

ICX1241
Three-field Ionization Chamber
Calibration Procedure for Pre-Amplifier board 61154H

The following adjustments apply to the calibration of the 61154H pre-amplifier board used with the model ICX1241 three-field ion chamber.

WARNING:

- Do not attempt to service the equipment unless this service manual has been consulted and is understood.
- Failure to heed this warning may result in injury to the service provider, operator or patient from electric shock and mechanical or other hazards.

Note: When working with the pre-amplifier assembly it is important that electrostatic discharge (ESD) prevention techniques be observed. Before touching the pre-amp assembly, attach an ESD wrist strap to yourself. Be sure to ground yourself and the ion chamber frame to dissipate static charges.

Note: The pre-amp assembly is a very delicate and sensitive device. It is important to keep it as clean as possible. Wash and dry your hands thoroughly before working with it and, when possible, use unpowdered latex or cotton gloves. Take care to touch the pre-amp board as little as possible. Take extra care to avoid touching the three air-mounted field inputs. Oils from your fingers on the air-mounts or their components can cause performance degradation.

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The procedure assumes that the installation of the Automatic Exposure Control (AEC) is complete and that the AEC and the x-ray generator are in proper working condition. After making the necessary interconnections between the ion chamber and the AEC, power up the system.

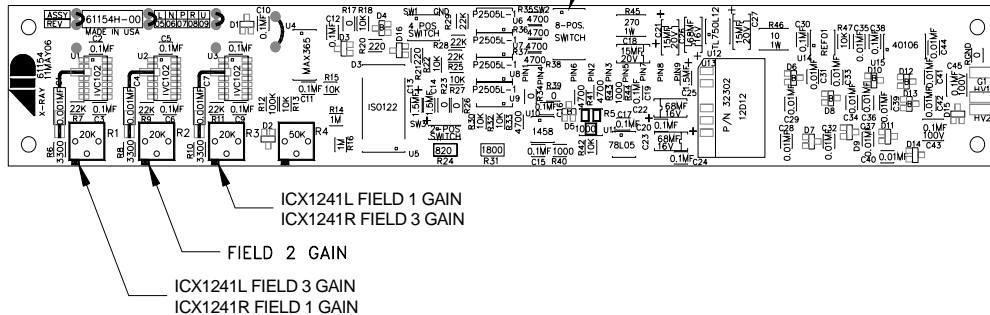
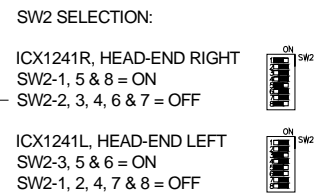
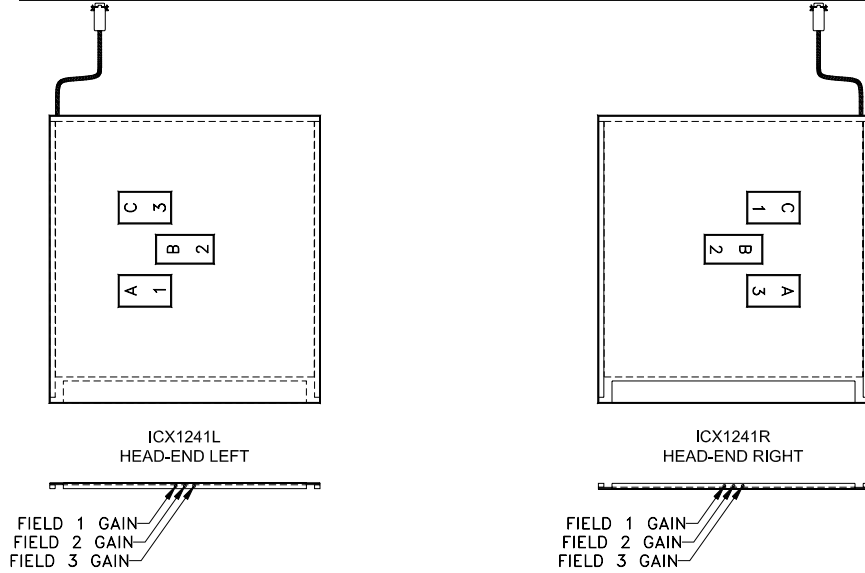
Calibration/Test Set Up:

Select the center field of the ion chamber. Set the generator for 100 kVp and maximum backup time. For 100 kVp use 8 to 10 inches (20 to 25 cm) of water or plastic for a phantom. Metals such as copper, aluminum or lead are not suitable for use as phantoms. Make sure the phantom is homogeneous and completely covers all fields equally. Center the x-ray beam on the center field. Collimate the x-ray beam so that it completely covers all three fields but does not extend beyond the limits of the phantom.

Field Selection and Orientation:

The ICX1241 can be used in either a head-end left (ICX1241L) or a head-end right (ICX1241R) configuration. Note that when changing the orientation, the left and right fields are reversed. Changing the field selection switches (61154H SW2) will maintain the association between the AEC field selection signals and the left, center and right fields.

Model Configuration	61154H Switch Setting	Field Configuration
ICX1241L	SW2-3,5 & 6: ON SW2-1,2,4, 7 & 8: OFF	1-2-3
ICX1241R	SW2-1,5 & 8: ON SW2-2,3,4, 6 & 7: OFF	3-2-1



Balance Check:

Using the AEC post-exposure mAs display or other calibrated mAs meter check the individual fields to see that they are balanced, that is, that they produce the same mAs reading. If mAs readings are not stable from exposure to exposure for an individual field, then it will be necessary to expose films and make these adjustments based upon optical density.

The individual gain potentiometers, 61154H R1, R2 and R3, correspond to ion chamber C, B and A fields, respectively. Refer to the section on Field Selection and Orientation for the relationship between the A, B and C Fields and the selection of left, center and right fields for the models ICX1241L and ICX1241R. If necessary, adjust the individual gain potentiometers to balance the outputs to give the same mAs reading for each field. Note that individual gain adjustments are multi-turn potentiometers. A clockwise adjustment to a gain potentiometer will increase the sensitivity of a field, causing the length of the exposure (mAs) to decrease.

Ionization Chamber Pin outs:

61154H PRE-AMP BOARD PAD NUMBER	FUNCTION	J1 9-PIN SUB-D PIN NUMBER
1	GROUND, 24V RTN	1
2	FIELD 2 SELECT (CENTER)	2
3	FIELD 1 SELECT (LEFT)	3
4	OUTPUT	4
5	START INTEGRATE	5
6	FIELD 3 SELECT (RIGHT)	6
7	-15VDC	7
8	+15VDC	8
9	GROUND, 15V RTN	9

NOTE: Cable wire colors do not match those inside the pre-amp chassis. Cable pin-out details are available on-line at <http://www.aidxray.com> or by contacting Advanced Instrument Development, Inc.

Acceptable Power Supply Ranges for 61154H Pre-amp:

Supply Voltage	Measurement Point	Acceptable Range
External +12VDC	61154H pin 8 (Referenced to 61154H pin 9)	+11.4VDC to +15.8VDC
External -12VDC	61154H pin 7 (Referenced to 61154H pin 9)	-11.4VDC to -15.8VDC
Internal +12VDC Isolated	Measure across 61154H C23	+10.8VDC to +12.5VDC
Internal -12VDC Isolated	Measure across 61154H C22	-10.8VDC to -12.5VDC
Internal +5VDC	Measure across 61154H C17	+4.7VDC to +5.3VDC
Internal +75VDC	Measure across 61154H C45 (HV1 to G1)	+65VDC to +85.0VDC

