Wheel Load Scale WL 101

Application	Measurement of wheel and axle loads of vehicles with pneumatic tires
Ranges	0...10 t 0...15 t 0...20 000 lb 0...30 000 lb
Temperature range	-20...+60℃ 0...140 ℉
Accuracy	OIML No. 76 Class 4 or NIST H 44, optionally with HAENNI works test report or intended for official test
Materials	Corrosion resistant aluminium-alloys and stainless steel
Type of protection	Watertight IP 65 (DIN 40050, IEC 144)
Dial	white, black markings, according to OIML No. 76 respectively NIST H 44
Lens	Acrylic glass (perspex), unbreakable
Weight	16 kg
Platform height	17 mm

Selection Chart

Ordering example:	**WL 101 / 4 1 1 . 1 1 1**	**/ 10Y**	**/ . . . .**
Temperature range and standard	- 20 . . . + 60℃ OIML Nr. 76 Cl. 4 **4 1 1 . 1 1 1**		
	0...140℉ NIST H 44 Cl. 4 **6 1 1 . 1 1 1**		
Ranges	0 . . . 10t	**10Y**	
	0 . . . 15t	**20Y**	
	0...20 000 lb	**60Y**	
	0...30 000 lb	**70Y**	
For official test	The ordering code is determined after the approval procedure		

Accessories

For accessories as levelling mats, pads for weighing point loads, carrying cases etc. refer to data sheet W9.100.

Operation

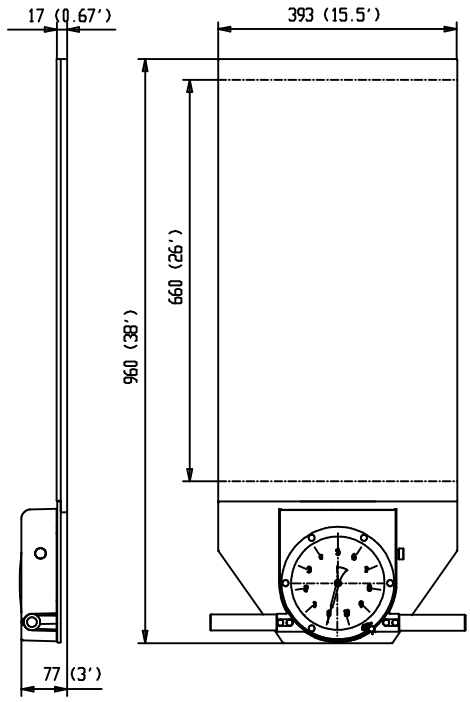
Because of its light weight the wheel load scale WL101 is easy to transport and can be used at any time without the need of ramps.
For efficient measurements it is recommended to work with at least two units. Measurements should be made on firm and level ground.
The scale is placed close to in front of the wheel to be tested and the vehicle is driven onto the platform.
The wheel load is indicated directly on the dial of the instrument.

Official Test

In most countries the wheel load scale WL 101 is approved by official test laboratories.

Wheel Load Scale WL 101

Dimensions



Construction and Function

The wheel load scale comprises of a flat weighing platform with a laterally mounted indicating instrument.
The weighing platform is equipped with a measuring element in the form of a grid of flat oval tubes, mounted between the massive ground plate and the top plate. All tubes are connected together and to a sensing element located in the indicating instrument. The whole system is filled with a non freezing liquid and is hermetically sealed. The elastic tubes are compressed when the platform is loaded. A part of the liquid is expelled from the measuring element and produces a deflection of the bellow in the indicating instrument, which is proportional to the applied load. A system of levers, connecting members and a gear movement is converting the deflection into a angle of the pointer, so that the load can be read directly on the dial.
Additionally a temperature measuring system is located in the platform to compensate for all unfavourable temperature influences.
An adjustment device located at the right side of the indicating instrument ensures an exact zero setting of the pointer before any measurement.
The absence of any moving part in the platform and the use of high strength and corrosion resistant materials guarantee both great reliability and a long lifetime. Periodic service and maintenance is not required.
The construction of the platform is specially designed for measuring the weight of vehicles with air filled tires. Hard rubber tires and rigid items as containers and so on, are not suitable because the load will be distributed on a too small surface. In these cases a measurement is possible by using a specially designed HAENNI load distribution pad. Such a pad is also needed for checking the accuracy on a test machine.

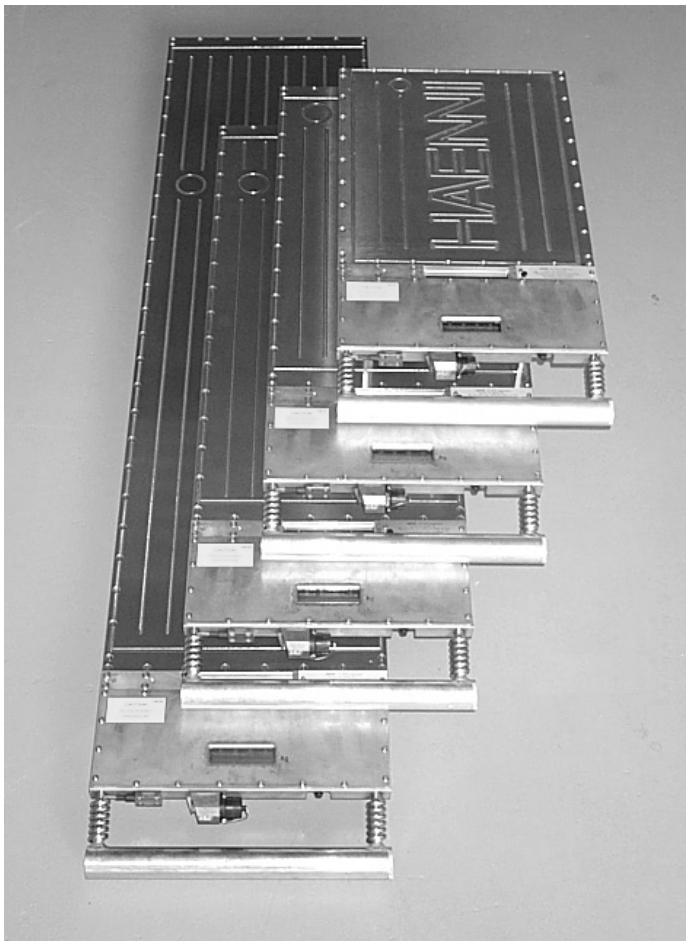
Technical Data

Execution		OIML [1]	NIST [1]	
Standard		OIML No. 76 Class 4	NIST H 44 Class 4	
Range		0...10 t, 0...15 t	0...20 000 lb	0...30 000 lb
Division		50 kg	50 lb	100 lb
Accuracy	at first calibration	±25 kg (up to 2,5 t)	±50 lb (up to 2500 lb)	±100 lb (up to 5000 lb)
		±50 kg (2,5 t...10 t)	±100 lb (2500...10 000 lb)	±200 lb (5000...20 000 lb)
		±75 kg (10 t...15 t)	±150 lb (10 000..20 000 lb)	±300 lb (20 000..30 000 lb)
	in operation	±50 kg (up to 2,5 t)	±100 lb (up to 2500 lb)	±200 lb (up to 5000 lb)
		±100 kg (2,5 t...10 t)	±200 lb (2500...10 000 lb)	±400 lb (5000...20 000 lb)
		±150 kg (10 t...15 t)	±300 lb (10 000..20 000 lb)	±600 lb (20 000..30 000 lb)
Loading limit		0...10 t: 12,5 t 0...15 t: 16 t	22 000 lb	33 000 lb
Permissible load per area		0...10 t: 12 kg/cm^2 0...15 t: 15 kg/cm^2	170 lb/in^2	210 lb/in^2
Loading limit per area		0...10 t: 24 kg/cm^2 0...15 t: 30 kg/cm^2	340 lb/in^2	430 lb/in^2
Temperature range	in operation	-20℃ .... +60℃	0 ℉ .... 140 ℉	
	storage	-30℃ .... +60℃	-20 ℉ .... 140 ℉	
Type of protection	(DIN 40 050, IEC 144)	IP 65		
Operating site		Firm and level ground, max. 10 mm bend through, max. 5% slope (≈3°)		
Dimensions	platform height	17 mm	0.67 in	
	active surface	660 x 380 mm (12 kg/cm^2) [2] 660 x 393 mm (6 kg/cm^2) [2]	26 x 15 in (170 lb /in^2) [2] 26 x 15.5 in (80 lb / in^2) [2]	26 x 15 in (210 lb /in^2) [2] 26 x 15.5 in (100 lb / in^2) [2]
	overall size	ca. 960 x 77 x 393 mm	ca. 38 x 3 x 15.5 in	

1) OIML is the abbreviation for Organisation Internationale de Métrologie Légale. NIST is the abbreviation for National Institute of Standards and Technology (USA)
2) In practical operation the complete surface may be used, because the ground pressure in the marginal area of the tyre foot print does not exceed 6 kg/cm² .

Electronic Wheel Load Scale WL 103

Application	Measurement of wheel and axle loads of vehicles with pneumatic tires.
Platform Size	Standard size for accommodating easily a dual tyre. Medium size for semi fixed installation. XL for weighing heavy haulage vehicles.
Ranges	0...2t 0...10t, 0...15t
Temperature range	-20...+60℃
Accuracy	OIML No. 76 Class 4, optionally with HAENNI works test report or intended for official test.
Execution	Aluminium alloys, water resistant IP 65 (IEC 144).
Supply	Integrated rechargeable power source, for 60h operation. Recharge (and operation) by 12V car battery or AC adapter.
Data in- and output	RS 232 C
Electrical connection	Robust plug, watertight
Weight	14 kg (0...2t) 17 kg (0...10t, 0...15t, standard) 20 kg (0...10t, 0...15t, medium) 29 kg (0...10t, 0...15t, XL)
Platform height	19 mm (0...2t) 17 mm (0...10t, 0...15t)



Selection Chart

Ordering example:	**WL 103 / 4 1 1 . 1 1 1 / 10Y / . . . .**							
Temperature and Standard	- 20 . . . + 60℃	**4**						
	OIML No. 76 Cl. 4	**1**						
Division	Standard		**1**					
	Smaller [3]		**3**					
Platform Size	Standard (small)			**1**				
	Medium			**4**				
	Extra Long			**9**				
Ranges	0 . . . 2t						**08Y**	
	0 . . . 10t						**10Y**	
	0 . . . 15t						**20Y**	
Options	Heavy duty ground plate with rubber base							**802**
	For official test. The ordering code is determined after the approval procedure							

Operation

Because of its light weight, the wheel load scale WL 103 is easy to transport and can be used at any time without the need of ramps.
For efficient measurements, it is recommended to work with at least two units. Measurements should be made on firm and level ground.
The scale is placed close to in front of the wheel to be tested and the vehicle is driven onto the platform.
The wheel load is indicated directly on the digital liquid crystal display.
With a connecting cable, two scales can be used as an axle load scale. Up to 12 scales can be connected serially to a separate processing unit or to a personal computer.

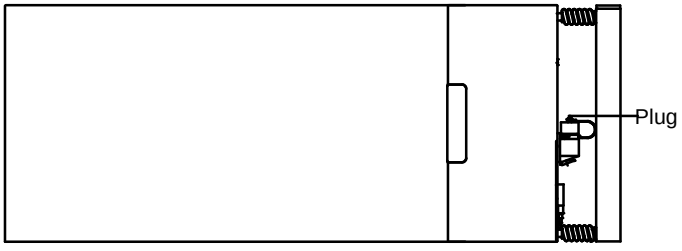
Accessories

For accessories as levelling mats, cables, pads for weighing point loads, carrying cases etc. refer to data sheet W9.100.

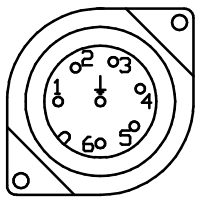
Official Test

In most countries the wheel load scale WL 103 is approved by official test laboratories. The 10 t and the 2 t range are tested and certified by OIML[1].

Electrical connection



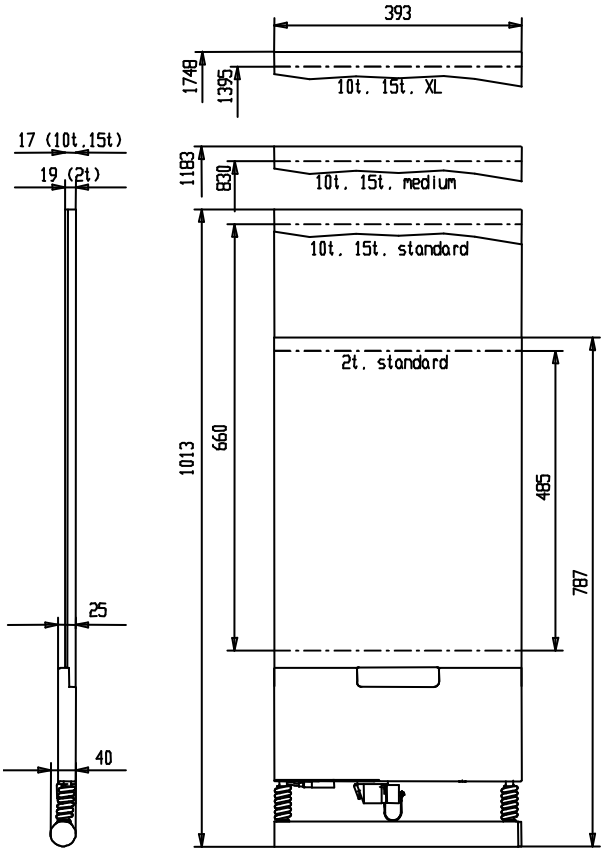
Plug view



1	Code
2	Code
3	Data output
4	V_0
5	V_B 10.8...16V
6	Data input
⊥	Shield

Electronic Wheel Load Scale WL 103

Dimensions



Construction and Function

The wheel load scale comprises of a flat weighing platform with a laterally connected indicating device.

The weighing platform has a measuring element in the form of a grid of flat oval tubes mounted between metal plates. All tubes are connected together and to a sensor located in the indicating device. The whole system is filled with a non freezing liquid and is hermetically sealed. The elastic tubes are pressed between the moving cover plate and the massive ground plate when the platform is loaded.
The liquid expelled is measured by the sensor which produces a electrical signal proportional to the applied load.
For compensation of all kinds of temperature effects the platform is equipped with a temperature sensor in the form of a loop.
The signals of the volume and the temperature sensor are digitised in the electronic circuit and processed by the micro processor to a weight value, which is indicated at the display.

At switch on of the scale a test routine is activated and the indication is set to zero. In service the indication is kept automatically at zero when the platform is unloaded, so there is no need for a zero adjusting screw.

If desired, two scales may be connected together to get an axle load scale. Each scale will indicate the sum of both units. An other possibility is to connect up to 12 scales serially to a processing unit or a personal computer. The signals are compatible to RS 232.
The charging circuit for the built in Ni-Cd accumulators avoids an overcharge. A total discharge is not possible because of the auto shutdown of the scale, when the lower limit of the battery voltage is reached. The result is a long lifetime of the batteries.

The construction of the platform is specially designed for measuring the weight of vehicles with air filled tires. Hard rubber tires and rigid items as containers and so on, are not suitable, because the load will be distributed on a too small surface. In such cases a measurement is possible by using the specially designed HAENNI load distribution pads.

Technical Data

Range		0...2 t		0...10 t		0..15t
Division (standard / smaller[3])		10 kg	5 kg	50 kg	20 kg	50 kg
Accuracy at first calibration	Standard Division	±5 kg (up to 500 kg) ±10 kg (500 kg..2000 kg)		±25 kg (up to 2,5 t) ±50 kg (2,5 t...10 t)		±25 kg (up to 2,5 t) ±50 kg (2,5 t...10 t) ±75 kg (10 t...15 t)
	Smaller Division	±2.5 kg (up to 250 kg ±5 kg (250 kg...1000 kg) ±7.5 kg (1000 kg...2000 kg)		±10 kg (up to 1 t) ±20 kg (1 t...4 t) ±30 kg (4 t...10 t)		-----
in operation		Twice the tolerance at first calibration				
Loading limit		2,5 t		12,5 t		18 t
Permissible load per area		6 kg/cm^2		12 kg/cm^2		15 kg/cm^2
Loading limit per area		12 kg/cm^2		24 kg/cm^2		30 kg/cm^2
Operating temperature		-20...+60℃	0...+40℃	-20...+ 60℃		
Storage temperature		-30℃ ....+60℃				
Electromagnetic susceptibility		OIML Nr. 76 [1]				
Zero tracking, test etc..		automatic according OIML Nr. 76 [1]				
Type of protection (IEC 144)		IP 65				
Overrunable		completely overrunable incl. cable				
Operating site		Firm and level ground, max. 10 mm bend through, max. 5% slope (≈3°)				
Active surface	in driving direction	345 mm		380 (12 kg/cm^2)[2] 393 (6 kg/cm^2)[2]		380 (15 kg/cm^2)[2] 393 (6 kg/cm^2)[2]
	across to driving dir.	see sketch				
Over all dimensions		see sketch				
Power supply		Integrated accumulators for 60h service Recharge and operation from 12V car battery or AC adapter				

1) OIML is the abbreviation for Organisation Internationale de Métrologie Légale.
2) In practical operation the complete surface may be used, because the ground pressure in the marginal area of the tyre foot print does not exceed 6 kg/cm^2 .
3) The smaller division should be chosen for specific applications only. In most applications the standard division is the better choice. Refer also to paper P 1196