

FLANGE AND SPINDLE TYPE BALANCING HEADS

The Marposs balancer is an electromechanical grinding wheel balancing system for grinding machines which gives significantly improved part surface quality and increased machine life and productivity.

By measuring the vibrations caused by an unbalanced grinding wheel and suitably moving weights flanged to the outside of the grinding wheel (FT balancers) or inserted in the spindle (ST balancers), the system definitively eliminates the need to manually pre-balance new grinding wheels, whether made of conventional agglomerate, CBN or diamond, restoring optimum dynamic conditions for the entire life of the grinding wheel.

The wide range of balancing systems can be applied to most grinding machines for exteriors, grinding without centres, grinding for tables, flexible and special grinding, solving the most diverse application problems.



Flange type (FT) balancing heads

Flange type (FT) balancing heads are simple to install on the grinding wheel, making them ideal for retrofitting. The extensive

range of balancing capacities available (from 100 gcm to 7500 gcm) caters for the most diverse requirements.

FT balancing heads with retractable contacts (FTR)

The contacts which transmit power to the balancing head are normally open and are only closed during the balancing cycle, giving them a practically unlimited life. The balancing heads with retractable contacts provide maintenance-free performance and are extremely competitively priced.



Model	Balancing capacity (gcm)	L (mm)	Ø (mm)	Rotation speed (rpm)
FT 400 R	400	106	112	4000
FT 600 R	600	106	112	4000
FT 900 R	900	106	112	4000
FT 1300 R	1300	106	112	4000
FT 2000 R	2000	106	112	3000
FT 3000 R	3000	106,5	132	3000
FT 4500 R	4500	106,5	132	2000
FT 6000 R	6000	106,5	132	1800
FT 7500 R	7500	106,5	165	1000

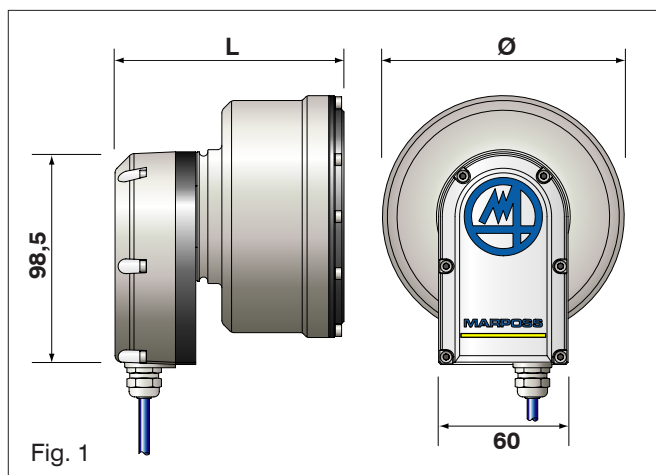


Fig. 1

FT balancing heads with contactless transmission (FTC) and integrated grinding wheel acoustic check sensor (FTCG)

The power and logic signals for performing the balancing cycle are transmitted through an air gap, guaranteeing an absolute seal and maintenance-free operation. The balancing heads with contactless transmission also have the exclusive zeroing cycle to neutralise the position of the balancing weights. This is useful during machine start up or after a grinding wheel change.

As well as satisfying the need for continuous automatic balancing, these balancing heads are characterised by the presence of an integrated wideband acoustic sensor, which operates close to the grinding wheel, for maximum sensitivity and the fastest possible response in all applications for grinding wheel air gap, dressing and crash control. All flange type balancers can be supplied with an integrated grinding wheel acoustic check sensor.



Model	Model (integrated AE sensor)	Balancing capacity (gcm)	L (mm)	Ø (mm)	Rotation speed (rpm)
FT 100 C	FT 100 CG	100	85,1	112	8000
FT 400 C	FT 400 CG	400	85,1	112	6000
FT 600 C	FT 600 CG	600	85,1	112	6000
FT 900 C	FT 900 CG	900	85,1	112	4000
FT 1300 C	FT 1300 CG	1300	85,1	112	4000
FT 2000 C	FT 2000 CG	2000	85,1	112	3000
FT 3000 C	FT 3000 CG	3000	88,2	132	3000
FT 4500 C	FT 4500 CG	4500	88,2	132	2000
FT 6000 C	FT 6000 CG	6000	88,2	132	1800
FT 7500 C	FT 7500 CG	7500	88,2	165	1000

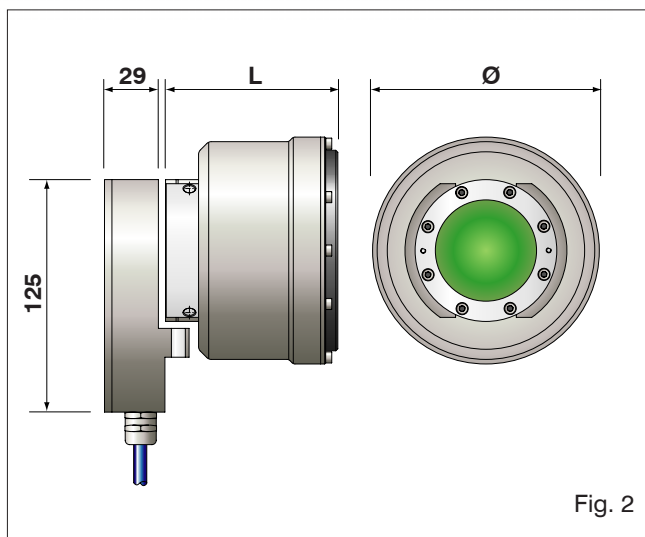


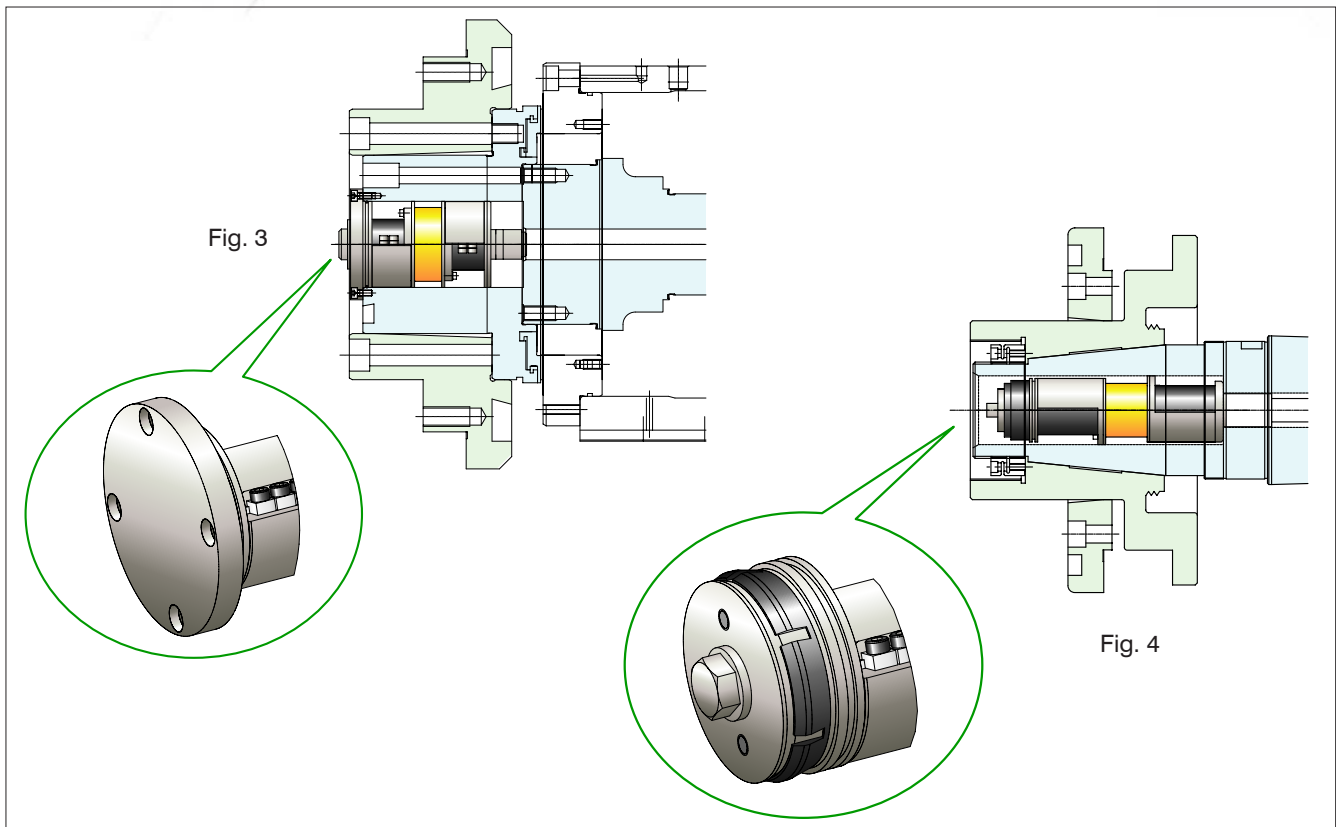
Fig. 2

Spindle type (ST) balancing heads

Spindle type (ST) balancing heads were designed to be installed in the grinding machine spindle, making them ideal for new OEM applications.

The whole product range displays a high level of modularity which allows it to be used for the most diverse applications.

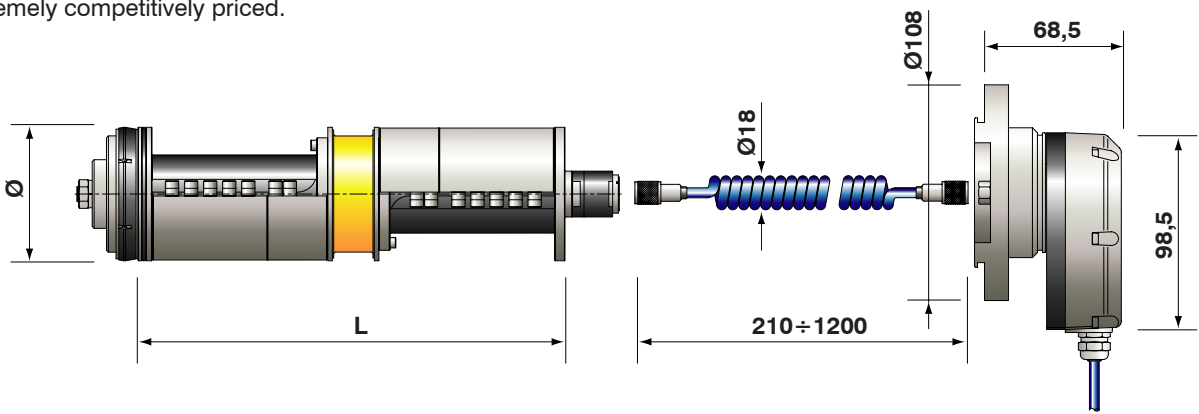
This modularity is given by the variability of the diameter (from 42 to 81 mm) and length (from 104 to 254 mm) which allow all of the necessary balancing capacities (from 400 to 13000 gcm); and by different systems for securing to the spindle, using a flange (Fig. 3) or expanding self-locking system (Fig. 4).



L (mm) \ Ø (mm)	104		119		134		149		194		254	
	Max. rpm	C (gcm)	Max. rpm	C (gcm)	Max. rpm	C (gcm)	Max. rpm	C (gcm)	Max. rpm	C (gcm)	Max. rpm	C (gcm)
42	6.500	400	5.900	500	5.400	600	5.000	700	4.400	900	3.500	1.400
50	4.600	810	4.200	1.000	3.800	1.180	3.600	1.360	3.200	1.730	2.600	2.650
60	3.800	1.190	3.400	1.500	3.100	1.810	2.800	2.120	2.500	2.730	2.000	4.280
70	2.600	2.530	2.300	3.130	2.200	3.730	2.000	4.330	1.800	5.530	1.400	8.520
81	2.100	3.850	1.900	4.840	1.700	5.840	1.600	6.830	1.400	8.820	1.100	13.800

ST balancing heads with retractable contacts (STR)

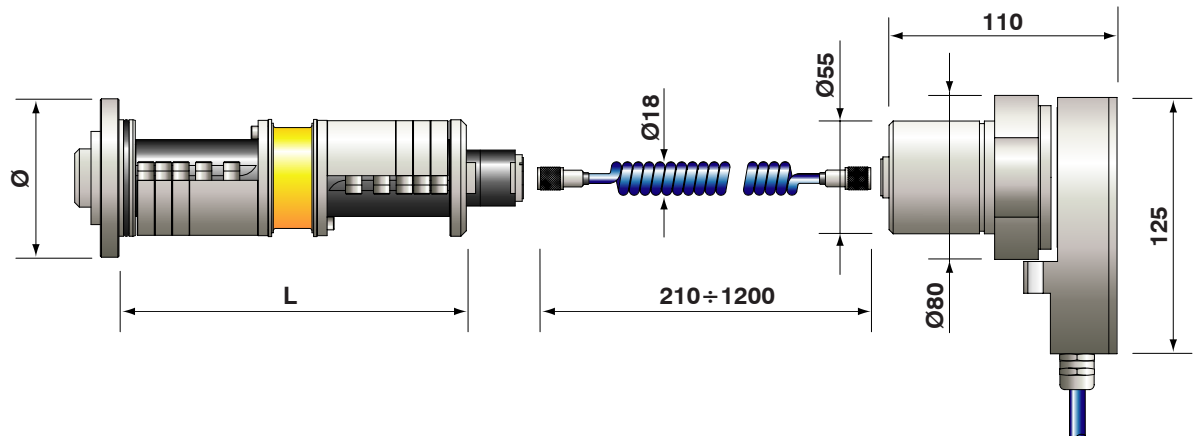
Power is transmitted to the balancing head by a distributor with retractable contacts which are normally open and are only closed during the balancing cycle, giving them a practically unlimited life. The balancing heads with retractable contacts provide maintenance-free performance and are extremely competitively priced.



ST balancing heads with contactless transmission (STC) and integrated grinding wheel acoustic check sensor (STCG)

The power and logic signals for performing the balancing cycle are transmitted through an air gap, guaranteeing an absolute seal and maintenance-free operation. The balancing heads with contactless transmission also have the exclusive zeroing cycle to neutralise the position of the balancing weights. This is useful during machine start up or after a grinding wheel change.

As well as satisfying the need for continuous automatic balancing, these balancing heads are characterised by the presence of an integrated wideband acoustic sensor, which operates close to the grinding wheel, for maximum sensitivity and the fastest possible response in all applications for grinding wheel air gap, dressing and crash control. All spindle type balancers can be supplied with an integrated grinding wheel acoustic check sensor.



ST balancing heads with coplanar weights for HIGH SPEED applications

The technology used on grinding machines, in particular with the use of CBN grinding wheels and electro-spindles, has allowed the circumferential speed to be increased up to 200-230 m/s.

CBN grinding wheels, particularly resistant to breaks caused by centrifugal force, suffer minimum deformations during high speed rotation thanks to their metal core. This provides limited manufacturing imbalances and a new method of securing them, in addition to the conventional method:

- 1) Conventional assembly using a tapered shaft spindle with conventional or CBN grinding wheels (Fig. 5).
- 2) New method of assembly directly on the spindle shaft dedicated to CBN grinding wheels only. This is more economical than the conventional assembly system (Fig. 6).

The high circumferential speed means that it is essential to align the centres of gravity of the balancing device and between the balancer and grinding wheel, to avoid torque imbalance problems induced by the centres of gravity lying in different planes.

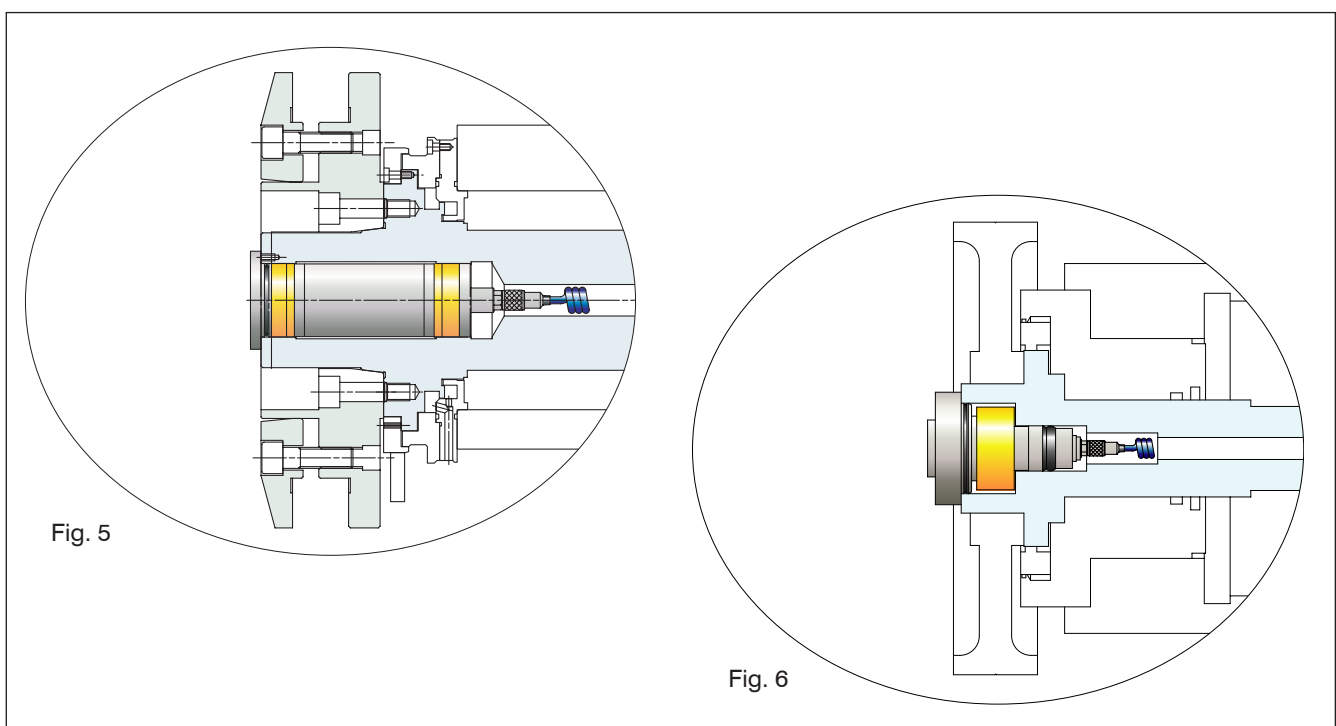
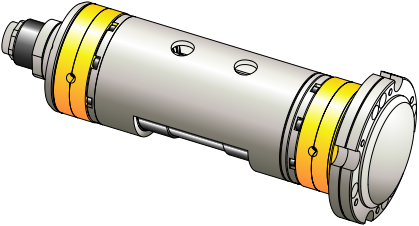


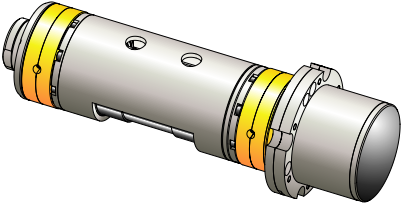
Fig. 5

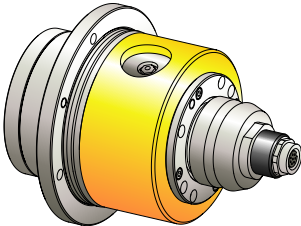
Fig. 6

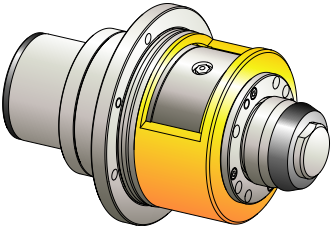
Considering these requirements and the new method for assembly of CBN grinding wheels, Marposs has developed a spindle type (ST) balancer with coplanar weights suitable for high speed operation. The range of products includes two different versions, the first cylindrical for conventional assembly and the second suitable for the new CBN grinding wheel assembly method. All of the versions available have an integrated wideband acoustic sensor.

CBN grinding wheels have very limited manufacturing imbalances, therefore, spindle type balancers have been sized with low capacity values (from 70 to 700 gcm). All of the versions are available either with a connector for separate contactless transmission (spindle with through-hole) or with an integrated transmission system (spindle without through-hole).

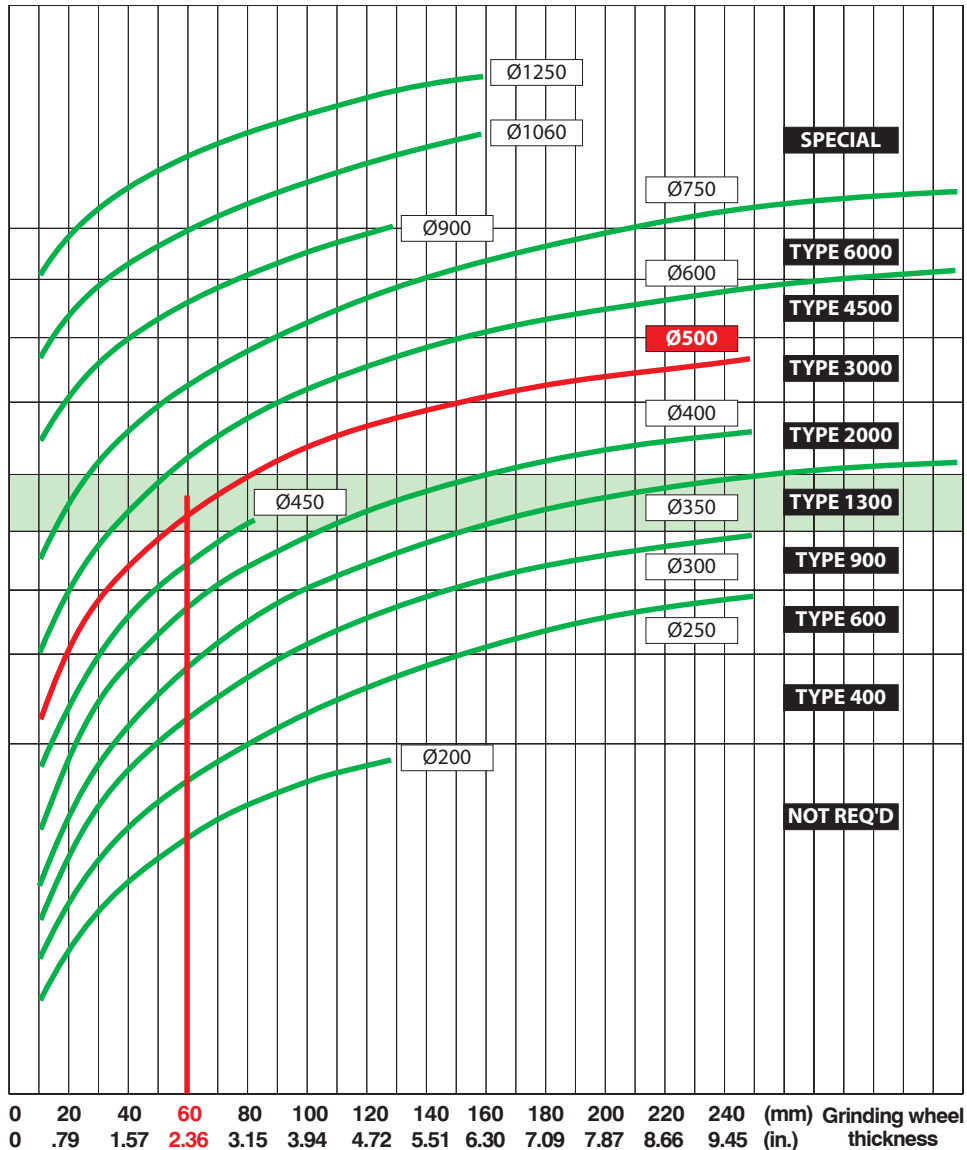
Version with connector		
		
Model	C (gcm)	Max rpm
ST42 x 120	100	12000
	150	12000
	300	9000
ST50 x 120	300	9000
	500	8000
	700	7000

Version with integrated RX		
		
Model	C (gcm)	Max rpm
ST42 x 120	100	12000
	150	12000
	300	9000
ST50 x 120	300	9000
	500	8000
	700	7000

Version with connector		
		
Model	C (gcm)	Max rpm
ST70 x 65,5	70	12000
	100	12000
	150	12000
	300	9000
	500	8000

Version with integrated RX		
		
Model	C (gcm)	Max rpm
ST70 x 65,5	70	12000
	100	12000
	150	12000
	300	9000
	500	8000

Balancing capacity chart



The chart shows the most suitable balancing head model and balancing capacity for conventional agglomerate grinding wheels: select the curve relative to the external diameter of the grinding wheel to be balanced and locate the point corresponding to the width of the grinding wheel. The recommended balancing head model is shown on the right.

Example:

- Grinding wheel external diameter = 500 mm
- Grinding wheel thickness = 60 mm
- Balancing capacity = 1300 gcm

For CBN grinding wheels the value obtained from the table is usually divided by a factor of 10.

The chart can be used to select both flange type (FT) balancing heads, to be fitted outside the grinding wheel, and spindle type (ST) balancing heads to be fitted in the spindle.

The wide range of Marposs flange type and spindle type balancing heads is available in versions:

- with retractable contacts
 - with contactless transmission
- with contactless transmission and integrated grinding wheel acoustic check sensor



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For a full list of address locations, please consult the Marposs official website

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