Numbering Heads

Technical Data Sheet

COLUMBIA MARKING TOOLS

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What are Numbering Heads?

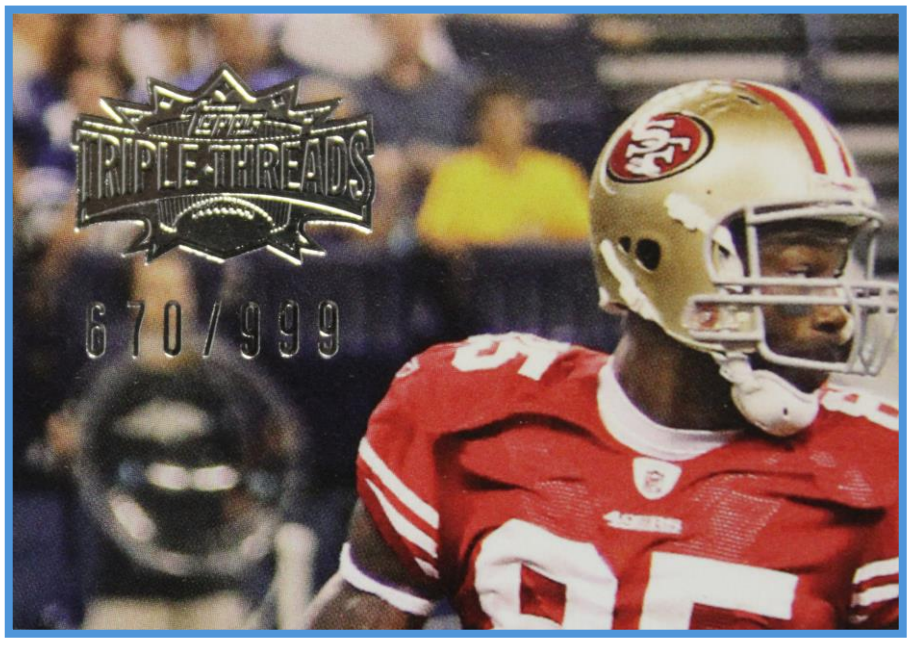
Numbering heads are critical tools in high-volume production, designed to stamp serial numbers, repetitive sequences, and codes onto various parts. These marking devices are versatile and can be used on materials such as metal and plastic. Common applications include imprinting product codes, part numbers, and date codes to ensure traceability and standardization in manufacturing. Their ability to provide precise and consistent marks makes them indispensable in industries requiring large-scale production with minimal manual effort.

Unlike traditional methods that use individual pieces of type, numbering heads feature marking characters engraved on wheels. This design allows for quicker and easier changes to the marking legend, significantly reducing downtime in production. The wheel-based mechanism streamlines the process of updating codes, ensuring that manufacturers can maintain high efficiency even when frequent adjustments are needed.

These engraved wheels also offer improved durability and precision compared to interchangeable type. Each wheel is crafted to maintain consistent marking quality over extended use, making it ideal for demanding industrial environments. The ability to swiftly rotate or change wheels to adjust serial sequences or codes further enhances their practicality in dynamic production settings.

This innovation not only simplifies the process of marking but also reduces the risk of errors. With fewer components to handle and adjust, operators can focus on maintaining accuracy and productivity. Additionally, the durability of the engraved wheels ensures that the marking characters remain sharp and legible, even after extensive use.

By combining speed, ease of use, and reliability, numbering heads with engraved wheels provide an efficient solution for high-volume production. Their advanced design meets the needs of modern manufacturing processes, where precision, adaptability, and efficiency are paramount.

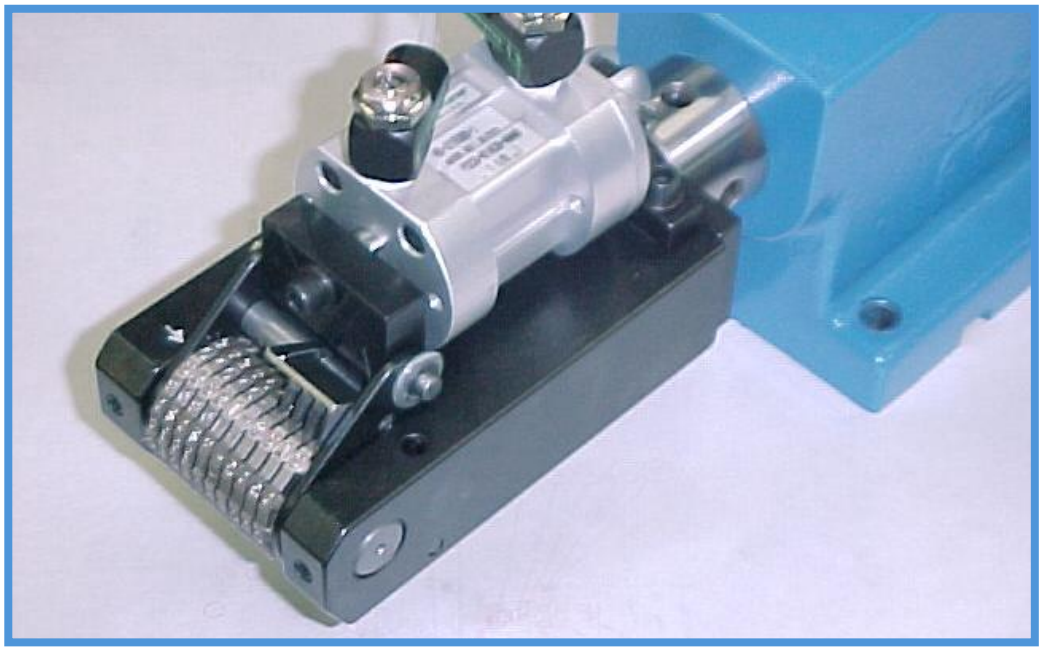


Applications

1. **Serial Numbering**
    a. Ensures traceability for individual products or components in industries like automotive, aerospace, and electronics.
    b. Essential for warranty tracking and recalls.
2. **Date Coding**
    a. Marks production dates for quality control and inventory.
    b. Used for quality control to ensure inventory rotation and product warranty.
3. **Part Identification**
    a. Marks part numbers or model numbers to streamline inventory management and assembly processes.
    b. Common in manufacturing sectors like metalworking and heavy equipment.
4. **Lot or Batch Coding**
    a. Tracks groups of products for process monitoring, traceability, and quality assurance.
    b. Vital for industries dealing with high production volumes.

Styles of Numbering Heads

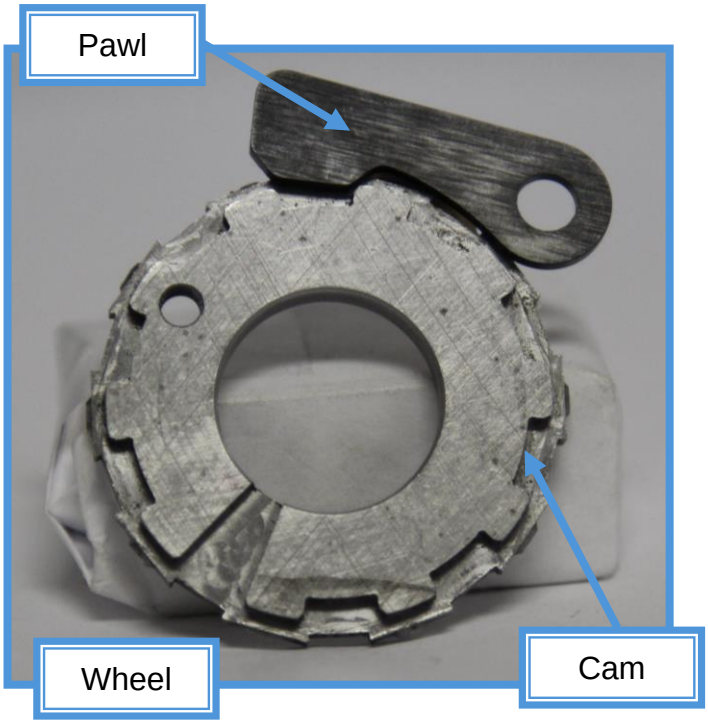
1. **Manual**
    a. Flat head with engraved marking wheels mounted in a press. This time saving tool improves production uptime and reduces tooling changeover time for marking legend changes.
2. **Automated**
    a. Using a trip bar or pneumatic cylinder the automated numbering head is the fastest method for industrial part marking of a serial number.

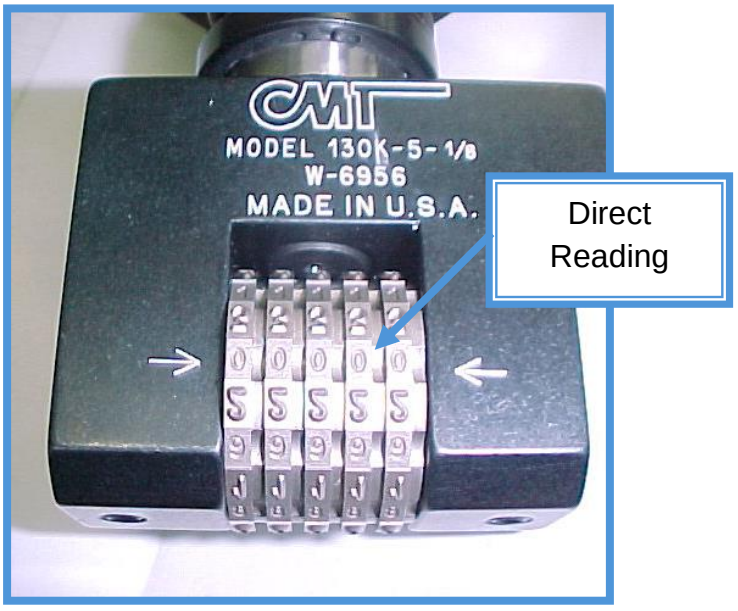


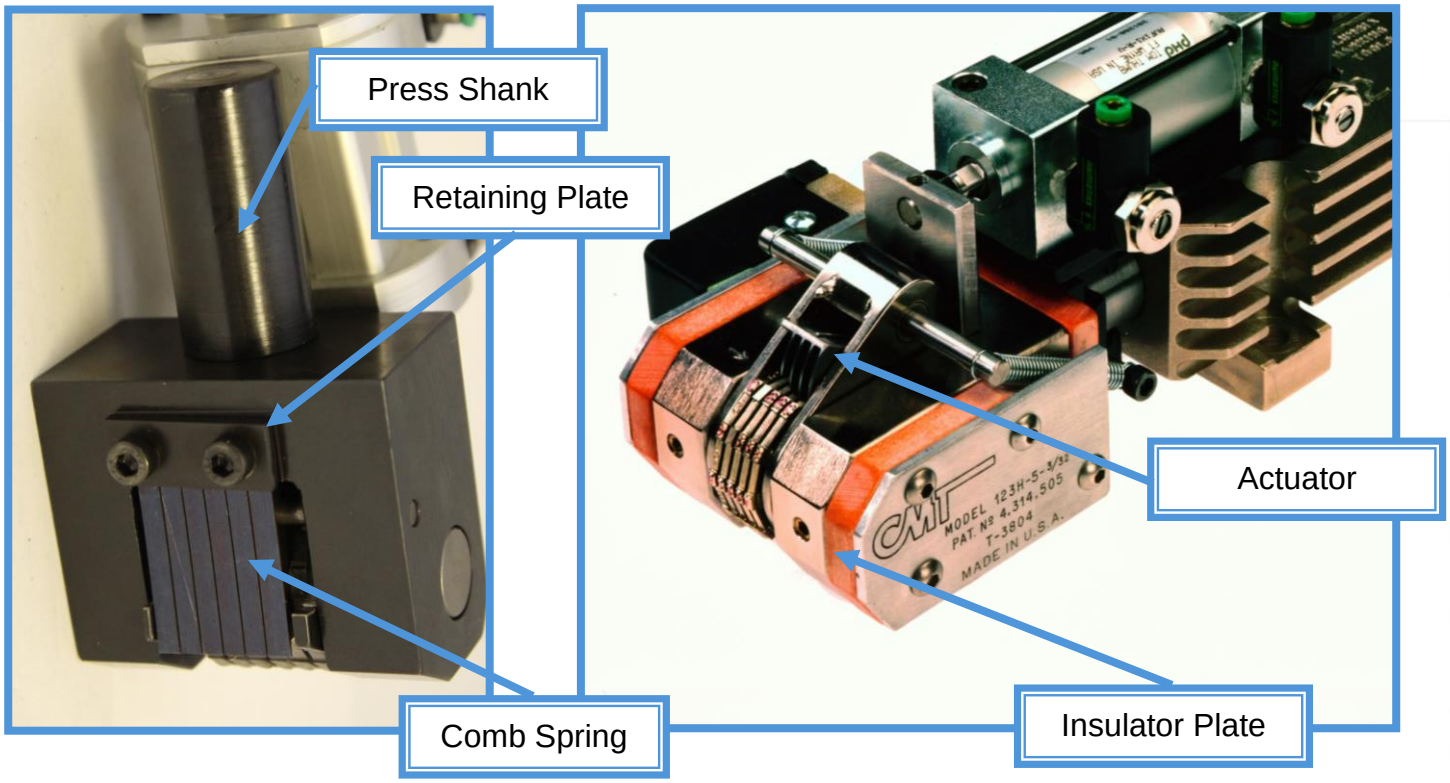
3. **Slide-A-Mark**
    a. The numbering head for the Slide-A-Mark reduces the changeover time for date code and part number changes.
4. **In-Die**
    a. The In-Die numbering head allows for quickly changing date codes without the costly time used in removal of the tooling from the die.
5. **Convex**
    a. Designed exclusively for serial numbering within a roll marking operation. The convex numbering heads are used in roll marking on flats, and D-2-D Diameter-2-Diameter roll marking applications.
6. **Embossing**
    a. Embossing numbering heads have two parts male and female that form the metal from both sides.
7. **Random**
    a. Random industrial part numbering with integration of a PLC with individual wheel actuators.

Components of a Numbering Head

Name	Description
Actuator	Claw shaped fingers that connect with the cam to advance the wheels in automatic numbering heads.
Actuator Spring	Spring that holds the actuator in the retracted position.
Cam	The specially shaped projection off the side of the wheel that connects with the actuator to advance the wheel.
Cartridge Heaters	Tube shaped industrial heating element used in hot stamp numbering heads.
Comb Spring	Metal plate or set of metal plates that hold the pawl in the wheels to keep them from rotating during the marking cycle.
Direct Reading	The characters that are in the current marking position for the numbering head but are on the side to provide easy reading and verification.
Frame	The solid metal supports the numbering head wheels and shaft.
Insulator Plate	A spacer plate made of material that is not thermally conductive, the purpose is to keep the heat in the number head.



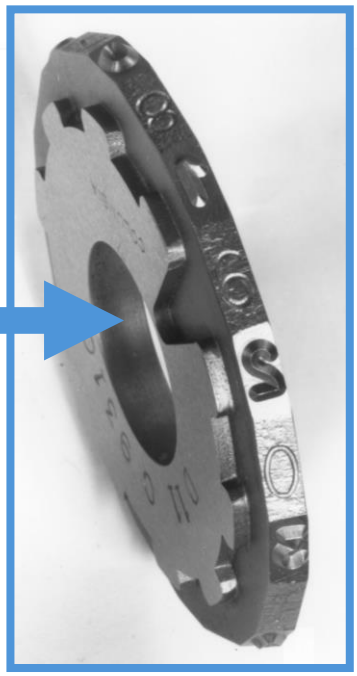




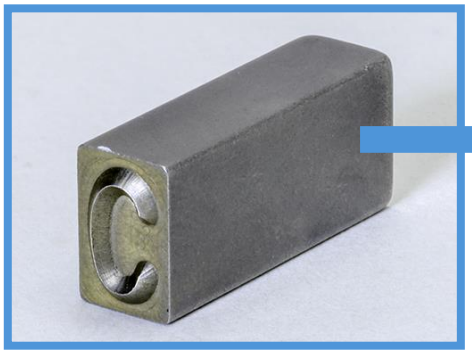
Name	Description
Mounting	The surface or shape of the surface that connects the numbering head to the operational press.
Pawl	Finger shaped metal plate that fit into the cam on the wheel to keep the wheel in position during the marking process.
Press Shank	Cylindrical mounting style used to attach numbering head tooling to press.
Retainer Plate	Hold the comb spring in place on the numbering head frame.
Shaft	The metal piece that holds the wheel in position inside the frame.
Tempswitch	A circuit that opens and closes a conductive path based on temperature.
Thermocouple	A thermoelectric device for measuring temperature, consisting of two wires of different metals connected at two points, a voltage being developed between the two junctions in proportion to the temperature difference.
Wheel	The main marking element of a numbering head is engraved with characters or numbers on the outer surface to be indented into workpiece.

Manual Numbering Head - Model 130

The CMT manual numbering head is a great upgrade from individual steel type for indention marking. The use of a solid wheel reduces tooling changeover for marking legends.

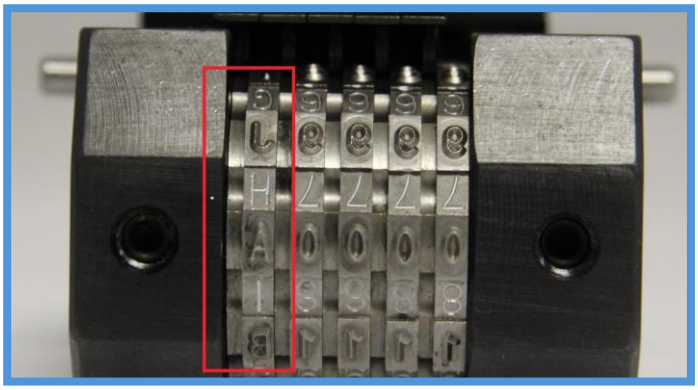


The wheels are quickly rotated to the new marking legend. This provides a cost saving in tooling changeover time and an increase in production time.



Model 130 is individually designed per customer application:

- Mounting Style
  - Press shank – size of the round or square shank and the length. Standard size is 1” diameter by 2” long
  - Dovetail mount – please provide length across dovetail, or machine model this tool will be used in
  - Flat top mount with tapped holes. CMT can provide the recommended design during the approval process.
- Character Size
  - Metric or Inches for each character
  - Remember it is easy to overestimate the character size
- Number of wheels
  - Number of wheels in the numbering head
  - The tooling design may also include prefix and suffix type holders
- Wheel readings
  - The standard, and most common, readings are figures 0 through 9.
  - The wheels may be designed with 10,12, or 14 station wheels.
  - Each station is engraved with character. They may be different or the same.
  - An example of the Alpha wheel shown on the right.



Technical Specifications:

- Solid Frame – designed and manufactured to fit wheels in configuration.
- Extra wide CMT proprietary cam design.
- Large shaft design to meet extra marking force for indention marking.
- CMT patented pawl design – to allow for easy setup in either direction.
- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc
- Deburred

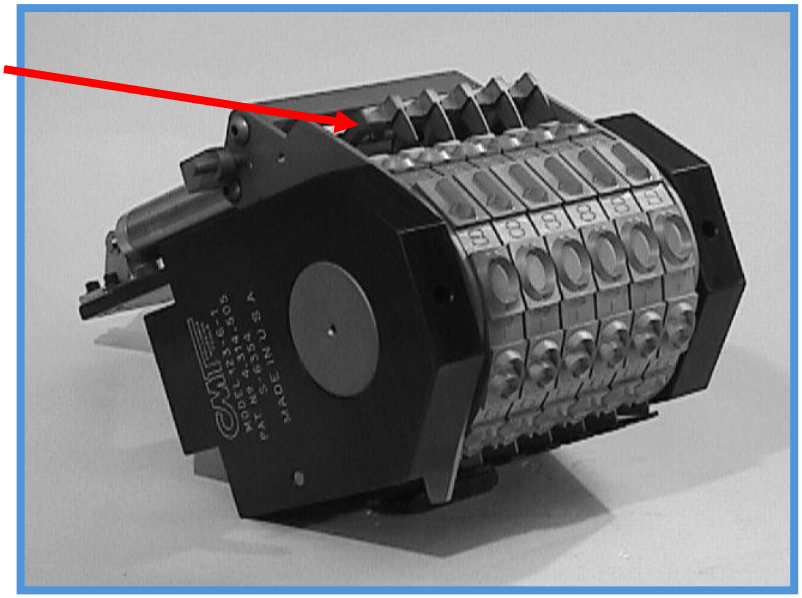
Along with the proposal CMT will provide an estimated marking legend length. A complete dimensional drawing iis provided for review upon placement of an order.

An example of a manual numbering head, Model 130, is shown in the picture. The example has (6) wheels with 4mm characters. All of the wheels are reading figures 0 through 9. Standard font and legend length has been used to provide a clear deep mark. The numbering head has the standard 1” diam x 2” long press shank for mounting into the operational press. Lastly, for ease of operation the direct reading is noted on the front of the tooling between the white arrows.

Automated Numbering Head – Model 123

The **CMT Model 123** stands out as the fastest solution for **serial numbering** in the realm of industrial direct part marking. Its versatility shines across industries, handling everything from marking **baseball cards** to **diaper boxes** with precision and efficiency. Whether your application requires speed, durability, or adaptability, the Model 123 delivers a permanent, reliable mark that meets the highest standards.

At the heart of the Model 123's efficiency is its **automated wheel**, powered by a **claw-shaped actuator**. This actuator can be triggered through either a **mechanical trip mechanism** or a **pneumatic actuator**, offering flexibility for integration into diverse production environments. This design ensures seamless operation, making it the ideal choice for businesses prioritizing fast, consistent, and durable marking solutions.



Model 123 is individually designed per customer application:

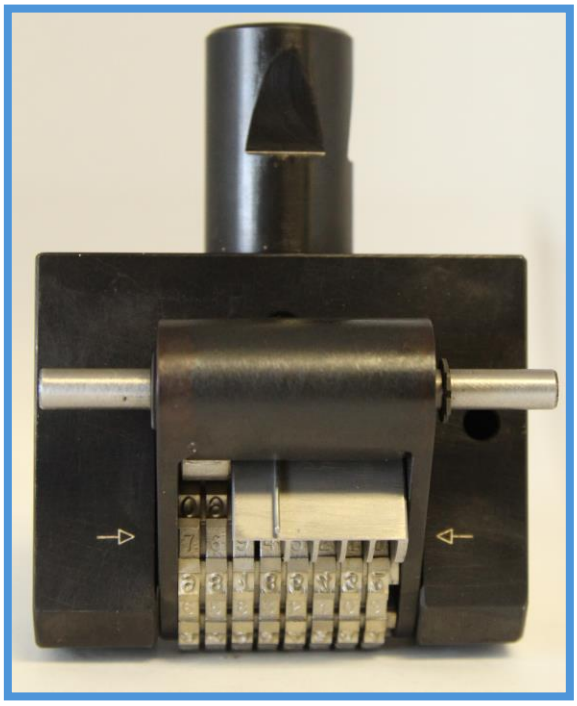
- Mounting Style
  - Press shank – size of the round or square shank and the length. Standard size is 1” diameter by 2” long
  - Dovetail mount – please provide length across dovetail, or machine model this tool will be used in
  - Flat top mount with tapped holes. CMT can provide the recommended design during the approval process.
- Character Size
  - Metric or Inches for each character
  - Remember it is easy to overestimate the character size
- Number of wheels
  - Number of wheels in the numbering head - automatic and manually indexed.
  - The tooling design may also include prefix and suffix type holders.
- Wheel readings
  - The standard, and most common, readings are figures 0 through 9.
- Actuation Method
  - Pneumatic cylinder
  - Mechanical Trip bar

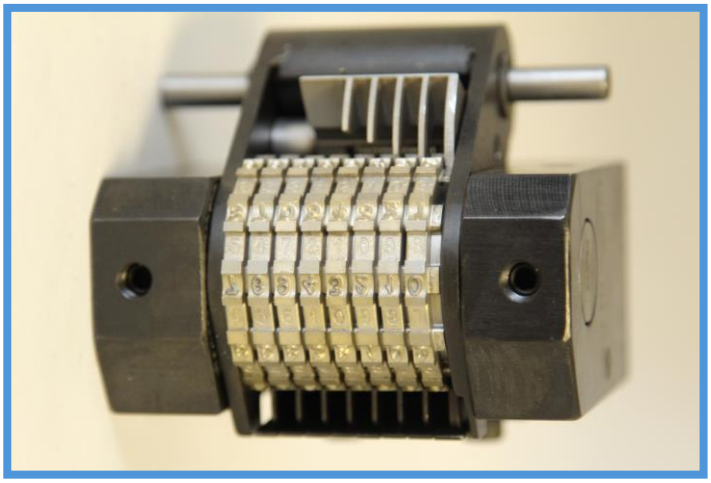
Technical Specifications:

- Solid Frame – designed and manufactured to fit wheels in configuration.
- Extra wide CMT proprietary cam design.
- Large shaft design to meet extra marking force for indention marking.
- CMT patented pawl design – to allow for easy setup in either direction.
- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc
- Deburred

Along with the proposal CMT will provide an estimated marking legend length. A complete dimensional drawing is provided for review upon placement of an order.

An example of a manual numbering head, Model 123, is shown in the pictures. The example has (8) wheels with 3/32” characters. All the wheels are reading figures 0 through 9. Standard font and legend length has been used to provide a clear deep mark. The numbering head has the standard 1” diam x 2” long press shank for mounting into the operational press. Lastly, for ease of operation the direct reading is noted on the front of the tooling between the white arrows.





The numbering head features a mechanical trip bar that may be cycled within the customer press or via an external pneumatic air cylinder.

Numbering Heads for Slide-A-Mark – Models 130K and 123K

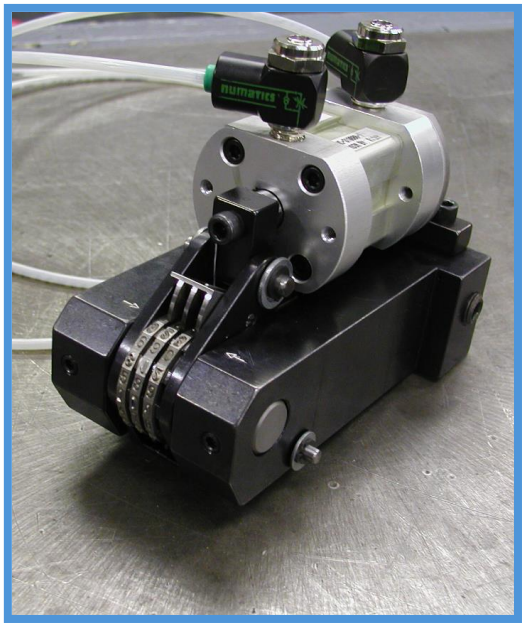
The Slide-A-Mark air impact marker with telescoping action allows for the use of external holders and numbering heads. The numbering heads tooling provides reduction of tooling changeover time over the use of individual type and type holders.

Slide-A-Mark Models that may be used with numbering heads.

- Model 751 – 8 ton
- Model 851 – 10 ton

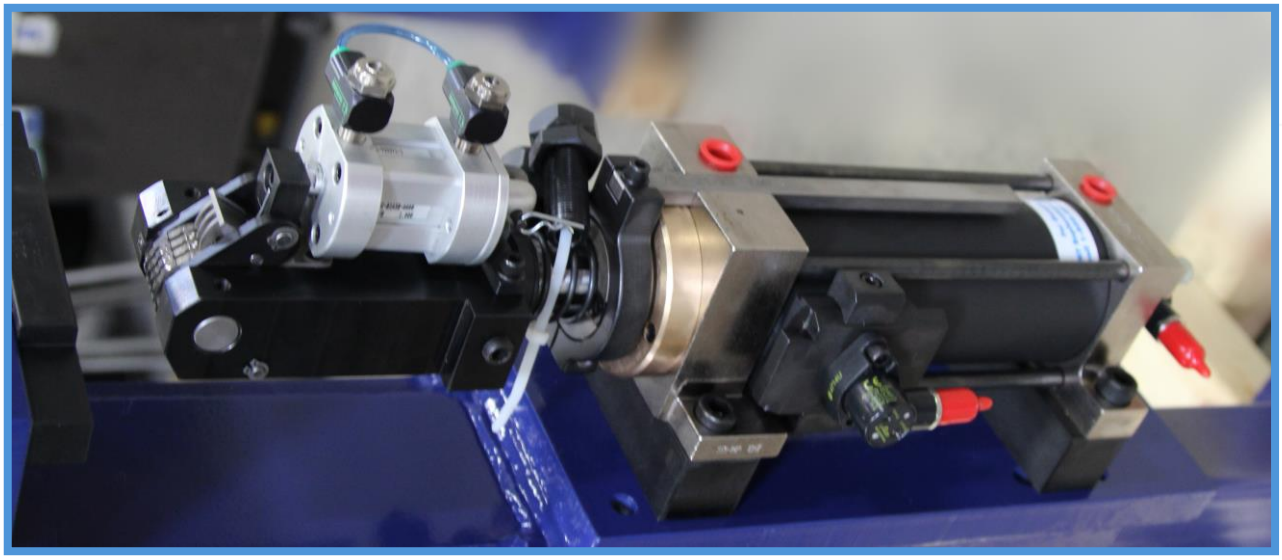
Example at right shows 130K with (7) manual wheels having 5/32” characters. Please note the even mark and the alignment of the characters.

Model 130K and 123K are individually designed per customer application:



- Mounting Style
  - K style ball lock mount for the K style rod
- Character Size
  - Inches are standard 1/16” through 1/4”
  - Metric Provided upon request
- Number of wheels
  - Number of wheels in the numbering head - automatic and manually indexed.
  - The tooling design may also include prefix and suffix type holders.
- Wheel readings
  - The standard, and most common, readings are figures 0 through 9.
- Automated Actuation Method for 123K
  - Pneumatic cylinder requires a second 4-way valve

Along with the proposal CMT will provide an estimated marking legend length. A complete dimensional drawing is provided for review upon placement of an order.



How To Order

Feature	Symbol	Example
Model		123K-06-2M-3A
Manual	130K	
Automatic	123K	X
Character Size		
1/16" [1.6mm]	06	X
3/32" [2.4mm]	09	
1/8" [3.2mm]	13	
3/16" [4.8mm]	19	
1/4" [6.3mm]	25	
Number of Wheels		
# Manual	#M	X
# Automatic	#A	X

Where # is the number of wheels of each type. The Model 130K does not have any Automated wheels.

Technical Specifications:

- Solid Frame – designed and manufactured to fit wheels in configuration.
- Extra wide CMT proprietary cam design.
- Large shaft design to meet extra marking force for indention marking.
- CMT patented pawl design – to allow for easy setup in either direction.
- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc

In Die Numbering Head – Model 130ID

For many parts manufacturers, tracking products through the stamping or manufacturing process can be both costly and challenging. Retainer and backing plates in the die are commonly used to hold date codes, part numbers, or other markings. These parts are typically marked as they are stamped or produced. While this method has been effective for some time, there are opportunities to improve the process.

In the past, the old-style retainer and backing plate sets required the removal of two screws to replace the retainer and update the stamps. While a highly skilled operator might be able to complete this task in about 5 minutes, it remains a tedious and time-consuming chore that slows down production.

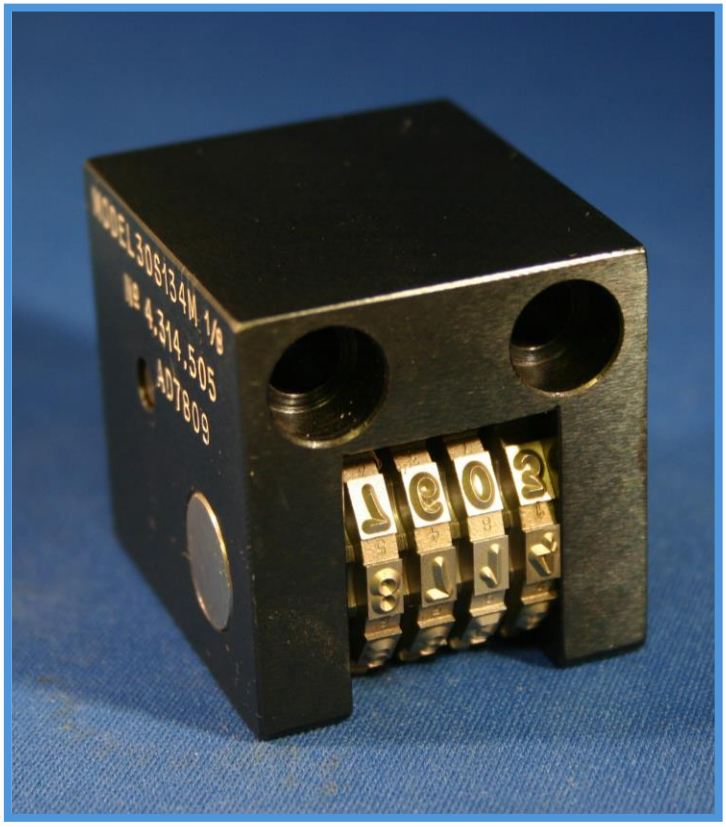
The new tooling design, known as a numbering head, has greatly simplified this process. Installed directly in the die, the numbering head allows the operator to quickly change the number by simply rotating a wheel. This innovative design dramatically reduces the time needed to change the markings, taking only 2 to 3 seconds due to its easy accessibility and streamlined operation.

Along with the proposal CMT will provide an estimated marking legend length. A complete dimensional drawing is provided for review upon placement of an order.

How To Order

Feature	Symbol	Example
Model		130ID-13-4M
Manual	130ID	X
Character Size		
1/16" [1.6mm]	06	
3/32" [2.4mm]	09	
1/8" [3.2mm]	13	X
3/16" [4.8mm]	19	
1/4" [6.3mm]	25	
Number of Wheels		
# Manual	#M	X

Where # is the number of wheels.



The result is significant time savings during the tooling setup, which can be reallocated to increase manufacturing time. With the ability to switch markings quickly and efficiently, manufacturers can boost productivity and minimize downtime, ultimately leading to more cost-effective operations.

Technical Specifications:

- Solid Frame – designed and manufactured to fit wheels in configuration.
- Extra wide CMT proprietary cam design.
- Large shaft design to meet extra marking force for indention marking.
- CMT patented pawl design – to allow for easy setup in either direction.
- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc

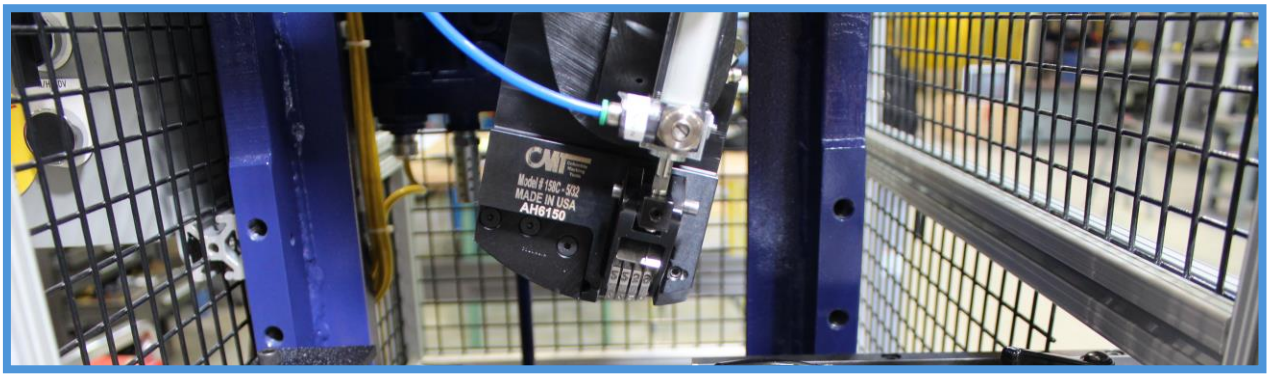
Convex Roll Marking Numbering Head – Model 158C

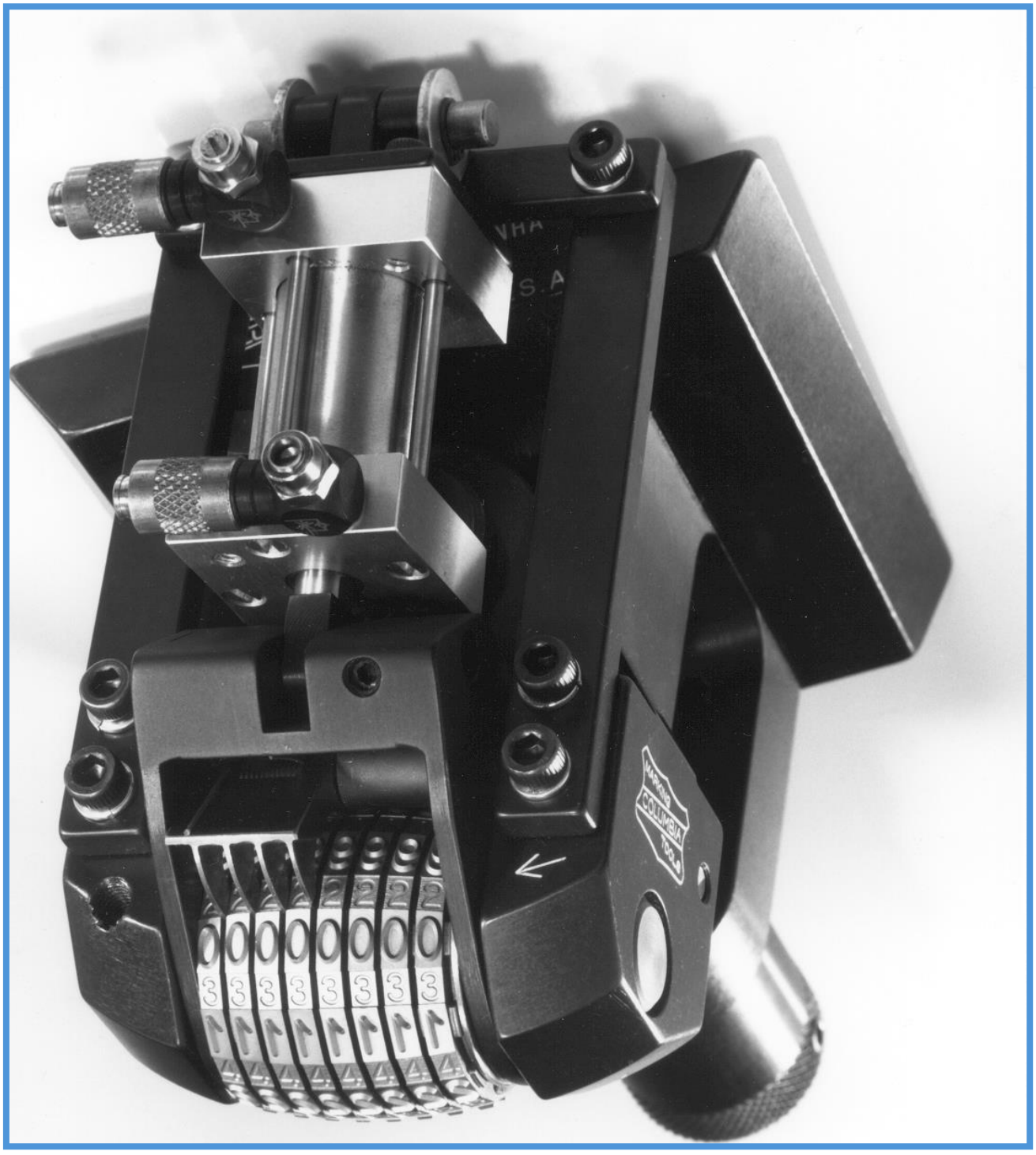
The **CMT Model 158C convex roll marking numbering heads** are specialized tools designed for serial numbering during the roll marking process. These heads are particularly known for delivering **fast, clear, and deep marks** directly onto parts, making them ideal for **direct part marking** applications.

Key Features of the CMT Model 158C:

1. **Convex Barrel Style**: The heads feature a **barrel shape**, which is rolled by the **die slide** of a marking machine. This is like the process used with **roll-type holders** but with the added benefit of a more efficient marking mechanism.
2. **Pressure Efficiency**: Compared to **press marking** with flat heads, the **CMT Model 158C** requires only a **fraction of the pressure** for marking, which enhances the overall efficiency of the process and reduces wear and tear on the machinery.
3. **Precision Marking**: These heads are designed to produce clear and legible marks, ensuring that **serial numbers** or other identifying information are easily readable on the part. The **depth** and **clarity** of the markings are especially advantageous for high-volume production environments.
4. **Durability**: The robust construction of these marking heads ensures they can withstand the stresses of continuous use, making them ideal for industrial applications where precision and speed are critical.
5. **Application**: These heads are commonly used in industries requiring direct part marking, such as automotive, aerospace, and manufacturing, where parts must be serialized for identification or traceability.

By utilizing the CMT Model 158C convex roll marking numbering heads, manufacturers can achieve reliable and consistent serial numbering results with a faster, more efficient process compared to traditional flat-head marking methods.





Example 158C numbering head is designed for use in a CMT 860 roll marking machine. The tooling mount is the dovetail mount, and the automated serialization is provided with the additional air cylinder. The numbering head shown has (4) automated wheels and (4) manual wheels with 3/16” characters all reading 0 through 9.

Model 158C is individually designed per customer application:

- Mounting Style
  - Dovetail mount standard – please provide length across dovetail, or machine model this tool will be used in
  - Flat top mount with tapped holes. CMT can provide the recommended design during the approval process.
- Character Size
  - Metric or Inches for each character
  - Remember it is easy to overestimate the character size
- Number of wheels
  - Number of wheels in the numbering head - automatic and manually indexed.
  - The tooling design may also include prefix and suffix type holders.
- Wheel readings
  - The standard, and most common, readings are figures 0 through 9.
- Actuation Method
  - Pneumatic cylinder

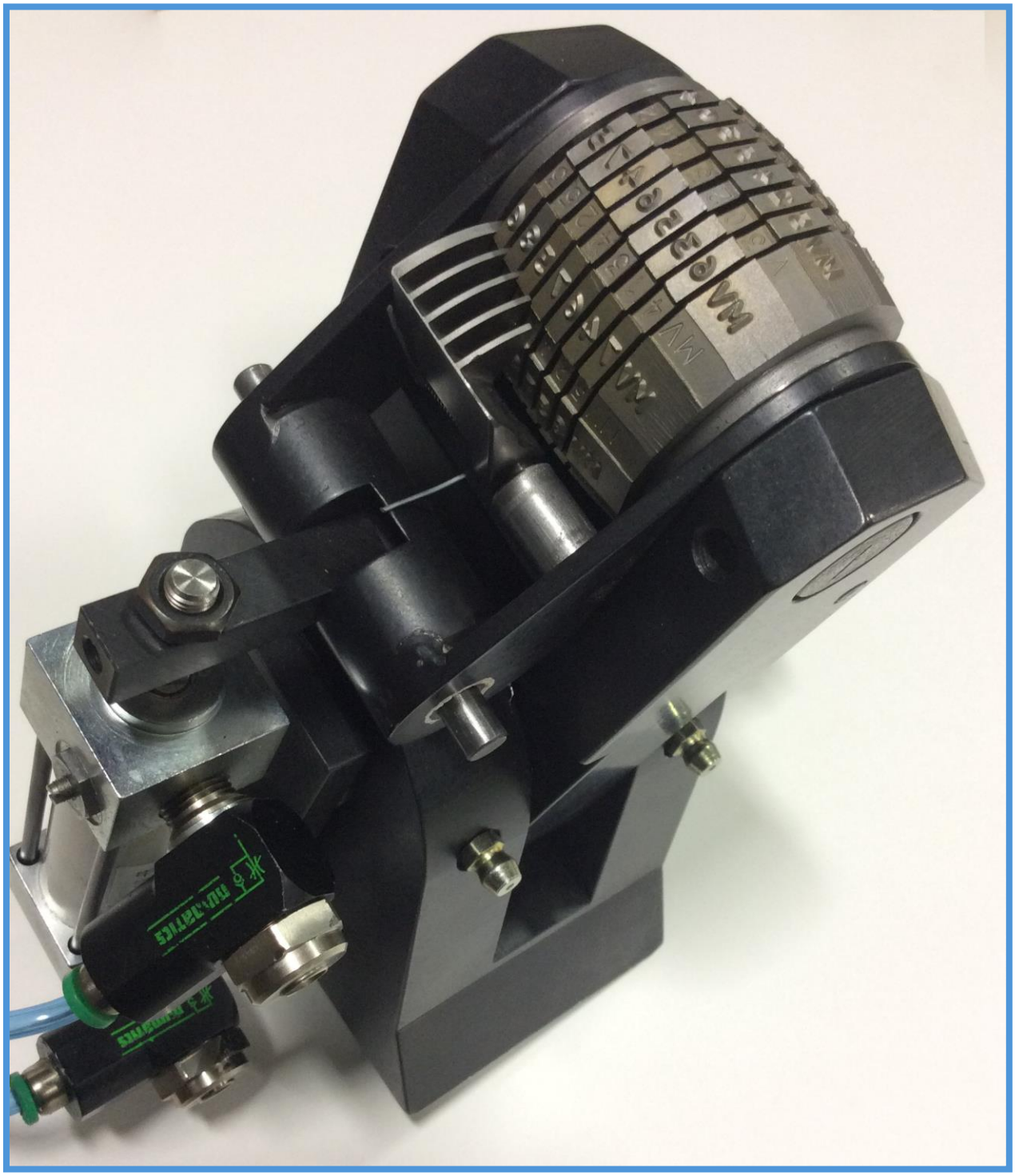
Along with the proposal CMT will provide an estimated marking legend length. A complete dimensional drawing is provided for review upon placement of an order.

Technical Specifications:

- Solid Frame – designed and manufactured to fit wheels in configuration.
- Extra wide CMT proprietary cam design.
- Large shaft design to meet extra marking force for indention marking.
- CMT patented pawl design – to allow for easy setup in either direction.
- Double pass engraved (NOT EDM)
- W-1 Tool Steel
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font
- Heat treated to 57-59 Rc
- Deburred

Upgrades depend on the application requirements and could include custom font, dot-stye characters, 12 or 14 station wheels, and multicharacter wheels.

Example 158C numbering head has an extra-wide prefix wheel with additional characters.



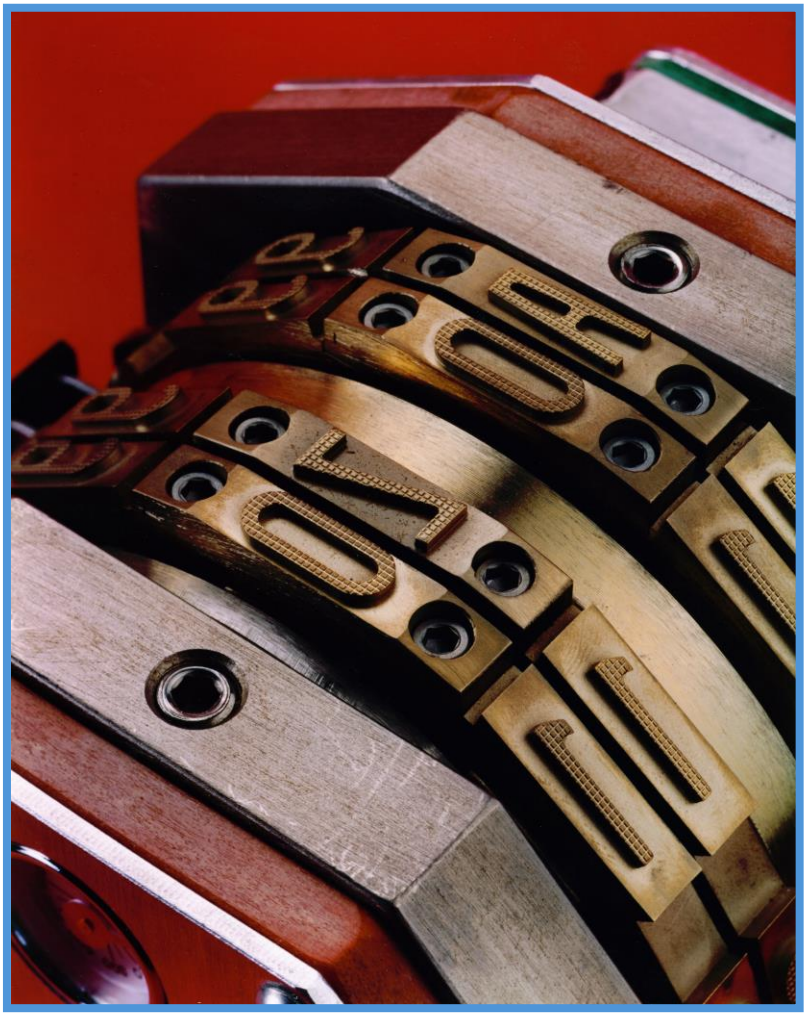
Hot Stamping Numbering Heads – Model 130H & Model 123H

Manual and automated hot stamping numbering heads provide a reliable solution for marking serial numbers on plastic parts. These tools use heat and pressure to transfer characters onto the plastic surface, ensuring a clean and permanent mark.

Manual Hot Stamping Numbering Heads
Designed for smaller-scale or occasional marking needs, manual hot stamping heads are user-operated and offer precise control. They are ideal for low-volume production or customization tasks, providing flexibility and affordability.

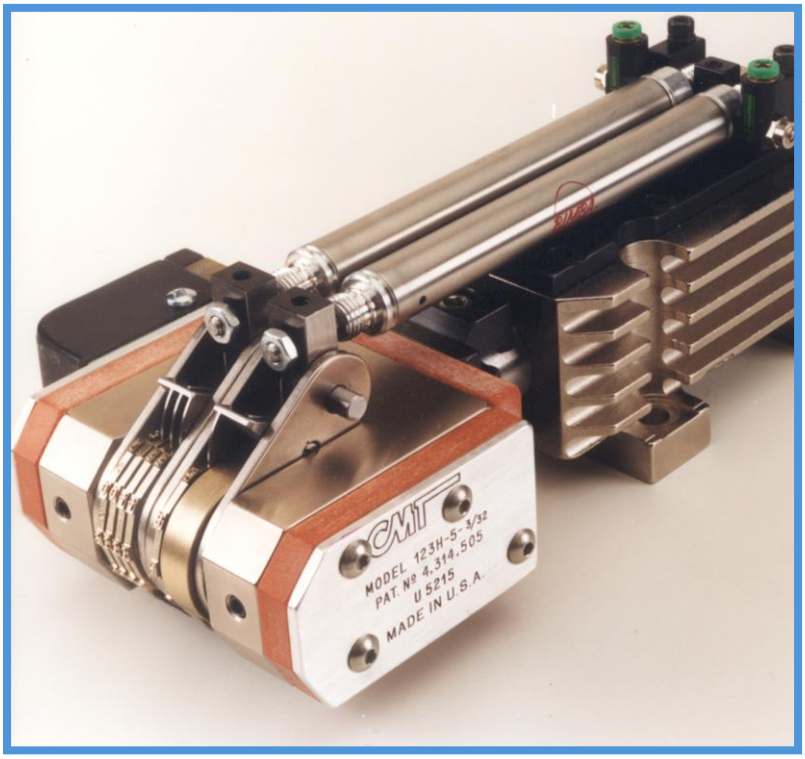
Automated Hot Stamping Numbering Heads
For high-volume or repetitive marking applications, automated hot stamping numbering heads deliver efficiency and consistency. Integrated into production lines, these heads can handle large quantities with minimal downtime, ensuring uniform marking across all parts.

Both options are customizable to meet specific requirements, such as font size, character arrangement, or serial progression, ensuring versatility and high-quality results for marking on plastic components.



Model 130H and 123H is individually designed per customer application:

- Mounting Style
  - Dovetail mount – please provide length across dovetail, or machine model this tool will be used in
  - Flat top mount with tapped holes. CMT can provide the recommended design during the approval process.



- Character Size
  - Metric or Inches for each character
  - Remember it is easy to overestimate the character size
- Number of wheels
  - Number of wheels in the numbering head - automatic and manually indexed.
  - The tooling design may also include prefix and suffix type holders.
- Wheel readings
  - The standard, and most common, readings are figures 0 through 9.

- Actuation Method
  - Pneumatic cylinder
  - Mechanical Trip bar

Technical Specifications:

- Solid Frame – designed and manufactured to fit wheels in configuration.
- Extra wide CMT proprietary cam design.
- Large shaft design to meet extra marking force for indention marking.
- High density specially wound cartridge heaters
- CMT patented pawl design – to allow for easy setup in either direction.
- CMT patented pawl design – to allow for easy setup in either direction.
- Selection of Temp switch or J wire thermocouple for temperature control.
- Double pass engraved (NOT EDM)
- Ampco Bronze
- 45 Degree engraving angle
- Sharp face character
- Gothic standard (San Serif) font

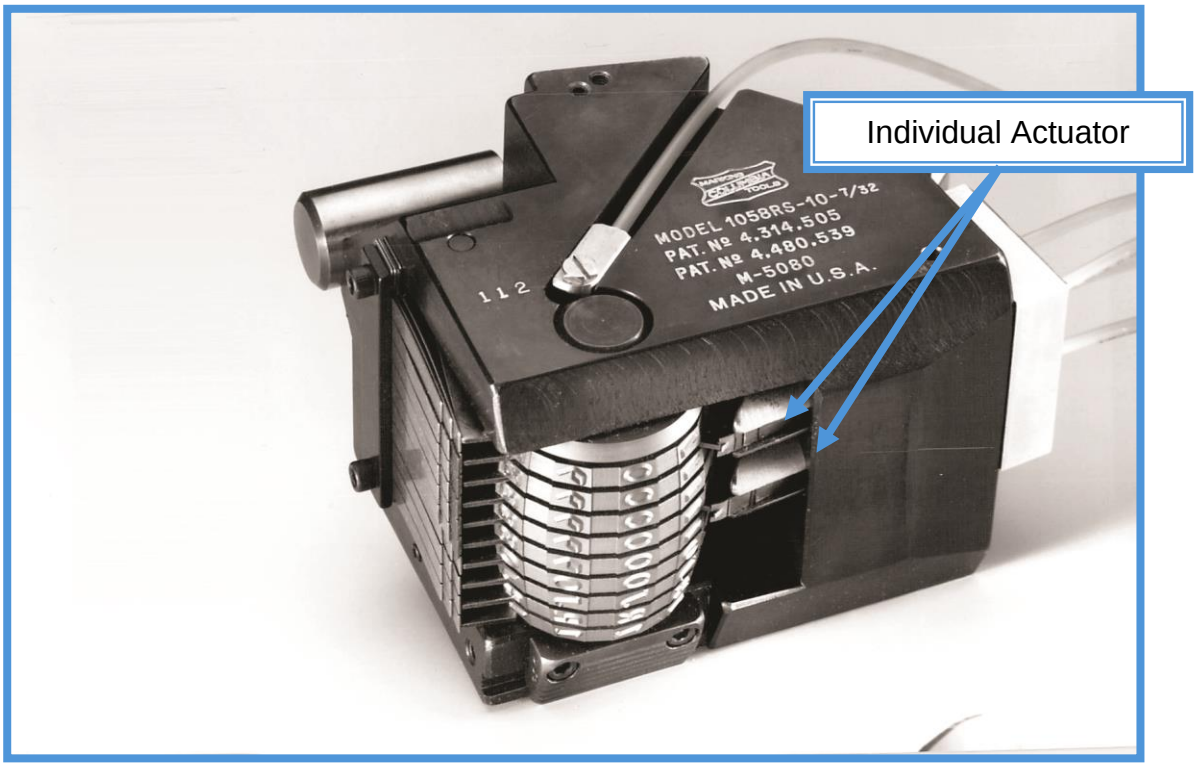
Along with the proposal CMT will provide an estimated marking legend length. A complete dimensional drawing is provided for review upon placement of an order.

Random Numbering Head – Model 1023 and 1058

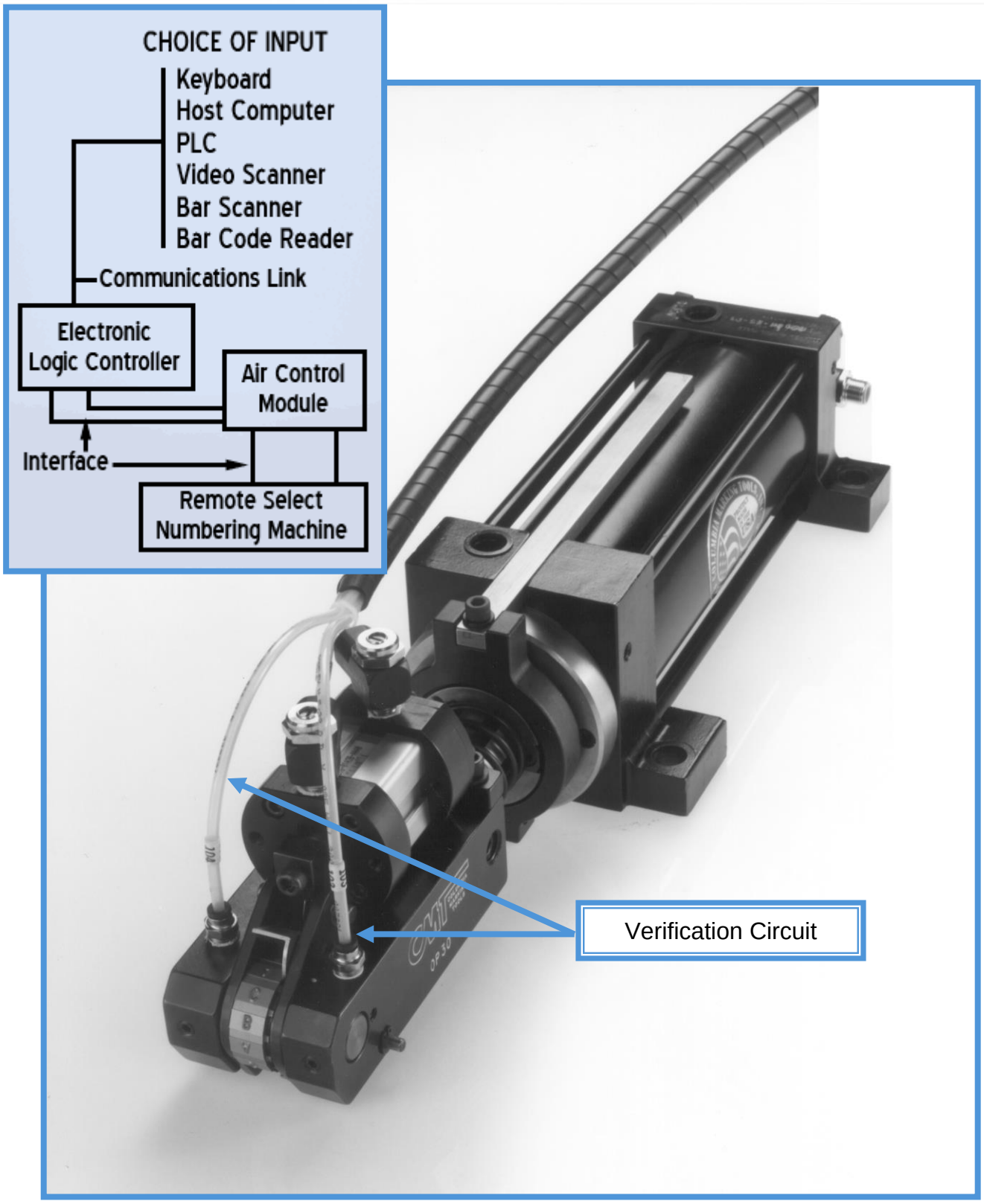
Columbia Marking Tools' **models 1023 and 1058 numbering heads** are purpose-built for specialized applications, offering unmatched precision and efficiency in marking electronically generated alphanumeric random sequences.

These cutting-edge numbering heads are designed with **remote selectivity**, allowing seamless integration with computer systems for fully customizable and controlled marking operations. Each wheel is **individually actuated**, enabling unparalleled flexibility in creating dynamic and unique markings essential for industries focused on traceability, serialization, and part identification.

Engineered for **rugged plant environments**, these machines boast exceptional durability and reliability, ensuring consistent, high-quality performance in even the most demanding industrial conditions. With innovative features and robust construction, models 1023 and 1058 set the standard for advanced metal marking solutions in modern manufacturing.



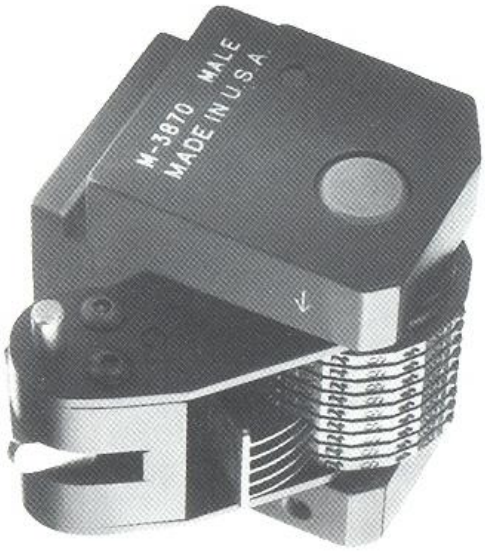
Verification Circuit - Error proofing of the random number is provided via air pressure sensor.

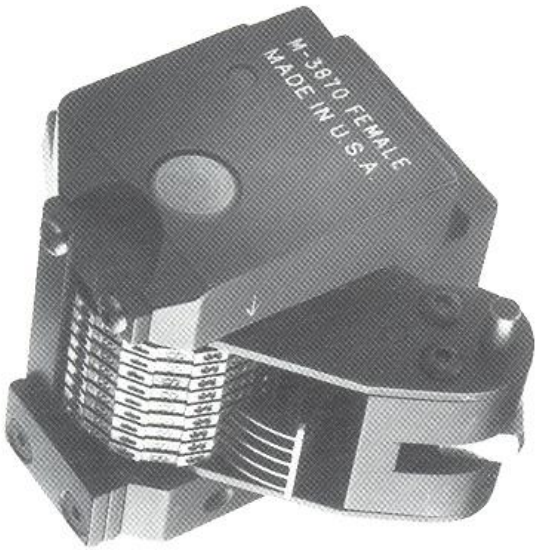


Embossing Numbering Heads – Model 124

Embossing numbering heads are precision tools that raise characters above the surface of sheet metal, creating a durable and easily legible mark. This technique is ideal for applications requiring clear numbering on materials up to 0.093" thick.

Renowned for their reliability, these numbering heads are customized to meet specific customer needs, ensuring optimal performance for various industries. Embossed characters stand out for their sharpness and permanence, making this method superior for marking part numbers, serial codes, or production data on metal stock. Whether for traceability, identification, or branding, embossing offers a professional and lasting solution.





The Embossing numbering head must be used in a Die Shoe. A **die shoe** is a critical component in die assembly, serving as a robust foundation to support and align die components during metal forming or stamping operations. It provides structural stability and ensures precision by maintaining the correct alignment of the upper and lower die sets.

Embossing Technical Data Sheet

Embossing Quotation Request

Embossing Force Chart