diatron

CK-MB

CREATINE KINASE-MB

Specifically for use with Diatron PICTUS® 700 and PICTUS® 500 Analyzers

2°C – 8°C

REF 1419-0292 **Packaging:** 6 x Lyoph. (R1 Reag.) + 6 x 10 mL Buffer (R1) Σ 198

INTENDED USE
Reagents for In Vitro quantitative automated determination of Creatine Kinase-MB (CK-MB) in samples of human serum or plasma from the general patient population. Measurements of CK-MB are to be used as an aid to diagnosis and monitoring of conditions that require physicians to distinguish between skeletal muscle and heart muscle damage.

This reagent is formulated specifically for use with Diatron Pictus® P700 and P500 analyzers.
For in vitro diagnostic use only by trained laboratory professionals.

CLINICAL SIGNIFICANCE
Creatine Kinase consists of M and B subunits and is found in the MM, MB and BB isoforms. The CK- MB isoform is found mainly in the cardiac muscle. CK-MB activity is raised in patients with renal failure, in concurrent skeletal muscle and myocardial injuries, as well as in many other conditions, such as non -cardiac surgery, chest trauma, asthma, malignancies and pulmonary embolism. Also presence in patient serum of Macro-CK and/or CK-BB isoform due to brain injury will lead to falsely elevated CK-MB results, so increase of CK-MB activity is not specific enough for the laboratory diagnosis of myocardial infarction; additional *in Vitro* (Troponin, FABP, Myoglobin etc.) and *in Vivo* (ECG) tests are required.

METHOD PRINCIPLE
The enzymatic Immunoinhibition of the M subunit is applied. The anti-CK-M antibody present in the CK-MB reagent inhibits the catalytic activity of the M subunit of CK-MB enzyme. The observed activity is only due to the B subunit of the enzyme. The activity is measured as the increase of the signal at 340/380 nm observed during the following reactions:

$$\text{Phosphocreatine} + \text{ADP} \xrightarrow{\text{CK}} \text{Creatine} + \text{ATP}$$

$$\text{ATP} + \text{D-Glucose} \xrightarrow{\text{HK}} \text{Glucose 6- Phosphate} + \text{ADP}$$

$$\text{Glucose-6- Phosphate} + \text{NADP}^{+} \xrightarrow{\text{G6PDH}} \text{6-Phosphoglyconolactone} + \text{NADPH} + \text{H}^{+}$$

CK: Creatine Kinase **HK**: Hexokinase **G6PDH**: Glucose 6- Phosphate Dehydrogenase
The increase of absorption at 340/380 nm is proportional to the CK-MB activity in the sample.

METHOD LIMITATIONS
The CK-BB isoenzyme is also measured with this method. Its activity is usually negligible but the presence of CK-BB may be giving falsely elevated CK-MB values. A macro morph of the CK-BB isoenzyme may be present during the determination of CK-MB. If the activity of the CK-B isoenzyme surpasses the 20% of total CK activity, then the presence of CK-B macro morph may be supposed. Overestimation of CK-MB may occur in cases of CK macro morph presence in the sample. Refer to the book "Effects of Preanalytical Variables on Clinical Laboratory Tests" for possible interference of other pharmaceutical agents in this particular test. Interference of other agents is described in the "Clinical Guide to Laboratory Tests".
This reagent is formulated specifically for use with Diatron Pictus® P700 and P500 analyzers. For additional information please contact customer support at Diatron or Medicon.

REAGENT COMPOSITION

Final concentration in the working solution	
Imidazole (pH):	105 mM
ADP:	2 mM
G6PDH:	4350 U/L
Hexokinase:	4000 U/L
Creatine Phosphate:	11.4 U/L
6PGL:	1400 U/L
6PGDH:	240 U/L
D(+) Glucose:	20 mM
Non reacting ingredients, preservative.	

⚠ **WARNINGS – PRECAUTIONS**
- This reagent is designed for in vitro diagnostic use. In vitro diagnostic reagents can be hazardous. They should be handled according to good laboratory techniques. Avoid inhalation and contact with eyes and skin.
- Samples should be considered as potentially infectious. Handle with special caution.
- The reagent contains sodium azide (NaN_3) ≤ 0.1%. Avoid swallowing and contact of the reagent with skin and mucous membranes
- Any serious incident that may occur in relation to this device must be reported by the user to the manufacturer and the competent authority of the country in which the user and/or the patient is established!
- Dispose all waste according to national laws.
- MSDS is available by Diatron or MEDICON upon request.

⚠ **PREPARATION**
For the preparation of the working solution dissolve the contents of one vial of Reagent 1 (R1) with the whole content of one vial of Reagent 2 (R2). Avoid loss of lyophilized reagent during reconstitution. The reconstituted reagent is ready to use. The vials bear barcodes for automatic recognition by Diatron Pictus® P700 / P500 analyzers.

⚠ **REAGENT DETERIORATION**
The reagents should not be used:
- When they do not exhibit the specified linearity or control values lie outside the acceptable range after recalibration.
- After prolonged exposure to direct sunlight or high temperature.

⚠ **SHELF LIFE**
Unopened the reagent is stable at 2 – 8°C up to the expiry date stated on the label. Once opened, it remains stable for 2 weeks when stored in the reagent sampler of Diatron Pictus® P700 or P500 analyzers.

⚠ **SAMPLE** Fresh serum or Li-heparin plasma may be used as specimen. Use established Good Laboratory Practices for sampling, transport and separation from blood cells. Do not use hemolyzed, contaminated or turbid sample specimens. ATP, adenylic kinase and glucose-6-phosphate dehydrogenase are abundant in red blood cells and they may interfere severely in the reaction, if hemolysis exists. Anti-coagulants other than Li-heparin have not been tested and should not be used. Centrifuge sample as soon as possible, and store properly if analysis cannot take place right after sample separation. Do not store samples, to avoid in vitro CK isoform creation.

CALIBRATION Diatron offers MEDICON CK-MB Calibrator (1578-0291) traceable to ERM-AD455 for calibration. Calibrate the assay when a new lot of reagent is installed. The analyzer will automatically perform a Reagent Blank measurement every 1 week. Calibration should be repeated when a new lot of reagent is used, after major maintenance is performed on the analyzer, after a critical part is replaced, or when a significant shift in control values occurs.

QUALITY CONTROL Diatron offers MEDICON CK-MB CONTROL (1578-0295) for quality control. Control recovery should lie within the acceptable range. Results outside the acceptable range even after recalibration could be due to reagent deterioration, unsuitable storage conditions or control deterioration, instrument malfunction, or error during test procedure.

MATERIALS REQUIRED BUT NOT PROVIDED WITH THE KIT
- CK-MB calibrator
- Quality control material
- Diatron Pictus® analyzer
- Common laboratory equipment

REFERENCE INTERVALS
Serum: CK-MB up to 24 U/L when total CK is inside reference range.
Reference range for CK: Women: < 167 U/L (37°C)
Men: < 190 U/L (37°C)
When total CK exceeds reference range then CK-MB should be < 6% of the total. When there is suspicion of myocardial infarction but the CK-MB levels are within reference range, repeat the test with a new sample taken after 4 hours. Expected values may vary with age, sex, sample type, diet and geographical location. Each laboratory should determine its own expected values as dictated by good laboratory practices.

SPECIFIC PERFORMANCE CHARACTERISTICS
The following values are representative of the reagent performance on Diatron Pictus® P700 or P500 analyzers. The reagent performance has been evaluated on other types of analyzers, covering all requirements of the 98/79 IVD Directive. A list of analyzers with the corresponding performance characteristics is available in the special leaflet accompanying the insert. The results taken in your laboratory may differ from these values
Linearity Up to 950 IU/L
Lowest detection limit 1.0 IU/L
The lowest detection limit (LDL) is defined as the lowest concentration of analyte that is distinguishable from zero. A sample free of analyte is assayed 20 times in one run and the LDL is calculated as the absolute mean plus three standard deviations.
Precision: Precision is estimated on two concentration levels of analyte according to NCCLS protocol EP-5T (20 consecutive days, 2 runs per day, 2 repeats per run).

Pictus® P700 and P500	
Level (IU/L)	**CV%**
37.2	0.83
140	0.48
Level (IU/L)	**TOTAL %CV**
37.2	2.06
140	2.79

INTERFERENCES - Criterion: recovery within ±10% from target value

	(Insignificant up to)
Bilirubin	18 mg/dL
Conj. Bilirubin	20 mg/dL
Ascorbic Acid	3 mg/dL

Correlation: A comparison was performed between this reagent on a Diatron Pictus® P700 and P500 analyzer and another commercially available product. The results were as follows:
Y = 0.9935X – 0.6466 R=0.9309 N=40 Sample Range = 3.5 – 42.4 U/L

BIBLIOGRAPHY

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SYMBOLS

Manufacturer	IVD *In vitro* diagnostic medical device
Temperature Limit	REF Catalogue Number
Caution	Σ Contains sufficient for <n> tests

MEDICON HELLAS S.A. - Melitona 5-7, 153 44 Gerakas, Greece. Tel: +302106606000 - Fax: +302106612666 – www.mediconsa.com

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