



ELECTRONIC BALANCE GUIDE








Transducer
TECHNOLOGY

OPTIMA SCALE

Rancho Cucamonga, CA USA || Rogers, MN USA • PH: 800.360.9619 • sales@optimascale.com

©2017 Optima Scale Manufacturing Inc.

| | |
|---|--|
|  | Pharmaceutical Industry <ul style="list-style-type: none"> • Sample preparation in R & D laboratories • Material inspection • Quality assurance of drugs |
|  | Food Industry <ul style="list-style-type: none"> • Inspection for harvest before export • Quality assurance of processed food • Packaging final products |
|  | Chemical Industry <ul style="list-style-type: none"> • Reagent preparations • Manufacturing process inspection • Maintain continuous operations (reduced downtime) |
|  | Electronic and Semiconductor <ul style="list-style-type: none"> • Piece counting for small parts in factories • Measurement of thin film on the surface of silicon wafers • Pass/fail by checkweighing |
|  | Jewelry Market <ul style="list-style-type: none"> • Jewelry making • In retail shop • Purity check |



Electromagnetic Force Restoration: coil in a permanent magnet for the the most accurate weighings



High Resolution Load Cell: strain gauge measure the deformation as change in electrical resistance



Accumulator: Balance has internal accumulator or can be used with optional external accumulator



RS-232 Data Interface: to connect the balance to printer, PC, peripheral devices



Measuring Units: Select the measuring unit that balance will use to display weight



Piece counting function: to count identical items, reference quantities are selectable



Checkweighing: upper and lower limits can be set individually, for dosing and portioning



Percentage Weighing function: calculates the weight of a sample as a percentage from a reference weight (100%)



Totalization Function: measure cumulative weight of multiple items. Shows total and current weight



Animal Weighing: accurate readings under unstable conditions such moving laboratory animals



Battery Operating: Balance can work using AA batteries



Gross-Net-Tare function: shows simultaneously gross, net weight and tare



Suspended Weighing: a support with hook can be loaded on the underside of the balance



Max Load (Peak hold) function: retains the peak value in a series of consecutive weights



Water Resistant: stainless steel housing design to protect it from water damage



Density Determination function: accurately determines density of a solid object or a liquid

OPD-E Series - Resolution 0.1 mg



| Features | Benefits |
|---|---|
| Electromagnetic force sensor | High-sensitivity, high stability |
| Auto single button internal calibration | Ensures easy and frequent calibrations during use |
| 3-Door Anti-Static Draft Shield (removable) | Protect weighing samples from surrounding influences |
| Detachable display | Minimizes vibration when touching the display |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Leveling feet with 2 points of adjustment | Makes it level even on uneven working surfaces |
| Below balance weighing | Determines density of large pieces |
| Configurable RS 232 interface | Allows for communication w/ peripheral data collection and printing |
| Multiple weighing units | Allows for flexibility of weighing |

| Model | OPD-E104 | OPD-E204 |
|-----------------------------|--|----------|
| Capacity | 120 g | 210 g |
| Resolution | 0.0001 g (0.1 mg) | |
| Repeatability (Std. Dev.) | ± 0.0001 g (0.1 mg) | |
| Linearity Error | ± 0.0002 g (0.2 mg) | |
| Response Time | ≤ 2 sec | |
| Calibration | Auto Internal Calibration or Calibration with External Weight | |
| Weighing Units | g, ct, lb, oz, ozt, dwt | |
| Construction | Cast aluminum, static resistant ABS, static-resistant doors, stainless steel pan | |
| Display | Large, easy to read LCD display with backlight and icons, 3/4" (19 mm) high | |
| Pan Size | Φ 3.5 inches / 90 mm diameter | |
| Body dimensions (W x D x H) | 18" x 12" x 12.5" / 470 x 310 x 320 (mm) | |
| Power | 110v - 240v, 50HZ / 60HZ | |
| Operational Temperature | 50 °F to 158 °F / 10 °C to 70 °C | |
| Connectivity | Configurable RS 232 interface | |

OPD-A Series - Resolution 1mg, 0.01g



OPD-A103 --- OPD-A603



OPD-A1002 --- OPD-A6002



| Features | Benefits |
|--|---|
| Gold-plated ceramic capacitance sensor | High stability, minimizing the influence of temperature change |
| 3-Door Anti-Static Draft Shield (1mg models) | Protect weighing samples from surrounding influences |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Leveling feet with 2 points of adjustment | Makes it level even on uneven working surfaces |
| Below balance weighing | Determines density of large pieces |
| Configurable RS 232 interface | Allows for communication with peripheral data collection and printing |
| Multiple weighing units | Allows for flexibility of weighing |

| Model | OPD-A 103 | OPD-A 203 | OPD-A 303 | OPD-A 403 | OPD-A 503 | OPD-A 603 | OPD-A 1002 | OPD-A 2002 | OPD-A 3002 | OPD-A 4002 | OPD-A 5002 | OPD-A 6002 |
|----------------------|---|--------------|--------------|--------------|--------------|--------------|-------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Draft Shield | With Draft Shield | | | | | | No Draft Shield | | | | | |
| Capacity | 120g | 210g | 310g | 410g | 510g | 600g | 1100g | 2100g | 3100g | 4100g | 5100g | 6100g |
| Resolution | 0.001 g (1 mg) | | | | | | 0.01 g | | | | | |
| Repeatability | ± 0.001 g (1 mg) | | | | | | ± 0.01 g | | | | | |
| Linearity Error | ± 0.002 g (2 mg) | | | | | | ± 0.02 g | | | | | |
| Response Time | ≤ 2 sec | | | | | | | | | | | |
| Calibration | Calibration with External Weight | | | | | | | | | | | |
| Weighing Units | g, ct, lb, oz, ozt, dwt | | | | | | | | | | | |
| Construction | Cast aluminum, static resistant ABS, static-resistant doors (1mg models), stainless steel pan | | | | | | | | | | | |
| Display | Large, easy to read LCD display with backlight and icons, 3/4" (19 mm) high | | | | | | | | | | | |
| Pan Size | Φ 4.5" (115 mm) | | | | | | Φ 6.3" (160 mm) | | | | | |
| Body dim. | 9" x 12" x 13" (230 x 310 x 330 mm) | | | | | | 9" x 12" x 3.5" (230 x 310 x 90 mm) | | | | | |
| Power | 110v - 240v, 50HZ / 60HZ | | | | | | | | | | | |
| Operational Temp. | 50 °F to 158 °F / 10 °C to 70 °C | | | | | | | | | | | |
| Connectivity | Configurable RS 232 interface | | | | | | | | | | | |

OPH-P Series - Resolution 1mg



Optional Density Determination Kit



VATN High Contrast LCD Display

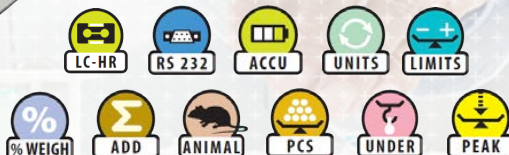


| Features | Benefits |
|---|---|
| Efficient filtering-out of vibrations | High stability and reliability |
| Legendary High Contrast Black LCD screen | Ensures clear readings in any areas |
| 3-Door Anti-Static Draft Shield | Protect weighing samples from surrounding influences |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Leveling feet with 2 points of adjustment | Makes it level even on uneven working surfaces |
| Optional density determination kit | Determines accurate density of both solid and liquid items |
| Below balance weighing | Determines density of large pieces |
| Configurable RS 232 interface | Allows for communication w/ peripheral data collection and printing |
| Multiple weighing units (17 total) | Allows for flexibility of weighing |

| Model | OPH-P103 | OPH-P203 | OPH-P303 | OPH-P1003 | OPH-P2003 |
|----------------------------|---|----------|----------|---------------------------|-----------|
| Capacity | 100 g | 200 g | 300 g | 1000 g | 2000 g |
| Resolution | 0.001 g (1 mg) | | | | |
| Repeatability | ± 0.001 g (1 mg) | | | | |
| Linearity Error | ± 0.002 g (2 mg) | | | | |
| Response Time | ≤ 2 sec | | | | |
| Calibration | Calibration with External Weight | | | Auto Internal Calibration | |
| Weighing Units | g, lb, kg, oz, ct, ozt, pcs, tls, tIT, tIH, dwt, GN (grain), dr, ms, bat, mom T/A/R | | | | |
| Construction | Cast aluminum, static resistant ABS, static-resistant doors (1mg models), stainless steel pan | | | | |
| Display | Large, easy to read LCD display with backlight and icons, 3/4" (19 mm) high | | | | |
| Pan Size | Φ 3.5" (90 mm) | | | Φ 4.25" (108mm) | |
| Body dimension (W x D x H) | 13.5" x 8.75" x 13" (345 x 223 x 330 mm) | | | | |
| Power | 110v - 240v, 50HZ / 60HZ | | | | |
| Operational Temp. | 50 °F to 86 °F / 10 °C to 30 °C | | | | |
| Connectivity | Configurable RS 232 interface | | | | |

PRECISION BALANCES (1mg, 0.01g, 0.1g)

PRECISION BALANCES (0.01 g, 0.1 g)



| Features | Benefits |
|---------------------------------|--|
| Economical and reliable | Helps you save money with confidence |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Leveling feet with level bubble | Makes it level even on uneven working surfaces |
| Below balance weighing | Determines density of large pieces |
| AC-DC available | Able to operate with rechargeable battery (not included) |
| LCD display with backlight | Allows for easy reading |
| Multiple weighing units | Allows for flexibility of weighing |

| Model | OPH-T 202 | OPH-T 302 | OPH-T 502 | OPH-T 602 | OPH-T 1002 | OPH-T 2002 | OPH-T 4002 | OPH-T 2001 | OPH-T 3001 | OPH-T 5001 | OPH-T 6001 |
|-----------------------|---|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---|---------------|---------------|
| Pan Size | Round Pan, Φ 5” (130 mm) | | | | | | | | Square Pan, 6.3” x 5.7” (165 x 145 mm) | | |
| Capacity | 200 g | 300 g | 500 g | 600 g | 1000 g | 2000 g | 4000 g | 2000 g | 3000 g | 5000 g | 6000 g |
| Resolution | 0.01 g | | | | | | | 0.1 g | | | |
| Repeatability | ± 0.01 g | | | | | ± 0.02 g | | ± 0.1 g | | | |
| Linearity Error | ± 0.02 g | | | | | ± 0.03 g | | ± 0.2 g | | | |
| Response Time | ≤ 2 sec | | | | | | | | | | |
| Calibration | Calibration with External Weight | | | | | | | | | | |
| Weighing Units | g, lb, oz, ct, ozt, N, dwt, GN (grain), tLT | | | | | | | | | | |
| Construction | Static resistant ABS, stainless steel pan | | | | | | | | | | |
| Display | Large, easy to read LCD display with backlight and icons, 3/4” (19 mm) high | | | | | | | | | | |
| Body dims (W x D x H) | 10.25” x 6.9” x 2.4” (260 x 175 x 60 mm) | | | | | | | | | | |
| Power | 110v - 240v, 50HZ / 60HZ | | | | | | | | | | |
| Operat.Temp. | 50 °F to 86 °F / 10 °C to 30 °C | | | | | | | | | | |

OPH-Z Series - Resolution 0.01g, 0.1g



VATN High Contrast LCD Display



| Features | Benefits |
|---|---|
| Large Capacity and High Resolution | Works for various applications |
| Rugged Construction | Assures fast, stable, and reproducible results |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Date, Time and Temperature displays | Advanced, user-friendly features |
| Legendary VATN High Contrast LCD screen | Ensures clear readings in any conditions |
| Leveling feet with level bubble | Makes it level even on uneven working surfaces |
| Below balance weighing | Determines density of large pieces |
| Configurable RS 232 interface | Allows for communication w/ peripheral data collection and printing |
| Multiple weighing units | Allows for flexibility of weighing |

| Model | OPH-Z4002 | OPH-Z10001 | OPH-Z20001 | OPH-Z30001 |
|----------------------------|---|----------------------------|---------------|---------------|
| Capacity | 4 kg (8.8 lb) | 10 kg (22 lb) | 20 kg (44 lb) | 30 kg (66 lb) |
| Resolution | 0.01 g | 0.1 g | | |
| Repeatability | ± 0.02 g | ± 0.2 g | | |
| Linearity Error | ± 0.02 g | ± 0.2 g | | |
| Response Time | ≤ 2 sec | | | |
| Calibration | Calibration with External Weight | | | |
| Weighing Units | g, lb, kg, oz, ct, ozt, pcs, tls, tIT, tIH, dwt, GN (grain), dr, ms, bat, mom T/A/R | | | |
| Construction | Cast aluminum, static resistant ABS, stainless steel pan | | | |
| Display | Large, easy to read LCD display with backlight and icons, 3/4" (19 mm) high | | | |
| Pan Size | 10" x 7" (255 x 180 mm) | 12" x 9" (295 x 220 mm) | | |
| Body dimension (W x D x H) | 13" x 13" x 5" (320 x 320 x 120 mm) | | | |
| Power | 110v - 240v, 50HZ / 60HZ | | | |
| Operational Temperature | 50 °F to 86 °F / 10 °C to 30 °C | | | |
| Connectivity | Configurable RS 232 interface | | | |

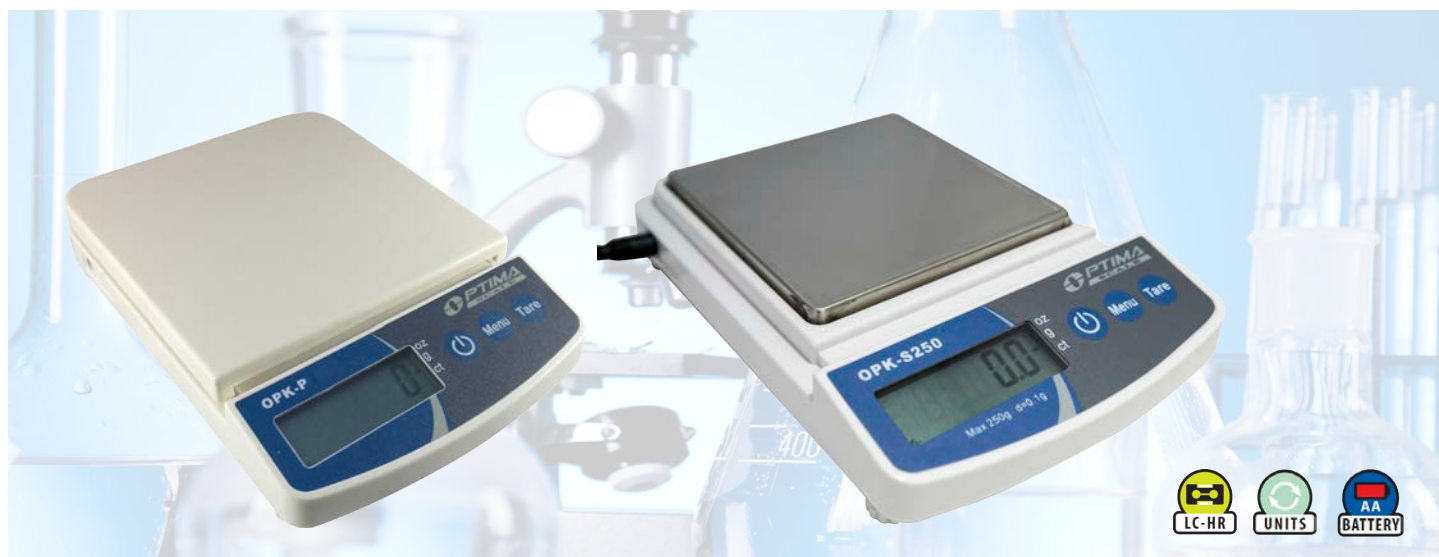
OPF-N Series - Resolution 0.1g, 1g



| Features | Benefits |
|---------------------------------------|--|
| Economical and reliable | Cost effective with high performance |
| Large Capacity and High Resolution | Works for various applications |
| Rugged Construction | Assures fast, stable, and reproducible results |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Leveling feet with level bubble | Makes it level even on uneven working surfaces |
| AC / Rechargeable battery (100 hours) | Complete mobility |

| Model | OPF-N3 | OPF-N7.5 | OPF-N15 | OPF-N30 |
|----------------------------|---|------------------|---------------|---------------|
| Capacity | 3 kg (6.6 lb) | 7.5 kg (16.5 lb) | 15 kg (33 lb) | 30 kg (66 lb) |
| Resolution | 0.1 g | 0.2 g | 0.5 g | 1 g |
| Repeatability | ± 0.1 g | ± 0.2 g | ± 0.5 g | ± 1 g |
| Linearity Error | ± 0.2 g | ± 0.5 g | ± 1 g | ± 2 g |
| Response Time | 3 sec | | | |
| Calibration | Calibration with External Weight | | | |
| Weighing Units | g, lb, kg, pcs | | | |
| Construction | Cast aluminum, static resistant ABS, stainless steel pan | | | |
| Display | Large, easy to read LCD display with backlight and icons, 3/4" (19 mm) high | | | |
| Pan Size | 11"x 8.5" / 260 x 220 mm | | | |
| Body dimension (W x D x H) | 10.5"x 12.5" x 5.5" / 260 x 320 x 140 mm | | | |
| Power | 110v - 240v, 50HZ / 60HZ; 9V Rechargeable battery (Bat. time: 30-60 hrs) | | | |
| Operational Temperature | 50 °F to 86 °F / 10 °C to 30 °C | | | |

OPK Series Compact Balances - Resolution 0.1g, 1g



| Features | Benefits |
|--|---|
| Entry level model with lab precision | Cost effective and high performance |
| Ergonomically optimized key pad w/ large keys | Convenient and efficient performance |
| Precise tare button | Calculates the net weight of your ingredients |
| Secure and non-slip positioning with rubber feet | Precise leveling of the scale |
| Detachable pan | For easy and hygienic cleaning |
| Both AC and AA batteries (not included) | Complete mobility |

| Model | OPK-P 250 | OPK-P 500 | OPK-P 2500 | OPK-P 5000 | OPK-S 250 | OPK-S 500 | OPK-S 2500 | OPK-S 5000 |
|-----------------------|---|--------------|---------------|---------------|----------------------------|--------------|---------------|---------------|
| Pan Type | ABS Plastic Pan | | | | Stainless Steel Pan | | | |
| Pan Size | 7" x 7" (175 x 175 mm) | | | | 5.7" x 5.7" (145 x 145 mm) | | | |
| Capacity | 250 g | 500 g | 2500 g | 5000 g | 250 g | 500 g | 2500 g | 5000 g |
| Resolution | 0.1 g | 0.1 g | 1 g | 2 g | 0.1 g | 0.1 g | 1 g | 2 g |
| Repeatability | ± 0.1 g | ± 0.1 g | ± 1 g | ± 2 g | ± 0.1 g | ± 0.1 g | ± 1 g | ± 2 g |
| Linearity Error | ± 0.2 g | ± 0.2 g | ± 2 g | ± 2 g | ± 0.2 g | ± 0.2 g | ± 2 g | ± 2 g |
| Response Time | 3 sec | | | | | | | |
| Calibration | Calibration with External Weight | | | | | | | |
| Weighing Units | oz, g, ct | | | | | | | |
| Construction | Static resistant ABS, stainless steel pan (OPK-S models) | | | | | | | |
| Display | Easy to read LCD display 5/8" (16 mm) high | | | | | | | |
| Body dims (W x D x H) | 9" x 16" x 1.6" (230 x 400 x 40 mm) | | | | | | | |
| Power | 110v - 240v, 50HZ / 60HZ (adapter not included); or (4) AA batteries (not included) | | | | | | | |
| Operat. Temp. | 50 °F to 86 °F / 10 °C to 30 °C | | | | | | | |

OPF-P Series Counting Scales - Resolution 0.1g, 1g

ACCURATE PARTS COUNTING FOR AN EFFICIENT INVENTORY MANAGEMENT SOLUTION



- Weighing
- Counting
- Checkweighing
- Checkcounting
- Accumulating
- Kitting

ALL IN ONE SCALE

| Features | Benefits |
|---|---|
| QUICKCOUNT™ | Jump and count in no time |
| Three windows (total weight, unit weight, quantity) | Weight and piece count show simultaneously |
| 21 PLU's (product LOOK-UP) | Fast retrieval of stored sample weights |
| Unit weight memory | Makes it possible to remember the important items counted |
| Overload alarm | Helps avoid overload |
| Portable and rugged design | Minimizes chances of damage due to frequent moves |
| Large stainless steel pan | Large enough to tare regular-sized bins or trays |
| AC / Rechargeable battery | Complete mobility |
| Large stainless steel pan | Allows for easy weighing of large objects |
| Leveling feet with level bubble | Makes it level even on uneven working surfaces |
| AC / Rechargeable battery (included) | Easy to use anywhere |

| Model | OPF-N3 | OPF-N7.5 | OPF-N15 | OPF-N30 |
|----------------------------|---|------------------|---------------|---------------|
| Capacity | 3 kg (6.6 lb) | 7.5 kg (16.5 lb) | 15 kg (33 lb) | 30 kg (66 lb) |
| Resolution | 0.1 g | 0.2 g | 0.5 g | 1 g |
| Internal Resolution | 600,000 graduations | | | |
| Count Capacity | 999,999 pieces | | | |
| Unit Weight Memory | 21 items | | | |
| Tare | Tare Full Capacity | | | |
| Display | Weight, Unit Weight, pcs | | | |
| Response Time | 2 sec | | | |
| Calibration | Calibration with External Weight | | | |
| Weighing Units | g, lb, kg, oz, pcs | | | |
| Construction | Cast aluminum, static resistant ABS, stainless steel pan | | | |
| Display | Large, easy to read LCD display with backlight and icons, 5/8" (16 mm) high | | | |
| Pan Size | 13.2"x 9" / 335 x 220 mm | | | |
| Body Dimension (W x D x H) | 13.5"x13"x4" / 340 x 320 x 95 mm | | | |
| Power | 110v - 240v, 50HZ / 60HZ; 9V Rechargeable battery (Bat. time: 100 hrs) | | | |
| Operational Temp. | 50 °F to 86 °F / 10 °C to 30 °C | | | |

OPD-P Series Paint-Mixing Scales - Resolution 0.1g



| Features | Benefits |
|---|--|
| Formula and filling weighing functions | Increases your paint mixing efficiency |
| Stainless steel housing resistant to solvents | Helps mix under tough ambient conditions |
| Weighing with a container | To weigh object or liquids without including the weight of the container |
| Percent deviation function | To calculate the amount by which a weight varies from a reference |
| Calculation by factor function | To mix fractional amounts |
| Percentage mode | Can adjust formula coefficients to make it display desired value |
| Display unit is backlit and tiltable | Excellent readouts and easy adjustment to your viewing angle |
| Display unit can be installed separately | Caters to your space requirements |
| Configurable RS 232 interface | Allows for communication w/ peripheral data collection and printing |

| Model | OPD-P5 | OPD-P8 | OPD-P10 | OPD-P15 |
|----------------------------|---|----------------|---------------|---------------|
| Capacity | 5 kg (11 lb) | 8 kg (17.6 lb) | 10 kg (22 lb) | 15 kg (33 lb) |
| Resolution | 0.1 g | | | |
| Linearity | ± 0.2 g | | | |
| Response Time | 2 sec | | | |
| Calibration | Calibration with External Weight | | | |
| Weighing Units | g, oz, Ct, Dwt, %, PCS | | | |
| Construction | Cast aluminum, stainless steel pan | | | |
| Display | Large, easy to read LCD display with backlight, 5/8" (16 mm) high | | | |
| Pan Size | Φ 9.5" (240 mm) | | | |
| Body Dimension (W x D x H) | 9.5" x 13.4" x 15" / 240 x 340 x 385 mm | | | |
| Net Weight | 7.7 lbs (3.5 kgs) | | | |
| Power | 110v - 240v, 50HZ / 60HZ | | | |
| Operational Temp. | 39 °F to 104 °F / 4 °C to 40 °C | | | |

REFERENCES BY CAPACITY/RESOLUTION

| RES. CAP. | 0.0001 g [0.1 mg] | 0.001 g [1 mg] | 0.01 g | 0.1 g | 0.2 g | 0.5 g | 1 g | 2 g |
|--------------|----------------------|----------------------|-------------------------------------|-------------------------------|----------|---------------------|---------------------|----------|
| 100 g | OPD-E104 | OPD-A103 OPH-P103 | | | | | | |
| 200 g | OPD-E204 | OPD-A203 OPH-P203 | OPH-T202 | | | | | |
| 250 g | | | | OPK-P250 | | | | |
| 300 g | | OPD-A303 OPH-P303 | OPH-T302 | | | | | |
| 400 g | | OPD-A403 | | | | | | |
| 500 g | | OPD-A503 | OPH-T502 | OPK-P500 | | | | |
| 600 g | | OPD-A603 | OPH-T602 | | | | | |
| 1000 g | | OPH-P1003 | OPD-A1002 OPH-T1002 | | | | | |
| 2000 g | | OPH-P2003 | OPD-A2002 OPH-T2002 | OPH-T2001 | | | | |
| 2500 g | | | | | | | OPK-2500 | |
| 3000 g | | | OPD-A3002 | OPH-T3001 OPF-N3 OPF-P3 | | | | |
| 4000 g | | | OPD-A4002 OPH-T4002 OPH-Z4002 | | | | | |
| 5000 g | | | OPD-A5002 | OPH-T5001 OPD-P5 | | | | OPK-5000 |
| 6000 g | | | OPD-A6002 | OPH-T6001 | OPF-P6 | | | |
| 7.5 kg | | | | | OPF-N7.5 | | | |
| 8 kg | | | | OPD-P8 | | | | |
| 10 kg | | | | OPH-Z10 OPD-P10 | | | | |
| 15 kg | | | | OPD-P15 | | OPF-N15; OPF-P15 | OPW-SS15 | |
| 20 kg | | | | OPH-Z20 | | | | |
| 30 kg | | | | OPH-Z30 | | | OPF-N30; OPF-P30 | |

OPTIMA SCALE

Rancho Cucamonga, CA USA || Rogers, MN USA • PH: 800.360.9619 • sales@optimascale.com

©2017 Optima Scale Manufacturing Inc.