm with centre point, big wheel	00640089
Radius arm with centre point, small wheel	00640037
Hole cutting attachment	00640090
Twin wheel cutting guide, big wheels for bevel cutting	00640091
Twin wheel cutting guide, big wheels	00640092
Twin wheel cutting guide, small wheels	00640036
Bushing	00640093



## Safety Goggles

Safety Goggles with shade level 5 for gas welding, soldering and gas cutting.

Fully ventilated and also have a flip-front mechanism.

CE approved in Accordance with EN 175/EN 166-F.

Safety Goggles for visitors with full-coverage polycarbonate lens in a single Piece. Integral side protection and contoured nose bridge. Perforated Side pieces for fitting extra safety bands. Corresponds with EN166 and EN167.



Part No: 00640117



Part No: 00331065

## Lenses

### Lenses to goggles Ø 50 mm

	Sealing level, DIN	Area of application/description	Qty	Part No.
Welding glass	4	Gas cutting, aluminium welding, weld and hard-soldering	4	00640094
Welding glass	5	Gas welding of more slender material thicknesses	4	00640095
Welding glass	6	Gas welding and cutting of thicker material thicknesses	4	00640096
Welding glass	7	Gas welding and cutting of thicker material thicknesses	4	00640097
Grinding glass	Clear	Shatterproof	2	00640098

## Gas Lighter



Gas lighter

Part No: 00640139

Gas saver GS 10

Part No: 00640140

## Cleaning Needles

Part No: 00640144



### Single Hose and Twin Hose

As gas hoses are made of rubber, they are affected by the external environment, e.g. ultraviolet radiation, which makes the rubber more brittle. It is therefore important to replace hoses frequently to avoid leaks.

#### Single Hose – 50mtrs

Colour 5	Dia mm	Type of Gas	Part No.
Blue	6.3mm	Oxygen	00640099
Blue	10.0mm	Oxygen	00640100
Blue	12.5mm	Oxygen	00640101
Orange	6.3mm	Propane/Hydrogen	00640102
Orange	8.0mm	Propane/Hydrogen	00640103
Orange	10.0mm	Propane/Hydrogen	00640104
Black	5.0mm	Argon/Dry Flow	00640105
Black	6.3mm	Argon/Dry Flow	00640106
Black	5.0mm	Argon	00640107
Black	6.3mm	Argon	00640108

#### Twin Hose – 50mtrs

Colour	Dia mm	Type of Gas	Part No.
Blue/Red	5.0 – 5.0	Oxygen/Acetylene	00640109
Blue/Red	6.3 – 6.3	Oxygen/Acetylene	00640110
Blue/Red	8.0 – 8.0	Oxygen/Acetylene	00640111
Blue/Orange	6.3 – 6.3	Oxygen/Propane	00640112
Blue/Orange	6.3 – 8.0	Oxygen/Propane	00640113
Blue/Orange	10 – 10	Oxygen/Propane	00640114

### Single Hose and Twin Hose

As gas hoses are made of rubber, they are affected by the external environment, e.g. ultraviolet radiation, which makes the rubber more brittle. It is therefore important to replace hoses frequently to avoid leaks.

#### Single Hose – 10 mtrs

Colour	Dia mm	Type of Gas	Part No.
Black	5.3mm	Argon/Dry Flow	00640115
Black	6.3mm	Argon/Dry Flow	00640116



#### Twin hose with compression couplings and non-return valves BV 12

Colour Ø mm	Dimension BV12	Non-return valve	5 mtr SB Part no.	10 mtr SB Part No.
Blue/Red (X11)	5.0 – 5.0	1/4"	00640118	00640119
Blue/Red (X21)	6.3 – 6.3	3/8"		00640120



## AGA Quick Coupling

Oxygen and other gases	Part No.
Connection (female): G 3/8"	00640121
Hose fitting (male) Ø 5.0 mm	00640122
Hose fitting (male) Ø 6.3 mm	00640123
Hose Fittings and Cap Nuts	00640124

Acetylene and Hydrogen	Part No.
Connection (female): LH G 3/8"	00640125
Hose fitting (male) Ø 5.0 mm	00640126
Hose fitting (male) Ø 6.3 mm	00640127
Hose fitting (male) Ø 8.0 mm	00640128



Quick coupling for oxygen



Hose fitting



Quick coupling without hose fitting

## Hoses Fittings & Cap Nuts

Hose fittings for X11 Pro handle, G 1/4" according to EN 560	Qty	Part No.
Hose fitting Ø 5.0 mm	2	00640145
Hose fitting Ø 6.3 mm	2	00640146
Hose fittings for regulators and large torches, G 1/2" according to EN 560	Qty	Part No.
Hose fitting Ø 5.0 mm	2	00640147
Hose fitting Ø 6.3 mm	2	00640148
Hose fitting Ø 8.0 mm	2	00640149
Hose fitting Ø 10.0 mm	2	00640150
Cap nuts	Qty	Part No.
For X11 - handle: Cap nut Acetylene LH G 1/4" + Oxygen G 1/4"	1+1	00640151
For regulators and large torches: Cap nut acetylene LH G 3/8" + Oxygen G 3/8"	1+1	00640152
Blanking plug 3/8" 301816		00640153



## Extension Pieces

### Non-separable (whole)

Hose dimension Ø mm	Qty in SB	SB pack	Part No.
Extension piece	5.0 – 5.0	2	00640154
Extension piece	6.3 – 6.3	2	00640155
Extension piece	8.0 – 8.0	2	00640156



### Separable

Hose dimension Ø mm	Qty in SB	Part No.
Extension piece 5.0 – 5.0	2	00640157
Extension piece 6.3 – 6.3	2	00640158
Extension piece 8.0 – 8.0	2	00640159



## Centre Piece for Extension Pieces

	Part No.
Centre piece LH G 3/8"	00640160
Centre piece G 3/8"	00640161
Centre piece LH G 1/4"	00640162
Centre piece G 1/4"	00640163
Centre piece G 3/8" - G 1/4"	00640164



## Hose Clips - Hose Holder

	Qty	Part No.
Hose clip 08 – 14 mm	4	00640165
Hose clip 13 – 20 mm	2	00640166





## 2 Gas Welding and Brazing Rods

Part No.	Star Products	Dia mm	Weigh Pkt	Description
00630000	Star SI-60 Flux Coated Silver Solder	2.0mm	0.5 kg	A flux coated cadmium free, seawater resistant, high strength silver rod for joining all types of steel and stainless steel, copper. Copper alloys, nickel and nickel alloys, cast iron, Yorcabro pipes (Aluminium brass) cunifer pipes 9/10 and 70/30
00630010	Star Silver 45%	2.0mm	0.4 kg	Bare cadmium free silver rod for joining of all types of steel, stainless steel, copper, copper alloys, nickel and nickel alloys cast iron and hard metals. The brazing rod gives a very good joint and can be used for brazing nipples, sleeves and unions to copper pipes.
00630011	Star Mild Steel 500mm	2.5mm	1.25 kg	A special alloy steel rod containing manganese for toughness. It provides a weld deposit of high strength and ductility. Recommended for oxy/acetylene welding for pipelines and pressure vessels.
00630012	Star Mild Steel 500mm	3.0mm	1.25 kg	A special alloy steel rod containing manganese for toughness. It provides a weld deposit of high strength and ductility. Recommended for oxy/acetylene welding for pipelines and pressure vessels.
00630013	Star Alu-Mag 500mm	3.2mm	1.25 kg	A general purpose aluminium rod containing 5% magnesium that has excellent corrosion resistance and high strength Suitable for welding magnesium bearing aluminium alloys such as 5251 (N4), 5154 (N5). 5454 (N51) and also heat treatment alloys 6063 (H9), 6061 (H20) and also heat treatable alloys 6063 (N9), 6061 (H20) 6082 (H30)
00630014	Star Coated Bronze 500m	2.4mm	1kg	This rod is bronze with a full flux coating providing the added benefit of faster continuous brazing through not having to flux--dip it is ideally suited for general mild steel work, galvanised steel and dissimilar metal applications.
00630015	Star Coated Bronze 500mm	3.2mm	1kg	This rod is bronze with a full flux coating providing the added benefit of faster continuous brazing through not having to flux--dip. It is ideally suited for general mild steel work, galvanised steel and dissimilar metal applications.

Part No.	Star Products	Dia mm	Weigh Pkt	Description
00630016	Star Bronze 500mm	3.2mm	1.0 kg	This rod is bronze with a full flux coating and with Similar characteristics. The UTS is approximately 25% greater than Sifredicote No1. and is ideal for high strength production and maintenance application.
006-30017	Star Bronze 500mm Bronze-264	5.0mm	2.5 kg	This rod is bronze with a full flux coating and with similar characteristics. The UTS is approximately 25% greater than Sifredicote No1. and is ideal for high strength production and maintenance application.
00630018	Star Coated Wear-Bro 500mm	3.2mm	1.25 kg	This rod is bronze No.1 with a full flux coating providing the added benefit of faster, continuous brazing through not having to flux-dip it is ideally suited for general mild steel work, galvanised steel and dissimilar metal applications.
00630020	Star Coated Cast-Iron	5.0mm	2.5 kg	The rod is suitable for full fusion welding of cast iron, providing a high strength weld metal which is easily Machineable. It gives an excellent colour match and has the same structure as a grey cast iron.



### 3 Electric Welding Units

#### MONO STAR 1620/M SYNERGIC for MIG/MAG welding

Part No. 00640172



##### Technical Specification

Power Supply (+15%/-20%)	230V 1Ph
Fuse A	T16
Regulation Field	20-160A
Duty Cycle @ 60%	110A
Protection Class	IP23S
Weight	11 Kg

- 2 Roll Feeder
- Synergic Mode
- MIG Brazing
- Flux Cored Welding
- Hot Start
- 5 Kg Spool Holder
- 2T/4T
- Spot Timer
- Stitch Timer
- Soft Start
- Burn Back
- Adjustable Inductance
- PFC Compliant (EN-61000-3-12)
- Generator Compatible

##### Package Includes:

2 Metre Earth Return

##### Options:

MIG Torch,  
Trolley (ART1653),  
Synergic Programme Upgrade (ART266)

#### POCKET PULSE for MIG/MAG welding

Part No. 00640173



##### Technical Specification

Power Supply (+15%/-20%)	230V 1Ph
Fuse A	T16
Regulation Field	20-185A
Duty Cycle @ 60%	140A
Protection Class	IP23S
Weight	13.5 Kg

- 2 Roll Feeder
- Synergic Mode
- MIG Brazing
- Flux Cored Welding
- Hot Start
- 5 Kg Spool Holder
- 2T/4T
- Crater Fill
- Spot Timer
- Stitch Timer
- Soft Start
- Burn Back
- Pre/Post Gas
- Adjustable Inductance
- 3L 3Levels
- PFC Compliant (EN-61000-3-12)
- Generator Compatible

##### Package Includes:

3 Metre Earth Return

##### Options:

MIG Torch,  
Aluminium Accessory Kit



Part No. 00640174

**Technical Specification**

Power Supply (+15%/-20%)	400V 3Ph
Fuse A	T16
Regulation Field in MIG/ TIG/ MMA	15 - 330A
MIG/ TIG/ MMA Duty Cycle @ 60%	300A
TIG Ignition	LIFT
Protection Class	IP23S
Weight	82 Kg

- 15 Kg Spool Holder
- 2T/4T
- Spot Timer
- Stitch Timer
- Soft Start
- Pre/Post Gas
- Burn Back
- Adjustable Inductance
- Software Updates
- Flux Cored Wire
- 3L 3Levels
- MIG Brazing
- 4 Roll Feeder
- Synergic Mode
- Pulsed MIG Welding
- Double Pulsed MIG Welding
- DC TIG Welding
- DC MMA Welding
- Ready For Air Cooled Push/ Pull Torch
- Hot Start
- Crater Fill
- PFC Compliant (EN-61000-3-12)

**Package Includes:**

3.5 Metre Earth Return

**Options:**

MIG Torch,  
TIG Torch, GRV14 Water Cooling Unit (ART1681),  
4 Metre Air Cooled Push/Pull Torch (ART2003),  
Upgrade to Pulsed TIG Function (ART234),  
T-Link (ART434),  
Welding Data Logger (ART408),  
Welding Data Interface Kit (ART429),  
5 Metre Extension Lead for Data Logger (ART2050)



## WIN TIG DC 220M for TIG , MMA welding

Part No. 00640175



### Options:

3 Metre Earth Return,  
Trolley (ART1653), Foot Control (ART193),  
Remote Control (ART187),

5 Metre Extension Cable (ART1192),  
TIG Foot Control Adaptor (ART1180),  
MMA Accessories Kit (ART1281.03)

### Technical Specification

Single Phase Input	115V/230V 50/60 Hz+15%/-20%
Fuse Rating (Slow Blow)	16A (230V)
Input Power	3.8kVA 40%
	3.1kVA 60%
	2.2kVA 100%
Duty Cycle (10min. 40°C)	160 A 40%
	140 A 60%
	110 A 100%
Protection Class	IP23s
Weight	12.9 Kg

- Inverter Power Source
- LCD Colour Display
- TIG/MMA
- Generator Compatible
- APC (Active Power Control)
- HF/LIFT Arc Striking
- EVO Start
- Pulse XP
- Pulsed Arc
- Pulse XP
- Rapid Tack
- Pre/Post Current
- Pre/Post Gas
- Slope Up/Slope Down
- Complete Pulse Adjustment
- Wizard Set Up
- Job Saving

## WIN TIG AC-DC 180M - TIG AC, MMA

Part No. 00640176



### Options:

Trolley (ART1653),  
Foot Control (ART193),  
Remote Control (ART187),

Remote Extension Lead (ART1192),  
TIG Foot Control Adaptor (ART1180),  
MMA Accessory Kit (ART1281.03)

### Technical Specification

Single Phase Input	230V 50/60 Hz +15% / -20%
Fuse Rating (Slow Blow)	16A
Regulation Field	5-180A
Duty Cycle @ 60%	110A
Protection Class	IP23s
Weight	17.5 Kg

- Inverter Power Source PFC
- LCD Colour Display
- TIG DC/TIG AC/MMA
- Generator Compatible
- APC (Active Power Control)
- HF/LIFT Arc Striking
- 2T/4T/3L
- EVO Start
- AC Balance Control
- AC Frequency Control
- Pulsed Arc
- Pulse XP
- Rapid Tack
- Pre/Post Current Value and Time
- Pre/Post Gas
- Slope Up/Slope Down
- Complete Pulse Adjustment
- Wizard Set Up
- Job Saving



### Technical Specification

Three phase input	400 V 50/60 Hz± 10%
Fuse rating (slow blow)	16 A
Input power	16,6 kVA 30%
	10,0 kVA 60%
	8,0 kVA 100%
Current adjustment range	10 ÷ 380 A
Duty Cycle, (10 min.40°C) according to IEC 60974-1	380 A 30%
	270 A 60%
	230 A 100%
Electrodes that can be used	Ø 1,5 ÷ 6,0
Protection class	IP23S
Weight	26,3 kg
Dimensions (WxLxH)	297x463x588 mm

### Suitable for cellulosic coated electrodes

The three-phase power source **POWER ROD 380 T-Cell** (art.519) allows professional welding of coated electrodes by means of the Hot Start and Arc Force functions, which assure a sophisticated control of short-circuit conditions, and thus of the electrode transfer, which is the parameter that most strongly affects welding quality.

It is possible to weld cellulosic electrodes by means of a specialized program available from the panel. The power source is also suitable for D.C. TIG / pulsed TIG welding with "Cebora lift ignition".

The machine software is stored in the flash memory, and may therefore be upgraded. The machine has a connector to connect the remote control for the current as well as a digital ammeter to read the welding current.

### Complies with EN 61000-3-12.

The power source can be powered by motor generators of adequate power.



## Accessories

Part No.	Description	504	506	513	514	519
00640178	Foot control unit for welding current adjustment. Supplied with 5 m (16 ft) cable and ON/OFF switch			•	•	•
00640179	Remote control unit for welding current adjustment			•	•	•
00640180	Adapter to simultaneously attach the torch and the foot control unit			•		
00640181	5 m (16 ft) extension cable for remote control unit				•	•
00640182	Accessories set for electrode welding: Electrode holder (5 m - 16 mm <sup>2</sup> ) Work return lead (3 m - 16 mm <sup>2</sup> ), mask with glasses, chipping hammer and steel brush	•	•			
00640183	Electrode holder (5 m - 35 mm <sup>2</sup> ) and work return lead (3,5 m - 35 mm <sup>2</sup> )			•	•	
00640184	Electrode holder (5 m - 50 mm <sup>2</sup> ) and work return lead (3,5 m - 50 mm <sup>2</sup> )					•
00640185	5 m (16 ft) extension cable for remote control			•		
00640186	"CEBORA T 150" torch - 4 m length (13 ft)	•	•			
00640187	"CEBORA T 150" torch - 4 m length (13 ft)			•		
00640188	Trolley for transportation of the power source				•	
00640189	Trolley for transportation of the power source					•

			
00640178	00640170	00640180	00640181/00640185
			
00640182	00640183/00640184	00640186	00640187
			
		00640189	00640189

## 4 Electrodes and Blister Packs

Star International office has installed a fast response centre, equipped with all the latest facilities, specifically to increase speed of service to you, the customer.

Star can offer different diameter size of electrodes - 2.0mm to 6.0mm if required, as with each packet we can offer the BLISTER PACKS (4pcs) to check that you have the right electrode to do that specific job...electrode packing comes from 1 kilo - 4 kilo packs, bigger packs are also available if required.

### Mild and Low Alloy

STAR GPO-6013  
STAR LH-7018  
STAR LH-7016  
STAR LH-8018

### Stainless Steel

STAR STAIN-316L  
STAR STAIN-309MoL  
STAR DUPLEX-2209

### Special High/Hard Mixed Steel

STAR SUPER TENSILE  
STAR STELL-6  
STAR HF600  
STAR HF900

### Special Cast Iron

STAR CAST NICKEL  
STAR CAST Ni-Fe

### Bronze Al-Bro

STAR TINBRONZE  
STAR AL-BRONZE  
STAR ALUMINIUM

### Stud Remover

STAR STUD  
REMOVER

### Cryogenic High Temperature Electrodes

STAR INCO

### Cutting & Gouging

STAR Gouging

## Mild and Low Alloy Steel Electrodes STAR GP-6013



Product Number	Dia	Pkt Size	Amp A	Classification
006-10000	2.5mm	4 kilo	55-90	AWS E6013
006-10001	3.2mm	4 kilo	70-120	
006-10002	4.0mm	4 kilo	110-200	

### Description & Applications:

Superior all positional general purpose organic mild steel electrode for joining light and heavy gauge steel sections. May be used with conventional or touch welding techniques and are particularly suitable where welding has to be carried out in confined or awkward places. Welds are ductile and of a high radiographic quality.

## STAR LH-7018

Product Number	Dia	Pkt Size	Amp A	Classification
006-10003	2.5mm	4 kilo	70-100	AWS E7018
006-10004	3.2mm	4 kilo	90-130	
006-10005	4.0mm	4 kilo	130-180	

### Description & Applications:

High quality superior all positional low hydrogen Manual Metal Arc welding electrode using a silicon free, low nitrogen, high purity C:Mn core wire with concentrically extruded, moisture resistant chemically basic flux with a controlled iron powder addition, to provide 120% metal recovery. Welds are of smooth appearance, ductile and of high radiographic quality. For welding mild and medium tensile steels and for BS4360 1972 steels where low hydrogen levels and crack resistant weld metal are required. The electrodes are particularly suitable for welding heavy sections subject to high levels of resistance and for welding problem steels with high sulphur content. Recommended for unalloyed C:Mn ferritic steels with high sub-zero toughness requirements, e.g:- Charpy values down to -60°C. CTOD values at -10°C. Used to best advantage for welding thick sections either on-board ship or in fabrication shops.

## Mild and Low Alloy Steel Electrodes

### STAR LH-7016

Product Number	Dia	Pkt Size	Amp A	Classification
006-10006	2.5mm	4 kilo 60-100	AWS E7016	
006-10007	3.2mm	4 kilo 80-130		
006-10008	4.0mm	4 kilo 120-170		

#### Description & Applications:

Low Hydrogen Manual Metal Arc welding electrode with a silicon free C: Mn core wire with a concentrically extruded chemically basic flux coating which has been so modified to provide good welding electrode for inexperienced welders.

### STAR LH-8018

Product Number	Dia	Pkt Size	Amp A	Classification
006-10009	2.5mm	4 kilo	70-90	AWS E8018-B2
006-10010	3.2mm	4 kilo	90-130	
006-10011	4.0mm	4 kilo	130-180	

#### Description & Applications:

A superior versatile low hydrogen electrode Ni Cr type. AWS E8018-B2 which uses a silicon free, low nitrogen, high purity C:Mn core wire with a moisture resistant chemically basic flux with a controlled iron powder addition. Recommended for resistance to hydrogen attack up to 330°C and corrosive effects of processing high S crude oil up to 450°C and for prolonged elevated temperature service up to 550°C

with reasonable degree of corrosion resistance in superheated stream. The AWS E8018-B2 also incorporates the following electrodes 316 – E8018-G, 314 – E7028, 319-E8018-C1 320-E8018-G making it a superior electrode.

## Stainless Steel Electrodes

### STAR STAIN-316L

Product Number	Dia	Pkt Size	Amp A	Classification
006-10012	1.5mm	2 kilo	25-35	AWS E316L
006-10013	2.0mm	2 kilo	30-45	
006-10014	2.5mm	2 kilo	45-70	
006-10015	3.2mm	2 kilo	70-110	

#### Description & Applications:

High quality rutile low carbon stainless steel electrode depositing weld metal of the 19% Cr, 12% Ni, 3% Mo type for corrosion resistance. Suitable for use in all positions except vertical down, high acid resistance. Extra low carbon. Wide usage in textile, pulp and paper, rayon and chemical industries. May be used for overlaying carbon and low alloy steels to provide corrosion and acid resistance. Suitable for general service at temperatures up to 500°C and for acid resistance up to 350°C. The electrode is suitable for welding steels of AISI 316L, 316 and 317 types.

### STAR STAIN-309MoL

Product Number	Dia	Pkt Size	Amp A	Classification
006-10016	2.5mm	2 kilo	50-60	AWS E309Mo
006-10017	3.2mm	2 kilo	70-100	
006-10018	4.0mm	2 kilo	110-140	

#### Description & Applications:

General purpose stainless steel electrode of 23/12/3 type designed for joining dissimilar stainless steels, of the most common types, to one another. Primarily designed for maintenance applications where various types of stainless steels intermediate in composition between 18/8 and 23/12 chrome nickel, are used and where the need for one electrode, to accommodate all applications on a general basis, is required. Most of the common types of stainless steel can be welded with this electrode, without the loss of properties.



## STAR DUPLEX-2209

Product Number	Dia	Pkt Size	Amp A	Classification
006-10019	2.5mm	2 kilo	45-70	AWS E2209
006-10020	3.2mm	2 kilo	70-100	
006-10021	4.0mm	2 kilo	110-140	

### Description & Applications:

General purpose stainless steel electrode of 23/12/3 type designed for joining dissimilar stainless steels, of the most common types, to one another. Primarily designed for maintenance applications where various types of stainless steels intermediate in composition between 18/8 and 23/12 chrome nickel, are used and where the need for one electrode, to accommodate all applications on a general basis, is required. Most of the common types of stainless steel can be welded with this electrode, without the loss of properties

## Special High / Hard Mixed Steels Electrodes

### STAR SUPER TENSILE

Product Number	Dia	Pkt Size	Amp A	Classification
006-10051	1.5mm	2 kilo	25-35	AWS E312 – 17
006-10052	2.0mm	2 kilo	30-45	
006-10053	2.5mm	2 kilo	50-70	
006-10054	3.2mm	2 kilo	90-110	
006-10055	4.0mm	2 kilo	120-140	

### Description & Applications:

Superior specially designed high strength austenitic type electrode of duplex structure. Can be used for overlaying and joining dissimilar steels to one another, high and low carbon steels, spring steels, tool and die steels, cast steels, ferritic to austenitic steels and steels of unknown composition. High resistance to cracking coupled with good wear, heat, impact and corrosion resistance. Therefore this electrode has uses in practically every type of industry resulting in one of the most universally used electrodes for problem and unknown steels. The AWS E312 - 17 also incorporates the following 328N - E312 making the STAR SUPER WELD ELECTRODE one of the most superior electrodes.

### STAR STELL-6

Product Number	Dia	Pkt Size	Amp A	Classification
006-10022	2.5mm	2 kilo	60-75	AWS E Co Cr-A (Grade 6)
006-10023	3.2mm	2 kilo	90-115	
006-10024	4.0mm	2 kilo	100-150	

### Description & Applications:

Cobalt based electrode designed on a fully alloyed core wire to combat all four elements of wear, i.e. heat, impact, corrosion and abrasion. High impact properties. Most suitable of cobalt range where impact is the most predominant of the four elements of wear. Excellent for

rebuilding corners with minimum base metal dilution. Has ability to overlay extensive areas without cracking. Will retain hardness at high temperatures. The welds are machinable. Suitable for repair to valve seats, piston rings,

## STAR HF600

Product Number	Dia	Pkt Size	Amp A	Classification
006-10025	2.5mm	2 kilo	80-100	
006-10026	3.2mm	2 kilo	90-120	
006-10027	4.0mm	2 kilo	120-170	

### Description & Applications:

Hard facing electrode designed for applications on ferrous metals involving friction and severe abrasion, also where certain heat and corrosive conditions apply. The electrode is of the rutile chromium carbide all positional type and has a metal recovery rate of 150%. Typical hardness value on a single pass 62HRC, multi-pass 65HRC

## STAR HF900

Product Number	Dia	Pkt Size	Amp A	Classification
006-10028	3.2mm	2 kilo	90-130	
006-10029	4.0mm	2 kilo	139-170	

### Description & Applications:

Hard surfacing, wear resistant overlay against gauging abrasion, pressure and impact. Applications include welding work onboard. dredgers and cement carriers.

## Special Cast Iron Electrodes

### STAR CAST NICKEL

Product Number	Dia	Pkt Size	Amp A	Classification
006-10030	2.5mm	2 kilo	50-80	AWS ENi-Ci
006-10031	3.2mm	2 kilo	80-100	
006-10032	4.0mm	2 kilo	120-170	

### Description & Applications:

High quality general purpose nickel electrode designed for economical joining and surfacing of cast iron. Positive arc, fast build-up, easy slag detachability and fully machinable porosity free welds. May be used for hot or cold welding of cast irons and for surfacing and building up on malleable irons. It is suitable for joining mild steel to cast iron and is ideal for maintenance repair where sound welds are required.

### STAR CAST Ni-Fe

Product Number	Dia	Pkt Size	Amp A	Classification
006-10033	2.5mm	2 kilo	40-70	AWS Ni-Fe-Ci
006-10034	3.2mm	2 kilo	70-110	
006-10035	4.0mm	2 kilo	110-150	

### Description & Applications:

High strength machinable electrode for joining and building up on cast irons. Low amperage, smooth arc, minimum spatter and high resistance to cracking. For the repair of grey, S.G., nodular or ductile irons where higher strength is required. Also suitable for joining cast iron to mild steel (in conjunction with Star Gouging), pressure vessels, etc.

## Bronze Al-Bro Electrodes

### STAR TINBRONZE

Product Number	Dia	Pkt Size	Amp A	Classification
006-10039	2.5mm	2 kilo	50-75	AWS E Cu Sn
006-10040	3.2mm	2 kilo	80-120	

#### Description & Applications:

Superior coated tough bronze electrode for joining and overlaying steels, cast irons, malleable irons, bronzes and copper based metals. Due to the high thermal conductivity of copper and copper alloys pre-heating is advisable in certain instances particularly where heavy sections are involved. Highly recommended for bearing surfaces and for wear facing against sea water corrosion.

### STAR AL-BRONZE

Product Number	Dia	Pkt Size	Amp A	Classification
006-10041	2.5mm	2 kilo	60-80	AWS E Cu Al-A2
006-10042	3.2mm	2 kilo	80-130	

#### Description & Applications:

An electrode designed for joining and overlaying aluminium bronze and for corrosion and wear resistant deposits on steel and cast irons. The weld metal deposits will produce good friction and corrosion resistance. Ideal for bearing surfaces, shafts, guides, slides, gear teeth and any wear application involving metal to metal friction.

### STAR ALUMINIUM

Product Number	Dia	Pkt Size	Amp A	Classification
006-10043	2.5mm	2 kilo	60-90	DIN 1732S Al Si12
006-10044	3.2mm	2 kilo	80-110	

#### Description & Applications:

Aluminium 10/12% silicon type electrode for welding wrought and cast aluminium alloys of similar composition. Rapid deposition rate, good penetration characteristics, excellent stability, weldability and slag control. The special chemically active mineral coating enables easy removal of surface oxides during welding ensuring results of high quality. Suitable for slag over slag welding. Welding wrought alloys N4, H9, H10, H20, H30 and cast alloys LM6, LM8, LM9, LM13 and LM20. Used extensively for repair of casting defects such as surface voids where slag over slag techniques may be employed.

## Stud Remover Electrodes

### STAR STUD REMOVER

Product Number	Dia	Pkt Size	Amp A	Classification
006-10045	2.5mm	2 kilo	50-90	No Specification exists
006-10046	3.2mm	2 kilo	75-130	

#### Description & Applications:

Extruded flux coated MMA electrode made on high alloy Duplex micro structured high tensile non-heat treatable (Hence no softening alloyed core wire). The electrode has the ability to maintain a continuous arc when slag over slag welding while restricting the flow of the molten metal. These physical welding characteristics make the electrode ideal for the removal of threaded bolt when the bolt head has sheared at or just below the surface.

#### Broken bolt removal procedure:

Selecting the appropriate diameter electrode, e.g. approximately 50% of the stud's diameter. Make short continuous build up welds. During the breaks in welding remove slag and check circumference of build-up is within the diameter of the stud. Repeat weld procedure until build up is 5 to 8mm above component surface. File two opposite flats on weld deposit and remove broken stud (unscrew) with the use of mole grips.



## Cryogenic High Temperature Electrodes

### STAR INCO

Product Number	Dia	Pkt Size	Amp A	Classification
006-10047	2.5mm	2 kilo	60-90	AWS ENi Cr Fe 3
006-10048	3.2mm	2 kilo	80-120	
006-10049	4.0mm	2 kilo	100-150	
006-10050	5.0mm	2 kilo	130-200	

#### Description & Applications:

Superior electrode for joining and overlaying almost any nickel chrome alloy for service in both cryogenic and high temperature conditions, with the emphasis on the cryogenic side. For welding Inconel 600 and 601 type alloys, Incoloy 800 and 800H, involved in temperatures

up to 540°C and for dissimilar applications such as Incoloy 600 and 800HT to carbon or stainless steels; nickel 200 or Inconel 400 and Inconel 75. Also suitable for welding 3%, 5% nickel semi cryogenic steels and 9% nickel steels for full cryogenic conditions:

## Cutting and Gouging Electrodes

### STAR Gouging

Product Number	Dia	Pkt Size	Amp A	Classification
006-10036	2.5mm	4 kilo	100-150	
006-10037	3.2mm	4 kilo	150-250	
006-10038	4.0mm	4 kilo	250-300	

#### Description & Applications:

An electrode specially designed for cutting, gouging and piercing operations on all metals without the use of air or oxygen. Easy to use with little skill required. Operates at lower current and produces fewer fumes than would normally be expected from an electrode of this type. Metal surfaces are seared by the force of the arc leaving them clean and ready for subsequent welding operations. Smooth and even grooves are easily produced. Applications include, grooving, cutting, gouging and piercing operations on all metals including those, which would normally present difficulties by machining. These include hardenable steels, armour plate, hard weld overlays, cast iron and stainless steels. The electrodes are ideal for back gouging of butt welded seams and almost indispensable for the preparation of cast irons prior to welding repair.

## 5 Head Protection

### Phantom Impact Auto-Darkening Helmet

#### Summary

A Stylish auto-darkening welding helmet, suitable for all welding and cutting applications down to 10 Amps. Externally adjustable from 9-13. A high impact resistant nylon shell allows use for grinding operations. Comfortable and lightweight with 'metal & ice' decal design.

#### Target Applications

Can be used in Stick, TIG, MIG/MAG, Plasma welding/cutting, Grinding and Oxy/Fuel welding/cutting.

#### Further information

- Grind Mode & High Impact Resistant Shell
- Popular 110 x 90 x 9mm Cartridge
- Clear 98 x 44mm Viewing Area
- Fully Automatic Power on/off
- Auto – Darkens In < 1/16,000s
- Lightweight and comfortable, at just 0.4Kg total product weight
- 10A minimum current sensitivity for many MIG, Stick & TIG tasks
- External shade adjustment 9 - 13
- 2x Light detection sensors
- Constant UV/IR protection to DIN16
- Powered by solar cell.
- Adjustable sensitivity and delay
- Supplied with user manual, clear replacement front lens, adjustable headgear and comfort sweatband



#### Articles and Accessories

Part No	Product Description
00640190	Phantom Impact 9-13 variable
00640192	Replacement inner lens
00640193	Replacement outer lens
00640194	Universal sweatband
00640195	Replacement headgear

#### Technical Specification

Standard	CE, EN175B, EN379, ANSI Z87.1
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## Phantom Active Auto-Darkening Helmet - FXADF600S

### Summary

A Stylish auto-darkening welding helmet, suitable for all welding and cutting applications down to 10 Amps. Externally adjustable from 9-13. Fully automatic on/off. Comfortable and lightweight with 'ice' decal design.

### Target Applications

Can be used in Stick, TIG, MIG/MAG, Plasma welding/cutting, Grinding and Oxy/Fuel welding/cutting.

### Further information

- Popular 110 x 90 x 9mm Cartridge
- Clear 98 x 44mm Viewing Area
- Fully Automatic Power on/off
- Auto – Darkens In < 1/16,000s
- Lightweight and comfortable, at just 0.4Kg total product weight
- 10A minimum current sensitivity for many MIG, Stick & TIG tasks
- External shade adjustment 9 - 13
- 2x Light detection sensors
- Constant UV/IR protection to DIN16
- Powered by solar cell.No battery change required
- Adjustable sensitivity and delay
- Supplied with user manual, clear replacement front lens, adjustable headgear and comfort sweatband

#### NOTE:

Cartridges with Serial numbers dated 140805 (year/month/day) and before require EV445865310P

Cartridges with Serial numbers dated 140905 (year/month/day) and before require ES9647SP



### Articles and Accessories

Part No	Product Description
00640191	Phantom active 9-13 variable
00640192	Replacement inner lens-140905
00640193	Replacement outer lens-140805
00640194	Universal sweatband
00640195	Replacement headgear

### Technical Specification

Standard	CE, EN175B, EN379, ANSI Z87.1
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## SWP Eliminator XV 9-13 Pro Auto Darkening Welding Helmet

Part No: 00640196

### Features

- Shade 4-9/13
- Grinding function with warning flash
- Cartridge size: 114x133mm
- Viewing area: 100x60mm
- Switching times:  
Light to dark: 0.08 secs  
Dark to light: 0.1-0.9 secs
- four sensors offer wider detection of welding arc
- Adjustable sensitivity/delay
- Shell B rated for impact protection
- UV/IR protection up to DIN 15
- Tig welding from 3 amps
- Optical classification: 1/1/1/2
- CE EN 175 / EN379
- Low battery warning light



### Spare Parts for Eliminator XV

Truecolour Lens  
Part No: 00640197



Premium headgear  
Part No: 00640198



Comfortable foam easily moulds to the head, while offering support and stability during prolonged use

Lightweight suspension harness with rotating size adjusters for individual width adjustment

106 x 66 (inner)  
Part No: 00640199  
114 x 66 (inner)  
Part No: 00640200

Sweatband  
Part No: 00640201



## SWP Handscreens

Handscreen  
Part No: 00640202  
4.25"x3.25"



Handscreen  
Part No: 00640203  
4.25"x3.25"



## 6 Electrode Holders, Clamps, Cables and Hand Protection

### Twist Type Electrode Holders BS EN 60974-11



LC Twist Type 400 amp - Yellow handle  
Part No: 00640204

LC Twist Type 600 amp - Yellow handle  
Part No: 00640205



Twist Type PG 400 amp - Red handle *Econ 405 equivalent*  
Part No: 00640206

Twist Type PG 600 amp - Red handle *Econ 405 equivalent*  
Part No: 00640207

### Myking Electrode Holders BS EN 60974-11



The double screw body on these products makes them almost impossible to break. They are extremely well insulated

Part No:	Description
00640208	Myking 200 amp electrode holder - 2 position 45/90°
00640209	Myking 450 amp electrode holder - 2 position 45/90°
00640210	Myking 600 amp electrode holder - 2 position 45/90°

### Earth Clamps



Earth clamp croc  
200 amp  
Part No: 00640216



Earth clamp croc  
400 amp  
Part No: 00640217

### Myking Earth Clamps



Myking G-600 clamp  
Part No: 00640215

- Earth clamp
- Brass body with 2 screws
- Well insulated
- Maximum cable size: 120mm

Qty 1-15

## Air Arc Torches



Part No:	Description
00640211	K3 Torch 600A (straight head) c/w 6ft monocable
00640212	K3 Torch 1200A (straight head) c/w 6ft monocable
00640213	K3000 Torch 600A (angled head) c/w 6ft monocable
00640214	K4000 Torch 1000A (angled head) c/w 6ft monocable

## Gouging and Round Jointed Carbons



Part No:	Description
00640252	5mm x 305mm gouging carbons (5/32" x 12")
00640253	6.4mm x 305mm gouging carbons (1/4" x 12")
00640254	8mm x 305mm gouging carbons (5/16" x 12")
00640255	10mm x 305mm gouging carbons (3/8" x 12")
00640256	13mm x 305mm gouging carbons (1/2" x 12")
00640257	13mm x 430mm round jointed carbons (1/2" x 17")
00640258	16mm x 430mm round jointed carbons (5/8" x 17")
00640259	19mm x 430mm round jointed carbons (3/4" x 17")

## Cables

### PVC Single Insulated Cable

EN 50525-2-11



Part No:	Description	Coil
00640218	35mm Cable - Black	100m
00640219	50mm Cable - Black	100m
00640220	70mm Cable - Black	50m

### Rubber Single Insulated Welding Cable

BS EN 50525-2-81:2011 /H01N2-D

Part No:	Description	Coil
00640221	35mm Cable - Black	100m
00640222	50mm Cable - Black	100m
00640223	70mm Cable - Black	50m

### PVC Double Insulated Cable

EN 50525-2-11



Part No:	Description	Coil
00640224	35mm DI Cable - Orange	100m
00640225	50mm DI Cable - Orange	100m
00640226	70mm DI Cable - Orange	50m

### Rubber Double Insulated Welding Cable

BS EN 50525-2-81:2011 /H01N2-D

Part No:	Description	Coil
00640227	35mm DI Cable - Orange	100m
00640228	50mm DI Cable - Orange	100m
00640229	70mm DI Cable - Orange	50m



## Croc Earth Clamp & Cable Sets



Part No:	Description	Coil
00640230	200 amp earth ClampCroc c/w 10-25 Dinse (25mm cable)	5m
00640231	200 amp earth ClampCroc c/w 35-50 Dinse (25mm cable)	5m
00640232	400 amp earth ClampCroc c/w 35-50 Dinse (50mm cable)	5m

*Special builds available on request*

## Electrode Holder & Cable Sets



Part No:	Description	Coil
00640233	200 amp Electric Holder c/w 10-25 Dinse (25mm cable)	5m
00640234	200 amp Electric Holder c/w 35-50 Dinse (25mm cable)	5m
00640235	400 amp Electric Holder c/w 35-50 Dinse (50mm cable)	5m

*Special builds available on request*

## Safety Cable Connectors

BS EN 60974-12



Part No:	Description
00640236	BB Cable Connector (male) Wescol For 35-70mm cable



Part No:	Description
00640237	BB Cable Connector (female) Wescol For 35-70mm cable

## Dinse Type Plugs

BS EN 50974-12



Part No:	Description
00640238	10-25 Dinse Type Plug
00640239	35-50 Dinse Type Plug
00640240	50-70 Dinse Type Plug
00640241	70-95 Dinse Type Plug

## Dinse Type Sockets

BS EN 60974-12



Part No:	Description
00640242	10-25 Dinse Type Socket
00640243	35-50 Dinse Type Socket
00640244	50-70 Dinse Type Socket
00640245	70-95 Dinse Type Socket

## Hammers and Wire Brushes



Part No:	Description
00640260	Tubular Handle Chipping Hammer



Part No:	Description
00640261	2 Row Mild Steel Wire Brush
00640262	3 Row Mild Steel Wire Brush
00640263	4 Row Mild Steel Wire Brush
00640264	2 Row Stainless Steel Wire Brush
00640265	3 Row Stainless Steel Wire Brush
00640266	4 Row Stainless Steel Wire Brush
00640267	4 Row Mild Steel Wire Brush with Scraper (inset above)

## Hand Protection



Part No:	Description
00640268	MIG Gauntlet - Blue cowhide <i>Comfoflex, reinforced palm, Kevlar stitched</i>



Part No:	Description
00640270	Reinforced Palm Rigger <i>Size - 10</i>



Part No:	Description
00640269	MIG Gauntlet <i>Reinforced thumb, Kevlar stitched</i>



Part No:	Description
00640271	MIG Gauntlet - Size - 10 <i>Red 14" split leather with gold leather reinforced palm - Kevlar stitched</i>

## 7 Star Welding Consultants Teaching on-board ships

### The need for an approved welder according to a class standard onboard, Star International can help you!

Using competent crew members onboard a ship to perform maintenance welding during voyage make good sense, to avoid a costly flying squad. However, what welding skills should he or she inherit, and is it beneficial to have a person that is approved according to a class standard onboard as welder?

#### Essential facts

In most cases the welding onboard will be maintenance welding, not production welding. There are some exceptions like onboard heavy lifters performing large sea fastening jobs, or onboard pipe laying vessels.

In maintenance welding onboard, it will be a great variety of base materials to be welded and cut and not the repeated well-known base material that is typical for a fabrication workshop. The welder onboard must be able to identify the base metal, choose the right consumable and follow the correct welding procedure. All this very often without the guidance of a foreman or another superior.

In a fabrication workshop the parts are clean, pre-cut and ready to be welded. The welder has to do edge preparation himself. Rust, paint, oil and the old weld must be removed or the crack must be gouged or grinded out before welding. This requires the use of cutting, grinding or gouging equipment. Welders with a fabrication welding background are used to turn tables and positioning equipment placing the object in the horizontal position that make welding so much easier.



Marine Academies



Onboard Welding Training Courses

Safety conscious toward the working environment and in handling electric welding equipment and oxy- acetylene equipment/ cylinders.

If the vessel is a chemical carrier there will be a need for the welder to also have the specific skills towards welding and handling stainless steel. Wrong handling of stainless steel is just as much a source for bad welding results as the welding itself.

Onboard a vessel the only location meant for safe welding and hot work will be the workshop. Outside the workshop, where many of the jobs will have to be performed, a number of safety precautions will have to be in place before work can commence. The consequences of not adhering to correct safety procedures can be both hazardous for the crew and damaging to the vessel.

The welding methods used in shore-based production welding will in most cases be semi-automatic MIG/ MAG type of welding methods. In maintenance welding onboard Electrode/ Stick welding is the preferred method because of simplicity and its ability to cope with a variety of base materials without long set up time. On to that comes intricate work on thin walled seawater and stainless-steel pipes that require TIG welding and Brazing.

Electrode/Stick arc welding. More than 80% of all welds onboard a vessel will be fillet welds. It is therefore important that he master this type of joint in all positions for plates and pipes. TIG welding of seawater pipes (Cunifer, York Albro) and stainless steel.

Oxy Acetylene Gas cutting and gouging. If vessel is equipped with plasma cutting equipment it is of importance that he also knows how to operate this type of equipment.



Operating plasma cutting equipment require a completely different technique than oxy-acetylene equipment.

Brazing (especially silver brazing/capillary bracing). Skill to perform brazing is needed in order to repair small more intricate items like small diameter pipes. Knowledge of how to identify metals and choose the correct consumable and the right welding procedure.

### **Sum up:**

Avoid recruiting fabrication welders from shore without sufficient background and experience from the demanding work onboard. Make sure the welder has attended an approved marine academy that offer welding training. These courses aim at giving shipboard welders the necessary skill and confidence to perform their tasks in a safe and proper manner.

**Star International can help you, we have qualified consultants that can help!**

### **Welding Procedure Approvals**

Various procedural standards, such as ISO 15614, give the requirements for the preparation of test pieces and their subsequent examination to show that a particular combination of welding process, consumable and material can be made to produce an acceptable welded joint. The weld procedure test requirements are drawn up so that the same welding procedure can be recognised as approved for a range of other combinations of the 'essential variables' detailed in the procedure such as welding position and thickness.



*Welding Seminars*

### **Welder Approvals**

A welder approval test, e.g. in accordance with ISO 9606 (EN 287) is designed to prove that a particular welder is competent to weld with the specific process, consumables and position. However, the welder approval test plate is not subject to the same extensive destructive testing as the weld procedure tests. As with the weld procedure approval, the welder who has passed an approval test in a particular combination of essential variables will also be approved to weld within the range of essential variables given in the specification.



*Welding Training Seminars*

The fundamental difference, therefore, between a Procedure approval and a Welder approval is that the procedure approval is carried out to demonstrate that a weld, made in accordance with the procedure, will have the necessary mechanical properties such as tensile strength, ductility and toughness. The welder approval test demonstrates that the welder has a sufficient level of skill such that he can deposit a weld of the correct quality, free of welding defects.



*Safety courses in order to avoid accidents onboard*



*Safety first at welding training seminars onboard ship.*



*Welding Training Seminars onboard ship.*

## **Welder Approval Qualification Tests**

Welder certification is based on specially designed tests to determine a welder's skill and ability to deposit sound weld metal. The main part of the welder's test consists of welding one or more test pieces which are then examined using non-destructive and destructive methods. The extent of certification is described by a number of variables, which include the specific welding process, type of deposited metal, thickness, joint design, position, backing, and others. Most often, the test is conducted in accordance with a particular code.

Depending on product requirements the test can be administered under the supervision of a national or international organization, such as the American Welding Society (AWS), or American Society of Mechanical Engineers (ASME), but manufacturers may specify their own standards and requirements as well.

## **Procedures Star International can help with include**

- Welding Consultancy Service
- Welding Seminars
- Onboard Welding Training Courses
- Consultancy for Marine Academies
- Underwater Welding & Cutting

## **Technical Update for 'Underwater Welding & Cutting'**

Underwater welding and cutting does not necessarily mean that you are a diver doing the welding while submerged under water. On-board a vessel it's much more likely that you have to do welding in a partly submerged compartment where you, as a welder, are above or partly above water but the actual welding takes place below water.

**Nevertheless the same stringent procedure and safety precautions must be followed.**





## 8 Hypertherm Powermax30® AIR and Powermax45 XP®

### Powermax30® AIR

Part No. 00640025

The revolutionary, self-contained, 'plug in and use' Plasma System.

- Easy metal cutting
- Built-in air compressor
- Fully self-contained
- Professional grade plasma system
- Can be used in virtually any location

Capacity	Thickness	Cut speed
	Cutting	
Recommended	8 mm	500 mm/min
	10 mm	250 mm/min
Severance	16 mm	125 mm/min

#### Easy-to-setup and operate

- Operate it anywhere with the internal air compressor.
- Plug into any 120 or 240 V power with Auto-Voltage™ technology and included plug adapters.
- Highly portable. The smallest, lightest weight system in its class.

#### Finish jobs faster

- Do more in less time. Fast cutting speeds and superior cut quality result in less secondary operations.
- Quickly cut metal grate or rusted metal without retriggering with the continuous pilot arc feature.
- One tool to cut a variety of metal types and thicknesses.

#### Rugged and reliable

- New AIR T30 torch is rugged and designed to withstand the toughest environments.
- Robust internal air compressor eliminates the costs associated with an external compressor.
- Hypertherm Certified™ reliability ensures performance in the most demanding environments.

#### System includes

- Power supply, AIR T30 hand torch with 4.5 m lead and work clamp with 4.5 m lead
- Operator and safety manuals
- 1 nozzle and 1 electrode • Carrying strap

#### Ordering Information

Power Supply	System part number with 4.5 m AIR T30 torch
120-240 V	00650025

#### Torch consumable parts

Consumable type	Torch type	Amperage	Shield/Deflector	Retaining cap	Nozzle	Swirl ring	Electrode
Standard	Hand	30	00650027	00650028	00650030	00650029	00650031

**Hypertherm®**



#### High performing technology

The new patent-pending consumable designs enable consistent cutting by optimizing the air flow from the compact, internal compressor. Coupled with the highly effective moisture removal system, the Powermax30® AIR provides great cut quality and performance in hot and humid conditions.

**Hypertherm genuine accessories also available**



## Powermax45 XP®

Part No. 00650003

Professional-grade plasma system for cutting 16 mm thick metal, gouging, and marking.

Capacity	Thickness	Cut speed
Cutting		
Recommended	16 mm	500 mm/min
	22 mm	250 mm/min
Severance	29 mm	
(hand cutting)		125 mm/min
Pierce*	12 mm	

\*Pierce rating for handheld use or with automatic torch height control

Capacity	Metal removal rate	Groove profile
Gouging		
Typical gouge	3.4 kg per hour	3.2 mm D x 6.8 mm W

### Easy-to-use with versatile design

- Small size and light weight provides exceptional portability for a 16 mm rated cutting system.
- Handheld and mechanized usage with CNC interface and FastConnect™ torch connection.
- Patented drag-cutting technology makes it easy to use – even for first time operators.
- Tackle different jobs with multiple, easy-to-use torch styles.
- No need to change the air pressure. Smart Sense™ technology ensures that it is always correctly set.
- Mark, score and make precision gouges with new low amp process.

### Maximum productivity

- Finish jobs faster with cut speeds one and a half times greater than oxyfuel on 6 mm mild steel.
- Spend less time on grinding and edge preparation due to superior cut and gouge quality.
- Fast change out of consumables using the new torch disable switch feature.

### Rugged and reliable

- Duramax® Lock torches are designed for high-impact and heat resistance.
- SpringStart™ technology ensures consistent starting and a more reliable torch.
- Hypertherm Certified™ reliability ensures performance in the most demanding environment.

## Hypertherm®



### Duramax Lock standard torch styles



Duramax Lock 75° hand torch

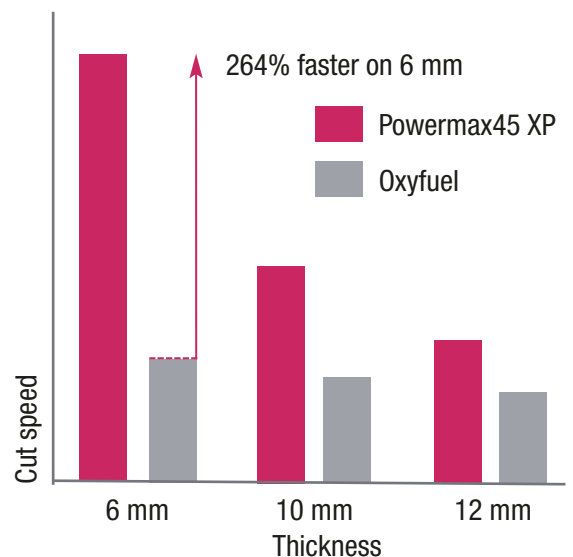


Duramax Lock 15° hand torch



Duramax Lock machine torch

### Relative cut performance on mild steel



## Recommended Hypertherm genuine accessories



### Face shield

Clear face shield with flip-up shade for cutting and grinding. Safety shield included. ANSI Z87.1, CSA Z94.3, CE

Part No.

00650026 Face shield shade 6

00650007 Face shield shade 8



### Air filtration kit

A ready-to-install kit with a 1-micron filter and an auto drain moisture separator protects against contaminated air

Part No.

00640129 Eliminiz



### Leather torch sheathing

Available in 77.6 m sections, this option provides additional protection for torch leads against burn-through and abrasion.

Part No.

00640130 Brown leather

00640131 Black leather with Hypertherm logos



### Circle cutting guides

Quick and easy set up for accurate circles up to 70 cm diameter. For optional use as a stand-off guide for straight and bevel cuts.

Part No.

00640132 Basic kit - 38 cm arm, wheels and pivot pin

00640133 Deluxe kit - 28 cm arm, wheels, pivot pin, anchor base and plastic case



### Rolling tool bag

Part No.

00640134

This rugged bag transports the Powermax45 XP with extra room for torches, consumables, accessories, and other gear. 50 cm x 44 cm x 32 cm

Part No.

00650026 Face shield shade 6

00650007 Face shield shade 8



### System dust covers

Part No.

00640135

Made from a flame-retardant vinyl, a dust cover will protect your Powermax® system for years.

Part No.

00640135

Cover, Powermax45 and 45XP

### ISO 9001:2008

Environmental stewardship is a core value of Star International. Powermax products are engineered to meet and exceed global environmental regulations including the RoHS directive. ISO 9001:2008



### Essential consumable kit

Part No.

00640136

Essential kits provide an assortment of standard consumables in a convenient case for organizing and reordering.

Part No.

00640136 Powermax45 XP kit

## 9 Oxy-Acetylene Integra® Cylinders - our safest yet!

### Main Features

- Built-in, fully adjustable, regulator
- Active content gauge
- Outlet pressure gauge
- Quick connector with integrated flashback arrestor
- Safety cut-off in outlet quick connect
- Ergonomic valve guard
- Easier and safer to handle 30 litre cylinders

### Active Content Gauge

- Always shows cylinder content -even when not in use
- Eliminates the risk of selecting cylinder with insufficient content for job

### Quick Connector/FBA

- Combined quick connect and flashback arrestor (FBA)
- Unique design male/female connection
- Oxygen and acetylene connector/FBA cannot be interchanged
- Improved design to reduce risk of accidental disconnection

### Quick Connector

Ensures safest use every time the cylinder is used (optimum level 2 safety). Snap-on connection to cylinder - no spanner needed. Additional safety locking and release device prevents accidental removal.

### Built in safety devices:

- Safety locking and release mechanism
- Flame arrestor
- Non-return valve
- Thermal cut-off valve
- Dust filter



The INTEGRA cylinder has been awarded the TUV Safety Test Mark

- Additional safety
- Time saving tested
- Easy to use
- User tested

## Integra quick connector Including flame arrestor Oxygen and acetylene applications



Specially designed for the Air Products oxygen (200- and 300 bar) and acetylene (18 bar) Integra® cylinders. The quickconnectors for both gases have a built in flame arrestor with non return valve and thermal cut-off valve.



### Max. outlet pressure

Oxygen: 10 bar  
Acetylene 1,5 bar

### Part No.

Oxygen 00640137  
Acetylene 00640138

## Specifications

Material	brass
Pressure- and temperature range	Max. outlet pressure acetylene : 1,5 bar Max. outlet pressure oxygen : 10 bar Temp. range : -15°C / +40°C
Connections	Inlet : quickconnector EN 561 Outlet : G3/8"BSP. EN560
Designed for gas grades	Industrial / technical
Weight	190 grammes
Dimensions dia x length	22 mm x 60 mm



## Star International v Marine Gas Cylinder Comparison

### Marine Oxygen Cylinder

40 ltr / 150 bar

Gas Capacity: 6.4m<sup>3</sup>

Weight: 52 kg empty / 60 kg full

### Marine Acetylene Cylinder

40 ltr

Gas Capacity: 5.6m<sup>3</sup>

Weight: 67kg Tare weight / 73 kg Gross

### Marine Argon Cylinder

50 ltr / 200 bar

Gas Capacity 11.0m<sup>3</sup>

Weight 81 kg empty / 99 kg full

### Star Oxygen Intergra Cylinder

30 ltr / 300 bar

Gas Capacity: 9.25m<sup>3</sup>

Weight: 49.25kg empty / 61.70 full

### Star Acetylene Cylinder

30 ltr

Gas Capacity: 5.4m<sup>3</sup>

Weight: 50kg empty / 56 kg full

### Star Argon Integra Cylinder

30 ltr / 300 bar

Gas Capacity 8.90m<sup>3</sup>

Weight: empty 49.25 kg / 64.28 kg full



# Integra® Flow Optimiser

MIG/MAG/TIG welding with Maxx® gases,  
Argon and standard weld process mixtures

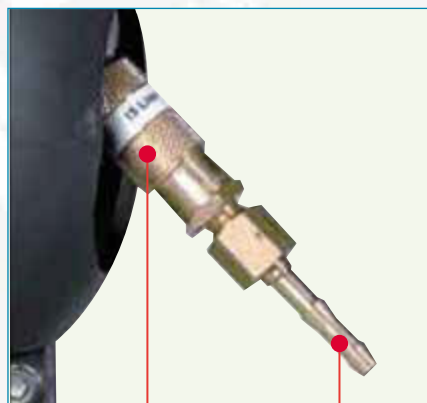
- No need for extra regulators or flow meters
- Simply change the connector and with one click you have the correct gas flow
- Available in a range of flows: 8, 10, 12 15 and 18 litres per minute
- Reduces gas consumption - saves you money.

## Specifications

<b>Material</b>	Brass
<b>Pressure range</b>	Max inlet pressure 20 bar
<b>Operational temperature range</b>	-20°C/+60°C
<b>Inlet connection type</b>	QC acc to EN 561 - N
<b>Outlet connection type</b>	G3/8" right hand (RH) acc to EN 560
<b>Weight</b>	79g
<b>Size</b>	Diameter: 21mm Length: 51mm

## Order details

<b>Pre-set flow/capacity, litres per minute (l/min)</b>	<b>Part No.</b>
8 l/min	00640272
10 l/min	00640273
12 l/min	00640274
15 l/min	00640275
18 l/min	00640276



Part No  
00640275  
(15 l/min IFO)

Part No  
00640277/  
0064279  
(1/4" tail)

## Integra quick connector

### Preset-flow\*

Industrial – MIG/MAG/TIG welding  
for Maxx® gases, Euromix M21, Argon

Specially designed for the Air Products 300 bar Integra® cylinders. No need for extra regulators or flow meters, as the outlet pressure (4 bar) and flow are preset.

Simply change the connector and with one click you have the correct gas flow. The quick connectors are available with a flow of 8, 10, 12, 15 and 18 l/min.



### Specifications

<b>Material</b>	Brass
<b>Pressure &amp; temperature range</b>	Max. outlet pressure 4 bar and -15°C / +40°C
<b>Connections</b>	<b>Inlet :</b> quickconnector EN 561 <b>Outlet :</b> G3/8"exd. EN560
<b>Designed for gas grade</b>	Industrial / technical
<b>Weight</b>	90 grammes
<b>Dimensions</b>	Dia x L = 22mm x 60mm

### Order details

Pre-set flow	Part No.	Gas	Capacity	Outlet	Inlet
8 l/min	00640272	Maxx® welding gases Euromix M21Argon	8 l/min.	G3/8"exd.	QC
10 l/min	00640273	Maxx® welding gases Euromix M21Argon	10 l/min.	G3/8"exd.	QC
12 l/min	00640274	Maxx® welding gases Euromix M21Argon	12 l/min.	G3/8"exd.	QC
15 l/min	00640275	Maxx® welding gases Euromix M21Argon	15 l/min.	G3/8"exd.	QC
18 l/min	00640276	Maxx® welding gases Euromix M21Argon	18 l/min.	G3/8"exd.	QC

### Options for preset flows

Part No.	Description
00640277	1/4" tail (for 6.3mm bore hose) to take 3/8" BSP nut
00640278	5/16" tail (for 8mm bore hose) to take 3/8" BSP nut
00640279	1/4" tail (for 6.3mm bore hose) to take 1/4" BSP nut
00640280	3/8" BSP RH nut

## Integra quick connector Dial-a-flow\*

Industrial – MIG/MAG/TIG welding  
for Maxx® gases, Euromix M21, Argon

Adjustable flow	Part No.
Step by step adjustable: 6-8-10-12-15-18-22-25-30-max. 60 l/min.	00640281



Specially designed for the Air Products 300 bar Integra® cylinders. The dial-a-flow is adjustable in steps from 6-8-10-12-15-18-22-26-30 to max. 60 l/min.



### Specifications

<b>Material</b>	Brass
<b>Pressure &amp; temperature range</b>	Max. outlet pressure 4 bar and -15°C / +40°C
<b>Connections</b>	<b>Inlet :</b> quick connector EN 561 <b>Outlet :</b> 6 mm hose connection G3/8" exd. EN560
<b>Designed for gas grade</b>	Industrial / technical
<b>Weight</b>	DaF : 400 grammes
<b>Dimensions dia x length</b>	DaF : 35 mm x 105 mm, VF : 22 x 95 mm

# Integra quick connector Purging Assembly

## TIG Welding and Purging

TIG Welding 45deg. unit with 1 flow tube  
Purging Assembly with 2 flow tubes

Purging Assembly	Part No.
2-30 l/min. (3,5 bar)14 l/min.	00640282
TIG Welding	Part No.
2-14 l/min.	00640283



Specially designed for the Air Products 300 bar Integra® cylinders. Click on equipment for (TIG) welding in combination with a backing gas. The quick connectors are available with 2 flow tubes or one single flow tube with an adaptor. For flow from 2 – 14 l/min.



Part No. 00640283



Part No. 00640282

## Specifications

Material	Brass (flowtube plastic)
Pressure & temperature range	Max. inletpressure 4 bar and -15°C / +40°C
Connections	Inlet : quickconnector EN 561 Outlet : G3/8"exd. EN560. Adaptor: EN 561
Designed for gas grade	Industrial / technical
Weight	DAF : 900 grm. VF : 560 grm.
Dimensions w x h x t	DT : 220x145x35 mm. ST : 110x175x30 mm

## Order details

Part No.	Gas	Capacity	Outlet	Inlet
00640282	Maxx® welding gases Euromix M21Argon	2-14 l/min.	G3/8"exd.	QC
00640283	Maxx® welding gases Euromix M21Argon	2-14 l/min.	G3/8"exd.	QC

## Options for preset flows

Part No.	Descriptiont
00640277	1/4" tail (for 6.3mm bore hose) to take 3/8" BSP nut
00640278	5/16" tail (for 8mm bore hose) to take 3/8" BSP nut
00640279	1/4" tail (for 6.3mm bore hose) to take 1/4" BSP nut
00640280	3/8" BSP RH nut



## 10 Oxygen and Acetylene Gas Distribution System (GDS)

### Star International is approved to test oxygen & acetylene gas systems

On-board most vessels they have fixed GDS where the cylinders are stored in easy access on the upper deck, they install oxygen & acetylene pipe lines re run down to the workshop in the engine room, which is connected to the outlet station.

In accordance with the Maritime Directorate's Regulations concerning welding equipment etc. for the welding gases acetylene and oxygen in ships and mobile offshore units. The installation certificate shall be issued for a period of 5 years.

The installation is annually to be non-leakage by the chief engineer. After the 5 years the installation has to be recertificated and new certificate issued, Star Engineering (trading as Star International) is authorized by DNV-GL to carry out this work.

### The Gas Distribution System (GDS)

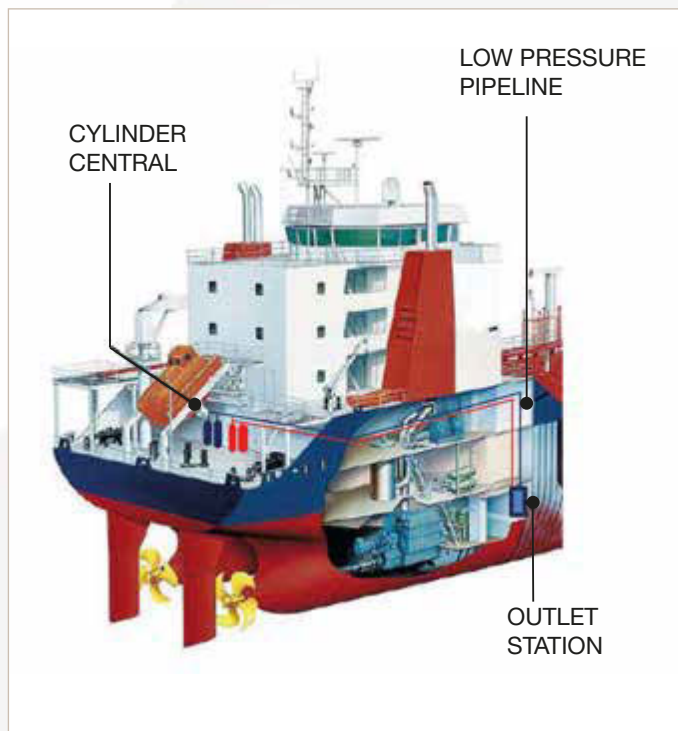
High-pressure gas cylinders inside the ship's hull is a safety risk to crew and vessel and should always be avoided. A full oxygen cylinder have a pressure of 150 bar, acetylene 18 bar and filled with a highly flammable acetylene gas dissolved in acetone. Neither a good combination if out of control in confined space inside the ship's hull.

The Gas Distribution System (GDS) was developed specifically to improve safety and efficiency. Simply place the cylinders on the uppermost open continuous deck and pipe the gas to outlet stations. If a dangerous situation was to develop the cylinders can be removed and if needed be thrown overboard.

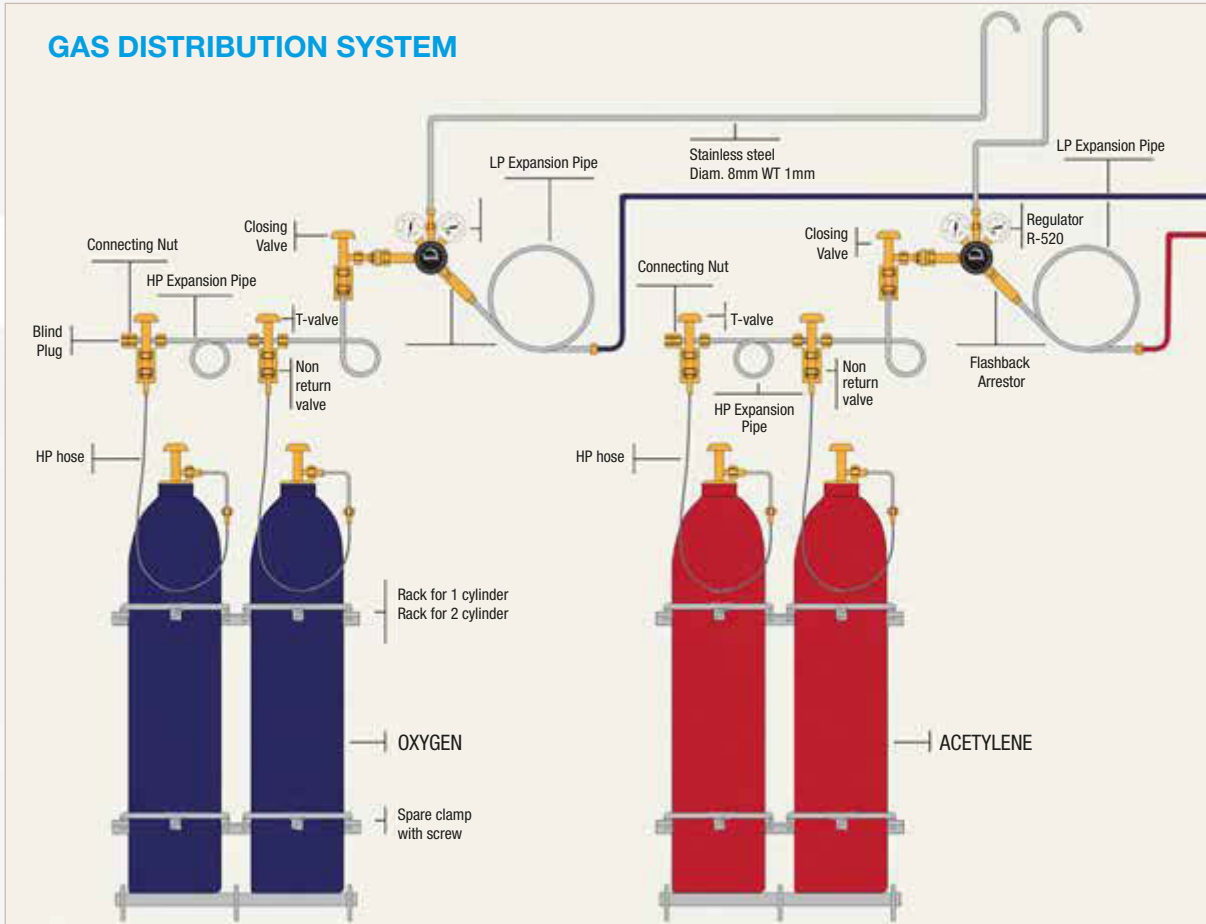
Most classification societies and class flags have legislation covering the use, on-board, of gas welding systems and equipment. It is implicit that a certain standard of consistency regarding supply and installation is required in order to maximise results in terms of operational efficiency and that safety at all times are enjoyed,

The GDS system was developed in close cooperation with the Norwegian Maritime Authorities and forms today part of rules and Regulations for handling gases on-board ships. The GDS is ideal for use on board most vessels and rigs with a certain consumption of welding gases such as Oxygen, Acetylene and shielding gases.

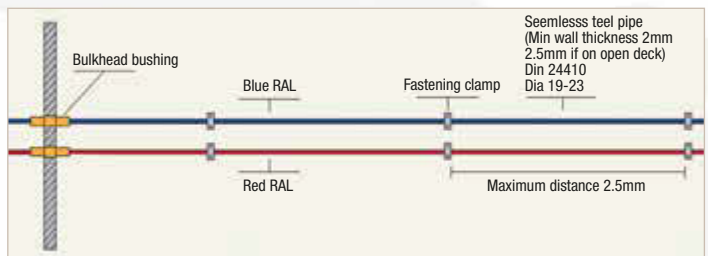
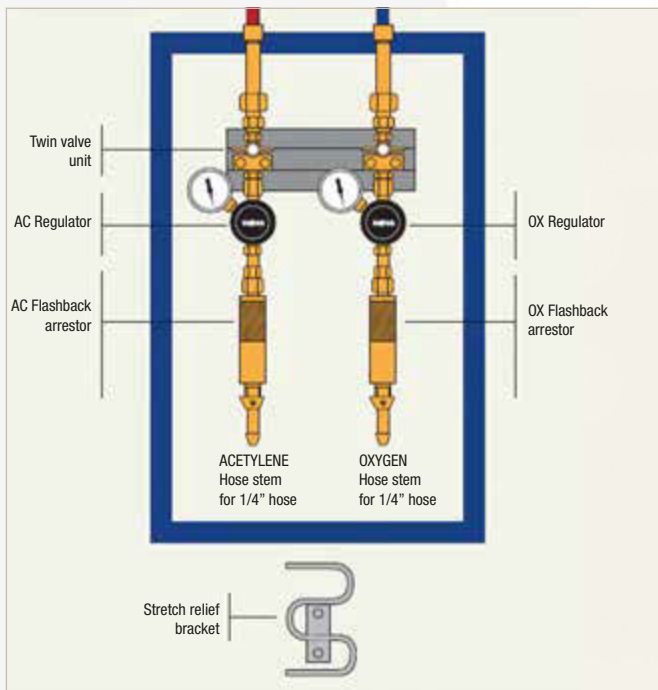
The system consist of the Cylinder Central placed on the uppermost open continuous deck. The cylinders are manifolded together and the pressure reduced from Cylinder pressure to Low pressure pipeline pressure. The system is protected by non-return valves and flashback arrestors to provide outmost safety. The regulators are fitted with safety valves. In case of opening, the gas will ventilate out of the cylinder central. When the total numbers of cylinders exceeds eight, oxygen and acetylene shall be kept in separate compartments.



## GAS DISTRIBUTION SYSTEM



The gases pass through the Low-pressure piping to the Outlet station(s). When going through bulk heads and deck they are shielded in bulkhead bushings and supported by special fastening brackets



The gases pass through the Low-pressure piping to the Outlet station(s). When going through bulk heads and deck they are shielded in bulkhead bushings and supported by special fastening brackets.

## The benefits of a Safety GDS

### SAFETY

- Easy access to cylinders. The cylinders are stored safely in ventilated spaces
- No need to move cylinders around
- Easier to remove cylinders in event of fire on-board.

### ECONOMY

- Equipment is less exposed to damage.
- More economical use of gases. A Gas Distribution System with multiple cylinders ensures sufficient gas flow for all welding, cutting and heating purposes.

Large flow of oxygen is for ex. needed when cutting thick steel plates. Note: an acetylene gas cylinder has a limited discharge rate! Acetylene drawn from a single cylinder may register as empty even if the cylinder is half-full due to the slow process of acetone to release acetylene gas. By drawing from two or more cylinders at the same time, the gas will have more time to form and be ready for continual use.

## EFFICIENCY

Greatly reduced set-up time. Changing or moving cylinders. Hoses to be laid. The system can be operated with several outlet stations as the gas pressure is adjusted in the outlet station to suit the type of activity. The outlet station also reduces the need for long hoses.

## WHAT REGULATIONS HAVE TO BE FOLLOWED?

Norwegian Maritime Authority (Previously Norwegian Maritime Directorate) state:

### Regulation of 25 April 2002 No. 422 concerning welding, welding equipment, hot work and storage of gas cylinders on board ship

#### Definitions

For the purpose of this Regulation the following definitions shall apply:

- Acetylene:**  $C_2H_2$  for storage on special gas cylinders (15 to 19 bar at 15°C)
- Recognised classification society:**
  - American Bureau of Shipping (ABS).
  - Bureau Veritas (BV).
  - Det Norske Veritas (DNV).
  - Germanischer Lloyd (GL).
  - Lloyd's Register of Shipping (LRS).
- Existing central plant:** Central plant installed before 1 July 2000.  
**New central plant:** Central plant installed before 1 July 2000.

#### Central Plant

- Central plants shall be installed when the number of gas cylinders on board containing acetylene and/or oxygen exceeds 4. This requirement applies regardless of cylinder size.

Most authorities accept the Drew Marine, Marigases and Survitec standard design GDS.

- Some Class Societies have own design rules to be followed and shall then (except for NOR & NIS ships) approve the system and endorse the testing.
- When STAR INTERNATIONAL are issuing Installation certificates for NOR and NIS flagged ships a STAR INTERNATIONAL Installation Certificate is issued (Service Chart #32).

- The Class Societies that all have the requirement For leak testing every 5 years are: ABS, BV, DNV, GL, LR, RINA.
- Original Installation Certificate shall be posted in the GDS central, and a copy shall be kept for at least 6 years by the person who issued it.

## COMPLETE STANDARD CENTRAL

The standard centrals for Acetylene and Oxygen include all items necessary for the gas central room, including signs, racks, equipment and brackets to be screwed or welded to deck and bulkhead.

Central installation for 1 Acetylene + 1 Oxygen

Central installation for 1 Acetylene + 2 Oxygen

Central installation for 2 Acetylene + 2 Oxygen

Central installation for 2 Acetylene + 4 Oxygen

## Expansion kit:

Expansion set for 1 Acetylene Product

Expansion set for 1 Oxygen Product

Outlet station 700 complete w/SG-5 steel cabinet

For further details, please refer to the GDS chart

## WHAT MAINTENANCE IS NEEDED ON A GDS?

Service of the GDS is an important task.

Every 5 years, a system shall be fully checked, tested and certified by a qualified person.

## Service Chart 32





Worldwide Marine and  
Offshore Services

### Some of the popular products and services we offer

- Welding Gases
- Plasma Cutters
- Gas Welding Equipment
- Arc Welding Equipment
- Marine Chemicals
- Water Treatment Test Kits
- Fuel Oil Test Kits
- Reagents
- Biological Products
- Disposable Span Gases
- Medical Equipment
- Fire Fighting Equipment (Service)
- Lifejacket, Immersion Suits (Supply & Service)
- Lifteraft (Service, Exchange & Supply)
- Multi Gas Detectors (Supply & Service)
- Refrigeration Services / Spares Supplied
- RS-Series Refrigerant Gases
- Rescue Boats and Lifeboats (Supply & Service)
- Marine Safety Equipment (Supply & Service)
- Star EndoSan (Next Generation Disinfectant)
- Den-Sin Ultra High Pressure Washers

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