

Series WM Moment Weighing Scales for Jet-Engine Blades



- Precision measurement of jet-engine blade moments
- Simple balancing of bladed rotors
- Single-axis type for narrow blades and bi-axial type for wide chord fan blades
- Optional software for optimized blade distribution

Range of application

Determining the radial, axial and tangential moments of jet-engine blades for evaluation of mass and position of center of gravity.

Application of the scale in testing, inspection and quality control.

With the use of the optional BLADIS Net blade-distribution system, the exact position of the blade in the assembly can be determined.

Design

Electronic scale on a base plate with built-in levelling device.

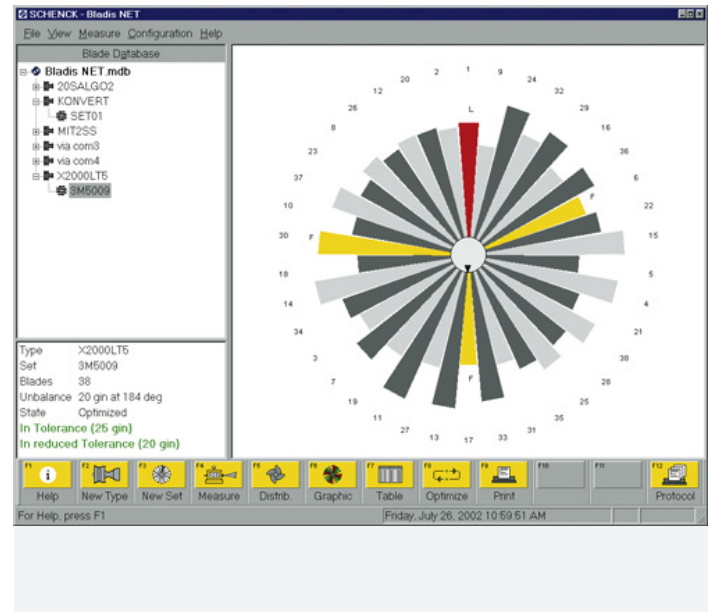
Weigh-beam mounted on knifeedges for friction-free operation, including oil damping, measuring system with load-cell and microprocessor-controlled measuring unit (digital display), thus, ensuring high weighing accuracy and repeatability. An adapter flange is provided for mounting the blade adapter.

Single-axis or dual-axis types according to the application and blade form.

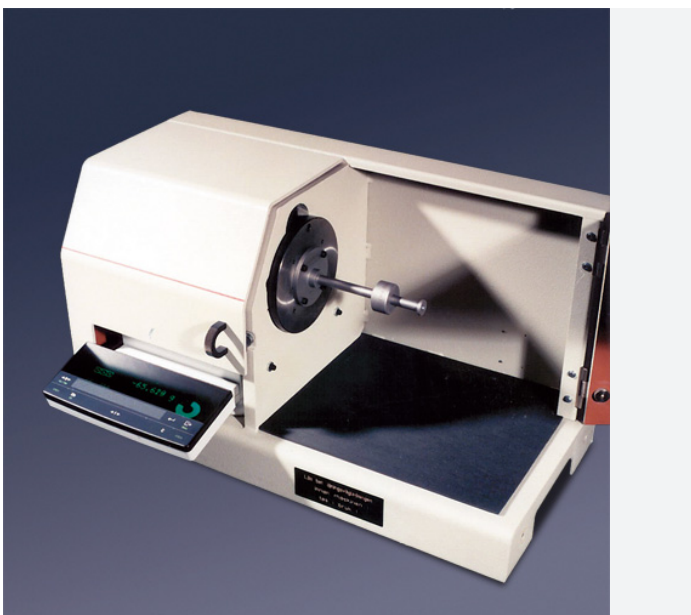
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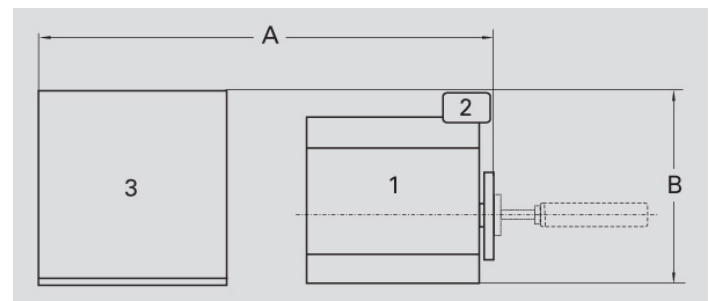
With multi-axis equipment, the axial and tangential moments can also be measured. This is especially necessary for wide chord, heavy blades. With the single-axis scale only the radial moment is determined.



If the mass distribution of the blades is known, the blades can be installed on the turbine disc in a sequence that will result in the lowest possible residual unbalance. This may become a difficult task, even in standard applications, and in particular when the unbalance of the disc is to be compensated for by the blade positions. Complex tasks of mass and radial moment processing are completed quickly, efficiently and cost-effectively by the blade optimization program BLADIS Net. This runs on an IBM-compatible PC directly connected to the moment weighing scale. For multi-axis evaluations BLADIS 3D is available.



The central element of the Schenck RoTec moment weighing scale is a solid, horizontal beam mounted friction-free on knife-edges. With a blade mounted on the adapter flange, the moment is determined by a precision loadcell and the lever-arm. In the case of singleaxial scales, the important radial moment is determined. A digital measurement and display instrument ensures a broad measurement range along with high display sensitivity.



1 Moment weighing scale
2 Adapter and blade wheel
3 Measuring device
Plan view (non-binding example)

Series WM Moment Weighing Scales for Jet-Engine Blades

Technical data at a glance		WM 02	WM 01	WM 00	WM 0	WM 1	WM 2	WM 0 BA	WM 1 BA	WM 2 BA
Measuring unit		Digital	Digital	Digital	Digital	Digital	Digital	Digital	Digital	Digital
Single-axis measurement		•	•	•	•	•	•			
Triple-axis measurement							•	•	•	
Jet-engine blade										
Weight	[kg]	0,1	0,3	1	3	10	30	3	10	20
Radial moment	[kgm]	0,02	0,1	0,5	2	10	40	2	10	30
Tangential moment	[kgm]	-	-	-	-	-	-	0,25	1,25	2,5
Axial moment	[kgm]	-	-	-	-	-	-	0,25	1,25	2,5
Root radius, min.	[mm]	30	30	80	80	125	275	100	165	200
Machine										
Width A	[mm]	1000	1000	1200	1200	1500	2000	800	1500	1500
Depth B	[mm]	800	800	1000	1000	1200	1500	800	1000	1000
Height C	[mm]	300	300	500	500	600	800	600	1000	1000
Flange radius	(mm)	30	30	80	80	125	275	100	165	200
Sensitivity	(gmm)	0,1	1	10	20	100	1000	20	100	500
Power requirement	[V]	230	230	230	230	230	230	230	230	230
Order No.		R0710100.01	R0710200.01	R0710300.01	R0710400.01	R0710500.01	R0710600.01	R0710700.01	R0710800.01	R0710900.01
Order No.		R0710101.01	R0710101.01	R0710101.01	R0710101.01	R0710101.01	R0710101.01	-	-	-
BLADIS 3D 2)	Order No.	-	-	-	-	-	-	R0710201.01	R0710201.01	R0710201.01
Revolving flange	Order No.	-	-	-	-	-	-	-	R0710802.01	R0710902.01
Calibration Master	Order No.	R0710103.01	R0710203.01	R0710303.01	R0710403.01	R0710503.01	R0710603.01	R0710703.01	R0710803.01	R0710903.01

2) Blade distribution system (software and hardware)

3) Data non-binding, dependent on the respective equipment

WME 2 - WME 3 Moment Weighing Scale for Rotor Blades



- Solid Construction
- Less space required
- High accuracy
- Measurement of weight and moment
- Inexpensive blade adapter
- Compatible with BLADIS Net

Range of application

The latest generation of moment weighing scales – the WME series – enables the blades to be even more precisely weighed and distributed on the rotor via the BLADIS Net software. The WME series moment weighing scales precisely determine the mass and the exact centre of gravity. The reduction in unbalance through weighing is ideally suited for all new bladed rotors and also following rotor repair. Thanks to the blades being positioned centrally above the measuring device, the space required for the WME series is significantly reduced. The measuring unit is mounted on a beam directly on the scale, which enables a simple, space-saving installation.

BLADIS Net – the software for blade distribution features a simple and easy to operate user interface with touch screen. The blade distribution is based on continuously improved algorithms that are coordinated with the scale's enhanced possibilities. The new, integrated database concept also enables rapid calculation of the distribution and transfer of the data to other applications. Numerous additional functions simplify working with BLADIS Net and offer a comfortable and user-friendly operation.

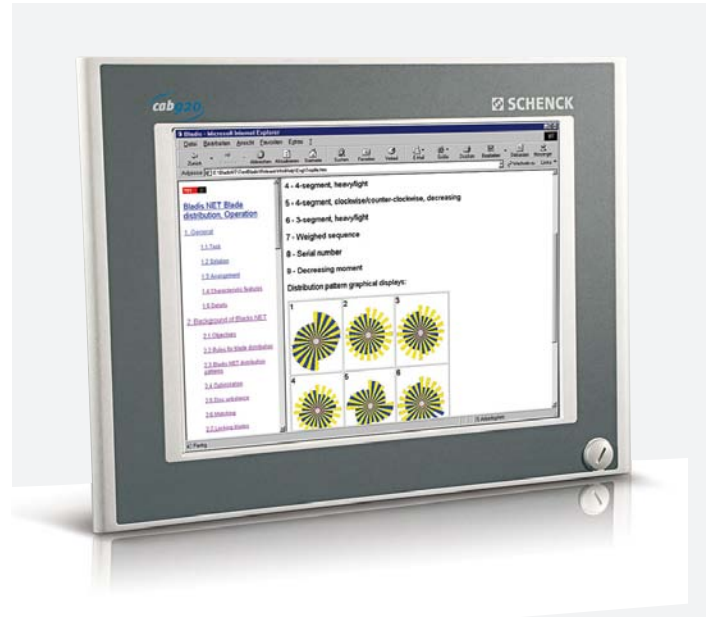
Special features

- The machine can be mounted directly on the workshop floor without foundations and without bolting, and is immediately ready for use.
- 50% reduced space required
- Easy to set up
- Inexpensive blade adapters
- Distribution system BLADIS NET with touch screen operation

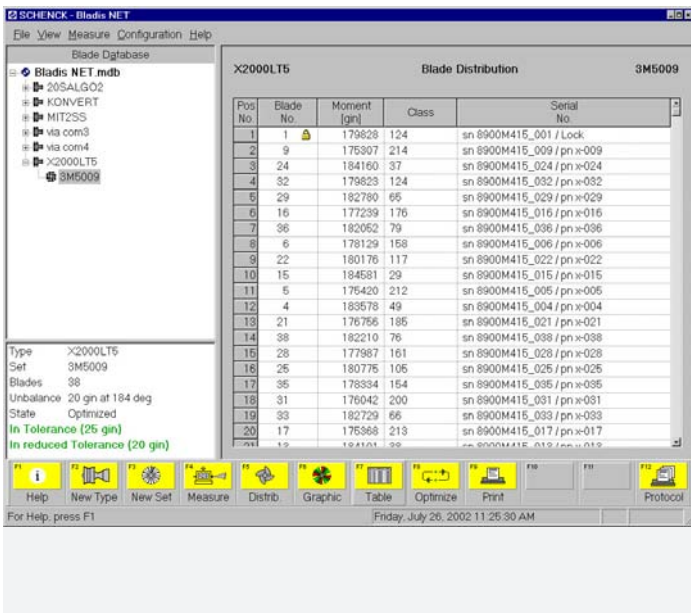
WME 2 - WME 3 Moment Weighing Scale for Rotor Blades



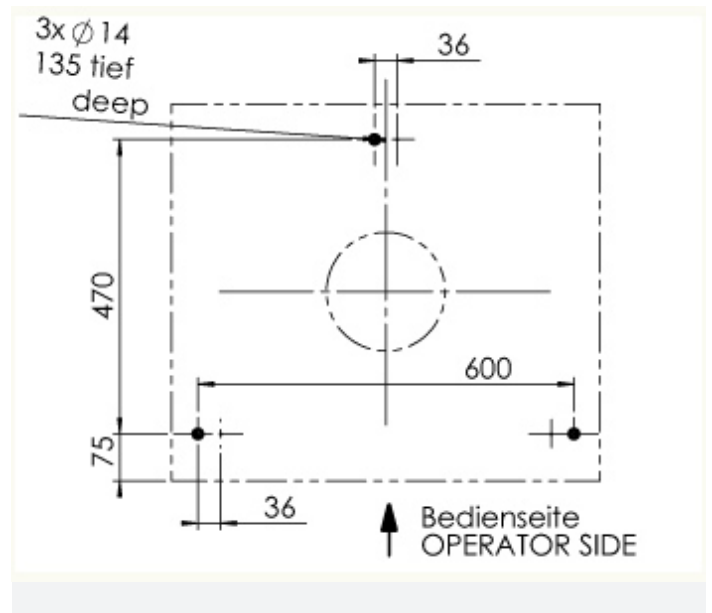
Simple and precise blade adapter



Pre-distribution of engine blades



Integrated database in BLADIS NET distribution system



WME 2 - WME 3

Moment Weighing Scale for Rotor Blades

Technical Data		WME2	WME3
Measuring Unit		Digital	Digital
Blades			
Max. blade weight	[kg]	40	140
Max. additional mass of blade adapter	[kg]	20	60
Max. blade moment	[kgm]	unlimited	unlimited
Machine			
Measuring time	[s]	2-5	2-5
Overload protection		5x max. load	5x max. load
weighing accuracy	[g]	0.1	0.5
Accuracy of internal unbalance measurement	[gmm]	20	100
Accuracy of the measured blade moment	[gmm]	1)	2)
Power supply	[V]	230	230
Options			
Blade distribution software		BLADIS Net	BLADIS Net