

# Product catalogue.

Gas welding, gas cutting, soldering and heating.



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# Introduction.

Equipment and accessories for cutting, welding, heating and soldering from AGA.

AGA develops, produces, sells and distributes gases, system solutions, gas engineering systems, equipment and services that produce a long-term collaboration that is beneficial for both parties.

AGA is part of The Linde Group, one of the world's leading suppliers of industrial gases and medical gases. The Nordic market is AGA's home market, and we are also the market leader here.

AGA's local links ensure long-term gas supplies and a high level of service regarding both gas-related equipment as well as expertise and knowledge.

This catalogue presents the equipment that AGA sells and markets within the welding and cutting segment. The range is largely the same for all the Nordic countries. The products in the range are intended for welding, soldering and cutting methods, as well as related processes where work is carried out using fuel gases, oxygen or air.

The catalogue is intended to be used as a basis when placing orders. It can also provide support in the form of information for dealers or end users.

# You can purchase AGA's products here.

## General information

AGA has customer service offices/order reception in all Nordic countries. See addresses and telephone numbers on the back page.

### For further information, visit our websites:

Denmark	<a href="http://www.aga.dk">www.aga.dk</a>
Estonia	<a href="http://www.aga.ee">www.aga.ee</a>
Finland	<a href="http://www.aga.fi">www.aga.fi</a>
Iceland	<a href="http://www.aga.is">www.aga.is</a>
Latvia	<a href="http://www.aga.lv">www.aga.lv</a>
Lithuania	<a href="http://www.aga.lt">www.aga.lt</a>
Norway	<a href="http://www.aga.no">www.aga.no</a>
Sweden	<a href="http://www.aga.se">www.aga.se</a>

AGA also has dealers throughout the Nordic region. They normally deliver immediately from their own stock.

### Quality system

AGA is ISO 9001 certified for our work with sales, distribution and the manufacture of industrial and medical gases, as well as associated equipment. This means, for example, that all of our products and services must be of sufficient quality that our customers' needs and the requirements of the authorities are satisfied.

### Environmental policy

AGA is certified in accordance with ISO 14001. AGA's objective is to lead the way in the field of industrial gas engineering for a better environment, for example by using gas engineering as a basis for helping our customers to introduce new, improved technologies that relieve the load on the environment.

### Miscellaneous

It is important for purchasers/users to keep up-to-date as regards which safety regulations apply to the use and transport of equipment and gases.

AGA is not responsible for any personal injury and/or damage to property that may arise during the use of products contained in the catalogue or in conjunction with work processes.

The version, design and function of the products may, as a result of product development and new requirements from the authorities, differ from the information presented in this catalogue. AGA reserves the right to make amendments in its product range. Local deviations may occur.

## New online service

You can now find information and order equipment and accessories for welding & cutting in a simple, flexible manner on the Internet. You still have the option of calling and speaking directly to our Customer Services regarding equipment or to place an order. Our goal is for your contacts with us to be as simple as possible, and for there to be several ways to contact us to obtain information or place orders.

- Ordering online
- Product catalogue online
- Templates for your orders
- Order history
- Information from AGA
- Campaign offers
- Telephone support

### How to proceed

- **Contact the Equipment Group at Customer Services to obtain a username and password**
- Go into [www.aga.se/utrustning](http://www.aga.se/utrustning)
- Click on "Utrustning online"
- Log in with your username and password
- Select a product from the menu to the left, or use the search function
- To place your order, specify the quantity and then click on the shopping trolley
- Fill in the delivery information
- Check your order and submit
- Your order will be confirmed by e-mail

### Good overview

When you have placed an order, you can save it as a template that you can use to place future orders. You gain a good overview of your order history, as all orders are saved in a separate compilation.

### Updated information and campaign offers

Through our new service, you always have access to up-to-date information. You will receive campaign offers, updated information and always have the potential to use the message function for your contacts with us. You will also find information about use and safety.

We are here for you

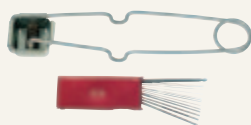
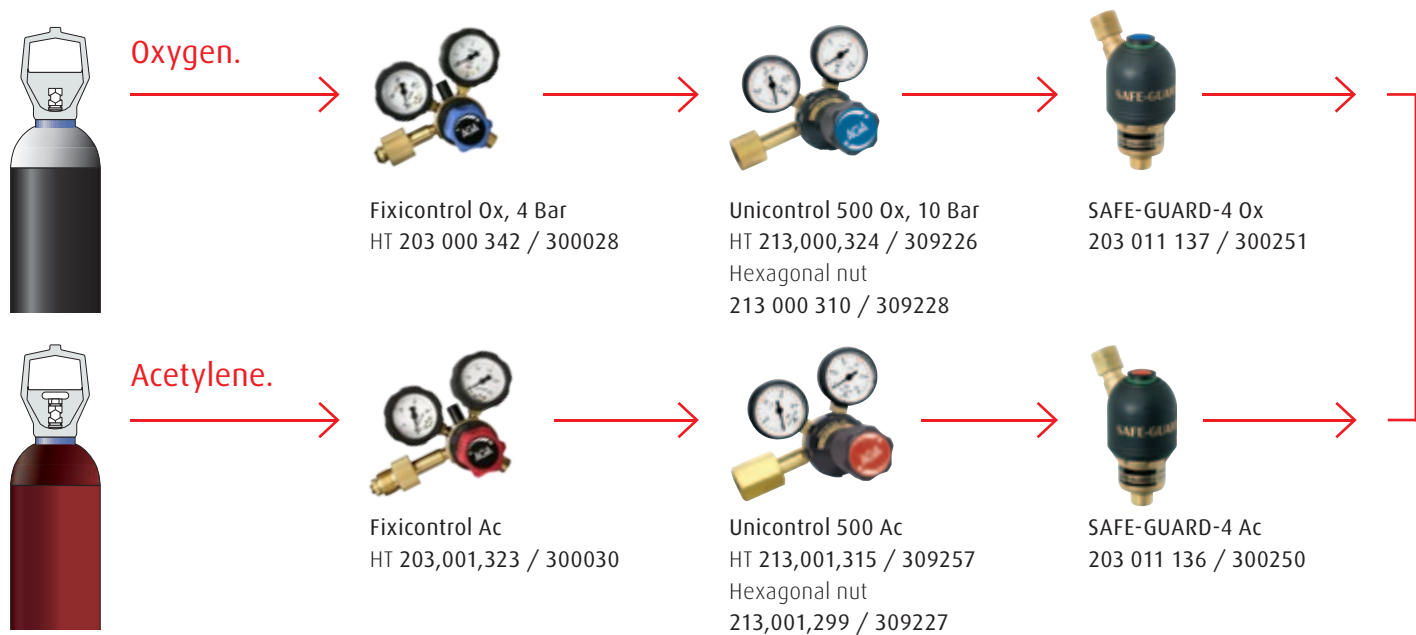
We have made it easy for you to obtain up-to-date information and to place orders. Contact either the Equipment Group at Customer Services for personal support, tel. 08-7069588, or utilise our new service on the Internet, [www.aga.se/utrustning](http://www.aga.se/utrustning). Select the way that best suits your needs!







## X 11 – overview.



### Accessories

Gas lighter	217 190 014 / 300895
Cleaning needle	214 100 004 / 305435
Gas saver GS 10	203 010 393 / 300838



### Multiple flame heating inserts, acetylene

I/h	
500	214 100 318 / 300357
800	214 100 319 / 300359
1000	214 100 320 / 300448
Multiple flame heating inserts, propane	
90	214 100 435 / 300410
1000	202 232 126 / 300351



### Accessories

Circle-cutting support for hole diameters Ø 60 – 600 mm	202 130 258 / 300419
Cutting support, graduated	214 100 003 / 300414
Support for hole-cutting insert, hole diameters Ø 20 – 60 mm	214 100 327 / 300406



### Cutting nozzle HP 433 Propane

	mm	
HP 433 – 1	1 – 3	214 100 330 / 300327
HP 433 – 2	3 – 8	214 100 331 / 300328
HP 433 – 3	8 – 20	214 100 332 / 300330
HP 433 – 4	20 – 50	214 100 333 / 300333



Twin hose 5 m, Ø 5.0 mm with  
compression couplings  
and non-return valves  
214 100 472 / 307680



BV 12 G ¼" Non-return valves  
Ø 5.0 mm  
214 100 066 / 300386

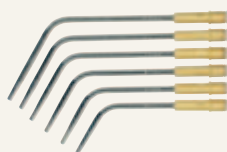


X 11 Handle  
202 100 278 / 300449



Flexible welding inserts

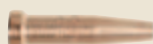
l/h	mm	
80	0,5 - 1,0	214 100 312 / 300409
160	1,0 - 2,0	214 100 313 / 300422
315	2,0 - 4,0	214 100 314 / 300424
500	4,0 - 6,0	214 100 315 / 300435
800	6,0 - 9,0	214 100 316 / 300434
Flexible welding inserts with hard tip		
160	1,0 - 2,0	329614
315	2,0 - 4,0	329615
500	4,0 - 6,0	329616



Welding inserts

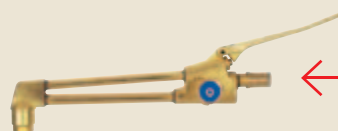
l/h	mm	
40	0,2 - 0,5	214 100 422 / 300388
80	0,5 - 1,0	214 100 423 / 300390
160	1,0 - 2,0	214 100 424 / 300392
230	1,5 - 3,0	214 100 425 / 300402
315	2,0 - 4,0	214 100 426 / 300394
400	3,5 - 5,0	214 100 427 / 300368
500	4,0 - 6,0	214 100 428 / 300396
650	5,0 - 7,0	214 100 429 / 300391
800	6,0 - 9,0	214 100 430 / 300398
1000	8,0 - 12,0	214 100 431 / 300400
1250	9,0 - 14,0	214 100 432 / 300436

Welding



Cutting nozzle  
HA 411 acetylene

	mm	
HA 411 - 1	1 - 3	214 100 330 / 300327
HA 411 - 2	3 - 8	214 100 331 / 300328
HA 411 - 3	8 - 20	214 100 332 / 300330
HA 411 - 4	20 - 50	214 100 333 / 300333
HA 411 - 5	50 - 100	214 100 334 / 300335



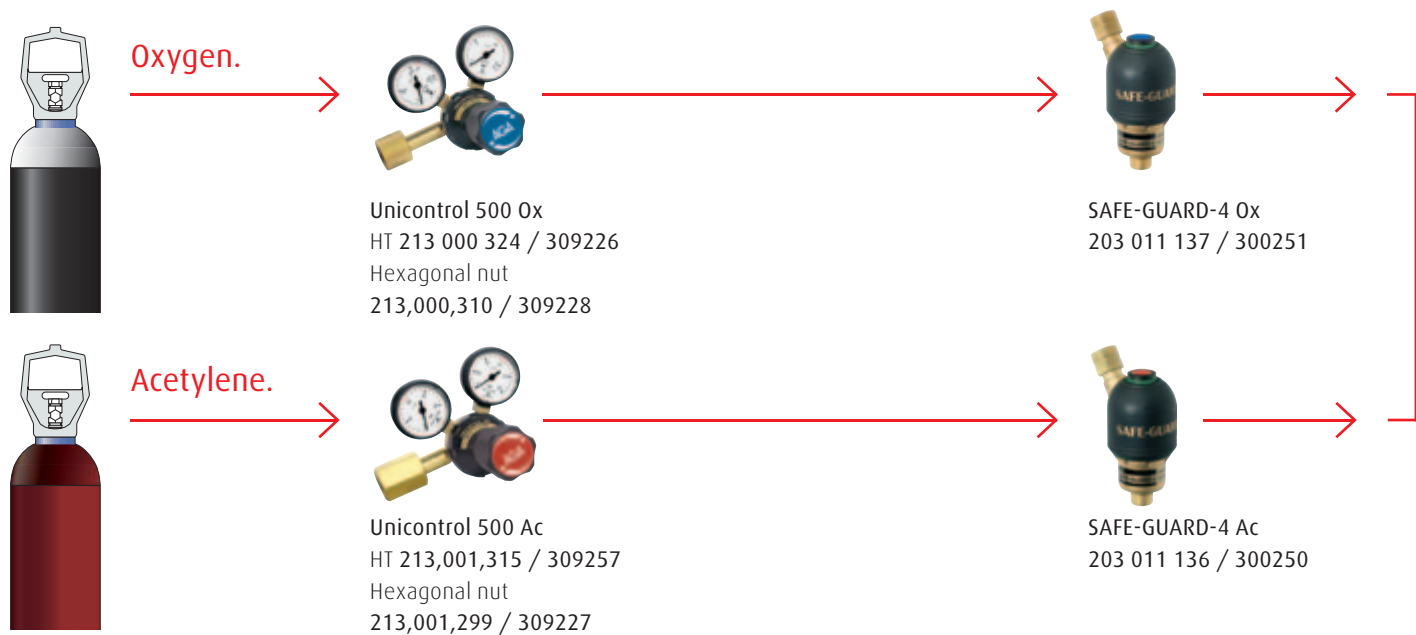
Cutting inserts

90° Ac lever	202 235 151 / 300374
90° Ac wheel valve	202 235 152 / 300355
90° Pr lever	202 235 121 / 300373





## X 21 – overview.



**Multiple flame heating insert – propane**

l/h	
1000	202 232 217 / 300494
2000	202 232 218 / 300493
4000	202 232 219 / 300491
7000	202 232 220 / 300489



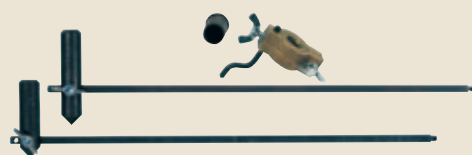
**Multiple flame heating inserts – acetylene**

l/h	
1000	202 232 210 / 300545
2500	202 232 211 / 300543
5000	202 232 212 / 300541



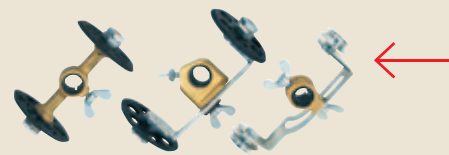
**Single flame heating inserts – acetylene**

l/h	
180	202 231 333 / 300542
250	202 231 334 / 300525
500	219 100 228 / 300547



**Accessories**

Double cutting support, adjustable with small wheels	219 100 294 / 300576
Double cutting support with large wheels	219 100 295 / 300584
Double cutting support, adjustable with large wheels and graduation	219 100 296 / 300510
Cutting support with centre holder for large wheels	219 100 280 / 300575
Cutting support with centre holder for small wheels	219 100 297 / 300564
Support for hole-cutting insert 0° (wheel diameter Ø 20 – 100 mm)	202 130 143 / 300568
Spacer sleeve	219 100 509 / 300572



**Cutting nozzle**

**COOLEX® P 311 Propane**

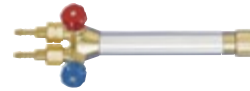
	mm	
P 331 - 1	1 – 3	214 100 444 / 300675
P 331 - 2	3 – 10	214 100 445 / 300676
P 331 - 3	10 – 25	214 100 446 / 300668
P 331 - 4	25 – 50	214 100 447 / 300674
P 331 - 5	50 – 100	214 100 448 / 300671
P 331 - 6	100 – 200	214 100 449 / 300670
P 331 - 7	200 – 300	214 100 450 / 300669
P 331 - 8	300 – 500	214 100 451 / 300672



Twin hose 10 m  
with hose couplings  
Ø 6.3 mm  
214 100 474 / 305034



BV 12 G  $\frac{3}{8}$ " Non-return valves  
Ø 6.3 x 6.3 mm  
214 100 068 / 300522  
Ø 8.0 x 8.0 mm  
214 100 069 / 300521



X 21 Handle  
Round  
219 100 271 / 300527  
Oval  
219 100 273 / 308544



#### Flexible welding inserts

l/h	mm	
80	< 1,0	214 100 167 / 300602
160	1,0 - 2,0	214 100 168 / 300583
315	2,0 - 4,0	214 100 169 / 300600
500	4,0 - 6,0	214 100 170 / 300599



#### Welding inserts

l/h	mm	
40	0,2 - 0,5	214 100 156 / 300578
80	0,5 - 1,0	214 100 157 / 300582
160	1,0 - 2,0	214 100 158 / 300596
230	2,0 - 3,0	214 100 159 / 300605
315	2,0 - 4,0	214 100 160 / 300604
400	3,5 - 5,0	214 100 161 / 300603
500	4,0 - 6,0	214 100 162 / 300590
650	5,0 - 7,0	214 100 163 / 300594
800	6,0 - 9,0	214 100 164 / 300470
1000	7,0 - 10,0	214 100 165 / 300459
1250	9,0 - 14,0	214 100 166 / 300460

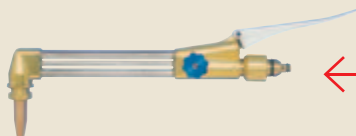
### Welding



#### Cutting nozzle

#### HA 311 Acetylene

	mm	
HA 311 - 1	1 - 3	219 100 340 / 305847
HA 311 - 2	3 - 10	219 100 341 / 305853
HA 311 - 3	10 - 25	219 100 342 / 305849
HA 311 - 4	25 - 50	219 100 343 / 305852
HA 311 - 5	50 - 100	219 100 344 / 305834
HA 311 - 6	100 - 200	219 100 345 / 305843
HA 311 - 7	200 - 300	219 100 347 / 305841
HA 311 - 8	300 - 500	219 100 349 / 305832



#### Cutting inserts

0°	lever	219 100 206 / 300487
Hose fitting	45°	219 100 207 / 300554
75°	lever	219 100 208 / 300500
90°	lever	219 100 209 / 300569

### Cutting



# MIG/MAG and TIG welding – overview.



Gas switch  
202 502 406 / 300248



Test flow meter  
269 121 330 / 300766

## Weldflow

→ the optimal gas saver

## Test flow meter

→ for correct measurement of gas flow

## Gas switch

→ safety against weld defects

## Gas pre-heater

→ for large gas outlets in a cold environment



Weldflow gas saver  
Ø 5.0  
202 502 430 / 307911  
Ø 6.3  
202 502 429 / 307923



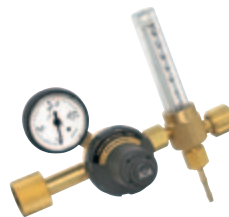
Gas preheater  
CO<sub>2</sub>  
201900 914 / 309450  
Argon / argon mixtures  
201 900 913 / 309451



PROSAVER™ regulator  
Argon and MISON®  
203 007 335 / 331001



Flowreg  
Argon and MISON®  
223005023 / 308057



Unicontrol 100  
Argon and MISON®  
213 005 304 / 309260



Unicontrol 300  
Argon and MISON®  
213 007 300 / 309252



Fixicontrol  
Argon and MISON®  
HT 203,007,335 / 307601



Fixicontrol CO<sub>2</sub>  
HT 203 007 336 / 307600



Rotam Plus for Unicontrol  
Single 203 009 121 / 300100  
T-piece 214 100 453 / 300104



Dry flow – Argon hose  
Ø 5.0 mm, 40 m 316719  
Ø 5.0 mm, 10 m 316720  
Ø 6.3 mm, 40 m 316721  
Ø 6.3 mm, 10 m 316722



## Complete welding and cutting equipment.

With AGA's complete equipment kit, users have the most common components gathered together in one place. These complete kits also make it easier to transport and take along the equipment e.g. in service vehicles etc.

### X 11 Torch system.



X 11 Original  
204 000 342 / 300317



X 11 Extend  
204 000 373 / 309693



X 11 Combi  
205 000 226 / 310133



FLAME® kit  
Incl. 5 l cylinders  
323078  
Excl. cylinders  
323080

### X 21 Torch system.



X 21 Original  
Round handle  
Cutting insert 90°  
219 124 225 / 305467  
Cutting insert 75°  
219 124 226 / 300315



Oval handle  
Cutting insert 90°  
219 124 235 / 309344  
Cutting insert 75°  
219 124 236 / 309345

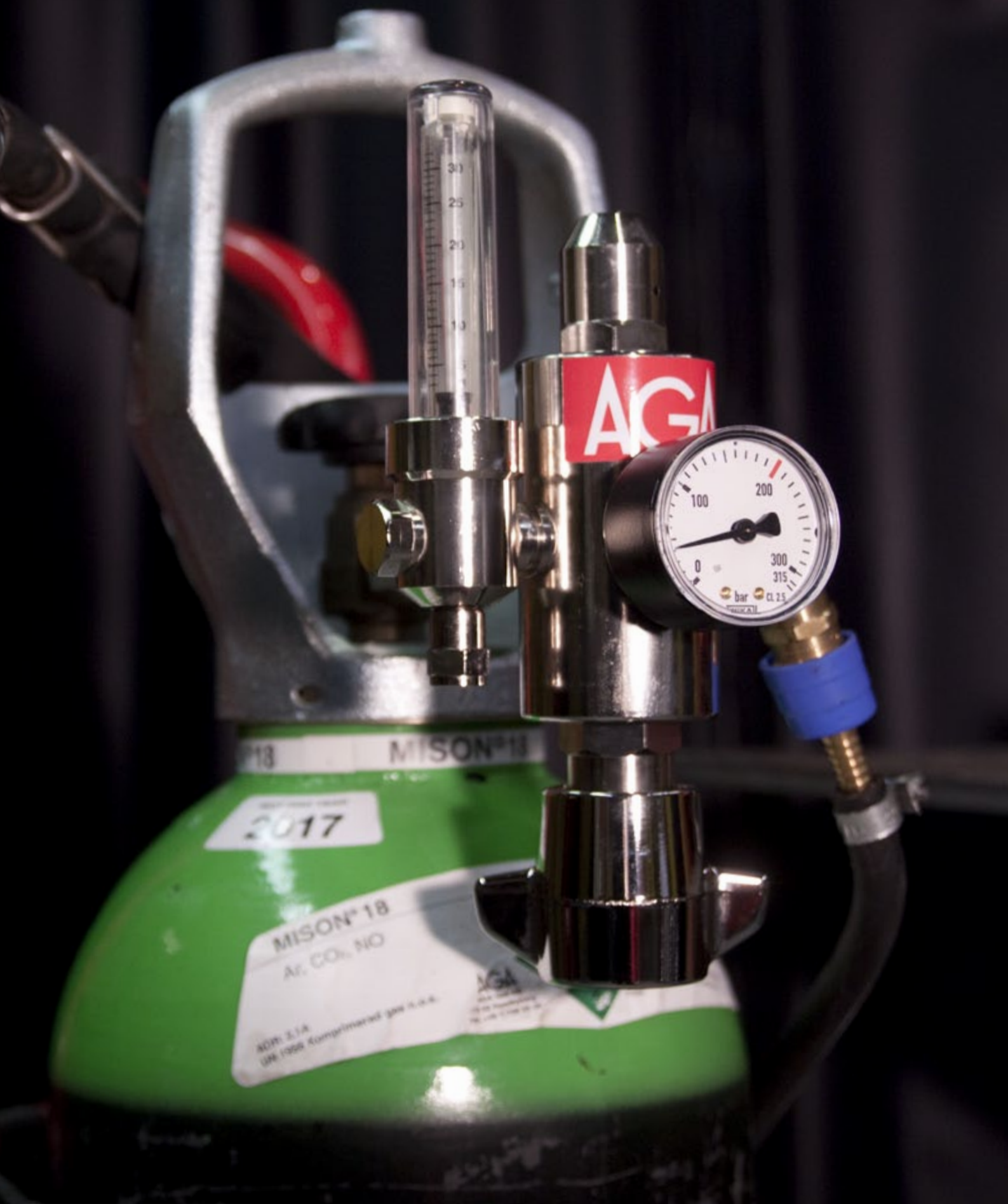


X 21 Select  
204 000 356 / 305468



X 21 Combi  
205 000 231 / 316161

# Regulators.



# AGA's regulators.

## Properties that characterise AGA's regulators:

- Adapted to and satisfies the requirements stipulated by the EN ISO 2503 standard
- The regulator housing must be marked in accordance with the applicable standard
- Approved in an "oxygen shock test" conducted by an independent testing institute
- Most regulators are fitted with a flat seat that provides rapid, precise regulation with maximum capacity
- The flat seat, combined with a larger diameter for the membrane, entails a constant gas flow even at low working pressures
- In order to facilitate adjustment, the regulators have a large, ergonomic wheel
- Corrosion-resistant overflow valve
- A filter within the regulator prevents particles from entering the seat
- Improved properties at low temperatures

## Increased safety.

It is not permitted to transport gas cylinders in or on vehicles or trailers with the regulators connected (mandatory provisions according to ADR). With an HT connection (HT = Hand Tight) it is easier to comply with the

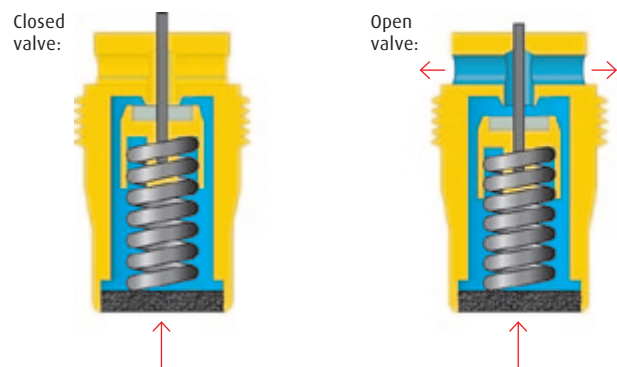
provisions. This increases safety when moving between temporary work-places.

Most regulators are also available with hexagonal nuts.

## Safety and function – to rely on.

1. The regulators have a robustly dimensioned inlet that can withstand knocks and bumps.
2. The sinter filter cleans the gas of particles.
3. The cylinder's maximum inlet pressure, 200 bar, is reduced to the desired working pressure in the low-pressure chamber. The secondary pressure/working pressure in a regulator must conform to the applicable pressure classes in the standard. For example, regulators are available for oxygen and the other compressed gases in various pressure classes. Acetylene must always have a maximum working pressure of 1.5 bar.
4. The stable flow characteristics are achieved in most regulators through a perfect balance between valve spring and control spring in relation to valve seat and membrane. The regulator opens when the control wheel is screwed in. This then causes the control spring and membrane to press in the valve lifter, which then allows a reduced flow to pass through in combination with a stamp.
5. Safety 1: If the pressure should exceed a certain value in the low-pressure chamber, the overflow valve opens and the excess pressure is released.
6. Safety 2 (for regulators with membrane): If the pressure in the low-pressure chamber should rise so rapidly that the safety valve does not have time to evacuate the excess pressure, the membrane will rupture at approx. 30 bar and the gas will be released via evacuation holes in the cap.

### The function of the enclosed valve (for regulators with membrane and enclosed valve)

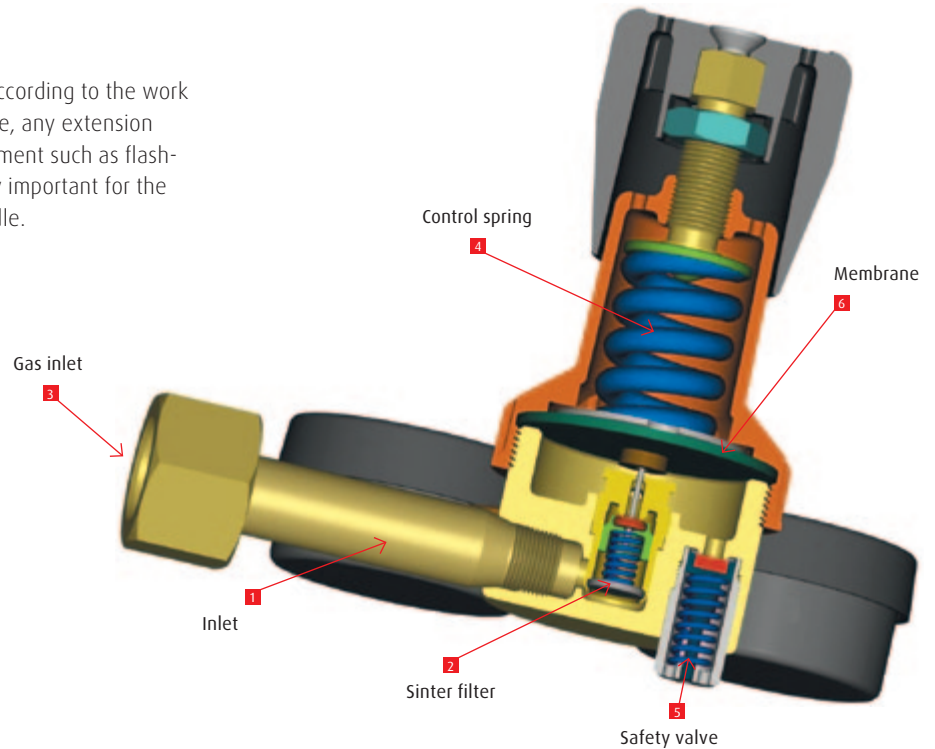


# Regulators.

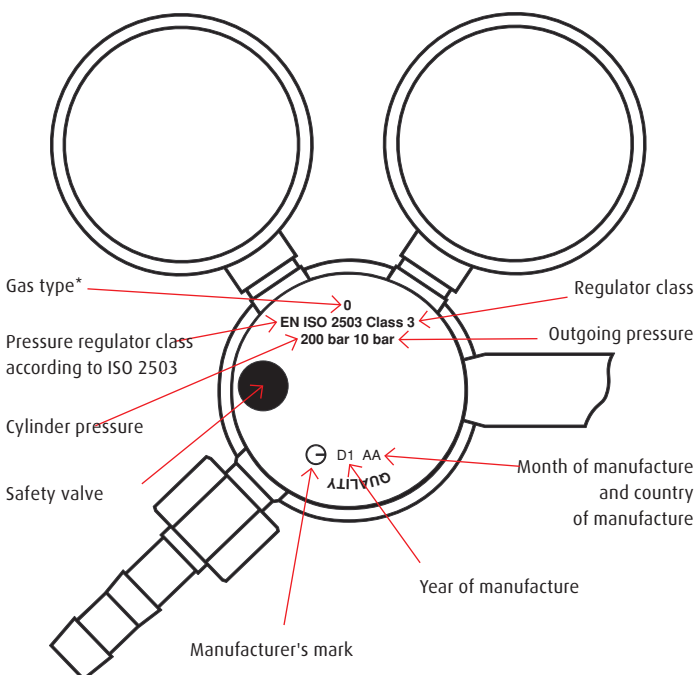
How a regulator works.

## Parts of the regulator.

The flow capacity from a cylinder regulator varies according to the work situation. The dimensions and length of the gas hose, any extension pieces in the gas hose, the capacity of safety equipment such as flash-back arrestors and non-return valves, are extremely important for the pressure and flow that it available at the torch handle.



## Example of marking of regulator



\* Gas type: A = Acetylene, H = Hydrogen, O = Oxygen, N = Nitrogen (and other inert gases such as argon, helium, carbon dioxide), D = Air

Regulators manufactured in accordance with EN ISO 2503 must be permanently marked with:

- Gas type
- Pressure regulator class corresponding to EN ISO 2503
- The manufacturer's identification mark
- Year of manufacture / month or week
- Month of manufacture A = Jan, B = Feb

E.g. Unicontrol 500 HT Oxygen is in Class 3, which means:

- that max. cylinder pressure is 200 bar
- that outgoing pressure is 10 bar
- that the safety valve should allow through 30 m<sup>3</sup>/h

There are three different O-rings for HT connection.

### Acetylene

Small black O-ring, same as previous version. Fits in both new and earlier HT connections.

### Oxygen, MISON® and argon mixtures

- Small (n10.3 x 2.4 mm) green or black O-ring only fits in the earlier HT connection
- Large (n11.3 x 2.4 mm) black O-ring is intended for the new HT connection with brass nut

## Note!

Grease in combination with oxygen entails a risk of explosion!



# Regulators.

Regulators for welding, cutting, heating and soldering.

## Unicontrol 500.

**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.**

- When gas cutting material thicknesses above 300 mm, R 21 (see page 20) for oxygen is selected
- Unicontrol 500 HT is connected to the gas cylinder by hand. No tools are required. The regulator is installed and removed quickly and easily
- Always relieve the pressure on the regulator before removing
- The gasket is in the form of an O-ring that sits securely in an adapted groove
- The risk of the O-ring disappearing during transport is small

An HT version is available for regulators for acetylene and oxygen, as well as the shielding gases MISON®, and all mixtures of MISON®, argon and argon mixtures with flow measurement.

The regulators can be chosen either with hexagonal nuts or hand-tight connections.

### Properties:

- High stability of the welding flame at low working pressures and small flows make the work easier during pipe welding
- High flame stability in the event of large gas outlets and long hoses saves time for the welder who is a long way from the gas cylinders
- A precise and stable welding/cutting flame saves time and increases productivity

Unicontrol 500 has easy-to-read pressure gauges and single wheel adjustment of the working pressure.

Supplied with hose fittings for Ø 5.0 and 6.3 mm hose diameters, cap nuts and 3 extra O-rings or gaskets.



HT (= Hand Tight) Hand connection



Hexagonal nut



External connection for propane

# Regulators.

Regulators for welding, cutting, heating and soldering.

## Unicontrol 500

	Work area (bar)	Content pressure gauge (bar)	Work pressure gauge (bar)	Connection Inlet	Thread	Outlet	AGA no. / Part no.
<b>HT nut*</b>							
Acetylene	0 – 1,5	0 – 40	0 – 2,5	G 3/4" HL	Ext.	G 3/8" LH	213 001 315 / 309257
Oxygen	0 – 10,0	0 – 315	0 – 16,0	W 21.8 x 1/4"	Int.	G 3/8"	213 000 324 / 309226
<b>Hexagonal nut</b>							
Acetylene	0 – 1,5	0 – 40	0 – 2,5	G 3/4" HL	Ext.	G 3/8" LH	213 001 299 / 309227
Oxygen	0 – 10,0	0 – 315	0 – 16,0	W 21.8 x 1/4"	Int.	G 3/8"	213 000 310 / 309228
Argon, Nitrogen, Helium	0 – 10,0	0 – 315	0 – 16,0	W 24.32 x 1/4"	Int.	G 3/8"	213 007 280 / 309254
Nitrogen	0 – 2,0	0 – 315	0 – 6,0	W 24.32 x 1/4"	Int.	G 3/8"	213 004 269 / 309250
Carbon dioxide	0 – 10,0	0 – 315	0 – 16,0	W 21.8 x 1/4"	Int.	G 3/8"	213 007 281 / 309253
Air	0 – 10,0	0 – 315	0 – 16,0	G 5/8"	Ext.	G 3/8"	213 002 300 / 309256
Hydrogen	0 – 10,0	0 – 315	0 – 16,0	W 21.8 x 1/4" LH	Int.	G 3/8" LH	213 003 273 / 309255
Propane	0 – 2,5	—	0 – 6,0	(NGO) 0.885" x 1/4" LH	Ext.	G 3/8" LH	213 006 132 / 309229

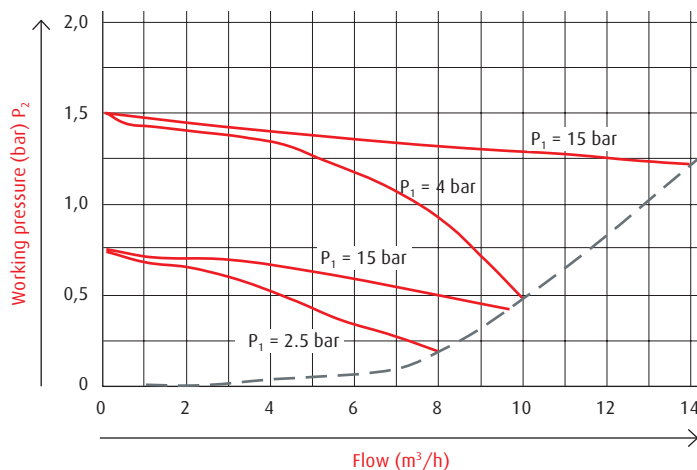
Clamp for 5 L

acetylene gas cylinder

/ 310489

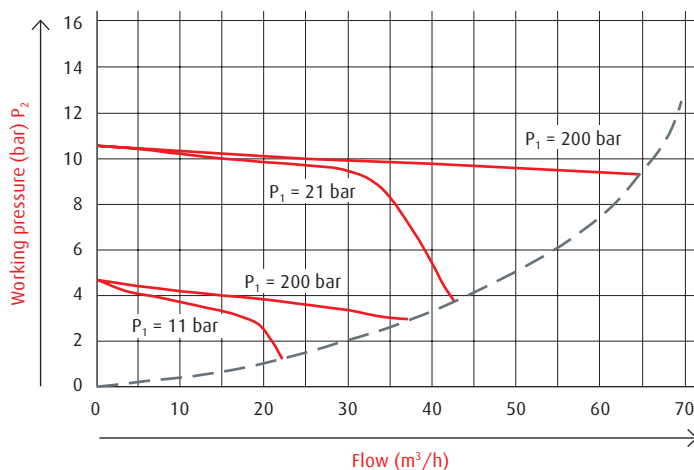
\* Hand connection

## Acetylene



The flow rate curve shows the change in working pressure in relation to the flow outlet.

## Oxygen



## Pressure gauge for Unicontrol 500.



Content pressure gauge, oxygen 0–315 bar

Content pressure gauge, acetylene 0–40 bar

Content pressure gauge, neutral 0–315 bar

Working pressure gauge, oxygen 0–16 bar

Working pressure gauge, acetylene 0–2.5 bar

Working pressure gauge, neutral 0–16 bar

Working pressure gauge, neutral 0–6 bar

SB pack

AGA no. / Part no.

202 222 531 / 300038

202 222 533 / 300048

202 222 536 / 300047

202 222 532 / 300042

202 222 534 / 300046

202 222 543 / 300045

202 222 544 / 300044



# Regulators.

Regulators for welding, cutting, heating and soldering.

## Pressure gauge protection, gaskets and O-rings for Unicontrol 500.



Pressure gauge protection.



Gaskets.



O-rings.



		Qty in SB	SB pack AGA no. / Part no.
Pressure gauge protection			214 100 113 / 300192
Gaskets	Acetylene + oxygen (nylon+aluminium)	5 + 5	214 100 028 / 300793
Oxygen + carbon dioxide (aluminium)		100	202 502 028 / 300055
		10	214 100 227 / 309372
	Acetylene (nylon)	100	202 502 029 / 300054
		10	214 100 226 / 309373
	Argon, air, hydrogen, nitrogen (nylon)	100	202 502 030 / 300053
		10	214 100 124 / 300089
	Gasket acetylene for clamp coupling	10	214 100 225 / 310495
O-rings	Acetylene HT	10	214 100 224 / 300193
	Oxygen, Argon HT, MISON® and MISON® mixtures (Unicontrol)	10	214 100 480 / 308384
	Oxygen, Argon HT, MISON® and MISON® mixtures (Jetcontrol)	10	214 100 223 / 300194



# Regulators.

Regulators for welding, cutting, heating and soldering.

## Fixicontrol HT.

**Fixicontrol HT is intended for small to medium-sized gas outlets and copes with all gas welding, soldering, heating with nozzles max. 2,500 l/h and gas cutting of materials up to a thickness of 50 mm.**

The regulator has a hand connection and is therefore very well suited to small equipment that is frequently transported.

Fixicontrol HT is manufactured in accordance with EN ISO 2503 and consequently satisfies all safety and functional requirements that users will place on a cylinder regulator for industrial gases.

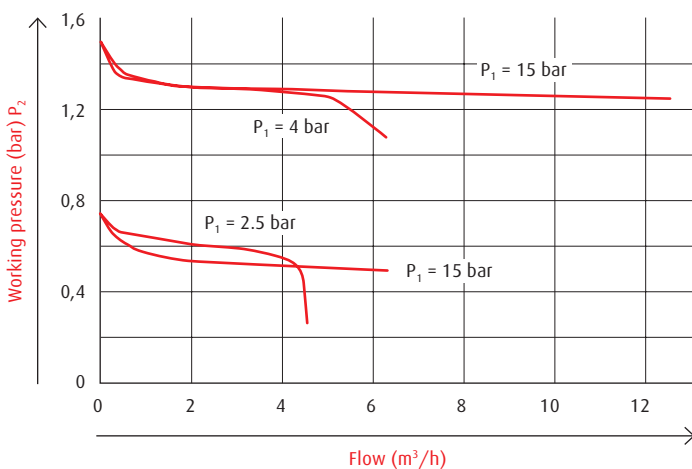
Fixicontrol HT is available for acetylene and oxygen. It comes with easy-to-read pressure gauges fitted with rubber protection. Single wheel adjustment of the working pressure means that it is easy to work with the regulator.

Supplied with pressure gauge protection, hose fitting for gas hose Ø 5.0 mm, cap nut and 3 extra O-rings.

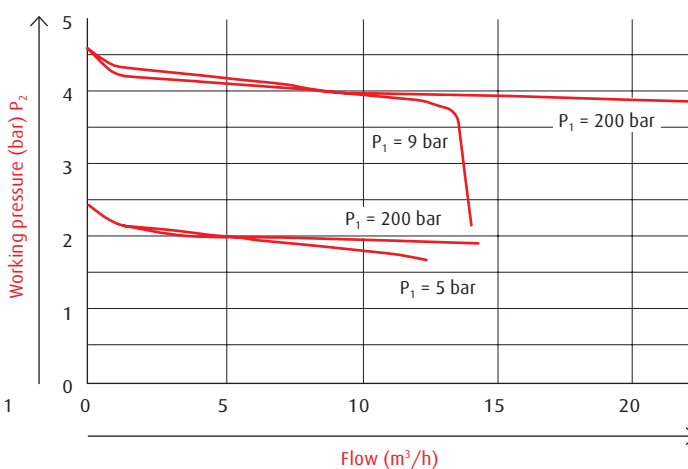


	Work area (bar)	Content pressure gauge (bar)	Work (bar)	Connection pressure gauge Inlet	Thread	AGA no. / Part no. Outlet
<b>HT nut*</b>						
Acetylene	0 – 1,5	0 – 40	0 – 2,5	G 3/4" LH	Ext.	G 3/8" LH 203 001 323 / 300030
Oxygen	0 – 4,0	0 – 315	0 – 6,0	W 21.8 x 1/4"	Int.	G 3/8" 203 000 342 / 300028
Acetylene incl. clamp	0 – 1,5	0 – 40	0 – 2,5	G 3/4" LH	Ext.	G 3/8" LH 203 001 172 / 310437

## Acetylene



## Oxygen



The flow rate curve shows the change in working pressure in relation to the flow outlet.

# Regulators.

Regulators for welding, cutting, heating and soldering.

## Pressure gauges for Fixicontrol HT.



			SB pack AGA no. / Part no.
Content pressure gauge	Acetylene	40 bar	202 222 575 / 308265
Content pressure gauge	Oxygen	315 bar	202 222 574 / 308740
Working pressure gauge	Acetylene	2.5 bar	202 222 577 / 308741
Working pressure gauge	Oxygen	6 bar	202 222 576 / 300223

## O-rings for Fixicontrol HT.



	Qty in SB	SB pack AGA no. / Part no.
Acetylene HT	10	214 100 224 / 300193
Oxygen, Argon HT as well as MISON® and MISON® mixtures	10	214 100 480 / 308384
Pressure gauge protection	1	201 190 253 / 309421



# Regulators.

Regulator series R 21.

## R 21 regulators for low pressure (below 10 Bar).

The R 21 regulator series reduces the cylinder pressure to the desired working pressure with the aid of a special regulating principle that is different from other regulators. The principle uses a balanced valve plug and retains an even working pressure when the cylinder pressure drops due to the consumption of the gas. The R 21 regulator can be connected with a two-stage regulator thanks to an ingenious design that requires a minimum of service and maintenance.

## R 21 regulators regulators for high flows and gas outlets (above 10 bar).

R 21 regulators for high pressure (up to 200 bar on the outlet side) are available for oxygen, nitrogen, hydrogen and air. The high-pressure regulators are suitable for cutting thick materials, pressure testing, lancing, etc. All high-pressure regulators are supplied with a soldering connection and three extra gaskets. The capacity of e.g. R 21 for oxygen is 115 m<sup>3</sup>/h.

The R 21 regulator for high pressure is ideally suited to gas cutting materials with a thickness of more than 300 mm.

R21 is supplied with 6.3 mm hose fittings.

R21 is specially intended for heavy-duty engineering, on vessels and the offshore sector. The pressure gauge also has a special feature that allows it to be placed in the required position.

On the outlet side there is a needle valve for regulating the gas flow, which can be shut off in the event of short breaks in the work. If the needle valve is opened again, the outlet pressure will be the same as before. The R 21 regulator is fitted with an overflow valve on the low-pressure side.



10 bar oxygen regulator



40 bar oxygen regulator

### Up to 10 bar

	Work area (bar)	Content pressure gauge (bar)	Work pressure gauge (bar)	Connection Inlet	Thread	Outlet	AGA no. / Part no.
Acetylene	0 – 1,5	0 – 40	0 – 2,5	G 3/4" LH	Ext.	G 3/8" LH	219 114 199 / 305342
Oxygen	0 – 10,0	0 – 315	0 – 16,0	W 21.8 x 1/4"	Int.	G 3/8"	219 114 002 / 305353
Nitrogen	0 – 10,0	0 – 315	0 – 16,0	W 24.32 x 1/4"	Int.	G 3/8"	219 114 003 / 305349
Air	0 – 10,0	0 – 315	0 – 16,0	G 5/8"	Ext.	G 3/8"	219 114 005 / 305351
Hydrogen	0 – 10,0	0 – 315	0 – 16,0	W 21.80 x 1/4" LH	Ext.	R 3/8" LH	219 114 004 / 305359
Carbon dioxide	0 – 10,0	0 – 315	0 – 16,0	W 21.80 x 1/4"	Int.	G 3/8"	219 114 006 / 305358
Argon/MISON®	0 – 10,0	0 – 315	0 – 16,0	W 24.32 x 1/4"	Int.	G 3/8"	219 114 007 / 305357
Oxygen	0 – 1,0	0 – 315	0 – 2,5	W 21.80 x 1/4"	Int.	G 3/8"	219 114 008 / 305344
Nitrogen	0 – 1,0	0 – 315	0 – 2,5	W 24.32 x 1/4"	Int.	G 3/8"	219 114 009 / 305341
Nitrous oxide	0 – 10,0	0 – 315	0 – 16,0	G 3/8"	Int.	G 3/8"	/ 305355
THERMOLEN®	0 – 3,0	0 – 25	0 – 6,0	W 21.8 x 1/4" LH	Ext.	G 3/8" LH	/ 305348
Propane	0 – 6,0	0 – 315	0 – 10,0	(NGO) 0.885" x 1/4" LH	Ext.	G 3/8" LH	219 114 017 / 305343

### Over 10 bar (Note: A high-pressure hose must be used at the outlet).

	Work area (bar)	Content pressure gauge (bar)	Work pressure gauge (bar)	Connection Inlet	Thread	Outlet	AGA no. / Part no.
Nitrogen	8 – 28	0 – 315	0 – 40	W24.32 x 1/4"	Int.	G 3/8"	/ 305364
Oxygen	8 – 28	0 – 315	0 – 40	W21.80 x 1/4"	Int.	G 3/8"	219 114 193 / 300000
Nitrogen	20 – 40	0 – 315	0 – 60	W24.32 x 1/4"	Int.	G 3/8"	219 114 194 / 300017
Oxygen	30 – 200	0 – 315	0 – 315	W21.80 x 1/4"	Int.	G 3/8"	219 114 018 / 305354
Nitrogen	30 – 200	0 – 315	0 – 315	W24.32 x 1/4"	Int.	G 3/8"	219 114 019 / 305347
Hydrogen	30 – 200	0 – 315	0 – 315	W21.80 x 1/4" LH	Int.	G 3/8"	219 114 020 / 305360
Air	30 – 200	0 – 315	0 – 315	G 5/8"	Ext.	G 3/8"	219 114 021 / 305346

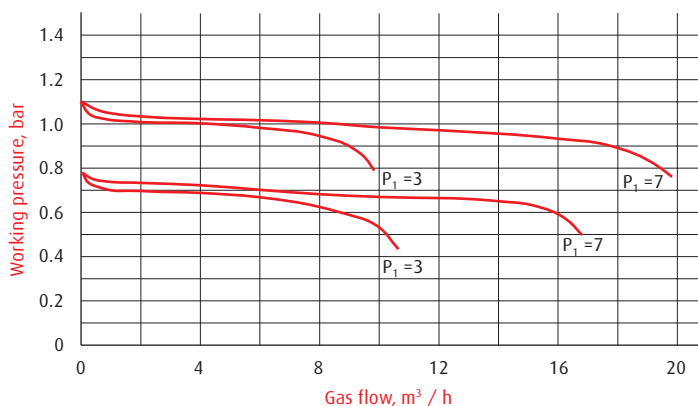


# Regulators.

Regulators for high working pressure and flows.

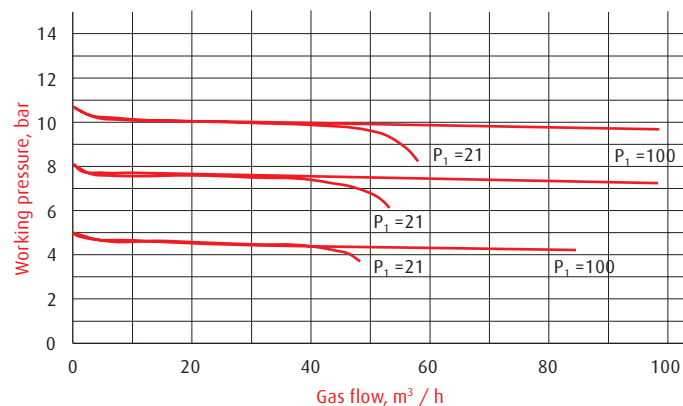
## Capacity curves - Acetylene

Incoming pressure



## Capacity curves - Oxygen

Incoming pressure



## Pressure gauge for R 21.



Pressure gauges Ø 63 mm.

	SB pack AGA no. / Part no.
Content pressure gauge, neutral 0-6/86 bar	219 114 391 / 305370
Content pressure gauge, oxygen 0-315/450 bar	219 114 395 / 300087
Content pressure gauge, neutral 0-315/450 bar	219 114 106 / 300074
Working pressure gauge, neutral 0-40/580 bar	219 114 105 / 300085
Working pressure gauge, acetylene 0-40/580 bar	219 114 103 / 305368
Working pressure gauge, oxygen 0-16/230 bar	219 114 108 / 305373
Working pressure gauge, neutral 0-16/230 bar	219 114 104 / 305371
Working pressure gauge, acetylene 0-2.5/36 bar	219 114 396 / 305372
Working pressure gauge, neutral 0-28 l/min	/ 305367
Nipple for pressure gauge G 1/4"	201030 9366 / 300249

## DIN Control regulator.

DIN Control är en prisvärd och effektiv regulator för provtryckning med nitrogen.

Arbetsområde 0-30 bar. Observera att högtrycksslang måste användas med regulatorn.

We need a  
translation  
for this



	Arbets- område (bar)	Nominellt arbetsflöde (m³/h)	Innehålls- manometer (bar)	Arbets manometer (bar)	Inlopp	Gänga	Utlopp	Artikelnr.
Nitrogen	0 - 30	100	0 - 200	0 - 60	W 24,32 X 1/4"	Inv.	G 1/4"	323191

# Regulators.

Regulators for high pressure and flows.

## CR 60.

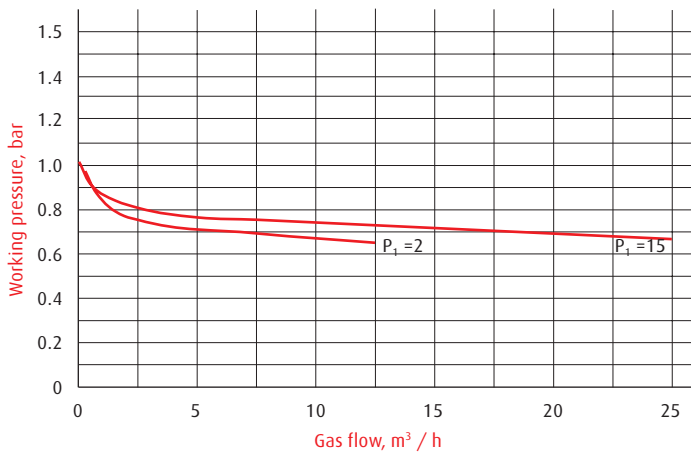
**CR 60** is a regulator for large gas outlets.

Suitable for cutting more than 300 mm and flushing large pipe systems. Supplied with a 12 mm hose fitting for acetylene and an 8 mm fitting for oxygen, as well as 3 extra gaskets.



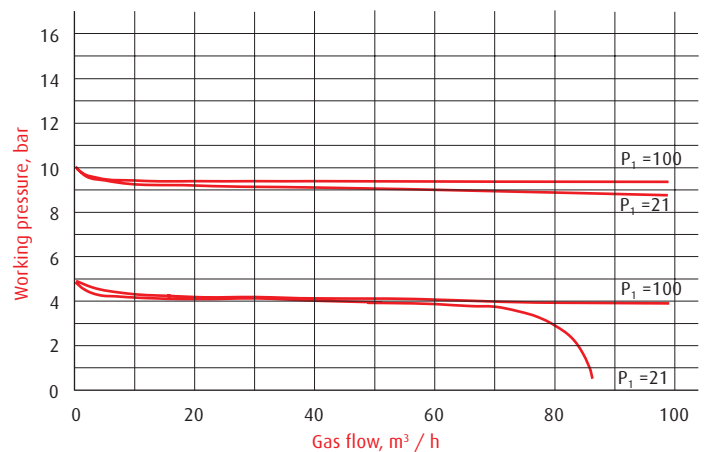
### Capacity curves - Acetylene

Inlet pressure -  $P_1$  = bar



### Capacity curves - Oxygen

Inlet pressure -  $P_1$  = bar



	Work area (bar)	Content pressure gauge (bar)	Work pressure gauge (bar)	Connection			AGA no. / Part no.
				Inlet	Thread	Outlet	
Acetylene	0 - 1,5	0 - 30	0 - 5	G 3/4" LH	Ext.	R 1"	203 001 340 / 300027
Oxygen	0 - 15,0	0 - 300	0 - 30	W 21.8 x 1/4"	Int.	R 1"	203 000 370 / 300032
Argon/MISON®	0 - 15.0	0 - 300	0 - 30	W 24.32 x 1/4"	Int.	R 1"	203 007 360 / 300022

## Unicontrol 600.

**Unicontrol 600** is a regulator for high working pressure, e.g. pressure testing.

The working pressure is adjusted with a robust regulator screw.

When the cylinder pressure is approx. 5 bar above the working pressure, the capacity is approx. 75 m³/h for hydrogen and helium, and approx. 18 m³/h for the other gases. A 1/4" clamping ring connection is supplied, as well as 3 extra gaskets.



	Work area (bar)	Content pressure gauge (bar)	Work pressure gauge (bar)	Connection			AGA no. / Part no.
				Inlet	Thread	Outlet	
Nitrogen	200	0 - 315	0 - 315	W 24.32 x 1/4"	Ext.	W 21.8 RH	203 004 601 / 300004
Air	200	0 - 315	0 - 315	G 5/8"	Ext.	W 21.8 RH	203 002 601 / 300005
Oxygen	200	0 - 315	0 - 315	W 21.8 x 1/4"	Ext.	W 21.8 RH	203 000 601 / 300026



# Regulators for gas shielded arc welding.



## Regulators for gas shielded arc welding.

**AGA's cylinder regulators for gas shielded arc welding produce a minimal "gas puff" without a gas saver thanks to low working pressure. During all quality welding, a certain "gas puff" is necessary to avoid start-up pores in the weld.**

The gas supply to the gas shielded arc welding processes TIG, MIG/MAG and plasma is extremely important when it comes to the welding result. Demands as regards quality, such as increased strength and the appearance of the welded product, are affected by the gas shielding. In order to satisfy these requirements, pure shielding gas is required in the gas cap, as are the correct gas flow and a certain amount of additional gas when starting welding. Many items of welding equipment are therefore equipped with gas pre-flow.

The best results are achieved most easily with a short gas hose (as a rule, 1 – 1.5 m is sufficient) along with a small hose diameter, normally Ø 5.0 mm. As a result, the volume in which the "gas puff" is built up is optimised.

PROSAVER™ is a regulator that works with a constant gas flow and produces an adapted working pressure with positive, technical and economic benefits as a result.

In the event of greater hose lengths, diameter or pressure, AGA's gas savers can be used to great advantage. [See page 24.](#)

### PROSAVER™ regulator.

**ProsaVer™ regulator with integrated gas saver function for shielding gas with flow meter.**

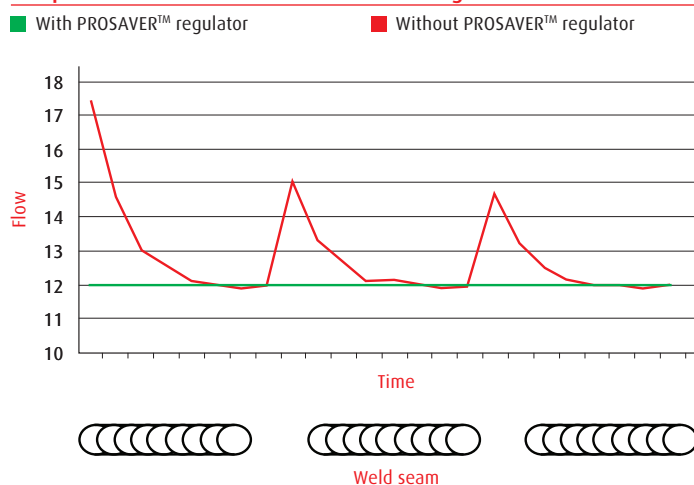
- Produces an optimal gas flow for MIG/MAG and TIG welding.
- Minimises the "gas puff" when starting the welding cycle, which produces savings as regards gas consumption.
- Very even flow 2 - 30 l/min, regardless of the cylinder pressure.
- Developed and adapted for MISON® shielding gases. Also works excellently with other argon and argon mixtures.

**Integral gas saver function:**

The greatest gas saving is achieved in the event of numerous short welds in a welding cycle. The size of the gas saving is dependent on the welding method, number of starts and stops, etc.

To safeguard the quality of the welding starts, the pre-flow of shielding gas should be increased when using a gas saver.

#### Comparison with and without PROSAVER™ regulator



Name	Working pressure	Content pressure gauge	Flow meter	Connection inlet	Connection outlet	SAP no. / Part no.
ProsaVer™	2.5 bar	0-315 bar	2-30 l/min	W 24.32X 1/4"	G 3/8"	/ 331001

# Regulators.

Regulators for gas shielded arc welding.

## Unicontrol 300 HT.

**Unicontrol 300 HT is available for MISON® Ar, and all mixtures of MISON®, argon and argon mixtures, as well as carbon dioxide.**

The regulator has a content pressure gauge and a flow pressure gauge showing the gas flow in litres per minute, as well as single wheel adjustment of the gas flow.

Unicontrol 300 HT is intended for MIG/MAG and TIG welding.

Supplied with hose fittings for Ø 5.0 and 6.3 mm hose diameters, cap nuts and 3 extra O-rings.



	Nominal work flow (l/min)	Flow pressure gauge (l/min)	Content pressure gauge (bar)	Connection			AGA no. / Part no.
				Inlet	Thread	Outlet	
Argon/MISON®	0 – 25	0 – 45	0 – 315	W 24.32 x 1/4"	Int.	G 3/8"	213 007 300 / 309252
Carbon dioxide	0 – 25	0 – 45	0 – 315	W 21.8 x 1/4"	Int.	G 3/8"	213 007 328 / 309251

## Pressure gauge for Unicontrol 300 HT.



		SB pack
		AGA no. / Part no.
Content pressure gauge	315 bar	202 222 536 / 300047
Working pressure gauge	0 – 45 l/min	202 222 572 / 300178

## O-rings for Unicontrol 300 HT.



	Qty in SB	SB pack
		AGA no. / Part no.
Oxygen, Argon HT as well as MISON® and MISON® mixtures	10	214 100 480 / 308384

# Regulators.

Regulators with flow pipe for gas shielded arc welding.

## Flowreg.

**Flowreg is intended for MIG/MAG and TIG welding, as well as for root protection gas.**

Flowreg is available for MISON® Ar and all mixtures of MISON®, argon and argon mixtures, carbon dioxide and nitrogen/hydrogen mixtures (FORMIER® 10). In the case of hydrogen and mixtures with hydrogen, a left-hand thread is used for safety reasons on connections at inlets and outlets.

Flowreg is set at a working pressure of 2.5 bar and has a well-balanced valve that produces a gas flow with very small variations. The standard requires a variation coefficient of < 0.3 when the gas cylinder is emptied from 200 bar to 2.5 bar.

This means that Flowreg has a variation coefficient that is more than seven times better than the standard requirement. Flowreg has a content pressure gauge and a rotameter with a graduated scale showing the flow

in l/min. The scale's graduation is adapted for argon or carbon dioxide. The flow is read off at the upper flat surface of the floating device.

Supplied with hose fittings for Ø 5.0 and 6.3 mm hose diameters as well as 3 extra O-rings.



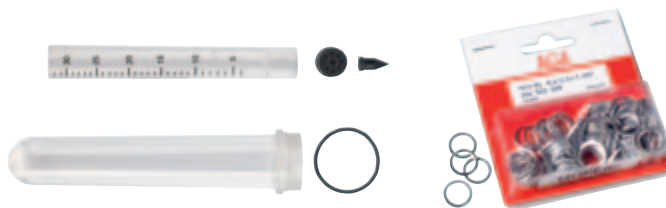
	Work area (bar)	Content pressure gauge (bar)	Flow pressure gauge (l/min)	Connection Inlet	Thread	Outlet	AGA no. / Part no.
Argon/MISON®	2.5	0 - 315	3 - 30	W 24.32 x 1/4"	Int.	G 3/8"	223 005 023 / 308057
Carbon dioxide	2,5	0 - 315	3 - 30	W 21.8 x 1/4"	Int.	G 3/8"	223 005 024 / 308058
FORMIER® 10	2.5	0 - 315	3 - 30	W 21.8 x 1/4" LH	Int.	G 3/8" LH	223 004 283 / 308056

## Pressure gauge for Flowreg.

	Content pressure gauge (bar)	SB pack AGA no. / Part no.
Argon, carbon dioxide and FORMIER® 10	0 - 315	202 222 588 / 309420



## Flow pipe and gaskets for Flowreg.



	Flow [l/min] (Working pressure bar)	Max. deviation at various flows (l/min)	Qty in SB	SB pack AGA no. / Part no.
<b>Flow pipe complete</b>		5/±0.1		
Argon, Carbon dioxide	30 (2,5)	15/±0,3		202 502 478 / 308651
FORMIER®	50 (2.5)	25/±0,5		/ 315503
<b>Gaskets</b>				
Oxygen + carbon dioxide (aluminium)			100	202 502 028 / 300055
Oxygen + carbon dioxide (aluminium)			10	214 100 227 / 309372
Argon, air, hydrogen, nitrogen (nylon)			100	202 502 030 / 300053
Argon, air, hydrogen, nitrogen (nylon)			10	214 100 124 / 300089

# Regulators.

Regulators with flow meter for gas shielded arc welding.

## Unicontrol 100 HT.

**Unicontrol 100 HT is intended for MIG/MAG and TIG welding.**

The regulator is available for MISON® and all mixtures of MISON®, argon and argon mixtures.

It is pre-set at a working pressure of 2.5 bar to produce an accurate flow setting.

The regulator has a content pressure gauge and a rotameter with a ball/floating device showing the flow in l/min against a graduated scale. The scale's graduation is adapted for argon. The flow is read off at the upper edge of the ball/floating device. Supplied with hose fitting for a 5.0 mm hose diameter and 3 extra O-rings.



	Work area (bar)	Content pressure gauge (bar)	Flow pressure gauge (l/min)	Connection			AGA no. / Part no.
				Inlet	Thread	Outlet	
Argon	2,5	0 - 315	3 - 32	W 24.32 x 1/4"	Int.	R 3/8"	213 005 304 / 309260

## Pressure gauge for Unicontrol 100 HT.



			SB pack
			AGA no. / Part no.
Content pressure gauge	Ar/CO <sub>2</sub>		202 222 579 / 309447
Flow pressure gauge	Ar/CO <sub>2</sub>		202 222 580 / 309448

## O-rings for Unicontrol 100 HT.



		Qty in SB	SB pack
			AGA no. / Part no.
Carbon dioxide, Argon HT as well as MISON® and MISON® mixtures		10	214 100 480 / 308384



# Regulators.

Regulators with flow meter for gas shielded arc welding.

## Fixicontrol HT.

Fixicontrol HT is intended for welding with MIG/MAG and TIG.

Fixicontrol HT is available for MISON® Ar and all mixtures of MISON®, argon and argon mixtures, as well as carbon dioxide.

The regulator has a content pressure gauge and rotameter showing the gas flow in litres/min, as well as an ergonomic wheel for regulating the flow.



	Nominal work flow (l/min)	Content pressure gauge (bar)	Flow pressure gauge (l/min)	Connection			AGA no. / Part no.
				Inlet	Thread	Outlet	
HT nut							
Argon	0 – 22	0 – 315	0 – 32	W 24.32 x 1/4" RH	Int.	G 3/8"	203 007 335 / 307601
Carbon dioxide	0 – 22	0 – 315	0 – 32	W 21.80 x 1/4" RH	Int.	G 3/8"	203 007 336 / 307600

## Pressure gauges for Fixicontrol HT.



		SB pack
		AGA no. / Part no.
Content pressure gauge	Ar/CO <sub>2</sub>	202 222 579 / 309447
Flow pressure gauge	Ar/CO <sub>2</sub>	202 222 580 / 309448

## O-rings for Fixicontrol HT.



	Qty in SB	SB pack
		AGA no. / Part no.
Carbon dioxide, Argon HT as well as MISON® and MISON® mixtures	10	214 100 480 / 308384



# Regulators.

Flow meter for shielding gases.

## Rotam Plus.

**Rotam Plus** is a flow meter that is used together with cylinder regulators for MISON® Ar , and all mixtures of MISON®, argon and argon mixtures, as well as carbon dioxide with connection  $\frac{3}{8}$ " on the outlet side. **However, Rotam must always be combined with regulators that have the working pressure gauge graduated in bar, e.g. regulator Unicontrol 500 Argon.**

The regulator's working pressure is set at 2.5 bar to produce the correct gas flow.

Rotam must be connected to a T-piece, which can be used with one or two Rotams The T-piece can be adjusted to achieve the correct angle in relation to the regulator's outlet. The T-piece is ordered separately.

Rotam shows the gas flow in l/min and the scale's graduation is adapted for argon or carbon dioxide. The flow is read off at the upper edge of the ball/floating device.

Double Rotam is used when shielding gas is required for both a welding gun and root protection. With the combination of double Rotam and Uni-control 500 Argon, the gas is distributed in two rotameter pipes.

Supplied with a hose fitting for Ø 5.0 mm hose diameter.



	AGA no. / Part no.
Single Rotam Plus	203 009 121 / 300100
Double Rotam Plus	2 x 203 009 121 / 300100
T-piece incl. blanking plug	214 100 453 / 300104
Blanking plug	201 041 541 / 301816

## Flow meter for Rotam Plus.



	Flow [l/min] (Working pressure bar)	Max. deviation at various flows (l/min)	SB pack AGA no. / Part no.
Flow meter assembly		5/±0,1	
Hexagonal body	30 (2,5)	15/±0,3	202 502 318 / 300195
Round body	30 (2,5)	25/±0,5	/ 317302

# Regulators.

Accessories, regulators.

## Weldflow gas saver for quality welding.

**The amount of gas that can be saved during MIG/MAG welding is dependent on several different parameters.**

**Choice of equipment:**

- Working pressure in cylinder regulator/outlet point
- Gas hose diameter
- Gas hose length
- Welding parameters
- Set shielding gas flow
- Number of welding starts
- Welding time

The correct choice of equipment and correctly set shielding gas flow can produce savings – without additional equipment such as gas savers. [See also page 14.](#)

By installing a **Weldflow** gas saver in the equipment for TIG and MIG/MAG welding, optimum saving function is achieved because:

- The gas saver is installed in the gas hose close to the welding unit, which means that the effect of the gas hose's dimensions and the cylinder regulator is subordinated
- The desired shielding gas flow in the gas cap is set with the aid of a separate flow meter and the measurement takes place at the gas cap, which is the correct measurement point for shielding gas flow
- Weldflow is a cost-effective solution

The new location of the regulator/valve minimises the influence of the pressure build-up in the gas hose, and the correct "gas puff" can be achieved. Weldflow has good capacity at low pressures (1–2 bar). This means that the pressure build-up in the event of a welding stop can be reduced to a necessary minimum.

Supplied with test flow meter and hose clips, as well as operating instructions.



	AGA no. / Part no.
Weldflow gas saver, hose connection Ø 6.3 mm	202 502 430 / 307911
Weldflow gas saver, hose connection Ø 5 mm	202 502 429 / 307923

## Test flow meter for shielding gases.

**Test flow meter for shielding gas welding for argon and argon mixtures.**

The measurement tube must be held vertically and directly against the welding gun's nozzle. The flow is read off in the middle of the ball. The measurement range is 5–25 l/min.



	SB pack AGA no. / Part no.
Test flow meter	269 121 330 / 300766

# Regulators.

Accessories, regulators.

## Gas switch/pressure monitoring kit.

**The advantages of having a gas switch installed in the cylinder regulator are:**

- Easier to achieve desired welding quality
- Increased productivity thanks to fewer weld defects
- Improved production economy

**During all quality welding, the weld must be finished in the correct way. If the gas runs out in an uncontrolled manner, welding is affected.**

- With a wire electrode, there is an immediate indication if anything is wrong
- With core electrodes, and in particular when flux-filled core electrodes (FCW) are used, it is difficult for the welder to see when the gas runs out and welding continues for a short period
- The resulting weld defects can entail significant costs. The extent of these costs depends on the quality requirements that apply to the welded joint in question
- The gas switch interrupts the current to the welding contactor at approx. 5 bar remaining in the gas cylinder



	AGA no. / Part no.
Gas switch	202 502 406 / 300248

## Gas preheater.

**Gas preheaters are used for large gas outlets of carbon dioxide and argon mixtures when the cylinder regulator is significantly cooled.**

The preheater has an output of 25 W and is thermostatically controlled at 70°C.

### Capacity:

Carbon dioxide	1200 l/h
Argon mixtures	1200 l/h

### Threaded connection:

Carbon dioxide	W21.80 x 1/4"
Argon mixtures	W24.32 x 1/4"

### Electrical connection:

230 V, single phase and 25 W

CE marked EN-61010 and insulation class IP 44  
Supplied with 3 m cable and 4 gaskets.



	AGA no. / Part no.
Carbon dioxide	201 900 914 / 309450
Argon	201 900 913 / 309451

## Note!

Gas pre-heaters may not be used with oxygen or flammable gases.



# Torch systems.

A close-up photograph of a welder's hands and arms. The welder is wearing blue protective clothing and green leather welding gloves with yellow stitching. They are holding a torch that is cutting through a thick metal plate. A large volume of bright orange sparks is being ejected from the point of contact between the torch and the metal. The background is a clear blue sky.

## Note!

Injector torches are lit differently from pressure torches. See [page 21](#).



# Torch systems.

## Gas welding.

Gas welding is a well-known process that has been used for almost 100 years and has many production benefits, including a low investment cost for the equipment, the fact that the equipment is easy to move, and that you are not dependent on the electrical distribution network.

Many different metals can be welded: steel, cast iron, aluminium, copper, brass, etc. Gas welding has significant advantages in the welding of pipes, particularly outdoors, e.g. when welding steel district heating pipes, and for material thicknesses up to 6 mm. It is admittedly possible, with welding inserts for X 11 and X 21, to weld much thicker materials, although few people currently possess the practical professional knowledge to do this. The X 11 and X 21 torch systems are perfect for the other flame processes – heating, soldering and flame-cleaning with X 21.

## Gas cutting.

Gas cutting is the most common thermal cutting process. This is due in part to the fact that the investment cost is generally low and the cut quality is high with parallel cut surfaces. Gas cutting is a very flexible process and easy to use in many different work situations, as it is possible to cut product thickness ranging from 0.5 to 2500 mm. It is suitable for manual and mechanised cutting. Gas cutting is used almost exclusively for cutting unalloyed and low-alloy steel.

When performing gas cutting, a gas flame/heating flame is used to heat up one point of the steel that is to be cut to the ignition temperature.

After this, cutting oxygen is added that burns and transports the combustion products (the slag) away from the cut.

Oxygen and a fuel gas, normally acetylene or LPG, are used for the heating flame. Gouging and powder cutting are variants of gas cutting. Gouging is used e.g. for joint preparation and the removal of defective welds. The equipment is the same as for gas cutting, with only the cutting nozzle needing to be replaced with a gouging nozzle. (See pages 96–99) Powder cutting is used to cut material that cannot be gas-cut in the normal way, e.g. stainless steel, cast iron, copper. (See page 67)

## Two different torch systems.

AGA has two different torch systems for welding and cutting, injector torches and pressure torches.

It is easy to see the difference in the cutting insert. The injector torch has two pipes out to the nozzle head and the pressure torch has three pipes. The difference in the design is that, in the injector torch, the oxygen draws the fuel gas into the torch. The injector principle has the advantage that it produces the correct mixture ratio between oxygen and fuel gas. The symbol for injector torches = i

Pressure torches or equal pressure torches have the same inlet pressure for oxygen and fuel gas for the heating flame. The higher pressure that is needed for the cutting oxygen is provided in a separate pipe to the cutting nozzle.

The symbol for pressure torches = II.

### Double safety injector for X 21.

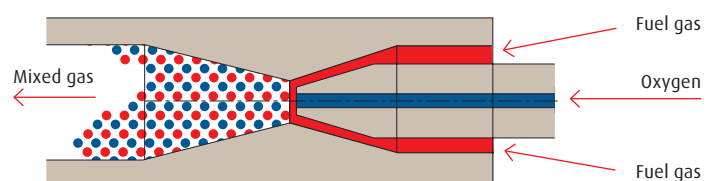
This is the new, patented safety injector, with double safety nozzle for X 21. It produces the highest safety against flashback. AGA's injector principles are produced in accordance with EN ISO 5172, which provides the user with the safety that can justifiably be demanded of a serious supplier.

The symbol for safety injectors = i

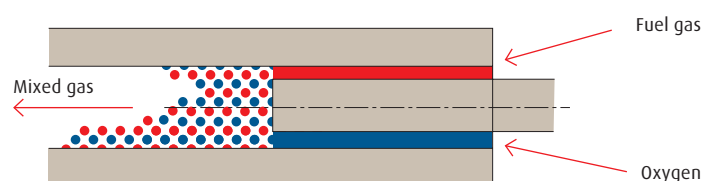
Intended for 3-cone sealed nozzles.

Injector torches are available for both acetylene and propane.

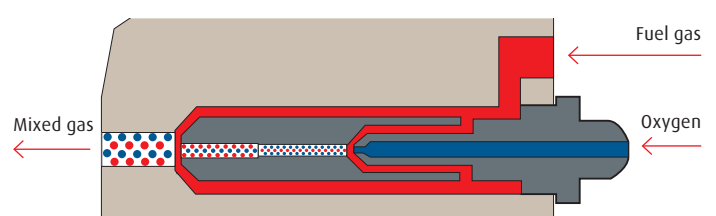
### Injector torch = i



### Equal pressure torch = II



### Safety injector = i





## Torch systems.

X 11 – torch system for welding, cutting, soldering, heating, etc.

### Complete kits.

With AGA's complete equipment kit, users have the most common components gathered together in one place. These complete kits also make it easier to transport and take along the equipment in service vehicles etc.

Complete kits are a good foundation to begin with, which can then be supplemented with specific additional components.



X 11 Original

X 11 Extend



X 11 Combi



FLAME® flexible gas cart

# Torch systems.

X 11 – torch system for welding, cutting, soldering, heating, etc.

## X 11 Original.

**X 11 Original is a combined gas welding and gas cutting torch for manual work. It is an injector torch (i) and is designed according to and satisfies the stringent demands stipulated by the standard EN ISO 5172.**

The demands regarding airtightness, mechanical strength, flashback safety, flame stability and the easy adjustment of the torch are the foundations for the X 11 system. This means that X 11 Original is a quality torch that satisfies very stringent demands from users regarding operability and operational reliability.

X 11 Original is one of the world's best-selling torch systems. During the final check prior to delivery, each insert and nozzle is lit and the flame is checked.

### Benefits with X -11 Original:

- Potential to weld material with a thickness of 14 mm (normally a maximum of 6 mm)
- Cuts up to 100 mm with an injector insert (150 mm with pressure cutting insert)
- Solders and welds with different heating and welding inserts
- Heat for rectification and heat forming
- Oval, grip-friendly torch handle
- Large range of accessories

X 11 Original is available for the fuel gases acetylene and propane (LPG). With propane, the torch's use is limited to cutting, soldering and heating.

### Welding

The welding inserts are entirely forged in copper and chrome-plated for effective heat dissipation and to deflect weld spatter. For weld locations that are difficult to access, there are a range of flexible welding inserts that are not chrome-plated. All welding inserts have replaceable welding nozzles.

### Cutting

X 11 Original has several different cutting insert alternatives:

- Lever valve or wheel valve for the cutting oxygen
- Acetylene or propane
- Injector or pressure torch
- Nozzle mount 90° or 0°
- Several different ranges of cutting nozzles

### Soldering and heating

In addition to welding inserts, there is a single flame heating insert and multiple flame heating inserts with shower nozzles.

- Single flame inserts are used when narrow heating zones are sought
- Multiple flame inserts are most suitable for wide heating zones and when the entire workpiece is to be heated up

**Welding, soldering and heating small parts and thin sheet metal.**

### Mixer add-on for X 11 Original

Mixer for low working pressures and various nozzle tips for small gas flows. The mixer add-on works according to the pressure principle, which means that oxygen and fuel gas have the same inlet pressure to the nozzle tips.

A mixer (mixing nozzle) is suitable for seven sizes of nozzle tip, ranging from 25 to 370 l/h. The nozzle tips are entirely forged in copper. Mixers are available for both acetylene and propane. With propane, the area of application is limited to soldering and heating.

## Note!

**When propane is used, the propane hose must be connected to the torch handle. This is important, as acetylene and propane react differently to the material in the hose.**

## Torch systems.

X 11 – torch system for welding, cutting, soldering, heating, etc.

### X 11 Original box – the basis of the X 11 system.

**X 11 Original, complete box comprising:**

- X 11 handle
- X 11 cutting insert 90° injector (i)
- Welding insert 80 l/h
- Welding insert 160 l/h
- Welding insert 315 l/h
- Welding insert 500 l/h
- Welding insert 800 l/h
- Welding insert 1,000 l/h
- Cutting nozzle HA 411-2
- Cutting nozzle HA 411-3
- Nozzle nut
- Non-return valve BV-12 acetylene
- Non-return valve BV-12 oxygen
- Cleaning needle kit
- Fixed key for six key widths
- Robust plastic storage box
- Instructions as well as welding and cutting tables



	AGA no. / Part no.
X 11 Original, complete in box. Cutting insert (i) 90° with lever	204 000 342 / 300317
X 11 Original, complete in box. Cutting insert (i) 90° with wheel valve	204 000 343 / 309399
Box only excl. equipment	/ 300428

### X 11 Extend.

**X 11 Extend has the same equipment as X 11 Original, but comprises fewer parts.**

The box is the same as for X 11 Original, and can be supplemented with the components that are required when the need arises.

**X 11 Extend comprises:**

- X 11 handle
- X 11 cutting insert 90° injector with lever
- Welding insert 230 l/h
- Welding insert 500 l/h
- Cutting nozzle HA 411-3
- Non-return valve BV-12 acetylene
- Non-return valve BV-12 oxygen
- Cleaning needle kit
- 3 gaskets
- Fixed key for six key widths
- Robust plastic storage box
- Instructions as well as welding and cutting tables



	AGA no. / Part no.
X 11 Extend	204 000 356 / 309693

# Torch systems.

X 11 – torch system for welding, cutting, soldering, heating, etc.

## X 11 Combi.

X 11 Combi is a complete series for gas welding, cutting, soldering and heating. With the X 11 Combi contents you can:

- Weld materials in thicknesses from 0.5 – 8 mm
- Cut materials in thickness from 2 – 20 mm

### X 11 Combi comprises:

- X 11 handle
- X 11 cutting insert 90° injector (i), lever
- Welding insert 160 l/h
- Welding insert 315 l/h
- Welding insert 800 l/h
- Cutting nozzle HA 411-2
- Cutting nozzle HA 411-3
- Fixicontrol HT acetylene
- Fixicontrol HT oxygen
- Non-return valve BV-12 acetylene
- Non-return valve BV-12 oxygen
- Flashback arrestor SAFE-GUARD-4 acetylene
- Flashback arrestor SAFE-GUARD-4 oxygen
- 10 meter twin hose Ø 5 mm
- Welding goggles
- Gas lighter
- Cleaning needle kit
- Fire glove
- Fixed key for six key widths
- Storage box that also contains instructions, welding and cutting tables, as well as the yellow card





# Torch systems.

FLAME® kit – complete welding, cutting and soldering equipment.

## FLAME® flexible gas cart.

**FLAME® kit is a modular equipment system suitable for service work where there are demands for considerable mobility, for example within heating, ventilation and sanitation, refrigeration, property maintenance and operational maintenance. It is also suitable for hobby use.**

The FLAME® flexible gas cart is suitable for both 5 l and 10 l gas cylinders, and has pneumatic tyred wheels as standard, which means that the cart rolls softly on all surfaces. The gas cylinders have an effective mount and sit securely during transport and lifting. The cart is made of powder-painted steel and is approved for lifting. There are two storage boxes for the equipment.

The equipment included in the FLAME® kit satisfies the requirements in accordance with EN 2503, EN 730-1, EN 559, EN 560, EN 562 and EN ISO 5172. The gas hose for acetylene and oxygen is a 5 m twin hose with compression couplings and non-return valves, BV 12.

**The complete FLAME® flexible gas cart comprises:**

- FLAME® kit, flexible gas cart including boxes
- Regulator, Acetylene Fixicontrol HT with clamp
- Regulator, Oxygen Fixicontrol HT
- Flashback arrestor, SAFE-GUARD-4 Acetylene
- Flashback arrestor, SAFE-GUARD-4 Oxygen
- X11 Handle, Ergonomic
- Gaskets, 10 pcs
- Clamp coupling to handle
- Welding insert 160 l/h
- Welding insert 315 l/h
- Welding insert 500 l/h
- Cutting insert 90°, with lever
- Cutting nozzle, HA 411-2
- Cutting nozzle, HA 411-3
- 5 metre twin hose Ø 5 mm with compression couplings and non-return valves, BV12
- Cleaning needle set
- Gas lighter
- Welding goggles
- Fire glove



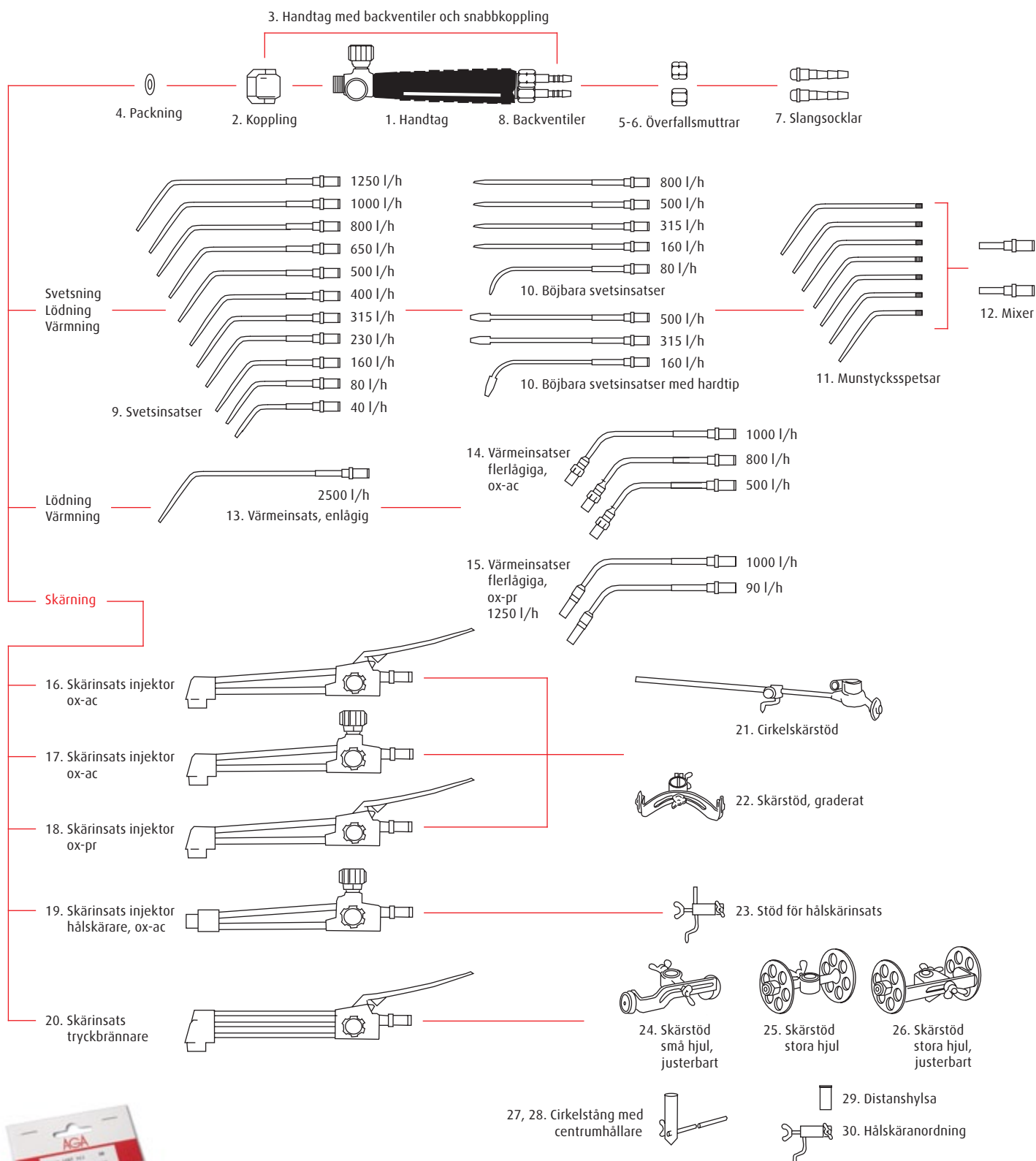
	Weight kg	Dimensions L x W x H	AGA no. / Part no.
Complete gas cart including 5 l gas cylinders	37	440 x 400 x 990	/ 323078
Complete gas cart excluding gas cylinders	20	440 x 400 x 990	/ 323080
Gas cart including boxes	15	440 x 400 x 990	/ 323597
Gas cart excluding boxes	10	440 x 400 x 990	/ 323077



# Torch systems.

X 11 Original – torch system for welding, cutting, soldering and heating.

## Handle with quick coupling – combination options.



### Gaskets for X 11



	Qty	AGA no. / Part no.
Gaskets	10	214 100 007 / 300423

# Torch systems.

X 11 Original – torch system for welding, cutting, soldering and heating.

## 1 – 7. Handle with accessories.



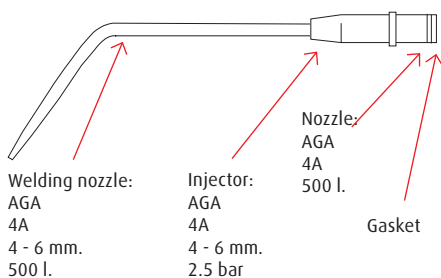
	Qty in SB	SB pack AGA no. / Part no.
1. Handle Ergonomic	1	202 100 278 / 300449
2. Clamp coupling	1	214 100 002 / 309170
3. Handle with non-return valves BV 12 Ø 5 mm and clamp coupling	1	214 100 172 / 300447
4. Gasket for welding and cutting insert	10	214 100 007 / 300423
5. Cap nut LH G ¼"	1 + 1	214 100 008 / 300835
6. Cap nut G ¼"		
7. Hose fitting Ø 5.0 mm Ac/O <sub>2</sub>	2	214 100 006 / 300 834

## 8. Non-return valve BV 12.

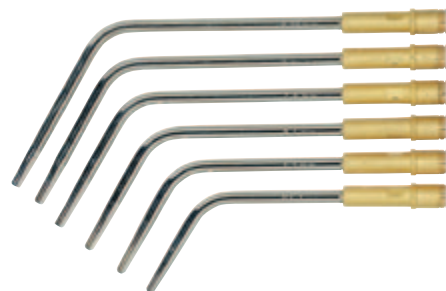
	Qty in SB	SB pack AGA no. / Part no.
Ø 5.0 mm ac/pr R ¼" LH	1 + 1	214 100 066 / 300386
Ø 5.0 mm oxygen R ¼" RH		
Ø 6.3 mm ac/pr R ¼" LH	1 + 1	214 100 067 / 300442
Ø 6.3 mm oxygen R ¼" RH		



## 9. Welding inserts in accordance with ISO 5172 (DIN 8543).



4	=	Size no.
A	=	Acetylene
4 - 6 mm.	=	Material thickness
500 l.	=	Gas flow, oxygen Litres per hour
2.5 bar	=	Working pressure, oxygen
i	=	Injector torch
E	=	Extra size in addition to standard



Size No.	Gas flow Ox - Ac - Ox l/h	Material thickness	SB pack AGA no. / Part no.	Recommend. cleaning needle AGA no. / Part no.
0	40	0,2 - 0,5	214 100 422 / 300388	206 000 030 / 300478
1A	80	0,5 - 1,0	214 100 423 / 300390	206 000 080 / 300482
2A	160	1,0 - 2,0	214 100 424 / 300392	206 000 160 / 300445
E2A	230	1,5 - 3,0	214 100 425 / 300402	206 000 230 / 300456
3A	315	2,0 - 4,0	214 100 426 / 300394	206 000 315 / 300458
E3A	400	3,5 - 5,0	214 100 427 / 300368	206 000 400 / 300467
4A	500	4,0 - 6,0	214 100 428 / 300396	206 000 500 / 300461
E4A	650	5,0 - 7,0	214 100 429 / 300391	206 000 650 / 300466
5A	800	6,0 - 9,0	214 100 430 / 300398	206 000 800 / 300453
E5A	1000	8,0 - 12,0	214 100 431 / 300400	206 001 000 / 300465
6	1250	9,0 - 14,0	214 100 432 / 300436	206 001 250 / 300462

Acetylene pressure: 0.1 to 0.8 bar.

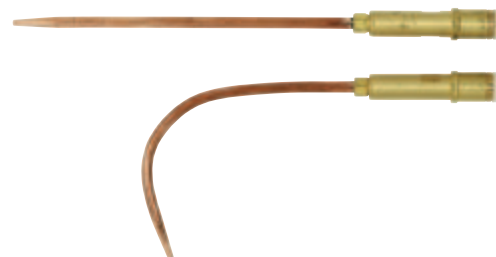
Oxygen pressure: 2.5 bar.

The figures refer to the picture on page 39

# Torch systems.

X 11 Original – torch system for welding, cutting, soldering and heating.

## 10. Flexible welding inserts.

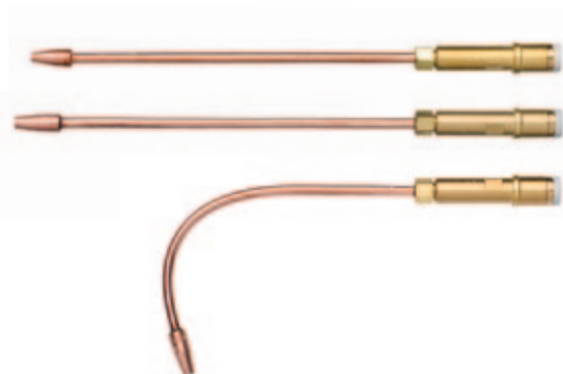


Size	Gas flow Ox - Ac - Ox l/h	Material thickness mm	SB pack AGA no. / Part no.	Cleaning needle, loose AGA no. / Part no.
1	80	0,5 - 1,0	214 100 312 / 300409	206 000 080 / 300482
2	160	1,0 - 2,0	214 100 313 / 300422	206 000 160 / 300445
3	315	2,0 - 4,0	214 100 314 / 300424	206 000 315 / 300458
4	500	4,0 - 6,0	214 100 315 / 300435	206 000 500 / 300461
5	800	6,0 - 9,0	214 100 316 / 300434	206 000 800 / 300453

Acetylene pressure: 0.2 - 0.6 bar.

Oxygen pressure: 2.5 bar.

## 10. Flexible welding inserts with hard tip.

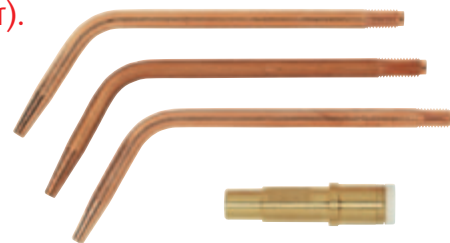


Size	l/h	AGA no. / Part no.
1	160	206 000 080 / 329614
2	315	206 000 160 / 329615
3	500	206 000 800 / 329616

## Torch systems.

X 11 Original – torch system for welding, cutting, soldering and heating.

### 11 – 12. Mixer and nozzle tips for low working pressure (0.15 – 0.30 bar).



Nozzle tip No.	Gas flow		AGA no. / Part no.	Qty in SB	SB pack
	Ox - Ac - Ox l/h	Ox - Pr - Pr l/h			AGA no. / Part no.
1	25	2	-	1	201 180 380 / 300339
2	50	10	-	1	201 180 381 / 300340
3	80	20	-	1	201 180 382 / 300341
5	140	25	-	1	201 180 383 / 300343
7	190	30	-	1	201 180 384 / 300344
10	280	40	-	1	201 180 385 / 300342
Mixer for acetylene			202 153 532 / 300346	-	-
Mixer for propane			202 153 556 / 300347	-	-
Mixer acetylene and nozzle tips 1, 3 and 7			-	1 + 3	214 100 434 / 300354
Mixer propane and nozzle tips 1, 3 and 7			-	1 + 3	214 100 433 / 300349

### Welding nozzles – replaceable inserts in accordance with tables 9, 10 and 13-15.



	Gas flow Ox - Ac - Ox l/h	AGA no. / Part no.
A. Nozzles for the welding inserts in table 9	40	201 180 430 / 300389
	80	201 180 431 / 300405
	160	201 180 432 / 300380
	230	201 180 439 / 300403
	315	201 180 433 / 300395
	400	201 180 440 / 300393
	500	201 180 434 / 300397
	650	201 180 441 / 300356
	800	201 180 435 / 300399
	1000	201 180 436 / 300401
	1250	201 180 437 / 300362
B. Nozzles for the flexible welding inserts in table 10	80	201 180 430 / 300389
	160	201 180 431 / 300405
	315	201 180 432 / 300380
	500	201 180 439 / 300403
	800	201 180 433 / 300395
C. Nozzles for single flame heating insert in tables 13 – 15	2500	201 180 430 / 300389

# Torch systems.

X 11 Original – torch system for welding, cutting, soldering and heating.

## 13 – 15. Heating inserts, acetylene and propane.



13. Single flame acetylene



14. Multiple flame acetylene

Type of heating insert	Gas flow l/h		SB pack AGA no. / Part no.	Cleaning needle, loose AGA no. / Part no.
	Oxygen	Propane		
13. Acetylene Single flame	2500		214 100 171 / 309330	
14. Acetylene Multiple flame	500		214 100 318 / 300357	206 000 060 / 300473
	800		214 100 319 / 300359	206 000 080 / 300482
	1000		214 100 320 / 300448	206 000 160 / 300557
	Acetylene, nozzle tip		/ 307449	
15. Propane Multiple flame	800		/ 307450	
		90	214 100 435 / 300410	
		1000	202 232 126 / 300351	

### Heating insert

Acetylene pressure: 0.8 bar

Oxygen pressure: 2.5 bar

### Multiple flame heating insert

Acetylene pressure: 0.6 - 0.8 bar

Oxygen pressure: 2.5 bar

### Multiple flame heating insert Propane

Propane pressure: 0.2 - 0.8 bar

Oxygen pressure: 2.5 bar

## Rule of thumb for heating and rectification.



Material thickness x 2.5 x 100 = Size heating insert

E.g.: 7 mm x 2.5 x 100 = 1,750 l/h

10 mm x 2.5 x 100 = 2,500 l/h

Heating output  
kW Ac/ox flame

20

29



The figures refer to the picture on page 39



## Torch systems.

X 11 Original – torch system for welding, cutting, soldering and heating.

### 16 – 20. Cutting inserts and hole-cutting inserts for pressure torch.



16. Cutting insert injector, acetylene



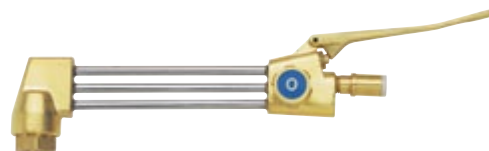
17. Cutting insert injector, acetylene



18. Cutting insert injector, propane



19. Hole-cutting insert injector, acetylene



20. Cutting insert pressure torch, acetylene or propane

#### Cutting inserts

	Qty in SB pack	SB pack AGA no. / Part no.
<b>Injector</b>		
16. Cutting insert 90° injector with lever valve	1	202 235 151 / 300374
17. Cutting insert 90° injector with wheel valve	1	202 235 152 / 300355
18. Cutting insert 90° injector oxygen/propane with lever	1	202 235 121 / 300373
19. Cutting insert 0° hole cutter injector	1	202 235 028 / 300379
– Nozzle nut for injector torch	2	214 100 351 / 309350
<b>Pressure torch</b>		
20. Cutting insert 90° pressure torch with lever valve	1	202 235 150 / 300350
– Nozzle nut for pressure torch	1	214 100 483 / 300595

#### Cutting inserts – dimensions and products facts for various items above

	Length cutting insert mm	Total length with handle mm	Angle of torch head	Weight with handle
<b>Injector</b>				
16.	170	350	90°HV	0,87
17.	170	350	90°RV	0,81
18.	170	350	90°HV Pr	0,87
19.	170	350	0°RV	0,87
<b>Pressure torch</b>				
20.	170	350	90°HV	0,86

HV = Lever for cutting oxygen

RV = Wheel valve for cutting oxygen

#### Note!

When using X 11 pressure torches and to obtain capacity for cutting 150 mm thick steel, the hose fitting and hose must have a dimension of Ø 6.3 mm.

# Standard nozzles for X 11.

Cutting nozzles, flat-sealed for X 11 injector torch.

## HA 411 – Acetylene.

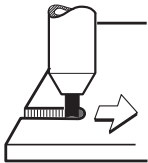
**HA 411 is a flat-sealed 1-piece nozzle with flicker flames.**

The nozzle is entirely forged from copper. The gas ducts are cylindrical and produce an even, turbulence-free heating flame and cutting oxygen jet. Note! Nozzle no. 5 for cutting material thickness from 50–100 mm can only be used in X 11 equipment manufactured after 1987.



Nozzle Serial no.	2 pack AGA no. / Part no.	10 pack AGA no. / Part no.	Cleaning	
			Heating duct Cleaning needle	Cutting duct Cleaning needle
HA 411-1	/ 315439	202 150 396 / 300323	206 000 030	206 000 030
HA 411-2	/ 315450	202 150 397 / 300329	206 000 040	206 000 080
HA 411-3	/ 315451	202 150 398 / 300332	206 000 060	206 000 230
HA 411-4	/ 315452	202 150 399 / 300334	206 000 060	206 000 400
HA 411-5	/ 315453	202 150 400 / 300336	206 000 060	206 000 650

## Cutting data HA 411

		Acetylene		Heating oxygen		Cutting oxygen		
Serial no.	mm	bar	m³/h	bar	m³/h	bar	m³/h	
HA 411-1	1 – 3	0,2 – 0,8	0,1 – 0,2	–	–	1,5	0,2 – 0,3	1 200 – 600
HA 411-2	3 – 8	0,2 – 0,8	0,1 – 0,2	–	–	1,5 – 2,0	0,5 – 0,6	600 – 500
HA 411-3	8 – 20	0,2 – 0,8	0,3	–	–	3,0 – 4,0	1,6 – 2,0	500 – 320
HA 411-4	20 – 50	0,2 – 0,8	0,3	–	–	4,0 – 4,5	3,8 – 4,2	320 – 200
HA 411-5	50 – 100	0,2 – 0,8	0,3 – 0,5	–	–	3,0 – 6,5	5,0 – 9,8	200 – 150



## Standard nozzles for X 11.

Cutting nozzles, flat-sealed for X 11 injector torch.

### HP 433 – Propane.

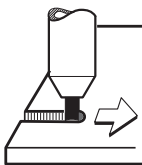
HP 433 is a flat-sealed 2-piece nozzle with slotted flames.

The outer nozzle is made of copper and the inner nozzle of brass. The cutting oxygen duct is cylindrical and produces a turbulence-free cutting oxygen jet.



Nozzle Serial no.	2 pack AGA no. / Part no.	Cleaning Heating duct Chemical agent AGA no. / Part no.	Cutting duct Cleaning needle AGA no. / Part no.
HP 433-1	/ 315454	218 190 051 / 300560	206 000 030
HP 433-2	/ 315455	KR 21 (page 111)	206 000 080
HP 433-3	/ 315456		206 000 230
HP 433-4	/ 315457		206 000 400

### Cutting data HP 433

		Propane		Heating oxygen		Cutting oxygen		
Serial no.	mm	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	
HP 433-1	1 – 3	0,3 – 1,5	0,1	–	–	2	0,2 – 0,8	425
HP 433-2	3 – 8	0,3 – 1,5	0,1 – 0,2	–	–	1,5 – 3,0	1,0 – 1,4	485 – 360
HP 433-3	8 – 20	0,3 – 1,5	0,2	–	–	2,0 – 4,0	1,7 – 3,0	380 – 265
HP 433-4	20 – 50	0,3 – 1,5	0,2	–	–	2,5 – 5,0	3,6 – 6,0	310 – 215



## Torch systems.

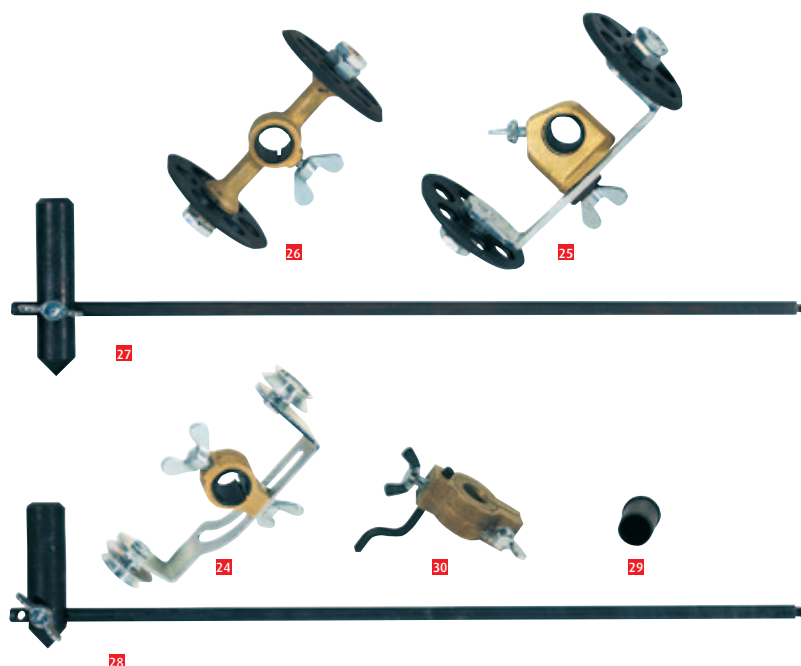
X 11 Original – torch system for welding, cutting, soldering and heating.

### 21 – 23. Cutting support for injector torch.



	SB pack
	AGA no. / Part no.
21. Circle-cutting support for hole diameters Ø 60 – 600 mm	202 130 258 / 300419
22. Cutting support, graduated	214 100 003 / 300414
23. Support for hole-cutting insert, hole diameters Ø 20 – 60 mm	214 100 327 / 300406

### 24 – 30. Cutting support for pressure torch.



	AGA no. / Part no.
24. Double cutting support, adjustable with small wheels	219 100 294 / 300576
25. Double cutting support with large wheels	219 100 295 / 300584
26. Double cutting support, adjustable with large wheels	219 100 296 / 300510
27. Cutting support with centre holder for large wheels	219 100 280 / 300575
28. Cutting support with centre holder for small wheels	219 100 297 / 300564
29. Spacer sleeve	219 100 509 / 300572
30. Hole-cutting device	202 130 143 / 300568



## Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating and rectification.

### Complete kits.

With AGA's complete equipment kit, users have the most common components gathered together in one place. These complete kits also make it easier to transport and take along the equipment e.g. in service vehicles. Complete kits are a good foundation to begin with, which can then be supplemented with specific additional components.



X 21 Original with round handle



X 21 Select



X 21 Combi



# Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## X 21 Original.

**X 21 Original is a combined gas welding and gas cutting torch for manual work. It is a pressure torch (II) that is designed on the basis of the stringent demands stipulated by standard EN ISO 5172.**

Stringent demands regarding airtightness, mechanical strength, flashback safety and flame stability are the foundations for the X 21 system. X 21 satisfies the high expectations that users have of a quality torch. With the X 21 pressure torch, the gases are mixed in the torch head, which increases safety against flashbacks.

Pressure torches entail that oxygen and fuel gas for the heating flame have the same inlet pressure to the nozzle. The cutting oxygen is supplied in a separate gas duct to the cutting nozzle. This provides the potential to have higher pressure for the cutting oxygen, which means that larger material thicknesses can be cut.

### Benefits with X 21 Original:

- Choose between round and oval torch handle
- Colour marking: red for fuel gas and blue for oxygen on the handle \* and cutting insert
- Potential to weld material thicknesses up to 14 mm
- Cut up to 500 mm
- Heat for rectification and heat forming
- Special flame-rectification torches
- Flame-cleaning torches
- Large range of accessories
- Suitable for powder cutting

X 21 Original is available for the fuel gases acetylene and propane (LPG). Using propane as the fuel gas, all the processes apart from gas welding can be used.

### Welding

The welding inserts, 8 inserts from 40 1250 l/h, are entirely forged from copper and chrome-plated for efficient heat dissipation and to deflect weld spatter. For weld locations that are difficult to access, there are four flexible welding inserts, ranging from 80 to 500 l/h, that are not chrome-plated. All welding inserts have replaceable welding nozzles.

### Cutting

#### X 21 Original for cutting:

- Cutting insert with lever valve or wheel valve
- Acetylene or propane
- Nozzle mount 90°, 75°, 45° and 0°
- Material thicknesses up to 500 mm
- Several different series of 3-cone sealed cutting nozzles
- Various alternative gouging nozzles
- Rivet cutting nozzles
- Available both as injector and pressure torches

### Soldering and heating

In addition to various welding inserts, there are three single flame heating inserts for acetylene, ranging from 1800 to 5000 l/h, as well as three multiple flame heating inserts ranging from 1000 to 5000 l/h. In addition there are four multiple flame heating inserts for propane, ranging from 1000 to 7000 l/h.

### Select the correct nozzle according to the choice of fuel gas:

Acetylene	HA-311 or COOLEX® A-311
Propane	COOLEX® P -331
Natural gas	THERMOLEN® MY-339

## Note!

When propane is used, the propane hose must be connected to the torch handle. This is important, as acetylene and propane react differently to the material in the hose.

# Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## X 21 Original – the basis of the X 21 system – complete in steel box.

**X 21 Original contains**

- Handle with non-return valves BV 12

→ Welding insert 80 l/h

→ Welding insert 160 l/h

→ Welding insert 315 l/h

→ Welding insert 500 l/h

→ Welding insert 800 l/h

→ Welding insert 1,250 l/h

→ Cutting insert 90° or 75°
- Cutting nozzle COOLEX® No 2

→ Cutting nozzle COOLEX® No 3

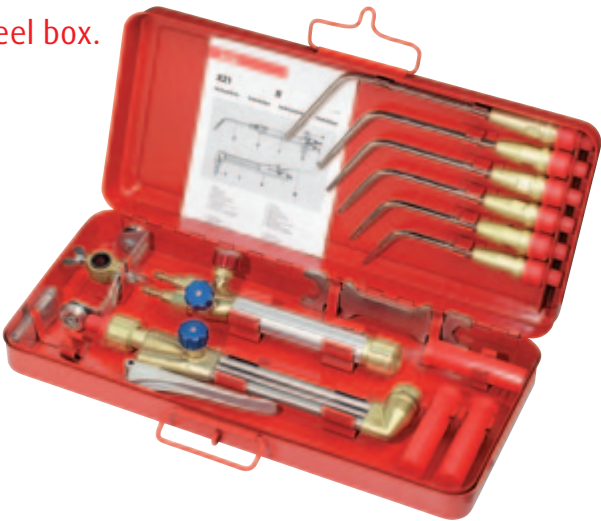
→ Cutting nozzle COOLEX® No 4

→ Cutting support

→ Fixed key

→ Cleaning needle kit

→ Supplied in steel box with welding/cutting table and instructions



		AGA no. / Part no.
With round handle		
Choose between two types:	- cutting insert 90°	219 124 225 / 305467
	- cutting insert 75°	219 124 226 / 300315
With oval handle		
Choose between two types	- cutting insert 90°	219 124 235 / 309344
	- cutting insert 75°	219 124 236 / 309345

## X 21 Select – combined gas welding and gas cutting torches.

X 21 Select has the same equipment as X 21 Original, but comprises fewer parts. X 21 Select satisfies the stringent demands required by the EN standard.

**X 21 Select contains:**

- X 21 round handle

→ X 21 cutting insert 90°

→ Cutting nozzle HA 133 - 4
- Welding insert 230 l/h

→ Welding insert 400 l/h

→ Cleaning needle kit

Supplied in robust plastic storage box. Instructions and the yellow card can be found in the storage box.



	AGA no. / Part no.
X 21 Select	204 000 356 / 305468

# Torch systems.

X 21 Combi with large capacity for welding, cutting, soldering, heating and rectification.

## X 21 Combi.

**X 21 Combi satisfies the stringent demands required by the EN standard and CE directives.**

X 21 Combi is a complete series for gas welding, cutting, soldering and heating. With the X 21 Combi contents you can

- weld materials in thicknesses from 0.5 – 6 mm
- cut materials in thicknesses from 2 – 50 mm

### X 21 Combi contains

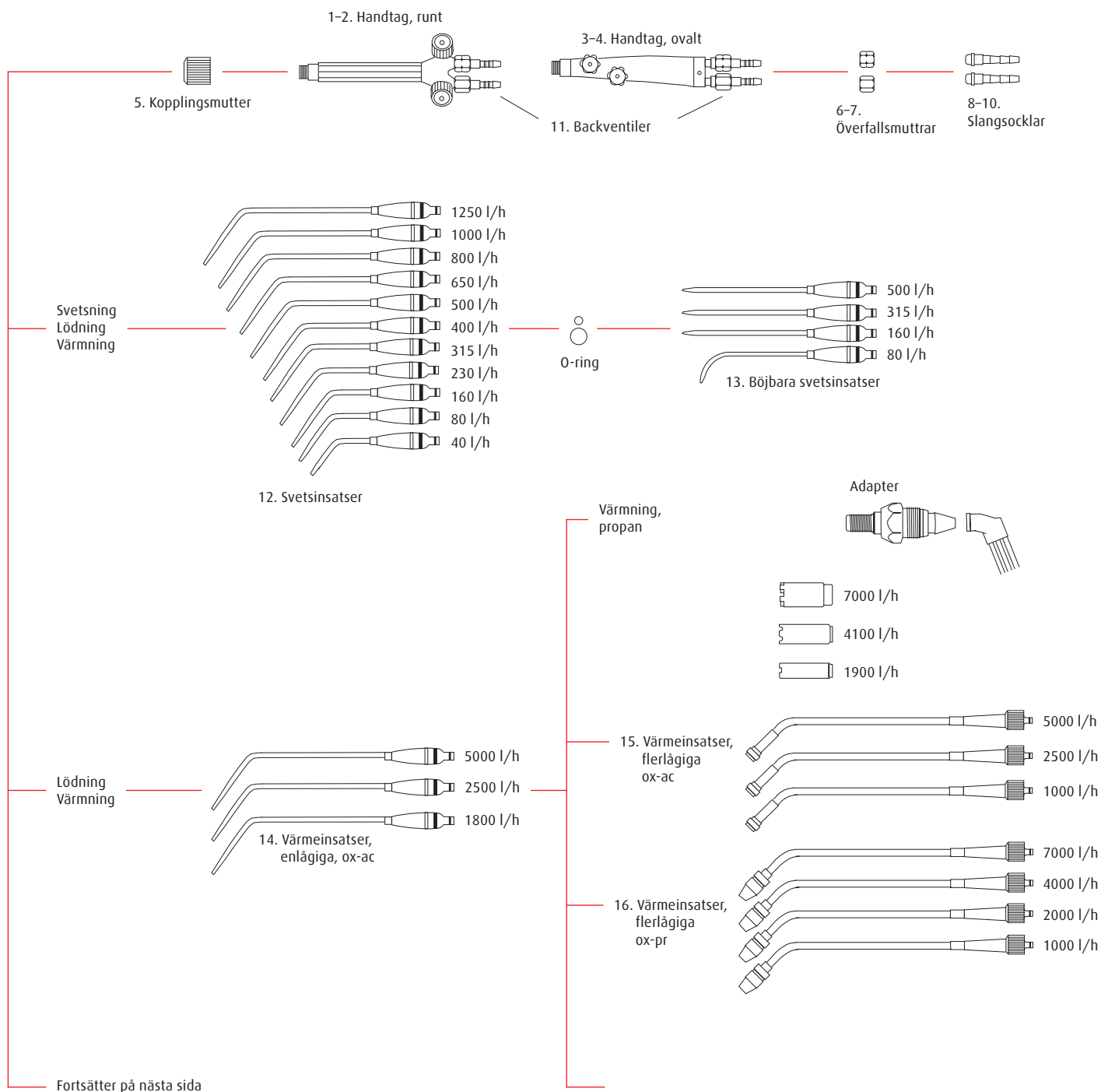
- X 21 round handle
- X 21 cutting insert 90° lever
- Welding insert 80 l/h
- Welding insert 315 l/h
- Welding insert 500 l/h
- Cutting nozzle HA 311-2
- Cutting nozzle HA 311-3
- Cutting nozzle HA 311
- Unicontrol 500 HT acetylene
- Unicontrol 500 HT oxygen
- Non-return valve BV-1
- Non-return valve BV-1
- Flashback arrestor SAFE-GUARD-4 acetylene
- Flashback arrestor SAFE-GUARD-4 oxygen
- 5 m twin hose Ø 6.3 mm
- Welding goggles
- Gas lighter
- Cleaning needle kit
- Hose clips 4 pcs
- Fire glove
- Fixed key for 6 key wrench
- Storage box that also contains instructions, welding and cutting tables as well as the yellow certificate



# Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## Handle with coupling nut – combination options.



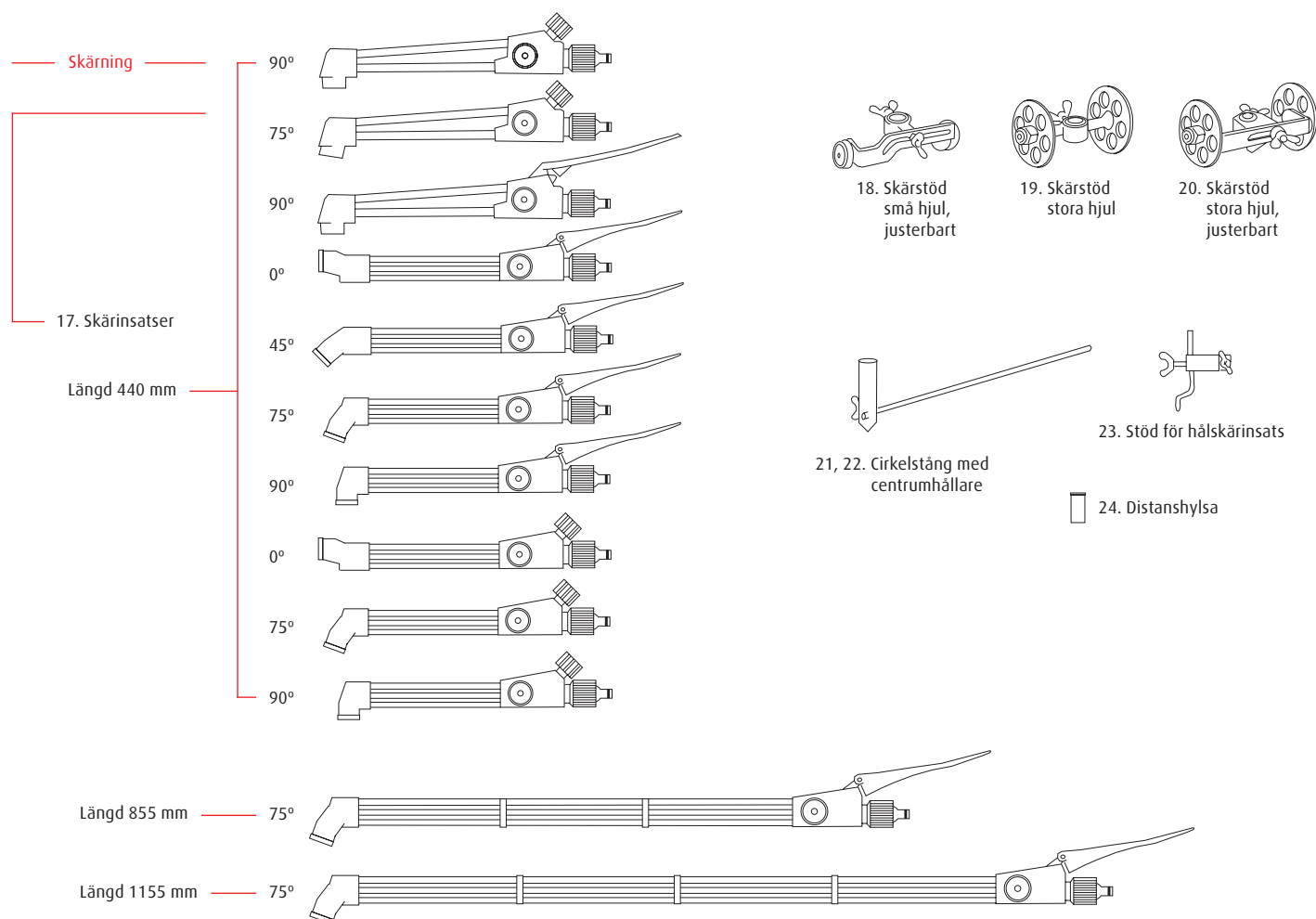
### O-ring for X 21

	Qty	AGA no. / Part no.
O-ring small	10	202 502 156 / 300571
O-ring large	10	202 502 154 / 300498
O-ring set 2 small and 2 large	2 x 2	219 100 278 / 300501

# Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## Handle with coupling nut – combination options.





# Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## 1 – 10. Handle and accessories.



Handle, round



Handle, oval

	AGA no. / Part no.	Qty in SB	SB pack AGA no. / Part no.
1. Handle, round with non-return valve BV 12 Ø 6.3	219 124 053 / 300581	-	-
2. Handle, round with hose fittings 6.3 mm	219 100 271 / 300527	-	-
3. Handle, oval with non-return BV 12 Ø 6.3	219 100 275 / 308543	-	-
4. Handle, oval with hose fittings 6.3 mm	219 100 273 / 308544	-	-
5. Coupling nut	219 100 436 / 300532	-	-
6. Cap nut LH G 3/8"		1+1	214 100 009 / 300836
7. Cap nut G 3/8" RH			
8. Hose fitting Ø 6.3 mm		2	214 100 024 / 300931
9. Hose fitting Ø 8 mm		2	214 100 025 / 300933

## 11. Non-return valves BV 12 incl. hose couplings.

	Qty in SB	SB pack AGA no. / Part no.
Ø 6.3 mm acetylene/propane	1+1	214,100,068 / 300522
Ø 6.3 mm oxygen		
Ø 8.0 mm acetylene/propane	1+1	214 100 069 / 300553
Ø 8.0 mm oxygen		
Ø 10.0 mm acetylene/propane	1+1	203 011 106 / 305656
Ø 10.0 mm oxygen		203 011 105 / 305657



## 12. Welding inserts.



Size No.	Gas flow oxygen l/h	Material thickness mm	SB pack AGA no. / Part no.	Cleaning needle AGA no. / Part no.
0	40	0,2 – 0,5	214 100 156 / 300578	206 000 030 / 300478
1	80	0,5 – 1,0	214 100 157 / 300582	206 000 080 / 300482
2	160	1,0 – 2,0	214 100 158 / 300596	206 000 160 / 300455
2E	230	2,0 – 3,0	214 100 159 / 300605	206 000 230 / 300456
3	315	2,0 – 4,0	214 100 160 / 300604	206 000 315 / 300458
3E	400	3,5 – 5,0	214 100 161 / 300603	206 000 400 / 300467
4	500	4,0 – 6,0	214 100 162 / 300590	206 000 500 / 300461
4E	650	5,0 – 7,0	214 100 163 / 300594	206 000 650 / 300466
5	800	6,0 – 9,0	214 100 164 / 300470	206 000 800 / 300453
5E	1000	7,0 – 10,0	214 100 165 / 300459	206 001 000 / 300465
6	1250	9,0 – 14,0	214 100 166 / 300460	206 001 250 / 300462

Acetylene pressure: 0.3 bar

Oxygen pressure: 0.3 bar

The figures refer to the picture on pages 52 - 53

## Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

### O-rings.

	Part no.
Large O-ring, 10 pack	305656
Small O-ring, 10 pack	300571
O-ring set 2 small and 2 large	300570

### 13. Flexible welding inserts.



Size No.	Gas flow oxygen l/h	Material thickness mm	SB pack AGA no. / Part no.	Cleaning needle AGA no. / Part no.
1	80	< 1,0	214 100 167 / 300602	206 000 080 / 300482
2	160	1,0 – 2,0	214 100 168 / 300583	206 000 160 / 300455
3	315	2,0 – 4,0	214 100 169 / 300600	206 000 315 / 300458
4	500	4,0 – 6,0	214 100 170 / 300599	206 000 500 / 300461

Acetylene pressure: 0.3 bar

Oxygen pressure: 3 bar

### Welding nozzles – replaceable inserts in accordance with tables 12, 13 and 14.



	Gas flow l/h	AGA no. / Part no.
A. Nozzles for the welding inserts in table 12	40	201 180 430 / 300389
	80	201 180 431 / 300405
	160	201 180 432 / 300380
	230	201 180 439 / 300403
	315	201 180 433 / 300395
	400	201 180 440 / 300393
	500	201 180 434 / 300397
	650	201 180 441 / 300356
	800	201 180 435 / 300399
	1000	201 180 436 / 300401
B. Nozzles for the flexible welding inserts in table 13	1250	201 180 530 / 300362
	80	202 151 051 / 300421
	160	202 151 052 / 300420
	315	202 151 053 / 300425
	500	202 151 054 / 300426
	800	202 151 055 / 300427
C. Nozzles for single flame heating insert in tables 14	1800	201 180 307 / 300555

# Torch systems.

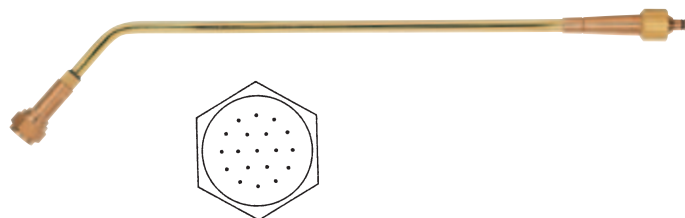
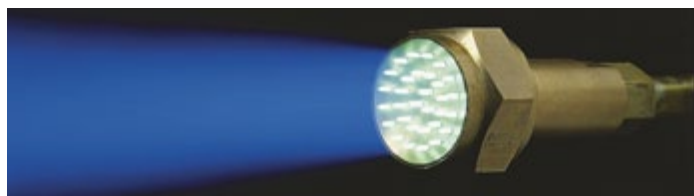
X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## 14. Single flame heating inserts – acetylene.



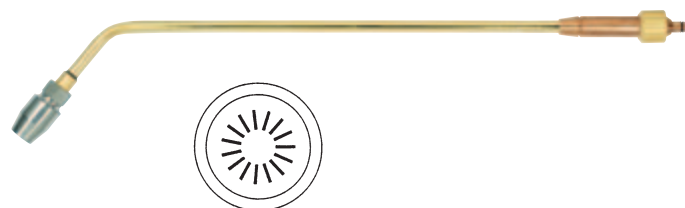
Size l/h	Length mm	Working pressure bar		Consumption l/h		Heating power kW	Cleaning Ø mm	AGA no. / SAP no.
		Oxygen	Acetylene	Oxygen	Acetylene			
1 800	340	3	0,3	1 800	1 620	21	3,3	202 231 333 / 300542
2 500	350	6	0,4	2 500	2 250	29	3,8	202 231 334 / 300525
5 000	510	8	0,6	5 000	4 500	58	5,0	219 100 228 / 300547
Extension pipe 450 mm								219 100 269 / 300556

## 15. Heating inserts acetylene – oxygen, extension pipe.



Size l/h	Length mm	Working pressure bar		Consumption		Heating power kW	Cleaning Ø mm	AGA no. / Part no.
		Oxygen	Acetylene	Oxygen l/h	Acetylene l/h			
1 000	250	3	0,3	1 000	900	11,6	–	202 232 210 / 300545
2 500	670	6	0,4	2 500	2 250	29,0	–	202 232 211 / 300543
5 000	680	8	0,6	5 000	4 500	58,1	–	202 232 212 / 300541
Extension pipe 450 mm								219 100 269 / 300556

## 16. Heating inserts propane – oxygen, extension pipe.



Size l/h	Length mm	Working pressure bar		Consumption		Heating power kW	AGA no. / Part no.
		Oxygen	Propane	Oxygen l/h	Propane l/h		
1 000	370	0,9	0,7	4 250	1 000	1 820	7
2 000	500	2,4	0,8	8 500	2 000	3 640	13
4 000	670	4,9	1,9	15 000	4 000	6 800	26
7 000	770	8,0	2,5	30 000	7 000	12 740	46
Extension pipe 450 mm							219 100 269 / 300556

### Recommendation for rectification

Material thickness x 2.5 x 100 =	Capacity of heating insert
E.g. material thickness 17 mm x 2.5 x 100 =	1,750 l/h
10 mm x 2.5 x 100 =	2,500 l/h
20 mm x 2.5 x 100 =	5,000 l/h
25 mm x 2.5 x 100 =	6,250 l/h
30 mm x 2.5 x 100 =	7,500 l/h

The figures refer to the picture on pages 52 - 53

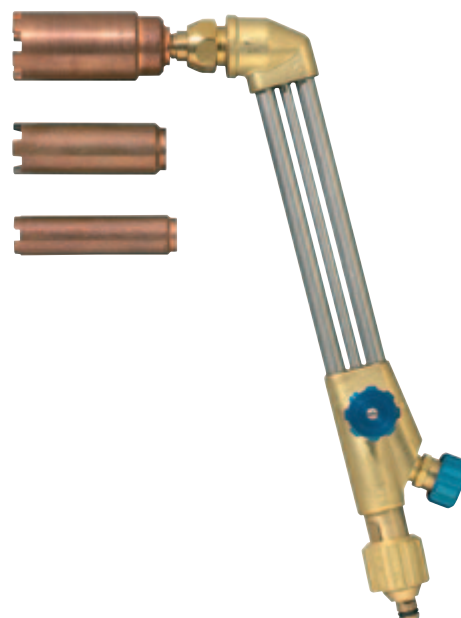
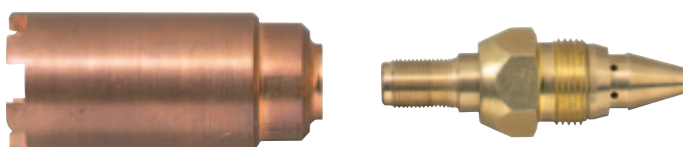
# Torch systems.

Heating, propane.

## Heating adapter for X 21.

The heating adapter for the X 21 is a device for heating with an X 21 pressure cutting insert.

One of the most flexible and essential items in any workshop is gas, along with welding and cutting tools. However, not everyone is aware that welding and cutting are only some of the possibilities offered by such equipment. By adding a few, simple components, the X 21 can be used for many different heating processes. The adapter is fitted directly to the torch head on the cutting insert. The heating nozzle is screwed into the adapter by hand.



18. Heating adapter for X 21

## Recommendation for rectification

Nozzle	1H	1H	3H	3H	5H	5H
Propane, bar	0,15	0,5	0,3	1,1	0,85	2,0
Oxygen, bar	0,7	2,0	1,8	5,0	3,5	8,7
Propane, l/h	830	1900	2100	4100	3200	7000
Oxygen, l/h	3500	7300	8300	16500	12700	28000
Heat output, kW	21,1	47,8	53,6	105,8	82,3	181,1

The heat output varies at different pressures. The above table presents two pressure settings.

	AGA no. / Part no.
Adapter	202 502 436 / 309336
Nozzle No.: 1H	202 150 271 / 309335
Nozzle No.: 3H	202 150 273 / 309334
Nozzle No.: 5H	202 150 275 / 309333

## Note!

Use a cutting insert with wheel valve for cutting oxygen when the cutting oxygen valve is to be fully open during use.



The figures refer to the picture on pages 52 - 53



# Torch systems.

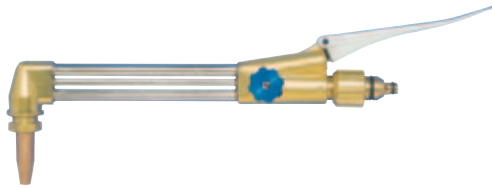
X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## 17. Cutting inserts.

The combined torch system X 21 with cutting inserts of various lengths.

→ Increased safety due to the fact that the oxygen can be shut off with the wheel valve on the handle. This eliminates the risk of the oxygen supply being opened accidentally

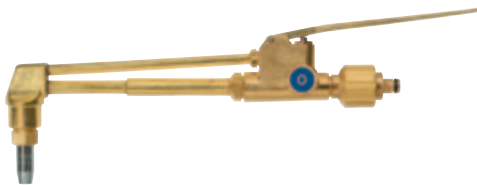
- Easy to supplement the existing X 21 torch system with the desired length of cutting insert
- Special lengths produced to order
- The torch may be used both for acetylene and propane/ THERMOLEN®



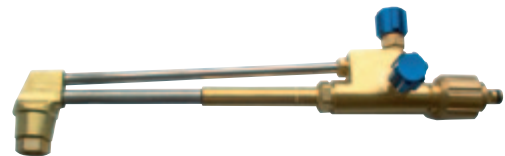
Cutting insert, pressure torch with lever



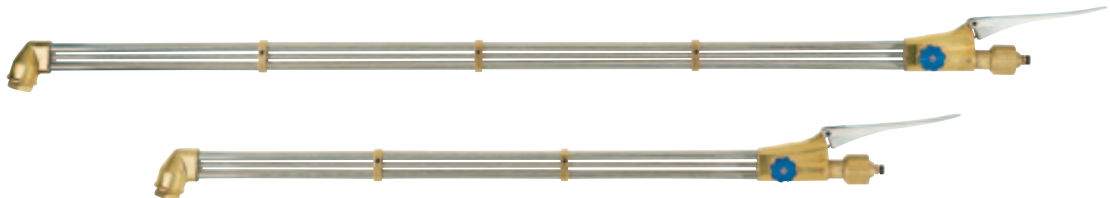
Cutting insert, pressure torch with wheel valve



X 21 Injector cutting insert



X21 Injector cutting insert



X 21 cutting insert with lever

Nominal Length mm		Angle	Weight with	AGA no. / Part no.
Cutting insert	Total length incl. handle	torch head	handle kg	
Pressure torch				
240	440	0° HV	1,30	219 100 206 / 300487
240	440	45° HV	1,30	219 100 207 / 300554
240	440	75° HV	1,30	219 100 208 / 300500
240	440	90° HV	1,30	219 100 209 / 300569
240	440	0° RV	1,30	219 100 210 / 308545
240	440	75° RV	1,30	219 100 198 / 308542
240	440	90° RV	1,30	219 100 199 / 307324
655	855	75° HV	1,75	219 100 248 / 300608
955	1155	75° HV	2,05	219 100 249 / 300607
Nozzle nut				201 030 929 / 300595
Injector torch Acetylene:				
220	420	90° HV	1,26	219 100 397 / 308680
220	420	75° RV	1,26	219 100 399 / 308672
220	420	90° RV	1,26	219 100 398 / 308673
Nozzle nut, injector				201 032 270 / 305597

HV = Lever valve for cutting oxygen

RV = Wheel valve for cutting oxygen

## Standard nozzles for X 21.

Cutting nozzles, 3-cone sealed for pressure torch. Manual cutting torch: X 11 pressure torch, X 21 pressure torch and corresponding older models.

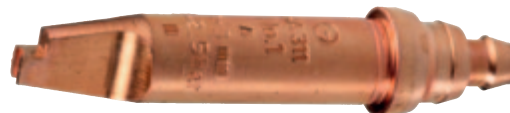
### HA 311 – Acetylene.

HA 311 is a 3-cone sealed cutting nozzle, exactly the same as COOLEX® A 311 but without a cooling flow. The nozzle has a cylindrical cutting duct and six heating flames, except for the largest nozzle, 300–500 mm, which has nine heating flames.

It is forged from a piece of copper over polished steel mandrels, which produces an even, turbulence-free flame. The smallest nozzle is known as a thin sheet metal nozzle, 1–3 mm, and is characterised by minimal heat spread and consequently little deformation of the workpiece. HA 311 has a large cutting range – a series of eight cutting nozzles for material thickness ranging from 1–500 mm.



HA 311-1 Thin sheet metal



HA 311-3



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	10 pack AGA no. / Part no.	Cleaning	
			Heating duct Cleaning needle	Cutting duct Cleaning needle
HA 311-1	219 100 340 / 305847	202 502 331 / 300631	206 000 160	206 000 160
HA 311-2	219 100 341 / 305853	202 502 332 / 300623	206 000 160	206 000 160
HA 311-3	219 100 342 / 305849	202 502 333 / 300624	206 000 160	206 000 300
HA 311-4	219 100 343 / 305852	202 502 334 / 300632	206 000 230	206 000 450
HA 311-5	219 100 344 / 305834	202 502 335 / 300612	206 000 315	206 000 650
HA 311-6	219 100 345 / 305843	202 502 336 / 300614	206 000 315	206 001 100
HA 311-7	219 100 347 / 305841	202 502 337 / 300621	206 000 315	–
HA 311-8	219 100 349 / 305832	202 502 338 / 300615	206 000 400	–

### Cutting data HA 311

Serial no.	mm	Acetylene		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
HA 311-1	1 – 3	0,2	0,1	–	–	0,5 – 2,5	1,3	Max. 1,000
HA 311-2	3 – 10	0,2	0,3	–	–	1,0 – 2,5	1,6	950 – 430
HA 311-3	10 – 25	0,2	0,4	–	–	1,5 – 4,0	3,6	580 – 350
HA 311-4	25 – 50	0,2	0,5	–	–	1,5 – 4,0	6,8	500 – 300
HA 311-5	50 – 100	0,2	0,7	–	–	3,0 – 6,0	7,8 – 14,1	380 – 180
HA 311-6	100 – 200	0,2	0,9	–	–	5,0 – 8,0	15,8 – 23,9	280 – 120
HA 311-7	200 – 300	0,3	1,2	–	–	5,0 – 8,0	23,6 – 36,7	150 – 100
HA 311-8	300 – 500	0,3	3,0	–	–	7,0 – 12,0	43,1 – 68,3	100 – 50

## Standard nozzles for X 21.

Mechanised cutting torch: X 541 and corresponding older models. Manual cutting torch: X 21 and corresponding older models.

### COOLEX® P 331 – Propane.

**COOLEX® P 331 is a 3-cone sealed cutting nozzle with slotted flames.**

The nozzle is in two parts, and the inner nozzle has a cylindrical cutting duct. The inner nozzle is shorter than the outer nozzle, and the recessed location helps effectively to guide the propane flame, which is even and turbulence-free.

**Distinguishing properties:**

- Large cutting range – a series of eight cutting nozzles for material thicknesses from 1–500 mm
- Long service life thanks to the cooling flow to the cutting oxygen duct



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Cleaning needle
P 331-1	214 100 444 / 300675	218 190 051 / 300560	206 000 160 / 300455
P 331-2	214 100 445 / 300676	KR 21 (page 111)	206 000 315 / 300458
P 331-3	214 100 446 / 300668		206 000 400 / 300467
P 331-4	214 100 447 / 300674		206 000 500 / 300461
P 331-5	214 100 448 / 300671		206 000 700 / 300464
P 331-6	214 100 449 / 300670		206 001 250 / 300462
P 331-7	214 100 450 / 300669		-
P 331-8	214 100 451 / 300672		-

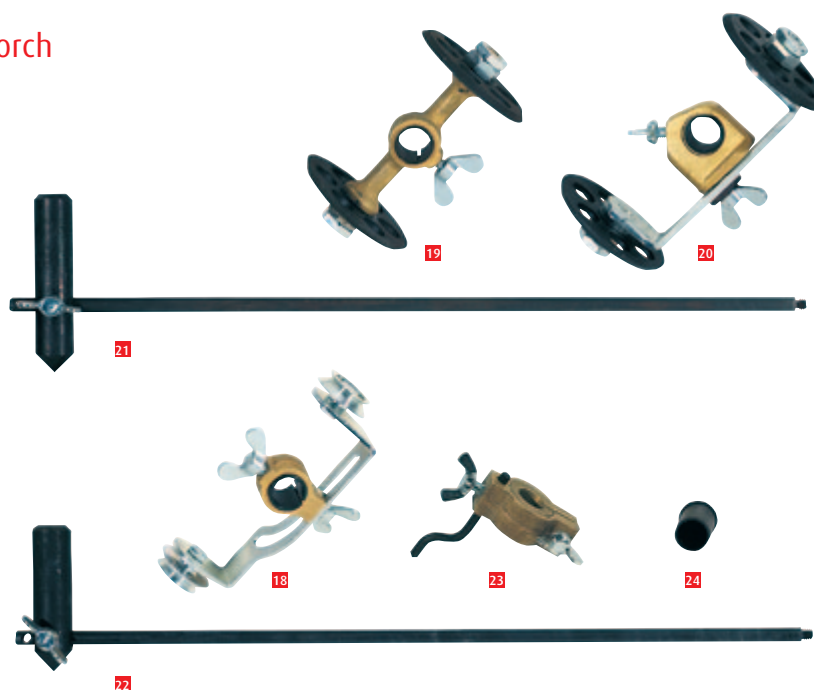
### Cutting data COOLEX® P 331

Serial no.	mm	Propane		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
P 331-1	1 – 3	0,3 – 1,5	0,1	-	-	0,6 – 1,9	1,6	Max. 900
P 331-2	3 – 10	0,3 – 1,5	0,2	-	-	0,4 – 0,9	2,7	850 – 390
P 331-3	10 – 25	0,3 – 1,5	0,5	-	-	0,6 – 2,1	4,5	540 – 325
P 331-4	25 – 50	0,3 – 1,5	0,5	-	-	0,8 – 2,4	7,8	475 – 285
P 331-5	50 – 100	0,3 – 1,5	0,5	-	-	1,9 – 5,0	9,0 – 15,2	380 – 180
P 331-6	100 – 200	0,3 – 1,5	0,5	-	-	3,1 – 5,6	14,7 – 24,3	280 – 120
P 331-7	200 – 300	0,3 – 1,5	0,6	-	-	4,4 – 7,5	25,8 – 45,2	150 – 100
P 331-8	300 – 500	0,3 – 1,5	1,2	-	-	5,5 – 10,5	41,3 – 75,0	100 – 50

## Torch systems.

X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

### 18 – 24. Cutting support for X 21 pressure torch and X 11 pressure torch.



	AGA no. / Part no.
18. Double cutting support, adjustable with small wheels	219 100 294 / 300576
19. Double cutting support with large wheels	219 100 295 / 300584
20. Double cutting support, adjustable with large wheels	219 100 296 / 300510
21. Cutting support with centre holder for large wheels	219 100 280 / 300575
22. Cutting support with centre holder for small wheels	219 100 297 / 300564
23. Hole-cutting device	219 100 509 / 300572
24. Spacer sleeve	202 130 143 / 300568

### Extra circle-cutting device for X 21.

High quality ball bearing circle-cutting device that increases the potential, with manual gas cutting, to achieve a narrow tolerance and high cut quality when cutting circles and holes.

The circle-cutting device is used together with X 21 and similar torches, as well as the cutting nozzles COOLEX®, HA 311, etc.



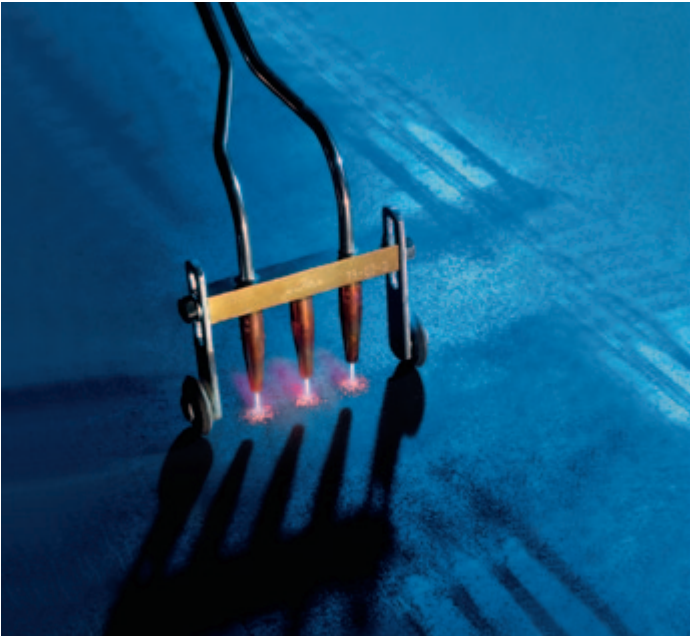
	Diameter mm	AGA no. / Part no.
Circle-cutting device	30 – 800	206 434 630 / 300606
Circle-cutting device	30 – 100	206 434 615 / 300531
Circle-cutting device X 21 Injector, X 311	60 – 800	202 130 260 / 310358



# Torch systems.

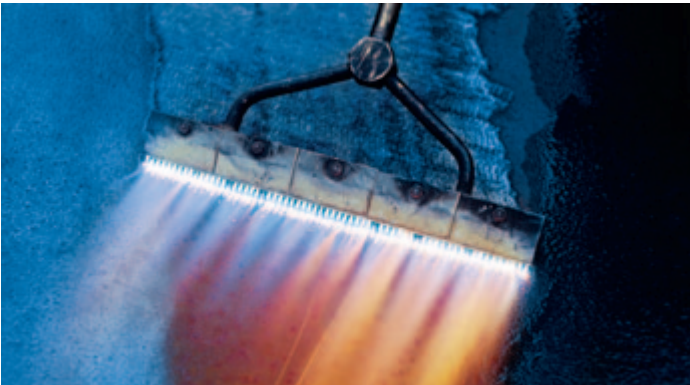
X 21 Original with large capacity for welding, cutting, soldering, heating, etc.

## Flame-rectification torch.



		Length mm	Working pressure bar		Consumption l/h		AGA no. / Part no.
			Oxygen	Acetylene	Oxygen	Acetylene	
Flame-rectification torch	3 nozzles	730	7	0,7	1 500	1 350	202 232 266 / 300534
	5 nozzles	690	7	0,7	2 500	2 250	202 232 267 / 300490
Nozzles for flame-rectification torch X 21, 500 l							201 187 143 / 300495
Wheel, incl. hub							/ 300506
Wheel holder							/ 307990

## Flame-cleaning torch.



	B	L	Working pressure bar		Consumption l/h		Cylinder requirement	AGA no. / Part no.
	mm	mm	Oxygen	Acetylene	Oxygen	Acetylene		
Flame-cleaning torch	50	490	0,7	0,7	1 250	1 150	2	202 235 735 / 300538
Flame-cleaning torch	150	490	0,7	0,7	2 500	2 300	6	202 235 736 / 300537
Flame-cleaning torch	250	1190	0,8	0,6	4 400	4 050	10	202 235 731 / 300536

Due to the large gas consumption, outlets are required from 2 cylinders of acetylene for every 50 mm width of the flame-cleaning equipment.

# Torch systems.

Flame rectification and heating.

## Flame rectification.

During welding and cutting, stresses are caused in the material that can result in unwanted deformations. If these deformations are unacceptable, the part must be rectified. A suitable method is usually flame rectification, and in some cases it is also the only option for reducing the deformations to an acceptable level.

### Flame rectification

Flame rectification takes place by means of rapid local heating, which entails a permanent local deformation of the material, through the prevention of thermal expansion. During cooling, the material then shrinks. Steel must be heated to approx. 600 – 700°C, which causes the steel to change to a dark red colour.

### Heat forming

Heating in order to bend bar profiles etc. generally entails the same demands for rapid, brief heating as for flame rectification.

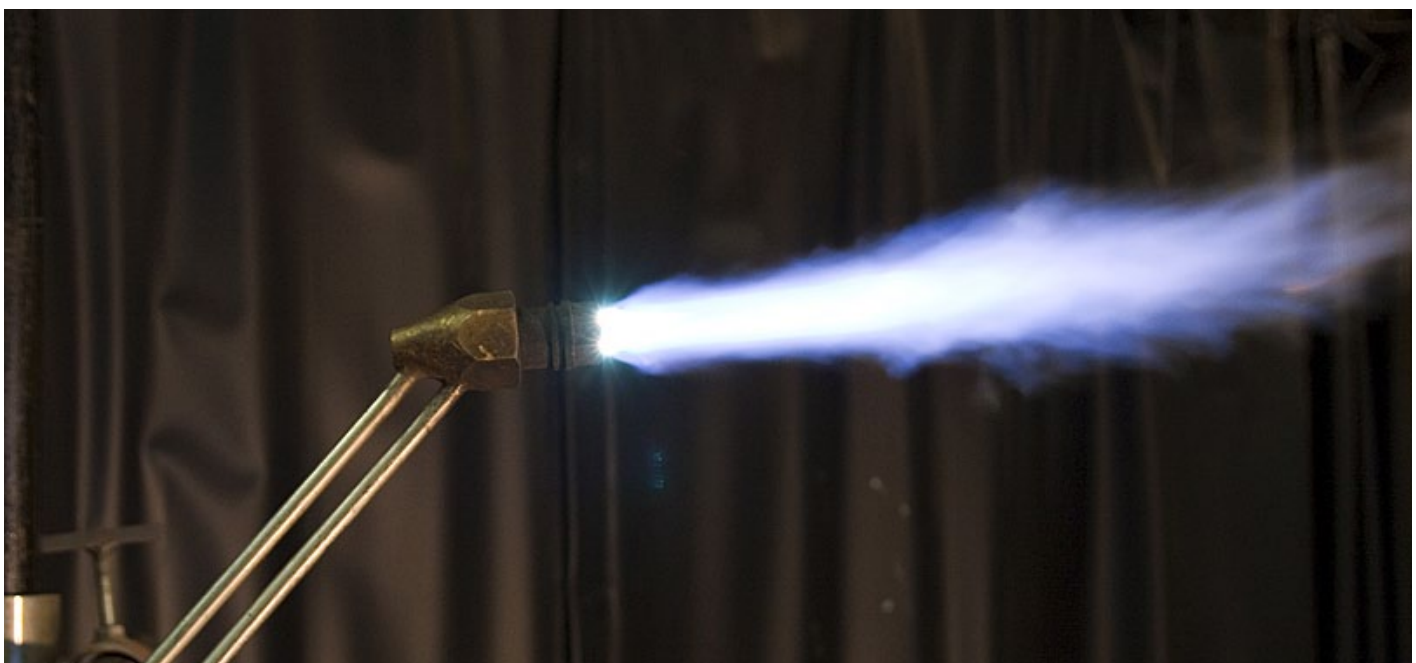
### Pre-heating (raised working temperature)

Pre-heating a welding object is dependent on the type of parent material, the thickness of the material and which welding process is to be used. If pre-heating is required, the Flamtech torch has suitable properties for the task.

## Note!

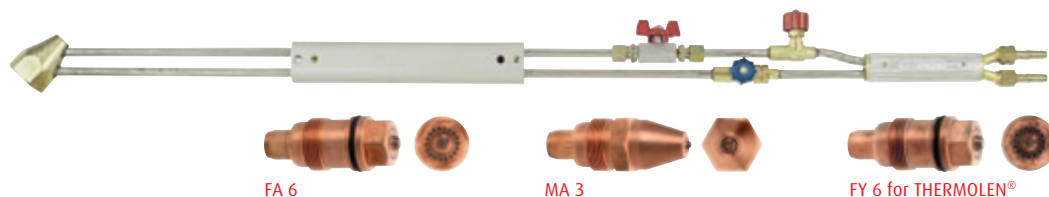
Consult your material supplier regarding suitable pre-heating temperature. In order to succeed with flame rectification, heating has to take place quickly. This means that acetylene (which has the highest effective heating value of all fuel gases) and an efficient torch have to be used. The Flamtech torch satisfies these requirements.

Flamtech torch



# Torch systems.

## Flame rectification.



### Nozzle MA 3, Flame rectification

Working pressure:	Oxygen 2 bar	8,500 l/h	Acetylene 1 bar
Lowest working pressure:	Oxygen 1.1 bar	5,400 l/h	Acetylene 0.9 bar
Heat output: 98 kW			

### Nozzle FA 6, Pre-heating (raised working temperature)

Working pressure:	Oxygen 1.5 bar	10,000 l/h	Acetylene 0.7 bar
Lowest working pressure:	Oxygen 0.8 bar	6,400 l/h	Acetylene 0.6 bar
Heat output: 116 kW			

		AGA no. / Part no.
FLAMTECH torch		203 024 050 / 300469
Nozzle	MA 3	202 502 310 / 300611
Nozzle	FA 6	202 502 311 / 300616
Nozzle	FY 6 for THERMOLEN®	202 502 408 / 307990

## Note!

The acetylene gas supply to Flamtech must take place from a cylinder bundle. In addition, double flashback arrestors, SAFE-GUARD-4, must be fitted with double outlets, as more than 5 m³/h of acetylene is required.

## Rule of thumb for output of acetylene from various cylinder sizes

Cylinder size	Content, filled cylinder	Maximum capacity
A 5	0.8 kg equiv. to approx. 740 l	90 l/h
A 20	3.1 kg equiv. to approx. 2,880 l	450 l/h
A 40	7.8 kg equiv. to approx. 7,170 l	900 l/h
Bundle		
A 40 x 10	62 kg equiv. to 57,000	10,000 l/h

- For a short period, larger nozzles can be connected to each gas cylinder
- A partially emptied gas cylinder reduces the capacity  
Can be estimated as follows:
  - Cylinder pressure x cylinder volume x 10 = approx. value of remaining gas volume.
  - Example: 8 bar x 40 (A 40 cylinder) x 10 = approx. 3,200 litres of gas.

## Rule of thumb for rectification and heating.

Material thickness x 2.5 x 100 =	Capacity of heating insert
E.g. material thickness: 20 mm x 2.5 x 100 =	15,000 l/h
E.g. material thickness: 30 mm x 2.5 x 100 =	17,500 l/h
E.g. material thickness: 40 mm x 2.5 x 100 =	10,000 l/h

For further information, see [page 134](#)

# Torch systems.

Manual cutting torch.

## Manual cutting torch X 511.

**X 511 is a pressure torch (II) and is intended for manual gas cutting.**

The capacity is sufficient for material thicknesses up to 500 mm. X 511 is designed according to and satisfies requirements set out in EN ISO 5172.

Acetylene, propane or natural gas can be used as the fuel gas, and it has a lockable lever valve for the cutting oxygen. X 511 has wheel valves installed on the side and a flat handle. COOLEX®, HA 311. The cutting nozzles can be found on pages 81-94 and the gouging nozzles on pages 96-99. Non-return valves are not included.



	Length mm	Nozzle mount	AGA no. / Part no.
X 511	470	90°	203 021 230 / 300696
	470	75°	203 021 231 / 300691
	855	75°	203 021 234 / 300690
	1.080	75°	203 021 236 / 300679

## Manual cutting torch X 31.

X 31 is a pressure torch (II) and is intended for manual gas cutting. The cutting capacity is sufficient for material thicknesses up to 500 mm. The handle is round, and there are oxygen and fuel gas valves at the rear of the torch handle. The lever valve for the cutting oxygen is lockable. The gas pipes are made of stainless steel. Acetylene, propane or natural gas can be used as the fuel gas. The torch satisfies EN ISO 5172. The cutting nozzles can be found on page 94 and the gouging nozzles on [pages 90-92](#). Non-return valves are not included.



	Length mm	Nozzle mount	AGA no. / Part no.
X 31	470	90°	/ 305578
	470	75°	/ 305558

## Manual cutting torch SIDER 7.

The SIDER 7 injector torch is a robust cutting torch for propane and oxygen. It is durable and reliable. It satisfies requirements set out in EN ISO 5172. The stainless steel pipes are placed in a triangular layout for optimum stability. The mixing chamber is placed in the cutting head

and the cutting oxygen valve is designed for soft-starting the cutting process. SIDER 7 has a cutting capacity of up to 300 mm. Supplied with non-return valves. Nozzles for SIDER 7, see [page 71](#).



	Length mm	Weight g	Connections	AGA no. / Part no.
SIDER 7	920	1.400	3/8" RH - 3/8" LH	/ 315502
SIDER 7 Long	1.500	1.600	3/8" RH - 3/8" LH	/ 330468



# NFF cutting nozzle for SIDER 7 scrap cutting torch.

Cutting nozzles for scrap cutting for manual cutting torch.



## NFF Propane.

Nozzle NFF Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
NFF-1	/ 315501	218 190 051 / 300560 KR 21 (page 111)	218 190 051 / 300560 KR 21 (page 111)
NFF-2	/ 315497		
NFF-3	/ 315496		
NFF-4	/ 315499		
NFF-5	/ 315500		
NFF-6	/ 315498		

## Cutting data NFF

Serial no.	Cutting range mm	Propane		Oxygen	
		bar	m³/h	bar	m³/h
NFF-1	6-25	0,5	0,4	2,5-3,5	3,5- 4,5
NFF-2	25-50	0,5	0,4	3,0-4,0	4,0- 4,8
NFF-3	50-75	0,5	0,4	3,0-4,5	5,0- 6,5
NFF-4	75-150	0,5	0,5	3,5-5,5	6,5- 9,5
NFF-5	150-200	0,5	0,6	4,5-5,5	10,0-14,0
NFF-6	200-300	0,5	0,7	5,0-6,5	15,0-19,0



# Cutting equipment.

## Lance.

**The lance works quickly and quietly in aluminium, stainless steel, cast iron, copper and concrete.**

The lance (torch lance) is a tool for making holes and cutting in hard materials (reinforced concrete, natural stone, kiln bricks, acid-resistant steel, cast iron). The lance works without noise or vibrations. Areas of application: all cutting of scrap, sheet pile walls, underwater cutting and similar cutting of materials where normal thermal cutting cannot be used.

### Work execution

The lance is lit against a wood block with a small volume of oxygen, and applied at an angle against the surface to be processed. When the lance has begun to burn, the oxygen pressure is increased. The lance burns at a temperature of approx. 3,000°C, at which concrete and similar materials sinter ("melt"). Hole diameter approx. 40 mm. An area of approx. 30 mm around the torch hole is affected by the heat generation. The lance can be bent, making it possible to make holes behind obstacles such as pipelines, etc. The lance can be extended to a number of lengths. If a larger hole diameter is required, two or more lances can be connected in parallel.



Lance holder Model C, incl. non-return valve



Lance holder Model W, incl. non-return valve



Hose fitting 8 mm



Nut

Lance Ø mm	Cutting direction	Hole diameter mm	Oxygen, bar	Consumption during hole making			Cutting speed mm/min
				Oxygen m <sup>3</sup>	Lance m	Time min.	
16 (3/8")	Horizontal	40	6,0	2,3	5,4	5,4	190
16 (3/8")	Overhead	40	6,0	2,5	6,0	6,0	165

	AGA no. / Part no.
Lance holder Model C, incl. non-return valve	/ 316653
Lance holder Model W, incl. non-return valve	/ 330468
Lance Ø 16 X 3000	/ 300736
Hose fitting 8 mm	/ 316810
Nut	/ 316811



# Cutting equipment.

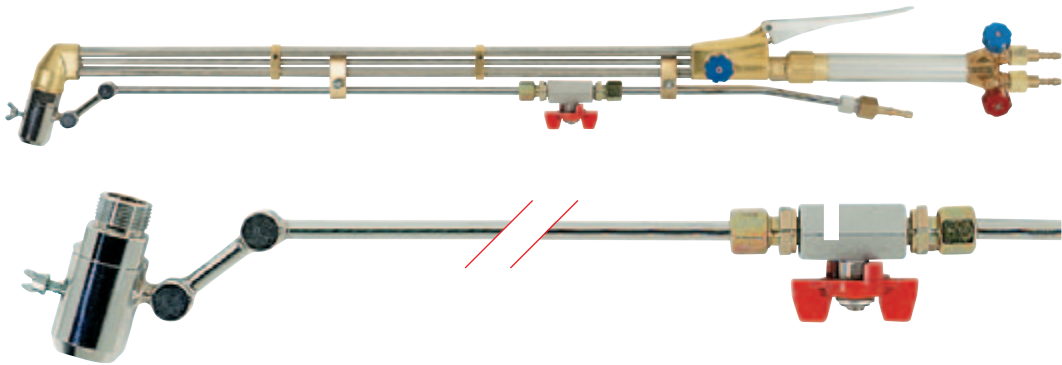
Powder cutting.

## Powder cutting torch X 21.

The X 21 power cutting torch is a manual cutting torch adapted for powder cutting.

It comprises a standard X 21 manual cutting torch, page 48, and a powder cutting add-on that is suitable for the powder dosing apparatus VF 2600.

The complete powder cutting torch is 905 mm long and weighs 2.9 kg.



Material	Material thickness mm	Cutting speed mm/min
Stainless steel SS 2333	25	300 – 400
	100	140 – 200
	150	100 – 170
Copper	100	60

	Length mm	AGA no. / Part no.
X 21 Handle with BV 12	250	219 124 053 / 300581
X 21 Cutting insert	655	219 100 248 / 300608
Powder cutting add-on	815	202 232 109 / 309347



# Cutting nozzles.

Cutting nozzles, 3-cone sealed, for pressure torch.

Manual cutting torch: X 21 for powder cutting. Mechanised cutting torch: X 541.

## Cutting nozzles for powder cutting.

**Cutting nozzle for powder cutting is a 3-cone sealed cutting nozzle with slotted flames. The nozzles are marked "Powder".**

The nozzle is in two parts, and the inner nozzle has a cylindrical cutting duct.

The inner nozzle is shorter than the outer nozzle, and the recessed location helps effectively to guide the propane flame, which is even and turbulence-free.

The outer nozzle is chrome-plated. These nozzles are 6 mm longer than COOLEX® P 337. Scrap cutting.



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
P 337 Powder No. 1	219 144 460 / 309310	218 190 051 / 300560	218 190 051 / 300560
P 337 Powder No. 2	219 144 461 / 309309	KR 21 (page 111)	KR 21 (page 111)
P 337 Powder No. 3	219 144 462 / 309308		
P 337 Powder No. 4	219 144 463 / 309307		

## Cutting data nozzle P 337 Powder cutting

Serial no.	mm	Propane		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
P 337 Powder No. 1	0 – 50	0,3	0,5	–	–	0,6 – 2,4	8,0	–
P 337 Powder No. 2	50 – 100	0,3	0,6	–	–	1,9 – 5,0	9 – 15,0	–
P 337 Powder No. 3	100 – 200	0,3	0,6	–	–	3,1 – 5,6	16 – 25,0	–
P 337 Powder No. 4	200 – 300	1,5	0,6	–	–	4,4 – 7,5	26 – 45,0	–



Mechanised  
cutting equipment.





# Mechanised cutting equipment.

Mechanised cutting torch.

## BIR for acetylene and propane.

The mechanised cutting torch BIR has been developed for mechanised gas cutting and the fuel gases acetylene and propane. BIR is an injector torch.

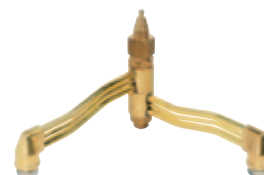
The BIR injector torch has its own cutting nozzles, which can be found on pages 85 and 86 in this catalogue. The torch is dimensioned in accordance with EN 874.

### Distinguishing properties:

- Integral cooling flow valve entails increased accessibility in the cutting machine thanks to the increased service life for the cutting nozzles
- Angled hose connections facilitate installation in the cutting machine
- Improved flashback safety thanks to a special spiral nozzle in the torch



Needle valve for fuel gas



Twin torch



Needle valve for cutting oxygen



Needle valve for heating oxygen

		AGA no. / Part no.
BIR acetylene	220/32	203 021 363 / 309794
BIR propane	220/32	203 021 364 / 309 793

The torch is supplied without needle valves

### Needle valves

		AGA no. / Part no.
Needle valve for cutting oxygen	G 3/8"	203 010 360 / 300121
Needle valve for fuel gas	LH 3/8"	203 010 359 / 305588
Needle valve for heating oxygen	G 1/4"	203 010 406 / 305683

## JETSTREAM® (injector) for acetylene and propane.

The JETSTREAM® mechanised cutting torch has been developed for mechanised gas cutting and the fuel gases acetylene and propane. JETSTREAM® is an injector torch.

The injector torch is intended for flat-sealed cutting nozzles and can be supplied in various lengths and diameters. It is dimensioned in accordance with EN 874. The cutting nozzles can be found on pages 83, 87 and 88.

### Distinguishing properties:

- Integral cooling flow valve entails increased accessibility in the cutting machine thanks to the increased service life for the cutting nozzles
- Angled hose connections facilitate installation in the cutting machine
- Improved flashback safety thanks to a special spiral nozzle in the torch



		AGA no. / Part no.
Acetylene	220/30	203 021 300 / 305612
	220/32	203 021 301 / 305610
	220/35	203 021 302 / 305613
	400/32	203 021 306 / 305611
	400/35	203 021 309 / 305607
Propane	220/30	203 021 303 / 305586
	220/32	203 021 304 / 305585
	220/35	203 021 305 / 305587
Nozzle nut		201 032 270 / 305597

## Mechanised cutting torch.

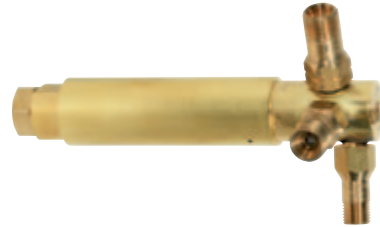
### BM 31CF (injector) for acetylene.

The machine cutting torch BM 31 CF is available for acetylene and is intended for mechanised cutting, in the first instance using portable cutting machines.

BM 31 CF is an injector torch for flat-sealed cutting nozzles and is dimensioned in accordance with EN 874. Supplied in different lengths and with different diameters.

#### Distinguishing properties:

- Integral cooling flow valve entails an increased service life for the cutting nozzles
- Improved flashback safety thanks to a special spiral nozzle in the torch



	Length mm	Ø mm	AGA no. / Part no.
BM 31 CF	100	28	203 021 243 / 305598
	100	32	203 021 245 / 308548
	160	28	203 021 244 / 305599
	160	32	203 021 246 / 308547
Nozzle nut			201 032 270 / 305597

### Twin torch injector – BM.

A twin torch is an add-on to the mechanised cutting torch that can double capacity and increase productivity at a low investment cost. The twin torch is available in two versions: Model BM is an injector torch with flat-sealed cutting nozzles for JETSTREAM® and BM31 CF torch Model TT 60 works with 3-cone sealed torches e.g. X541.

#### Distinguishing properties and areas of application:

- Increased productivity at a low investment cost
- Easy to use
- Cutting of straps or small parts within the working range

#### Twin torch injector BM.

- Distance between the cuts 30–400 mm
- Pressure heating oxygen min 4 bar. Twin torch pressure TT 60
- Distance between the cuts 30–400 mm



	AGA no. / Part no.
Twin torch injector BM.	202 235 504 / 305600

### Adjustable phase cutting device injector.

- Suitable for acetylene and propane.
- It has been developed for JETSTREAM® and BM 31.
- Maximum cutting thickness 75 mm.



	AGA no. / Part no.
Adjustable phase cutting device injector	202 235 166 / 305606

# Mechanised cutting equipment.

Mechanised cutting torch.

## X 541 (Pressure torch) for acetylene and propane.

The mechanised cutting torch X 541, which is available for acetylene and propane, is a pressure torch and is intended for 3-cone sealed cutting nozzles.

It is dimensioned in accordance with EN 874. X 541 can be supplied in various lengths and various diameters.

Distinguishing properties:

- Capacity for cutting up to 500 mm
- Angled hose connections facilitate installation in the cutting machine



	Gas	Length mm	Diam. mm	AGA no. / Part no.
X 541	Acetylene, Propane	150	32	203 021 310 / 305616
		220	32	203 021 298 / 305614
		320	32	203 021 299 / 305615

## Twin torch pressure torch – TT 60.

A twin torch is an add-on to the mechanised cutting torch that can double capacity and increase productivity at a low investment cost. The twin torches are available as pressure torches, TT 60 for 3-cone sealed cutting nozzles. The twin torch can be installed in the mechanised cutting torches: X 541 and corresponding older models.

Twin torch pressure TT 60

- Distance between the cuts 30–400 mm

Distinguishing properties and areas of application:

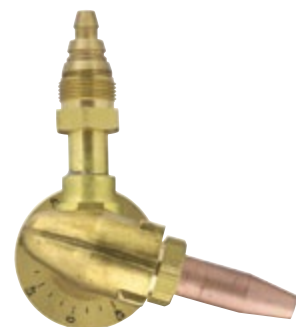
- Increased productivity at a low investment cost
- Easy to use
- Cutting of straps or small parts within the working range



	AGA no. / Part no.
Twin torch balanced pressure TT	202 235 505 / 305608

## Adjustable phase cutting device CD 75.

- CD 75 is suitable for acetylene and propane
- Developed for X 541
- Maximum cutting thickness 75 mm



	AGA no. / Part no.
Adjustable phase cutting device CD 75	219 200 073 / 305603

Cutting nozzles.



# Premium cutting nozzles.

## Function and maintenance.

A cutting nozzle has two main functions:

- To guide the heating flame
- To guide the cutting oxygen jet

The cutting nozzle's design and adaptation to various fuel gases as regards the gas ducts' size, exact geometry, tolerances and surface finish, are of decisive importance when it comes to achieving a quality cut.

The heating flame's task is to:

- Heat a point on the workpiece to its ignition temperature
- Retain the ignition temperature at the surface during the cutting process
- Clean the surface of impurities in order to facilitate the cutting oxygen jet's contact
- Protect and support the cutting oxygen jet

The cutting oxygen jet's task is:

- To strike the cut surface with high levels of gas purity and precision
- To burn iron to produce iron oxide
- To blow the iron oxide and other slag products out of the cut

**Important! Maintenance and choice of cutting nozzles**

In order to achieve the best cutting results, it is extremely important for the cutting nozzle to be cleaned and maintained regularly.

The cleaning methods used are:

- Mechanical with cleaning needles, see pages 120-121
- Chemical agents, KR 21 see page 111
- Ultrasound

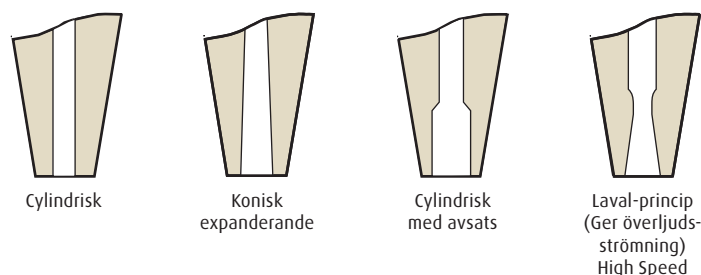
The method you choose is dependent on the nozzle type. Mechanical cleaning with cleaning needles for both cutting ducts and heating ducts may only be used on nozzles with cylindrical cutting ducts. Select the correct cleaning needle diameter in accordance with the table on pages 120-121. Cutting nozzles with expansion duct/conical, cylindrical with recess and the Laval principle/High Speed must be cleaned using chemical methods or ultrasound.

The choice of cutting nozzle is primarily dependent on:

- Type of fuel gas, normally acetylene or propane
- Type of cutting torch, normally for flat-sealed or 3-cone sealed nozzles
- Type of cutting; scrap cutting or quality cut with the highest possible cutting speed

After that, select nozzle size according to the material thickness to be cut. There are various cutting nozzles for special tasks such as gouging and rivet cutting.

### Design of cutting ducts



Cutting torch / Application	Acetylene	Page	Propane	Page
Small injector torches (i) X 11	HA 411	45	HP 433	46
Other injector torches (i) Manual injector torches:				
X 21 safety injector and older models	*MA 133 D	77	MP 133	87
type X 311 and X 501.	HA 121	82		
Mechanised cutting torches (1):				
BIR	AS-D, A-HD 10	85	P-SD, PY-HD 10	86
JETSTREAM®, BM 31 CF and corresponding older models	*JETEX®	84	*MP 133	87
			*PROPEX®	88
Gouging	JETGROOVER®	96		
Pressure torches (II) Manual cutting torches:	COOLEX® A 311	78		
X 21 and corresponding older models as well as	HA 311	59	COOLEX® P 331	62
X 11 pressure torch	*TRITEX®	90	MP 339	93
	*MA 319	92		
Mechanised cutting torches:	*COOLEX® A 311	78		
X 541 and corresponding older models				
Scrap cutting	COOLEX® A 317	60	COOLEX® P 337	80
Rivet cutting	COOLEX® A 341 BL	79		
Gouging	COOLEX® A 361	97		
	COOLEX® A 351 B	98		
	COOLEX® A 353 BL	99		
Powder cutting	COOLEX® A 337 Powder	67	COOLEX® P 337 Powder	69

\* Recommended for mechanised cutting



# Premium nozzles for X 21.

Cutting nozzles, 3-cone sealed for pressure torches.

## COOLEX® – 3-cone sealed cutting nozzles for pressure torches.

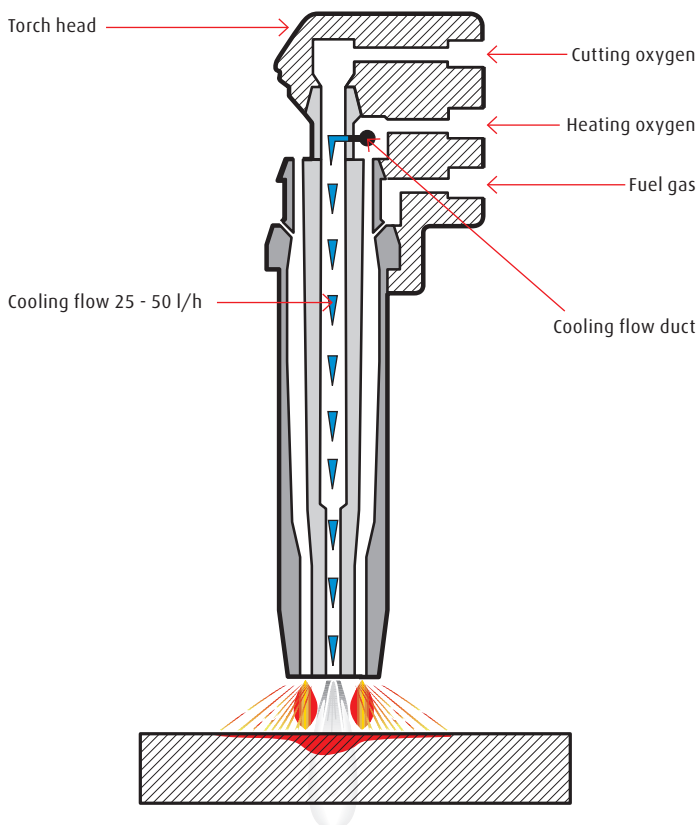
**COOLEX® is the generic name for AGA's 3-cone sealed cutting nozzles, which are a development of conventional cutting nozzles. The COOLEX® nozzles have a cooling flow duct that is an AGA patent.**

In a conventional cutting nozzle, hot gas penetrates from the heating flame into the cutting duct, causing inappropriate heating of the cutting nozzle, often up to 500°C.

This means that cutting spatter and combustion residue adhere more easily to the nozzle and its outlet ducts, which in turn impairs the cutting process in the form of poorer cut quality and more stoppages and interruptions to production.

The COOLEX® nozzles with a cooling flow duct improve the cut quality and increase accessibility through fewer operational interruptions. This is thanks to the small cooling flow (approx. 25–50 l/h) that is routed from the heating oxygen duct to the cutting oxygen duct.

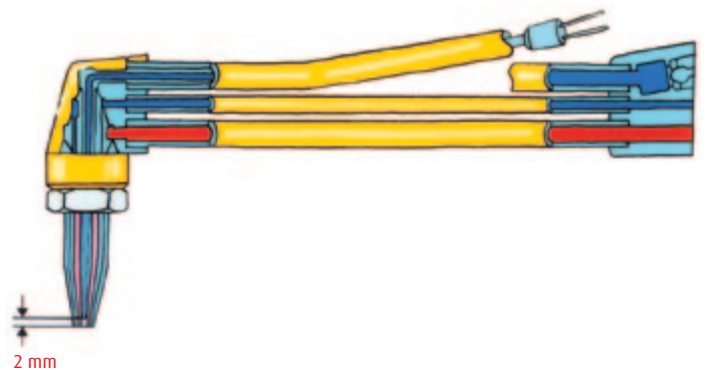
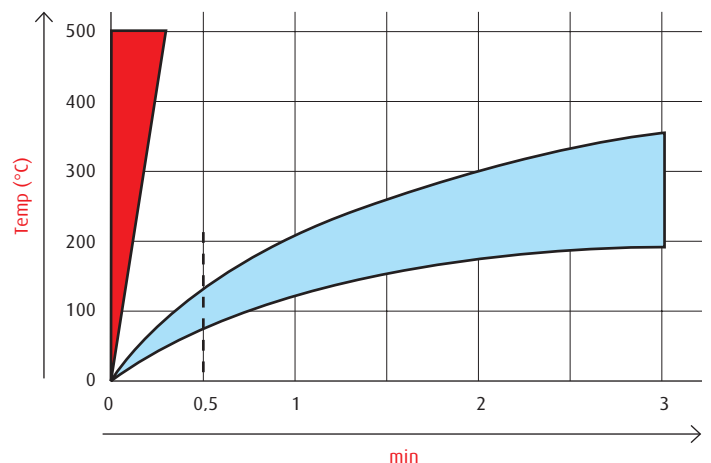
### Torch head



### Temperature measurement in the cutting nozzles

■ Nozzle without cooling

■ Nozzle with cooling



## Premium nozzles for X 21.

Cutting nozzles, 3-cone sealed, for pressure torch. Mechanised cutting torch: X 541 and corresponding older models

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

### COOLEX® A 311 – Acetylene.

**COOLEX® A 311 is a 3-cone sealed cutting nozzle.**

The nozzle has a cylindrical cutting duct and six heating flames, except for the largest nozzle, 300–500 mm, which has nine heating flames. It is forged from a single piece of copper, which produces an even, turbulence-free flame. The smallest nozzle is known as a thin sheet metal nozzle, 1–3 mm, and is characterised by minimal heat spread and consequently little deformation of the workpiece.

#### Distinguishing properties:

- Large cutting range – a series of eight cutting nozzles for material thicknesses from 1–500 mm
- Long service life thanks to the cooling flow to the cutting oxygen duct



A 311-1 Thin sheet metal



A 311-3

Nozzle Serial no.	SB pack - 1 pcs Part no.	Cleaning	
		Heating duct Cleaning needle	Cutting duct Cleaning needle
A 311-1	300640	206 000 160 / 300455	206 000 160 / 300455
A 311-2	300639	206 000 160 / 300455	206 000 160 / 300455
A 311-3	300643	206 000 160 / 300455	206 000 300 / 300464
A 311-4	300644	206 000 230 / 300456	206 000 450 / 300463
A 311-5	300645	206 000 315 / 300458	206 000 650 / 300466
A 311-6	300642	206 000 315 / 300458	206 001 100 / 300508
A 311-7	300641	206 000 315 / 300458	–
A 311-8	300638	206 000 400 / 300467	–

### Cutting data COOLEX® A 311

Serial no.	mm	Acetylene		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
A 311-1	1 – 3	0,2	0,1	–	–	0,5 – 2,5	1,3	Max. 1,000
A 311-2	3 – 10	0,2	0,3	–	–	1,0 – 2,5	1,6	950 – 430
A 311-3	10 – 25	0,2	0,4	–	–	1,5 – 4,0	3,6	580 – 350
A 311-4	25 – 50	0,2	0,5	–	–	1,5 – 4,0	6,8	500 – 300
A 311-5	50 – 100	0,2	0,7	–	–	3,0 – 6,0	7,8 – 14,1	380 – 180
A 311-6	100 – 200	0,2	0,9	–	–	5,0 – 8,0	15,8 – 23,9	280 – 120
A 311-7	200 – 300	0,3 – 0,8	1,2	–	–	5,0 – 8,0	23,6 – 36,7	150 – 100
A 311-8	300 – 500	0,3 – 0,8	3,0	–	–	7,0 – 12,0	43,1 – 68,3	100 – 50

## Standard nozzles for X 21.

Cutting nozzles for scrap cutting, 3-cone sealed for pressure torch.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

### COOLEX® A 317 – Acetylene.

#### Scrap cutting nozzles.

COOLEX® A 317 is a 3-cone sealed flicker flame nozzle that is forged from a single piece of copper.

The nozzle has a cylindrical cutting duct and six heating flames, except for the largest nozzle, 300–500 mm, which has nine heating flames.

#### Distinguishing properties:

- Specially adapted for scrap cutting
- Rapid cutting start thanks to effective heating flames
- Increased productivity thanks to the fact that each nozzle has a large cutting range, which means fewer stoppages for nozzle replacement
- Long service life thanks to the cooling flow to the cutting oxygen duct



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning	
		Heating duct Cleaning needle	Cutting duct Cleaning needle
A 317-1	219 144 170 / 300662	206 000 300 / 300464	206 000 450
A 317-2	219 144 171 / 300673	206 000 300 / 300464	206 000 650 / 300466
A 317-3	219 144 172 / 300661	206 000 315 / 300458	206 000 800 / 300463
A 317-4	219 144 173 / 300660	206 000 315 / 300458	–
A 317-5	219 144 174 / 300659	206 000 400 / 300467	–

#### Cutting data COOLEX® A 317

Serial no.	mm	Acetylene		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
A 317-1	3 – 50	0,3 – 0,8	0,7 – 1,0	–	0,8 – 1,2	1,0 – 3,1	2,4 – 5,2	480 – 370
A 317-2	50 – 100	0,3 – 0,8	1,1	–	1,2	1,8 – 4,9	5,3 – 11,3	370 – 240
A 317-3	100 – 200	0,5 – 0,8	1,1 – 1,3	–	1,2 – 1,5	4,2 – 7,4	13,3 – 21,5	280 – 150
A 317-4	200 – 300	0,5 – 0,8	1,3	–	1,5	4,3 – 7,3	22,4 – 34,2	150 – 100
A 317-5	300 – 500	0,8	2,8 – 3,0	–	3,2 – 3,3	5,9 – 8,5	36,5 – 50,0	100 – 50

## Premium nozzles for X 21.

Cutting nozzles for rivet cutting, 3-cone sealed for pressure torch.  
Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

### COOLEX® A 341 BL – Acetylene.

COOLEX® A 341 BL is a rivet cutting nozzle of the flicker flame type, forged from a single piece of copper. It has a cylindrical cutting duct and three powerful heating flames. The nozzle is bent for good accessibility.



#### Areas of application:

- Specially intended for separating rivet joints and screw joints that have rusted solid
- Cutting convex rivet heads or nuts and screws
- Separating welded joints welded in T-grooves, which are cut off level with the sheet metal

Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning Heating duct Chemical agent	Cleaning Cutting duct Chemical agent
A 341 BL-2	219 144 222 / 300666	218 190 051 / 300560	218 190 051 / 300560
A 341 BL-3	219 144 223 / 300665	KR 21 (page 111)	KR 21 (page 111)
A 341 BL-4	219 144 224 / 300664		
A 341 BL-5	219 144 225 / 300663		

### Cutting data COOLEX® A 341 BL

Serial no.	mm	Acetylene		Heating oxygen		Cutting oxygen		mm/min
		bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	
A 341 BL-2	5 – 25	0,2 – 0,5	0,5	–	–	3,0	2,8 – 3,8	340 – 260
A 341 BL-3	25 – 50	0,2 – 0,5	0,5	–	–	4,0	4,6	320 – 240
A 341 BL-4	50 – 100	0,2 – 0,5	0,6	–	–	3,0 – 6,0	5,5	270 – 160
A 341 BL-5	100 – 200	0,2 – 0,5	0,7 – 0,8	–	–	4,0 – 7,0	6,5 – 7,7	220 – 120

## Premium nozzles for X 21.

Cutting nozzles for scrap cutting, 3-cone sealed, for pressure torch. Manual cutting torch: X 21 and corresponding older models.

### COOLEX® P 337 – Propane.

#### Scrap cutting nozzles.

COOLEX® P 337 is a 3-cone sealed, two-part slotted flame nozzle with cylindrical cutting duct.

#### Distinguishing properties:

- Specially adapted for scrap cutting
- Rapid cutting start thanks to effective heating flames
- Increased productivity thanks to the fact that each nozzle has a large cutting range, which means fewer stoppages for nozzle replacement
- Long service life thanks to the cooling flow to the cutting oxygen duct



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning Heating duct Chemical agent	Cutting duct Cleaning needle
P 337-1	219 144 175 / 300647	218 190 051 / 300560	206 000 450 / 300484
P 337-2	219 144 176 / 300657	KR 21 (page 111)	206 000 650 / 300466
P 337-3	219 144 177 / 300655		206 001 250 / 300462
P 337-4	219 144 178 / 300656		-
P 337-5	219 144 179 / 300654		-

### Cutting data COOLEX® A 317

Serial no.	mm	Propane		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
P 337-1	3 – 50	1,0	0,9	–	3,5	4,0	6,0	1000 – 325
P 337-2	50 – 100	1,0	1,3	–	5,0	5,0	10,0	380 – 180
P 337-3	100 – 200	1,0	1,6	–	6,4	7,0	25,0	280 – 120
P 337-4	200 – 300	1,0	2,3	–	9,2	8,0	40,0	150 – 100
P 337-5	300 – 500	1,0	3,0	–	12,0	12,0	72,0	100 – 50



# Cutting nozzles.

## Gas cutting.

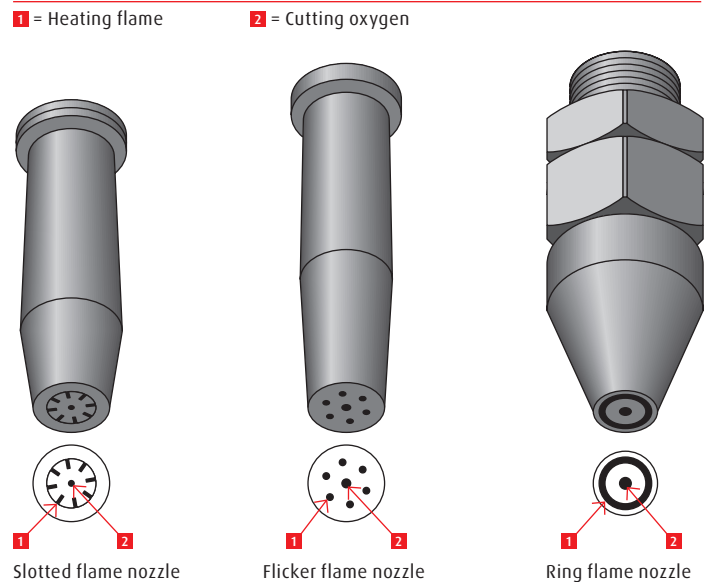
A decisive precondition for succeeding with gas cutting, irrespective of which fuel gas and nozzle type are being used, is for the fuel gas, heating oxygen and cutting oxygen to be present in sufficient volumes and with the correct pressure at the cutting nozzle.

If any of these are absent, a good cutting result can never be achieved. For good cutting results, read the cutting table.

Modern cutting nozzles for both acetylene and propane often have the heating flame in the form of a slotted flame or flicker flames. Ring flame nozzles are an older, outgoing model of cutting nozzle that can be replaced with slotted flame nozzles.

Propane nozzles differ from acetylene nozzles as the heating flame ducts are recessed in relation to the outer nozzle. The extent of the recess varies somewhat according to the type of nozzle, and is normally 0.7 to 1.5 mm. See illustration below.

Propane has a low burning speed and the recess is necessary to stabilise the heating flame so that it does not blow out when starting cutting when the cutting oxygen is turned on.

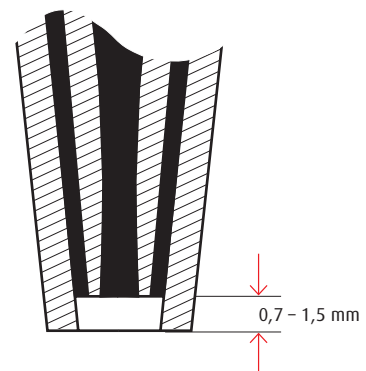


## Marking of cutting nozzles.

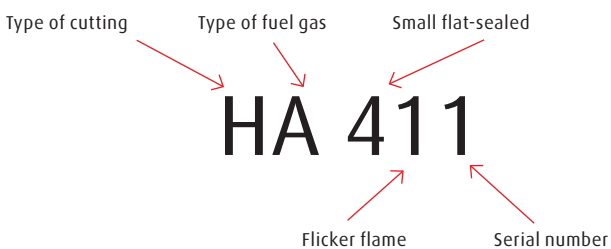
The cutting nozzles must be marked in accordance with the standards EN 874 for mechanised cutting nozzles and EN ISO 5172 for manual cutting nozzles.

Details that must be stamped into the nozzles are:

- Manufacturer's name
- Size
- Cutting range
- Type of fuel gas
- Oxygen pressure



The following can be read from a cutting nozzle's designation:



<b>Type of cutting:</b>	
Mechanised/Expansion duct	= M
Manual/Cylindrical duct	= H
Flicker flame	= 1
Ring flame	= 2
Slotted flame	= 3
<b>Fuel gas type:</b>	
Acetylene	= A
Propane	= P
For more gases	= Y
<b>Sealing system:</b>	
Large flat-sealed	= 1
2-cone sealed	= 2
3-cone sealed	= 3
Small flat-sealed	= 4

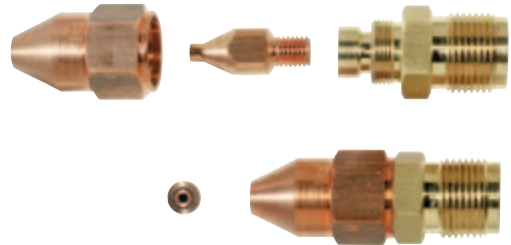
# Cutting nozzles.

Cutting nozzles for injector torches. Manual cutting torch: X 501 and X 21 injector.

## HA 121 – Acetylene.

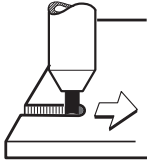
**HA 121 is a flat-sealed ring flame nozzle with a cylindrical cutting duct and ring-shaped heating flame.**

The nozzle comprises three parts: fitting, inner nozzle and outer nozzle.  
HA 121 is intended for cutting material thicknesses up to 150 mm.  
The cutting nozzle is an older design, but is very much liked by users.



Nozzle Serial no.	10 pack AGA no. / Part no.	SB pack AGA no. / Part no. Chemical agent	Cleaning	
			Heating duct Cleaning needle	Cutting duct
HA 121-0	202 150 401 / 309288	214 100 393 / 309287	218 190 051 / 300560	206 000 060 / 300455
HA 121-1	202 150 402 / 309286	214 100 394 / 309302	KR 21 (page 111)	206 000 160
HA 121-2	202 150 403 / 309285	214 100 395 / 309301		206 000 450 / 300483
HA 121-3	202 150 404 / 309284	214 100 396 / 309300		206 000 650 / 300466
HA 121-4	202 150 405 / 309283	214 100 397 / 309289		206 000 800 / 300453

## Cutting data HA 121

		Acetylene		Heating oxygen		Cutting oxygen		
Serial no.	mm	bar	m³/h	bar	m³/h	bar	m³/h	
HA 121-0	5 – 10	0,1 – 0,8	0,3	–	–	4,0 – 5,0	1,1 – 1,8	625 – 500
HA 121-1	5 – 20	0,1 – 0,8	0,3	–	–	5,0 – 6,0	1,1 – 2,4	625 – 350
HA 121-2	20 – 30	0,1 – 0,8	0,4	–	–	6,0 – 7,0	2,4 – 4,5	350 – 300
HA 121-3	30 – 75	0,1 – 0,8	0,5	–	–	6,5 – 7,5	4,5 – 9,5	300 – 215
HA 121-4	75 – 150	0,1 – 0,8	0,6	–	–	7,0 – 7,5	9,5 – 13,9	215 – 90

# Cutting nozzles.

Cutting nozzles, flat-sealed, for other injector torches. Manual cutting torch: X 501 and corresponding older models, as well as X 311. Mechanised cutting torch: BM 31 CF, JETSTREAM® and X 21 injector.

## MA 133D – Acetylene.

**MA 133D is a flat-sealed, 2-part slotted flame nozzle. It can be used for all gas cutting up to material thicknesses of 300 mm.**

- The outer nozzle is made of chrome-plated copper, which means that it is more difficult for spatter and slag to adhere to the nozzle. The inner nozzle is made of copper. The heating flame's properties, together with the expanding cutting ducts, produce a very concentrated and stable cutting oxygen jet, which provides the potential for a high cutting speed and cut quality.



### Distinguishing properties and areas of application:

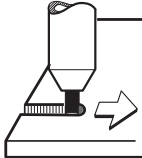
- With a knowledge of the gas cutting process and the correct gas supply, a high cutting speed (e.g. approx. 700 mm per minute in a material thickness of 10 mm) can be used in production
- High cut quality

Nozzle Serial no.	10 pack AGA no. / Part no.	SB pack AGA no. / Part no.	Cleaning Heating duct Brass brush	Cutting duct Chemical agent KR 21 (page 111)
MA 133D-0	202 502 343 / 305817	214 100 384 / 305762		
MA 133D-1	202 502 344 / 305818	214 100 385 / 305760		
MA 133D-2	202 502 345 / 305727	214 100 386 / 305770		
MA 133D-3	202 502 346 / 305729	214 100 387 / 305746		
MA 133D-4	202 502 347 / 305730	214 100 388 / 305768		
MA 133D-5	202 502 348 / 305735	214 100 389 / 305767		
MA 133D-6	202 502 349 / 305732	214 100 366 / 305731		
MA 133D-7	202 502 350 / 309346	214 100 367 / 305728		

### Outer and inner nozzles for MA 133D

AGA no. / Part no.			AGA no. / Part no.		
Outer nozzle	no. 0 – 5	202 150 358 / 305772	Inner nozzle	no. 3	202 150 353 / 305763
	no. 6 – 7	202 150 359 / 305787		no. 4	202 150 354 / 305748
Inner nozzle	no. 0	202 150 350 / 305747		no. 5	202 150 355 / 305761
	no. 1	202 150 351 / 305737		no. 6	202 150 356 / 305773
	no. 2	202 150 352 / 305765		no. 7	202 150 357 / 305786

### Cutting data MA 133D

				Acetylene		Heating oxygen		Cutting oxygen		
Serial no.	mm	mm	mm	bar	m³/h	bar	m³/h	bar	m³/h	mm/min
MA 133D-0	3 – 8			0,2 – 0,8	0,5	1,5	0,6	3,5 – 5,0	1,3 – 1,9	900 – 650
MA 133D-1	8 – 15			0,2 – 0,8	0,5	1,5	0,6	5,0 – 6,0	2,3 – 2,6	725 – 600
MA 133D-2	15 – 30			0,2 – 0,8	0,5	1,5	0,6	6,0 – 7,0	3,6 – 4,2	680 – 460
MA 133D-3	30 – 50			0,2 – 0,8	0,5	1,5	0,6	6,5 – 7,5	5,2 – 5,9	575 – 360
MA 133D-4	50 – 70			0,2 – 0,8	0,7	2,3	0,7	7,0 – 7,5	7,5 – 8,0	475 – 340
MA 133D-5	70 – 100			0,2 – 0,8	0,7	2,3	0,7	7,0 – 8,0	11,1 – 12,3	365 – 280
MA 133D-6	100 – 200			0,5 – 0,8	0,7 – 0,8	2,0 – 5,0	0,8 – 0,9	6,0 – 8,0	11,7 – 15,7	250 – 150
MA 133D-7	200 – 300			0,5 – 0,8	1,0 – 1,3	2,0 – 5,0	1,1 – 1,5	6,0 – 7,0	26,8 – 31,0	180 – 110

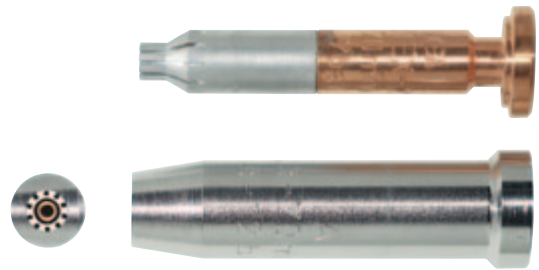
# Cutting nozzles.

Cutting nozzles for injector torches. Manual cutting torch: X 501 and X 21 injector.

## JETEX® – Acetylene.

**JETEX® is a flat-sealed, mechanised cutting nozzle of the curtain type, with expanding cutting duct.**

JETEX® comprises three parts: outer nozzle and a two-part inner nozzle. The entire nozzle is made of copper. The outer nozzle is bright nickel-plated for good heat dissipation, which reduces the amount of adhering cutting spatter. The slotted part of the inner nozzle is matt chrome-plated.



### Distinguishing properties and areas of application:

- With a knowledge of the gas cutting process and the correct gas supply, a high cutting speed (e.g. approx. 900 mm per minute in a material thickness of 10 mm) can be used in production
- High cut quality
- Mechanised cutting is a precondition for optimum utilisation of the properties

Nozzle Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Brass brush	Cutting duct Chemical agent
JETEX® No. 1	202 150 191 / 305749		218 190 051 / 300560
JETEX® No. 2	202 150 192 / 305750		KR 21 (page 111)

## Cutting data JETEX® – Blasted sheet metal

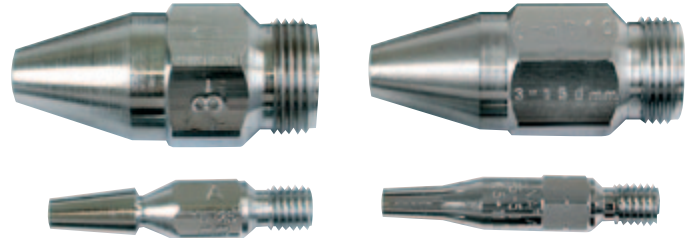
					Acetylene		Heating oxygen		Cutting oxygen	
Serial no.	mm	mm	mm	mm/min	bar	m³/h	bar	m³/h	bar	m³/h
JETEX® No. 1	3	4,0	2,6	1050 – 1100	0,2 – 0,8	0,5	1,5	0,6	8,0	5,7
	5			950 – 1000						
	10	6,0	2,6	870 – 920						
	15	6,0	2,7	780 – 820	0,2 – 0,8	0,5	1,5	0,6	10,0	7,0
	20			680 – 740						
	25			610 – 670						
	30			550 – 600						
	40			420 – 480						
JETEX® No. 2	3	4,0	3,0	1050 – 1100	0,2 – 0,8	0,5	1,5	0,6	8,0	9,2
	5			950 – 1000						
	10	6,0	3,0	870 – 920						
	15	6,0	3,2	780 – 840	0,2 – 0,8	0,5	1,5	0,6	10,0	11,1
	20			700 – 740						
	25			620 – 700						
	30			570 – 610						
	40			460 – 550						
	50	9,0	3,3	380 – 460	0,2 – 0,8	0,7	2,25	0,8	10,0	11,1
	70	12,0	3,5	260 – 320						

# Cutting nozzles.

Cutting nozzles for BIR mechanised cutting torches.

## A-SD Acetylene, A-HD 10 – Acetylene.



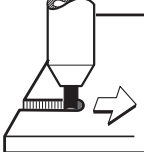






A-SD and A-HD 10 nozzles comprise two parts: outer nozzle and inner nozzle. The nozzles are chrome-plated, which reduces the amount of adhering cutting spatter. The cutting range is 3 - 300 mm. Cutting quality in accordance with EN ISO 9013.



A-SD produces a 15% faster cutting speed compared to a standard nozzle.

A-HD 10 produces a 30% faster cutting speed compared to a standard nozzle thanks to the expanding cutting duct, which produces a stable, concentrated cutting oxygen jet.



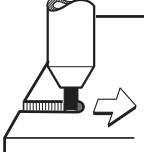






### Cutting data A-SD

		Fuel gas		Heating oxygen		Cutting oxygen		
								
AGA no. / Part no.	mm	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	mm/min
219 144 518 / 309771	3 - 5	0,5	0,30	2,0 - 2,5	0,4	2,0 - 3,0	0,4 - 0,5	800 - 750
219 144 496 / 309779	6 - 10	0,5	0,35	2,5	0,5	4,0 - 5,0	1,2 - 1,5	750 - 700
219 144 497 / 309772	10 - 25	0,5	0,35	2,5	0,5	6,5 - 7,5	3,2 - 3,7	650 - 500
219 144 498 / 309773	25 - 40	0,5	0,35	2,5	0,5	6,5 - 8,5	4,6 - 5,5	500 - 420
219 144 499 / 309774	40 - 60	0,5	0,35	2,5	0,5	6,5 - 8,5	5,6 - 7,1	420 - 360
219 144 502 / 309775	60 - 100	0,6	0,35	2,5	0,5	6,5 - 8,5	9,1 - 11,0	360 - 270
219 144 503 / 309776	100 - 150	0,6	0,50	3,5	0,6	6,5 - 7,0	12,1 - 12,9	270 - 210
219 144 506 / 309777	150 - 230	0,6	0,85	6,5 - 7,5	1,1	6,5 - 7,5	19,4 - 22,0	210 - 130
219 144 507 / 309778	230 - 300	0,6	0,85	6,5 - 7,5	1,1	6,5 - 7,5	28,5 - 32,5	140 - 110

Outer nozzle 219 144 500 / 309780 3 - 150 mm

Outer nozzle 219 144 508 / 309781 150 - 300 mm

### Cutting data A-HD 10

		Fuel gas		Heating oxygen		Cutting oxygen		
								
AGA no. / Part no.	mm	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	mm/min
219 144 537 / 309769	3 - 5	0,5	0,35	2,5	0,4	2,0 - 3,0	0,4 - 0,5	800 - 750
219 144 510 / 309762	6 - 10	0,5	0,40	3,0	0,5	4,0 - 5,0	1,0 - 1,2	750 - 700
219 144 511 / 309763	10 - 25	0,5	0,40	3,0	0,5	9,0 - 12,0	2,7 - 3,6	725 - 530
219 144 512 / 309764	25 - 50	0,5	0,40	3,0	0,5	8,5 - 11,5	3,6 - 4,6	530 - 420
219 144 513 / 309765	50 - 80	0,5	0,40	3,0	0,5	9,0 - 12,0	6,7 - 8,6	420 - 330
219 144 515 / 309766	80 - 100	0,6	0,40	3,0	0,5	9,5 - 11,0	8,9 - 10,1	300 - 280
219 144 516 / 309767	100 - 150	0,6	0,50	4,0	0,6	6,5 - 7,0	12,1 - 12,9	280 - 210
219 144 506 / 309777	150 - 230	0,6	0,85	6,5 - 7,5	1,1	6,5 - 7,5	19,4 - 22,0	210 - 140
219 144 507 / 309778	230 - 300	0,6	0,85	6,5 - 7,5	1,1	6,5 - 7,5	28,5 - 32,5	150 - 110

Outer nozzle 219 144 516 / 309761 3 - 150 mm

Outer nozzle 219 144 508 / 309781 150 - 300 mm



# Cutting nozzles.

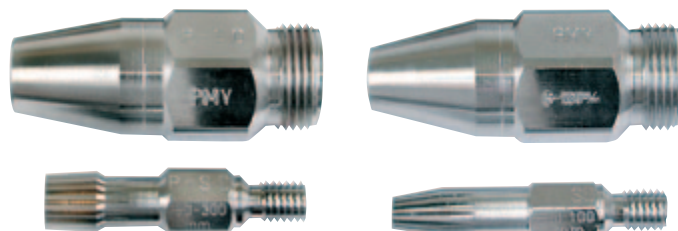
Cutting nozzles for BIR mechanised cutting torches.

## P-SD Propane, PY-HD 10 – Propane.

P-SD and PY-HD 10 nozzles comprise two parts: outer nozzle and inner nozzle. The nozzles are chrome-plated, which reduces the amount of adhering cutting spatter.

→ The cutting range is 3 - 300 mm

→ Cutting quality in accordance with EN ISO 9013



P-SD produces a 15% faster cutting speed compared to a standard nozzle.

PY-HD 10 produces a 30% faster cutting speed compared to a standard nozzle thanks to the expanding cutting duct, which produces a stable, concentrated cutting oxygen jet.

### Cutting data P-SD

AGA no. / Part no.	mm	Fuel gas		Heating oxygen		Cutting oxygen		mm/min
		bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	
219 144 548 / 309745	3 - 6	0,2	0,25	1,5	1,0	2,0 - 5,0	0,5 - 1,0	750 - 740
219 144 549 / 309734	7 - 15	0,2	0,32	2,0	1,3	5,0 - 7,0	1,6 - 2,0	670 - 560
219 144 550 / 309735	15 - 25	0,2	0,32	2,0	1,3	6,0 - 7,0	2,5 - 3,1	560 - 460
219 144 551 / 309736	25 - 40	0,2	0,32	2,0	1,3	6,0 - 7,5	3,8 - 4,5	460 - 400
219 144 552 / 309738	40 - 60	0,2	0,32	2,0	1,3	5,5 - 7,5	4,2 - 5,6	400 - 340
219 144 553 / 309739	60 - 100	0,2	0,32	2,0	1,3	6,0 - 8,5	7,6 - 10,6	340 - 270
219 144 554 / 309724	100 - 200	0,3	0,32	4,5	2,4	7,5 - 9,5	13,3 - 16,5	270 - 180
219 144 555 / 309725	200 - 250	0,3	0,60	4,5	2,4	6,5 - 8,5	18,0 - 22,0	180 - 130
219 144 556 / 309726	250 - 300	0,3	0,62	5,0	2,5	6,5 - 8,5	23,0 - 30,0	130 - 110

Outer nozzle 219,144,557 / 309744 3 - 100 mm

Outer nozzle 219 144 558 / 309732 100 - 300 mm

### Cutting data PY-HD 10

AGA no. / Part no.	mm	Fuel gas		Heating oxygen		Cutting oxygen		mm/min
		bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	
219 144 537 / 309717	3 - 5	0,2	0,25	2,0 - 2,5	1,0	2,0 - 3,0	0,4 - 0,5	800 - 750
219 144 538 / 309719	6 - 10	0,2	0,33	2,5	1,3	4,0 - 5,0	1,0 - 1,2	750 - 690
219 144 539 / 309720	10 - 25	0,2	0,38	2,5	1,5	9,0 - 12,0	2,7 - 3,6	690 - 500
219 144 540 / 309721	25 - 50	0,2	0,38	2,5	1,5	8,5 - 11,0	3,6 - 4,6	500 - 390
219 144 541 / 309722	50 - 80	0,2	0,38	2,5	1,5	9,0 - 12,0	6,7 - 8,6	390 - 320
219 144 542 / 309723	80 - 100	0,2	0,38	2,5	1,5	9,5 - 11,0	8,9 - 10,1	320 - 280
219 144 543 / 309724	100 - 200	0,3	0,60	4,5	2,4	7,5 - 9,5	13,3 - 16,5	270 - 180
219 144 544 / 309725	200 - 250	0,3	0,60	5,0	2,4	6,5 - 8,5	18,0 - 22,0	180 - 130
219 144 545 / 309726	250 - 300	0,3	0,62	5,0	2,5	6,5 - 8,5	23,0 - 30,0	130 - 110

P= Propane Y= Natural gas/Thermolén SD= Standard HD= Heavy duty

Outer nozzle 219 144 546 / 309730 P 3 - 100 mm

Outer nozzle 219 144 547 / 309729 Y 3 - 100 mm

Outer nozzle 219 144 558 / 309732 PY 100 - 300 mm

# Cutting nozzles.

Cutting nozzles, flat-sealed, for other injector torches. Mechanised cutting torch: JETSTREAM® and X 21 injector, as well as X 311.

## MP 133 – Propane.

**MP 133 is a flat-sealed, 2-part slotted flame nozzle. It can be used for all gas cutting up to a material thickness of 300 mm with propane.**

The outer nozzle is made of chrome-plated copper, which means that it is more difficult for spatter and slag to adhere to the nozzle. The inner nozzle is made of copper.



Nozzle Serial no.	SB pack AGA no. / Part no.	10 pack Part no.	Cleaning Heating duct Brass brush	Cutting duct Chemical agent KR 21 (page 111)
MP 133-0	214 100 400 / 305766	314514		
MP 133-1	214 100 401 / 305758	314515		
MP 133-2	214 100 402 / 305755	314516		
MP 133-3	214 100 403 / 305753	314517		
MP 133-4	214 100 404 / 305751	314518		
MP 133-5	214 100 405 / 305738	314519		
MP 133-6	214 100 406 / 305734	314520		
MP 133-7	214 100 407 / 305733	314521		

## Cutting data MP 133

Serial no.	mm	Acetylene		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
MP 133-0	5 – 10	0,1 – 0,8	0,4	1,5	1,6	4,0 – 5,0	1,8	750 – 600
MP 133-1	10 – 15	0,1 – 0,8	0,4	1,5	1,6	5,0 – 6,0	2,3 – 2,6	635 – 540
MP 133-2	15 – 30	0,1 – 0,8	0,4	1,7	1,6 – 1,8	6,0 – 7,0	3,6 – 4,0	610 – 440
MP 133-3	30 – 50	0,1 – 0,8	0,4	1,7	1,8	6,5 – 7,5	4,9 – 5,7	510 – 380
MP 133-4	50 – 70	0,1 – 0,8	0,5	2,3	2,1	7,0 – 7,5	7,4 – 7,8	460 – 320
MP 133-5	70 – 100	0,1 – 0,8	0,5	2,3	2,1	7,0 – 8,0	11,1 – 12,3	400 – 280
MP 133-6	100 – 200	0,1 – 0,8	0,5	2,2 – 3,0	2,1	5,5 – 7,5	11,7 – 15,7	250 – 150
MP 133-7	200 – 300	0,1 – 0,8	0,7	2,2 – 3,0	2,6	5,5 – 6,5	26,8 – 31,0	180 – 110

## Cutting nozzles.

Cutting nozzles, flat-sealed, for other injector torches. Mechanised cutting torch: JETSTREAM®.

PROPEX<sup>®</sup> – Propane.

PROPEX® is a flat-sealed, curtain-type cutting nozzle with an expanding cutting duct.

PROPEX® comprises three parts: outer nozzle and a two-part inner nozzle. The entire nozzle is made of copper. The outer nozzle is bright nickel-plated for good heat dissipation, which reduces the amount of adhering cutting spatter. The slotted part of the inner nozzle is matt chrome-plated.



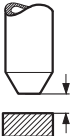

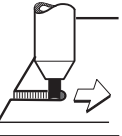



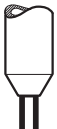




Distinguishing properties and areas of application:

- With a knowledge of the gas cutting process and the correct gas supply, a high cutting speed (e.g. approx. 800 mm per minute in a material thickness of 10 mm) can be used in production
- High cut quality
- Mechanised cutting is a precondition for optimum utilisation of the properties

Nozzle Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Brass brush	Cutting duct Chemical agent
PROPEX® No. 1	202 150 370 / 314509		218 190 051 /300560
PROPEX® No. 2	202 150 371 / 314510		KR 21 (page 111)

## Cutting data PROPEX®- Blasted sheet metal

					Acetylene		Heating oxygen		Cutting oxygen	
										
Serial no.	mm	mm	mm	mm/min	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h
PROPEX® No. 1	5	6	2,8	850 – 930	0,2 – 0,8	0,4	1,5	1,6	8,0	5,7
	10			760 – 840						
	15	6	2,9	700 – 760	0,2 – 0,8	0,4	1,5	1,6	10,0	7,0
	20			610 – 690						
	25			540 – 620						
	30			460 – 540						
	40			360 – 410						
PROPEX® No. 2	5	6	3,0	850 – 930	0,2 – 0,8	0,4	1,5	1,6	8,0	9,2
	10			760 – 840						
	15	6	3,2	700 – 760	0,2 – 0,8	0,4	1,5	1,6	10,0	11,1
	20			610 – 690						
	25			550 – 630						
	30			490 – 570						
	40			440 – 490						
	50	9,0	3,3	350 – 410	0,2 – 0,8	0,5	2,2	2,1	10,0	11,1
	70	12,0	3,5	260 – 300						

# Cutting nozzles.

Mechanised cutting nozzles for injector torches.

## MY 133 D THERMOLEN® – natural gas.

**MY 133 D is a mechanised cutting nozzle that is used for cutting material thicknesses up to 300 mm.**

MY 133 D is a flat-sealed, 2-part nozzle with an expanding cutting oxygen duct, which produces a very concentrated cutting oxygen jet.



Nozzle Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
MY 133 D-0	202 150 340 / 305782	218 190 051 / 300560 KR 21 (page 111)	218 190 051 / 300560 KR 21 (page 111)
MY 133 D-1	202 150 341 / 305781		
MY 133 D-2	202 150 342 / 305780		
MY 133 D-3	202 150 343 / 305779		
MY 133 D-4	202 150 344 / 305783		
MY 133 D-5	202 150 345 / 305778		
MY 133 D-6	202 150 346 / 305775		
MY 133 D-7	202 150 347 / 305774		

## Cutting data MY 133 D

				THERMOLEN®		Heating oxygen		Cutting oxygen	
Serial no.	mm	mm	mm/min.	bar	m³/h	bar	m³/h	bar	m³/h
No. 0	3	1,2	630 – 750	0,2 – 0,8	0,3	1,5	0,8	3,5	1,2
	8		600 – 730					5,0	1,5
No. 1	8	1,5	580 – 635	0,2 – 0,8	0,4	1,5	1,1	5,0	2,3
	15		540 – 600					6,0	2,6
No. 2	15	1,8	550 – 610	0,2 – 0,8	0,4	1,7	1,1	6,0	3,6
	20		540 – 600					6,5	3,9
	25		500 – 540				1,2	6,5	3,9
	30		440 – 490					7,0	4,0
No. 3	30	2,0	450 – 510	0,2 – 0,8	0,4	1,7	1,2	6,5	4,9
	40		400 – 470					6,5	4,9
	50		380 – 435					7,5	5,7
No. 4	50	2,5	400 – 460	0,2 – 0,8	0,5	2,3	1,5	7,0	7,4
	60		380 – 420					7,5	7,8
	70		320 – 380					7,5	7,8
No. 5	70	3,0	340 – 400	0,2 – 0,8	0,5	2,3	1,5	7,0	11,1
	80		320 – 380					7,0	11,1
	90		300 – 360					8,0	12,3
	100		280 – 350					8,0	12,3
No. 6	100	–	200 – 250	0,2 – 0,8	0,5	2,2	1,5	5,5	11,7
	150		180 – 200					6,7	13,7
	200		150 – 180					7,5	15,7
	200		150 – 180					5,5	26,8
No. 7	250	–	130 – 160	0,2 – 0,8	0,7	3,0	1,8	6,0	29,0
	300		110 – 140					6,5	31,0

## Cutting nozzles.

Cutting nozzles, 3-cone sealed, for pressure torch. Mechanised cutting torch: X 541.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

### TRITEX® – Acetylene.

**TRITEX® is a 3-cone sealed slotted flame nozzle comprising two parts, with a cooling flow and an expanding cutting duct.**

The outer nozzle and the front part of the inner nozzle are chrome-plated; chrome/nickel on the outer nozzle and chrome on the inner nozzle. This, along with the cooling flow, minimises the amount of cutting spatter that adheres to the nozzle.

The nozzle series contains nine cutting nozzles with a cutting range covering material thicknesses from 3 to 300 mm.

Note! Certain TRITEX® sizes require a cutting oxygen pressure up to 11 bar. See the cutting table.

The cutting oxygen pressure must be present in the cutting torch.

#### Distinguishing properties and areas of application:

- Better cutting results and cutting economy
- High cutting speed with maximum cutting quality in accordance with DIN EN ISO 9013
- Up to 30% higher cutting speeds compared to other cutting nozzles on the market
- Improved cutting results in thin material, less than 10 mm.
- Slotted flame nozzle provides a precise and even heating flame
- Short pre-heating time when starting cutting
- Backfire-safe
- Two-part cutting nozzle facilitates cleaning



Nozzle Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
TRITEX® 1	219 144 464 / 309390	218 1900 051 / 300560	218 1900 051 / 300560
TRITEX® 2	219 144 465 / 309391	KR 21 (page 111)	KR 21 (page 111)
TRITEX® 3	219 144 466 / 309392		
TRITEX® 4	219 144 467 / 309393		
TRITEX® 5	219 144 468 / 309394		
TRITEX® 6	219 144 469 / 309395		
TRITEX® 7	219 144 470 / 309396		
TRITEX® 8	219 144 471 / 309397		
TRITEX® 9	219 144 472 / 309398		

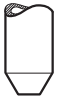

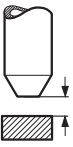

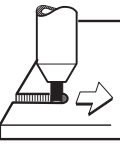







# Cutting nozzles.

Cutting nozzles, 3-cone sealed, for pressure torch. Mechanised cutting torch: X 541.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

## Cutting data TRITEX®

					Acetylene		Heating oxygen		Cutting oxygen	
										
Serial no.	mm	mm	mm	mm/min	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h
No. 1	3	3	0,9	760	0,1 – 0,2	0,5	0,1 – 0,2	0,55	3,0	0,5
	5			700					4,0	0,6
No. 2	6	5	1,3	700	0,1 – 0,2	0,5	0,1 – 0,2	0,55	5,0 – 5,5	1,6 – 1,8
	8			680					6,0 – 7,0	1,8 – 2,0
	10			650					7,5	2,1
No. 3	10	6	1,6	720	0,1 – 0,2	0,5	0,1 – 0,2	0,55	9,0	3,5
	15			650					10,0	4,0
	20			590					10,0	4,0
	25			530					11,0	4,2
No. 4	25	6	2,2	530	0,1 – 0,2	0,5	0,1 – 0,2	0,55	9,0	4,3
	30			500					9,5	4,5
	40			460					10,0	4,8
	50			410					11,0	5,2
No. 5	50	7	2,4	410	0,1 – 0,2	0,5	0,1 – 0,2	0,80	9,0	6,7
	60			370	0,2 – 0,3	0,7	0,2 – 0,3		10,0	7,4
	75			330	0,2 – 0,3	0,7	0,2 – 0,3		11,0	8,1
No. 6	75	8	2,7	330	0,2 – 0,3	0,7	0,2 – 0,3	0,80	9,0	8,9
	90			300					10,0	9,3
	100			280					11,0	10,2
No. 7	100	8	3,5	280	0,2 – 0,3	0,7	0,2 – 0,3	0,80	8,0 – 9,0	9,5 – 10,4
	130			230	0,2 – 0,3	0,7	0,2 – 0,3		10,0	11,5
	150			210	0,4 – 0,5	1,2	0,4 – 0,5		10,0	11,5
No. 8	150	10	5,0	210	0,4 – 0,5	1,2	0,4 – 0,5	1,50	6,5	19,0
	200			180	0,4 – 0,5		0,4 – 0,5		7,0	20,0
	240			130	0,5 – 0,6		0,5 – 0,6		7,5	22,0
No. 9	240	14	6,0	130	0,5 – 0,6	1,2	0,5 – 0,6	2,50	6,5	28,0
	260			120		2,2			7,0	30,0
	300			110		2,2			7,5	32,0

## Cutting nozzles.

Cutting nozzles, 3-cone sealed, for pressure torch. Mechanised cutting torch: X 541.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

### MA 319 – Acetylene.

**MA 319 is a 3-cone sealed flicker flame nozzle with an expanding cutting duct. The nozzle is fitted with a stainless steel insert in the cutting duct.**



The nozzle series is adapted to a standardised cutting oxygen pressure of 7 bar, which applies to all the nozzles in the series.

Distinguishing properties and areas of application:

- High cut quality
- High cutting speed
- A common cutting oxygen pressure makes the work easier for the cutting operator
- Increased service life thanks to stainless steel insert in the cutting oxygen duct
- Mechanised cutting in the first instance in order to make optimum use of the gas cutting process. The cutting oxygen pressure must be 7 bar for the entire series.

#### Note!

The cutting oxygen pressure must be present in the cutting torch.

Nozzle Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
MA 319-00	219 144 384 / 300625	218 190 051 / 300560	218 190 051 / 300560
MA 319-0	219 144 385 / 300626	KR 21 (page 111)	KR 21 (page 111)
MA 319-1	219 144 386 / 300628		
MA 319-2	219 144 387 / 300622		
MA 319-3	219 144 388 / 300620		
MA 319-4	219 144 389 / 300630		
MA 319-5	219 144 390 / 300627		
MA 319-6	219 144 391 / 300636		
MA 319-7	219 144 392 / 300633		
MA 319-8	219 144 393 / 300635		

### Cutting data MA 319

Serial no.	mm	Acetylene		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
MA 319-00	3 – 5	0,2	0,5	–	0,5	7,0	0,8	750
MA 319-0	5 – 10	0,2	0,5	–	0,5	7,0	1,1	750 – 680
MA 319-1	10 – 15	0,2	0,6	–	0,6	7,0	2,5	680 – 600
MA 319-2	15 – 30	0,2	0,6	–	0,6	7,0	3,8	600 – 500
MA 319-3	30 – 40	0,2	0,6	–	0,6	7,0	5,4	500 – 450
MA 319-4	40 – 50	0,2	0,7	–	0,8	7,0	7,3	450 – 400
MA 319-5	50 – 100	0,25	0,8	–	0,9	7,0	10,0	400 – 260
MA 319-6	100 – 150	0,3	0,9	–	1,0	7,0	14,0	260 – 180
MA 319-7	150 – 250	0,3	1,2	–	1,3	7,0	22,0	180 – 100
MA 319-8	250 – 300	0,4	1,5	–	1,7	7,0	35,0	100 – 70

# Cutting nozzles.

Mechanised cutting nozzles for pressure torch. Mechanised cutting torch: X 541.

## MP 339 – Propane.

### Mechanised cutting nozzle for cutting up to 300 mm.

MP 339 is a 3-cone sealed cutting nozzle that has an outer nozzle made of copper and an inner nozzle made of brass. The cutting oxygen duct is made of stainless steel and is conical in shape.

This produces a high cutting speed and long service life for the nozzle. The cutting oxygen pressure must be 7 bar for the entire series.



Nozzle Serial no.	SP pack - 1 pcs AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
MP 339-00	219 144 394 / 305796	218 190 051 / 300560 KR 21 (page 111)	218 190 051 / 300560 KR 21 (page 111)
MP 339-0	219 144 395 / 305802		
MP 339-1	219 144 396 / 305803		
MP 339-2	219 144 397 / 305812		
MP 339-3	219 144 398 / 305804		
MP 339-4	219 144 399 / 305800		
MP 339-5	219 144 400 / 305805		
MP 339-6	219 144 401 / 309311		
MP 339-7	219 144 402 / 309312		
MP 339-8	219 144 403 / 309313		

### Cutting data MP 339

Serial no.	mm	Propane		Heating oxygen		Cutting oxygen		mm/min
		bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	
MP 339-00	3 – 5	0,2	0,3	–	1,2	7,0	0,8	750
MP 339-0	5 – 10	0,2	0,3	–	1,2	7,0	1,1	750 – 680
MP 339-1	10 – 15	0,2	0,3	–	1,2	7,0	2,5	680 – 600
MP 339-2	15 – 30	0,2	0,4	–	1,4	7,0	3,8	600 – 500
MP 339-3	30 – 40	0,25	0,4	–	1,4	7,0	5,4	500 – 450
MP 339-4	40 – 50	0,3	0,5	–	1,9	7,0	7,3	450 – 400
MP 339-5	50 – 100	0,3	0,5	–	1,9	7,0	10,0	400 – 260
MP 339-6	100 – 150	0,3	0,8	–	3,0	7,0	14,0	260 – 180
MP 339-7	150 – 250	0,4	1,0	–	3,7	7,0	22,0	180 – 100
MP 339-8	250 – 300	0,4	1,0	–	3,7	7,0	35,0	100 – 70

# Cutting nozzles.

Mechanised cutting nozzles for pressure torch. Mechanised cutting torch: X 541 (X 31).

## MY 339 – THERMOLEN® – natural gas.

**Mechanised cutting nozzle for cutting material thicknesses up to 300 mm.**

MY 339 is a 3-cone nozzle that has an outer section made of copper and an inner section made of brass. The cutting oxygen duct is made of stainless steel and is conical in shape. This produces a high cutting speed and long service life for the nozzle. The cutting oxygen pressure must be 7 bar for the entire series.



Nozzle Serial no.	AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
MY 339-00	219 144 404 / 305806	218 1900 051 / 300560	218 1900 051 / 300560
MY 339-0	219 144 405 / 305807	KR 21 (page 111)	KR 21 (page 111)
MY 339-1	219 144 406 / 305810		
MY 339-2	219 144 407 / 305811		
MY 339-3	219 144 408 / 305808		
MY 339-4	219 144 409 / 305809		
MY 339-5	219 144 410 / 305801		
MY 339-6	219 144 411 / 305799		
MY 339-7	219 144 412 / 309337		
MY 339-8	219 144 413 / 305788		

## Cutting data MY 339

Serial no.	mm	THERMOLEN®		Heating oxygen		Cutting oxygen		mm/min
		bar	m³/h	bar	m³/h	bar	m³/h	
MY 339-00	3 – 5	0,2	0,5	–	0,8	7,0	0,8	750
MY 339-0	5 – 10	0,2	0,5	–	0,8	7,0	1,1	750 – 680
MY 339-1	10 – 15	0,2	0,5	–	0,8	7,0	2,5	680 – 600
MY 339-2	15 – 30	0,25	0,5	–	0,9	7,0	3,8	600 – 500
MY 339-3	30 – 40	0,25	0,5	–	0,9	7,0	5,4	500 – 450
MY 339-4	40 – 50	0,35	0,7	–	1,2	7,0	7,3	450 – 400
MY 339-5	50 – 100	0,35	0,7	–	1,2	7,0	10,0	400 – 260
MY 339-6	100 – 150	0,35	1,3	–	2,2	7,0	14,0	260 – 180
MY 339-7	150 – 250	0,35	1,3	–	2,2	7,0	22,0	180 – 100
MY 339-8	250 – 300	0,35	1,3	–	2,2	7,0	35,0	100 – 70

Gouging.





# Gouging.

Nozzles for gouging, flat-sealed, for injector torches. Manual cutting torch: X 21 injector and corresponding older models.

Gouging is an old method, developed from the gas cutting process, which has experienced a renaissance on the market thanks to high productivity and an improved working environment compared to arc air gouging. The equipment is simple. All you need is a gouging nozzle that fits the existing cutting torch.

## Areas of application:

- Gouging grooves for post-welded root or other joint preparation
- Gouging away fillet welds
- Good method for removing defects in welded joints, as it is easier to see pores, cracks, etc., compared to arc air gouging and grinding
- Gouging nozzles [pages 89 - 92](#).

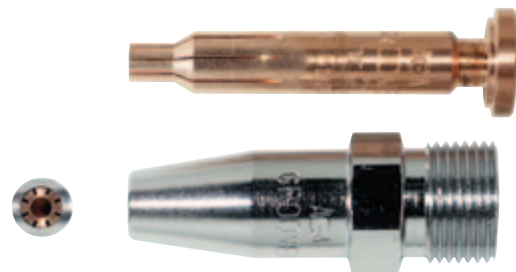
## JETGROOVER® – Acetylene.

**JETGROOVER® is a 2-part slotted flame nozzle. It is made of copper with a chrome-plated outer nozzle to reduce adhesion of cutting spatter and slag.**

The cutting oxygen duct is designed to produce a turbulent cutting oxygen duct with a larger diameter and lower outflow speed compared to a conventional cutting nozzle.

## Distinguishing properties:

- High processing capacity
- Powerful heating flame for rapid start
- Short nozzle for good accessibility



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
No. 0	202 150 506 / 309332	218 190 051 / 300560	218 190 051 / 300560
No. 1	202 150 504 / 309331	KR 21 (page 111)	KR 21 (page 111)
No. 2	202 150 505 / 309097		

## Cutting data JETGROOVER®

Serial no.	Acetylene		Heating oxygen		Cutting oxygen		mm/min
	mm	mm	bar	m³/h	bar	m³/h	
No. 0	5 – 6	2 – 4	0,3 – 0,8	1,3 – 1,7	–	1,4 – 1,9	400 – 1 400
No. 1	5 – 8	4 – 6	0,3 – 0,8	1,6 – 2,2	–	1,8 – 2,4	400 – 1 400
No. 2	7 – 10	5 – 8	0,3 – 0,8	1,1 – 1,6	–	1,2 – 1,7	400 – 1 400

# Gouging.

Nozzles for gouging, 3-cone sealed, for pressure torch.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

## COOLEX® A 361 – Acetylene.

**COOLEX® A 361 is a gouging nozzle of the flicker flame type, forged from a single piece of copper. It has an expanding cutting oxygen duct and six powerful heating flames.**



The cutting oxygen duct is designed to produce a turbulent cutting oxygen duct with a larger diameter and lower outflow speed compared to a conventional cutting nozzle.

### Distinguishing properties:

- Turbulent cutting oxygen jet which, in combination with the heating flames, produces a high level of processing
- Powerful heating flames for rapid start
- Robust with a long service life

Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning	
		Heating duct Chemical agent	Cutting duct Chemical agent
A 361-8	219 144 218 / 300646	218 190 051 / 300560	218 190 051 / 300560
A 361-10	219 144 219 / 300653	KR 21 (page 111)	KR 21 (page 111)
A 361-12	219 144 220 / 300652		

## Cutting data COOLEX® A 361

Serial no.	Acetylene		Heating oxygen		Cutting oxygen		mm/min
	mm	mm	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	
A 361-8	8 – 9	3 – 4	0,2 – 0,5	0,5	–	–	600
A 361-10	11 – 12	3 – 6	0,2 – 0,5	0,6	–	–	1 000
A 361-12	12 – 14	5 – 7	0,2 – 0,5	0,8	–	–	1 200

# Gouging.

Nozzles for gouging, 3-cone sealed, for pressure torch.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

## COOLEX® A 351 B – Acetylene.

COOLEX® A 351 B is a gouging nozzle of the flicker flame type, forged from a single piece of copper. It has a cylindrical cutting oxygen duct (step nozzle) and seven powerful heating flames. The nozzle is curved and fitted with a support lug.

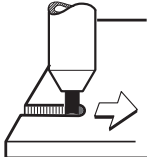
Distinguishing properties:

- Turbulent cutting oxygen jet which, in combination with the heating flames, produces a high level of processing
- Powerful heating flames for rapid start
- Support lug that, in certain cases, significantly facilitates gouging
- Robust with a long service life



Nozzle Serial no.	SB pack - 1 pcs AGA no. / Part no.	Cleaning Heating duct Chemical agent	Cutting duct Chemical agent
A 351 B- 8	219 144 215 / 300637	218 190 051 / 300560	218 190 051 / 300560
A 351 B-10	219 144 216 / 300658	KR 21 (page 111)	KR 21 (page 111)
A 351 B-12	219 144 217 / 300667		

## Cutting data COOLEX® A 351 B

			Acetylene		Heating oxygen		Cutting oxygen		
Serial no.	mm	mm	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	mm/min
A 351 B-8	6 – 8	3 – 6	0,2 – 0,5	0,9	–	–	5,0	5,3	600
A 351 B-10	8 – 11	6 – 11	0,2 – 0,5	1,8	–	–	6,0	10,8	1 000
A 351 B-12	11 – 13	10 – 13	0,2 – 0,5	2,2	–	–	7,0	19,7	1 200

# Gouging.

Nozzles for gouging, 3-cone sealed, for pressure torch.

Manual cutting torch: X 11 pressure torch, X 21 and corresponding older models.

## COOLEX® A 353 BL – Acetylene.

COOLEX® A 353 BL is a gouging nozzle of the flicker flame type, forged from a single piece of copper. It has an expanding cutting oxygen duct and six powerful heating flames. The nozzle is curved and long.

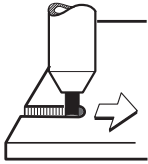


### Distinguishing properties:

- Turbulent cutting oxygen jet which, in combination with the heating flames, produces a high level of processing
- Powerful heating flames for rapid start
- Robust with a long service life

Nozzle	SB pack - 1 pcs	Cleaning	
Serial no.	AGA no. / Part no.	Heating duct	Cutting duct
		Chemical agent	Chemical agent
A 353 BL- 6	219 144 208 / 300651	218 190 051 / 300560	218 190 051 / 300560
A 353 BL- 8	219 144 209 / 300650	KR 21 (page 111)	KR 21 (page 111)
A 353 BL-10	219 144 210 / 300649		
A 353 BL-12	219 144 211 / 300648		

## Cutting data COOLEX® A 353 BL

			Acetylene		Heating oxygen		Cutting oxygen		
Serial no.	mm	mm	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	bar	m <sup>3</sup> /h	mm/min
A 353 BL-6	6 – 8	3 – 8	0,5	1,2	–	–	6,0	5,0	600
A 353 BL-8	8 – 11	6 – 11	0,5	1,7	–	–	6,8	11,5	1 000
A 353 BL-10	9 – 12	8 – 11	0,5	2,0	–	–	6,5	15,0	1 200
A 353 BL-12	10 – 15	10 – 13	0,5	2,3	–	–	6,5	19,0	1 500

# Accessories.





# Accessories.

Safety.

## Non-return valve BV 12.

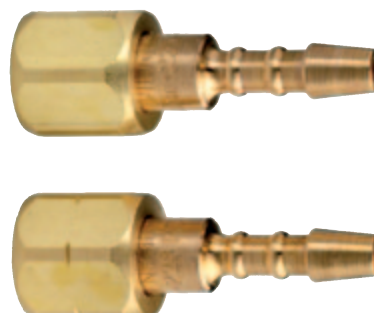
For increased safety when using oxygen/fuel gas processes, AGA has developed non-return valves that are built into the hose fittings. The non-return valves allow that gas to flow in one direction only. This prevents the gas from flowing back into a hose, forming a potentially explosive gas mixture. The risk of a hose explosion when lighting the torch due to gas flowing back is eliminated.

BV 12 has a low weight and does not impede the work with the gas welding and/or gas cutting torch.

The pressure drop in the non-return valve is insignificant. BV 12 can be used with up to 16 bar and in the temperature range -30°C to 50°C. The non-return valve is marked with gas type, through-flow direction, maximum working pressure and manufacturer.

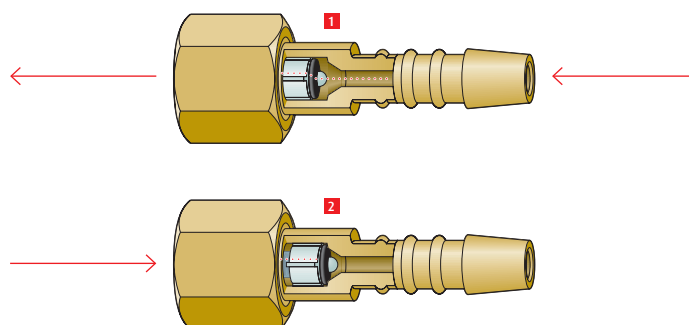
According to the Swedish Work Environment Authority's regulation regarding fusion-welding and thermal cutting, AFS 1992:9 "When performing welding and cutting, welding torches must have a non-return valve between the welding handle and the hose for both fuel gas and oxygen".

As the non-return valve is part of the safety equipment, AGA recommends that it is checked at least every six months.



1 = Open

2 = Closed



Gas		Connection	SB pack - 1+1 pcs AGA no. / Part no.
BV 12 for X 11	Acetylene/Propane/Oxygen G 1/4" x Ø 5.0 mm	LH G 1/4" x Ø 5.0 mm	214 100 066 / 300386
BV 12 for X 11	Acetylene/Propane/Oxygen G 1/4" x Ø 6.3 mm	LH G 1/4" x Ø 6.3 mm	214 100 067 / 300442
BV 12 for X 21	Acetylene/Propane/Oxygen G 3/8" x Ø 6.3 mm	LH G 3/8" x Ø 6.3 mm	214 100 068 / 300522
BV 12 for X 21	Acetylene/Propane/Oxygen G 3/8" x Ø 8.0 mm	LH G 3/8" x Ø 8.0 mm	214 100 069 / 300553

### Note!

The non-return valve does not replace the flashback arrestor.

# Accessories.

Safety.

## Flashback arrestor SAFE-GUARD-4.

**SAFE-GUARD-4 has four safety functions:**

- To prevent backflow
- To stop and extinguish penetrating flashbacks
- To turn off the gas supply in the event of penetrating flashbacks
- To turn off the gas supply in the event of overheating (95°C)

SAFE-GUARD-4 has a connection angle of 30°. The advantage of this is that, when connected to regulators, the flashback arrestor will sit parallel with the gas cylinder.

SAFE-GUARD-4 presents a green colour marking when it is open and in operation. In the event of a flashback, the green marking disappears. Resetting is performed by lifting the cover on the flashback arrestor; the green marking can now be seen again, and indicates that the flashback arrestor is open. SAFE-GUARD-4 is intended to be installed on gas cylinder regulators or on outlet points in gas supply systems.

According to the Swedish National Inspectorate of Explosives and Flammables' Statute Book (SÄIFS 1998:7) in Sweden, and corresponding authorities in Denmark and Norway, approved flashback protection must be used on all regulators and outlet points for acetylene. In Finland, flashback arrestors are required for both acetylene and oxygen.

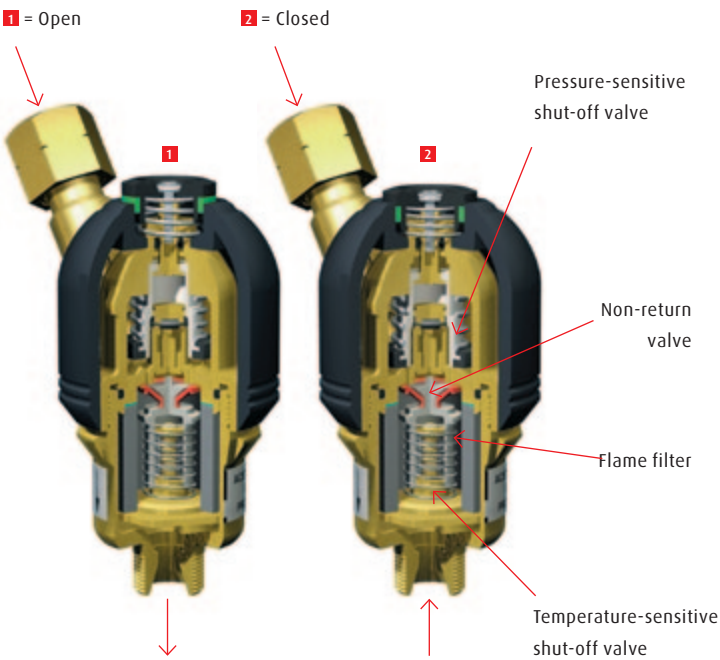
According to the Standard SFS 5900, "Hot work safety in assembly, maintenance and repair work" and the insurance companies' safety instruction C8: "Flammable and roof repair work"

Danish Working Environment Authority's Statutory Order AT no. 147 and Statutory Order AT no. 289

Flashback arrestors should also be used for propane. As oxygen increases the combustion speed, flashback arrestors should also be installed on the oxygen regulator.

The pressure must be relieved from the welding equipment before resetting can be carried out.

SAFE-GUARD-4 is manufactured in accordance with EN 730.



**Control**  
Flashback arrestors must be present on regulators/gas outlets for acetylene according to the Swedish National Inspectorate of Explosives and Flammables' regulation regarding flammable gas in loose containers, SÄIFS 1998:7.

The flashback arrestor's blocking and protective functions must be tested every 24 months according to SÄIFS 1998:7. This should be carried out as external testing in an authorised workshop.

	Gas	Connection	SB pack AGA no. / Part no.
SAFE-GUARD-4	Acetylene/Propane	LH G 3/8"	203 011 136 / 300250
SAFE-GUARD-4	Oxygen	G 3/8"	203 011 137 / 300251

## Accessories.

Safety.

### Double outlet for SAFE-GUARD-4.

When more acetylene than 5 m<sup>3</sup>/h at a working pressure of 1.5 bar or 3 m<sup>3</sup>/h at 0.8 bar (the gas flow varies with the back pressure) is required, two SAFE-GUARD-4 arrestors must be connected in parallel with double outlets.

#### Flow

At 0.7 bar and

→ Free outlet 13.3 m<sup>3</sup>/h

→ Back pressure 0.2 bar (standard test value) 10.4 m<sup>3</sup>/h

	Gas	Connection	SB pack AGA no. / Part no.
Double outlet 2 pcs	Acetylene/Propane	LH G 3/8"	203 010 736 / 300156
Double outlet 2 pcs	Oxygen	G 3/8"	203 010 737 / 300151



### Double outlet.

Double outlet for double gas outlet from a cylinder regulator.

#### Flow

At 0.7 bar and

→ Free outlet 13.3 m<sup>3</sup>/h

→ Back pressure 0.2 bar (standard test value) 10.4 m<sup>3</sup>/h

Gas	Qty	SB pack AGA no. / Part no.
Acetylene, Hydrogen	1	214 100 114 / 300148
Oxygen, Argon, Helium, Carbon dioxide, Nitrogen, Air	1	214 100 115 / 300145



### Note!

In order to use a double outlet, two flashback arrestors are required.

### Two regulators – one gas cylinder.

T-piece makes it possible to connect 2 regulators on 1 gas cylinder.

Gas	Connection	SB pack AGA no. / Part no.
Acetylene	LH G 3/4"	217 190 020 / 300160
Oxygen	W 21.8 x 1/4"	217 190 021 / 300163
Argon, Nitrogen	W 24.32 x 1/4"	217 190 005 / 300088

### Note!

For acetylene, flashback arrestors are required on both regulators.



## Accessories.

Cylinder carts.

### Cylinder carts.

The cylinder carts are powder painted and can be ordered with either solid or pneumatic wheels.

#### Cylinder transport cart

For transporting 1 x 20-50 litre cylinder.

##### AO 20

For mobile storage of 2 x 20 litre cylinders. The cart is CE marked and approved for lifting.

##### AO 40

For mobile storage of 2 x 40 or 50 litre cylinders. The cart is equipped with a practical storage box that can be supplied with a padlock. The cart is CE marked and approved for lifting.

#### FLAME® flexible gas cart

FLAME® flexible gas cart is perfect for work that places demands for considerable mobility, e.g. heating, ventilation and sanitation, construction, refrigeration, property and operational maintenance, as well as emergency vehicles. They are also suitable for hobby use, and can be fitted with two storage boxes. Suitable for both 5 and 10 litre cylinders. The cart is CE marked and approved for lifting, and is supplied with pneumatic wheels as standard.

#### AGA Kart

AGA Kart is a lightweight, versatile transport cart that works as an extension of the gas cylinder. It weighs just 2.5 kg and is sufficiently small that it can be put away. Thanks to its robust design, AGA Kart can always sit below the cylinder. It is also possible to move the gas cylinder up stairs with the aid of the cart. Note! Max. 20 litre cylinder. The cylinder must be anchored to a wall if it is standing in the Kart.



FLAME® flexible gas cart incl. boxes



Cylinder transport cart



AO 20



AO 40



AGA Kart



# Accessories.

Cylinder carts.



FLAME® flexible gas cart excl. boxes



Fixiflam cart for 5 l cylinders



## Carts

	Type of wheel	Length mm	Width mm	Height mm	Weight kg	AGA no. / Part no.
Cylinder transport cart	Solid wheels	470	445	1110	9	217 900 100 / 316759
Cylinder transport cart	Pneumatic wheels	470	445	1110	9	217 900 200 / 316762
AO 20	Solid wheels	690	480	1150	13	217 900 101 / 316760
AO 20	Pneumatic wheels	690	480	1150	13	217 900 201 / 316764
AO 40	Solid wheels	1025	790	1325	46	217 900 102 / 316761
AO 40	Pneumatic wheels	1025	790	1325	32	217 900 202 / 316765
FLAME® cart incl. boxes	Pneumatic wheels	440	400	990	10	/ 323597
FLAME® cart excl. boxes	Pneumatic wheels	440	400	990	10	/ 323077
AGA Kart	Solid wheels	120	270	150	2,5	/ 320727
Fixiflam Cart	Solid wheels	510	310	750	11,4	203 550 421 / 300319

## Spare parts for carts

	Diameter mm	AGA no. / Part no.
Solid wheels	250	/ 318847
Solid wheels	400	/ 318848
Pneumatic wheels	260	/ 318849
Pneumatic wheels	400	/ 318850
Cart - spare parts, wheels	250	201 084 247 / 310319
Accessory box FLAME® kit for welding equipment		/ 320219
Accessory box FLAME® kit for fire glove		/ 320220



# Accessories.

Lifting device.

## ER-5.

ER-5 is an approved lifting device for 1-4 x 50 l gas cylinders. The lifting device can be used with a crane or forklift pallet lifter in order to lift and transport the gas cylinders safely and simply, including on uneven surfaces. ER-5 is CE marked and satisfies the requirements in the EU directive 2006/42/EU.



	Height mm	Width mm	Depth mm	Weight kg	Max. load kg	AGA no. / Part no.
ER-5	1818	570	570	40	500	/ 331002

Note! Not stock item. Delivery time 4-6 weeks.

## HeroGrip.

Herogrip is a lifting tool that makes it easier to lift a 50 l cylinder up into a welding cart or up stairs. Improves the working environment and personal safety.



## Accessories.

### Mounting brackets for cylinders.

Cylinder brackets are available for one and two gas cylinders. These comprise a wall bracket made of stainless steel EN 1.4301 and a chain made of galvanised steel. All cylinders must be secured with cylinder brackets to prevent them tipping over.

If a cylinder tips over, it can cause personal injury and material damage. If the cylinder valve is damaged, the cylinder can start to rotate out of control. Cylinders on ships and other mobile installations must be secured with a fixed bracket.

#### Mounting brackets for cylinders.

Length mm	Qty gas cylinders	AGA no. / Part no.
260	1	215 191 074 / 301937
550	2	215 191 075 / 301957



### Back frame – foot stand.



Back frame for 2 x 5 litre gas cylinders  
Foot stand for 1 x Acetylene 5 l cylinder

AGA no. / Part no.  
203 551 001 / 305873  
217 190 024 / 300763

# Accessories.

Safety goggles.

## Safety goggles XC.

Modern safety goggles with full coverage, non-fogging/scratch-resistant lenses made of polycarbonate. Blue frame with adjustable side-pieces for a perfect fit. Replaceable lenses. Potential to fit RX insert for correction glass. Corresponds to EN166 class 1FT. DIN3/5 lenses also correspond to EN169.



XC clear lenses



XC DIN 3 lenses



XC DIN 5 lenses



RX Insert

	Part no.
Safety goggles XC clear lenses	329999
Safety goggles XC DIN 3 lenses	330017
Safety goggles XC DIN 5 lenses	330012
RX insert for XC safety goggles	330015

## Safety goggles Duality.

Traditional safety goggles with excellent coverage via integral protection at the sides. Sidepiece length adjustment. Potential to adjust the angle of the twistable sidepieces. Corresponds to EN166 class 1FT. DIN3/5 lenses also correspond to EN169.



Duality clear lenses



Duality DIN 3 lenses

	Part no.
Safety goggles Duality clear lenses	329997
Safety goggles Duality DIN 3 lenses	330010
Safety goggles Duality DIN 5 lenses	330013

## Safety goggles Metallite.

Safety goggles with metal frame that has sprung temple hinges. Flexible sidepieces that can be adapted to the wearer's ears. With non-fogging polycarbonate lens. TSR grey (minimises sunlight and reflections outdoors). Correspond to EN166 class 1F.



Pulsafe Metalite

	Part no.
Safety goggles Metallite clear lenses	322438
Safety goggles Metallite grey lenses	322439

## Safety goggles Amigo.

Safety goggles for gas welding, gas cutting and soldering with a soft, flexible vinyl frame. Shade level 5. CE approved in accordance with EN 175.



Amigo

	Part no.
Safety goggles Amigo	322444

## Accessories.

Safety goggles.

### Safety goggles Neptun.

Safety goggles with shade level 5 for gas welding, soldering and gas cutting. Neptun are ventilated and also have a flip-front mechanism. CE approved in accordance with EN 175/EN 166-F.



Neptun

	Part no.
Neptun shade level 5	300864

### Safety goggles SR 3.

Folding welding goggles with headband and shade level 5. Intended for gas welding and hard-soldering.



Welding goggles SR 3

	Part no.
Safety goggles, headband SR 3.	318761

### Polysafe safety goggles for visitors

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



Polysafe

	Part no.
Safety goggles Polysafe	322440

### Loose glass Ø 50 mm.

	Sealing level, DIN	Area of application/description	Qty	AGA no. / Part no.
Welding glass	4	Gas cutting, aluminium welding, weld and hard-soldering	4	214 100 042 / 300819
Welding glass	5	Gas welding of more slender material thicknesses	4	214 100 043 / 300821
Welding glass	6	Gas welding and cutting of thicker material thicknesses	4	214 100 044 / 300791
Welding glass	7	Gas welding and cutting of thicker material thicknesses	4	214 100 057 / 300861
Grinding glass	Clear	Plexiglas	2	214 100 149 / 300880
Grinding glass	Clear	Shatterproof	2	214 100 045 / 300790

## Accessories.

Safety goggles - welding helmet.

### Welding helmet with auto-darkening glass A900 DIN9-13.

A900 is an active welding helmet for MIG/MAG and MMA welding. During welding, the welding helmet darkens automatically to the set shade level DIN 9-13. Infinitely adjustable sensitivity and delay means that the welder has the correct setting for each situation, depending on e.g. high or low welding current. The delay is useful for strong amperages and when the welded goods continue glowing afterwards. The welding helmet is ergonomic with a low weight, just 530 g, as well as a robust, ergonomic headband that holds the helmet in place in all welding positions. Integral battery, with energy-saving function, which is charged by solar cells. CE approved in accordance with both EN 379 and EN 175.



	Part no.
Welding helmet A900 DIN9-13	322777

### Accessories and spare parts for AGA900 DIN9-13.

	Part no.
Auto-darkening welding glass	322808
Sweatband	322778
Internal protective glass 10 pcs/pack	322779
External protective glass 10 pcs/pack	322950
Headband	322809

### Fire glove.

**Fire protection gloves must always be placed in a clearly visible location adjacent to the gas cylinder stand. AGA's fire protection gloves satisfy the requirements according to CE 96 0403 EN 407.**

The test results have been classified in accordance with protection classes on a scale of one to four. The higher the protection class, the better the level of protection.

Protective properties	Protection class	Scale
Wear resistance	4	1-4
Tear strength	4	1-4
Fire properties	4	1-4
Contact heat	2	1-4
Flame contact	4	1-4
Heat radiation	2	1-4
Small splashes of melted metal	4	1-4
Splashes of melted metal	x	1-4



	AGA no. / Part no.
Fire glove	214 100 222 / 300904



## Accessories.

Detergent and leak-tracing spray.

### Warning signs.

Triangular warning sign of non-flammable material must be present at each storage location for gas cylinders or gas cylinder carts. The design can be seen from SÄIFS 1996:3 and AFS 1997:11.



	Format	AGA no. / Part no.
Open flame, prohibition, plastic	Square	215 191 136 / 308551
EX sign	Triangle	215 191 161 / 316731
Gas under pressure, self-adhesive	Triangle	215 191 135 / 308552

### Detergent KR 21.

Detergent in powder form for welding and cutting nozzles.

The powder is dissolved in water and produces a liquid that breaks down the oxides. KR 21 does not affect the nozzle material.

50 grams of powder are mixed with 1 litre of water, effective time 4 hours. The nozzle is rinsed with clean water.



	Delivery form	Net weight g	AGA no. / Part no.
Detergent KR 21	Plastic can	500	218 190 051 / 300560

### Leak-tracing spray TL 4.

TL 4 is used for checking the tightness of all systems containing gas or air under pressure.

Sprayed directly onto the point to be checked. If even the slightest leak is present, clear bubbles are formed.

TL 4 is non-hazardous. It contains no harmful substances.



	Delivery form	Net weight g	AGA no. / Part no.
Leak-tracing spray TL 4	Aerosol packaging	300	269 111 176 / 300820

## Accessories.

### Welding hose.

The welding hose is an important part of the equipment from a safety perspective. In addition, this "last link in the gas distribution" must maintain the gas's purity through to the point of consumption.

AGA's welding and propane hoses are manufactured in accordance with EN559.

The hoses are marked with gas type, dimensions and working pressure. All hoses are supplied in 40 m reels, except for black and blue/orange hoses.

- Red hose = Acetylene
- Blue hose = Oxygen
- Orange hose = Propane / Hydrogen
- Black hose = Shielding gas for gas shielded arc welding

Gas shielded arc welding is one of the welding processes that uses shielding gas as protection and a welding parameter: in the first instance TIG, MIG/MAG and plasma welding.



### Note!

As the gases react differently to the rubber material in the hoses, the hoses are manufactured according to the different properties of the gases. It is therefore important to use the correct hose for the type of gas in question.

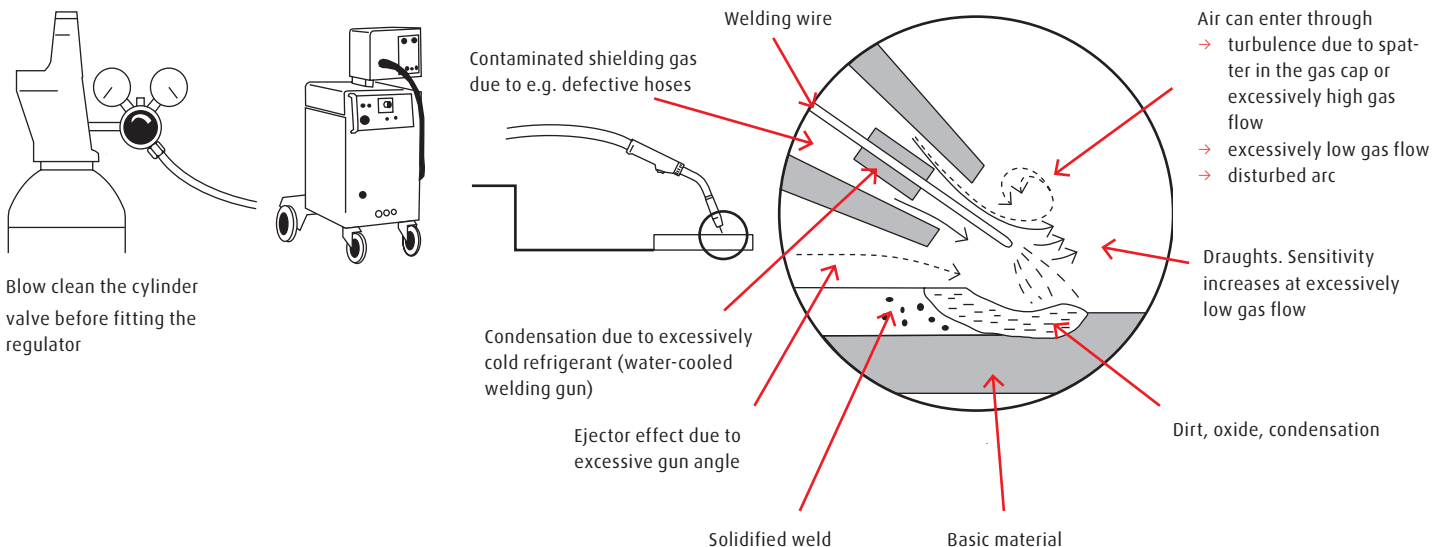
### The final link in the gas distribution.

The welding hose has an important role as the "Final link in the gas distribution". In order to maintain the purity of the shielding gas through to the welding process (the gas cap), the welding hose must be of such quality that a minimum of the surrounding air can diffuse into the hose and increase the levels of oxygen and moisture in the shielding gas.

Safeguarding pure shielding gas for the welding process applies to all gas shielded arc welding, and is an absolute condition if quality requirements are stipulated for the welded product.

A high quality welding hose, couplings and installation always benefit welding economy.

### How the shielding gas atmosphere and the melt can be contaminated during gas shielded arc welding



# Accessories.

Welding hose.

## Single hose and twin hose.

As gas hoses are made of rubber, the hoses 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.

Hose type Ø mm	Colour	Dimension	Type of gas	40 m reel AGA no. / Part no.	10 m reel AGA no. / Part no.
Single hose	Red	5,0	Acetylene	214 100 459 / 300920	217 100 307 / 315385
	Blue	5,0	Oxygen	214 100 460 / 300919	217 100 308 / 315386
	Red	6,3	Acetylene	214 100 461 / 300918	217 100 309 / 315387
	Blue	6,3	Oxygen	214 100 462 / 300917	217 100 310 / 315388
	Red	8,0	Acetylene	214 100 463 / 300916	217 100 311 / 315389
	Blue	8,0	Oxygen	214 100 464 / 300915	217 100 312 / 315390
	Blue	12,5		214 100 465 / 300891	/ 316710
	Orange	5,0	Propane/Hydrogen	214 100 466 / 309084	/ 316711
	Orange	6,3	Propane/Hydrogen	/ 309263	/ 316712
	Orange	8,0	Propane/Hydrogen	214 100 467 / 309430	/ 316714
	Orange	10,0	Propane/Hydrogen	/ 316728	/ 309165
	Black	5,0	Argon/Dry Flow	206 900 073 / 316719	/ 316720
	Black	6,3	Argon/Dry Flow	206 900 074 / 316721	/ 316722
	Black	5,0	Argon	/ 316723	/ 316725
	Black	6,3	Argon	/ 316724	/ 316726
Twin hose	Blue/Red	5,0 – 5,0	Oxygen/Acetylene	214 100 468 / 300914	217 100 313 / 315391
	Blue/Red	6,3 – 6,3	Oxygen/Acetylene	214 100 469 / 300913	217 100 314 / 315392
	Blue/Red	6,3 – 8,0	Oxygen/Acetylene	214 100 470 / 300899	217 100 315 / 315393
	Blue/Red	8,0 – 8,0	Oxygen/Acetylene	214 100 471 / 300865	217 100 316 / 315394
	Blue/orange	6,3 – 6,3	Oxygen/Propane	/ 316715	/ 316716
	Blue/orange	6,3 + 8,0	Oxygen/Propane	219 101 500 / 316717	/ 316718
	Blue/orange	10 -10	Oxygen/propane	/ 329529	

### Recommendation for choice of hose dimension

Welding hose, 20 metres long, with a diameter of Ø 6.3 mm, copes with cutting materials up to 250 mm thick.

This means that

- hose Ø 6.3 mm can cope with all gas welding and normally gas cutting/heating
- it is easier to work with the equipment thanks to increased mobility

### Pressure drop – example

- Hose Ø 6.3 mm, length 20 metres
- X 21 handle with non-return valves
- X 21 cutting insert
- Cutting nozzle: COOLEX® A-317-5
- Regulator: UNICONTROL 500
- Pressure at:
 

Regulator	8.5 bar	10.0 bar
Torch	5.2 bar	6.2 bar
Gas flow	28,000 l/h	32,800 l/h
- Pressure drop
 

	3.3 bar	3.8 bar
--	---------	---------

### Conclusion:

Select hose Ø 6.3 mm for cutting up to 250 mm.

## Accessories.

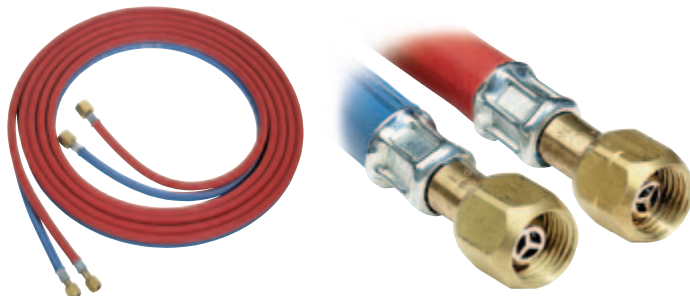
Quick couplings.

### Twin hose.

Twin hose with compression couplings increases safety and facilitates installation and replacement of welding hose.

#### Compression couplings

- mean that hose clips are not required, which facilitates the operation of torch handles during welding and cutting
- ensure correct installation, which increases safety and saves time



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

Colour Ø mm	Dimension BV12	Non-return valve	5 metre SB AGA no. / Part no.	10 metre SB AGA no. / Part no.
Blue/Red (X11)	5,0 – 5,0	¼"	214 100 472 / 307680	214 100 473 / 305880
Blue/Red (X21)	6,3 – 6,3	⅜"	–	214 100 474 / 305034

### AGA's quick coupling.

**AGA's patented quick couplings fit all of AGA's regulators, including older models. With quick couplings, hoses and torches can be replaced quickly and easily without the aid of tools.**

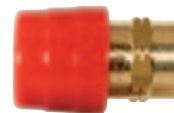
Quick couplings for acetylene and hydrogen have red marking, oxygen and other fuel gases are marked with blue.

Quick couplings for regulators/outlet points and gas hoses mean that connection and disconnection in a gas line system can be achieved quickly and easily.

Thanks to the automatic locking mechanism, it is possible to dismantle equipment under gas pressure. A secure, durable design as well as hard technical function tests ensure that AGA's quick couplings maintain a high quality.



Hose fitting



For Acetylene and Hydrogen



For Oxygen

#### Quick coupling without hose fitting

Gas		AGA no. / Part no.
Acetylene and Hydrogen	Connection (female): LH G ⅜"	217 190 006 / 300787
	Hose fitting (male) Ø 5.0 mm	200 087 574 / 300869
	Hose fitting (male) Ø 6.3 mm	200 087 576 / 300860
	Hose fitting (male) Ø 8.0 mm	200 087 578 / 300859
Oxygen and other gases	Connection (female): G ⅜"	217 190 010 / 300844
	Hose fitting (male) Ø 5.0 mm	200 087 575 / 300858
	Hose fitting (male) Ø 6.3 mm	200 087 577 / 300857
	Hose fitting (male) Ø 8.0 mm	200 087 579 / 300885

# Accessories.

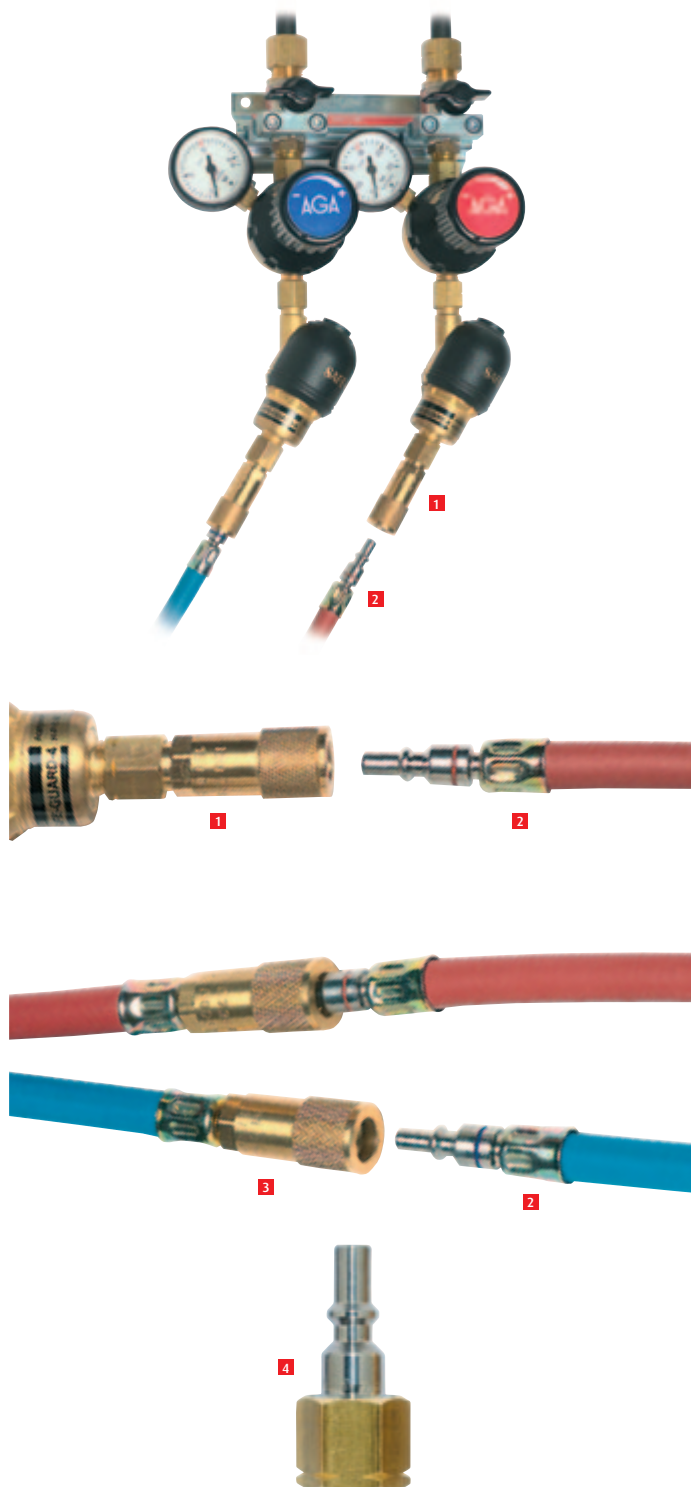
Quick couplings.

## Quick couplings in accordance with ISO 561.

The quick couplings are made of brass with hose fittings made of stainless steel.

All components are adapted for each gas type for which they are to be used. The quick couplings are simple to connect/disconnect without tools. The couplings may only be used on the low-pressure side.

		AGA no. / Part no.
<b>1 Quick coupling (female 3/8") for outlet point and regulator</b>		
Fuel gas	LH G 3/8"	/ 305639
Oxygen	G 3/8"	/ 305653
Argon	G 3/8"	/ 305636
<b>2 Hose fitting (male) for quick coupling</b>		
Fuel gas	5,0	/ 309413
	6,3	/ 305640
	8,0	/ 309475
Oxygen	5,0	/ 309412
	6,3	/ 305648
	8,0	/ 309474
Argon	5,0	/ 309411
	6,3	/ 305644
<b>3 Quick coupling (female) with hose fitting</b>		
Fuel gas	5,0	/ 309416
	6,3	/ 305632
	8,0	/ 309476
Oxygen	5,0	/ 309417
	6,0	/ 305634
	8,0	/ 309477
Argon	5,0	/ 309418
	6,3	/ 305628
<b>4 Quick coupling (male) for e.g. Nemo® valves</b>		
Acetylene	R 3/8" LH	/ 305646
Oxygen	R 3/8" RH	/ 305654
Shielding gas	R 3/8" RH	/ 309410





## Accessories.

Accessories for welding hose.

### Hose fittings and cap nuts.

Hose fittings for X 11 Original handle, G 1/4" according to EN 560

	Qty	SB pack AGA no. / Part no.
Hose fitting Ø 5.0 mm	2	214 100 006 / 300834
Hose fitting Ø 6.3 mm	2	214 100 017 / 300932

Hose fittings for regulators and large torches, G 3/8" according to EN 560

	Qty	SB pack AGA no. / Part no.
Hose fitting Ø 5.0 mm	2	214 100 023 / 300930
Hose fitting Ø 6.3 mm	2	214 100 024 / 300931
Hose fitting Ø 8.0 mm	2	214 100 025 / 300933
Hose fitting Ø 10.0 mm	2	214 100 075 / 300892

Cap nuts.

	Qty	SB pack AGA no. / Part no.
For X 11 - handle: Cap nut acetylene LH G 1/4" + oxygen G 1/4"	1+1	214 100 008 / 300835
For regulators and large torches: Cap nut acetylene LH G 3/8" + oxygen G 3/8"	1+1	214 100 009 / 300836
Blanking plug 3/8"		201 041 541 / 301816

### Extension pieces – non-separable (whole).

Extension pieces – non-separable (whole)

	Hose dimension Ø mm	Qty in SB	SB pack AGA no. / Part no.
Extension piece	5,0 – 5,0	2	214 100 019 / 300841
Extension piece	5,0 – 8,0	2	214 100 058 / 300900
Extension piece	6,3 – 6,3	2	214 100 020 / 300832
Extension piece	6,3 – 8,0	2	214 100 034 / 300905
Extension piece	8,0 – 8,0	2	214 100 021 / 300833
Extension piece	10,0 – 10,0	2	214 100 029 / 300912

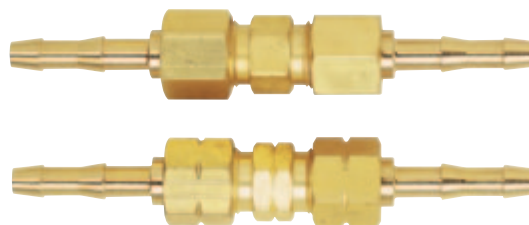


## Accessories.

Accessories for welding hose.

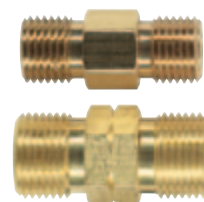
### Extension pieces – Separable

	Hose dimension Ø mm	Qty in SB	SB pack AGA no. / Part no.
Extension piece	5.0 – 5.0 Acetylene	1+1	214 100 117 / 300929
Extension piece	5.0 – 5.0 Oxygen		
Extension piece	6.3 – 6.3 Acetylene	1+1	214 100 118 / 300936
Extension piece	6.3 – 6.3 Oxygen		
Extension piece	8.0 – 8.0 Acetylene	1+1	214 100 119 / 300888
Extension piece	8.0 – 8.0 Oxygen		
Extension piece	10.0 – 10.0 Acetylene	1+1	214 100 038 / 300901
Extension piece	10.0 – 10.0 Oxygen		



### Centre piece for extension pieces.

	AGA no. / Part no.
Centre piece LH G 3/8"	201 030 517 / 300886
Centre piece G 3/8"	201 030 516 / 300870
Centre piece LH G 1/4"	219 114 541 / 300896
Centre piece G 1/4"	219 114 072 / 300897
Centre piece G 3/8" - G 1/4"	206 501 209 / 300854



### Hose clips – hose holder.

	Qty	AGA no. / Part no.
Hose clip 08 – 14 mm	4	214 100 026 / 300795
Hose clip 13 – 20 mm	2	214 100 010 / 300796
Hose holder	1	206 501 350 / 300827



### Blow gun.

The blow gun is made of brass. The valve is a membrane type, leak-proof, reliable and durable.

The membrane is made of synthetic material and is not affected by oil-contaminated compressor air.

Fixed hose fitting for Ø 6–8 mm hose. Length: 220 mm Weight: 325 g

	AGA no. / Part no.
Blow gun	203 080 201 / 300810



# Accessories.

Accessories for welding hose.

## Needle valve.

Needle valve for low pressure.



	Marking/Wheel	Gas type	AGA no. / Part no.
Needle valve LH G 3/8"	Red	Acetylene	305660 / 305660
Needle valve LH G 3/8"		Hydrogen	305662 / 305662
Needle valve LH G 3/8"		Propane	305631 / 305631
Needle valve G 3/8"	Blue	Oxygen	303628 / 303628
Needle valve G 3/8"	Grey	Carbon dioxide	305661 / 305661
Needle valve G 3/8"		Argon	
Needle valve G 3/8"		Helium	
Needle valve G 3/8"		Air	
Needle valve G 3/8"		Nitrogen	



## Accessories.

Other accessories.

### Gas saver GS 10.

**Gas saver for the fuel gases acetylene and propane, as well as oxygen. Adjustable bunsen-type flame. No soot formation during lighting and extinguishing.**

Maximum working pressure 4.5 bar. Supplied with hose fittings for Ø 5.0, 6.3 and 8.0 mm.

In addition to saving gas, GS 10 has an environmental benefit in that there are less nitrous gases from the small bunsen flame compared to a free-burning welding or cutting flame.



	AGA no. / Part no.
Gas saver GS 10 for acetylene	203 010 393 / 300838
Gas saver GS 10 for propane	/ 323294

### Gas lighter.

The gas lighter comprises a sprung bar that is fitted with replaceable flint stones.



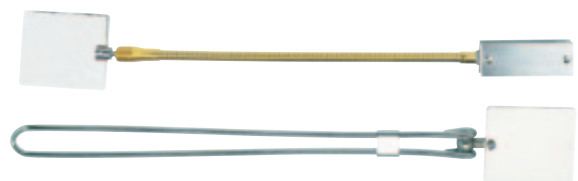
	Qty	AGA no. / Part no.
Gas lighter		217 190 014 / 300895
- Flint stones	10	214 100 018 / 300781

### Welding and inspection mirror.

Mirror with magnetic mount and flexible arm. The mirror is secured with a ball joint on the arm and is easy to adjust to different positions.

Length: 500 mm

Robust magnetic mount: 480 N



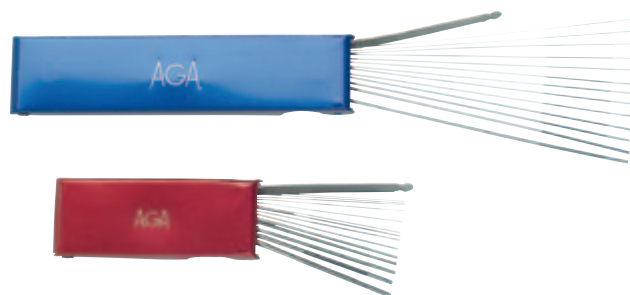
	Qty	AGA no. / Part no.
Welding and inspection mirror with magnet and flexible handle	1	219 103 107 / 300893
Welding and inspection mirror with ball joint and fixed handle	1	206 554 500 / 300780
Spare mirror made of polished stainless steel	1	219 103 108 / 300894

## Accessories.

Other accessories.

### Cleaning needles.

Grooved cleaning needles for cleaning outlet ducts in welding and cutting nozzles. The cleaning needles are supplied in a sheet metal box.

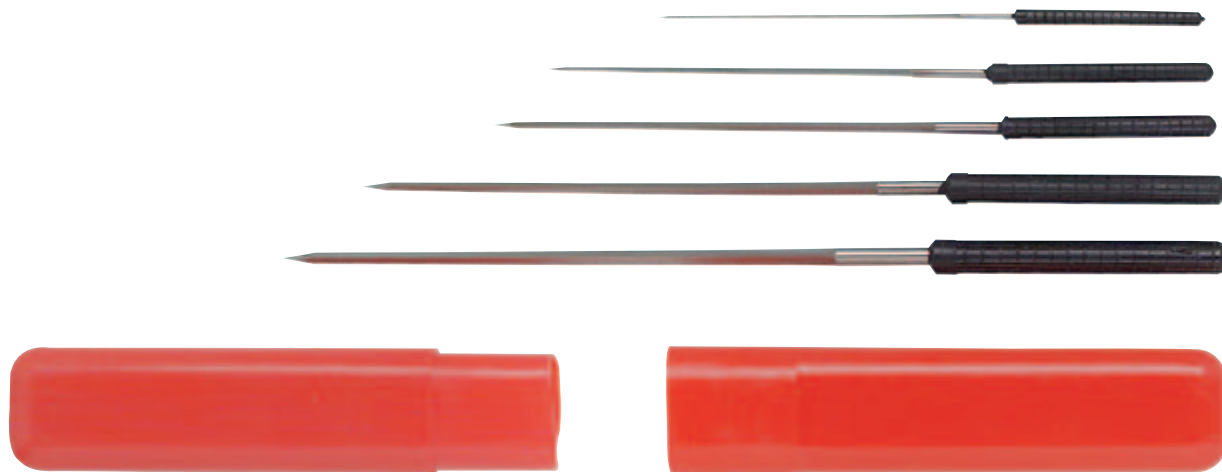


	Dimension Ø mm	Qty	SB pack AGA no. / Part no.
X 11 – X 21	0,5 - 3,0	12	214 100 004 / 305435
X 11 – X 21 – X 31 (steel case)		1	204 010 250 / 305554
Long	0,4 - 2,5	13	206 435 710 / 300559

### Reamer.

Used for cleaning nozzles. Alternative to cleaning needles when the cleaning needles are not sufficiently effective.

Supplied in plastic case with 6 reamers and a cleaning blade for slotted flame nozzle.



Dimension Ø mm	Qty	SB pack AGA no. / Part no.
0,5 - 2,5	6 + 1	206 560 000 / 300803
0,5	1	206 560 001 / 300804
1,0	1	206 560 002 / 300805
1,5	1	206 560 003 / 300817
2,0	1	206 560 004 / 300807
2,5	1	206 560 006 / 300882
3,0	1	206 560 007 / 300881



# Accessories.

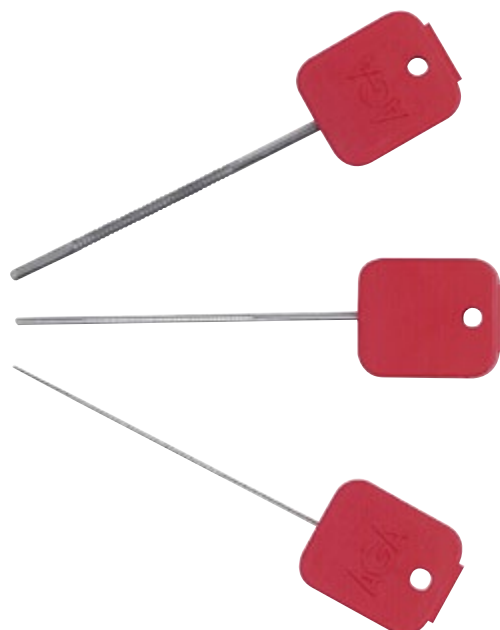
Other accessories.

## Loose cleaning needles with plastic handle.

All cleaning needles are supplied in packs of 10.

### X 11 and X 21 Welding inserts

No.	l/h	AGA no. / Part no.
0	40	206 000 030
1	80	206 000 080
2	160	206 000 160
2E	230	206 000 230
3	315	206 000 315
3E	400	206 000 400
4	500	206 000 500
4E	650	206 000 650
5	800	206 000 800
5E	1 000	206 001 000
6	1 250	206 001 250



### X 11 and X 21 Flexible welding inserts

No.	l/h	AGA no. / Part no.
1	80	206 000 080
2	160	206 000 160
3	315	206 000 315
4	500	206 000 500
5	800	206 000 800

### Cleaning needles Dimension Ø mm

Dimension Ø mm	AGA no. / Part no.
0,369	206 000 030 / 300478
0,458	206 000 040 / 300472
0,534	206 000 060 / 300473
0,610	206 000 080 / 300482
0,712	206 000 100 / 300454
0,813	206 000 160 / 300557
0,889	206 000 230 / 300456
0,940	206 000 250 / 300457
0,991	206 000 300 / 300463
1,067	206 000 315 / 300458
1,220	206 000 400 / 300467
1,397	206 000 450 / 300483
1,575	206 000 500 / 300461
1,753	206 000 650 / 300466
1,880	206 000 700 / 300464
1,981	206 000 800 / 300453
2,159	206 001 100 / 300508
2,286	206 001 250 / 300462

### X 11 Heating inserts, multiple flame

No.	l/h	AGA no. / Part no.
-	500	206 000 060
-	800	206 000 080
-	1 000	206 000 160

### X 11 and X 21 Cutting nozzles

Serial no.	AGA no. / Part no.	
	Cleaning needle Cutting duct	Cleaning needle Heating duct
HA 411-1	206 000 030	206 000 030
HA 411-2	206 000 080	206 000 040
HA 411-3	206 000 230	206 000 060
HA 411-4	206 000 400	206 000 060
HA 411-5	206 000 650	206 000 060
HA 311-1	206 000 160	206 000 160
HA 311-2	206 000 160	206 000 160
HA 311-3	206 000 300	206 000 160
HA 311-4	206 000 450	206 000 230
HA 311-5	206 000 650	206 000 315
HA 311-6	206 001 100	206 000 315
HA 311-7	-	206 000 315
HA 311-8	-	206 000 400

## Accessories.

Flux for gas welding. Unalloyed and low-alloy steel.

**Gas welding is a versatile welding process with a large area of application (see page 24). Gas welding is excellent for welding unalloyed and low-alloy steel.**

The choice of flux – welding wire – must take place with regard to the parent material and its composition. Consult your material supplier if in doubt.



### H 44.

H 44 is a bright-drawn welding wire intended for unalloyed construction steel and some pressure vessel steel with a highest minimum breaking strength of 430 N/mm<sup>2</sup>.

H 44 is used to a large extent for gas welding of pipes.

Approved in accordance with EN 12536.

### H 44 MO.

H 44 Mo is a bright-drawn welding wire intended for unalloyed and low-alloy construction steel and some pressure vessel steel with a highest minimum breaking strength of 430 N/mm<sup>2</sup>. H 44 Mo is supplemented with 0.5% molybdenum (Mo) and consequently has a slightly wider area of application.

Approved in accordance with EN 12536.

### Note!

Pay attention to how the parent material is sealed, as both silicon-sealed and aluminium-sealed steel are available on the market. With aluminium-sealed steel, there is a risk of pores in the welded items. In this case, select H 44 Mo.

Supplied in 5 kg boxes

		Supplied in 5 kg boxes
	Dimension Ø mm	AGA no. / Part no.
H 44	1,60 *700	218 100 004 / 300983
	2,00 *700	218 100 005 / 300982
	2,50 *700	218 100 006 / 300977
	3,15 *700	218 100 007 / 300981
	4,00 *700	218 100 008 / 300980
	5,00 *700	218 100 009 / 300984
H 44 Mo	2,00 *700	218 100 121 / 300978
	2,50 *700	218 100 122 / 300979
	3,15 *700	218 100 123 / 300985

## Accessories.

Flux for gas welding. Unalloyed and low-alloy steel.

### Comparison – Steel – Swedish - European - German standard

Designation	Suitable for steel			Principal analysis %						
	Swedish Std SS	European Std EN	German Std DIN	C Carbon	Si Silicon	Mn Manganese	Cr Chrome	Mo Molybdenum	P Phosphorus	S Sulphur
H 44	1232	P 195								
	1305		GS 45							
	1306									
	1311	S 235 JR	Ust 37 – 2							
	1312	S 235 JRG2	Rst 37 – 2							
	1330	P 235 GH	HI	0,11	0,21	1,00	–	–	0,025	0,020
	1411									
	1412	S 275 JR	St 44 – 2							
	1430	P 265 GH	HI							
H 44 Mo	1232	P 195								
	1305	GS 45								
	1306									
	1311		USt 37 – 2							
	1312	S 235 JRG2	RSt 37 – 2							
	1330	P 235 GH	HI							
	1411			0,11	0,21	1,00	–	0,50	0,025	0,020
	1412	S 275 JR	St 44 – 2							
	1430	P 265 GH	HI							
	1434	P 265	St 45.8/I							
	1435	P 265	St 45.8/III							
	2912	16 Mo3	15 Mo3							



Other equipment.





## Other equipment.

Jet freezer. Jet freezing is the fast method when supplementing and repairing pipe systems.

### Jet freezer.

Jet freezing is used when repairing and supplementing pipe systems that contain water. The jet freezer's casing is simple to secure around the pipe. Inside the casing, dry ice is produced at a temperature of  $-78^{\circ}\text{C}$ . The water in the pipe freezes and forms an ice plug, which effectively stops the continuing flow.

Dry ice is formed when the gas ( $\text{CO}_2$ ) in liquid form is allowed to expand under atmospheric pressure. In order to extract carbon dioxide in liquid phase, we recommend a gas cylinder with a riser pipe. A complete Jet freezer comprises a casing, HT hose and protective gloves. Models 80 and 100 are equipped with two nozzles and double hoses, as well as a T-piece.

In order to know how much gas is in the gas cylinder, it can be weighed. The cylinder's tare (weight without gas) is stamped on the collar. Spring scales graduated 0–25 kg are available as an accessory. It takes approximately 13 minutes to freeze a 28 mm pipe with a model 22 casing, and this requires approximately 1.2 kg of carbon dioxide. To ensure that the ice plug does not thaw, a small amount of carbon dioxide needs to be released into the casing now and then to ensure it is constantly filled with dry ice.



### Guide values for the consumption of carbon dioxide and freezing time for various pipe diameters

Casing model	Pipe diameter								
	15 mm	22 mm	28 mm	42 mm	54 mm	65 mm	80 mm	90 mm	100 mm
Model Mini	3 min	7 min							
Model 22	3 min	6 min	13 min						
Model 42	3 min	5 min	11 min	17 min					
Model 80				20 min	35 min	50 min	75 min		
Model 100							75 min	105 min	125 min
	0.5 kg	0.75 kg	1.2 kg	2.5 kg	4.1 kg	6.4 kg	9.1 kg	12.7 kg	16.4 kg

The time it takes to freeze and thaw an ice plug is dependent on the thickness of the pipe, the temperature of the water in the pipe and the ambient temperature. The jet freezer does not damage the pipes, as freezing takes place rapidly and the freezing area is restricted.

		AGA no. / Part no.
Jet freezer complete	Model Mini	500 002 501 / 311341
	Model 22	500 002 502 / 311342
	Model 42	500 002 503 / 311343
	Model 80	500 002 504 / 311344
	Model 100	500 002 505 / 311345
Spare parts	Casing, model Mini	500 002 506 / 311346
	Casing, model 22	500 002 507 / 311347
	Casing, model 42	500 002 508 / 311348
	Casing, model 80	500 002 509
	Casing, model 100	500 002 510 / 311350
	Nozzle for casing Mini, 22, 42	500 002 514 / 311354
	HT hose	500 002 511 / 311351
	T-piece	500 002 512 / 311352
	Protective gloves, size 10.5	500 002 513 / 311353
	Spring scales 0 – 25 kg	500 002 517 / 311355
	Gas cylinder OTM-5 (3.5 kg $\text{CO}_2$ ) with riser pipe	310560
	Gasket	311610



# Safety.

Gas welding equipment should look like this.

## During all welding – consider the fire risk.

Fire is the main risk when using gas equipment for welding, cutting and soldering. Fire can occur easily at a workplace that is poorly delimited and that has too much flammable dust and debris, perhaps with a raised oxygen level, and with an ignition source in the vicinity. Other causes of fire can include excessive working pressure or incorrect equipment. Lack of knowledge and negligence can also eliminate the equipment's built-in safety features.

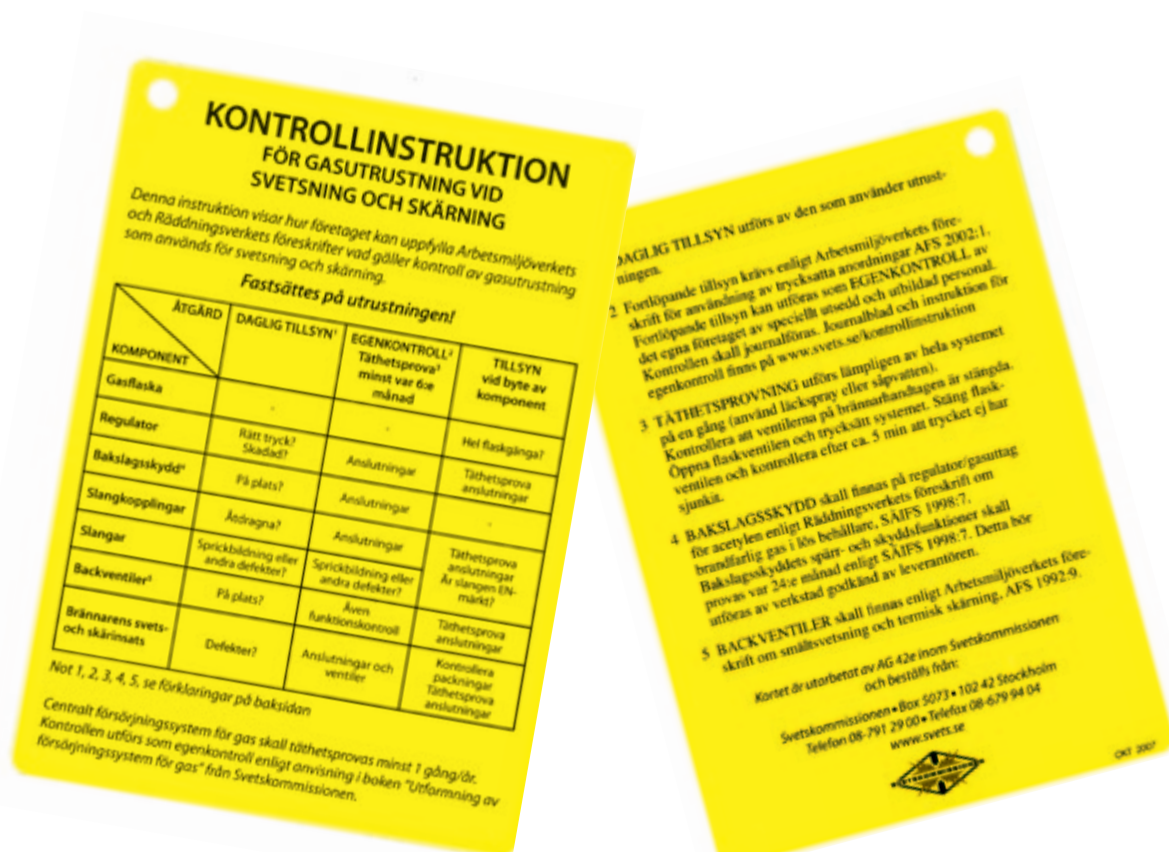
1. Regulator
2. Flashback arrestor
3. Welding hose
4. Non-return valves on the torch handle
5. Gasket between handle and insert
6. The nozzle is the cutting and welding tool's most exposed part. Look after it!
7. Fire glove
8. Securely stored gas cylinders.  
Securing chain on a wall or a cylinder cart
9. Warning signs



## Checklist.

Safe gas equipment		Yes	No
1. Regulator	Is the gasket in good condition?	<input type="checkbox"/>	<input type="checkbox"/>
	Is there a spare gasket?	<input type="checkbox"/>	<input type="checkbox"/>
	Is the regulator undamaged?	<input type="checkbox"/>	<input type="checkbox"/>
2. Flashback protection	Is there flashback protection in place?	<input type="checkbox"/>	<input type="checkbox"/>
	Requirement for Acetylene, recommended for Oxygen.		
	Connections OK?	<input type="checkbox"/>	<input type="checkbox"/>
The flashback protection's functions must be tested as regards function every 24 months in accordance with SÄIFS 1997:2. This must be performed by a workshop approved by the supplier. Has a test been performed in the past 24 months?			
3. Welding hose	Are there any cracks?	<input type="checkbox"/>	<input type="checkbox"/>
	If so, replace the hose package.		
	Is the welding hose suitable for the gas type?	<input type="checkbox"/>	<input type="checkbox"/>
	Red – Acetylene Blue – Oxygen Orange – LPG		
4. Non-return valve	Is there a non-return valve in the torch handle?	<input type="checkbox"/>	<input type="checkbox"/>
	Perform the function check (blow from the rear).		
5. Gasket between handle and insert (only applies to Combi torches)	Are the seat and the gasket in good condition?	<input type="checkbox"/>	<input type="checkbox"/>
6. Cutting nozzle/Welding insert	Is the nozzle/insert undamaged?	<input type="checkbox"/>	<input type="checkbox"/>
	Is the seat in good condition?	<input type="checkbox"/>	<input type="checkbox"/>
7. Fire glove	Is there a fire glove?	<input type="checkbox"/>	<input type="checkbox"/>
	Recommended.		
8. Gas cylinders	Are the cylinders at no risk of tipping over (anchored).	<input type="checkbox"/>	<input type="checkbox"/>
9. Warning signs		<input type="checkbox"/>	<input type="checkbox"/>
10. Test airtightness (leak-trace) of the entire equipment according to point 3 on the Yellow Card.		<input type="checkbox"/>	<input type="checkbox"/>
11. Yellow Card "Inspection instructions"	Secured to the equipment.	<input type="checkbox"/>	<input type="checkbox"/>

The inspections described above must be logged and archived according to the Swedish Welding Commission's template.  
This template can be downloaded from the Swedish Welding Commission's website, [www.svets.se](http://www.svets.se)



## Safety.

Installing the equipment. After completing the work or in the event of extended stoppages – Close the cylinder valve – Empty the hoses – Unscrew the control wheel until the spring tension has ceased.

### The gas cylinders.

**Most cylinders in AGA's range are fitting with fixed valve protection**

- Fixed valve protection may not be removed from the cylinders
- Valve protection is not approved for crane lifting

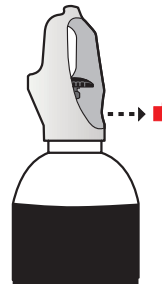
### The regulators.

Before installing the regulator, check that:

1. The control wheel is unscrewed so that the spring tension has ceased.
2. The O-ring is in perfect condition.

### The hoses.

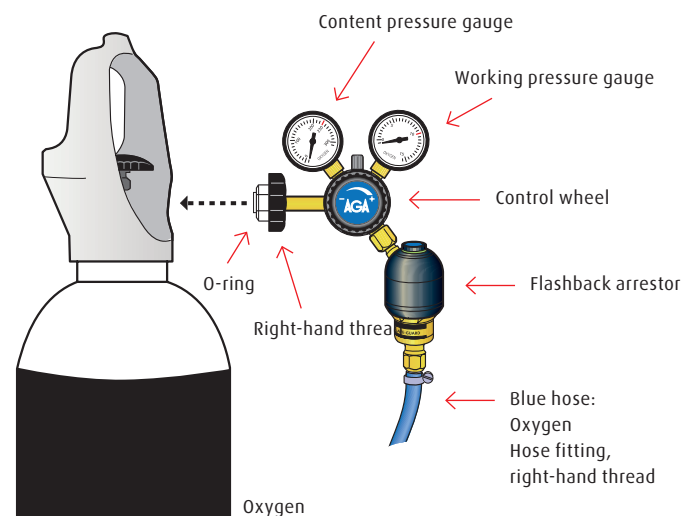
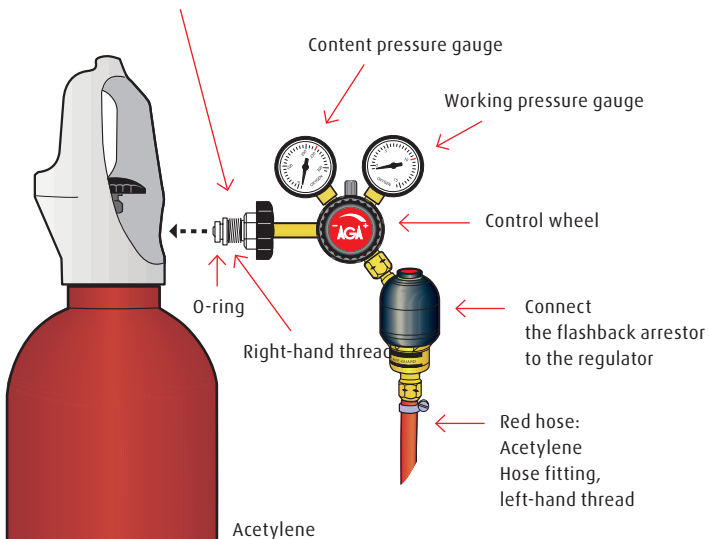
- Connect the hoses to the hose fittings on the regulator and the flashback arrestor
- Secure the connections with hose clips/compression couplings
- Use AGA's welding hose. This is approved for welding gases.



**Note!**

Always use original O-rings and gaskets!

- Connect the regulators to the relevant gas cylinder
- Tighten the nuts moderately by hand. Applies to hand nuts



The content pressure gauge shows the cylinder pressure • The working pressure gauge shows the working pressure that is set with the control wheel

### Calculate the content in the acetylene cylinder.

The gas content in an acetylene cylinder cannot be calculated exactly using the pressure because the acetylene's dissolubility in acetone is greatly affected by the ambient temperature. The content must therefore be calculated by means of weighing. As a guide, however, it is possible to calculate the approximate content by multiplying the reduction valve pressure in bar by the acetylene cylinder's volume in litres. Then multiply the result by 10.

#### Example A50

50 l in volume, 7 bar.

The approximate gas content is  $50 \times 7 \times 10 = 350$  l per cylinder = 3.5 m<sup>3</sup> gas, which is equivalent to 3.5 kg.

#### Emptying speed

In the event of high consumption of acetylene, it is advisable to check that the cylinders are not being emptied too quickly. Long-term use (more than 25% per hour of the cylinder's content) should be avoided. In the event of a shorter consumption period (approx. 30 min), the emptying speed can be increased to the equivalent of 50% per hour of the cylinder's total gas content. High consumption of acetylene occurs during heating, welding and flame cleaning, or when several torches are connected to the same cylinder(s).

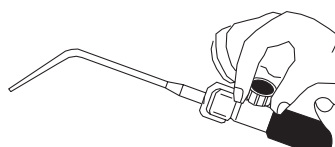
In the event of 5 minutes of consumption, the emptying speed can be increased to 75% of the cylinder's total gas content.

# Information.

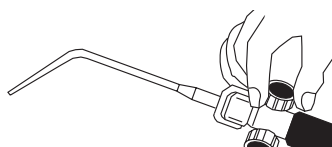
## Lighting injector torch



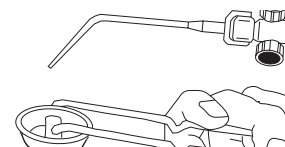
1. Set the pressure



2. Open the oxygen valve

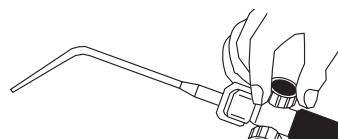


3. Open the fuel gas valve

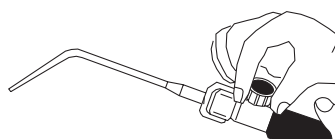


4. Light the torch

## Extinguishing injector torch

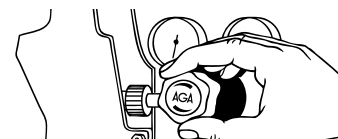


1. Close the fuel gas valve  
2. Close the oxygen valve  
3. Close the cylinder valve

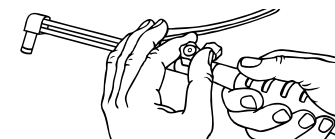


4. Relieve the hose pressure  
5. Relieve the load on the regulator

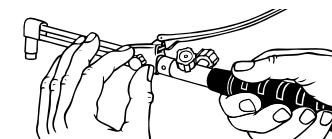
## Lighting and extinguishing pressure torch



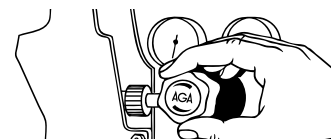
1. Set the working pressure on the cylinder regulators



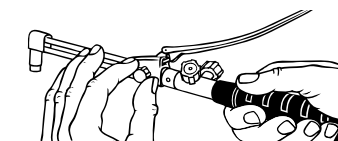
2. Open the oxygen valve on the handle fully



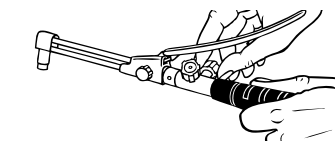
3. Open the oxygen valve on the cutting insert and allow the oxygen to flow freely



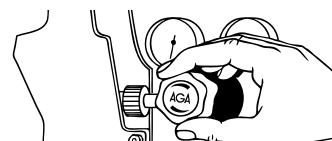
3a. Adjust the pressure on the oxygen regulator to the required level, see the cutting table.



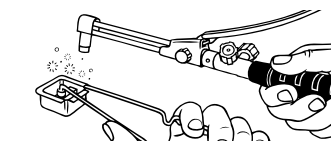
3b. Then close the oxygen valve on the cutting insert until only a little gas is flowing out



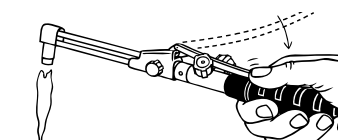
4. Open the acetylene valve on the torch handle approximately half a turn



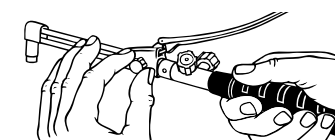
4a. Adjust the acetylene regulator until the cylinder reaches the required pressure, see the cutting table



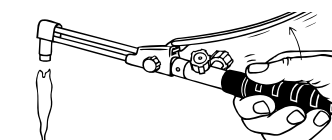
5. Light the flame (use gas lighter)



7a. Press and hold the rocker arm for the cutting oxygen



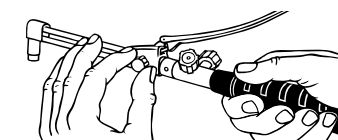
7b. Adjust the flame with the valve on the cutting insert until you have a clear core flame immediately after the cutting nozzle



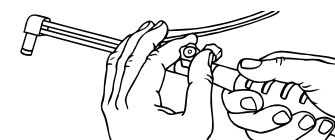
8+9. Release the rocker arm. The equipment is now ready for cutting.



10. Close the acetylene valve on the handle



11a. Close the oxygen valve on the cutting insert



11b. When you leave the equipment after completing work: also close the oxygen valve on the handle

## G-TECTA®

Portable Gas Detection Instruments.



### G-TECTA gassdetektorer

G-TECTA™ bærbare gassdetektorer er utformet slik at de er enkle å bruke med et tydelig display og kun knapp for betjening. Den røde fargen sikrer at gassdetektorene er godt synlig når de bæres. Gassnivå og de visuelle alarmene er godt synlig i displayet. G-TECTA finnes i fire ulike bærbare versjoner samt en for fast installasjon. De er testet og godkjent i henhold til gjeldende internasjonalt regelverk.

[www.g-tecta.com](http://www.g-tecta.com)

The G-TECTA® website is an information tool, designed to give you access to all the information you need to select the most appropriate instrument for your needs. The g-tecta.com website also has approval information and links to your local AGA office.



## G-TECTA® SG.

G-TECTA® SG is a fully functional premium single gas instrument, water and dust resistant, with one button operation and a choice of 28 sensors to suit almost every application. The lightweight and robust design combined with full download and data logging capability offers the ideal single gas solution for both operators and engineers across all industries.



## G-TECTA® SG<sub>2</sub>.

The G-TECTA® SG<sub>2</sub> instrument offers the user a simple to use, low maintenance disposable gas detector with a warranted 2 year life. Designed to resist the most arduous environments and to be used with basic training, the G-TECTA® SG<sub>2</sub> is ideal for contract work and where limited functionality is a requirement.



## G-TECTA® 4G.

The G-TECTA® 4G is a compact and easy to use four gas instrument with full data management and operator functionality. With 14 sensor options, one button operation and a robust water and dust resistant ergonomic casing, G-TECTA® 4G is the ideal confined space entry monitor.



## G-TECTA® 4GP.

With a choice of 26 sensors, the G-TECTA® 4GP provides a multi-gas solution for almost every environment. An integrated pump and charger, single button operation and full data management allows the user to effectively manage their gas detection requirements with confidence. G-TECTA® 4GP has infrared communication is extremely robust and is ideal for environments where deep water may be encountered.



## AGA safety and responsibility training.

The knowledge requirements are constantly increasing for those employees who work with gas and associated equipment. AGA offers a number of training packages, including safety, responsibility and process modules for personnel who come into contact with gas. The courses have been developed to provide personnel and companies with the potential to live up to the responsibilities placed on them by law. Through knowledge we can prevent accidents and minimise personal injury and damage to property. The knowledge requirements we satisfy are specified both in the Swedish Work Environment Act and the Swedish Rescue Services Agency's statute books, as well as in the "Civil Protection Act". These courses are available as individual training courses or in combination with process or application training in order to increase knowledge about the potential offered by the gases. The courses are described below in modules, which are subsequently adapted in packages for potential target groups. For more information, contact your local AGA Gas sales office.

The courses comprise the following modules:

### Module 1 - Safety when handling gas

- Properties and production of gas that is difficult to condense, easy to condense and absorbed
- Storage of flammable gases
- Transport rules and legislation
- If an accident occurs – gas cylinders in fires

### Module 2 – Safe handling of gas during gas welding and gas cutting

- Review of welding and cutting equipment
- Common causes of accidents, flashback, backfire and hose explosion
- Design of the workplace
- Demands for in-house checks

### Module 3 – Safe handling of gas during gas welding and gas cutting, including in-house checks

- Use of pressurised devices
- In-house checks in practice – continual supervision
- Legislation and legal requirements AFS 2002:1

### Module 4 - Safe handling of gas including in-house checks and hot work

- The course provides authorisation to conduct in-house checks, as well as a certificate for "Hot work"

### Module 5 - LPG heating at the building site

- LPG's properties, production and areas of application
- Handling and storage of LPG
- Transport rules, responsibility and permits
- If an accident occurs

### Module 6 - Operational supervisors for gas installations with cylinders and bundles

- Properties and production of gas that is difficult to condense, easy to condense and absorbed
- Storage of flammable gases
- Transport rules and legislation
- If an accident occurs – gas cylinders in fires
- The gas system from a safety perspective, with continual supervision - in-house inspections
- Legislation and legal requirements

### Module 7 – Manager training for large gas installations with tanks

- Properties and production of air gases (oxygen, nitrogen and argon)
- The gas system from a safety perspective, with continual supervision - in-house inspections
- Areas of application and risks associated with air gases
- The Civil Protection Act (LSO)
- The ATEX directive, classification plans, explosion protection documents, risk analysis, risk assessment in accordance with AFS 2002:1 and other applicable laws, regulations and standards relating to gas



# WELDONOVA® process support.

AGA process training.

## WELDONOVA® process training - MIG MAG Basic

- Underlying theories regarding MIG & MAG processes such as short, spray and mixed arc
- The structure and maintenance of welding machines
- The shielding gases and fluxes in the welding process
- Common weld defects and how to avoid them
- Highly productive welding methods within MAG welding
- Welding economy

## WELDONOVA® process training - TIG Basic

- Underlying theories regarding TIG processes
- The structure and maintenance of welding machines
- Shielding gases and fluxes, as well as various types of current and their impact on the welding process
- Common weld defects and how to avoid them
- Preconditions when performing TIG welding in various types of flux and parent material

## WELDONOVA® process training – Welding, cutting and soldering

- The gases acetylene, oxygen and LPG
- Basic knowledge regarding gas welding, gas cutting and soldering.
- Choice of nozzles
- Cutting and welding parameters
- Lighting and extinguishing the flame, as well as adjusting the flame
- Flux
- Safety.

## WELDONOVA® process training – Shielding gas flushing when soldering copper pipes

- Why oxide-free pipes are required for medical gases
- Choice of fuel gas and solder
- The shielding gas, its properties and flushing flows
- Demands as regards the material we are soldering in
- Regulation SS-EN 737-3 Medical gas systems
- Practical test – soldering t-joint

Registration and cancellation take place via:

[www.aga.se](http://www.aga.se) > courses > course calendar & registration

Questions regarding the content, location and dates of the various courses can be put to:

AGA Gas AB – Market Services

Switchboard

Tel.: 08 - 7069500

Fax: 019 - 272606

E-mail: [peter.bolund@se.aga.com](mailto:peter.bolund@se.aga.com)





# ODOROX® odourised oxygen – safety is paramount.

Air the danger. ODOROX® odourised oxygen is suitable for all processes that include oxygen and fuel gases.

## Risks during use

Oxygen is an invisible, odourless gas that exists naturally in the air you breathe. You may therefore not consider that there are risks associated with the use of oxygen. If the oxygen content in the air rises, perhaps due to a leak, the combustion speed increases rapidly in the event of ignition. Fires in oxygen-saturated air often become explosive, and can produce serious injuries to you and severe damage to your equipment and your surroundings. Remember that the smaller the space you are working in, the sooner dangerous oxygen levels can be attained in the event of a leak.

## A clear warning

To enhance safety during gas welding, gas cutting, soldering and similar work, AGA has developed ODOROX® odourised oxygen. If a leak should occur, you will be warned immediately by a distinct smell and can take action in time. ODOROX® odourised oxygen is an effective complement to other safety measures that you must always take when working with gas. Switch to ODOROX® odourised oxygen. A safety precaution that can save lives.

## Storage

Gas cylinders must always be stored in specially designated spaces with proper ventilation. Oxygen must never be stored with fuel gases such as acetylene or LPG. The cylinders must be secured so that they cannot fall.

## Transport

Remember to secure the cylinders properly during transport. Make sure the cylinder valves are properly closed. Regulators and hoses should be removed and the protective cap should be on. If an oxygen leak should occur despite the measures taken, ODOROX® odourised oxygen means that you will be warned in plenty of time.

## Usage

Always ensure good ventilation. Prevent leakage by ensuring that connections are tightened, and that the hoses and gaskets are free of defects. Replace the hose immediately if you notice cracks in it. Use ODOROX® odourised oxygen as an additional safety precaution.

## For all needs

ODOROX® odourised oxygen is now available for all users, regardless of whether you consume a lot or a little. Choose from the following:

- 5-litre cylinders
- 20-litre cylinders
- 50-litre cylinders
- Cylinder bundle, 12 x 50 litres
- Odourisation directly in the central system



ODOROX® odourised oxygen has a characteristic odour to warn of leaks and hazardous accumulations of oxygen.

## MISON® shielding gases.

Avoid harmful ozone – always use MISON® shielding gases when you are welding.

**During welding, harmful ozone is formed. Even in well-ventilated premises, ozone can enter your welding helmet and affect your health. However, it can be avoided.**

### Ozone is harmful to your health

The most common symptoms of exposure to ozone are headache, coughing, dry mucous membranes and irritation to the eyes, nose and throat. The symptoms arise when you are exposed to ozone in conjunction with welding where normal shielding gas is used. Many welders experience symptoms, but do not realise the link with their welding work. Ozone is invisible, but it is there and it is harmful to health.

### MISON® shielding gases protect you from ozone

MISON® shielding gases reduce the harmful ozone to a level that is not harmful to work in. This means that when you use MISON® shielding gases during welding, you are protected from the unpleasant symptoms and the ozone's harmful impact on your health.

### Better welding results with MISON® shielding gases

In addition to a better working environment, MISON® shielding gases also provide higher productivity and increased welding quality. This is because MISON® shielding gases have a carefully balanced composition that ensures a more stable welding process.

### Ozone causes

- Headache
- Irritation in the eyes, nose and throat
- Risk of damage to the lung tissue
- Impaired efficiency

### MISON® shielding gases provide:

- Better health
- Improved welding quality
- Higher performance





# Information.

Standards and approvals.

This catalogue specifies the standards that AGA's equipment satisfies, along with approvals and CE marking. It is very advantageous to be aware of and take such information into account when making decisions regarding procurement.

The user has a guarantee that equipment manufactured in accordance with standards will maintain a high level of safety and reliability – important properties when working with fuel gases and oxygen in various environments. On the Nordic market, not all equipment in this sector satisfies the applicable standards. Always make a comparison before purchasing!

Name	Standard	CE marking/Approval
Fire glove	EN 407	CE, 96 0403
Cylinder carts		CE, EG-89/392 EEC
Gas pre-heaters	IEC 364	CE, EG 900126/1, 900126/2
Pressure gauges	EN 562	
Mechanised cutting torches	EN 874	
Regulators	EN ISO 2503	Oxygen shock testing performed by Det Norske Veritas
Safety goggles	EN 166	CE
Hose connections	EN 1256*	
Hose fittings	EN 560	
Quick couplings	EN 561	
Hose:                    - Propane hose	EN 559	
- Welding hose	EN 559	
Welding equipment	EN ISO 5172	
Safety equipment	EN 730 - 1, EN 730 - 2	
Flux:                    - Welding wire H 44		
- Welding wire H 44 Mo		

\*) Standard for installation of hose on hose fitting.

Cylinder valve threads		
Hydrogen	DIN 477 No 1	W 21.8x $\frac{1}{4}$ " LH
Oxygen	DIN 477 No 6	W 21.8x $\frac{1}{4}$ " LH
Argon	DIN 477 No 10	W 24.32x $\frac{1}{4}$ " LH
Acetylene	DIN 477 No 12	G $\frac{3}{4}$ " INT

# Information.

Conversion table.

## Gases and condensed gases.

### Physical data

Gas	Chemical designation	Gas volume m <sup>3</sup> *1)	Liquid volume at boiling point	kg	Boiling point at 1 atm
Acetylene	C <sub>2</sub> H <sub>2</sub>	1	–	1,08	
		–	–	–	– 84
		0,926	–	1	
Propane	C <sub>3</sub> H <sub>8</sub>	1	3,71	1,88	
		0,27	1	0,51	– 42
		0,51	1,96	1	
Hydrogen	H <sub>2</sub>	1	1,17	0,0825	
		0,858	1	0,0706	– 253
		12,1	14,1	1	
THERMOLEN®	C <sub>3</sub> H <sub>6</sub>	1	3,53	1,8	
		0,29	1	0,52	– 48
		0,55	1,92	1	
Oxygen	O <sub>2</sub>	1	1,15	1,31	
		0,870	1	1,14	– 183
		0,763	0,877	1	
Argon	Ar	1	1,17	1,64	
		0,856	1	1,40	– 186
		0,611	0,714	1	
Nitrogen	N <sub>2</sub>	1	1,42	1,15	
		0,708	1	0,812	– 196
		0,871	1,23	1	
Carbon dioxide	CO <sub>2</sub>	1	1,53	1,81	
		0,577	1 **2)	1,18	– 78
		0,552	0,847	1	
Helium	He	1	1,31	0,164	
		0,726	1	0,125	– 269
		6,10	8,00	1	
Air	–	1	1,36	1,19	
		0,723	1	0,860	– 194
		0,840	1,16	1	

\*1) At + 15°C (288 K) and 98 kPa (0.98 bar).

\*\*2) At triple point –56.6°C (not boiling point).





# Getting ahead through innovation.

With its innovative concepts, AGA is playing a pioneering role in the global market. As a technology leader, our task is to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

AGA offers more. We create added value, clearly discernible competitive advantages and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardized as well as customised solutions. This applies to all industries and all companies regardless of their size.

**AGA – ideas become solutions**

## **Sweden**

AGA Gas AB  
[www.aga.se](http://www.aga.se)

## **Norway**

AGA AS  
[www.aga.no](http://www.aga.no)

## **Iceland**

ISAGA ehf  
[www.aga.is](http://www.aga.is)

## **Latvia**

AGA SIA  
[www.aga.lv](http://www.aga.lv)

## **Finland**

Oy AGA Ab  
[www.aga.fi](http://www.aga.fi)

## **Denmark**

AGA A/S  
[www.aga.dk](http://www.aga.dk)

## **Estonia**

AS Eesti AGA  
[www.aga.ee](http://www.aga.ee)

## **Lithuania**

AGA UAB  
[www.aga.lt](http://www.aga.lt)