

## Creatinine PAP FS\*

Diagnostic reagent for quantitative in vitro determination of creatinine in serum, plasma or urine on DiaSys respons<sup>®</sup>910

### Order Information

Cat. No. 1 1759 99 10 920

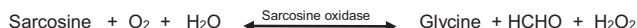
4 twin containers for 180 tests each

### Method

Enzymatic colorimetric test

### Principle

Creatinine is determined by the following reaction:



The absorbance of the produced red dye at 545 nm is proportional to the creatinine concentration in the sample.

### Reagents

#### Components and Concentrations

<b>R1:</b>	Goods buffer	pH 8.1	25 mmol/L
	Creatinase		≥ 30 kU/L
	Sarcosine oxidase		≥ 10 kU/L
	Ascorbate oxidase		≥ 2.5 kU/L
	Catalase		≥ 350 kU/L
	HTIB (3-Hydroxy 2,4,6-triiodo benzoic acid)		2.3 mmol/L
<b>R2:</b>	Goods buffer	pH 8.1	25 mmol/L
	Creatininase		≥ 150 kU/L
	Peroxidase		≥ 50 kU/L
	4-Aminoantipyrine (4-AA)		2 mmol/L
	Potassium hexacyanoferrate		0.18 mmol/L

#### Storage Instructions and Reagent Stability

The reagents are stable up to the end of the indicated month of expiry, if stored at 2 - 8°C, protected from light and contamination is avoided. DiaSys respons containers provide protection from light. Do not freeze the reagents!

#### Warnings and Precautions

1. Reagent 2 contains sodium azide (0.95 g/L) as preservative. Do not swallow! Avoid contact with skin and mucous membranes.
2. High homogentisic acid concentrations in urine samples lead to false results.
3. In very rare cases, samples of patients with gammopathy might give falsified results [9].
4. N-acetylcysteine (NAC), acetaminophe, metamizole and phenindione medication leads to falsely low, eltrombopag medication to falsely low or high results in patient samples.
5. Please refer to the safety data sheets and take the necessary precautions for the use of laboratory reagents. For diagnostic purposes, the results should always be assessed with the patient's medical history, clinical examinations and other findings.
6. For professional use only!

#### Waste Management

Please refer to local legal requirements.

#### Reagent Preparation

The reagents are ready to use. The bottles are placed directly into the reagent rotor.

### Specimen

Serum, heparin plasma or urine

Stability [1]:

#### Serum/plasma

7 days	at	4 - 25°C
3 months	at	-20°C

#### Urine

2 days	at	20 - 25°C
6 days	at	4 - 8°C
6 months	at	-20°C

Discard contaminated specimens. Freeze only once.

### Calibrators and Controls

For calibration, the DiaSys TruCal U calibrator is recommended. The calibrator values have been made traceable to NIST (National Institute for Standardization) Standard Reference Material SRM 967 using level 1 and 2 and, therefore, to GC-IDMS (gas chromatography-isotope dilution mass spectrometry). For internal quality control DiaSys TruLab N and P or TruLab Urine controls should be assayed. Each laboratory should establish corrective action in case of deviations in control recovery.

	Cat. No.	Kit size
TruCal U	5 9100 99 10 063	20 x 3 mL
	5 9100 99 10 064	6 x 3 mL
TruLab N	5 9000 99 10 062	20 x 5 mL
	5 9000 99 10 061	6 x 5 mL
TruLab P	5 9050 99 10 062	20 x 5 mL
	5 9050 99 10 061	6 x 5 mL
TruLab Urine Level 1	5 9170 99 10 062	20 x 5 mL
	5 9170 99 10 061	6 x 5 mL
TruLab Urine Level 2	5 9180 99 10 062	20 x 5 mL
	5 9180 99 10 061	6 x 5 mL

### Performance Characteristics

Measuring range up to 160 mg/dL creatinine in serum and 440 mg/dL in urine (in case of higher concentrations re-measure samples after manual dilution with NaCl solution (9 g/L) or use rerun function).	
Limit of detection**	0.1 mg/dL creatinine
On-board stability	3 weeks
Calibration stability	3 weeks

Interfering substance	Interferences (serum) < 10%	Creatinine [mg/dL]
<b>Ascorbate</b>	up to 30 mg/dL	1.16
<b>Hemoglobin</b>	up to 400 mg/dL	1.55
	up to 550 mg/dL	5.08
<b>Bilirubin, conjugated</b>	up to 30 mg/dL	1.81
	up to 35 mg/dL	16.2
<b>Bilirubin, unconjugated</b>	up to 20 mg/dL	1.75
	up to 30 mg/dL	16.2
<b>Lipemia (triglycerides)</b>	up to 1000 mg/dL	1.66
	up to 2000 mg/dL	15.4
<b>Creatine</b>	up to 40 mg/dL	1.52
	up to 60 mg/dL	15.0
<b>Proline</b>	up to 12 mg/dL	1.10

For further information on interfering substances refer to Young DS [8].

Precision in serum			
Within run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/dL]	0.79	1.31	8.04
Coefficient of variation [%]	2.09	1.77	1.46
Between run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/dL]	0.57	1.07	6.54
Coefficient of variation [%]	3.20	2.62	1.88

Method comparison in serum (n=149)	
Test x	DiaSys Creatinine PAP FS (Hitachi 917)
Test y	DiaSys Creatinine PAP FS (respons <sup>®</sup> 910)
Slope	1.01
Intercept	0.033 mg/dL
Coefficient of correlation	0.99996

Precision in urine			
Within run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/dL]	60.0	167	261
Coefficient of variation [%]	2.77	2.40	2.18
Between run (n=20)	Sample 1	Sample 2	Sample 3
Mean [mg/dL]	36.4	164	255
Coefficient of variation [%]	4.00	3.45	5.09

Method comparison in urine (n=110)	
Test x	DiaSys Creatinine PAP FS (BioMajesty 6010)
Test y	DiaSys Creatinine PAP FS (respons <sup>®</sup> 910)
Slope	0.992
Intercept	-0.171 mg/dL
Coefficient of correlation	0.9995

\*\* according to NCCLS document EP17-A, vol. 24, no. 34

## Calculation of Creatinine-Clearance [mL/min/1.73 m<sup>2</sup>] [2]

$$= \frac{\text{mg Creatinine} / 100 \text{ mL Urine} \times \text{mL Urine}}{\text{mg Creatinine} / 100 \text{ mL Serum} \times \text{min Urine collection time}}$$

The calculated creatinine clearance refers to the average body surface of an adult (1.73 m<sup>2</sup>).

## Conversion factor

$$\text{Creatinine [mg/dL]} \times 88.4 = \text{Creatinine [\mu mol/L]}$$

## Reference Range

### Serum/Plasma

	mg/dL	μmol/L
<b>Adults</b> [4]		
Women	0.51 – 0.95	45 – 84
Men	0.67 – 1.17	59 – 104
<b>Children</b> [5]		
0 – 7 days	0.6 - 1.1	53 - 97
1 week – 1 month	0.3 – 0.7	27 - 62
1 – 6 month(s)	0.2 – 0.4	18 - 35
7 – 12 months	0.2 – 0.4	18 - 35
1 – 18 year(s)	0.2 – 0.7	18 - 62

### 1st Morning urine

 [4]

Women	29 – 226 mg/dL	2.55 – 20.0 mmol/L
Men	40 – 278 mg/dL	3.54 – 24.6 mmol/L

### 24h urine

 [2]

Women	720 – 1510 mg/24h	6 – 13 mmol/24h
Men	980 – 2200 mg/24h	9 – 19 mmol/24h

### Creatinine clearance

 [2]

66.3 - 143 mL/min/1.73 m<sup>2</sup>

### Albumin/creatinine ratio (early morning urine) [10]:

< 30 mg Albumin/g Creatinine

Each laboratory should check if the reference ranges are transferable to its own patient population and determine own reference ranges if necessary.

## Literature

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- Levey AS, Coresh J, Greene T, Marsh J et al: Expressing the Modification of Diet in Renal Disease Study Equation for Estimating Glomerular Filtration Rate with Standardized Serum Creatinine Values. Clin Chem 2007; 53 (4): 766-72.
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- Thomas L. Clinical Laboratory Diagnostics. 1<sup>st</sup> ed. Frankfurt: TH-Books Verlagsgesellschaft; 1998. p. 366-74.
- Young DS. Effects of Drugs on Clinical Laboratory Tests. 5th. ed. Volume 1 and 2. Washington, DC: The American Association for Clinical Chemistry Press, 2000.
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- Dati F, Metzmann E. Proteins-Laboratory testing and clinical use. 1st ed. Holzheim: DiaSys Diagnostic Systems; 2005: p. 93

## Manufacturer

DiaSys Diagnostic Systems GmbH  
Alte Strasse 9 65558 Holzheim Germany



## Creatinine PAP FS

### Application for serum, plasma or urine samples

This application was set up and evaluated by DiaSys. It is based on the standard equipment at that time and does not apply to any equipment modifications undertaken by unqualified personnel.

Identification	
This method is usable for analysis:	Yes
Twin reaction:	No
Name:	CREA PAP
Shortcut:	
Reagent barcode reference:	031
Host reference:	031

Technic	
Type:	End point
First reagent:[ $\mu$ L]	160
Blank reagent	Yes
Sensitive to light	
Second reagent:[ $\mu$ L]	80
Blank reagent	No
Sensitive to light	
Main wavelength:[nm]	546
Secondary wavelength:[nm]	700
Polychromatic factor:	1.0000
1 st reading time [min:sec]	(04:24)
Last reading time [min:sec]	10:00
Reaction way:	Increasing
Linear Kinetics	
Substrate depletion: Absorbance limit	
Linearity: Maximum deviation [%]	
Fixed Time Kinetics	
Substrate depletion: Absorbance limit	
Endpoint	
Stability: Largest remaining slope	
Prozone Limit [%]	

Reagents	
Decimals	
Units	

Sample	
Diluent	DIL A (NaCl)
Hemolysis:	
Agent [ $\mu$ L]	0 (no hemolysis)
Cleaner	
Sample [ $\mu$ L]	0
Technical limits	
Concentration technical limits-Lower	0.1000
Concentration technical limits-Upper	160.0000
SERUM	
Normal volume [ $\mu$ L]	4.0
Normal dilution (factor)	1
Below normal volume [ $\mu$ L]	
Below normal dilution (factor)	
Above normal volume [ $\mu$ L]	4.0
Above normal dilution (factor)	6
URINE	
Normal volume [ $\mu$ L]	4.0
Normal dilution (factor)	10
Below normal volume [ $\mu$ L]	
Below normal dilution (factor)	
Above normal volume [ $\mu$ L]	4.0
Above normal dilution (factor)	16
PLASMA	
Normal volume [ $\mu$ L]	4.0
Normal dilution (factor)	1
Below normal volume [ $\mu$ L]	
Below normal dilution (factor)	
Above normal volume [ $\mu$ L]	4.0
Above normal dilution (factor)	6
CSF	
Normal volume [ $\mu$ L]	4.0
Normal dilution (factor)	1
Below normal volume [ $\mu$ L]	
Below normal dilution (factor)	
Above normal volume [ $\mu$ L]	4.0
Above normal dilution (factor)	6
Whole blood	
Normal volume [ $\mu$ L]	4.0
Normal dilution (factor)	1
Below normal volume [ $\mu$ L]	
Below normal dilution (factor)	
Above normal volume [ $\mu$ L]	4.0
Above normal dilution (factor)	6

Results	
Decimals	2
Units	mg/dL
Correlation factor-Offset	0.0000
Correlation factor-Slope	1.0000

Range	
Gender	Male
Age	
SERUM	$\geq 0.70 \leq 1.20$
URINE	$\geq 40.00 \leq 278.00$
PLASMA	$\geq 0.70 \leq 1.20$
CSF	
Whole blood	
Gender	Female
Age	
SERUM	$\geq 0.50 \leq 1.00$
URINE	$\geq 29.00 \leq 226.00$
PLASMA	$\geq 0.50 \leq 1.00$
CSF	
Whole blood	

Contaminants	
Please refer to r910 Carryover Pair Table	

Calibrators details	
Calibrator list	Concentration
Cal. 1/Blank	0
Cal. 2	*
Cal. 3	
Cal. 4	
Cal. 5	
Cal. 6	
	Max delta abs.
Cal. 1	0.003
Cal. 2	0.010
Cal. 3	
Cal. 4	
Cal. 5	
Cal. 6	
Drift limit [%]	0.80

Calculations	
Model	X
Degree	1

\* Enter calibrator value