

ABRASIVE CUTTING

# SERVOCUT 602



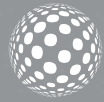


# MULTI-TARGET

AUTOMATIC ABRASIVE CUTTING MACHINE



# SERVOCUT 602



SERVOCUT 602 is an advanced high capacity cutting machine especially designed for cutting extra-large and multiple specimens.

- Modern and sturdy design
- Extra Large Cutting Capacity
- Extraordinary access for easy handling
- Unique belt protection system
- Programmable with colored HMI touch screen controls
- X-Y-Z three axes cutting capability
- Ergonomic Joystick control offers excellent application versatility
- Cut-Off Wheel Diameter Measurement
- Inbuilt Lubrication System

## DESIGN

SERVOCUT 602, an advanced high capacity cutting machine, offers advantage of combining different cutting techniques and methods to obtain superior cut surfaces for a broad range of heavy-duty cutting applications.

SERVOCUT 602 has a robust and reliable design with low noise and emission levels. The modern and sturdy design with powerful 15 kW cutting motor ensures fast and efficient cutting through the hardest and complex materials with precise servo motor driven axis controls.

**SERVOCUT 602 has X-Y-Z triple axes cutting capability:**

### Z-axis Chop cutting

The specimen is clamped and the cut-off wheel approaches the specimen.

### Y-axis Table-feed cutting

Feeding the clamped specimen into a rotating cut-off wheel using a T-slotted feed table.

### X-axis Parallel Cutting

Parallel serial sectioning in the x-axis with cutting wheel movement.

A large, stainless steel T-slotted feed table located in the cutter's generous work area can accommodate a variety of different clamping devices which need to be selected. The servo driven table provides a long travel depth making the SERVOCUT 602 ideal for cutting long or deep samples up to 100Hx500D in a single pass or 200Hx550D with optional Combined Cut feature.

The front sliding door and side cover can be completely opened for easy access and handling to all sides. Side access ports make it possible to make transverse sections on long specimens. A large window of Lexan and a sealed LED lamp in the cutting chamber allow precise observation of the cutting process at an optimum degree of safety.

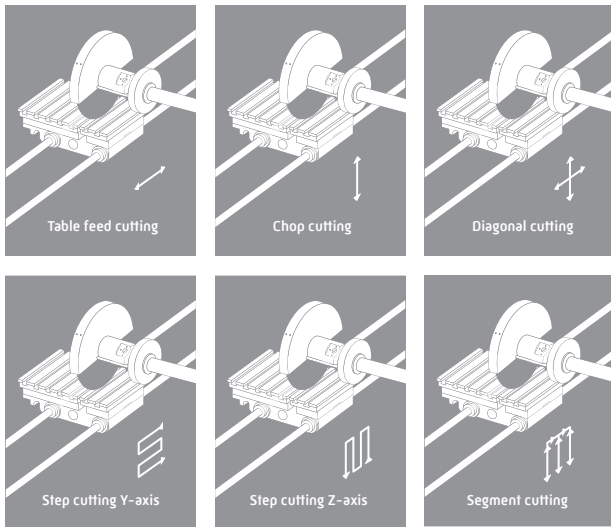


Extra large cutting chamber with easy access and handling.

## Safety

SERVOCUT 602 automatic cutting machine has the highest safety standards. The interlocking safety device does not allow the motor to be started unless the sliding door or the side access ports are closed. The sliding door cannot be opened before the cutting motor is stopped. The electronic brake system, which is a standard feature, brings the cutter to a quick full stop in seconds after it has been switched off. A two-hand control feature ensures that the operator's hands are completely out during positioning and prevented from reaching into the moving components with open sliding door. A stack light is located on the top of the equipment to provide visual and audible indication of machine status. Easily accessed and operated E-stop button ensures immediate shut down.

# AUTOMATIC OPERATION



SERVOCUT 602 Automatic cutting machine has advanced techniques and software with programmable HMI touch screen controls increasing the productivity, sample consistency and minimize operator intervention. Control of X/Y/Z Axis can also be performed with the ergonomic proportional Joystick control offers smooth and precise positioning.

## Cutting Methods

Chop cutting (Z-axis) and Table feed cutting (Y-axis) combined with pulse cutting is standard. New cutting methods ensures easy cutting of large and complex specimens.

## Multi-Slice Cutting

The movable cut off wheel on x-axis allows programmable plane parallel sectioning. Slices of equal thickness with number of slices as well as programming slices of different thickness is possible. SERVOCUT 602 has the largest cutting capacity on x-axis (cross sectioning)

## Optional Cutting Methods

Optional cutting methods make SERVOCUT 602 perfect choice for a broad range of heavy-duty cutting applications.

**Diagonal Cut:** For increased cutting capacity.

**Step Cut:** For extra hard materials.

**Segment Cut:** For difficult and complex shaped materials.

**Combined Cut:** For increasing cutting capacity.

## Cutting Parameters

The preselection of the cutting force level as well as the setting of cutting feed rate (0,02-5mm/sec) is possible from the touch screen LCD. The feed rate is automatically adjusted, if needed reduced, resulting in perfect cuts and eliminating sample and machine damage. Pulse cutting mode is a standard feature in all automatic models for cutting extra hard specimens. Integrated speed regulating unit is available to adjust the cut-off wheel speed between 600-2400 rpm.

## Programmable Return Positions

SERVOCUT 602 has 3 different stop modes:

**Stay at the end of cutting:** Stops when the specimen has been cut through.

**Back to starting point:** Stops when it has returned to its starting point.

**Back to reference point:** Stops when the ultimate reset point in all axes has been reached.



HMI touch screen controls with various cutting methods and database with cutting programs and maintenance monitoring



Ergonomic Joystick Control



Two Hand Control For Safety Operation



## Database

A library of 70 different cutting programs with related specimen name or number can be saved with all cutting parameters which can be recalled at any time. Data with Metkon cutting consumables is also listed for easy selection.



Easy Exchange of Cut Off Wheel



FUMEFILTER





# NEW CUTTING FEATURES

## Multi Target Cutting

Several clamped specimens can be cut in one step. Same or different cutting parameters can be set for each specimen. Cut off wheel moves to the predefined start position automatically for rapid and fast positioning

## Table Oscillation

During chop cutting the table makes an oscillation movement to minimize the contact area to reduce the risk of specimen damage.

## Instafeed

Optimizes the feedrate according to the specimen hardness and contact of cutting area.

## Rapid Pulse

Reduces contact time and ensures maximum cooling of specimen.

Multi Target Cutting

## Automatic Wheel Measurement

The cut off wheel diameter is measured prior to each cut for exact positioning. Also the peripheral cutting speed is automatically arranged by automatic wheel measurement system.

## AutoClean

Cleaning & Maintenance is an important job and can be time-consuming. The AutoClean function provides a thorough cleaning of the entire cutting chamber. The AutoClean function reduces operator effort, saves time and lowers maintenance while improving overall operation and accuracy of the instrument. The cleaning gun which is mounted externally for easy access can be used for cleaning the remained residual on horizontal surfaces.

## FIXED PERIPHERAL WHEEL SPEED

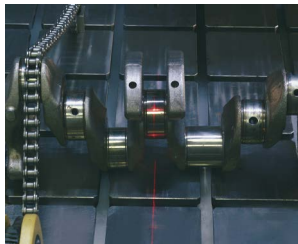
Peripheral speed changes as soon as cut-off wheel wears if motor speed is fixed. This may result inconsistent sample surface quality. SERVOCUT 602 has standard feature to keep peripheral speed consistent no matter what the wheel diameter is. Motor speed is automatically adjusted according to wheel diameter thanks to automatic cut-off wheel diameter measurement technology. The peripheral speed can be adjusted from 20 m/s to 60 m/s.

## Central Lubrication System

The Central Lubrication System is optionally available to minimize maintenance and shutdowns. The system optimizes the amount of lubrication to the machine components and supplies lubrication only when it is needed, thus reducing the amount of lube required for the machine, and limiting the chance of excess lube contaminating the coolant.



Automatic Wheel Measurement



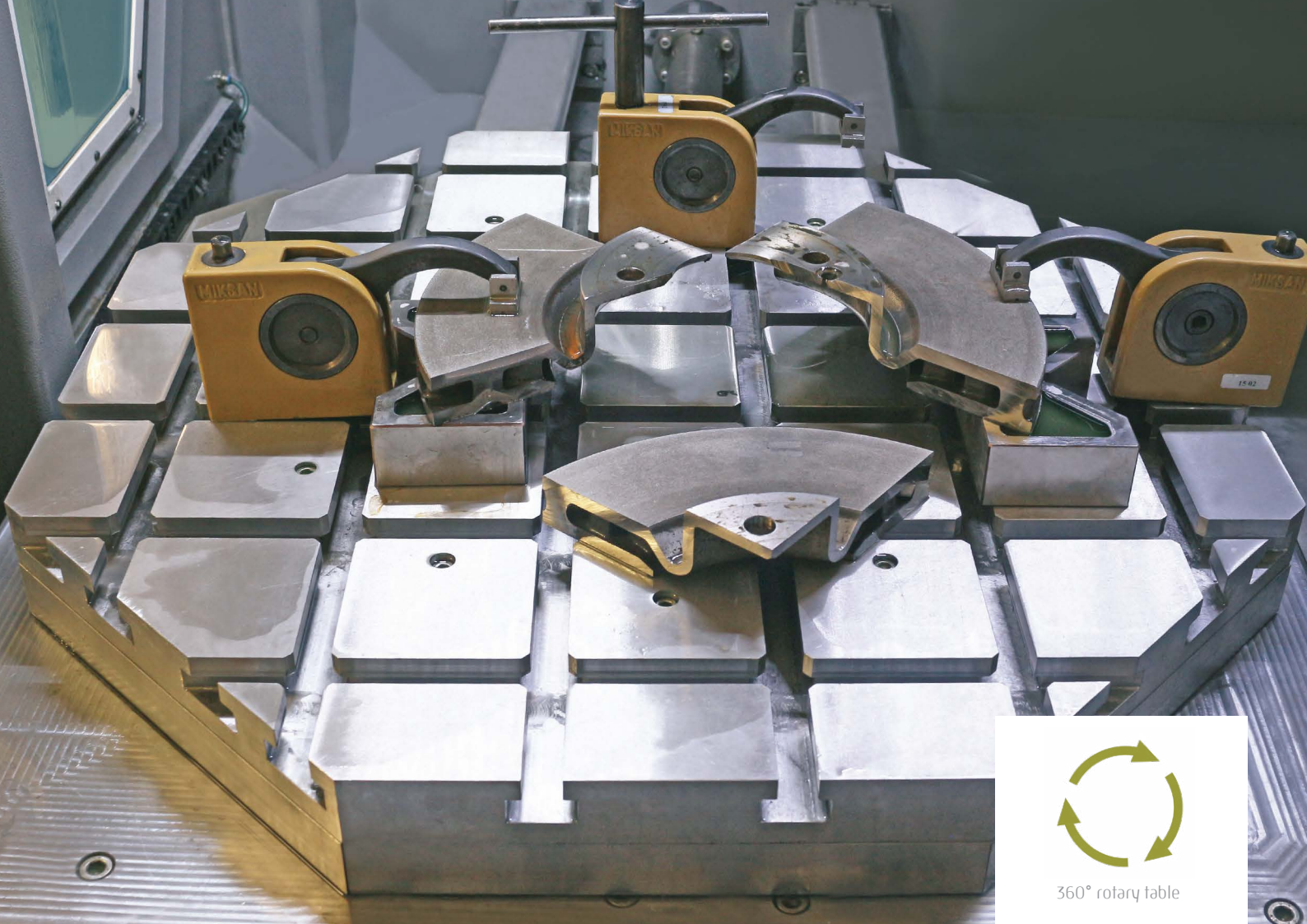
Laser Alignment Unit



Central Lubrication System



Auto Clean Function



360° rotary table

## SERVOCUT 602-AX-R 4-Axis Multi-Target Cutting Machine

SERVOCUT 602-AX-R is designed for cutting complex shaped specimens in any angle without re-clamping.

- Equipped with 360° rotary table with servo motor drive
- Ability to cut specimens up to 20 different cutting lines in different angles
- Program memory for cutting lines and parameters for Multi-Target Cutting.

## DESIGN & BENEFITS

SERVOCUT 602-AX-R combines the most advanced cutting techniques in the same machine. Equipped with the large automated rotary table that eliminates re-clamping, saves time and provides maximum automation. Servo motor driven rotary table allows very precise angle positioning. Save setup time by storing up to 20 cutting lines with different angles which can be recalled at any time for quick and easy loading. Different parameters and cutting techniques can be set for each cutting line, ensuring maximum accuracy with better cutting results. The cut-off wheel diameter is measured automatically and wheel wear can be compensated by optimizing the peripheral cutting speed automatically. Thus, the cut-off wheel position is automatically adjusted to the pre-set cutting lines, no matter what the wheel compensation is.

## ROTARY TABLE DO EVEN MORE!









Very large rotary table with a diameter of Ø710 mm. allows to fix, position and cut very large samples easily and efficiently. 4-axis cutting is the fastest way to reduce setups, boost throughput, and increase accuracy on complex parts. The angle of rotary table can be adjusted with 0.1° accuracy. With combination of all 4-axis, the cutting can be done in any possible position without re-clamping.

## CLAMP-LESS OPERATION REDUCE SETUPS AND INCREASE ACCURACY

SERVOCUT 602-AX-R enables 20 simultaneous cuts without having to unclamp, rotate and re-clamp the specimen for the next cuts. Metkon 4-Axis rotary table makes cutting easier than ever, allowing you to totally eliminate multiple re-clamping and cutting is handled easily in different angles for the area of interest.



## CLAMPING DEVICES

<p>Mechanical Clamping Device</p>  <p>GR 0610</p>	<p>Serial Clamping Device for clamping multiple specimens from 1 to 4</p>  <p>GR 0611</p>	<p>Angular Precision Clamping Device in 3-Axis Direction</p>  <p>GR 0613</p>	<p>Vertical Clamping Device with clamping shoe</p>  <p>15 06</p>	<p>Height Block</p>  <p>15 07</p>	<p>Chain spanner set with anchor block</p>  <p>GR 0033</p>	<p>V-Block for holding parts above table slots</p>  <p>15 00</p>	<p>Adjustable V-Support</p>  <p>GR 0615 GR 0616 GR 0617 GR 0618</p>
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Many sample preparation applications require the sectioning of a specimen from a small or irregularly shaped sample or component part. The small size or irregular sample shape can create positioning and clamping difficulties for the operator. To overcome these difficulties,

METKON offers a number of special clamping devices for use with SERVOCUT abrasive cutters. METKON cut-off machines are equipped with stainless T - slot clamping tables. All clamping devices are made of stainless steel and can be attached to the cutters T - slot beds in seconds for fast and positive clamping of parts having virtually any configuration.

## ACCESSORIES

### Laser Alignment Unit

For rapid and accurate positioning of the cut of wheel and helps to define the exact cutting line.

### 3-Lights Warning Beacon With Audible Signal

Informs operator about machine status from the long distance.

### Cooling System

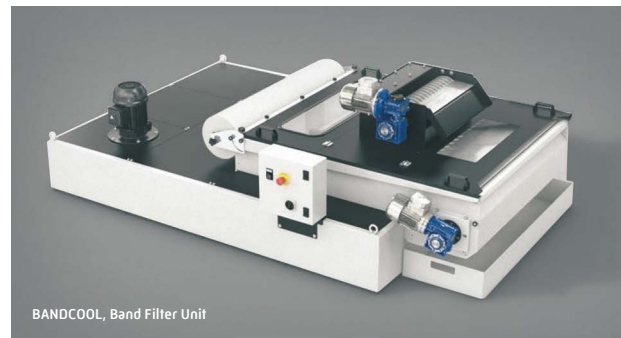
A closed loop recirculating cooling unit is a standard part of the machine. The cutting surface is cooled by spray nozzles whose water jets hit both the cutting wheel and the specimen. This provides an efficient cooling of the sample and prevents the overheating of the surface structure.

### FUMEFILTER

It is an advanced fume and mist removing unit that optionally available for SERVOCUT 602. Removes coolant mist for better illumination and viewing with centrifugal separator.

### Coolant Level Sensor

Informs operator when coolant level is insufficient.

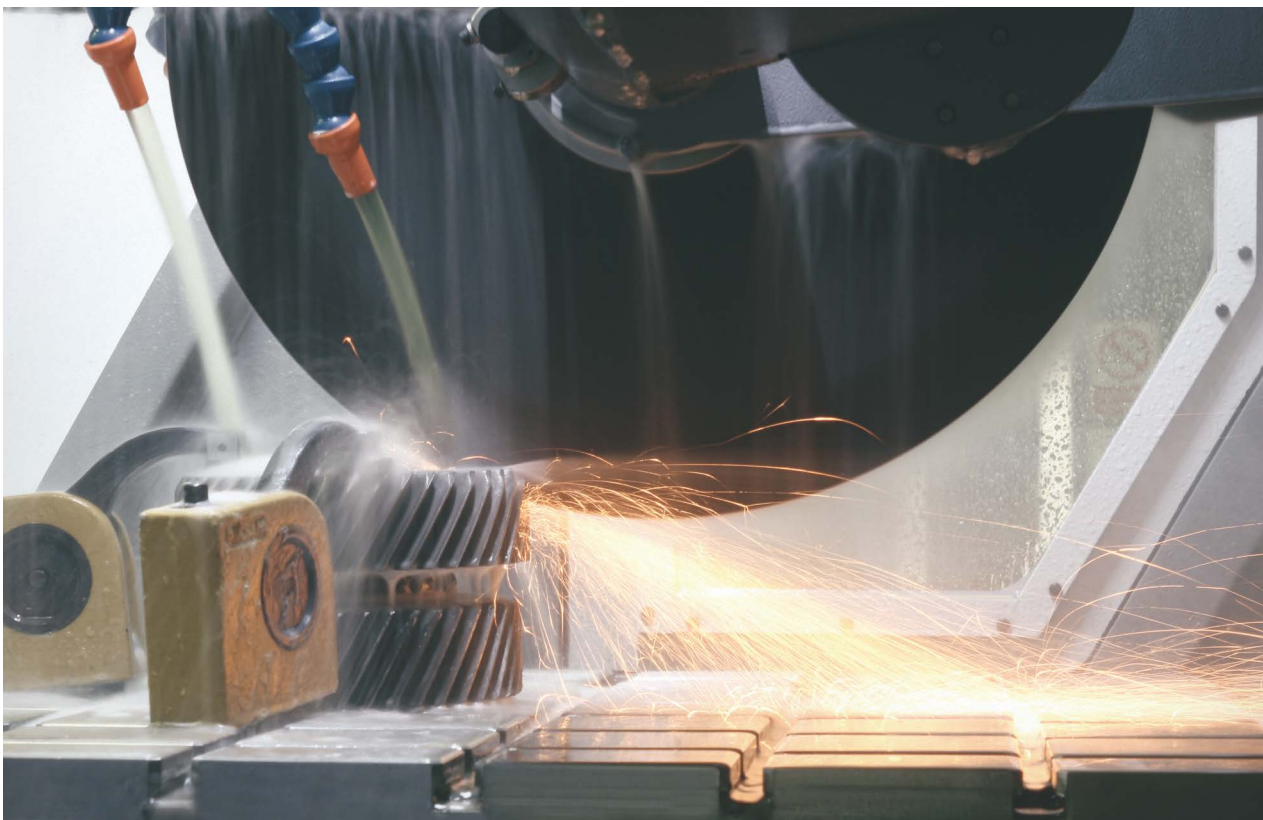


### Magnetic Collector Rods

Collects the finest magnetic particles from the cooling liquid and keep it clean.

### BANDCOOL

It is optionally available for cutting materials which generate a lot of swarf or for higher volume usage. Band filter conveyor for the automatic collection and disposal of swarf with large capacity of 150 lt. for long continuous usage. It is environmentally friendly filtering the coolant and depositing the swarf in a separate container for easy disposal.



Fast cutting with efficient cooling

# SPECIFICATIONS

## 14 87-AX — SERVO CUT 602-AX-R

For cutting large and multiple specimens, ability to work with cut-off wheels up to Ø600 mm, cutting capacity up to Ø225 mm solid stock, 100Hx500D mm for rectangular specimens (cutting capacity can be increased up to 200Hx550D mm with optional Combined Cut feature), powerful 15 kW cutting motor with unique belt protection system, with electronic brake system, with variable cut-off wheel speed 600-2400 RPM, ability to set fixed peripheral speed of cut-off wheel from 20 to 60 m/s, overload display and protection system, accurate Servo motor driven table and wheel movement for precise and fast positioning, joystick with adjustable speed control, stainless steel table (772x710mm) with 560 mm Y-axis movement range, Servo motor driven cut-off wheel positioning system on X-axis, 540 mm positioning range on X-axis, including advanced cutting methods: "Serial Parallel Cutting" for slicing multiple pieces from a specimen automatically in one cycle. "Multi Target Cutting" for cutting up to 20 different clamped specimens on the table to be cut automatically in one cycle. Programmable with 9.7" HMI touch screen control, Siemens PLC control unit, automatic cut-off wheel diameter measurement and automatic starting position adjustment according to cut-off wheel wear, Positioning System allows clamping several components simultaneously, with automatic chop cutting and automatic table feed cutting systems, with automatic cutting feedrate control, with extra advanced cutting methods: "Multi-Target Cutting, Serial Parallel Cutting, Rapid Pulse Cutting, Table Oscillation Cutting, Instafeed Cutting, Automatic Chop Cutting, Automatic Table Feed Cutting, Joystick Cutting" Powerful LED illumination, robust construction. Ready for operation. Without clamping devices, without recirculation cooling tank.

Includes a standard set of cutting consumables composed of;

- An assortment of 10 cut-off wheels with 600 mm dia.
- 5 lt of METCOOL cooling fluid.  
400 V, 3 phase, 50/60 Hz.

## 1487-AX-R — SERVO CUT 602-AX-R

4-Axis Multi-Target Automatic Cutting Machine as above (14 87) and including 360° automated rotary table with servo motor drive. Possibility to cut complex shaped specimens in any angle. Consecutive cuts without re-clamping. "Multi Target Cutting" for cutting specimens up to 20 different cutting lines in different angles. Program memory for cutting lines and parameters of "Multi Target Cutting".

## GR 0928 — Software package for optional cutting methods;

- Diagonal Cut
- Step Cut
- Segment Cut
- Combined Cut

## GR 1226 — Power Supply for SERVO CUT 602

Transformer kit for 200-240 VAC, 3 phase, 50/60 Hz mains voltage.

## Cooling Systems for SERVO CUT 602

- GR 1530** — Recirculation cooling tank with pump system, 200 lt tank capacity
- YM 8816** — Fine filter sheets for recirculation cooling tank (GR 1530), 10 pcs
- GR 1559** — Coolant level sensor for recirculation cooling tank, informs operator when coolant level is insufficient.
- GR 1540** — Magnetic collector rod for recirculation cooling tank
- GR 0591** — BANDCOOL Band Filter Unit for SERVO CUT 602 Band filter conveyor for the automatic collection and disposal of swarfs, with capacity of 150 lt., with fluid level indicator, complete system on wheels, with connection kit. 400V, 3phase,50Hz
- YM 8877** — Filter roll for BANDCOOL, 50 m, SRC 602

## Clamping Devices for SERVO CUT 602

- GR 0610** — Mechanical Clamping Device
- GR 0611** — Serial Clamping Device for clamping multiple specimens from 1 to 4
- GR 0613** — Angular Precision Clamping Device in 3-Axis Direction
- 15 06** — MBU 1031 Vertical Clamping Device with clamping shoe, clamping height upto 115mm.
- 15 07** — MK 10 22 Height Block, 70 mm
- GR 0037** — Chain spanner set with anchor block
- 15 00** — V-Block for holding parts above table slots
- GR 0615** — Adjustable V-Support, Small (Height Range: 57-67mm)
- GR 0616** — Adjustable V-Support, Medium (Height Range: 65-85mm)
- GR 0617** — Adjustable V-Support, Large (Height Range: 85-115mm)
- GR 0618** — Adjustable V-Support, Extra Large (Height Range: 115-155mm)

## Accessories for SERVO CUT 602

- GR 0134** — FUMEFILTER Centrifugal Separator for SRC 602 Removes coolant mist for better illumination and viewing [To be ordered simultaneously together with the machine order]
- YM 8836** — Spare Filter Kit for FUMEFILTER (GR 0134)
- GR 0135** — Laser Alignment Unit Laser Alignment Unit for SERVO CUT 602 [To be ordered simultaneously together with the machine order]
- GR 0136** — Central Lubricating System with programmable maintenance cycle [To be ordered simultaneously together with the machine order]
- GR 0137** — AUTOCLEAN Automatic Cleaning System for cutting chamber [To be ordered simultaneously together with the machine order]
- GR 0140** — 3-lights warning beacon with audible signal [To be ordered simultaneously together with the machine order]

- GR 1966** — Spare Part Kit for SERVO CUT 602 Recommended Set of Spare Parts, SERVO CUT 602

\* Other voltages and frequencies available upon request. Please state when ordering. All specifications are subject to change without notice.



# SPECIFICATIONS

ORDER NO	14 87-AX	14 87-AX-R
MODEL NO	SERVOCUT 602-AX	SERVOCUT 602-AX-R
Max. Cut-off Wheel Diameter	Ø600 mm	Ø600 mm
Max. Cutting Capacity for Round Rections, Ø	Ø225 mm	Ø225 mm
Max. Cutting Capacity for Rectangular Sections, HxD	100x500 mm	100x500 mm
Max. Cutting Capacity for Rectangular Sections, HxD (with Combined Cut)	200x550 mm	200x550 mm
Z-Axis Travel, (mm)	340 mm	340 mm
Y-Axis Travel, (mm)	560 mm	560 mm
X-Axis Travel, (mm)	540 mm	540 mm
T-Table Dimension, (mm)	772x710 mm	Ø710 mm Rotary Table
Rotary Table Positioning Angle	Not Available	360° with 0.1° Accuracy
T-Slot dimension, (mm)	18 mm	18 mm
Cutting Motor Power (S1)	15 kW	15 kW
Variable Wheel Speed	600-2400 RPM	600-2400 RPM
Wheel Diameter Measurement	Standard	Standard
Constant Peripheral Wheel Speed	Standard	Standard
Cutting Feedrate, (µm/s)	20-5000 µm/s	20-5000 µm/s
HMI Touch Screen Controller	9.7 inch	9.7 inch
Chop Cutting in Z- Axis	Auto	Auto
Table Feed Cutting in Y-Axis	Auto	Auto
Angle Cutting	Not Available	Standard
Parallel Cutting in X-axis	Standard	Standard
Multi Target Cutting	Standard	Standard
Table Oscillating Cutting	Standard	Standard
Rapid Pulse Cutting	Standard	Standard
Smart Feed Control	Standard	Standard
Step Cut; Segment Cut; Diagonal Cut	Optional	Optional
Combined Cut	Optional	Optional
Automatic Cleaning System	Optional	Optional
Central Lubricating System	Optional	Optional
Size WxDxH	184x173x200 cm	184x173x200 cm
Weight	1600 kgs	1600 kgs
Recirculation Cooling Unit	200 lt	200 lt
Mains	3-phase, 400V, 50/60 Hz. AC	3-phase, 400V, 50/60 Hz. AC

