



Celltac **F**

**Automatic Hematology Analyzer  
MEK-8222J/K**

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# **Technical Data**

*Fighting Disease with Electronics*

 **NIHON KOHDEN**

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# DESIGN FEATURES

## **22 parameters standard with 5-part WBC differential**

*Celltac F* measures 22 parameters including WBC 5-part differential (lymphocyte, monocyte, neutrophil, eosinophil, and basophil) with high accuracy and precision.

## **Low reagent consumption**

*Celltac F* requires only 55 µL of whole blood for 22 parameters measurement. It has very low reagent consumption: 0.6 mL of hemolysing reagent for CBC and requires only 0.4 mL of hemolysing reagent for WBC 5 part diff.

## **High reproducibility and accuracy**

Nihon Kohden *Celltac* series always assure high reproducibility and accuracy by unique mechanism such as twin dilution sampling nozzle, double mixing chamber for effective hemolysing, and automatic sampling nozzle cleaning.

## **80 samples per hour throughput**

Two unique features of *Celltac F* allow high speed processing on a compact machine. One is a simplified and minimized fluid path including a double mixing chamber for effective hemolysing and dilution. The other is an effective auto-load sampling system which allows parallel processing such as mixing the blood sample, removing air pressure from a cap pierced sampling tube and aspirating the blood sample for measurement.

## **Auto loading and manual sampling mode**

*Celltac F* has two sampling modes. One is closed-tube sampling mode which is performed automatically and up to 50 samples can be loaded in a sampling rack. The other is open-tube (manual) mode which is available as emergency measurement at any time during routine auto-loading measurement. Manual mode also allows capillary measurement.

## **Emergency Sample Measurement**

There are two types of interrupt measurement mode. One is manual measurement and the other is when a closed-tube is put into the interrupt position of the sampling rack. Interrupt measurements are processed as priority at any time even during measurement by auto-loading mode.

## **CBC or CBC with 5 part diff modes**

CBC or CBC with WBC 5 part diff can be selected. CBC mode requires just 35 µL of whole blood. This helps save reagent consumption.

## **Capillary blood measurement**

10 µL or 20 µL capillary blood measurement for CBC is available in the open-tube sampling mode. This is

very useful for measuring neonatal and pediatric patients.

## **Data storage without PC**

400 numerical data and 60 histograms and scattergrams can be saved in the analyzer memory. A PC with optional data management software can store 100,000 or more numerical data, histograms and scattergrams.

## **2 types of bar code readers (option)**

*Celltac F* can use two types of bar code readers: hand-held type for manual and built-in type for auto loading.

## **High resolution clear color TFT LCD display with touch screen**

The numeric data, histograms and scattergrams are displayed on a clear 8.4 inch high resolution color TFT LCD screen. The touch screen allows easy and intuitive operation of the hematology analyzer.

## **Effective patient data control on a work list**

Up to 500 data can be entered on the work list for patient data control. Individual measurement commands can be sent from a connected PC with optional data management software to a work list in the *Celltac F*. You can specify the sample and parameters to be measured so that time and reagent can be saved.

## **Useful QC management programs**

3 levels such as "Normal", "Low" and "High" of X bar-R (Levey & Jennings) graphs can be displayed for easy QC management. Also X bar Batch graph for QC based on human blood is available. *Celltac F* provides continuous X bar Batch management of up to 20 batches (400 samples). X bar Day CV program helps good data control on a daily basis.

## **3 levels of security and password**

To prevent measuring condition change by unqualified persons, some screens or functions can only be entered or changed by an operator who has the authority and password. There are 3 levels of authority: "Manufacturer" for service and maintenance staff, "Lab technician" for laboratory technicians and "Other" for other staff such as emergency staff.

## **Useful flag messages**

13 kinds of WBC flags, 6 kinds of RBC flags and 3 kinds of Platelet flags can be shown on the display.

## **High reliability**

*Celltac F* uses high reliable parts for key devices such as a very compact and robust optical laser system for flow cytometry, ceramic core for dilutors and high reliable Nihon Kohden made electric valves for fluid valves.

### **Local language display**

*Celltac F* can display in your local language. It requires installation of translated image data at your side. (Some languages are not available. Contact us for details.)

### **Space saving design**

The compact design with advanced laser optical technology is the smallest in the world (for a hematology analyzer with 5 part diff built-in display, 50 sample auto-loader and data storage function). This allows more effective use of your work bench space.

### **Easy maintenance**

*Celltac F* has a self-check program to verify optimum function. A maintenance history program keeps track of the operation life of critical parts such as filters and tubes, and a screen message reminds you when to check or replace each item. *Celltac F* is

also designed for easier replacement of key maintenance parts for rapid maintenance.

### **USB interface**

*Celltac F* has a USB interface for high speed data transfer to a PC with optional Data Management Software. The PC can connect to an LIS (Laboratory Information System) or HIS (Hospital Information System) as gateway. (The connecting software must be developed by the customer. Nihon Kohden will provide the architecture for LIS and HIS connection.)

### **160 sample throughput and low cost backup system by DPC-Celltac (option)**

The DPC-Celltac (Dual Process Controlled-*Celltac F*) system can control dual *Celltac F*'s by optional data management software. This increases throughput to 160 per hour and provides a low cost backup system in your lab.

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## **MEASURING PARAMETERS**

<b>Measured parameters</b>	<b>Measuring range</b>	<b>Reproducibility to Specimen from Venous Blood (CV: Coefficient of Variation)</b>
WBC: White blood cell count	0 to $300 \times 10^3/\mu\text{L}$	within 2.0 %CV ( $4.0$ to $9.0 \times 10^3/\mu\text{L}$ )
NE%: Neutrophil percent	0 to 99.9%	within 5.0%CV (WBC: $4.0$ to $9.0 \times 10^3/\mu\text{L}$ , NE%: 40 to 70%)
LY%: Lymphocyte percent	0 to 99.9%	within 5.0%CV (WBC: $4.0$ to $9.0 \times 10^3/\mu\text{L}$ , LY%: 20 to 45%)
MO%: Monocyte percent	0 to 99.9%	within 12.0%CV (WBC: $4.0$ to $9.0 \times 10^3/\mu\text{L}$ , MO%: 2 to 10%)
EO%: Eosinophil percent	0 to 99.9%	within 20.0%CV (WBC: $4.0$ to $9.0 \times 10^3/\mu\text{L}$ , EO%: 2 to 10%)
BA%: Basophil percent	0 to 99.9%	within CV30.0% (>2%) or average value $\pm 1\%$ (0 to 2%) (WBC: $4.0$ to $9.0 \times 10^3/\mu\text{L}$ , BA%: 0 to 3%)
NE: Neutrophil count	0 to $99.9 \times 10^3/\mu\text{L}$	
LY: Lymphocyte count	0 to $99.9 \times 10^3/\mu\text{L}$	
MO: Monocyte count	0 to $99.9 \times 10^3/\mu\text{L}$	
EO: Eosinophil count	0 to $99.9 \times 10^3/\mu\text{L}$	
BA: Basophil count	0 to $99.9 \times 10^3/\mu\text{L}$	
RBC: Red blood cell count	0 to $14.9 \times 10^6/\text{mL}$	within 1.5%CV ( $5.0 \times 10^6/\mu\text{L}$ )
HGB: Hemoglobin concentration	0 to 29.9 g/dL	within 1.5%CV (16 g/dL)
HCT: Hematocrit	0 to 99.9%	
MCV: Mean cell volume	20 to 199 fL	within 1.0%CV (70 to 120fL)
MCH: Mean cell hemoglobin	10 to 50 pg	
MCHC: Mean cell hemoglobin concentration	10 to 50 g/dL	
RDW: Red blood cell distribution width	0 to 50%	
PLT: Platelet count	0 to $1490 \times 10^3/\mu\text{L}$	within 4.0%CV ( $3.0 \times 10^3/\mu\text{L}$ )
PCT: Platelet crit	0 to 2.9%	
MPV: Mean platelet volume	0 to 20.0 fL	
PDW: Platelet distribution width	0 to 50%	

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# SPECIFICATIONS

## ◆ Detection Method

**Blood cell count:** Electrical resistance detection

**Hemoglobin:** Cyanmethemoglobin optical detection

**Hematocrit:** Histogram calculation

**WBC population:** Light scatter by laser

**Platelet crit:** Histogram calculation

**RBC distribution width:** Histogram calculation

**Platelet distribution width:** Histogram calculation

## ◆ Standardization Analysis Methods

### **WBC: ICSH 1988**

ICSH: The assignment of values to fresh blood used for calibrating automated blood cell counters. Clin Lab Haematol, 10:203-212, 1988

### **RBC: ICSH1988**

ICSH: The assignment of values to fresh blood used for calibrating automated blood cell counters. Clin Lab Haematol, 10:203-212, 1988

### **HGB: NCCLS H15-A2**

H15-A2: Reference and Selected Procedures for the Quantitative Determination of Hemoglobin in Blood Second Edition; Approved Standard (1994)

### **HCT: NCCLS H7-A2**

H7-A2: Procedure for Determining Packed Cell Volume by the Microhematocrit Method Second Edition; Approved Standard (1993)

### **PLT: Brecher & Cronkite**

## ◆ Counting Time and Throughput

Approximately 45 s/sample, 80 samples/hour

## ◆ Dilution Ratio

**Venous blood** (55  $\mu$ L sample)

WBC/HGB: 200 : 1

RBC/PLT: 40,000:1

**Capillary blood** (10  $\mu$ L sample)

WBC/HGB: 1200:1

RBC/PLT: 240,000:1

**Capillary blood** (20  $\mu$ L sample)

WBC/HGB: 600:1

RBC/PLT: 120,000:1

## ◆ Display

**Display:** 8.4 inch, TFT type color LCD with touch screen keys

**Resolution:** 800  $\times$  600 dots

**Size:** 170 H  $\times$  128 W mm

**Display items:** Numerical data, histograms, scattergram, measuring conditions, alarm message and other messages, touch screen keys

## ◆ Data Storage

Numerical data for all counted parameters for up to 400 samples, and histograms and scattergrams for up to 60 samples. Optional data management software allows storage of 100,000 or more numerical data, histograms and scattergrams.

## ◆ Bar Code Reader (option)

**Readable bar code for hand held bar code reader:**

JAN/EAN.UPC(A.E.), NW-7, ITF, INDUSTRIAL 2 OF 5, IATA, CODE39, CODE93, CODE128, EAN128

**Readable bar code\* for built-in type bar code**

**reader:** CODE39, CODE128, ITF, NW-7, INDUSTRIAL 2 OF 5, COOP 2 OF 5, JAN/EAN.UPC(A.E.)

\*Up to 4 types of bar code at a time can be set.

## ◆ Sample Tubes

**Usable sample tubes for auto loader:**

Nihon Kohden: T440A sample tube, 75 mm  $\times$  12.3 mm $\varnothing$ , 2 mL

Becton Dickinson: HEMOGARD, 367846, 75 mm  $\times$  12.3 mm $\varnothing$ , 2 mL

Becton Dickinson: VACUTAINER, 360004, 75 mm  $\times$  13 mm $\varnothing$ , 2 mL

Becton Dickinson: VACUTAINER, 367862, 75 mm  $\times$  12.3 mm $\varnothing$ , 4 mL

Becton Dickinson VACUTAINER, 360003, 75 mm  $\times$  16 mm $\varnothing$ , 2 mL

Terumo: VENOJECT II, VT-052DK, 75 mm  $\times$  12.4 mm $\varnothing$ , 2 mL

SARSTEDT: S-Monovette<sup>\*1</sup>, 80.5 mm (with cap)  $\times$  11.6 mm $\varnothing$ , 2.7 mL

KABE: Art.-Bez.: E772G3.5<sup>\*2</sup>, 80 mm (with cap)  $\times$  12.4 mm $\varnothing$ , 3.5 mL

GREINER: VACUETTE, 454036, 75 mm  $\times$  12.5 mm $\varnothing$ , 4 mL

\*1: When using this sample tube, the T413 Monovette rack must be used. For the built-in bar code reader, use the ZK-821VG bar code reader.

\*2: When using this sample tube, the T412 Kabe rack must be used. For the built-in bar code reader, use the ZK-821V bar code reader.

## ◆ Safety

**Safety standard:** IEC-61010-1 2nd Edition (2001), EN61010-1 (1993) Amendment 2 (1995)

Laser: IEC60825-1 (1993) Amendment 1 (1997), EN60825-1 (1994) Amendment 11 (1996)

**According to the type of protection against electrical shock:** Class I EQUIPMENT

**According to the degree of protection against harmful ingress of water:** IPX0 (Ordinary EQUIPMENT)

**According to the degree of application in the presence of a flammable anaesthetic mixture with air, or with oxygen or nitrous oxide:** Equipment not

suitable for use in the presence of FLAMMABLE ANAESTHETIC MIXTURE WITH AIR, OR WITH OXYGEN OR NITROUS OXIDE

**According to the mode of operation:** CONTINUOUS OPERATION

**EQUIPMENT types (classification):** Indoor stationary EQUIPMENT

**Installation category:** II EQUIPMENT

**Pollution Degree:** 2 EQUIPMENT

**Requirements for marking of in vitro diagnostic instruments:** EN1658 (1996)

### ◆ Electromagnetic Compatibility

IEC61326-1 (1997) Amendment 1 (1998) Amendment 2 (2000)

EN61326-1 (1997) Amendment 1 (1998)

CISPR11 (1997), Group 1, Class B

EN55011 (1998) Amendment 1 (1999), Group 1, Class B

### ◆ Environmental Conditions

**Storage temperature:** – 20 to 60°C

**Operating temperature:** 15 to 30°C

**Storage humidity:** 10 to 95% (Non-condensing)

**Operating humidity:** 30 to 85% (Non-condensing)

**Atmospheric pressure:** 70 to 106 kPa

### ◆ Power Requirements

**Power requirements:**

MEK-8222J: 110, 117 or 127 V ±10% AC, 50 or 60 Hz

MEK-8222K: 220, 230 or 240 V ±10% AC, 50 or 60 Hz

**Power consumption:** 360 VA

### ◆ Dimensions and Weight

Dimensions: 613 W × 550 H × 583 D mm

Net weight: Approx. 55 kg

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## Data Management Software (option)

### Design Features

- Huge data storage: depends on the PC hard disk size. (on the recommended PC, 100,000 or more numerical data, histograms, scattergrams can be saved)
- DPC-Celltac (Dual Process Controlled-Celltac F) system can control dual Celltac F's and increase throughput to 160 per hour.
- Bi-directional communication between Celltac F and PC for work list data transfer.
- Editing of acquired data on the PC

- Creating bar code labels for thermal printer
- Gateway between Celltac F and LIS or HIS

### System Environment

**Operating system:** Microsoft Windows 2000 Professional (local purchase)

**Hardware:** local purchase

**Minimum specifications of PC:**

CPU: Pentium II 350 MHz or higher

Main memory: 256 MB or more

Video RAM: 8 MB

Hard disk: 6 GB or more

CD drive

Floppy disk drive: (depends)

LAN: 10/100 Base T Ethernet (Depends)

Display: XGA (1024×768)

Keyboard

Mouse

Safety standards: IEC-950

EMI: FCC class B

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## STANDARD ACCESSORIES

Fuse	2
Time-lag 3.0 A for MEK-8222J	
Time-lag 1.6 A for MEK-8222K	

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## OPTIONAL ACCESSORIES

### Accessory kit

The following accessory kits are available, grouped according to the power cord type. Absolutely needed.

**YZ-0244 (W, 100 V area)**

**YZ-0245 (N, 200V area)**

**YZ-0246 (GB, 200V area)**

**YZ-0247 (UL, 117V area)**

The accessory kits consist of:

Power cord	1
Ground lead	1
Diluent tubes (marked blue)	2
Waste tubes (marked red)	2
Detergent tube (marked green)	1
Detergent tube (marked white)	1
Pump tube (N) assy, YS-001B1	3
Hemolynac5 tube assy	1
Hemolynac3 tube assy	1
18 L tube assy (8222)	1
Cleanac tube assy (8222)	2
Sampling nozzle (0.8) for manual mode	1
Sampling nozzle (820) for closed mode	1
Cap pierce nozzle	1
Screwdriver	1
Hex wrench (thick)	1

Hex wrench (thin)	1
Filter assy	3
Hemolynac3 cap	2
18 L cap	3

**Impact printer**\*1, WA-711V

**Printer**\*2, WA-820V, Thermal printer

**Card printer**\*3, WA-460V

\*1: Substitution: local purchase LQ-300+ made by Epson  
(www.epson.co.jp/world/)

\*2: Substitution: local purchase TM-L90 made by Epson

\*3: Substitution: local purchase TM-U295 made by Epson

**Handy bar code reader**, ZK-820V, hand-held type

**Bar code reader**, ZK-821V, installed in the MEK-8222,  
use with T411/T412

**Bar code reader**, ZK-821VG, installed in the MEK-8222,  
use with T413

**T411 Rack**

**T412 Kabe rack**, for Kabe type sample tube

**T413 Monovette rack**, for Monovette type sampe tube

		NK, other	Kabe	Monovette
Bar code reader	ZK-821V	✓	✓	
	ZK-821VG			✓
Rack	T411	✓		
	T412		✓	
	T413			✓

**Mixing plate**, YZ-0253

**Data management software**, QP-820V

## CONSUMABLES

**T436D** Diluent, ISOTONAC•3, 18L container

**T438D** Detergent CLEANAC•3, 5L container

**T438** Detergent CLEANAC, 5L container

**T489** Hemolysing reagent HEMOLYNAC•3, 500mL × 3

**T496** Hemolysing reagent HEMOLYNAC•5, 500mL × 3

Cleaning bottle kit, YZ-0252

**T466A** Reagent bottle set, 2L

**T905** 7 μm polymer microsphere suspensions

YZ-0261, Sampling nozzle for closed mode

YZ-0262, Cap pierce nozzle

**T444B** Sampling nozzle for manual mode

**T802** Hemoglobin filter assy, 10 filters/box

**T462** Pump tube (N) assy

YS-002B4, Tube A, 1.5 m

**T463** Connection tube (5.0 m)

6114-003748, Cleanac tube 8 (1.5 m)

**T812** Micro cap (20 μL), 100 pcs/set

**T813** Micro cap (10 μL), 100 pcs/set

**T857** Sample cup (5.0 mL), TA-8, 500 pcs/set

**T421** Sahli pipette, (0.02 mL)

**T422** Dispenser for capillary sample, MODEL 8100

**T435** Sample container set, 200 pcs/set, 5 sets

**T440A** Blood sample tube with EDTA-2K, 100 pcs

**T723** 18 L diluent container cock

390649A, Sleeve brush, 5 pcs/set

**Y075** Touch pen

**B291** Recording paper for WA-820V, 78 m (NTP080-80)

**B292** Label for printing bar code, 33 m, (NTL060-80)

**C975** Hematology data sheet for WA-711V printer,  
narrow type, 1000 sheets/set

**C962** Hematology data sheet for WA-711V printer, wide  
type, 2000 sheets/set

**C976** Hematology data card for WA-460V card printer,  
100 cards × 4 copies

Hematology control, MEK-5DN, MEK-5DL, MEK-5DH

Hematology calibrator, MEK-3DN

## ORDERING INFORMATION

When ordering, please specify the following information:

- 1) Power line voltage and frequency
- 2) Requirements for optional accessories
- 3) Requirements for consumables
- 4) Specify part order code in

**Factory option:** Following are factory option units. Be sure to specify when ordering.

- Bar code reader: ZK-821V/ZK-821VG
- Maker of sample tubes if you use sample tubes not by Nihon Kohden sample tube

This brochure may be revised or replaced by Nihon Kohden at any time without notice.



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