

## Company Profile

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## Contact

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## Access

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1-1-4 Nankadai Kawachinagano, Osaka,  
586-0077, JAPAN

Updated May 31, 2018

# EMF520·521·522·523

## Single Range 6.5 Digits High Accuracy Dosimeter

MADE IN JAPAN



Specification

Model		EMF520	EMF521	EMF522	EMF523	
A/D converter		24bit				
Measuring unit	Electrical	Current : pA, Charge : nC			Current : nA, Charge : $\mu$ C	
	Radiological	Dose rate : mGy / min, Dose : mGy			Dose rate : Gy / min, Dose : Gy	
Measuring range	Current	$\pm 2\text{nA}$ / F.S. single range		$\pm 200\text{nA}$ / F.S. single range		
		High resolution mode	$\pm 0.0001\text{pA} \sim \pm 199.9999\text{pA}$ $\pm 200.000\text{pA} \sim \pm 1999.999\text{pA}$	$\pm 0.001\text{pA} \sim \pm 1999.999\text{pA}$ $\pm 2000.00\text{pA} \sim \pm 19999.99\text{pA}$	$\pm 0.01\text{pA} \sim \pm 19999.99\text{pA}$ $\pm 20000.0\text{pA} \sim \pm 199999.9\text{pA}$	$\pm 0.0001\text{nA} \sim \pm 199.9999\text{nA}$ $\pm 200.000\text{nA} \sim \pm 1999.999\text{nA}$
	Standard resolution mode	$\pm 0.001\text{pA} \sim \pm 1999.999\text{pA}$	$\pm 0.01\text{pA} \sim \pm 19999.99\text{pA}$	$\pm 0.1\text{pA} \sim \pm 199999.9\text{pA}$	$\pm 0.001\text{nA} \sim \pm 1999.999\text{nA}$	
	Charge	$\pm 2\mu\text{C}$ / Max		$\pm 200\mu\text{C}$ / Max		
		High resolution mode	$\pm 0.00001\text{nC} \sim \pm 19.99999\text{nC}$ $\pm 20.0000\text{nC} \sim \pm 199.9999\text{nC}$ $\pm 200.000\text{nC} \sim \pm 1999.999\text{nC}$	$\pm 0.00001\text{nC} \sim \pm 19.99999\text{nC}$ $\pm 20.0000\text{nC} \sim \pm 199.9999\text{nC}$ $\pm 200.000\text{nC} \sim \pm 1999.999\text{nC}$	$\pm 0.0001\text{nC} \sim \pm 199.9999\text{nC}$ $\pm 200.000\text{nC} \sim \pm 1999.999\text{nC}$ $\pm 2000.00\text{nC} \sim \pm 19999.99\text{nC}$	$\pm 0.00001\text{nC} \sim \pm 19.99999\mu\text{C}$ $\pm 20.0000\text{nC} \sim \pm 199.9999\mu\text{C}$ $\pm 200.000\text{nC} \sim \pm 1999.999\mu\text{C}$
	Standard resolution mode	$\pm 0.00001\text{nC} \sim \pm 19.99999\text{nC}$ $\pm 20.0000\text{nC} \sim \pm 199.9999\text{nC}$ $\pm 200.000\text{nC} \sim \pm 1999.999\text{nC}$	$\pm 0.0001\text{nC} \sim \pm 199.9999\text{nC}$ $\pm 200.000\text{nC} \sim \pm 1999.999\text{nC}$ $\pm 2000.00\text{nC} \sim \pm 19999.99\text{nC}$	$\pm 0.001\text{nC} \sim \pm 1999.999\text{nC}$ $\pm 2000.00\text{nC} \sim \pm 19999.99\text{nC}$	$\pm 0.00001\mu\text{C} \sim \pm 19.99999\mu\text{C}$ $\pm 20.0000\mu\text{C} \sim \pm 199.9999\mu\text{C}$ $\pm 200.000\mu\text{C} \sim \pm 1999.999\mu\text{C}$	
Lower limit of the measuring range	Current	JJMP Electrometer Guidelines	$\pm 2\text{pA}$	$\pm 20\text{pA}$	$\pm 200\text{pA}$	$\pm 2\text{nA}$
		IEC60731 Radiationtherapy ref. class	$\pm 0.4\text{pA}$	$\pm 4\text{pA}$	$\pm 40\text{pA}$	$\pm 0.4\text{nA}$
		IEC61674 Diagnostic radiology	$\pm 0.1\text{pA}$	$\pm 1\text{pA}$	$\pm 10\text{pA}$	$\pm 0.1\text{nA}$
	Charge (measuring time:50sec)	JJMP Electrometer Guidelines	$\pm 0.1\text{nC}$	$\pm 1\text{nC}$	$\pm 10\text{nC}$	$\pm 0.1\mu\text{C}$
		IEC60731 Radiationtherapy ref. class	$\pm 0.02\text{nC}$	$\pm 0.2\text{nC}$	$\pm 2\text{nC}$	$\pm 0.02\mu\text{C}$
		IEC61674 Diagnostic radiology	$\pm 0.005\text{nC}$	$\pm 0.05\text{nC}$	$\pm 0.5\text{nC}$	$\pm 0.005\mu\text{C}$
Time constant of the I-V converter		0.1sec				
ADC sampling rate		1000 samples / sec				
Display refresh rate		0.5sec				
Averaging time for current		0.5sec, 1sec, 2sec, 4sec, 8sec selectable				
Measuring time		0.5~99999.5sec 100000~999999sec				
Interval time		1~999999sec				
Offset current		$\leq \pm 0.001\text{pA}$	$\leq \pm 0.01\text{pA}$	$\leq \pm 0.1\text{pA}$	$\leq \pm 0.001\text{nA}$	
Temperature drift of the offset current		$\leq \pm 0.0003\text{pA} / ^\circ\text{C}$	$\leq \pm 0.003\text{pA} / ^\circ\text{C}$	$\leq \pm 0.03\text{pA} / ^\circ\text{C}$	$\leq \pm 0.0003\text{nA} / ^\circ\text{C}$	
Temperature drift of the measuring current		$\leq \pm 0.0025\% / ^\circ\text{C}$ (+1nA·15 $^\circ\text{C}$ ~35 $^\circ\text{C}$ Average)	$\leq \pm 0.0025\% / ^\circ\text{C}$ (+10nA·15 $^\circ\text{C}$ ~35 $^\circ\text{C}$ Average)	$\leq \pm 0.0025\% / ^\circ\text{C}$ (+100nA·15 $^\circ\text{C}$ ~35 $^\circ\text{C}$ Average)	$\leq \pm 0.0025\% / ^\circ\text{C}$ (+1 $\mu\text{A}$ ·15 $^\circ\text{C}$ ~35 $^\circ\text{C}$ Average)	
Accuracy (IEC60731)	High resolution mode	$\leq \pm (0.25\% + 20\text{digit})$				
	Standard resolution mode	$\leq \pm (0.25\% + 2\text{digit})$				
Repeatability		$\leq \pm 0.01\%$ ( $\pm 0.1\text{nA} \sim \pm 2\text{nA}$ )	$\leq \pm 0.01\%$ ( $\pm 1\text{nA} \sim \pm 20\text{nA}$ )	$\leq \pm 0.01\%$ ( $\pm 10\text{nA} \sim \pm 200\text{nA}$ )	$\leq \pm 0.01\%$ ( $\pm 0.1\mu\text{A} \sim \pm 2\mu\text{A}$ )	
Non-linearity		$\leq \pm 0.1\%$ ( $\pm 2\text{pA} \sim \pm 2\text{nA}$ )	$\leq \pm 0.1\%$ ( $\pm 20\text{pA} \sim \pm 20\text{nA}$ )	$\leq \pm 0.1\%$ ( $\pm 200\text{pA} \sim \pm 200\text{nA}$ )	$\leq \pm 0.1\%$ ( $\pm 2\text{nA} \sim \pm 2\mu\text{A}$ )	
Long term stability		$\leq \pm 0.1\%$ / year				
Zeroing		automatically in selectable 50sec or 200sec				
Display	Top	(pA or mGy/min)		7-digit green 7-segment LED		
	Middle	(nC or mGy)		7-digit green 7-segment LED		
	Bottom	(sec)		6-digit green 7-segment LED		
High voltage		0~ $\pm 1000\text{V}$ , adjustable in 1V steps				
Max. deviation of high voltage		$\leq \pm 1\%$ ( $\pm 50\text{V} \sim \pm 1000\text{V}$ )				
Terminal for ion chamber		Triax BNC (2 lug)				
RS232C interface	Baudrate	19200bps (8bit, no parity)				
	Handshake	None				
	Terminal	D-sub 9pin male				
Trip relay		2 relays equipped (Relay A and Relay B) setting value in mGy unit Relay A : 100% of setting value Relay B : 50% of setting value Relay contact spec.:AC125V 0.6A or DC110V 0.6A				
Rated range of use	Temperature	+10~+40 $^\circ\text{C}$				
	Rel. humidity	10~80%, no condensation				
	Atmospheric pressure	600~1200hPa				
Dimensions (W×D×H)		260mm×230mm×100mm				
Weight		2.8kg				
Power supply		AC100~240V (-12%~+10%), 50~60Hz				
Power consumption		6VA				