

REFLEX ACT

Electronic core orientation

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Reflex ACT is a fully electronic orientation device, designed to provide highly accurate and consistent core orientations in broken formations. The unit is easy to operate and its robust design ensures long and trouble-free operation.

Accurate Orientations in broken ground

The Reflex ACT instrument is a precision tool and is accurate to 0.5 of a degree. Unlike conventional mechanical orientation devices, which begin to lose accuracy at a dip of approximately 75 degrees, the Reflex ACT provides full accuracy up to 88 degrees. The high accuracy is achieved by three accelerometers which electronically measure the Earth's gravitational field. This superior technology ensures that geological anomalies and magnetic disturbances have no effect on the accuracy of the Reflex ACT.

The Reflex ACT has been designed for geotechnical and mine planning applications where highly accurate and consistent data streams are required.

Broken ground is overcome by the use of triple tube. On retrieval of the sample, the core is marked using the standard Reflex ACT orientation method. The splits are then pumped out and one of the tubes is removed. The orientation mark can then be scribed up the core sample, carefully placed in a core tray, and examined with confidence in the accuracy of the orientation marks.

Ease of assembly

The Reflex ACT is available in sizes to suit LTK60, NQ, NQ2, NQ3, NTW, HQ, HQ3, PQ, PQ3, as well as the new generation QPQ back ends. Assembly of the equipment is straightforward; the tool is simply inserted between the core tube and the backend assembly. The only other addition to the drill string is the inclusion of a barrel extension to account for the increased length of the inner tube.

Water proof and durable

The Reflex ACT was designed with the realities of harsh drilling environments in mind. The tool is fully sealed and has a rugged design. When installed into the drill string and secured by the driller's normal tightening practice, the Reflex ACT is rated to 3,500m water resistance. The unit is shock resistant and can handle the forces created during the lowering of the inner tube and seating in the barrel. Resilience up to 500 G's of force is achievable due to clever internal shock absorption techniques.

On-site calibration test

A quick function test on the surface allows any questions regarding the performance of the Reflex ACT to be answered in less than two minutes. The calibration of the tool does not fluctuate and is not subject to intermittent lapses in accuracy. Therefore, if the unit passes the function test, other factors would be the cause of any discrepancies.

More metres drilled

Every Reflex ACT kit contains two orientation tools, allowing orientation of every core sample from every run. While one of the tools is down the hole locating the orientation of the drilled sample, the other unit is on the surface being orientated.

No consumable costs

The Reflex ACT requires no consumables and has no moving mechanical parts to wear and fail during use. Contamination and clogging of moving parts by the drilling mud is also not possible. A non-rechargeable lithium battery pack ensures long and trouble-free operation.

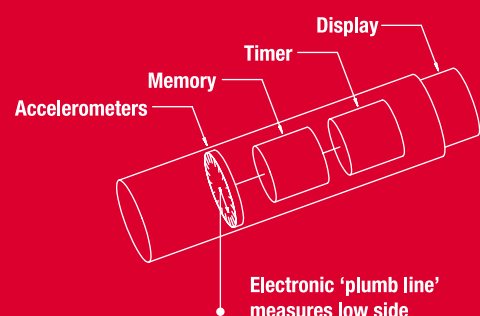
Proven concept

The Reflex ACT has been in service all over the world since the beginning of 2005. The units orientate accurately and consistently in all types of extreme environments, including Canada's frozen Northern Territories, the humidity of New Guinea and the hot exploration holes encountered in Indonesia.



WORKING PRINCIPLE

Every minute during the drilling process, the accelerometers sense the 'low side' of the core tube and records the position in the memory. On completion of the drilling run, the tool is returned to the surface and the driller enters the time at which the core was broken. The tool uses the associated accelerometer information stored in its memory and guides the user to position the tool so that the same 'low side' position is reproduced on the surface. In layman's terms, the tool is acting as an electronic plumb line.



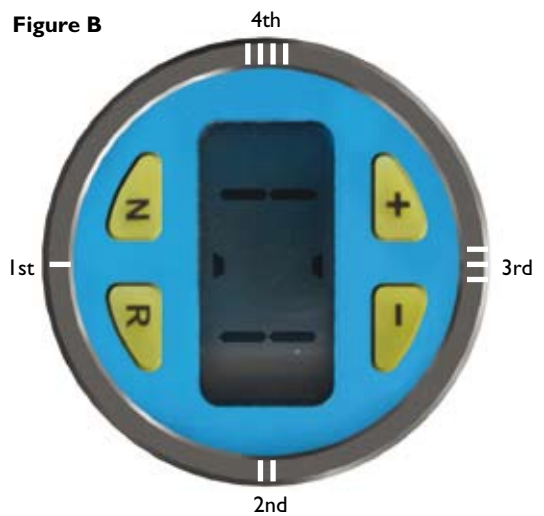
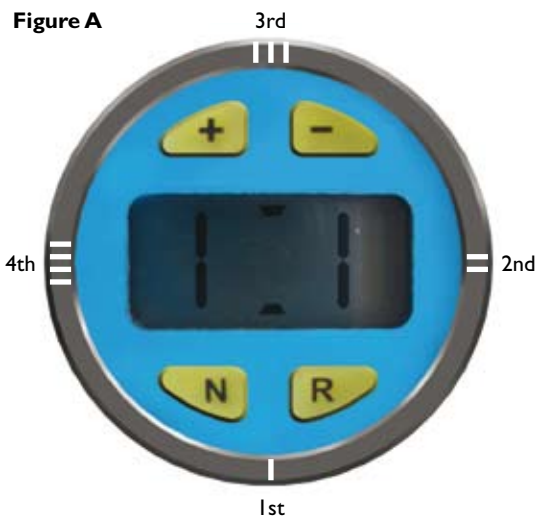


On site calibration check procedure

The Reflex ACT does not suffer from intermittent calibration errors, it is either calibrated correctly or requires maintenance. Being a digital item it is important that the accuracy of each Reflex ACT can be determined on site quickly and easily.

The calibration check procedure requires the operator to use the tools in the same manner as they would when in the field. This calibration check mimics the tool operation whilst drilling and merely recreates the activity in sight of the person performing the test. The tool records the orientation of the tool in memory at the end of every minute after the tool is armed.

- 1) Reset the Reflex ACT as for normal use by pressing and holding the N button until 888 appears on the screen. When 888 appears start the stop watch.
- 2) Lay the tool at an inclined angle in a stationary position and make a single mark at the base of the bezel indicating bottom of hole. When 888 flashes on the screen of the tool it indicates that an orientation has been taken, this will coincide with approximately 1 minute on the stop watch.
- 3) After the first orientation has been taken, roll the Reflex ACT approximately 90 degrees and repeat the procedure above. In this case mark the bezel with 2 marks.
- 4) Continue steps 2 and 3 until you have recorded 4 minute readings each approximately 90 degrees apart. Stop the stop watch at the end of the fourth minute.
- 5) Press the R button and then + to enter 1 minute, press R again and roll the tool as per normal operating procedure until the full box appears in the LCD screen. With the formation of a full box, the 1st mark should be at the bottom indicating that the tool has successfully reorientated the first mark (figure A).
- 6) Press the R button again and then the + button once more to scroll to the second minute. By recalling the 2nd minute, the tool is being asked to show the orientation it took at minute number 2.
Press R again and roll the tool until a full box is formed. With the formation of a full box the 2nd mark on the bezel should be at the bottom, indicating that the tool has successfully reorientated the second mark (figure B).
- 7) Repeat step 6 for the remaining 3rd and 4th minutes.



If the tool passes this test it is operating correctly. Please contact Reflex for training assistance because incorrect use of the tool is the most likely cause of core misalignment.

Key features of Reflex ACT

- Highly accurate
- Easy to use and maintain
- Water resistant and rugged
- Available for all drilling sizes
- No battery charging
- No consumables and hidden costs
- Not affected by geological anomalies

Technical Specifications

Reflex ACT

Dimensions

Outer diameter	To suit all Q series applications
Length	Average tool length 300mm
Weight	Average weight per kit is 24kg

Accuracy

Range	0 to $\pm 88^\circ$ dip
Accuracy	$\pm 0.5^\circ$

Depth rating

Housing pressure	3,500 m vertical in fresh water 6,000psi, >4000m.
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Temperature rating

Operating: -20c to +70c

Battery

Non-rechargeable lithium battery pack

Approximate battery life:

Infrequent use	3 years +
Normal use	2 years

Measurement every 60 seconds.

The core orientation device is protected by Australian Innovation Patent Number 2006100113 (and other patents in other parts of the world).

All patent rights and core orientation device are reserved.

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Reflex is a leading manufacturer world wide of survey instruments for drill holes. Its product portfolio includes a complete programme of borehole surveying instruments for mining, tunnelling, construction, oil operations, and other geotechnical applications. Reflex is established in all major markets, the Americas, Africa, Europe and Asia Pacific. The success of Reflex is based on its leading innovative technology, customer focus and a network of local service centres world wide.



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