KONICA MINOLTA

THE STANDARD IN MEASURING
COLOR

CR-410FF

French Fry Package

The Right Color for French Fries

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What is a CR-410FF?

The CR-410FF is a precise colorimeter that can be used to measure the color of cooked French Fries. Currently, cooked fries are either evaluated visually for color or they are measured by a bulky and expensive instrument. The CR-410FF can be used to measure the color of fried potatoes and will display a number, an index value, calculated to correlate to industry standard measurements. The CR-410FF instrument is based on Konica Minolta's CR-400 series instrument technology, a highly accurate and reliable platform that has been in service to the food industry for over 20 years.

What makes the CR-410FF different than currently available instruments?

Advantages:

- Portability-Measurements can be taken on the production floor
- Lower cost, up to 50% less expensive than competitive instruments
- Improved accuracy over competitive models
- Measures color in the visible range, as people see it. Competitive instruments do not

How can the CR-410FF help the industry?

The CR-410FF is very accurate and repeatable. The CR-410FF boasts one of the best inter instrument agreement specifications in the industry.

That means if you are correlating data with other locations or using multiple instruments you can be assured the numbers match instrument to instrument, location to location.

The lower initial cost of ownership of CR-410FF coupled with its high accuracy gives companies the ability to access a first class measurement solution economically. The total cost of ownership including service is substantially lower than competitive models.

What are the key features/benefits to the customer?

- Ease of use
- More affordable than competitive instruments
- Portable/Handheld
- CR-410FF has lower maintenance costs than competitive models

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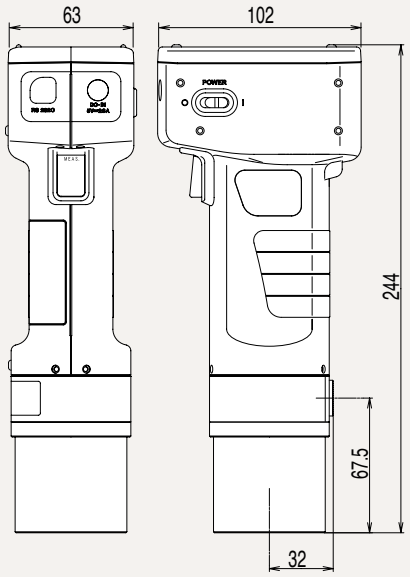
Specifications

Model	CR-410 Head
Name	Chroma Meters Measuring Head
Illuminating/viewing system	Wide-area illumination/0° viewing angle; specular component included
Detector	Silicon photocells (6)
Display range	Y: 0.01% to 160.00% (reflectance)
Light source	Pulsed xenon lamp
Measurement time	1 sec.
Minimum measurement interval	3 sec.
Battery performance	Approx. 800 measurements (when using batteries under Konica Minolta's testing conditions)
Measurement/illumination area	ϕ50mm/ ϕ53mm
Repeatability	Within ΔE*ab 0.07 standard deviation (when the white calibration plate is measured 30 times at intervals of 10 seconds)
Inter-instrument agreement	ΔE*ab: Within 0.8 Average of 12 BCRA Series II colors
Observer	2° Closely matches CIE 1931 Standard Observer (x2 λ, yλ, zλ)
Illuminant *1	C, D65
Display *1	Chroma values, color difference values, PASS/WARN/FAIL display
Tolerance judgement *1	Color difference tolerance (box tolerance and elliptical tolerance)
Color space/ colorimetric data	XYZ, Y x y, L*a*b*, Hunter Lab, L*C*h, Munsell (only illuminant C), CMC (l:c), CIE1994, Lab99, LCh99, CIE2000, CIE WI-Tw (only illuminant D65), WI ASTM E313 (only illuminant C), YI ASTM D1925 (only illuminant C), YI ASTM E313 (only illuminant C), User index (up to six can be registered from computer)
Languages *1	Operating keys: English LCD: English (default) (LCD: German, French, Italian, Spanish, Japanese) *1
Storable data sets	1000 (measuring head and data processor save different data)
Color difference target colors	100
Calibration channels *1	20 channels (ch00: white calibration, ch01 to ch19 : user calibration)
Display	Dot-matrix LCD with back light (15 chars x 9 lines + 1 line for icon display)
Interface	RS0232C compliant (for data processor/PC) *Baud rate: 4800, 9600, 19200 (bps) set at 9600 b ps when shipped from factory
Power source	4 AA size alkaline or Ni-MH batteries, AC adapter AC120V 50-60Hz (for North America and Japan) AC230V 50-60Hz (for worldwide except North America)
Size	410: 102 (W) x 244 (H) x 63 (D) mm
Weight	410: Approx 570g (including 4 AAA size batteries and not including RS-232C cable)
Operating temperature/ Humidity Range	0° to 40°C, relative humidity 85% or less (at 35° C) with no condensation *Operating temperature/humidity range of products for North America: 5° to 40°C, relative humidity 80% or less (at 31° C) with no condensation
Storage temperature/ Humidity range	-20° to 40°C, relative humidity 85% or less (at 35° C) with no condensation
Other	LCD back light ON/OFF function (when ON< back light stays ON for 30 seconds after last key or measuremment operation)
*1 indicates when connected to the Data Processor or when not set using the Data Processor or the optional software, that some of the function are not available when the measuring head is not connected.	

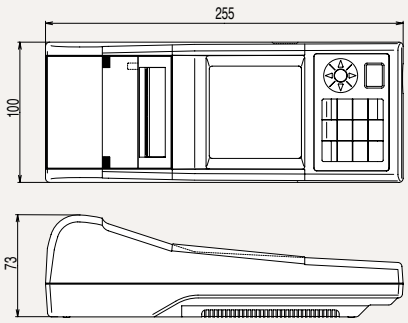
Dimensions

Units : mm

MEASURING HEAD CR-410



DATA PROCESSOR DP-400 (OPTIONAL)



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Name	Data Processor
Model	DP-400
Display range	Y : 0.01 to 160.00% (reflectance)
Measurement time *2	1 Seconds
Minimum measurement interval *2	3 Seconds
Battery performance	Approx. 800 measurements (when using batteries under company testing Konica Minolta's conditions)
Illuminants	C, D65
Display	Chroma values, color difference values, color difference graphs, PASS/WARN/FAIL display
Tolerance judgment *2	Color difference tolerance (box tolerance and elliptical tolerance) Only for the display function
Color space/ colorimetric data	XYZ, Y x y, L*a*b*, Hunter Lab, L*C*h, Munsell (only illuminant C), CMC (l:c), CIE1994, Lab99, LCh99, CIE2000, CIE WI-Tw (only illuminant D65), WI ASTM E313 (only illuminant C), YI ASTM D1925 (only illuminant C), YI ASTM E313 (only illuminant C), User index (up to six registered in the Measuring Head can be used)
Languages	Operating keys : English, LCD : English (default), German, French, Italian, Spanish, Japanese
Storable data sets	Max. 2000 pieces of data (divisible into 100 pages) Deletion and Undoing selected stored data (one piece of data or all data) are possible
Color difference target colors *2	Only for the operating function (100 pieces of data when the measuring head is connected; input of measurement values or numeric) (independent of page function)
Calibration channels *2	Only for the operating function (20 channels when the measuring head is connected) (ch00: white calibration; ch01 to ch19: user calibration)
Page function	100 pages
Display	Dot-matrix LCD with back light (16 chars x 9 lines + 1 line for icon display) Contrast adjustment
Printer	384 dot line thermal printer (can also print graphs) Automatically prints out all measurement results (can be set not to print)
Statistical function	Maximum, minimum, average and standard deviation
Automatic measurement *2	Date and time display: year, month, day, hour, minute Timer: 3 seconds. to 99 minutes (Some measurement modes require more than 3 seconds)
Interface	RS-232C compliant Baud rate (bps) : 19200 fixed (when connected to PC) When measuring head is connected baud rate is automatically set to that of the measurement head
Power source	4 AA size alkaline or Ni-MH batteries, AC adapter AC120V 50-60Hz (for North America and Japan) AC230V 50-60Hz (for worldwide except North America)
Size	100(W) x 73(H) x 255(D)mm
Weight	Approx. 600g (not including batteries and paper)
Operating temperature/Humidity Range	0° to 40°C, relative humidity 85% or less (at 35°C) with no condensation *Operating temperature/humidity range of products for North America : 5° to 40°C, relative humidity 80% or less (at 31°C) with no condensation
Storage temperature/Humidity range	-20° to 40°C, relative humidity 85% or less (at 35°C) with no condensation
Other User	calibration function (multi-calibration/manual calibration) *2, Measurements for automatic average function, Print ON/OFF function. CR-400 measurement data import function *2, All color space print ON/OFF function, Data protection ON/OFF function. Back light ON/OFF function. Buzzer ON/OFF function. Display color limit function, Remote mode (stored data output), Character input function (alphanumeric)
*2 indicates that part of or all functions are not available when the measurement head is not connected	

Specifications are subject to change without notice.

SAFETY PRECAUTIONS

For correct use and for your safety, be sure to read the instruction manual before using the instrument

- Always connect the instrument to the specified power supply voltage. Improper connection may cause a fire or electric shock.

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