



Morehouse
THE FORCE IN CALIBRATION SINCE 1925

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Product Guide

Universal Scale Calibrator



Model USC-60K



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Accurate Scale Calibration

Aircraft and truck scales come in all different shapes and sizes and typically serve one purpose: to approximate the weight of an aircraft or truck. Calibrating these scales properly is essential to ensure safety and improve profitability. Common calibration problems include:

- Large-size, high-capacity scales that don't fit in the calibrating machine
- Bending of the top beam and load-bearing table
- Adapters that are different from the tire footprint can cause significant measurement errors
- Calibrating in mass and using the scale in a different location produces errors from different gravity values
- Several standards might be needed to certify tolerance correctly *

The Universal Scale Calibrator is designed to address these problems. It accommodates the large size, high-capacity scales utilized to weigh aircraft and heavyweight vehicles and is designed to be plumb, level, rigid, and square. It will speed up the calibration and certification of scales while maintaining the high degree of accuracy required for proper certification.



Figure 1: Universal Scale Calibrator, USC-60K



Technical Specifications

Capacity	Model designation	Order code	Max capacity	Hydraulic operation control
60,000 lbf	USC-60MD-01	USC-60K STD	60,000 lbf	Hand pump
60,000 lbf	USC-60MD-01	USC-60K UHP	60,000 lbf	Universal hydraulic pump
250 kN	USC-60ME-01	USC-250 kN STD	266.8 kN	Hand pump
250 kN	USC-60ME-01	USC-250 kN UHP	266.8 kN	Universal hydraulic pump

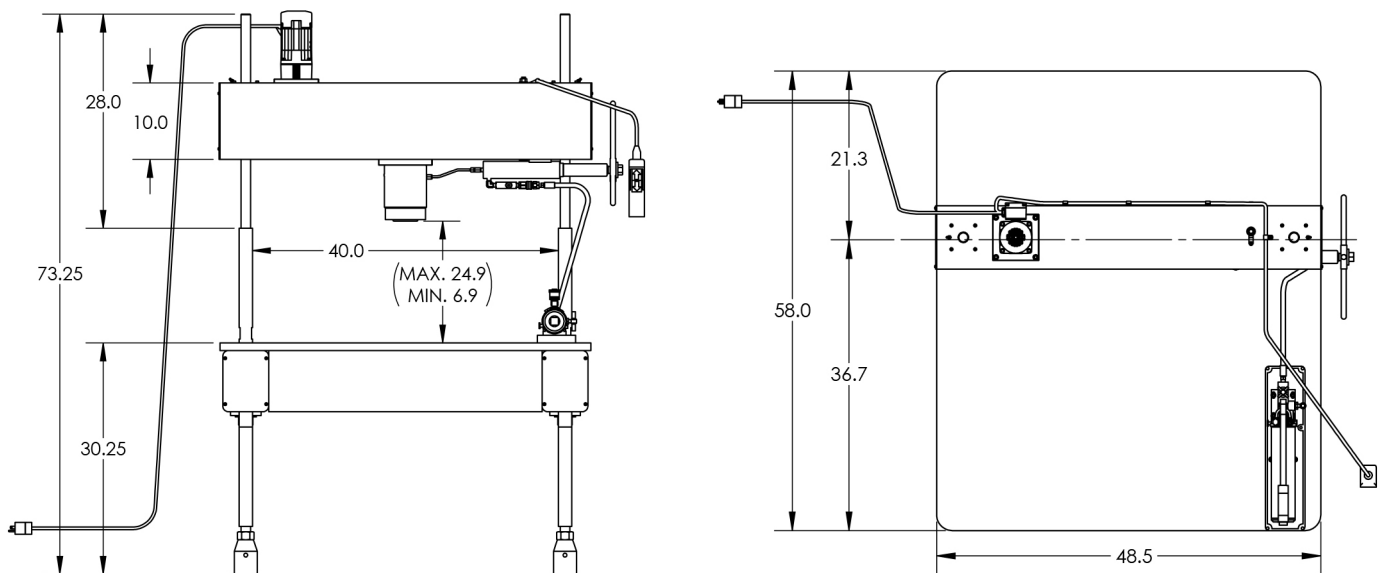


Figure 2: Universal Scale Calibrator Dimensions

The Universal Scale Calibrator can calibrate many different types of aircraft and truck wheel load scales with capacities from 1,000 lbf to 60,000 lbf, made by numerous manufacturers including:

- Intercomp
- Jackson Aircraft Weighing (JAWS)
- GEC
- Haenni
- Rice Lake
- Ohaus
- Proform
- Brechnell
- Sentran
- Tanner Racing
- Taylor
- Road Runner

The transfer of force is typically facilitated through a load cell, and adapters are custom-made to duplicate the footprint of the airplane or truck tires that the scale will be used to weigh. Load cells are not included with the machine.

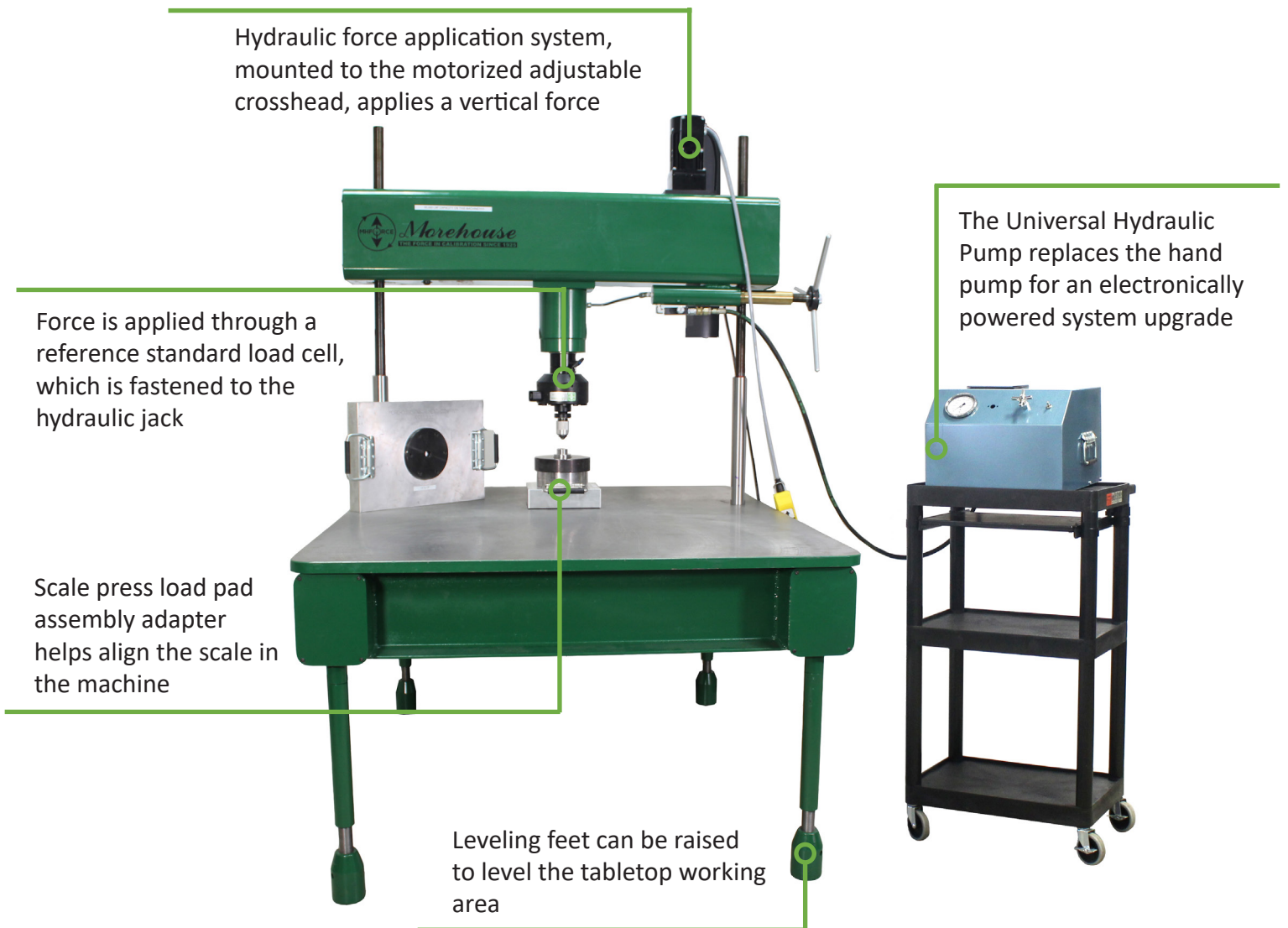


Figure 3: Universal Scale Calibrator with Universal Hydraulic Pump Upgrade

Scale Calibration Made Easy

The Universal Scale Calibrator is powered by a 60,000 lbf capacity hydraulic jack, which is mounted on the moveable crosshead. The jack is used to apply a vertical force between the adjustable crosshead and the platen, where the scale is placed.

The hydraulic jack is activated by a hand pump, which does not need any source of electric power to operate. The pump is connected to the jack with a hydraulic hose that has a quick disconnect on one end.

The Universal Hydraulic Pump (UHP) is an electronically powered system that is an upgraded replacement to the hand pump. It provides a higher flow rate and power.



Figure 4: Hydraulic Hand Pump



Figure 5: Universal Hydraulic Pump

Reference Standard Load Cell

Morehouse Ultra-Precision Load Cells are accurate to better than 0.005 % of full scale, making them the reference standard of choice for calibration laboratories that want to improve their measurement process. Low uncertainties are achieved using Morehouse deadweight primary standards known to be better than 0.002 % of applied force to calibrate the reference load cells. Load cells are not included with the machine and can be purchased separately.



Figure 6: Ultra-Precision Load Cell

Recommended Mounting Adapters

The Scale Reference Mounting Kit (SRK) includes recommended adapters for the reference standard in a Universal Scale Calibrator.

The kit includes:

1. Detent pin
2. Base thread adapter
3. Ball adapter
4. Ball cup

English units (lbf)

The kit is designed around Morehouse Shear Web load cells. Capacities are approximately 2K lbf, 25K lbf, 60K, and 100K lbf. Note: The 100K load cell can only be used up to 60,000 lbf capacity.

Load Cell	2,000 - 10,000 lbf	25,000 - 50,000 lbf	60,000 lbf	100,000 lbf
Order Code	SRK-10k	SRK-50k	SRK-60k	SRK-100k

SI units (kN)

The kit is designed around Morehouse Shear Web load cells. Capacities are approximately 20 kN, 100 kN, 250 kN and 500 kN. Note: The 500 kN load cell can only be used up to 250 kN capacity.

Load Cell	20 - 50 kN	100 -200 kN	250 kN	500 kN
Order Code	SRK-50kN	SRK-200kN	SRK-250kN	SRK-500kN

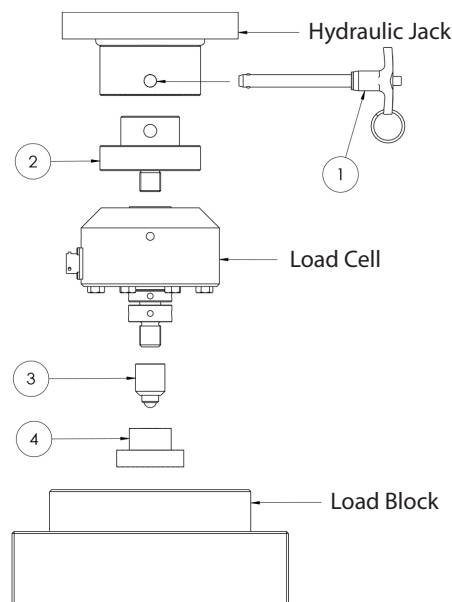


Figure 7: Scale Reference Mounting Kit

Replicating the Tire Footprint

Aircraft and truck scale calibration often requires special adapters to simulate a tire contact area with the scale. Scales come in a variety of sizes and have specific tolerances. Adapters that are different from the tire footprint can cause significant measurement errors.

Morehouse designed the Scale Press Load Pad Assembly to replicate the tire footprint during calibration. The load cell's load button is placed on the compression top alignment block, which is centered in the Universal Scale Calibrator.



Figure 8: Scale Press Load Pad Assembly

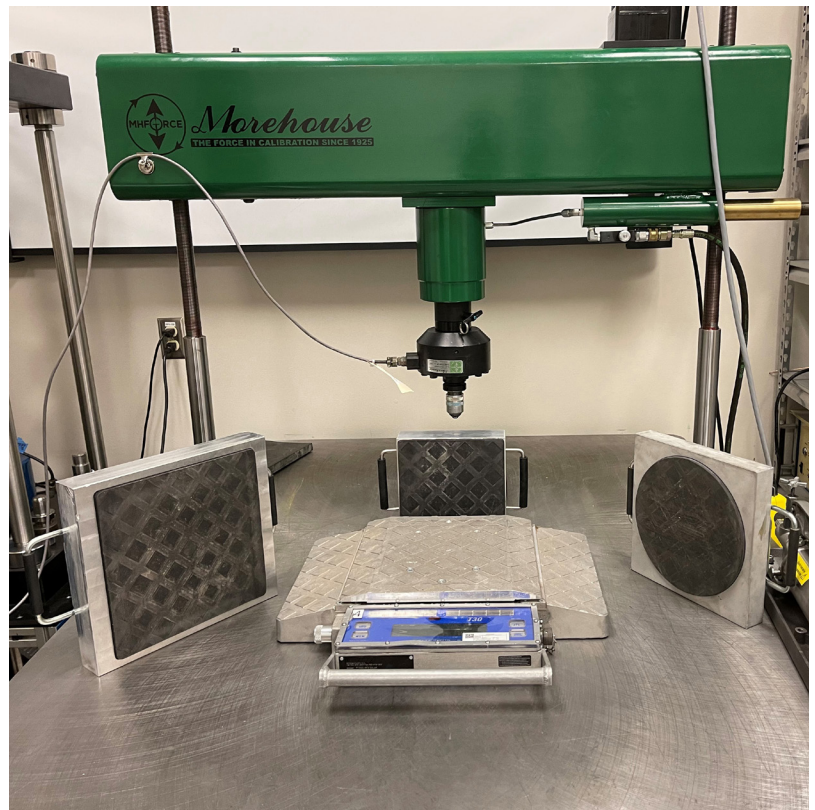


Figure 9: Scale with Three Different Adapters

Scale calibration can be difficult. The Morehouse USC-60K with adapters and reference standards simplifies it. We welcome the opportunity to answer your questions or concerns. Our technical experts are here to help. Learn more at:

[Aircraft and Truck Scale Calibration Tips](#)

[Using Mass Weights to Calibrate Force Devices Can Result in a Large Measurement Error](#)