

Product manual

Welding torch

PSF

501 032-502 Rev. 05 02 09



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ABB Automation Technologies AB
Arc Welding Products
SE-69582 Laxå
Sweden

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2 SAFETY

WARNING



Arc welding and cutting can be injurious to yourself and others. Take precautions when welding. Ask for your employer's safety practices which should be based on manufacturer's hazard data.

ELECTRIC SHOCK – Can kill

- Install and earth the welding unit in accordance with applicable
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES – Can be dangerous to health

- Keep your head out of fumes.
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS – Can injure eyes and burn skin

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

MALFUNCTION

- Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE MANUAL BEFORE INSTALLING AND USING THE EQUIPMENT

PROTECT YOURSELF AND OTHERS!



Users of welding equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of welding equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well-acquainted with the operation of the welding equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the welding equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding
2. The operator must ensure that:
 - no unauthorized person is stationed within the working area of the equipment when it is started up.
 - no-one is unprotected when the arc is struck
3. The workplace must:
 - be suitable for the purpose
 - be free from drafts
4. Personal safety equipment
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves.
 - Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns.
5. General precautions
 - Make sure the return cable is connected securely.
 - Work on high voltage equipment **may only be carried out by a qualified electrician.**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
 - Lubrication and maintenance must **not** be carried out on the equipment during operation.

3 INTRODUCTION

The PSF 315M / 315 R is an self-cooled welding gun. The welding gun is developed for use in robot applications or mechanised welding.

A range of accessories including welding tips, swan necks and contact nozzles are also available.

Details of welding torches accessories can be found on page 14.

4 TECHNICAL DATA

Welding gun	PSF 315 M / 315 R
Permitted load at 60% intermittence	
CO ₂	315 A
MIX	285 A
Permitted load at 100% intermittence	
CO ₂	200 A
MIX	170 A
Electrode dimensions	0.8 - 1.2 mm
Rec. gas flow l/min	10 - 20 l/min
Weight, hose length	
1.5 m	2.0 kg
2.2 m	2.6 kg
3 m	3.2 kg

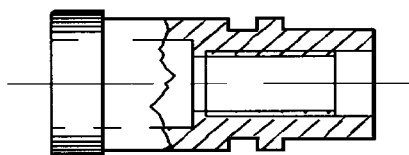
Duty cycle

The duty cycle refers to the time as a percentage of a ten-minute period that you can weld at a certain load without overloading.

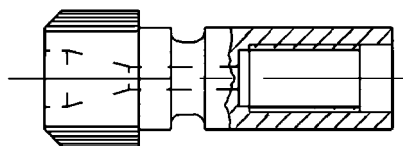
5 CONSUMABLES

5.1 Changing wire liner, replacing electrode conductors

5.1.1 Install the correct nipple



ESAB Connection



EURO Connection

Note! 2 nipples are supplied with each welding liner, 1 for an ESAB connection and 1 for a EURO connection.

5.1.2 Remove the gas nozzle and tip adator.

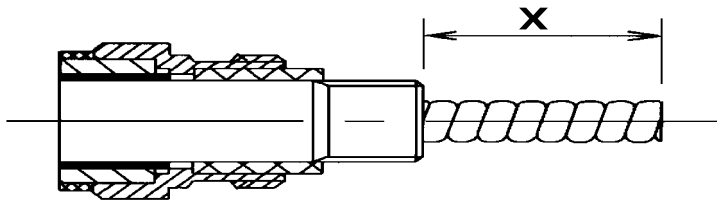
5.1.3 Install the wire liner in the welding gun.

5.1.4 Cut the wire liner to the correct length.

When cutting, the welding gun should be extended with the wire liner fully inserted in the rear connection.

Cut the wire liner so that it protrudes by "X" in accordance with the table below.

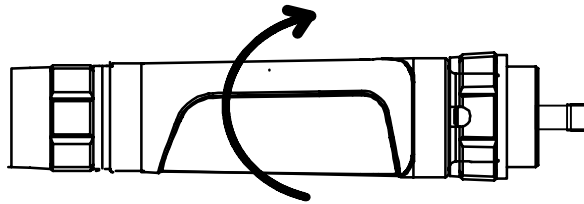
Welding gun	Length	Adapter	Measurement X	Helix	Measurement X
PSF 315 M / 315 R	1.5 m	0368 145 001	27 mm	0368 683 001	22 mm
PSF 315 M / 315 R	2.2 m	0368 145 001	28 mm	0368 683 001	23 mm
PSF 315 M / 315 R	3.0 m	0368 145 001	31 mm	0368 683 001	26 mm



Sharp edges are not allowed on the inside of the wire liner guide after cutting.

5.1.5 Reinstall the tip adaptor and gas nozzle.

5.1.6 Install the welding gun on the machine.



- a) Turn the connecting piece clockwise when you encounter resistance
- b) The welding rod goes in

5.2 Interchangeable connectors

Connectors are manufactured with the same measurements between the mount and the tip of the contact tip and are therefore directly interchangeable.

For dimensions and guaranteed tolerances, see diagram on page 10.

5.3 Compressed air cleaning

The connector has a connection and ducts for compressed air cleaning of the gas nozzle.

5.4 Contact tip

Contact tips are selected according to electrode diameter, type of shielding gas and rating of the welding current being used. See table on page 14.

The contact tips are initially selected with the guidance of the CO₂ table. If seizing occurs in the event of high welding data with Argon or mixed gas, select on the basis of the MIX, AR table.

For HELIX, the table applies regardless of shielding gas type. HELIX contact tips must be combined with a special tip adaptor, see spare parts list. Note that the item number for HELIX includes 2 contact tips + 1 locking nut for installation.

5.5 Wire liners

In order to achieve good welding rod feed, the wire liner should be selected in accordance with the table on page 15. A Teflon-based wire liner produces less friction and is kinder to the electrode, but normally has a shorter service life than a steel spiral. It is suitable for all types of electrode, except for the majority of core wire types thicker than 1.2 mm.

Steel spirals can be used for all except for stainless steel and aluminium electrodes.

For changing electrode guides – see the enclosed instructions.

Note! All welding guns are supplied with steel spirals for welding liner \varnothing 1.0.

5.6 Gas nozzles

If you want a gas nozzle with a smaller opening diameter, this is available as an accessory for each gun. See the spare parts list. Note that it is also possible to exchange the connector type.

IMPORTANT! There is a spatter guard in the gas nozzle. This must be in place to prevent welding spatter penetrating the connector.

For good function, the gas nozzle must always be screwed in as far as it will go.

5.7 Gas protection

Several factors combine to provide good gas protection. The most important of these are:

1. Choice of shielding gas. – Mixed gas and argon require a greater flow than carbon dioxide
2. Set flow quantity. – See technical data (should be measured at the gas nozzle).
3. Set welding current. – High current requires a greater gas flow.
4. Position of the welding joint. – A vertical position requires a greater gas flow.
5. Type of welding joint. – An outer corner joint requires a greater gas flow than a butt joint. A fillet weld joint requires a correspondingly smaller gas flow.
6. The angle of the welding gun against the workpiece – below 45° entails a risk of poor gas protection.

6 OPERATION

General safety regulations for the handling of the equipment can be found on page 3. Read through before you start using the equipment!

The welding gun contains a lead for starting point searching. This is connected to the ring-shaped adapter plug in the welding gun's feeder end. The connection lead from starting point searching (e.g. Smartac) is connected to the corresponding flat-pin connection in the feeder's terminal block.

7 MAINTENANCE

Note!

All guarantee undertakings from the supplier cease to apply if the customer himself attempts any work in the product during the guarantee period in order to rectify any faults.

Regular servicing reduces unnecessary and expensive operational stoppages.

1. Welding spray in the gas nozzle impairs the gas protection and increases the risk of flash-over.
-Clean regularly and use a moderate amount of welding paste or welding spray.
2. The spray guard in the gas nozzle should be replaced when its front end has become thin.
3. Every time the electrode bobbin is replaced, the welding hose should be disconnected from the feeder and blown clean with compressed air.
4. The end of the electrode may not have any sharp edges when it is inserted into the welding rod guide. This is particularly important in the case of Teflon-based welding rod guides.

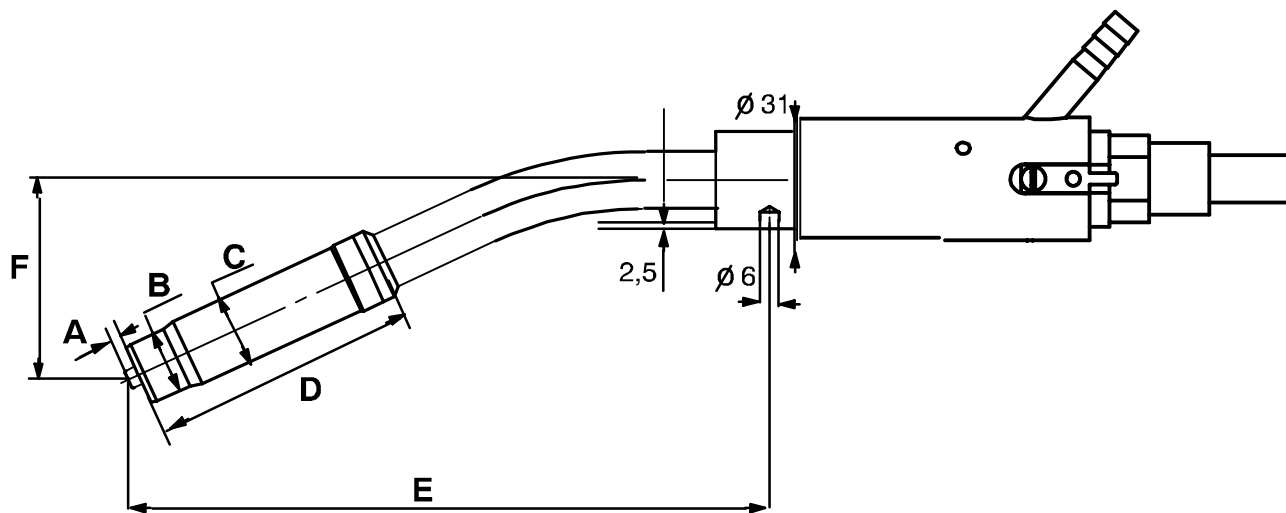
8 SPARE PARTS AND ACCESSORIES

PSF 315 M / 315 R is designed and tested in accordance with the international and European standards IEC/EN 60974-7 and EN 60974-7. It is the obligation of the service unit which has carried out the service or repair work to make sure that the product still conforms to the said standard.

Spare parts may be ordered through your nearest ABB dealer.

When ordering, please state product type, serial number, designation and spare part number in accordance with the spare parts list. This facilitates shipment and ensures correct delivery.

Dimension drawing



	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
PSF 315M, 25°	3.5	20	22	94	196.3	63.4
PSF 315M, 25° extended 100	3.5	20	22	94	296.3	63.4
PSF 315M, straight	3.5	20	22	94	209.3	0
PSF 315M, straight, extended 100	3.5	20	22	94	309.3	0

Welding gun PSF 315 M / 315 R

Ordering number

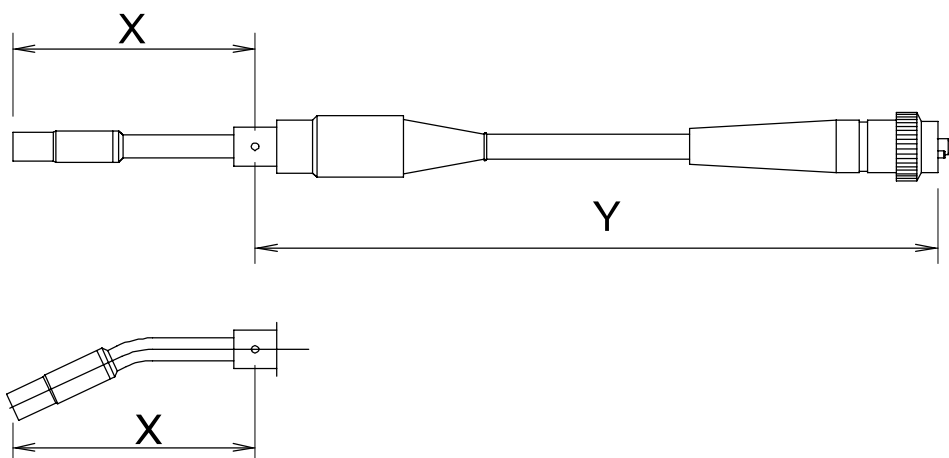


Ordering numbers for *Welding gun PSF 315 M / 315 R*

0367 233 894	PSF 315 M / 315 R 1.5 m, 25°	EURO Connection
0367 233 896	PSF 315 M / 315 R 1.5 m, straight	EURO Connection
0367 233 898	PSF 315 M / 315 R 3.0 m, 25°	EURO Connection
0367 233 900	PSF 315 M / 315 R 2.2 m, 25°	EURO Connection
0367 233 901	PSF 315 M / 315 R 2.2 m, straight	EURO Connection
0367 233 905	PSF 315 M / 315 R 3.0 m, straight	EURO Connection

Welding gun PSF 315 M / 315 R

Ordering numbers for other lengths



When ordering please quote:

- Neck type
- Wire diameter
- Cable assembly length

These ordering numbers apply only to standard torch variations. Other variations will be issued with part numbers on receipt of order. Refer to order confirmation.

Order form for torch with extended swan neck or custom specific length 0367 233 90x					
PSF 315M / R Item no 0367 233 xxx	1.5 m	2.2 m	3.0 m	Free length*	X (mm)
Swan neck 25° (0368 155 890)	894	900	898		196.3
Swan neck straight (0368 155 894)	896	901	905		209.3
Swan neck 25° ext. 100 (0368 155 892)					296.3
Swan neck straight, ext. 100 (0368 155 896)					309.3
Length Y (± 20 mm)	1300 mm	2040 mm	3000 mm		

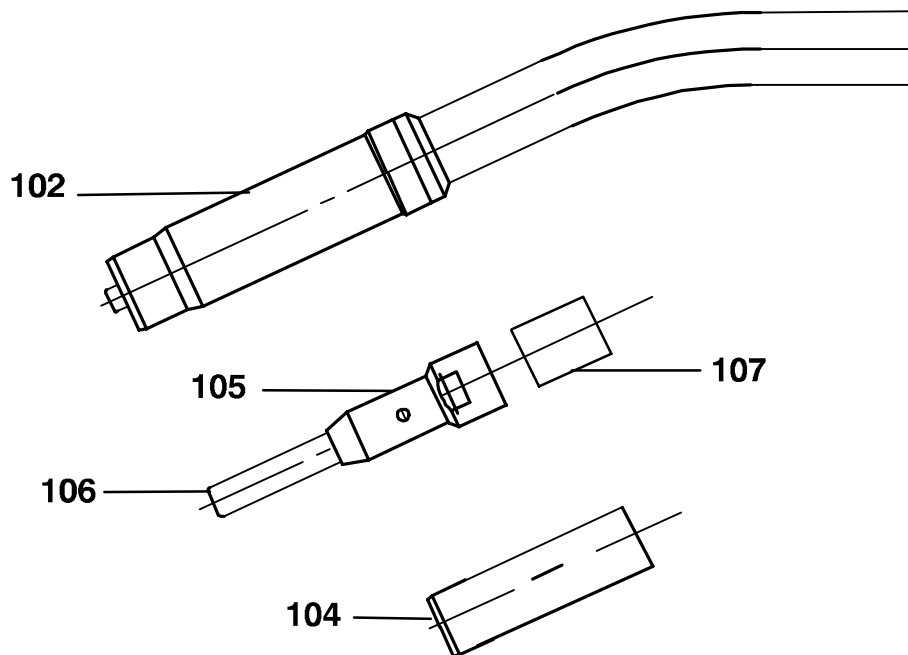
* Specify length Y = in the correct column (swan neck)

Welding gun PSF 315 M / 315 R

Wear parts

(W) = wear part (A) = accessory

Item	Qty	Ordering no.	Denomination	Notes
102	1	0459 073 882	Gas nozzle, standard	(W) D/d 20/16 mm
-	1	0366 946 882	Gas nozzle, conical	(A) (W) D/d 17/13 mm
104	1	0366 396 003	Spatter protection	(W) Included in item 102
105	1	0368 145 001	Adapter	(W) M6
-		0368 683 001	Adapter	(A) HELIX, M7
106	1		Contact tip	(W) See table on page 14
107	1	0366 397 002	Insulation bushing	(W)



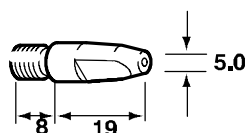
Welding gun PSF 315 M / 315 R

Accessories

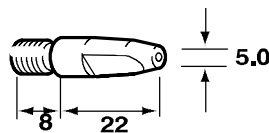
Contact tip

The bore dimension of the contact tips is to be selected with regard to wire diameter, type of shielding gas and actual intensity of the current – we refer to the table below.

Standard M6 **ESAB**



Standard M6 **ABB**



To start with, choose a contact tip as specified in the shortarc-table (CO₂). Should binding occur with high parameters when using Argon or gas mixture, choose contact tip from the sprayarc table.

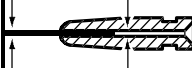
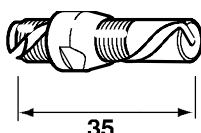
Welding wire		Contact-tip hole Ø	Ordering No M6 x 27 ESAB	Marked 	Wire Ø	Ordering No M6 x 30 ABB	Contact tip hole Ø
Short arc CO ₂	Spray arc MIX						
(0.8)	0.6	0.9	0468 500 002	W0.8 ESAB	0.8	0153 500 202	1.0
0.8	(0.8)	1.0	0468 500 003	W0.8 ESAB	0.9	0153 500 203	1.1
0.9	0.8	1.1	0468 500 004	W0.9 ESAB	1.0	0153 500 204*	1.2
1.0	0.9	1.2	0468 500 005	W1.0 ESAB	-	-	1.2
1.1	(1.0)	1.3	0468 500 006	W1.2 ESAB	-	-	1.3
1.2	1.0-1.1	1.5	0468 500 007	W1.2 ESAB	-	-	1.5

Table 1

*) Is delivered as standard

Helix M7



Helix M7 contact tip must be combined with special tip adapter. See spare parts list.

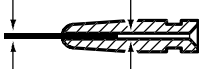
Ordering number M7 HELIX	Marked 
0368 313 881	W0.8 -
0368 313 882	W0.9 -
0368 313 883	W1.0 -
0368 313 884	W1.2 -

Table 2

Welding gun PSF 315 M / 315 R

Wire liner

Welding wire *)	Teflon conduit incl. wear insert (steel) 3 m	Wear insert separate	
		Steel	Teflon (Al)
0.8 mm	0366 550 882	0366 545 880	0368 742 880
0.9-1.0 mm	0366 550 884	0366 545 881	0368 742 880
1.2 mm	0366 550 886	0366 545 882	0368 742 881

*) The wire guide aperture = 1.5 x wire diameter. The wire guide is marked with the max. wire diameter (stamped on the nipple).

Table 3

Welding wire *)	Steel spiral
	3 m
0.6-0.8 mm	0366 549 882
0.9-1.0 mm	0366 549 884
1.2 mm	0366 549 886

*) The wire guide aperture = 1.5 x wire diameter. The wire guide is marked with the max. wire diameter (stamped on the nipple).

Table 4

PSF 315M/R

Item	Qty	Ordering no.	Denomination	Notes
400	1	0368 155 880	Swan neck 25°	Includes item 401, 403 and 404
-	1	0368 155 892	Swan neck 25°, extended 100 mm	Includes item 401, 403 and 404
-	1	0368 155 894	Swan neck, straight	Includes item 401, 403 and 404
-	1	0368 155 896	Swan neck, straight, extended 100 mm	Includes item 401, 403 and 404
401	1	0459 073 882	Gas nozzle, standard	D/d 20/16 mm
-	1	0366 946 882	Gas nozzle, conical	D/d 17/13 mm
402	1		Contact tip	See "Wear parts"
403	1	0368 145 001	Adapter	M6
403	1	0700 200 170	Adapter set "old style torch"	
404	1	0366 396 003	Spatter protection	Included in item 402
-		0368 683 001	Adapter	HELIX, M7
405	1	0366 397 002	Insulation bushing	
406	1	0455 994 001	Tube	
407	1	0467 867 881	Protection sleeve	
408	1	0700 200 150	Support sleeve	
409	1	0700 200 097	Adapter nut	
410	1	0700 200 151	Central connector	Including control leads
411	1	-	Liner	
412	1	0700 200 198	Cable assembly 1.5 m	

