



## **IGM FR 3500 Series**

**Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines**  
**X x Y x Z = 2500 - 10000 x 3500 x 1400 - 2350 mm**



**WORKING  
VIDEO  
SCAN, WATCH!**

# ABOUT US

## İğrek Makina



## İĞREK MAKİNA: RELIABLE PARTNER FOUNDRY

İğrek Makina, founded by A. Osman İğrek in 1946, is a family-owned and managed industrial company in Bursa, Turkey. Aiming to be a leader of the sector through its product variety, capacity, technology and made up of three main divisions:

**Pattern production**, world wide, a top performer of its class in production of polystyrol patterns for full mould casting method. This department allowed the company to produce any complicated and big part in short amount of time and make casting process possible.

**Foundry**, more than 76 years of experience in production of gray iron, nodular iron and steel castings (GG-GGG-GS) especially for machine tools.

**Machining**, milling - turning and grinding services for big and heavy duty casting parts with high precision and good lead times.

The facility upgraded both in volume and lay-out and reached to 40.000 m<sup>2</sup> of area today. Integrating its production centre with 150 employees including 30 engineers and 30 qualified technicians leading production, quality, administration and planning.

İğrek Makine is now constructing a new giant factory in 140.000m<sup>2</sup> area offering flexible and diverse abilities in supplying heavy industry demands with good timing, cost and high quality.





### MACHINE TOOL DESIGN & PRODUCTION

The experience of the company increased by supplying machine tool parts for global market and working with a highly equipped **internal machining department**. This department includes:

- Waldrich Coburg Grinding Machine: 6000 x 2000 x 1500 mm
- Fermat Horizontal Boring & Milling Machine with rotary table: 12000 x 4000 x 2000 mm
- 10 Bridge Type Milling Machines with various functions, sizes up to 10000 mm in X Axis.
- 3 Vertical Lathe Machines with CNC and C-Axis, diameters up to 5000 mm.
- ROBBI Cylindrical Grinding Machine - Diameter 1000 mm - Length 3000 mm.
- KITAMURA High Precision Horizontal Machining Center for machining Head and Spindle parts

All this Know How and machinery finally led to constitution of the new machine tool production department.

**İğrek Machine Tools** production began with 2 different machines and they are both active in the premises: **İGREK PORTAL HSM5000** & **İGREK ÖNCÜ SERIES**.

The Machine Tool Design, Assembly and Service Team is now preparing the new 4 **machine types**. The aim of the company is to build:

- **High technology & quality machines in good price level**
- **Cast Iron machine structure for best rigidity & dynamic stability**
- **Specialized designs for special customer demands**



#### İGREK ÖNCÜ SERIES

Light Weight, High Speed Milling Machine 6000 x 4000 x 1500 mm  
Siemens 828 CNC



#### İGREK PORTAL HSM5000

5-Axis Gantry Type Milling Machine  
5000 rpm continuous head

10000 x 5000 x 2000mm  
Siemens 840D CNC

# IGM FR 3500 Series

Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines

**Fork Type**  
Machining Head  
**16000** rpm  
**46** kW  
**220** Nm



**Monoblock**  
**Cast Iron Body Design**  
requires no heavy-duty  
fundament construction



## FEATURES

IGM FR 3500 is **completely made of GG30 cast iron** by our own foundry. Stress relieving heat treatment was applied to the castings. The body parts are machined on precision milling machines and the linear guide mounting surfaces grinded.

Components are measured and assembled using our Renishaw Laser Alignment and Calibration Systems, precision Niveltronic devices with Bluetooth communication, Atos 3D Scanner and certified granite gauge blocks.

Axis drive systems are composed of high quality linear guideways, servo motors, gear units and rack and pinion gear systems. All axes are equipped with absolute measuring scales.

All kinematics, pneumatic, hydraulic, electrical and electronic components are selections of top-class products and brands for achieving the highest quality and reliability.

Our machine has high stability and accuracy thanks to its monoblock design. Our design is subjected to dynamic, static, stress, vibration and fatigue analysis by finite element methods and production was planned accordingly.

Accuracy and usage norms are according to CE, VDI-DGQ 3441 and ISO standards.

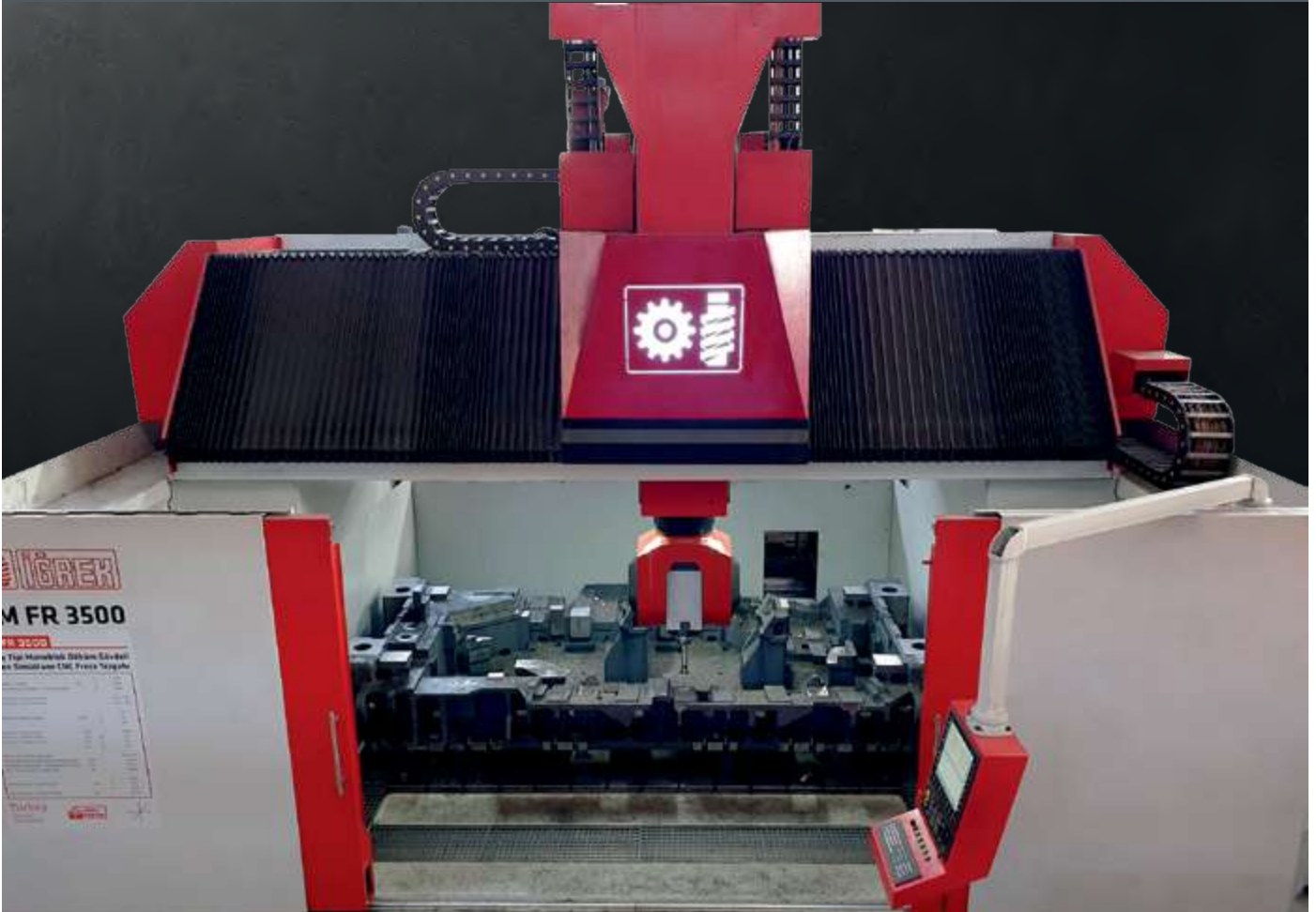


WORKING  
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All equipment used in our machines are selected from the top series of the leading brands in their class. High quality sustainability is maintained with strong communication and support with our suppliers.

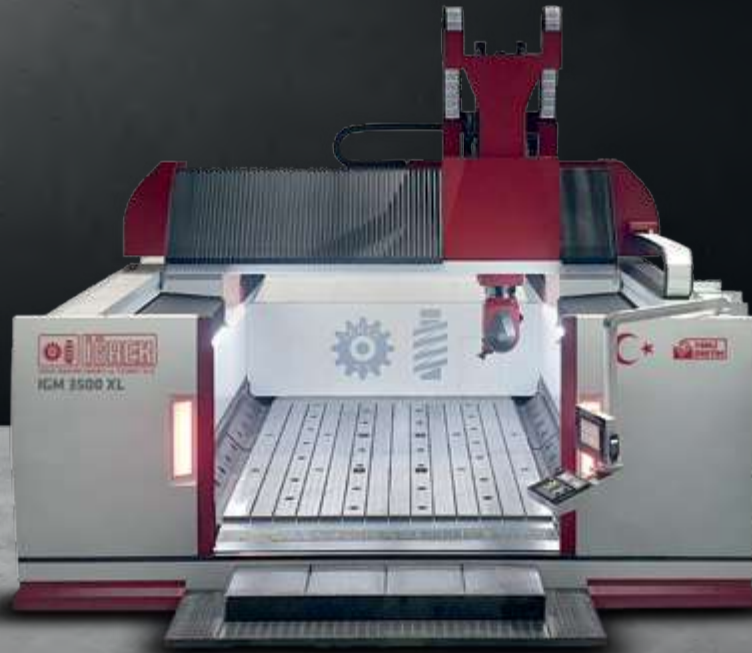
# IGM FR 3500 Series

Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines



# IGM FR 3500 Series

## Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines



TECHNICAL DETAILS			COMPACT	XL	XXL
<b>General Features</b>					
		X	2500	6500	10500
Stroke	mm	Y	3500	3500	3500
		Z	1400	1400	2350
A-Axis Rotation	°			+/- 115	
C-Axis Rotation	°			+/- 360	
		X		30	
Rapid Feedrate	m/dk	Y		30	
		Z		30	
<b>Spindle</b>					
Spindle Speed	dk/devir			16000	
Spindle Power	kW	S1		46	
Spindle Torque	Nm	S1		220	
		S6		310	
Tooling Taper Type				HSK-A100	
Positioning Accuracy	mm			<0,012	
Repeatability Accuracy	mm			<0,010	
Table Load	kg/m <sup>2</sup>			4000	
<b>Physical Characteristics</b>					
Lenght		X	7800	11500	16000
Width	mm	Y	7370	7400	7400
Height		Z	6600	6600	8500
Weight	kg		70000	120000	195000
<b>Specifications</b>					
Optional 24-48-96 Tool Capacity ATC					
Chip Conveyor					
BLUM or RENISHAW Laser Touch Probe and Laser Tool Measuring Device					
Auto Lubrication and Cooling Unit					
Air Conditioned Electrical Cabinet					
<b>CE Norm Safety Standards</b>					

# IGM FR 3500 Series

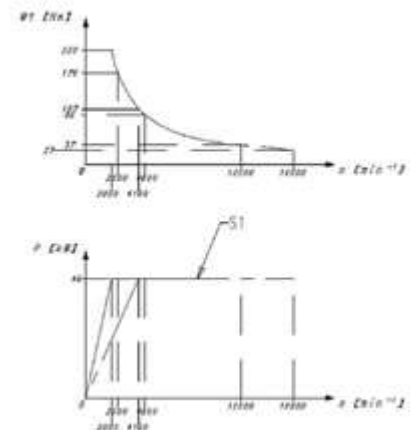
## Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines

### MILLING HEAD & SPINDLE FEATURES

Main body of the continuous fork type milling head is made of cast iron. The spindle is equipped with special ceramic bearings, pulverized lubrication system, internal and external cooling availability. The spindle has a HSK-A 100 cone and it is also ready for ISO 50. The high-tech A-Axis and C-Axis are equipped with direct drive torque motors, brake systems and encoders. For any special requests on spindle and milling heads, please do not hesitate to contact us.

Milling Head		
C-Axis Rotation	°	± 360
C-Axis Power	kW	22
C-Axis Torque S1 - S6	Nm	1200 - 1700
C-Axis Speed	rpm	50 - 120
C-Axis Braking Torque	Nm	4000
A-Axis Rotation	°	± 115
A-Axis Power	kW	6 x 2 = 12
A-Axis Torque S1 - S6	Nm	500 / 700 x 2 = 1000 / 1400
A-Axis Speed	rpm	50 - 120
A-Axis Braking Torque	Nm	4000
Spindle		
Spindle Power	kW	46
Spindle Torque S1	Nm	220
Spindle Speed (Nominal)	rpm	16000
Tool Taper		HSK-A 100

### Performance Graph



Our experts are qualified in production, assembly, maintenance and testing of our heads and spindles. Spare parts and units are kept safely in our storages for your security in production sustainability.



CNC Unit Control Panel



Laser Touch Probe & Laser Tool Measuring Device



Automatic Changing Heads available on request



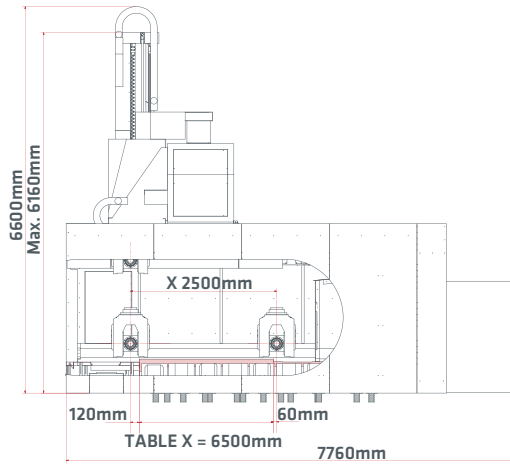
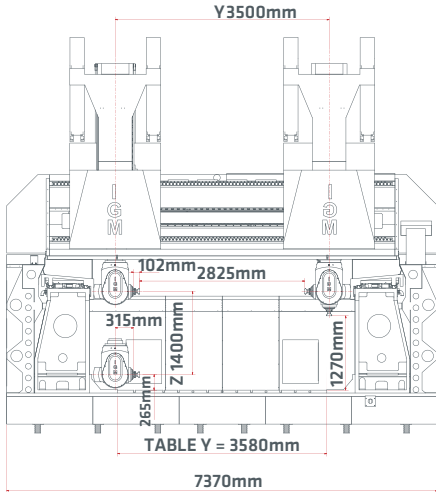
Graphical interface for machine usage and maintenance procedures.

# IGM FR 3500 Series

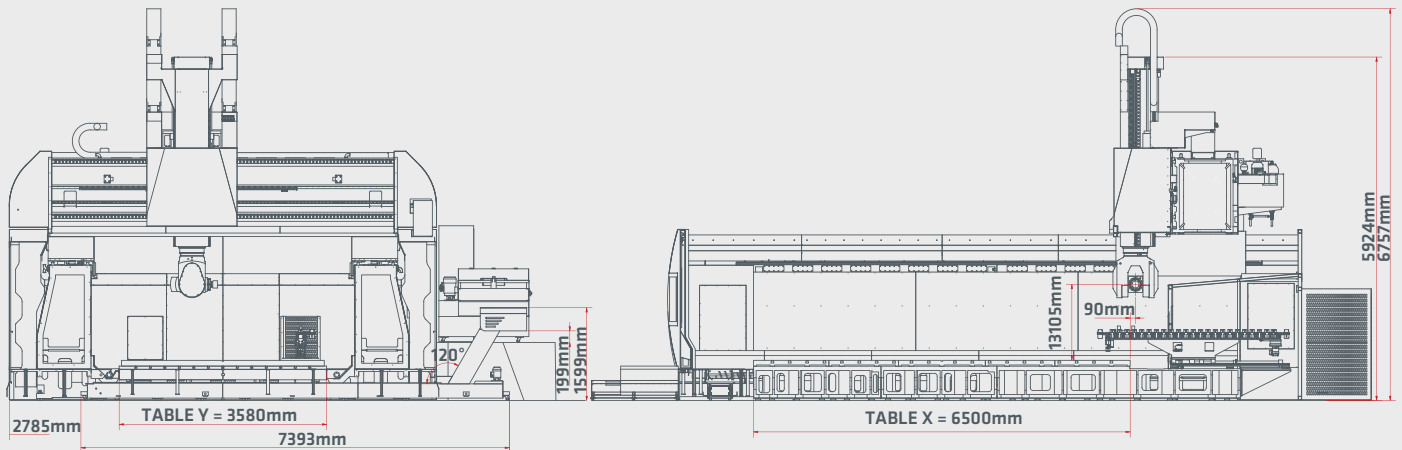
Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines

## MACHINE SIZE

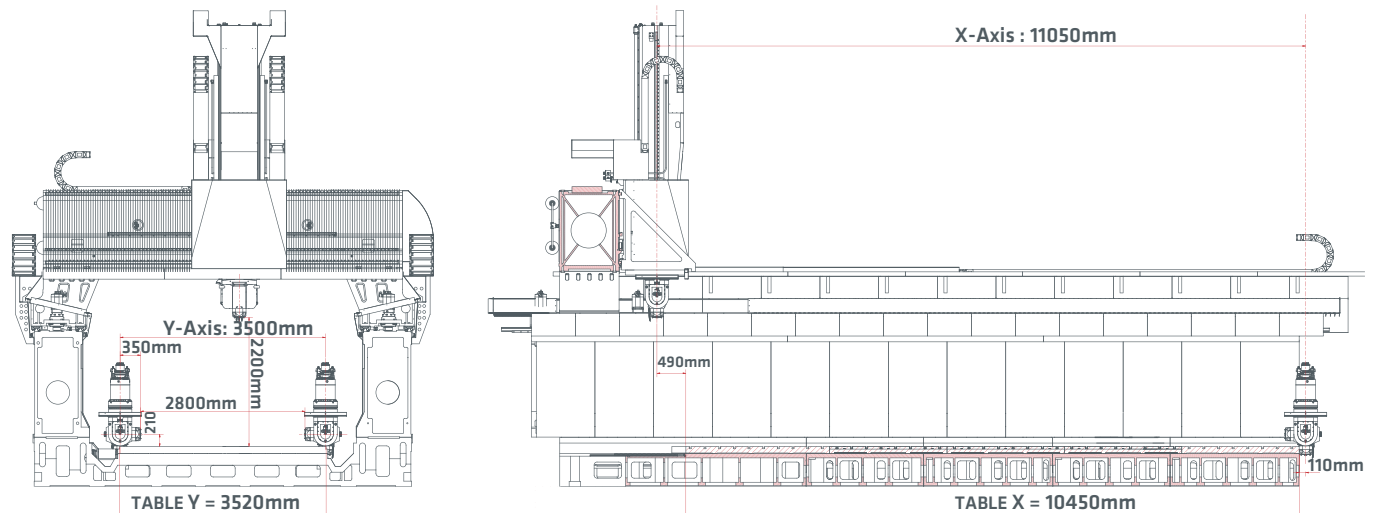
IGM FR 3500 KOMPAKT



IGM FR 3500 XL



IGM FR 3500 XXL





# IGM FR 3500 Series

## Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines

### CNC CONTROL UNIT

The control board is on the operator station at the front of the machine. All commands of the machine and the CNC are centralized on the control board.

#### SIEMENS SINUMERIK 840D

Drive-based, modular CNC with modular panel concept up to 24" color display  
SIMATIC S7-300 PLC supported.

Control system Siemens 840D SL features and hardware:

- CPU Type: NCU730.3 or higher
- 21" touch screen as standard, higher as optional,
- Siemens MDynamics, Top Surface, Advance Surface features are enabled,
- Shopmill latest version enabled,
- Collision Avoidance Standard enabled: Real-time anti-collision protection for user specified regions on the work area,
- Collision Avoidance ADVANCE: Real-time anti-collision work piece protection module is optional.
- Siemens Tool Management system is enabled,
- 3D Simulation screen is enabled,
- HT2 wired and screened hand wheel is included,
- PILZ user key card selection module is included,
- Joystick controlled dome camera within work area included.



### MONOBLOCK CAST IRON BODY



# IGM FR 3500 Series

## Upper Gantry Type 5-Axis Simultaneous CNC Milling Machines

### SPECIFICATIONS

#### AXES DEFINITIONS

Longitudinal Axis	X UPPER GANTRY
Cross Axis	Y RAM'S CROSS SLIDE
Vertical Axis	Z VERTICAL RAM
Rotating Axis	C HEAD FORK TYPE HOLDING PLATFORM
Rotating Axis	A SPINDLE BODY

#### LUBRICATION SYSTEM OF THE MACHINE

An advanced automatic and centralized lubrication system is used to lubricate all moving parts of the machine.

The whole system is constantly under control with a dedicated software in the CNC of the machine with dedicated alarm messages in case of failures or malfunctions.

#### AXES DRIVES

The linear X-axis is controlled with 4 SIEMENS motors and digital drives.

The linear Y and Z axes are driven by SIEMENS motors with digital drives.

#### MEASURING SYSTEMS

The linear axes X, Y and Z are equipped with coded optical scale HEIDENHAIN having a resolution of 0,001 mm.

The rotative axes C and A are equipped with rotary measuring system HEIDENHAIN with a resolution of 0.001°.t



#### FLUID SYSTEMS

Automatic Lubrication, Cooling, Hydraulic & Pneumatic Systems are standard. The machine has a tool fluid system with filtering device and filter-cartridges in line. The coolant comes out from nozzles around the spindle ring. Coolant through the spindle is enabled and included in our quotation.



#### ELECTRICAL CABINET

The electrical cabinets are mounted on the floor and realised in waterproof material with IP55 safety standard.

Dedicated air conditioners are mounted to keep constant the internal temperature.



#### AUTOMATIC TOOL CHANGER

48 Tool Capacity ATC is included. 24 or 96 tool capacity is available.



#### CHIP CONVEYOR

2 worm conveyors in the machine bed transport into a chip conveyor (belt-type or deep cleaning type conveyor) with interval control, placed at right angles.

# İGREK Machine Tools

## Other Machine Tools

### IGM DT 4000

Vertical Lathe with Ø4000 mm Hydrostatic Rotary Table & Moving Traverse

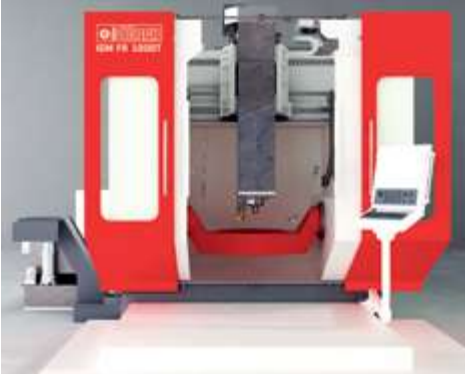


**World-class CNC vertical lathe, capable of precision machining for heavy parts with its direct driven, hydrostatic guided rotary table and moving traverse. Milling and hole drilling abilities thanks to live spindle and precision positioning C-Axis.**

Table Diameter	mm	4000
Max. Turning Diameter	mm	5000
Max. Turning Height From Table	mm	2000
Ram Slide Stroke	mm	2100
Spindle Speed	rpm	4000
Spindle Torque	Nm	1200
Rotary Table Speed	rpm	80
Rotary Table Power	kW	180

### IGM FR 1000T

5-Axis Milling & Turning Center with Tilting Table



**A high-end, mass production machine for precise milling and turning operations. With its cast iron single block body structure and superior automation, capable of processing all operations of complex geometry parts in one adjustment with high performance and short lead times.**

Stroke	mm	X	1350
		Y	1500
		Z	900
A-Axis Rotation	°	< +120 / -30 >	
C-Axis Rotation	°	± 360	
Spindle Speed	rpm	12000	
Nominal Spindle Power	kW	46	
Nominal Spindle Torque	Nm	220	
Max. Workpiece Diameter	mm	1000	
Rotary Table Speed	rpm	600	
Work Load Capacity	kg	2000	

### IGM YF 150

CNC Horizontal Milling & Boring Machine



**The heavy-duty milling and boring machine equipped with hydrostatic guides in all axes and a rotary table.**

Longitudinal Travel – Axis X	mm	3200 - 29400	
Headstock Vertical Travel – Axis Y	mm	2500 - 5500	
Ram Travel - Axis Z	mm	1000	
Spindle Out Travel – Axis W	mm	1000	
Rotary Table Dimensions	mm	3500 x 3500	
Transversal Travel of Rotary Table – Axis V	mm	2500	
Spindle Diameter	mm	150	
Spindle Power	kW	60	
Spindle Speed		450 Nm @ 1500 rpm	
		1800 Nm @ 475 rpm	

### IGM FR 1100

3-Axis CNC Vertical Milling Center



**With its strong cast iron structure, high quality dynamic component selection IGM FR 1100 is the allround CNC Vertical Machining Center that can produce most basic machining operations with high accuracy.**

Stroke	mm	X	1320
		Y	610
		Z	600
A-Axis Rotation	°	< +120 / -30 >	
C-Axis Rotation	°	360	
Spindle Speed	rpm	12000	
Spindle Power	kW	13	



İGREK MAKİNA SANAYİ ve TİCARET A.Ş.



**High Speed**  
**High Technology**  
**High Precision**  
**Machine Tools**  
**“Made in Türkiye”**



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