diagnosys

leading the wave

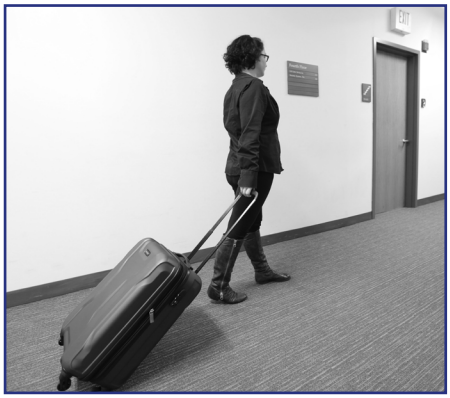
Envoy

Advanced PERG and VEP

Desktop Envoy™

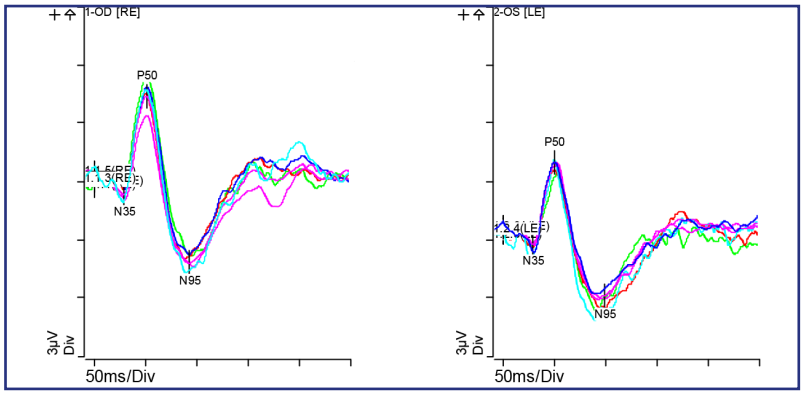
The first advanced monitor system, custom engineered by Diagnosys, that has no luminance artifact enabling precise ISCEV standard compliant PERG and VEP testing

E^3 console paired with an *Envoy* monitor, patient chin rest and 32-bit amplifier create a compact system



Portable System

The desktop *Envoy* system can easily be transported from one office location to another within minutes



Performance Leader

Unmatched repeatability: PERG responses from 6 different tests on the same patient

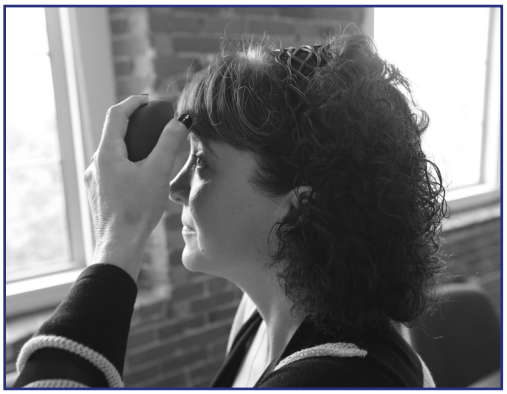
Cart-Based Envoy

Our fully integrated cart-based systems enable compact funtionality in a mobile system for use throughout your facility

Monocular monitor:
Ultra high luminance and contrast monitor that is only 4"x3" in size

Profile with *Envoy* features:

- Operating Room arm
- Patient set up in nearby chair
- Fully integrated with the system



Handheld Application

The *Envoy* stimulator disconnects from its stand enabling ultimate flexibility for patient testing, including pediatric

32-Bit Amplifier

Unprecedented 1 nano Volt resolution and illuminated receptacles guide lead insertion and eletrode contact quality

Envoy™

Advanced PERG and VEP

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Macula and Ganglion Cell objective, functional testing

PERG Applications[1]

- Detect & monitor dysfunction of retinal ganglion cells caused by conditions such as:
  - Glaucoma
  - Optic neuropathies
  - Primary ganglion cell diseases

VEP Applications[2, 3]

- Detect & monitor dysfunction of optic nerve & disc function caused by conditions such as:
  - Optic nerve atrophy, including glaucomatous
  - Ischemic optic neuropathy
  - Papilledema

Envoy shown mounted on its table stand

Features

Advanced performance

- Very high luminance
- Micro-second class response times
- High contrast black and white monitor

Easy to use

- Monocular and ultra compact
- Setup in minutes & portable
- Desktop, extendable arm for cart, handheld

Industry leading protocols

- Pattern Electroretinography (PERG), ISCEV standard
- Pattern Visual Evoked Potential (VEP), ISCEV standard
- Custom PERG, including horizontal bars and larger field size
- Custom Pattern VEP, including horizontal bars and larger field size
- Onset VEP

Specifications

Display type: OLED SVGA 800x600 pixel array	Calibrated luminance: >200 cd/m^2
Contrast ratio: >300:1	Monochromatic black and white
Viewing area: approx. 12.5 x 9mm	Viewing angle: 40 degrees
Response time: <1 ms	Checks, bars, gratings as standard with 1 pixel resolution
Envoy Monitor Weight: <1 lb (0.5 kg)	Dimensions: 3.9 x 2.8 x 1.8 inches (98x70x45 mm)
Multiple spatial frequencies	

Envoy ordering information

Envoy configuration

Model number: D352
Configuration: select 1 option per field below

D352 -	___
T	Table stand and chinrest
W	Table stand and no chinrest
A	Extendable arm for cart
H	No table stand, no arm

Available on the following systems:

- Diagnosys *E*^{3} desktop systems
  - Options "T", "W", and "H"
- Diagnosys *Profile* cart-based systems
  - Options "W", "A", and "H"

References:

1. ISCEV standard for clinical pattern electroretinography (PERG): 2012 update; Bach et. al.; Doc Ophthalmol (2013) 126:1-7
2. ISCEV standard for clinical visual evoked potentials (2009 update); Odom et. al.; Doc Ophthalmol (2010) 120:111-119
3. U.S. Centers for Medicare & Medicaid Services (CMS) ICD billing codes

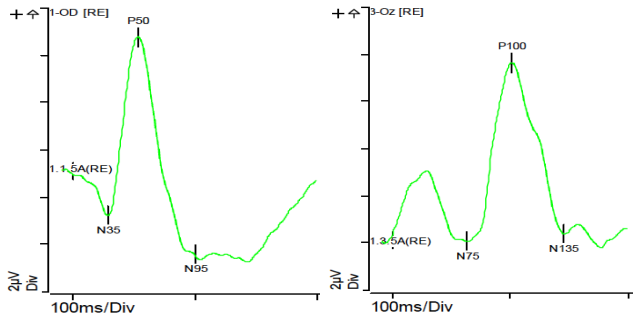
Application overview: Glaucoma

Research and clinical practice, including the International Society for Clinical Electrophysiology of Vision (ISCEV)[1,2,4] have found that PERG and VEP tests may detect early optic nerve and retinal damage, including Glaucoma. PERG and VEP results using a Diagnosys system on a range of patients.

Description	Summary	PERG	VEP

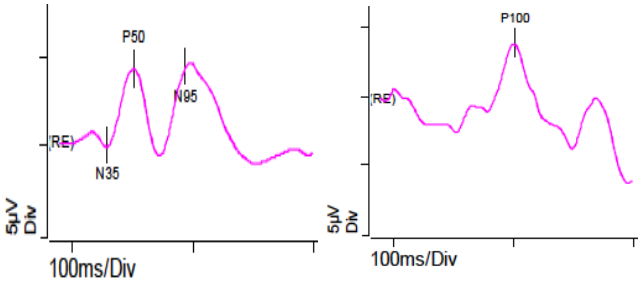
- **Normal patient**
- Well formed PERG and VEP
- Large P50 and N95 responses
- N95/P50 >1.1
- VEP P100 peak near 100 ms

PERG	
P50 Amp (uv)	7.5
N95 Amp (uv)	9.1
N95/P50	1.2
VEP	
P100 peak (ms)	101



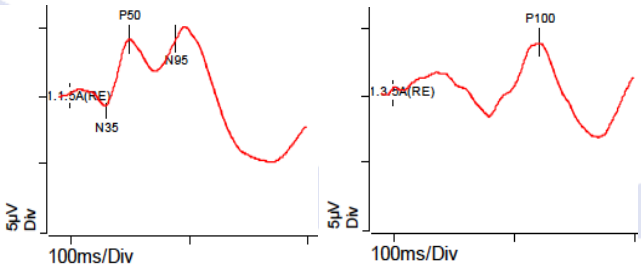
- **Abnormal patient**
- Poorly formed PERG
- Small N95 response
- N95/P50 <<1.1
- VEP P100 peak near 100 ms

PERG	
P50 Amp (uv)	4.3
N95 Amp (uv)	0.2
N95/P50	0.05
VEP	
P100 peak (ms)	102



- **Highly abnormal patient**
- Poorly formed PERG
- Small N95 response
- N95/P50 <<1.1
- VEP P100 peak >> 100 ms

PERG	
P50 Amp (uv)	4.1
N95 Amp (uv)	0.1
N95/P50	0.02
VEP	
P100 peak (ms)	122



Additional references on PERG, VEP and Glaucoma:

4. ISCEV: A Guide to Procedures; Standards, Recommendations and Guidelines
5. Heckenlively, JR, et. al.: Principles and Practice of Clinical Electrophysiology of Vision; 2006; *MIT Press*
6. Bach M, et. al.: Check-size specific changes of PERG in patients with early open-angle glaucoma. *Doc Ophthalmol* 1987: 315-322
7. Trick GL, et. al.: PRERP abnormalities in ocular hypertension: correlation with glaucoma risk factors. *Curr Eye Res* 1988; 7:201-206
8. Seiple W, et. al.: The PERG in optic nerve disease. *Ophthalmology* 1983; 90:1127
9. Markoff JI, et. al.: Pattern reversal electroretinogram in glaucoma, glaucoma suspects and normal. *Invest Ophthalmol Vis Sci* 1983: 24 (suppl):102
10. Quigley HA, et. al.: Chronic glaucoma selectively damages large optic nerve fibers; *Invest Ophthalmol Vis Sci* 1987; 28:913-920
11. Howe, JW, et. al.: Simultaneous recoring of PERG and VEP in a group of patients with chronic glaucoma. *Doc Opthalmol Proc Ser* 1984; 40:101-107
12. Bobak P, et. al.: PERG and VEP in glaucoma and multiple sclerosis. *Am J Ophthalmol* 1983; 96:72
13. Korth M, et. al.: PERG in normal glaucomatous eyes. *Invest Ophthalmol Vis Sci* 1987; 28 (suppl): 129
14. Weinstein GW, et. al.: The PERG in ocular hypertension and glaucoma. *Arch Ophthalmol* 1988; 106:923-928
15. Drum B, Quigley HA, et. al.:PERG and optic nerve histoloty in monkeys with unilateral laser induced glaucoma. Invest Ophthalmol Vis Sci 1986; 27 (suppl): 40

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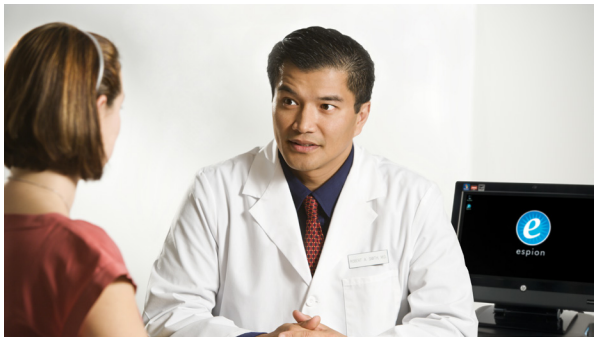
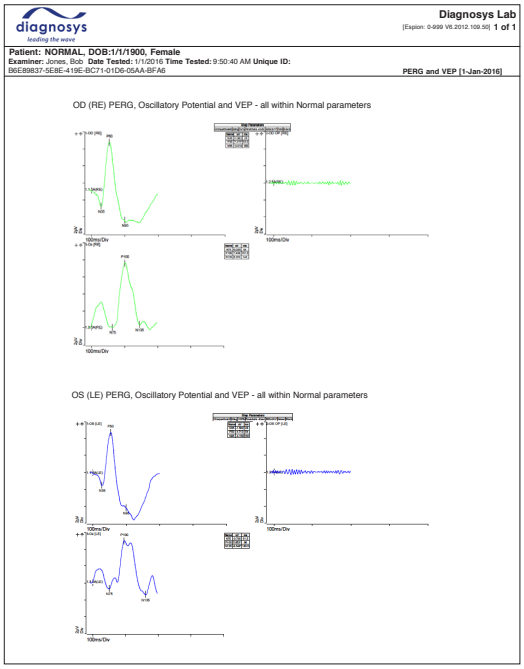
Doc: #14824 **Rev:** #A ECN 876 **Date:** 11/02/2016

Simplify your visual electrophysiology





Espion™ software provides detailed test reports that are concise and easy to interpret (ISCEV standard PERG & VEP tests using the *E*^{3} or *Profile* system).

The industry leader.
Decades of experience, thousands of installations.

- Most experienced customer support team in the industry
- Hundreds of peer-reviewed papers published using our systems
- Extensive world-wide network of leading experts operating Diagnosys systems

Ordering information:

Model #: D352

Available on the following systems or as an upgrade to them:

- Diagnosys *E*^{3} desktop systems
- Diagnosys *Profile* cart-based systems

diagnosys

www.diagnosysllc.com

If you would like more information on Diagnosys products, please contact us at either our US or UK locations.

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