

ROVER – Exd Rotary Transmitter

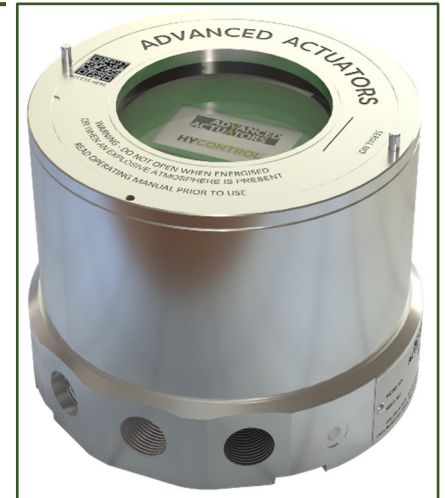
USER INSTALLATION & OPERATION MANUAL

Doc No. TECH-00116



1. Description

The Rover Rotary sensors are high resolution 12-bit contactless transmitters designed for measuring rotary position up to 360 degrees. They can be fitted with a variety of limit switches and digital communications such as HART for diagnostic purposes. With a rugged 316L enclosure they are suitable for numerous harsh applications providing reliable and precise feedback.



* For illustration purposes and may be subject to change.

Hazardous Area

Ex Markings	II 2 G Ex db IIC T6 Gb II 2 D Ex tb IIIC T85°C Db
North American Markings	Class I Div 1 Groups B, C, D T6 Class II Div 1 Groups E, F, G T85°C
Ta	-40°C > 50°C
ATEX	22 ATEX 1346 X
IECEX	EXV 22.0039 X
UK EX	22 UKEX 1347 X
Inmetro	CPEX 24.1587 X
Nobo	ExVeritas UK - www.exveritas.com
North American	80210798
Nobo (North American)	CSA Group – www.csagroup.org

2. Purpose

This document details the processes and instructions required in order to ensure the correct use of this product along with the safety of those operating personnel.

3. Additional Documentation

All laws, standards and directives applicable to the use in the operating location must be adhered to. Hazardous areas should conform to Directive 2014/34/EU and the associated standards.

Data sheets, drawings, declarations of conformity, type examination certificates, certificates and control drawings if applicable should be used in conjunction with this document. Check www.vrgcontrols.com for the latest information.

All special conditions found on the Ex certificates must always be maintained while product is in explosive atmospheres.

4. End User Responsibility

Responsibility for the planning, assembly, commissioning, operation, maintenance and removal lies with the end user / operator.

Those personnel must be appropriately trained and qualified in order to carry out such duties as detail in this and supporting documentation. These trained and qualified personnel must have read and understood this instruction manual before proceeding.

5. Intended Use

This device is only approved for its intended use. Ignoring these instructions and those contained within supporting documentation will void any warranty and absolve the manufacturer of any liability.

Some parameters of operation may be restricted depending on the intended use, these will be detailed within this document. Use of the device outside these parameters will void any warranty and absolve the manufacturer of any liability.

The device should only be operated in the atmospheric and environmental conditions listed here and in the product data sheet or type test certificate.

5.1 Requirements for Equipment Protection Level Gb & Class I Div 1

This device can be used in hazardous area locations containing gas, vapour & mist. Obstructions adjacent to flame path joints are in accordance with IEC/EN/BS 60079-14.

Refer to the relevant certificate to check the circuit connection type, maximum permitted ambient temperature, maximum power transmission and if applicable the surface temperature or the temperature class.

5.2 Requirements for Equipment Protection Level Db & Class II Div 1

This device can be used in hazardous area locations containing combustible dust. Care should be taken when mounting to reduce the possible undue accumulation of dust and dirt based on the environment.

Refer to the relevant certificate to check the circuit connection type, maximum permitted ambient temperature, maximum power transmission and if applicable the surface temperature or the temperature class.

6. Improper Use

Protection of personnel and plant will not be provided if the device is not operated in accordance with its intended use. The manufacturer will be absolved of all liability if this occurs.

7. Ambient Temperatures of Use

Housing must only be used within environments with ambient temperatures under values stated in table below.

T Class	Max Ambient	
T6	131°F	55°C
T5	158°F	70°C
T4 (Glass Lid)	194°F	90°C
T4	221°F	105°C

8. Mounting and Installation

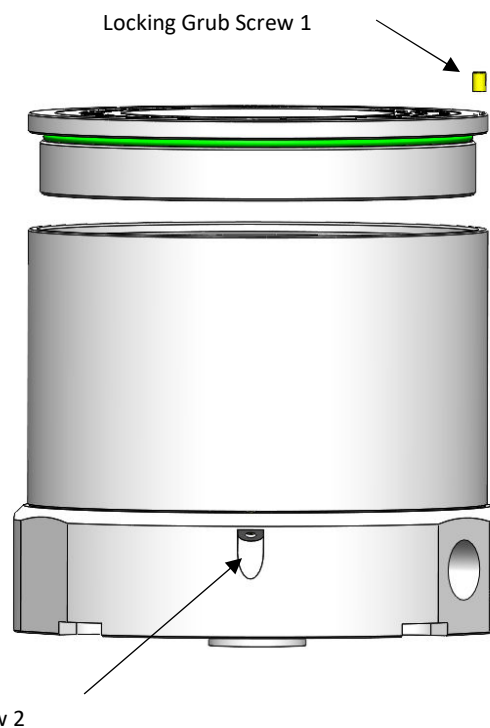
Ensure that all installation instructions are as per IEC/EN/BS 60079-14. Safety relevant markings are found on the nameplate of the device or the loose nameplate supplied. Attach any loosely supplied nameplates in the immediate vicinity of the device. Ensure that it is legible and will not be prone to wear, taking ambient conditions into consideration.

Do not mount a damaged or broken device.

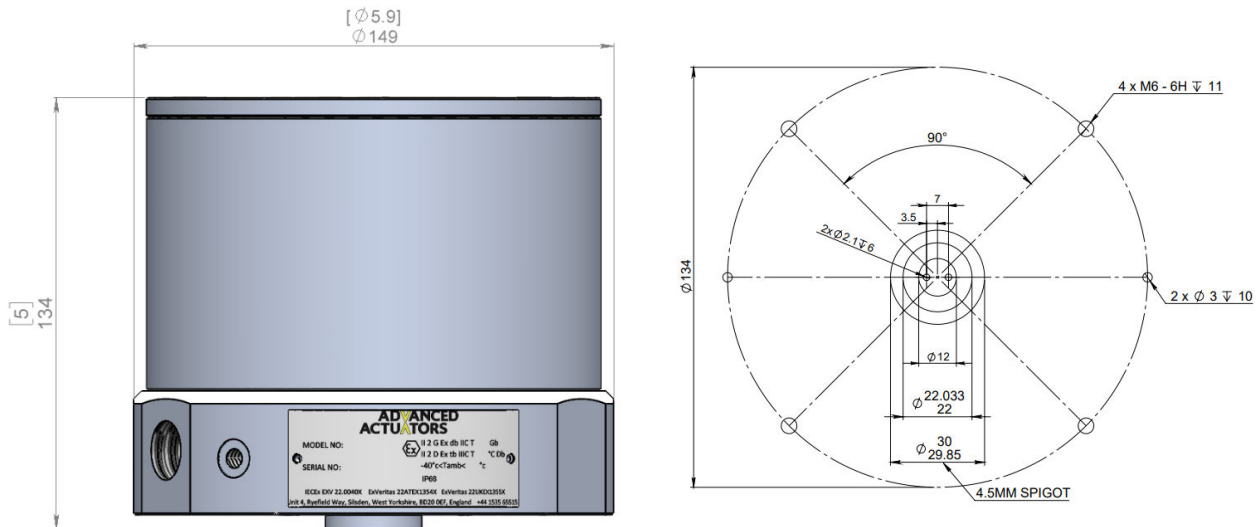
If the product will be subject to harsh or adverse environmental conditions, you must make suitable arrangements to protect the device accordingly.

Use full installation instructions found in DOC-001012 to gain access and make electronic connections, once complete, fasten unit together ensuring tube and lid are fully seated (metal to metal) and 2 x locking grub screws are fully installed (labelled below).

Apply stainless steel anti-galling paste to threads before installing plugs/ glands to prevent galling occurring during tightening, Stauff ABF Anti-Bloc-Grease or equivalent.



9. Dimensional Drawing



10.1 Electrical Connection

Ensure that all connections are made by an appropriately trained and qualified electrician. Glanding & plugs to comply with IEC/EN/BS 60079-14 particularly in terms of certification, protection concept & temperature rating.

PE connection to body or earth lug must be min 2.5 mm²

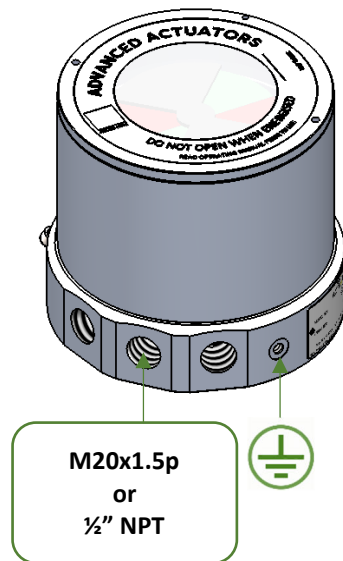
External earth connection – M6 Tapped hole in base

Ensure wiring is suitable for power requirements of equipment

1.5mm² conductor area minimum for hook up connections

250V minimum insulation resistance for hook up connections

For UL applications, control circuit must be in accordance with UL 1310 - Class 2 Power Units.



10.2 Electrostatic Protection

The transmitter should be installed in such a way as to avoid the possibility to become inadmissibly high electrostatically charged. Cleaning with damp cloths only.

The mounting and body should be included in the equipotential bonding of the installation.

11. Environmental

Ingress Protection: IP66 Type Rating: 4X

Ensure that when the transmitter is supplied without the manufacturers cable gland that the mounting and installation complies with IEC/EN/BS 60529 for ingress protection.

Indoor and outdoor use permitted

Use in polluted areas permitted, up to AQI 200 index

Permitted use at high altitudes up to 2000m

12. Operation, Maintenance, Inspection & Repair

The specific conditions of use should always be maintained. Safety relevant markings are found on the nameplate of the device or the supplied nameplate.

Periodic inspection should be carried out in accordance with IEC/EN/BS 60079-17 and plant procedures - Check condition and presence of seals, check for damage to flamepaths/ structural components, condition of internal components, condition of wiring.

Damaged or faulty devices should not be used. Defective devices should be replaced with the same original model.

Nameplate and warning labels should not be removed.

Warning - Do not open when energised or when an explosive atmosphere is present

Clean externals with damp cloth

There are no parts inside the assembly that require cleaning.

13. Conditions of Acceptability

For UL applications the equipment shall be supplied with Limited Energy Circuit (LEC) as defined in CSA C22.2 No. 61010-1-12, Class 2 as defined in article 725.121 of NFPA70, or Limited Power Source (LPS) as defined in CAN/CSA C22.2 No. 60950-1.

The device and all variants is not a serviceable item. It cannot be modified or repaired unless by the manufacturer.

Seal all conduits within 18 inches.

Temperatures at the entry point may exceed 158°F (70°C). Temperatures at the branching point may exceed 176°F (80°C). Suitably rated cable must be used.

14. Delivery, Transport & Disposal

Check all packaging and contents for damage on receipt of delivery. Confirm that all the items have been delivered and the part numbers are those which were specified at order.

Always store and transport in the original packaging.

Store the device in a clean, dry environment. The ambient storage conditions must be adhered to.

The device, built in components, batteries (If contained) and packaging must be disposed of in compliance with the laws and guidelines of the respective country.

15. Hazardous Materials

Some of the circuitry in the unit does contain Tantalum which can be harmful if inhaled or ingested however these effects are negligible as the parts are fixed to the circuit board. However, these materials are an integral part of the system and cannot be removed or reduced without affecting the performance of the unit.

If the product is used in a way other than specified in this document, then the safety of the operator and the integrity of the device and its ability to provide protection can become compromised.

The power supply used must have 24Vdc input and must meet the class 2/SELV limited energy with respect to UL 61010-1 and CSA C22.2 No 61010-1 for North American applications. This standard outlines the general safety requirements for varying types of electrical equipment and their accessories, wherever they are intended to be used.

Install in accordance with local and national regulations.

16. Training Instructions

Training is not required to setup and operate the A-HR, contact VRG Controls Ltd if assistance is required.

17. Safety

Prior to use check that the ROVER has been installed in accordance with this manual and that all connections to and from the unit are within the allowable ranges.

18. Electrical Connection diagram

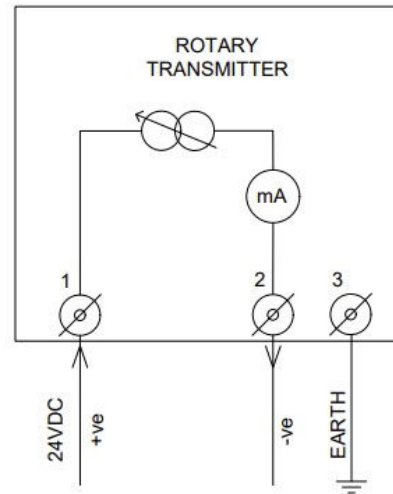
Loop powered

Power Supply:

Input Voltage: 24Vdc

Instrument only running current: 0.1A

Analogue output :
Output range: 4-20mA



19. Part Codes

Model Number		
	Series	A-HR
	Model	Feedback Only Switches Feedback & Switches
		A-HR-F A-HR-S A-HR-FS
	Digital Communication	None HART
		-N -H
	Switch Quantity	0 2 4
	Switch Type	None Mechanical Non-Contact Special
		0 M P X
	Entry	3 x M20 (Std) 3 x 1/2" NPT <i>Up to 6 entries possible, change number accordingly.</i>
		-3 -3N
	Indicator	Standard Special
		V (-522) VX (-622)
	Certification	Standard (ATEX/IECEX) Inmetro (ATEX/IECEX) North American (CSA/IECEX)
		-BR -US
	Special Design Code	VRG Std VRG Std WITH Hi Viz Indicator
		-522 -622
	ROVER VRG Standard Model	VRG ROVER EXd Rotary Feedback w Limit Switches / AA ID: A-HR-FS-H-2-M-3N-V-US-522 / 4-20 mA + Mechanical Limit Switches (2) / HART / CSA + IECEX / Digital Indicator / NAMUR Mount / VRG Part. BA-9890
	ROVERHICIZ VRG Std Model w High Visibility Indicator	VRG ROVER EXd Rotary Feedback w Limit Switches / AA ID: A-HR-FS-H-2-M-3N-VX-US-622 / 4-20 mA + Mechanical Limit Switches (2) / HART / CSA + IECEX / Hi Visibility Indicator (Red_Green) / NAMUR Mount / VRG Part. BA-9892

* Part Codes for model referencing only, unique build number provided at order placement

20. Safety Relevant Technical Data

Hazardous Area

Type of protection	Explosion Proof	
CE / UKCA Marking	CE / UKCA	
Certificates		
ATEX Certificate	22 ATEX 1354 X	
ATEX Marking	II 2 G Ex db IIC T6 Gb / II 2 D Ex tb IIIC T85°C Db	
IECEX Certificate	EXV 22.0040 X	
IECEX Marking	II 2 G Ex db IIC T6 Gb / II 2 D Ex tb IIIC T85°C Db	
UK EX Certificate	22 UKEX1355 X	
UK EX Marking	II 2 G Ex db IIC T6 Gb / II 2 D Ex tb IIIC T85°C Db	
North American Certificate	80210798	
North American Markings	Class I Div 1	Groups B, C, D T6
	Class II Div 1	Groups E, F, G T85°C

21. Company Contact Details:

Details

Address	VRG Controls, LLC 1199 Flex Ct Suite B Lake Zurich, IL 60047 USA
Email	Sales@VRGControls.com
Phone	Toll-Free: 844-FLOW-VRG (USA and CANADA)