

ABB Robotics

Operating manual Wire Cutter, M2001



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1 General

1.1 For compliance

You will find general information on the use of these operating instructions in this chapter.



This chapter contains general information about the use of these operating instructions. This text must be read and understood by all persons who work with these components or systems in which these components are installed.

The safety instructions are an integral part of these operating instructions. Non-compliance with the safety instructions can lead to accidents!

These operating instructions refer exclusively to the wire cutter.

The operating instructions should always be kept in the vicinity of the plant and be available within reach to every responsible person at any time.



Note!

The present operating instructions are a supplement to the product specification “Torch cleaning device TC 96”.

The product specification “Torch cleaning device TC 96” must therefore also be available to the reader of this description.

The contents of these operating instructions should be read, understood and complied with in every regard by every responsible person. This applies especially for safety instructions which are identified specially in these operating instructions.

Complying with the safety instructions in these operating instructions helps to avoid accidents, errors and disturbances.

With these operating instructions you receive all documents for the operation and maintenance of the components. The documents correspond at handover to the current status at the time of commissioning.

Only these operating instructions are binding for the clarification of technical questions and ordering spare parts. All documents that you have received for example with quotations or in training courses can be inappropriate or erroneous.

Should errors, damage, operating disturbances and production losses resulting from these arise due to non-compliance with the individual items of these operating instructions, then ABB undertakes no liability.

Should however disturbances occur, please contact the customer service department of ABB. This must be observed especially during the warranty period.

1.2 Area of application

The wire cutter is an attachment module of the torch cleaning device TC 96 and is also controlled from this.

The quality, efficiency and functionality of the wire cutter is achieved only if it is used in plants that are designed by ABB. The wire cutter should be used only in the intended area of application (warranty!).

ABB reserves the right to make technical changes that are necessary for improving the wire cutter. Deviations from the contents or from the pictorial representation in these operating instructions are therefore possible.

1.3 Target group

These operating instructions are directed at all persons who work on the plant/machine or its components. Specialist knowledge about the operation of the plant/machine is required in order to understand the operating instructions.

The following table lists which parts of the operating instructions absolutely have to be read for the activity.

	Maintenance								
	Operation								
	Start-up								
	Installation								
	Function and construction								
	Transport								
	Safety								
	Technical data								
	General								
Operation of the plant or of its components	x	x	x	x	x	x	x	x	x
Start-up	x	x	x		x		x	x	x
Programming operating parameters	x	x	x		x		x	x	
Maintenance, service, repair	x	x	x	x	x	x	x	x	x
Installation	x	x	x	x	x	x	x	x	x
Transport	x		x	x		x			
Cleaning	x		x						x

Determining the areas of activity, duties and competencies is the responsibility of the operator of the plant/machine. He must also ensure that only qualified personnel instructed by him work on the plant and its components.

1.4 Use as intended

The wire cutter is intended for attachment to the torch cleaning device TC96 and is intended only for the automatic cutting off of the welding wire. Compliance with the operating, maintenance and repair instructions is also part of use as intended.

Intended installation site:

At the torch cleaning device TC96 in the working area of an industrial robot.

1.5 Use not as intended

Any use deviating from the use as intended of the plant/machine and its components is considered as use not as intended.

Use not as intended results in the loss of the warranty from ABB. The plant operator alone is liable for damage resulting from use not as intended.



This component may be used exclusively corresponding to the operating conditions and performance data (technical data) specified in the specification and operating instructions.

Other use or use going beyond this or unauthorized conversions or modifications to the wire cutter are considered to be use not as intended



Not permissible!

- Other use without consultation with the manufacturer.
- Use in explosion-endangered zones.

1.6 Copyright

For reasons of copyright we must draw attention to the fact that these operating instructions may be used only for internal operational purposes.

Duplication, even of excerpts and for internal operation purposes, requires basically the agreement of ABB. For reasons of competition, the documents or parts of the documents may not be communicated to third parties.

General

Use as intended

2 Technical Data

You will find the most important technical data for the wire cutter in this chapter.

2.1 General



In this chapter you will find the most important technical data for the machine/component. This chapter must be read by all persons who are authorized with operation, start-up, programming, maintenance and installation.

2.2 Technical Data

Technical Data			
Air pressure	5-10 bar		
Clamping cylinder diameter	45 mm		
Stroke	36 mm		
Clamping force (at 5 bar)	790 N		
Max. welding wire diameter to be cut	d=1.0 mm d=1.2mm	Steel Aluminium	At 5 bar air pressure at least
Max. welding wire diameter to be cut	d=1.2mm d=1.6mm	Steel Aluminium	At 6 bar air pressure at least
Weight	approx. 1.5kg		

Supply Data	
Voltage	24 V control voltage
Compressed air connection	G 3/8 inch
Compressed air	6 bar unooled

3 Safety

In this chapter you will find general safety instructions for the use of the wire cutter.

3.1 General



In this chapter you will find the most important safety instructions for the machine/component.

This chapter must be read by all persons who work on the machine/component or the total plant.



Higher-ranking instructions and regulations for safety that can be found in the operating instructions for the plant/machine must be complied with. Non-compliance can lead to injury to persons or to damage of plant parts



In all work on the wire cutter, the plant must be switched off and protected against being switched back on. Danger to life!



**When working on the wire cutter make sure that no parts can drop down.
Keep a container for small parts at hand for this purpose.
Handle the wire cutter with very great care.
Never use forced when handling the wire cutter. Even minor damage can considerably impair the operation of the wire cutter.**

3.2 Sources of danger

The wire cutter is installed generally in the working area of an industrial robot/handling device. Robots have very varied movements and work with high accelerations. In the automatic mode, the robot is program-controlled and can start “unpredictably” even after a long rest position. Persons who are caught by the movement of a robot can suffer very severe and lethal injuries.

3.3 Safety measures

The operator must identify the dangers that can occur in connection with the production plant and estimate the risks connected with them.

Technical protective measures for the work to be performed must be selected and designed making it possible to program, setup, maintain, test, trouble-shoot and to rectify faults if required under safe conditions.

4 Transport and storage

In this chapter you will find information on transport and storage.

4.1 General



Warning!
Observe without fail the safety instructions in “3 Safety”



Danger!
Danger of injury due to unsuitable means of transport and hoists.
Test means of transport and hoists for sufficient load capacity.



Danger!
Danger of injury due to parts tilting.
Make sure that the plant/machine or components do not tilt during transport (observe centre of gravity).



Danger!
Danger of injury due to incorrect transport.
When transporting the plant/machine or components comply with the locally applicable provisions and accident prevention regulations.

If the wire cutter is not transported by order of ABB, then the operator of the plant must ensure for the transport that only qualified, trained personnel are employed.

4.2 Transport / packaging / transport damage

New wire cutters are tested before despatch at ABB for damage and completeness and provided with protective packaging for transport.

On delivered all drilled holes are closed with plugs to prevent dirt penetrating into the interior.

Remove and keep the plugs only on installation. The plugs can then be refused on later dismantling.



The packaging of the wire cutter can protect only conditionally against the influences of transport.

In any event you must prevent the possibility of damage due to external force (do not throw, do not drop). Even minor damage can lead to faults in the wire cutter.

If the wire cutter was damaged in transport, then the transport company must be informed immediately for the purpose of appraisal and a concealed damage claim must be submitted.

4.3 Storage



The wire cutter must be stored correctly if it is not installed directly in the plant. The original packaging should be used for storage.

The following conditions must be complied with for the wire cutter in the spare parts ware-house:

- On longer storage oil all bare steel parts lightly with commercially available silicone-free corrosion protection oil and close the compressed air connections with caps.
- When changing and storing the wire cutters place on a frame made of wood.
- Protect the stored parts against humidity.

4.4 Packaging / disposal

The transport packaging provided by ADD serves as packaging for storage of the plant components. Disposal takes place only corresponding to the contractual agreements made.

5 Function and construction

In this chapter you will find information about the function and construction of the wire cutter.

5.1 General



In this chapter you will find information on the mode of operation and on the construction of the machine/component. This chapter must be read by all persons who are authorized with operation, start-up, programming, maintenance and installation.

5.2 Function

The wire cutter is an attachment module of the torch cleaning device TC96 and is also controlled by this.

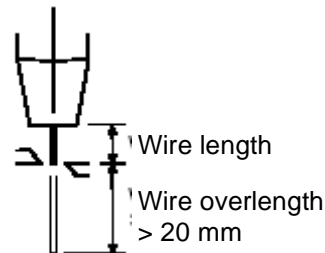
The welding wire is cut off to a required length with this additional device.

The robot stands in its cleaning position in this process. In this case the welding torch is as a rule inside the torch cleaning device, above the spray head.

The cutting plate is connected mechanically with the clamping cylinder of the torch cleaning device and requires no additional control elements.

After selection of a wire cutting program filed in the robot

- the cutting blade opens (thus the clamping cylinder also closes automatically, the two movements are coupled with one another).



Figur 1. Wire length

- The welding torch moves to the required wire length (e.g 10mm above the blade in the wire cutting position of the torch cleaning device.
- The wire feed conveys an excess welding wire length of **at least 20 mm!**
- The cutting blade closes and cuts the welding wire to the required wire length. The cutting blade and clamping cylinder are then back in the basic positions.



To obtain perfect function of the wire cutter, the following points must be complied with:

- the compressed air must be oiled
- bare steel parts must be greased

5.3 Assemblies

The wire cutter Model 2001 consists of the following assemblies:

- Cutting plate on the piston side with support and shaft
- Cylinder, complete with 2 gaskets
- Housing, complete with cutting plate, gaskets and cover
- Probe, complete with initiator (mini probe) and flange connector.

6 Installation and dismantling

In this chapter you will find information about installing and dismantling the wire cutter.

6.1 General



Warning!
Comply without fail the safety instructions in “3 Safety”



Warning!
Before working on the wire cutter the plant must be switched off from the energy supply and protected against being switched back on. Under energy is understood the power required to operate the wire cutter. This can be compressed air, electrical power, hydraulics or a combination of these.

6.2 Installation



In all work on the wire cutter the plant must be switched off completely and protected against being switched back on!
All pipes must be pressureless and empty.
A functional control of the wire cutter must be performed before its installation.



There is danger to life and limb on non-compliance with the safety instructions!



The electrical installation may be made only by specialist personnel.

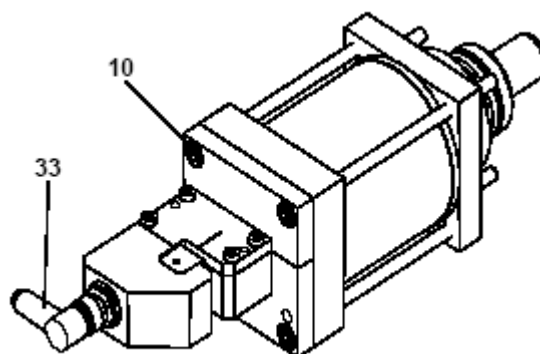


Protect compressed air lines against kinking, too strong bending and possible tearing on utilization of the entire room for movement of the handling device.



You receive the “wire cutter Model 2001” in pre-assembled condition.
Nevertheless check that the delivery is complete and the sealing rings are inserted.
Brush the sealing rings with anti-friction grease before jointing work.

Before you can attach the wire cutter to the torch cleaning device TC96, the cylinder currently installed there must be dismantled. Please refer to “[Chapter 6.4.2 Dismantling the cylinder](#)” for information about this.



Figur 2. Attaching the wire cutter to the torch cleaning device TC96

After you have dismantled the cylinder, now install the wire cutter as follows on the torch cleaning device TC96:

1. Fasten the pre-assembled module “wire cutter Model 2001” by means of the 4 M6 × 115 machine screws (10) at the place provided for it on the torch cleaning device TC96 an.
2. Plug the angle plug (33) back on the initiator (mini probe).
3. Fasten the air connection.

Connect air and electric power and test the function of the wire cutter.

6.3 Dismantling



Note!

Substances endangering the environment must be disposed of in accordance with the locally applicable regulations and ordinances.



Danger of injury due to insufficiently qualified personnel!

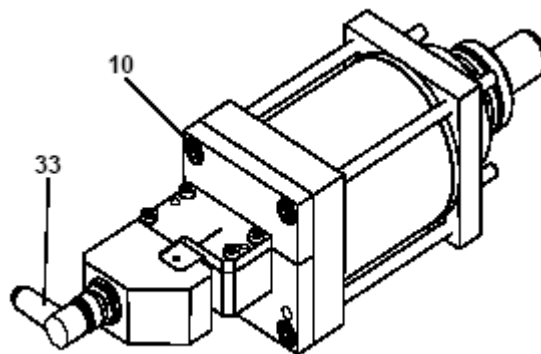
The machine/component may be dismantled only by specialist personnel trained for the corresponding work.



In all work on the wire cutter the plant must be shut off completely and protected against being switched back on!

All lines must be pressureless and empty.

There is danger for life and limb on non-compliance with the safety instructions.



Figur 3. Dismantling the wire cutter Model 2001.

To dismantle the wire cutter from the torch cleaning device TC96 proceed as follows:

1. Bring the handling device/robot into a suitable position and switch it off.
2. Shut off the main compressed air line.
3. Make the system pressureless.
4. Loosen air connection.
5. Unplug angle plug (**33**) from the initiator (mini probe).
6. Loosen the 4 M6 × 115 machine screws (**10**) and remove the wire cutter from the torch cleaning device TC96.

6.4 Subsequent attachment of the wire cutter Model 2001

6.4.1 Preparations for conversion



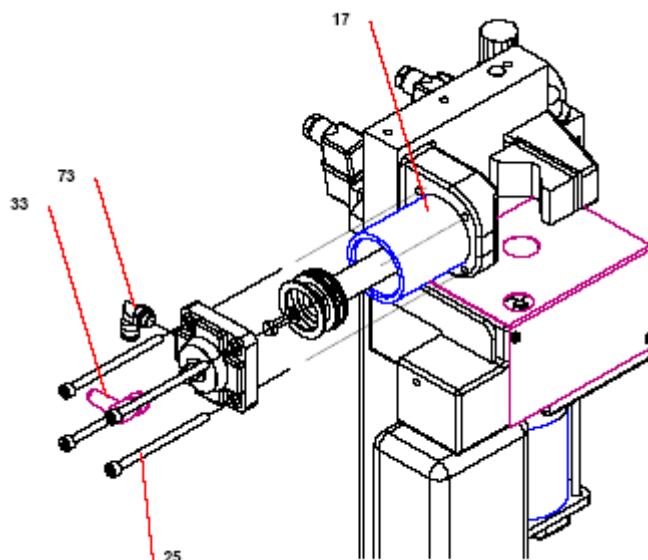
Before you start with the conversion:
Make sure that the air and power supply is interrupted!



Clean the torch cleaning device TC96 before the conversion!

6.4.2 Dismantling the cylinder

Before you can attach the wire cutter Model 2001 to the torch cleaning device TC96, the cylinder currently attached to the TC96 must be dismantled.



Figur 4. Dismantling the cylinder

Proceed as follows:

1. Unscrew the union nut of the angle plug (33) of the initiator (mini probe) and pull the angle plug out.
2. Unscrew the angle union (73) of the pneumatic connection.
3. Loosen the 4 M6 ×90 machine screws (25) on the cylinder head.
4. The cylinder tube (17) is now held by the friction of the O-ring seals. Remove the cylinder from the torch cleaning device by turning and pulling.



Note!

The removed parts are no longer required for the attachment of the wire cutter Model 2001.

6.5 Disposal



Note!

The operator is obliged to comply with the relevant valid Federal, State and communal regulations.

6.6 Scrapping



Note!

The operator is obliged to comply with the relevant valid Federal, State and communal regulations.

Dismantling the cylinder

7 Start-up

In this chapter you will find information on starting up the wire cutter.

7.1 General



Warning!
Comply without fail the safety instructions in “3 Safety”

7.2 Information on start-up

Before start-up, check:

- that all components are correctly installed and fastened
- that all electrical connections are correctly connected
- that all supply lines are correctly dimensioned and connected



It is recommended that the air pressure is monitored by means of a pressure switch.

- that all supply lines have freedom of movement
- that the function of the safety devices is guaranteed



Warning!
Danger due to incorrect connections/settings and not functioning/missing safety devices.

7.3 Functional test

The functional test must be performed in the manual mode.



Danger!
No persons may be in the danger area.
Perform the test only in the manual mode.

8 Operation

In this chapter you will find information on operating the wire cutter.

8.1 General



Warning!
Comply without fail the safety instructions in “3 Safety”



Warning!
Check the function of all safety devices and the correct connection of all supply lines before you release the plant for production.



Warning!
Check the case of changes to the movement program, it must be ensured absolutely that the distances between the moving plant parts and the fixed plant parts correspond to the applicable standards.



The plant may be operated only by correspondingly trained and qualified personnel.

8.2 Operating modes

The plant/machine is designed for automatic operation.



Note!
The set-up mode (manual mode) may be operated only by correspondingly trained and qualified personnel.

8.3 Operating devices

The wire cutter may be operated only using the operating devices.



The wire cutter may be operated only by correspondingly trained and qualified personnel.

8.4 Switching on



Danger of electric shock!
Make sure that all components conducting voltage are correctly covered.



Danger of Injury!
Make sure that all pneumatic lines are correctly installed and connected.

8.5 Ignition behaviour / uptime of the plant

You will achieve an improvement in the ignition behaviour and uptime of your welding plant if:

- you cut off bent or too long wire projection before every torch cleaning and before every TCP measurement you cut off the wire end.
- you cut off scale forming at the wire end.

9 Service, maintenance and repair

In this chapter you will find:

- information on maintenance
- information on repair

9.1 General



Warning!

Danger of injury!

The maintenance/repair personnel must possess the necessary training and qualifications corresponding to the work!



Warning!

Danger due to non-compliance with special maintenance instructions.

9.2 Maintenance and care

Maintenance interval	Maintenance
Daily	Visual inspection
Weekly	Clean dirt and swaff off from device in the area of the cutting blades with a brush. Do not use compressed air
	Replace blunt cutting plates on time.
	Regularly check and replenish the contents in the oil mist tank of the torch cleaning device "TC 96".

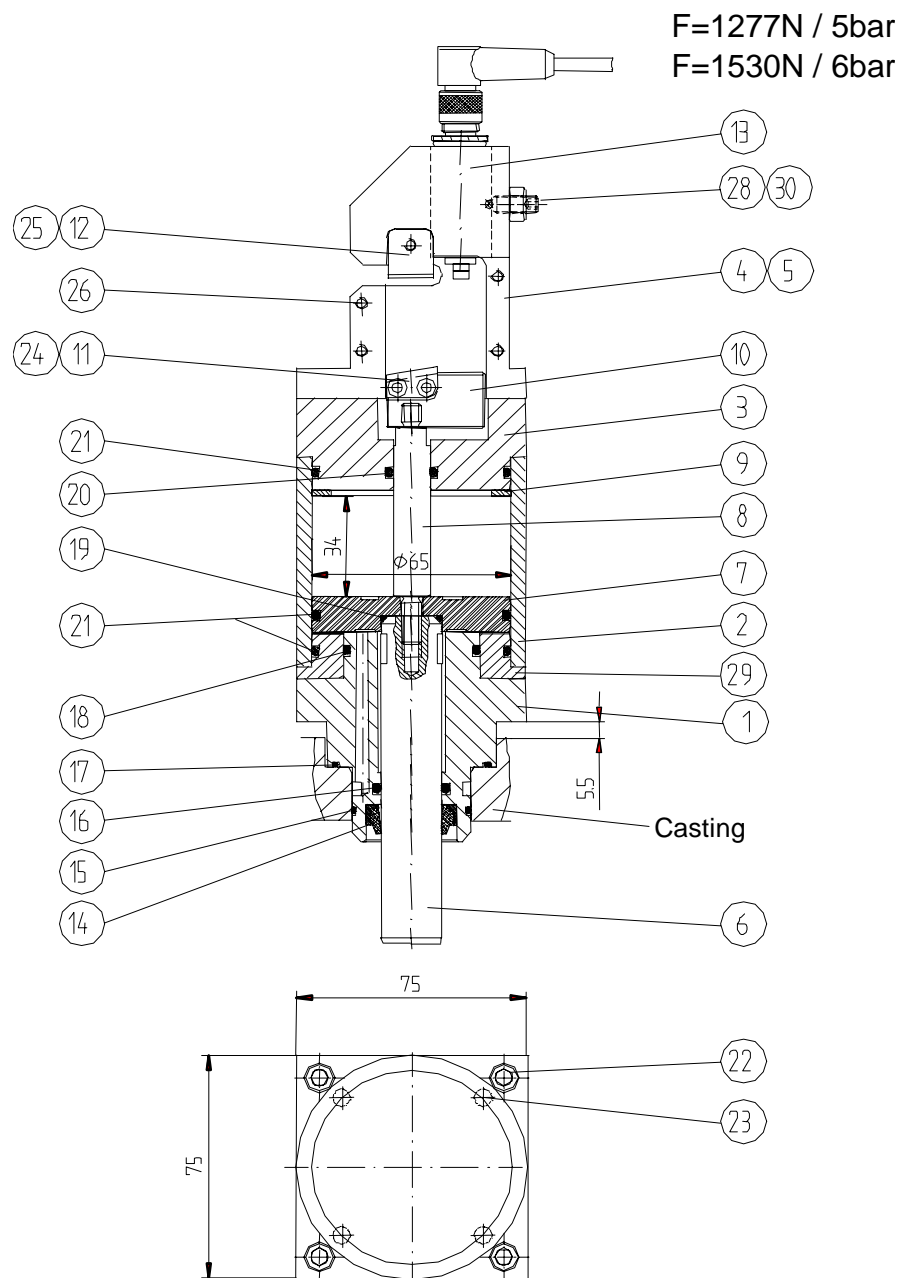
9.3 Repair



Caution!

Shut off the compressed air without fail for repair work on the wire cutter.

9.4 Spare and wearing parts



Figur 5. Assembly drawing

Spare and wearing parts list

Item	Designation	Drawing No.: ABB Article No.	Dimension/Material	Spare part	Wearing part
	Wire Cutter Model 2001 complete	0.746.800.113			
01	Adapter bush	81-0383.11.01		x	
02	Cylinder	81-0383.11.02		x	
03	Head	81-0383.11.03 a		x	
04	Housing	81-0383.11.04 a		x	
05	Cover	81-0383.11.05		x	
06	Piston rod	81-0383.11.06		x	
07	Piston D=65	81-0383.11.07		x	
08	Shaft	81-0383.10.04 a		x	
09	Damping washer	81-0383.11.08			x
10	Support	81-0383.10.05 a		x	
11	Cutting plate	0.743.800.084			x
12	Cutting plate	0.743.800.084			x
13	Bush complete with probe	0.742.800.554		x	
14	Wiper AS 20x30x7/10	0.743.212.002			x
15	O-ring 34x2 black	0.743.195.009			x
16	O-ring 20x3 black	0.743.195.008			x
17	O-ring 48x2 black	0.743.195.012			x
18	O-ring 40x3 black	0.743.195.011			x
19	O-ring 16x2 black	0.743.195.007			x
20	O-ring 12x3 black	0.743.195.071	Simrit 82-NBR 872		x
21	O-ring 60x3 black		Simrit 82-NBR 872 or equivalent		x
22	Allen machine screw M6x115 ISO 4762	0.743.700.580	8.8 galv.		
23	Allen machine screw M6x30 ISO 4762	0.743.700.521	8.8 galv.		
24	Countersunk screw with slot M3x10 DIN 963	0.743.800.061	8.8 galv.		
25	Allen machine screw M4x20 ISO 4762	0.743.700.502	8.8 galv.		
26	Allen machine screw M4x20 DIN 6912	0.743.800.060	8.8 galv.		
27	Straight pin 4M6x12-A2 with oval point DIN 7	0.743.800.062			
28	Setscrew M6x14-45H with hex socket and tip				

Service, maintenance and repair

Spare and wearing parts

Item	Designation	Drawing No.: ABB Article No.	Dimension/Material	Spare part	Wearing part
29	Intermediate ring	81-0383.11.09		x	
30	Hexagonal nut M6	0.743.700.700			

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