



Smoke Jumper CYPRES 2 User's Guide

- english version -

Congratulations on your choice of CYPRES, the surely safest and most accurate AAD currently available.

Like most skydivers, you probably assume you will always have time to deploy your reserve canopy yourself, and that situations requiring use of an automatic activation device always happen to others. We do hope you will never have such trouble, and that your CYPRES will never have to take action to save your life.

Should CYPRES ever decide to activate your reserve, it will most likely happen at a moment which, no matter how experienced and cautious you are, justifies that you haven't left your safety to chance.

Airtec GmbH & Co. KG Safety Systems

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What a Smoke Jumper CYPRES 2 is

The Smoke Jumper CYPRES 2 is an Automatic Activation Device for parachutes, which is built for the needs of Smoke Jumper activities.

It initiates the reserve deployment sequence; if the Smoke Jumper should still have a vertical speed of more than 35 meters per second (78 mph) at approximately 1200 ft AGL assuming the arming handle was pulled at 3000 ft AGL.

The Smoke Jumper CYPRES 2 does its job by severing the reserve closing loop allowing the spring loaded pilotchute in the reserve container to push away the flaps of the container and to jump out into the slipstream and initiate the reserve opening.

1. Function

1.1 How CYPRES works

The processing unit contains a factory-programmed microprocessor that is capable of real-time calculations of the jumper's altitude and rate of descent based on barometric pressure.

By monitoring this data, certain criteria are generated from which conclusions are drawn. Should the conclusion be that the jumper is in a dangerous situation (i.e. still in freefall at a low altitude) the processing unit triggers the release unit which initiates the reserve deployment sequence.

The release unit (cutter) system for the reserve container is completely independent of the rig's primary system, because it does not pull the ripcord pin out of the closing loop, but rather cuts the loop inside the reserve container to release the pilot chute.

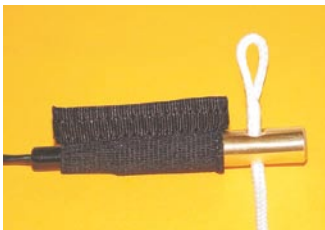
Initiating the reserve deployment sequence by cutting the loop is a method invented and patented by the founder of Airtec, Helmut Cloth, in 1987.

The CYPRES' activation system has these advantages:

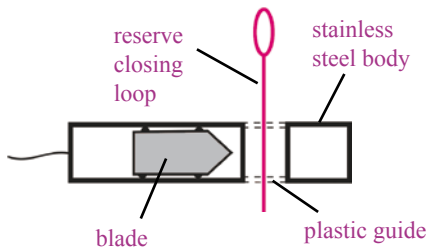
- The deployment sequence of the reserve parachute can be initiated in two different ways. One method is by the jumper pulling the reserve release handle. The other method is used by CYPRES it automatically cuts the closing loop.
- Mechanical components are reduced to a single movable piston in the release unit.
- The activation system is located inside the reserve container where it is not exposed to excessive shock or other adverse influences.
- The system is unobtrusive and can be installed so that it is undetectable from the outside.

- The system is unobtrusive and can be installed so that it is undetectable from the outside.

Release unit
(cutter) with
elastic keeper



Functional diagram:



The distance which the piston moves in case of an activation is approx. 5 mm.

The release unit (cutter) is a unique design specifically developed for CYPRES. Features include a completely self-contained enclosure to avoid expelling anything during activation.

During an 18 month long investigation by BAM (Bundesanstalt für Materialprüfung), Berlin, 99 release units were tested. The result is that BAM and the U.S. DOT have classified the CYPRES as being non-hazardous.

Due to its high reliability and other properties, the CYPRES release unit is currently being used in aerospace applications (satellites).

1.2 Components

CYPRES consists of a control unit, a processing unit and one release unit (cutter) for 1-pin reserve container or two release units (cutters) for 2-pin reserve container.



control unit



processing unit



Please do not:

- pull
- lift
- carry or
- throw CYPRES by the cables



release unit
(cutter)

1.3 Power supply

No attention is needed to the power supply of Smoke Jumper CYPRES 2.

The unit is designed to function from the date of manufacture until the first maintenance, from the first maintenance to the second maintenance, and from the second maintenance until the end of warranty time without limitations concerning the number of jumps. If a Smoke Jumper CYPRES 2 should cease to function due to a faulty power supply prior to the maintenance due date, Airtec will take care of this with the highest priority.



2. How to handle the Smoke Jumper CYPRES 2

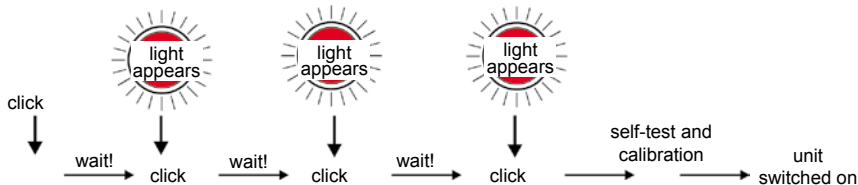
2.1 How to deal with the control unit

The push button on the control unit should be pressed with the fingertip alone; please do not use a fingernail or any object. Use a short clicking action in the middle of the button. You should familiarize yourself with switching Smoke Jumper CYPRES 2 on to be able to do the functioning test.

With this Smoke Jumper CYPRES 2, you can use the control unit only to check the operativeness. Nothing else.

Do the operativeness check prior to every first jump of a day.

The functioning test of the Smoke Jumper CYPRES 2 is initiated by pressing the push button four times with very short clicks. Start the switch-on cycle by clicking the button once. After approx. one second, the red LED-light will glow. You must acknowledge the red light immediately by clicking the button again. This sequence - a click following appearance of the red light - will be repeated two more times. After a total of four clicks, Smoke Jumper CYPRES 2 goes into self-test mode. If you do not act promptly after seeing the LEDlight, or if you push the button too soon, Smoke Jumper CYPRES 2 will ignore the



2.2 How to check the operativeness

switch-on attempt. This four-click initiation cycle has been designed to avoid accidental switch-on. Once the switch-on procedure is finished, the unit will run through its self-test. Initially, the display will show the number „10“, and then a countdown ending in „0“.

Between „2“ an „0“ the unit will interrupt and show the actual airpressure in hPa (that is equivalent to millibars). It will be a value between 700 and 1050.

hPa is the scale the Smoke Jumper CYPRES 2 works with.

When you see the „0“ at the end of the selftest then the functioning test has successfully finished and the display will go blank again, stating that the unit is ready for work.

Perform a switch on procedure (see chapter 2.1) whereupon automatically the selftest will be carried out.

The selftest ends showing a 0▼ on the display for 1 second and then the display goes blank.

After this procedure the unit has shown its operativeness.

Conduct this operativeness check prior to every first jump of a day.

2.3 How to handle in practical use

Aside the operativeness check prior to the first jump of the day the sole action required for the Smoke Jumper CYPRES 2 is only necessary on the jumprun. Prior to exit, a handle on the main lift web must be separated from its velcro and pulled downward for at least 10 centimetres. (To confirm this action a “0” will be displayed in the control unit window) The Smoke Jumper CYPRES 2 will now initiate the active mode and monitors the situation. If it detects that the Smoke Jumper has left the plane and has fallen to approximately 1.200 feet AGL with a vertical speed higher than 35 meters per second (that is 78 mph), then it will cut the reserve containers closing loop to initiate the deployment sequence. The Smoke Jumper CYPRES 2 will initiate the deployment sequence of the reserve container even lower, down to approximately 400 feet AGL, if the vertical speed has not exceeded 35 meters per second at 1.200 feet AGL, but only later. These calculations assume that the the arming handle was pulled at approximately 3.000 feet above ground.

Activation window

- **Arm the unit on jumprun at approx. 3.000 feet AGL**
- **Activation window starts at approx. minus 1.800 feet from jumprun**
- **Activation window ends at approx. minus 2.600 feet from jumprun**

If the arming handle is pulled at another height above ground: the activation should happen at approx. 1.800 to approx. 2.600 feet below this specific arming altitude if the activation conditions are given.

Once the handle has been pulled the unit is in active mode right away.

At any time it is possible to put the unit manually back into 'sleep mode' by bringing back the handle into its original position. The unit is now in 'sleep mode', when the arming cable is gently pushed into the Smoke Jumper CYPRES 2 and physically stops. To achieve 'sleep mode' it is mandatory to push the cable this far.

The unit will automatically go back into sleep mode two hours after the active mode was initiated or after a height loss of approx. 2.600 ft from arming elevation, even without touching the handle.

On packing your parachute after a training jump or a mission, bring the handle back into its original position. This is mandatory because only by „pulling the activation handle some centimeters downwards from its original position“ will allow the Smoke Jumper CYPRES 2 to change between 'sleep mode' and active mode. This allows the unit to monitor what is going on and being ready to do its job.

In short words:

- **the activation handle has to be in its original position when you enter the plane**
- **on the jumprun, prior to exit, it has to be pulled downwards some centimeters**
- **it has to be put back into its original position after the jump, at least prior to the next boarding.**

3. Access to unit information

If you do the switch on procedure and keep the pushbutton in the control unit pressed down permanently from your last click, you will - after the selftest has ended - see that:

- 1) the display goes blank for half a second,
- 2) the serial number is shown for 5 seconds,
- 3) the display goes blank for half a second,
- 4) the month and year of the next maintenance due date is shown for 5 seconds,
- 5) finally, the unit shuts off.

display of the serial number



next maintenance due in 05 / 2012



4. Changing the release unit(s)

After an activation the release unit can be changed by your rigger packer via the plug-and-socket connection.

Disconnecting the release unit:

Hold plug and socket by their aluminium grips and pull them apart using a smooth straight motion. Do not twist!



1-pin Cutter



Connecting the release unit(s):

Hold plug and socket by their aluminium grips. Place the plug directly in front of the socket and connect them by pushing together with a smooth straight motion until it is completely seated.

Do not twist!



It is easy to change a 1-pin CYPRES to a 2-pin or CYPRES or vice-versa, by swapping cutter types.

2-pin Cutter



Notes:

1. CYPRES 1 field replaceable cutters (no aluminum grip) can be used with CYPRES 2. (CYPRES 2 is equivalent to Smoke Jumper CYPRES 2 concerning the release units.) They will function properly.

CYPRES 2 cutters (identified by aluminum grip) can be used with any CYPRES 1 with the field replaceable cutter connector. They function properly.

2. Release units (cutters) are numbered via a heat shrink tubing placed on the cable. This number identifies the cutter. A table of cutter numbers with corresponding dates of manufacture are available at www.cypres.cc

3. It is possible that the cutter plug could separate from the socket after a CYPRES activation. In the rare combination of this and a water landing, the socket must be dried out before further use. Do that by tapping the open end of the socket flat onto a flat surface such as a table top. Once no additional water comes out while tapping on

the table top, store the CYPRES with the open end of the socket hanging downward for another 24 hours in a dry area, to allow the socket to dry out completely. When completely dry, insert the plug of the new cutter.

4. Use a one-pin cutter in a one-pin container and a two-pin cutter in a two-pin container.



WARNING! Do not use release units (cutters) after the Lifetime Warranty period.

Release units (cutters) also require technical service (maintenance) every four years.

Please send cutters more than four years old, that have not been attached to a CYPRES during maintenance to Airtec or SSK for a free no-charge inspection prior to use.

5. Water contact

Because of the cable housing for the arming cable, the Smoke Jumper CYPRES 2 is not waterproof.

If a Smoke Jumper CYPRES 2 came in contact with water, please send it in for a free inspection.

6. Important notes for users

- CYPRES is shielded against radio-transmitter signals. Extreme concerted efforts have been taken to protect the Smoke Jumper CYPRES 2 from „radio pollution“. Although the extraordinary shielding system of the Smoke Jumper CYPRES 2 has been investigated thoroughly, it is impossible to have 100% protection. It is still recommended to avoid strong radio-transmitters. Please contact Airtec if you have questions.
- A release unit that has activated builds up a high internal pressure and will remain pressurized. Never attempt to open it by force. It can, however, be stored safely for an indefinite period of time, provided that it has not been damaged.
- To achieve ‘sleep mode’, the arming handle needs to be pushed gently into the Smoke Jumper CYPRES 2 until it physically stops.

7. Error Display

If there is an error condition detected, during the functioning test, Smoke Jumper CYPRES 2 displays a number on the display for approx. 60 seconds, then it switches itself off. (Display goes blank).

Error code number / error code description:

1111 One or both of the attached release units are not correctly electrically connected to the unit. The reason may be a cable break, or
2222 the cutter plug could be disconnected, or the release unit(s) may have activated.

3333 Excessive variations in ambient air pressure have been measured during the self-test period. The unit is unable to obtain consistent values for the ambient air pressure at ground level. Possible reasons could be that an attempt to switch Smoke Jumper CYPRES on has been made in a car driving uphill or downhill, in an elevator or in a flying aircraft.

The switch-on procedure can be performed several times after a „3333“ error was displayed. If the 0^v is displayed, the unit is fully functional and can be used for skydiving.

If other than these three described numbers appear in the display, or if the unit switches itself off and can not be switched on again, please contact Airtec or SSK.

Please record the error code number!

8. Installation

The original smoke jumper harness and container was investigated by Airtec a number of years ago. The positioning of all components was defined and tested.

The new smoke jumper harness and container, designed by the Relative Workshop in the end of 2003 was also investigated by Airtec. The positioning of all components was defined in cooperation with the Relative Workshop and tested.

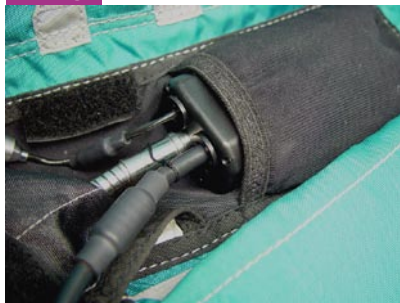
Under no conditions are deviations from these instructions allowed.

Control unit cable and cutter cable must be placed without tension. Excess cable is stowed in the flat part of the pocket underneath the velcro-adjustable flap. If you have to stow both the thinner cutter cable and the thicker control unit cable, be sure to place the thicker cable so that it lays on top of the thinner one. Cables should be placed in a circle in order to avoid twists. Always avoid pulling, bending, twisting or kinking the cables.

right



wrong



9. Technical service

The extremely reliable function of CYPRES is based on 4 facts: exclusive use of carefully pre-treated and approved parts, strict detailed manufacturing procedures, continuous quality control and monitoring through the manufacturing process, and regular periodic technical service (maintenance). 4 and 8 years after the original date of manufacture, maintenance procedures according to the manufacturers guidelines are necessary. There are 4 primary reasons for the maintenance:

1. Deviations between nominal and actual values are corrected to ideal values. Every detail is observed. It is common that signs of wear and tear are corrected and sometimes even ‘cosmetic’ treatment is done.
2. The technical condition of each unit is analyzed. The fact that a very high percentage of units are returned for the periodic maintenance gives the ability to see statistical trends and to predict potential problems at a very early

stage. The advantage: often it’s possible to prevent situations by modifications during the maintenance procedures, rather than having to fix problems with downtime later.

3. Experience shows that during a period of 4 years, changes and improvements do happen. Applicable updates are performed during maintenance. Such updates may have the background of technical improvements, or enhancement of knowledge, or may result from environmental changes or changes in the sport (e.g. new disciplines), which Airtec is always researching and taking into consideration.
4. The most important part of the maintenance is the individual pre-adjustment of each unit for the next 4 years. A unit will not be returned before a high confidence level is reached regarding the prediction of the unit’s proper function for the next 4 years.

The maintenance has to be performed 4 and 8 years after the original date of manufacture. The earliest possible date for the CYPRES2 maintenance is 6 months early, the latest 6 months after the month of manufacture.

A delayed maintenance has no advantage. It does not save any cost as the Lifetime Warranty remains the same. It's smart to choose a suitable time during the 13 month window for sending the unit in for maintenance, rather than waiting until the last possible moment, or until the beginning of the next season.

Because of the 134,000+ maintenance procedures performed to date on CYPRES, and lots of improvements incorporated into the design of CYPRES2, Airtec has determined that it is possible to extend the maintenance window to 13 months on CYPRES2. This maintenance window gives you more freedom, and avoids maintenance down-time at the wrong time of the year - please use this new feature wisely!

At any time it's possible to check the date of the next maintenance. (See chapter 3)

If the unit enters 6 months before maintenance due date, the maintenance date (next maint. in month / year) will automatically be shown at each selftest. 6 months after the due date the display will change to: 'next maint. now'.



All displayed dates are only a reminder. Please choose a suitable date during the 13 month time frame for a convenient performance of the maintenance. According to experience, the number of maintenances and the necessary time to do them increases February-May. For quicker service, a date between June and January is a better choice.

After the 8-year maintenance, the Smoke Jumper CYPRES 2 should be airworthy for the complete Lifetime Warranty period.

CYPRES2 maintenance cost is a flat-rate (always the same), even when a unit requires extensive repairs. During the CYPRES 2 Lifetime Warranty, the skydiver should not have any operation costs other than the 2 maintenance fees (except for an activated cutter or filter).

Please contact your local CYPRES Dealer or Service Point concerning the maintenance. The list of CYPRES Certified Dealers or CYPRES Service Points is available at www.cypres.cc

The CYPRES Service Center for the USA, Canada, South America and other Western Hemisphere countries is:

SSK Industries, Inc.,
1008 Monroe Road
Lebanon, OH 45036 - USA
Tel: ++ 1 513 934 3201
Fax: ++ 1 513 934 3208
email: info@cypres-usa.com
www.cypres-usa.com



10. Repacking of the reserves

You should definitely take advantage of the CYPRES closing loop and disc system.

Previous closing loops - made by old suspension lines or Kevlar or Darcron or Spectra or Optima - were thick and not very slippery and not very flexible.

On container openings, when circumstances are unfortunate, these loops can be squeezed between the grommets.

That may cause a delay of the opening or even avoid the opening at all for some seconds.

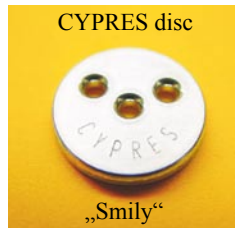
Fatalities did happen because of that.

Airtec has improved the closing loop system.

This is the result:



- extremely flexible
- extremely slippery
- breaking strength: 450 lbs
- diameter: 1,8 mm



- no sharp edges
- minimal loop tearing

The CYPRES closing loop is far safer than previous loops because:

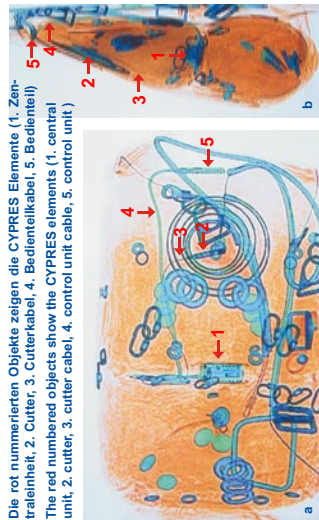
- the extra thin, flexible and slippery loop material reduces the possibility of the loop jamming in the grommets dramatically
- loop tearing is extremely reduced, because the fastening disc has no sharp edges
- the tensile strength is far greater (in excess of 440 lbs) than with former loops
- the extremely thin material which is impregnated with silicone reduces the pull force which is required to pull the ripcord up to 50% (although the tension on the container remains the same)

11. Regarding Air Travel

A CYPRES equipped rig may be transported in freight and passenger airplanes without restrictions. All its components (e.g. measuring technique, electronics, power supply, loop cutter, control unit, plugs, cables, casing) as well as the complete system, contain parts and materials that are approved by U.S. DOT and other agencies worldwide, and are not subject to any transport regulations.

Because of the size of a rig we recommend to check it in as normal luggage and to not take it on board as hand luggage. In case of questions or objections of the security personnel, please use the card shown on the right which you'll find in the back cover of this book. The card shows an X-ray of a complete rig with CYPRES 2. Depending on type and design of the rig the X-ray on the security's screen may vary.

Presently the Parachute Industry Association and the USPA are working with the Transportation Security Agency concerning traveling with parachutes.



If you've lost the card, you can get a new one from Airtec or SSK.

original card located in the back cover

12. Technical Data

for the Smoke Jumper CYPRES 2 excluding the ripcord housing for the activation handle:

Length, width, height of the processing unit: approx. 85 x 43 x 32 mm

Length, width, height of the control unit: approx. 65 x 18 x 6,5 mm

Length, diameter of the release unit: approx. 43 x 8 mm

Cable length of the release unit (including release unit): approx. 500 mm

Cable length of control unit: can vary, standard approx. 670 mm

Volume standard approx. 139 cm³

Weight: standard approx. 182 grams

Activation window: approx. 1.800 to 2.600 feet below arming altitude

Activation speed: approx. > 78 mph (35 m/s)

Storage temperature: +71° to -25° Celsius

Storage pressure: 200 to 1070 hPa (5,906 to 31,597 In.Hg)

Working temperature: +63° to -20° Celsius *

Maximum allowable humidity: up to 98 % rel. humidity

Operating range below / above sea level: -1500 feet to +17,000 feet (-500 m to +5000 m)

Functioning period: 2 hours from initiating

Maintenance: 4 and 8 years from date of manufacture***

Power supply: lifetime warranty**

Lifetime Warranty Period: 12.5 years from date of manufacture**

* These temperature limits do not mean the outside (ambient) temperatures but rather temperatures inside the processing unit. Therefore, these limits won't have any meaning until the processing unit itself has reached the temperatures in question. In actual fact, these limits will rarely be reached due to the mandatory location of the CYPRES in the reserve container, and the insulating properties of the nylon pocket and parachute canopies.

** If required maintenance has been performed.

*** Anticipated, according to the present knowledge base.

13. Warranty

Technical defects that show up during the CYPRES Lifetime Warranty** will be repaired by the manufacturer at no cost.

The manufacturer reserves the right to decide whether the unit will be repaired or replaced. Neither repair nor replacement will affect the original Lifetime Warranty. When a CYPRES 2 unit is returned to the manufacturer or service center, it must be packed in the original box or an equivalent shipping package.

No claims will be accepted if the unit has been damaged or has been opened by an unauthorized individual, or if an opening of the processing unit, release unit (cutter) or control unit has been attempted.

** If required maintenance has been performed.

14. Disclaimer

In designing and manufacturing CYPRES, the aim of Airtec GmbH is that the device should never cause an accidental canopy opening, but should initiate the opening sequence of a reserve canopy at an appropriate altitude when the activation criteria are met.

All investigations and experiments performed during the product's development, and all laboratory and field tests accompanying trial and production phases have shown to date that CYPRES meets both requirements.

However, the occurrence of a malfunction cannot be excluded. We accept no responsibility for damages and consequences resulting from any malfunction.

Airtec GmbH also accepts no responsibility for damages or problems which are caused by the use of non original Airtec parts and supplies.

The use of CYPRES does not automatically prevent injury or death. Risk can be reduced by assuring that each component has been installed in strict compliance with the manufacturer's instruc-

tions, by obtaining proper instruction in the use of this system, and by operating each component of the system in strict compliance with this User's Guide.

Automatic activation devices (AADs) sometimes fail to operate properly, and sometimes activate when they should not, even when properly installed and operated. Therefore the user risks serious injury or even death to themselves and others during each use.

By using or allowing others to use CYPRES, you acknowledge that you accept responsibility for the proper use of the device, as well as accepting the consequences of any and all use of this device.

Airtec GmbH, their Dealers, Service Centers, and Agents total and complete responsibility is limited to the repair or replacement of any defective device.

CYPRES is strictly a backup device, and is not intended to replace proper training or timely execution of appropriate emergency procedures.

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16. Packing List

In addition to the Smoke Jumper CYPRES 2 unit and the user's guide, the following items will be delivered:

For 1-pin Smoke Jumper CYPRES 2:

2 1-pin Loops

1 pull up

1 disc

For 2-pin Smoke Jumper CYPRES 2:

2 1-pin Loops

2 pull ups

2 discs

Trade Marks

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Further information can be found at:

www.cypres.cc

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