KONICA MINOLTA

Spectrophotometer

CM-5

Stand alone Top-Port
High Accuracy and Ease of Use
Flexible and Versatile

Giving Shape to Ideas

CM-5 Top-Port Spectrophotometer offering versatile usage and simple operation

Developed from the requirements of customers in the food & ingredients, pharmaceuticals & chemicals, and cosmetics & perfumes industry.

Requirements for colour measurement of foods, ingredients, flavours & fragrances, drinks, pharmaceuticals, cosmetics and base chemicals are especially demanding due to the extreme diversity of sample forms, from solids, powders, granules, pastes and liquids either opaque, translucent or transparent. An instrument capable of covering this wide range of products must not only be flexible in terms of measurement methodology but even more importantly in terms of user friendliness and minimum sample preparation time to allow fast routine measurements in the laboratory or in production control. The Konica Minolta Benchtop Spectrophotometer CM-5 offers exactly this combination of versatility and simplicity to cover all the requirements in a true “all-in-one” concept. Thanks to its large colour display, the measurements taken are visible automatically without the need of a computer.

Full-featured stand alone instrument **that covers all your applications**

The top-port concept allows easy sample positioning and measurement of solid samples in reflection mode. Just place the sample on the measuring port and press the measurement button.

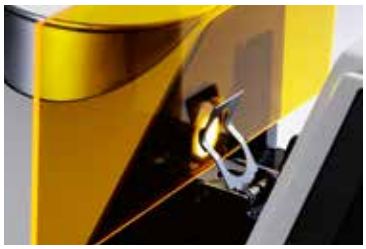
Measuring areas with 30, 8 and 3 mm allow perfect adaption to the sample size.

Samples in paste, powder or granule form can easily be measured with the optional petri-dish set.

Reflection measurement of solids

Reflection measurement of paste products

Measurement of liquids in transmission

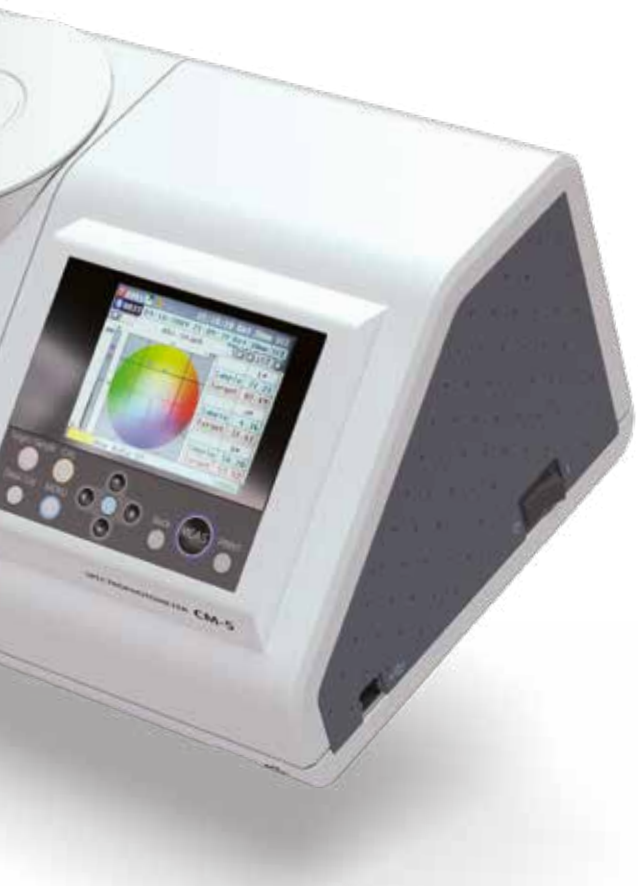


Measurement of solids in transmission

Simply sliding the top cover opens the large transmission chamber to measure all kind of transparent liquids or solids, such as foils or glass plates in transmission mode.

For liquids, glass or plastics, the sample thickness can be up to 60 mm, including 12.5 mm standard glass cells when using the optional adapter.

Functions and features that make **your daily work faster and easier**



The large LCD screen shows the measurement results either numerically or graphically including reflectance values, all colour systems and PASS/ FAIL evaluations (including colorimetric plots and spectal graphs).

To simplify the operation; the “Operation Wizard” is a perfect step-by-step on screen user guide in 8 languages to ease operation.

To simplify the use of the CM-5 by several people in parallel, measurement data and instrument settings can be saved on a USB stick. In addition, a USB keyboard can be directly connected to the CM-5 device to edit data directly (data names and comments)*.

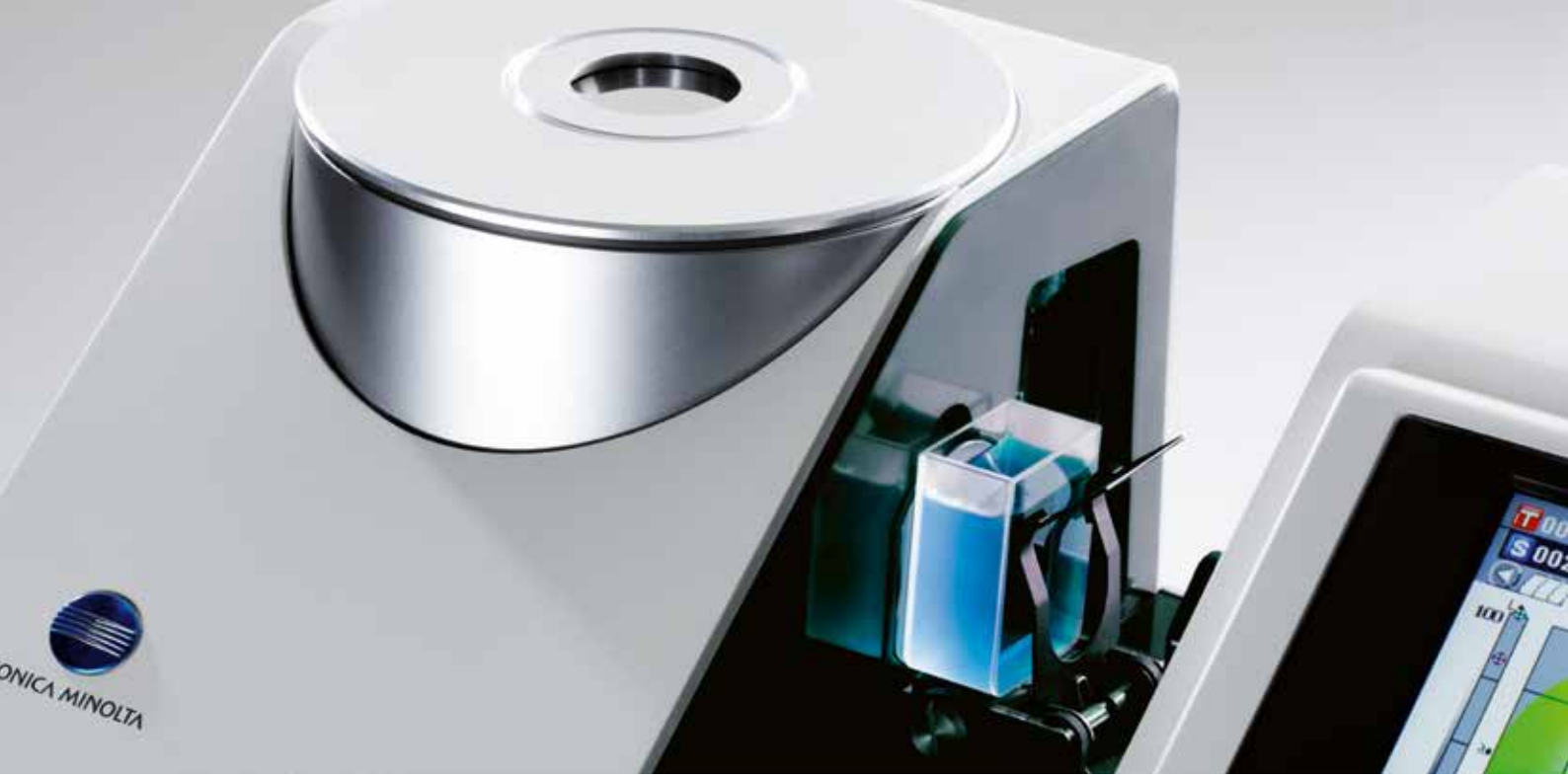
*US keyboard layout supported

Internal calibration curves for measuring standard chemical/ pharmaceutical indices

The CM-5 can measure several of the standard colour indices commonly used in the chemical and pharmaceutical field: Gardner, Platinum-Cobalt Color Scale (Hazen/ APHA), Iodine Color Number, European Pharmacopoeia, US Pharmacopeia and Japanese Pharmacopoeia. Calibration curves for these indices are stored in the CM-5, so measurements of samples based on these indices can be performed quickly and easily by anyone.

*Index calibration curves were measured using 10 mm-Wide Cell Measurement Set CM-A207 and commercially available 10 mm-wide cells with 10 mm-wide cells with 10 mm optional path length.

*APHA display range: 0 to 1000; Gardner display range: 0 to 18



Measurements as simple **as 1-2-3!**

Switch on power

The CM-5 starts up and automatically performs white/100% calibration* using an internal white calibration plate behind the shutter.

*Not applicable to liquid transmittance measurements using cells

Position sample

For reflectance, the top-port makes measuring samples of various shapes and sizes easy. For transmittance, sliding open the CM-5 reveals a large transmittance chamber. Liquids can be measured using optional cells.

Press MEAS

The measurement is taken and the results appear in the display. The large colour LCD enables data to be shown not only numerically, but also on the colorimetric plots and spectral graphs that normally require a computer to be visible.

The spectrophotometer CM-5 can be used **in a wide range of industries**

Food & Ingredients

Drinks

Flavours & Fragrances

Pharmaceuticals

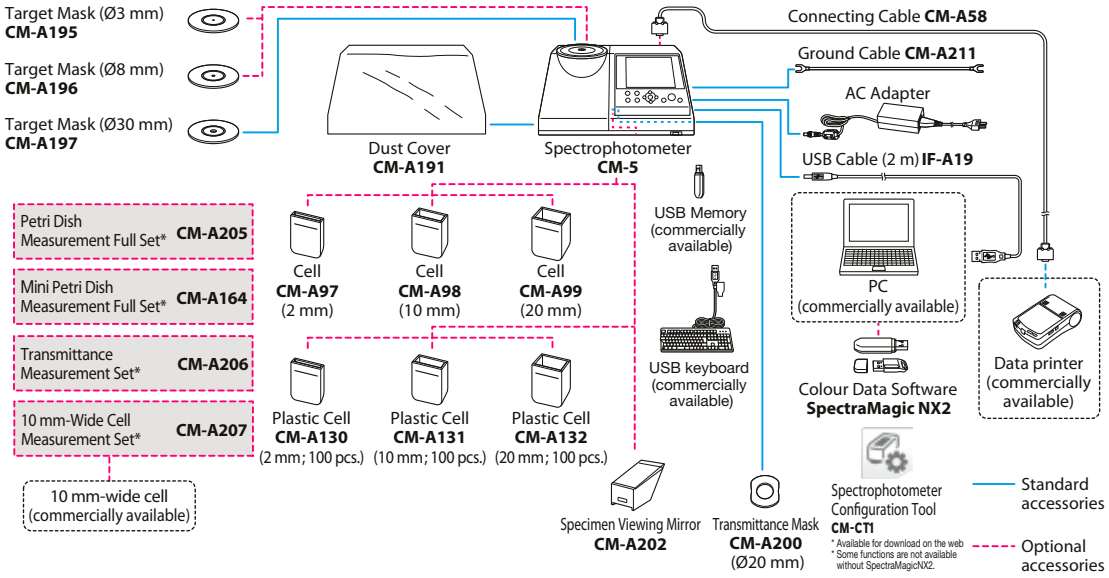
Cosmetics

Base Chemicals

The top 10 features

- High-end spectrophotometer with wide wavelength range
- Top-port concept for reflectance measurements
- Large transmission chamber for liquids & solids
- Stand alone function with LCD screen and firmware
- Measurement of industry specific indices
- Storage of user settings and data on USB stick
- "Operation Wizard" with real time on screen user guidance
- Firmware in 8 languages
- Extremely easy operation with automatic calibration
- Compact, lightweight and functional design

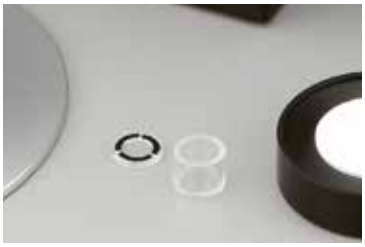
System Diagram



*For details, refer to the following table. Mini Petri Dish CM-157 requires firmware version 1.2 or later.

	Petri Dish Measurement Full Set **CM-A205**	Mini Petri Dish Measurement Full Set **CM-A164**	Transmittance Measurement Set **CM-A206**	10 mm-Wide Cell Measurement Set **CM-A207**
White Calibration Plate (with CD-ROM containing calibration data and data-setting software) **CM-A210**	●	●		
Zero Calibration Box **CM-A124**	●	●		
Target Mask (for Petri Dish) **CM-A203**	●			
Petri Dish **CM-A128**	●			
Calibration Glass (for Petri Dish) **CM-A212**	●			
Target Mask (for Mini Petri Dish) **CM-A158**		●		
Mini Petri Dish **CM-A157**		●		
Calibration Glass (for Mini Petri Dish) **CM-A159**		●		
Transmittance Zero Calibration Plate **CM-A213**			●	
Transmittance Specimen Holder **CM-A96**			●	
Transmittance Specimen Holder Attachment **CM-A199**			●	
Transmittance Specimen Holder (10 mm-wide cells) **CM-A198**				●
Transmittance Zero Calibration Plate (10 mm-wide cells) **CM-A204**				●
Accessory Case **CM-A193**	●	●	●	

Petri Dish Measurement Full Set CM-A205



Mini Petri Dish Measurement Full Set CM-A164

Transmittance Measurement Set CM-A206

10 mm-Wide Cell Measurement Set CM-A207

Specifications CM-5

Illumination/viewing system	Reflectance:	di:8°, de:8° (diffuse illumination: 8° viewing) / SCI (specular component included)/SCE (specular component excluded) switchable Conforms to CIE No. 15, ASTM E 1164, DIN 5033 Teil 7, and JIS Z 8722 (Condition g)
	Transmittance:	di:0°, de:0° (diffuse illumination: 0° viewing)
Integrating sphere size	Ø152 mm	
Detector	Dual 40-element silicon photodiode arrays	
Spectral separation device	Planar diffraction grating	
Wavelength range	360 nm to 740 nm	
Wavelength pitch	10 nm	
Half bandwidth	Approx. 10 nm	
Measurement range	0 to 175 % (Reflectance or transmittance); Output/display resolution: 0.01%	
Light source	Pulsed Xenon lamp	
Measurement time	Approx. 1 s (to data display/output); Minimum measurement interval: approx. 3 s	
Measurement/ illumination area	Reflectance:	Changeable by changing mask and settings. LAV: Ø30 mm / Ø36 mm; MAV (optional): Ø8 mm / Ø11 mm; SAV (optional): Ø3 mm / Ø6 mm
	Transmittance:	Ø20 mm / Ø26 mm
Repeatability	Spectral reflectance: Standard deviation within 0.1% (400 nm to 740 nm) / Chromaticity value: Standard deviation within ΔE*ab 0.04 * When a white calibration plate is measured 30 times at 10-second intervals after white calibration	
Inter-instrument agreement	Within ΔE*ab 0.15 (Typical) I (Based on 12 BCRA Series II colour tiles compared to values measured with a master body at 23°C)	
Transmittance chamber	No sides (unlimited sample length); Depth (maximum sample thickness): 60 mm Sample holder (optional) for holding sheet samples or containers of liquid samples can be installed/removed	
Display	14.5 cm TFT colour LCD	
Display languages	English, Japanese, German, French, Italian, Spanish, Portuguese, Simplified Chinese	
White calibration	Automatic white calibration (reflectance) / 100% calibration (transmittance) using internal white calibration plate. (Not applicable to 100% calibration when using cells for transmittance measurements of liquids.)	
Interfaces	USB 1.1 (Connection to PC, USB memory stick*1, USB keyboard*2); RS-232C standard (Connection to serial printer)	
Observer	2° Standard Observer or 10° Standard Observer	
Illuminant	A, C, D50, D65, F2, F6, F7, F8, F10, F11, F12, ID50, ID65 (simultaneous evaluation with two light sources possible)	
Displayed data	Spectral values, spectral graph, colorimetric values, colour-difference values, colour-difference graph, pass/fail judgment, pseudo colour, colour assessment	
Colour space	L*a*b*, L*C*h, Hunter Lab, Yxy, XYZ, Munsell, and colour differences in these spaces (except for Munsell)	
Index	Reflectance:	MI; WI (ASTM E 313-73, ASTM E 313-96); YI (ASTM E 313-73, ASTM E 313-96, ASTM D 1925); ISO Brightness, WB (ASTM E 313-73)
	Transmittance:	Gardner, Iodine, Hazen (APHA), European Pharmacopoeia, US Pharmacopeia
User index	User-defined index *User index can be used with CM-5 / CR-5 firmware version 1.2 or later	
Colour-difference equation	ΔE*ab (CIE 1976), ΔE*94 (CIE 1994), ΔE00 (CIE 2000), ΔE (Hunter), CMC (l: c)	
Pass/fail judgment	Tolerances can be set to colorimetric values (except Munsell), colour-difference values, or reflectance index values	
Storable data	Sample data: 4,000 measurements; Target colour data: 1,000 measurements	
USB memory*1 stick storage	Storage of measurement data and target colour data. Storage/reading of measurement condition settings (Security-en-abled USB memory sticks cannot be used.)	
Power	AC 100 to 240 V, 50/60 Hz (using exclusive AC adapter)	
Size	Slide cover closed: 385 (W) × 192 (H) × 261 (D) mm I Slide cover open: 475 (W) × 192 (H) × 261 (D) mm	
Weight	Approx. 5.8 kg	
Operating temperature/humidity range	13 to 33°C, relative humidity 80 % or less (at 35°C) with no condensation	
Storage temperature/humidity range	0 to 40°C, relative humidity 80 % or less (at 35°C) with no condensation	

*1 USB memory devices with no security features are supported.
*2 USB human interface device class US layout keyboards are supported. (Operation is not guaranteed for all of the above supported USB memories and keyboards.)

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.
- Be sure to use the specified batteries. Using im proper batteries may cause a fire or electric shock.

- Specifications and appearance are subject to change without notice.
- Company names and product names herein are trademarks or registered trademarks of their respective companies.
- The specifications and drawings given here are subject to change without prior notice.
- If you have any questions about specifications, please contact your Konica Minolta representative.

ISO 9001
Certificate No.: JQA-QMA15888
Registration Date : October 26, 2018
KONICA MINOLTA, Inc., Sakai Site
Product design, manufacture/manufacturing management, calibration and service

ISO 14001
Certificate No: JQA-E-80027
Registration Date: March 12, 1997
KONICA MINOLTA, Inc., Sakai Site

KONICA MINOLTA, INC	Osaka, Japan			
Konica Minolta Sensing Americas, Inc.	New Jersey, U.S.A.		Phone: +1-888-473-2656 (in USA) Phone: +1-201-236-4300 (outside USA)	E-Mail: marketing.SUS@konicaminolta.com
Konica Minolta Sensing Europe B.V.	European Headquarter	Nieuwegein, Netherlands	Phone: +31 (0) 30 248 -1193	E-Mail: info.sensing@seu.konicaminolta.eu
	German Office	München, Germany	Phone: +49 (0) 89 4357 156 0	E-Mail: info.germany@seu.konicaminolta.eu
	French Office	Roissy CDG, France	Phone: +33 (0) 1 80 -11 10 70	E-Mail: info.france@seu.konicaminolta.eu
	UK Office	Warrington, United Kingdom	Phone: +44 (0) 1925 467300	E-Mail: info.uk@seu.konicaminolta.eu
	Italian Office	Cinisello Balsamo, Italy	Phone: +39 02 84948800	E-Mail: info.italy@seu.konicaminolta.eu
	Swiss Office	Dietikon, Switzerland	Phone: +41 (0) 43 322 - 9800	E-Mail: info.switzerland@seu.konicaminolta.eu
	Polish Office	Wroclaw, Poland	Phone: +48 (0) 71 734 52 -11	E-Mail: info.poland@seu.konicaminolta.eu
	Belgium Office	Zaventem, Belgium	Phone: +32 (0) 2 7170 -933	E-Mail: info.benelux@seu.konicaminolta.eu
	Nordic Office	Västra Frölunda, Sweden	Phone: +46 (0) 31 7099464	E-Mail: info.nordic@seu.konicaminolta.eu
	SE Sales Division	Shanghai, China	Phone: +86- (0) 21-5489 0202	E-Mail: hcn_sensing@hcn.konicaminolta.cn
Konica Minolta (CHINA) Investment Ltd.	Beijing Office	Beijing, China	Phone: +86- (0) 10 -8522 1551	E-Mail: hcn_sensing@hcn.konicaminolta.cn
	Guangzhou Office	Guangzhou, China	Phone: +86- (0) 20-3826 4220	E-Mail: hcn_sensing@hcn.konicaminolta.cn
	Chongqing Office	Chongqing, China	Phone: +86- (0) 23-6773 4988	E-Mail: hcn_sensing@hcn.konicaminolta.cn
	Qingdao Office	Shandong, China	Phone: +86- (0) 532-8079 1871	E-Mail: hcn_sensing@hcn.konicaminolta.cn
	Wuhan Office	Hubei, China	Phone: +86- (0) 27-8544 9942	E-Mail: cn_sensing@hcn.konicaminolta.cn
Konica Minolta Sensing Singapore Pte Ltd.	Optics Company, Korea	Singapore	Phone: +65 6563 - 5533	E-Mail: ssg@konicaminolta.sg
Konica Minolta Sensing, Inc.	Optics Company, Sensing Business	Goyang-si, Korea	Phone: +82 (0) 2-523 -9726	E-Mail: sensing-gc@konicaminolta.jp
	Thailand Representative Office	Bangkok, Thailand	Phone: +66-2361 -3730	E-Mail: sensing-gc@konicaminolta.jp

Addresses and telephone numbers are subject to change without notice.
For the latest contact information, please refer to the KONICA MINOLTA Worldwide Offices web page: **www.konicaminolta.com/instruments/network**

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