<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>ALO 101</td>
<td>COILING SYSTEM</td>
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<tr>
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<td>COILING SYSTEM - THE CUBE, ELEVATOR, PLANE DRIVE, MILLING TAKE UP*</td>
</tr>
<tr>
<td>ALO 110</td>
<td>BAND SAW BLADE WASHER, HORIZONTAL BLADES</td>
</tr>
<tr>
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<td>BAND SAW BLADE WASHER, VERTICAL BLADES</td>
</tr>
<tr>
<td>ALO 123</td>
<td>AUTOMATIC CAPPING MACHINE FOR WELDED BAND SAW LOOPS</td>
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<td>GRINDING FIXTURE FOR BAND SAW WELDS</td>
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<td>BAND LOOP WELD TESTER</td>
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<td>ALO 131</td>
<td>BAND COILING STATION</td>
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<td>COIL WIND STATION</td>
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<td>SETTING MACHINE FOR BAND SAW BLADES</td>
</tr>
<tr>
<td>ALO 184-A</td>
<td>SETTING MACHINE WITH PROGRAMMABLE FEED UNIT FOR BAND SAW BLADES</td>
</tr>
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<td>ALO 184-B</td>
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</tr>
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<td>ALO 185</td>
<td>AUTOMATIC SET GAUGE</td>
</tr>
<tr>
<td>ALO 185-C</td>
<td>QUALITY CONTROL SYSTEM FOR BAND SAW BLADES</td>
</tr>
<tr>
<td>ALO 188</td>
<td>AUTO ADJUSTING SETTING MACHINE FOR BANDSAW BLADES</td>
</tr>
<tr>
<td>ALO 187-B</td>
<td>HEAVY DUTY SETTING MACHINE, PROGRAMMABLE FEED STROKE AND SGS CAMERA</td>
</tr>
<tr>
<td>ALO 191</td>
<td>TOOTH HARDENING AND HOT STRAIGHTENING OF BAND SAW BLADES</td>
</tr>
<tr>
<td>ALO 191-CP</td>
<td>TOOTH HARDENING AND HOT STRAIGHTENING OF BAND SAW BLADES COURSE PITCH</td>
</tr>
<tr>
<td>ALO 191-MS1</td>
<td>INDUCTION TOOTH HARDENING, STRAIGHTENING, TEMPERING OF BANDSAW BLADES</td>
</tr>
<tr>
<td>ALO 191-MS-4</td>
<td>INDUCTION TOOTH HARDENING, BEND- AND MECHANICAL STRAIGHTENING UNIT</td>
</tr>
<tr>
<td>ALO 191S</td>
<td>INDUCTION TOOTH HARDENING OF BANDSAW BLADES</td>
</tr>
<tr>
<td>ALO 198H</td>
<td>QUICK QUENCH</td>
</tr>
<tr>
<td>ALO 198-ILTA Mk.IV.</td>
<td>CONTINUOUS HARDENING AND INLINE TEMPERING OF BI-METAL BAND SAW BLADES</td>
</tr>
<tr>
<td>ALO 198-PREHEAT-A</td>
<td>INDUCTION PRE-HEATING OF BAND SAW BLADES</td>
</tr>
<tr>
<td>ALO 199</td>
<td>BACK HARDENING, TEMPERING, STRAIGHTENING, FOR CARBON BAND SAW BLADES</td>
</tr>
<tr>
<td>BS 3545</td>
<td>AUTOMATIC GRINDING MACHINE FOR BAND SAW BLADES</td>
</tr>
<tr>
<td>BS 75</td>
<td>AUTOMATIC GRINDING MACHINE FOR BAND SAW BLADES</td>
</tr>
<tr>
<td>BAS 050/051/052</td>
<td>BUTT WELDING MACHINE FOR BANDSAWS</td>
</tr>
<tr>
<td>BAS 100/120</td>
<td>BUTT WELDING MACHINE FOR BANDSAWS</td>
</tr>
</tbody>
</table>
ALO 101

Band coiling system, take up side

Take up system
The rack of coiler plates is made in 2 level pairs and can be made as long as needed to handle the requested number of coils. Each coiler plate is equipped with an individual pneumatic coil feeding mechanism that adjusts the speed and band take up individually and automatically. Each coiler plate is equipped with side support and can handle 1-3 coils per axle using discs to separate the coils. To facilitate unloading of the finished coils, each coiler pair can be tilted 90° by means of pneumatic cylinders and coil centres are collapsable and removable. The system lends itself both to milling and grinding operation.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>6 - 100 mm</td>
<td>¼ - 4”</td>
</tr>
<tr>
<td>Coil ID (collapsible):</td>
<td>300 - 320 mm</td>
<td>11.8 - 12.6”</td>
</tr>
<tr>
<td>Max Coil OD:</td>
<td>820 mm</td>
<td>32.3”</td>
</tr>
<tr>
<td>Max coil weight:</td>
<td>125 kg</td>
<td>275 lbs</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
<td>91 psi</td>
</tr>
<tr>
<td>Voltage:</td>
<td>Supplied from grinding / milling machine</td>
<td></td>
</tr>
</tbody>
</table>

Other customer requirements on request.

See also:
ALO 104 The Cube the smart coil handling system
ALO 101
Band coiling system, pay off side

Payoff system
The rack of coil holders is made in 2 level pairs and can be made as long as needed to handle the requested number of coils.
Each coil holder can be loaded with 1-3 coils using discs to separate the coils.
The pay off system is equipped with a band slack system that automatically adapts to the speed of the grinding/milling machine and pulls the bands out of the band holder. Each band holder is equipped with side support and can easily be loaded.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>6 - 100 mm</td>
</tr>
<tr>
<td>Max Coil OD</td>
<td>820 mm</td>
</tr>
<tr>
<td>Max coil weight</td>
<td>125 kg</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Voltage</td>
<td>Supplied from grinding / milling machine</td>
</tr>
</tbody>
</table>

Other customer requirements on request

See also:
ALO 104 The Cube the smart coil handling system
ALO 106
The Cube

THE CUBE:
The ALO Cube is a universal coil handling system designed to make all coil handling safe, easy and efficient. The system can be retrofitted to almost any machine system for coils.

The space and time saver
Instead of only one coil, this solution allows you to store and move up to ten coils simultaneously, process time and cost will improve, by the reduced storage requirements as well as more efficient handling of coils between separate operations.

A safe environment for you and the blades
Band saw blades can inflicting cuts and scratches on the operator if not controlled properly, ALO 106 will handle the blades in safe way by enclosing the coils and also protecting the teeth from damage. This ensures that the saw bands high quality from the production is maintained.

The Cube can be used as:
Band storage and transport system.
Undriven pay off system for uncrated coils and/or crated coils.
Single coil/tray driven pay off or take up system.
Multi band pay off or take up system

The cube system brings you:
Safe- smart- cheap- rational coil handling and storing. Complete system with many smart options for all existing tooting- setting- hardening and CTL system.
ALO’s setters, hardening, CTL-machines, tooth milling or grinding machines can be equipped with the cube system for operation as pay off and/or take up.

Many other coil or band saw machines can be equipped with this system.

The Cube consists of a rigid frame that is equipped with 10 shelves. Each shelf locks in a safe position or opens as a sliding extension for easy band access.

Bands may be handled clockwise or counter clockwise. Each shelf can be equipped to handle uncrated coils of bands or crated band coils. The Cube can be rotated for left or right hand band pay off or take up coiler. Cubes can be nested on top of each other to save space.

Our upgraded Cube has now a coil with 1000mm which suits most of our customers’ requests.

ALO can offer various solutions with the right features and functionalities that you need, to improve your production. For example, add ALO 825 loop table to your coil system to maintain an automatically controlled loop of band being feed into your ALO machine.

We strive to offer a unique solution for your individual production and our experience in this area lets us offer the best system for you.

**OPTIONS:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>103-6C</td>
<td>Standard center with band end lock, Ø 320mm</td>
</tr>
<tr>
<td>200619</td>
<td>Safety clutch</td>
</tr>
<tr>
<td>300020</td>
<td>Auto band end lock</td>
</tr>
</tbody>
</table>

**ALO 106 SPECIFICATION:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size L x W x H:</td>
<td>1010 x 1125 x 950 mm</td>
<td>39.8 x 44.3 x 37.4”</td>
</tr>
<tr>
<td>Max band width:</td>
<td>41 mm</td>
<td>1.61”</td>
</tr>
<tr>
<td>Max coil diameter:</td>
<td>860 mm</td>
<td>33.9”</td>
</tr>
<tr>
<td>Max weight/shelf:</td>
<td>150 kg</td>
<td>330 lb</td>
</tr>
<tr>
<td>Max pay load/cube:</td>
<td>1500 kg</td>
<td>4.400 lb</td>
</tr>
<tr>
<td>Weight inc 10 empty shelves:</td>
<td>407 kg</td>
<td>897 lb</td>
</tr>
</tbody>
</table>
ALO 106-E
Hydraulic cube elevator

The ALO 106 Cube can be docked to an hydraulic elevator that automatically lock the cube in a secure way. The elevator can lift the cube to get any shelf in the correct height for operation.

Each shelf is easily indexed with a built in semi-automatic height function for fast and reliable coil changes.

ALO can offer various solutions with the right features and functionalities that you need, to improve your production. For example, add ALO 825 loop table to your coil system to maintain an automatically controlled loop of band being feed into your ALO machine.

The cube elevator have a safety protective guards for a secure work environment as an option.

ALO 106-ESD
Single plane takeup drive or Single plane payoff drive

106-ESD is an extended version of 106-E and equipped with the single plane drive.
To be used as take up system into the cube from a single band operation such as setting for example. The elevator can lift the cube to get any shelf in the correct height for operation.
ALO 106-MTU is a universal coil handling system designed to make all coil handling safe, easy and efficient.

It can handle up to 40 bands at the same time. Perfect to place after a tooth milling or grinding machine. 106-MTU will sort, separate and coil the bands into the cube system.

ALO 106-MTU offers an optimized space- and cost-efficient system. 106-MTU is using one feed unit for up to 40 bands, where other systems often need one feed unit per band. The cubes can be nested on top of each other to save space.

An operator friendly HMI gives you total control over of the operation and all the important settings and parameters during the process of your band saw blades or other band blades or strips.

ALO 106-MTU can be retrofitted to almost any machine system for coils.
ALO 110
Band saw blade washer system

Multi band washing system
System includes hot high pressure water cleaning, rust protection and drying. System handle as standard 2–20 bands up to 100 mm width.

HIGHLIGHTS:
• In line with process with no added labor costs
• Low cost since washer use just high pressure, heated and circulated tap water
• Cleaned bands meet food industry demands
• Washed and de-burred bands generate better set and hardening results
• Less oil and dirt on shop floor downstream washer
• Dry and rust protected bands after washing
MACHINE DESCRIPTION
The washer is built in stainless steel with two water tanks and four wash/drying chambers. One of the tanks is heated by electrical heaters. The top of the washer can manually be opened for service etc. The system are designed to clean mineral oil, swarf and dirt from bands.

OIL BLOW OFF CHAMBER
The saw blade coils is mainly "cleaned" from oil via air knives, which are connected to a high pressure fan. This oil can be returned to grinder/milling if filtered or recovered by an outlet pipe to container, not included.

WASH CHAMBER
The washer is using high pressure water that splits and cleans the band stacks. The high pressure spray cleaning over the saw blades is made with two turbo rotor spray nozzles. The water are heated to approx. 60ºC and thereby clean water without any chemicals can be used. The "dirty" water passes through a magnetic filter cassette that seperates the remaining steel from the water. The cassette can easily be removed for cleaning. The water in the first tank is continuously cleaned from oil by a band oil skimmer system to separate the oil from the inse / wash water.

RUST INHIBITOR CHAMBER
The rust inhibitor is mixed with the water in Tank No 2 and sprayed on the coils with a high pressure pump. Make up water and rust inhibitor are added to the tank via magnetic valves and a dosing pump.

DRYING CHAMBER
Bands are completely dried by two oscillating air knives before exiting the washer.

FILTERING:
Water is constantly filtered and cleaned through several filter stages like: magnetic filter oil skimmer water tank with several settling compartments changeable large capacity filter bag No need of unfriendly chemicals in cleaning process make system easy and safe to handle as well as cost effective.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max band width</td>
<td>100 mm</td>
</tr>
<tr>
<td>Band capacity</td>
<td>2-20 bands</td>
</tr>
<tr>
<td>Water temperature</td>
<td>Heated to 60ºC</td>
</tr>
<tr>
<td>Space requirement (LxWxH):</td>
<td>2.3 x 1.8 x 1.7 m</td>
</tr>
</tbody>
</table>
ALO 110K
Multi band saw blade washer system for vertical bands with twin washing tubes

Multi band washing system
The system includes hot high pressure water cleaning, rust protection and drying. System can handle as standard 2–56 bands up to 100 mm width.

HIGHLIGHTS:
• In line with process with no added labor costs
• Low cost since washer use just high pressure, heated and circulated tap water
• Cleaned bands meet food industry demands
• Washed and de-burred bands generate better set and hardening results
• Helps to keep your hardening system clean
• Less oil and dirt on shop floor downstream washer
• Dry and rust protected bands after washing
MACHINE DESCRIPTION
The washer is built in stainless steel with two water tanks and two separated washing/drying tubes. One of the tanks is heated by electrical heaters. The front and the back side of the washer is manually opened for service etc. The system are designed to clean coolant, swarf and dirt from bands.

BLOW OFF CHAMBER
The saw blade coils is mainly "cleaned" via air knives, which are connected to a high pressure fan. This coolant can be returned to grinder/milling if filtered or recovered by an outlet pipe to container, not included.

WASH CHAMBER
The washer is using high pressure water that splits and cleans the band stacks. The high pressure spray cleaning over the saw blades is made with two turbo rotor spray nozzles. The water are heated to approx. 60°C and thereby clean water without any chemicals can be used. The "dirty" water passes through a magnetic filter cassette that separates the remaining steel from the water. The cassette can easily be removed for cleaning. The water in the first tank is continuously cleaned from oil by a band oil skimmer system to separate the oil from the rinse/wash water.

RUST INHIBITOR CHAMBER
The rust inhibitor is mixed with the water in Tank No 2 and sprayed on the coils with a high pressure pump. Make up water and rust inhibitor are added to the tank via magnetic valves and a dosing pump.

DRYING CHAMBER
Bands are completely dried by two oscillating air knives before exiting the washer.

FILTERING:
Water is constantly filtered and cleaned through several filter stages like: magnetic filter, oil skimmer, water tank with several settling compartments, changeable large capacity filter bag. No need of unfriendly chemicals in cleaning process make system easy and safe to handle as well as cost effective.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Max band width:</td>
<td>100 mm</td>
</tr>
<tr>
<td>Band capacity:</td>
<td>2-56 bands</td>
</tr>
<tr>
<td>Water temperature:</td>
<td>Heated to 60°C</td>
</tr>
<tr>
<td>Space requirement (LxWxH):</td>
<td>2.3 x 1.8 x 1.7 m</td>
</tr>
</tbody>
</table>

ALO Center AB
Industrivägen 10
SE-792 32 Mora Sweden
phone: +46 250 94900
fax: +46 250 18332
e-mail: info@alocenter.se
www.alocenter.se
ALO 123

Automatic capping machine for welded band saw loops

ALO 123

Is a compact and easy operated machine for fitting U-shaped plastic tooth protection on welded band saw loops. After the loop is placed in the open fixture by the operator or by a robot, the machine automatically adds the plastic teeth protection and completes the loop.

For safety reasons the cycle is started with double buttons on a separate control cabinet.
Light curtain safety system can be used as an option to the dual button operation.
No adjustments needed for different band length, thickness or tooth pitch.
Parameters can be saved under product names and easily recalled from the control systems memory.

CAPACITY:

Band widths: 20 - 54 mm ¾ - 2.1”
Band thickness: 0.6 - 2 mm 0.02 - 0.078”
MACHINE DESCRIPTION

The tooth protection material is opened and pneumatically fed over the first teeth by the strip feeding unit. The frequency controlled feed wheels feed the loop and after a complete revolution the protection material is cut automatically by the shear unit. The feed speed and several other parameters can be easily be adjusted on the operator terminal, and saved for future use.

After loading a new loop in the open fixture by use of a floor pedal the machine is ready for the next cycle. The tooth protection material is fed from a coil that is driven by a frequency controlled motor.

The ALO 123 manages several different plastic types and sizes. A new coil of plastic strip are easily loaded when the strip coil are consumend.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>20 - 54 mm</td>
<td>¾ - 2.1”</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.6 - 2.0 mm</td>
<td>0.02 - 0.078”</td>
</tr>
<tr>
<td>Min. band loop length:</td>
<td>2 m</td>
<td>6.5 ft</td>
</tr>
<tr>
<td>Capacity:</td>
<td>10 sec for a 8 m / 26ft loop</td>
<td></td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
<td>91 psi</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 VAC ± 10%, 1 or 2 phase, 50 - 60 Hz</td>
<td></td>
</tr>
<tr>
<td>Space requirement (l x w x h)</td>
<td>2300 x 1100 x 1800mm</td>
<td>7.5 x 3.6 x 5.9 ft</td>
</tr>
</tbody>
</table>
Table top grinding fixture for welded band saw loops

**ALO126**

Designed for quick and easy grinding of band saw welds. Pneumatic clamping pads activated by a foot pedal holds the blade. The blade is placed in the fixture with the toothing towards an adjustable mechanical stop.

Stabil and easy horizontal and vertical movement of the grinding unit thanks to linear ball guides.

The horizontal axle is equipped with mechanical stop and fine tuning device to optimize the grinding result.

**Options**

126-1 Assembly for sharpening of grinding wheel

### TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max band width</td>
<td>100 mm 4”</td>
</tr>
<tr>
<td>Max band thickness</td>
<td>3 mm 0.19”</td>
</tr>
<tr>
<td>Weight</td>
<td>80 kg 175 lbs</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3 bar 91 psi</td>
</tr>
<tr>
<td>Grinding wheel quality</td>
<td>Norton “SG” (3SG46P8VH 71) 150 mm Ø</td>
</tr>
<tr>
<td>Voltage</td>
<td>220 VAC, ± 10%, 1-phase, 50 - 60 Hz ± 1%</td>
</tr>
<tr>
<td>Space requirement (l x w x h)</td>
<td>302 x 684 x 590 mm 11.8 x 27 x 23”</td>
</tr>
</tbody>
</table>
ALO 127

Band and weld fatigue tester

ALO 127

Designed for quick, easy and safe testing of band loop welds.

ALO 127 are built on an aluminium frame that can be mounted on the wall, table or similar. The whole assembly is protected by an easy open cover.

A welded bandsaw blade of 1200mm length is to be used, where the ends are placed in two locking devices that will hold the ends. The weld is bent over a wheel that is pneumatically pressured and the bandsaw blade will cycle back and forth over the wheel by the means of an electrical motor drive.

Once the band or the weld is broken by fatigue, the automatic cycle is stopped and the number of feeds or cycles can be read out on a counter display.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max band width:</td>
<td>67 mm</td>
<td>2.6”</td>
</tr>
<tr>
<td>Max band thickness:</td>
<td>1.6 mm</td>
<td>0.06”</td>
</tr>
<tr>
<td>Weight:</td>
<td>90 kg</td>
<td>198 lbs</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
<td>91 psi</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 VAC, ± 10%, 1-phase, 50 - 60 Hz ± 1%</td>
<td></td>
</tr>
<tr>
<td>Space requirement (l x w x h):</td>
<td>1135 x 775 x 1350 mm</td>
<td>44.7 x 30.5 x 53.1”</td>
</tr>
</tbody>
</table>
ALO 131
Band coiling station

HIGHLIGHTS:
• Recoil in all directions
• Electrically powered coiling
• Option: Collapsible centre with auto band lock
• Option: Protective cover for the bands with an easy opening for load or unload
• Options for band end holder and band end sensor

CAPACITY:
Band width: 12 - 67mm
Band thickness: 0.3 - 1.6mm
Max coil weight: 250kg

OPTIONS / ACCESSORIES:
Collapsible centre
90915/6/7
MACHINE DESCRIPTION

The electrically powered coilers on ALO 131 can rewind bands in all optional directions. The speed will automatically decrease during coiling to prevent over speed on the payoff coiler. The coiling speed is pre-set and the coiling system gives a soft and controlled acceleration.

OPTIONS

ALO 131 can be equipped with band fault detector to detect pre-marked band faults, band end holders, band end sensor and a protective cover for the bands with an easy opening for load or unload.

Select between different expandable and removable coiling centre, they have an automatic band end lock device that lock and hold the band end during take up, and automatically releases the band end when paying off. Several different standard sized expandable coiling center’s including auto band end locking device are available as option.

SELECT:

ALO 90915/90916/90917
Expandable centre with auto band lock
Coil center
Expanded size
90915 320 mm
90916 450 mm
90917 500 mm

MODELS:

131: Coilers are electrically driven
131-1200: Coiler OD = 1200 mm / 47.2"

TECHNICAL SPECIFICATION:

Band width: 12 - 67 mm ½” - 2.6"
Coiler OD: 1000 / 1200 mm 39.4” / 47.2”
Coiler ID: 450 mm (expanded) 17.7"
Voltage: 230 VAC ±10%, 1-phase, 50-60 Hz ±1%, directly earthed system
Motor: 2 x 0.55 kW
Feed speed: 0.5 - 50 m/minute 0 - 164 ft/minute
Max. coil weight: 250 kg 550 lbs
Air pressure: 6.3 bar 91 psi
Power consumption (normal): 0.6 kVA
Weight: 250 kg 550 lb
Space requirement (LxWxH):
130/131 2.2 x 1.3 x 1.2 m 7.2 x 4.3 x 3.9 ft
131-1200 2.7 x 1.55 x 1.2 m 8.9 x 5.1 x 3.9 ft

ALO 131 is also available with pneumatically driven coilers on ALO 130
ALO 144
Coil wind station for band saw blades

THE SYSTEM COMPRISÉS:
Feed and measuring system
Cutting unit
Tooth matching system
Pay-off coiler with protective cover
Take-up coiler with protective cover

CAPACITY:
Blade width: 12 - 50 mm ½ - 2"
Blade thickness: 0.3 - 1.6 mm 0.01 - 0.063"
Blade length: 0 - 1000 m 0 - 3280 ft
Feed speed: 0 - 57 m/min 0 - 187 ft/min

HIGHLIGHTS:
• Length measuring with coiling rates up to 57m/min
• Match finder compare actual band pitch against programmed band pitch to avoid wrong set up
• Improved and updated shear unit for trouble free cutting
• Take up coiler operates with torque control for best coiling result
• Safe version of coiling center that interlocks with coiler plate
• Coilers have safe protective guarding
• Option: Capping allows you to add capping during coiling
• Option: Bar code reader system for quick and easy setup of work orders
• Option: Ink jet printer can be connected to print your brand/logo during coiling

COILER:
Take up coiler operates with torque control: 880-CW 1000mm outside diameter (OD)
Pay off coiler, options: 880-CTL 1000mm OD
863-CTL 1250mm OD
MACHINE DESCRIPTION

Our new machine is easy to use and fast, length measuring with a coiling rates up to 57m/min. Let the “Match finder” do the job when comparing the actual band pitch against programmed band pitch to avoid wrong set up and the improved and updated shear unit gives you a trouble free cutting.

Take up coiler operates with torque control for best coiling result and the new safe version of coiling center interlocks with the coiler plate. The coilers have a safe protective guarding for a secure work environment.

To make the job even easier ALO 144 has some great options:

- Bar code reader system for quick and easy setup of work orders.
- Capping allows you to add capping during coiling.
- Ink jet printer can be connected to print your brand/logo during coiling.

OPTIONS:

144-BAR: Bar code reading system
144-CAP: Tooth protection applier
144-INK-KIT: Ink jet printer
9091x: Collapsible coiling center

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>12 - 50 mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.3 - 1.6 mm</td>
</tr>
<tr>
<td>Band length</td>
<td>0 - 1000 m</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 10 mm at L = 10 m</td>
</tr>
<tr>
<td>Feed speed</td>
<td>0 - 57 m/min</td>
</tr>
<tr>
<td>Coiler OD take up</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Coiler OD pay off</td>
<td>1000/1250 mm</td>
</tr>
<tr>
<td>Max coil weight</td>
<td>250 kg</td>
</tr>
<tr>
<td>Type of coiler centres</td>
<td>Collapsible coiling center with automatic band end lock device.</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Voltage</td>
<td>400 VAC ±10% 3 phase, 50 60 Hz ±1% directly earthed system.</td>
</tr>
<tr>
<td>Space requirement (LxWxH)</td>
<td>6000x2000x1800mm</td>
</tr>
<tr>
<td>Weight</td>
<td>612 kg</td>
</tr>
</tbody>
</table>

Safety coil center 90915-S: Releasing the hooks from the plate
ALO 144-PSS
Band service station for band saw blades

THE SYSTEM COMPRISSES:
- Feed and measuring system
- Cutting unit
- Tooth matching system
- Pay-off coiler with protective cover
- Take-up coiler with protective cover

CAPACITY:
- Blade width: 12 - 50 mm (½ - 2"
- Blade thickness: 0.3 - 1.6 mm (0.01 - 0.063"
- Blade length: 0 - 1000 m (0 - 3280 ft
- Feed speed: 0 - 57 m/min (0 - 187 ft/min

HIGHLIGHTS:
- Length measuring with coiling rates up to 57m/min
- Match finder compare actual band pitch against programmed band pitch to avoid wrong set up
- Improved and updated shear unit for trouble free cutting
- Defect removal match finder automatically cut out pre marked defects with kept teeth pattern after weld
- Take up coiler operates with torque control for best coiling result
- Safe version of coiling center that interlocks with coiler plate
- Coilers have safe protective guarding
- Option: Capping allows you to add capping during coiling
- Option: Bar code reader system for quick and easy setup of work orders
- Option: Ink jet printer can be connected to print your brand/logo during coiling

COILER:
- Take up coiler operates with torque control: 880-CW 1000mm outside diameter (OD)
- Pay off coiler, options: 880-CTL 1000mm OD, 863-CTL 1250mm OD
**MACHINE DESCRIPTION**

Our new machine is easy to use and fast, length measuring with a coiling rates up to 57m/min. Let the “Match finder” do the job when comparing the actual band pitch against programmed band pitch to avoid wrong set up and the improved and updated shear unit gives you a trouble free cutting.

The feature "Defect removal match finder" helps you to automatically cut out pre marked defects with kept teeth pattern after weld. With help of the additional pendant control system you can manually jog the band to different finishing stations with the safety feature SLS (Safe Limited Speed).

The machine also have counters helping you to keep track of scrap lengths, number of weld in ordered coil and how much more length needed to complete ordered length after band fault.

144-PSS also comes with a light barrier safety feature.

The take up coiler operates with torque control for best coiling result and the new safe version of coiling center interlocks with the coiler plate. The coilers have a safe protective guarding for a secure work environment

To make the job even easier ALO 144-PSS has some great options:
- Bar code reader system for quick and easy setup of work orders.
- Capping allows you to add capping during coiling.
- Ink jet printer can be connected to print your brand/logo during coiling.

**OPTIONS:**
- **144-BAR:** Bar code reading system
- **144-CAP:** Tooth protection applier
- **144-INK-KIT:** Ink jet printer
- **9091x:** Collapsible coiling center

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>12 - 50 mm</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.3 - 1.6 mm</td>
</tr>
<tr>
<td>Band length:</td>
<td>0 - 1000 m</td>
</tr>
<tr>
<td>Accuracy:</td>
<td>± 10 mm at L= 10 m</td>
</tr>
<tr>
<td>Feed speed:</td>
<td>0 - 57 m/min</td>
</tr>
<tr>
<td>Coiler OD take up:</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Coiler OD pay off:</td>
<td>1000/1250 mm</td>
</tr>
<tr>
<td>Max coil weight:</td>
<td>250 kg</td>
</tr>
<tr>
<td>Type of coiler centres:</td>
<td>Collapsible coiling center with automatic band end lock device.</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Voltage:</td>
<td>400 VAC ±10% 3 phase, 50 60 Hz ±1% directly earthed system.</td>
</tr>
<tr>
<td>Space requirement (LxWxH)*:</td>
<td>6000-15000x2000x1800mm 236-591x79x71&quot;</td>
</tr>
<tr>
<td>Weight:</td>
<td>612 kg Including coilers</td>
</tr>
</tbody>
</table>

*) The length depends on which equipment are used between ALO 144-PSS and the coilers
ALO 177
Cut to length machine with match finder system

The newest generation of ALO’s cut to length machine is completely new and designed with the unique and innovative tooth matching system called “match finder”. Never before has it been so easy to prepare band saw blades for welding thanks to our brand-new ALO 177 cut to length machine.

The new design makes it so easy to perform a setup, simply load an actual blade into the machine, activate the match finder feature, toggle matching preference on the screen and save.

Now there is no need to manually adjust tooth detector in any axis. Simply specify the size from a tooth where the finished weld should be located and then prepare the band saw blade for welding with compensation for weld burn off for perfect tooth and pattern match. The process is fully automatic and can repeat the same set up time after time with excellent results. Just choose length, band width and how many blades you need to cut and go!

With this new machine ALO is changing the way band saw blades are cut to length, the new ALO 177 cuts your blades faster, more consistent and with higher accuracy than ever before. The system also comes with a new cut to length feature, “eco-mode” that gives you the possibility to minimize the waste piece between bands when matching VIP (Varying inch pattern).

HIGHLIGHTS

- Tooth matching are now easier than ever with the new system “Match finder”
- Several different automatic cutting modes for band saw material or edge material
- A fully manual cut to length mode for quick process of single or small batch orders
- VIP patterns as well as regular patterns can automatically be cut to length
- New cut to length mode for set pattern match of band saw blades with regular pitch
- Band ends fully prepared for welding with perfect tooth match after welding process
- Blade pattern are compared to program pattern before auto start
- Completely new mechanical design of feed and drive unit
- New and improved shear unit design that warrant for trouble free cutting
Band length is measured by a metering wheel and a pulse transducer to eliminate band slipping faults.

Tooth pitch, band width, length with tolerance and number of bands are chosen from a drop down bar in the HMI panel. The machine will compare the actual blade loaded into the machine to the saved group pattern. If they match, the machine will execute the cut to length job fully automatic.

With no match the machine will alarm the operator, this will minimize the risk for human errors by loading wrong band type or size. ALO 177 also has a detector for pre-marked band faults that will stop automatic mode.

The cut are made by a new powerful pneumatic shear unit with blades made of high speed steel. The slide is forcibly guided and will follow the cylinders wedge back on the return stroke. Two shear sizes are available for cutting band widths 6-50mm or 6-100mm.

The machine are available both with left to right or right to left band feed direction.

**Match finder legend:**
- **1** First priority cut, e.g. start a new blade at this gullet
- **X** This gullet(s) not allowed to be used for tooth match
- **✓** This gullets are ok to match with each other, also in combination with first priority cut
- **✓** This gullets are ok to match with each other

**TECHNICAL SPECIFICATION:**
- **Band width:** 6 - 50 mm or 6 -100 mm  
  0.24 - 1.97” or 0.24 - 3.94”
- **Band thickness:** 0.3 - 1.6 mm  
  0.01 - 0.063”
- **Band length:** 0.25 - 20 m  
  0.82 - 65.6 ft
- **Air pressure:** 6.3 bar  
  91 psi
- **Voltage:** 400 VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system
- **Space requirement (LxWxH):** 0.7 x 0.8 x 1.4 m  
  2.3 x 2.6 x 4.6 ft

**REMARKS:**
- Band width between 6-10 mm requires a band guide, 200674 or 200674-V. Tooth match is possible from 10mm.
ALO 181
Setting machine for band saw blades

CAPACITY:
- Band widths: 6 - 50 mm (1/4 - 2"
- Band thickness: Up to 1.6 mm (Up to 0.063"
- Overall setting accuracy: ±0.02 mm (±0.001"
- Symmetry accuracy: ±0.02 mm (±0.001"
- Max. group length: 75 mm (3"
- Tooth pitch: ¾ - 32 tpi

ALO 181 are available in three different models:
- **ALO 181-50-C** For ALO 185 set gauge with free standing coilers
- **ALO 181-50-D** For ALO 185 set gauge without coilers
- **ALO 181-50-E** For ALO 185 set gauge with free standing electrical coilers

OPTIONS / ACCESSORIES:
- **ALO 104 CUBE** Coil handling system
- **ALO 822** Double coiler
- **ALO 181-011** Auto symmetry control
- **ALO 181-Vision** Position control system
- **ALO 81-60** Set gauge
- **ALO 61201** Grinding fixture
**MAchine Description**

**Setting unit**
The ALO 181 can set all forms and groups of teeth, such as raker, alter, wavy or vary pitch with a repeated pattern of 75 mm / 3" or less. The machine is universal and easy to adjust for different band dimensions, strokes and tooth forms.

All wear surfaces are made of hard metal or coated with hard chrome. The clutch and gearbox are immersed in oil. The band saw blade are guided through a guide system and clamped by a pair of mechanically timed clamping jaws during the setting sequence, assuring a consistent setting result. The oscillatory motion of the setting tools together with the angled setting dies gives a minimal tooth deformation. The setting speed is adjustable by means of a potentiometer.

**Setting tools**
Setting tools for ¾ - 32 tpi available as standard tools. Tools for group setting or vary pitch are custom made after specification. The hard metal dies can easily be replaced.

**Payoff / takeup coilers**
The coilers are driven by a pneumatic motor with regulator and valve, thus the speed and torque are infinitely variable. The speed and band tension are automatically regulated by means of a pneumatic valve mechanism. The coilers may be driven clockwise or counter clockwise and are equipped with collapsible centre for easy loading and unloading.

**Technical Specification:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>6 - 50 mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>Up to 1.6 mm</td>
</tr>
<tr>
<td>Overall setting accuracy</td>
<td>± 0.02 mm</td>
</tr>
<tr>
<td>Symmetry accuracy</td>
<td>± 0.02 mm</td>
</tr>
<tr>
<td>Tooth pitch</td>
<td>¾ - 32 tpi</td>
</tr>
<tr>
<td>Max. group length</td>
<td>75 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>430 Kg</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Voltage</td>
<td>230 VAC, ± 10%, 1phase, 50 - 60 Hz ± 1%, directly earthed system</td>
</tr>
<tr>
<td>Power consumption (at max output power)</td>
<td>0.44 kVA</td>
</tr>
<tr>
<td>Space requirement (l x w x h)</td>
<td>3.1 x 1.7 x 1.45 m</td>
</tr>
</tbody>
</table>

**Remarks:**

ALO 181 can set all forms of groups and teeth with a repeated pattern of 75 mm / 3"

Max. VIP setting / band thickness:
- 1.1 mm / 0.043” 2/3, 3/4, 4/6 VIP
- 0.9 mm / 0.035” 2/3, 3/4, 4/6, 6/8 VIP
- 0.65 mm / 0.025” 2/3, 3/4, 4/6, 6/8, 6/10, 8/12, 10/14 VIP

Band width between 6-10 mm requires a narrow band kit, part number 8149-A, 8149-B or 8149-C.
ALO 183

Setting machine for band saw blades

**CAPACITY:**
- Band widths: 20 - 100 mm ¾ - 4”
- Band thickness: Up to 2.54 mm Up to 0.1”
- Overall setting accuracy: ±0.02 mm ±0.001”
- Symmetry accuracy: ±0.02 mm ±0.001”
- Max. stroke length: 125 mm 5”
- Tooth pitch: ¾ - 32 tpi

**ALO 183 are available in two different models:**
- **ALO 183 - 100 - C** For ALO 185 set gauge with free standing coilers
- **ALO 183 - 100 - D** For ALO 185 set gauge without coilers
- **ALO 183 - 100 - E** For ALO 185 set gauge with free standing electrical coilers

**OPTIONS / ACCESSORIES:**
- **ALO 104 CUBE** Coil handling system
- **ALO 822** Double coiler
- **ALO 185-013** Auto symmetry control
- **ALO 183-Vision** Position control system
- **ALO 83-80** Set gauge
- **ALO 61201** Grinding fixture
**MACHINE DESCRIPTION**

**Setting unit**
The ALO 183 can set all forms and groups of teeth, such as raker, alter, wavy or vary pitch with a repeated pattern of 125 mm / 5” or less. The machine is universal and easy to adjust for different band dimensions, strokes and tooth forms.

All wear surfaces are made of hard metal or coated with hard chrome. The clutch and gear box are immersed in oil. The band saw blade are guided through a guide system and clamped by a pair of mechanically timed clamping jaws during the setting sequence, assuring a consistent setting result. The oscillary motion of the setting tools together with the angled setting dies gives a minimal teeth deformation.

The setting speed is adjustable by means of a potentiometer.

**Setting tools**
Setting tools for ¾ - 32 tpi available as standard tools. Tools for group setting or vary pitch are custom made after specification. The hard metal dies can easily be replaced.

**Payoff / takeup coilers**
The coilers are driven by a pneumatic motor with regulator and valve, thus the speed and torque are infinitely variable. The speed and band tension are automatically regulated by means of a pneumatic valve mechanism. The coilers may be driven clockwise or counter clockwise and are equipped with collapsible centre for easy loading and unloading.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>20 - 100 mm / ¾ - 4” See remarks</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>Up to 2.54 mm / Up to 0.1”</td>
</tr>
<tr>
<td>Overall setting accuracy:</td>
<td>± 0.02 mm / ± 0.001”</td>
</tr>
<tr>
<td>Symmetry accuracy:</td>
<td>± 0.02 mm / ± 0.001”</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>¾ - 32 tpi</td>
</tr>
<tr>
<td>Max. stroke length:</td>
<td>125 mm / 5” See remarks</td>
</tr>
<tr>
<td>Weight:</td>
<td>430 kg / 948 lbs</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar / 91 psi</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 VAC, ± 10%, 1 phase, 50 - 60 Hz ± 1%, directly earthed system</td>
</tr>
<tr>
<td>Power consumption:</td>
<td>0.5 kVA</td>
</tr>
<tr>
<td>Space requirement (l x w x h):</td>
<td>3.6 x 1.7 x 1.45 m / 11.8 x 5.6 x 4.8 ft</td>
</tr>
</tbody>
</table>

**REMARKS:**

ALO 183 can set all forms and groups with a repeated pattern of 125 mm / 5”

Max. VIP setting / band thickness:
- 2.5 mm / 0.1” 2/3, 3/4, 4/6 VIP
- 1.8 mm / 0.072” 2/3, 3/4, 4/6, 6/8 VIP
- 1.1 mm / 0.043” 2/3, 3/4, 4/6, 6/8, 6/10, 8/12, 10/14 VIP

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*Image showing clamping jaws and setting tools movement during setting.*
ALO 184-A

Setting machine with programmable feed unit for band saw blades

The new generation ALO setting machine with its modular design makes it possible to start with the basic setting unit 184-A and upgrade the system to 184-B with SGS camera systems and automatic symmetry adjustment at later stage.

New features include programmable linear servo feed pawl unit which enables varying feed lengths and set patterns.

Adjustments such as setting height and the feed units pick-up and drop-off positions can be saved in the HMI making the set-up or change-over of the machine easy and quick for the operator. Another novelty is pneumatical blade guide clamping which simplifies loading and unloading and ensures that bands are guided correct.

A completely new design of the machine head and clamping unit with very few and durable parts ensures high availability and higher set precision even on more demanding sizes and materials.

CAPACITY:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
<th>Setting tolerance:</th>
<th>Symmetry tolerance:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>12 - 67mm</td>
<td>±0.01mm</td>
<td></td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.4 - 1.6mm</td>
<td></td>
<td>±0.01mm</td>
</tr>
<tr>
<td>Tooth pitch</td>
<td>0.5 - 32 tpi</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Modular design, coilers and SGS camera system can be added as options
- A programmable feed pawl system give new possibilities, like variable feed lengths
- Straight and fixed band back position through the machine from coiler to coiler
- New enforced clamping system that also eliminates overclamping issues
- Fine tuning of set balance and clamping can be done on the fly

OPTIONS / ACCESSORIES:

- ALO 61201 Grinding fixture
- ALO 61207 Grinding fixture
- ALO 83-60 Set gauge
- ALO 880 Coiler
- ALO 104 CUBE Coil handling system
The new band saw setting machine 184-A can handle all known forms and groups of teeth with a repeated feed pattern of max 125mm. In addition, the machine with its new linear servo feed unit can be programmed to alternate two different stroke lengths, opening possibilities for new never before seen group lengths and patterns.

The band is guided by pneumatically operated band guides to assure that the band is held in position and also facilitates loading and unloading of the bands. Bands are always oriented from the back, and the setting head are adjusted up or down with an electrical motor for different band widths, making changeover between widths very easy for the operator.

The clamping jaws is adjusted by two micrometres, if clamping pressure is adjusted to high, there is a safety feature that will give before mechanical failure occurs. Minor adjustments of the clamping can be done while the machine is running.

The setting head can also be tilted to optimize the set result over long groups. Overall set are adjusted with micrometres.

In the operator friendly HMI all the set related values can be saved making change-over and set-up easy for the user. Adjustment of set balance are made from the HMI by means of an actuator and can be made during setting operation.

The feed pawls and setting tools are of the same standard as on previous ALO setting machines, on certain sizes of setting tools minor adjustments are needed before use in ALO 184.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>20-67mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.4-1.6mm</td>
</tr>
<tr>
<td>Overall setting accuracy</td>
<td>± 0.01mm</td>
</tr>
<tr>
<td>Symmetry accuracy</td>
<td>± 0.01mm</td>
</tr>
<tr>
<td>Tooth pitch</td>
<td>Up to 32 tpi</td>
</tr>
<tr>
<td>Max stroke length</td>
<td>125mm</td>
</tr>
<tr>
<td>Weight</td>
<td>810kg</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3bar</td>
</tr>
<tr>
<td>Standard voltage</td>
<td>400VAC, ± 10%, 3phase, 50-60Hz ±1% directly earthed system, other voltages available upon request.</td>
</tr>
<tr>
<td>Max power consumption</td>
<td>3 kVA</td>
</tr>
<tr>
<td>Space requirement (l x w x h)</td>
<td>2x1.5x2m</td>
</tr>
</tbody>
</table>

ALO 184-B model that includes SGS camera system are also available.
ALO 184-B

Setting machine with programmable feed unit and SGS camera system for band saw blades

The new generation ALO setting machine that together with the SGS camera system will help you to monitor and get in full control of the setting process and quality.

New features include programmable linear servo feed pawl unit which enables varying feed lengths and set patterns.

Adjustments such as setting height and the feed units pick-up and drop-off positions can be saved in the HMI making the set-up or change-over of the machine easy and quick for the operator.

Another novelty is pneumatical blade guide clamping which simplifies loading and unloading and ensures that bands are guided correct.

A completely new design of the machine head and clamping unit with very few and durable parts ensures high availability and higher set precision even on more demanding sizes and materials.

CAPACITY:

- Band width: 12 - 67mm
- Bland thickness: 0.4 - 1.6mm
- Tooth pitch: 0.5 - 32 tpi
- Setting tolerance: ±0.01mm
- Symmetry tolerance: ±0.01mm

- Modular design, coilers and SGS camera system can be added as options
- A programmable feed pawl system give new possibilities, like variable feed lengths
- Straight and fixed band back system give new possibilities, like variable feed lengths
- New enforced clamping system that also eliminates overclamping issues
- Automatic set symmetry adjustment

OPTIONS / ACCESSORIES:

ALO 61201 Grinding fixture
ALO 61207 Grinding fixture
ALO 83-60 Set gauge
ALO 880 Coiler
ALO 104 CUBE Coil handling system
The new band saw setting machine 184-B can handle all known forms and groups of teeth with a repeated feed pattern of max 125mm. In addition, the machine with its new linear servo feed unit, can be set-up to alternate different stroke lengths, opening possibilities for never before seen group lengths and patterns.

The band is guided by pneumatically operated band guides to assures that the band is held in position and also facilitates loading and unloading of the bands. Bands are always oriented from the back, and the setting head are adjusted up or down with an electrical motor for different band widths, making changeover between widths very easy for the operator.

The clamping jaws is adjusted by two micrometres, if clamping pressure is adjusted to high, there is a safety feature that will give, before mechanical failure occurs. Minor adjustments of the clamping can be done while the machine is running.

The setting head can also be tilted to optimize the set result over long groups. Overall set are adjusted with micrometres.

In the operator friendly HMI all the set related values can be saved making change-over and set-up easy for the user. The automatic adjustment of set balance based on the SGS camera readings are carried out by an actuator during setting operation.

The feed pawls and setting tools are of the same standard as on previous ALO setting machines, on certain sizes of setting tools minor adjustments are needed before use in ALO 184.

A high resolution CCD line camera measures the set teeth and stops the machine if the set is out of the set-up tolerances. Information about the set as well as what coursed the stop, will be shown on the computer monitor. The operator will also get advice how to adjust the machine to correct any faults in the setting result.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>(12) 20-67mm (12mm by change of clamping jaws)</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.4-1.6mm</td>
</tr>
<tr>
<td>Overall setting accuracy</td>
<td>± 0.01mm</td>
</tr>
<tr>
<td>Symmetry accuracy</td>
<td>± 0.01mm</td>
</tr>
<tr>
<td>Tooth pitch</td>
<td>Up to 32 tpi</td>
</tr>
<tr>
<td>Max stroke length</td>
<td>125mm</td>
</tr>
<tr>
<td>Weight</td>
<td>810kg</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3bar</td>
</tr>
<tr>
<td>Standard voltage</td>
<td>400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system, other voltages available upon request.</td>
</tr>
<tr>
<td>Max power consumption</td>
<td>3 kVA</td>
</tr>
<tr>
<td>Space requirement</td>
<td>2x1.5x2m</td>
</tr>
</tbody>
</table>
ALO 185
Automatic set gauge for band saw blades

THE SYSTEM COMPRISSES:
Measuring fixture
Camera
PC and SGS software

CAPACITY:
Blade width: 12 - 100 mm ½ - 4"
Blade thickness: 0,4 - 1,6 mm 0,016 - 0,063"
Tooth pitch: 0,5 - 14 tpi
Measure width max: 5 mm 1/5"

OPTIONS / ACCESSORIES:

ALO 81-60
Set gauge

ALO 185-011 / 185-012
Band symmetry control kit
MAIN MENU:
Choose mode of operation in a simple interactive menu system. The program handles all European languages and works with metric or Imperial readings.

HELP MENU:
Help is available at any place in the program by pressing the help function key. The help system also provides help with common setup mistakes.

SET CALIBRATION:
A very simple calibration system makes it possible to calibrate the system to any other measuring system as well as fulfilling standards like ISO-9000.

EDIT SAW BLADE:
Pre-programming of all band and system parameters makes it easy for the operator to select the actual blade from the library at set up. The use of passwords prevents tampering with band or system parameters.

OPTICAL CALIBRATION:
Real time vision showing the blade with set teeth, actual set readings, the database as well as quality of the camera readings.

AUTO SYMMETRY ADJUSTMENT:
If the ALO 185 set gauge stands together with a ALO setting machine, a kit is available that will control and adjust the symmetry automatically.
During the actual measurement it’s possible to see the results of the set and several different statistical diagrams while the system keeps control of the set.

Top part of the screen is showing a setting diagram over the last 500 feedings. Left side set = white, Right side set = blue, Imbalance = red. The red horizontal lines are the tolerance limits. The grey line in the middle represents the nominal set. Mid part of the screen is showing the last five groups of set/tooth, imbalance, average/side and the overall set. Each tooth is measured and the set value is displayed. The background colour is showing the status of the set; green, yellow or red.

The change between these screens is done by a simple touch on a function key. The frame around all screens is always showing basic information like actual band name or number, auto stop on or off, video quality and calibration status.

The system can stop the setter if the set goes out of the tolerances and will give instructions how to adjust the setting machine to correct the set.

Low part of the screen is from left showing coil number, shop order and operators id. Mid part is showing the basic blade information. Right side is giving band length, speed, auto stop on or off, metering system and the actual offset.

Top part of the screen is showing a standard deviation diagram over left and right side set. Min, max, average set as well as standard deviations are shown. The set values with histogram can be printed out at any time or at the end of the measurement.

Automatic self-test of the set gauge computer and the camera at system start up. The system also displays the current speed and the produced length as well as speed and length counter.
MACHINE DESCRIPTION

The set gauge will measure each set tooth on a band saw blade and check against user defined tolerances.

The individual setting of each tooth as well as average, imbalance and overall set can be displayed on the PC monitor. Control of the set gauge and programming of all parameters and tolerances are done interactive by the menu driven software. The user can freely choose metric or inch as measuring units.

The software supports all Western languages. A special set gauge computer equipped with a CCD line camera scanning the teeth of the saw blade does the measuring. The analysis of the incoming data is done in real-time and the result is transmitted online to the PC. The gauge can be placed in line with any ALO band saw setting machine.

If the 185 stand together with an ALO band saw setting machine, a kit that automatically will control and adjust the set symmetry can be added, making it possible to keep a very tight tolerance without any unnecessary stops for manual adjustments.

OPTIONS:

185 - 001A PC monitor stand
185 - 003 Laser printer
185 - 011 Automatic symmetry adjustment kit for 181 machine
185 - 012 Automatic symmetry adjustment kit for 182 and 183 machines
185 - 181 Kit with all necessary parts, including a free standing coiler type 820 - 6, for connecting ALO 185 to an existing ALO 181 setting machine.
185 - 182 Kit with all necessary parts for connecting ALO 185 to an existing ALO 182 or ALO 183 setting machine.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Metric</th>
<th>Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade width:</td>
<td>12 - 100 mm</td>
<td>¼ - 4”</td>
</tr>
<tr>
<td>Blade thickness:</td>
<td>0,4 - 1,6 mm</td>
<td>0,016 - 0.063”</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>0,5 - 14 tpi</td>
<td></td>
</tr>
<tr>
<td>Measure width max:</td>
<td>5 mm</td>
<td>1/5”</td>
</tr>
<tr>
<td>Resolution:</td>
<td>0,002 mm</td>
<td>0,00008”</td>
</tr>
<tr>
<td>Resolution on screen(user selectable):</td>
<td>0,01, 0,001 mm</td>
<td>0,001, 0,0005, 0,0001”</td>
</tr>
<tr>
<td>Camera:</td>
<td>High speed, high resolution CCD line camera</td>
<td></td>
</tr>
<tr>
<td>PC:</td>
<td>Actual market standard with monitor, keyboard and SGS software</td>
<td></td>
</tr>
</tbody>
</table>
ALO 185-C

Band quality control system for band saw blades

This system lends itself to be placed in-line with other band coiling systems to make a final quality control of your continuous feeding band saw blade. The camera system will measure set parameters like set per side, balance and overall set.

The blade data base in the SGS software allows the user to set up tolerances for each of the above parameters and will measure and record the actual result of the band.

The system can also be completed with additional sensors to detect for example pre-marked band faults.

Reports can be printed of the measured result, proving the actual set quality of the measured band including statistical data information.

Examples of operations where the system could be integrated are sandblasting, coiling/recoiling, ALO 143 band service station, ALO 175 CTL system or ALO 198-ILT75 bi-metal hardening system. ALO 185-C can also be put in-line with systems that are not provided by ALO, as long as it feeds and drives the band saw blade.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade width:</td>
<td>12 - 100 mm</td>
</tr>
<tr>
<td>Blade thickness:</td>
<td>0.4 - 1.6 mm</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>0.5 - 14 tpi</td>
</tr>
<tr>
<td>Measure width max:</td>
<td>5 mm</td>
</tr>
<tr>
<td>Resolution:</td>
<td>0.002 mm</td>
</tr>
<tr>
<td>Resolution on screen(user selectable):</td>
<td>0.01, 0.001 mm</td>
</tr>
<tr>
<td>Camera:</td>
<td>High speed, high resolution CCD line camera</td>
</tr>
<tr>
<td>PC:</td>
<td>Actual market standard with monitor, keyboard and SGS software</td>
</tr>
</tbody>
</table>
ALO 186
Automatic setting machine for band saw blades

Capacity:
Band width: 20 - 80 mm ¾ - 3.15"
100 mm 4" only on request
Blank thickness: 0.5 - 1.6 mm 0.02 - 0.062"
Tooth pitch: 0.3 - 10/14 tpi
Setting tolerance: ±0.02 mm ±0.001"
Symmetry tolerance: ±0.02 mm ±0.001"

ALO 186 is available in three different models:

ALO 186 Setting machine, manual adjustment
ALO 186-185 Setting machine with SGS camera, manual adjustment
ALO 186-185-A Setting machine with SGS camera, automatic adjustment of set

- Can handle larger and more demanding pitches up to a length of 150 mm or 6”.
- A programmable feed system can vary the feed length and give new possibilities, like variable set pattern.
- Straight and fixed band back position through the machine from coiler to coiler.
- The basic ALO 186 can at any time be updated to higher automation.

OPTIONS / ACCESSORIES:

ALO 83-60 Set gauge
ALO 61201 Grinding fixture
ALO 61207 Grinding fixture
ALO 824 Loop table
ALO 860 Coiler
ALO 104 CUBE Coil handling system
MACHINE DESCRIPTION

The machine is designed and built to be a heavy duty band saw setter and capable to handle the widest, thickest and most demanding tooth patterns found on the market.

Setting unit

The machine head is made out of welded steel plates. A servo motor drives the motion of the setting head. Wear parts are easy to change and made of wear resistant material. Alo 186 can set all known forms and groups of teeth with a repeated pattern of 150 mm or 6". Feeding, clamping and the motion of the setting head are timed and controlled by a PLC which facilitates new possibilities such as variable feed lengths and variable set patterns. The machine is universal and adjustments have been greatly improved. The 186-185-A version is equipped with four servo motors controlled by the measuring system for automatic adjustment of the set/symmetry when necessary.

Feed unit

The feed unit consists of 2 pairs of pneumatically compressed feeding wheels that are all driven and controlled by a servo motor.

Setting tools

Setting tools for regular tpi available as standard tools. Tools for group setting or vary pitch are custom made after specification. The hard metal dies can easily be replaced.

Coilers

All versions can be equipped with coiling systems like:
ALO 860 single coilers,
ALO 822 double coilers,
ALO 104 Cube, multi coil system.

Speed example

Average speed when setting a group of teeth with a length of:
100 mm or 4" x 150 rpm = 15 meter or 49 ft/minute.
150 mm or 6" x 120 rpm = 18 meter or 60 ft/minute.

<table>
<thead>
<tr>
<th>TECHNICAL SPECIFICATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width: 20 - 80 mm 3/4 - 3.15&quot; (100mm / 4&quot; on request)</td>
</tr>
<tr>
<td>Band thickness: 0.5 - 1.6 mm 0.02 - 0.062&quot;</td>
</tr>
<tr>
<td>Setting tolerance: ±0.02 mm ±0.001&quot;</td>
</tr>
<tr>
<td>Symmetry tolerance: ±0.02 mm ±0.001&quot;</td>
</tr>
<tr>
<td>Tooth pitch: 0.3 - 10/14 tpi</td>
</tr>
<tr>
<td>Max. group length: 150 mm 6&quot;</td>
</tr>
<tr>
<td>Feed speed: 120 feedings/min &quot;crusing speed&quot;</td>
</tr>
<tr>
<td>Air pressure: 6.3 bar 91 psi</td>
</tr>
<tr>
<td>Voltage: 400 VAC ±10%, 3-phase, 50 - 60 Hz, direct earthed system</td>
</tr>
<tr>
<td>Power consumption (at max output power): 0.5 kVA</td>
</tr>
<tr>
<td>Space requirement (LxWxH): 3.6 x 1.7 x 1.45 m 11.8 x 5.6 x 4.8 ft</td>
</tr>
<tr>
<td>Weight: 1180 kg 2600 lb</td>
</tr>
</tbody>
</table>

REMARKS:

ALO 186 can set all forms of groups and teeth with a repeated pattern of 150 mm / 6"
ALO 824

Electrical driven loop table for ALO 186

ALO 824
Designed to maintain a automatically controlled loop of band being feed into the ALO 186 setting machine. The unit has a pair of pneumatically compressed feed wheels that are driven by a frequency controlled DC motor. The two wheel drive system ensures no band slipping problems.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>20 - 80 mm</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.5 – 1.6 mm</td>
</tr>
<tr>
<td>Weight:</td>
<td>200 Kg</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Voltage:</td>
<td>230 VAC ± 5%, 3-phase, 50 – 60 Hz ± 1%</td>
</tr>
<tr>
<td>Space requirement (LxWxH):</td>
<td>1450 x 1040 x 1100 mm</td>
</tr>
</tbody>
</table>
ALO 860

Electrical driven take-up coiler for ALO 186

ALO 860

Has a sturdy design by the means of a welded steel frame and with aluminium coiler plates. The coiler is supplied with expanding centres, facilitating coil changing.

The coiler is equipped with an electrical motor and specially designed to work together with the ALO 186 setting machine.

The takeup coiler has a manual jog function as well as a pneumatically operated arm that will help to protect the tooth tips on the band from getting damages when being coiled.

The coiler can be operated both clockwise or counterclockwise.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coiler ID:</td>
<td><em>435 - 450 mm</em></td>
</tr>
<tr>
<td>Coiler ID:</td>
<td><em>1000 mm</em></td>
</tr>
<tr>
<td>Max coil weight:</td>
<td>300 kg</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Coiler height:</td>
<td>Adapted for ALO 186</td>
</tr>
<tr>
<td>Coiler height adjustment:</td>
<td>± 40 mm</td>
</tr>
<tr>
<td>Space requirement (LxWxH):</td>
<td>1200 x 1200 x 1100mm</td>
</tr>
<tr>
<td>Weight:</td>
<td>183 kg</td>
</tr>
</tbody>
</table>

*standard size, other sizes available on request*
ALO 187-B

Heavy duty setting machine with programmable feed stroke and SGS camera system for band saw blades

The new generation ALO setting machine together with the SGS camera system will help you to monitor and get in full control of the setting process and quality. The SGS system automatically adjust over all set and symmetry by servo motors.

New features include programmable linear servo feed pawl unit which enables varying feed lengths and set patterns. A new setting head sets all teeth, both sides, simultaneously and can thereby handle both longer set groups and harder band material.

Adjustments such as setting height and the feed units pick-up and drop-off positions can be saved in the HMI making the set-up or change-over of the machine easy and quick for the operator.

Another novelty is pneumatically blade guide clamping which simplifies loading and unloading and ensures that bands are guided correct.

A completely new design of the machine head and clamping unit with very few and durable parts ensures high availability and higher set precision even on more demanding sizes and materials.

**CAPACITY:**

- Band width: 20 - 100 mm
- Bland thickness: 0.4 - 1.6 mm
- Feed stroke: max 200 mm.
- Tooth pitch: 0.5 - 14 tpi
- Group lengths: 140 mm set teeth + neutral tooth/stroke
- Material: Soft or harden bands

**Setting tolerance:** ±0.01mm

**Symmetry tolerance:** ±0.01mm

(Variable length/stroke.)

- A programmable feed pawl system give new possibilities, like variable feed lengths
- Straight and fixed band back position through the machine from coiler to coiler
- New enforced clamping system that also eliminates over-clamping issues
- Automatic over all and set symmetry adjustment

**OPTIONS / ACCESSORIES:**

- ALO 61201 Grinding fixture
- ALO 61207 Grinding fixture
- ALO 83-60 Set gauge
- ALO 880 Coiler
- ALO 104 CUBE Coil handling system
The new ALO 187 band saw setting machine can handle all known forms and groups of teeth with a repeated feed pattern of max 200 mm. In addition, the machine with its new linear servo feed unit, can be set-up to alternate different stroke lengths, opening possibilities for never before seen group lengths and patterns.

The band is guided by pneumatically operated band guides to ensure that the band is held in position and also facilitates loading and unloading of the bands. Bands are always oriented from the back, and the setting head are adjusted up or down with an electrical motor for different band widths, making changeover between widths very easy for the operator.

The clamping jaws parallelism is adjusted by two micrometres in the front of the machine equipped with a display that can show both metric or inch values. The clamping jaws pressure are adjusted by a knob on the back of the unit, if clamping pressure is adjusted to high, there is a safety feature preventing mechanical failure.

The setting head can also be tilted to optimize the set result over long groups.

In the operator friendly HMI all the set related values can be saved making change-over and set-up easy for the user. A high resolution CCD/SGS camera measures the set teeth and servo motors will automatically adjust over all set and set balance.

The feed pawls and setting tools are of the same standard as on previous ALO setting machines, on certain sizes of setting tools minor adjustments are needed before use in ALO 187-B.

**TECHNICAL SPECIFICATION:**

- **Band width:** 20 - 100 mm
- **Band thickness:** 0.4 - 1.6 mm
- **Overall setting accuracy:** ± 0.01 mm
- **Symmetry accuracy:** ± 0.01 mm
- **Tooth pitch:** 0.5 - 14 TPI (Up to 32 TPI (without measuring))
- **Max set length/set cycle:** 140 mm + unset tooth
- **Max stroke/ feed length:** 200 mm
- **Air pressure:** 6.3 bar
- **Standard voltage:** 400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system, other voltages available upon request.
- **Max power consumption:** Approx 1.5 kW
- **Weight:** 1030kg
- **Space requirement (l x w x h):** 2 x 1.5 x 2 m
ALO 191
Induction tooth hardening and hot straightening of bandsaw blades

THE SYSTEM COMPRISEx:

Feed unit
Hardening generator and inductor
Straightening generator and inductor
Closed coolant system
Closed quench system

CAPACITY:

Band width 6 - 38 mm
Band thickness 0.4 - 1.3 mm
Tooth pitch 3 - 32 tpi

Hardening generator frequency 27 MHz.
Straightening generator frequency 1.5 MHz.
Tempering generator frequency 1.5 Mhz. (option)

- High efficiency and low energy consumption generators with air-cooled oscillator tubes.
- Automatic anode current control keep the anode current constant during the whole coil.
- Automatic flash guard protect the system against damage from flash-overs.
- Band feeder with a pulling 4-wheel drive system designed for accurate speed and guiding.
- Electromagnetic brake for optimal control of band tension.
- High reproducibility due to accurate digital/analogue settings of power, speed and work coils.
- Fast and easy start up and change over.

OPTIONS / ACCESSORIES:

ALO 822
Double coiler

ALO 831
Double coiler

ALO 880
Electric coiler

ALO 104 CUBE
Coil handling system
MACHINE DESCRIPTION

Band feeder
The band feeder consists of two units, one 4-wheel feed unit, the other as an adjustable brake to control the band tension by using a electromagnetic friction brake. Both units are equipped with two pairs of inclined rolls. The four rolls on the feed unit are driven by a servomotor, and the speed is controlled by a servo controller. The oscillating circuits with the inductors are located between the brake and the feed units such that the band is pulled through the inductors at a controlled tension.

Generators
The hardening and straightening generators are enclosed in separate aluminium cabinets, equipped with separate oscillating circuits connected to the cabinets via coaxial cables. The generators are air cooled, thus limiting the cooling water requirements to inductors and oscillating circuit only. The hardening generator is equipped with an automatic anode current regulator, thus ensuring a stable power during the hardening operation. The straightening generator is equipped with a chopper for infinitely variable control of the output power.

Inductors
The inductors are made of copper tubing and can be custom made for different pitches and band gauges. They are adjustable in height for different blade widths and sideways for different blade gauges. The inductors are interchangeable and can easily be replaced.

Quench system
The system is designed for liquid quenching, such as oil or polymer quenchants. It consists of quenching device for the teeth, quenchant tank built into the feeder, circulation pump, thermostat, heat exchanger, magnetic filter and a heating device for preheating of the quenchant.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>6 - 38 mm</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.4 - 1.3 mm</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>3 - 32 TPI</td>
</tr>
<tr>
<td>Capacity:</td>
<td>5 - 15 m/min</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Standard voltage:</td>
<td>400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system, other voltages available upon request.</td>
</tr>
<tr>
<td>Power consumption (at max output power):</td>
<td>20 kVA</td>
</tr>
</tbody>
</table>

ALO 191 is also available with a inline tempering generator ALO 191 - T

Other customer requirements may be discussed between customer and ALO.
ALO 191-CP
Induction tooth hardening and hot straightening of bandsaw blades

THE SYSTEM COMPRISES:
Feed unit
Hardening generator and inductor
Straightening generator and inductor
Closed coolant system
Closed quench system

CAPACITY:
Band width 6 - 38 mm ¼ - 1 ½” (other widths on request)
Band thickness 0.4 - 1.4 mm 0.016 - 0.055”
Tooth pitch 0.5 - 14 tpi
Hardening generator frequency 3 MHz.
Straightening generator frequency 1.5 MHz.
Tempering generator frequency 1.5 Mhz. (option)

• High efficiency and low energy consumption generators with air-cooled oscillator tubes.
• Band feeder with a pulling 4-wheel drive system designed for accurate speed and guiding.
• Electromagnetic brake for optimal control of band tension.
• High reproducibility due to accurate digital/analogue settings of power, speed and work coils.
• Fast and easy start up and change over.

OPTIONS / ACCESSORIES:

ALO 822
Double coiler

ALO 831
Double coiler

ALO 880
Electric coiler

ALO 104 CUBE
Coil handling system
MACHINE DESCRIPTION

Band feeder
The band feeder consists of two units, one 4-wheel feed unit, the other as an adjustable brake to control the band tension by using a electromagnetic friction brake. Both units are equipped with two pairs of inclined rolls. The four rolls on the feed unit are driven by a servomotor, and the speed is controlled by a servo controller. The oscillating circuits with the inductors are located between the brake and the feed units such that the band is pulled through the inductors at a controlled tension.

Generators
The hardening and straightening generators are enclosed in separate aluminium cabinets, equipped with separate oscillating circuits connected to the cabinets via coaxial cables. The generators are air cooled, thus limiting the cooling water requirements to inductors and oscillating circuit only. The hardening and straightening generator is equipped with a chopper for infinitely variable control of the output power.

Inductors
The inductors are made of copper tubing and can be custom made for different pitches and band gauges. They are adjustable in height for different blade widths and sideways for different blade gauges. The inductors are interchangeable and can easily be replaced.

Quench system
The system is designed for liquid quenching, such as oil or polymer quenchants. It consists of quenching device for the teeth, quenchant tank built into the feeder, circulation pump, thermostat, heat exchanger, magnetic filter and a heating device for preheating of the quenchant.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>6 - 38 mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.4 - 1.4 mm</td>
</tr>
<tr>
<td>Tooth pitch</td>
<td>1 - 14 tpi</td>
</tr>
<tr>
<td>Capacity</td>
<td>5 - 15 m/min</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Standard voltage</td>
<td>400 VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system, other voltages available upon request.</td>
</tr>
<tr>
<td>Power consumption</td>
<td>20 kVA</td>
</tr>
</tbody>
</table>

ALO 191 CP is also available with a inline tempering generator ALO 191 - CPT

Other customer requirements may be discussed between customer and ALO.
ALO 191-MS1
Induction tooth hardening, mechanical straightening of bandsaw blades

THE SYSTEM COMPRISSES:
Feed unit
Hardening generator and inductor
Mechanical straightening unit
Closed coolant system

CAPACITY:
Band width 6 - 38 mm ¼ - 1 ½" (other widths on request)
Band thickness 0.4 - 1.4mm 0.016 - 0.051"
Tooth pitch 0.5 - 6 tpi
Hardening generator frequency 3 MHz

• High efficiency and low energy consumption generators with air-cooled oscillator tubes.
• Band feeder with a pulling 4-wheel drive system designed for accurate speed and guiding.
• Electromagnetic brake for optimal control of band tension.
• High reproducibility due to parameters are saved for individual products and easy to recall
• Fast and easy start up and change over.

OPTIONS / ACCESSORIES:

ALO 822
Double coiler

ALO 831
Double coiler

ALO 880
Electric coiler

ALO 104 CUBE
Coil handling system
MACHINE DESCRIPTION

Band feeder
The band feeder consists of two units, one 4-wheel feed unit, the other as an adjustable brake to control the band tension by using an electro magnetic friction brake. Both units are equipped with two pairs of inclined rolls. The four rolls on the feed unit are driven by a servomotor, and the speed is controlled by a servo controller. The oscillating circuit with the inductor are located between the brake and the feed units such that the band is pulled through the inductor at a controlled tension.

Generator
The hardening generator are enclosed in a separate aluminium cabinet, equipped with separate oscillating circuit connected to the cabinet via coaxial cable. The generator are air cooled, thus limiting the cooling water requirements to inductor and oscillating circuit only. The generator is equipped with a chopper for infinitely variable control of the output power.

Inductors
The inductors are made of copper tubing and can be custom made for different pitches and band gauges. They are adjustable in height for different blade widths and sideways for different blade gauges. The inductors are interchangeable and can easily be replaced.

Straightening device
The straightening device consists of a pair of rolls situated between the hardening and tempering inductors. The rolls are driven and are mechanically adjustable in height for different band widths. The straightening force is mechanically controlled by a fine threaded screw system.

TECHNICAL SPECIFICATION:

- Band width: 6 - 38 mm
- Band thickness: 0.4 - 1.4 mm
- Tooth pitch: 0.5 - 6 tpi
- Capacity: 5 - 15 m/min
- Air pressure: 6.3 bar
- Standard voltage: 400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system

Power consumption (at max output power): 20 kVA

ALO 191-MS1 is also available with a inline tempering generator ALO 191-MST1

Other customer requirements may be discussed between customer and ALO.
ALO 191-MS-4
Induction tooth hardening with bend straightening and mechanical pinch roller straightening unit

HIGHLIGHTS:

- High efficiency and low energy consumption generator with air-cooled oscillator tube.
- Automatic anode current control keep the anode current constant during the whole coil.
- Automatic flash guard protect the system against damage from flash-overs.
- Band feeder with a pulling 4-wheel drive system designed for accurate speed and guiding.
- Electromagnetic brake for optimal control of band tension.
- High reproducibility due to accurate digital/analogue settings of power, speed and work coils.
- Fast and easy start up and change over.

THE SYSTEM COMPRISSES:

- Band feed unit
- Hardening generator and inductor
- Closed coolant system
- Closed quench system
- Bend straightening unit
- Pinch roller straightening unit

CAPACITY:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>6 - 38 mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.4 - 1.3 mm</td>
</tr>
<tr>
<td>Tooth pitch</td>
<td>3 - 32 tpi</td>
</tr>
<tr>
<td>Capacity</td>
<td>5-15 m/min</td>
</tr>
<tr>
<td>Hardening generator frequency</td>
<td>27 MHz.</td>
</tr>
<tr>
<td>Tempering generator frequency</td>
<td>1.5 Mhz. (option)</td>
</tr>
</tbody>
</table>

OPTIONS / ACCESSORIES:

- **ALO 90915/16/17/18**
  - Collapsible coil center

- **ALO 831**
  - Double coiler

- **ALO 880**
  - Electric coiler

- **ALO 104 CUBE**
  - Coil handeling system
MACHINE DESCRIPTION

Band feeder
The band feeder consists of two units, one 4-wheel feed unit, the other as an adjustable brake to control the band tension by using a electro magnetic friction brake. Both units are equipped with two pairs of inclined rolls. The four rolls on the feed unit are driven by an asynchronous motor, and the speed is controlled by a frequency controller. The oscillating circuit with the inductor is located between the brake and the feed units such that the band is pulled through the inductor at a controlled tension.

Generator
The hardening generator is enclosed in separate aluminium cabinets, equipped with separate oscillating circuits connected to the cabinets via coaxial cables. The generator is air cooled, thus limiting the cooling water requirements to inductor and oscillating circuit only. The hardening generator is equipped with an automatic anode current regulator, thus ensuring a stable power during the hardening operation.

Inductors
The inductors are made of copper tubing and can be custom made for different pitches and band gauges. The inductors are interchangeable and can easily be replaced from one type to another.

Quench system
The system is designed for liquid quenching, such as oil or polymer quenchants.

Bend straightening unit
A section of the bench are hinged in such manner that the band can be bent over a high point to counteract camber effect during teeth hardening on the most narrow bands, typically 6-12mm width.

Mechanical pinch roller straightening unit
The second straightening device consists of a pair of rolls situated after the quench tank. The mechanical straightening unit are best suited to work within the band widths of 12-20 mm, thickness of 0,45-0,6 mm with TPI between 3-6 TPI.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>6 - 38 mm</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.4 - 1.3 mm</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>3 - 32 TPI</td>
</tr>
<tr>
<td>Capacity:</td>
<td>5 - 15 m/min</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Standard voltage:</td>
<td>400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system, other voltages available upon request.</td>
</tr>
</tbody>
</table>

Power consumption (at max output power): 10 kVA

Other customer requirements may be discussed between customer and ALO.
ALO 191S
Induction tooth hardening of bandsaw blades

THE SYSTEM COMPRISSES:
Feed unit
Hardening generator and inductor
Closed coolant system

CAPACITY:
Band width 6 - 50 mm
Band thickness 0.6 - 1.4 mm
Tooth pitch 0.5 - 4 tpi

• High efficiency and low energy consumption generator with air-cooled oscillator tube.
• Band feeder with a pulling 4-wheel drive system designed for accurate speed and guiding.
• Electromagnetic brake for optimal control of band tension.
• High reproducibility due to accurate digital/analogue settings of power, speed and work coils.
• Fast and easy start up and change over.

OPTIONS / ACCESSORIES:

ALO 822
Double coiler

ALO 831
Double coiler

ALO 880
Electric coiler

ALO 104 CUBE
Coil handling system
MACHINE DESCRIPTION

Band feeder
The band feeder consists of two units, one 4 wheel feed unit and one two wheel unit with an adjustable brake to control the band tension using an electromagnetic friction brake. The rolls are made of hardend tool steel with knurled circumference. The four rolls on the feed unit are driven by an AC-motor. The speed is controlled by a frequency controller. The oscillating circuit with the inductor are located between the brake and the feed units such that the band is pulled through the inductor at a controlled tension. The teeth are quenched in air by means of a pair of nozzlers.

Generator
The hardening generator is enclosed an aluminium cabinet and equipped with a separate oscillating circuit connected to the cabinet via a coaxial cable. The generator is air cooled, thus limiting the cooling water requirements to inductor only. The generator is equipped with a chopper for infinitely variable control of the output power.

Inductor
The inductor is made of copper tubing and can be custom made for different pitches and band gauges. They are adjustable in height for different blade widths and sideways for different blade gauges. The inductors are interchangeable and can easily be replaced.

Closed circuit coolant/circulation system
The closed circuit cooling system is used for cooling of HF-generators and similar equipment where clean nonconductive cooling water with controlled temperature and constant water pressure is required.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>6 - 50 mm (other widths on request)</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.6 - 1.4 mm</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>0.5 - 4 TPI</td>
</tr>
<tr>
<td>Capacity:</td>
<td>5 - 10 m/min</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Standard voltage:</td>
<td>400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system (other voltages available upon request)</td>
</tr>
<tr>
<td>Power consumption (at max output power):</td>
<td>10 kVA</td>
</tr>
</tbody>
</table>

Other customer requirements may be discussed between customer and ALO.
ALO 198H QUICK QUENCH

ALO 198H Quick Quench
The quick quench system consists of a blower and a cooling unit build in stainless steel. The quick quenching of the hot band is done by high volume of cool protective gas soaking the band. The gas is circulated in a closed loop system to avoid colorization or scale on the band. The hot gas is effectively cooled in a gas/water heat exchanger tank.

Blower unit
The blower head is equipped with blocks of nozzles that can be adjusted to match different band widths to optimize the quenching effect. The unit are equipped with a filter and are easy to open for service. The blower unit should be connected to the furnace muffle and are allowed to move on guides to self-compensate length vice for temperature related movements. It also allows larger side movements for service purpose.

HIGHLIGHTS
- The system can be integrated to any existing hardening system where quick quenching of bands are needed
- The system monitors airflow, water temps, in and outgoing gas temps giving a good overview of the process
- Bands are quenched only with high velocity protective gas and no contact against the bands
- Air nozzle blocks can be adjusted for different band widths for most effective quenching
- Air pump can be regulated by means of a frequency controller to tune and keep electrical consumption low

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>12 - 80 mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.9 - 1.6 mm</td>
</tr>
<tr>
<td>Quench effect</td>
<td>15-30 kW depending on system setting</td>
</tr>
<tr>
<td>Voltage</td>
<td>400 VAC, 3-phase, 50 - 60 Hz direct earthed system</td>
</tr>
<tr>
<td>Power consumption average</td>
<td>3.5 kVA</td>
</tr>
<tr>
<td>Power consumption max</td>
<td>9 kVA</td>
</tr>
</tbody>
</table>

The system requires an external coolant water source as well as an external protective gas source.

Other customer requirements may be discussed between customer and ALO.
ALO 198-ILTA Mk.IV.
Continuous hardening and inline tempering of bi-metal bandsaw blades.

ALO 198-ILTA Mk.IV is one of the fastest and most cost effective system compared to other bi-metal hardening systems on the market.

- Can be operated with 2-3 times higher speeds compared to other systems.
- Reducing your energy consumption dramatically compared to pit furnace concept.
- Reducing your energy consumption to half compared to other induction heating system.
- Process time and cost will improve dramatically when minimizes the handling and operations such as recoiling- straightening and separate tempering operations.

Thanks to:
- Induction pre-heating with Litz coils before hardening and tempering furnaces.
- Properly insulated furnace system with high quality heating elements.
- Highly efficient Quick Quench system.
- Multi band feed system with exceptional well controlled band feeding and tensioning.
- A Central PLC that is handling all process parameters.

THE SYSTEM COMPRISES:
3 times band feed and tension units.
Generator and inductor for pre-heating before hardening.
High temperature hardening furnace.
Quick Quench after hardening.
Generator and inductor for pre-heating before tempering 1.
Tempering 1 furnace.
Quick Quench after tempering 1.
Generator and inductor for pre-heating before tempering 2.
Tempering 2 furnace.
Quick Quench after tempering 2.
Closed cooling system for generators and inductors.
Flying shear.
Central control and power distribution system.
(Optional band coiling systems available)

HIGHLIGHTS:
- One in line operation complete hardening and tempering operation.
- High output capacity, up to 4 meters/minute.
- Short lead time, 6-8 minutes from coil to coil.
- Low cost-meter band produced.
- Eliminating recoiling and separate tempering operation.
- Reduce or eliminate need of camber straightening.
- Low energy cost thanks to induction band pre heating.
- Low cost and high capacity Quick quench system.
- Full process control and coil histogram by central control table.

CAPACITY:
Band width: 25 - 80 mm 0.8 - 3.165”
Band thickness: 0.9 - 1.6 mm 0.035 - 0.063”
Speed example, 27 x 0.9 mm: 3.0 - 4.0 m/min
**MACHINE DESCRIPTION**

**Optional Band Coiling System (picture 1 and 2)**

**Pay off and take up double coilers**
Double coilers built on a sturdy welded stand.
Pay off is unpowered with friction brakes.
Take up is driven by an AC motor with gear box.
Equipped with folding coil protector and expandable centers which can be removed to facilitate loading.

**Cube pay off and take up system**
The Cube will dock to a hydraulic elevator that automatically locks the Cube.
From the elevators control panel each cube-shelf can be indexed by the operator. On the take up side, the cube elevator also is equipped with power unit for singel coil drive.

**Band loop accumulator (picture 3)**
The band accumulator will towards end of each coil be activated to generate a loop of band. This will give time to weld coils together and facilitate continuous hardening/tempering.

**Band feed/tensioning unit (picture 4)**
A total of three feeding and tensioning units are included in the line, equipped with three pairs of feed rolls as all driven by a DC-motor. Each roll is driven and each pair is mechanically compressed. The speed is infinitely variable between 0 - 5 m/min and the torque can be controlled to give optimum tensioning of the band in the hardening furnace. All band feeding units are monitored and controlled by the central PLC line control for optimal band feeding. The third (3) band feed unit is equipped with a flying pneumatic shear for cutting band samples.

**Induction preheating before hardening and tempering (picture 5)**
Band is pre-heated by induction before entering the hardening and tempering furnace to allow band maximum time at temperature for proper transformation. Each furnace have a preheating unit capable of heating the bands up to approx 750°C.

After the preheating inductors, an infrared thermometer monitor and report band temperature to the PLC system. Nitrogen is introduced through the box lid. By using Litz-coils, the induction heating efficiency rate will be significantly better than other available technologies in the market and capable to deliver well over 90% of energy consumed to the band compared to 40-45% for conventional induction systems. Induction coils are designed as separate flat coils on both sides of the band and thereby easily open for service.

The output power is continuously controllable by frequency converter and a current breaker protects the generator in the event of a short circuit or overload.
High temperature hardening furnace (picture 6)
The high temperature muffle furnace is designed and build for hardening temperature of approximately 1160 – 1220 °C and divided into six separate heating zones, with totally 60 kW to be distributed individually to each zone. The furnace is made of a stable steel casing with a separate ceiling section. The ceiling can be swing opened for easy access to the heating chamber for service reasons. The heating elements are arranged freely radiating in the furnace walls and are designed for an intrinsic temperature up to max 1380 °C. The muffle and band guides are made of a high temperature resistant alloy, Inconel 602, and kept in a straight condition by an automatic mechanical stretching device.

Quick Quench zone (picture 7)
The quick quenching of the hot band is done by high volume of cool protective gas soaking both sides of the band. The gas is circulated in a closed loop system to avoid colorization or scale on the band. The hot gas is effectively cooled in a gas/water heat exchanger tank. The blower head is equipped with an air filter and blocks of nozzles that can be adjusted to match different band widths to optimize the quenching effect. The blower unit head is placed on a special floor stand allowing muffle expansion and retraction as well as a larger side movement for easy access to muffle.

Tempering 1 and 2 furnace
The muffle furnaces are light weight construction, made of rectangular profiles and angle-iron bars. In order to obtain a low surface temperature the outer shutting is distanced from the furnace body. The furnace body is made of two separate sections, one top and one bottom section to facilitate service. The furnace is insulated with a multi layer made of light-weight ceramic blocks and ceramic fibre boards. The wire helix heating elements of high quality heating conductor alloy, imbedded in ceramic fibre insulation in the furnace walls. The furnace is divided in four separate heating zones, with 12kW to be distributed individually to each zone.

Master control panel (picture 8)
The electrical power supply is modular by the use of Schneider Canalis that simplify installation and allowing future modifications and/or upgrading of the line. The setting- handling and control of all process parameters is executed in a Profi Bus D.P. system as mastered by a Siemens S7 1200 PLC unit. All data is entered and presented on a Siemens Comfort Touch Panel 15". Import or export of process data is available via an Ethernet communication module.

Software includes:
- System set up by band recipe handling
- Central monitoring and recording of related parameters.
- On line graphic presentation of process data
- External communication via Ethernet module
- Band batch and coil histogram recording
## TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>20 - 80mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.9 - 1.6 mm</td>
</tr>
<tr>
<td>Air pressure</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Mains voltage</td>
<td>400 VAC ±10%</td>
</tr>
<tr>
<td>Power consumption at max. output power</td>
<td>170 kVA (complete system)</td>
</tr>
<tr>
<td>Preheating HF generator, hardening max. output power</td>
<td>37 kW</td>
</tr>
<tr>
<td>Preheating HF generators, tempering max. output power</td>
<td>24 kW</td>
</tr>
</tbody>
</table>

## SPEED AND ENERGY CONSUMPTION EXAMPLE:

<table>
<thead>
<tr>
<th>Size</th>
<th>Speed</th>
<th>Energy Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 x 0.9mm</td>
<td>3.0 – 4.0 meter/min</td>
<td>57 – 68 kWh</td>
</tr>
<tr>
<td>34 x 1.1 mm</td>
<td>2.0 – 2.8 meter/min</td>
<td>55 – 63 kWh</td>
</tr>
<tr>
<td>42 x 1.1 mm</td>
<td>1.5 – 2.3 meter/min</td>
<td></td>
</tr>
<tr>
<td>54 x 1.3 mm</td>
<td>1.0 – 1.5 meter/min</td>
<td></td>
</tr>
<tr>
<td>67 x 1.3 mm</td>
<td>1.0 – 1.3 meter/min</td>
<td></td>
</tr>
<tr>
<td>67 x 1.6 mm</td>
<td>0.8 – 1.2 meter/min</td>
<td></td>
</tr>
<tr>
<td>80 x 1.6 mm</td>
<td>0.6 – 1.0 meter/min</td>
<td></td>
</tr>
</tbody>
</table>

## TECHNICAL SPECIFICATION HARDENING FURNACE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of furnace</td>
<td>Electrically heated pull-through muffle furnace</td>
</tr>
<tr>
<td>Process</td>
<td>Austenitizing of HSS</td>
</tr>
<tr>
<td>Approx. operating temperature</td>
<td>1160 -1220°C</td>
</tr>
<tr>
<td>Approx. connected power</td>
<td>Approx. 60 kW</td>
</tr>
<tr>
<td>Heating power</td>
<td>Approx. 60 kW</td>
</tr>
<tr>
<td>Approx. weight</td>
<td>4800 kg</td>
</tr>
</tbody>
</table>

## TECHNICAL SPECIFICATION TEMPERING FURNACE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of furnace</td>
<td>Electrically heated pull-through muffle furnace</td>
</tr>
<tr>
<td>Process</td>
<td>Tempering of HSS</td>
</tr>
<tr>
<td>Approx. operating temperature</td>
<td>600 - 750°C</td>
</tr>
<tr>
<td>Approx. connected power</td>
<td>Approx. 12 kW</td>
</tr>
<tr>
<td>Heating power</td>
<td>Approx. 12 kW</td>
</tr>
<tr>
<td>Approx. weight</td>
<td>3000 kg</td>
</tr>
</tbody>
</table>

## TECHNICAL SPECIFICATION DOUBLE PAYOFF COILER. (OPTION)

For more information please refer to our brochure ALO 831

## TECHNICAL SPECIFICATION CUBE PAYOFF SYSTEM. (OPTION)

For more information please refer to our brochure ALO 104

Other customer requirements on request.
ALO 198-PREHEAT-A
Induction pre-heating of band saw blades

THE SYSTEM COMPRISES:
- Work coil and generator
- Work coil against furnace muffle assembly
- HMI

CAPACITY:
- Band width: 20 - 85mm
- Band thickness: 0.6 - 1.6mm
- Heating capacity: up to 750°C

- Can be integrated to any existing hardening or tempering furnace to boost the output rate
- High efficiency rate, some 85% or more by use of Litz coils imbedded in magnetic flow material SM²C®!
- The heater have in principle no magnetic stray fields eliminating medical risks
- Work coils are very robust and easy to service and operate
- Reduce energy consumption (compared with conventional induction heaters with efficiencies of 55%)
MACHINE DESCRIPTION

Heaters
By the new Induction technology it’s possible to design inductors as separate flat coils on both sides of the band saw blade allowing easy access for service. In the gap for the band insulation material eliminates heat to reflect back from the band to the heaters. The SM2C®-material is the essential magnet flux leader which with correctly adopted permeability induces the right temperature in the band.

The heater is mounted against a motorized mounting plate that can be lowered to a service position giving access to the furnace muffle. The individual heaters can easily be dismounted giving access for service of for example the heaters insulation. The heater and the mounting plate should be assembled to an existing furnace/muffle and will keep the protective gas atmosphere since the unit are mounted against muffle and sealed on the band entrance side.

Internal cooling
Even if the system delivers over 85% of energy to the band it’s still required with an inductor water cooling system. Cooling tubes for the excess heat are integrated into the inductors, and the internal water/liquid heat exchanger in cabinet generates cooling for inverters, inductors and supply lines.

HMI
The system is supplied with a Siemens PLC and operator terminal where parameterizing are made.

Environment and Economy
An important aspect in choosing a heater constructed by casting Litz coils into soft magnetic composite material, SM2C®, is the reduced energy consumption. This heaters high efficiency of 85% or more shall be compared with efficiencies of 55% for conventional induction heaters.

By using of this type of Induction heating equipment in two shift/day, means in comparison to existing induction alternatives an energy savings in the range of 90 MWh per year.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>20 - 85mm</td>
</tr>
<tr>
<td>Band thickness</td>
<td>0.6 - 1.6mm</td>
</tr>
<tr>
<td>Heating capacity</td>
<td>Up to 750°C</td>
</tr>
<tr>
<td>Heating capacity/speed</td>
<td>27x0,9mm @5m/min 600°C</td>
</tr>
<tr>
<td>PLC system</td>
<td>Siemens S7 1200</td>
</tr>
<tr>
<td>Voltage</td>
<td>400 VAC 3-phase, 50-60 Hz direct earthed system</td>
</tr>
<tr>
<td>Max power consumption</td>
<td>14 kVA</td>
</tr>
</tbody>
</table>

The system requires an external cooling system
ALO 199

Back hardening and tempering, tooth hardening and hot straightening of carbon steel band saw blades

THE SYSTEM COMPRISES:
- Back hardening generator and inductor
- Back tempering generator and inductor
- Tooth hardening generator and inductor
- Straightening generator and inductor
- Closed cooling system
- Band feeder
- Quench system
- Universal clarifier for the quenchant

CAPACITY:
- Band width: 6 - 32 mm (¼ - 1 ¼"
- Band thickness: 0.64 - 1.07 mm (0.025 - 0.042"
- Tooth pitch: 1 - 14 tpi
- Speed capacity: 5 - 9 m/min (15 - 30 ft / min

OPTIONS / ACCESSORIES:
- ALO 822
  - Double coiler
- ALO 831
  - Double coiler
- ALO 880
  - Electric coiler
- ALO 104 CUBE
  - Coil handing system
MACHINE DESCRIPTION

Band feeder
The band feeder consists of two units, one 6-wheel feed unit, the other as an 4 wheel adjustable tension control using an electro magnetic friction brake. The six rolls on the feed unit are driven by a servomotor, and the speed is controlled by a servo controller. The inductors are located between the brake and the feed units such that the band is pulled through the inductors at a controlled tension.

Generators
The generators are enclosed in separate aluminium cabinets. The tooth hardening and straightening generators are air cooled, while the back hardening and tempering are water cooled. The tooth hardening generator are equipped with a chopper for infinitely variable control of the output power.

Inductors
The inductors are made of copper tubing and can be custom made for different pitches and band gauges. They are adjustable in height for different blade widths and sideways for different blade gauges. The inductors are interchangeable and can easily be replaced. The inductors for back hardening are made of copper and designed for uniform heating of the whole of the bandsaw blades. They are easily exchangeable for service or replacement.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width:</td>
<td>6 - 32 mm</td>
</tr>
<tr>
<td>Band thickness:</td>
<td>0.64 - 1.07 mm</td>
</tr>
<tr>
<td>Tooth pitch:</td>
<td>1 - 14 TPI</td>
</tr>
<tr>
<td>Capacity:</td>
<td>5 - 9 m/min</td>
</tr>
<tr>
<td>Air pressure:</td>
<td>6.3 bar</td>
</tr>
<tr>
<td>Standard voltage:</td>
<td>400VAC ±10% 3-phase, 50-60 Hz ±1% directly earthed system, other voltages available upon request.</td>
</tr>
<tr>
<td>Power consumption (at max output power):</td>
<td>95 kVA</td>
</tr>
<tr>
<td>Weight:</td>
<td>900 kg</td>
</tr>
<tr>
<td>Space requirement (l x w x h):</td>
<td>8 x 2 m</td>
</tr>
</tbody>
</table>

Other customer requirements may be discussed between customer and ALO.
NORMAC BS 35 / BS 45
Automatic grinding machine for band saw blades

EXCLUSIVE FEATURES OF THE BS35 AND BS45 AUTOMATIC BAND SAW GRINDING MACHINES

• FULLY AUTOMATIC OPERATION
• FULLY ENCLOSED GRINDING CHAMBER
• AUTOMATIC LUBRICATION
• HARDENED AND GROUND WHEEL AND DRESSER SLIDES
• PRECISION GRINDING SPINDLE
• HEAVY DUTY, COMPACT DESIGN
NORMAC’S BAND SAW GRINDING MACHINES GREATLY IMPROVE THE QUALITY AND CONSISTENCY OF BAND SAW BLADE PRODUCTION

Both models can fully automatically grind straight or variable pitches from 1 to 32 TPI in one plunge with a band stock reciprocation, up to 10 degrees positive rake angle. Machines capable to grind band widths from 6 to 66 mm in a band stack up to 13 mm thickness.

The BS 35 model is equipped with an automatic diamond roll dressing system that is adjustable for depth of dress and for the number of grinding cycles between dressing operations. The machine also includes an automatic dress-in feature for automatically dressing tooth forms in new grinding wheels.

The BS45 is equipped with a 2 axis CNC dressing.

The Grind Vise Slides are mounted on extra precision Preloaded Linear Bearing Ways providing maximum rigidity and nearly frictionless motion on all Normac Band Saw Machines.

Precision Grinding Spindle Cartridge type, lubricated for life, driven by a 40 HP motor.

Fully Enclosed Grinding Chamber For a cleaner, quieter grinding environment.

Fully Automatic Lubrication Reduces parts wear and maintenance. Automatic consumable burr plate system.

Production rate example:

- 3 tpi. band thickness 1.2 mm = 225 m / hr.
- 18 tpi. band thickness 0.9 mm = 225 m / hr.

**TECHNICAL SPECIFICATION:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>6 - 66 mm</td>
</tr>
<tr>
<td>Band stack thickness</td>
<td>&lt; 13 mm</td>
</tr>
<tr>
<td>Pitch</td>
<td>2 - 32 T.P.I.</td>
</tr>
<tr>
<td>Vari. Pitch</td>
<td>2 - 6 T.P.I. Up to 90 mm repeat patterns.</td>
</tr>
<tr>
<td></td>
<td>6 - 32 T.P.I. Up to 40 mm repeat patterns.</td>
</tr>
<tr>
<td>Typical Cycle times</td>
<td>3 T.P.I. - 18 sec.</td>
</tr>
<tr>
<td>Materials</td>
<td>Bi-metal or carbon steel, fully annealed or hardened.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Tooth height to within 0.002 mm in 100 mm band length.</td>
</tr>
<tr>
<td>Weight</td>
<td>4350 Kg</td>
</tr>
<tr>
<td>Electrical requirement</td>
<td>230, 38, 415 &amp; 60 or 575 V.A.C. 50 or 60 Hz, 3 phase, 38 KW.</td>
</tr>
</tbody>
</table>
NORMAC BS 75
Automatic grinding machine for band saw blades

EXCLUSIVE FEATURES BS75 AUTOMATIC BAND SAW GRINDING MACHINE
• EASY DATA ENTRY
• FULLY AUTOMATIC OPERATION
• CNC CONTROLLED TOOTH FORM
• FULL CNC OPERATION INCLUDING STOCK FEEDING, WHEEL POSITIONING AND WHEEL DRESSING
• DESIGNED FOR HIGH PRODUCTION
• AUTOMATIC SELF-COMPENSATING DRESSER SYSTEM
• FULLY ENCLOSED GRINDING CHAMBER

www.normac.com
MACHINE DESCRIPTION

Normac’s Band Saw Grinding Machines greatly improve the quality and consistency of band saw blade production. Model BS75 uses a plunge grind method, but allows either full tooth form grinding with band stock oscillation, or alternate tooth grinding with multiple grinding plunges.

FEATURES:

- Full CNC operation including stock feed, wheel dressing, plunge grind and tooling choice.
- Easy data entry.
- Operator friendly controls.
- Fully automatic lubrication reduces parts wear and maintenance.
- CNC controlled tooth form.
- Self compensating, rigid, hydraulically driven diamond rotary disc, is CNC controlled, allowing a wide variety of tooth forms.
- Small floor space required, easy accessibility for quick setups and changeovers.
- Precision grinding spindle cartridge type, lubricated for life, driven by a 50 HP motor.
- Fully enclosed grinding chamber for a cleaner, quieter grinding environment and the sliding hood opens for ease of setup and maintenance.

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band width</td>
<td>25 - 101 mm 1” to 4”</td>
</tr>
<tr>
<td>Band stack thickness</td>
<td>13 mm 0,5”</td>
</tr>
<tr>
<td>Pitch</td>
<td>0,67 - 10 T.P.I.</td>
</tr>
<tr>
<td>Repeat pattern</td>
<td>175 mm 7”</td>
</tr>
<tr>
<td>Max form dept</td>
<td>17 mm 0.700”</td>
</tr>
<tr>
<td>Grinding: Method</td>
<td>Full tooth grinding with reciprocation or alternate tooth grinding.</td>
</tr>
<tr>
<td>Materials</td>
<td>Bi-metal or carbon steel material, fully annealed or hardened.</td>
</tr>
<tr>
<td>Rake</td>
<td>Up to 15 degree positive rake.</td>
</tr>
<tr>
<td>Coolant required</td>
<td>375 P.S.I. (25 BARS), 130 G.P.M. (500 L/M).</td>
</tr>
</tbody>
</table>
IDEAL BAS 050
Butt welding machines for bandsaws

For many years IDEAL is the market leader for bandsaw welding machines for wood and metal cutting bandsaws of any type.

Our Butt Welding Machines Type BSS are used for wood cutting saws, and carbon steel metal bandaws. A weld takes just seconds - operation is very easy.

Our Flash Butt Welding Machines Type BAS are used for top quality welds for all types of bandsaws including bimetallic, alloy stainless steel and high carbon steel. The flashing process and the following upset of the weld at very high pressure produces a top quality weld.

Our machines are used at bandsaw manufacturers, blade distributors and saw doctors. The BAS machines are suitable to weld very thin strip (down to 0.35 mm).

Why not use the experience of the market leader for bandsaw welding equipment!

BAS050-01/BAS050-11
The BAS050 has been designed for welding of bands up to 50mm in width and 0.4mm in thickness. We have made this machine easily adjustable for manufactures that need to change band sizes during production at a moments notice. The BAS050 can be equipped with a pyrometer to provide the operator an accurate tool for measurement and adjust the annealing temperature.

<table>
<thead>
<tr>
<th>TECHNICAL SPECIFICATION:</th>
<th>BAS050-01</th>
<th>050-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity at 50% duty cycle, kVa</td>
<td>4,5</td>
<td>4,5</td>
</tr>
<tr>
<td>Metal (bi-metall, tungsten)</td>
<td>6 - 34 mm</td>
<td>0.23” - 1.33”</td>
</tr>
<tr>
<td>Wood-cutting</td>
<td>6 - 50 mm</td>
<td>0.23” - 1.97”</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>6 - 30 mm</td>
<td>0.23” - 1.18”</td>
</tr>
<tr>
<td>Bandknives for leather, foam</td>
<td>6 - 30 mm</td>
<td>0.23” - 1.18”</td>
</tr>
<tr>
<td>Steel strip (Plain) max cross section</td>
<td>70 mm²</td>
<td>0.11 sq in</td>
</tr>
<tr>
<td>Steel strip max clamping width</td>
<td>70 mm</td>
<td>2.75”</td>
</tr>
<tr>
<td>Net Weight</td>
<td>140 kg</td>
<td>309 lbs</td>
</tr>
</tbody>
</table>
IDEAL BAS 051 - BAS 052

Butt welding machines for bandsaws

For many years IDEAL is the market leader for bandsaw welding machines for wood and metal cutting bandsaws of any type.

Our Butt Welding Machines Type BSS are used for wood cutting saws, and carbon steel metal bandaws. A weld takes just seconds - operation is very easy.

Our Flash Butt Welding Machines Type BAS are used for top quality welds for all types of bandsaws including bimetallic, alloy stainless steel and high carbon steel. The flashing process and the following upset of the weld at very high pressure produces a top quality weld.

Our machines are used at bandsaw manufacturers, blade distributors and saw doctors. The BAS machines are suitable to weld very thin strip (down to 0.35 mm).

Why not use the experience of the market leader for bandsaw welding equipment!

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th></th>
<th>BAS051</th>
<th>BAS052</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity at 50% duty cycle, kVA</td>
<td>7,5</td>
<td>25</td>
</tr>
<tr>
<td>Metal (bi-metall, tungsten)</td>
<td>6 - 41 mm</td>
<td>6 - 50 mm</td>
</tr>
<tr>
<td>Wood-cutting</td>
<td>6 - 50 mm</td>
<td>6 - 50 mm</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>6 - 30 mm</td>
<td>6 - 30 mm</td>
</tr>
<tr>
<td>Bandknives for leather, foam</td>
<td>6 - 50 mm</td>
<td>6 - 50 mm</td>
</tr>
<tr>
<td>Steel strip (Plain) max cross section</td>
<td>100 mm²</td>
<td>125 mm²</td>
</tr>
<tr>
<td>Steel strip max clamping width</td>
<td>50 mm</td>
<td>50 mm</td>
</tr>
<tr>
<td>Net Weight</td>
<td>460 kg</td>
<td>460 kg</td>
</tr>
</tbody>
</table>

www.ideal-werk.de
For many years IDEAL is the market leader for bandsaw welding machines for wood and metal cutting bandsaws of any type.

Our Butt Welding Machines Type BSS are used for wood cutting saws, and carbon steel metal bandaws. A weld takes just seconds - operation is very easy.

Our Flash Butt Welding Machines Type BAS are used for top quality welds for all types of bandsaws including bimetallic, alloy stainless steel and high carbon steel. The flashing process and the following upset of the weld at very high pressure produces a top quality weld.

Our machines are used at bandsaw manufacturers, blade distributors and saw doctors. The BAS machines are suitable to weld very thin strip (down to 0.35 mm).

Why not use the experience of the market leader for bandsaw welding equipment!

BAS100/120

The BAS100/BAS120 are the largest machines in this series designed for welding of bands up to 100mm/120mm in width and from 0.4mm in thickness. These machines can be equipped with the PK monitoring system that will monitor for consistency in production along with the GSR for automatic annealing and adjusting of annealing temperature. We can also equip the machines with a special deburring unit that will remove the majority of the weld burr during anneal and will reduce the finishing time by up to 95%. When it comes to welding larger bands the Ideal BAS100/BAS120 are ready to provide your customers with the quality bands they will expect.
OPTIONS

Flash Butt Welders of type BAS can be equipped with various options. You decide on the optimal, tailor-made machine concept according to your individual requirements:

• Automatic Thyristor annealing device with infra-red spectral pyrometer for automatic adjustment of annealing temperature of several, pre-selected and graded reference values

• Electronic parameter control for monitoring of welding current, upsetting force and welding time, with printer interface for external parameter documentation

• Pneumatically operated centering device for strip ends in the clamping device

• Clamping device for band knives with spring suspended and separately adjustable pressure segments

• Hydraulic deburring tool for removal of weld burr from both flat sides of blades

TECHNICAL SPECIFICATION:

<table>
<thead>
<tr>
<th></th>
<th>BAS100</th>
<th>BAS120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity at 50% duty cycle, kVA</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Metal (bi-metall, tungsten)</td>
<td>15 - 81 mm, 0,59&quot; - 3,19&quot;</td>
<td>25 - 105 mm, 0,98&quot; - 4,13&quot;</td>
</tr>
<tr>
<td>Wood-cutting</td>
<td>15 - 100 mm, 0,59&quot; - 3,94&quot;</td>
<td>25 - 120 mm, 0,98&quot; - 4,72&quot;</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>15 - 50 mm, 0,59&quot; - 1,97&quot;</td>
<td>25 - 60 mm, 0,98&quot; - 2,36&quot;</td>
</tr>
<tr>
<td>Bandknives for leather, foam</td>
<td>25 - 80 mm, 0,98&quot; - 3,15&quot;</td>
<td>30 - 100 mm, 1,18&quot; - 3,94&quot;</td>
</tr>
<tr>
<td>Steel strip (Plain) max cross section</td>
<td>150 mm², 0,23 sq in</td>
<td>180 mm², 0,28 sq in</td>
</tr>
<tr>
<td>Steel strip max clamping width</td>
<td>100 mm, 3,93&quot;</td>
<td>120 mm, 4,72&quot;</td>
</tr>
<tr>
<td>Net Weight</td>
<td>600 kg, 1323 lbs</td>
<td>625 kg, 1378 lbs</td>
</tr>
</tbody>
</table>
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FOR LIFE