

HIDEX Specifications

Hidex Automatic Gamma Counter

Specification

Hidex AMG

100-240V AC and 24 V DC.

Features Model (425-601) Automatic Gamma Counter.

General Description

Hidex Automatic Gamma counter is the premier measurement system for high energy gamma emitters, as well as low level gamma activity and environmental samples, suitable especially well for sophisticated research in nuclear medicine and PET applications.

The counter is equipped with a 3 inch thallium activated sodium-iodine crystal to support gamma counting and a modern MS Windows based touch screen operated interface for user-friendly operation. The design with small footprint and low weight allows integration into small laboratories.

The instrument has 55 mm internal and on conveyor side 80mm Pb shielding design for low background and minimal interference.

An optional automated sample balance with excellent weighing technology and weighing resolutions as low as 0.1 mg provides high precision and efficient measuring.

Transportation and movement of standard instrument does not require licenses for handling radioactivity and decommissioning is easy and low cost.

The instrument is intended for general laboratory use by trained personnel.

Detector

The detector consists of a NaI crystal that provides optimal counting efficiency.

- 1 x 3 inch sodium iodine (NaI) crystal.
- 1 x 3 inch Single Photon Counting Photo Multiplier Tube (PMT).
- The position of the detector provides optimum measurement geometry and low background and minimal interference from samples on the conveyor.

Detector shielding

- Optimal Pb shield design with a 4-pi 55 mm shielding
- Lead shutter provides optimum shielding from cosmic radiation.
- 80 mm shielding on conveyor side to minimize crosstalk.

Sample vials

- No minimum dimensions of the vials.
- Maximum dimensions of the vials: with cap 13mm vs 28mm in diameter.
- Maximum height 95 mm including cap.
- No restrictions in vial shape.
- Vial compatibility must be confirmed with Hidex.

Sample racks and vial holders

Two different sample racks can be used. They can be mixed in the conveyor and are automatically identified and processed accordingly. Racks are provided with individual vial holders which can be replaced in case of contamination.

- Rack 1 for Ø13mm vials 10 samples/rack.
- Rack 2 for Ø28mm vials, 6 samples/rack.
- Vial holder for Ø13mm vials.
- Vial holder for Ø28mm vials.

The sample changer has a storage capacity of 12 racks (72 samples, 20ml vials) or 22 racks (220 samples, 6 or 5 ml tubes)

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Sample ID

- Each rack can be provided with an ID code plate to identify specific racks.
- Supported barcode languages is code 39.

Analysis of data

- Linear Multi-Channel Analysis with 2047 channels.
- Several ROIs can be measured simultaneously.

Isotopes

Detection of gamma emitters

- Gamma emitters up to 2000 keV.
- Software assay library with 51 isotopes. Additional isotopes can be added by the user.

Performance Specifications

All the measurements are performed at temperature of $22^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and at normal humidity conditions of Hidex laboratory, Turku, Finland (relative humidity not measured). Background may vary locally depending on natural environmental radiation.

Counting efficiency (open window):

- typical 78 % for I-125
- typical 58 % for I-129
- typical 47 % for Cs-137
- typical 6% for Cr-51

Typical background:

- Open window 5-2000 keV 450 CPM.

Resolution:

- < 30 % for I-125
- < 30 % for I-129
- < 9,5 % for Cs-137

Count Rate

- up to 10 million CPM, with MCA

Performance Assessment

- Using standard samples
- OQ protocol template with Cs-137, I-129 and o I-125.
- Background monitoring template

Counting time

- 1 second – 1176 h (49 d) /sample.

Instrument operation and software

Counter can be operated using:

- MS Windows 10 based, Hidex AMG user interface software (21 CFR part 11 support as an optional item)
- Hidex AMG service software.

Data reduction by:

- MS Windows based, spectral analysis Hidex AMG UI software
- By user definable export format (txt, xls, csv, etc.) to any other data reduction software or data base.

The assay templates include predefined settings for running the assay and calculation formulas for printing out desired data. Hidex AMG software includes capabilities for biological assays, immunoassays, screening type assays, data validation and control history.

Analysis of data includes features such as automatic calculation of activity, normalization of results, background subtraction, half-life correction, etc. Also sample identification with user definable ID is facilitated.

Hidex Gamma User interface is compatible with Windows 10 (win 7 or 8 on request).

Results are saved permanently in the Hidex AMG-folder in computer memory after counting of each sample.

Unlimited installations in customer site for Hidex AMG User Interface.

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Data recovery

Automatic storing of measured data in HidexAMG software database created before the start of the measurement. The data of every sample is stored permanently in computer hard disk after completing the measurement of that particular sample.

Vial recovery

Automatic return of sample vials after power failure.

Power up diagnostics

Automatic power up diagnostics of instrument settings.

Physical Dimensions

- Hidex AMG: 620 mm (Width) x 700 mm (Depth) x 600 mm (Height).
- With balance: 620 mm (Width) x 830 mm (Depth) x 600 mm (Height).
- Analyzer well dimensions: Ø32mm, 46mm (Depth)
- Table (Optional): 800 mm (Width) x 700 mm (Depth) x 650 mm (Height).
- Total weight 198 kg, with balance 203 kg.

Operating conditions

- +10°C – +40°C; maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- Indoor use only.
- Dust during operation: The system shall function in normal laboratory environment.
- Light during operation: The system shall function normally in normal ambient laboratory illumination.

Storage and transport conditions

- Transportation conditions -40°C to +70°C, humidity 5 – 90 %, packed in transport packaging.
- Storage conditions -25°C to +50°C, humidity 5 – 90 %, packed in transport packaging.
- Detector unit must be stored a minimum 24h in room temperature for stabilization before installation.

Electrical Connections

- Voltage: 100 ~ 240 VAC
- Frequency: 50 – 60 Hz

Vial transport

- Robotic loading arm with elevator mechanism.

Communication connections

- Connection port using Universal Serial Bus (USB) allows communication with PC.
- Windows Service based communication.

Safety Standards

- CE marked.
- External power UL/CSA approved.

Warranty

- 12 months.

Maintenance

- Extended warranty and maintenance & service program available on request.

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Equipment included in the delivery

- 425-601 Hidex AMG
- 840-086 Rack for Ø13mm vials, 12pcs
- 840-087 Rack for Ø28mm vials, 6pcs
- 840-088 Vial holder for Ø13mm vials, 120 pcs
- 840-089 Vial holder for Ø28mm vials, 36 pcs
- 840-097 ID code plates, 40pcs
- 431-207 Power supply 100-240V/24V
- 529-011 USB-cable
- Hidex AMG User manual (on CD)
- Hidex AMG User interface software with isotope templates for most common isotopes and applications
- Hidex AMG service software for service use
- QC report

Optional Items

425-640 MCA extension

- High energy gamma emitters up to 4000 keV.
- Linear MCA up to 4000 channels.

425-645 Sample balance

- Automated sample balance with monolithic weighing technology.
- High-precision readability as low as 0.1 mg.
- Reproducibility: standard deviation 0.1 mg with 0.1 mg tolerance.
- Linearity: maximum linearity 0.2 mg with ± 0.2mg tolerance
- Off-center load: maximum deviation 0.2 mg with ±0.5 mg tolerance

425-646 Sample vial 2D code reader

- Automated sample vial ID reader for traceability
- 2D coder reading of datamatrix or QR codes

426-005 PC with touchscreen

- Can be obtained locally or as optional item from Hidex (al sw components preinstalled)
- Requirements of the PC:
 - Hidex AMG runs under Microsoft Windows 7, 8 and 10 operating systems.
 - The computer requires a minimum of 64 MB.
 - Resolution full HD (1920x1080).
 - MS Excel is suggested to facilitate results export.
 - Internet connection is suggested to facilitate updates from software manufacturer and remote desktop support from Hidex.

525-007 Instrument table, AMG

- Dimensions: 800 mm (Width) x 700 mm (Depth) x 650 mm (Height).
- Maximum supported weight: 300 kg

Manufacturer

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Data and specifications are subject to change, Hidex reserves the right to alter specifications.

No maximum is specified for background values.

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Document control

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