FHT 1377 PackEye # **4255051**

Scope of supply: 1 ea. light weight backpack containing radiation detection equipment[1], 1 ea. indicator unit mounted at the backpack's belt and 1 ea. accessory aluminium case[2].

[1] Comprising: *1 ea. NBR-Detector, 2 ea. He-3 tubes (2.5 bar), 1 ea. preamplifier and controller type FHT 681.*

[2] Containing: *1ea. user manual, 1 ea. USB connection cable with Driver Software, 1 ea. RS 232 serial connection cable, 1 ea. rain cover for backpack, 1 ea. earphone, 2 ea. rechargeable battery packs (one in exchange) for 60-70 h operation time each (378 g ea.), 1 ea. charger for 120/240 V AC and 12 V DC, 1 ea. package of black bands to secure the cables and belts of the backpack.*

Accessories

PackEye Case # **4255085**

Scope of supply: 1 ea. transport case for one PackEye (not included). The case allows the inside operation of a PackEye to be used as stationary detector. The PackEye can be powered externally by a case-adapter. It is recommended to use the optional PackEye PDA for data display as the indicator unit is hidden inside the case.

Tripod Stand # **4255086**

Scope of supply: 1 ea. easily adjustable tripod stand with mounting plate for the PackEye case (not included).

Case with PackEye inside

PackEye PDA # **425505091**

Scope of supply: 1 ea. Windows Mobile PDA including preinstalled software for data display and logging for retrospective analysis, 1 ea. plug-and-play Bluetooth adapter for the PackEye. The PDA has a built-in GPS system and class 2 Bluetooth capability.

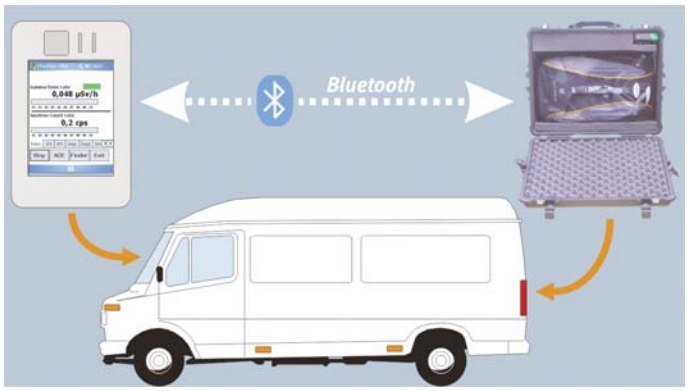
Case-Adapter DC/DC # **4255087**

Power adapter with special plug for the connection to a PackEye case. Input 12-24 V DC, output 7.5 V DC

Case-Adapter AC/DC # **4255088**

Power adapter with special plug for the connection to a PackEye case. Input 100-240 V AC, output 7.5 V DC

Application Example



Gamma Test-Adapter Kit - # **4254949:**
(100 g natural Lu_2O_3); Immediate indication of artificial gamma alarm (NBR).

Technical Specification

Gamma detector	NBR-detector FHZ 672 E (advanced version)
Gamma energy range / sensitivity	50 keV to 3 MeV / > 30 cps / µR/h [3000 cps / µSv/h] at 662 keV
Artificial gamma alarm	Typically better than 20 % of natural background
Neutron detectors	2 ea. He-3 tubes (2.5 bar), active length 15"ea., dia. 2"
Update	100 ms
Power supply	Rechargeable NiMH - power pack (7.2 V) - operation time 60-70 h
Total weight	approx. 6 kg (approx. 13 lbs)

www.thermo.com

USA:
27 Forge Parkway
Franklin MA 02038
USA
+1 (800) 274-4212
+1 (508) 520 2815 fax

UK:
Bath Road
Beenham, Reading RG7 5PR
England
+44 (0) 118 971 2121
+44 (0) 118 971 2835 fax

Germany/International:
Frauenauracher Straße 96
D 91056 Erlangen
Germany
+49 (0) 9131 909-0
+49 (0) 9131 909-205 fax

Thermo SCIENTIFIC

FHT 1377 PackEye

Radiation Detection Backpack

- High sensitivity plastic scintillation detector for fast response - true gamma doserate (50 keV to 3 MeV)
- Natural Background Rejection (NBR) indicates artificial sources - no false alarm upon NORM and natural background changes
- High neutron detection sensitivity
- User friendly, simple LED status indication
- Unchallenged light weight of 6 kg
- Low power consumption - operation time 60-70 h

NBR

Natural Background Rejection Technology for Enhanced Sensitivity

FHT 1377 PackEye

The FHT 1377 PackEye system was developed by Thermo Fisher Scientific for the rapid detection and location of gamma emitting radioactive sources. It provides survey teams with a tool for effectively addressing the problems of orphaned sources, radiological contamination, and maliciously introduced sources.

FHT 1377 PackEye

By virtue of the proprietary NBR-technology (**N**atural **B**ackground **R**ejection) extremely low contributions of artificial gamma radiation are quickly detected, despite much larger fluctuations of the natural gamma background radiation. Thus alarm levels in the order of 1 µR/h for SNM or heavily shielded industrial sources (dirty bombs) are achieved.

The NBR measurement method has been developed by Thermo Fisher Scientific, Erlangen (Germany) for extremely fast discrimination between natural and artificial gamma radiation. Worldwide, more than 2000 devices based on this technology are in use.

Unlike conventional spectroscopic based gamma identification systems, the systems using NBR do not require the presence and resolution of gamma spectral lines. Because of this flexibility, NBR can also definitively distinguish artificial high energy beta sources and heavily shielded gamma ray sources from fluctuating natural background sources. NBR has a rapid response time. Artificial gamma radiation sources are identified in seconds by operators with basic training levels. Presence of artificial gamma radiation is simply indicated by a red flashing light and an audible alarm.

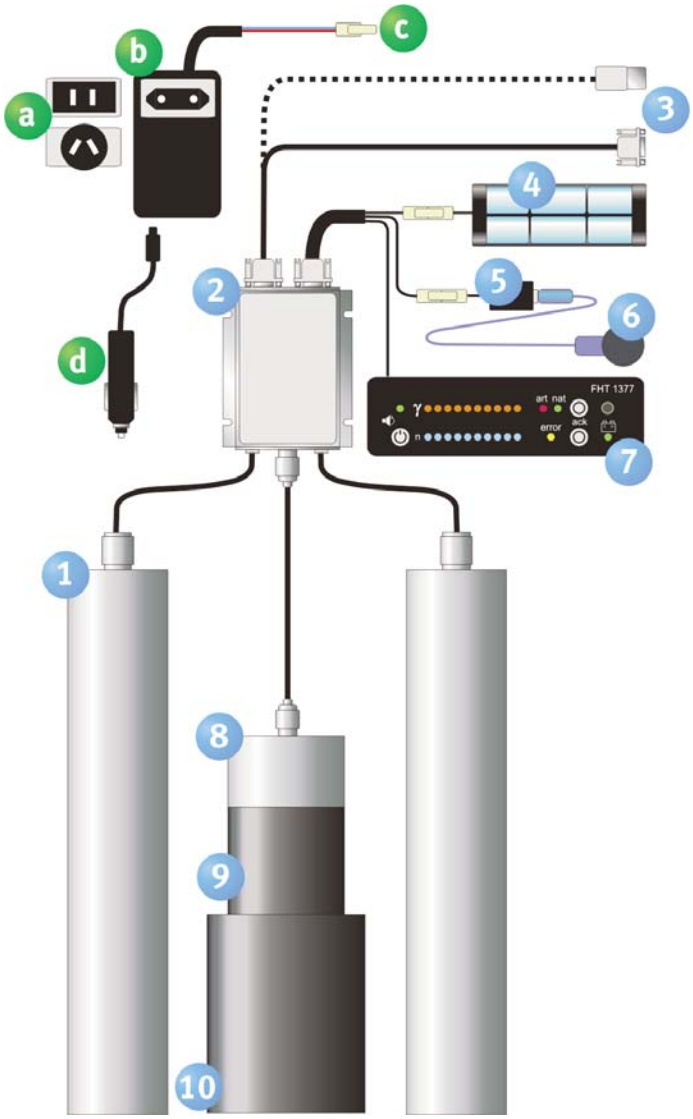
In addition to the detection of artificial gamma radiation (percentage alarm) a sigma based net count rate gamma alarm is active as well. Within a preset count rate range this alarm level is constantly and automatically updated according to the present background level.

System components

The detection of neutron sources is performed with the help of 2 ea. He-3 tubes (2.5 bar, 770 ccm active volume ea.). The sliding evaluation window with 100 ms update cycles allows the setting of a very low net alarm threshold level. A neutron source with an activity of 20,000 n/s can typically be detected in a distance of 3 m (10 ft), i.e. the neutron detection limit corresponds to the requirement for installed gate monitors!

1. Two He-3 counting tubes
2. Intelligent amplifier FHT 681
3. Connection cables to PC or notebook (serial RS232 or USB)
4. Battery pack
5. Earphone socket
6. Optional single earphone
7. Indication unit
8. Voltage devider
9. Photomultiplier
10. NBR detector

a. Set of international power socket plugs for charger
b. Battery charger with interchangeable plugs
c. Connector to battery pack
d. Car adapter as alternative power supply for the battery charger



Discrimination between artificial and natural radiation

In case of absence of detectable artificial gamma radiation, the green "nat" LED (E) is flashing slowly. The red "art" LED (D) light is blinking once artificial radiation is present. The presence of artificial radiation always triggers an alarm.

Excess of high energy radiation

If both LED lights (D + E) are on, the presence of an excess of high energy gamma radiation is indicated. Such an unusual background energy distribution results in a slightly reduced NBR-sensitivity to SNM or shielded industrial sources and can be caused by large amounts of K-40, an AmBe source or N-16 radiation

Alarm indication

Once an alarm had been triggered the location of the source can be traced by using the acoustical and / or LED bar indication. For stealth operation or in a noisy environment a standard earphone can be used. Optionally data display , alarm indication and data storage can be performed with the help of a PDA with bluetooth communication.

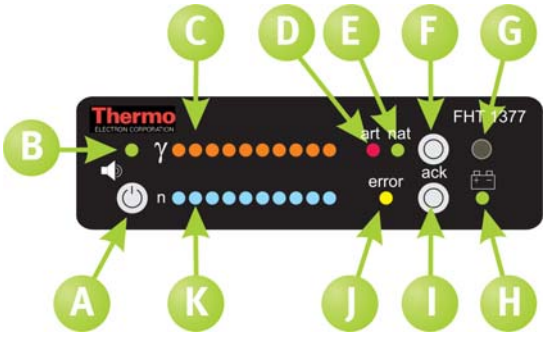
RadEye PRD - Personal Radiation Detector

For very low gamma energies the shielding effect of the user's body might hamper the detection of a source located in front of the user. It is therefore strongly recommended to wear an additional RadEye PRD at the belt. This pocket-sized instrument is an ideal complementary instrument for the precise localization of a source initially detected by the larger size FHT 1377.

RadEye PRD calibrated in R/h
4250671

RadEye PRD calibrated in Sv/h
425067120

Holster for RadEye PRD
425067046



Indicator unit display

- A Push button on
- B LED chirper Mode Indication
- C LED gamma radiation level bar
- D LED artificial radiation
- E LED natural radiation
- F Push button acknowledgement gamma radiation alarm
- G Sounder
- H LED battery status
- I Push button acknowledgement neutron radiation alarm
- J LED system error
- K LED neutron radiation level bar

Indicator unit

Stealth Operation:
The indicator unit can be hidden inside the backpack. The display of data as well as alarm indication is achieved through the optional PDA.

- 1 PDA
- 2 Radiation Detection Backpack
- 3 RadEye PRD
- 4 Indicator unit
- 5 Hidden radioactive material

Upon request, other backpack brands and models can be provided - weight and size will change accordingly.

Interceptor™

For advanced isotope identification Thermo Fisher Scientific's new Interceptor™ is available. The Interceptor™ offers immediate gamma isotope analysis.

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Please ask for detailed datasheets!