

## Operation Manual

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## **NIGHT VISION ATTACHMENT NVS-33**

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105 Sparks Ave., Toronto, ON M2H 2S5, Canada

# IMPORTANT INFORMATION

Read prior to activation.

**You have purchased a sophisticated electronic device. To operate it properly, please read this manual fully. Ignoring operation procedures described in this manual will void your warranty.**

▪ <b>NEVER</b>	Disassemble the unit. Device contains a source of high voltage, which may be hazardous to your health!
▪ <b>NEVER</b>	Aim active unit towards intense light sources (i.e. lights, headlamps, campfires, the Sun, the Moon, etc.)
▪ <b>NEVER</b>	Reverse the polarity of a battery
▪ <b>NEVER</b>	Connect the unit to external power source
▪ <b>ALWAYS</b>	Remove battery when not in use for a long period of time
▪ <b>ALWAYS</b>	Keep the objective lenses covered other than when in use during the night operation
▪ <b>ALWAYS</b>	Store the unit in a warm dry place when not in use

## WARNING!

**Use of this device may be restricted by the national regulations. Please consult with local authorities.**

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# 1. BRIEF DESCRIPTION

## 1.1. Overview

NVS-33 is an afocal night vision attachment to a daytime weapon scope designed for precise aiming in darkness.

The device is equipped with a high-quality generation 3 electro-optical image intensifier tube that amplifies light in the visible and IR spectrum providing for up to a 400-700 m effective observation range at low light.

Observation range depends on the characteristics of the daytime scope NVS-33 is attached to and actual observation conditions, such as available light, atmosphere transparency and target reflectivity. The observation range increases by brighter light, at moony night, or if the object is positioned against a light background, such as snow or grass. The range decreases at lower light, low atmosphere transparency, or if the object is positioned against dark background, such as plough-land, desert, stems of trees, etc.

## **1.2. Key features of NVS-33**

- Installation of NVS-33 in front of a day scope on a weapon does not affect the latter's zeroing and scope's tactical parameters
- Exit pupil fits a broad range of daytime scopes
- Accurate internal focus adjustment mechanism
- High quality image within the entire field of view
- Withstands large calibre recoil
- Optionally supplied with MIL-STD-1913 Weaver / Picatinny mount
- Mounting adapters fit a vast majority of the daytime riflescopes.
- Up to 1 meter of immersion waterproof design
- Can be equipped with an optional powerful IR Illuminator
- Low battery indicator
- Two possible types of batteries (AA and CR123) can be used
- Low power consumption
- Compact and lightweight

## 2. DESIGN of NVS-33

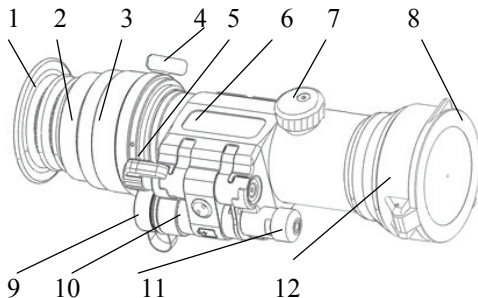


Fig.1 Configuration 1

1 – Ocular with light suppressor	7 – Objective focus adjustment knob
2 – Adapter ring with thread	8 – Objective lens cover
3 – Fixating ring	9 – Battery compartment cover
4 – Retention pin	10 – Battery compartment
5 – On/Off switch	11 – Remote switch connector
6 – Device body	12 – Objective lens

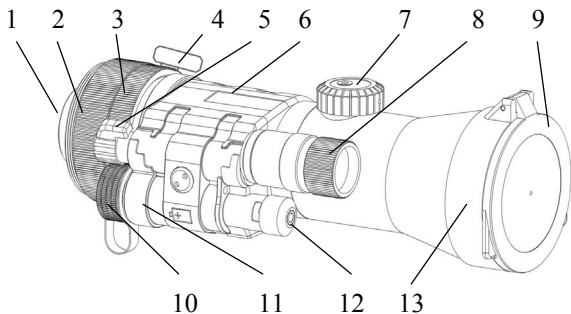


Fig .2 Configuration 2 (Special order with IR Illuminator)

1 – Ocular	8 – IR illuminator
2 – Adapter ring with thread	9 – Objective lens cover
3 – Fixating ring	10 – Battery compartment cap
4 – Retention pin	11 – Battery compartment
5 – On/Off and IR switch	12 – Remote switch connector
6 – Device body	13 – Objective lens
7 – Objective focus adjustment knob	

### 3. SPECIFICATIONS

<b>Optical</b>	
Magnification, x	1
Field of view, degrees	8.8
Daytime scope magnification, x	1-20
Acceptable	3-12
Recommended	
Focus length, mm	78
F-number	1.5
Focus range	10 m to infinity
Image intensifier tube	N3XT3631IC
Type	Gen. 3 18mm MCP
Gain, min	35,000
Resolution, lp/mm	57
Infrared illuminator (optional)	
Type	IR diode
Power, mW	75
Illumination angle, degree	5-20



Illumination wavelength, nm	805
<b>Electrical parameters</b>	
Power supply	1 CR123 or 1 AA battery
Voltage, V	3
Continuous work time, h, min	60
<b>Mechanical characteristics</b>	
Dimensions, mm	180 x 75 x 60
Weight, g	615

<b>Environmental conditions</b>	
Operating temperature range	-50°C to +55°C
Relative humidity	Up to 98%
Waterproof rating	IP67

**NOTE: As the design is being continuously improved some parameters may differ from those given above.**

## 4. DELIVERY SET

- NVS 33	1 pc.
- Objective lens cap	1 pc.
- Remote control switch	1 pc.
- Operator's manual	1 pc.
- Ocular protective cap	1 pc.
- Soft case	1 pc.
- CR123 Battery	1 pc.
- Additional battery cap for AA battery	1 pc.
- Cleaning cloth	1 pc.
- Quick release Picatinny mount	1 pc.
- Light suppressor	1 pc.
- Riflescope mounting adapter NC540.50	1 pc.

<b>Optional accessories:</b>	
- Hard case	1 pc.
- Riflescope mounting adapter NC540.56, NC540.42	1 pc. of each
- Threaded adapters M48, M52, M54, M55	1 pc. of each
- M540 converter to convert NVS33 into 2x monocular	1 pc. of each
- IR illuminator (mounted on the sight) (Configuration 2)	1 pc.

Exact delivery set depends on particular order.

## 5. INSTALLATION ON A RIFLE

### 5.1. Installation with thread usage

Your NVS-33 matches to the inner thread M52x0.75 of the objective lens of those daytime riflescopes that can accept daytime filters. If your scope does not match this thread, use mechanical adapters that transform M52 into M54, M55 or M48 threads. M52 adapter is used to increase the depth of the thread in case if the scope objective lens is close to the edge of the scope.

Mount your night vision attachment as follows:

If necessary, screw the corresponding threaded adapter in the thread on the adapter ring (2) (Fig.1).

Loose the retention pin (4) by turning it counters clockwise.

Turn the adapter ring (2) counter clockwise and screw it into the inner thread of the daytime rifle scope until stop. Avoid applying extra strength while tightening.

1. Turn the night vision attachment NVS-33 so that the objective focus adjustment knob (7) is located on top
2. Lock the attachment in this position by turning the fixating ring (3) in the counter clockwise direction.

*The night vision attachment NVS-33 is ready for use.*

NVS-33 can be screwed directly into the Newcon 3-12x50 riflescope. Its design allows such mounting without any additional adapters. To attach NVS-33 in front of NC 3-12x50, proceed as described above without using threaded adapters.

Due to different designs of the daytime riflescopes we cannot guarantee that threaded connection is supported in all cases. This design may be not strong enough to hold the night vision attachment during shooting. In such case, the ring and objective thread of the daytime scope may be damaged.

**The manufacturer is not responsible for use of NVS-33 night sight attachment by a threaded connection on the scope models other than those, which were approved by Newcon Optik.**

There is no need to re-zero daytime scope or perform any additional adjustment when NVS-33 is installed on the rifle.

## 5.2. Installation with a riflescope mounting adapter NC540

Three adapter modifications are available for the NVS-33 night vision attachment to install it in front of daytime riflescopes of different models:

Adapter	Diameter of the objective lens of the daytime riflescope	Plastic inserts set (quantity x thickness)
NC540.56	56 mm	1pc.x1mm, 2pc.x2mm
NC540.50	50mm	1pc.x1mm, 1pc.x2 mm
NC540.42	42 mm	1pc.x1mm, 1pc.x2 mm

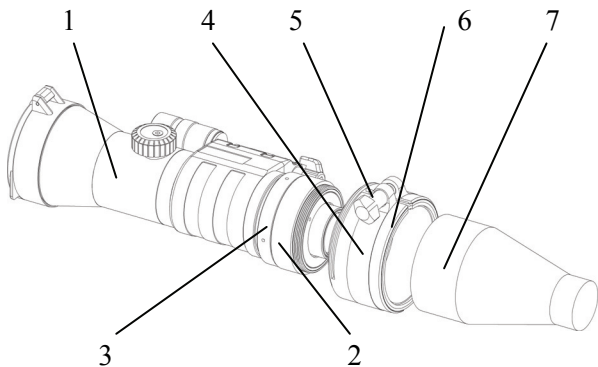


Fig. 3

1. NVS-33 night vision attachment
2. Adapter ring
3. Fixing ring with the pin
4. NC540.50 (NC540.56, NC540.42) adapter
5. Adapter screw
6. Plastic inserts
7. Objective lens of a daytime riflescope

Assemble the adapter and mount the night sight attachment as follows (Fig. 3):

1. It's necessary to select needed quantity of the plastic inserts (6) for a particular external diameter of the objective lens of the daytime riflescope. The objective lens of the daytime riflescope (7) should fit loose, but without apparent drift into the adapter (4) with the installed inserts (6) and loosen adapter screw (5).
2. After the inserts (6) are installed, the adapter (4) must be screwed on the adapter ring (2) against the stop and locked by the retention pin (3) in the counter clockwise direction.
3. Put the night vision attachment with the fixed adapter (4) on the objective lens of the daytime riflescope (7) and fix it by the adapter screw (5).



The lens of the daytime scope must be positioned at least 15 mm behind the front edge of the scope body. This excludes mechanical contact of the NVS-33 night sight attachment and daytime scope objective lens.

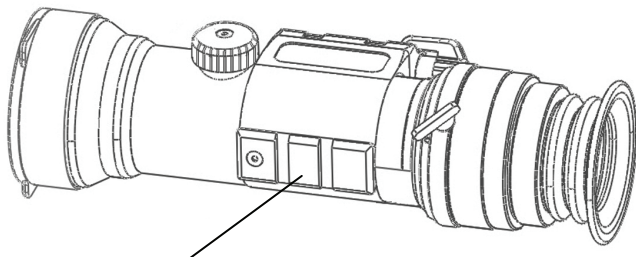
Last digits in the NC540 adapters part numbers correlate with the diameter of the daytime riflescope. For example, to use NVS33 with Swarovski Z6i 2-12x50 scope, you should take the adapter NC540.50.

During shooting with the night vision riflescope attachment NVS-33, which is attached to the daytime riflescope with help of the adapter the adapter ring could move along the objective lens of the daytime riflescope.

The size of this movement depends on the tightening force of the adapter screw (5), recoil force of weapon, etc., and could be equal to 1 mm on each shot. This movement is allowed and do not affect on the impact point. However, the position of the adapter should be controlled after each shot in the shooting process.

### 5.3. Installation on a Picatinny rail

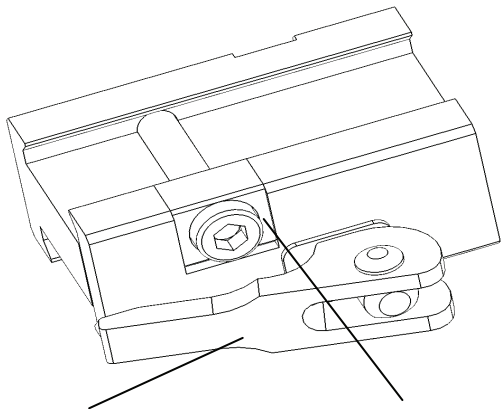
The night vision attachment NVS-33 can be installed on a Picatinny rail in front of the daytime riflescope. For this purpose, it has an additional Picatinny rail on the side.



Night sight Picatinny rail

Fig. 4

The rail adapter is designed to make the night vision attachment profile as low as possible to work together with low-profile scopes.



Quick release  
rifle rail clamp

Fig. 5

Night sight rail  
clamp with screw

Actual height of the adapter must be determined at the moment of ordering of the Picatinny rail adapter. Each rifle and riflescope combination is unique, and it is necessary to know height of the line of sight above the Picatinny mount to produce this part precisely.

Distance between NVS-33 line of sight and daytime riflescope line of sight must not exceed 2 mm. In case of two different rails are used, the angle deviation between two rails must not exceed 2 degrees.

Picatinny rail adapter is attached to the scope permanently by means of a small clamp and screw. The other side of the adapter is equipped with quick release clamp, which can be adjusted for width and pressing exertion. It allows almost immediate installation and de-installation of the sight on the rifle.

Light suppressor is used to prevent the user disclosure by greenish light emitted by the working NVS-33. It is attached on to the night sight instead of mounting adapters. The size of the light suppressor is determined by the riflescope design. The night sight should be mounted on the Picatinny rail as close to the riflescope as possible.

## 6. OPERATION INSTRUCTIONS

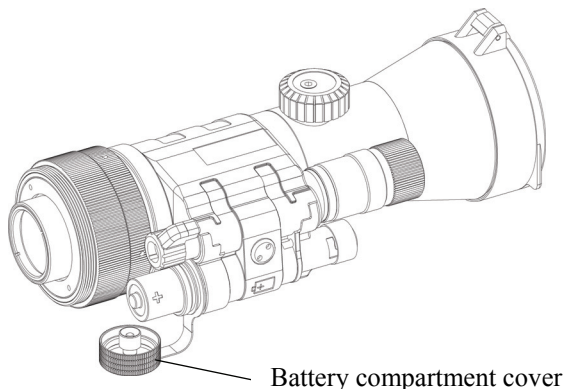
### **WARNING!**

**Lens cover should be always on when switching on NVS-33 in bright light conditions. Never aim the lens in the directions of bright light**

### **6.1. Battery installation**

NVS-33 is powered by one standard CR123A battery or 1 AA battery. The type of the used battery is determined by the battery compartment cap. By default, the sight is delivered with CR123 battery compartment cap screwed to the battery compartment. AA battery compartment cap is included into delivery set.

Prior to battery installation make sure it is in good condition.



Battery compartment cover

Fig. 6

To install batteries unscrew the battery compartment cover insert batteries, observing correct polarity, and screw the cover back on.

Your NVS-33 is equipped with the low battery indicator located in the field of view. This indicator starts blinking in red colour when the battery charge is low. Change the battery as soon as possible.

## 6.2. Testing NVS-33 in the daytime

**Daytime mode of NVS-33 was designed for testing purposes only. Image may be fuzzy.**

To test the device in the daylight:

1. Turn switch (5) (Fig.1) into ON position.
2. Direct the device at an object within 10-20 m from the viewer.
3. Turning the focus knob (7) (Fig.1) adjust focus to obtain
4. The sharpest image visible through the eyepiece.

**Keep the objective lens cover closed during daytime. Do not direct night vision attachment to bright sources of light, the Sun, highly reflective surfaces and similar objects. This may damage the image intensifier tube inside.**

### **6.3. Testing NVS-33 at night**

To test NVS-33 in darkness:

1. Take off the lens cover (9) (Fig.1)
2. Turn on the device using switch (5) (Fig.1)
3. By turning knob (7) (Fig.1) obtain clear image of the object.

### **6.4. Testing NVS-33 at night with daytime scope**

1. Install NVS-33 (see Chapter 5 “INSTALLATION ON A RIFLE”)
2. Take off the lens cap (9) (Fig.1).
3. Turn on the device using on/off switch (5) (Fig.1). Greenish image must be seen through the daytime scope.
4. Select necessary zoom of the daytime scope. By turning the knob (7) (Fig.1) of NVS-33 acquire the target through daytime scope.



## 6.5. Operation at night

Operation procedure:

1. Check the adjustment of the daytime riflescope (diopter adjustment, parallax adjustment, etc.).
2. Install the battery into the NVS-33 and mount it in front of the daytime riflescope as described above.

Being mounted in front of a daytime riflescope, the night vision riflescope attachment NVS-33 keeps all tactical features of a daytime riflescope (zoom level, adjustment step, etc.) intact.

3. Open the objective lens cover (9) (Fig.1).
4. Turn the switch (5) (Fig.1) of the device into ON position. You should see a yellowish-green light through the eyepiece of a daytime riflescope (the device works in passive mode).
5. Set the required magnification of a day riflescope.

In order to get the maximum quality of night picture through the daytime riflescope, we recommend using riflescope magnifications from 3 to 12.

6. Aim the rifle to an object and focus the objective of device with the knob (7) (Fig.1) on its top until you get maximum sharpness of the observed picture.

Observation and identification range provided by the night vision riflescope attachment NVS-33 depends on the ambient illumination, atmospheric transparency and contrast between the target and background. Identification range increases in conditions of higher illumination, in moonlight with external light sources of illumination, or if the target is located in front of light background (sand, snow). The identification range decreases in conditions of low illumination, low atmospheric transparency, or if the target is located in front of dark background (plough-land, trees, etc.).

7. If necessary, turn on the IR-illuminator (6) (Fig.2) (Special order only). NVS-33 is protected against accidental illuminator switch by the design of the switch handle. Press and rotate the switch (5) (Fig.2) to activate the illuminator. Divergence of IR beam could be changed from 5 to 20 degree by rotating of the IR lens.

The sight is not necessarily equipped with the IR illuminator. Your sight configuration is determined by your order. Working with IR illuminator can potentially disclose your location to the other side.

8. The fire adjustment of the combination daytime riflescope / night vision attachment should be performed in accordance with the instructions of the fire adjustment of the daytime riflescope.
9. Turn off the switch (5) (Fig.2) after work is over.
10. Close the objective lens cover.

When mounted in front of the daytime riflescope, night vision attachment NVS-33 can change zeroing as not more than 3 cm at 100 m. This is connected with changes in the weapon balance, light distortions in the image intensifier tube, technological limits of the adjustment of the night riflescope attachment. This imprecision usually appears as fixed value and can be easily compensated by the adjustment mechanism of the daytime riflescope.

We recommend you to make 10-15 shots with the mounted NVS-33 before practical using it in field conditions. Such test will check NVS-33 by a real shooting impact and thus will increase reliability of the whole system.

**DO NOT FORGET TO TURN OFF THE NIGHT VISION RIFLESCOPE ATTACHMENT AFTER USE!**

## **6.6. Use in a dark time as a 2x night vision monocular**

Operation procedure:

1. Screw the optional M-540 optical monocular into the eyepiece of the NVS-33 night vision attachment.
2. Open the objective lens cover (9) (Fig.1).
3. Turn the switch (5) (Fig.1) of the device into ON position. You should see a yellowish-green light through the eyepiece of a daytime riflescope (the device works in passive mode).
4. Choose the object of observation.
5. If necessary, turn on the IR-illuminator (5) (Fig.2) (Special order only) as described above (the device works in active mode).
6. Turn off the switch (5) (Fig.1) after work is over.
7. Close the objective lens cover.

## 6.7. Operation with remote control

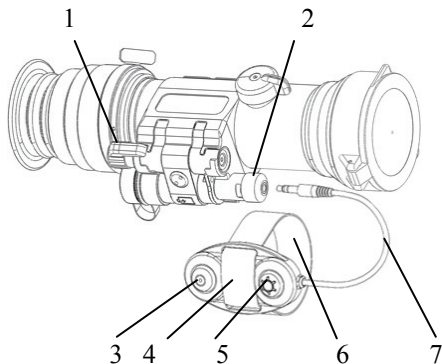


Fig. 7

- 1 – On/Off switch
- 2 – Female connector for the remote control
- 3 – The start button of the remote control
- 4 – Remote control body
- 5 – The start button of the IR illuminator  
(Special order only)
- 6 – Fixating band
- 7 – Remote control cable

The NVS-33 night vision attachment has the capability of operation with the external remote control that turns on and off the device itself and its IR illuminator.

Operation procedure:

1. Insert the jack of the remote control into the female connector (2) (Fig.7).
2. Fix the remote control (4) (Fig.7) on the weapon by the fixating band (6) (Fig.7) in the comfortable place on the butt.
3. Press and release the button (3) (Fig.7) to turn the device on.
4. Press and release the button (5) (Fig.7) to turn the IR illuminator (Special order only) on. The power of the IR illuminator corresponds to the position of the switch (1) (Fig.7).
5. Next press and release of the buttons (3) (Fig.7) and (5) (Fig.7) will toggle the controlled functions.

## 7. STORAGE AND MAINTENANCE

### **WARNING!**

**If NVS-33 has been stored for a long time at temperature lower than  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ), then prior to using the device must be kept at an ambient temperature of  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ) to  $+40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ) with humidity below 80%.**

NVS-33 is a sophisticated precise optical instrument equipped with electronics. It should be handled with due care:

- Unit contains fragile components and sensitive optics. Avoid impacts, dust, moisture and sharp changes of temperature.
- Do not touch the optical surfaces other than for cleaning. Doing so may damage the anti-reflection coating.
- Clean optical surfaces with professional lens cleaning supplies.
- Use only soft clean cloth to clean the exterior of the device.



- Keep away from sources of heat, such as heating appliances, sunlight or central heating. Do not keep the device at temperatures higher than 60°C (140°F).
- Switch off the unit and remove the batteries during the extended periods of non-operation.
- Do not apply excessive force or pressure to the lens assembly, this may damage fragile elements and thread connections.
- Small dark and/or white marks may be seen in the field of view. This does not affect the operational capabilities of the device.
- Do not remove the cover from the lens other than for night-time operation.

## 8. TROUBLESHOOTING

- **The scope does not turn on**

Check whether the batteries are installed properly. Check the charge of the batteries. Replace if they are weak. Do not mix old batteries with new ones.

- **The target does not appear in focus**

Bring the target to the center of the image. By turning the knob 7 (Fig.1) achieve the clearest target acquisition on the screen. If NVS-33 is used with daytime scope re-focus it. Repeat the focusing of NVS-33 and scope if necessary.

If the image still does not seem to be in focus, clean the lenses. They could be foggy or dusty.

- **Image has disappeared**

If the objective lens of switched on NVS-33 are exposed to bright light it automatically shuts off to protect the image intensifier tube from overload. When it happens, turn the unit off, wait for a few seconds and turn it on again.

If the image has been lost at the moment of a shot, check contacts in the battery compartment.

- **Condensation accumulates on the parts**

In order to avoid misting of the eyepiece lens at cold use the special protective cover.

- **Black dots on the screen**

These are some blemishes in the image intensifier, which do not affect the performance or reliability of a night vision device. Blemishes may vary in size and number; they are inherent in the manufacturing process. Most of them are seen in the daytime only and become almost invisible during the night time.

## **9. WARRANTY**

**NEWCON** warrants this product against defects in materials and workmanship for one year from the date of the original purchase. Longer warranty is available, subject to the terms of the specific sales contract. Should your Newcon product prove to be defective during this period, please deliver the product securely packaged in its original container or an equivalent, along with the proof of the original purchase date, to your Newcon Dealer. Newcon will repair (or, at its option, replace with the same or comparable model), the product or part thereof,

which, on inspection by Newcon, is found to be defective in materials or workmanship.

*What This **Warranty Does Not Cover:***

NEWCON is not responsible for warranty service should the product fail as a result of improper maintenance, misuse, abuse, improper installation, neglect, damage caused by disasters such as fire, flooding, lightning, improper power supply, or service other than by a NEWCON Authorized Service.

Postage, insurance and shipping costs incurred while presenting your NEWCON product for warranty service are your responsibility.

If shipping from North America please include a cheque or money order payable to NEWCON OPTIK for the amount of \$25.00 to cover handling and return shipping.

## 10. CUSTOMER SUPPORT

Should you experience any difficulties with your Newcon Optik product, please, consult this manual first.

If the problem remains, contact our customer support department at +1(416) 663-6963 or toll free at 1-877-368-6666 (North America only). Our operating hours are 9am-5pm, Monday - Friday, Eastern Standard Time.

**Under no circumstances should the equipment be sent to Newcon without authorisation from our technical support department.  
Newcon accepts no responsibility for unauthorized returns.**

To locate NEWCON Authorized Dealer call +1(416) 663-6963 or

fax +1(416) 663-9065

Email: [newconsales@newcon-optik.com](mailto:newconsales@newcon-optik.com)

Web: [www.newcon-optik.com](http://www.newcon-optik.com)

The defective products should be shipped to:

### **US Customers:**

2331 Superior Ave. Cleveland, OH 44114, USA

### **From all other countries:**

105 Sparks Ave., Toronto ON, M2H 2S5, CANADA

# 11. ACCEPTANCE CERTIFICATE

Image Intensifier Tube serial number:

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	Minimum	Measured
Resolution, lines/mm	57	
Photocathode sensitivity, integral, $\mu\text{A}/\text{lm}$	500	
Light gain	35000	

Date of production:

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Quality Inspector's signature:

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Unit serial number:

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The unit complies with all technical specifications and has passed the inspection.

Date of production:

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Quality Inspector's signature:

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Quality Assurance Seal

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