airbond

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2019

Airbond Splicers

162 Series Splicers

GTW Developments Group Ltd., Unit 1, Pavilion Industrial Estate, Pontypool, UK, NP4 6NF

Tel. +44 1495 755661
Fax. +44 1495 752619

Web: www.airbondsplicer.com
Email: enquiries@airbondsplicer.com

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The new-generation Airbond splicers

Airbond has a well-established reputation for supplying tough, reliable splicers. We have achieved this reliability by developing simple designs, and by the use of rugged components.

We have now moved on; our products are now even simpler, and even stronger. We've done this by investing in cutting-edge new additive-manufacturing (3d printing) technology.

From 2020 onward, all Airbond products will be printed, in materials which are more durable than those used in the past.

The first generation of printed products will be familiar to our customers; they are direct replacements for the existing products - identical in shape and function.

Model 162

The 162 is an all-purpose wrapper.

The 162 occupies the market position for which splicers were originally developed – relatively fine yarns for industrial and conventional textile applications. The 162, with its wide range of formats and operating systems, is the ideal splicer for a large range of counts and mono filaments.

Holstered, fixed, or rail-mounted, the 162 can meet most factory needs, and if circumstances change, new 162 bodies to the required configuration can be printed quickly by Airbond. The splicer can be supplied with multiple styles of easy to change wheels for different yarns.

The Model 162 sets a new standard as an effective and user-friendly tool for continuous-filament synthetics, particularly modern industrial fibers such as false grass.

The range is simple, durable, and easy to maintain. The splicers can handle a wide range of yarn counts

Splice format	Ends opposed Wrapped.
Industrial applications :	Composites processes such as filament winding, pultrusion, and most textile processes such as weaving, knitting, tufting and braiding.
Yarns:	False grass, Nylon, Polyester, Glass fiber, Aramid, Carbon, Synthetic staple, Synthetic C.F., Worsted spun and many more.
Yarn counts:	Up to 6000 tex.
Twist	Any twist level.

Getting started

Model 162 – getting started

Please read this section before you start operating the splicer. The rest of the manual deals with maintenance, and with details of products; those sections will not be needed immediately.

Remove all packaging. For each splicer, you will have the appropriate splicing chamber – which will usually already be fitted.
Depending on what you have ordered, you may have some or all of the following:

- Additional wrapper wheels chamber(s)
- Optional hanger
- Optional hanging clip
- Optional harness
- Optional bobbin colours

It may be useful to have a fixed place to store the splicer temporarily when the operator has finished, in which case you will have specified the "W" modification. This modification will change the splicer designation – the Model 162 H, for example, becomes the 162 HW. If it has been supplied, bolt the hanging clip to a convenient spot on a machine. The splicer can then be placed in the hanging clip when not in use. This reduces the likelihood of the splicer being dropped and damaged in service.

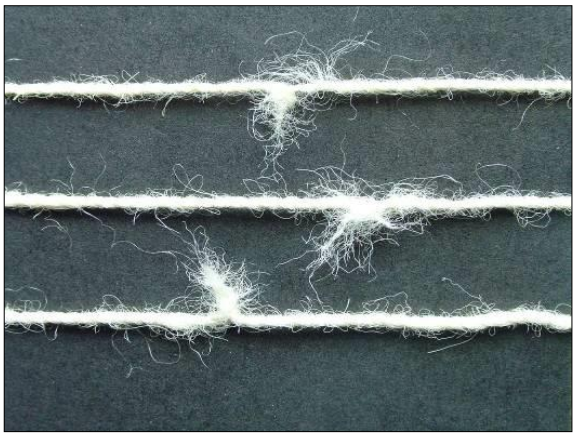
Connect the splicer to an air line.

Under normal circumstances, the line pressure should be around 6 bar. The line should preferably be fitted with a pressure regulator so that adjustment may be made to suit local needs.
Place yarns into the wheel. Activate by pushing button 1, create the wrap length you desire, disengage by pushing button 0, remove the wrap splice and trim with ring knife.

Making a Splice

Ends-opposed splices.

Suitable for higher-quality applications
The Model 182 is designed to make splices of this form as standard



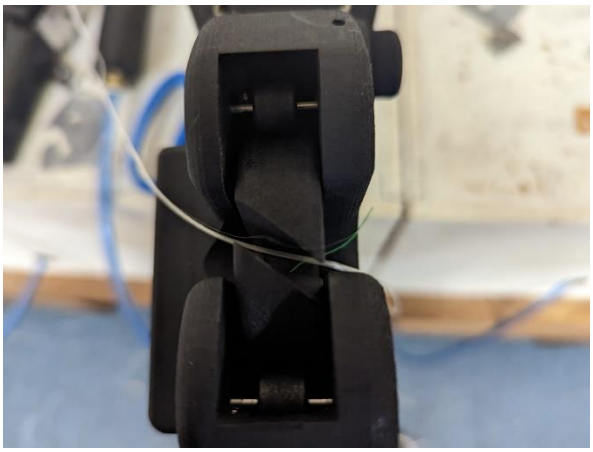
Ends-together splices.

Suitable for less critical applications
The Model 182 is not designed from the outset to make splices of this form, but is able to do so if circumstances demand, and if appropriate splicing chambers are fitted.

Wrapped Splice

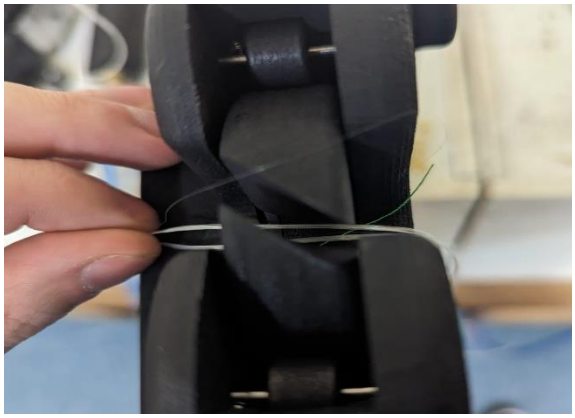
Suitable for more difficult yarns to splice
A wrapped splice creates a strong single filament splice that wraps around Parent yarns. This is the type of splice you will find with model 162.

Splicer threading

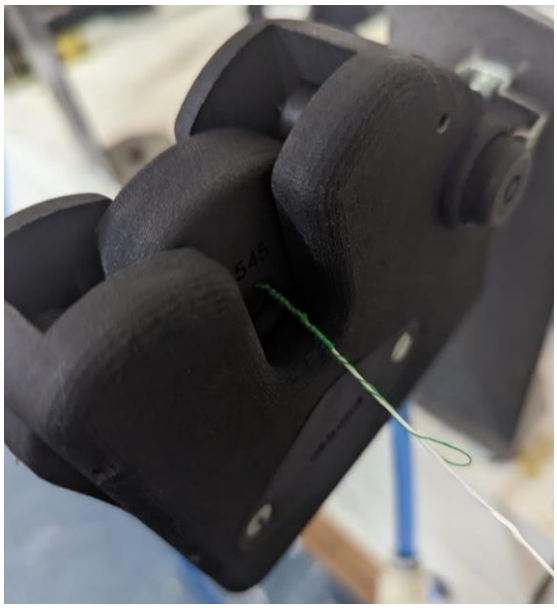


Making a wrapped splice

First stage: Present first yarn to splicer
The first yarn is placed in the wrapper Wheel. The yarn can enter from either Side.



Second stage: present second yarn to the splicer. The second yarn is placed in the wrapper wheel. Make sure that the thread is put in the opposite way from the first splice.



Third stage: make the splice
Hold both yarns and press button 1, in one swift, single movement, proceed to move the yarns left and right.
The longer the wrapper is on the tighter and stronger the splice becomes.

Fourth stage: push button 0 to knock off the splicer and remove the splice.
Use a ring knife /scissors to remove the thread from the wrapper wheel.

Optimising splicing performance

The operator has a number of operating parameters which can be changed at will, so that the optimum performance may be achieved for a given situation. The following variations are possible:

- Change splicing chamber.
- Change air pressure.

The third parameter needs to be explained. All splicers of the 162 range are capable of dealing with a wide range of yarn counts. The splicer requires fewer wrapper wheels than most in order to cover its operating range.

Important service information

Apart from accidental damage, and the occasional replacement of yarn, the Model 162 requires very little attention. However, one aspect of maintenance should NEVER be neglected. The valve assembly, in which the valves and o rings sit, needs regular lubrication. The frequency of lubrication depends upon the nature of the factory environment and the workload on the splicer.

As a general rule, assembly should be removed and greased with Molykote 111 (available from the company) at least once per month. The service interval should be reduced if the splicer experiences very heavy work loads.

Model 162 – General product information

Introduction

The 162 Series of splicers continues the philosophy of airbond. It was the outcome of a programme to apply new design principles to ends-opposed splicers that introduces a third party yarn. Improved wrapping wheels were developed for multiple counts of yarn. The result was a new wrapping splice which is for .

The 162 Series was designed to be as uncomplicated as possible, with a simple, durable body structure. For simplicity of manufacture and maintenance, the 162 Series was developed, using modular principles of design. All of the Model 162 splicers had a common base unit. Parts were added to the base unit, to make up the complete splicer assembly as needed. The splicer was therefore is available in many different forms, to suit different customer needs.

- All 162 Series splicers had a simple straight-line string-up.
- All had an unusually simple construction.
- Simple construction leads to simple maintenance; the splicer in its basic form could be completely dismantled and re-assembled in about twenty minutes.
- The splicer had a very strong construction; it resisted damage in service very well.
- The splicers contained new and patented technology, and need a smaller range of splicing chambers than splicers of earlier generations.

In its quest for continuing improvement, Airbond has adopted 3d printing manufacturing technology, and this has enabled us to transform the splicer. Instead, printing enables Airbond to make a multiplicity of designs – almost “designing to order” to meet customer needs.

General description

Being printed from tough PA12 polymer, the new Model 162 Splicer is capable of standing up to heavy-handed use, but is still much lighter than any .

The Model 162 Splicer has a number of components mounted on a body in which airways conduct the compressed air for the splicing action.

Button - pressing the Button initiates the splicing operation.

Valve - operation of the button moves the valve allowing compressed air to pass into the body for splicing.

Bobbin – The bobbin holds a spool of wrapping thread.

Wrapping Wheel- a removeable wheel that houses a bobbin of string

The Model 162 is simple and easy to maintain. Moreover, its construction is such that it is extremely rugged, and requires very little attention in service. The splicer has revolutionary and patented wrapping wheel technology, which enables the splicer to make wraps in a wide range of yarns without any change.

162 Model range

The list below is indicative, not exhaustive. Customers may specify combinations of features according to need.

Examples:

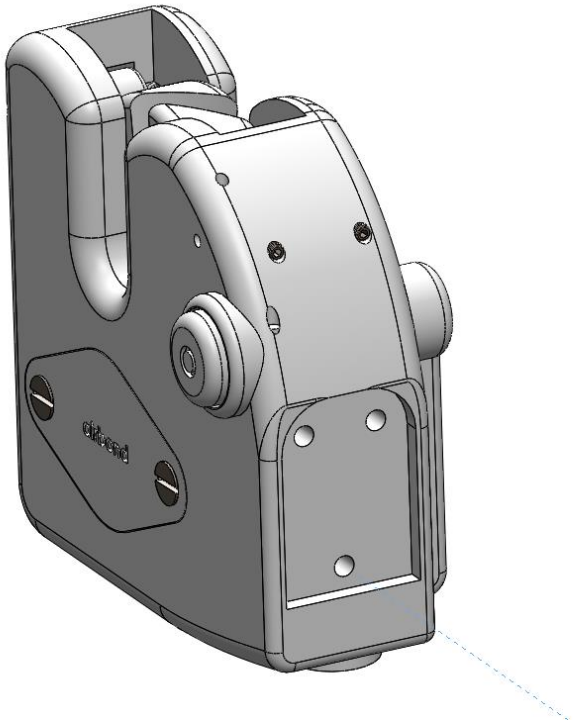
162 H	162 splicer with no accessories
162 HH	162 splicer fitted with harness
162 HW	162 splicer fitted with hanging assembly
162 HM	162 Splicer fitted with magnet assembly

162 HP	162 foot operated splicer fitted with no accessories
162 HHP	162 foot operated splicer fitted with harness
162 HWP	162 foot operated splicer fitted with hanging assembly
162 HMP	162 foot operated splicer fitted with magnet assembly

Example:

Splicer Model 162 HP + 162 HW

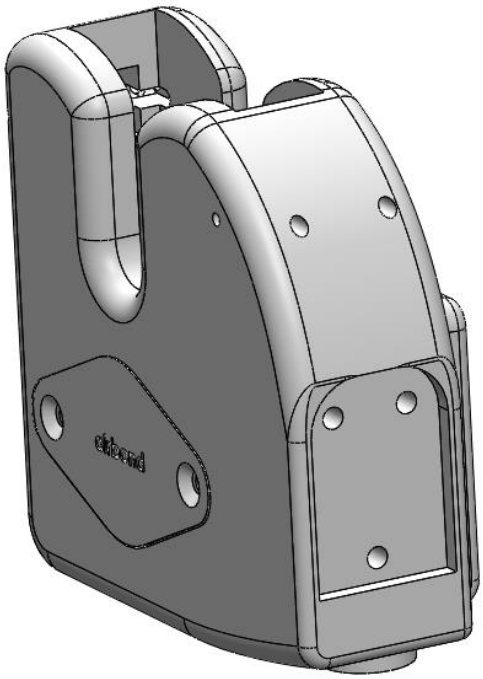
162 Model range



The body of the Model 162 H.

This shows the Model 162 H body – the simplest of the range, with no additional add-ons.

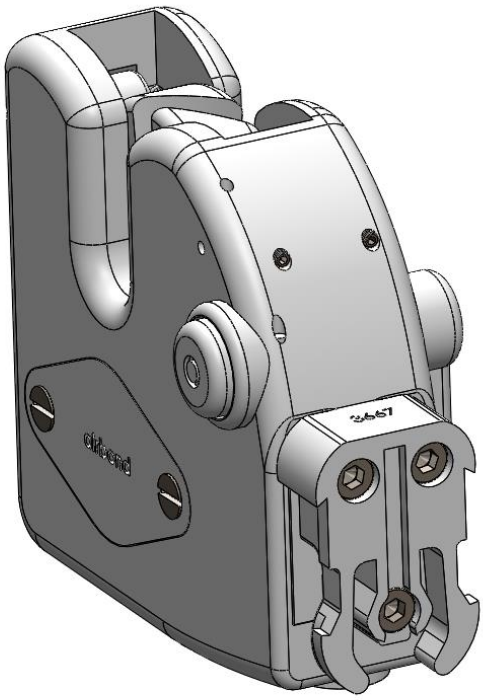
This version is a button operated version



The body of the Model 162HP

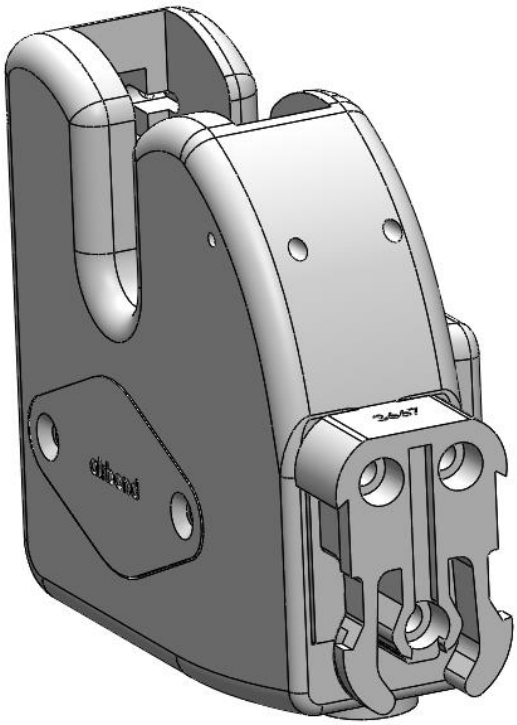
This shows the Model 162 HP body – the simplest of the range, with no additional add-ons.

This is a foot operated version of the without the button mechanism.



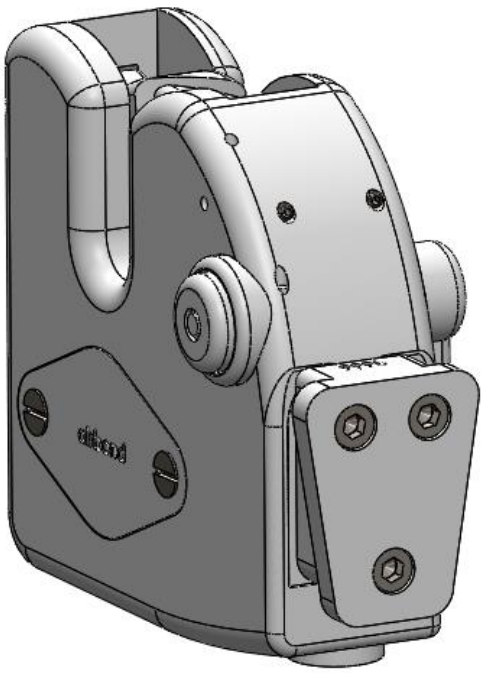
The body of the Model 162HH

The entire configuration, includes the main 162H body, holding clip and harness.



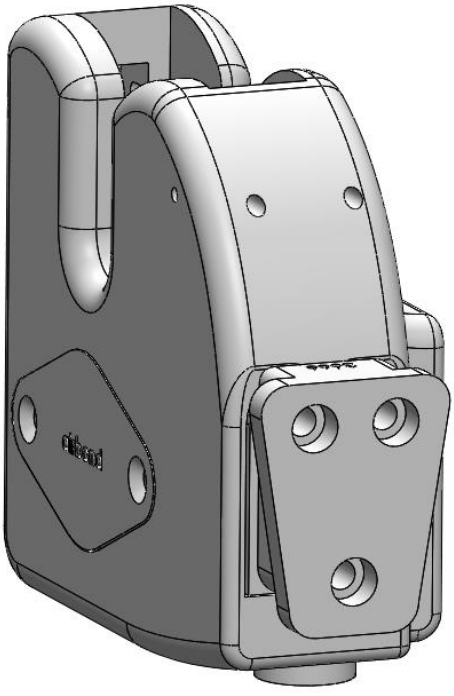
The body of the Model 162HP.

The entire configuration, includes the main 162HP body, holding Clip and harness.



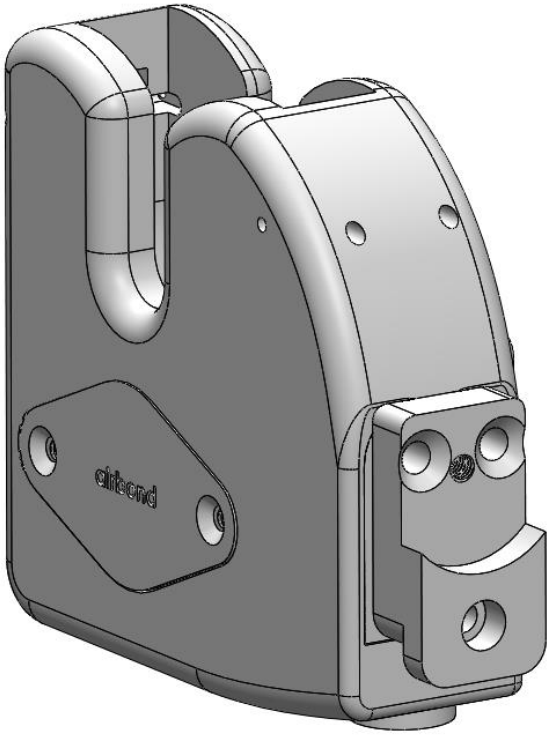
The body of the Model 162HW

Theis configuration, includes the main 162H body and a mount holding clip.



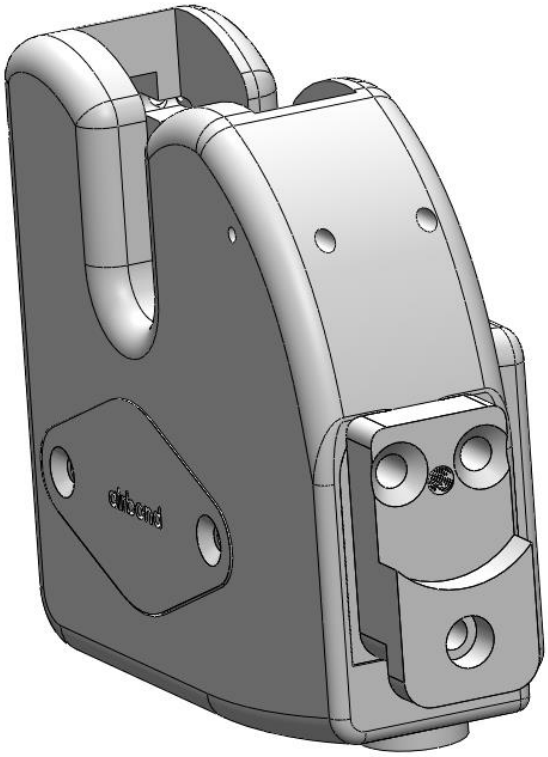
The body of the Model 162HWP

This configuration includes the Main 162HP body and a mount holding clip.



The body of the Model 162HM

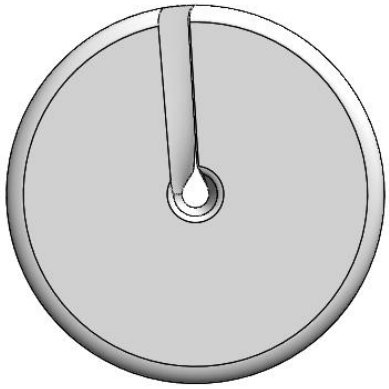
Theis configuration, includes the main 162H body and a magnet holding clip.



The body of the Model 162HMP

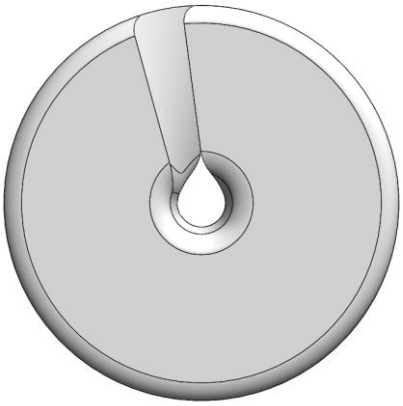
This configuration includes the Main 162HP body and magnet holding clip.

162 Wrapping wheels



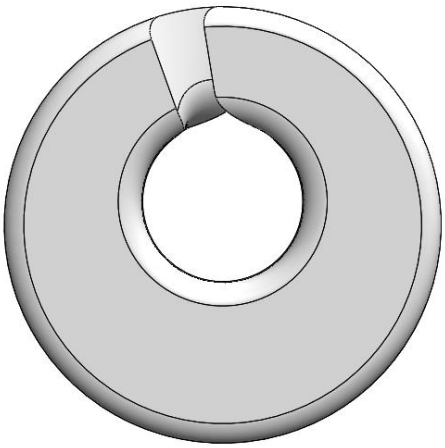
7mm wrapping wheel

The smallest wrapping wheel size that is available in the standard Airbond bobbin size and Mesdan bobbin size.



10mm wrapping wheel

The medium wrapper wheel size that is available in the standard Airbond bobbin size and Mesdan bobbin size.



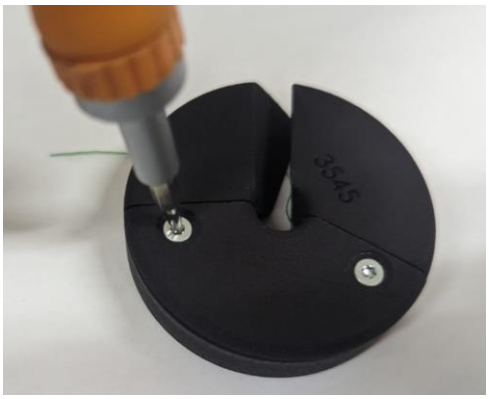
Extra large wrapping wheel

The largest wrapping wheel that Is for extra large yarns.

Model 162 – Maintenance

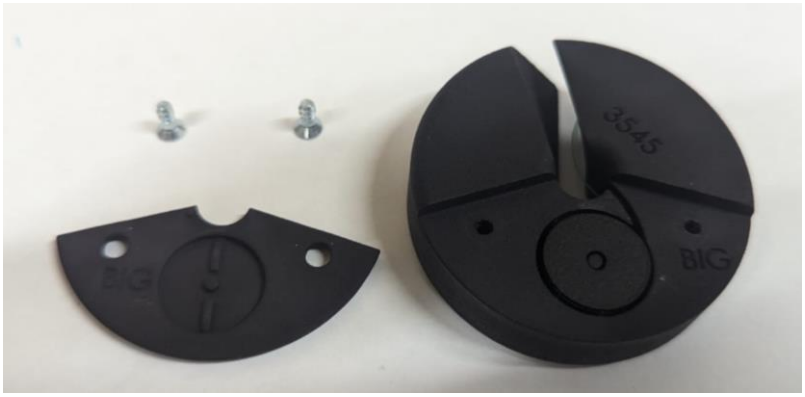
Changing bobbins in wrapper wheel

The Model 162 is a unique splicer in which a bobbin of material is located within its wrapping wheel. Changing wheel is very easy but this guide shows how to replace the internal bobbin.



To replace the bobbin within the wrapper wheel remove the wheel from the wrapper body by pulling up.

Once the wheel is removed it will then be possible to access the two T8 screws. Once the two screws are removed the wheel cover is able to be lifted off revealing the bobbin inside the wheel.



You will then be able to replace the bobbin inside the wheel. Make sure the yarn follows the channel leaving an inch outside of the wheel for when it is used Next. Once that is done place the cover back onto the wheel and tighten the two t8 screws back up.

WARNING: If the wrapper wheel is removed while the splicer is connected to the air supply DO NOT press the trigger.

Adjusting alignment wheels

Over time the wrapper alignment wheels (circled in red) will need adjustments to keep the wrapper wheel rotating at its most efficient.

Adjustments too loose will make the wheel become unstable and wobble not giving an efficient wrap. Having the adjustment wheels too tight will cause too much friction slowing the wrapping wheel down.

There are 4 adjustment points in total. Two per alignment wheel.

To adjust the alignment wheels an M4 Hex key can be used to loosen and tighten the adjusting wheels.

Turning the hex key clockwise tightens the adjustment and turning the hex key anti-clockwise loosens the adjustment. It is recommended that when adjusting you count how many turns you takes so that the springs give equal tension.

162 Maintenance.

It is recommended when doing routine maintenance that the splicing unit is disconnected from any air connections.

Tools needed to complete a full Maintenance include:

1. M3 Hex key
2. M4 Hex key
3. M5 Hex key
4. Flat head screw driver
5. T8 torque

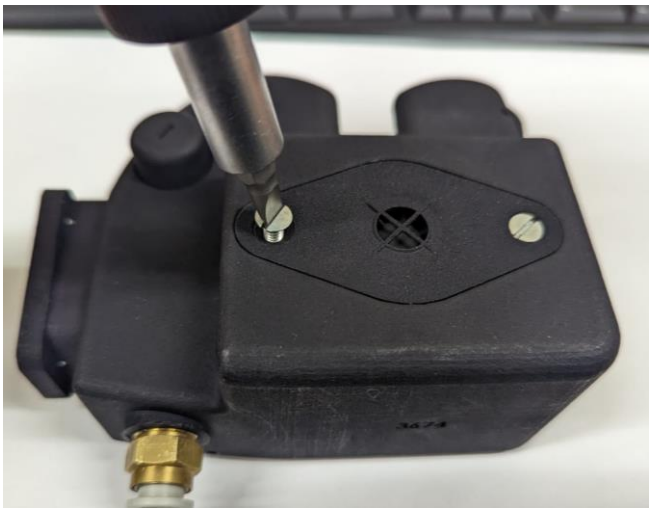
Removal of bearing.

Within the body of the 162 is a bearing. To access the bearing you will need a flat head screw driver to remove two Screws (item 606) which will allow you to take the bearing cover off (item 1806)

With the screws and the cover removed the bearing (item 1014) will now be able to be taken out. The easiest way to remove the bearing is to either use a hook tool or a flat head screwdriver. When the bearing has been removed out of the body you will then be able to access the roller wheel.

Removal of roller wheels.

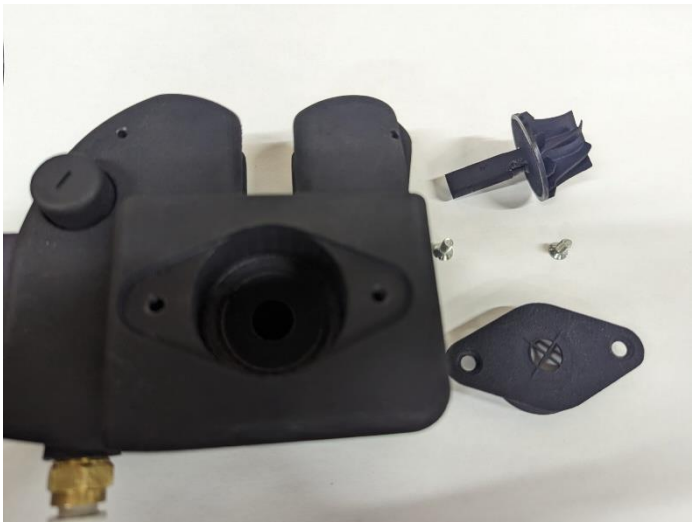
With the cover and bearing removed it will now be possible to remove the roller (item 1809) that is on the turbine Shaft. Upon the roller wheels are 4 O rings (item 1123) that can be replaced if they are warn out.



Removal of Turbine cover

To take the turbine cover (item 1812) off two flat head screws (item 606) will need to be removed. Once removed you will able to access the turbine.

Once the cover is removed you will be able to carefully lift out the turbine (item 1811) that is held within the body. Once its removed you will be able to inspect the turbine blade for any damage.



Dismantling button assembly.

To get to the valve and shells and o ring assembly and to get the button off you will have to twist one of the buttons anti clockwise. There are two buttons left off button (item 1807) and right hand on button (item 1808).

You can undo either of the buttons by using your hands or use two mole grips. Once the button is removed from on side it will then be possible to remove the valve. (Item 1816)

Once the valve is removed it will then be possible to remove the other button.

Once the valve has been removed it will Then be possible to remove the trigger shell (item 1810) which holds the shells and o rings together.

To remove the retaining disk a hex key or a small tool can be used to push out two retaining pins (item 1826) from the body. The holes are located on the bearing side of the wrapper.
Once the pins have been pushed out the trigger shell will be able to be removed.

Removal of shells and O Ring assembly

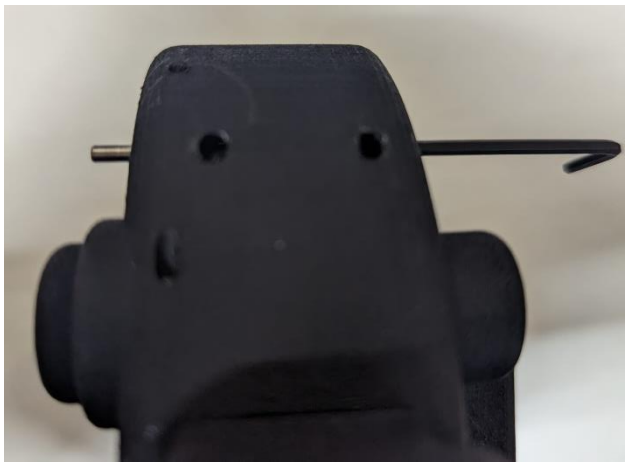
Now that the trigger shell has been removed it will now be possible to access the shells and o ring assembly.
A way to remove the shells and o rings would be to use a hex key or a piece of wire too hook the shells and o rings out.

The sequence of the shells and o rings Is as follows within the picture. When all of the shells and o rings have been removed it is then recommended to clean all of the parts and the bore of the splicer. When reassembling remember to

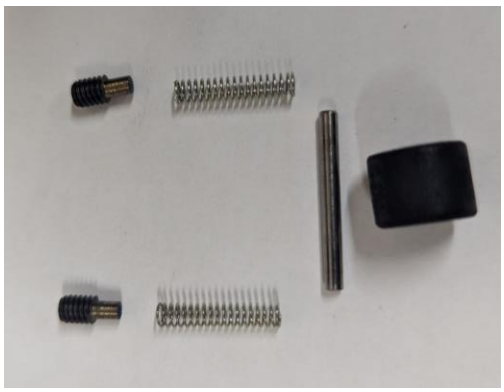
Removal of alignment wheels

To remove the alignment wheels you will need to use a hex key to access two grub screw (item 1017) which are found on the side of the body.

Once the two grub screws are removed it will then be possible to get two of the retaining springs (item781 on the trigger side, item 307 on the blank side) out. Putting pressure onto the retaining wheel will push the springs out or you can use a hex key to pull them out.



Now the springs are removed it will then be possible to remove the alignment bar (item 1815) from the body. By pushing onto the alignment wheel (item 1805) and using a hex key you will then be able to push the pin out. When the pin is out the alignment wheel will be loose and able to remove.



The full assembly of all the parts is shown. The same method will be used on the other side of the splicer.
When reassembling follow the steps but in reverse.

Removal of additional add-ons

To remove the additional add-ons that is on the side of the splicer an m5 hex key will be used . Turning the hex key anti clockwise on the three M5 x 20 (item 647) you will then be able to remove the add-on.

Compressed air

Pneumatic splicers are operated by compressed air. Therefore the air supply must be appropriate.

The following points are important:

Splicers generally operate at a pressure between 3 and 8 bar.

Pressure may vary according to application, but it must be as uniform as possible.

The air supply should be reasonably dry and clean, with the lowest possible flow resistance.

Because the time taken to make a splice is short, transient pressure drops associated with other demands in the mill may become important,

When the splicer is operated, line pressure at the splicer head normally drops by about 1 bar. If there are restrictions in the line, air will not be replenished, so that the pressure drop will be greater; weak splices may result.

Compressed air installations should therefore be designed to minimise pressure drop.

Never use narrow-bore supply tube; this introduces resistance.

When there is doubt about the quality of the air supply system, a pressure gauge should be fitted - temporarily - as near as possible to the splicer, so that static pressure and pressure drop can be monitored. This is particularly desirable in an installation which uses long lengths of coiled hose; losses in such hoses tend to be significant.

Sometimes, static line pressure is known to be adequate, but there sometimes serious problems with transients. Then it may be useful to fit a few metres of wide-bore pipe or other form of plenum, close to the splicer. This will act as a reservoir, to minimise pressure drops while the splicer is in use.

Do not fit lubricators in the line very near to the splicer; an excess of oil on the yarn may weaken the splice.

Compressed air and safety

All our splicers have been designed with safety in mind. The few moving parts have been enclosed or shielded to reduce the possibility of injury to the operator. In normal use, the only component which is in any way a source of hazard is the knife assembly. By design, however, the blades are difficult to reach, and are not dangerous in any normal circumstances. Knives represent a hazard only during removal and disposal. So, in normal use, the splicers present no risk.

However, the splicers do use compressed air, and that has the potential to cause injury. Compressed air is dangerous: avoid any bodily contact with it.

Always follow the safety precautions recommended by the compressor manufacturer. Always ensure that unions and connectors are fully tightened and sealed, and that there are no leaks.

Check the conditions of air supply lines on a regular basis. Always ensure that any flexible hoses are unblemished; if there are any cuts or abrasions to the outer surface of the hose, stop using the splicer and have the hose replaced by qualified personnel.

Do not look into the working parts of the splicer when it is being operated.

If a splicer malfunctions, do not use it until it has been repaired by qualified personnel.

For maintenance staff, additional advice is necessary. When cleaning or servicing is being carried out, access to the internal mechanism of the splicer is essential.
Under these circumstances, maintenance engineers will be at greater risk than ordinary users. The engineer should adhere strictly to the following guidelines:

Before undertaking any service work, disconnect the splicer from the air supply.
Under normal circumstances, always refit safety covers before reconnecting the splicer to the air supply.
Under exceptional circumstances, it may be necessary - for test purposes - to reconnect the splicer to the air supply without its safety covers.
While the splicer is being tested, wear protective gear and exercise due caution.

Compressed air and noise

A splicer uses compressed air, which for a brief period - about 1 to 2 seconds – is vented to atmosphere while the splice is being made. Air at perhaps 7 bar pressure escapes through a small blast hole, creating intense turbulence in a small volume.

Noise is inevitable.

Typical maximum noise levels vary from 80 db to 98 db, depending on the splicing chamber. Some chambers are quieter than others, simply because they have a smaller blast-hole, and allow less air to emerge.

Our noisiest splicer, with the biggest blast hole in our range, generates a noise spectrum as shown in the table below:

Hz	63	125	250	500	1000	2000	4000	8000	16000
dB	47	52	57	63	74	89	92	93	95

In practice, splicers are barely noticeable in a textile mill. This is because the other mill machinery tends to be very noisy, and the sound of the splicer is lost in the general noise. Also, the blast only lasts for about one second.
Nevertheless, in compliance with UK health and safety regulations, we recommend that ear defenders (to local standards equivalent to British Standard 6344 Part 1) be worn.

Troubleshooting

Trouble with splicers generally takes one of two forms: poor splicing or component malfunctioning.

1) Splicing performance.

If there is no apparent damage to the splicer, there may still be something subtle, which cannot easily be seen. It will be best, however, to look at the possible causes which are easy to spot. These include:

Simple checks:

- Has yarn specification changed markedly? The splicer is very flexible, but it can't do ALL yarns on one configuration. If the yarn has changed, take another look at your operating procedures and – possibly – the splicing chamber specification. If, for instance with glass, the yarn count has remained constant, but the level of sizing has increased, it may be necessary to increase air pressure and/or increase the duration of the blast.

- Is the air pressure as it should be? The line pressure may have changed – upward or downward. Excessive air pressure will cause bad filamentation, and low air pressure will result in weak splices. Consideration should be given to using flow-control versions of the splicer.

- If you have a splicer with flow control – has the position of the flow controller shifted? This can happen if the clamping screw has come slightly loose.

- Are there any obstructions in the main air line or in the splicer itself? It has been known for foreign matter to get into the air-line, and to obstruct the chamber blast hole; this is usually accompanied by a reduction in the noise level of the blast.

- Have operating procedures changed? If the procedure changes, performance will change.

- Are the splice ends being trimmed properly? For perfect performance, all splicers rely on the waste ends of yarn being cleanly trimmed. Good cutting performance must be maintained at all times. (See more details on next page for information on cutting issues and how to resolve)

- If fitted, has the timer calibration changed?

- Are the yarns slipping in the clamps? Sometimes the yarns will slip, and "balloon" in the region between clamp and chamber, giving a bad splice.

Model 162 Splicer - Parts list

Description	Item No.	Part No.	Quantity
Body Parts List			
'O' Ring – BS010	264	01-10-10	1
Yarn Clamp Spring	307	301-1007	2
M4x12 Slotted countersunk head screw	606	16-44-12	4
M5x20 Socket cap head screw	647	11-15-20	3
Knife spring and guide spring LS 800/11	781	10-136-020	2
Blast valve and yarn clamp adjusting screw	1017	10-138-118	4
'O' Ring-body to handle 111	1123	BS 014	4
Wrapper Body	1800	10-162-00	1
Wrapper Alignment Wheel	1805	10-162-05	2
Bearing Cover	1806	10-162-06	1
Left OFF Button	1807	10-162-07	1
Right ON Button	1808	10-162-08	1
Wrapper Roller	1809	10-162-09	1
Wrapper Trigger Shell	1810	10-162-10	1
Wrapper Turbine	1811	10-162-11	1
Wrapper Turbine Cover	1812	10-162-12	1
10mm I.D. Bearing	1814	10-162-14	1
Wrapper Alignment Bars	1815	10-162-15	2
Wrapper Trigger Valve	1816	10-162-16	1
Pin 33.7mm	1826	10-162-26	2
Wrapper Air Valve and O ring Assembly	1827	10-162-27A	2
Wedge Mounting	1817	10-162-17	1
Clip Mounting	1818	10-162-18	1
Magnet mount	1839	10-162-39	1
Magnet	1819	10-162-19	1
Harness	1822	10-162-22	1

Wrapper Wheel			
M3 x 8 Torx Countersunk head self tapping screw	1190	19-43-08	2
7mm Wrapper Wheel	1801	10-162-01	1
10mm Wrapper Wheel	1802	10-162-02	1
7mm Wheel Cover	1803	10-162-03	1
10mm Wheel Cover	1804	10-162-04	1
Extra Large Wrapper Wheel	1828	10-162-28	1
Extra Large Wrapper Wheel Cover	1829	10-162-29	1
Mesdan Wrapper Wheel	1830	10-162-30	1
Mesdan Wrapper Wheel Cover	1831	10-162-31	1
Wrapper bobbins			
Wrapper bobbin (empty)	1813	10-162-13	1
Wrapper Bobbin White	1838	10-162-38	1
Wrapper Bobbin Light Green	1832	10-162-32	1
Wrapper Bobbin Dark Green	1833	10-162-33	1
Wrapper Bobbin Light Green (14 pack)	1834	10-162-34	1
Wrapper Bobbin Dark Green (14 pack)	1835	10-162-35	1
Wrapper Bobbins White (14 pack)	1701	10-162-103	1

162 Exploded Diagram