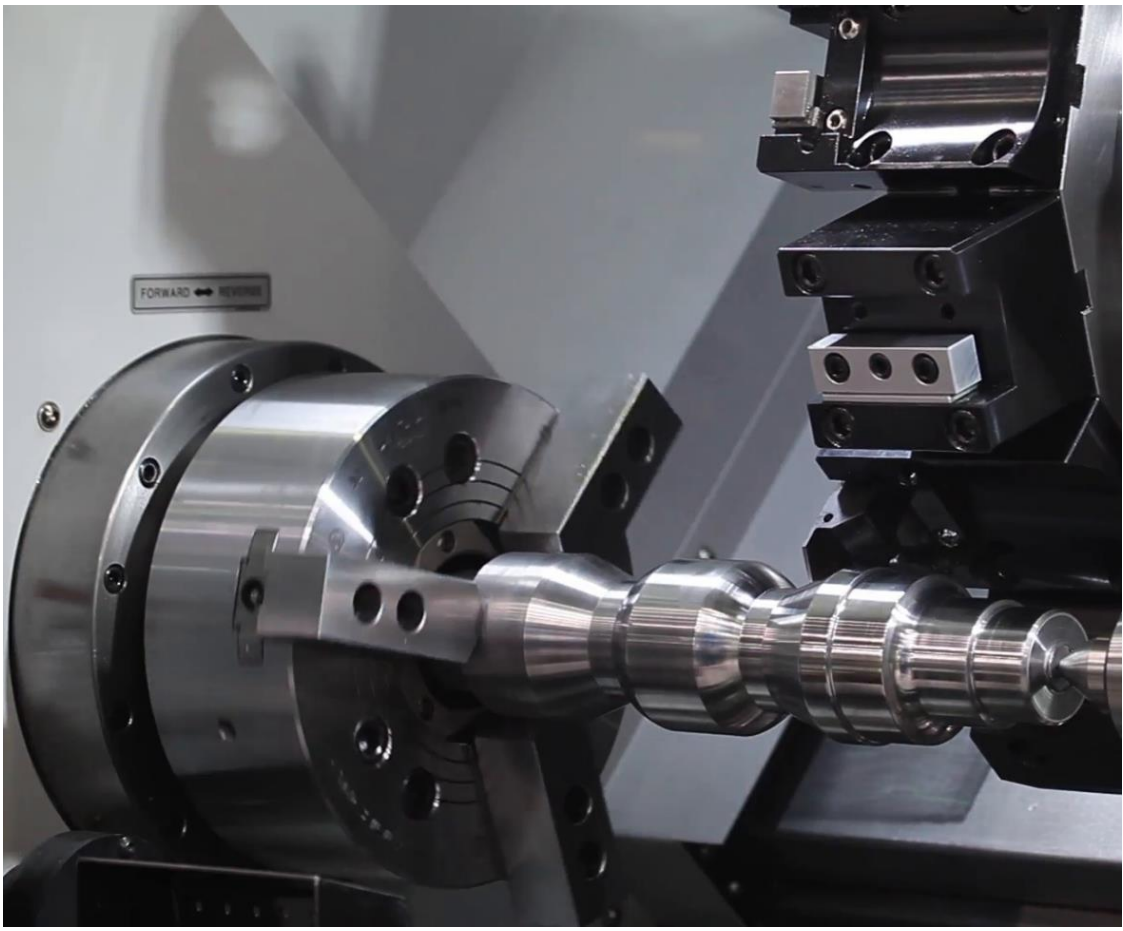
BARUFFALDI
MACHINE TOOL COMPONENTS

The Partner for Machine Tool Builders

Baruffaldi General Quick guide

Catalogo generale sintetico



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BARUFFALDI – Since 1927

90 years of Italian mechanical excellence

1927

Eng. Cesare Boffelli

Baruffaldi was founded in Milano (Italy) by Cesare Boffelli, a qualified mechanical engineer, in 1927

1932

Motorcycle Certum from '30s

The Company started the production of brakes for motorcycles in the '30s

1955

Baruffaldi Catalog '50s

In the '50s Baruffaldi expanded its business area manufacturing brakes and clutches for several industrial applications

1972

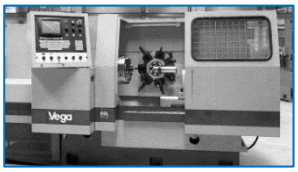
Fiat Truck '70s

With high technology knowledge in brake and clutches The Company became a partner of truck manufacturers

BARUFFALDI

1975

In the '70s it began the production of components for Machine Tool industry



PPL "Galaxy" turning lathe '70s

1984

Baruffaldi entered the agricultural and textile machines industries

Agricultural Tractor '80s

2007

Baruffaldi reorganized the company into 2 new production units located in Milan area.The total covered area is 25.000sqm

Baruffaldi Production Units

Today Baruffaldi, with over 90 years of experience, is one of the leaders in the Machine Tool Industry offering high quality products and services worldwide.

Oggi Baruffaldi, con oltre 90 anni di esperienza, è una dei leader del settore delle Macchine Utensili offrendo prodotti di alta qualità e servizi in tutto il mondo.

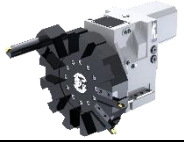
Baruffaldi, The Partner for Machine Tool Builders

SERVO TURRETS

SATATIC TOOL TURRETS

TB Servo Turrets

TBH Servo Turrets



DRIVEN TOOL TURRETS

TBMA Axial Driven Tool Turrets

TBHMA Axial Driven Tool Turrets

TBMR Radial Driven Tool Turrets

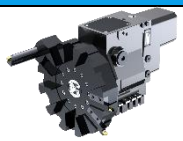
VERTICAL AXIS TURRETS

TAB Servo Turrets

ELECTROMECHANICAL TURRETS

SATATIC TOOL TURRETS

TE Electromechanical Turrets



DRIVEN TOOL TURRETS

TEMA Axial Driven Tool Turrets

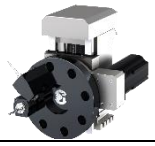
VERTICAL AXIS TURRETS

TAN Electromechanical Turrets

Y-AXIS SERIES

YAX Standard Unit

YAX-C Compact Unit



TBYA Axial Driven Tool Turrets

TBYR Radial Driven Tool Turret

GEARBOXES

CE 2-Speed Gearboxes

CEA 2-speed Gearboxes

CTG 2-Speed Gearboxes

B-AXIS

BAX-T Unit

ACCESSORIES

Tool Holder Discs

Rotary Tool Holders

Coupling Rings

TB SERVO MOTOR TURRETS

TB Turrets

Servo Turrets with Horizontal Axis

TB-type turrets rotate thanks to a **BRUSHLESS SERVO MOTOR** controlled by a **SERVO DRIVE**. A pneumatic or hydraulic piston locks/unlocks the unit. High rigidity, very accurate positioning and very high rotating speeds.
The turrets are available with several type of Tool Disc: VDI (standard), BMT, Polygonal open slot type, Capto and other special Discs.

Main characteristics:

- Disc rotation thanks to a **Servo Motor** controlled by a **Servo Drive**
- Very high indexing speed
- Locking and unlocking without axial movement
- Bi-directional rotation
- Absolute positioning
- Hydraulic or pneumatic locking/unlocking systems
- **Coolant pressure** through the turret up to **70 Bar**

Size		TB100	TB120	TB160	TB200	TB250	TB320	TB400	TB500
N° of divisions		8-12-16	8 - 12 - 16 - 24						
Max Moment of Inertia	Kgm²	0,25	0,15÷1,8	0,15÷1,8	0,4÷8	0,4÷8	0,7÷40	20÷100	100
Max Tangential Torque	Nm	450	1100	1900	4000	7500	16000	26000	75000
Max Overturning Torque (pressing)	Nm	400	1200	2100	6000	12000	25000	41400	50000
Max Lifting Torque (lifting)	Nm	150	700	1600	3500	6500	13000	20000	25000
Positioning Accuracy	Deg	±4" Deg.							
Accuracy of Repeatability	Deg	±1,6" Deg.							
Locking System	PN	●	●	●	●	●			
	HYD		●	●	●	●	●	●	●
Locking/Unlocking: Pneumatic Pressure		5±1 Bar							
Locking/Unlocking: Hydraulic Pressure		30±3 Bar							
Coolant pressure (standard)		40 Bar							
Coolant pressure (special)		70 Bar							

TBMA Turrets (With Axial Driven Tools)

Servo Turrets with Horizontal Axis

TBMA-type turrets, with **axial driven tools**. Discs according to ISO 10889 (ex DIN 69880) norms can be used. Compact overall dimensions of the driven tool system, very high rotating tools speed, double sensor switches for the engagement control, high rigidity and even higher performances due to the new design.

Main characteristics:

- High Speed of the driven tool system up to 6000rpm
- **Double proximity switch** for the tool engagement control
- Suitable for tooling/coupling: Baruffaldi (standard), DIN 5480 and DIN1809
- **7 turrets sizes**, many different possibilities and special applications
- Easy maintenance
- Possibility for **forced lubrication** in order to increase the working **time (100%)** and the **speed (8000rpm)**

Size		TBMA100	TBMA120	TBMA160	TBMA200	TBMA250	TBMA320	TBMA400
VDI		16-20	20-30	30-40	40-50	50	60	60-80
Max Speed	rpm	6000	6000	6000	5000	5000	3000	3000
Max Motor Torque	Nm	10	16	20	50	55	100	130
Max Power	Kw	3	5	6	9	10	15	19
Ratio		1:1	1:1	1:1	1:1	1:1	1:1	1:1
		-	-	1:1,25	1:1,315	1:1,52	1:1,45	1:1,85
Locking System	PN	●	●	●	●	●		
	HYD		●	●	●	●	●	●
Live Tooling System		Baruffaldi						
		-		DIN 1809			-	
		-	DIN 5480				-	

This table shows the characteristic of the Driven Tool Unit, for the turret see the TB's data sheet.

TBMR-type turrets, with **radial driven tools.** The tools are located on discs with radial seats with **VDI system** (as per ISO 10889 norms) or according to **BMT system (Base Mounted Tool Holder)**. High speed, automatic engagement and disengagement of the rotating tool during turret indexing cycle, short or extended neck useful for back machining operations, strong housing and high flexibility.

Main characteristics:

- Double proximity switch for the tool engagement control
- High rigidity, due to the new design
- Wide range 160-200-250-320
- Possibility to use 8-12-16-24 position discs
- Possibility to use VDI 20-30-40-50-60
- BMT coupling (Base Mounted Toolholder) 45-55-65-75-85
- Suitable for tooling/coupling: Baruffaldi (standard) and DIN 5480
- Easy maintenance

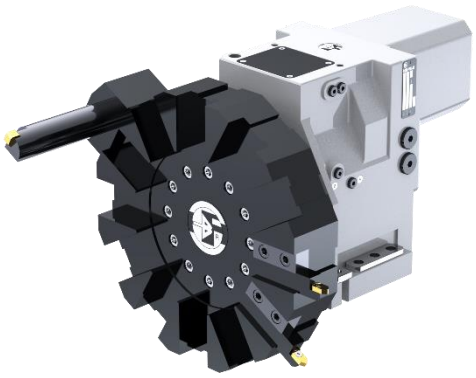
Size		TBMR120	TBMR160	TBMR200	TBMR250	TBMR320
VDI		20	30	40-50	50	60
BMT		/	45-55	55-65	65-75	75-85
Max Speed	rpm	6000	6000	5000	5000	3000
Max Motor Torque	Nm	16	20	50	55	100
Max Power	Kw	5	6	9	10	15
Ratio		1:1	1:1	1:1	1:1	1:1
Locking System	PN	●	●	●	●	
	HYD	●	●	●	●	●
Live Tooling System		Baruffaldi				
		BMT				
		DIN 5480				

This table shows the characteristic of the Driven Tool Unit, for the turret see the TB's data sheet.

ECO LINE -TBH SERVO MOTOR TURRETS

TBH Turrets

Servo Turrets with Horizontal Axis



A new **ECO LINE** of Servo Turrets has been designed, in order to match the global competition. They use a **fully hydraulic locking system** and rotate thanks to a **BRUSHLESS SERVO MOTOR** controlled by a **SERVO DRIVE**.
TBH turrets have a extremely **simple design**, really high performances and request a minimum maintenance.

Main characteristics:

- Disc rotation thanks to a **Servo Motor** controlled by a **Servo Drive**
- Very high indexing speed
- Locking and unlocking without axial movement
- Bi-directional rotation
- Absolute positioning
- Hydraulic or pneumatic locking/unlocking systems
- **Coolant pressure** through the turret up to **70 Bar**

Size		TBH160	TBH200	TBH250
N° of divisions		8 – 12 – 16 - 24		
Max Moment of Inertia	Kgm²	0,15÷1,8	0,4÷8	0,4÷8
Max Tangential	Nm	1900	4000	7500
Max Overturning Torque (pressing)		2100	6000	12000
Max Overturning Torque (lifting)		1600	3500	6500
Positioning Accuracy	Deg.	±4"		
Accuracy of Repeatability		±1,6"		
Hydraulic Locking Pressure	bar	40 ± 3		30 ± 3
Coolant pressure (standard)		40		
Coolant pressure (special)		70		

TBHMA Turrets (With Axial Driven Tools)

Servo Turrets with Horizontal Axis

TBHMA-type turrets, **ECO Line** Servo Turrets **with axial driven tools**. Discs according to ISO 10889 (ex DIN 69880) norms can be used. Compact overall dimensions of the driven tool system, very high rotating tools speed, double sensor switches for the tool engagement control.
Possibility for **forced lubrication** in order to increase the **working time (100%)** and the **speed (8000rpm).**

Main characteristics:

- High Speed of the driven tool system up to 6000rpm
- **Double proximity switch** for the tool engagement control
- Suitable for tooling/coupling: Baruffaldi (standard), DIN 5480 and DIN1809
- Easy maintenance
- Possibility for **forced lubrication** in order to increase the **working time (100%)** and the **speed (8000rpm)**

Size		TBHMA160	TBHMA200	TBHMA250
VDI		30-40	40-50	50
Max Speed	rpm	6000	5000	5000
Max Motor Torque	Nm	20	50	55
Max Power	Kw	6	9	10
Hydraulic Locking Pressure	bar	40 ± 3		30 ± 3
Coolant pressure (standard)		40		
Coolant pressure (special)		70		
Live Tooling System		Baruffaldi		
		DIN 1809		
		DIN 5480		

This table shows the characteristic of the Driven Tool Unit, for the turret see the TBH's data sheet.

VERTICAL AXIS TURRETS

TAB Bi-directional Turrets

Servo Turrets with Vertical Axis

They use a **fully hydraulic locking system** and rotate thanks to a **BRUSHLESS SERVO MOTOR** controlled by a **SERVO DRIVE**.
TAB turrets are **bi-directional**, **no body lifting** during the indexing rotation, really simple design, really high performances and request a minimum maintenance.
Turrets can carry 4/6 tools as per DIN 3425 norms; on demand, they can be supplied with a different number of faces.

Size		TAB 210	TAB 265	TAB 340
N° of stations		4 - 6		
Max Moment of Inertia	Kgm²	4	9	22
Max Tangential Torque	Nm	3200	6560	13850
Max Overturning Torque (pressing)*		6600	13800	29500
Max Overturning Torque (lifting)*		2600	5000	10900
* Distance from turret axis	mm	200	250	300

Positioning Accuracy	Deg.	±4" Deg.
Accuracy of Repeatability		±1,6" Deg.
Hydraulic Locking Pressure	Bar	40 Bar

TAN Mono-directional Turrets

Electromechanical Turrets with Vertical Axis

TAN series turrets is **fully electromechanical** and consist of a fixed basis and a rotating head both made of hardened and ground steel.
A single 3-phase asynchronous motor controls release, rotation, positioning and locking.
TAN series turrets can be mounted with the axis in horizontal, vertical or slanting position. Turrets can carry 4/6 tools as per DIN 3425 norms

Size		TAN 160	TAN 210	TAN 265	TAN 340	TAN 440
N° of stations		4	4 - 6			
Max Moment of Inertia	Kgm²	1	3	8	21	55
Max weight to be carried	Kg	35	75	120	220	320
Max Tangential Torque	Nm	1100	1800	3600	12000	22000
Out of Balance in Horizontal Axis		8	35	130	200	400
Positioning Accuracy	Deg.	±6"				
Accuracy of Repetibility	Deg.	±2"				
Motor Voltage	V	110 – 220 – 380 – 400				
Brake Voltage		24				

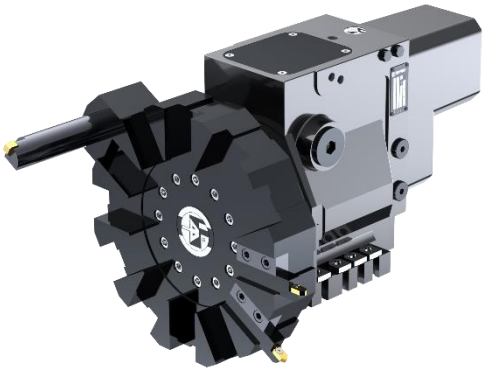
ELECTROMECHANICAL HORIZONTAL AXIS TURRETS

TE Turrets

Electromechanical Turrets with Horizontal Axis

The TE turrets, horizontal vertical axis units, are **totally electromechanical**.
A single AC Motor drives the unlocking movement, rotation, positioning and locking movement.
They do not require any additional hydraulic or pneumatic connection.

Bi-directional rotation and easy control by the interface PLC of the machine



Size		TE120	TE160	TE200	TE250
N° of division			8 – 12		
Max Moment of Inertia		0,15÷1,8		0,4÷8	
Max Tangential Torque	Nm	1100	1900	4000	7500
Max Overturning Torque (pressing)		1200	2100	6000	12000
Max Overturning Torque (lifting)		700	1600	3500	6500
Positioning Accuracy	Deg.	±4"			
Accuracy of Repeatability		±1,6"			
Indexing frequency	n°/h	800	700	550	400
Motor Voltage	V	110– 220 – 380 – 400			

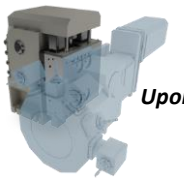
Y-AXIS SERIES

YAX

Y-Axis Unit (Standard Version)

The YAX unit allows displacement of tools in lathe Y-direction, in order to produce manifolds where out-of-axis operations are required, such as face millings, holes and tapping, key-slots and so on.
It can be fitted on flat bed lathes as well as on slant bed lathes, where required y-axis movement is perpendicular to machine slide.
The rugged meehanite cast iron column with wide sliding guideways and all other strongly designed components, together with hydraulic guideways preload system allow hard machining operations either with fixed and live tools

Size		YAX16		YAX25	
Turret Size (TBYA or TBYR)		160	200	200	250
Nominal Stroke	mm	+55/-55		+70/-70	
Max Feed Speed	m/min	10		10	
Max Feed Force	N	12000		18000	
Min. Motor Torque	Kw	6		10	
Hydraulic Brake Force	N/bar	50		90	
Max. Brake Oil Pressure	bar	100		100	
Accuracy of Positioning with motor encoder	µm	≤20		≤20	
Accuracy of Positioning with linear encoder		≤10		≤10	



Upon request, a complete unit (turret + y-axis) ready for use can be supplied

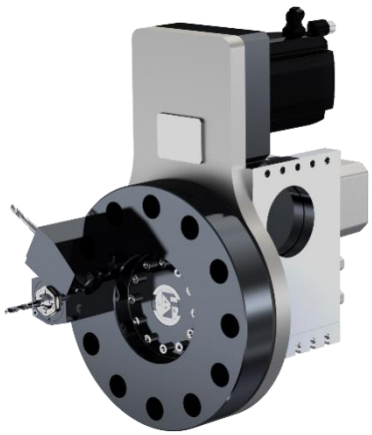
These turrets have been designed for use on the Y axis of turning centers. The turrets have compact overall dimensions towards the chuck, the tailstock and the slide. This solution allows use of tool holder discs with standard dimensions. Main features of these turrets are similar to TBMA and TBMR turrets.

TBYA (Turret for Y-Axis with Axial Driven Tools)

Servo Turrets for Y-Axis applications

Size		TBYA160	TBYA200	TBYA250	TBYA320
VDI		30-40	40-50	50	60
Max Speed	rpm	6000	5000	5000	3000
Max Motor Torque	Nm	20	50	55	100
Max Power	Kw	6	9	10	15
Ratio		1:1	1:1	1:1	1:1
		1:1,25	1:1,315	1:1,52	1:1,45
Locking System	PN	●	●	●	
	HYD	●	●	●	●
Live Tooling System		Baruffaldi			
		DIN 1809			-
		DIN 5480			-

This table shows the characteristic of the Driven Tool Unit, for the turret see the TB's data sheet.



TBYR VDI and BMT (Turret for Y-Axis with Radial Driven Tools)

Servo Turrets for Y-Axis applications

Size		TBYR120	TBYR160	TBYR200	TBYR250	TBYR320
VDI		20	30	40-50	50	60
BMT		-	45	55-65	65-75	75-80
Max Speed	rpm	6000	6000	5000	5000	3000
Ratio		1:1	1:1	1:1	1:1	1:1
Max Motor Torque	Nm	16	20	50	55	100
Max Power	Kw	5	6	9	10	15
Locking System	PN	●	●	●	●	
	HYD	●	●	●	●	●

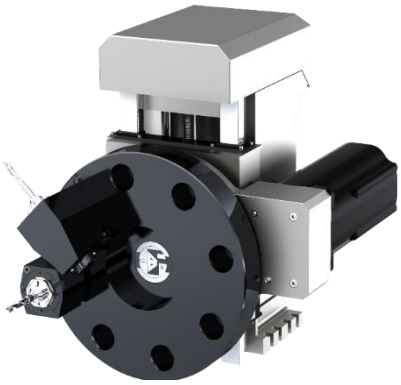
This table shows the characteristic of the Driven Tool Unit, for the turret see the TB's data sheet.

Baruffaldi has developed the new “Compact” Y-Axis units Type “C”.

These new units with reduced dimensions can be assembled and integrated on any sizes of standard turning machines, flat or slant bed.

A new hydraulic guideways preload system allows hard machining operations, either with fixed tools and live tools.

The YAX-C units mount integrated Driven Tool Turrets with Axial or Radial Tooling system (VDI or BMT).



Size		YAX-C 16	YAX-C 20*	YAX-C25	YAX-C 32*
Turret Size (axial or radial driven tools)		160	200	250	320
Nominal Stroke	mm	+60/-60	+100/-100	+125/-125	+150/-150
Max Feed Speed	m/min	10	10	10	10
Max Feed Force	N	12000	21000	25000	29000
Min. Motor Torque	Nm	6	10	13	25
Accuracy of Positioning with motor encoder	µm	≤20			
Accuracy of Positioning with linear encoder		≤10			

*under development

COUPLING RINGS

Thoothed 3-Ring Sets (custom design)

Hirth Profile Teeth Couplings

Baruffaldi has been manufacturing Frontal Teeth Rings and Hirth Rings for over 50 years using them for its own products. Thanks to its long manufacturing experience and design optimization, Baruffaldi can offer custom Ring Units for all devices, designed and produced according to customer's specifications and drawings:

-**FRONTAL TEETH RINGS** that are used in all indexing systems, such as turning tables, revolver turrets, B-Axis units, turn-mill electrospindles and so on, in order to achieve high division precision and repeatability, together with extremely high stiffness and load capacities.

-**HIRTH RINGS** that are profitably used for ensuring a very stiff, strong, precise and stable Coupling in many different applications.

ACCESSORIES

Baruffaldi furthermore offers a wide series of Accessories for the machine tools market:

- TOOL HOLDER: Axial and Radial rotating tool holders, with shanks according to ISO 10889 (DIN69880) or BMT
- TOOL DISC: Different size and many kinds are available

Tool Holder Discs

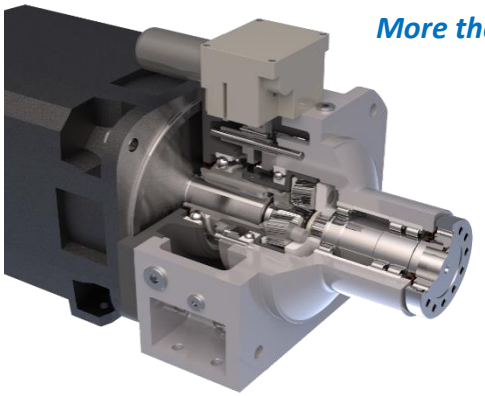
Rotary Tool Holders

2-SPEED PLANETARY GEARBOXES

CE Series

2-Speed Planetary Gearboxes

Baruffaldi can supply a wide range of 2-speed planetary gearboxes, in order to meet increasing demands coming from the market. 2-speed gearboxes are commonly used on machine tools main spindles together with variable speed motors, aiming to extend the constant power field offered by the motor and to increase torque at low speeds. By using Baruffaldi two speed gearboxes, production flexibility of the machine is increased without affecting precision: high torque is available for hard materials machining and high speed for soft materials.



More than 25 Years of experience with 2-Speed Gearboxes

9 Gearboxes sizes

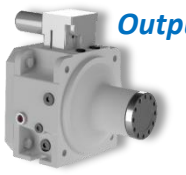
Output Torque up to 3200Nm

Input Speed up to 10.000rpm

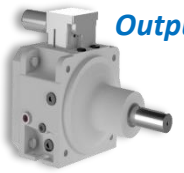
Different Output Shafts

Suitable for any kind of motor

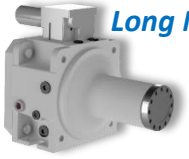
Size		CE11		CE12		CE13			CE13+		CE14			CE15			CE16		CE18		CE20
Ratio		*i=4*	*i=4.48*	*i=4*	*i=5*	*i=4*	*i=4.4*	*i=4.9**	*i=4*	*i=5.5*	*i=4*	*i=5*	*i=5.5*	*i=4*	*i=5*	*i=5.5*	*i=4*	*i=5*	*i=4*	*i=5*	*i=4*
Nominal power	Kw	19	19	22	22	40	40	40	47	41	51	44	44	63	54	54	60	60	63	63	84
Nominal speed	RPM	1500															1250		1000		
Nominal input torque	S1 Nm	120	120	140	140	260	260	260	300	260	325	280	280	400	340	340	450	450	600	600	800
	S6 Nm	150	150	160	160	400	400	400	400	400	400	400	400	500	425	425	630	630	840	840	900
Nominal output torque	Nm	480	540	560	700	1040	1144	1280	1200	1430	1300	1400	1540	1600	1700	1870	1800	2250	2400	3000	3200
Max input speed	RPM	8000				7000					6300			6300			5000				
Max input speed*	RPM	10000									8000			-							
Mass moment of inertia	i=1 (kgcm²)	134		189		310			315		624			680			1587		1630		2066
	output	400	400	378	550	1136	1355	1570	1168	2117	1408	2075	2450	1530	2660	2880	6208	9400	6256	9450	6896
	input	25	20	23,6	22	71	70	68	73	70	96	90	87	96	90	87	388	376	391	378	431
Max angular backlash	α Arcmin	25																			
Max radial backslash	X mm	0,03																			
Max axial backslah	Y mm	0,25																			
Max vibration value	mm/s	1																			
At test run speed	RPM	6000															5000				
Weight ca.	kg	45		65		80			88		90			95			190-230		200-230		205-240



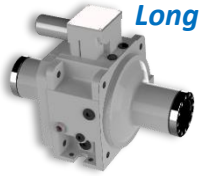
Output Flange type



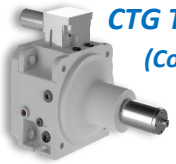
Output Shaft type



Long Neck type



Long Neck type



CTG Type

(Coolant Through Gearbox)

SPECIAL APPLICATIONS

TB Turrets for ATC Systems

Automatic Tool Changer

These new units are standard TB turrets with special tool holder discs for automatic tool change systems.
An integrated hydraulic locking/unlocking system allows automatic tool change and makes this solution perfectly suitable for CNC turning machines equipped with ATC (Automatic Tool Change).

Turret lines for automatic tool change:
- n°2 hydraulic lines for tools locking/unlocking
- n°1 pneumatic line for tool seat cleaning
- n°1 pneumatic line for tool presence detection
- n°1 coolant line up to 90 bar

Suitable for:
Coromant Capto Hydraulic Clamping Unit

TBF Turrets

Turret with Hollow Shaft

The TBF turrets are standard TB with hollow shaft through the unit.
This model is commonly used in special applications when it is necessary to pass through the turrets with electrical cables, hydraulic/pneumatic lines, and so on.

TBF is typically used when inspection probes are requested, in order to check the workpiece. In this case, the electrical supply cable of the inspection probe passes through the turret from the disc to the rear side of the unit.

Ideal Solution for:
applications with **Inspection Probe**

TB High Pressure Coolant

70-160 bar Coolant

The standard TB turrets can be used with a coolant pressure through the disc up to 40bar.

Baruffaldi has a solution that allows to reach 70bar with coolant (2nd pressure level) or even more, 160 bar (3rd high pressure level).

Pressure 1st level (standard)	**bar**	40
Pressure 2nd level (special)		70
Pressure 3rd level (special)		160
Filtering	**µm**	50

TB Turrets for High Speed

High Speed Mode – Forced Lubrication

The TBMA and TBMR turrets can now be equipped with **Forced Lubrication** that allows Tool Driving at High Speed (up to **10.000 rpm**) in continuous mode (up to **100%**).

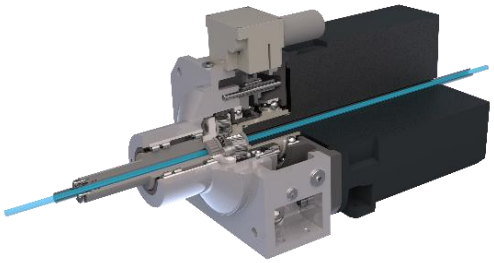
The turrets might in fact be upgraded to a Milling Unit.

CTG Series – Coolant Through Gearbox

2-Speed Planetary Gearbox

This special application allows the use of the **2-Speed Gearbox** for Inline solutions with coolant flowing through the unit and the spindle directly to the tools.

Available in many versions and customizable on customer's request.



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The tecnical data, dimensions and weight are subject to change without notice. The illustrations are for reference only.