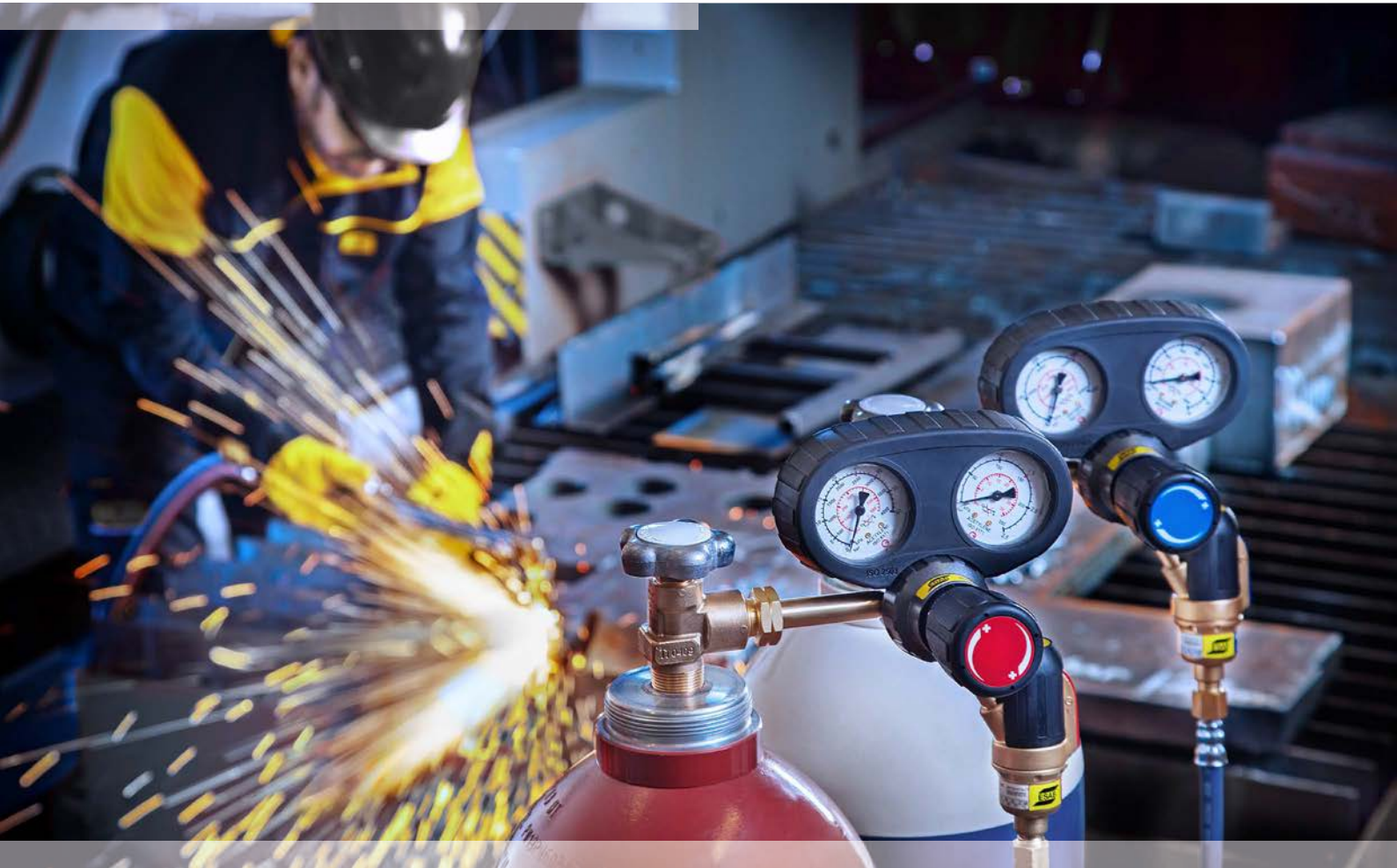


# CUTTING AND WELDING ESAB PRODUCT CATALOGUE



# GAS EQUIPMENT OVERVIEW

ESAB Corporation acquired GCE in 2018 to set the foundation for a new growth platform with a strong global footprint. GCE is the leading provider of industrial, specialty and medical gas solutions, developing and manufacturing of all types of equipment for pressure and flow control of high-pressure gasses across various industries.

With extensive experience in the handling of high-pressure gasses, GCE's origins go back to the beginning of the twentieth century when oxy-acetylene cutting and welding methods were invented. Today's product portfolio fits a large variety of applications for industrial, medical, life sciences, and specialty gas controls.

The ESAB branded gas equipment products are manufactured and serviced via the GCE group in Europe.

## GLOBAL BRAND RECOGNITION

With increasing global health precautions, more streamlined manufacturing, and progressively stringent regulations, the demand for gas equipment that's safer, more efficient, and cost-effective is greater than ever. With the backing of ESAB Corporation, GCE is tackling these challenges head-on by not only enabling development of innovative products and solutions, but relentlessly looking for ways to drive continuous improvement and deliver additional value to customers.

The GCE gas equipment group serves as a single source for end-to-end gas control products – equipped for any application in any region across the globe.

Our product lines are just as impressive as our global reach, with service expanding from basic pressure regulators to complex gas supply systems across all applications. A core range of products for oxy-fuel welding and cutting, arc welding and cutting, gas supply systems, plumbing, and more.

- A uniquely impressive collection of gas control expertise and products – more than any other company in the world
- Gas control solutions that are safer, more efficient, and cost-effective
- Equipped to meet the ever evolving challenges of gas use

## MARKET LEADERS

We are number one for a reason. Our gas equipment brands are built on a strong foundation of worldwide innovation, including industry-first products that are still used today. We continue to develop leading solutions on an international scale, delivered through a growing global distribution network.

## GCE CORPORATE RESPONSIBILITY

GCE provides high quality premium products. Today's portfolio fits a large variety of applications, from pressure regulators and blowpipes for cutting and welding to sophisticated gas supply systems for medical and electronics industry applications.

## HISTORY

GCE's main business was originally concentrated in the oxy-acetylene cutting and welding market. However, with almost 100 years of experience in the handling of high pressure gases, the product range has grown to include high purity and medical gas equipment.



In 1904, ESAB's founder, Oscar Kjellberg, invented the world's first coated welding electrode. Ever since, the brand has been the leader in fabrication technology, delivering efficient, high-productivity solutions to customers in the world's biggest manufacturing industries. Voice-of-customer research is at the heart of the company's new product development, allowing ESAB to make meaningful improvements that deliver real impacts.

**With its individual powers combined, the gas equipment group at GCE simply can't be beat. Together, our breadth, experience, and global presence make us the true global leader in gas control equipment.**

**Our reach is global, but our products meet all local standards, and our service exceeds all of our customers' expectations.**

# GAS EQUIPMENT - CUTTING AND WELDING TECHNOLOGIES

Welding is one of the leading processes within metal fabrication. Driven by innovations it is widely used as the main technology in areas such as construction, automotive, the transport sector, shipyard industries, offshore and several others.

Metal sheets are fabricated by thermal cutting processes and joined to ensure a rigid and high quality construction. High quality standards and fundamental safety precautions are prerequisite in all works related to cutting and welding technologies.

As GCE Cutting and Welding Technologies (GCE CWT) is one of the global market leader in gas welding, oxy-fuel cutting, brazing and heating processes ESAB Gas Equipment group (GEQ) provides a full range of gas pressure regulators, arc welding, gas economizers, safety equipment and a comprehensive global range of torches specially designed to meet international standards and local market requirements.

With strong focus on innovations and global market coverage ESAB GEQ provides solutions which fit to the customer needs. Experienced sales teams supported by application, marketing and technical experts promote the latest ESAB GEQ solutions within global distribution network on daily basis. Dedicated production team cooperates in two main production facilities and the complete organisation is formed as a Value stream team creating added value to all stakeholders.



## SIMPLY SAFE

Safety is always a primary concern in an oxygen/fuel process and ESAB GEQ is fully committed to the elimination of all risks in this process. It is not only visible on the complete range of safety devices for oxy-fuel applications. Safety is the main objective within all range of ESAB GEQ products, applications and as well as within internal production processes.

## QUALITY TIME

All equipment from ESAB GEQ is engineered and produced with highest focus on quality. High quality is the base for all activities and by using Lean processes and 6-Sigma tools we constantly refine and develop existing procedures. All ESAB GEQ products are designed, tested and manufactured within the quality management system ISO 9001 and in accordance with following regulations and global standards (selected short-list) :

- 2014/68/EC, Pressure Equipment Directive
- 2006/42/EC Machinery Directive
- ISO 2503, Cylinder regulators
- ISO 5172, Cutting, welding, heating torches and nozzles
- EN 730, ISO 5175, Safety devices
- ISO 3821, Rubber hoses
- EN 561, Quick couplers
- ISO 5171, Pressure gauges

## ALL SYSTEMS GO

ESAB GEQ is one of the global drivers of oxy-fuel innovations. Well known solutions are innovative safety systems, pressure regulators and heating equipment. A new program of Intelligent Torches and Systems for oxy-fuel cutting has been launched recently and there is still significant potential to increase the efficiency of oxy-fuel cutting technology.

## CUSTOMERS FIRST

Everything we do is conducted in close co-operation with our customers and users. ESAB GEQ is a service-oriented company which keeps close contact with both its customers and end-users. Thanks to a high level of experience and technical competence within cutting and welding technologies ESAB GEQ has today a global network of loyal distributors which enables to develop right solutions for the global as well as for local markets.

It's no coincidence that, where the challenge and demands are the greatest, you will find ESAB GEQ hard at work.

# GCE LOCAL OFFICE FOR ESAB

ESAB gas equipment products are manufactured and serviced via the GCE group in Europe. Here in the UK GCE has its own sales office, workshop and warehouse based at Haydock, St Helens. Our sales team has acquired many years of experience in all aspects of Gas Control Equipment and is on hand to offer help and advice.

## GCE SALES OFFICE & WAREHOUSE

100 Empress Park  
Penny Lane, Haydock  
ST Helens  
WA11 9DB  
Phone: +44 (0)1942 29 29 50  
Fax: +44 (0)1942 29 29 77

Email: [sales.gb@gcegroup.com](mailto:sales.gb@gcegroup.com)



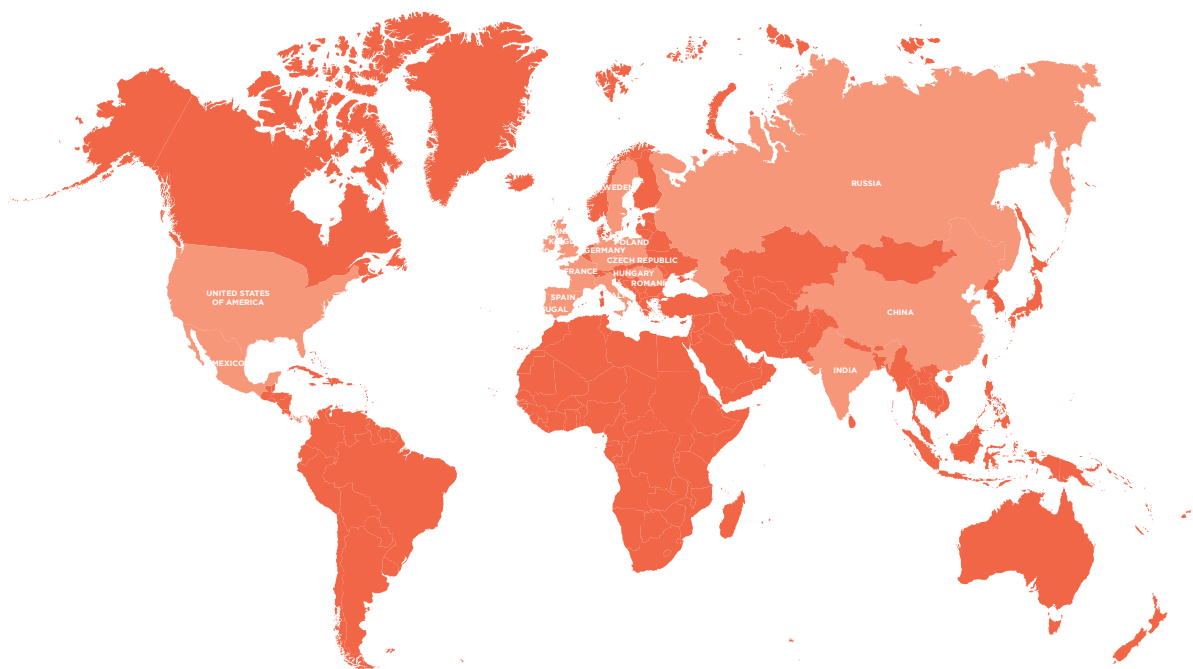
Please see our website for our current terms and conditions

[www.gcegroup.com](http://www.gcegroup.com)

<https://pages.services/connect.gcegroup.com/gas-equipment/>



Scan to learn more



# CONTENT

Gas Equipment Overview .....	2
Gas Equipment - cutting and welding Technologies .....	3
GCE local office for ESAB .....	4
<b>CYLINDER REGULATORS .....</b>	<b>7</b>
ESAB ProGen .....	8
FE300 .....	12
<b>COMBINED TORCH SYSTEMS,WELDING TORCHES .....</b>	<b>17</b>
ESAB ST443 .....	18
ESAB SAFFIRE 6 .....	22
ESAB SAFFIRE DH+ .....	25
WELDING & HEATING NOZZLES .....	29
<b>SAFETY DEVICES FOR REGULATORS, TORCHES</b>	
ESAB SAFE-GUARD-5 .....	38
FR1000 PLUS .....	40
FRT .....	42
FTH .....	44
FT .....	45
<b>RUBBER HOSES AND ACCESSORIES .....</b>	<b>47</b>
RUBBER HOSES WITH FITTINGS .....	48
<b>COMPLEMENTARY PRODUCTS .....</b>	<b>51</b>
PRODUCT SELECTION GUIDES .....	62





# CYLINDER REGULATORS





## PREMIUM CYLINDER REGULATOR

# ESAB PROGEN

*The ESAB ProGen regulator is suitable for all technical gas applications within industrial environment such as gas welding, heating and soldering, as well as the gas cutting of materials up to a thickness of 300 mm.*

The ergonomic design combined with a rigid construction results in a safe and wear-resistant regulator. A strong metal gauges shield covered by a rubber sleeve prevents the gauges from being damaged which is one of the most common reasons for malfunction.

The operation of the regulators is first-rate and provides highly efficient and precise regulation of gas supplies. The design is compact with a low weight, yet the flow capacity is sufficient for the majority of gas processes in the cutting and welding field.

Raw materials have been selected with great care in order to ensure compatibility with the gas type and usage. All regulators are subject to individual tests before leaving the factory.





# ESAB PROGEN

## FEATURES

- › Double protection for gauges incl. special metal cage
- › **Safety protected** with integrated pressure relief valve for overpressure protection
- › **Easy handling** for the operator by **ergonomic** arrangement
- › Three scale pressure gauges acc. to ISO 5171
- › Encapsulated regulating technology for precise and **stable control**
- › **Safety** focused ISO 2503
- › Available with NEVOC connection
- › Up to **300 bar** cylinder pressure
- › European design

## TECHNICAL DATA

Gas	O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> , He	Ar, Ar/CO <sub>2</sub> , F.G.*	CO <sub>2</sub>	Acetylene	Propane
Body	Brass forged				
Bonnet	Zn/Al alloy Die Cast				
Stems, nuts and fittings	Brass				
Diaphragm	EPDM			NBR	
Seat sealing	PA			CR	
Inlet/ Outlet connection	Gas specific connection				
Maximal inlet pressure	200 or 300 bar		200 bar	25 bar	
Outlet pressure/ flow range	0-10 bar	0-40l/min		1,5 bar	4 bar
Temperature range	From -20°C to 60°C				
Weight	Approx. according to gas variant: 1,9 kg				
Pressure relief valve	Used in all variants				

## PRODUCT ADVANTAGES

**Advanced Gauge Cover cap** giving an optimal protection from results of potentially rough handling and contributing to even better safety of the operation.

**Exact gas pressure measurement.**  
Easy reading of the gas parameters on a three-unit scale with a contrast pointer.



User friendly **Ergonomic Handwheel** for easy set-up, colour coded according to the gas.

### Inlet Connection

Side and Bottom Entry variants available, variants fit on all types of cylinder valves.



**Encapsulated regulating valve technology** Stable gas outlet pressure and optimal flow performance for the gas application.

Safe operation thanks to **pre-adjusted pressure relief valve.**

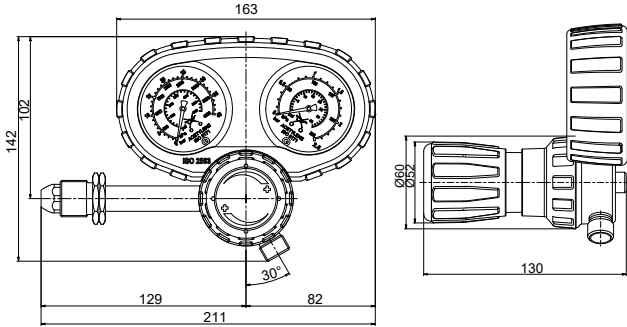


**On-line Instructions for Use**  
accessible via QR code

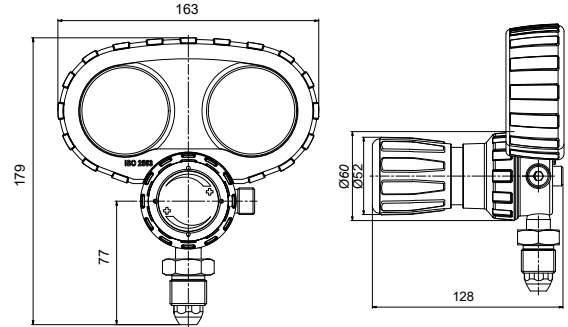
# ESAB PROGEN

## DIMENSIONS

### PROGEN SE

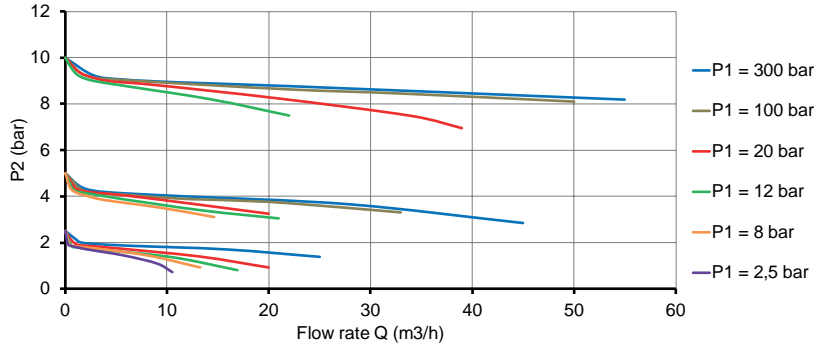


### PROGEN BE

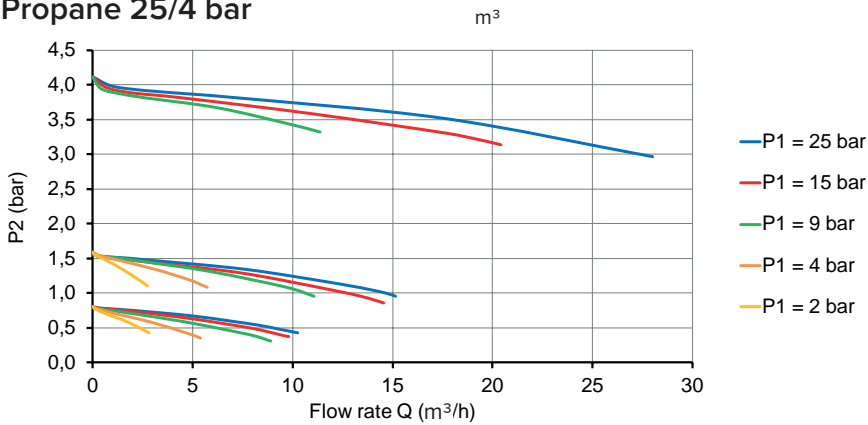


## FLOW CHARACTERISTICS

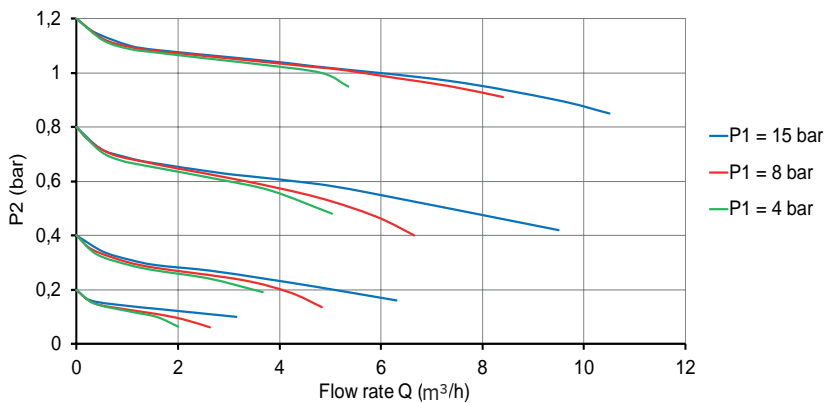
### Oxygen 300/10 bar



### Propane 25/4 bar



### Acetylene 25/1,5 bar



# ESAB PROGEN

Art. Nr.	Gas	Inlet pressure	Outlet pressure	Inlet connection	Outlet connection	Inlet Position
PG0700017201	Oxygen	300 bar	4 bar	G5/8"	G3/8"	BE
PG0700017200	Oxygen	300 bar	4 bar	G5/8"	G3/8"	SE
PG0700017202	Oxygen	300 bar	10 bar	G5/8"	G3/8"	SE
PG0700017203	Oxygen	300 bar	10 bar	G5/8"	G3/8"	BE
PG0700018103	Oxygen	300 bar	10 bar	W30 x 2	G3/8"	SE
PG0700017207	Acetylene	25 bar	1,5 bar	G5/8" LH	G3/8" LH	SE
PG0700017208	Acetylene	25 bar	1,5 bar	G5/8" LH	G3/8" LH	BE
PG0700017209	Propane	25 bar	4 bar	G5/8" LH	G3/8" LH	SE
PG0700017219	Ar/CO2	300 bar	0-40 LPM	G5/8"	G3/8"	BE
PG0700017217	Ar/CO2	300 bar	0-40 LPM	G5/8"	G3/8"	SE
PG0700018101	Ar/CO2	300 bar	0-40 LPM	W30 x 2	G3/8"	SE
PG0700018104	Inert	300 bar	10 bar	G5/8"	G3/8"	SE
PG0700017220	Inert	300 bar	10 bar	G5/8"	G3/8"	BE
PG0700018102	Inert	300 bar	10 bar	W30 x 2	G3/8"	SE
PG0700017218	Carbon Dioxide	300 bar	0-40 LPM	0.860 - 14 TPI	G3/8"	SE



PG0700017207



PG0700018104



PG0700017201



PG0700017209







## HIGH-PERFORMANCE CYLINDER REGULATOR

# FE300

**ESAB FE300** is the reliable partner of each user in the welding workshop. It will never make the operator disappointed leaving him without a proper gas supply. By its performance, it covers the majority of all industrial gas applications with gas cylinder use. It protects the surrounding area by keeping it insulated from the high gas pressure and supplying only the wished amount of the gas at pressure adjusted by a user.

Variants with side entry, bottom entry, pressure gauges, and flow meter fulfill all the requested tasks.

Cylinder regulator FE300 is made in Europe.

It has been created to help make the production process safe and efficient.





## FE300

### PRODUCT FEATURES

- › High-performance regulator following all common technical gas applications needs.
- › Safety focused design following **ISO 2503**.
- › **Prolonged lifetime** saving costs related to services, spares and replacements.
- › Encapsulated regulating technology for precise and stable control.
- › Easy handling for the operator by ergonomic arrangement.
- › Side and Bottom entry design variants fit on all types of cylinder valves.
- › Three scale pressure gauges acc. to ISO 5171 with high contrast pointer for better gas pressure clarity.
- › Made in Europe.

### TECHNICAL DATA

Gas	O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> , He	Ar, Ar/CO <sub>2</sub>	CO <sub>2</sub>	Acetylene	Propane
Body	Brass forged				
Bonnet	Zn/Al alloy Die Cast				
Stems, nuts and fittings	Brass				
Diaphragm	EPDM			NBR	
Seat sealing	PA			CR	
Inlet/ Outlet connection	Gas specific connection				
Maximal inlet pressure	200 or 300 bar		200 bar	25 bar	
Outlet pressure/ flow range	0-10 bar	0-16l/min 0-30 l/min 0-40l/min		1,5 bar	4 bar
Temperature range	From -20°C to 60°C				
Weight	Approx. according to gas variant: 1,9 kg				

### PRODUCT ADVANTAGES

#### **Triple scale gauges**

According to ISO 5171, with high contrast pointer for better gas pressure clarity.



Accurate parameter setting with an optimized pressure adjusting mechanism.

#### **Encapsulated regulating valve technology.**

Encapsulated regulating technology for precise parameters and stability, tested for many years.



#### **Inlet connection**

Side and bottom entry variants available, variants fit on all types of cylinder valves.

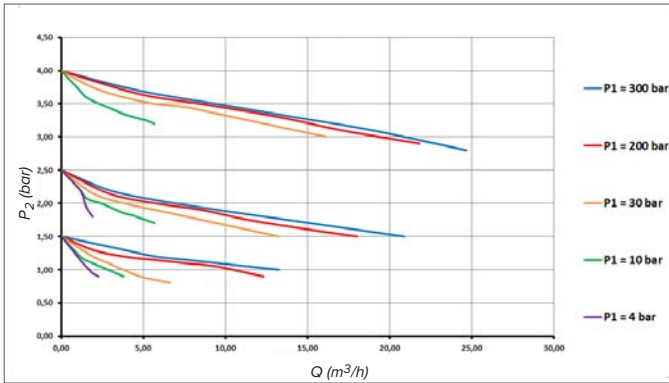
#### **Colour coded handwheel**

Simple identification of the gas, ergonomic and robust design, easy handling for the operator.

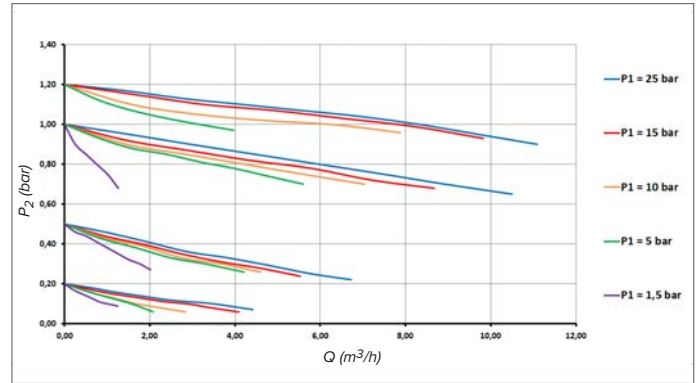
# FE300

## FLOW CHARTS

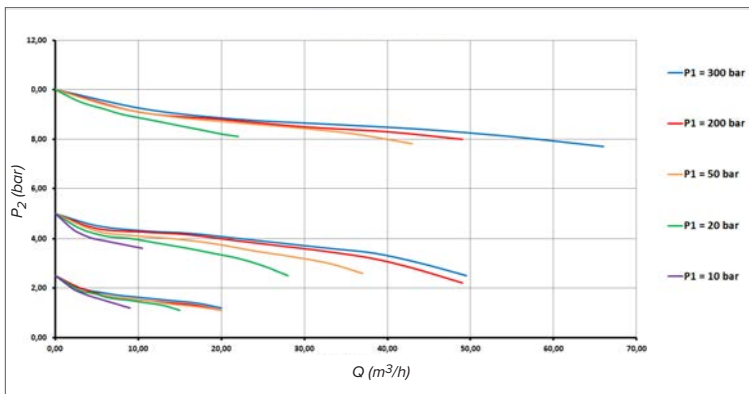
Oxygen 300/4 bar



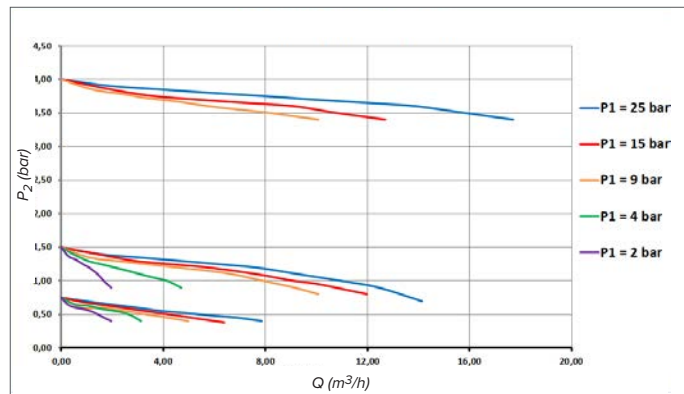
Acetylene 25/1,2 bar



Compressed gases 300/10 bar (measured by air)



Propane 25/4 bar



### Conversion coefficient

Test gas	Air	Oxygen	Nitrogen	Argon	Hydrogen	Helium	CO <sub>2</sub>
Air	1	0,950	1,02	0,851	3,81	2,695	0,808

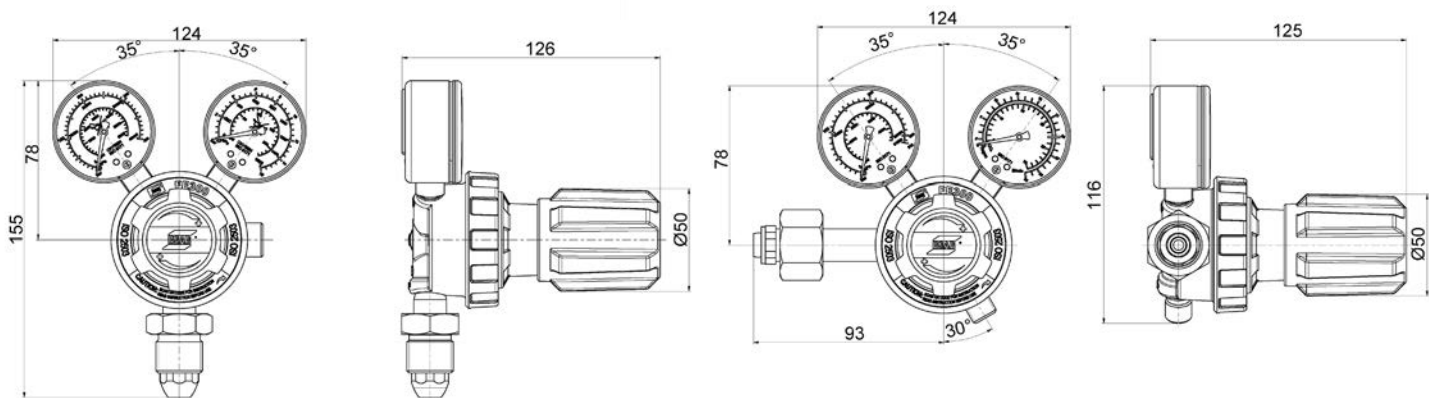
Flow of the gas (A)

$$A = Q * f$$

Q... Air Flow

f... Conversion coefficient

### DIMENSIONS



# FE300

## ORDERING INFORMATION

Part number	Gas	Inlet position	Inlet pressure	Outlet pressure	Inlet connection	Outlet connection	Type
FS0700017210	ACETYLENE	side	25 bar	1,5 bar	G5/8" LH BSP	G3/8" LH BSP	
FS0700017211	ACETYLENE	bottom	25 bar	1,5 bar	G5/8" LH BSP	G3/8" LH BSP	
FS0700017212	ACETYLENE	bottom	25 bar	1,5 bar	G5/8" LH BSP	G3/8" LH BSP	LP gauge only
FS0700017221	Ar/CO <sub>2</sub>	bottom	300 bar	0 - 40 l/min	G5/8" BSP	G3/8" BSP	
FS0700017222	Ar/CO <sub>2</sub>	side	300 bar	0 - 40 l/min	G5/8" BSP	G3/8" BSP	
FS0700017223	Ar/CO <sub>2</sub>	bottom	300 bar	4,5 bar preset	G5/8" BSP	G3/8" BSP	HP gauge only
FS0700017460	Ar/CO <sub>2</sub>	side	300 bar	4,5 bar preset	G5/8" BSP	G3/8" BSP	HP gauge only
FS0700018107	Ar/CO <sub>2</sub>	side	300 bar	0 - 40 l/min	W30x2	G3/8" BSP	
FS0700018106	INERT	side	300 bar	10 bar	G5/8" BSP	G3/8" BSP	
FS0700017204	OXYGEN	side	300 bar	10 bar	G5/8" BSP	G3/8" BSP	
FS0700017205	OXYGEN	bottom	300 bar	10 bar	G5/8" BSP	G3/8" BSP	
FS0700017206	OXYGEN	bottom	300 bar	10 bar	G5/8" BSP	G3/8" BSP	LP gauge only
FS0700017459	OXYGEN	bottom	300 bar	4 bar	G5/8" BSP	G3/8" BSP	
FS0700017461	OXYGEN	side	300 bar	4 bar	G5/8" BSP	G3/8" BSP	
FS0700017458	PROPANE	side	25 bar	4 bar	G5/8" LH BSP	G3/8" LH BSP	LP gauge only
FS0700017213	PROPANE	side	25 bar	4 bar	G5/8" LH BSP	G3/8" LH BSP	no gauge



FS0700017213



FS0700017205



FS0700017222



FS0700017223

### SPARE PARTS FLOWMETERS

Part number	Gas	Flow	Working pressure	Inlet connection	Outlet connection
FS0701300021	Ar/CO <sub>2</sub>	16 l/min	4,5 bar	G3/8"	G3/8"
FS0701300022	Ar/CO <sub>2</sub>	30 l/min	4,5 bar	G3/8"	G3/8"



FS0701300021



FS0701300022



FS0700017223

FS0701300022

For more regulators please see our complementary products section at the end of the catalogue page 51





# COMBINED TORCH SYSTEMS

## WELDING TORCHES





## NOZZLE MIX STRAIGHT CUTTING TORCH

# ESAB ST443

*The ST443 Straight Cutting Torch offers better ergonomics, a clearer view of the cutting path, visual cues for easier use and enhanced safety.*

The torch features a contoured, high-strength alloy torch handle that fits naturally in most operators' hands. The ST443 accepts nozzle-mix style consumables and is suitable for use with both propane and acetylene.



# ESAB ST443

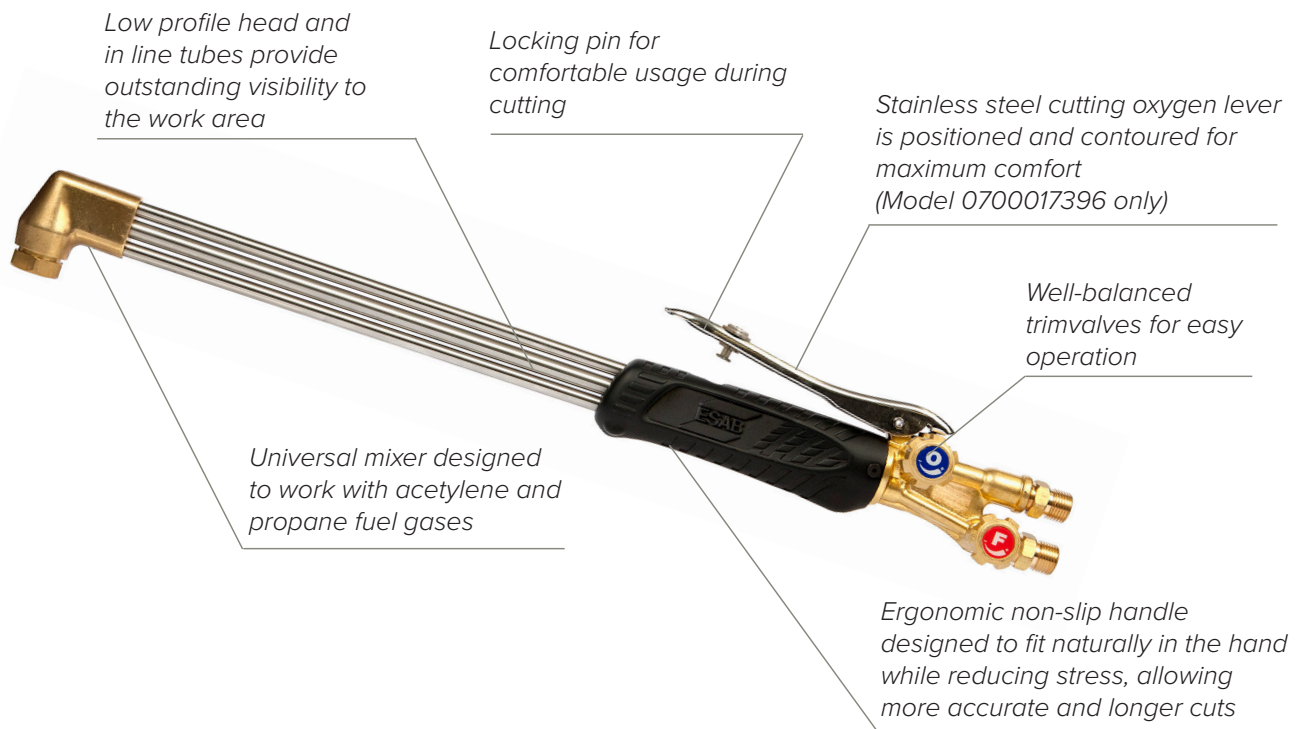
## FEATURES

- › Exceptionally well-balanced, ergonomic non-slip handle eases stress on the hand.
- › Knobs are contoured and spaced further apart for easy adjustment and colour coded with increase/decrease labels.
- › In-line stainless tubes for better visibility and reduced profile.
- › Forged brass body.
- › Stainless steel valves for extended operational life and increased safety

## TECHNICAL DATA

Weight	1,003 kg
Length	533 - 914 mm
Connections	3/8 BSP Hose Nipples 6,3 mm *12 -10 mm*17
Standards	EN ISO 5172
Gas	Universal cutting torch system suitable for both acetylene and propane gases
Cutting Capacity	12" / 300 mm

## PRODUCT ADVANTAGES



## ORDERING INFORMATION

### ESAB ST443 SHANK



0700017396

Art. Nr.	Description	Gas	Lenght	Cutting Capacity	Inlet Connection	Nozzle Type
0700017396*	ST443 LNM Straight Cutting Torch with lever, 21" / 90° Head	Oxygen/ Acetylene Oxygen/ Propane	21" / 533 mm	12" / 300 mm	G3/8" – G3/8LH	ANM, ANME, PNM, PNME, FGA

\* Notice: All variants are delivered without hose nipples and their connecting nuts.



## ESAB ST443

### HCV HOSE CONNECTION VALVE (1 FUNCTION SAFETY DEVICE)



Art. Nr.	Fitting	Hose (mm)	Consisting of
0764759	HCV SET G3/8" - G3/8"LH	6,3	2 pcs HCV, 1 pc nut G3/8", 1 pc nut G3/8"LH
0764760	HCV SET G3/8" - G3/8"LH	8	2 pcs HCV, 1 pc nut G3/8", 1 pc nut G3/8"LH

### FT (2 FUNCTION SAFETY DEVICE)



Art. Nr.	Fitting	Location Type	Resettable	Gas Type	Connection Thread
0700016556	FT	Torch Mounted	No	Oxygen	G 3/8"
0700016557	FT	Torch Mounted	No	Fuel gas	G 3/8" LH

### ACCESSORIES



F22310030



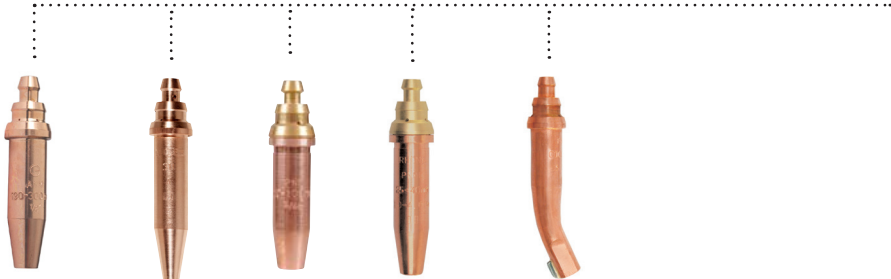
F22510004

Art. Nr.	Description
9427210	Head nut for use with ST443 cutter
F22310030	Cutting guide with clamp for nozzle/head of diameter Ø 15 mm (ANM/PNM/ES80/ST443)
F22510004	Circle cutting device for circles of Ø min 100 - max 900 mm
0700153391N	Cleaning needles in a case



# ESAB ST443 - TYPICAL ASSEMBLIES

## CUTTING & GOUGING



- |             |             |             |             |            |
|-------------|-------------|-------------|-------------|------------|
| <b>ANM</b>  | <b>ANME</b> | <b>PNM</b>  | <b>PNME</b> | <b>FGA</b> |
| 0700016610N | 0700016616N | 0700016622N | 0700016628N | 0768698    |
| 0700016611N | 0700016617N | 0700016623N | 0700016629N | 0768661    |
| 0700016612N | 0700016618N | 0700016624N | 0700016630N | 0768699    |
| 0700016613N | 0700016619N | 0700016625N | 0700016631N |            |
| 0700016614N | 0700016620N | 0700016626N | 0700016632N |            |
| 0700016615N | 0700016621N | 0700016627N | 0700016633N |            |



F22310030

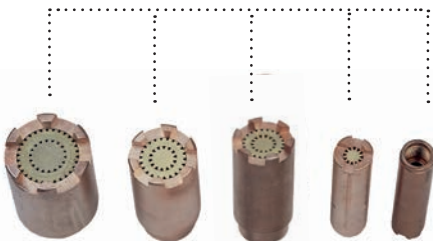


F22510004



0700017396

## PROPANE SUPERHEATING

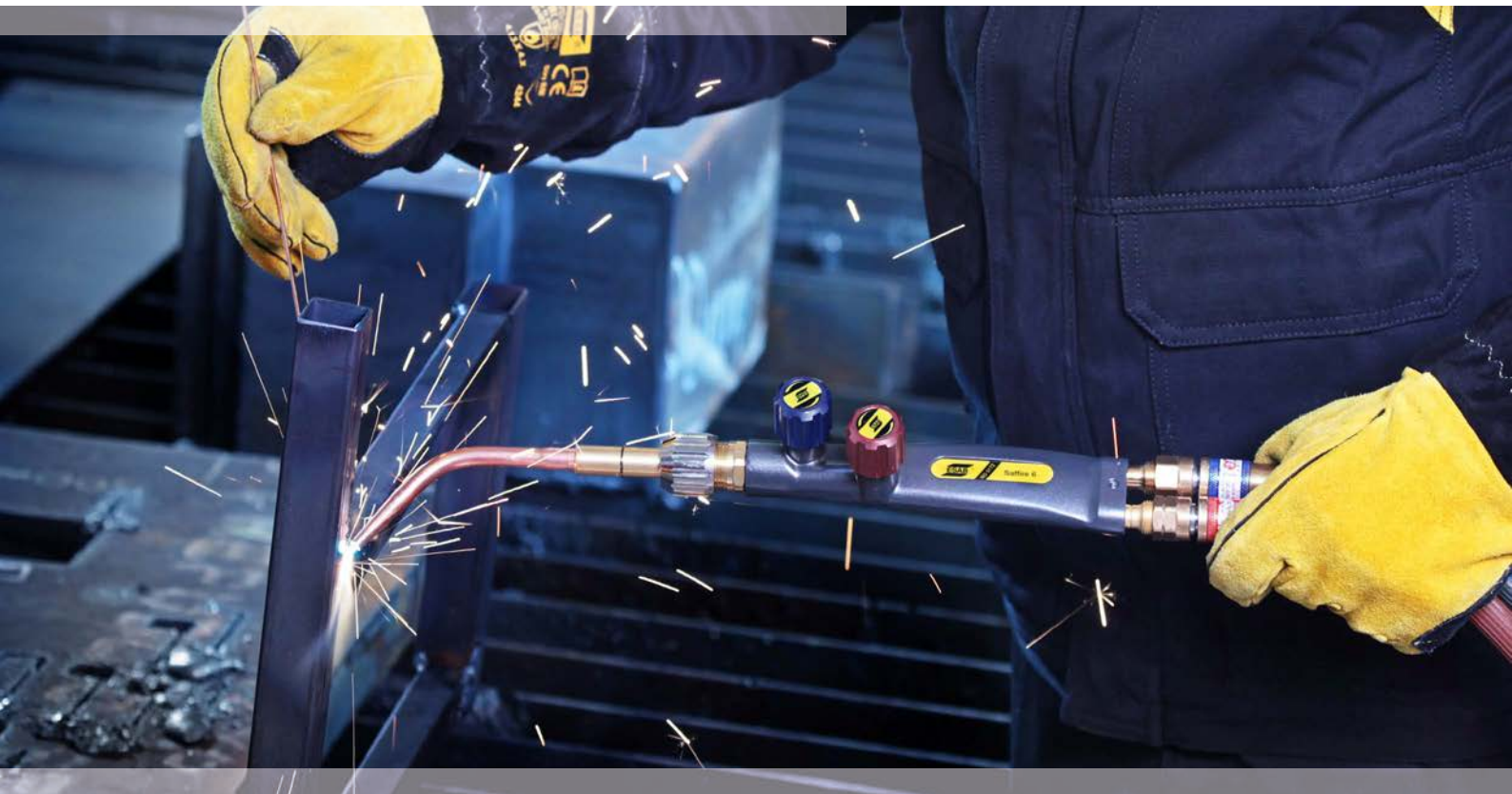


0769476 0769475 0769474 0769473 0769472



0768929

For more details about cutting, gouging, heating and superheating nozzles see special section on pages 29-33.



## COMBINED WELDING & CUTTING TORCH FOR MEDIUM DUTY APPLICATIONS

### ESAB SAFFIRE 6

ESAB Saffire 6 ORIGINAL is a new torch design within the GCE Cutting & Welding equipment programme.

The ESAB Saffire 6 is a high pressure, sturdily constructed and well-balanced welding and cutting torch with additional progressive features. It has a new design and well-balanced front-mounted colour-coded control valves, employing stainless valve spindles. Providing fine adjustment and leak-free conditions. The shank is common to both welding and cutting attachment the same quick positive positioning and leak-free means of attachment being used for both. The ESAB Saffire 6 torch system and nozzles conform to the EN ISO 5172.



# ESAB SAFFIRE 6

## FEATURES

### WELDING AND HEATING

- Designed for welding work from 1 mm to over 25 mm thickness using type ESAB Saffire 6 swaged nozzles sizes 1 - 2500 l/h.
- The mixer seats on serrated toothed faces allowing the operator a selection of positive nozzle positioning through 360°.
- Can also be used for heating, with either acetylene or propane heating nozzles, together with a heating neck.

### CUTTING

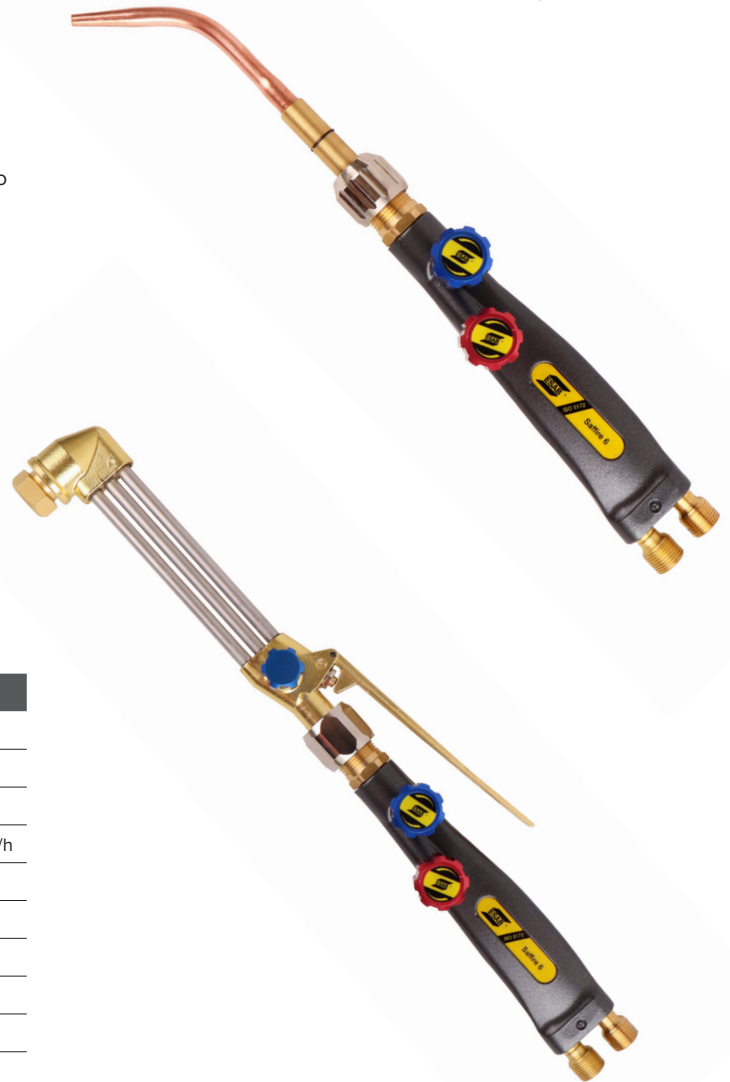
- The cutting head is nozzle mixing, enabling the operator to use either acetylene or propane fuel gases by fitting the appropriate nozzle.
- A range of ANM and PNM nozzles are available for clean efficient cutting of material thickness from sheet metal to 100 mm.
- Its versatility allows gouging, flame cleaning etc., to be supplied to customer's requirements.

### PROPANE SUPER HEATING

- Using a propane super heating mixer and 10" or 28" stainless steel super heating neck an intense heat output of up to 175 KW/h is obtained.
- Ideal for heating castings and similar large articles.



Tool free exchange of cutting and welding attachments.



TECHNICAL DATA	
Hose connections:	G 3/8" x G 3/8" LH
Welding capacity:	25 mm
Cutting capacity:	100 mm
Welding nozzles:	Type 2/3/4/5 Swaged Welding Nozzles Sizes 1-90 ft3/h
Cutting nozzles:	ANM (Acetylene) Cutting Nozzles
	PNM (Propane) Cutting Nozzles
	ANME (Acetylene) Cutting Nozzles
	PNME (Propane) Cutting Nozzles
	FGA
Heating nozzles:	AHT (Acetylene) Heating Nozzles
Super heating nozzles:	Super Heating Nozzles (Propane) Sizes 1H-5H



## ESAB SAFFIRE 6

### ORDERING INFORMATION

### SHANK ESAB SAFFIRE 6



Article number	Inlet connection	Outlet connection
F22280004	G3/8 × G3/8" LH	15/16" X 16 UN

### CUTTING ATTACHMENT



Art. Nr.	Type	Gas	Version	Head	Nozzle type
F22280005	nozzle mix	A/P	Lever	90°	ANM, ANME, PNM, PNME, FGA

### WELDING TIPS



Art. Nr.	Description	Mid Steel		Nozzle size	Operating pressure				Gas consumption				1 pack includes	
		mm	in		Acetylene	Oxygen	Acetylene	Oxygen	Acetylene	Oxygen				
0700016660N	ESAB Saffire Welding Nozzle 1	0,9	20	1	0,14	2	0,14	2	28	1	28	1	3 pcs	
0700016661N	ESAB Saffire Welding Nozzle 2	1,2	18	2	0,14	2	0,14	2	57	1	57	2	3 pcs	
0700016662N	ESAB Saffire Welding Nozzle 3	2	14	3	0,14	2	0,14	2	86	3	86	3	3 pcs	
0700016663N	ESAB Saffire Welding Nozzle 5	2,6	12	5	0,14	2	0,14	2	140	5	140	5	3 pcs	
0700016664N	ESAB Saffire Welding Nozzle 7	3,2	1/8	10	7	0,14	2	0,14	2	200	7	200	7	3 pcs
0700016665N	ESAB Saffire Welding Nozzle 10	4	5/32	8	10	0,21	3	0,21	3	280	10	280	10	3 pcs
0700016666N	ESAB Saffire Welding Nozzle 13	5	3/16	6	13	0,28	4	0,28	4	370	13	370	13	3 pcs
0700016667N	ESAB Saffire Welding Nozzle 18	6,5	1/4	3	18	0,28	4	0,28	4	520	18	520	18	3 pcs
0700016668N	ESAB Saffire Welding Nozzle 25	8,2	5/16	0	25	0,42	6	0,42	6	710	25	710	25	3 pcs

### MIXER



Article Number	Description
F22990042	ESAB SAFFIRE 6 Mixer

### HEATING NECK



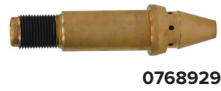
Art. Nr.	Description	Length
0700143884N	ESAB Saffire 6 Brass Heating Neck - short ( for AHT heating nozzles)	254 mm
F22280006	ESAB Saffire 6 Long Brass Heating Neck - long ( for AHT heating nozzles)	710 mm
0700157553N	ESAB Saffire 6 Superheating Neck - long ( for Superheating nozzles)	710 mm





# ESAB SAFFIRE 6 - TYPICAL ASSEMBLIES

## PROPANE SUPERHEATING



## CUTTING



## WELDING



- 0700016661N
- 0700016662N
- 0700016663N
- 0700016664N
- 0700016665N
- 0700016666N
- 0700016667N
- 0700016668N

## HEATING



For more details about cutting, gouging, heating and superheating nozzles and necks see special section on pages 29-33.



## LIGHTWEIGHT CUTTING AND WELDING SYSTEM

# ESAB SAFFIRE DH+

A new torch design across the extensive Cutting & Welding product range. Now it's time to present the ESAB SAFFIRE DH+ torch program.

The ESAB SAFFIRE DH+ with its new design is a light weight constructed welding & soldering blowpipe. Designed with safety in mind and engineered from highest quality materials to complement the operator in production or light gauge maintenance welding, brazing & soldering. The neat design and light weight makes the torch perfect suitable for brazing operations. The trim valves are easy to adjust and control to set whatever flame required.

The shank can be used with either lightweight swaged nozzles or D.H. solid copper tips + brass neck according to the operators preference enabling precise flame control and up to 8mm (5/16") welding capacity in steel.



# ESAB SAFFIRE DH+

## ADVANTAGES

- > High operating safety. The shank is manufactured from a solid drilled aluminum forging, no risk for any leakage.
- > Light weight. Perfect suitable for precise soldering and brazing operations.
- > New trim valve design for easy and precise setting of the flame.
- > Conform to EN standard EN ISO 5172
- > Tool free



Special tool free connection design

### TECHNICAL DATA

<b>Hose connections:</b>	G 1/4" x G 1/4" LH
<b>Welding capacity:</b>	8 mm
<b>Welding nozzles:</b>	Lightweight, Swaged Nozzles Size 1-25 D.H. Solid Copper Tips Sizes 1-25

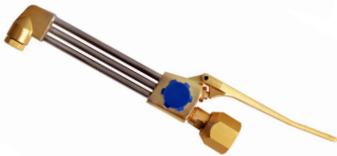
## ORDERING INFORMATION

### SHANK ESAB SAFFIRE DH+



Article Number	Description	Inlet Connection	Outlet Connection
F22210012	ESAB SAFFIRE DH+ Shank	G 1/4" x G 1/4" LH	G 1/2"

## CUTTING ATTACHMENT



Art. Nr.	Type	Gas	Version	Head	Nozzle type
F22210013	nozzle mix	A/P	Lever	90°	ANM, ANME, PNM, PNME, FGA, ASFN, AFN

## MIXER



Article Number	Description
0700017247N	ESAB SAFFIRE DH+ Mixer

## WELDING TIPS



Article Number	Range	Size	1 pack includes
0700016670N	to 1 mm	Size 1	3 pcs
0700016671N	1-1,5 mm	Size 2	3 pcs
0700016672N	1,5-2 mm	Size 3	3 pcs
0700016673N	2-2,5 mm	Size 5	3 pcs
0700016674N	2,5-3 mm	Size 7	3 pcs
0700016675N	3-4 mm	Size 10	3 pcs
0700016676N	4-5 mm	Size 13	3 pcs
0700016677N	5-6 mm	Size 18	3 pcs
0700016678N	6-8 mm	Size 25	3 pcs

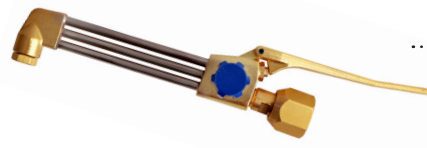
## HEATING NOZZLE & NECK



Article Number	Description
0701256652	ESAB SAFFIRE DH+ Heating Nozzle and Neck

# ESAB SAFFIRE DH+ - TYPICAL ASSEMBLIES

## CUTTING



F22210013



**AFN**  
F24410002  
F24410003  
F24410004

**ASFN**  
F24410001



F22210012

## WELDING



0700016670N

- 0700016671N
- 0700016672N
- 0700016673N
- 0700016674N
- 0700016675N
- 0700016677N
- 0700016678N



0700017247N

## HEATING



0700016668N



0700017247N

For more details about cutting, gouging, heating and superheating nozzles and necks see special section on pages 29-33.



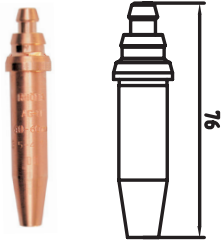
## CUTTING AND HEATING NOZZLES





# CUTTING NOZZLES

## ANM SHORT PATTERN



Standard cutting nozzle for simple usage in the narrow areas.

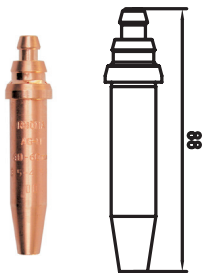
6 heating holes, 76 mm long.

USE:

Acetylene fuel gas.

Art. Nr.	Thickness mm (")	Tip Size	Model No.
0700016610N	3 - 6	1/32	ANM-0
0700016611N	5 - 12	3/64	ANM-1
0700016612N	10 - 75	1/16	ANM-4
0700016613N	70 - 100	5/64	ANM-5
0700016614N	90 - 150	3/32	ANM-6
0700016615N	190 - 300	1/8	ANM-8

## ANME LONG PATTERN



Longer cutting nozzle allowed precise homogenous mixture of the acetylene and oxygen for faster preheating of the material.

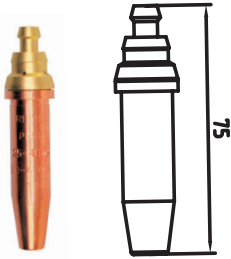
6 heating holes, 88 mm long.

Art. Nr.	Thickness mm (")	Tip Size	Model No.
0700016616N	3 - 6	1/32	ANME-0
0700016617N	5 - 12	3/64	ANME-1
0700016618N	10 - 75	1/16	ANME-4
0700016619N	70 - 100	5/64	ANME-5
0700016620N	90 - 150	3/32	ANME-6
0700016621N	190 - 300	1/8	ANME-8

Material Thickness		Nozzle size	Operating pressure				Gas consumption				Approx. Cutting Speeds			
mm	in		Oxygen bar	Oxygen PSI	Acetylene bar	Acetylene PSI	Cutting Ox l/h	Cutting Ox ft <sup>3</sup> /h	Heating Ox l/h	Heating Ox ft <sup>3</sup> /h	Acetylene l/h	Acetylene ft <sup>3</sup> /h	mm/m	in/m
6	1/4	1/32	1,8	25	0,14	2	800	28	480	15	400	14	510	20
13	1/2	3/64	2,1	30	0,21	3	1900	67	570	20	510	18	480	19
25	1	1/16	2,8	40	0,14	2	4000	140	540	19	470	17	400	16
50	2	1/16	3,2/3,5	45/50	0,14	2	4500	160	620	22	560	19	300	12
75	3	1/16	3,5/4,2	50/60	0,14	2	4800	170	680	24	620	22	205	8
100	4	5/64	3,2/4,8	45/70	0,14	2	6800	240	850	30	790	27	150	6
150	6	3/32	3,2/5,5	45/80	0,21	3	9400	330	960	34	850	30	125	5
200	8	1/8	4,2	60	0,28	4	14800	510	1380	48	1250	44	100	4
250	10	1/8	5,3	75	0,28	4	31500	760	1560	55	1420	50	75	3
300	12	1/8	6,3	90	0,28	4	25000	880	1560	55	1420	50	50	2

# CUTTING NOZZLES

## PNM SHORT PATTERN

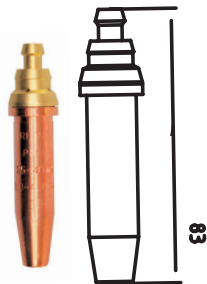


Standard cutting nozzle for simple usage in the narrow areas.  
9 spline inner, 76 mm long.

USE:  
Propane fuel gas.

Art. Nr.	Thickness mm (")	Size	Model No.
0700016622N	3 - 6	1/32	PNM-0
0700016623N	5 - 12	3/64	PNM-1
0700016624N	10 - 75	1/16	PNM-4
0700016625N	70 - 100	5/64	PNM-5
0700016626N	90-150	3/32	PNM-6
0700016627N	190-300	1/8	PNM-8

## PNME LONG PATTERN



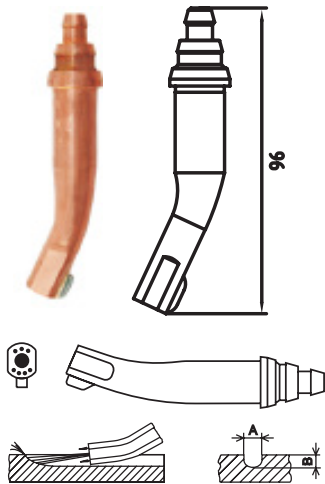
Longer cutting nozzle for simple usage in the narrow areas.  
9 spline inner, 76 mm long.

USE:  
Propane fuel gas.

Art. Nr.	Thickness mm (")	Size	Model No.
0700016628N	3 - 6	1/32	PNME-0
0700016629N	5 - 12	3/64	PNME-1
0700016630N	10 - 75	1/16	PNME-4
0700016631N	70 - 100	5/64"	PNME-5
0700016632N	90-150	3/32	PNME-6
0700016633N	190-300	1/8	PNME-8

Material Thickness		Nozzle size	Operating pressure				Gas consumption				Approx. Cutting Speeds			
mm	in		Oxygen bar	Oxygen PSI	Propane bar	Propane PSI	Cutting Ox l/h	Cutting Ox ft <sup>3</sup> /h	Heating Ox l/h	Heating Ox ft <sup>3</sup> /h	Propane l/h	Propane ft <sup>3</sup> /h	mm/m	in/m
6	1/4	1/32	2,1	30	0,2	3	1000	36	1300	48	300	12	430	17
13	1/2	3/64	2,1	30	0,2	3	1800	65	1600	57	300	14	360	14
25	1	1/16	2,8	40	0,2	3	3000	140	1700	62	400	15	280	11
50	2	1/16	3,2	45	0,3	4	4500	160	1800	66	400	16	205	8
75	3	1/16	3,5	50	0,3	4	4800	170	2000	73	500	18	205	8
100	4	5/64	3,5	50	0,3	4	7300	260	2600	93	600	23	152	6
150	6	3/32	4,2	60	0,4	6	12300	435	3300	120	800	30	125	5
250	10	1/8	5,6	80	0,6	8	22300	790	4600	165	1100	42	50	2
300	12	1/8	6,7	95	0,8	8	26300	930	5900	210	1400	50	50	2

## FGA GOUGING NOZZLES



Special cutting nozzle for removing low quality weld.  
 94 mm long.  
 USE:  
 Acetylene fuel gas.

Art. Nr.	Range	Size	Quantity
0768698	6 - 8 mm Width × 3 - 9 mm Depth	13 - 1/32"	1
0768661	8 - 11 mm Width × 6 - 11 mm Depth	19 - 3/64"	1
0768699	9 - 12 mm Width × 9 - 12 mm Depth	25 - 1/16"	1

## AFN TYPE CUTTING NOZZLES



Fuel gas: Acetylene

Art. Nr.	Range	Size	Quantity
F24410001	0 - 3 mm	Sheet Metal ASFN	1
F24410002	3 - 6 mm	AFN size 1/32"	1
F24410003	6 - 20 mm	AFN size 3/64"	1
F24410004	20 - 30 mm	AFN size 1/16"	1

Material Thickness mm in	Nozzle size	Operating pressure		Cutting Ox l/h ft <sup>3</sup> /h	Gas consumption		Approx. Cutting Speeds	
		Oxygen bar PSI	Acetylene bar PSI		Heating Ox l/h ft <sup>3</sup> /h	Acetylene l/h ft <sup>3</sup> /h	mm/m	in/m
3 1/8	S/M	2,1 30	0,3 4	650 30	120 4,5	220 8	110 4	
6 1/4	1/32	2,1 30	0,15 2	710 25	255 9	255 8	255 8	
20 3/4	3/64	2,1 30	0,15 2	1415 50	255 9	225 8	225 8	
25 1	1/16	3,8 55	0,15 2	3400 120	255 9	225 8	225 8	
50 2	1/16	5,3 75	0,20 3	4530 60	310 11	285 10	285 10	

## SUPERHEATING NOZZLES



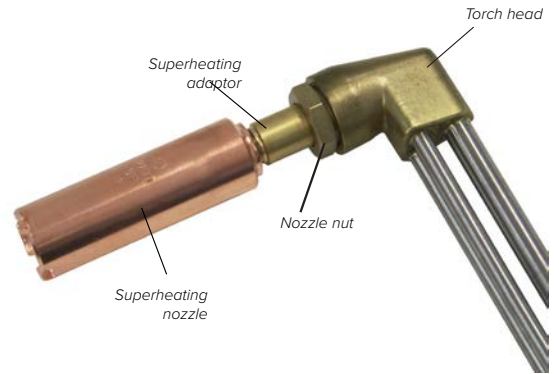
Can also be used with NM250/Steelmaster in conjunction with superheating adaptor 0768929.  
 USE:  
 Propane fuel gas.

Art. Nr.	Size	Output	Quantity
0769472	1H	72 000 - 163 000 Btu/H	1
0769473	2H	102 000 - 188 000 Btu/H	1
0769474	3H	183 000 - 361 000 Btu/H	1
0769475	4H	236 000 - 406 000 Btu/H	1
0769476	5H	250 000 - 618 000 Btu/H	1
0768929	Superheating adaptor for nozzle mix cutters		

## How to fit a superheating adaptor

Place the “three cone end” of the supeheating adaptor into the torch head and fasten using the nozzle nut.

Once the adaptor is in place screw the superheating nozzle onto the adaptor.

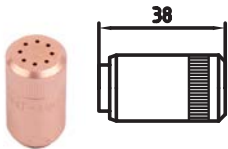


## HEATING NECK



Art. Nr.	Description	Lenght
<b>0700143884N</b>	ESAB Saffire 6 Brass Heating Neck - short ( for AHT heating nozzles)	254 mm
<b>F22280006</b>	ESAB Saffire 6 Long Brass Heating Neck - long ( for AHT heating nozzles)	710 mm
<b>0700157553N</b>	ESAB Saffire 6 Superheating Neck - long ( for Superheating nozzles)	710 mm

## AHT HEATING NOZZLES



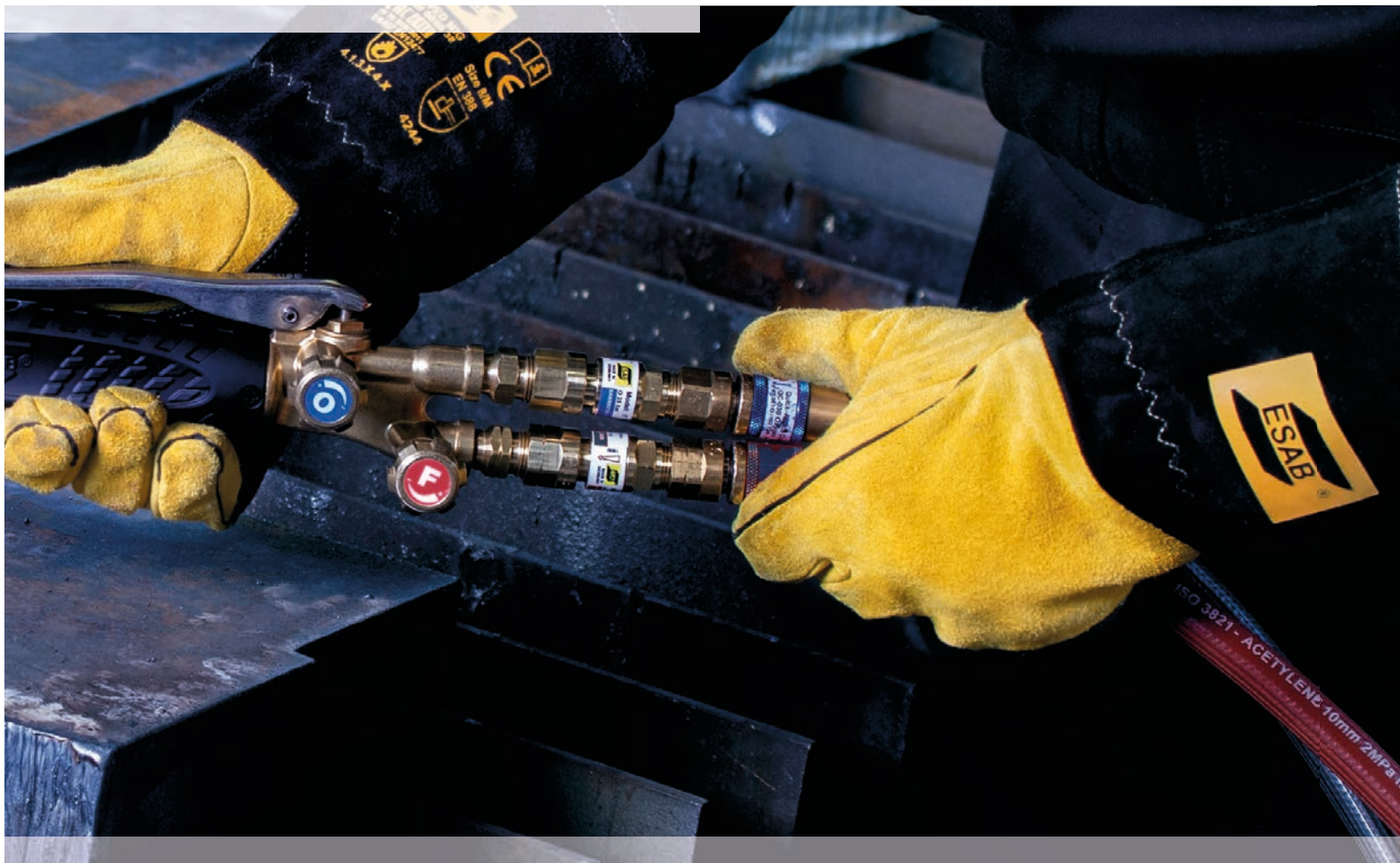
Art. Nr.	Description	Output
<b>0700016641N</b>	AHT 25 heating tip	52 000 Btu/H
<b>0700016642N</b>	AHT 50 heating tip	91 000 Btu/H
<b>0700016643N</b>	AHT 100 heating tip	139 000 Btu/H





# SAFETY DEVICES FOR REGULATORS

# SAFETY DEVICES FOR TORCHES



# SAFETY DEVICES - FLASHBACK ARRESTORS

If using high quality equipment kept in good condition and if such equipment is used properly maintaining all health and safety rules, oxy-fuel cutting and heating equipment is safe to handle. There is no substitute for proper training, safety procedures and adequate caution among those that operate oxy-fuel equipment. The right torch, nozzle and a stable source of gas as well as their professional handling is essential but still may not be sufficient. Daily practice shows that Backfire and Flashbacks not only may happen but happen quite frequently. Extra hardware in the form of reliably working flashback arrestors provides an additional safety barrier protecting the cutting/welding operator and surrounding property against health and safety risks and material damages.

## NATURE OF OXY-FUEL RISKS

In the course of proper operation the highly flammable mixture of gases is precisely mixed in the injector, mixer or directly in the cutting nozzle and then ignited and fully combusted right and only at the cutting / welding nozzle orifice. In reality the equipment may get damaged or worn, the gas supply pressure unstable or skills and concentration of the operator not reach necessary levels. Any of these reasons and several others may initiate a chain of events resulting in an accident. The most common mishaps are as follows:

### BACKFLOWING

Backflow is a dangerous situation whereby oxygen is pushed into the flammable gas hose (or vice versa) creating a highly flammable/explosive gas mixture inside the flexible hoses. A damaged injector or mixer or – more often - clogged or blocked welding tip or damaged cutting nozzle can also cause a change of inner pressure conditions in the system resulting in backflow. Another case is where the reverse flow of a gas occurs when one cylinder runs out during operation, creating an imbalance of pressure in the system. The non-return valve units – both in check valves and/or flashback arrestors are the only

### FLASHBACK

A flashback is a momentary or sustained retrogression of the flame upstream of the mixer, usually in the torch or hoses. This is a potentially dangerous situation, particularly if the flame reaches the hoses, where an explosion will occur, causing a rupture or separation of the hose.

### SUSTAINED BACKFIRE

Sustained backfire is the continuous burning of the flame back inside the torch, usually at the mixer or injector. Flames can also travel further upstream and in extreme cases can reach the regulator and gas cylinders. Sustained backfires are often accompanied by a hissing or squealing sound and/or a smoky, sharp pointed flame. The user should immediately close all torch valves to avoid damage or injury. If a sustained backfire continues to burn without closing torch valves, severe damage to the torch, as well as an increased risk of fire, would result

## FLASHBACK ARRESTORS

Flashback arrestors (FBAs) are common safety devices that stop or impede the progress of a flame upstream of the insertion point, avoiding back flow and build up of explosive mixtures inside of hoses and can protect the system in case of fire and stop pressure wave in the gas lines. Different FBA provides a different combination of basic safety features:

GCE flashback arrestors are designed to protect the operator. Attention to the following points will greatly reduce the risk of backfire:

- Ensure all equipment is in good condition and regularly checked.
- Ensure all hose connectors are gas tight.
- Follow the manufactures instructions for the torch.
- Ensure pressure settings are correct.
- Purge hoses before lighting torch.
- Keep hands and tools clean. (Oil or grease can cause an explosion when in contact with oxygen).
- In the event of a backfire do not re-ignite the torch until the cause has been determined and remedied.

ESAB flashback arrestors require no routine maintenance other than regular checks for external leaks applicable to all gas equipment. ESAB flashback arrestors are sealed and tested during manufacture and no attempt should be made to dismantle or repair the unit. Should there be any doubt about the performance of the unit it should be replaced or returned to the manufacture for service.

# SAFETY DEVICES

FBA's suitable for fuel gases are suitable for a range of fuel gases however it is industry best practice that once a gas be used with the equipment, it remains in use on that gas type only.

## SAFETY ELEMENTS BY FLASHBACK ARRESTOR TYPE

Model	Non return valve (NA)	Flame arrestor (FA)	Thermal cut off valve (TV)	Pressure sensitive cut off valve (PV)	Dust filter (DF)
<b>SAFE-GUARD-5</b>	YES	YES	YES	YES	YES
<b>FR1000 PLUS</b>	YES	YES	YES	YES	YES
<b>FTH</b>	YES	YES	NO	NO	NO
<b>FT</b>	YES	YES	NO	NO	NO
<b>FRT</b>	YES	YES	YES	NO	NO

\* All fuel gas models are suitable for the following gas service:

- Acetylene (A)
- Propane (P)
- Ethylene (E)
- Hydrogen (H)
- Methane (M)
- Town Gas (C)



SAFE-GUARD-5



FTH



FR1000 PLUS



FRT



FT



## ESAB SAFE-GUARD-5 – RESETTABLE - 5 FUNCTION SAFETY DEVICE

### FEATURES

- › Maximum number of safety features defined by ISO 5175-1
- › High visibility trip/reset lever coupled with quick acting reset even when pressurised
- › Angled inlet to minimise hose damage
- › 100% production flame tested for Flashback resistance
- › Inspection dates can be marked on product for easy reference

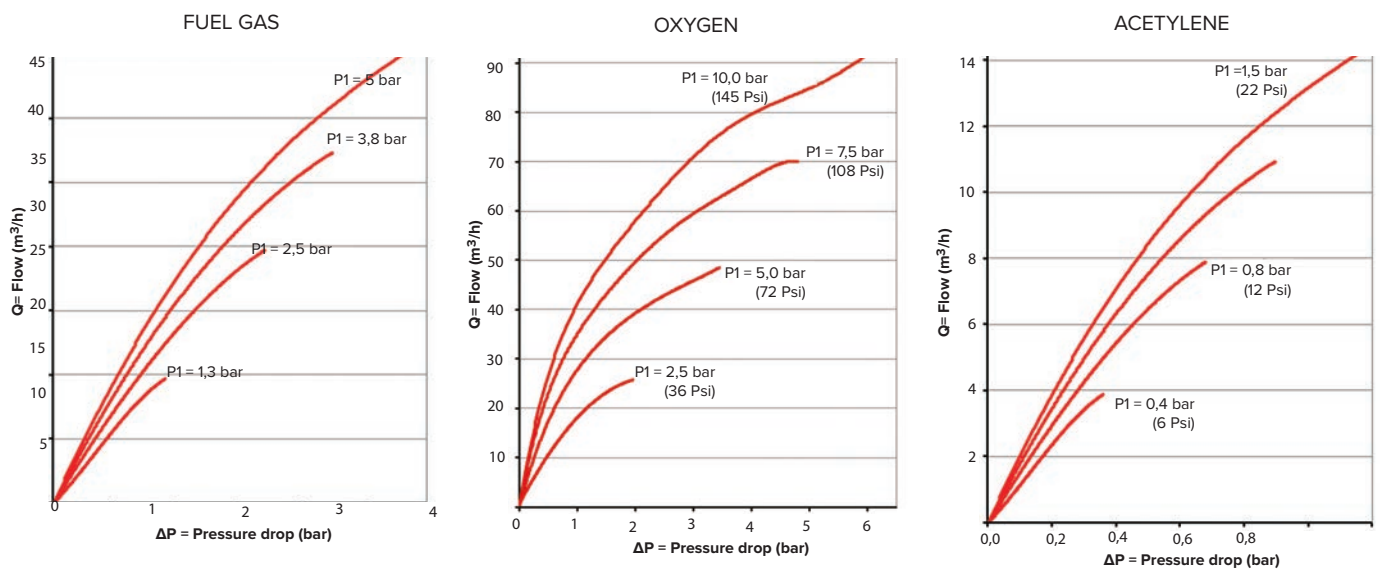
### TECHNICAL DATA

#### GAS OPTIONS AND SERVICE PRESSURE

RIGHT HAND	
Oxygen	10 bar
LEFT HAND	
Acetylene	1,5 bar
Hydrogen	5 bar
Propane	5 bar
Methane	5 bar
Natural Gas	5 bar
MPS	5 bar
MAPP	5 bar



### GRAPHS

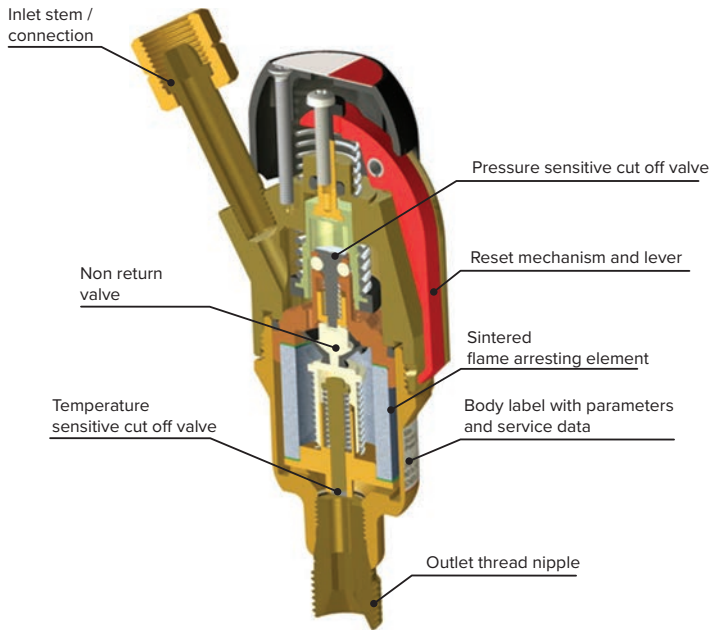


### CONVERSION COEFFICIENT

	PROPANE	METHANE	ETHYLENE	HYDROGEN
Gas	C <sub>3</sub> H <sub>8</sub>	CH <sub>4</sub>	C <sub>2</sub> H <sub>4</sub>	H <sub>2</sub>
Coefficient	x 0,8	x 1,33	x 1,02	x 3,75

# ESAB SAFE-GUARD-5 – RESETTABLE - 5 FUNCTION SAFETY DEVICE

## INTERNAL PARTS - SAFETY DEVICES



## SAFETY ELEMENTS

Model	Non return valve (NA)	Flame arrestor (FA)	Thermal cut off valve (TV)	Pressure sensitive cut off valve (PV)	Dust filter (DF)
<b>SAFE-GUARD-5</b>	Yes	Yes	Yes	No	No

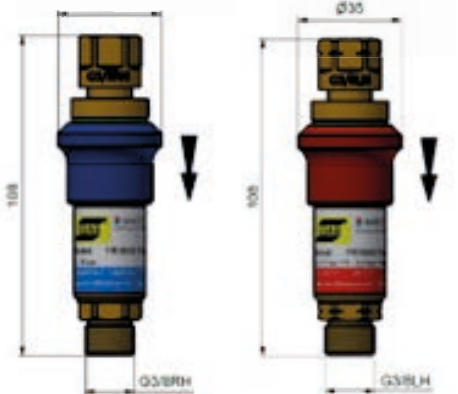
## ORDERING INFORMATION

Art. Nr.	Model	Location type	Resettable	Gas Type	Connection Thread
<b>0764456E</b>	SAFE-GUARD-5	Regulator Mounted	Yes	Oxygen	G 3/8"
<b>0764457E</b>				Fuel gas	G 3/8" LH

# FR1000 PLUS – RESETTABLE - 4 FUNCTION SAFETY DEVICE

## FEATURES

- > avoids dangerous gas mixtures by a gas non-return valve (NV)
- > stops flashback through flame arrestor (FA)
- > a temperature-sensitive cut-off valve stops the gas flow when a predetermined temperature is exceeded (TV)
- > interrupts the further gas flow on pressure shocks by a resettable pressure-sensitive cut-off valve (PV)
- > a dust filter protects the gas non-return valve against contamination
- > every safety device is 100% tested

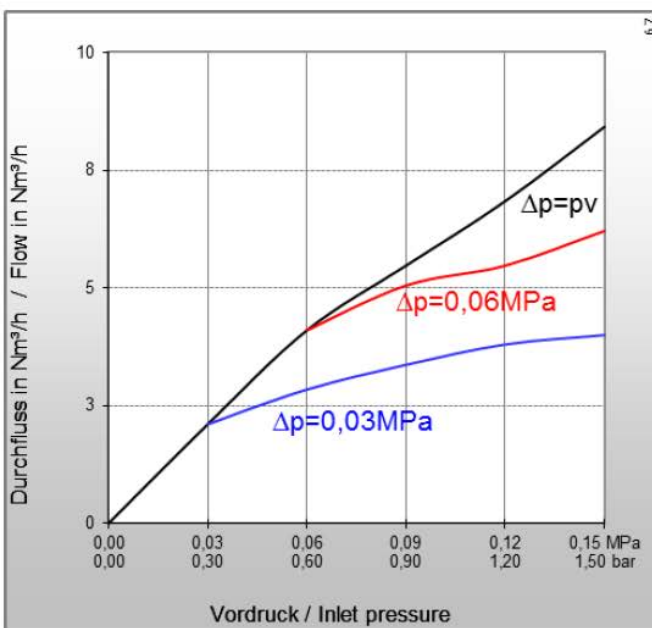


INTERNAL PARTS

## TECHNICAL DATA

Gas types:	Acetylene (A)	Oxygen (O)
<b>Working pressure</b>	0,15 MPa 1,5 bar	1,5 MPa 15 bar
<b>Gas temperature:</b>	-20 °C up to +70 °C ( Oxygen -20 °C up to +60 °C)	
<b>Ambient temperature:</b>	-20 °C up to +70 °C	
<b>Threads: EN560</b>	G 3/8" LH	G 3/8"
<b>Diameter:</b>	35,0 mm	
<b>Length:</b>	107,0 mm	
<b>Weight:</b>	253,0 g	

## GRAPHS



## FR1000 PLUS

### Flow rates [air]:

$p_v$  = Primary pressure

$p_h$  = Secondary pressure

$\Delta p$  = Primary pressure minus Secondary pressure

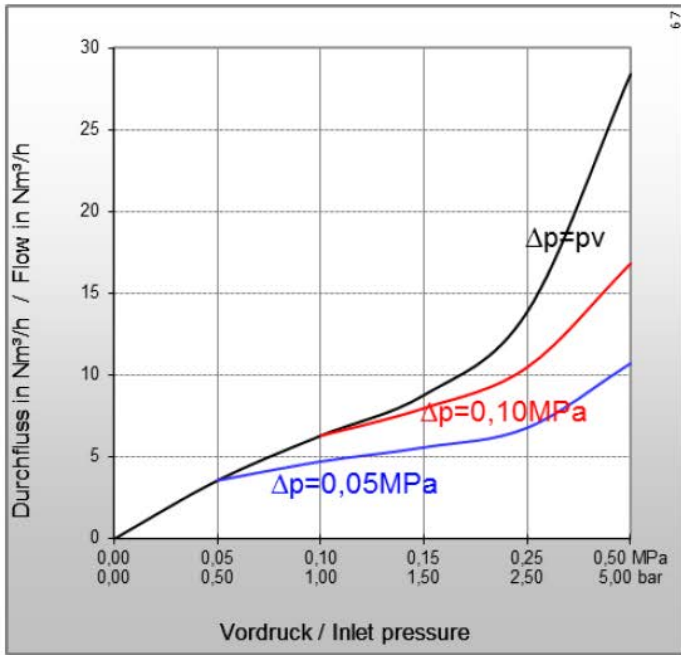
### Conversion Factors:

0,1 MPa = 1 bar = 100 kpa = 14,504 psi

1 m<sup>3</sup>/h = 35,31 cu ft/h

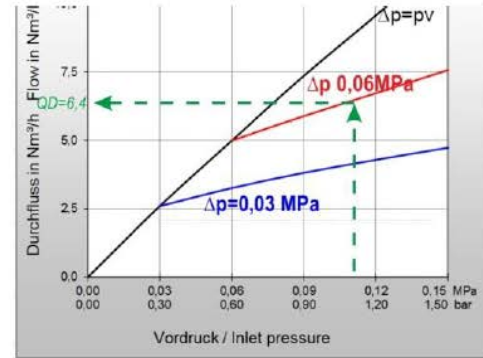
	A	H	P	M	M	O	E	L
QG ▶	C <sub>2</sub> H <sub>2</sub>	H <sub>2</sub>	C <sub>3</sub> H <sub>8</sub>	CH <sub>4</sub> +C	CH <sub>4</sub>	O <sub>2</sub>	C <sub>2</sub> H <sub>4</sub>	C <sub>3</sub> H <sub>6</sub>
F	1,2	3,8*	0,90	1,25	1,4	0,95	1,02	0,92

## FR1000 PLUS – RESETTABLE - 4 FUNCTION SAFETY DEVICE



\* Conversion factor 2.5 for devices comprising a flame arrestor  
 The conversion factor for free flow is 3.8.  
 (Reference: BAM report 220, D. Lietze)

### Example:

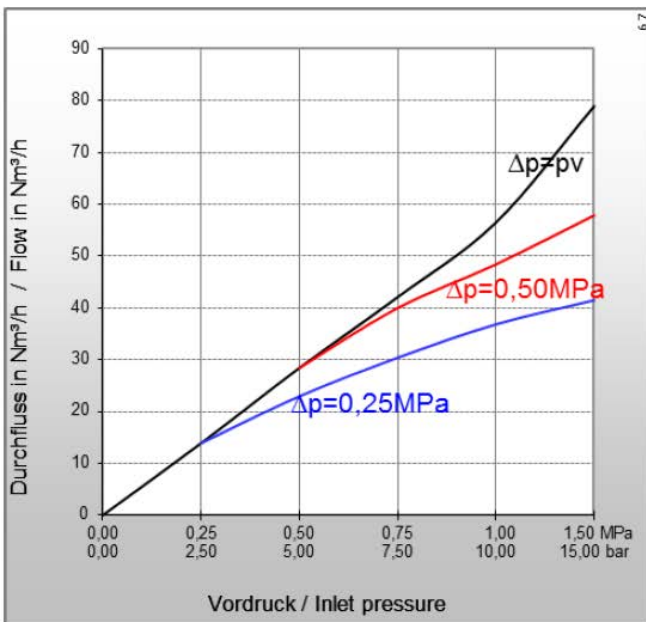


$$QG = QD \times F$$

$$QG \blacktriangleright A = 6,4 \times 1,2 = 7,68 \text{ m}^3/\text{h C}_2\text{H}_2$$

QG = flow / gas type

F = conversion factor



QD = flow / air

### Certification / Technical Standards / Rules

BAM Federal Institute for Materials Research and Testing, UL Underwriters Laboratories Inc., DGUV employer's liability insurance association rules and regulations, DVS German Association for Welding, Cutting and Allied Processes, TRBS German Technical rules for operation safety.

### Standards/ Approvals

Company certified according to ISO 9001:2015 and ISO 14001:2015, CE-marking according to: Pressure Equipment Directive 2014/68/EU

(Subject to change without notice)

## SAFETY ELEMENTS

Model	Non return valve (NA)	Flame arrestor (FA)	Thermal cut off valve (TV)	Pressure sensitive cut off valve (PV)	Dust filter (DF)
FR1000 Plus	Yes	Yes	Yes	Yes	Yes

## ORDERING INFORMATION

Art. Nr.	Model	Location type	Resettable	Gas Type	Connection Thread
0700016550N	FR1000 Plus	Regulator Mounted	Yes	Oxygen	G 3/8"
0700016551N		Regulator Mounted	Yes	Fuel gas	G 3/8" LH



## FRT TYPE – NON RESETTABLE - 3 FUNCTION SAFETY DEVICE

### FEATURES

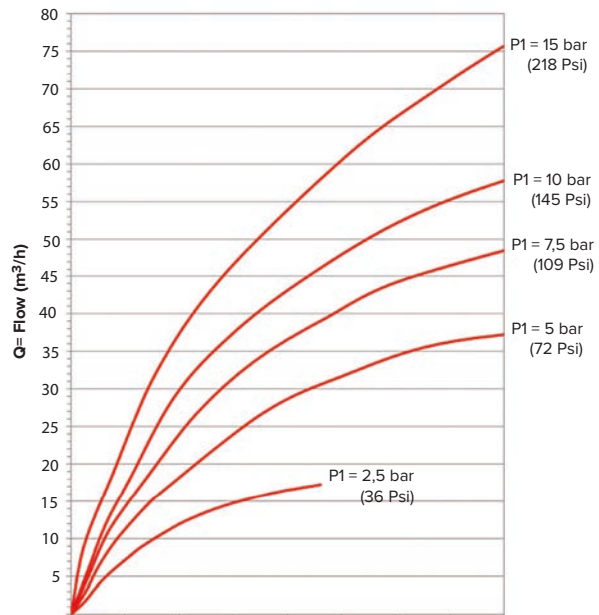
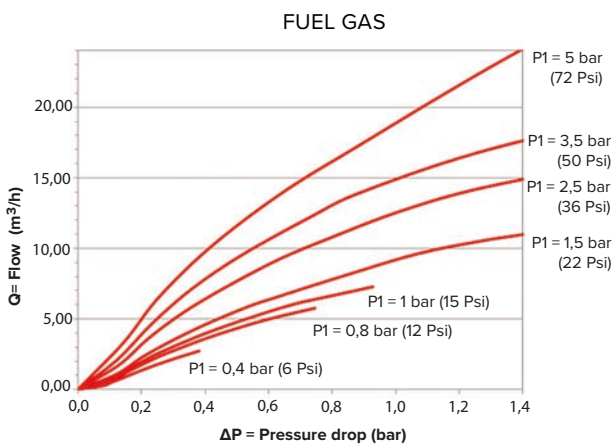
- › avoids dangerous gas mixtures by a gas non-return valve (NV)
- › stops flashback through flame arrestor (FA)
- › a temperature-sensitive cut-off valve stops the gas flow when a predetermined temperature is exceeded (TV)
- › dust filter
- › every safety device is 100% tested
- › ISO 5175-1 compliant



### TECHNICAL DATA

Gas types:	Acetylene (A)	Oxygen (O)
Working pressure	0,15 MPa 1,5 bar	2.0 MPa 15 bar
Threads: EN560 ISO 3253	G 3/8" LH	G 3/8"
Diameter:	22,0 mm	
Length:	83,0 mm	
Weight:	152,0 g	

### GRAPHS



### CONVERSION COEFFICIENT

	OXYGEN	HYDROGEN	ACETYLENE
Gas	O <sub>2</sub>	H <sub>2</sub>	C <sub>2</sub> H <sub>2</sub>
Coefficient	x 0,95	x 3,75	x 1,04

	PROPANE	METHANE	ETHYLENE
Gas	C <sub>3</sub> H <sub>8</sub>	CH <sub>4</sub>	C <sub>2</sub> H <sub>4</sub>
Coefficient	x 0,8	x 1,33	x 1,02

## SAFETY ELEMENTS

Model	Non return valve (NA)	Flame arrestor (FA)	Thermal cut off valve (TV)	Pressure sensitive cut off valve (PV)	Dust filter (DF)
FRT	Yes	Yes	Yes	No	No

## ORDERING INFORMATION

Art. Nr.	Model	Location type	Resettable	Gas Type	Connection Thread
0700016554	FRT	Regulator Mounted	No	Oxygen	G 3/8"
0700016555		Regulator Mounted		Fuel gas	G 3/8" LH

## FTH TYPE – NON RESETTABLE – 2 FUNCTION SAFETY DEVICE

The cylindrical flashback arrestors, are of advanced design giving a higher flow rate. The FTH model is designed to be connected to the torch, this model is equipped with a large cylindrical flame arresting element, and an automatic reset non return valve.

### FEATURES

- > Flame arresting element FA
- > Non return valve NV



### TECHNICAL DATA

Gas types:	Acetylene (A)	Hydrogen (H)	Industrial Gas (C) Ethylene (E) Natural Gas (M) Compressed Air (D) (Methane) Propane (P)	Compressed Air (D) Oxygen (O)
<b>Working pressure</b>	0,15 MPa 1,5 bar	0,35 MPa 3,5 bar	0,50 MPa 5,0 bar	2,0 MPa 15 bar
<b>Threads: EN560 ISO 3253</b>	G 3/8" LH	G 3/8" LH	G 3/8" LH	G 3/8"
<b>Diameter:</b>	21,0 mm			
<b>Length:</b>	68,0 mm			
<b>Weight:</b>	89,6 g			

### SAFETY ELEMENTS

Model	Non return valve (NA)	Flame arrestor (FA)	Thermal cut off valve (TV)	Pressure sensitive cut off valve (PV)	Dust filter (DF)
<b>FTH</b>	Yes	Yes	No	No	No

### ORDERING INFORMATION

Art Number	Model	Location type	Resetttable	Gas Type	Connection Thread
<b>0700016558</b>	FTH	Torch Mounted to unfitted hose	No	Oxygen	dia. 8 - G 3/8"
<b>0700016559</b>				Fuel gas	dia. 8 - G 3/8" LH

## FT TYPE – NON RESETTABLE – 2 FUNCTION SAFETY DEVICE

The cylindrical flashback arrestors, are of advanced design giving a higher flow rate. The FT model is designed to be connected to the torch, this model is equipped with a large cylindrical flame arresting element, and an automatic reset non return valve.



### FEATURES

- > Flame arresting element                      FA
- > Non return valve                                NV

### TECHNICAL DATA

Gas types:	Acetylene (A)	Hydrogen (H)	Industrial Gas (C) Ethylene (E) Natural Gas (M) Compressed Air (D) (Methane) Propane (P)	Compressed Air (D) Oxygen (O)
<b>Working pressure</b>	0,15 MPa 1,5 bar	0,35 MPa 3,5 bar	0,50 MPa 5,0 bar	2,0 MPa 15 bar
<b>Threads: EN560 ISO 3253</b>	G 1/4" LH G 3/8" LH	G 1/4" LH G 3/8" LH	G 1/4" LH G 3/8" LH	G 1/4" G 3/8"
<b>Diameter:</b>	19,5 mm			
<b>Lenght:</b>	55,0 mm			
<b>Weight:</b>	70,0 g			

### SAFETY ELEMENTS

Model	Non return valve (NA)	Flame arresstor (FA)	Thermal cut off valve (TV)	Pressure sensitive cut off valve (PV)	Dust filter (DF)
<b>FT</b>	Yes	Yes	No	No	No

### ORDERING INFORMATION

Art Number	Model	Location type	Ressettable	Gas Type	Connection Thread
<b>0700016556</b>				Oxygen	G 3/8"
<b>0700016557</b>	FT	Torch Mounted	No	Fuel gas*	G 3/8" LH
<b>0700016740</b>				Oxygen	G 1/4"
<b>0700016739</b>				Fuel gas*	G 1/4" LH

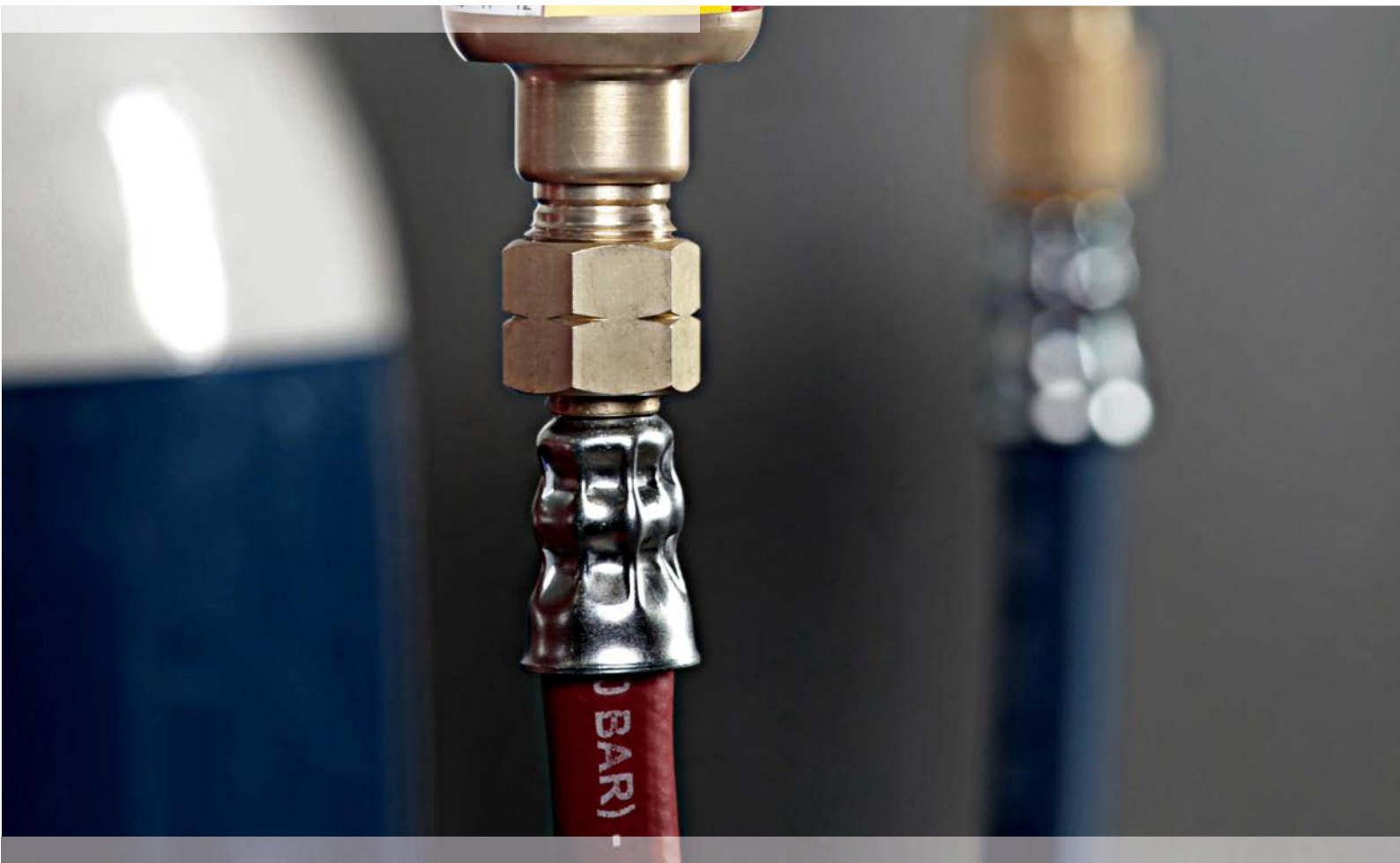
\* All fuel gas models are suitable for the following gas service:

- Acetylene (A)
- Propane (P)
- Ethylene (E)
- Hydrogen (H)
- Methane (M)
- Town Gas (C)





# RUBBER HOSES AND ACCESSORIES



# RUBBER HOSES - WITH FITTINGS

## SINGLE HOSE OXYGEN (BLUE) ISO 3821 WITH FITTINGS AND NON RETURN VALVE (FOR WELDING AND ALLIED PROCESSES)

**ISO 3821  
EN 1256**

Rubber hose for use with Oxygen in cutting and welding and allied processes.  
Not suitable for LPG, MPS and CNG

- › Inner tube: Synthetic rubber resistant to the welding gases
- › Reinforcement: High tensile synthetic textile
- › External cover: Blue synthetic rubber resistant to abrasion and weather
- › **NON RETURN VALVE** in the outlet



**WORKING  
PRESSURE  
20 BAR**

TECHNICAL DATA	
Temperature:	-20°C / +60°C
Safety factor:	3:1
Marking:	In compliance with the below mentioned standard
Working pressure:	20 bar
Bursting pressure:	60 bar
Standards:	ISO 3821(hose) EN 1256 (hose assembly)

Art. Nr.	Ø int × Ø ext	Inlet-Outlet	Coil
841065	6×13 mm	G3/8" - G1/4"	5 m
841067	6×13 mm	G3/8" - G3/8"	5 m
841068	6×13 mm	G3/8" - G3/8"	10 m
841089	8×15 mm	G3/8" - G3/8"	10 m
841105	10×17 mm	G3/8" - G3/8"	5 m
841109	10×17 mm	G3/8" - G3/8"	10 m
841102	10×17 mm	G3/8" - G3/8"	20 m

## SINGLE HOSE ACETYLENE (RED) ISO 3821 WITH FITTINGS AND NON RETURN VALVE (FOR WELDING AND ALLIED PROCESSES)

**ISO 3821  
EN 1256**

Rubber hose for use with Acetylene in cutting and welding and allied processes.  
Not suitable for LPG, MPS and CNG

- › Inner tube: Synthetic rubber resistant to the welding gases
- › Reinforcement: High tensile synthetic textile
- › External cover: Red synthetic rubber resistant to abrasion and weather
- › **NON RETURN VALVE** in the outlet



**WORKING  
PRESSURE  
20 BAR**

TECHNICAL DATA	
Temperature:	-20°C / +60°C
Safety factor:	3:1
Marking:	In compliance with the below mentioned standard
Working pressure:	20 bar
Bursting pressure:	60 bar
Standards:	ISO 3821(hose) EN 1256 (hose assembly)

Art. Nr.	Ø int × Ø ext	Inlet-Outlet	Coil
849065	6×13 mm	G3/8" LH - G1/4" LH	5m
849064	6×13 mm	G3/8" LH - G3/8" LH	5 m
849068	6×13 mm	G3/8" LH - G3/8" LH	10 m
849089	8×15 mm	G3/8" LH - G3/8" LH	10 m
849105	10×17 mm	G3/8" LH - G3/8" LH	5 m
849109	10×17 mm	G3/8" LH - G3/8" LH	10 m
849102	10×17 mm	G3/8" LH - G3/8" LH	20 m

# RUBBER HOSES - WITH FITTINGS

## SINGLE HOSE PROPANE/BUTANE (ORANGE) ISO 3821 WITH FITTINGS AND NON RETURN VALVE (FOR WELDING AND ALLIED PROCESSES)

**ISO 3821**  
**EN 1256**

Rubber hose for use with Propane/Butane in cutting and welding and allied processes. Suitable for Liquid Petroleum Gas (LPG), Methylacetylene-propadiene (MPS) gas, Compressed Natural Gas (CNG)



- › Inner tube: Synthetic rubber resistant to LPG and Propane/Butane gases
- › Reinforcement: High tensile synthetic textile
- › External cover: Orange synthetic rubber resistant to abrasion and weather
- › **NON RETURN VALVE** in the outlet

**WORKING  
PRESSURE  
20 BAR**

TECHNICAL DATA	
Temperature:	-20°C / +60°C
Safety factor:	3:1
Marking:	In compliance with the below mentioned standard
Working pressure:	20 bar
Bursting pressure:	60 bar
Standards:	ISO 3821(hose) EN 1256 (hose assembly)

Art. Nr.	Ø int × Ø ext	Inlet-Outlet	Coil
849113	6×13 mm	G3/8" LH - G3/8" LH	5 m
849114	6×13 mm	G3/8" LH - G3/8" LH	10 m
849117	8×15 mm	G3/8" LH - G3/8" LH	10 m
849119	10×17 mm	G3/8" LH - G3/8" LH	5 m
849120	10×17 mm	G3/8" LH - G3/8" LH	10 m
849121	10×17 mm	G3/8" LH - G3/8" LH	20 m





## SPECIALISED PRODUCTS





## PREMIUM CYLINDER REGULATOR SERIES

# GCE ProStage®

***GCE ProStage® two-stage regulator fits to users working with Plasma and Hi-Tec Oxy-Fuel applications with need of very accurate outlet pressure and flow.***

*GCE ProStage® regulators designed to provide accurate, fluctuation free delivery for precision applications such as shielding gas arc welding, CNC oxy-fuel cutting or laboratory use use of technical gases. The first stage reduces the inlet pressure by over 90% and the large second stage diaphragm ensures accurate delivery pressure with keeping of enough flow for medium gas consumption applications.*



# GCE ProStage®

## FEATURES

The GCE ProStage® two stage regulators provide a precise and constant control of outlet pressure regardless variations of the inlet pressure which occurs when the gas content in the gas cylinder decrease over time

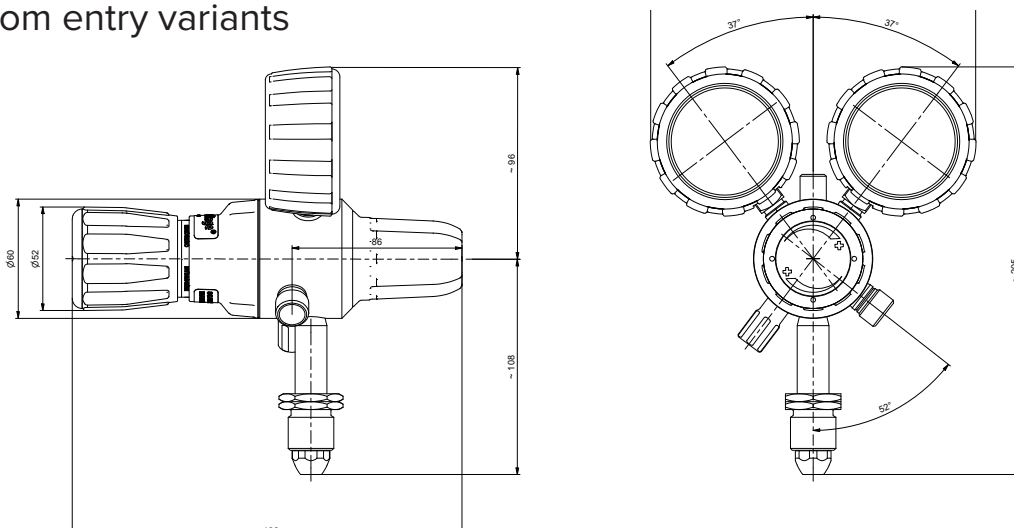
- › Two-stage regulation for constant outlet pressure, flow and stability
- › Optimum safety through pre-set first stage pressure reduction
- › High-performance regulator following specific needs of technical gas applications
- › Highly accurate via sensitive adjustment of second stage outlet.
- › Robust rubber gauge protection preventing damages and impurities
- › Compact, durable construction saving cost
- › Safety protected with integrated pressure relief valve for overpressure protection
- › Easy handling, ergonomic
- › Design according to ISO 5171& ISO 2503
- › Excellent pressure/flow characteristics.
- › Up to 300 bar cylinder pressure
- › European design and manufacture
- › Available with NEVOC connection

## TECHNICAL DATA

Gas	O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> , Ar, Air, CO <sub>2</sub>
Body	Brass forged
Bonnet	Zn/Al alloy Die Cast
Stems, nuts and fittings	Brass
Diaphragm	EPDM
Seat sealing	PA
Inlet/ Outlet connection	Gas specific connection
Maximal inlet pressure	25, 200, 300 bar
Outlet pressure	0-1,5 bar
	0-4 bar
	0-10 bar
	0-20 bar
Temperature range	From -20°C to 60°C
Weight	Approx. according to gas variant: 2,4 kg
Pressure relief valve	Used in all variants

## DIMENSIONS

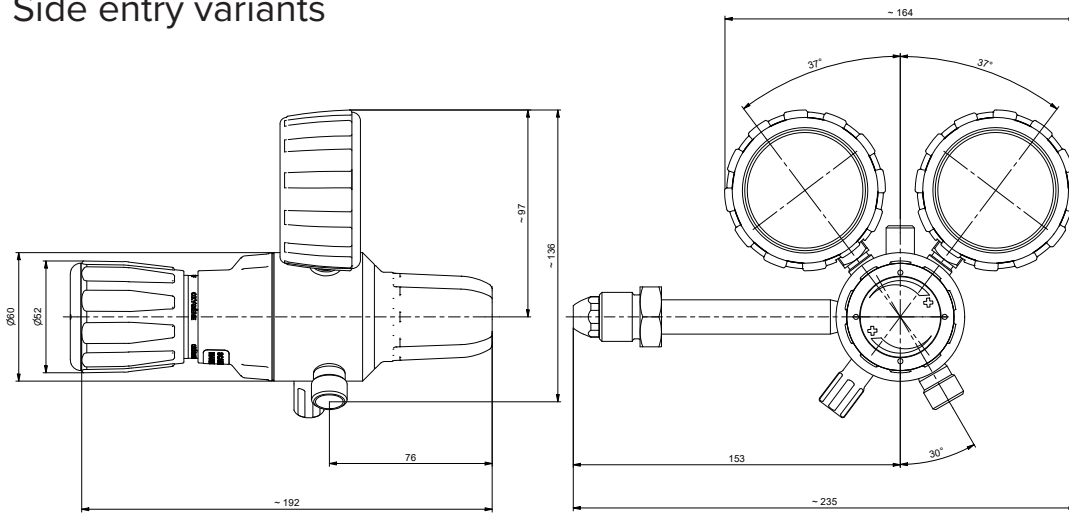
### Bottom entry variants





## DIMENSIONS

### Side entry variants



Conversion coefficient							
Test gas	Air	Oxygen	Nitrogen	Argon	Hydrogen	Helium	CO <sub>2</sub>
Air	1	0,950	1,02	0,851	3,81	2,695	0,808

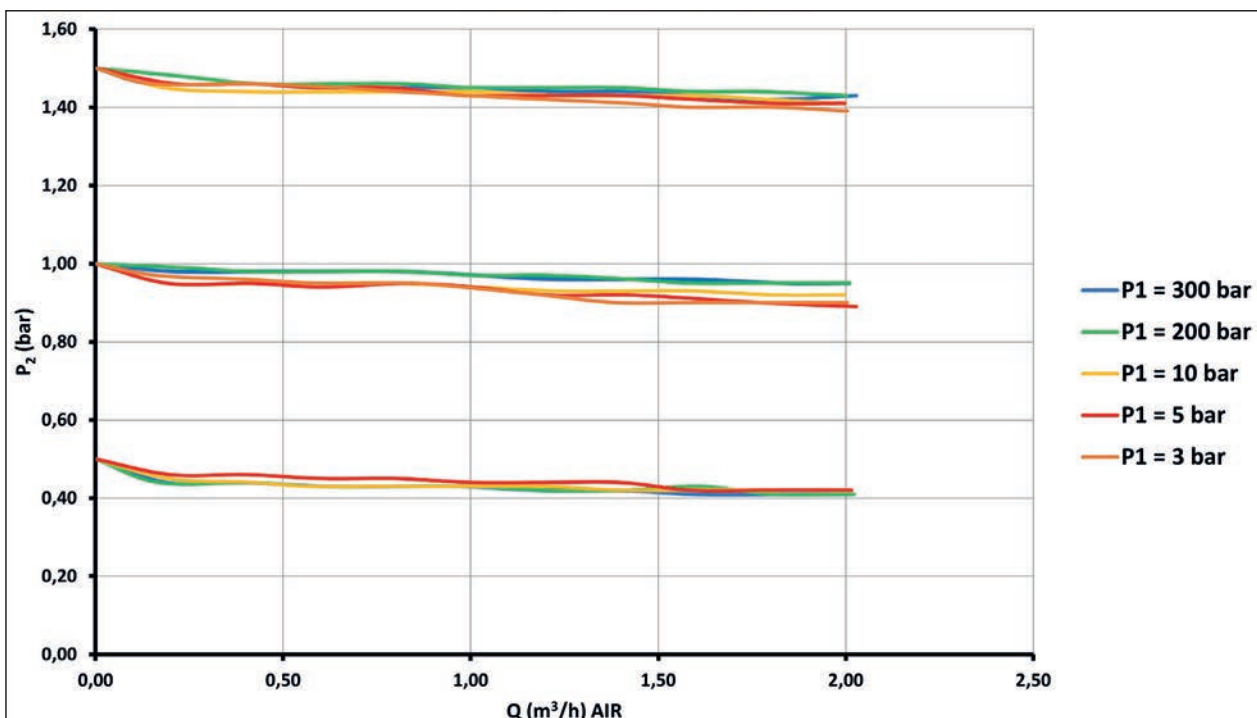
Flow of the gas (A)

$$A = Q * f$$

Q... Air Flow

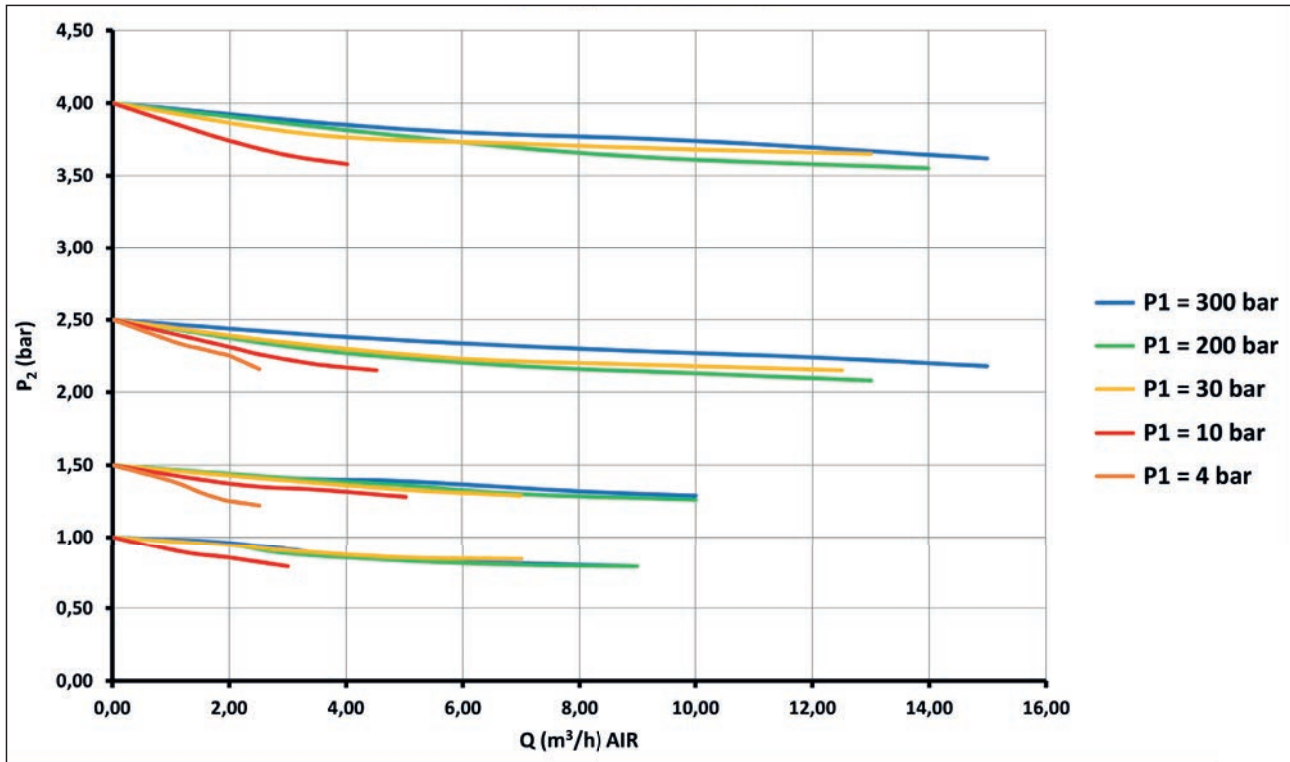
f... Conversion coefficient

### 300/1,5 bar

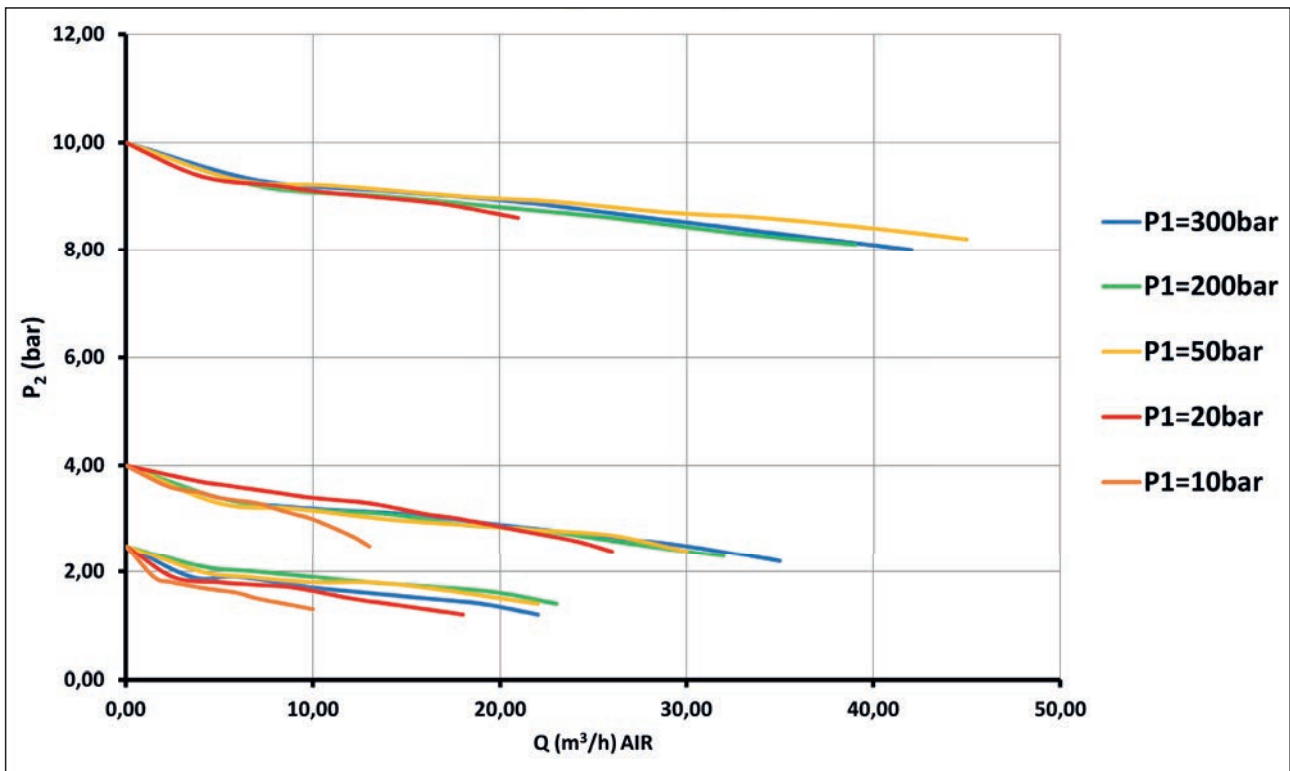


## FLOW CHARACTERISTICS

### 300/4 bar



### 300/10 bar



## PRODUCT ADVANTAGES

**Exact gas pressure measurement.** Easy reading of the gas parameters on a three-unit scale with a contrast pointer.

**Advanced Gauge Cover cap** giving an optimal protection from results of potentially rough handling and contributing to even better safety of the operation.



Each regulator stage is protected by **pressure relieve valve**.

**Encapsulated regulating valve technology**  
Stable gas outlet pressure and optimal flow performance for the gas application.

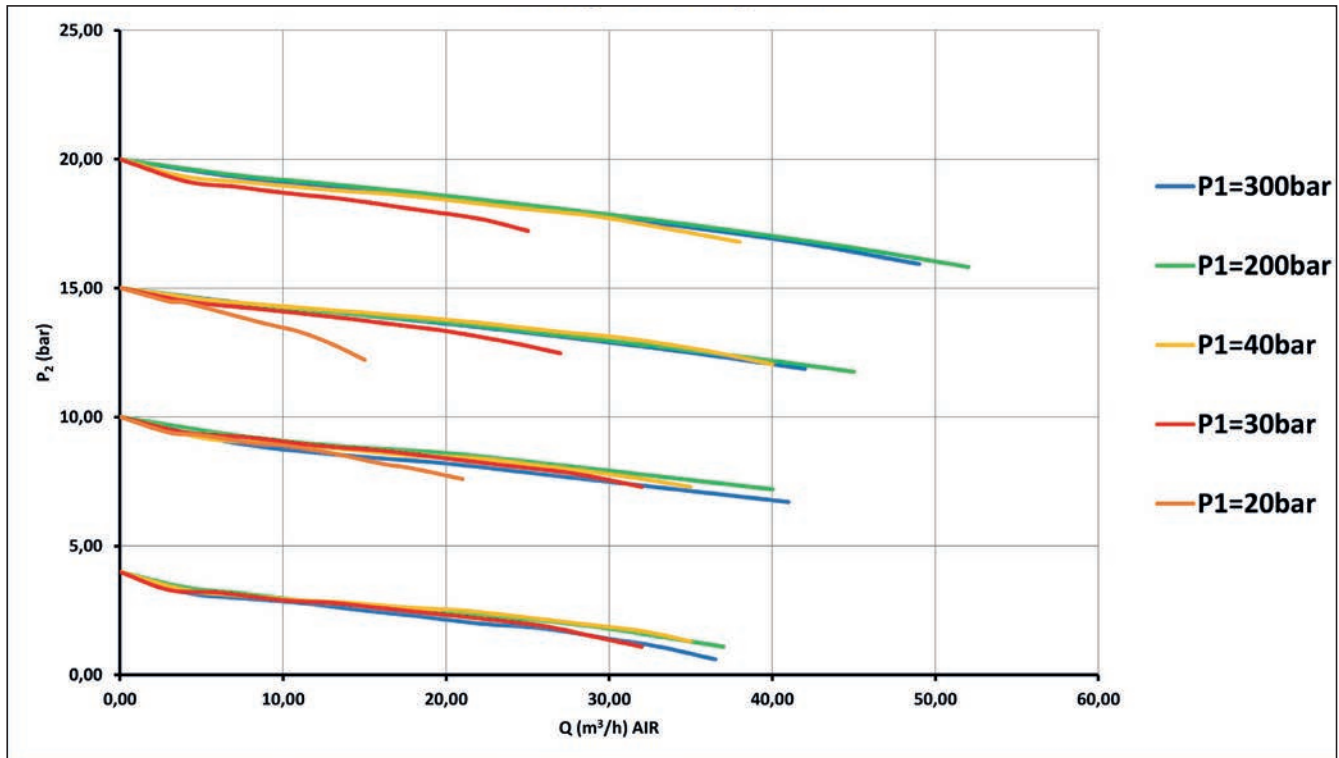
User friendly **Ergonomic Handwheel** for easy set-up.

## ORDERING INFORMATION

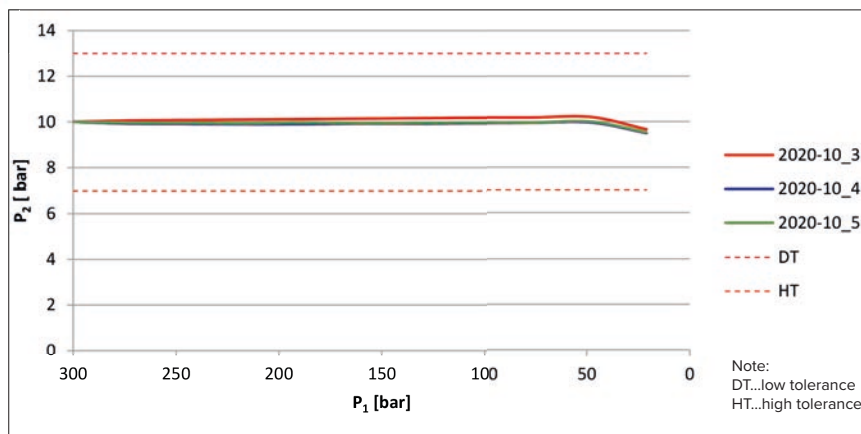
Art. Nr.	Gas	Inlet pressure	Outlet pressure	Inlet connection	Outlet connection	Inlet Postion
PS0762143	Acetylene	25 bar	1,5 bar	G5/8" LH	G3/8" LH	BE
PS0762196	Acetylene	25 bar	1,5 bar	G5/8" LH	G3/8" LH	SE
PSF21210011	Argon	300 bar	0 - 32 l/min	G5/8"	G3/8"	BE
PSF21200019	Argon	300 bar	0 - 32 l/min	W30x2	G3/8"	SE
PS0762153	Carbon dioxide	200 bar	10 bar	0.860 - 14 TPI	G3/8"	SE
PS0762197	Carbon dioxide	200 bar	4 bar	0.860 - 14 TPI	G3/8"	SE
PSF21200021	Helium	300 bar	10 bar	G5/8"	G3/8"	BE
PS0762151	Helium	300 bar	10 bar	G5/8"	G3/8"	SE
PS0762150	Helium	300 bar	4 bar	G5/8"	G3/8"	SE
PS0762149	Hydrogen	300 bar	10 bar	G5/8" LH	G3/8" LH	BE
PS0762148	Hydrogen	300 bar	4 bar	G5/8" LH	G3/8" LH	BE
PS0762147	Inert	300 bar	10 bar	G5/8"	G3/8"	BE
PS0762146	Inert	300 bar	4 bar	G5/8"	G3/8"	BE
PS0762181	Inert	300 bar	2 bar	G5/8"	G3/8"	BE
PSF21200015	Inert	300 bar	10 bar	G5/8"	G3/8"	SE
PSF21200016	Inert	300 bar	10 bar	W30 x 2	G3/8"	SE
PS0762182	Inert	300 bar	2 bar	G5/8"	G3/8"	SE
PS0762152	Nitrous oxide	100 bar	10 bar	W11/16" - 20 TPI	G3/8"	BE
PS0762145	Oxygen	300 bar	10 bar	G5/8"	G3/8"	BE
PS0762144	Oxygen	300 bar	4 bar	G3/8"	G3/8"	BE
PS0762199	Oxygen	300 bar	10 bar	G5/8"	G3/8"	SE
PSF21200012	Oxygen	300 bar	10 bar	W30 x 2	G3/8"	SE
PS0762198	Oxygen	300 bar	4 bar	G5/8"	G3/8"	SE

# FLOW CHARACTERISTICS

300/20 bar



## Irregularity curve







SPECIAL CYLINDER REGULATOR

# GCE ECOSAVER+

The ECOSAVER+ **keeps a constant level of gas pressure and flow** in the downstream system during the welding process. This prevents pressure and flow surges from being created in the system. Surges can cause gas waste and give rise to a poor weld.

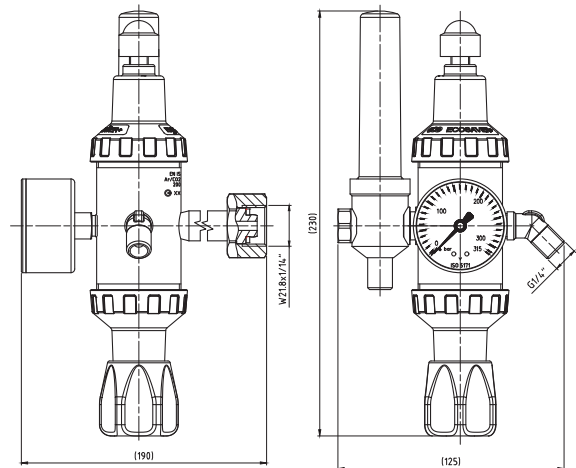
**Weld quality and gas consumption are optimised** when the ECOSAVER+ is used as part of the control system.



## GCE ECOSAVER+

### CHARACTERISTICS

- > Excellent stability of the outlet pressure
- > Ergonomic and robust design
- > Variants for all shielding gases
- > 300 bar inlet pressure variants available
- > In accordance with standards EN ISO 2503, ISO 5171
- > Precise scale of the gauge/flowmeter for simple recognition of the values
- > Regulation of the outlet pressure thanks to the robust encapsulated valve



### TECHNICAL DATA

Gas	Ar, Ar/CO <sub>2</sub> , Forming Gas	CO <sub>2</sub>
Body	Brass	
Bonnet	Zn/Al alloy Die Cast	
Stems, nuts and fittings	Brass	
Diaphragm	EPDM	
Seat sealing	PA/CR	
Inlet/ Outlet connection	Gas specific connection	
Maximal inlet pressure	200 or 300 bar	200 bar
Outlet pressure/ flow range	0-30 l/min 2 x 0 - 30 l/min	
Temperature range	From -20°C to 60°C	
Weight	Approx. according to gas variant: 2,2 kg	
Pressure relief valve	Used in all variants	

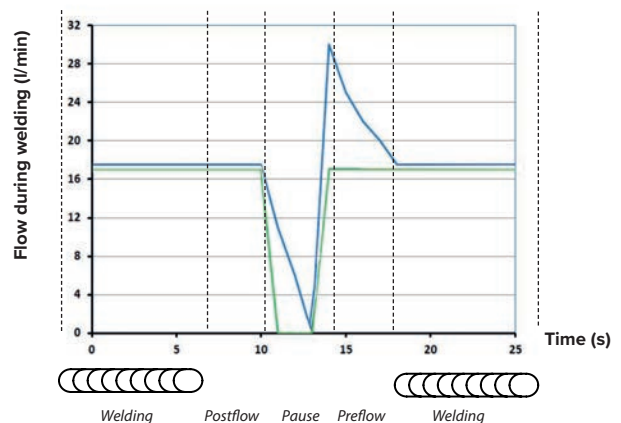
### THE BASIC PRINCIPLE OF GAS SAVING

An unwanted waste of gas can occur very often during welding operations .

If the gas flow is interrupted with a standard pressure regulator during the welding process, the outlet pressure in the connecting hose increases above the optimal level.

When the welding process starts again, the volume of the gas, higher than is really needed, surges through the system to the atmosphere.

**Ecosaver+ minimises** the amount of such **wasted gas** accumulated in the connecting hoses. Thanks to special technology, the optimal, predefined gas flow is delivered to the welding torch during the entire welding process.



- Common single stage cylinder regulator
- Ecosaver+

## GCE ECOSAVER+

### MAIN ADVANTAGES

- › Saved gas during the welding operation **of about 40 %\***
- › High accuracy due to the regulation of the flow
- › Continuous supply of the gas during the welding operation
- › Specially designed for shielding applications
- › Ideal for arc welding technology (MIG/MAG/TIG)
- › No pressure increase in the downstream equipment during work interruption
- › Easier setting
- › Less cylinder changing
- › Safer work
- › An investment which pays for itself in approximately four months depending on operating conditions
- › Ergonomic handwheel for perfect grip

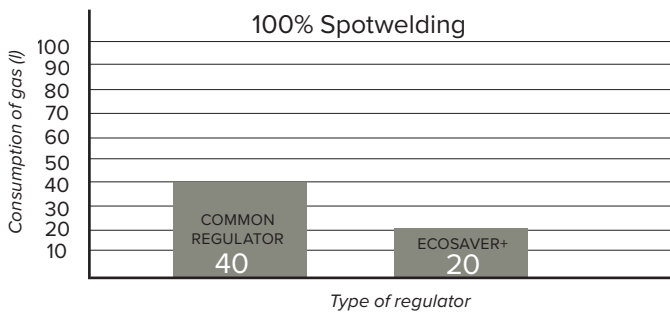
\*The 40% lower consumption of gas was validated by an independent test executed under following conditions: 600 welded 3 mm long joints ; Gas: Argon; Compared regulator Dincontrol Flow: 17l/min; Type of welding: MIG

The real amount of the saved gas depends on many factors. To demonstrate how the results differ with processes performed, we undertook various tests. To measure gas consumption, we used a digital counter flowmeter at the welding torch to ensure that the gas flow was the same for both outlet points, the one with Ecosaver+ and the other with common regulator.

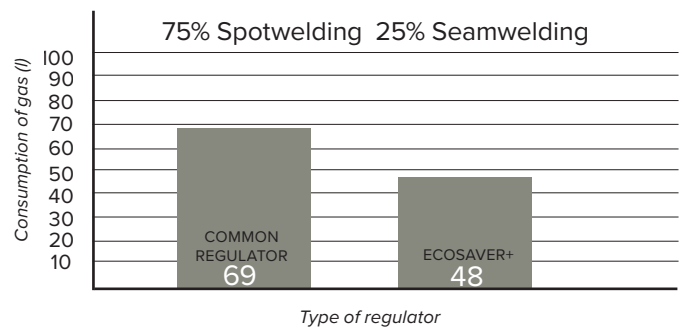
During the first test with spot welding operation with Ecosaver + a save of 50 % shielding gas was achieved compared to the same operation with a normal outlet point, as reported on the Graph 1.

During the second test with short welding operation with Ecosaver + was achieved a save of 31 % shielding gas compared to the same operation with a normal outlet point, as reported on the Graph 2.

Graph 1



Graph 2



**GCE ECOSAVER +**



**ECOSAVER +**



Art. Nr.	Type	Inlet Pressure	Outlet Flow	Inlet Connection	Outlet Connection
<b>F21710004</b>	Twin Flow	200 bar	2x30 l/min	W21.8x1/14"	G1/4"
<b>F21710005</b>	Outlet point	40 bar	30 l/min	G3/8"	G1/4"
<b>F21710006</b>	Regulator	200 bar	30 l/min	S21,7x1,14"	M12x1
<b>F21710007</b>	Regulator	300 bar	30 l/min	W30x2"	G1/4"
<b>F21410008</b>	Regulator	200 bar	30 l/min	W21.8x1/14"	G1/4"
<b>F21710010</b>	Regulator	200 bar	30 l/min	0,960"x14NGO	9/16"
<b>F21710011</b>	Regulator	200 bar	30 l/min	G5/8"	G3/8"
<b>F21710013</b>	Outlet point	40 bar	15 l/min	G3/8"	G1/4"
<b>F21710014</b>	Regulator	200 bar	15 l/min	W21.8x1/14"	G1/4"
<b>F21710015</b>	Regulator	200 bar	15 l/min	G3/4"	G1/4"



## OXY-FUEL CUTTING SYSTEMS

### RECOMMENDED MEDIUM DUTY CUTTING SYSTEM

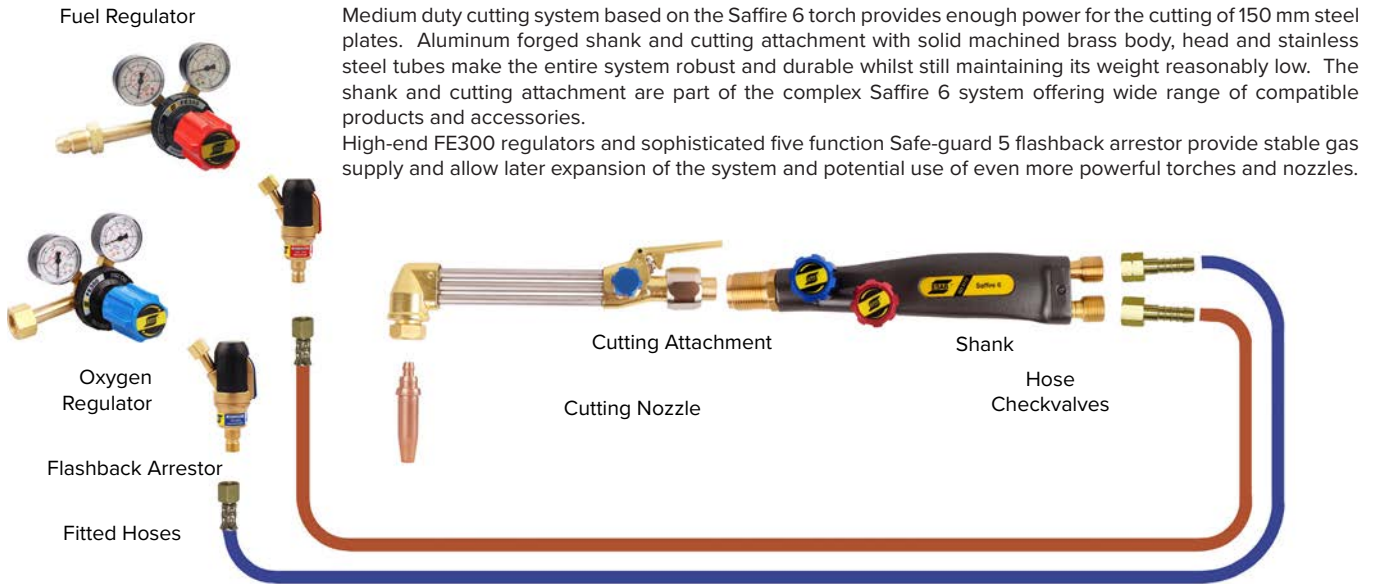


Plate thickness	Nozzle ACE	Nozzle PROP	Torch	Checkvalve	Hose	Flashback Arrestor	Regulators
3 - 6	0700016610N	0700016622N	F22280004 ESAB Saffire 6	0764759	Hose 6,3 × 13,3	0764456E Safe-guard 5 OXY G3/8"	FS0700017204 FE300 OXYGEN
5 - 12	0700016611N	0700016623N	Shank +	set: 2 pcs HCV, 1 pc nut G3/8"		+	+
10 - 75	0700016612N	0700016624N	F22280005 ESAB Saffire 6	+		0764457E Safe-guard 5 FUEL G3/8"	FS0700017210 FE300 ACETYLENE
70 - 100	0700016613N	0700016625N	Cutting Attachment	1 pc nut G3/8" LH		LH	

### RECOMMENDED HEAVY DUTY CUTTING SYSTEM



Plate thickness	Nozzle ACE	Nozzle PROP	Torch	Checkvalve	Hose	Flashback Arrestor	Regulators	
3 - 6	0700016610N	0700016622N	0700017396 - ST443 Cutting Torch 533 mm	0764760	Hose 8 × 15	0764456E Safe-guard 5 OXY G3/8" RH	PG0700017203 PROGEN OXYGEN	
5 - 12	0700016611N	0700016623N		set: 2 pcs HCV, 1 pc nut G3/8"		+	+	+
10 - 75	0700016612N	0700016624N		+		0764457E Safe-guard 5 FUEL G3/8" LH	PG0700017208 PROGEN ACETYLENE	
70 - 100	0700016613N	0700016625N		1 pc nut G3/8" LH				
90 - 150	0700016614N	0700016626N						
190 - 300	0700016615N	0700016627N						



## OXY-FUEL WELDING SYSTEMS

### RECOMMENDED LIGHT DUTY WELDING SYSTEM

The Saffire DH+ ORIGINAL welding set-up benefits from a lightweight aluminum shank and extremely precise copper welding tips. Its smaller dimensions and perfect balance make the Saffire DH+ set ideal for all applications where neat and accurate welding is required. FE300 Regulators recommended for this light-duty kit guarantee perfect pressure stability so important for accurate flame setting. Despite welding being a less risky operation than heavy duty cutting we still recommend protecting the system and more importantly the operator by the use of adequately selected flashback arrestors. A pair of 3 function Safe-guard 3 flashback arrestors keep the cost of the system to a reasonable level without any compromising of safety.



Plate thickness	Welding tip	Torch	Checkvalve	Hose	Flashback Arrestors	Regulators
1 - 8 mm	0700016670N	F22210012 - Shank ESAB SAFFIRE DH+	0764759 set: 2 pcs HCV, 1 pc nut G3/8"	Hose 6,3 × 13,3	0700016554 FRT OXY G3/8"	FS0700017204 FE300 OXYGEN
	0700016678N	+ 0700017247N - MIXER ESAB SAFFIRE DH+	+ 1 pc nut G3/8" LH		+ 0700016555 FRT FUEL G3/8"LH	+ FS0700017210 FE300 ACETYLENE

### RECOMMENDED HEAVY DUTY WELDING SYSTEM

Our heavy duty welding system built around the robust Saffire 6 shank presents a sturdy and reliable base for all general welding operations. On top of higher robustness and durability the major advantage of this system is a much bigger potential for future expansion into cutting and heating applications. The FE300 regulators and SRT arrestors are still a perfectly safe choice even for heavy duty welding. However, if you plan to use the same gas source for oxy-fuel cutting then it is recommended to use the FE300 regulators combined with Safe-guard 5 flashback arrestors.

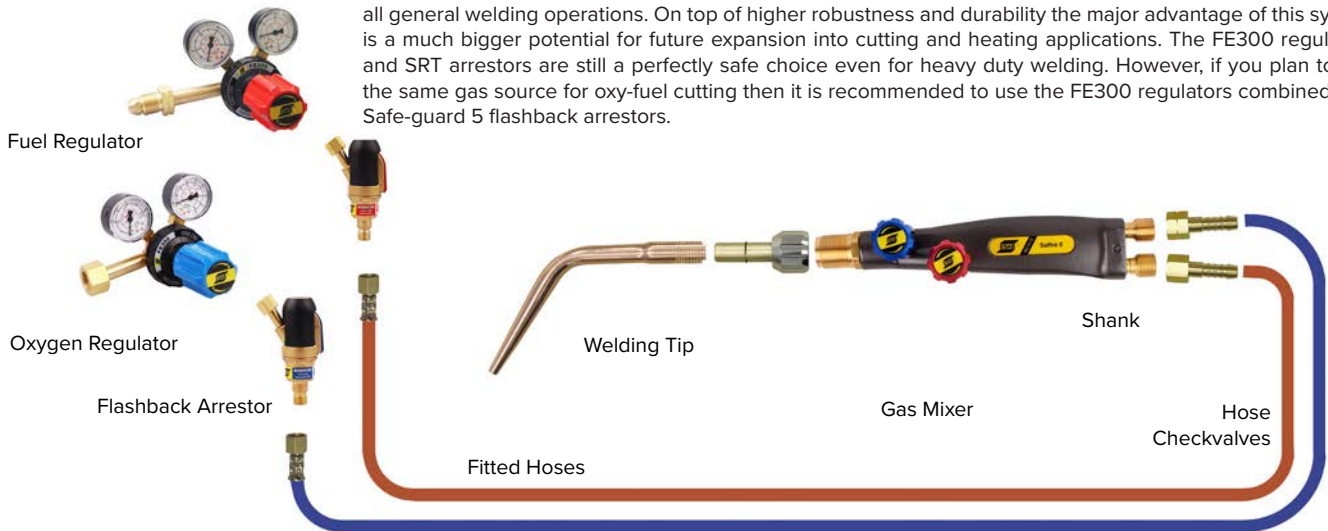


Plate thickness	Welding tip	Torch	Checkvalve	Hose	Flashback Arrestor	Regulators
1 - 8 mm	0700016660N	F22280004- Saffire 6 Shank	0764759 set: 2 pcs HCV, 1 pc nut G3/8"	Hose 6,3 × 13,3	0764456E Safe-guard 5 OXY G3/8" RH	FS0700017204 FE300 OXYGEN
	0700016668N		+ 1 pc nut G3/8" LH		+ 0764457E Safe-guard 5 FUEL G3/8" LH	+ FS0700017210 FE300 ACETYLENE

## OXY-FUEL HEATING SYSTEMS

The precise selection of the correct heating torch is always entirely dependent on the application you need to solve. It is important to know if you plan on brazing, straightening, surface treatment or other thermal treatment. It is always necessary to know the temperature level you need to reach and the speed of preheating.

If required to straighten a welded construction then a torch with a very concentrated flame is needed.

If required for preheating of metal (casting or forging) a completely different torch must be used to heat up the bigger component's surface.

To keep all heating torches working properly it is necessary to use high flow Safe-guard 5 FBA with powerful FE300 regulators. 8 mm hoses are a key factor in delivering enough gases for reliable performance.

Even proper equipment cannot guarantee reliable function if gas supply is not strong enough.

### ACETYLENE TORCHES

Max. acetylene supply from a 50-liter bottle = approximately 1 m<sup>3</sup>/h.

Reliable function of these torches is guaranteed only with supply from an acetylene bundle.

### PROPANE TORCHES

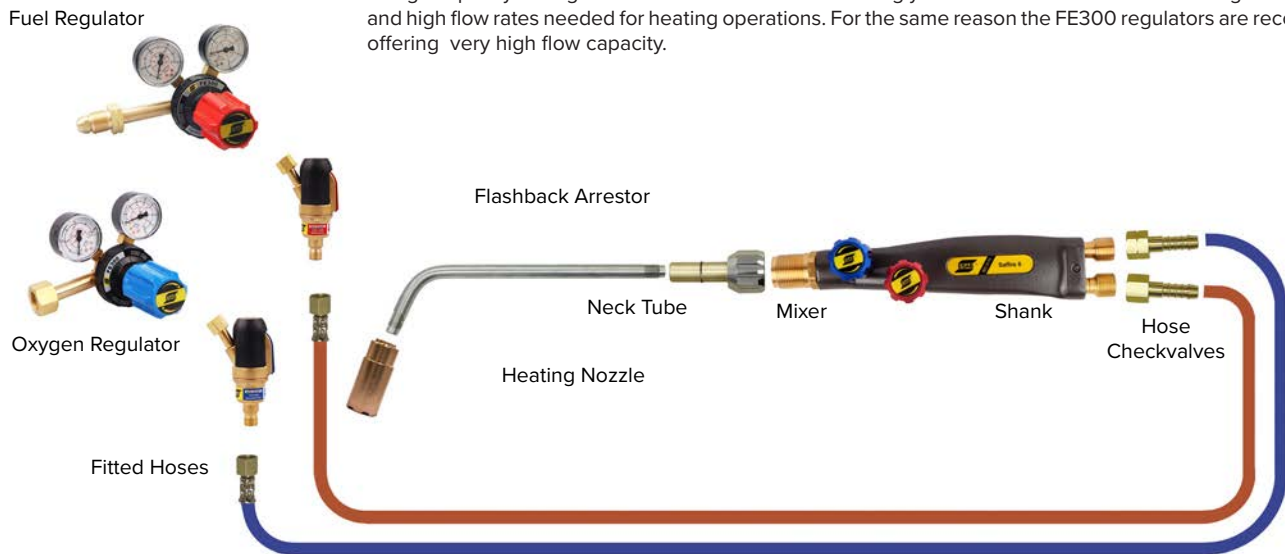
Max. propane supply from a 33-kg bottle = approximately 1,6 m<sup>3</sup>/h.

Reliable function of these torches is guaranteed only with supply from a propane bundle or tank.

See also page 27 for typical assemblies and other options for Welding/Cutting and Heating using MK3 equipment.

## RECOMMENDED HEATING SYSTEM

We recommend the Saffire 6- based heating system for heating, flame straightening, stress-relieving and other related flame applications. We offers a wide selection of specialized torches, burners and superheating heads compatible with standard Saffire 6 shank and gas mixer. Despite propane often being the gas of choice the use of high capacity Safe-guard 5 flashback arrestors is strongly recommended due to enormous gas consumption and high flow rates needed for heating operations. For the same reason the FE300 regulators are recommended offering very high flow capacity.



Nozzle	Torch	Checkvalve	Hose	Flashback Arrestors	Regulators
0700016641N	F22280004- Saffire6 Shank	0764760		0764456E	FS0700017204
0700016642N	+ F22990042 - Saffire 6 Mixer	set: 2 pcs HCV, 1 pc nut G3/8"	Hose 8 x 15	Safe-guard 5 OXY G3/8" RH	FE300 OXYGEN
0700016643N	+ 0700143884N Saffire 6 Neck Tube	+ 1 pc nut G3/8" LH		0764457E	FS0700017210
				Safe-guard 5 FUEL G3/8" LH	FE300 ACETYLENE

# GENERAL SAFETY PRECAUTIONS AND RECOMMENDED PROCEDURES

## RUBBER HOSE

Use only hose in good condition, fitted with special hose connections attached by permanent ferrules. Do not expose the hose to heat, traffic, slag and sparks from welding and cutting operations, oil or grease. Scrap it as soon as it becomes leaky. Good hose will re-pay the cost many times by long life, safe operation and elimination of waste through leaks.

## PRESSURE REGULATORS

Always treat a regulator as a precision instrument. Do not expose it to knocks, jars or violent pressure caused by the sudden opening of the cylinder valve. Release the pressure on the control spring when shutting down. Never use the regulator on any gas except for that for which it was designed do not use regulator with broken gauges. Never use oil or grease.

## BLOW PIPES / CUTTERS

For lighting up and extinguishing any type of blow pipe the maker's instructions should always be followed. To clean the nozzle, use the manufacturer's nozzle cleaner set.

## GOGGLES

Goggles should be worn at all times when welding and cutting.

## ASSEMBLY OF EQUIPMENT

1. Stand both both cylinders vertical. Oxygen cylinders are painted black. Acetylene are painted maroon, and propane cylinders are painted red.

2. See that joining surfaces in cylinder valves and regulators are free from oil and grease.

3. Open the valve on the oxygen cylinder momentarily in order to sniff the cylinder valve, dislodging dirt or obstructions, close valve.

4. Open a fuel gas cylinder valve as in item 3.

5. Check pressure rating on regulator is suitable for cylinder in use. Screw the oxygen regulator in to the oxygen cylinder valve. The cylinder valve and the regulator inlet stem, and the regulator outlet connection have a right hand screw thread.

6. Screw the fuel gas regulator in to the gas cylinder valve. The cylinder valve, the regulator inlet and the regulator outlet have left hand screw thread.

7. Tighten the regulator in to the cylinder valve Do not use excessive force, but make certain that the joints are gas tight.

8. Connect the hose to the screwed outlets of the regulator by means of screw connections secured in the ends of the hose.

Blow the hose through before attaching to regulator or to the blow pipe in order to remove dust or dirt, or chalk when the hose is new.

OXYGEN MUST NOT BE USED FOR THIS PURPOSE.

9. Connect the other ends of the hose, that fitted with a hose check valve; to the blow pipe, the fuel gas hose to the left hand connections, the oxygen hose to the right hand connection. Keep the blow pipe control valves closed.

10. Fit the appropriate sized nozzle to the blow pipe. To obtain best possible results from GCE BUTBRO blow pipes always use GCE BUTBRO precision nozzles.

## LIGHTNING UP PROCEDURE WELDING BLOW PIPES

11. Open the cylinder valve slowly by means of the cylinder key. Do not open suddenly or there may be serious damage to the regulator and the possibility of

an accident. Open the cylinder valve spindle one turn only. Open the fuel gas control valve on the blowpipe and adjust the regulator to give the correct working pressure (this ensures that any air or oxygen is purged from the hose). Repeat the above procedure for the oxygen side.

12A. Open the fuel gas control valve and light gas preferably by means of a GCE BUTBRO spark light making sure that the spark lighter is held at right angles to the nozzle.

12B. Reduce or increase the acetylene supply to the blow pipe valve until the flame just ceases to smoke.

12C. Slowly turn on the oxygen by the blow pipe control valve until the white inner cone in the flame is sharply defined with the merest trace of an acetylene haze. The blow pipe is now correctly adjusted for welding.

## CUTTING BLOW PIPES

A. Proceed with assembly of the equipment exactly as outlined for the welding equipment, but remember the following points.

B. After fitting the correct size cutting nozzle, open the cylinder valves and after purging both hoses set the working oxygen pressure on the regulator with the oxygen passing through the cutting oxygen valve on the cutter, hence out through the nozzle. Shut all the valves on the blow pipe, open the fuel gas valve slowly and ignite the gas. Open the heating oxygen valve on the cutter slowly, and adjust the flame to neutral. Now depress the cutting oxygen lever and again adjust the heating gas controls to give a neutral flame. Depress the cutting oxygen lever, and the cutter is ready for use. These instructions apply to the nozzle mix type cutters since these are of the most modern design.

C. When cutting with a combined welding/cutting torch, the oxygen valve on the shank should remain fully open and all adjustments to the oxygens stream made with the oxygen valve on the cutting attachment, as detailed in (B above).

## CLOSING DOWN PROCEDURE

### 13A WELDING EQUIPMENT

Turn off the acetylene first by the blow pipe control valve and then the oxygen. Close the cylinder valve. Open the blow pipe valves one at a time to release the pressure in the hose, i.e. open the oxygen valve and close it; open the fuel gas valve and close it. Unscrew the pressure regulating screws on the oxygen and acetylene regulators.

### 13B. CUTTING BLOW PIPES

On completion of the work, close the oxygen cutting valve, then the fuel gas and heating oxygen valves. Close the cylinder valves, open and close the cutter, oxygen and fuel gas valves one at a time to release pressure in the hose, unscrew the pressure regulating screws on the oxygen and acetylene regulators.

14. It is most important to emphasise the earlier instructions, that prior to re-lighting either the welding blow pipe or the cutter, the hoses must be purged to ensure a pure and adequate supply of oxygen/fuel gas. Back-fires may occur by one of a combination of circumstances, e.g. defective equipment, incorrect gas pressures, incorrect lighting-up procedure or careless handling of the blow pipe in use, such as permitting the nozzle to touch the work, overheating the tip of the nozzle, or working with a loose nozzle. Usually the back-fire is arrested at the injector in case of low pressure equipment or the source where the gases are mixed, e.g. the head of the cutting blowpipe, and if prompt action is taken in turning off first the oxygen, and then the blowpipe may be re-lit as soon as the cause of the trouble has been eliminated.

In some cases, however, a back-fire may pass beyond the torch and go back into either the oxygen or the fuel gas hoses; it is then termed a 'flash-back' and its

effect is more serious in that it may result in immediate damage to hoses and regulators. In extreme cases there is also a possibility of injury to the operator. The outward signs of flash-back may be squealing or hissing noise, sparks coming out of the nozzle; heavy black smoke; or the blowpipe handle may get hot. If the flame burns back far enough it may even burst through the hose.

Both blow-backs and flash-backs can be avoided by adherence to recommended procedure in the case of

equipment. Investigation shows that such occurrences often occur purely through overfamiliarity leading eventually to neglect of ordinary safeguards.

For example, the blowpipe settings, or a light being applied before the flow of fuel gas is properly established.

IF THE FLAME SNAPS OUT WHEN THE BLOW PIPE IS IN USE IT IS BECAUSE:

A. The regulator pressure, and/or gas flow, are incorrect - either too high or too low.

B. The nozzle has been obstructed.

C. The nozzle is held too close to the work.

D. The nozzle has become overheated.

When this happens completely shut both the blowpipe valves, check the regulator setting, cylinder pressures, and re-light in accordance with the procedure. In the case of 'D', close the acetylene valve, reduce oxygen flow to a trickle, and plunge the nozzle and head into cold water.

## HOSE CHECK VALVES

The hose check valve is a safeguard which will operate independently and without attention from the operator. The device is essentially a non-return valve, the purpose of which is to prevent back feeding or the reverse flow of gases. It must in all cases be fitted to the inlet connections of the blowpipe.

## FLASHBACK ARRESTORS

The ESAB flashback arrestor is a device to be fitted in the system to protect the upstream equipment. ESAB flashback arrestors can be mounted to regulators, in line or to torches depending on the application. The flashback arrestor will contain between 1 and 5 features, depending on its specification.

FA Sintered flame arresting element to put out the flame.

NV Non return valve to prevent the reverse flow of gases.

PV Pressure trip device to temporarily shut off gas supply. The device can be reset after the problem is corrected.

TV Thermal trip device - to permanently shut off gas supply in the case of overheating.

SI Status indicator shows if the unit is ready for use.

# WELDING, CUTTING & HEATING DATA

## WELDING - SAFFIRE DH+ & SAFFIRE 6 TORCHES

Mid Steel Tk'ness mm in	Nozzle size	Operating pressure				Gas consumption				
		Acetylene		Oxygen		Acetylene		Oxygen		
		bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	
0,9	20	1	0,14	2	0,14	2	28	1	28	1
1,2	18	2	0,14	2	0,14	2	57	1	57	2
2	14	3	0,14	2	0,14	2	86	3	86	3
2,6	12	5	0,14	2	0,14	2	140	5	140	5
3,2	1/8 10	7	0,14	2	0,14	2	200	7	200	7
4	5/32 8	10	0,21	3	0,21	3	280	10	280	10
5	3/16 6	13	0,28	4	0,28	4	370	13	370	13
6,5	1/4 3	18	0,28	4	0,28	4	520	18	520	18
8,2	5/16 0	25	0,42	6	0,42	6	710	25	710	25
10	3/8 4/0	35	0,63	9	0,63	9	1000	35	1000	35
13	1/2 7/0	45	0,35	5	0,35	5	1300	45	1300	45
25	1+	90	0,63	9	0,63	9	2500	90	2500	90

## FLAME CLEANING - SAFFIRE 6 TORCHES

Acetylene fuel gas Nozzle Type	Fuel gas pressure		Oxygen pressure		Fuel gas consum.		Oxygen consum.	
	bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h
50 mm flat	0,49	7	0,57	8	1050	37	1200	41
100 mm flat	0,7	10	0,7	10	2000	70	2200	78
150 mm flat	0,85	12	0,85	12	2700	94	3000	104

## SUPER HEATING - PROPANE

### - SAFFIRE 6 & SUPER HEATING TORCHES

The flame size and heat output of these nozzles varies considerable with the pressure settings used. Two typical alternatives are given for each size of nozzle.

Nozzle Type	Propane pres.		Oxygen pres.		Propane cons.		Oxygen cons.		Heat output (app.)	
	bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	W	Btu/h
1H	0,14	2	0,7	10	830	29	350	121	244800	72000
	0,49	7	2,1	30	1900	65	7300	255	554200	163000
2H	0,21	3	1,1	15	1200	41	4800	168	348800	102000
	0,46	8	2,5	35	2100	75	8700	304	639200	188000
3H	0,28	4	1,8	25	2100	75	8300	290	622200	183000
	1,1	15	5,0	70	4100	144	16500	575	1227400	361000
4H	0,35	5	2,5	35	2700	94	10600	370	802400	236000
	1,3	18	5,7	80	4800	162	18800	650	1380400	406000
5H	0,85	12	3,5	50	3200	112	12700	444	955400	281000
	2,1	30	8,7	125	7000	246	28000	964	2101200	618000

## HEATING - ACETYLENE - SAFFIRE 6 TORCH (AHT NOZZLES)

Nozzle Type	Acetylene pres.		Oxygen pres.		Acetylene cons.		Oxygen cons.		Heat output (app.)	
	bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	W	Btu/h
A-HT25	0,14	2	0,7	10	830	29	350	121	176800	57000
A-HT50	0,49	7	2,1	30	1900	65	7300	255	309400	91000
A-HT100	2,1	30	8,7	125	7000	246	28000	964	472600	139000

## CUTTING - ACETYLENE - SAFFIRE DH+ TORCH

Material	Tk'ness mm in	Nozzle size	Operating pressure				Gas consumption				Approx. Cutting Speeds			
			Oxygen		Acetylene		Cutting Ox		Heating Ox		Acetylene			
			bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	mm/m	in/m
3	1/8	S/M	2,1	30	0,3	4	650	30	120	4,5	220	8	110	4
6	1/4	1/32	2,1	30	0,15	2	710	25	255	9	255	8	255	8
20	3/4	3/64	2,1	30	0,15	2	1415	50	255	9	225	8	225	8
25	1	1/16	3,8	55	0,15	2	3400	120	255	9	225	8	225	8
50	2	1/16	5,3	75	0,20	3	4530	60	310	11	285	10	285	10

## CUTTING - ACETYLENE - SAFFIRE 6 & ST443 CUTTERS (ANM NOZZLES)

Material	Tk'ness mm in	Nozzle size	Operating pressure				Gas consumption				Approx. Cutting Speeds			
			Oxygen		Acetylene		Cutting Ox		Heating Ox		Acetylene			
			bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	mm/m	in/m
Sheet		ASNM	1,5	20	0,14	2	800	28	85	3	85	3	-	-
6	1/4	1/32	1,8	25	0,14	2	800	28	480	15	400	14	510	20
13	1/2	3/64	2,1	30	0,21	3	1900	67	570	20	510	18	480	19
25	1	1/16	2,8	40	0,14	2	4000	140	540	19	470	17	400	16
50	2	1/16	3,2/3,5	45/50	0,14	2	4500	160	620	22	560	19	300	12
75	3	1/16	3,5/4,2	50/60	0,14	2	4800	170	680	24	620	22	205	8
100	4	5/64	3,2/4,8	45/70	0,14	2	6800	240	850	30	790	27	150	6
150	6	3/32	3,2/5,5	45/80	0,21	3	9400	330	960	34	850	30	125	5
200	8	1/8	4,2	60	0,28	4	14800	510	1380	48	1250	44	100	4
250	10	1/8	5,3	75	0,28	4	31500	760	1560	55	1420	50	75	3
300	12	1/8	6,3	90	0,28	4	25000	880	1560	55	1420	50	50	2

## GOUGING - SAFFIRE 6 & ST443 CUTTERS (AGNM NOZZLES)

Material	Tk'ness mm in	Nozzle size	Operating pressure				Gas consumption				Approx. Cutting Speeds			
			Oxygen		Acetylene		Cutting Ox		Heating Ox		Acetylene			
			bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	mm/m	in/m
8	5/16	13	4,0	60	0,5	7	3680	130	990	35	905	32	610	24
11	7/16	19	5,0	75	0,5	7	9340	330	1870	66	1700	60	1970	42
12	1/2	25	5,5	85	0,55	8	16270	575	2290	81	2100	74	1220	48

## CUTTING - PROPANE - SAFFIRE 6 & ST443 CUTTERS (PNM NOZZLES)

Material	Tk'ness mm in	Nozzle size	Operating pressure				Gas consumption				Approx. Cutting Speeds			
			Oxygen		Propane		Cutting Ox		Heating Ox		Propane			
			bar	PSI	bar	PSI	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	l/h	ft <sup>3</sup> /h	mm/m	in/m
6	1/4	1/32	2,1	30	0,2	3	1000	36	1300	48	300	12	430	17
13	1/2	3/64	2,1	30	0,2	3	1800	65	1600	57	300	14	360	14
25	1	1/16	2,8	40	0,2	3	3000	140	1700	62	400	15	280	11
50	2	1/16	3,2	45	0,3	4	4500	160	1800	66	400	16	205	8
75	3	1/16	3,5	50	0,3	4	4800	170	2000	73	500	18	205	8
100	4	5/64	3,5	50	0,3	4	7300	260	2600	93	600	23	152	6
150	6	3/32	4,2	60	0,4	6	12300	435	3300	120	800	30	125	5
250	10	1/8	5,6	80	0,6	8	22300	790	4600	165	1100	42	50	2
300	12	1/8	6,7	95	0,8	8	26300	930	5900	210	1400	50	50	2

1. Data is for guidance only and may vary with operating conditions, materials etc.
2. Gas pressures are shown in BAR- 1 bar - 1 kg cm<sup>2</sup> 1 PSI - 0,069 bar.
3. Gas consumption in LITRES PER HOUR (l/h).





## REGIONAL OFFICES

### EUROPE

---

CZECH REPUBLIC  
FRANCE  
GERMANY  
HUNGARY  
ITALY  
POLAND  
PORTUGAL  
ROMANIA  
SPAIN  
SWEDEN  
UNITED KINGDOM & IRELAND

### AMERICA

---

LATIN AMERICA  
MEXICO  
USA

### ASIA

---

CHINA  
INDIA  
RUSSIA  
UAE

YOUR DISTRIBUTOR:

visit: [www.gcegroup.com](http://www.gcegroup.com)



Gas Control Equipment

GCE Ltd. , 100 Empress Park, Penny Lane, Haydock, St Helens, WA11 9DB, UK  
Phone: +44 (0)1942 29 29 50  
Fax: +44 (0)1942 29 29 77  
[sales.gb@gcegroup.com](mailto:sales.gb@gcegroup.com)  
[www.gcegroup.com](http://www.gcegroup.com)

Art.Nr. CATCWTESABUK2023. Alterations are subject to change without notice. 16012023md®GCE2023