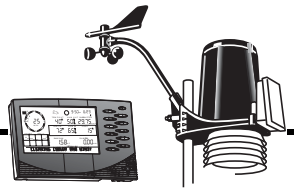
Cabled Vantage Pro2™ & Vantage Pro2 Plus™ Stations



6152C
6162C

Vantage Pro2™

The Vantage Pro2™ (# 6152C) and Vantage Pro2™ Plus (# 6162C) cabled weather stations include two components: the Integrated Sensor Suite (ISS) and the console. The ISS contains the sensor interface module (SIM), rain collector, an anemometer, and a passive radiation shield. The Vantage Pro2 console provides the user interface, data display, and calculations. The Vantage Pro2 Plus weather station includes two additional sensors that are optional on the Vantage Pro2 and purchased separately: the UV Sensor and the Solar Radiation Sensor. The console and ISS are powered by an AC-power adapter connected to the console. Batteries can be installed in the console to provide a backup power supply. Use WeatherLink® for Vantage Pro and Vantage Pro2 to let your weather station interface with a computer, log data, and upload weather information to the Internet. The 6152C and 6162C models rely on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings.

Integrated Sensor Suite (ISS)

Operating Temperature . . . . . -40° to +140°F (-40° to +60°C)
Storage Temperature . . . . . -50° to +158°F (-45° to +70°C)
Power Source, ISS SIM . . . . . Vantage Pro2 console / AC-power adapter
Connectors . . . . . Modular RJ-11
Cable Type . . . . . 4-conductor, 26 AWG
Cable Length, Console . . . . . 100' (30 m) (supplied) 1000' (300 m) (maximum recommended)
Cable Length, Anemometer . . . . . 40' (12 m) (supplied), 240' (73 m) (maximum recommended)
Wind Speed Sensor . . . . . Large wind cups with magnetic switch
Wind Direction Sensor . . . . . Wind vane with potentiometer
Rain Collector Type . . . . . Tip bucket, 0.01" per tip, 33.2 in^2 (214 cm^2) collection area
Temperature Sensor Type . . . . . Thermistor
Relative Humidity Sensor Type . . . . . Film capacitor element
Housing Material . . . . . UV-resistant PVC plastic
Sensor Inputs
  RF Filtering . . . . . RC low-pass filter on each signal line
ISS Dimensions:

Product #	Dimensions (Length x Width x Height)	Package Weight
6152C	11.0" x 9.3" x 14.0" (279 mm x 238 mm x 355 mm)	5.7 lbs. (2.6 kg)
6162C		6.1 lbs. (2.8 kg)

Console

Console Operating Temperature . . . . . +14° to +140°F (-10° to +60°C)
Display Temperature . . . . . +32° to +140°F (0° to +60°C)
Storage Temperature . . . . . -5° to +158°F (-20° to +70°C)
Current Draw (includes ISS) . . . . . 0.10 mA (average), 15 mA (peak) (plus 120 mA for illuminated display) at 4 to 6 VDC
Power Adapter . . . . . 5 VDC, 200 mA
Battery Backup . . . . . 3 C-cells
Battery Life (no AC power) . . . . . 1 month (approximately)
Connectors . . . . . Modular RJ-11
Housing Material . . . . . UV-resistant PVC plastic
Console Display Type . . . . . LCD Transflective
Dimensions (Console: length x width x height; Display: length x height)
  Console . . . . . 9.63" x 1.50" 6.13" (244 mm x 38 mm x 156 mm)
  Display . . . . . 5.94" x 3.375" (151 mm x 86 mm)
Weight (with batteries) . . . . . 1.88 lbs. (.85 kg)

Data Displayed on Console

The data display categories represent all weather variables that the console displays and are listed in alphabetical order. General describes the general ways in which data is displayed and archived for all data display categories and is listed first as a point of reference. See the individual data display categories for specific display information.

General

Daily Data	Includes the earliest time of occurrence of highs and lows; period begins/ends at 12:00 am
Monthly Data	Period begins/ends at 12:00 am on the first of the month
Yearly Data	Period begins/ends at 12:00 am on the first of January unless otherwise noted
Current Display Data	Current display data describes the current reading for each weather variable. In most cases, the variable lists the most recently updated reading or calculation. Some current variable displays can be adjusted so there is an offset for the reading.
Current Graph Data	Current graph data appears in the right most column in the console graph and represents the latest value within the last period on the graph; totals can be set or reset. Display intervals vary. Example include: Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data	Includes the past 24 values listed unless otherwise noted; all can be cleared and all totals reset. Display intervals vary. Examples include: 15-min., and Hourly Reading; Daily, Monthly, High and Low
Graph Time Interval Length	1 min., 10 min., 15 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected)
Graph Time Span	24 Intervals + current interval (see graph intervals to determine time span)
Graph Variable Span (Vertical Scale)	Automatic (varies depending upon data range); Maximum and Minimum value in range appear in ticker
Alarm Indication	Alarms sound for only 2 minutes (time alarm is always 1 minute) if operating on battery power. Alarm message is displayed in ticker as long as threshold is met or exceeded. Alarms can be silenced (but not cleared) by pressing the DONE key.
Update Interval	Varies with sensor - see individual sensor specifications

Barometric Pressure

Resolution and Units	Measured in 0.01" Hg. Other units are converted from Hg and rounded to nearest 0.1 mm, 0.1 hPa, 0.1mb
Corrected Range	26.00" to 32.00" Hg, 660.0 to 810.0 mm Hg, 880.0 to 1080.0 hPa/mb
Uncorrected Range	16.00" to 33.50" Hg, 406.0 to 850.0 mm Hg, 542.0 to 1130.0 hPa/mb
Elevation Range	-1500' to +15,300' (-460 m to 4670 m). The console screen limits display of lower elevation to -999' when using feet as elevation unit.
Uncorrected Reading Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb) (at room temperature)
Sea-Level Reduction Equation Used	United States Method employed prior to use of current "R Factor" method
Equation Source	Smithsonian Meteorological Tables
Equation Accuracy	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb)
Elevation Accuracy Required	±10' (3m) to meet equation accuracy specification
Overall Accuracy	±0.04" Hg (±1.0 mm Hg, ±1.4 hPa/mb)
Trend (change in 3 hours)	Change 0.06" (2.0 hPa/mb, 1.5 mm Hg) = Rapidly Change 0.02" (0.7hPa/mb, 0.5 mm Hg)= Slowly
Trend Indication	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval	15 minutes or when console BAR key is pressed twice
Current Display Data	Instant
Current Graph Data	Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data	15-min. and Hourly Reading; Daily, Monthly Highs and Lows

Alarms	High Threshold from Current Trend for Storm Clearing (Rising Trend) Low Threshold from Current Trend for Storm Warning (Falling Trend)
Rising and Falling Trend Alarms Range	0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)

Clock

Accuracy	±8 seconds/month
Resolution	1 minute
Units	Time: 12 or 24 hour format (user-selectable) Date: US or International format (user-selectable)
Adjustments	
Time	Automatic Daylight Savings Time (for users in North America, Europe and Australia that observe it in AUTO mode, MANUAL setting available for all other areas)
Date	Automatic Leap Year
Alarms	Once per day at set time when active

Dewpoint (calculated)

Resolution and Units	1°For 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-105° to +130°F (-76° to +54°C)
Accuracy	±3°F (±1.5°C) (typical)
Update Interval	10 seconds
Source	World Meteorological Organization (WMO)
Equation Used	WMO Equation with respect to saturation of moist air over water
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Daily, Monthly High and Low
Historical Graph Data	Hourly Calculations; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Calculation

Evapotranspiration (calculated, requires Solar Radiation Sensor)

Resolution and Units	Measured in 0.01". Converted to mm and rounded to nearest 0.2 mm
Range	Daily to 99.99" (999.9 mm); Monthly & Yearly to 199.99" (1999.9 mm)
Accuracy	Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a CIMIS ET weather station
Update Interval	1 hour
Calculation and Source	Penman-Monteith Equation as implemented by CIMIS (California Irrigation Management Information System) including Net Radiation calculation
Current Display Data	Latest Hourly Total Calculation
Current Graph Data	Latest Hourly Total Calculation, Daily, Monthly, Yearly Total
Historical Graph Data	Hourly, Daily, Monthly, Yearly Totals
Alarm	High Threshold from Latest Daily Total Calculation

Forecast

Variables Used	Barometric Reading & Trend, Wind Speed & Direction, Rainfall, Temperature, Humidity, Latitude & Longitude, Time of Year
Update Interval	1 hour
Display Format	Icons on top center of display; detailed message in ticker at bottom
Variables Predicted	Sky Condition, Precipitation, Temperature Changes, Wind Direction and Speed

Heat Index (calculated)

Resolution and Units	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-40° to +135°F (-40° to +57°C)
Accuracy	±3°F (±1.5°C) (typical)
Update Interval	10 seconds
Source	United States National Weather Service (NWS)/NOAA
Formulation Used	Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Daily, Monthly High
Historical Graph Data	Hourly Calculations; Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

Humidity

Inside Relative Humidity (sensor located in console)

Resolution and Units	1%
Range	0 to 100% RH
Accuracy	±5%
Update Interval	1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant, Hourly Reading; Daily, Monthly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

Outside Relative Humidity (sensor located in ISS)

Resolution and Units	1%
Range	0 to 100% RH
Accuracy	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Temperature Coefficient	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift	±0.5% per year
Update Interval	50 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant and Hourly Reading; Daily, Monthly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

Moon Phase

Console Resolution	1/8 (12.5%) of a lunar cycle, 1/4 (25%) of lighted face on console
WeatherLink Resolution	0.09% of a lunar cycle, 0.18% of lighted face maximum (depends on screen resolution)
Range	New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Wanning Gibbous, Last Quarter, Waning Crescent
Accuracy	±38 minutes

Rainfall

Resolution and Units	0.01" or 0.2 mm with optional metric adapter (included) (Console rounds 1 mm if rain totals are 2000 mm or higher)
Daily/Storm Rainfall Range	0 to 99.99" (0 to 9999 mm)
Monthly/Yearly/Total Rainfall Range	0 to 199.99" (0 to 19999 mm)
Rain Rate	0 to 199.99" (0 to 19999 mm)
Accuracy	For rain rates up to 2"/hr (50 mm/hr): ±4% of total or +0.01" (0.2 mm) (0.01" = one tip of the bucket, 0.2 mm with metric adapter), whichever is greater. For rain rates from 2"/hr (50 mm/hr) to 4"/hr (100 mm/hr): ±5% of total or +0.01" (0.2 mm) (0.01" = one tip of the bucket, 0.2 mm with metric rain adapter), whichever is greater.
Update Interval	10 seconds
Storm Determination Method	0.02" (0.5 mm) begins a storm event, 24 hours without further

	accumulation ends a storm event
Current Display Data	Totals for Past 15-min
Current Graph Data	Totals for Past 15-min, Past 24-hour, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin date); Umbrella is displayed when 15 minute total exceeds zero
Historical Graph Data	Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin and end dates)
Alarms	High Threshold called "Flash Flood" (15-min. Total, default is 0.50", 12.7 mm), 24-hour Total, Storm Total
Range for Rain Alarms	0 to 99.99" (0 to 999.7 mm)

Rain Rate

Resolution and Units	0.01" or 0.2 mm (with optional metric adapter (included)) at typical rates (see Fig. 2 and 3)
Range	0, 0.04"/hr (1 mm/hr) to 100"/hr (0 to 1999.9 mm/hr)
Accuracy	±5% or ±0.04"/hr (1 mm/hr) (up to 10"/hr. [250 mm/hr.]), whichever is greater
Update Interval	10 seconds
Calculation Method	Measures time between successive tips of rain collector. Elapsed time greater than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.
Current Display Data	Instant
Current Graph Data	Instant and 1-min. Reading; Hourly, Daily, Monthly, Yearly High
Historical Graph Data	1-min Reading; Hourly, Daily, Monthly, Yearly Highs
Alarm	High Threshold from Instant Reading

Solar Radiation (requires Solar Radiation Sensor)

Resolution and Units	1 W/m^2
Range	0 to 1800 W/m^2
Accuracy	±5% of full scale (Reference: Eppley PSP at 1000 W/m^2)
Drift	Up to ±2% per year
Cosine Response	±3% for angle of incidence from 0° to 75°
Temperature Coefficient	-0.067% per °F (-0.12% per °C); reference temperature = 77°F (25°C)
Update Interval	50 seconds (5 minutes when dark)
Current Display Data	Instant
Current Graph Data	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Reading

Sunrise and Sunset

Resolution	1 minute
Accuracy	±1 minute
Reference	United States Naval Observatory

Temperature

Inside Temperature (sensor located in console)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C.°(nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C. Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	+32° to +140°F (0° to +60°C)
Sensor Accuracy	±1°F (±0.5°C) typical
Update Interval	1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; Daily and Monthly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

Outside Temperature (sensor located in ISS)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C.°(nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C. Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±1°F (±0.5°C) typical (see Fig. 1)
Radiation Induced Error	+4°F (2°C) at solar noon (insolation = 1040 W/m^2, avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Update Interval	10 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant Reading; Daily, Monthly, Yearly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

Temperature Humidity Sun Wind Index (requires Solar Radiation Sensor)

Resolution and Units	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	-90° to +135°F (-68° to +64°C)
Accuracy	±4°F (±2°C) (typical)
Update Interval	10 seconds
Sources and Formulation Used	United States National Weather Service (NWS)/NOAA Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used	Instant Outside Temperature, Instant Outside Relative Humidity, 10-minute Average Wind Speed, 10-minute Average Solar Radiation
Formulation Description	Uses Heat Index as base temperature. Effects of wind and solar radiation are either added or subtracted from this base to give an overall effective temperature
Current Display Data	Instant
Current Graph Data	Instant and Hourly Calculation; Daily, Monthly Highs
Historical Graph Data	Hourly Calculation; Daily, Monthly Highs
Alarm	High Threshold from Instant Reading

Ultra Violet (UV) Radiation Dose (requires UV Sensor)

Resolution and Units	0.1 MEDs to 19.9 MEDs; 1 MED above 19.9 MEDS
Range	0 to 199 MEDs
Accuracy	±5% of daily total
Drift	up to ±2% per year
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Latest Daily Total (user resettable at any time from Current Screen)
Historical Graph Data	Hourly, Daily Totals (user reset from Current Screen does not affect these values)
Alarm	High Threshold from Daily Total
Alarm Range	0 to 19.9 MEDs

Ultra Violet (UV) Radlatlon Index (requires UV Sensor)

Resolution and Units	0.1 Index
Range	0 to 16 Index
Accuracy	±5% of full scale (Reference: Yankee UVB-1 at UV Index of 10 (extremely high))
Cosine Response	±4% (0° to 65° incident angle); 9% (65° to 85° incident angle)
Update Interval	50 seconds (5 minutes when dark)
Current Display Data	Instant
Current Graph Data	Instant and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

Wind

Wind Chill (Calculated)

Resolution and Units	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-110° to +130°F (-79° to +54°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 seconds
Source	United States National Weather Service (NWS)/NOAA
Equation Used	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Hourly, Daily, Monthly Low
Historical Graph Data	Hourly, Daily, Monthly Lows
Alarm	Low Threshold from Instant Calculation

Wind Direction

Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±4°
Update Interval	2.5 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Graph Data	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants

Wind Speed

Resolution and Units	Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot
Range (large wind cups, included)	2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h
Range (small wind cups; optional, not included)	3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h
Update Interval	Instant Reading: 2.5 seconds, 10-minute Average: 1 minute
Accuracy (large wind cups, included)	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Accuracy (small wind cups; optional, not included)	±3 mph (3 kts, 5 km/h, 1.5 m/s) or ±5%, whichever is greater
Maximum Cable Length	240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to the ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240' (73 m), the maximum is 100 mph.
Current Display Data	Instant
Current Graph Data	Instant; 10-minute and Hourly Average; Hourly High; Daily, Monthly, Yearly High with Direction of High
Historical Graph Data	10-min. and Hourly Averages; Hourly Highs; Daily, Monthly, Yearly Highs with Direction of Highs
Alarms	High Thresholds from Instant Reading and 10-minute

Sensor Charts

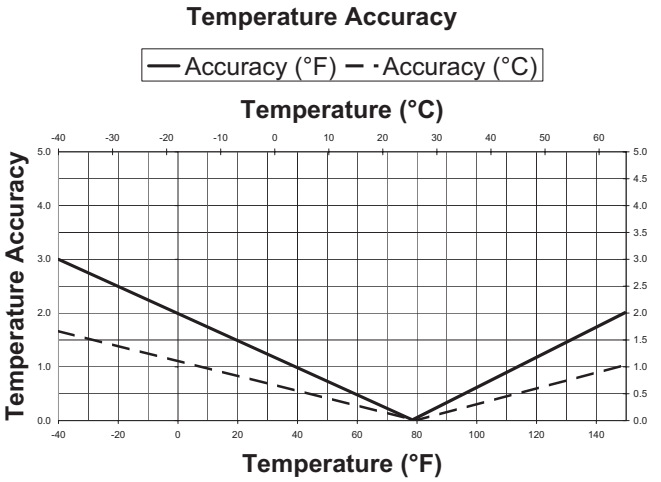


Figure 1. Temperature Accuracy

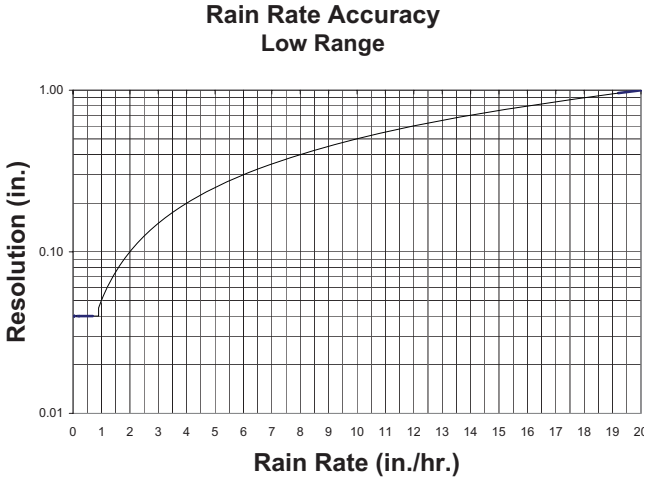


Figure 2. Low Range Rain Rate Resolution

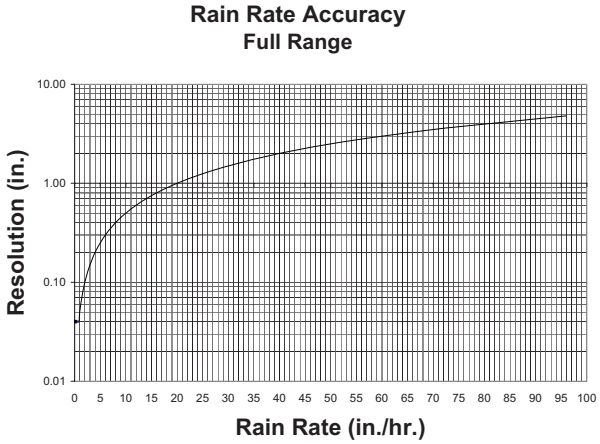


Figure 3. Full Range Rain Rate Resolution

Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6152C	17.0" x 11.0" x 13.0" (410 mm X 264 mm x 330 mm)	12.8 lbs. (5.8 kg)	011698 00755 4
6152CEU			011698 00772 1
6152CUK			011698 00773 8
6162C		13.3 lbs. (6.0 kg)	011698 00756 1
6162CEU			011698 00774 5
6162CUK			011698 00775 2