pico med

Your reference in   **Nuclear Medicine**

PRODUCTS CATALOG

Index

pico
med

Picomed is a recently founded start-up company.

R&D, manufacture, sale and after sale assistance for instruments, innovative devices for measurement, detection and manipulation of radioactive substances are its main business areas.
The main application field is **Nuclear Medicine**.

The company is made up of business partners (PTL Mirandola and TMP Lama Mocogno) with consolidated experience in the precision mechanics field for a lot of different application markets.
The Mirandola Biomedical district has an historical and strong aptitude to the innovation and to R&D activities.

The company, by getting advantage of a patent and know-how licenses set, will propose new instruments and devices under Picomed brand. In particular, a new radiation detector (Patent pending) will expand the company portfolio, by overtaking the limits related to the detectors actually present on the market.

The company has a strong collaboration with Physicists working in the reference sector, Universities and Research Centers, in order to quickly develop new and very innovative products.

The place of business is located in Mirandola (Modena-Italy).

AcMe
Activity meter

AcMe activity meter is a family of Dose Calibrators based on field proven state of-the-art technology.

The high precision innovative electrometer, coupled to a deep-well Argon filled Ionization Chamber, allows the highest measuring accuracy and stability.

A rational and user-friendly Windows-based HMI provides clear measurement results and full control of the device in terms of QC, data management, report and label generation.

To increase geometric measurement accuracy, the system gives user the unique capability to insert for each isotope an indefinite number of geometries, all stored in a permanent database. This features greatly reduces measurement errors in particular when measuring pure-beta emitters.

AcMe can be used as Stand-Alone device or installed inside hot cells and cabinets.

Software HMI can be installed over any Windows® 10 based system.

AcMe Dose calibrator general specifications

General

- AcMe is based on Argon filled well-type high-pressure ionization chamber directly coupled to a high accuracy smart electrometer.

- Electrometer is microcontroller based and performs automatically all measuring tasks, autozeroing, background, bias and gain digital control. Also the microcontroller continuously check the working parameters of the electrometer and send error codes to main HMI software, thus greatly reducing measuring errors due hardware malfunctioning.

- Functionalities like quality control, generation of reports and labels, make it the ideal tool for all operations of activity measurement in nuclear medicine departments and PET centers.

- Large 14" LCD touch screen display.

- More than 28 calibration factors stored for the most commonly used radioisotopes in Nuclear Medicine.

- System can store up to 110 isotope selection

- Nine customizable user-settable fast key for Isotope selection

- Geometries pre-set: Vial and syringe. Additional user-required geometries (indefinite number) can be set and calibrated easily

- PDF report generation and label generation both for patient or for production purposes. Reports and labels are permanently stored in SQL database

- Data are permanently saved in a SQL database, with USB export capability and TCP/IP protocol interface.

- Two-level password-protected device

- Label printing capability

- Ethernet TCP/IP output for interface with external systems (e.g. Standard Nuclear Medicine Management Systems)

- RS-232 and USB ports

- One Manual low density plastic canister Included

- HMI software can reside on any Windows 10 based PC and provides easy to use and intuitive interface

- External dimensions of the ionization chamber with shielding: (Ø x h) mm 150 x 390

- Ionization chamber with 3mm Pb: weight: 13 Kg

- Power supply: 110/240Vac 50/60 Hz

QC routines

- Full suite of Daily and long-term QC routines
- Digital Auto Zeroing by on-board Microcontroller
- Background measuring and digital compensation
- High-Voltage Digital check by on-board Microcontroller
- Calibration factors digital adjustment
- Amplifying-circuitry gain automatic digital adjustment due to on-board Microcontroller
- Accuracy QC
- Constancy QC
- Linearity QC (two methods: via decay or by manual samples preparation)
- Calibration QC: digital adjustment
- Molybdenum breakthrough measurement
- Linearity reports in form of .csv file to be exported and analyzed
- Calibration sources data are stored in SQL database for fast recovery and activity is kept always updated by the system, in order to reduce operator error and to speed-up QC routine activities. Indefinite number of source data can be stored in system memory.
- Automatic decay correction of calibration sources

Measuring performances

- Measuring range:
  > 8 Ci (18-F) > 25 Ci (Tc-99m), autoranging
- Electrometer accuracy: ± 1%
- Overall measurement accuracy over full-range: within ± 2%
- Linearity: ± 2% over the entire range of measure
- Resolution: 0.001 MBq max
- Long-term (1 year) stability: ± 2%
- Short-term (24h) stability: ± 1% with device constantly powered on
- Measuring time: 0.5 sec to 10 sec depending on activity of the sample
- Measuring Units: Bq or Ci

Options:

- Hot cell version, 8 Ci or 20 Ci model
- Molybdenum kit for Tc-99m quality controls
- Standard Label Printer: Brother P-Touch PT-710BT Option: Dymo Label Writer 4XL
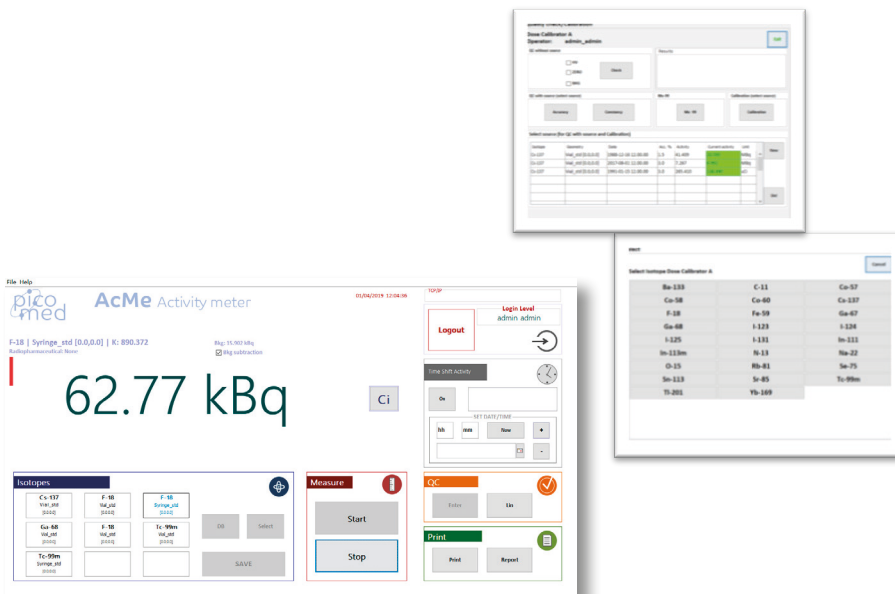
MaPi
Hand-feet-clothes monitor

Instrument developed for measuring gamma superficial contamination of hand, foot and clothes of the personnel operating with non-sealed radioactive sources in nuclear medicine labs, radiochemistry labs, production labs.

The standard version has 4 detectors, 2 for feet and 2 for hands; one hand probe is detachable in order to make full body contamination detection easy.

Detector signals are acquired, managed and displayed by a rugged PC based system with user friendly software HMI and touch screen display.

MaPi monitor general specifications

- Touch screen Colour LCD HMI with software for machine control and data display

- Alarm threshold Settable for every detection Unit

- Alarm with optical and acoustic signaling

- Relay outputs for interlocks

- Continuous display of background value

- Automatic background measuring and compensation

- Measurement in Bq/cm2 or CPS

- Simultaneous measurement of both hands (one detector for each hand) and feet (one detector for each foot)

- One hand detector is removable to allow body contamination measurement.

- Permanent Radionuclide library in SQL database

- Calibration factor for each detector (calibration routines included in software functions)

- Two-level Password protection (user and administrator)

- USB port data transfer

- Power supply: 100-240 Vac, 50/60 Hz

- Operating temperature: from +5 °C to +40 °C

- Relative Humidity working range: from 0% to 80% Non-condensing

- Dimensions: (w x d x h) 570 mm x 655 mm x 1330 mm

- Weight: Kg 60

Detectors

- 4 for the standard configuration
- Type of detector: Plastic Scintillator
- Average Single Detector efficiency on Cs-137 according to ISO 7530-1: $\approx 6\%$
- Typical Single detector MDA on Cs-137 according to ISO 11929: ≈ 1 Bq/cm^2 in 20 sec
- Detector sensitive area:
- Hand/body detector: 15 cm x 25 cm each (375 cm^2)
- Foot detector: 15 cm x 35 cm each (525 cm^2)
- MASTER ISOTOPE (for calibration): Cs-137

Electronics

- CPU: ARM v8 Quad Core (or superior/equivalent)
- Display: Touch Panel (800 x 480 resolution)
- USB Ports: 4
- Ethernet ports: 1 x 10/100/1000 Mb
- Relay output: 4 relays

MaPi Isotopes selection:

F-18	Tc-99m	Cs-137
I-131		

standard configuration with 4 detectors

NO ALARM	0 🖐 🖐 0 Bq/cm² 0 👣 👣 0
PRE-ALARM	0 🖐 🖐 15.8 Bq/cm² 0 👣 👣 0
ALARM	0 🖐 🖐 21.7 Bq/cm² 0 👣 👣 0

MiRi
Waste containers monitor

Through the measurement of the activity level performed by a pair of high sensitivity plastic scintillators with, MiRi is able to determine the activity concentration (in Bq/g) of a waste containers.
Different calibration factors can be used, based on the containers used.
A preset alarm thresholds informs the operator via a visual and acoustic signal about the activity content of the waste. Basing on isotopes information, the system gives the shelf life of the waste before discharging.

The system has three user levels defined by rights:

- **user rights:** allows you to operate the system and take measurements, but it does not allow you to modify the settings. The only configuration allowed is changing the access password.

- **administrator rights:** allows you to operate the system by taking measurements and to modify the settings.

- **service rights:** allows all operations and is reserved for maintenance activities done by the manufacturer.

A self-adhesive label printer allows operator to identify the measured containers.
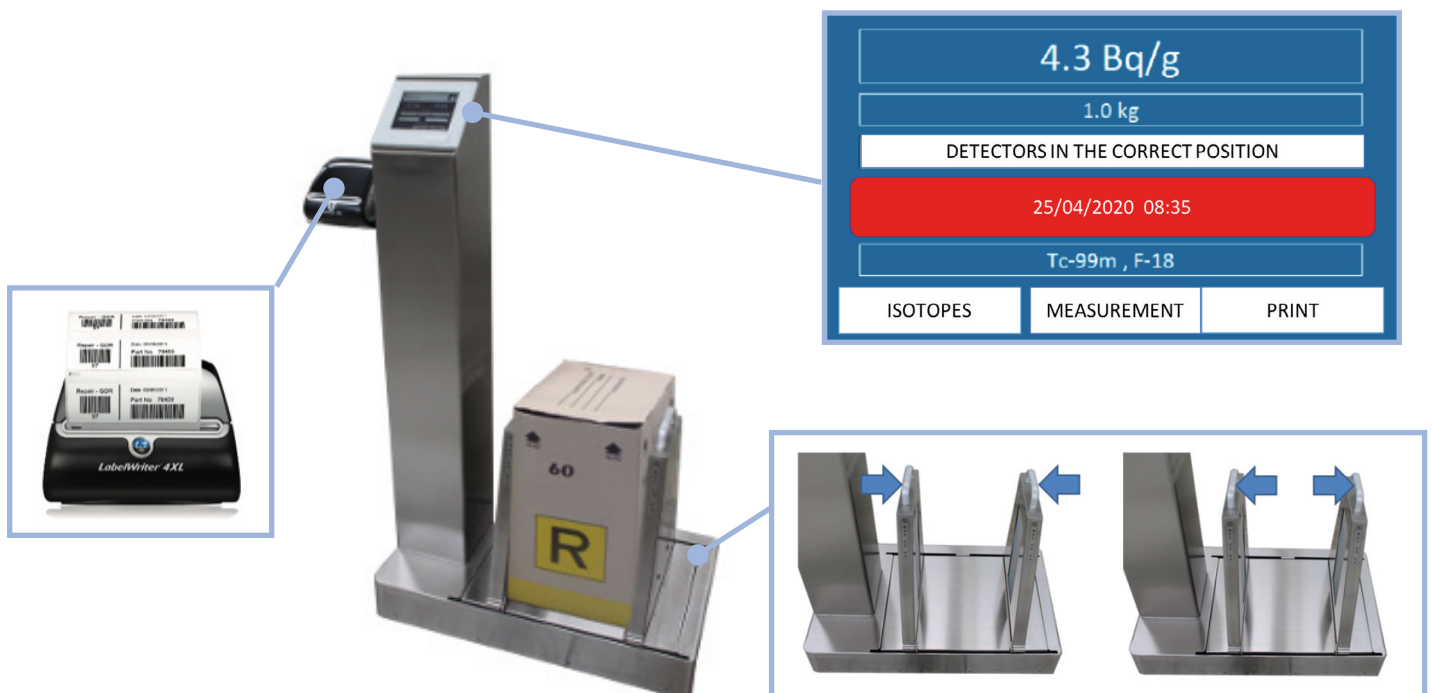
It can be used for the determination of the dose rate outside of the containers for the transport of FDG for their classification.

MiRi monitor general specifications

- Large area scintillator detectors, 20 mm thick

- Integrated scale, integrated printer

- Password protected software

- Main isotopes stored (customizable)

- Automatic background compensation

- Measuring efficiency for Co-57: the efficiency is 0,3% cps/Bq, the MDA is 1700 Bq

- Measuring efficiency for Cs-137: the efficiency is 0,1% cps/Bq, the MDA is 5100 Bq

- Measurement units: c.p.s. or Bq/g

- Power supply 110-230 V

- Large LCD Touch-Screen display

- Data permanently saved in a SQL database

- Data exportable to USB key

- Ethernet port

Technical data

Power supply	110 / 230 V
Frequency	60 / 50 Hz
Maximum current consumed	1 A
Display	LCD colour 6.5" touch screen
Interface	Virtual keyboard and mouse (touch screen monitor)
Alarms	Can be selected
System start-up	25 s
Internet connection	Ethernet cat.5E (RJ45 female connector)
Main power on	switch
Fuses	2 x 5 A
Operating system	Windows
Material	AISI 304 Stainless steel
Finish	Scotch-Brite
Height	1310 mm
Width	800 mm
Depth	480 mm
Weight	70 kg
Reference Source	Cs-137
MDA (Minimum Detectable Activity)	<5100 Bq
Mean Efficiency	0.1 %

4.3 Bq/g
1.0 kg
DETECTORS IN THE CORRECT POSITION
25/04/2020 08:35
Tc-99m , F-18
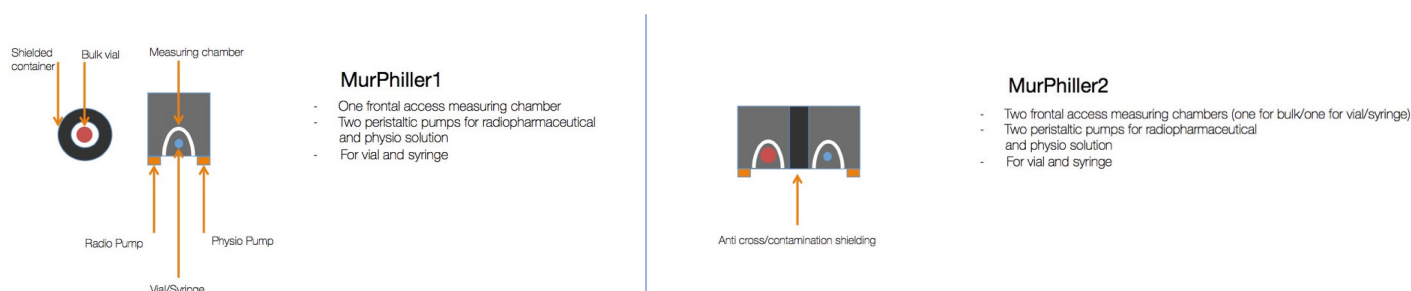ISOTOPES   MEASUREMENT   PRINT

MurPhiller
Dispensing systems family

MurPhiller is a family of radiopharmaceutical dispensing systems.

The heart of the project is the Patented detector, called STEM CHAMBER.
The particular and unique shape of the STEM CHAMBER allows to reduce the dimensions of the device, to have an optimal accuracy, in order to maximize the ergonomics.

The product is available in 2 different versions.

MurPhiller1
- One frontal access measuring chamber
- Two peristaltic pumps for radiopharmaceutical and physio solution
- For vial and syringe

MurPhiller2
- Two frontal access measuring chambers (one for bulk/one for vial/syringe)
- Two peristaltic pumps for radiopharmaceutical and physio solution
- For vial and syringe

MurPhiller general specifications

Consolle	
Hardware	Notebook
Operating System	Windows
Internal memory	> 32 GB
RAM	> 2 GB
Display	> 10"
Connections	USB micro A/B, power supply, ETHERNET, Wi-Fi

Ionization Chamber	
Type	DOSE DISPENSING
Operating voltage	500V
Filling gas	Ultrapure Argon
Filling pressure	20 bar
Power supply	24V DC

Dispensing specifications	
Type	DOSE DISPENSING
Calibrator activity range (F-18)	< 370 Gbq
(< 10 Ci)	> 2 GB

Main components

The MurPhiller dispensing unit is composed of two main components:

• Filling unit

• Control PC

The filling unit is responsible for determining the activity set by the user for the filling of the syringe and for performing the exact filling in the shielded syringe/vial.

The unit has an internal microprocessor based electronics, including a dedicated firmware, performing all the tasks required for the syringe/vial filling.

Its main components are:

• **Physio holder:** this is where the saline solution is placed

• **Physio pump:** is the high speed peristaltic pump responsible for pushing saline solution into the syringe or vial

• **Syringe/vial sliding holder:** holder for syringe/vial housing

• **Radiopharmaceutical pump:** is the low-speed peristaltic pump, responsible for pushing the radioactive compound into the syringe/vial

• **Measuring chamber for syringe/vial:** dedicated measuring chamber where the destination syringe/vial is placed. It is responsible for measuring the activity that is going to be dispensed in the syringe or vial

• **Integrated measuring electronics:** long life remotized electronics control board.

Technical specifications

• Dimensions and weight: 220 mm (w) x 210 mm (w) x 370 mm (h), weight around 15 kg

• Anodized aluminium construction

• Stainless steel chamber

• Power: 110/230 Vac, 50/60 Hz

• No need for gas or compressed air supply

• Two independent peristaltic pumps

• Electrometer Linearity: ± 2% over full range

• Electrometer accuracy: ± 2%

• High voltage readout

• Electronic zero control and adjustment

• Background measurement and compensation

Disposable kit setup is performed once the kit itself is properly introduced and opened in a class A environment.

Software

The system is fully controlled by a full featured software running over an external Laptop PC. The software main specifications are:

• Easy to use

• Password protected

• Real time activity measurement of the sample inside the chamber

• Setting of required activity

• Permanent SQL database storage of isotopes, geometries and calibration factors

• Full suite of QC routines (linearity, accuracy, calibration, High Voltage, Electronic Zero, background), in line with international regulations of measuring devices (Dose Calibrators)

• Fully compliant software with product regulations

• Intuitive user interface

• Real time control

QC Routines

Radioisotopes Database

Labels and reports

Password protected login

SonG
Gamma area monitor

SONG is a new generation gamma area monitor for gamma activity dose rate measurement.

It can be installed in all facilities whereas continuous dose-rate detection is required. Due to its design, it can be installed both as a stand-alone unit or in connection with a complete Environmental Monitoring System.

Great attention was given to GMP installation in clean rooms; the device design allows installation without visible cables. This, together with the rounded shape and the absence of any recess, avoids dust deposit and allows great cleanliness.

The basic device configuration foresees a dual-microprocessor electronics, internal High Voltage generation, four relays output, RS485 ready protocol, three relays indicating the status of the device (good functioning, pre-alarm, alarm), an OLED display and an integrated energy compensated GM tube.

As an option it is possible to connect an external probe. Such external probe can be of two types: normal dose rate range (with a single energy compensated GM tube), or high dose rate range (with dual energy compensated internal GM probe). The normal range probe is ideal for all application such area monitoring in facilities, radiopharmacy, preparation room, etc, while the high range probe is ideal for applications such as cyclotron vault monitoring and installation inside hot cells.

SonG monitor general specifications

Basic configuration details

- Dual-microprocessor electronics
- OLED display (128x 64 dots), for high visibility
- One internal Energy Compensated GM Tube for ambient dose rate measurement
- Four relays output for interfacing with external systems
- RS-485 communication port for connection to monitoring system software
- Three-color LEDs for system status
- Acoustic alarm signal
- Two configurable alarm threshold
- Password protected software
- Four selectable unit of measurement: cps, CPM, Sv/h, R/h
- Anodized aluminium enclosure

- Two microprocessor boards included as spare-parts for fast replace and system recovery
- 24 Vdc Power supply included

Options

- External remote probe with single Energy Compensated GM Tube (Centronics ZP1201 or LND 71210)
- External remote probe with high-range measurement capability with DUAL Energy Compensated GM tubes (Centronics ZP1201 or LND 71210 + Centronics ZP1313 or LND 7149). This option is ideal for cyclotron and hot cell application
- On-board or remote three lights alarm tower
- Calibration certificate from accredited laboratory

Technical specifications

- Detector: Halogen Quenched GM Tube - Centronics ZP1201 or LND 71210

- Radiation type: gamma

- Energy range: 50 keV – 1.5 MeV

- Energy Dependence: ± 15%

- Measurement range for SINGLE GAMMA PROBE: 0.1 μSv/h ÷ 10 mSv/h (0.01 mR/h ÷ 100 mR/h)

- Measurement range for DUAL GAMMA PROBE: 0.1 μSv/h ÷ 1 Sv/h (0.01 mR/h ÷ 100 R/h)

- Accuracy: ± 15%

- High Voltage: hardware settable, Typical 500V

- Display: 128x64 white OLED matrix. Long lasting and high visibility

- Factory Calibration sheet as per ISO9001

- Response time: 2 sec

- Alarm indication:
  three on board LEDs.

  GREEN LED:
  normal goof functioning status.
  YELLOW LED:
  pre-alarm threshold overcome,
  RED LED:
  alarm threshold overcome.
  ACOUSTIC SIGNAL:
  alarm threshold overcome

- Faulty condition:
  all LEDs are off and faulty indication
  is displayed over OLED display

- Controls:
  alram aknowledge
  (mutable acoustic signal),
  automatic restore of normal
  condition,
  high voltage control

- Output. 4 settable relays

- Communication protocol:
  RS485 with proprietary protocol

- Power: 110/230 Vac, 50/60 Hz

- Dimensions and weigth
  (without alarm column): 125 mm
  diameter x 60 mm depth, 1 kg.

- Operative Relative humidity range:
  0 ÷ 90%

- Operative Temperarture range:
  0 ÷ 50 °C
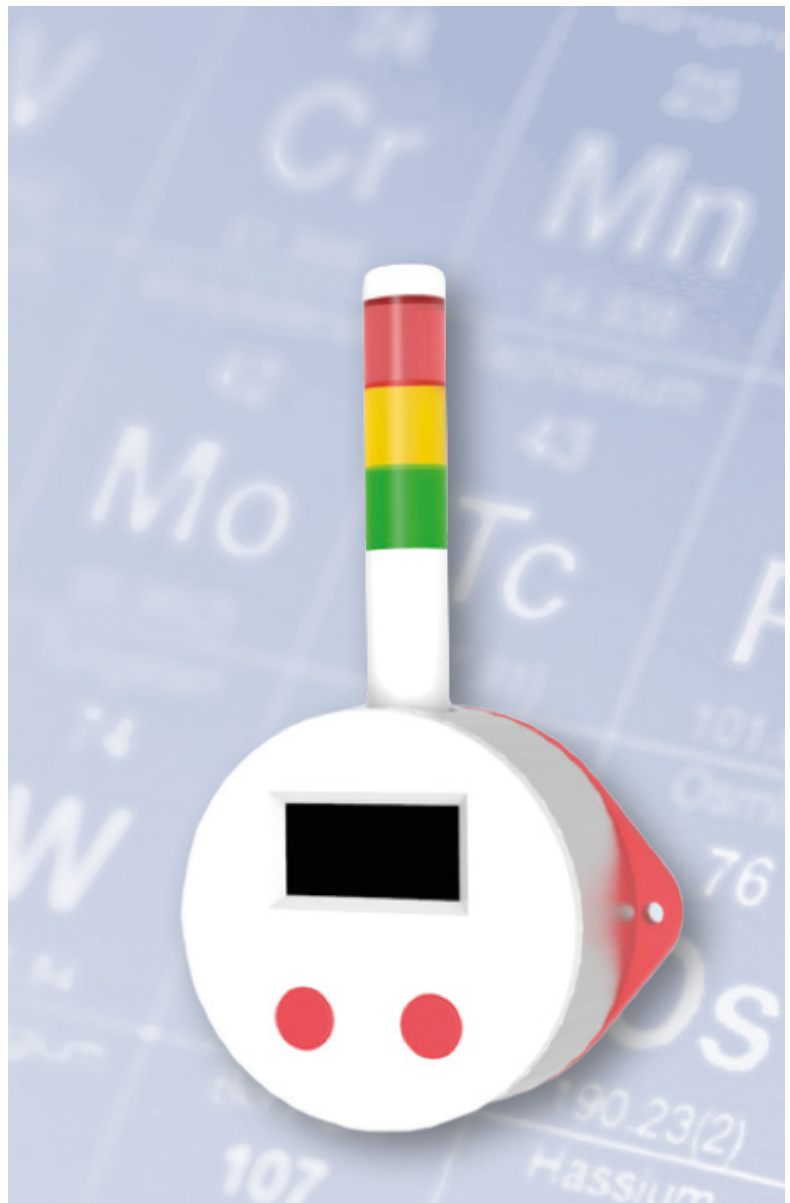
NuMe
Monitoring system

pico med

Nuclear Medicine Lab Monitoring System allows operators to monitor each room's radiation level by means of dislocated probes and a data collecting system.

The software, installed on a Pc, collects data from probes and shows any possible anomaly. The interface, realized using a virtual map, makes easier the event visualization. The system is meant to provide environmental activity level measurements in Traditional Nuclear Medicine and PET-Cyclotron Facilities and can be installed also in GMP laboratories.

The peculiar construction of the probes allows easy cleansing and installation with no visible cables.

It is a flexible and modular system and it allows to display, in real time, the whole facility status, by means of a dedicated software showing the building virtual map.
All probes, reliable, accurate and rugged, do not need any maintenance; they allow both gamma and neutron field (if present) radiation level measurement.

The system can also measure and quantify air radioactivity concentration level coming out the facility.

The system is able to manage all probes installed inside hot cells.
All probes connected can be controlled by the central unit in both READ and WRITE mode.
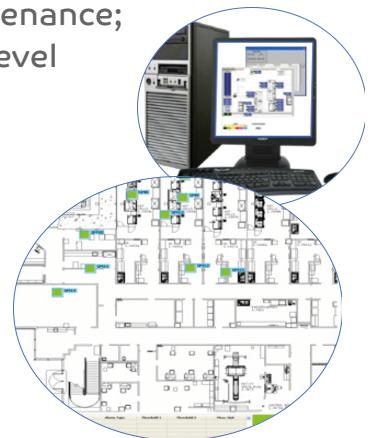
Control electric box
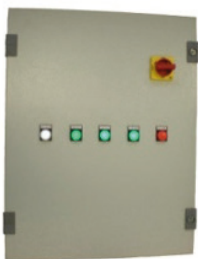
Tasks:

- Powering up all probes connected to the system

- Concentrating data from probes

- Visualization of system status via alarm column.

- Luminous indicators of power status

- On board visual and acoustic alarm column

- The electric box is provided with a general switch

- Indicator of low voltages presence inside the box; if a probe with automatic turn-off is requested, another indicator will show the probe's power status.

- Cables connection by the upper side of that box

Control PC

Tasks:

- to control the entire system,

- to print reports The PC has a mirrored hard disk for data storage
with a wide display and a printer

Software main specifications:

- User-customized interface software
- Customer-defined virtual map
- Real time data display
- Redundant alarm notification
(text and color coded messages, acoustic alarm)
- Remote configuration of all connected probes
- SQL database
- Scheduled and manual data backup

- Graphical and tabular data display
- Automatic and manual report generation
- Routines for calibration and activity air
concentration
- Routines for output interface to other systems
- (i.e. safety systems)
- Remote access ready
- 2-level password protection
(+1 level for assistance)

The remote control allows technical personnel
to control the system via Ethernet,
in case of system malfunctions.
A second Ethernet board is included in the PC configuration.
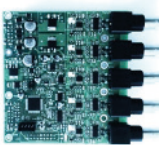
It's possible to add a dedicated electronic board in order to supply
7 relè outputs, programmable.

Function:

- to connect Monitoring system to other systems
- To use alarms to interlock doors, ventilation stop
- Settings included

UPS for Control PC

- Allows data storage and manages PC swithing off
in case of power failure.
- Allows Hot cell Geiger Muller Probes (Picomed model)
interfacing with the monitoring system.

SonG Gamma area monitor

SONG is a new generation gamma area monitor for gamma activity dose rate
measurement.

It can be installed in all facilities whereas continuous dose-rate detection is
required. Due to its design, it can be installed both as a stand-alone unit or in
connection with a complete Environmental Monitoring System.
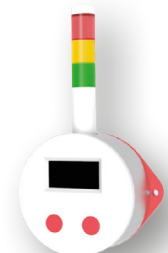
Neutron detector

Detector:

- He3 detector with moderator

- Energy field of the neutrons : Thermal to approximately 20 MeV

- Dose-rate range: 100 nSv/h ÷ 100 mSv/h

- Sensitivity: Typically 3.15 counts/nSv, for E=3 MeV

- Background: 0.05 cps

- Data communication: RS485

- Data storage: database

- Working temperature range: 0-45°C

- Relative humidity range: 0-75%

- LCD display acquisition unit:
 - GREEN LED (good functioning)
  - YELLOW LED (pre-alarm)
  - RED LIGHT (alarm)
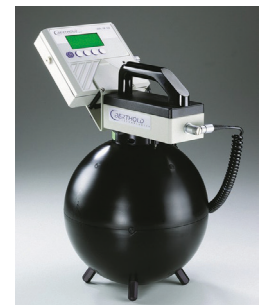
Continuous monitoring system for stack

1. One 2"x2" inches NaI(Tl) detector directly coupled to PMT and electronics

2. Full set of software calibration routines (energy and efficiency) included in the main control PC

3. Electronics (microprocessor based with an embedded Multi Channel Analyzer (MCA) and an automatic gain stabilizer).

4. Air Flow Meter for air volume calculation (in case air speed is not known or not constant over time).

The system can be calibrated on site by means of a known activity amount release in the duct (e.g. a gas such as C-11) or can come with a factory calibration.

Due to the internal automatic gain stabilizer the probe is not affected by the typical temperature drifts.

- Data communication: RS485

- Data storage: database

- Power supply: low voltage

- Working temperature range: 0-45°C

- Relative humidity range: 0-75%

- Mounting flange: included
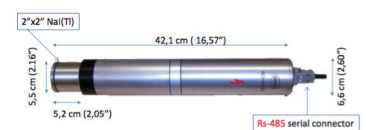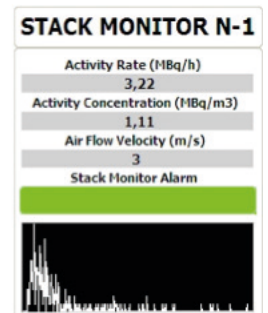
Digital flowmeter for the stack.

- Local display

- Data communication: RS485

- Power supply: low voltage from central electric box

- Operative temperature range: -20°C - +70°C

- Air speed range: 0 m/s - 20 m/s

- Framework: included

- Display dimensions: 130mm (l), 52,35 (d), 138 mm (h)

- Where is needed: Suggested in case air speed is not known or it is not constant over time

IdRa
Multi-Channel Analyzer
for waste disposal plant

This system allows activity quantification of liquid samples of waste disposal plants.

Precise quantification is obtained via a NaI(Tl) with Multi-Channel Analyzer probe installed in a low background well.

A water-tight Marinelli beaker is placed inside the well. Liquid is then sampled from tanks and stored in the Marinelli where measurement takes place with high geometrical efficiency.

The quantitive software allows data acquisition, ROI (Region Of Interest) definition and isotope identification, with consequent activity determination for each ROI.

The system is composed by:
- Low background shielded well.
  The well is made of iron with epoxy paint finishing.
  Standard shielding is 50 mm lead + copper internal sheet.
  OPTION: 100 mm lead shielding upon request
- 2"x 2" NaI (Tl) + PMT Probe with
  integrated high voltage generation,
  amplifier and 512 channels MCA;
- Quantitative Software for data acquisition,
  display and analysis of the spectra
  (peak recognition with automatic background subtraction);
- Software for energy and efficiency calibration
- Report generation

GAMMA SPECTRUM ANALYSIS SOFTWARE
- Quantitative software for data acquisition,
  display and analysis of the spectra
  (peak recognition with automatic background subtraction);
- Spectrum display
- Efficiency calibration
- Energy calibration
- ROI (Region Of Interest) definition
- Activity Calculation for each ROI
- Isotope identification
- Spectra Storage
- Report generation with activity, concentration,
  associated error and MDA for each isotope
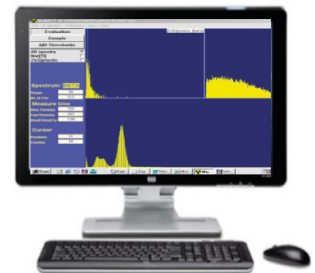
TELESERVICE UNIT
This unit allows to remote control the spectrometric software via ETHERNET connection.

Remote access allows Picomed technical personnel to verify any malfunction and restore the system proper functionality.

Also, it allows easy installation of eventual software updates.

Customer should prepare a socket with RJ45 connector and supply information about IP address and network configuration.

Custom
products

Our customers are choosing tailor-made solutions when they are unable to find suitable ready-made solutions on the market.
This usually means support for specific business processes that create added value and provide competitive advantage to companies.

It is important for us to guide the customer through all phases of custom developed project – from the business analysis of requirements, through the solution designing and drafting of specifications, to the implementation, introduction and maintenance of the final solution. We know how to adapt and provide assistance where is it most needed.
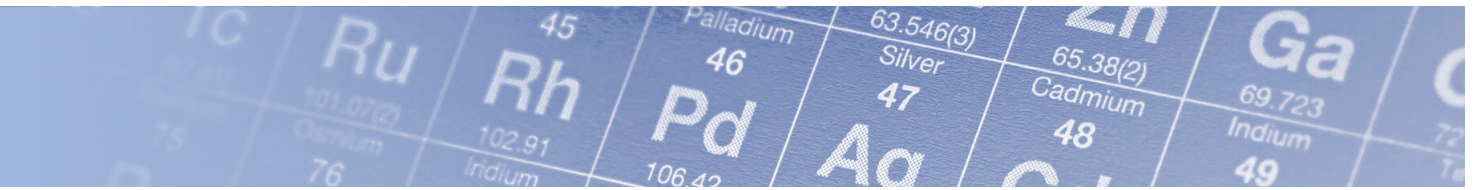
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