

# Powell Scales, Inc.

## Buyer's Guide

### INTRODUCTION

The Buyer's Guide has been prepared especially for the prospective scale owner's reference. It will familiarize you with the industry's terminology and assist you in selecting the scale design best suited to meet your individual requirements.

### TABLE OF CONTENTS

#### Section I - Buyer's Guide

Pit or Pitless

Levers or Load Cells

Design, Construction and Service

Capacity Ratings and Accuracy Classes

#### Section II - Powell Product Selection Guide

Lever Truck Scales

Load Cell Truck Scales

Truck Scale Optional Equipment

Scale Installation Options

Specialty Scale Designs

Service

Powell Literature and Sales Information

Appendix A - Vehicle Scale Safety Tips

If you should have any questions when reading this Buyer's Guide, please do not hesitate to call for further information or assistance... **(205)387-8647**

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### POWELL SCALE BUYER'S GUIDE

#### I. PIT OR PITLESS

1. **Available Area:** A pitless scale normally requires more ground area than does a pit scale. For permanent installations the access ramps are required to be at least half the length of the scale on each end. The first 10' of approach must be concrete and level with the scale deck. The remainder should have a recommended pitch of 1/2" of incline per lineal foot and be constructed of durable bituminous material. Therefore, consideration should be given to the available ground area for the scale and approaches, as well as the traffic pattern and flow around the scale.
2. **Permanent or Temporary?** Determine if the installation site will be short or long term. The foundation for a pit scale is normally more costly than for a pitless scale. If the scale is to be extended, relocated, or resold in the future, a pitless scale is the better investment. For installations of less than six months, most states allow some exceptions to the foundation requirements.
3. **Site Conditions:** Obstructions above ground or under ground may create difficulties. Overhead wiring or structures may regulate the height of the scale you can use. Above ground obstructions may also create problems during installation by limiting crane access. Under ground obstructions including plumbing, electrical, rock, or water may prohibit pit construction. The proposed scale site should be carefully chosen with consideration given to soil conditions, water drainage, and all environmental factors. Deep frost lines will regulate the depth of the foundation. Proper drainage from the scale site is mandatory.
4. **State Regulations:** For scales to be used in legal public trade, most states follow the guidelines of Federal Handbook-44 for scale installations and acceptance. However, some states, change or adopt additional regulations which may affect the type of scale acceptable in your area. It is the buyer's responsibility to conform to all local requirements for installation and use of the scale. It is recommended that you consult with your State Weights and Measures Department for current regulations prior to the purchase or installation of your truck scale.

#### II. LEVERS OR LOAD CELLS ?

A scale system is comprised of three main components:

1. The weighing elements (levers or load cells)
2. The weighbridge structure
3. The weight indicator

Most scale designs are available with either levers or load cell weighing elements. Since the scale virtually operates and performs the same for either design, the following site factors should be considered when choosing between levers and load cells:

1. **Power Supply:** The lever scale can support a mechanical weigh beam as well as an electronic indicator by using a small, inexpensive conversion load cell. The full load cell scale, however, is restricted to using an electronic indicator. If your location is remote, with poor or no power supply, you will need to use a lever scale. Storms, power interruptions, and peaks can affect or damage electronic equipment. An Uninterruptible Power System (UPS) with a backup battery is recommended for AC protection of the electronic indicator and printer or computer system. Proper grounding is essential.
2. The full electronic load cell scale usually has 6 to 8 or more load cells, priced at \$800 - \$900+ each. These load cells are at risk from electrical storms. The lever system is mechanical and therefore not subject to electrical damage. Load cells and electronic equipment may also be affected by RFI (Radio Frequency Interference) and EMI (Electromagnetic Interference), which can cause erroneous weight readings. Be sure that the equipment you purchase is protected against RFI & EMI. A designated, stable power line is recommended for the scale equipment.
- 3.
4. **Usage and Maintenance:** The intended use of the scale may also determine which type of system will be best suited for your application. Levers have parts which become worn and have to be replaced periodically. These parts wear in direct relation to the amount of usage on the scale. In addition to normal wear, load cells are affected by time deterioration, environmental elements, and electrical conditions, even if the scale is not being used. Applications where the scale is used periodically or seasonally are therefore best suited for lever scales for a long term investment.
5. **Height:** Most scale designs are available with either a lever system or with full load cells. The full load cell scale normally has a lower profile height by several inches. If the lowest profile height is the critical determining factor, then a full load cell design may best fit your requirements.

### III. DESIGN, CONSTRUCTION, AND SERVICE

Most manufacturers offer similar scale designs. It is therefore wise to compare the scale's construction components, life expectancy, and serviceability. These are the areas that Powell strives to be the leader in the industry, and the areas in which we take personal pride in.

1. **Deck Options:** **1. Steel Deck Plate.** Compare the thickness of the deck plate which may vary from ¼" to ½" depending upon the manufacturer and scale capacity. The thicker the checkered deck plate, the stronger and more durable it is. **2. Concrete Deck.** Compare what steel is included for the deck. Concrete decks require framing channel, rebar, framing tin, and manhole rings and covers. Are these items furnished with the scale or sold as options?
2. **Weighbridge Design:** Scale weighbridges are normally of two basic designs: FLAT-TOP design with the main support beams under the deck; or SIDE-GIRDER design with the main support beams on the sides with the deck inset between them. This design usually allows a lower deck height. **1. Main Support Beams.** Compare the size and weight. Taller, heavier beams are stronger and deflect less than shorter or lighter weigh beams. **2. Crossmember Beams.** Compare the quantity, size and weight. The crossmembers are the main support of the scale deck and serve to strengthen the main support beams. **3. Overall Structural Weight.** In most cases, the structure's strength and durability is directly related to the structural weight of the steel. (**NOTE:** A heavier built scale will not cost more to ship. Scales are shipped as a truck load and freight rates are charged by mileage!)
3. **Versatility:** A scale is meant to be an income producing investment which should provide many years of trouble-free service. Consider the long term costs: 1. Keep the scale's design and installation as simple and versatile as possible to allow expansion capabilities in the future as your needs change. 2. Choose a manufacturer with a proven history of customer service. Is the factory accessible to you for assistance in sales, service and technical support? Are there factory certified dealers near you? 3. Beware of scale brands and models which change designs every few years to avoid being stuck with a scale for which you can't get parts. 4. Avoid "Exclusive" dealers or brands that limit you to only one source for parts or service, which may prove costly in the future.
4. **Scale's Life Expectancy:** Truck Scales should be constructed to provide many years of dependable service. Some of the factors which adversely affect the scale's longevity include: volume of use; overloading and abuse; poor installation; lack of proper service; and harsh environmental conditions.

#### IV. CAPACITY RATINGS AND ACCURACY CLASSES

1. **Nominal (Gross) Capacity:** The Scale's Nominal Capacity should be equal to the maximum gross vehicle weight that you intend to weigh. The Nominal or Gross Capacity is the maximum weight to which your weight indicator will operate. **Caution:** The Gross Capacity Rating is not enough to determine if the scale is suitable for your needs.
2. **Axle and CLC (Concentrated Load) Capacities:** The Axle Capacity Rating for a truck scale should be one of the most critical determining factors in your scale purchase decision. The CLC Rating is the manufacturer's stated capacity for a concentrated load on the scale deck. The concentrated load pattern area is 4' long and the width of the scale deck. The stated CLC should be equivalent to your vehicle axles within the same 4' span (i.e. a dual axle). **Beware:** Some manufacturers state a high CLC rating when selling the scale, but specify a much lower recommended axle load capacity. Always request the scale's axle capacity ratings on quotes to confirm that the scale's CLC rating and Dual Axle Rating are comparable. CLC ratings will always follow the following formula:
  3. **Formula:** CLC must be  $\geq$  **Nominal Capacity** divided by (Number of **Sections** -  $\frac{1}{2}$ )
  4. **Example:** A **100 ton** scale with **4 sections** must have a minimum CLC rating of **57,143 lbs.** (200,000 lbs. /  $3\frac{1}{2}$  = 57,143 lbs.) Therefore, the dual axle rating should also be comparable to the rated CLC of 57,143 lbs.
- 5.
6. **Sectional Rating:** A scale "section" is a lever, or a set of two load cells. Therefore, compare the capacity and the number of sections in a scale. Lever systems are rated by the manufacturer with a sectional capacity which indicates the size of parts used in the lever. For full load cell scales, compare the quantity and capacity of load cells.
7. **Accuracy Class:** A vehicle scale must weigh accurately within specified tolerances to meet Federal Handbook-44 specifications and to be legal for trade. Truck scales are in the III L class. This specifies also that the weight increment size is determined by the Nominal Capacity of the scale. A truck scale is allowed a maximum of 10,000 divisions. Therefore, a 50 ton scale could have its weight displayed in 10 lb. increments. However, 60 - 100 ton scales must have a minimum of 20 lb. increments. For the closest weight accuracy, select a scale with the appropriate Gross and Axle Capacities for the vehicles you intend to weigh.

#### POWELL SCALES PRODUCT SELECTION GUIDE

##### I. LEVER MODELS AND DESIGNS:

###### "P" Series Mechanical Lever Pit Scales:

Powell offers a heavy-duty permanent pit scale design with a structural steel pipe system. Unlike cast iron levers, the fabricated steel levers protect against damage from shock loading. This scale will support a mechanical and/or electronic weight indicator. Shallow, standard, and deep pit designs are available. A concrete deck is standard, but it is also available with steel deck plate. Powell specializes in building replacement scales to fit existing pits.

###### "C" Series Mechanical Lever Pitless Scales:

The "C" Series offers a variety of design choices. All scales are of modular construction to allow future extensions by adding one or more modules. Primarily designed for above ground installations, the "C" series scale may also be installed in shallow or existing pit if preferred.

###### "PV" Portable Vehicle Scale Design:

This scale is self-contained in a structural frame for easy transportation and set-up. Modules may be easily added in the future to extend the scales length. The lever system will support a mechanical and/or and electronic weight indicator. Steel or concrete deck models are standard; optional wood deck design available upon request. Optional side guide rails are available.

###### "LP" Mechanical Low-Profile Side Beam Design:

The low-profile above ground scale has the main support girders on the sides with the deck inset between them. The side beams act as safety guides and also allow for a lower profile deck height. The structural lever system extends to one side of the scale where a mechanical beam and/or electronic indicator may be connected. Steel or concrete deck options are available.

###### "LT" Mechanical Low-Profile Flat Top Design:

This compact mechanical scale offers a low-profile flat top deck. The lever system extends to one side of the scale for use with a mechanical and/or electronic weight indicator. Available with steel or prepared for concrete deck. Side guide rails are optional.

##### II. ELECTRONIC LOAD CELL MODELS AND DESIGNS:

###### "EP" Series Electronic Pit Scale:

A heavy-duty, full load cell permanent pit scale available for shallow, standard, or deep pit construction. A concrete

deck is standard, but it is also available with steel deck plate. The load cell mount assembly is a patented design allowing for weighbridge oscillation without damage to the load cell. Powell specializes in building replacement scales to fit existing pits.

**"EC" Series Electronic Portable Contractor Scale:**

The full load cell portable contractor scale ships fully assembled in a heavy structural frame. Designed for easy set-up and mobility, the "EC" is built standard with a steel or concrete deck. Optional side guide rails are available. Additional modules may be purchased in the future to add on and extend the length and capacity of the scale.

**"EL" Series Electronic Low-Profile Side Beam Design:**

The "EL" design is a fully electronic load cell scale which provides a low-profile height by inseting the deck between the two main support girders. The main beams are located on the sides of the scale providing built-in safety side beams. Steel deck and concrete deck models are available.

**"ET" Series Electronic Low-Profile Flat Top Design:**

The "ET" design offers a flat top deck on a compact low-profile design. The load cell mount assemblies include a heavy capacity load cell and the patented Powell Pro-Link mount. The scale may be easily extended in the future by adding one or more additional modules. Standard steel and concrete prepared decks are available, along with optional side guide rails.

### III. PERIPHERAL EQUIPMENT OPTIONS

**Peripheral Equipment:**

Once you have the basic Powell Scale, you may add any of the processing equipment or features that you desire. A variety of peripheral equipment is available for use with your Powell Scale which will indicate, print, store, report, or process the weight information. Powell offers a full line of products ranging from simple weight displays to accounting and inventory control systems, all of which will interface with your scale.

**Mechanical Weigh Beams:**

The TRB (Type Registering Beam) is a mechanical balance beam which prints a ticket and requires no electrical power source. It is also available as a Direct Reading Beam, without the ticket printing capability. The weigh beam may be used as the exclusive weight indicator, or as a back-up indicator for applications that cannot tolerate any down time on their scale system. Mechanical beams will only interface to lever scales.

**Digital Weight Indicators:**

A variety of digital weight indicators are on the market today which will interface with your Powell Lever or Electronic Scale. If you are using your scale for legal trade, the weight indicator must meet state and/or federal guidelines. A digital indicator should be chosen based upon the features that you require. Options include interfacing to a ticket printer, remote display, computer system, or maintaining ID and tare weight storage. The cost of the indicator is a relatively small amount of your scale system. It is common over the life of a scale to change the indicator once or twice as new features are developed and your needs change.

**Remote Weight Displays:**

Some installation sites require the weight to be displayed at more than one location. In addition, it is sometimes desirable to have the weight displayed at or near the scale to inform the operator or truck driver of the gross or net load. In this case, a scoreboard is installed at the scale with highly visible digits. This is especially helpful when the truck is being loaded while on the scale. The main scale indicator, however, can remain within the scale office.

**Printers:**

A standard ticket printer may be used in conjunction with your digital indicator. Some printers can be equipped to print time and date, or consecutively number the tickets. If interfacing the indicator to a computer, the computer's form printer may be used to print the weight ticket.

**Computer Interfacing:**

You may wish to interface the scale with a computer in the weigh house. Many options are available to perform the tasks that you need. Simple software programs which run on compatible systems are offered, as well as full computer systems with programming to store transactions and do your invoicing. Other options include control and batching systems. Contact Powell for all of your computer software and hardware needs.

### IV. SCALE INSTALLATION OPTIONS

**Scale Guide Rails:**

For scales installed above ground, it is recommended that some type of side guides be provided. These guides may be posts, walls or rails which are part of the foundation. If preferred, pipe side guide rails located on the scale deck are optional from the factory. Some scale designs, like the "LP" have side running beams that act as guide rails.

**Deck Manhole Access:**

All Powell pit and portable scales are provided with manhole access openings and cover plates. Low-profile pitless scales are access through top or side cover plates, depending on the specific design.

**Steel Bulkheads:**

For Powell low-profile pitless designs, the bulkhead angle is supplied standard. Full steel bulkheads for portable scale designs are optional from the factory. They are ideal for temporary scale sites and can be easily moved with the scale. For permanent site installations, concrete bulkheads are recommended and may be required by your state.

**T-Strip Molding/Belting:**

Keeping your scale area clean is critical to the operation and life of your scale. Optional T-Strips are available to close the gaps between the scale deck units and the foundation walls. This helps to prevent build-up of debris around and under the scale. The molding protects the scale while allowing the deck to move freely, although it must be installed correctly to keep the scale deck from binding and weighing inaccurately.

**Installation Steel:**

All Powell pit scales are provided with anchor bolts, pit framing angles, concrete deck channel, deck rebar, bumper plates, and assembly bolts standard, at no extra charge.

Powell low-profile scales are provided with bulkhead angles, and anchor bolts.

All concrete deck models are furnished with deck channel and deck rebar. Powell portable designs do not require anchor bolts.

**Paint Options:**

The standard paint finish furnished on all Powell truck scales is a triple-agent rust inhibitive shop coat. This paint is sufficient for most environmental and use conditions. Operational enamel or epoxy paint systems are available upon request and bid according to customer specifications.

**V. SPECIALTY SCALE DESIGNS****Replacement Scales / Custom Applications:**

Powell specializes in building replacement scales for existing foundations and pits. Powell also customizes scale designs to fit virtually any weighing application. Consult Powell for all of your standard and specialized scale needs.

**Off-Road Vehicle Scales:**

Powell offers a full line of heavy capacity scales for off-road vehicles. Available in pit or pitless designs, each scale is a custom design built for the customer's specific vehicle specifications and applications.

**Railroad Track Scales:**

Powell manufactures several railroad track scale designs. The standard full length railroad track pit scale is used for single draft weighing. These scales are available as combination scales to weigh both rail cars and highway trucks. Powell's modular design railroad track scales are available for weighing cars by individual axles. The scale may be positioned to weigh the car while it is being loaded. Both static and in-motion weighing are available.

**Portable Wheel Weighers:**

Although not legal for trade, portable wheel pads are ideal for checking axle loading. Standard pads are designed to accommodate a set of single or dual tires and have a capacity of 20,000 lbs. Lighter and heavier capacities are available. Pads are normally used in sets of 2, 4, or 6. Both static and in-motion electronic pads are available.

**Other Miscellaneous Types of Scales:**

Warehouse Scales Livestock Scales Postal Scales

Conveyor Scales Floor Scales Aircraft Scales

Counting Scales Crane Scales Race Car Scales

Lab Scales Tank Scales Security Scales

**VI. SERVICE**

Powell offers a nationwide network of service centers and distributors. With over 400 factory-registered certified service centers throughout the United States, you can depend on fast and efficient product service backed by courteous and professional customer support from the factory. Customers may consult directly with the Powell factory for assistance in sales, service and technical support.

**VII. POWELL LITERATURE AND SALES AIDES**

The following literature and products are available upon request from the factory.

**Literature:**

- Truck Scale Brochures (Pit, Pitless, Portable)
- Specialty Scales

- Computer Systems
- Indicator, Printer, Load Cell Specification Sheets
- Detailed Scale Specification Sheets
- Terms and Conditions of Sale
- Warranty Statement and Extended Warranty Plans

**Manuals:**

- Scale Buyer's Guide booklet or software (please specify file format)
- Product Owner's Manual

**Software:**

Powell now is proud to offer a software package that will substantially reduce the time spent on hand writing, filing, billing, and tracking scale tickets. The SMS system connects directly to the Powell scale and keeps track of your customers, trucks, materials, accounting, and record keeping. There is no easier way to handle all of your daily tasks than the SMS system. If you would like to view a demo of this software, you may contact Powell directly, or you may download the software from our web site at <http://sonet.net/usr/powell/sms.htm>.

**Video Tape:**

Powell has a VHS video tape available for loan to potential scale buyers. The video has an introduction to the Powell factory and gives a general overview of the product line and personnel. It emphasizes Powell's commitment to quality, customer service, and product excellence. Approximate running time: 18 minutes.

**User's List:**

Powell offers a list of customer referrals for your reference. The database printout is available sorted by your choice of Powell model number; customer's industry; or customer's state and can be faxed, mailed, or e-mailed to your location. Please contact Powell for more information.

**Purchase Options:**

Powell control product costs through competitive material purchasing and stringent cost control measures, never sacrificing product quality. Special savings are passed directly to our customers. Powell products are available for purchase, short term rentals, and long term leases.

**VEHICLE SCALE SAFETY TIPS**

**GENERAL NOTES:**

1. Do NOT overload, misuse, or neglect you scale or it's proper operation.
2. Keep the scale area and weighing surface clean and safe.
3. Perform daily visual inspections of and around your scale. Notify you service technician of any changes or problems.
4. Have a factory certified service company provide routine maintenance and detailed inspections to assure proper and accurate operation of your scale equipment.
5. Provide a safe distance between the scale and the weigh house or other buildings and structures.

**VEHICLE ACCESS: (Post Appropriate Signs and Markers)**

1. Your scale is designed to accommodate specified vehicles (according to the scale model and capacity selected) traveling lengthwise on the platform at a low, safe speed.
2. Advise all vehicles to come to a complete, gradual **STOP** when approaching and loading the scale.
3. Advise vehicles to enter and exit the scale straight, centered on the platform, and in low gear.
4. If speed bumps are used, they should be placed at least 12' from each end of the scale to avoid bouncing or shock loading the scale.
5. Corner posts located on the scale approaches are recommended to help assure straight and proper vehicle alignment when entering and exiting the scale.
6. Side posts or barriers running along the outsides of a pitless scale are useful to provide a guide to your trucks. If used, these should be anchored into the foundation, and may NOT be attached to the scale. Allow proper clearance from the scale to prevent binding and allow room for maintenance access.
7. Optional factory guide rails attached to the scale platform are offered as a visual alignment aid ONLY, and are NOT designed to withstand or prevent trucks from running off of the scale.

**PEDESTRIAN ACCESS: (Post Appropriate Warnings)**

1. Your scale is NOT factory designed to accommodate a safe pedestrian access or walkway.
2. Deck surfaces may become slippery and unsafe for pedestrians due to deck materials, paint finishes, environmental conditions and normal use and wear.
3. Warn all personnel that the scale is NOT safe for pedestrians.
4. If needed, proper pedestrian walkways with handrails may be located along the side of the scale, but may NOT be attached to the scale in any way. Walkways should not interfere with the scale's safe operation or maintenance access.

**DRIVER ACCESS:**

1. Advise drivers and passengers not to get in and out of their vehicles while on the scale.

2. Advise all drivers of your operating procedures for weighing and obtaining a weight ticket.
3. Provide appropriate and safe access to the area where the driver must pick up his/her weigh ticket.

**MAINTENANCE ACCESS:**

1. Scale approaches should be visibly blocked off during maintenance and inspections.
2. Do not leave deck manhole or scale access openings unattended or without visible barriers.
3. Do not allow vehicles onto scale while maintenance or inspection personnel are working in, on, under, or around the scale area.
4. Be sure that all deck access covers are in place and safely secured before using the scale.

**MANUFACTURER'S DISCLAIMER:**

*Any use of the scale or access other than as specified by the manufacturer or outlined above is at the risk of the scale owner and/or user. The scale manufacturer, retailer, and installer are not liable for injuries or damages incurred from unsafe or incorrect use of the product or personal access to the scale. It is the responsibility of the owner to provide proper instructions, signs, and warnings at the scale site to insure a safe environment and operating procedures.*

**Recommended:** Have your business insurance representative and professional safety inspector visit your scale site. Provide them with a copy of these safety tips and advise them of your intended use and operating procedures. They will best be able to advise you concerning safety guidelines and regulations specific to your location and business operation.