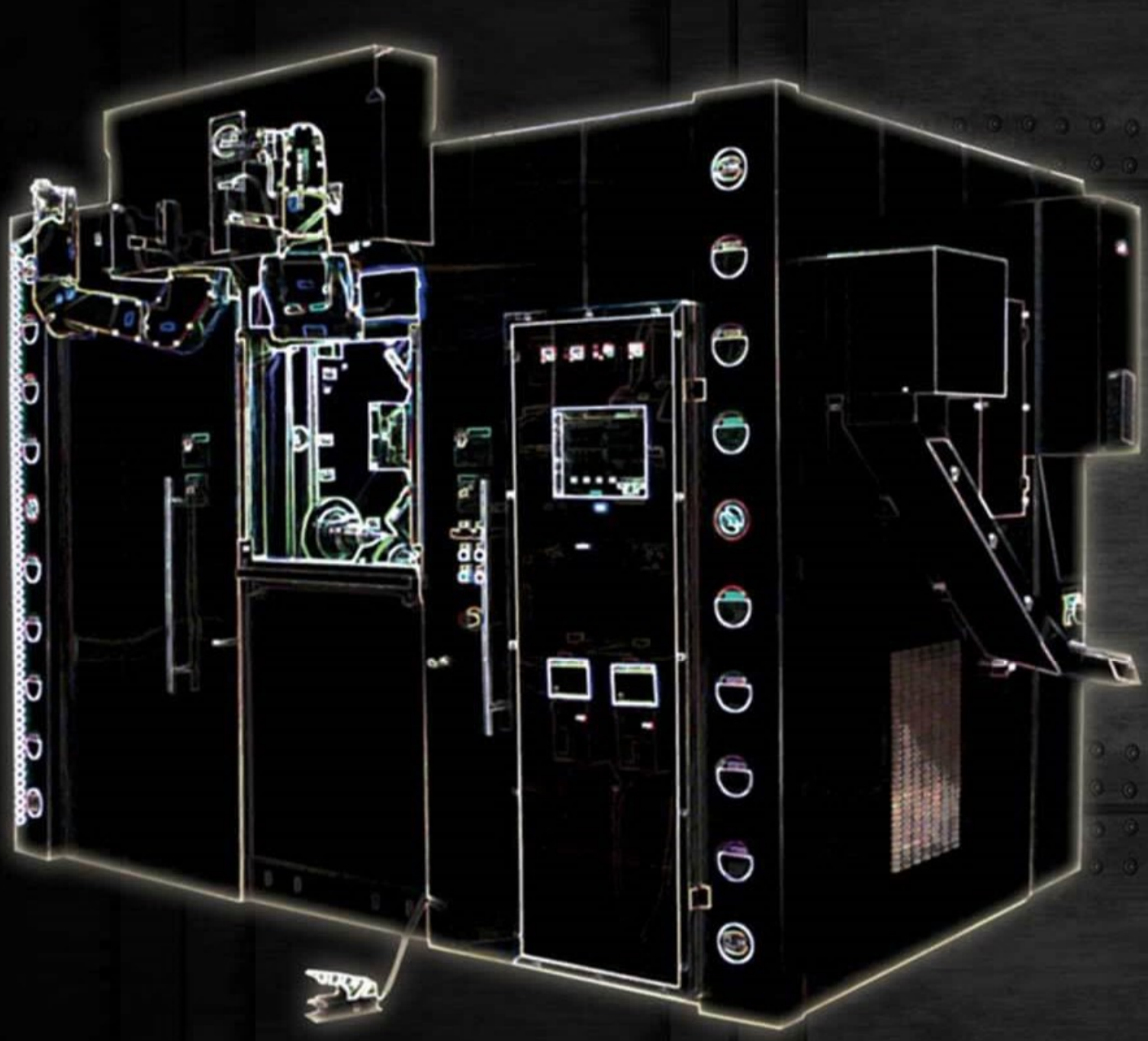
Turkish Technological Machinery

When examining our catalog please be free from prejudices

Open YOUR MIND



2015

I would like to thank to all our customers about their confidence for the manufacturing process of 1000 Machines between 2005-2013. We are proud to show our company's status and skills about producing various kinds of machines in our catalog.

We also would like to thank you for your interest about our machines that meets European standards in case of design, quality and economical life with the price advantage of %200 to our competitors...

Kind Regards

Fatih **KESTEK**

General Manager

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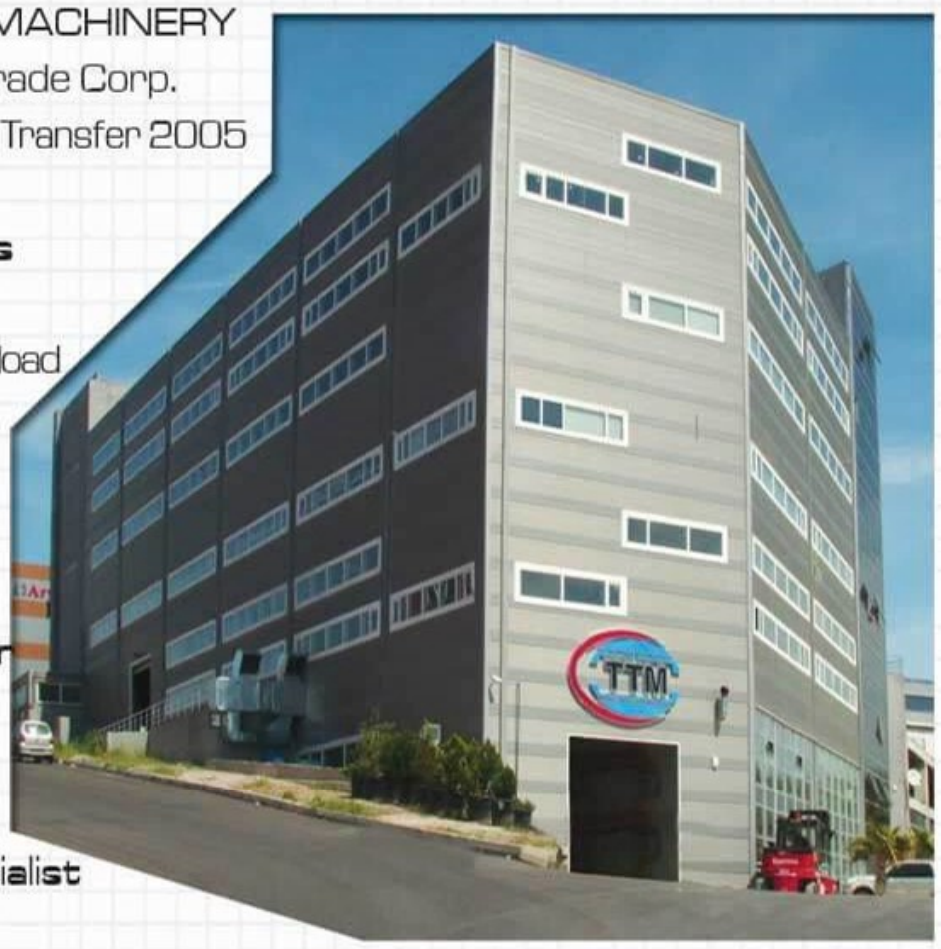
TTM : TURKISH TECHNOLOGICAL MACHINERY
Company Title : TTM Machine Production and Trade Corp.
Foundation Date : AKT 1990, TTM 2003, First CNC Transfer 2005
Annual Turn over : 7.600.000 € For 2014
Annual Production : 35-60 CNC Transfer Machines
Exp. Percentage : %45-55
Occupancy Rate : %140/16 Monthly Contract Workload
Growth Strategy : %400 Actual for 2008-2014
Staff :3 Mechanical Engineers
2 Research, Development and Design Engineers
1 Mechatronics Engineer
1 Software & robotics Engineer
1 Drafts Person
1 CAM Specialist
4 Executive, 4 Office Staff
1 Head Designer
1 Electric and Electronics Specialist
30 Highly Qualified Technicians



Manufacturing Yard: 2600 m2 Production,800 m2 Engineering and Management area
Premises : Tuzla/ Istanbul Free Zone TURKEY
Net Assets : 6.000.000 € Property , 2.750.000 € Machine Park
Owners : General Manager Fatih Kestek / Partners: Fatih Kestek and Ali Kestek

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OUR VALUES

Our main Value is to produce the right machines that pay off in a short period and do the right work in order to shorten the manufacturing process of the materials according to the needs of our customers. We also know the importance of quality products without any defect and aim on manufacturing machines that needs low operating costs and maintenance. While doing this we also aim to give the technical support within 12 hours period.

OUR RESPONSIBILITIES

Our responsibility is to establish customer satisfaction without losing customer reliability. As we continue to produce we would like to get ourselves on higher positions to provide machines for Turkish, European and American markets.

OUR VISION

By following the trends on technological products we aim on producing machines that rely on Quality, Price and Performance.

TTM was officially established in Tuzla Free Zone at 2005. Our main production activity consists of CNC Transfer Machines, Hot Forging Lines and Designing of special Machines. Producer ID is based on AKT Machine that started up at 1990. AKT Machine was founded by Mr. Ali Kestek graduated from İstanbul Technical University as a certified engineer. AKT Machine was manufacturing Hydraulic Transfer Machines, Hydraulic Clamps and Special Work Machines until 2001 when Mr. Fatih Kestek participated the company. After this period the company had the export capability and grew with technological research and development investments.Continuing at 2005 it was established in Istanbul Free Zone as TTM Machine company (Turkish Technological Machinery). TTM makes high-tech CNC Machines solely and has the export goal of %50. This aim and variation in a sense became a renaissance of the company with respect to production range, customer satisfaction and vision. TTM has acquired the new identity by making the high-tech CNC machine production instead of hydraulic and mechanical machines. With this vision Mr. Fatih Kestek has been appointed as the general manager of the company. Now TTM has high-tech production and is a corporate company setting up with the new engineer and technical staff.


1990


1995


2000


2005


2010


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CAPACITY, RESEARCH AND DEVELOPMENT

TTM machine corporation mainly aimed on automotive, plumbing, sanitary systems, gas armatures and furniture component sectors for producing parts from pourable or profile made from steel, copper, aluminum and so on.

After 2008 TTM produced 127 variations of machines from mainly 9 machine types. With manufacturing experiences TTM has distinct machines that have separate power supplies with 9 types of tool holders and from 2 to 18 stationary rotary table types. Also from 2012 TTM has completed 3 Tubitak (THE SCIENTIFIC AND TECHNOLOGICAL RESEARCH COUNCIL OF TURKEY) 1507 research and development projects without taking any external support.

The main advantages why we have %200 low prices from our competitors depend on two reasons. The first reason is that we can produce spindles, rotary tables, tool holders within our production yard.

The second reason is that we do all the engineering, programming and robotic automation within our system. By making machines according to the needs about the final product, customer needs, providing spare parts, fast and economical service we can give unrivaled advantages.

FORTUS 250 MC:
Fast Prototyping Machine

MITUTOYO:
High Accuracy Coordinate Measuring Machine

E.C.A

BOSCH

FIRAT

arçelik

TURAŞ

Rollmech automotive

TEKNOROT

Valeo

KONSAN TESİSAT MALZEMELERİ SAN. ve TİC.LTD.ŞTİ.

KALE

TEKSAN

Ford

Mercedes-Benz

YENİ AS METAL ROT ve ROTİL SAN.veTİC.LTD.ŞTİ.

BTS شرکت بهترانشان سیاهان (بی تی اس)

KIZZ IRAN

БЕТАР BETAR

PBK BRAND POLYMER SYSTEMS

ОАО АРЗАМАССКИЙ ПРИБОРОСТРОИТЕЛЬНЫЙ ЗАВОД

dist

ARSLAN

Emko ISITMA SİSTEMLERİ

büro mekaniker "Gaz Armatürlerinde Sigortamız"

YUMA KİLİT

REKSAN

ŞESAN YEDEK PARÇA SAN. TİC. A.Ş.

METAK

ЭКВАТЭЛ

disa AUTOMOTIVE

PARSAT

SİLTER MAKİNA

Gazelle

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MITSUBISHI ELECTRIC
Changes for the Better

Rockwell Automation

INA FAG

NSK

Steinmeyer

GIMATIC

GRIP srl

KOMET

TEDISA

Gisstec

pilz

Klemsan

BALLUFF

Schneider Electric

finder

EATON

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miksan

KASTAŞ

EROGLU Präzisionswerkzeuge

- SIMILAR CNC TRANSFER MACHINE PRODUCERS -

GNUTTI

BTB

BUCCIALI TRANSFER S.p.A.

PICCHI 1923 MACHINE TOOLS

riello sistemi

PORTA SOLUTIONS
LET'S START A REVOLUTION

Transfer machines are mainly used for producing high quantities in automotive parts, plumbing and sanitary system parts, gas armatures and furniture components. The examples you can see below are just %1 percent of what can be produced by using transfer machines. You can contact us by just an e-mail to learn about whether your parts can be produced and how many seconds will your transfer machine take to produce an initial part. We can also inform you about how long will it take for the assembling process and startup of your transfer machine.

Automotive Industry

Plumbing Fittings and Fixtures

Gas Armatures

Lock and Furniture Equipment

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pg. 10

STEEL AND DERIVATIVES

Why Transfer Machines ?

The main advantage of using a transfer machine against a standard CNC counter is that by using a transfer machine the machining process of the part can be done on multi axis at the same time. For standard CNC counters or other machining centers producing a single part takes time because of changing blades, changing the axis and so on.

By using the advantages of the rotary table and body system of a transfer machine you can make multi processing at the same time. Another advantage of transfer machine is for using the elapsed time while changing between machining counters with another one in the machining process. Within this context transfer machine's axis is build according to the machining process of the part rather than continuously changing the axis of the product according to the need. By this means there is no more need for loading and unloading the part and time is saved without changing the gears, blades etc. to machine it.

By this means the process time of a single part is easily calculated. This is because a single rotation period of the rotary table and chipping process time is known.

With all these advantages, in order to compare the performance of a transfer machine to a standard CNC Machine we can say that Transfer Machines have the ability to produce the same part while 5 to 20 standard CNC Machines do.

By doing this, a single staff can use the transfer machine with robotic automation which will ultimately end out with a highly accurate and economic product.

The last advantage of using a transfer machine is about saving a lot of space in the production area. Standard CNC Machines occupy 2 to 10 time more area compared to a Transfer Machine. For conclusion; method of using a transfer machine can be seen as the best option in today's modern world and the future for producing an accurate and economical part.

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TRANSFER MACHINE VS. UNIVERSAL MACHINE

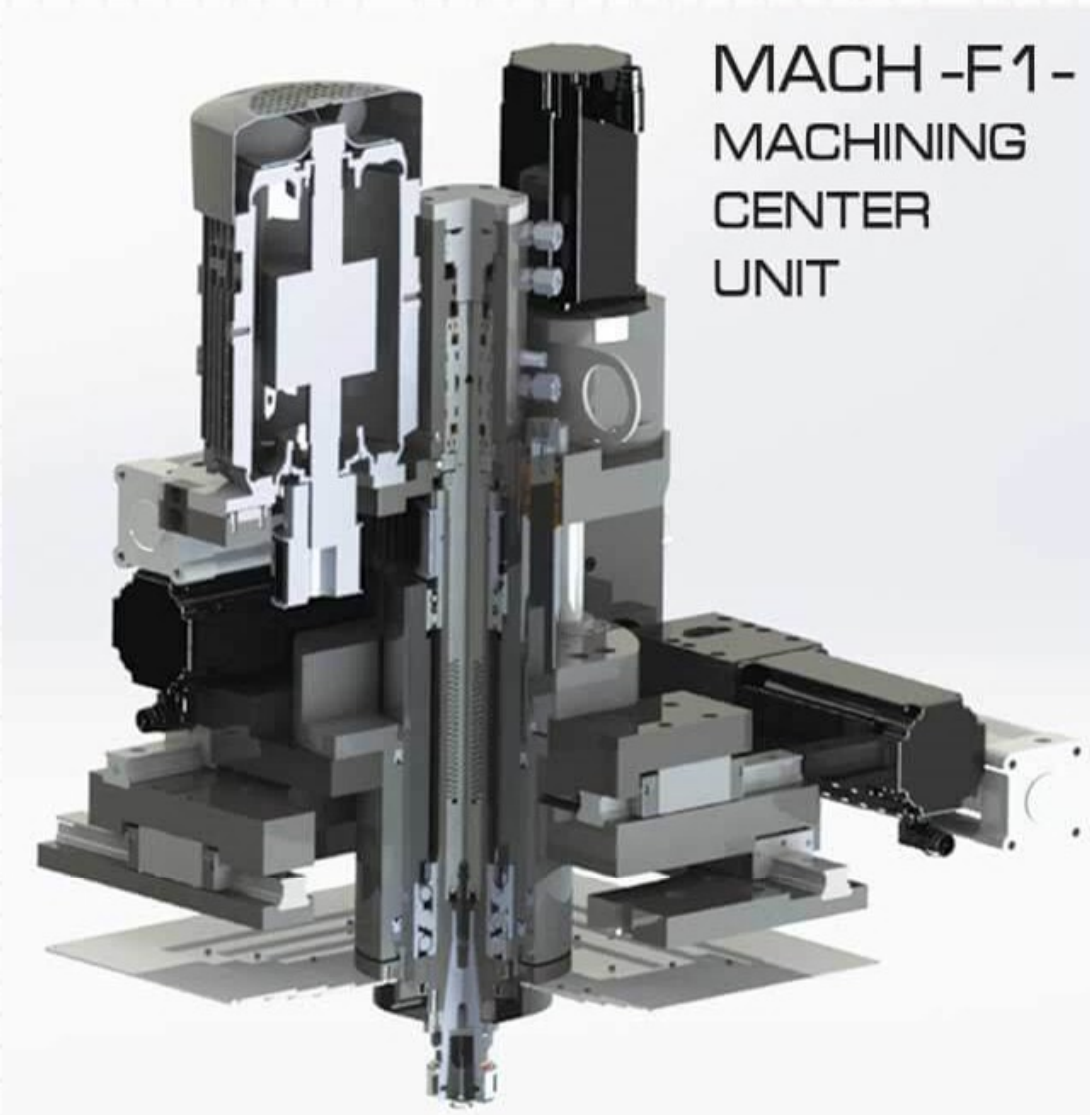
Part Definition:	PNEUMATIC PISTON CAPS	TAP MIXER WITH A MOVABLE HEAD	SLOTTED BALL JOINT
Part Visual:	 Ø100 Cylinder Cap		
Raw Material:	ALUMINUM	BRASS	FORGED STEEL
Process Stages:	Machining 2 sides of the body, machining the diameter of the bedding,Drilling, Opening an inside canal, opening an outside canal, drilling of a precise bush diameter; opening of an exhaust canal and screw cutting, machining a 4 part fixation holes, Opening the intake air canals and screw cutting totally 18 processes	Machining both sides of the body, machining the outside diameter; processing the inside canal, processing the outside canal, drilling the entrance holes of cold and hot water; screw cutting process, leveling, screw cutting using an external radius die nut, slot opening processes. Total Processes 17	Machining both sides of the body, Face milling, Broaching using U drill, sensitive inside machining, outside machining, drilling, machining the face and the inside diameter gradually, screw cutting by using scrubbing guide pin, slot opening, drilling the slotted area, chamfering, screw cutting processes. Total Processes 12
Quantity of Machines for Processing	**Transfer / Uni. Method** 1 With 18 Units 38 Axis Transfer Machine 7 Double chuck CNC lathing machine 6 Double Table Machining Center	**Transfer / Uni. Method** 1 With 17 Units 42 Axis Transfer Machine 8 Double chuck CNC lathing machine 9 Double Table Machining Center	**Transfer / Uni. Method** 1 With 12 Units 24 Axis Transfer Machine 4 Double chuck CNC lathing machine 5 Double Table Machining Center 1 Multi slot Opening Machine
Process Time :	20 sec. / Part Lathe 155 sec./Part Mach.Centr:140sec./Part	23 sec. / Part Lathe 185 sec./Part Mach.Centr:210sec./Part	18 sec. / Part Lathe 75 sec./Part Mach.Centr:85 sec./Part
Power Cons. :	40 kW/Hour 195 kW/Hour	45 kW/Hour 255 kW/Hour	30 kW/Hour 150 kW/Hour
Space Required :	30 m² 325 m²	30 m² 425 m²	30 m² 250 m²
Staff :	1 / Shift 13/ Shift	1 / Shift 17/ Shift	1 / Shift 10 / Shift
Cost :	200.000 EURO 1.100.000 EURO	280.000 EURO 1.500.000 EURO	170.000 EURO 800.000 EURO

MACHINING UNIT TYPES AND FEATURES pg. 13

After starting to produce hydraulic and mechanic units, today TTM produces 127 types of high-tech units from 9 different main types. All these units are suitable for (raw Steel, Brass, aluminum, alloys and extruded materials) and can be used for (drilling, machining, milling, slot opening, inside and outside screw cutting, centering, labeling, cutting, broaching, forming, polygonal machining, curing and so on) these units can be produced with a single axis or up to 5 axis types.

The main 5 axis, 4 axis, 3 axis machining base unit types Lathe, milling, screw cutting, recessing, 90degrees headed lathe, saw, internal broaching, tail stocking, polishing, grinding, polygonal machining, multi drilling with screw cutting, forceps holding, slotting, position shifting, position rotating, punching, automatic unloading, rod sliding and stationary angled units are our standard units. We can also provide different types of units according to the needs.

All these below unit's personal rights and designs belong to our company. Conic machining, grinding, finish grinding and also spindles are produced inside our own manufacture yard. All our machines are produced within the tolerance of 10 microns.



MACH -F1-
MACHINING
CENTER
UNIT

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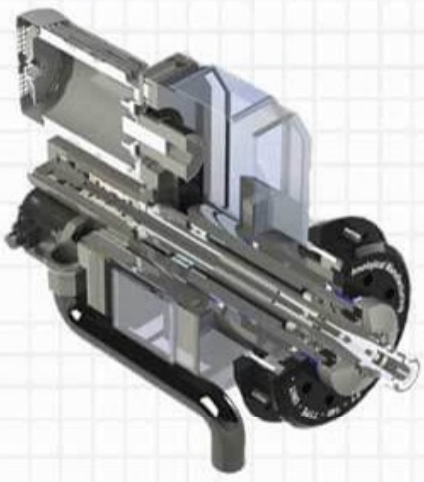
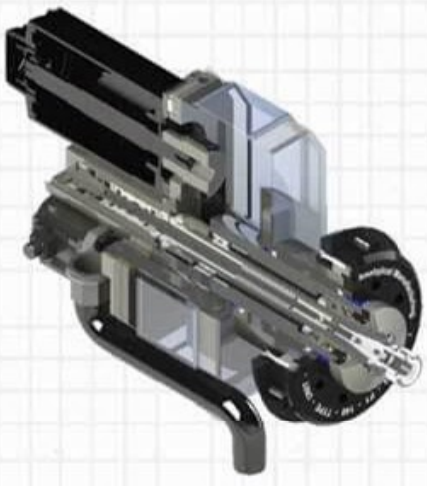
1 AND 1.5 AXIS UNIT TYPES AND FEATURES

Wheel spindle works on Z-axis with linear motion in Single axis unit work principle. There are 3 main products in this family. Which are, stationary spindle, AC driven wheel spindle and servo driven spindle.

MACH -F1-
Unit Group



MACH -F1-
Unit Group



The main working principle of these units is to work on a single axis and can manage Drilling, Forming with combined types of tools, screw cutting with die plate or guide pin, tailstock, punching, labeling, polygonal machining, rotating, sliding the part and broaching.

MT Unit Group

Polygonal
MT Unit Group

These Units work with precise rev and chipping according to the raw material of the part. These Units are produced on 4 main groups, which are Side activated YT series, center activated MT series, Mach series and Mach F1 series and can be used with the dimensions of direct headed forceps ISO30, ISO40 and ISO50.

SPZ Labeling and
Positioning Units

YT
Series

MACH Unit Group

1 AND 1.5 AXIS UNIT TECHNICAL SPECIFICATIONS pg. 15

	MACH F1 Group	Mach Group	MT Group	YT Group
Model Series	Mach F1 110 ISO 30 Mach F1 140 ISO 40 Mach F1 180 ISO 50	Mach 60 ER 32 Mach 80 ISO 30 Mach 100 ISO 40	MT 80 ISO 30 MT 115 ISO 40	YT 115 ISO 40 YT 160 ISO 50
Bedding Diameter	F1 110 = Ø110mm F1 140 = Ø140mm F1 180 = Ø180mm	Mach 60 = Ø60mm Mach 80 = Ø80mm Mach100= Ø100mm	MT 80 = Ø80mm MT115 = Ø115mm	YT 115 = Ø115mm YT160=Ø160mm
Maximum Z Stroke	F1 110 = 110mm F1 140 = 120mm F1 180 = 150mm	Mach 60 = 80mm Mach 80 = 90mm Mach100 = 100mm	MT 80 = 90mm MT115 = 105mm	YT 115 =100mm YT160=140mm
Inside Quenching	Quenching is optional	Quenching is not available	Quenching is not available	Quenching is optional
Pull Studs (Automatic Tool change)	Pull Studs is Optional	Pull Studs is not available	Pull Studs is not available	Pull Studs is not available
Maximum Spindle Rev	F1 110 = 20000rpm F1 110 = 6000rpm F1 140 = 5000rpm F1 180 = 2500rpm	Mach 60 = 6000rpm Mach 80 = 4000rpm Mach100 = 18000rpm Mach100 = 3000rpm	MT 80 = 18000rpm MT 80 = 4000rpm MT100 = 3000rpm	YT 115 = 3000rpm YT 160 = 2000rpm
Position Repeating Accuracy	F1 110 = 0,01mm F1 140 = 0,01mm F1 180 = 0,02mm	Mach 60 = 0,02mm Mach 80 = 0,02mm Mach100 = 0,02mm	MT 80 = 0,01mm MT115 = 0,01mm	YT 115 =0,02mm YT160=0,03mm
Maximum Spindle Power	F1 110 = 3 Kw F1 140 = 7,5 Kw F1 180 = 12 Kw	Mach 60 = 0,8 Kw Mach 80 = 2,2 Kw Mach100 = 3 Kw	MT 80 = 3 Kw MT115 = 5,5 Kw	YT 115 =7,5 Kw YT160 =12 Kw
Movement Technique	Hydrostatic cartridge embedded in nodular cast iron bedding in front Ball screw spindled absolute servo drive engine on two cylinders at the back	Cartridge embedded in graphite bronze bedding in front Ball screw spindled on secondary graphite bronze bedding with absolute servo drive engine at the back	Hydrostatic cartridge embedded in nodular cast iron bedding in front Ball screw spindled secondary ball bearing carriages with centralized absolute servo drive engine at the back	Hydrostatic cartridge embedded in nodular cast iron bedding in front Ball screw spindled secondary ball bearing carriages with absolute servo drive engine at the back

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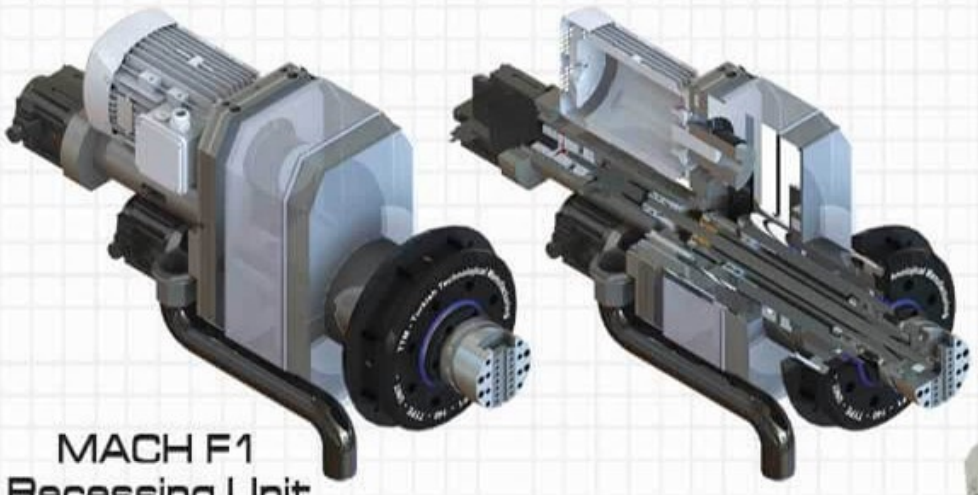
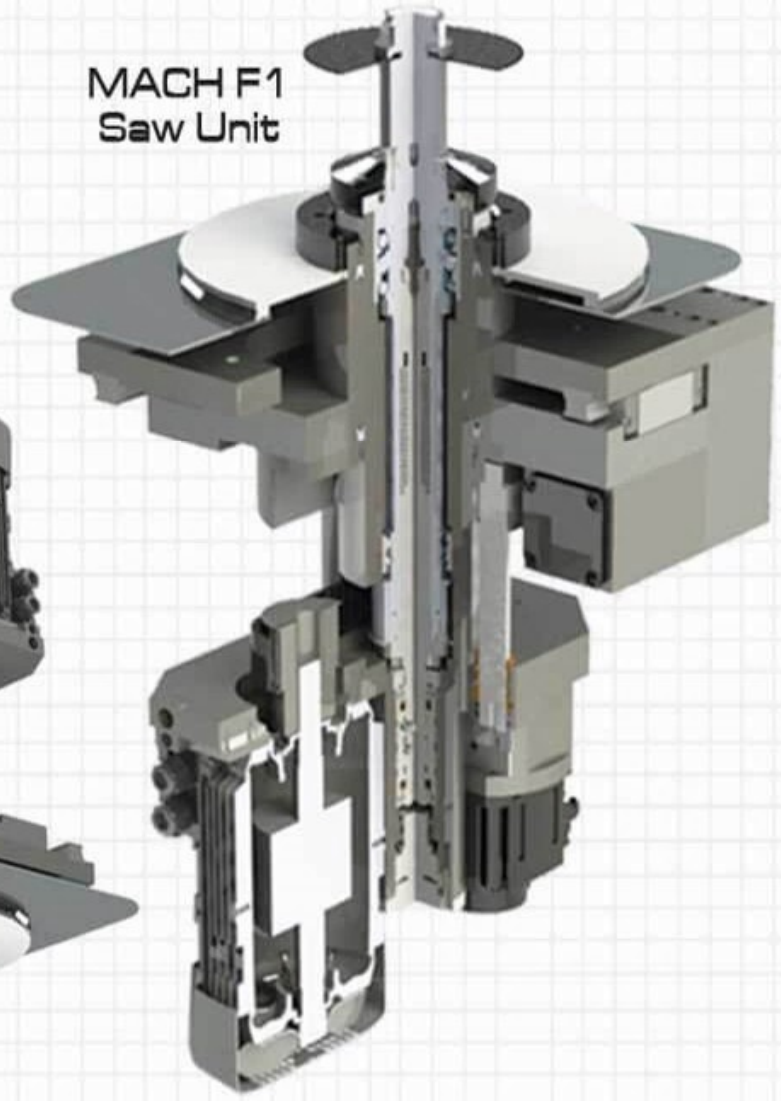
2 AND 2.5 AXIS UNIT TYPES AND FEATURES

Our Double Axis units work with linear and interpolate movement on X and Z-axis. For this group there are two main units that work with AC engine powered wheel spindle and servo powered spindle.



MACH F1
Recessing Unit

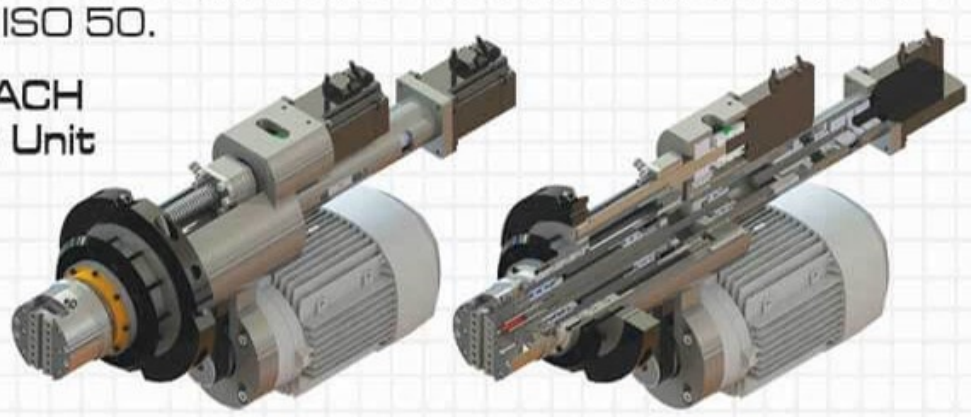


MACH F1
Saw Unit

Units that work with this working principle have internal and external diameter interpolation form figure machining, internal and external channel opening, screw cutting with diamond tipped tools, linear sequential perforation, channel opening with saw blade, linear milling, linear multi screw cutting with tap and die are all used with double axis process.

These Units work with precise rev and chipping according to the raw material of the part. These Units are produced on 4 main groups, which are Side activated YT series, center activated MT series, Mach series and Mach F1 series and can be used with the dimensions of direct headed forceps ISO 30, ISO 40 and ISO 50.

YT and MACH
Recessing Unit

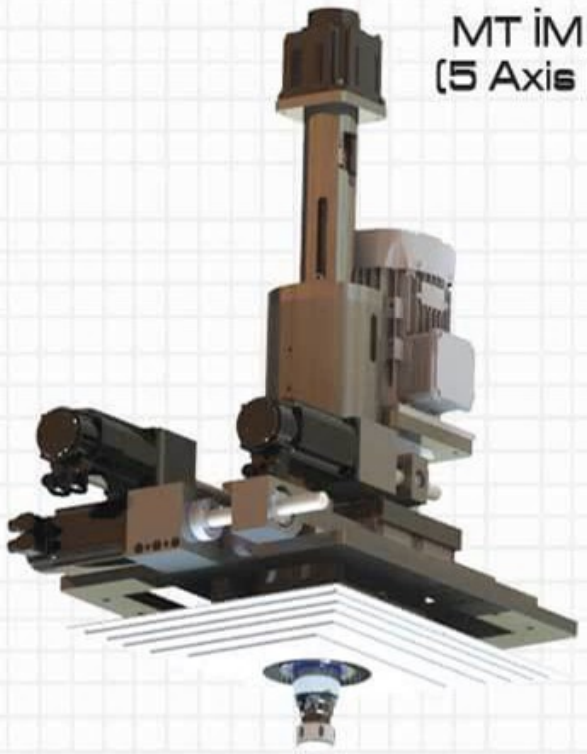


2 AND 2.5 AXIS UNIT TECHNICAL SPECIFICATIONS pg. 17

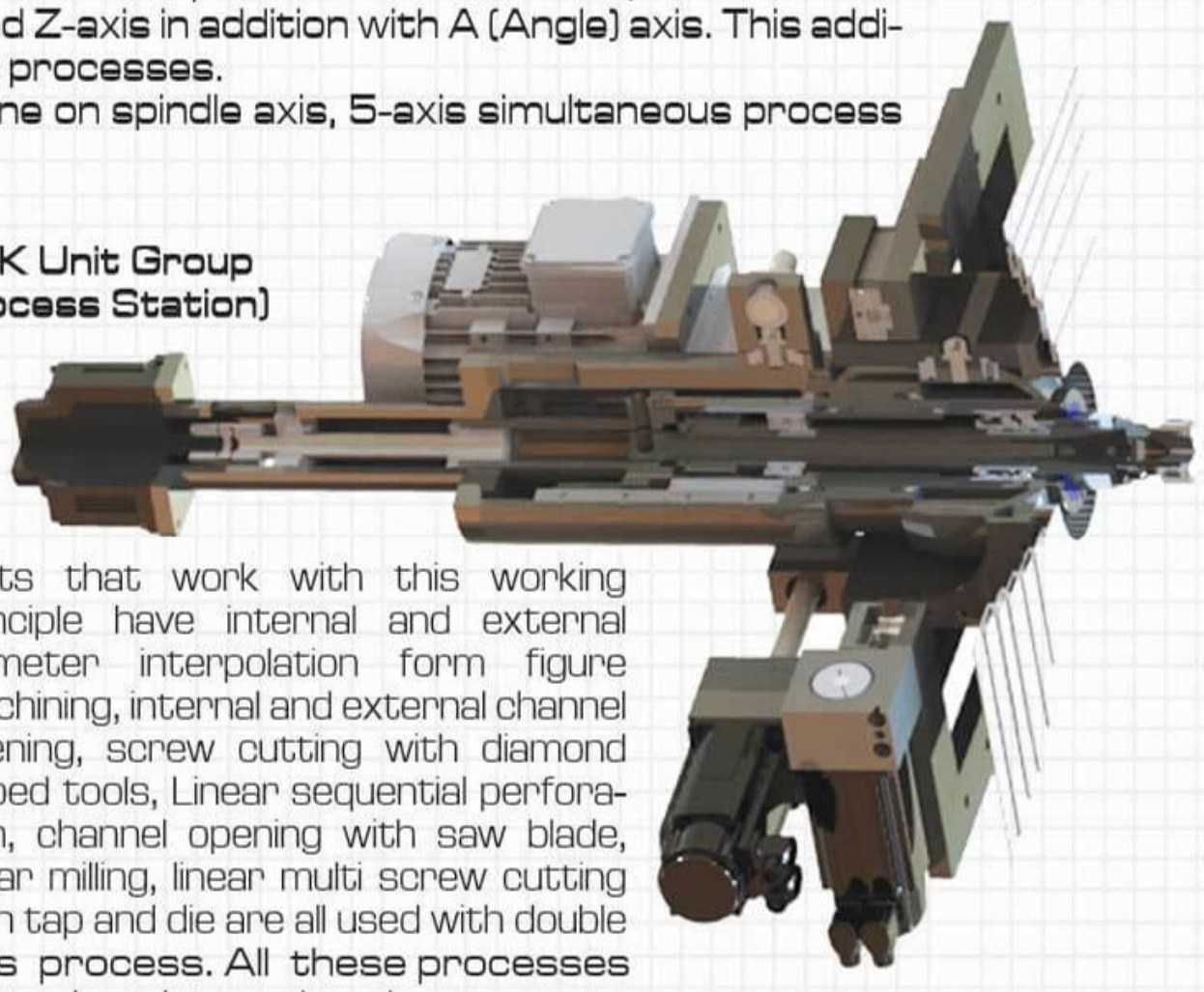
	MACH F1 Group	Mach Group	MT Group	YT Group
Model Series	F1 2 EK 110 ISO 30 F1 2 EK140 ISO 40 F1 ACR 110 ER 25 F1 ACR 140 ER 32	Mach 2 EK 60 ER 32 Mach 2 EK 80 ISO 30 Mach 2 EK100 ISO 40 Mach ACR 100 ER 25	MT 2 EK 80 ISO 30 MT 2 EK115 ISO 40	YT 2 EK115 ISO 40 YT 2 EK160 ISO 50 YT ACR115 ER 32
Maximum Z Stroke	F1 2 EK 110 =110mm F1 2 EK140 =120mm F1 ACR 110 =110mm F1 ACR 140 =120mm	Mach 2 EK 60 =80mm Mach 2 EK 80 =90mm Mach 2 EK100 =100mm Mach ACR 100 =100mm	MT 2 EK 80 =90mm MT 2 EK115 =105mm	YT 2 EK115 =100mm YT 2 EK160 =140mm YT ACR115 =100mm
Maximum X-Y Stroke	F1 2 EK 110 =200mm F1 2 EK140 =200mm F1 ACR 110 =17mm F1 ACR 140 =22mm	Mach 2 EK 60 =300mm Mach 2 EK 80 =250mm Mach 2 EK100 =200mm Mach ACR 100 =17mm	MT 2 EK 80 =250mm MT 2 EK115 =200mm	YT 2 EK115 =200mm YT 2 EK160 =150mm YT ACR115 =20mm
Inside Quenching	Quenching is optional	Quenching is not available	Quenching is not available	Quenching is optional
Pull Studs (Automatic Tool change)	Pull Studs is Optional	Pull Studs is not available	Pull Studs is not available	Pull Studs is not available
Maximum Spindle Rev	F1 2 EK110 - 6000rpm F1 2EK 140 - 5000rpm F1 ACR 110 - 2500rpm F1 ACR 140 - 2000rpm	Mach 2 EK 60 - 6000rpm Mach 2 EK 80 - 5000rpm Mach 2 EK 100 - 2500rpm Mach ACR 100 - 2000rpm	MT 2 EK 80 -18000rpm MT 2 EK 80 -4000rpm MT 2 EK115 -3000rpm	YT 2 EK115 -3000rpm YT 2 EK160 -2000rpm YT ACR115 -2000rpm
Position Repeating Accuracy X-Y-Z	F1 2 EK 110 =0,01mm F1 2 EK140 =0,01mm F1 ACR 110 =0,02mm F1 ACR 140 =0,02mm	Mach 2 EK 60 -0,02mm Mach 2 EK 80 -0,02mm Mach 2 EK100 -0,02mm Mach ACR 100 -0,02mm	MT 2 EK 80 =0,01mm MT 2 EK115 =0,01mm	YT 2 EK115 =0,02mm YT 2 EK160 =0,02mm YT ACR115 =0,02mm
Maximum Spindle Power	F1 2 EK 110 = 3 Kw F1 2 EK140 = 7,5 Kw F1 ACR 110 = 3 Kw F1 ACR 140 = 5,5 Kw	Mach 2 EK 60 = 0,8 Kw Mach 2 EK 80 = 2,2 Kw Mach 2 EK100 = 3 Kw Mach ACR 100 = 3 Kw	MT 2 EK 80 = 3 Kw MT 2 EK115 = 5,5 Kw	YT 2 EK115 = 7,5 Kw YT 2 EK160 = 12 Kw YT ACR115 = 5,5 Kw
Movement Technique	Z Axis-Hydrostatic cartridge embedded in nodular cast iron bedding in front Double Cylindrical secondary bedding at the back X Axis-Ball screw spindled quadplex ball bearing carriages with absolute servo drive engine at the back	Z Axis - Cartridge embedded in graphite bronze bedding in front Secondary graphite bronze bedding at the back X Axis - Ball screw spindled quadplex carriages with absolute servo drive engine at the back	Z Axis Hydrostatic cartridge embedded in nodular cast iron bedding in front Ball bearing Carriages at the back X Axis Ball screw spindled quadplex carriages with centralized absolute servo drive engine at the back	Z Axis Hydrostatic cartridge embedded in nodular cast iron bedding in front Ball bearing Carriages at the back X Axis Ball screw spindled quadplex carriages with absolute servo drive engine at the back

3- 4 AND 5 AXIS UNIT TYPES AND FEATURES

Our 3 Axis units work with linear and interpolate movement on X, Y and Z Axis. In 4 Axis, units work with X, Y and Z-axis in addition with A (Angle) axis. This addition enables 4 axis-interpolating processes.
Also by choosing the servo engine on spindle axis, 5-axis simultaneous process is possible.



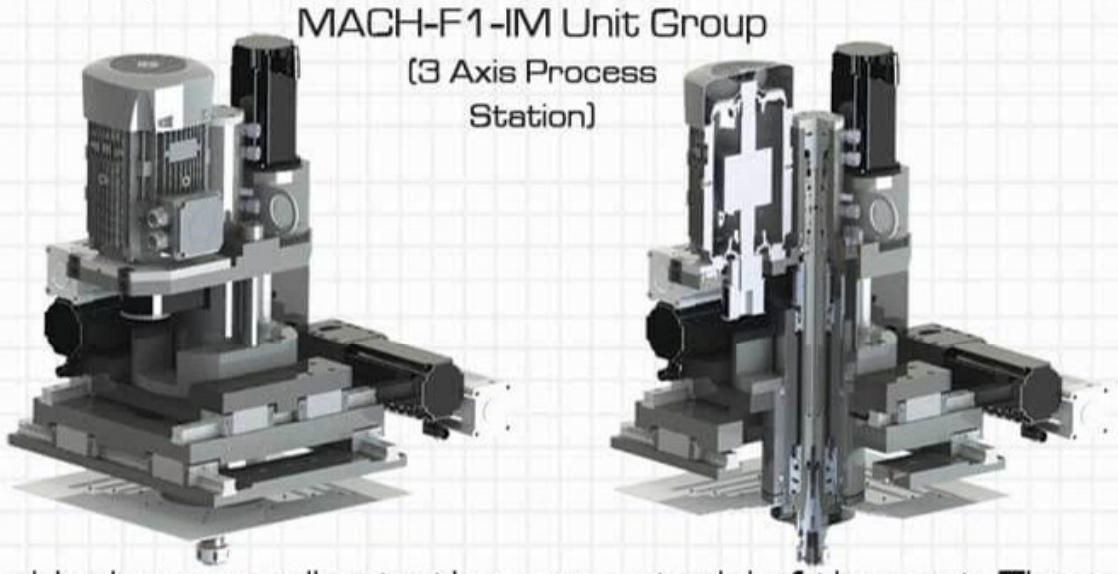
MT İM 5EK Unit Group
(5 Axis Process Station)



Units that work with this working principle have internal and external diameter interpolation form figure machining, internal and external channel opening, screw cutting with diamond tipped tools, Linear sequential perforation, channel opening with saw blade, linear milling, linear multi screw cutting with tap and die are all used with double axis process. All these processes are done on 3,4 or 5 point to point axis or interpolated movements.

MT IM Unit Group
(3 Axis Process Station)

MACH-F1-IM Unit Group
(3 Axis Process Station)



These Units work with precise rev and chipping according to the raw material of the part. These Units are produced on 3 main groups, which are Center activated MT series, Mach series and Mach F1 series and can be used with the dimensions of Direct headed forceps ISO 30, ISO 40 and ISO 50.

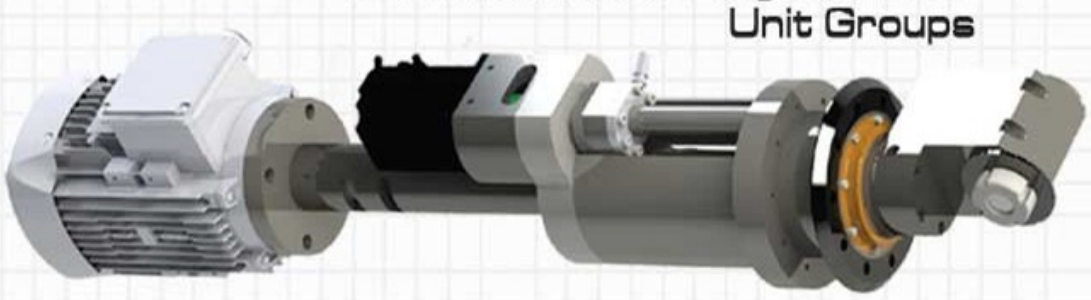
3-4 AND 5 AXIS UNIT TECHNICAL SPECIFICATIONS pg. 19

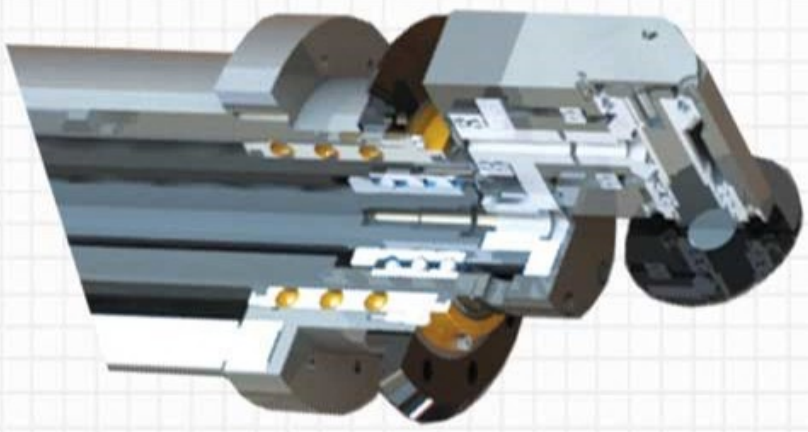
	Mach F1 Group	Mach Group	MT Group
Model Series	F1 İM 3 EK 110 ISO 30 F1 İM 3 EK 140 ISO 40 F1 İM 5 EK 110 ISO 30 F1 İM 5 EK 140 ISO 40	Mach İM 3 EK 60 ER 32 Mach İM 3 EK 80 ISO 30 Mach İM 3 EK 100 ISO 40 Mach İM 5 EK 100 ISO 40	MT İM 3 EK 80 ISO 30 MT İM 3 EK115 ISO 40 MT İM 5 EK 80 ISO 30 MT İM 5 EK115 ISO 40
Maximum Z Stroke	F1 İM 3 EK 110 =110mm F1 İM 3 EK140 =120mm F1 İM 5 EK 110 =110mm F1 İM 5 EK140 =120mm	Mach İM 3 EK 60 =80mm Mach İM 3 EK 80 =90mm Mach İM 3 EK100 =100mm Mach İM 5 EK100 =100mm	MT İM 3 EK 80 =90mm MT İM 3 EK115 =105mm MT İM 5 EK 80 =90mm MT İM 5 EK115 =105mm
Maximum X-Y-A Stroke	F1 İM 3 EK110 X,Y:250 mm A:25deg F1 İM 3 EK140 X,Y:250mm F1 İM 5 EK110 X,Y:250mm A:25 deg F1 İM 5 EK140 X,Y:250mm A:25deg	Mach İM 3EK60 X,Y: 300 mm Mach İM 3EK80 X,Y:250mm Mach İM 3EK00 X,Y:250mm Mach İM 5EK100 X,Y:250mm A:25deg	MT İM 3EK80 X,Y: 250mm MT İM 3EK115 X,Y:200mm MT İM 5EK80 X,Y:250mm A:25deg MT İM 5EK115 X,Y:200mm A:25deg
Inside Quenching	Quenching is optional	Quenching is not available	Quenching is not available
Pull Studs (Automatic Tool change)	Pull Studs is Optional	Pull Studs is not available	Pull Studs is not available
Maximum Spindle Rev	F1 İM 3 EK110 = 6000rpm F1 İM 3 EK140 = 5000rpm F1 İM 5 EK110 = 6000rpm F1 İM 5 EK140 = 5000rpm	Mach İM 3EK 60 = 6000rpm Mach İM 3 EK 80 = 5000rpm Mach İM 3EK100 = 3000rpm Mach İM 5EK100 = 3000rpm	MT İM 3EK 80 =4000rpm MT İM 3EK115 =3000rpm MT İM 5EK 80 =4000rpm MT İM 5EK115 =3000rpm
Position Repeating Accuracy X-Y-Z	F1 İM 3 EK110 : 0,01mm/A:0,05 F1 İM 3 EK140 : 0,01mm/A:0,05 F1 İM 5 EK110 : 0,01mm/A:0,05 F1 İM 5 EK140 : 0,01mm/A:0,05	Mach İM 3EK60 : 0,02mm/A:0,08 Mach İM 3EK80 : 0,02mm/A:0,08 Mach İM 3EK100 : 0,02mm/A:0,08 Mach İM 5EK100 : 0,02mm/A:0,08	MT İM 3EK80 : 0,01mm/A:0,05 MT İM 3EK115 : 0,01mm/A:0,05 MT İM 5EK80 : 0,01mm/A:0,05 MT İM 5EK115 : 0,01mm/A:0,05
Maximum Spindle Power	F1 İM 3 EK 110 = 3 Kw F1 İM 3 EK140 = 7,5 Kw F1 İM 5 EK 110 = 3 Kw F1 İM 5 EK140 = 7,5 Kw	Mach İM 3 EK 60 = 0,8 Kw Mach İM 3 EK 80 = 2,2 Kw Mach İM 3 EK100 = 3 Kw Mach İM 5 EK100 = 3 Kw	MT İM 3 EK 80 = 3 Kw MT İM 3 EK115 = 5,5 Kw MT İM 5 EK 80 = 3 Kw MT İM 5 EK115 = 5,5 Kw
Movement Technique	Z Axis Hydrostatic cartridge embedded in nodular cast iron bedding in front Double Cylindrical secondary bedding at the back X and Y Axis Ball screw spindled quadplex ball bearing carriages with absolute servo drive engine at the back Also with Angle axis units Cone Bearing headstock bedding servo drive angle machining	Z Axis Cartridge embedded in graphite bronze bedding in front Secondary graphite bronze bedding at the back X and Y Axis Ball screw spindled quadplex ball bearing carriages with absolute servo drive engine at the back Also with Angle axis units Cone Bearing headstock bedding servo drive angle machining	Z Axis Hydrostatic cartridge embedded in nodular cast iron bedding in front Ball bearing carriages for secondary bedding at the back X and Y Axis Ball screw spindled quadplex ball bearing carriages with centralized absolute servo drive engine.Also with Angle axis units Cone Bearing headstock bedding servo drive angle machining

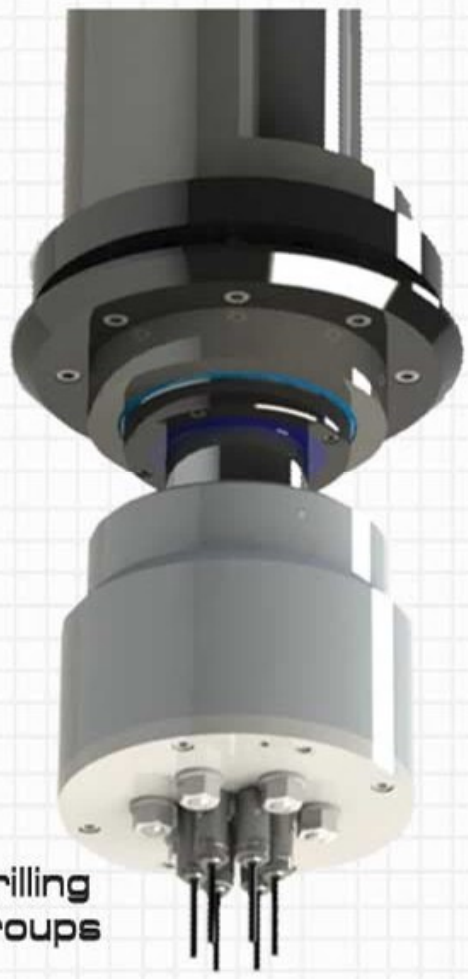
AUXILIARY UNITS AND FEATURES

Other than the standard units, TTM Machine corp. can also build craft unit which can process according to the technical needs of the part that is going to be produced.

MACH Series 90 Degree Head Unit Groups



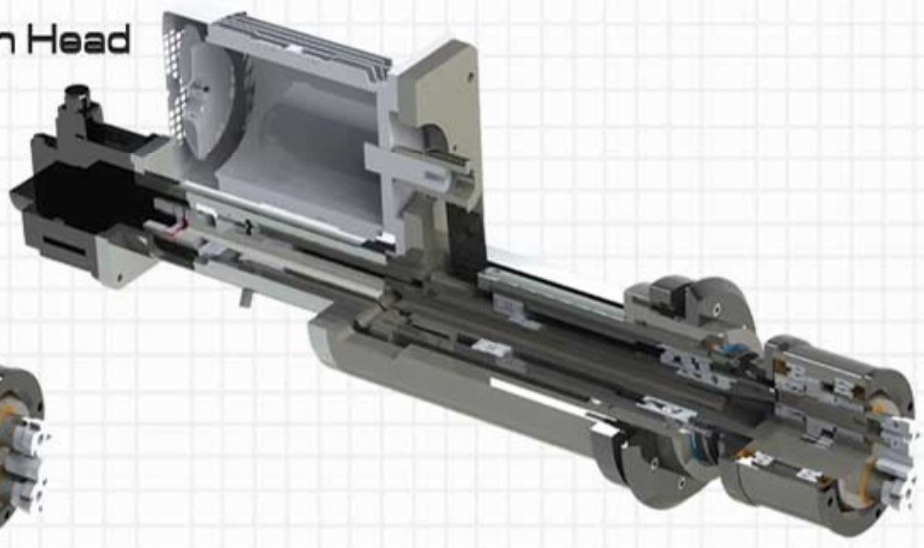




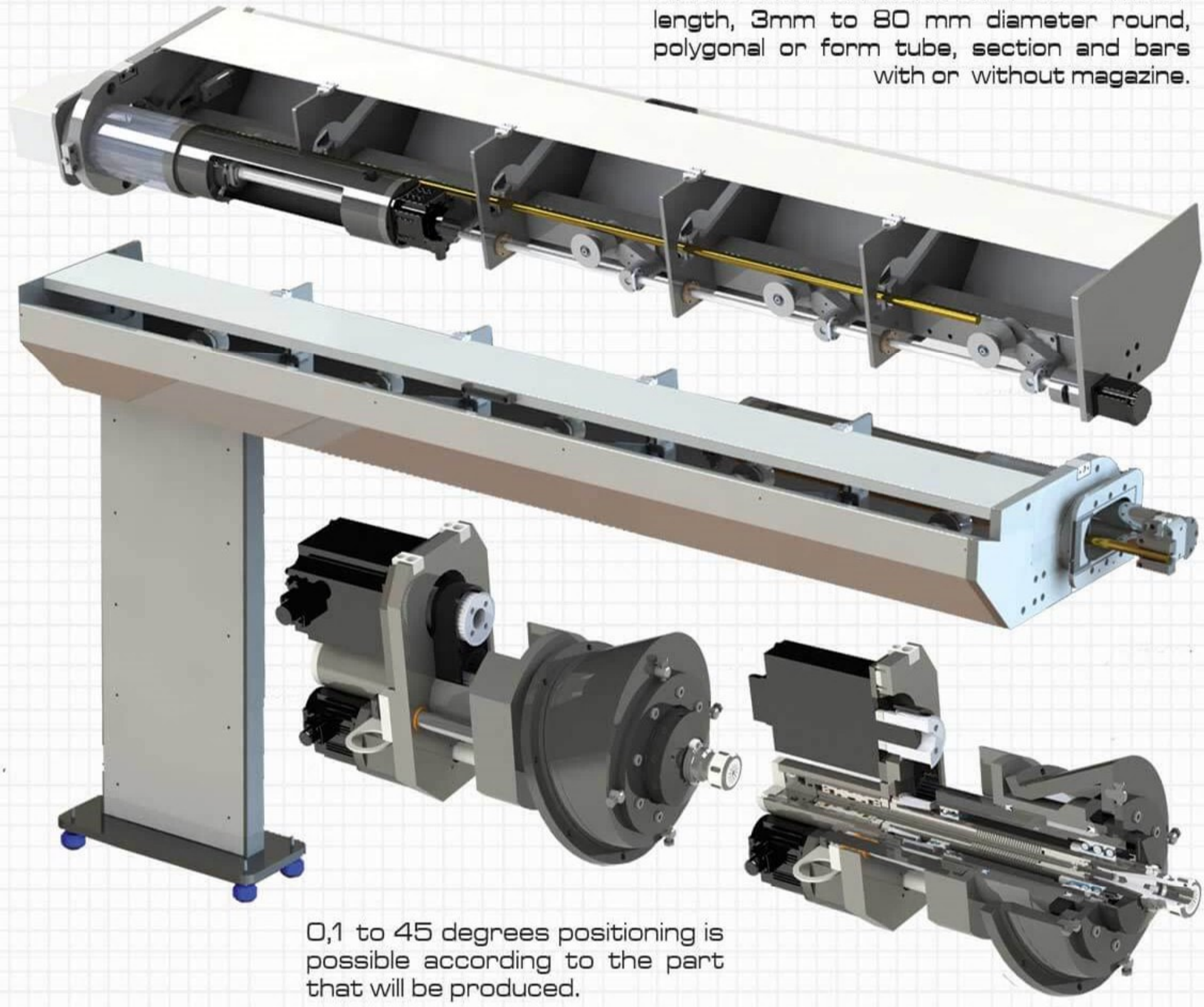
MT Series Multi drilling Unit Groups

Fixed angle units, servo rod drives, special axis multi drilling, polygon tools, poliangolar tools, 90 degree heads, forceps holding, part position sliding, part rotating units and so on can be processed according to the single or multi axis process if required.

MT Series Polygon Head Unit



Sliders that can work on 1 to 6 meter length, 3mm to 80 mm diameter round, polygonal or form tube, section and bars with or without magazine.



0,1 to 45 degrees positioning is possible according to the part that will be produced.

These machines are produced according to the properties of the part including raw material, revs, angle needs and positions.

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TRANSFER WORKBENCHES GENERAL FEATURES

We are able to produce transfer workbenches up to 40 unit 128 axis, full CNC controlled, absolute servo engine powered, from 2 station to 16 station, having rotary table and gripper fixture systems, robotic, suitable for bar driver or manual feed. All our products meet 100% European and USA standards.

Nabtesco

NSK

Steinmeyer

INA

KASTAŞ

TTM produces all unit and rotary table models in it's own facilities. 8620 and 4140 steels used for machining operations are provided from the main providers in Turkey, which are all analyzed and made from high quality raw materials. GGG 60 casting outer bodies are prepared sensitively at CNC machines in TTM facilities. After quenching and hard chrome coating operations bearing cases are grinded according to 0,002 tolerance and bearing elements at 0,01 tolerance continuing with the laboratory analysis and sent to the assembly department. With the Precise positions of the bearing elements that are between 0.01mm and 0.02mm are ready for testing by combining with components produced by Germany and Japan manufacturers. After this test stage all units are ready for the assembly.

TTM aims to produce rigid units with nodular cast iron beddings by using high-pressurized hydrostatic bedding and ball, Roller carriage or shaft bedding. Besides, at some high-speed series there are also self-lubricated bronze bearings can be found in the product range.

TTM uses 7000 series prestressed Precision ball bearings in all spindles. The primary preference for bearings is NSK ball bearings produced in Japan where else in some cases alternatively FAG ball bearings can be used.

Steinmeyer brand for the grinding ball screws.

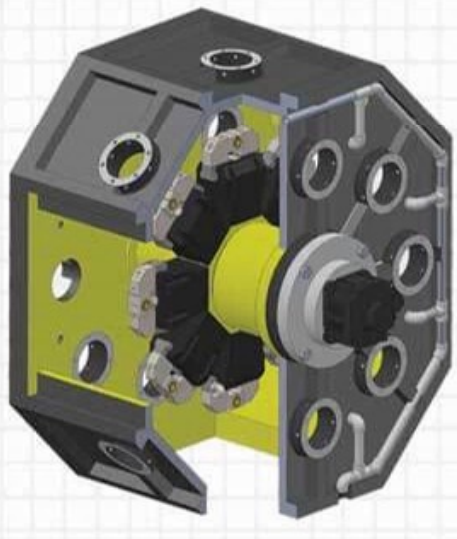
Steinmeyer and Thomson brand for scrubbing ball screws.

German Ina ball brand and roller prestressed precision series are used for ball carriage systems.

For sealing equipment TTM uses Suptex trademark oil seal from Viton raw material, which can endure high temperatures and chemicals. Also Double scrapper Nutrings and scratched dust seals made from polyurethane having Termo Elasto plastic raw material, resistant to 120°C, are used for extra heavy working conditions.

Steel Construction

- 50 or 70 mm thickness from ST37 Sidex trademark raw material with rib Egg construction designed body. The structure of the body is passed from normalization and aging process with 20-30mm welding groove rigid gas metal arc welding.
- TTM design rustproof casing
- Epoxy acrylic paint durable against external factors



ROTARY TABLE Systems

- Rotary Table structure from 2 to 16 stations
- 0,002 positioning sensitivity with Tedisa trademark grinded index gear
- Index locking pressure from 13 tons to 30 tons
- Servo powered tumbler rotation system
- Single or double sided bedding construction
- GGG60 nodular cast iron bedding
- Easy tool change by half station stop feature
- Second drum position and index control system

TEDISA

Holder systems
- GRIP brand Parallel part Retainers
- HAINBUCH brand part retainers with pliers
- ROEMHELD brand special equipment fixtures
- Hydraulic powered in all models
- Adjustable Pressing Force (50 kg- 2600kg)

Hydraulic Systems
- Vickers brand hydraulic pump group
- Vickers brand hydraulic command valve group
- 40-55 bar standard working pressure
- Standard pressure regulation valve
- Main system and fixture pressure indicator
- EMMEGI brand or equivalent air circulation oil cooler or Chiller type cooling system

Auxiliary Liquid Systems
- 5-30 bar pumping pressure,
- Grundfos auxiliary liquid pump
- Perforated separator or paper filtering systems
- Showa-Denki brand steam filtering (Oil mist) systems
- Christian Maier brand pressurized watering systems through spindle
- Oil scraper unit with standard disc

Dunnage Unloading Systems
- Tracked or scraped turnings conveyor chosen suitable for Dunnage (Brass , Aluminum or Steel)
- Optional endless screw powered helix dunnage removing conveyor
- Standard reverse function

Control Systems
- Mitsubishi or Rockwell brand multi axis motion control
- User Friendly TTM motion plus user software
- Turkish, English and Russian programming
- 32 bit colored 15 inches touch screen control panel
- Breakdown warning and history lookup
- Real time I/O diagnostic
- Remote help and upgrading via Ethernet connection over internet

Electrical Systems
- 380-400 volt main feed
- Schneider; Finder; and Baluff switch components
- Category 4 PILZ Safety PLC work accident prevention relays
- 100% CE compatibility

Servo Engine and Spindle Systems
- Mitsubishi or Rockwell brand Engines
- Multi Turn Absolute positioning 1.000.000 pulse encoder group
- Optical or Ether CAT 100 megabits high-tech driver group
- Mitsubishi Spindle Engine or Watt AC Spindle Engines
- All AC engines speeds are control by Mitsubishi vector invertors

Other Features
- Ultra compact design including Electric, Hydraulic, Auxiliary liquid and robotic feed or magazine bar driver group in single body
- Full automatic, Alfet ball screw lubrication unit
- Steinmeyer brand grinded ball screws
- Steinmeyer and Thomson brand scrubbed ball screws
- Ina ball and roller precision series carriages are used from prestressed series for all ball carriage systems

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TTM machine serves to customers with its complete solutions especially about forming the brass raw material parts. More over, in all product range it presents turnkey, perfect solutions using last technological products that are proved themselves about their subjects.

In this context, our product range have full automatic CNC hot forging lines which is collected under the name of F2 (servo press + 3 axis robot feed+ induction or gas heating group + transportation group), magazine feed full automatic CNC bar cutting machines and 4 way linear dovetail.

As a manufacturer and constructer of your all hot forging and machining lines our firm's first priority is a good service and replacement part support and therefore to serve by setting up business partnership spreaded out long years.

CONTROLLER

- Mitsubishi or Rockwell motion control
- TTM motion hot forming user software
- High definition, 32 bit, colored, touch pad control panel
- Multifunctional breakdown warning and history view
- Real time I/O diagnostic
- Remote help and upgrading via Ethernet connection over internet

SERVO AND AC ENGINE Group

- Mitsubishi or Rockwell servo engines
- Multi turn absolute 1.000.000 pulse encoder group
- Optical communicated Mitsubishi or Sercos brand 3 high-tech driver group with Ethernet communication
- Watt trademark AC engine

ELECTRIC Group

- 380-400 volt main feed
- Schneider; Finder; Baluff switch compnents
- Closed loop board cooling with air condition
- Protection relay from reverse phase
- Group 4 PILZ work accident prevention relay
- All pvc cables have protection pipes

ROBOTIC FEED Group

- 2 or 3 axis press feeding robot
- Interpolated motion ability
- Easy start up with Position teaching
- Single or double pneumatic gripper
- -+ 0.03 mm positioning sensitivity
- Fully programmable CNC software at all axis
- Item feed up to 1.5 kg

GENERAL PRESS Features

- 250-300 ton press models
- Rigid body construction designed with min 2,25 safety coefficient from forging tonnage
- Full automatic item dropper
- 15-25 kw main powered servo engine
- 2 kw ram adjust servo engine with brakes
- Full automatic programmable forging tonnage control
- Full automatic mold closing program
- Adjustable extra rigid ram bedding from 8 points
- Adjustable ram over thrust safety system
- 250-300mm ram stroke preference

BAR CUTTING Group

- 15-38 mm or 25-65mm diameter interval bar cutting capacity
- Programmable full servo engine powered control (spreading and cutting axis)
- Programmable saw cutting speed adjustment
- Head and tail separation program (with adjustable measurement system)
- Full automatic tool holder
- Full servo powered, minimum mechanical adjust needed , very fast and sensitive adaptation and alteration while bypassing between two different diameter
- Optional cutting according to the weight of the item and fine cutting

CONSTRUCTION

- Body with Feder construction from 50-200 mm thickness raw material st37 Sidex trademark
- Body structure which is passed from normalization process and aging process with 20-30mm groove rigid gas metal arc welding
- Low height by installing Overturned power drive
- Acrylic and epoxy paint resistant to external factor.

FURNACE Group

- Diameter 15-55 mm interval part feed ability
- About 5,76 m3 / hour gas consumption
- 209 kw / hour heat production
- Basic user friendly command panel
- Heat control sensor; optimum heat adjustment feature
- Manual or automatic start
- Optimum part diameter adjustment for press feed

GENERAL FEATURES

- Steinmeyer ball screw group
- Ina linear guide way group
- Full automatic, multipoint lubrication unit with dosage used in ball screws and bearings
- User friendly basic interface and all purpose software
- Turkish, English and Russian language control screen
- Thanks to overturned propelled group special design there is no need for high ceilings
- Compact design carrying robotic feed and part unloading group on the body
- With the full servo powered engine changing, adaptation and mechanical adjustment is fast and tender.

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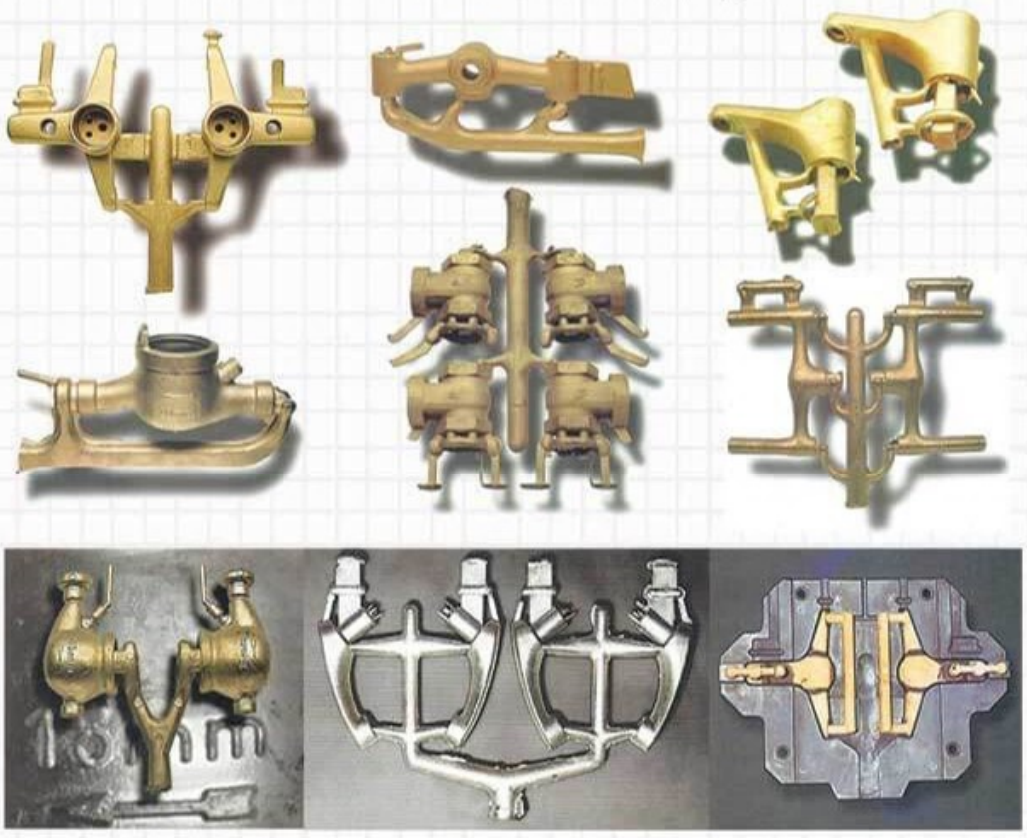
HOT FORGING Samples

Furthermore, inside forging line processes which is the other branch of hot forging we make complete solutions to our customers under the name of F6 with double station serial casting transfer machine which is the unique CNC model of it's class.

As a manufacturer and constructer of your all hot working and machining lines our firm's first priority is a good service and replacement part support and therefore to serve by setting up business spreaded out long years.

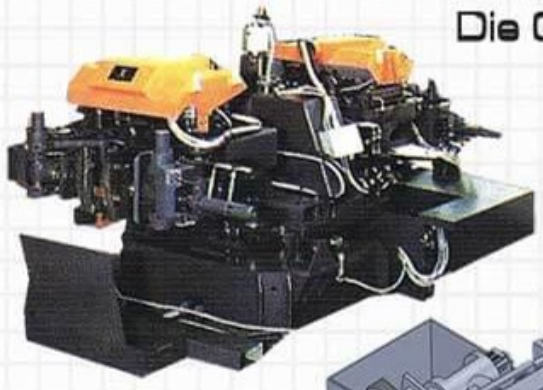
DIE CASTING MACHINE Sample Parts

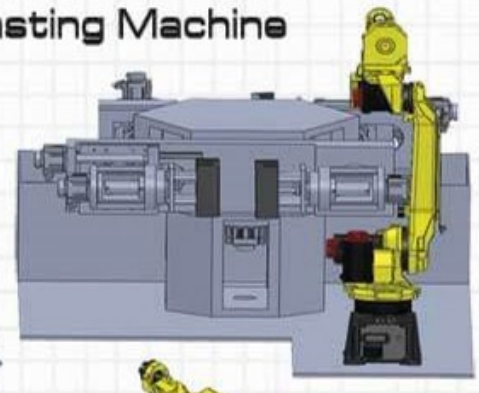


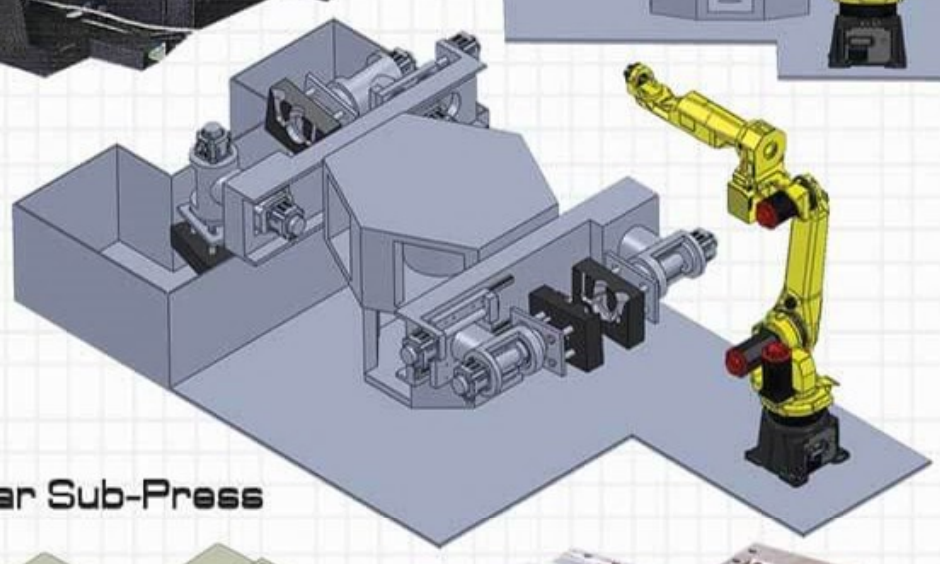
APPLICATION AREAS

Hot Forging and casting systems are used for; automotive parts, plumbing equipment, gas armatures and furniture accessories, especially production parts having brass raw material and mass quantity pieces. The items that are pointed out at pictures just represent a part of manufactured sample items. For different items please contact us. You can learn by sending us an e-mail about whether your items are appropriate to our hot forging and casting machines .

Double Station CNC Die Casting Machine



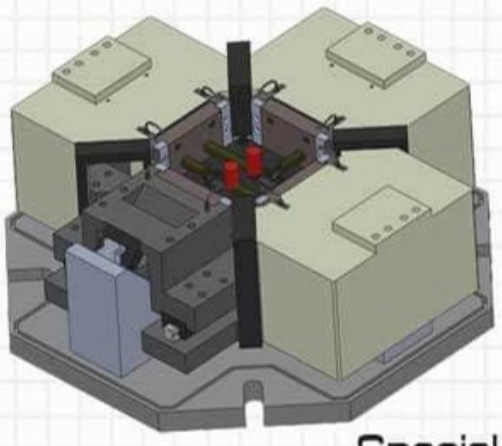




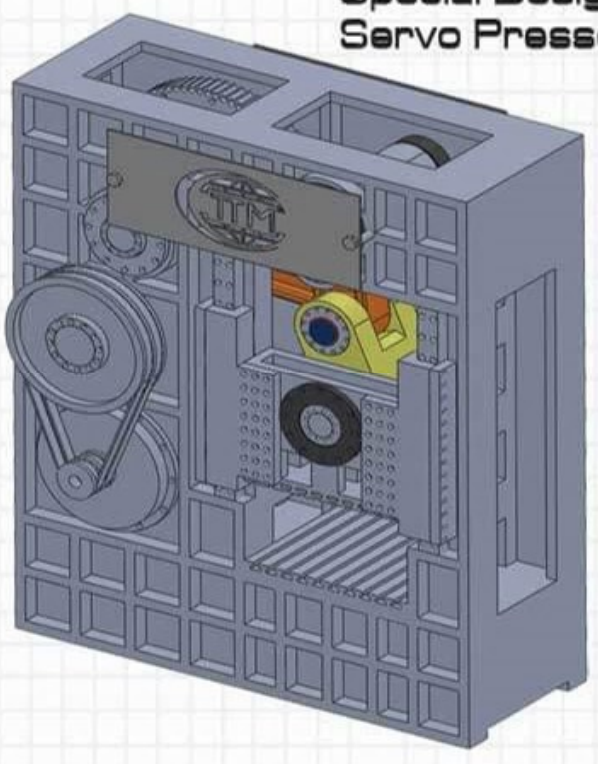
CNC DIE CASTING MACHINE

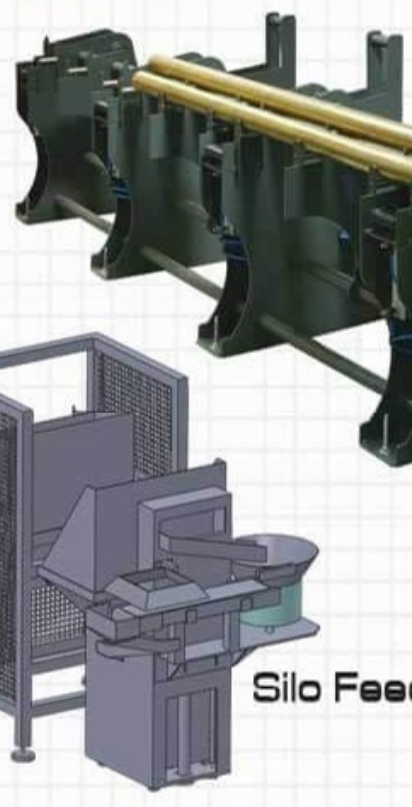
- 250 mm,300mm, 400mm molds In double station
- Full servo powered mold cover (programmable speed, cover pressure and range adjustment)
- Servo powered mold tilting (programmable speed and angle adjustment)
- Hydraulic powered automatic part dropper
- With 13 axis servo engine programmable speed, extra fast, mechanical construction
- Fully programmable axis motions, minimum time loss, very fast casting capacity
- CYCLO servo turning system at 3 axis
- INA trademark linear guide way bedding
- Mold fastening housing which can easily be adapted to distinct measurements
- Tank cooler with chiller (20000 calorie)

Linear Sub-Press

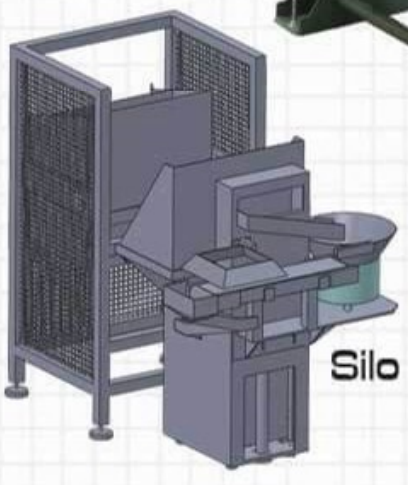


Special Design Servo Presses





Silo Feed



Servo Bar Cutting Machines

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WORKBENCH MODELS

In addition to our main expertise on CNC machine design, we designed more than 500 special machines and produced them. Multi axial special CNC milling machines, double head CNC lathes, clamps, multi axial and big dimension chip less pipe cutting machines, hydraulic cold forming presses, special hydraulic clamps, panel radiator and heated towel rack processing machines are manufactured in our own premises.

Within 25 years of experience, engineering and production we generate optimum solutions to our customers.

6 Spindle Double Headed CNC LATHE

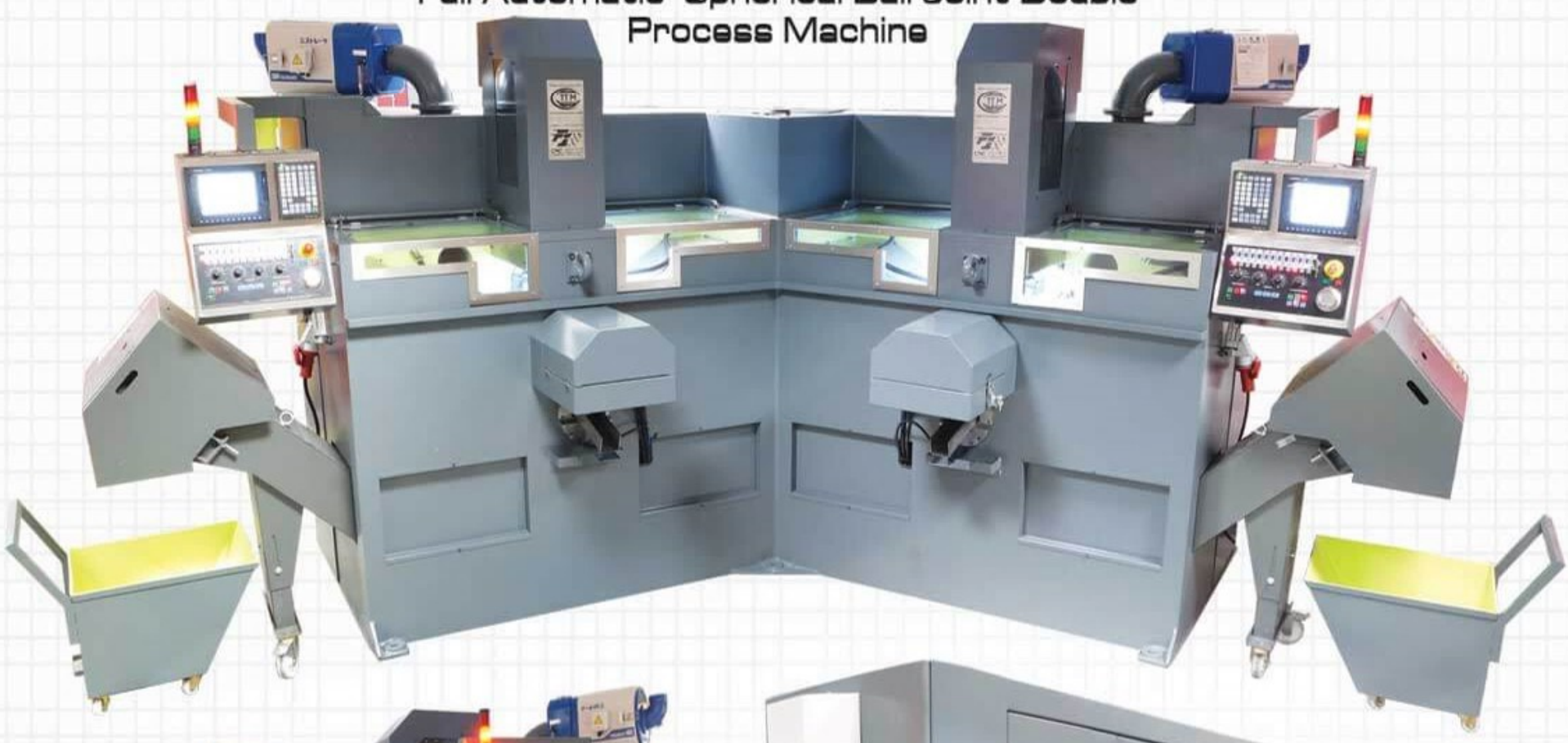
HYDRAULIC
2 and 3 way Press

3 Way DN 200
Flange Lathe

Special 4 Station Horizontal
TRANSFER MACHINE

3 Port Forceps Opening
Workbench Machine

Full Automatic Spherical Ball Joint Double Process Machine



Full Automatic Part Feeder System With Automatic Sequencer

Servo Manipulator Machining Between Two Parts

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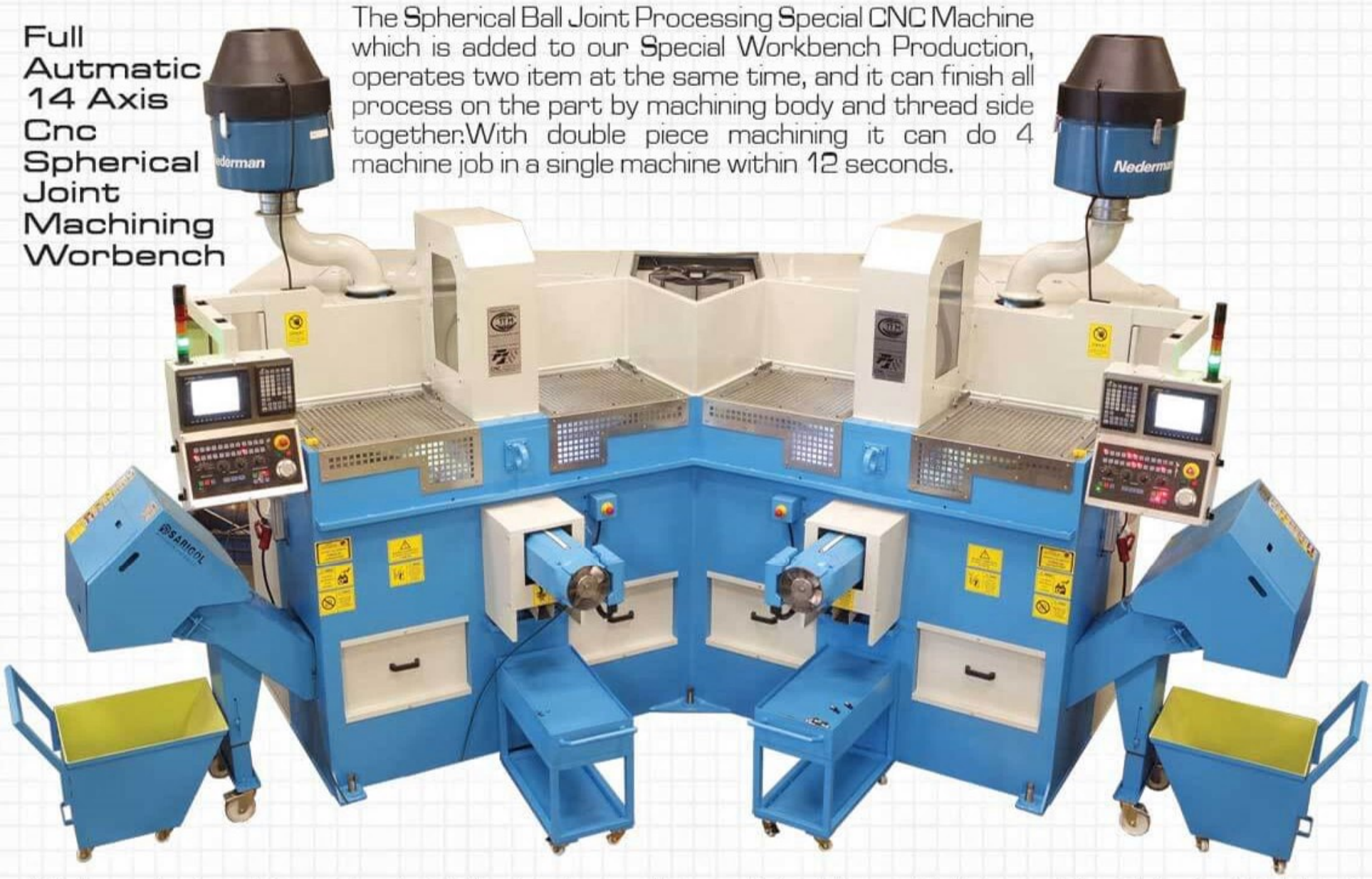
(Special)

WORKBENCH MODELS

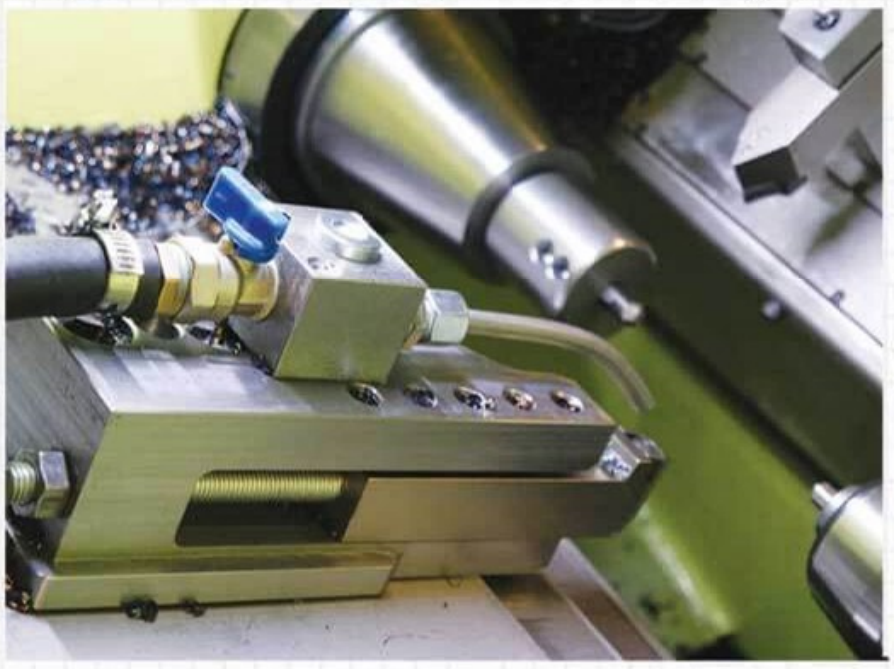
After 10 years of transfer Machines we produced for the automotive tool manufacturers which process the tail parts of the rod and ball joints, we decided to produce the Special CNC Transfer Machine which process the two piece Spherical Ball Joint elements at the same time. With this production we managed to produce all the supplementary components of the rod and ball joint body.

Full Autmatic 14 Axis Cnc Spherical Joint Machining Worbench

The Spherical Ball Joint Processing Special CNC Machine which is added to our Special Workbench Production, operates two item at the same time, and it can finish all process on the part by machining body and thread side together.With double piece machining it can do 4 machine job in a single machine within 12 seconds.



We have designed, items feed via Vibrobunker and Servo Robot Arm with this machine. Spherical Ball Joint is processed at our machine by fastening between two centers or fixing on pliers. Also there is no need for a staff because of it's fully automatic loading and unloading feature.



CONTROLLER

- MITSUBISHI M730VS CNC control
- Multiple featured, High Speed Nano Controller

- High resolution 8,4 " colored screen
- Automatic service alert
- Real time I/O Diagnostic
- Remote help and upgrading via Ethernet connection over internet

ELECTRIC Group

- 380-400 volt
- Schneider; Finder; Baluff switch components
- Closed loop air conditioning board cooling
- Reverse phase prevention relay
- PVC cable protection pipes in all cables

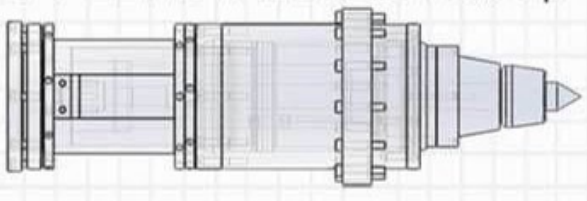
HYDROLIC AND AUXILIARY LIQUID Group

- Vickers hydraulic pump and command valve group
- 40-55 bar standard work pressure
- Emmegi or similar brand air circulation, oil cooler or Chiller type cooling systems
- 5-30 bar auxiliary liquid pump
- Perforated Separator or paper filter systems
- Showa – Denki vapor filter systems
- Liquid cooling systems with Chiller
- Oil stripper unit with standard disc

CHIPPINGS UNLOADING Group

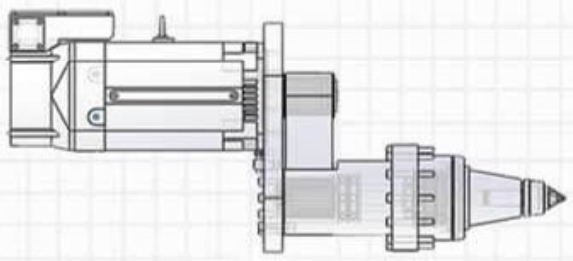
- SARIGOL trademark palletized turnings conveyor suitable for steel turnings
- Standard return function

OPPOSITE TAILSTOCK Group



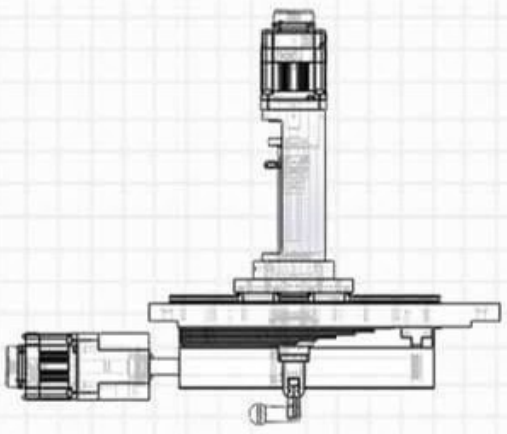
- Hydraulic drive, with 1424 kg press
- 4 center Morse taper
- RÖHM opposite live center

SPINDLE Group

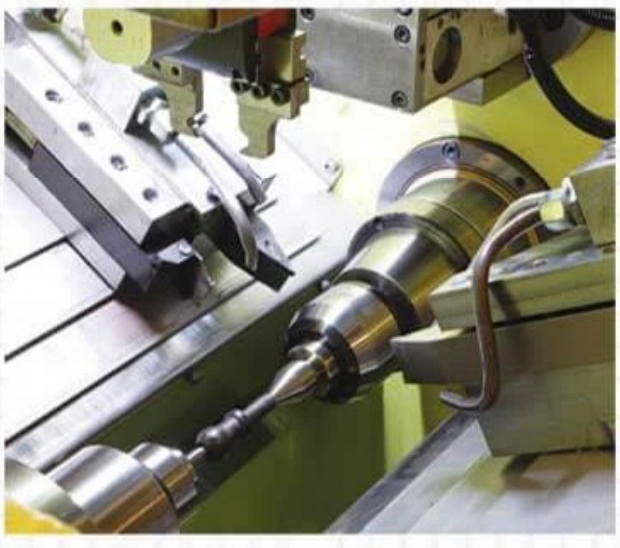


- Sensitive and rigid spindle design
- Axial power convenience from 16 sphere to 50 sphere Radius
- Suitable for 24 hours work, 4.77 Nm torque 11 Kw 6000 Rpm Mitsubishi Spindle Servo Motor
- 4 spindle Morse taper
- Röhm Spiked Tailstock or Hainbuch Pliers System
- 177000 N maximum radial transportable moment spindle

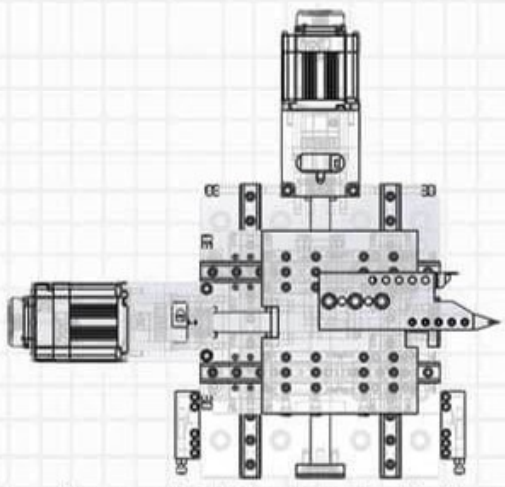
ROBOTIC FEED Group



- 2 axis servo feed robot
- GIMATIC item gripper
- Easy start-up with teaching position
- ± 0,03 mm positioning sensitiveness
- 500 kg item feed
- Axis values; 1kw at x &y axis, max 4000 rpm, 3.6 Nm continuous torque, max 30m/sec speed



CUTTER TURRET Group



- Sensitive and rigid Tool Holder Platform with center powered STEINMEYER C3 ball screw and 8 frontal stressed INA carriage
- 236000N dynamic load carrying construction
- Dynamic 78000 N cutting force at X and Y axis
- German STEINMEYER, center powered, ultra sensitive, with C3 32*5 steps, ball screw
- Frontal stressed, 4 piece German INA trademark RUE-E-Hx ultra sensitive carriage per floor structure working on X and Z axis
- At X and Y axis for 1.5 kw, max 4000 Rpm, can work at stable 4.8 Nm torque, with multi turn absolute encoder; servo engine power
- 20 meter/seconds driving capability At X and Y axis max
- Ultra sensitive motion ability at X axis 80mm, and Z axis 160mm
- Single or double, reciprocal tool fastening ability at double tool platform

Two center or pliers fed servo manipulator machining between two items

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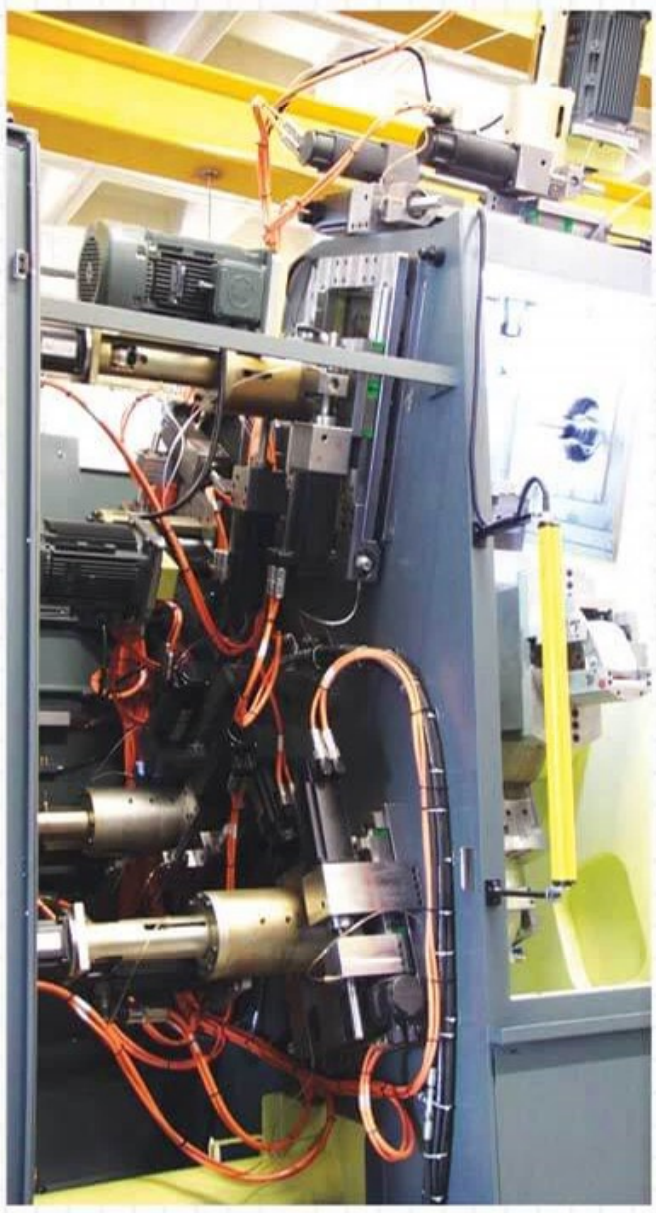
pg.32 (F1 Start)

MODEL TRANSFER MACHINES

F1 START MODEL CNC Transfer Machines designed for supplying performance and flexible process requirements where dunnage removal is needed in tight tolerances for processing of high-precision parts. This model with operator feed is suitable for working at maximum productivity and minimum cost where the size of the item is not suitable for robotic or line feeding. F1 START CNC TRANSFER MACHINE, which is fully controlled by using servos with absolute encoder; will be the right choice to operate constantly at high speed and to be able to function in many kinds at single workbench.

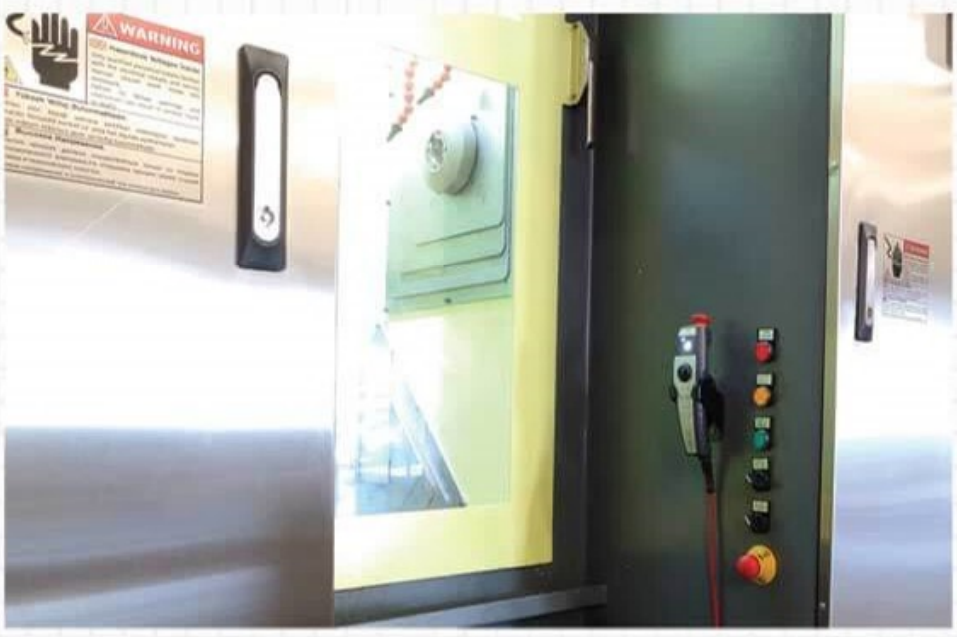
6,8,10 Station CNC F1
START TRANSFERS

Fully powered with absolute servos, and high-speed cycle technology, this unit is able to machine different parts at a single workbench and can easily pass from part to another part type.

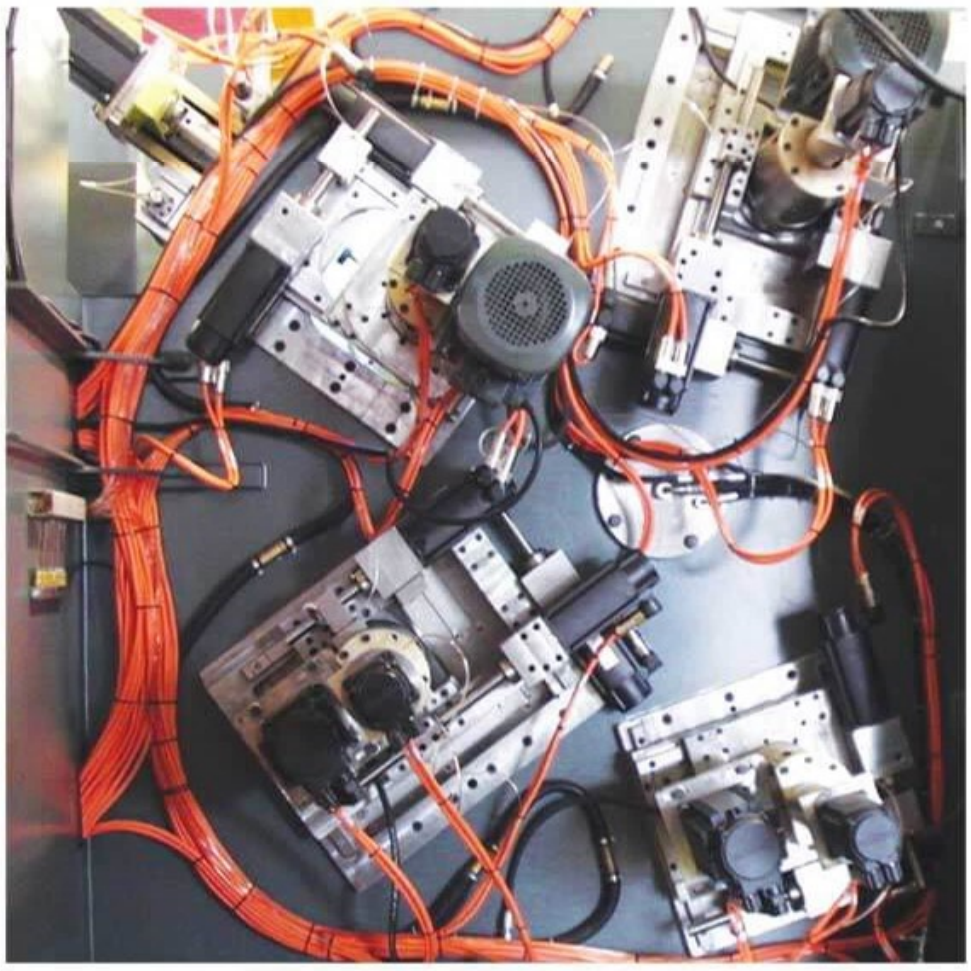


This model can be manufactured with vertical or horizontal axis. Also the structure of 2 station tumbler, 2 unit, 4 axis to 16 station tumbler, 40 unit and 128 axis can be used.Almost every kind of material (brass, steel, aluminum etc.) can be used processed with this machine. With the user-friendly interface this machine is exceptionally qualified to meet according to your needs with programmable features.

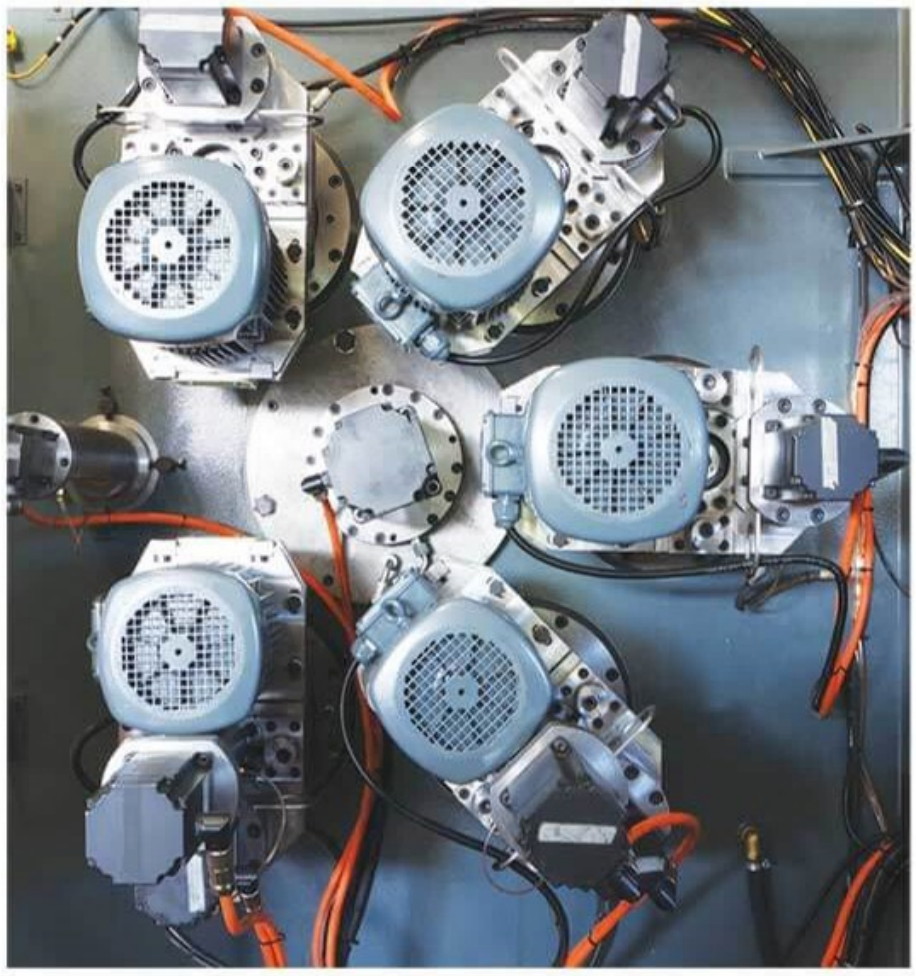
CNC F1 Start model front and backside view



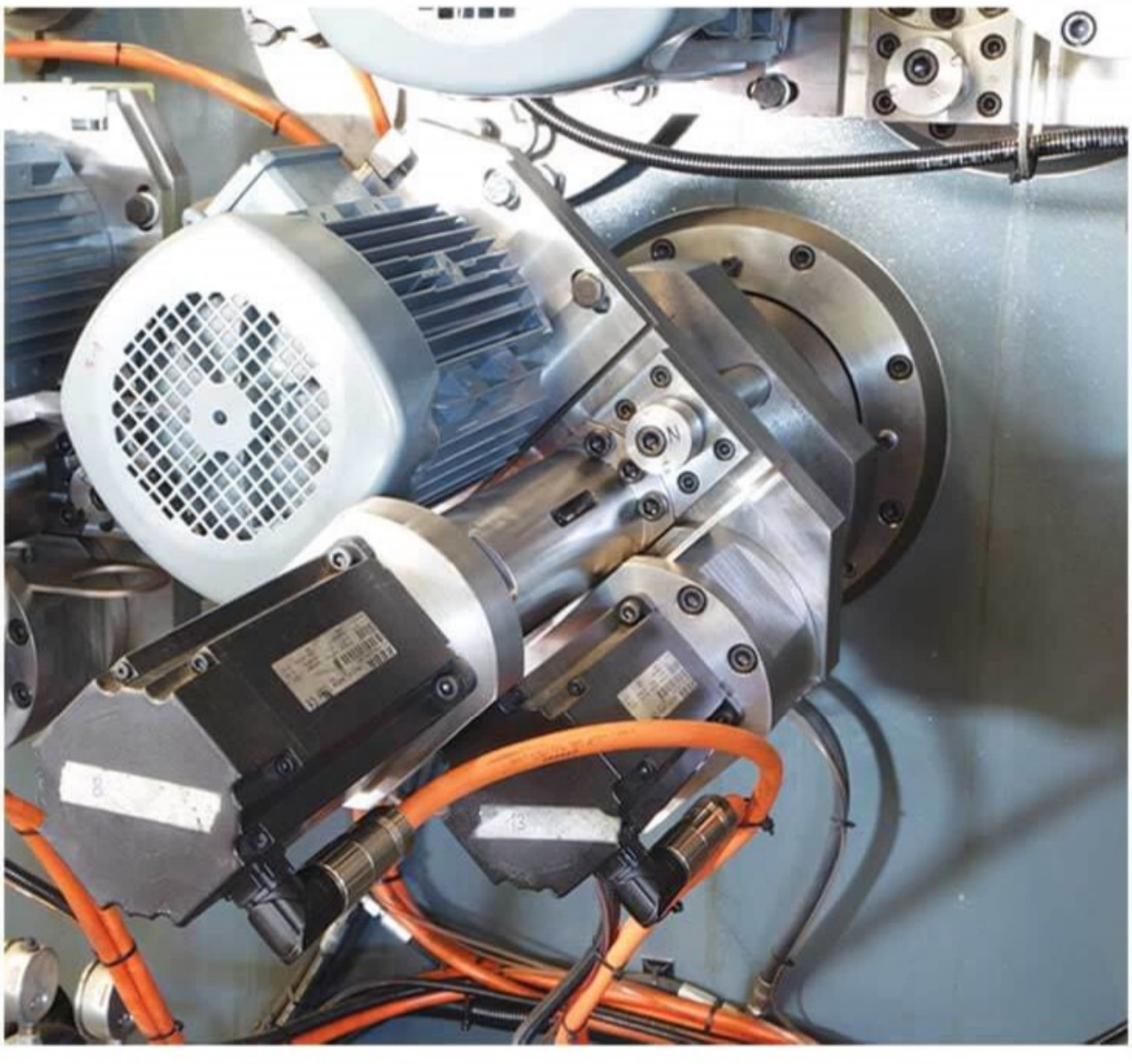
CNC TRANSFER
5 Axis MT Group Unit Inside Views



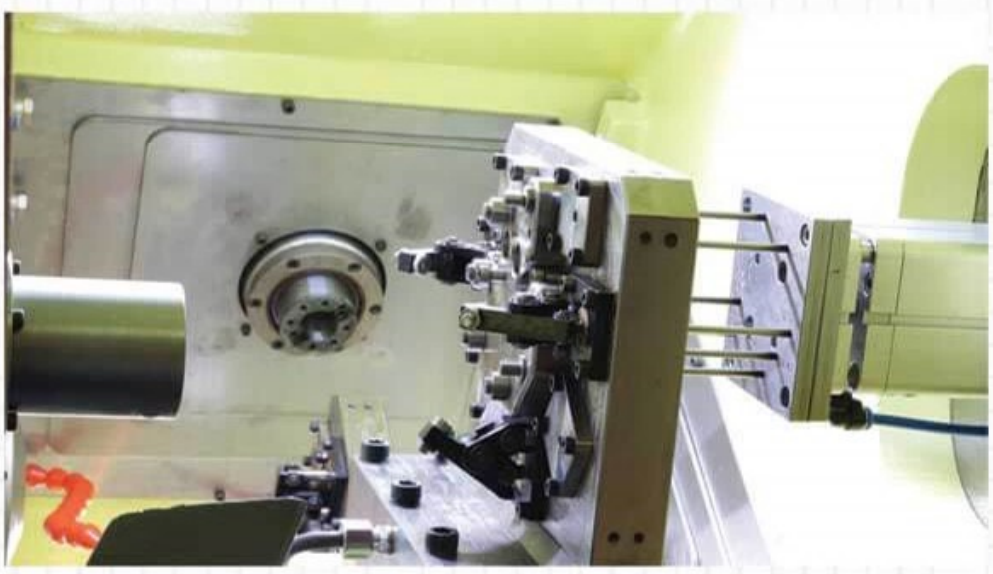
CNC TRANSFER
2 and 2,5 Axis MACH F1 Group Unit Views

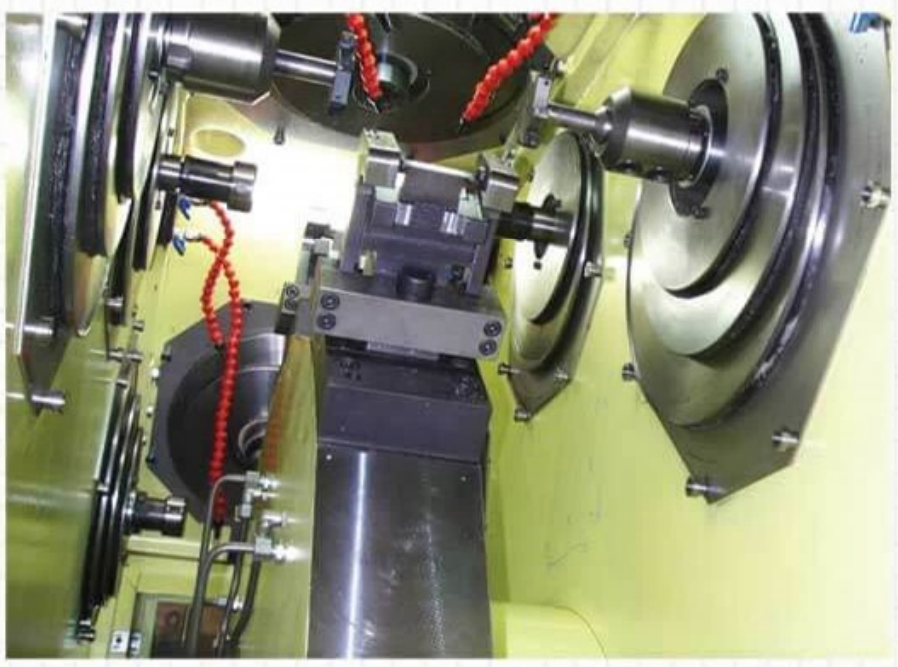


MACH F1 Group Unit Inside Views



CNC transfer 3 and 5 axis units
workbench inside views





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2015

pg.36 (F1 Bar) **MODEL TRANSFER MACHINES**

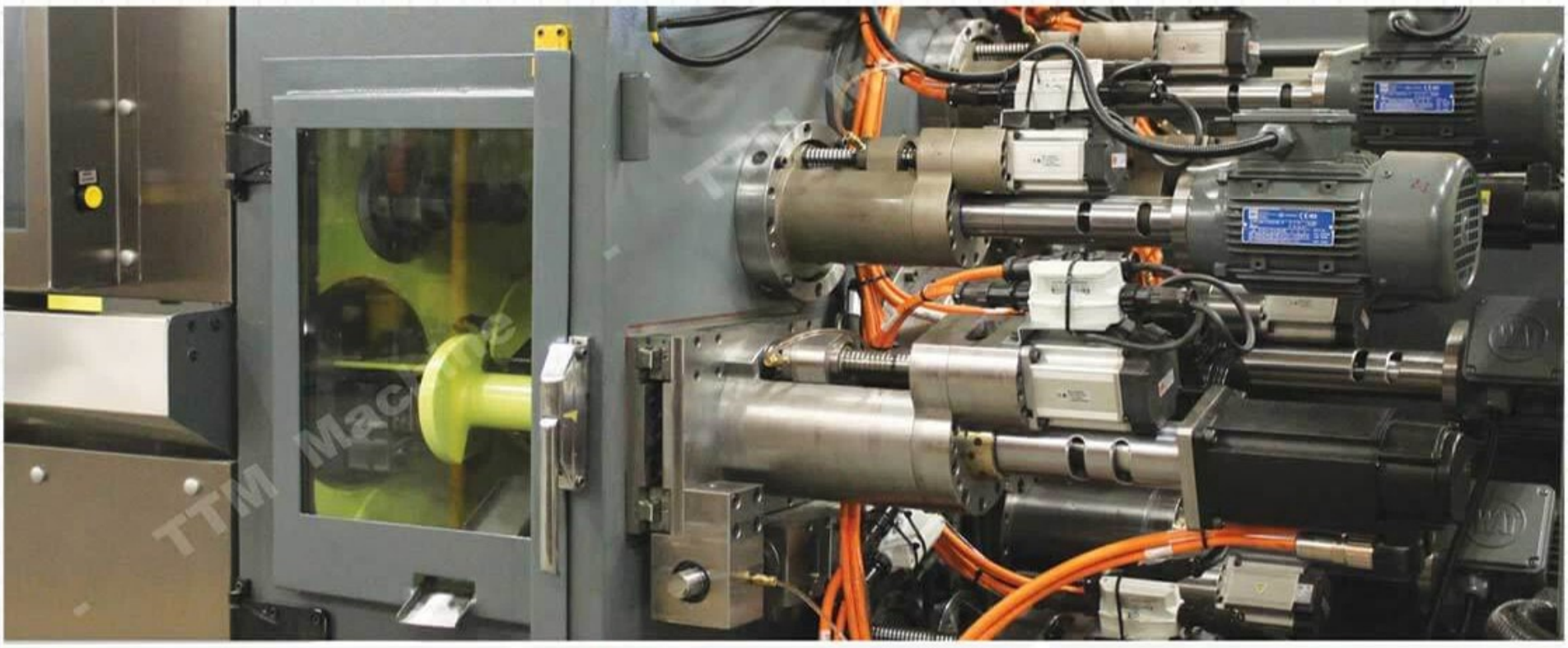
F1 Bar Model Transfer Machines are designed for supplying performance and flexible operation requirement about handling high precision parts from rod or profile materials by machining in tight tolerances. This model can be used with bar or profile type materials from 1 meter to 6 meter which brings matchless advantages especially about much faster machining, free cutting steels, work pieces processing in 6 spindle or bar feed lathes and multi axial functioning. Our CNC transfer model in this version is used for multiple processing when compared to the standard workbenches where it has more capacity about 3 to 15 times compared to 6 spindle and multiple axis lathes with tighter process tolerances.

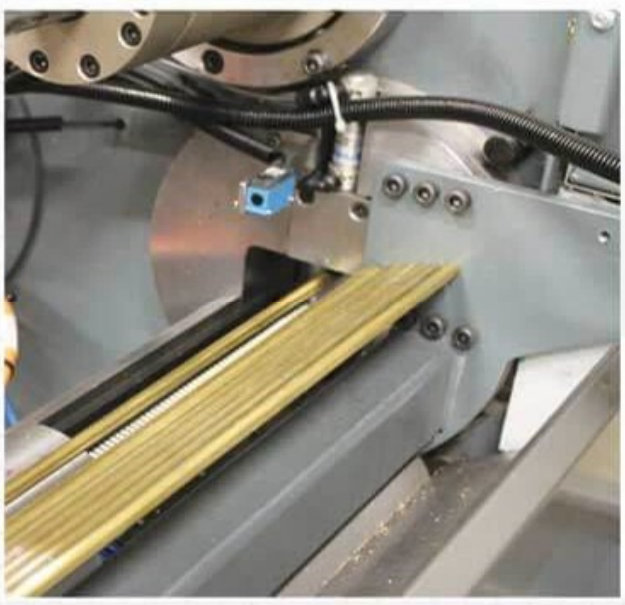
F1 BAR CNC Transfer Running Ø5-30 mm Diameter
4m Length Brass

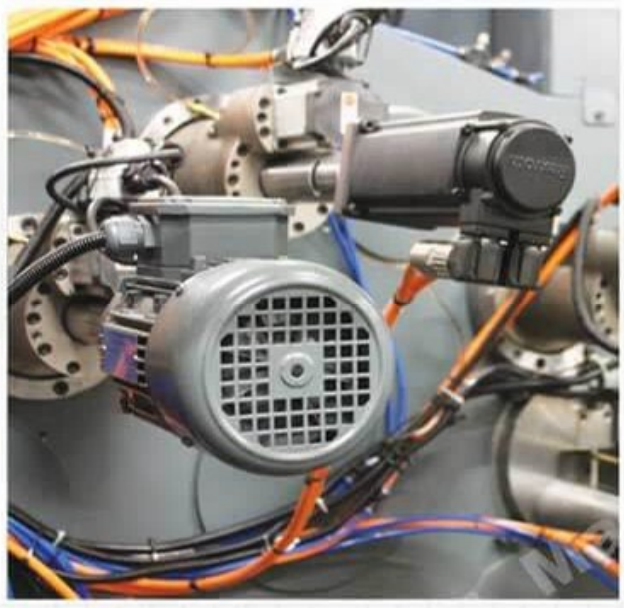
F1 BAR CNC Transfer Running Ø5-20 mm 6 Edge Brass

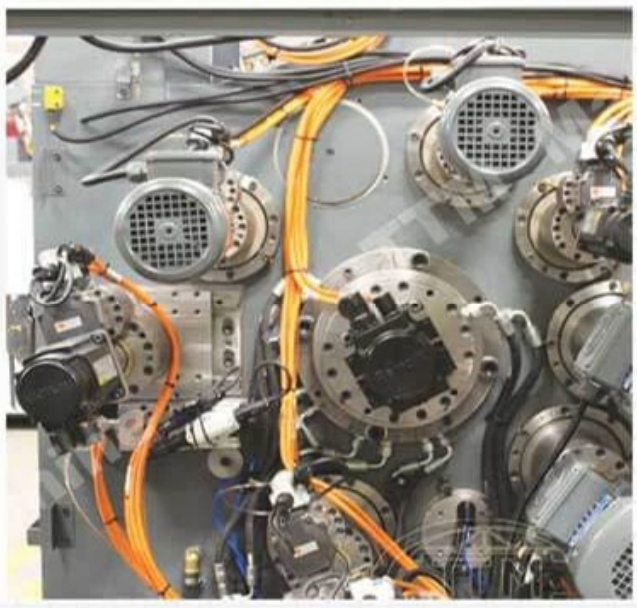
F1 BAR CNC Transfer Running
Ø20-60 mm Diameter 3m Transmission

Machining materials at different types and diameters at only one workbench by using rod driver with CNC tool holder and unit structure fully powered with absolute servo engine, rotary table with cyclo technology, programmable servo control makes this machine show itself up.



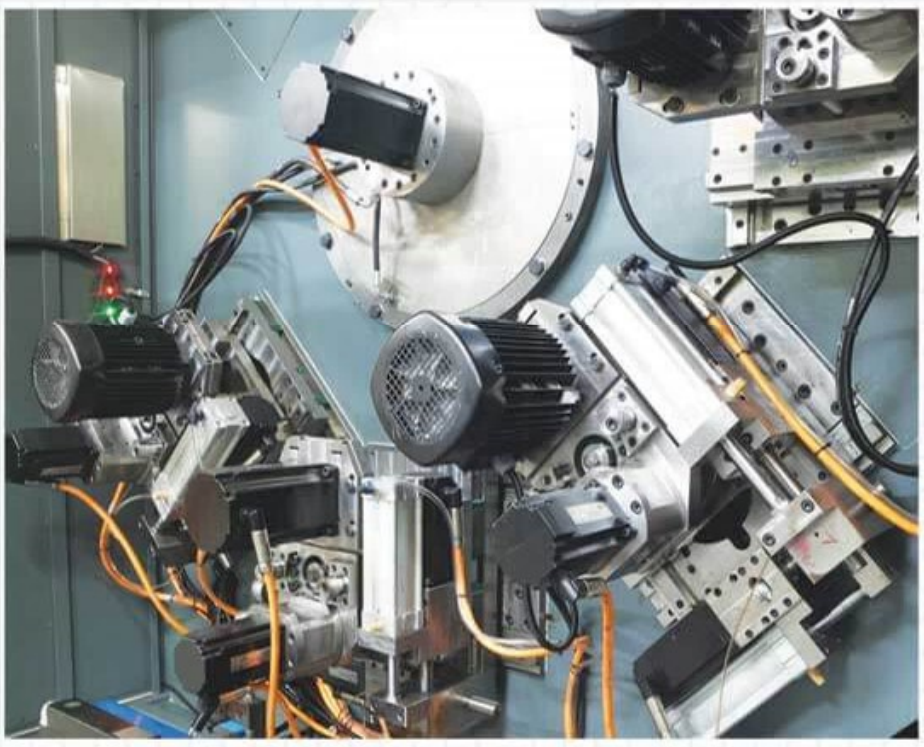






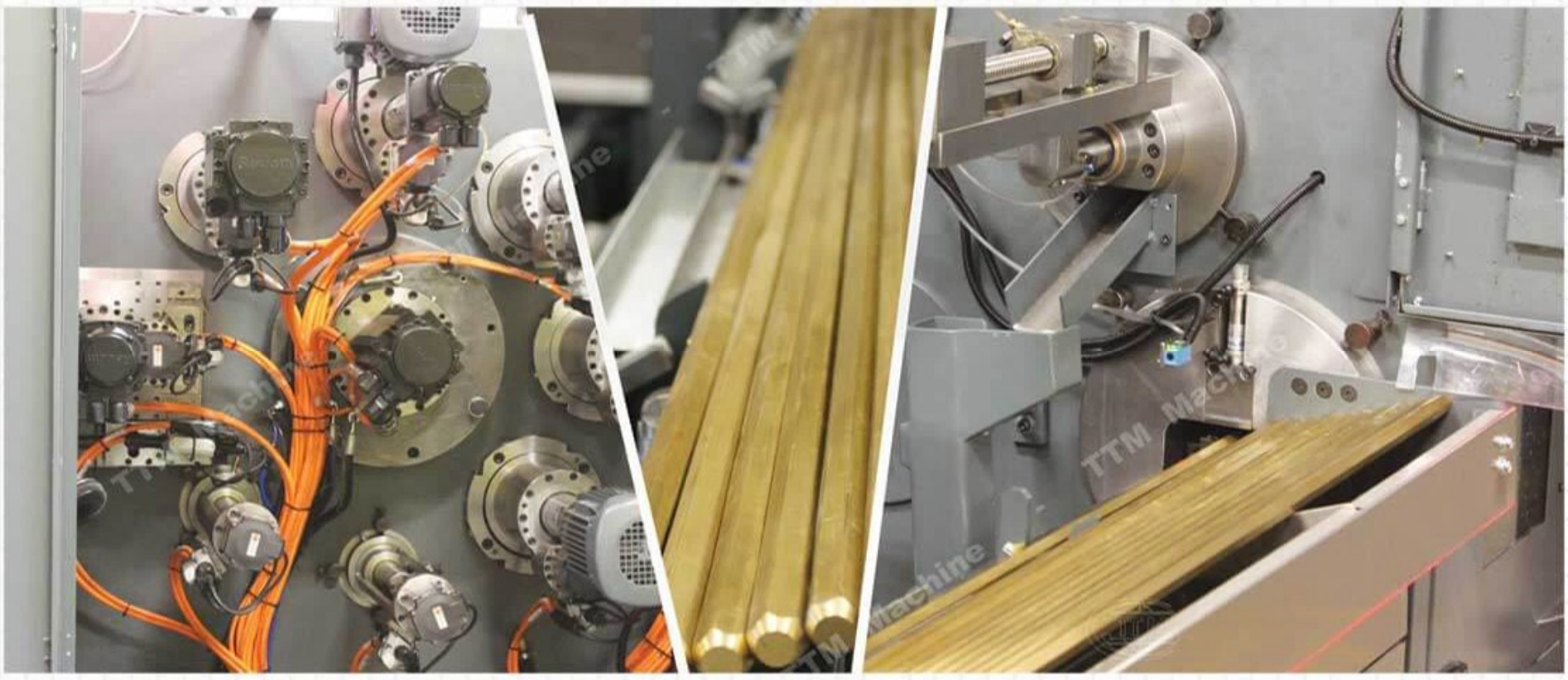
This model can be manufactured from 2 station rotary table, 3 unit, 5 axis structure to 16 station rotary table 40 unit, 128 axis body structure. It can compensate every sort of demand by its harmonious structure from 1m to 6m lengths. Nearly, any type of material (brass, steel, aluminum etc.) and parts that are circular; elliptical, rectangular; hexagonal, octagonal, decagonal, and dodecagonal and parts that have special profile can be handled. Furthermore, rod tail waste reduced to 2 cm by special rod driver; which is developed and produced by TTM. In this way, compared to the equivalent workbenches, raw material savings are at maximum level.

F1 BAR CNC Transfer Mach F1 4-3-2,5 And 2 Axis Unit Group

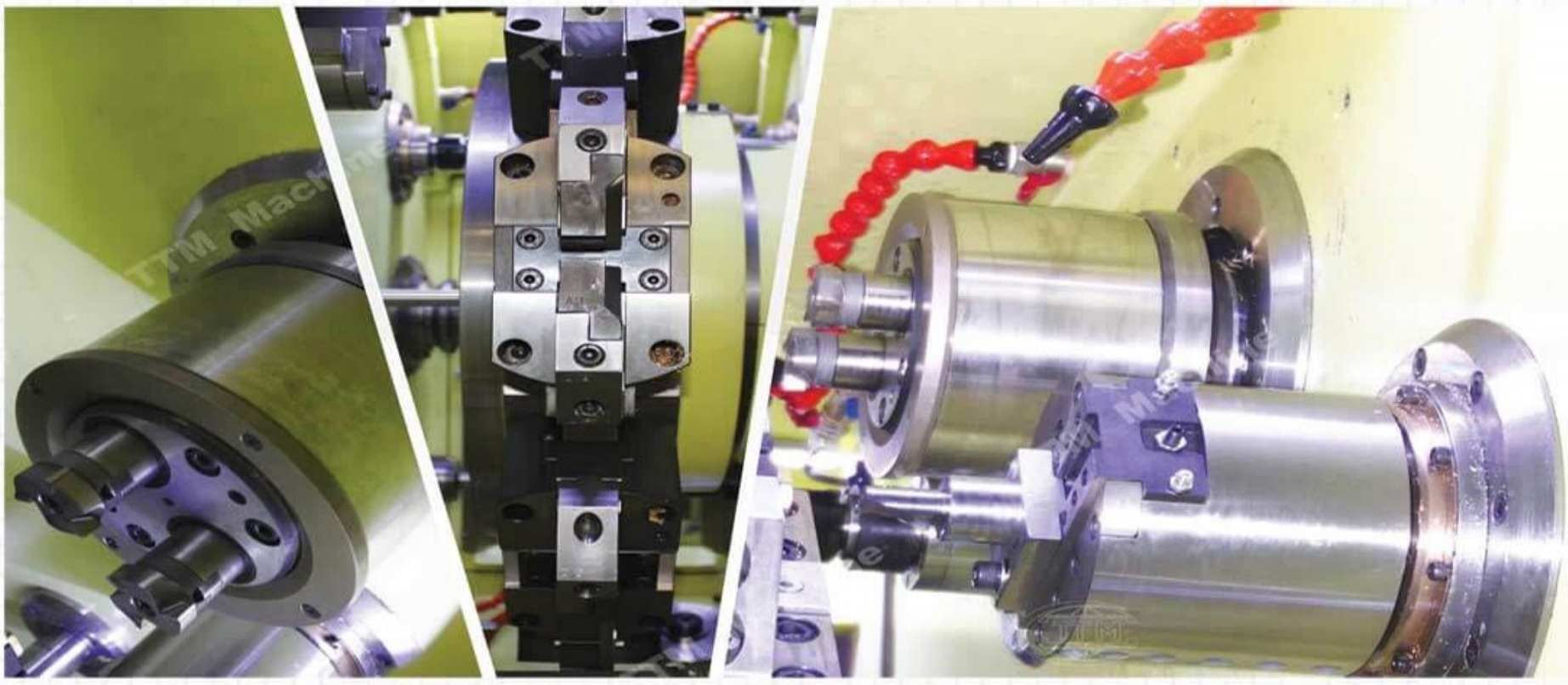


F1 BAR CNC Transfer Running Ø15-45mm Diameter Interval 3m Length Free Cutting Steel (Mach F1 Unit Group with 6 Station)

F1 BAR CNC Transfer Running 4m Circular, from 6 Edge and 8 Edge Material, Ø6-30mm Diameter Interval, 4m Brass (Mach F1 Unit Group With 8 Station)

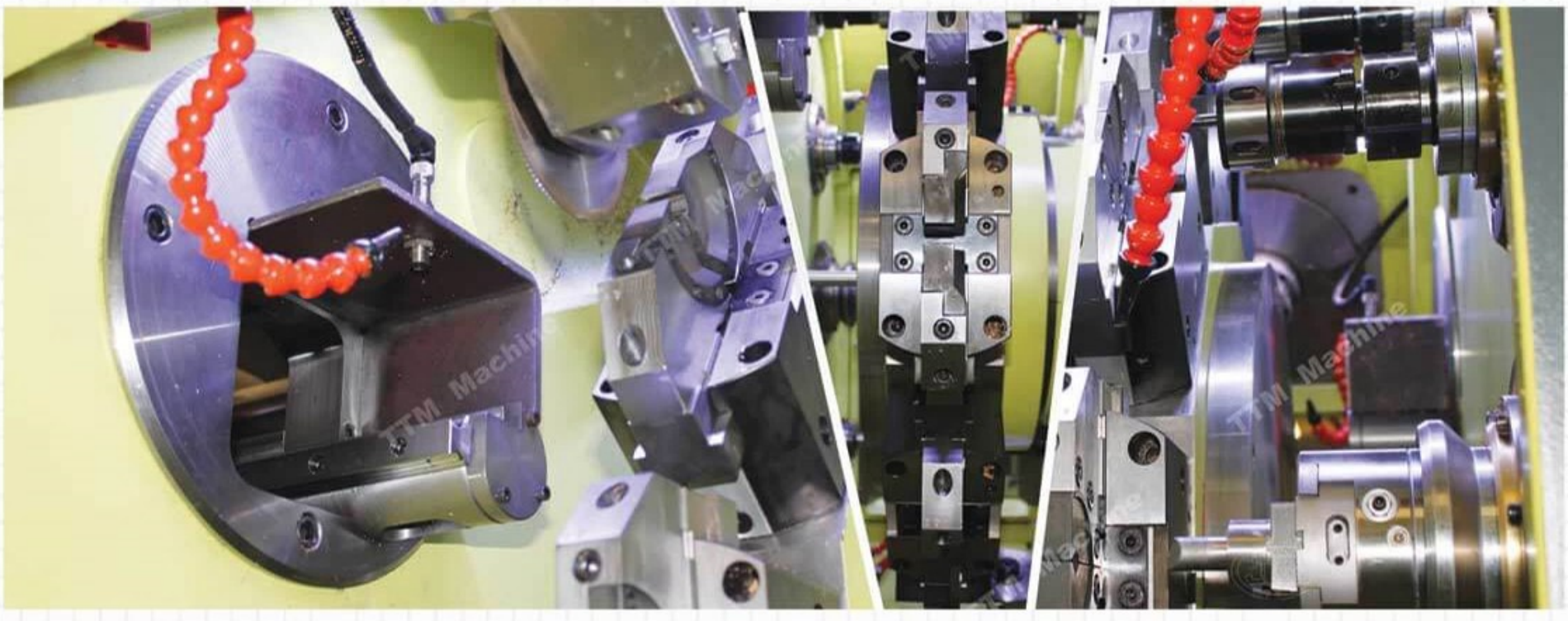


MT unit group with 10 station drum - F1 bar CNC transfer



Mach unit group with 12 station drum - F1 bar CNC transfer

Mach unit group with 8 station drum - F1 bar CNC transfer

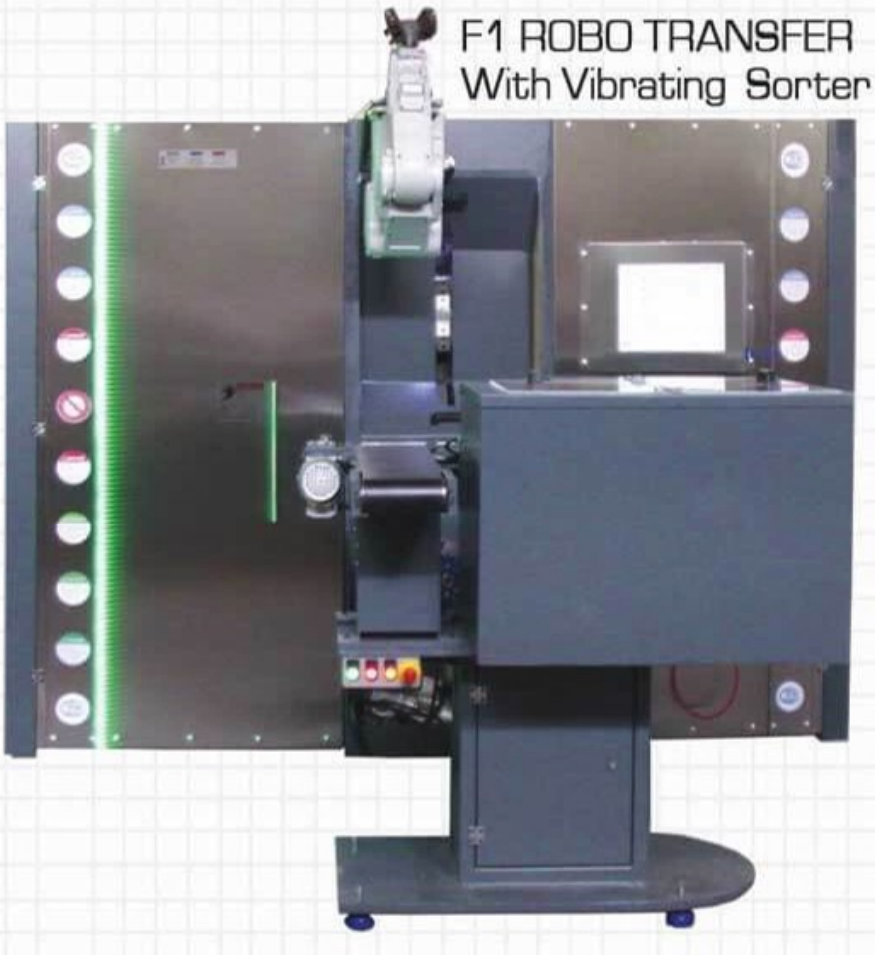


(F1 Robo) MODEL TRANSFER MACHINES

F1 ROBO Model Transfer Machines are designed for satisfying requirements to produce parts in excess amounts and high precision by machining in tight tolerances with robotic performance support for accuracy. Robotic feed and control is used in sectors especially excess quantity is needed. For instance automotive, plumbing equipment and gas armature excess quantity production processing. With the mounted high-tech smart cameras to the system quality check and passing from item to item is possible. This model can be used with by single or double robots. This CNC Transfer Machine is especially used to process the parts that are below 2 kg and produced in millions of pieces.

Compared with standard manual feeding workbenches this transfer machine can reduce the production cost while improving the actual production output with it's %25 to %400 extra capacity. Considering 24 hours work period this machine is able to pay itself off in a short period of time because of it's productivity. Moreover, thanks to the special design advantage belonging to TTM, this machine is very useful for our customers who have limited production area, which will save them %50 to %200 compared with equivalent workbenches.

F1 ROBO TRANSFER
With Double Robot Feed



F1 ROBO TRANSFER
With Vibrating Sorter

IMAGE PROCESSING AND ROBOTIC AUTOMATION pg. 45

(F1 Robo) MODEL TRANSFER MACHINES pg. 41

Position, weight and draft measurement control processes of parts can be performed by using Structure powered with fully absolute servos, rotary table with high speed cyclo technology, equipped with smart COGNEX cameras, and its flawless synchronization.
By connecting single or double Mitsubishi 6 axis robots human mistakes are eliminated and making high capacity and controlled production is possible in every means.

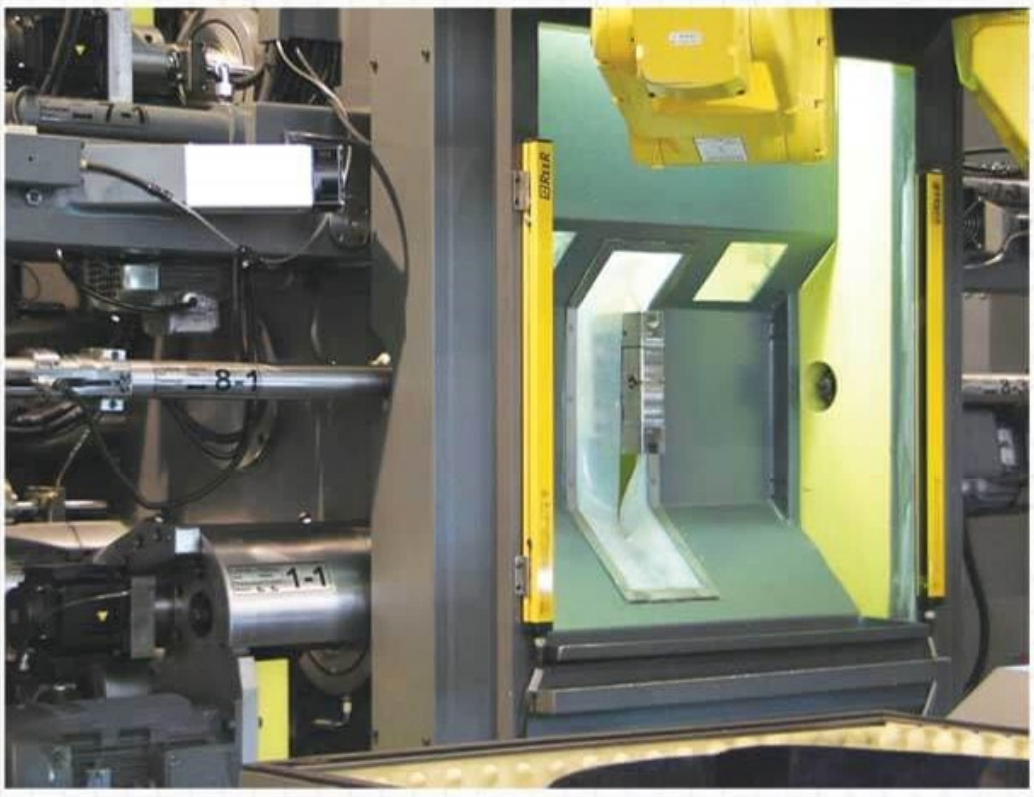
F1 ROBO Transfer Camera
Controlled Feeding Silo

F1 ROBO Transfer
Sliding Table Feed

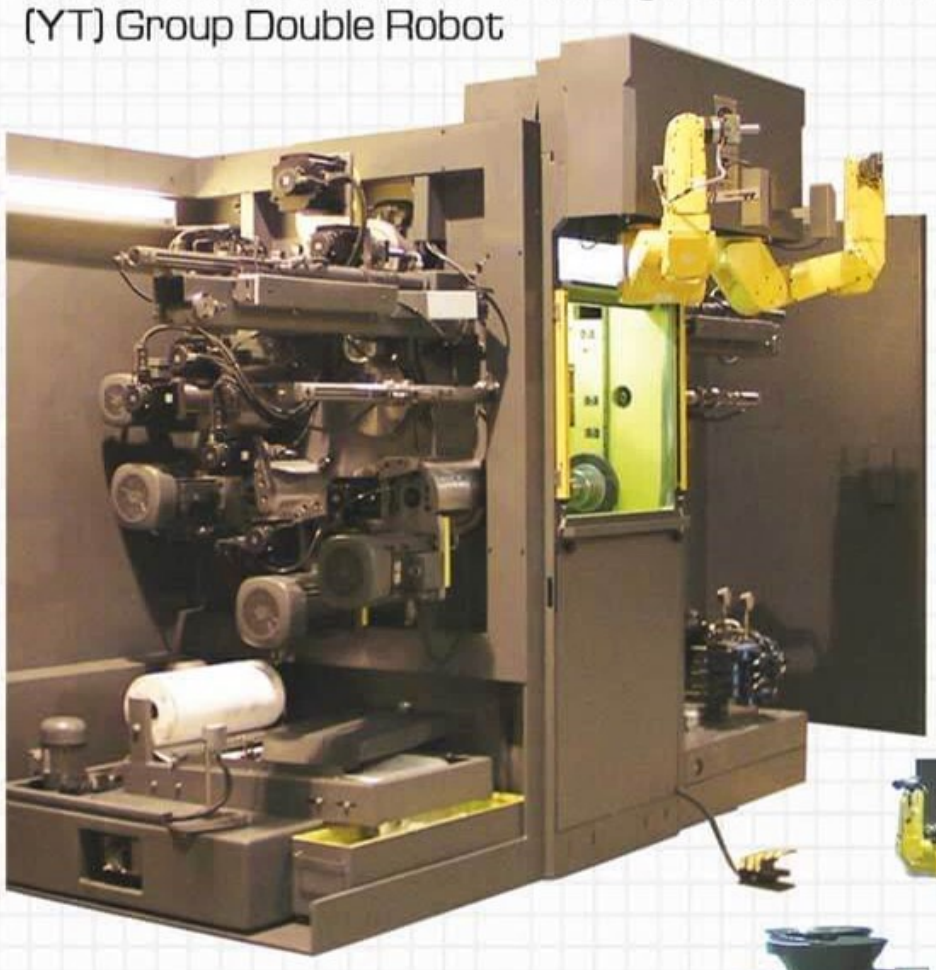
These models can be produced with single or double robot controlled and with or without cameras. Also full-automated silo feed, vibrating bowl feed, sliding table feed assembly is possible. The structure can be made with horizontal or vertical axis from 2-station rotary table, 2 units and 4 axis with 16 station rotary table to 40 units and 128 axis. Practically, it can satisfy any kind of demand. This machine is suitable for every kind of raw material (brass, steel, aluminum etc.) generally below 2 kg, and materials that have the process of forging, casting or cutting. In addition it has less area requirements thanks to workbench developed by TTM, which gathers robotic set up on a single chassis with minimized calibration requirements.

F1 ROBO Transfer
Vibrating Sorter

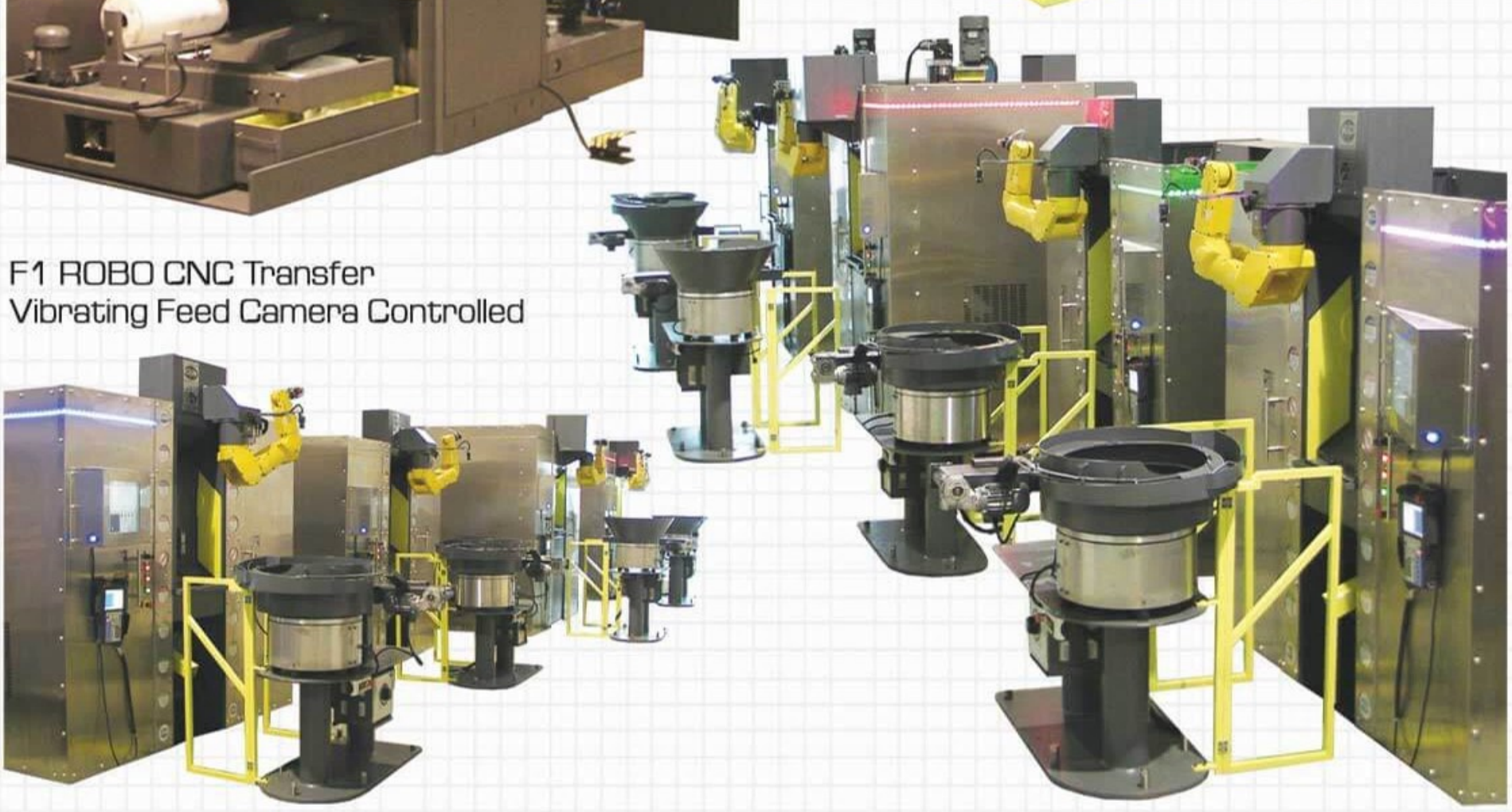
F1 ROBO CNC Transfer Vibrating Feed Lateral Drive (YT) Group



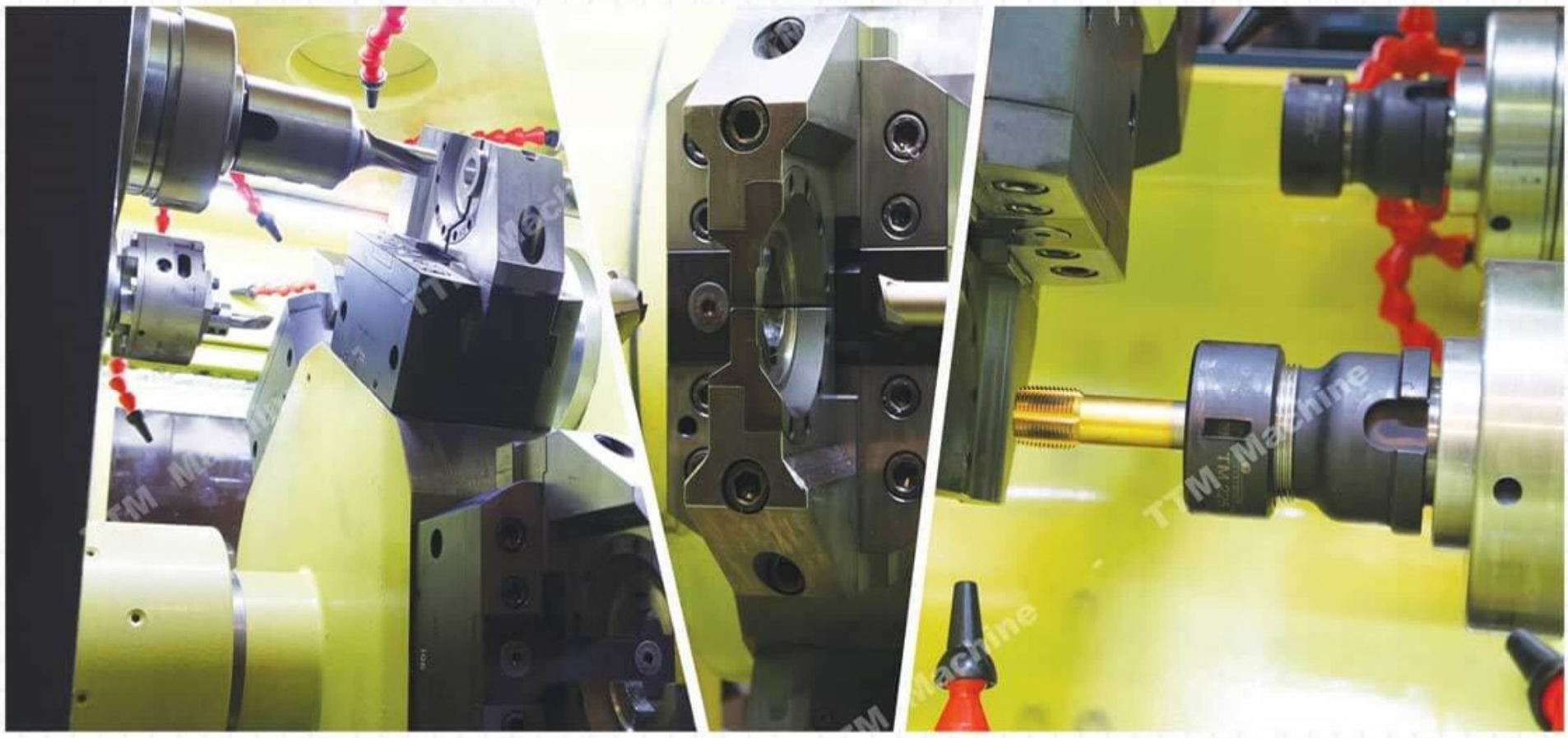
F1 ROBO CNC Transfer vibrating feed lateral drive (YT) Group Double Robot



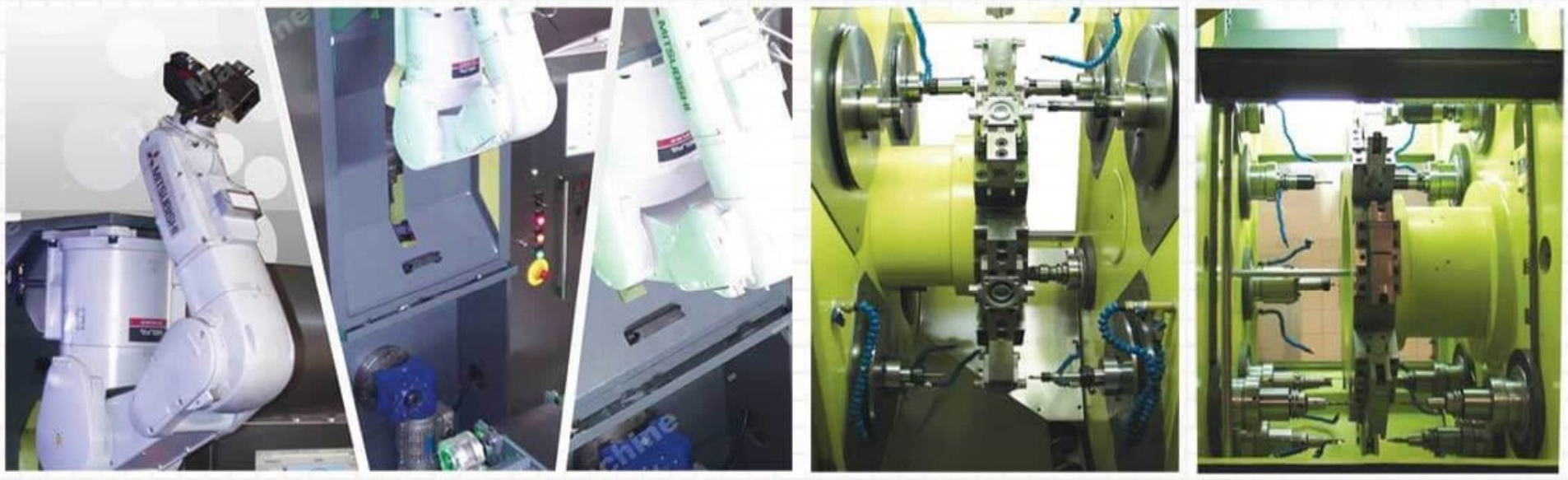
F1 ROBO CNC Transfer Vibrating Feed Camera Controlled



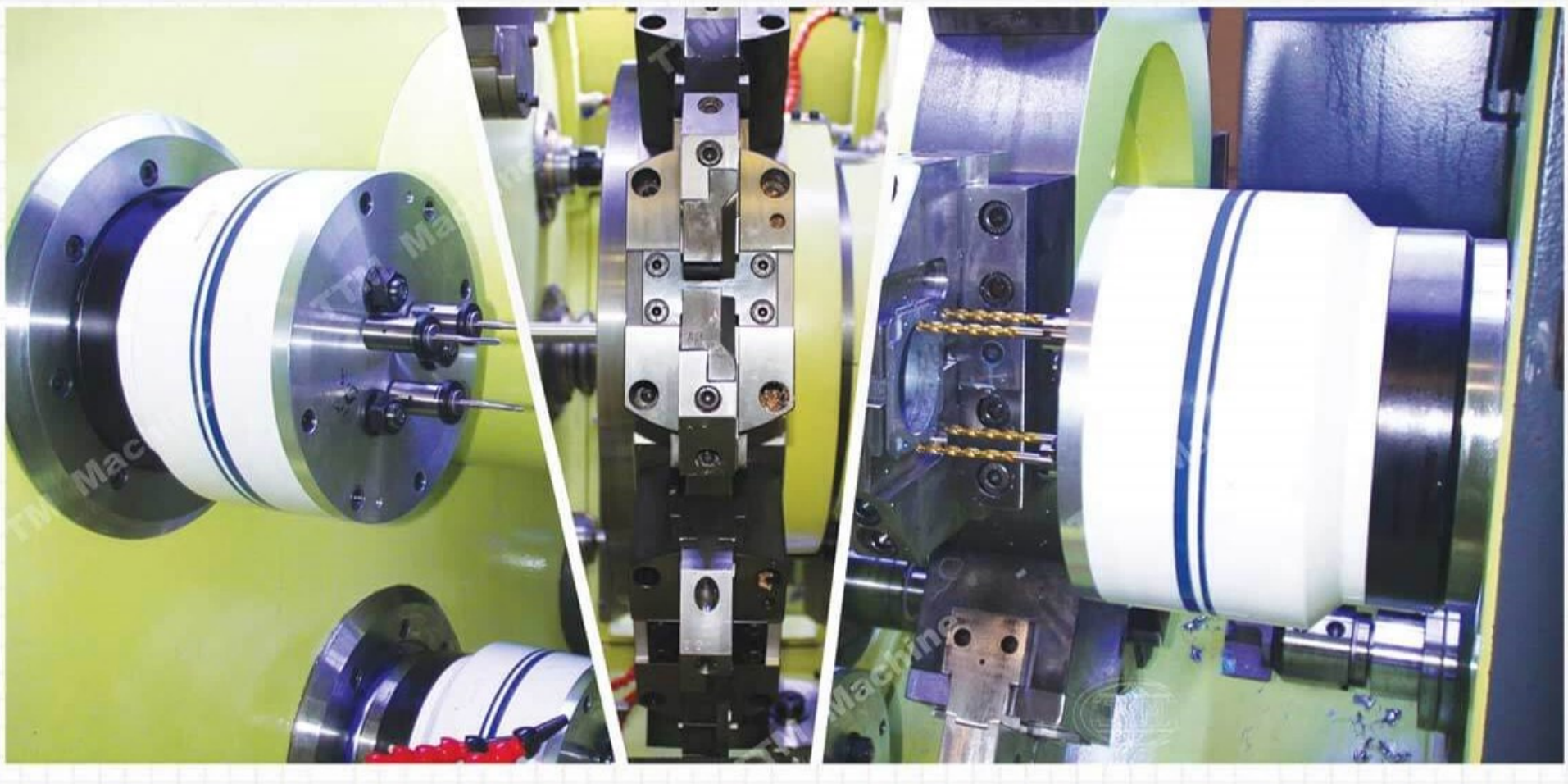
F1 ROBO CNCTRANSFER WITH MACH UNIT GROUP 8 STATIONS



F1 ROBO CNC TRANSFER CENTER DRIVE (MT) UNIT GROUP WITH 10 STATIONS



F1 ROBO CNC TRANSFER WITH MACH UNIT GROUP 12 STATIONS



pg.44 IMAGE PROCESSING AND ROBOTIC AUTOMATION

Precision Control and High Quality with MELFA Family Industrial Robots

VERSATILITY

Small robots have been used in more than 30,000 applications in widely differing fields since 1978 – and what is more they work around the clock, 24 hours a day, 7 days a week.

INNOVATIVE DESIGN

The high performance robots of Mitsubishi Electric gathers leader technology and design planned carefully in the market. For example, placing pneumatic hose and signal cables decreases the complexity and cost of holding arm and sensors, increases the labour safety

SIMPLE PROGRAMMING

A powerful range of robots needs an equally powerful and user-friendly programming interface. Mitsubishi Electric's RT ToolBox2 and MELFA Works packages are powerful programming and simulation software tools tailored precisely for the needs of your robots.

NETWORK CAPABILITIES

Network connections like Ethernet, ProfiBus, ProfiNet, DeviceNet and CC-Link make it easy to integrate Mitsubishi Electric robot controllers in to larger systems, providing users with access to every step of the process.

PLC FUNCTIONALITY

As robots are never installed on a stand-alone basis, the system must be easy to integrate into its working environment to enable it to communicate with PLC and motion systems as well as operating panels and other systems. Together with the modular robot CPU, the Mitsubishi Electric iQ Platform provides the ideal basis for integrating the full functionality of a PLC into the robot controller once again demonstrating the company's role as a pioneer in automation technology.

MORE SAFETY

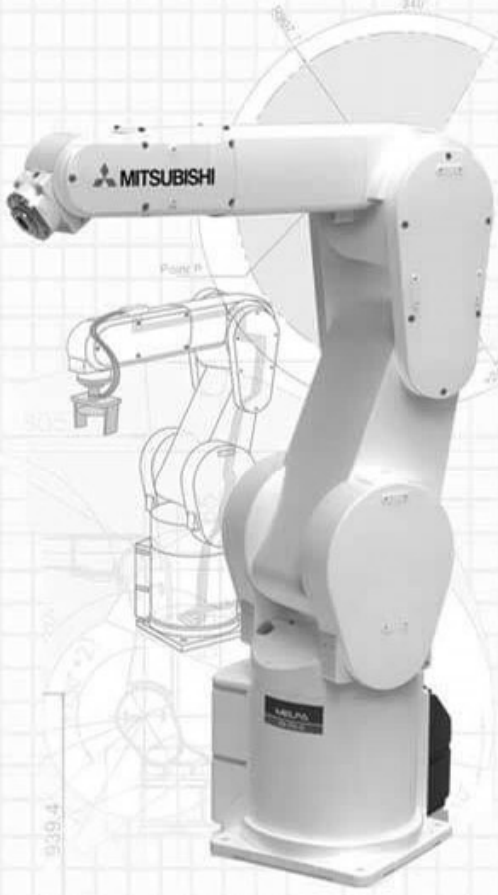
The DIN ISO-10218 safety standard is common to all robots and therefore guarantees safe operation in all applications. Mitsubishi Electric's supplementary product range including safety controllers enables the robots to be integrated into a common safety concept. Ready-made example projects make it possible for anyone to put together even complex systems quickly and effectively.

IMAGE PROCESSING

Mitsubishi Electric's industrial robots can be connected to any object recognition camera system via the Ethernet port or the robot controller's RS232 interface. This enables static and moving parts to be detected with the correct positional inforation.The possible uses of sensor controlled robots in factory automation are manifold. They range from component assembly via quality control and the reworking of workpieces to the location and removal of objects from a conveyor belt.

COMPACT AND ECONOMIC

The most important factors are good quality , compact montage and % 99,9 usability for any application.



MORE EFFICIENT MONITORING AND MAINTENANCE FUNCTIONS

Direct connection of the company's inatructure GOT operating terminal via Ethernet opens up a number of monitoring, control and maintenance functions for the robot. The correction of taught points, the backup and restore function, the entry of production data, and the selection and control of processes are just some of the options provided by the Mitsubishi Electric operating terminal in conjunction with MELFA robots.

OPEN COMMUNICATION

The robot controller can be connected to an MES system, for example for easily and quickly changing manufacturing sequenes withoutstopping production. Furtherore, the robot can be initiated for any kind of movement in real time. Flexible and complex movements, which are generated graphically on the PC, for example, can be realised in this way.

PROGRAMMING AND SIMULATION

High-performance industrial robots also require high-performance software. For this reason, more and more automation engineers are opting for the versatile and convenient Mitsubishi Electric software. All tasks, such as the creation of projects, programming and simulation, are implemented intuitively and mesh perfectly with one another. This results in optimum movement sequences in the shortest possible installation and commissioning time.

PROGRAMMING

Offline and online programming with simulation

SIMULATION

3D-CAD import and up to 16 robots can be simulated in one project; additional axes can be connected and positions taught directly in the simulation

PARAMETERS

Parameter structure for the simple parameterisation of functions; complete overview of all parameters with display of modified values only.

MAINTENANCE

Full backup and restore function and monitoring of service intervals, production runtimes and product cycles.

MONITORING

Display of load currents, position values, variables and variable positions. Monitoring of switching signals, program execution and fault history.

DOCUMENTATION

Full project documentation with output of modified parameters, program code and positions.

3D-SIMULATION WITH MELFA WORKS

The MELFA Works add-in tool for SolidWorks enables a robot in a production system to be simulated on a PC, and converts the workpiece paths into robot position data.
Supplementing the SolidWorks platform by the addition of MELFA-Works extends the simulation functions and opens up new simulation possibilities.
The CAD data of the system can be directly imported
Grippers can be connected directly to the robot
Handling of workpieces
Offline teaching in a 3D environment
Creation of robot programs
Collision-checking between robot and system environment

SUITABLE FOR MOBILE TEACHING

The R56TB is a powerful operating panel for carrying out all tasks directly at the robot, from controlling the robot and displaying the loads by means of the input/output display to complete program creation and parameterisation. The comprehensive functions ensure optimum utilisation of the robot system and thus reduce setup times.
The integral USB port enables data to be exchanged conveniently, and complete controller backups can be uploaded and downloaded through a memory stick.

■ Industrial robots RV-4FLM

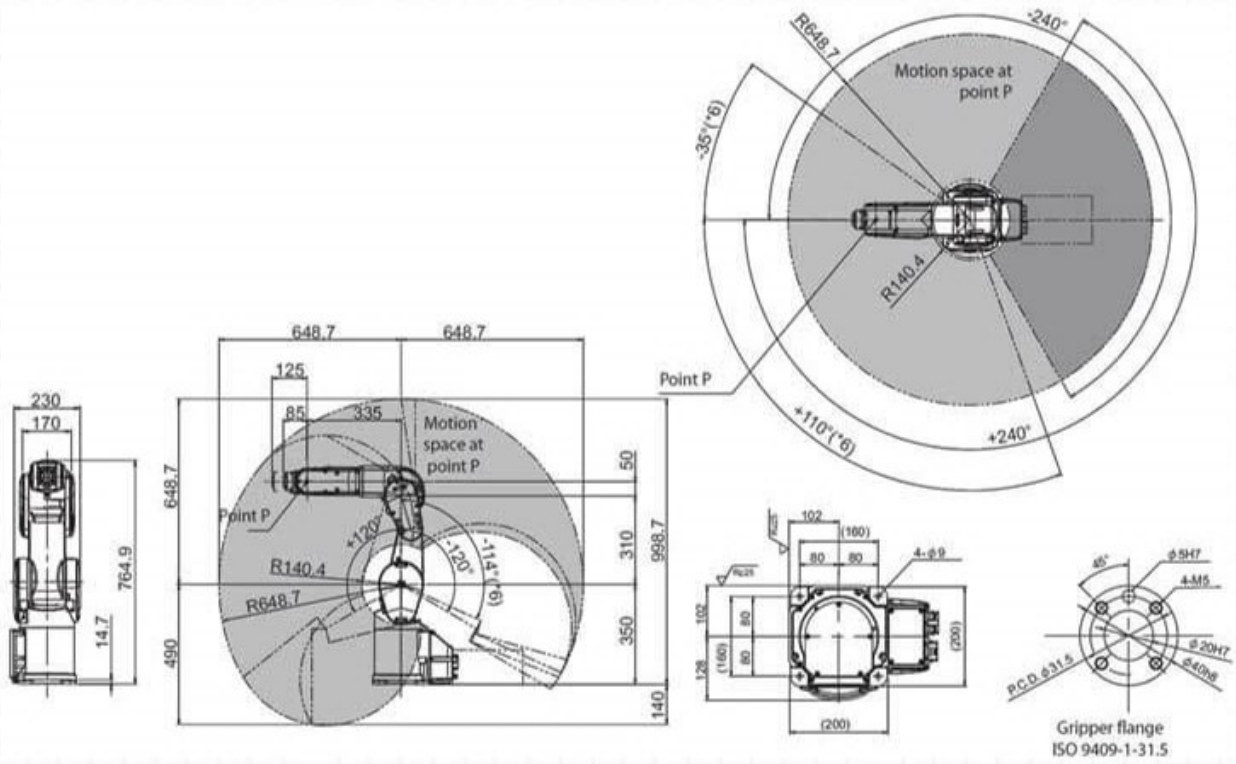
RV-4FLM

The articulated arm robots RV-4FLM

The robots of the RV-4 F series are designed for easy integration into existing work cells or innovative and compact applications. Features such as the direct control over local I/Os allows the robot to interact directly with sensors and actuators, speeding up and simplifying system building. A new innovative design allows a maximum of flexibility, so that the robot can expand his workspace to work faster and more flexible.

Highlights:

- Slim arm design
- IP67 protection
- Internal routed cables and air hoses
- Extended maintenance intervals
- 4 kg rated and maximal payload



Characteristics/Functions			Specifications	
			RV-4FLM-D1-S15	RV-4FLM-Q1-S15
Degrees of freedom (no. of axes)			6	
Installation posture			Floor, ceiling or wall mounting possible (wall mounting with limitations in the J1 axis)	
Structure			Vertical multiple-joint type	
Drive system			AC servo (brakes on all axes)	
Position detection method			Absolute encoder	
Payload capacity	maximum	kg	4	
Arm reachable radius (to the center point of the J5 axis)		mm	649	
Operating range	waist (J1)	degree	480 (±240)	
	shoulder (J2)		240 (-120—+120)	
	elbow (J3)		164 (-0 to +164)	
	wrist twist (J4)		400 (±200)	
	wrist pitch (J5)		240 (-120—+120)	
	wrist roll (J6)		720 (±360)	
Maximum speed	waist (J1)	degree/s	420	
	shoulder (J2)		336	
	elbow (J3)		250	
	wrist twist (J4)		540	
	wrist pitch (J5)		623	
	wrist roll (J6)		720	
Maximum composite speed		mm/s	9048	
Cycle time (25x300x25 mm with 1 kg load)		sec	0.36	
Position repeatability		mm	±0.02	
Ambient temperature		°C	0–40	
Weight		kg	41	
Tolerable moment	wrist twist (J4)	Nm	6.66	
	wrist pitch (J5)		6.66	
	wrist roll (J6)		3.96	
Tolerable inertia	wrist twist (J4)	kgm^2	0.20	
	wrist pitch (J5)		0.20	
	wrist roll (J6)		0.10	
Tool wiring			Hand input 8 points/hand output 8 points	
Tool pneumatic pipes			Ø 6x2 for robot connection (Ø4x8 from base portion to forearm)	
Supply pneumatic pressure		MPa	0.54 (as overpressure if required)	
Gripper flange			ISO 9409-1-31.5	
Protection rating			IP67 (Optional clean room model available)	
Robot controller			CR750-D	CR750-Q + Q172DRCPU
Order information		Art. no.	255268	255272

■ Industrial robots RV-7FM/7FLM/7FLLM

RV-7FLM

The articulated arm robots RV-7FM/7FLM/7FLLM

The RV-7FM with a nominal and maximum payload of 7 kg sets new benchmark standards for speed, flexibility, ease of integration and simplicity of programming. For an optimum work radius the robot is available in three versions with ranges from 713 mm to 1503 mm. Ethernet, USB, tracking, camera connection and additional axis connections are standard in all MELFA Robot Series.

Highlights:

- Cycle time of only 0.32 s (RV-7FM) for a 12-inch cycle
- Drastically increased working range for J1 and J4 axis for a maximum working area
- Internal wiring
- IP67 protection
- Workspace radius of up to 1503 mm (RV-7FLLM)

Characteristics/Functions			Specifications		
			RV-7FM-D1-S15/ RV-7FM-Q1-S15	RV-7FLM-D1-S15/ RV-7FLM-Q1-S15	RV-7FLLM-D1-S15 RV-7FLLM-Q1-S15
Degrees of freedom (no. of axes)			6		6 (super long arm)
Installation posture			Floor, ceiling or wall mounting possible (wall mounting with limitations in the J1 axis)		
Structure			Vertical multiple-joint type		
Drive system			AC servo (brakes on all axes)		
Position detection method			Absolute encoder		
Payload capacity	maximum	kg	7		
Arm reachable radius (to the center point of the J5 axis)		mm	713	908	1503
Operating range	waist (J1)	degree	480 (±240)		380 (±190)
	shoulder (J2)		240 (-115–+125)	240 (-110–+130)	240 (-90–+150)
	elbow (J3)		156 (-0–+156)	162 (-0–+162)	167.5 (-10–+157.5)
	wrist twist (J4)		400 (±200)		
	wrist pitch (J5)		240 (-120–+120)		
	wrist roll (J6)		720 (±360)		
Maximum speed	waist (J1)	degree/s	360	288	234
	shoulder (J2)		401	321	164
	elbow (J3)		450	360	219
	wrist twist (J4)		337		375
	wrist pitch (J5)		450		
	wrist roll (J6)		720		
Maximum composite speed		mm/s	11064	10977	15300
Cycle time (25x300x25 mm with 1 kg load)		sec	0.32	0.35	0.63
Position repeatability		mm	±0.02		±0.06
Ambient temperature		°C	0–40		
Weight		kg	65	67	130
Tolerable moment	wrist twist (J4)	Nm	16.2		
	wrist pitch (J5)		16.2		
	wrist roll (J6)		6.86		
Tolerable inertia	wrist twist (J4)	kgm^2	0.45		
	wrist pitch (J5)		0.45		
	wrist roll (J6)		0.10		
Tool wiring			Hand input 8 points/hand output 8 points		
Tool pneumatic pipes			Ø 6x2 for robot connection (Ø4x8 from base portion to forearm)		
Supply pneumatic pressure		MPa	0.54 (as overpressure if required)		
Gripper flange			ISO 9409-1-31.5		
Protection rating			IP67 (Optional clean room model available)		
Robot controller			CR750-D/CR750-Q + Q172DRCPU	CR750-D/CR750-Q + Q172DRCPU	CR750-D/CR750-Q + Q172DRCPU
Order information		Art. no.	255275/ 255279	255276/ 255280	268460/ 268462

■ Industrial robots RV-13FM/RV-13FLM/RV-20FM

RV-20FM

The articulated arm robots RV-13FM/RV-13FLM/RV-20FM

The high-performance robots RV-13 and RV-20 are specially suited for handling heavy loads. Due to the compact body and slim arm design, the robots can operate in a large work area. The anti-collision function of the iQ Platform models prevents collisions between robots which are working close together.

Highlights:

- internal routing of cables and air hoses through the robot arm
- New gears for quiet, precise positioning and movement
- maximum payload of 20 kg (RV-20FM)
- Protection rating IP67 standard

Characteristics/Functions			Specifications		
			RV-13FM-D1-S15 RV-13FM-Q1-S15	RV-13FLM-D1-S15 RV-13FLM-Q1-S15	RV-20FM-D1-S15 RV-20FM-Q1-S15
Degrees of freedom (no. of axes)			6		
Installation posture			Floor, ceiling or wall mounting possible (wall mounting with limitations in the J1 axis)		
Structure			Vertical multiple-joint type		
Drive system			AC servo (all axes with brakes)		
Position detection method			Absolute encoder		
Payload capacity	rated	kg	12		15
	maximum		13		20
Arm reachable radius (to the center point of the J5 axis)		mm	1094	1388	1094
Operating range	waist (J1)	degree	380(±190)		
	shoulder (J2)		240 (-90–+150)		
	elbow (J3)		167.5 (-10–+157.5)		
	wrist twist (J4)		400 (±200)		
	wrist pitch (J5)		240 (-120–+120)		
	wrist roll (J6)		720 (±360)		
Maximum speed	waist (J1)	degree/s	290	234	110
	shoulder (J2)		234	164	110
	elbow (J3)		312	219	110
	wrist twist (J4)		375		124
	wrist pitch (J5)		375		125
	wrist roll (J6)		720		360
Maximum composite speed		mm/s	10450	9700	4200
Cycle time (25x300x25 mm with 1 kg load)		sec	0.53	0.68	0.70
Position repeatability		mm	±0.05		
Ambient temperature		°C	0–40		
Weight		kg	120	130	120
Tolerable moment	wrist twist (J4)	Nm	19.3		49.0
	wrist pitch (J5)		19.3		49.0
	wrist roll (J6)		11		
Tolerable inertia	wrist twist (J4)	kgm^2	0.47		1.40
	wrist pitch (J5)		0.47		1.40
	wrist roll (J6)		0.14		
Tool wiring			Hand input 8 points / hand output 8 points		
Tool pneumatic pipes			Primary: Ø 6x2, secondary: Ø 6x8		
Supply pneumatic pressure		MPa	0.54 (as overpressure if required)		
Gripper flange			ISO 9409-1-40		
Protection rating			IP67 (Optional clean room model available)		
Robot controller			CR750-D/CR750-Q + Q172DRCPU		
Order information		Art. no.	268488/ 268492	268490/ 268494	268504/ 268506

COGNEX

VISION SYSTEMS

IN SIGHT IMAGE PROCESSING SYSTEMS

- Works autonomously from PC
- Ethernet and RS- 232 port
- Programming by PC using Mouse and keyboard
- Compact connection with all- in-one design
- Making a connection of cameras to one network and watched them from one computer via Ethernet
- Autofocus lens options models
- Lighting feed over camera

By making the screen arrangements, determining the control points, arranging the exits and saving.Now your application is ready to work.It is also very easy by copy/paste and reverse features of Windows using mouse and keyboard

ITEM DEFINITION TOOLS

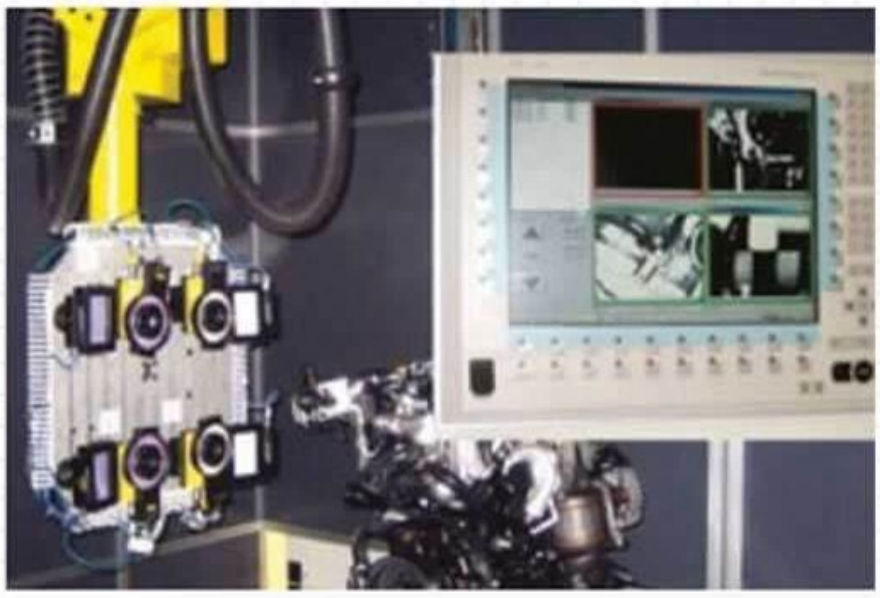
- Cognex cameras are the most sensitive item definition and position finder tools in the sector. This figure-defining tool that is Cognex patented and geometric relation based serves even under the difficult conditions.
- It makes the system configuration simple by declining the need of mechanical fixing. It gives smooth, unproblematic and certain results.
- Finding Automotive , plumbing and every kind of armature part position
- Finding variable dimension, angle and positions of part by oriented robot directing, absolute solution by much less sensitive algorithm to light
- Sensitive part alignment

RESEARCH TOOLS

- Repeatable results even if the place of part changes
- Describing error types, tolerances to user easily
- Controlling the parts in terms of true measure, outline and montage
- Unified part finding functions and telecommunication tools direct to the robot
- Reduces the costs of fixture in the application of Pick and Place and sensitive position finder tools
- Work possibility with more than one product at a single station
- Applications of high speed and sensitive part catching from package or pallet
- Defining the parts coming randomly on the conveyor and having position information
- Detection of the robot by changing the camera position to check the sensitive elements.

AUTOFOCUS AND LENS OPTIONS

You can easily set and save the optimal focus values associated with the inspection of each part on your line. This autofocus feature simplifies setup and is ideal for situations requiring regular part changes or projects that require the vision system to be placed in hard-to-reach spaces. In addition, field-replaceable lenses, like C-mount, allow you to further customize the vision system for specific applications.



INTUITIVE SOFTWARE OPTIONS

The In-Sight Explorer spreadsheet view provides a robust, flexible and efficient way to configure the vision tools and handle the data created from a vision application. Drag and drop vision tool pallet along with tool property sheets make job configuration simple.

The flexible In-Sight Explorer EasyBuilder® user environment makes all inspection, defect detection, guidance, alignment and measurement applications easy to set up and deploy.

FAST IMAGE CAPTURE

The In-Sight 7000 delivers the highest acquisition speeds of all In-Sight products at over 100 frames per second. This high acquisition rate provides you reliable 100% automated inspection of products on even the fastest bottling and pharmaceutical production lines.

Technical Changes
The Data and illustrations in this catalogue are not binding and only provide an approximate description. We reserve the right to make changes to the product delivered compared with the data and illustrations in this catalogue, E.g. in respect of technical data, design, fittings, material and external appearance.

TURKISH TECHNOLOGICAL MACHINERY

2015

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