VERTICAL BALANCING MACHINES

Balancing machines with vertical spindles are ideal for mass production. Standard vertical machines incorporate a precision spindle on which components like flywheels, clutch assemblies, textile spindles, nylon pots, turbine wheels etc. can be mounted and balanced.

MACHINES A EQUILIBRER VERTICALES

Les machines à équilibrer à l'arbre vertical sont idéales pour l'équilibrage en série. Les machines verticales standard incorporent un arbre de précision sur lequel des composants comme des volants, assemblages d'embrayage, arbres textiles, roues de turbine etc. peuvent être montées et équilibrés

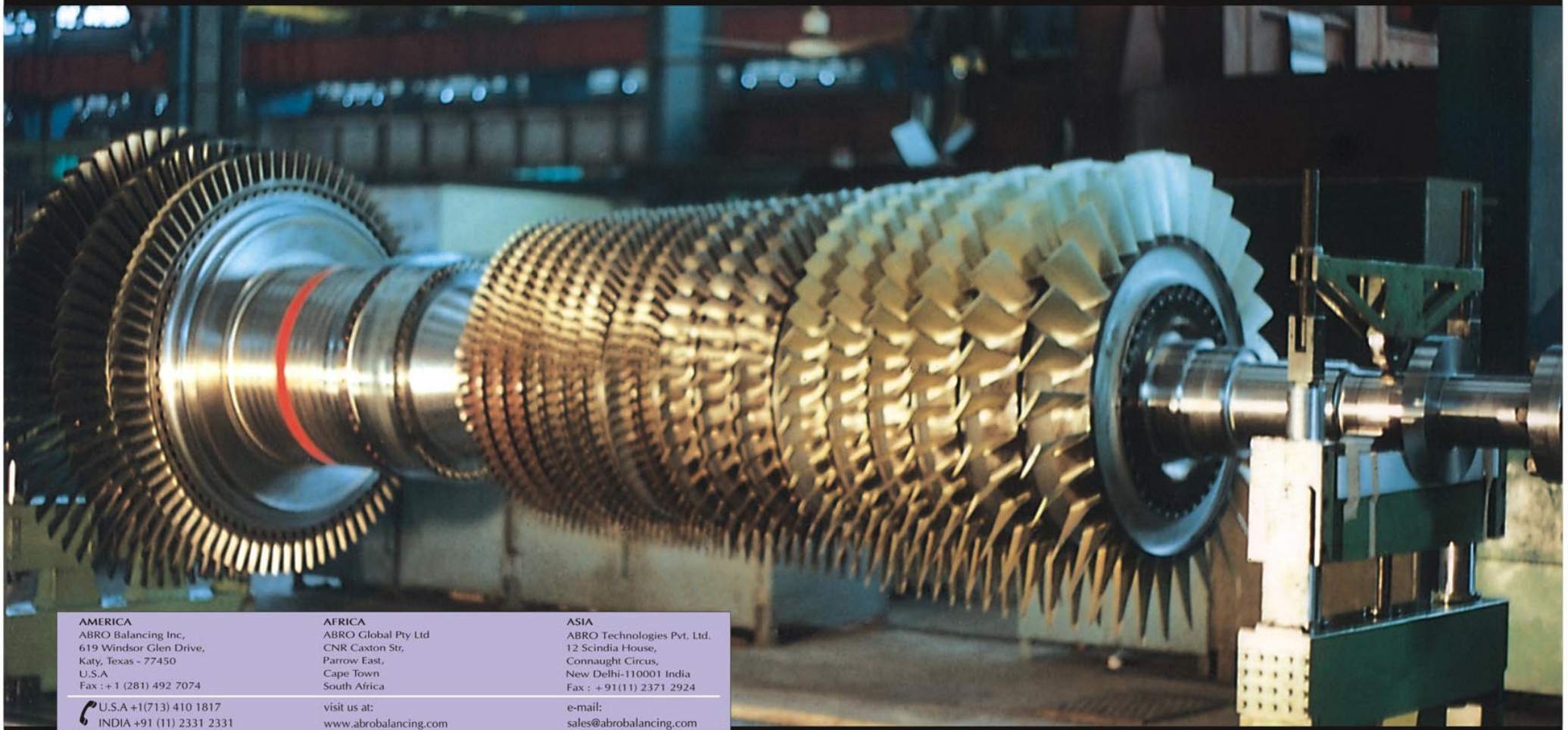
Single plane machines	Model	V3	V10	V30	V55	V100	V160	V300	V600	V1500
Two-plane machines	Model	VT3	VT10	VT30	VT55	VT100	VT160	VT300	VT600	VT1500
Max. workpiece weight	Kgs	3	10	30	55	100	160	300	600	1500
Standard workpiece diameter capacity - Size A	mm	250	320	400	400	500	500	625	800	800
- Size B	mm	300	400	500	500	625	625	800	1000	1000
- Size C	mm	400	500	625	625	800	800	1000	1400	1400

Bigger machines offered on request

Des machines plus grandes sont également disponides sur demande.

ABRO

Dynamic Balancing Machines
Machines à équilibrer



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Machines listed are manufactured by ABRO Companies & its Licencees

AB:406C

BALANCING MACHINES FROM ABRO

This leaflet only provides a brief summary of our comprehensive manufacturing programme.

ABRO can give you all kinds of machines, from simple general purpose machines to automatic unmanned machines, or large turbines balanced at high speeds in vacuum chambers, high accuracy machines for the aerospace industry or other for balancing large rotor weighing 200 tonnes...

And just in case you have a very special requirement, ABRO can modify one of its existing machines for your specific requirement.

Our specialists are always happy to look at your balancing problems and advise you on the most economical and efficient solution for you.

MACHINE A EQUILIBRER D'ABRO

Ce dépliant vous donne seulement un apercu de ce que nous pouvons fabriquer.

ABRO vous propose une gamme de machines allant de simples machines a utilisation générale, à des machines entierement automatiques, des larges turbines a grande vitesse en chambre sous vide, des machines de haute précision pour l'industrie aerospatiale ou d'autres pour l'équilibrage de grands rotors pesant 200 tonnes...

Si vous avez une demande Spécifique, ABRO peut adapter une de ses machines existantes à vos besoins.

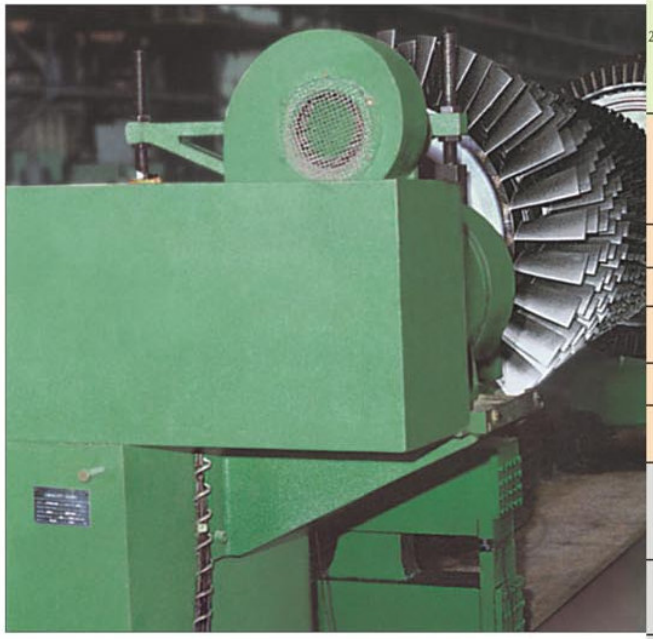
Nos spécialistes sont toujours attentifs à vos problèmes d'équilibrage et peuvent vous conseiller sur les methodes les plus économiques et sur les solutions les plus efficaces.

STANDARD MACHINES

A complete range of horizontal and vertical machines are available to balance jobs upto 200 tons.

MACHINES STANDARD

Une gamme complete de machines standard horizontales et verticales sont disponibles pour l'équilibrage des pieces allant jusqu'à 200 tonnes.



H160	H3K	H5K	H7K	H10K	H16K	H25K	H63K	H100K
3,000 3,700	4,500 5,500	7,600 9,000	10,000 12,500	15,000 20,000	24,000 30,000	36,000 45,000	94,000 115,000	150,000 187,000
1,600 2,100	1,600 2,100	2,100 2,500	2,100 2,500	2,500 3,200	2,500 3,200	3,200 4,000	4,000 5,000	4,000 5,000
20-160 305	20-160 305	30-210 425	30-210 425	30-210 300/475	40-210 300/475	40-210 300/525	55-275 375/900	55-275 375/900
2,300 600	2,800 600	3,000 1,200	3,100 1,200	3,300 1,200	4,400 1,200	4,800 2,500	7,200 2,500	9,600 2,500
50	140	150	170	210	225	290	500	500
7.5	11(V)	11(V)	15(V)	22(V)	30(V)	37(V)	55(V)	75(V)
180/315/530/850/1320			160/280/470/750/1170				140/220/370/600/1020	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
2,150 600	2,700 600	3,000 1,200	3,000 1,200	3,100 1,200	4,200 1,200	4,500 2,500	6,700 2,500	9,000 2,500
50 140	140 280	150 300	170 350	210 450	225 500	290 600	500 900	500 1000
5.5(V)	5.5(V)	11(V)	15(V)	18.75(V)	22(V)	30(V)	55(V)	75(V)
30-750	30-750	50-800 50-1250		50-1250			100-2000	
	200-5000			150-4500			120-3000	
400	500	700	800	1000	1200	1500	2500	2500
8-70	9-75	12-90	12-100	16-125	16-125	20-160	30-210	
40 100	100 200	120 225	140 250	170 275	200 300	200 350	400 600	400 600
2.2	2.2	3.7	3.7	5.5(V)	5.5(V)	5.5(V)	7.5(V)	11(V)
20-500	20-500	30-600		30-700			30-750	
	200-5000	150-4500				120-3000		

*** NOTES**

*1. The weight of rotors which can be balanced, is also limited by the acceleration capacity of the drive, the weight speed limitations of the machine (Wn^2 capacity), and the available speeds. For example, the power consumption to run typical impellers increases with speed and therefore, much bigger jobs can be balanced if low speeds are available on the machine. The weight capacity on rollers is also limited by the journal diameter and hardness especially for rotors above 4000Kg. Weight capacity per pedestals is half the capacity given.

*2. For higher diameters, machines with raised pedestals or a gap in the bed are offered.

*3 The maximum sensitivity per plane is defined as the minimum readable unbalance of the instrument possible under good conditions. The accuracy which can be achieved, depends on the rotor and its journals, the machine drive, the rotor weight, the balancing speed and the measuring instrument.

*4. The drive powers given here are only indicative and normally used for general-purpose balancing. Higher powers are offered when balancing bigger rotors at higher speeds. Normally 3 phase squirrel cage induction motors are used : 'S' stands for slip-ring motors and 'V' stands for infinitely variable speed drives using DC or AC motors.

*5. Other speeds can be provided.

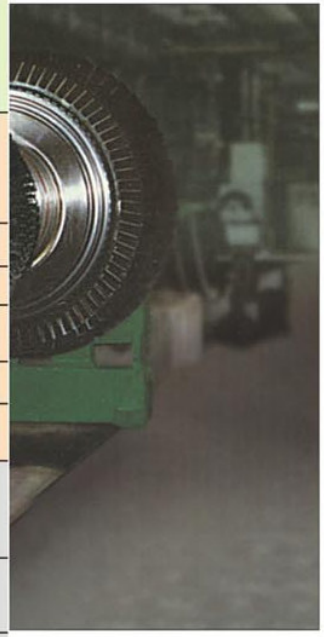
*6. Type 'S' belt drives are normally provided on larger endrive machines for accurate balancing of small jobs. Bigger jobs can be balanced on the machine with end drive.

*7. With 'S' type belt drives an additional set of precision roller carriages are provided to handle small journals. Bigger journals can be balanced on standard roller carriage.

The technical data mentioned in this catalogue is not binding and is subject to change without notice.

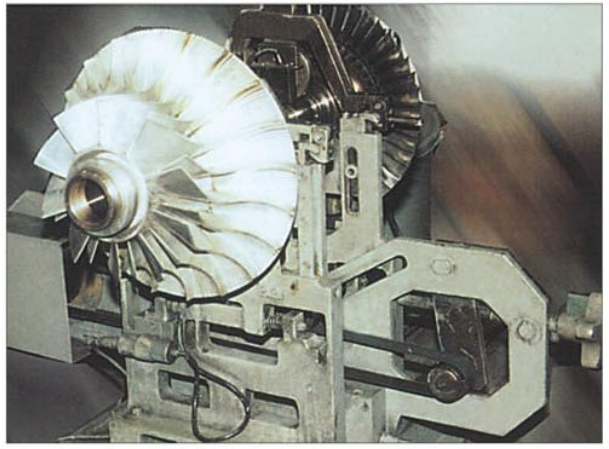
SPECIFICATIONS	Models / Unit	H2	H4	H10	H30	H64	H100
Maximum weight on rollers for symmetrical rotors *1	kg	30	60	150	450	1,000	1,500
Maximum weight in sleeve bearing (symmetrical rotor)	kg	-	-	-	-	1,200	1,800
Maximum diameter of rotor over bed *2							
- Normal	mm	400	650	850	1,100	1,600	1,600
- Extended dia facility	mm	-	-	-	-	-	-
Journal diameter range :							
- With standard carriages	mm	4-40	6-55	9-75	12-100	16-125	16-125
- With additional carriages up to	mm	80	110	145	205	250	250
Maximum sensitivity per plane *3	g.mm						
MACHINES WITH END DRIVE TYPE 'E'							
Maximum job length with 'A' size bed							
(from headstock faceplate to remote bearing)	mm	-	675	925	1,300	1,600	2000
Bed extension in steps of	mm	-	300	300	300	300	600
Minimum distance between pedestals	mm	-	20	25	25	30	35
Typical drive power *4	k.w	-	0.75	1.5	2.2	3.7	5.5
Typical balancing speed options : *5							
- Gear transmission	rpm	-	-	-	-	250/450/830	
- Pulley transmission	rpm	-	400/660/1100		300/600/900		
- Pulley transmission with							
2 speed motor (1.7/2.3hp)	rpm	-	-	300/450/600/900		-	-
MACHINES WITH BELT DRIVE TYPE 'B'							
Maximum distance between support bearing centres	mm	400	900	1,200	1,550	1,800	2,000
Bed extension in steps of	mm	500	300	300	300	600	600
Minimum distance between support bearing centres :							
a. With belt outside pedestals	mm	15	20	25	25	30	35
b. With belt inside pedestals	mm	30	75	85	90	115	120
Typical drive power *4	k.w	0.37	1.1	1.0/1.7	1.0/1.7	3.7	3.7
Range of rotor diameter driven				20-300			
by belt	mm	10-150	20-250	30-450		30-550	
Standard balancing speed range of electronics	rpm	400-6000				200-5000	
MACHINES WITH BELT DRIVE TYPE 'S'							
Recommended max weight of rotor for type **'S' belt drive** *6	kg					200	300
Journal diameter range with precision roller system *7	mm					-	-
Minimum distance between support bearing centres :							
a. With belt outside pedestals	mm					30	35
b. With belt inside pedestals	mm					85	90
Typical drive power *4	k.w					1.5	2.2
Range of rotor diameters driven by belt	mm					20-400	
Standard balancing speed range of electronics	rpm					200-5000	

Turbine weighing 18 tons is balanced accurately at low speed.
Turbine peur pesant 18 tonnes équilibrée avec précision à faible vitesse.



Vertical balancing machine tooled up for balancing flywheels.
Machine à équilibrage verticale équipée pour l'équilibrage à volants.

The belt drive is ideal for the accurate balancing of armatures, turbines and other rotors
Entraînement au bout de machine est ideale pour equilibrer les induits, turbines et les autres rotors.

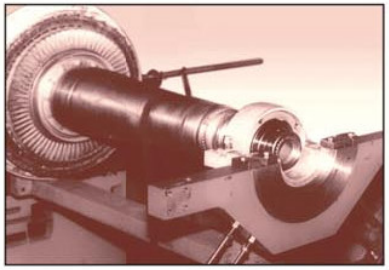


A 150 kg surface belt drive machine balancing a supercharger rotor.
Machine à capacité de charge de 150 kg et l'entrinement par corroie de surface équilibrant un rotor de supercharges.

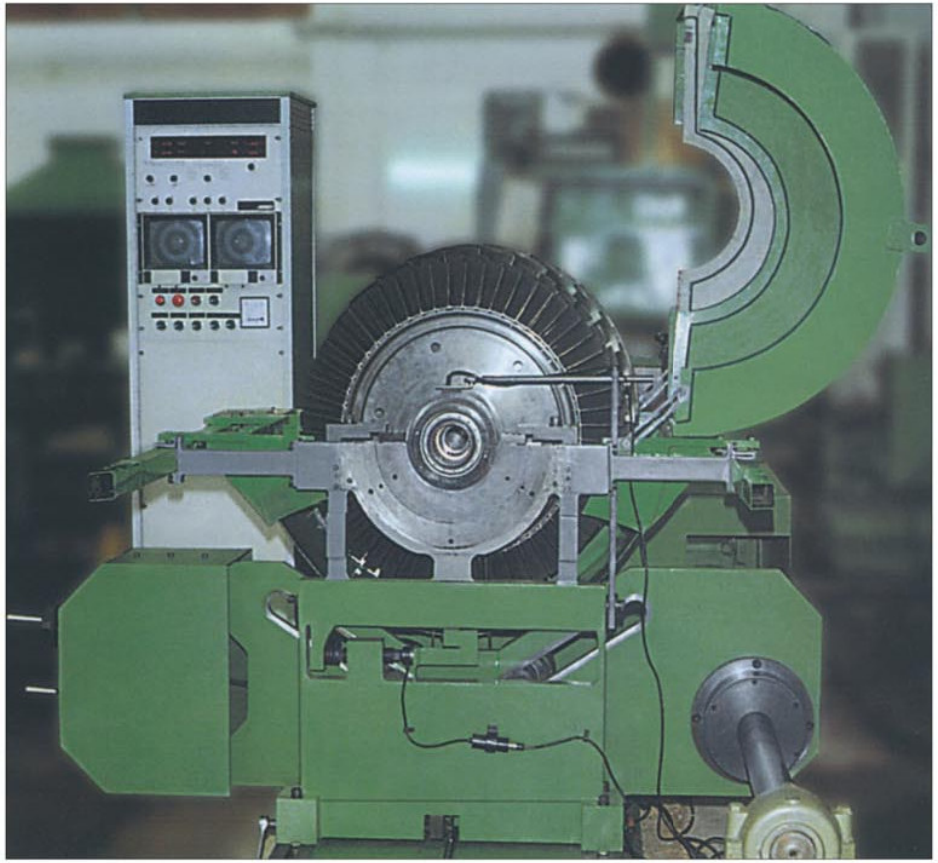
MACHINES FOR THE AEROSPACE INDUSTRY

Balancing to extremly high accuracies as required in the aerospace industry is best accomplished on ABRO machines.

Balancing parts of a helicopter engine.
Equilibrage des pièces d'un hélicoptère.



Balancing of the main turbine of a supersonic aircraft engine.
Equilibrage de la principale turbine d'un avion supersonique.



Balancing machine for balancing balance-shafts
Machine d'équilibrage pour les arbres d'équilibrage.

Semi-automatic machine for balancing small armatures.
Machine semi-automatiques pour l'équilibrage despetites armatures.

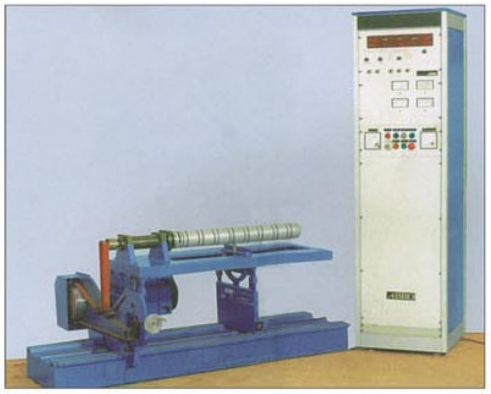
Crankshaft balancing machine.
Machine à équilibrer à vilebrequin.

HIGH SPEED MACHINES

Rugged high speed machines for balancing and overspeed testing of flexible and rigid rotors operate inside safety enclosures and vaccum chambers.

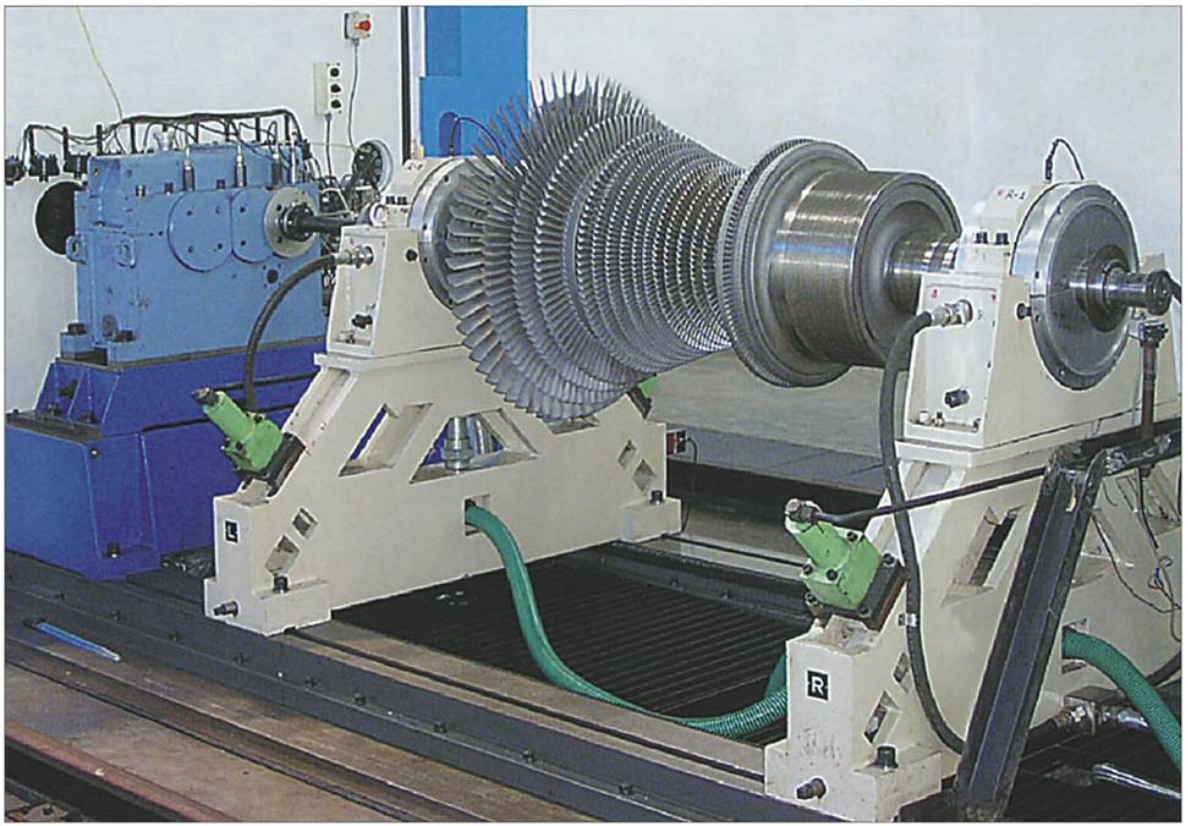
MACHINES A GRANDE VITESSE

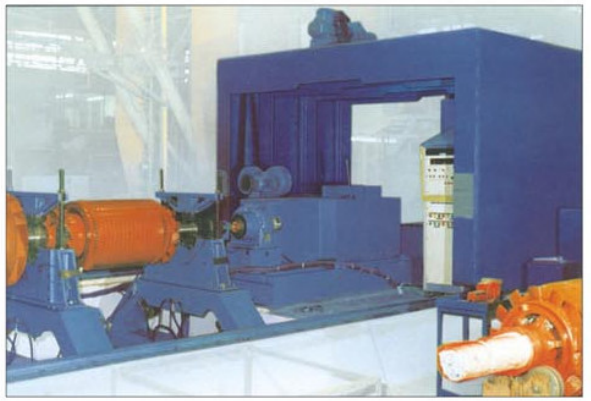
Les machines à grande vitesse solides pour l' equilibrage et li controle de survitesses de rotors flexibles et rigides operént à l'intérieur d'espaces de sécurité ou dans chambers sous vide.



This bobbin chuck is a flexible rotor and is balanced at various speeds up to 12,000 rpm.
Ce mandrin de bobine dans un rotor flexible est équilibré à des vitesses variées allant jusqu'à 12.000 tours/minutes

A high speed 8 tons machine for balancing and overspeed testing of rotors up to 18000 rpm in vaccum chamber.
Une machine à grande vitesse de 8 tonnes m/c pour effectuer l'équilibrage et le contrôle de survitesses de rotors allant jusqu'à 18000 tours/minutes dans une chambre sous vide.





A high speed 25 tonne machine for balancing and overspeed testing of rotors up to 4500 rpm.
Une machine à grande vitesse de 25 tonnes m/c pour effectuer l'équilibrage et le contrôle de survitesses de rotors allant jusqu'à 4500 tours/minutes.

Balancing turbomolecular pumps in vacuum chamber at 90,000 rpm.
L'équilibrage des pompes turbo Moléculaires dans une chambre sous vide à 90,000 tours/minutes.

PRODUCTION MACHINES

Modular design of ABRO machines makes it possible to produce machines for low, medium or high level of automotion suitable for different production requirements

MACHINES DE PRODUCTION

Le forme modulaire des machines ABRO rend plus simple la fabrication de machines pour petit, moyen, et grand degré d'automatisation pour répondre aux differrents besoins de production

Balancing machine for car wheels.
Machine à équilibrage pour roues de voitures.

Cardonshaft balancing machine with isotropic pedestals
Machine pour l'équilibrage de cardans à support isotropique.

Balancing machine for brake drums.
Machine d'equilibrage pour tambours de freins.

MACHINES POUR L'INDUSTRIE AEROSPATIALE

L'équilibrage de trés haute précision, comme réclame par l'industrie aérospatialé est la specialite des machines ABRO.

A 7000 kg. capacity machine used for stage balancing of gas turbines.
Machine à capacité de charge de 7000 kg utilisée pour l'équilibrage Par étape de turbines à gaz.

Digital electronics on machine for balancing satellites.
Numérique électronique utilisé pour machine à équilibrer pour satellites.