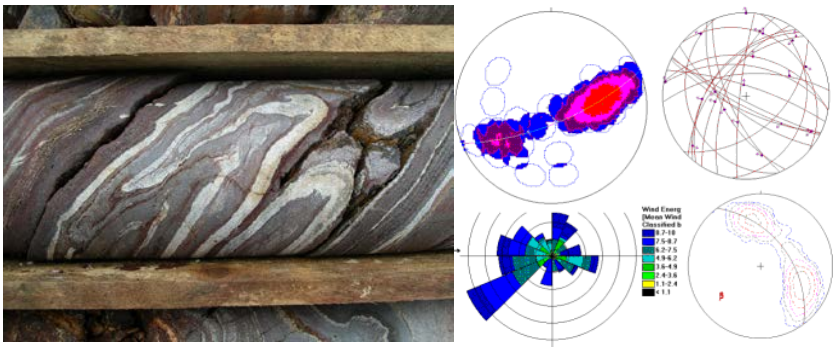
HTTPS://www.hcovglobal.com/

ORIENTED DRILL CORE PROTRACTOR TEMPLATES



Last modified Sept 2017

CONTENTS

- **Wrap around beta angle protractors for most common core sizes**
- **Wrap-around alpha/beta angle protractor for HQ and NQ core**
- **Scaled logging sheets for simplified rapid logging**

These templates are the printer-resolution attachment to the HCOV Global publication: “Oriented drillcore: Measurement, conversion, and QA/QC procedures for Structural and Exploration Geologists”, which can be downloaded from links at: https://www.hcovglobal.com/downloads.
The oriented drillcore procedures are also included in the Rod Holcombe text: “Mapping and Structural Geology in Mineral Exploration: where theory hits the fan”, see: https://www.holcombe.net.au/book/rodh-book.html

Contents

ORIENTED DRILL CORE WRAP-AROUND PROTRACTORS

Each of the following pages contains a protractor for a specific size of drill core formatted for printing using a laser printer on to A4 medium such as stiff plastic film. (Laser printers give a finer, more durable line than most ink-jet printers). I use HiClear™ Crystal Clear 200 micron PVC Report Cover for the film).

Check the core diameter to choose the appropriate template within each core size grouping. The protractors are in two groups: beta angle protractors and alpha/beta angle protractors. In practice I find that the beta angle protractor alone is best as it is least cluttered with lines (and alpha angles are easily measured using a protractor).

IMPORTANT
In order to preserve the correct scale **print on A4 paper** and ensure that all **scaling is switched off** in both the printing software (e.g. Adobe Reader) and in the printer settings. That is, look for settings such as 'Actual size', 'Normal size' or 'no scaling' in both the software printing settings and in the printer properties.
After printing check that the length of the scale along the base of the protractor is equal to the circumference of the core.
For protractors that also have alpha curves also check that the distance above the base line at which the 45° alpha curve intersects the 180° beta line is equal to the diameter of the core. [For planes with a 45° alpha angle the height above the base scale will be equal to the diameter of the core – and this occurs at a beta angle of 180].

To use the protractor

beta angles
Align the reference line (can be either a 'bottom' mark or 'top' mark) with the central zero line - **ensuring that the 'downhole' arrows point down the core**.
Wrap the protractor around the core
Read off the clockwise 360° beta angles to the ellipse (beta angle) using the spaced vertical lines.

alpha angles using alpha angle protractor
Align the reference line with the bottom of the ellipse made by the plane to be measured.
Wrap the protractor around the core.
Use the curved alpha angle lines to estimate the angle between the ellipse and the core axis (alpha angle).

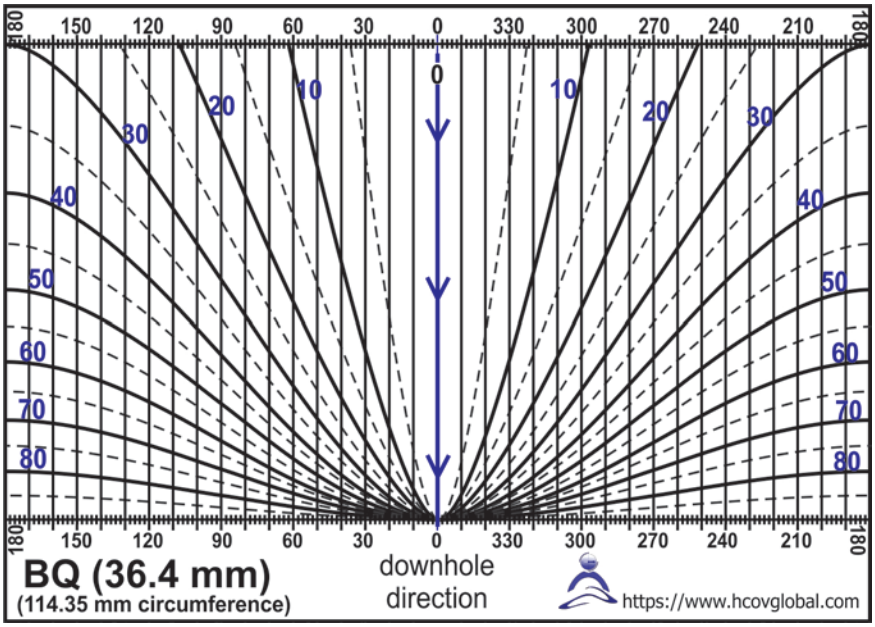
Template core sizes

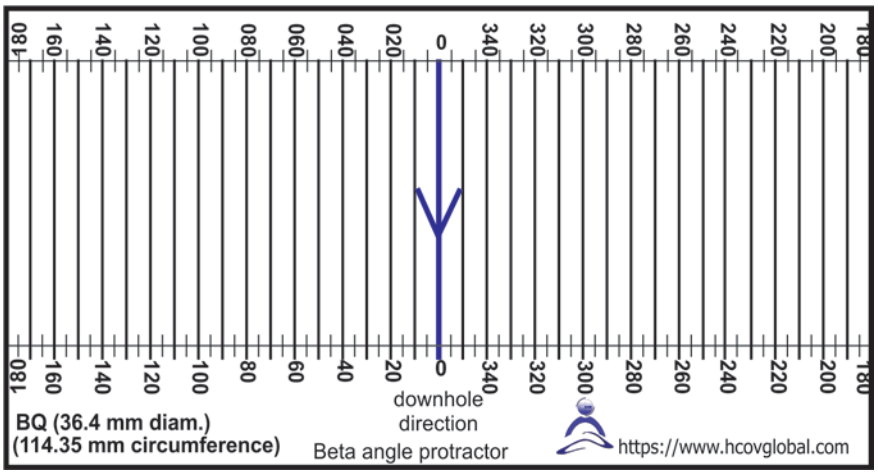
The main templates shown here are based on the set of 'standard' core sizes in general use. From time to time I am asked to produce a template for a non-standard core size. These are then labelled ***variant*** in the templates.

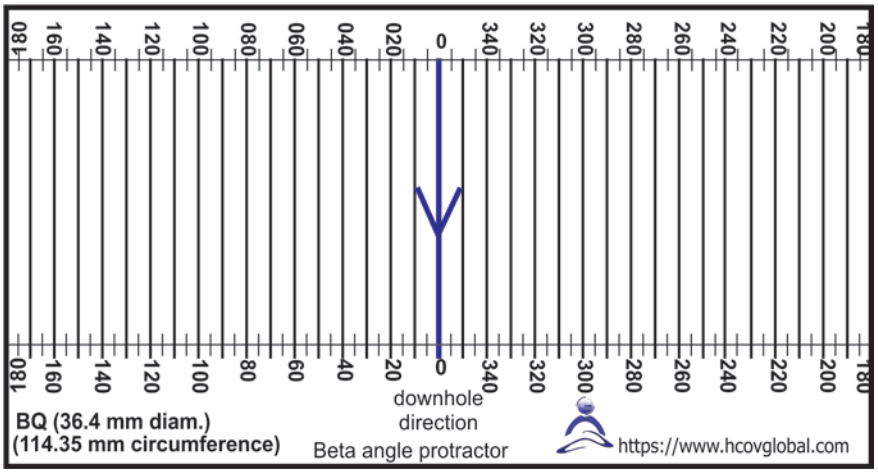
Making your own:

It is a relatively simple matter to construct a wrap-around protractor to measure beta angles in oriented core using any software drawing package. The procedure is to measure the circumference of the core and divide it by 360 to calculate the spacing of a 1-degree beta angle. A set of parallel lines is then drawn, using a convenient spacing (e.g., 10 degrees).

BQ (36.4 MM DIAM; 114.35 MM CIRCUMFERENCE) ALPHA-BETA PROTRACTORS

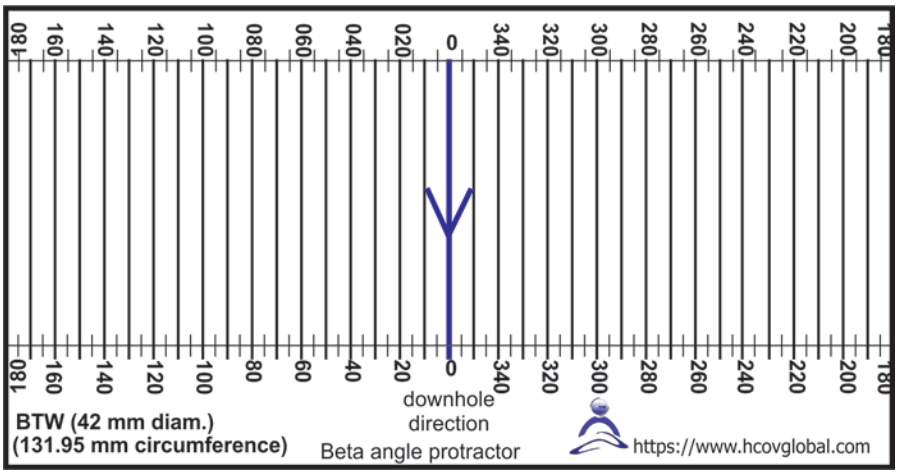


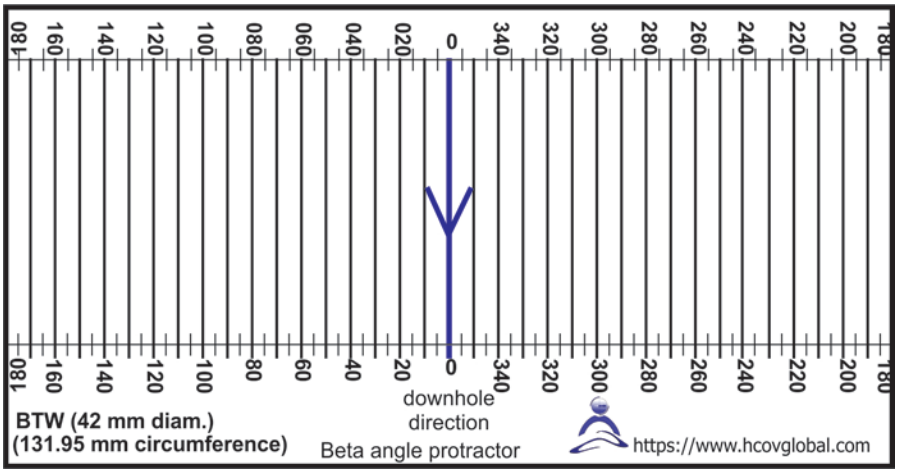


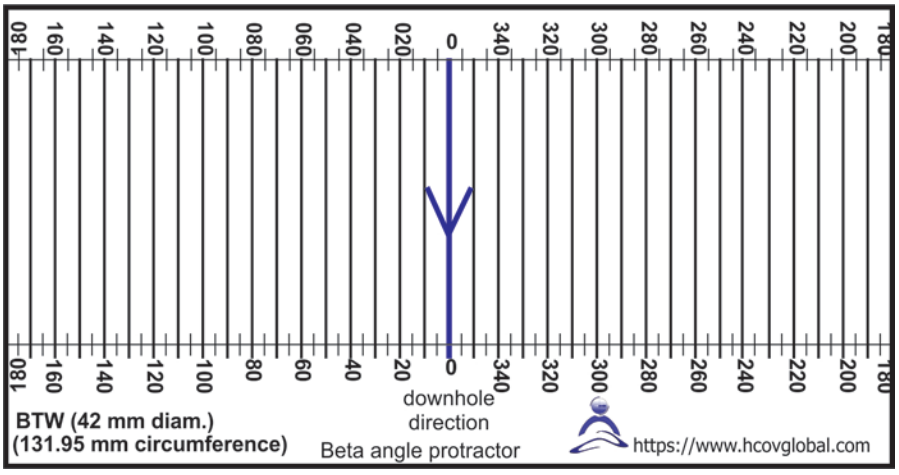


Caution: Beta angle errors tend to be larger in small diameter core. Note that in BQ core, 1 mm of error iin beta is ~3°; 10 mm is 31°

BTW (42 MM DIAM; 131.95 MM CIRCUMFERENCE) BETA PROTRACTOR

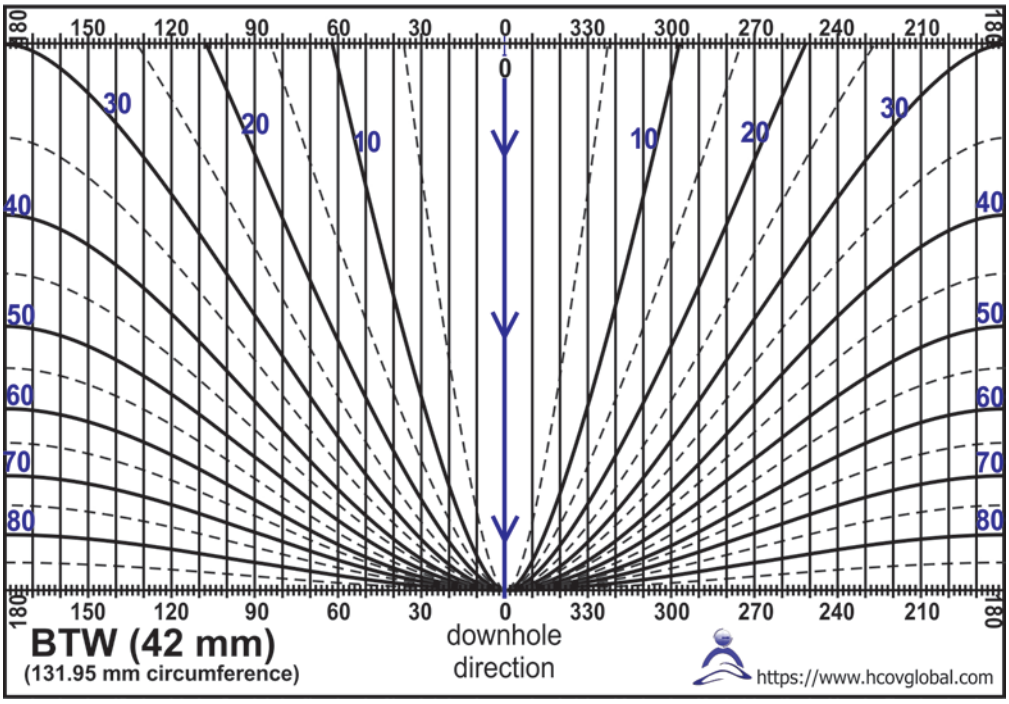


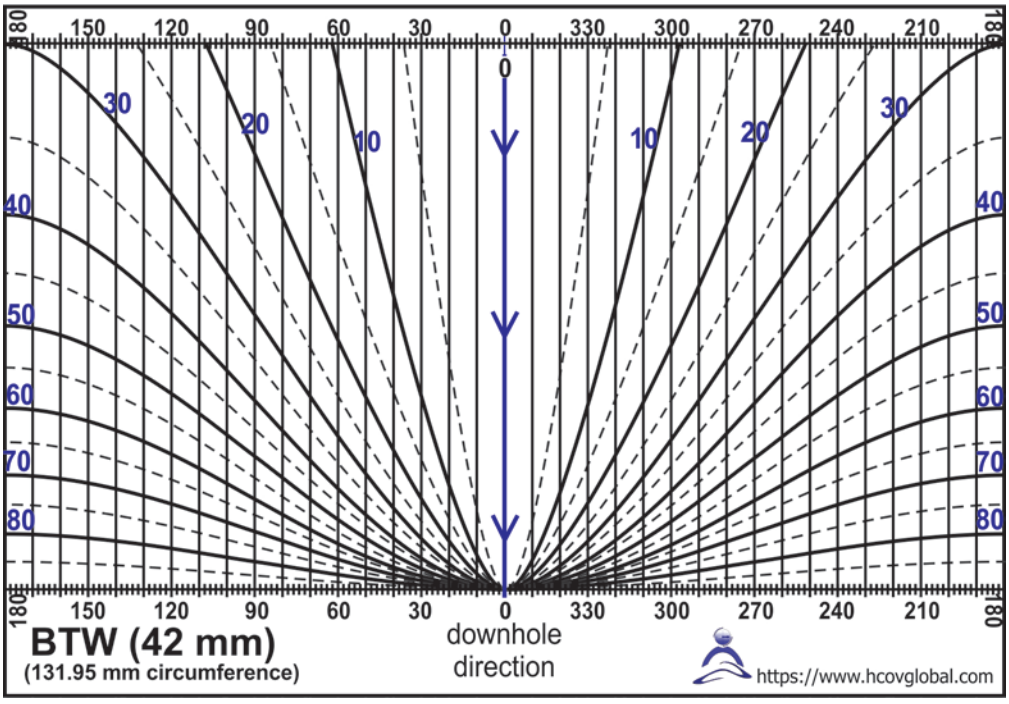




Caution: Beta angle errors tend to be larger in small diameter core. Note that in BTW core, 1 mm of error in beta is 2.7°; 10 mm is 27°

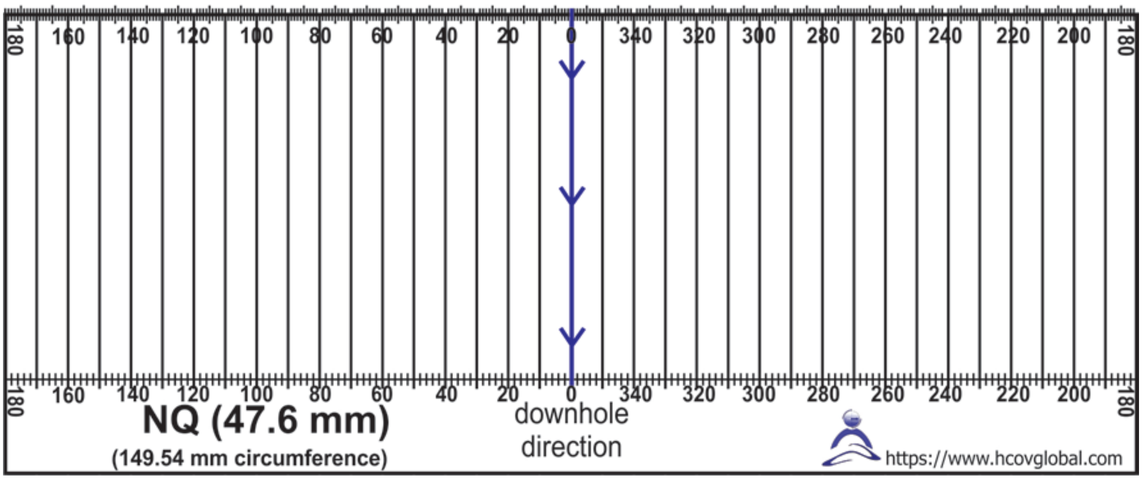
BTW (42 MM DIAM; 131.95 MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR

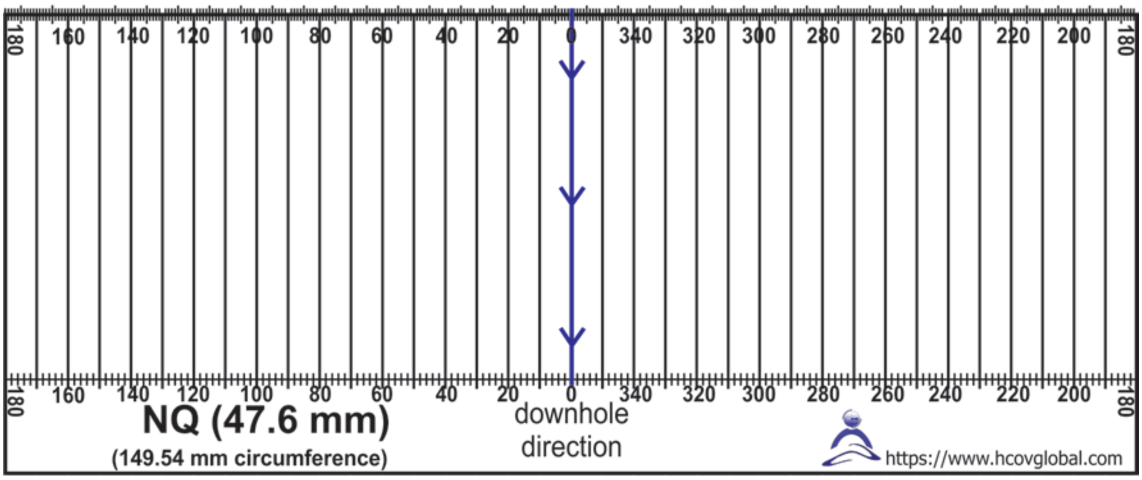


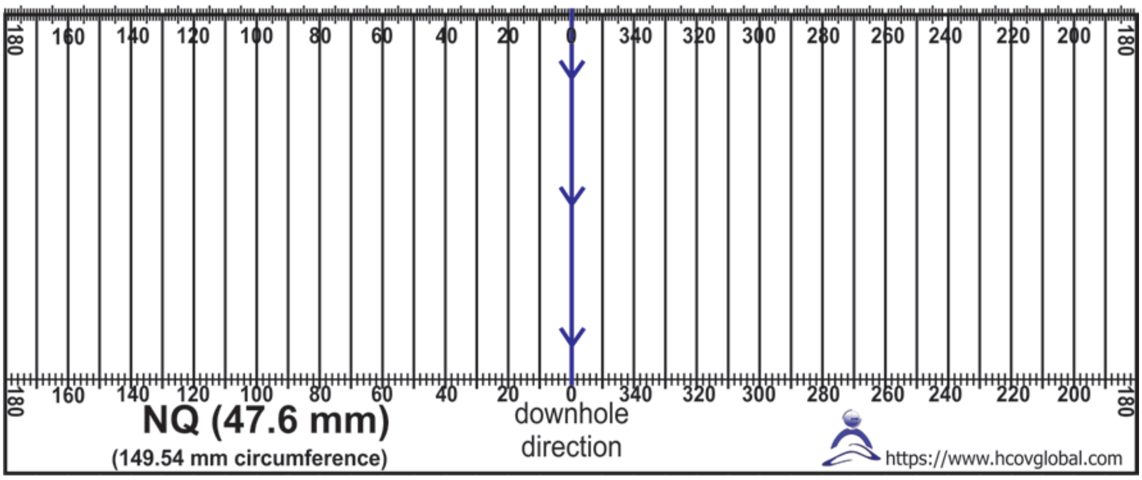


Caution: Beta angle errors tend to be larger in small diameter core. Note that in BTW core, 1 mm of error in beta is 2.7°; 10 mm is 27°

NQ (47.6MM DIAM; 149.54 MM CIRCUMFERENCE) BETA PROTRACTOR

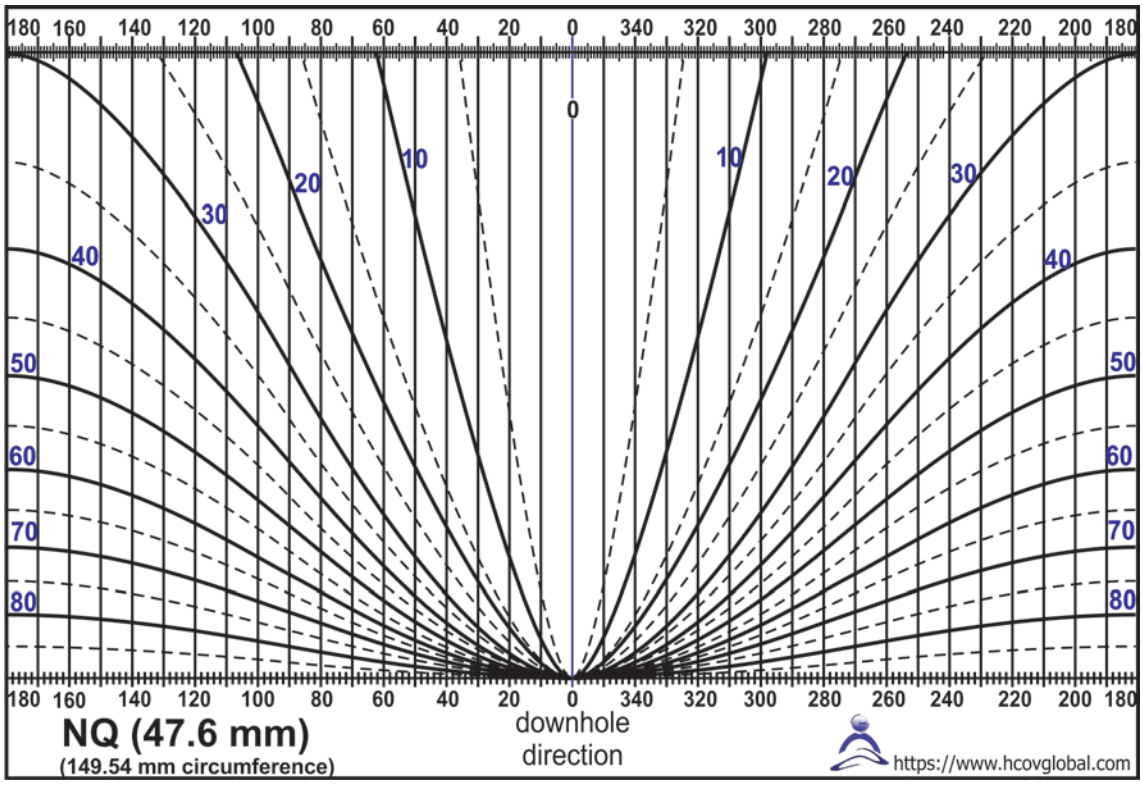


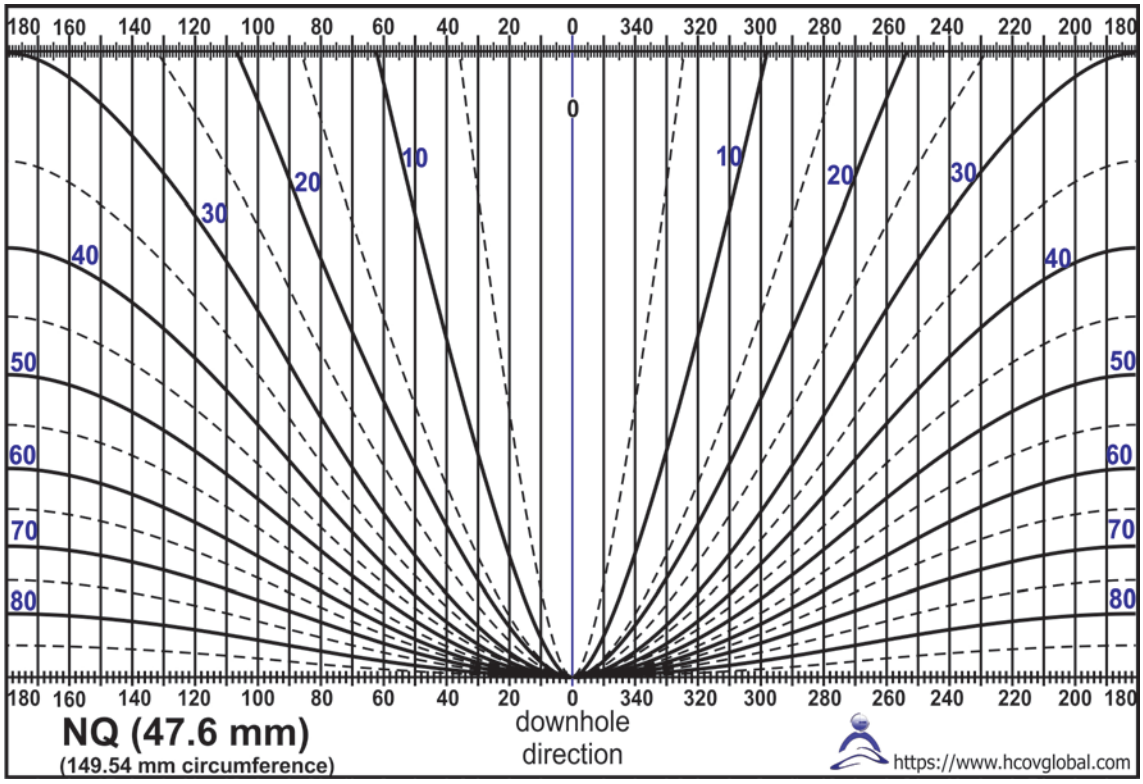




Caution: Beta angle errors tend to be larger in small diameter core. Note that in NQ core, 1 mm of error in beta is 2.4°; 10 mm is 24°

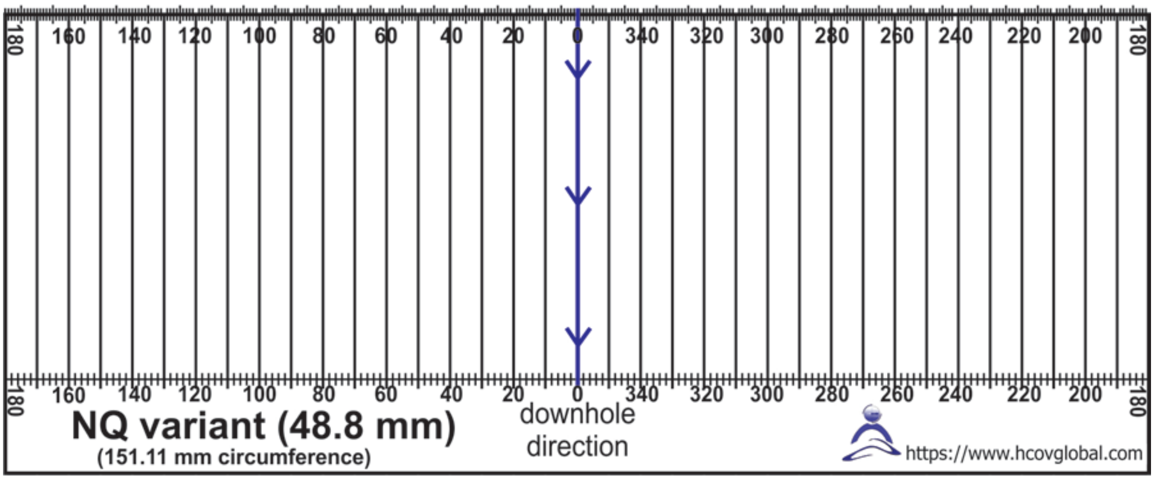
NQ (47.6MM DIAM; 149.54 MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR

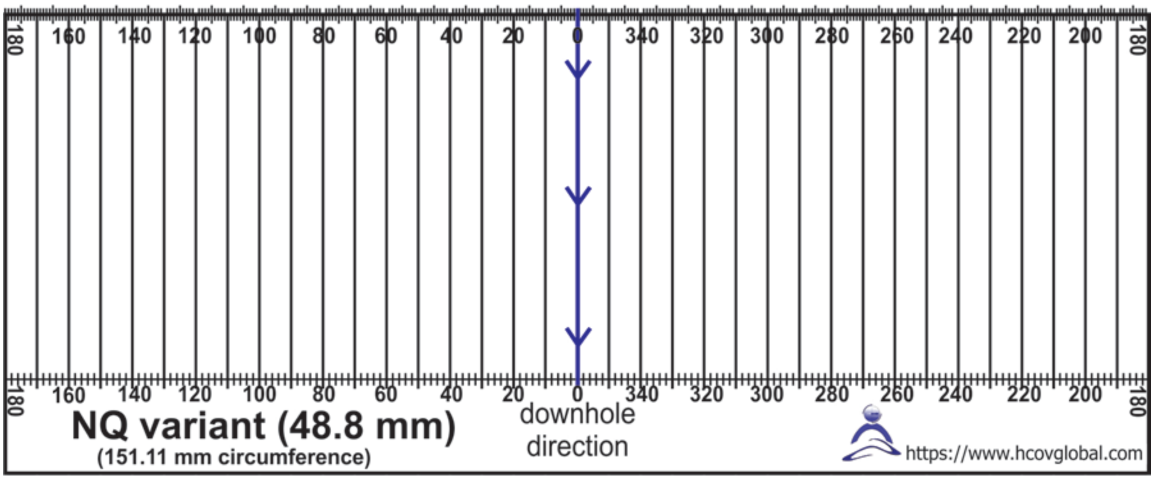


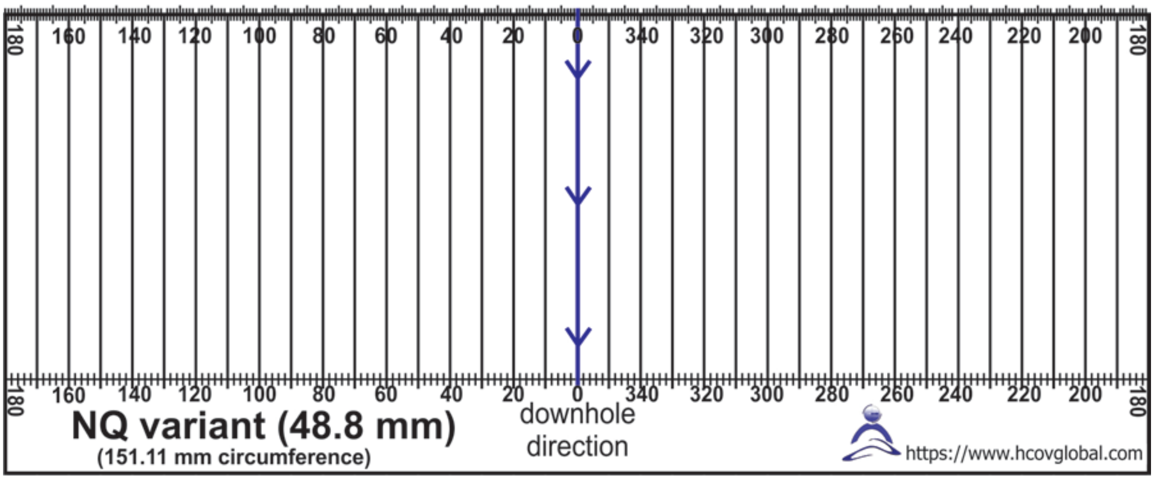


Caution: Beta angle errors tend to be larger in small diameter core. Note that in NQ core, 1 mm of error in beta is 2.4°; 10 mm is 24°

NQ VARIANT (48.1MM DIAM; 149.54 MM CIRCUMFERENCE) BETA PROTRACTOR

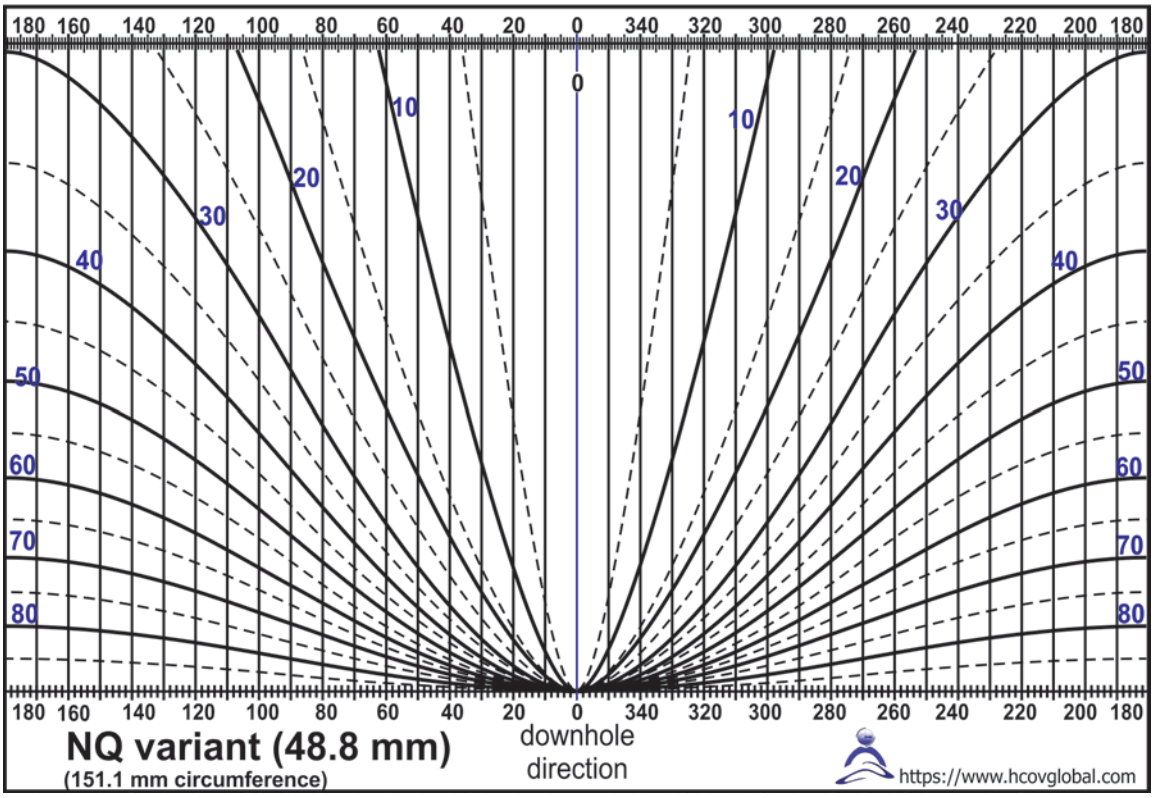


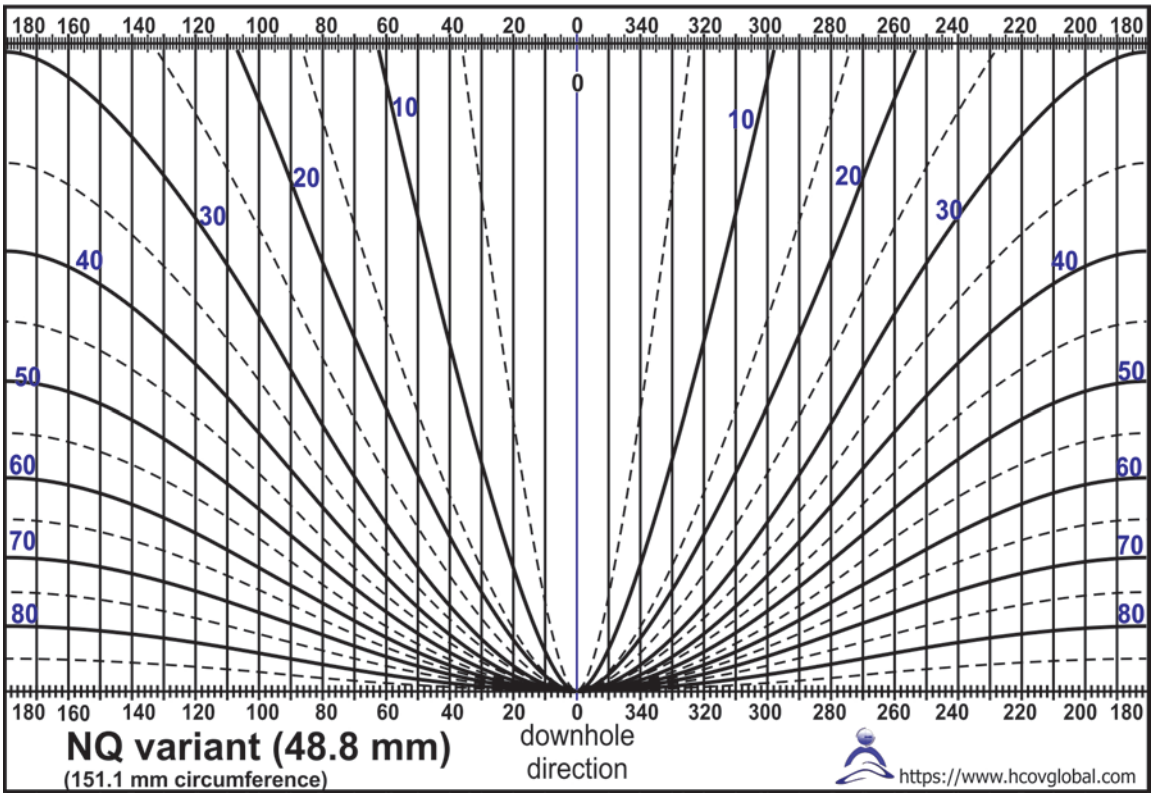




Caution: Beta angle errors tend to be larger in small diameter core. Note that in NQ variant core, 1 mm of error in beta is 2.4°; 10 mm is 24°

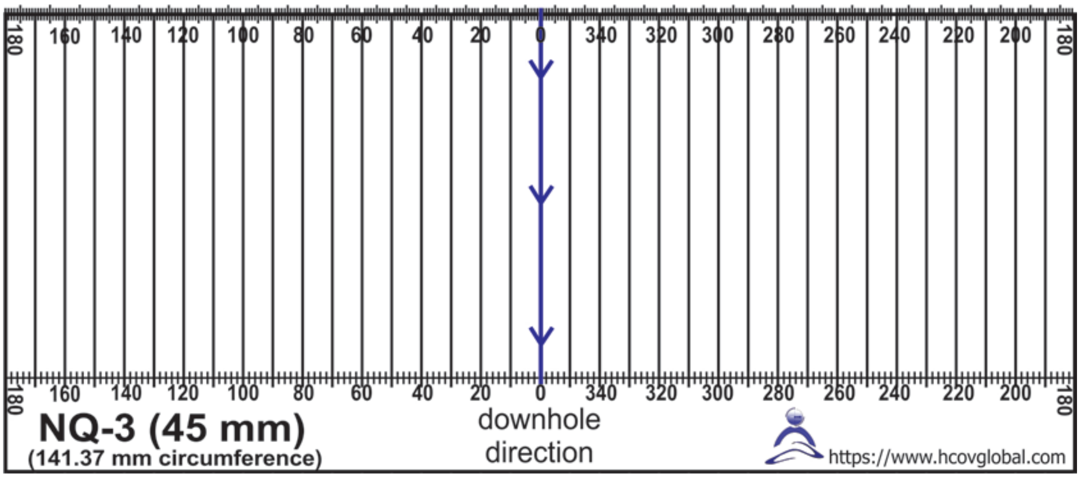
NQ VARIANT (48.1MM DIAM; 149.54 MM CIRCUMFERENCE)
ALPHA-BETA PROTRACTOR

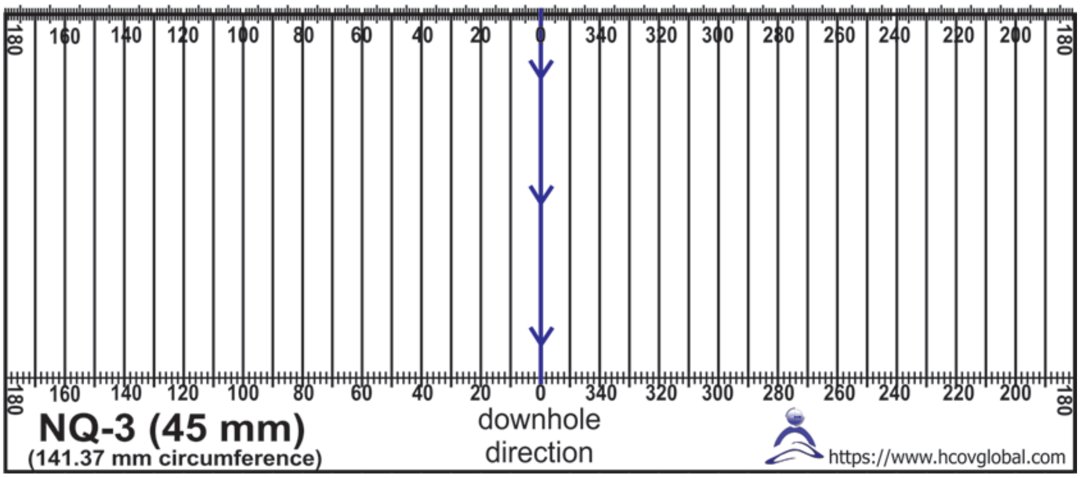


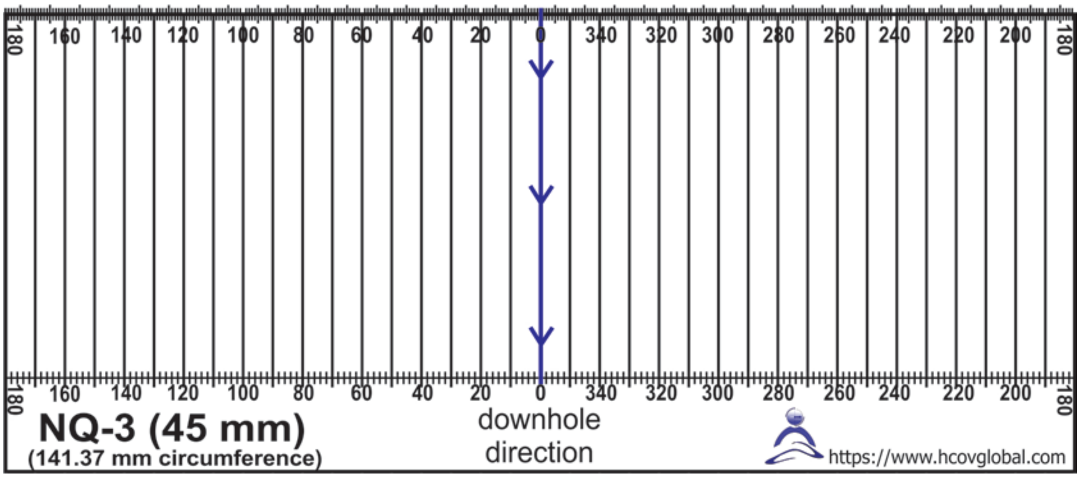


Caution: Beta angle errors tend to be larger in small diameter core. Note that in NQ variant core, 1 mm of error in beta is 2.4°; 10 mm is 24°

NQ-3 (45MM DIAM; 141.37MM CIRCUMFERENCE) BETA PROTRACTOR

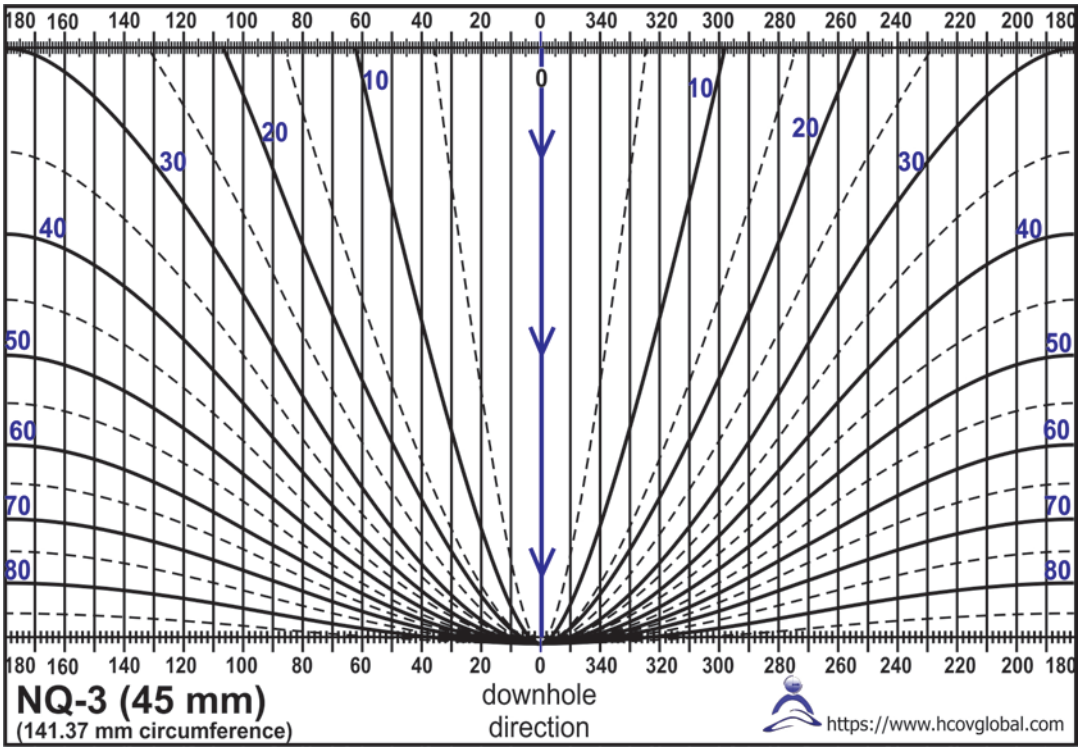


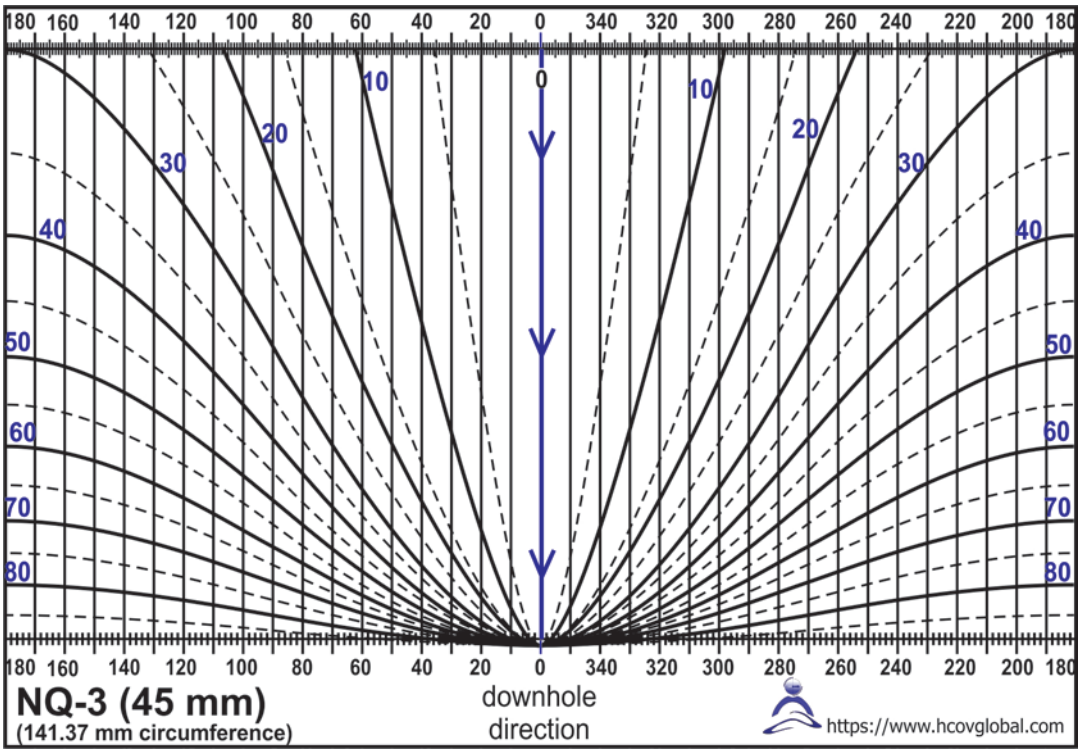




Caution: Beta angle errors tend to be larger in small diameter core. Note that in NQ3 core, 1 mm of error in beta is 2.5°; 10 mm is 25°

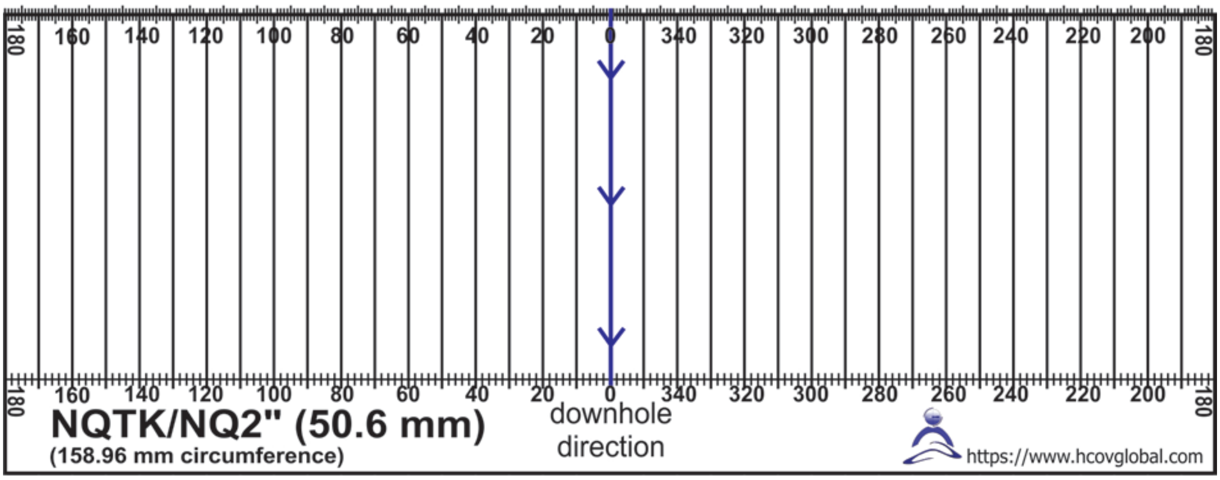
NQ-3 (45MM DIAM; 141.37MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR

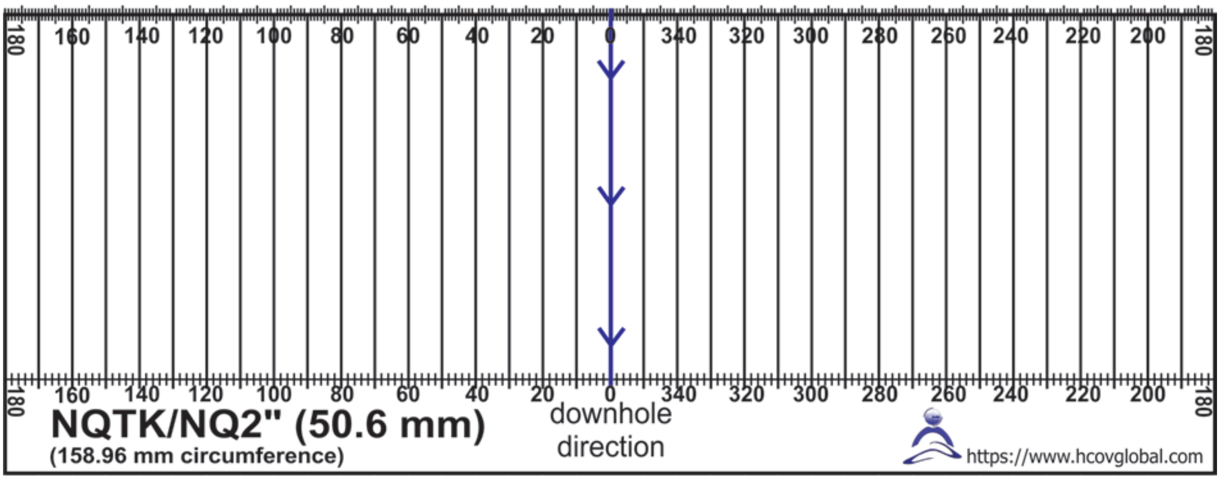


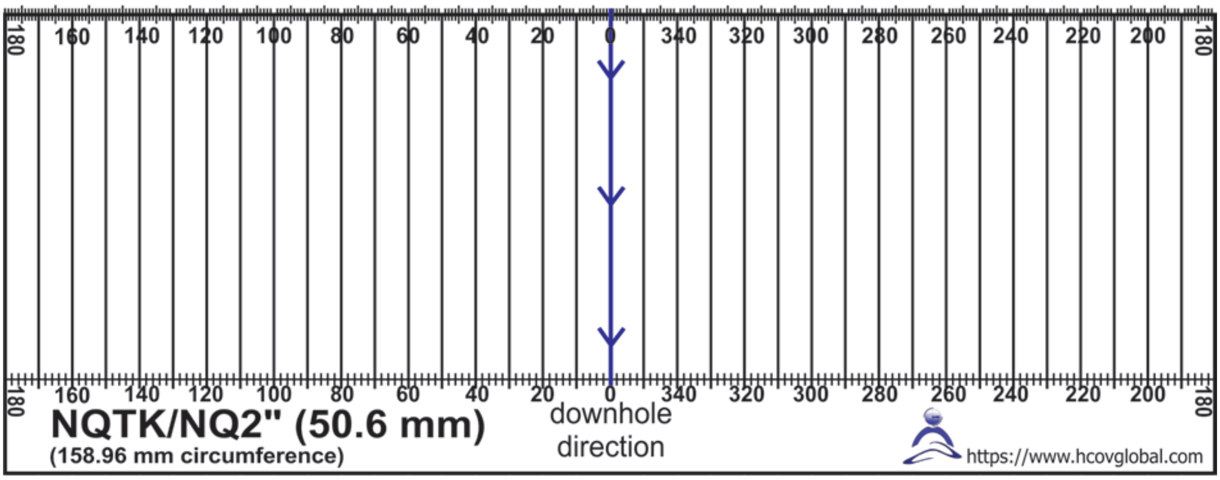


Caution: Beta angle errors tend to be larger in small diameter core. Note that in NQ3 core, 1 mm of error in beta is 2.5°; 10 mm is 25°

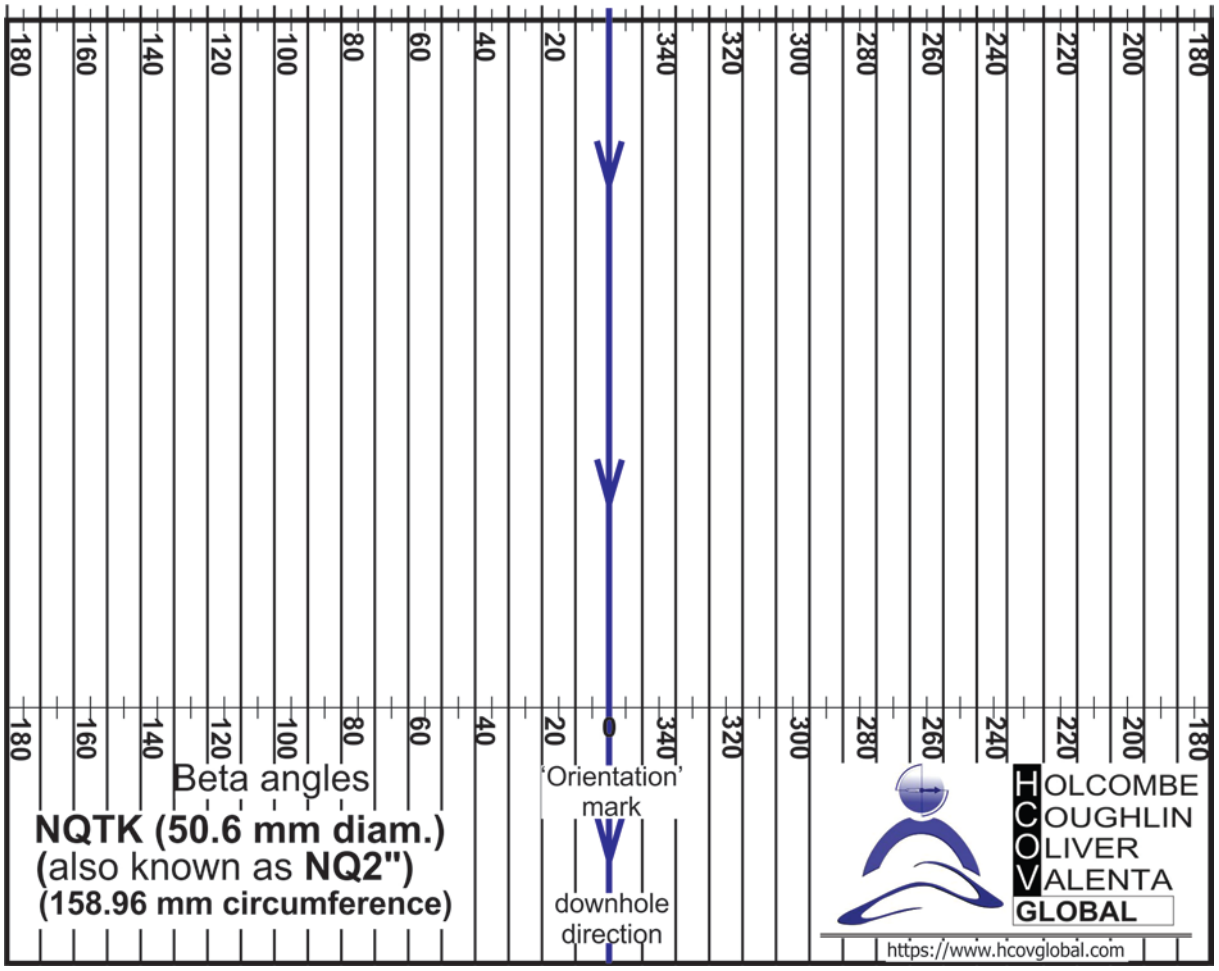
NQTK/NQ2" (50.6MM DIAM; 158.96 MM CIRCUMFERENCE) BETA PROTRACTOR



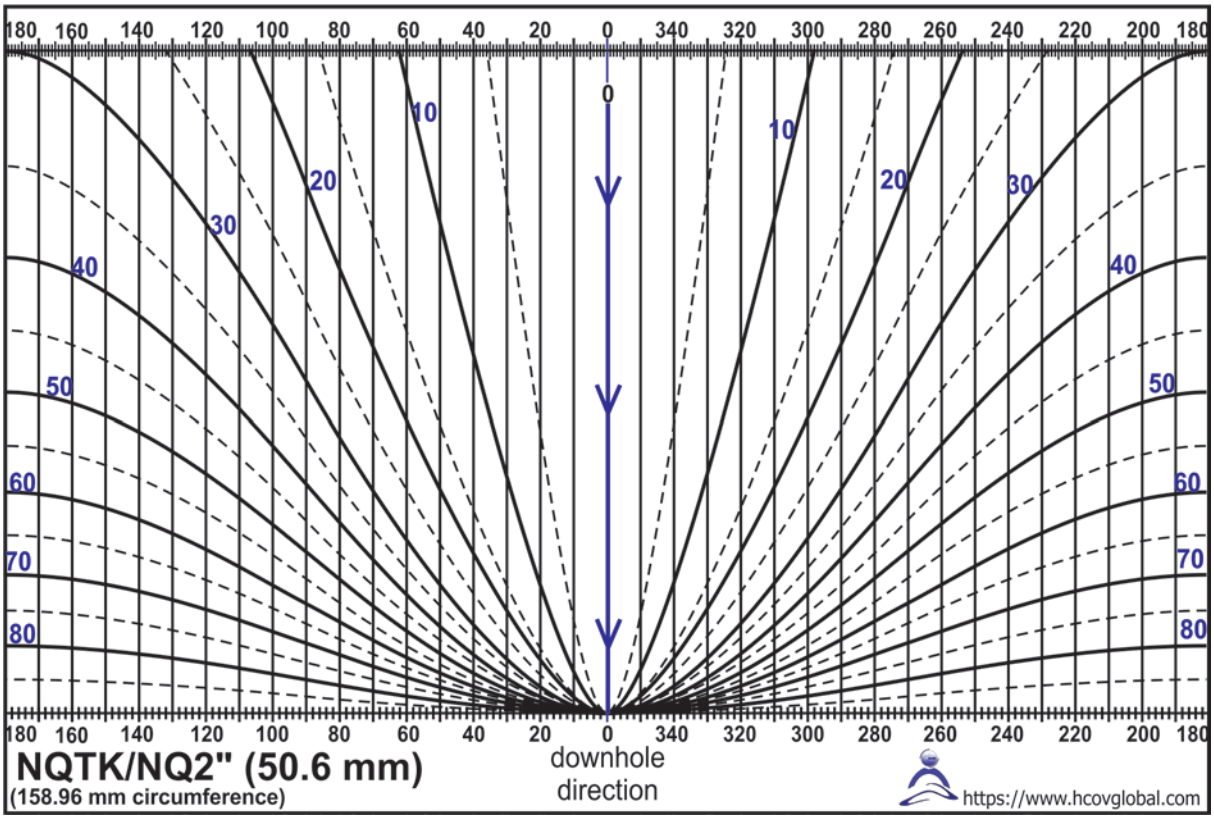


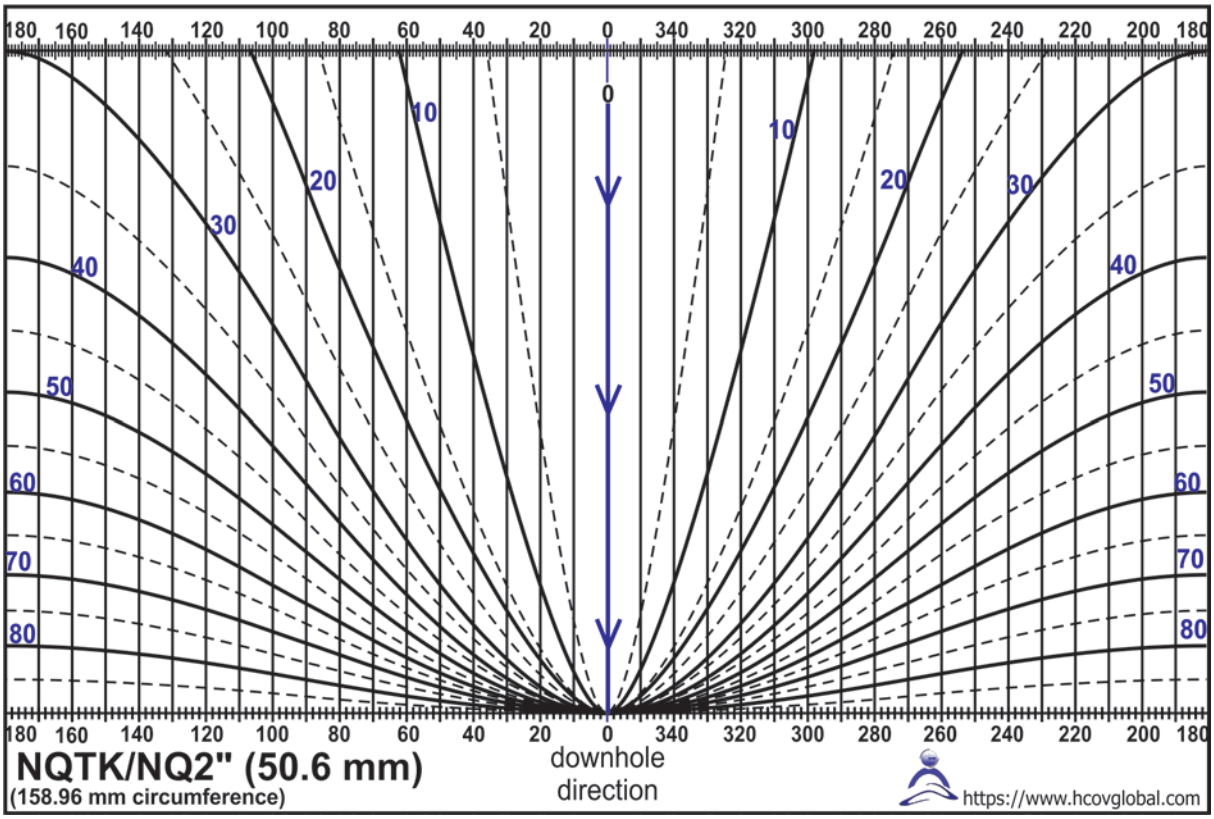


NQTK/NQ2" (50.6MM DIAM; 158.96 MM CIRCUMFERENCE)
WIDE-FORMAT BETA PROTRACTOR

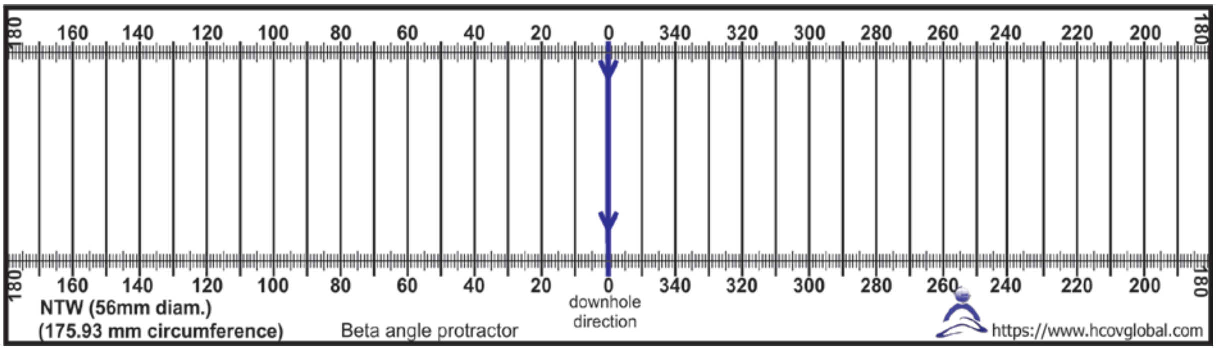


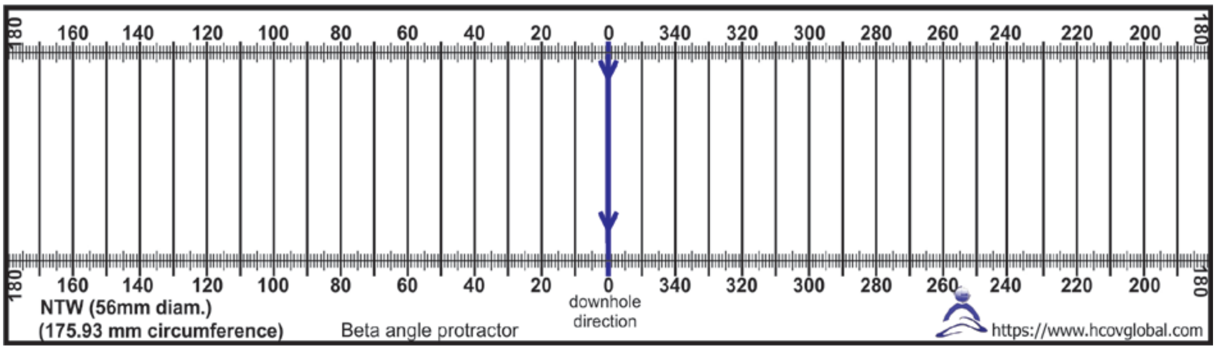
NQTK/NQ2" (50.6MM DIAM; 158.96 MM CIRCUMFERENCE)
ALPHA-BETA PROTRACTOR

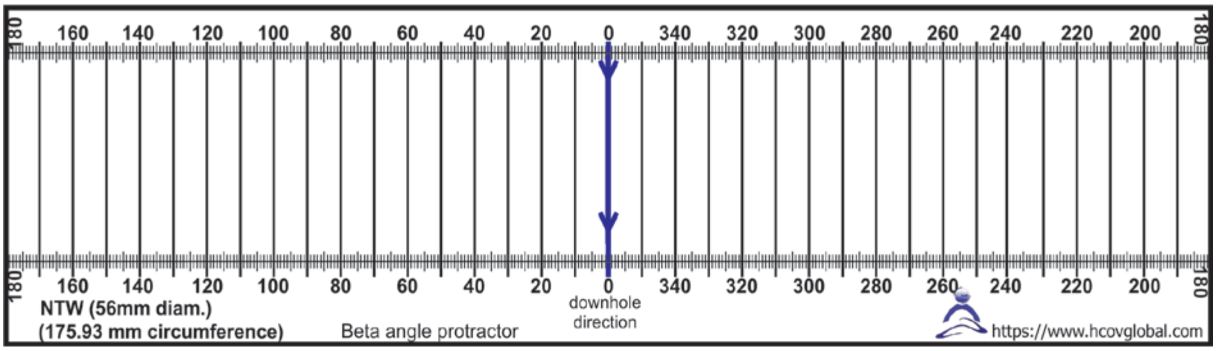


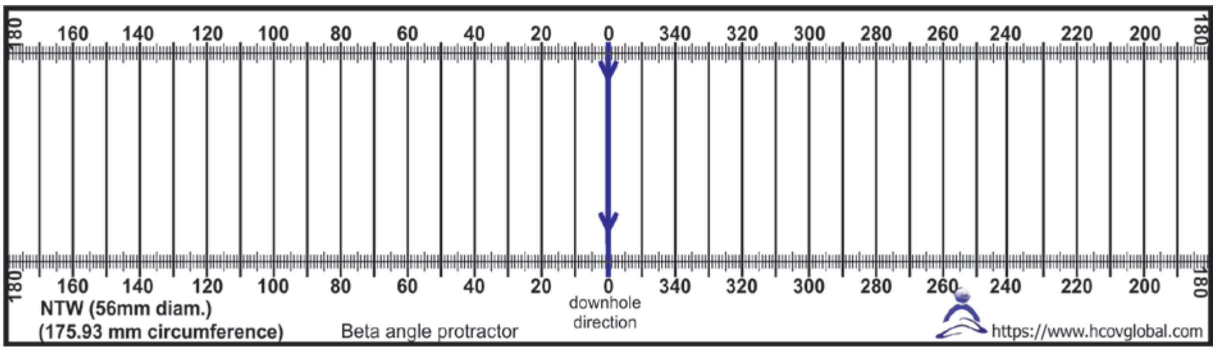


NTW (56MM DIAM; 175.93MM CIRCUMFERENCE) BETA PROTRACTOR

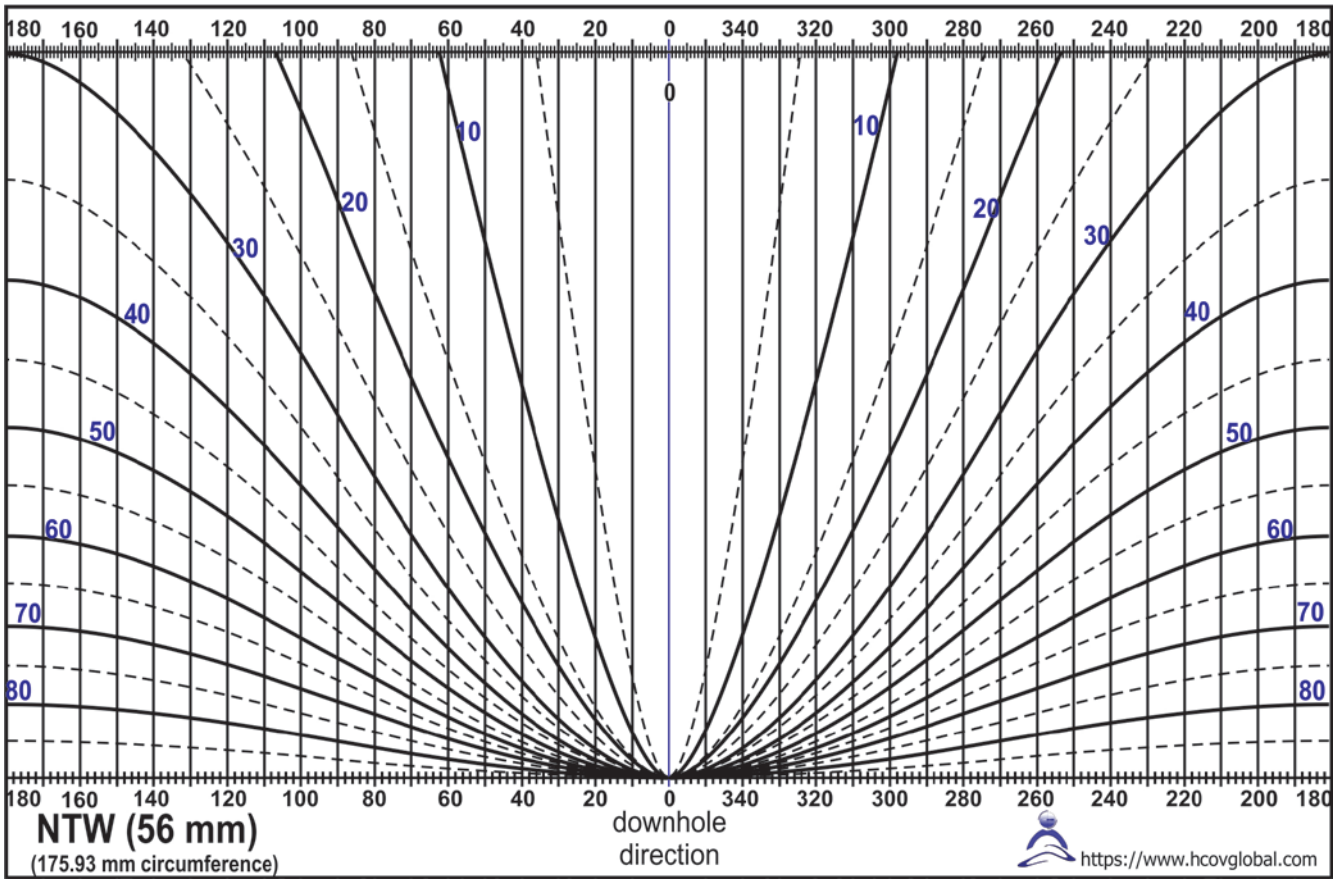


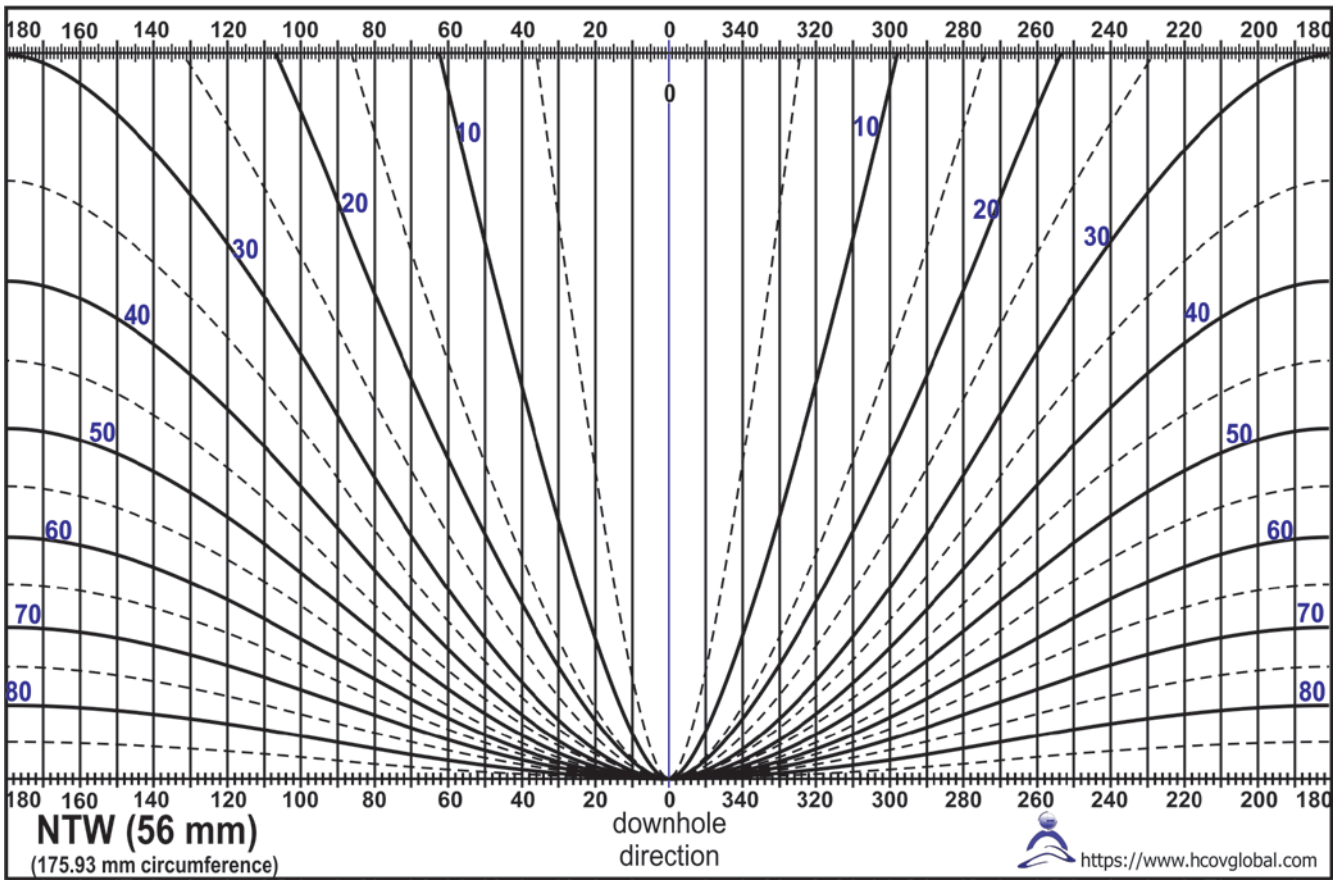




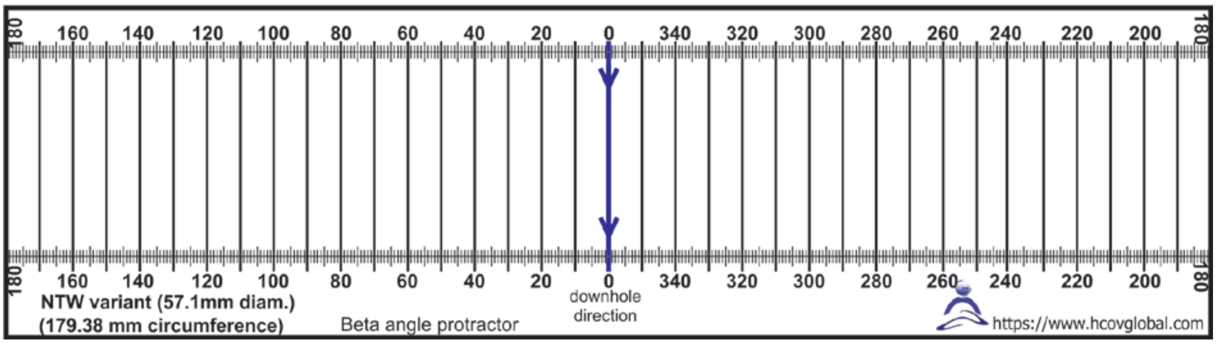


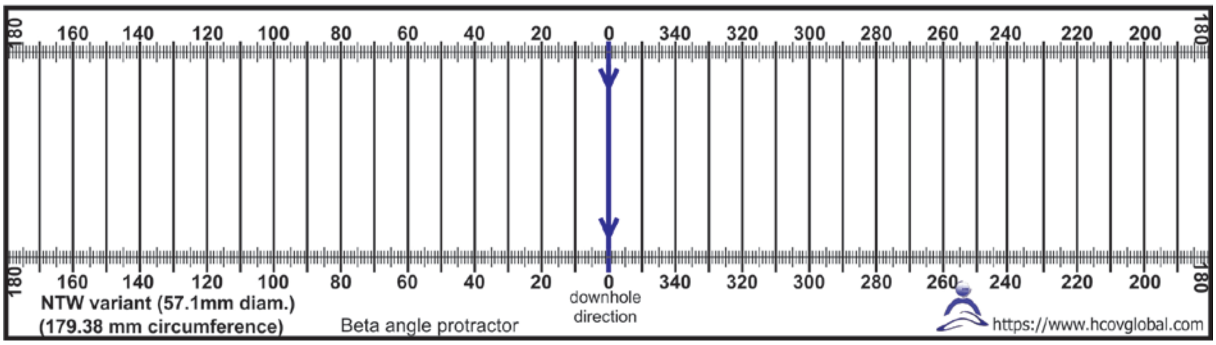
NTW (56MM DIAM; 175.93MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR

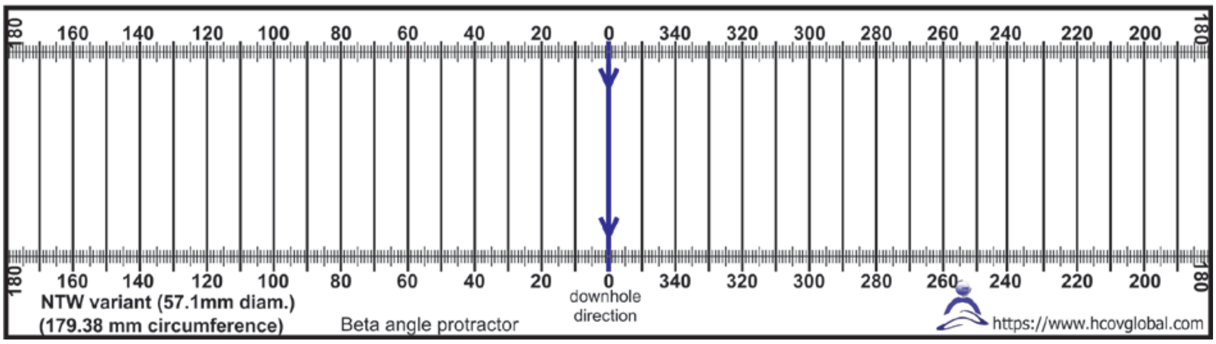


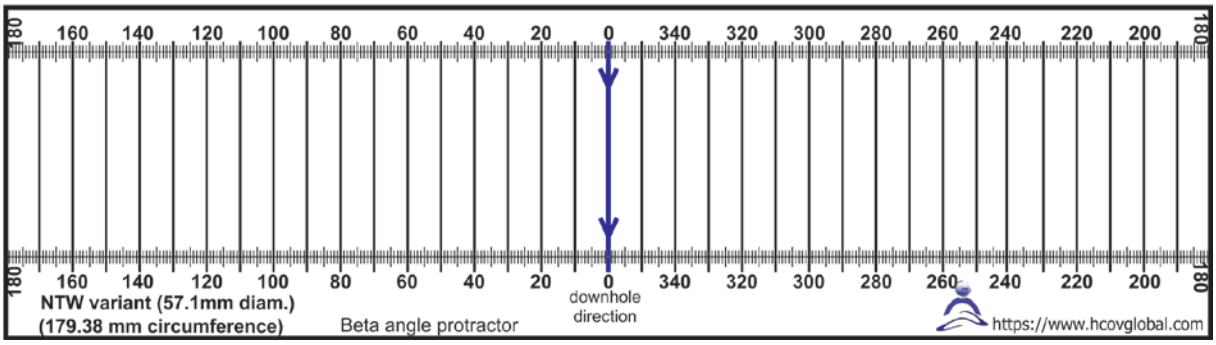


NTW VARIANT (57.1MM DIAM; 179.38MM CIRCUMFERENCE) BETA PROTRACTOR

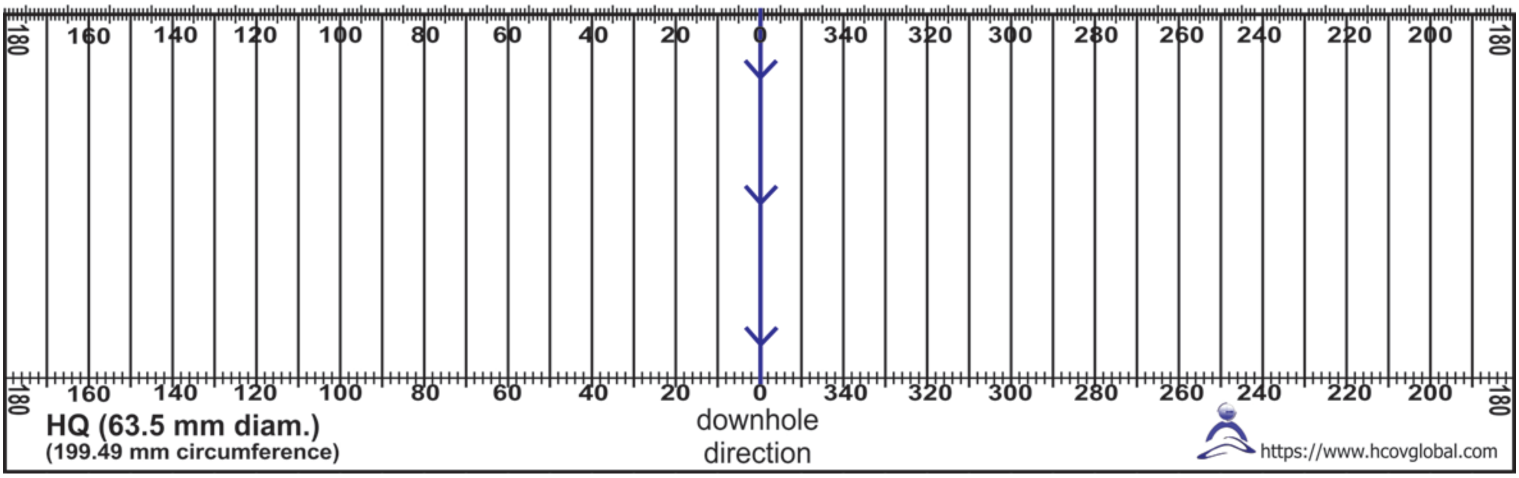


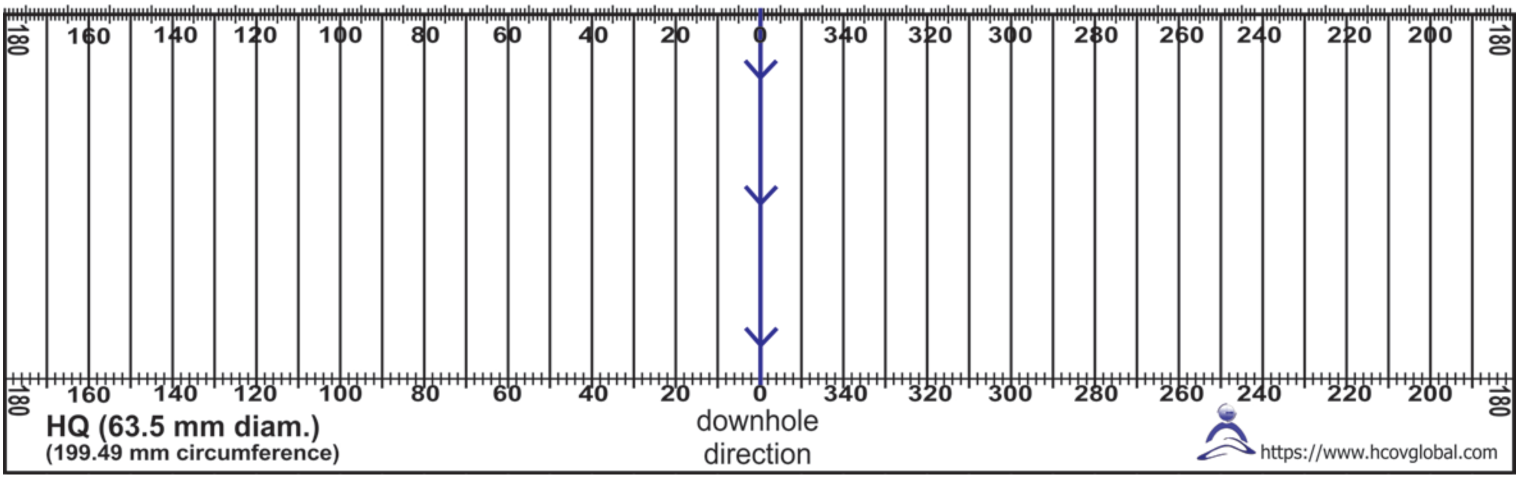


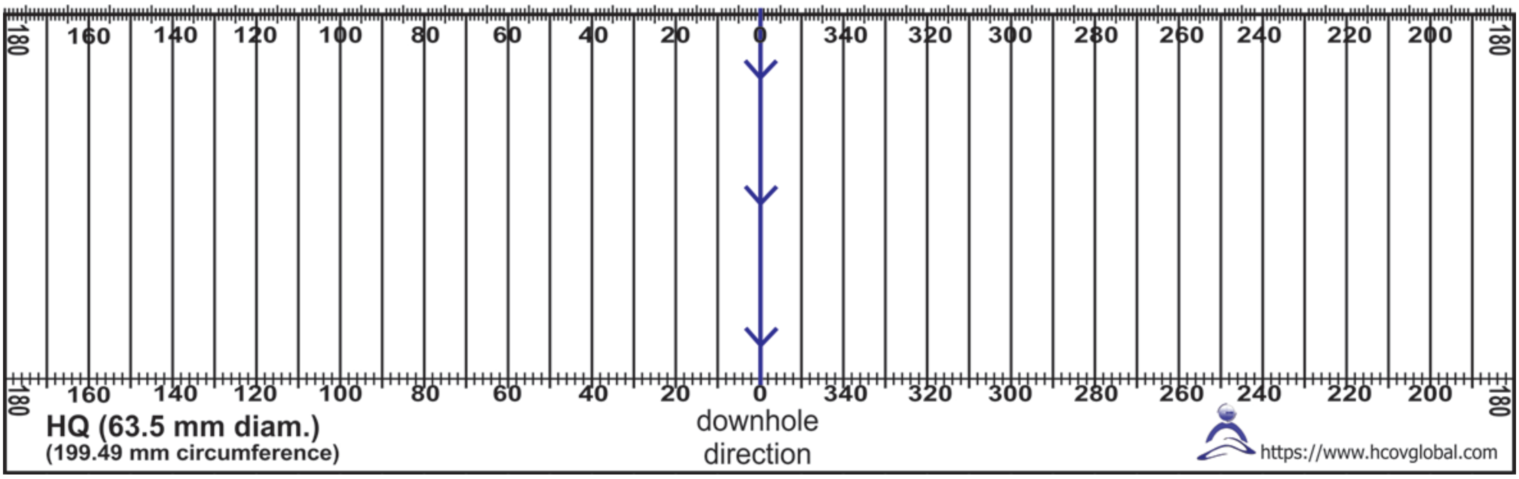




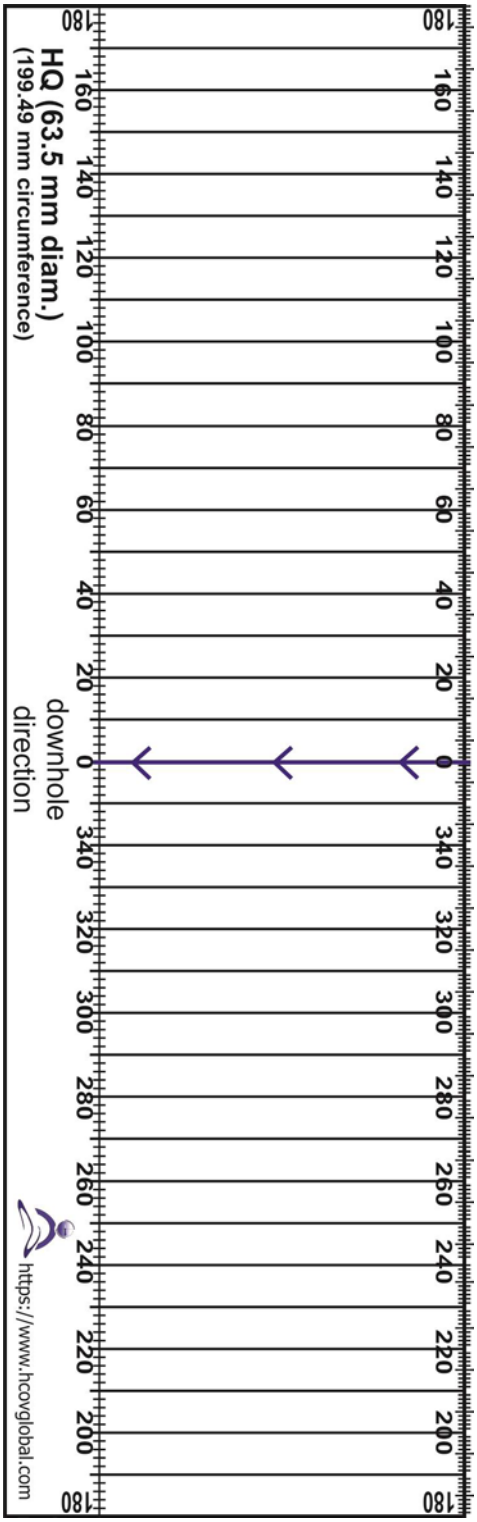
HQ (63.5MM DIAM; 199.49MM CIRCUMFERENCE) BETA PROTRACTOR

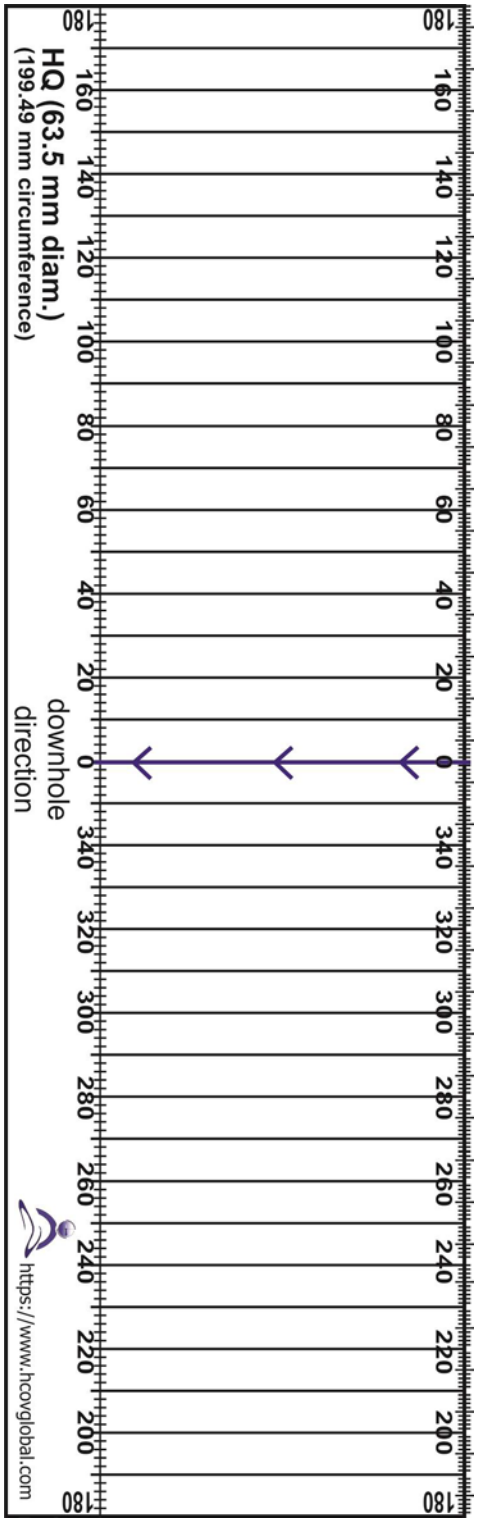




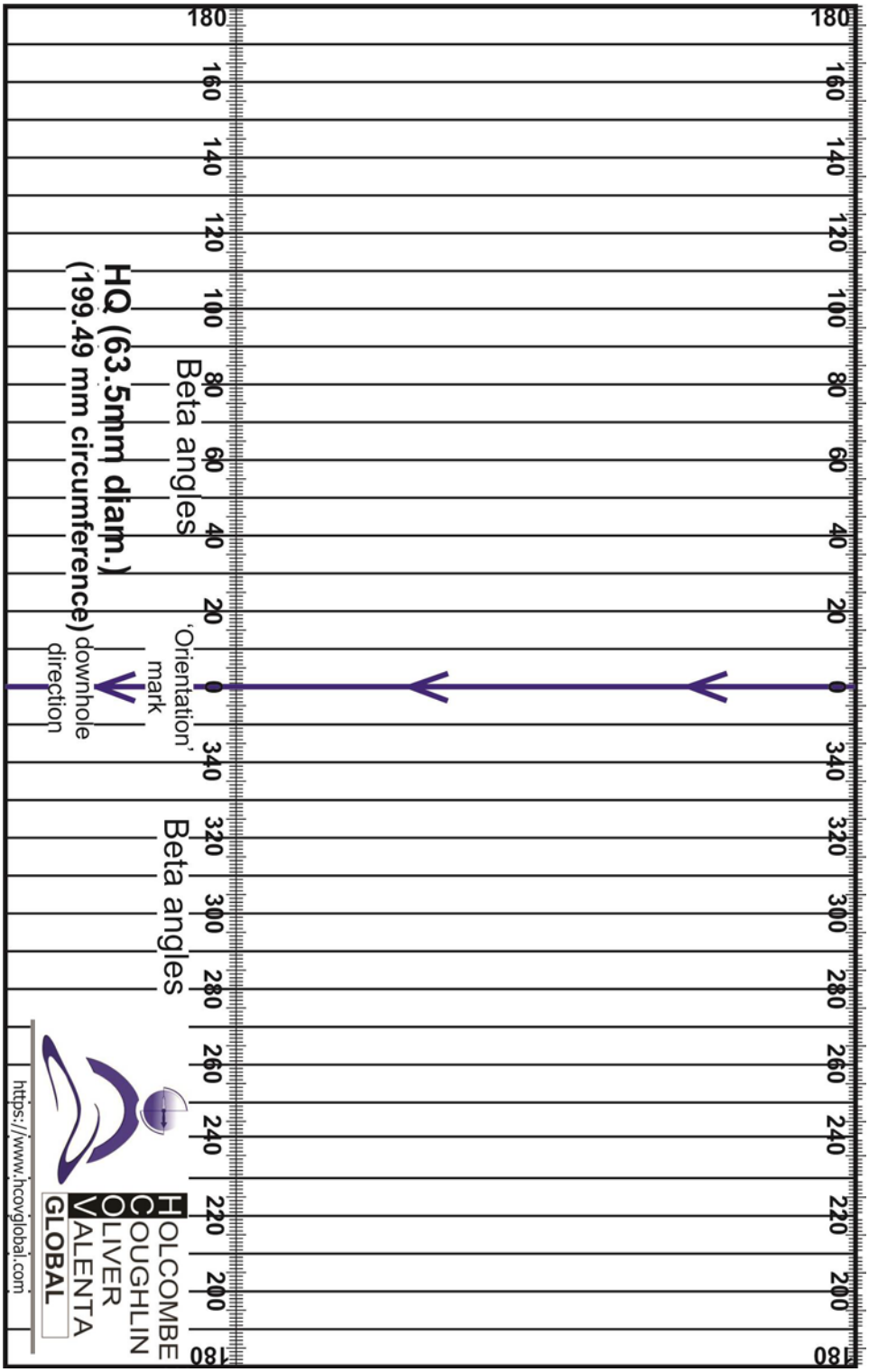


HQ (63.5MM DIAM; 199.49MM CIRCUMFERENCE) BETA PROTRACTOR

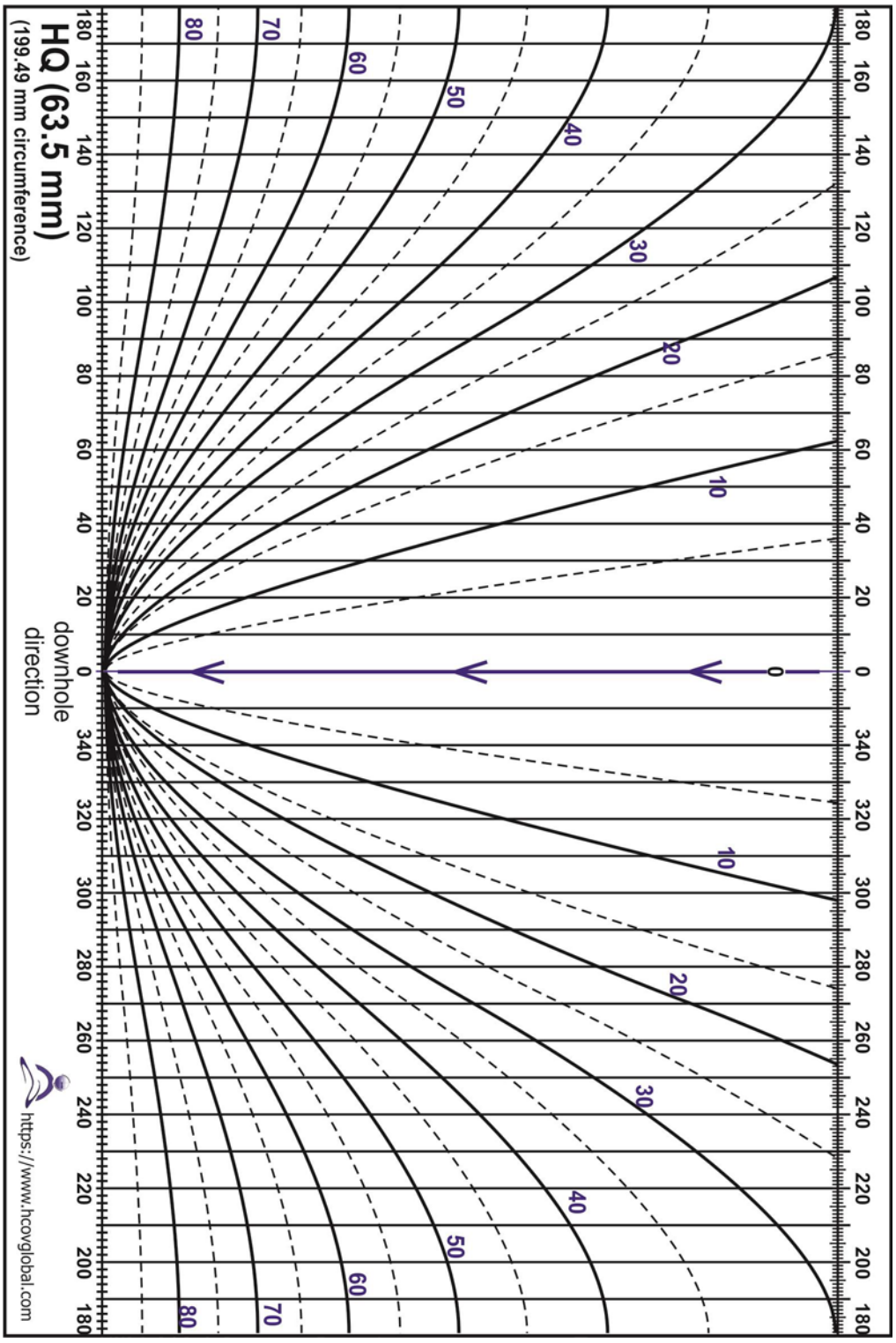




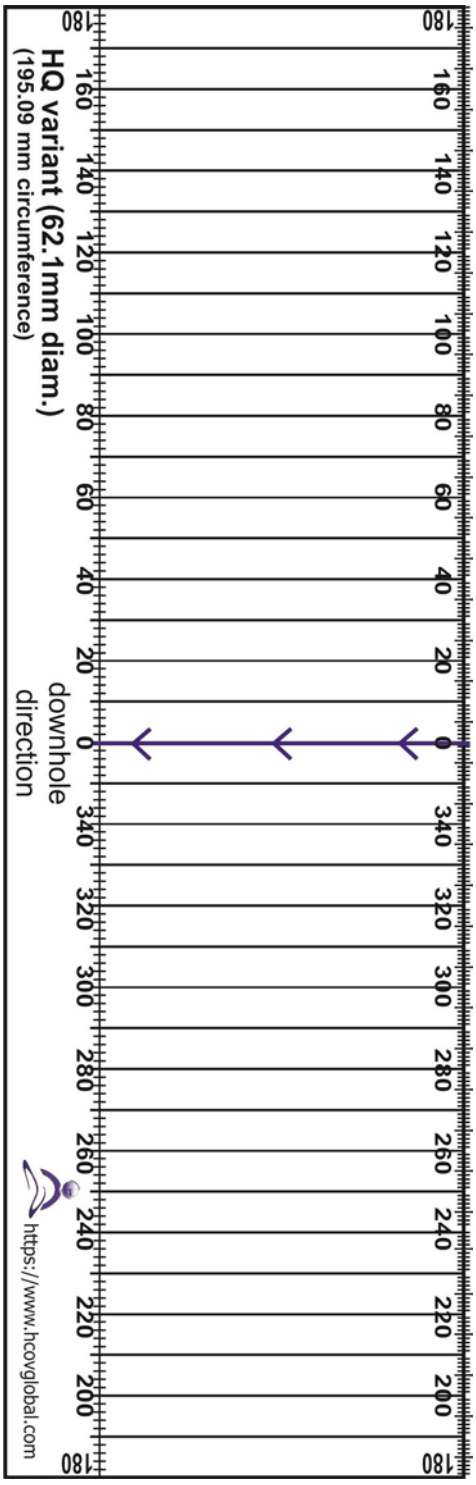
HQ (63.5MM DIAM; 199.49MM CIRCUMFERENCE), WIDE-FORMAT BETA PROTRACTOR

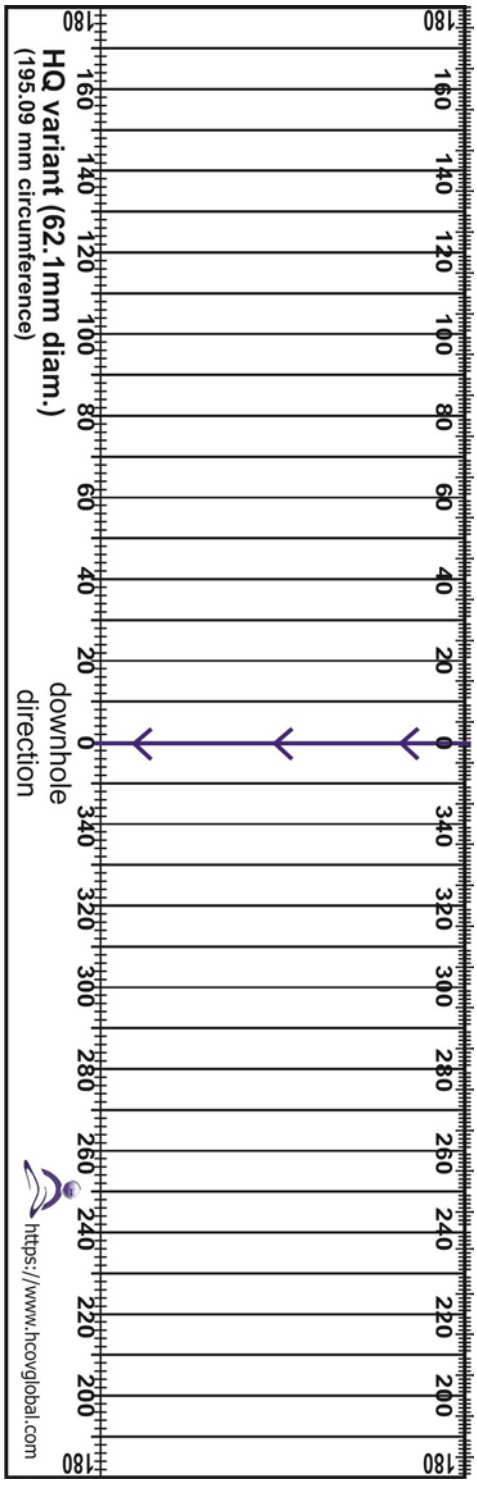


HQ (63.5MM DIAM; 199.49MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR

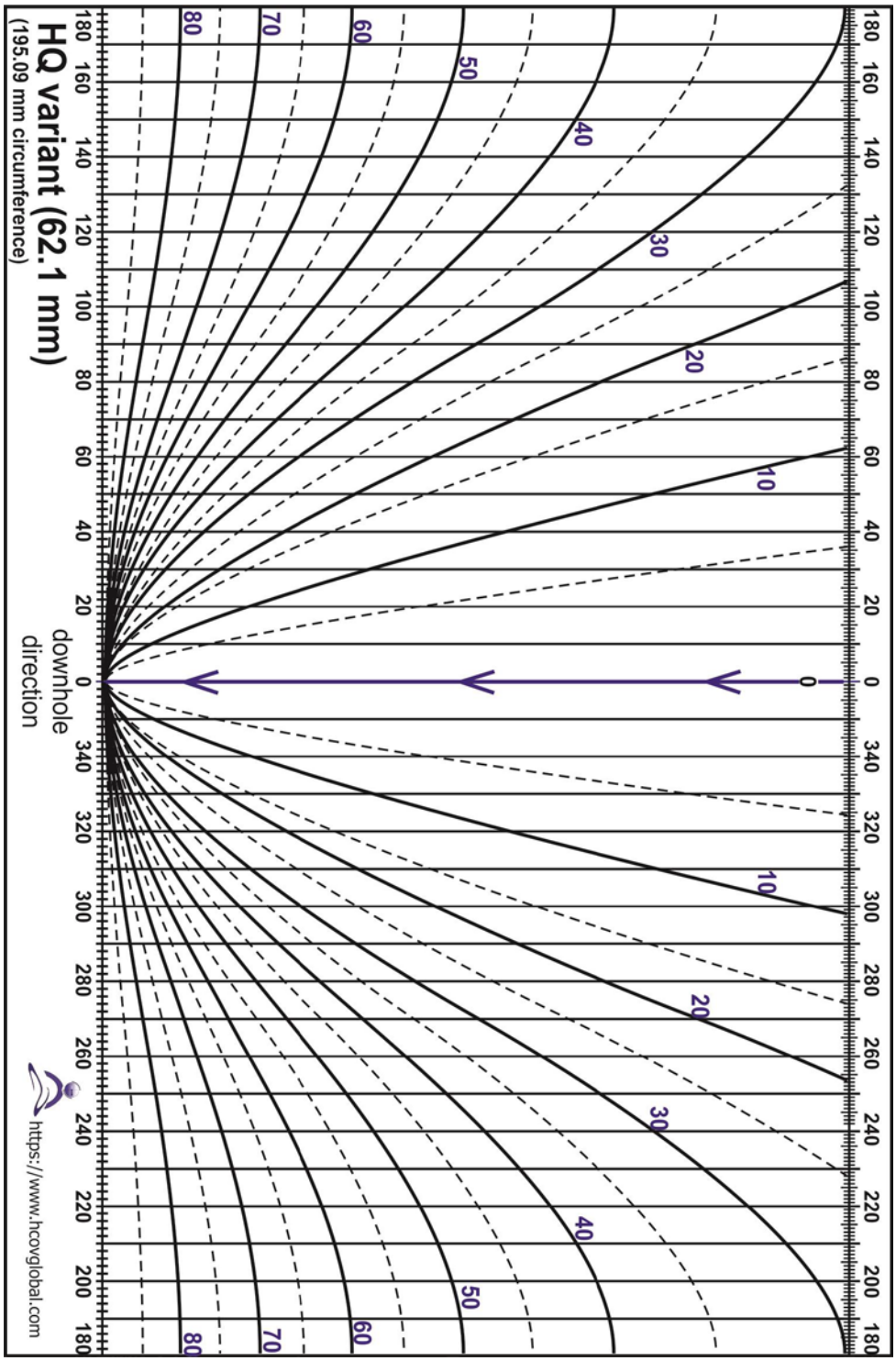


HQ VARIANT (62.1MM DIAM; 195.09MM CIRCUMFERENCE) BETA PROTRACTOR

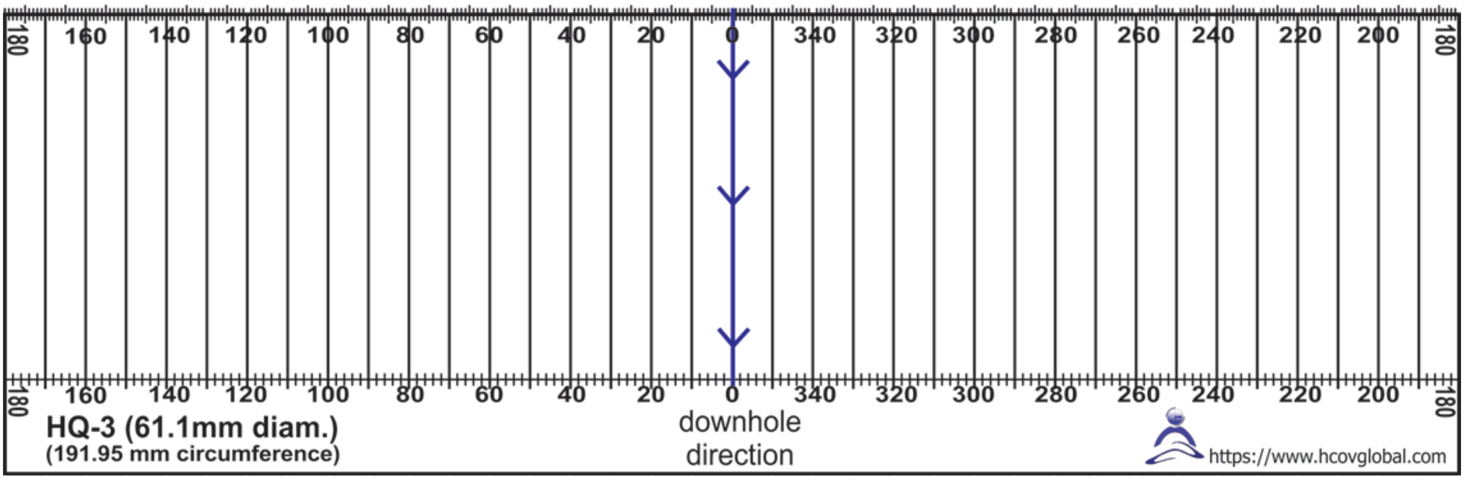


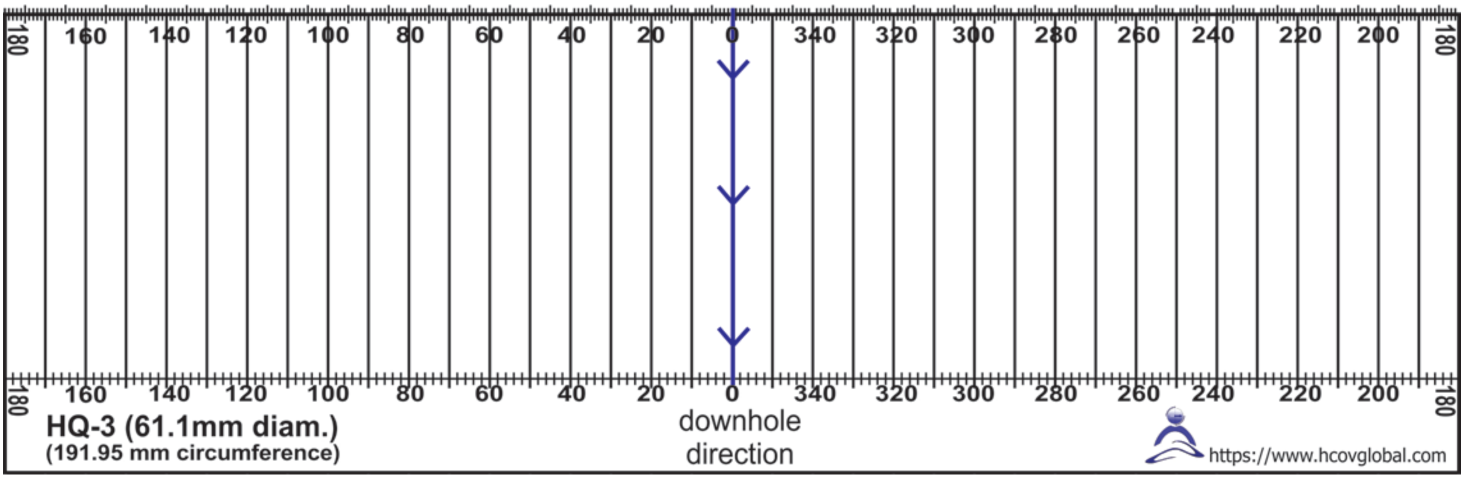


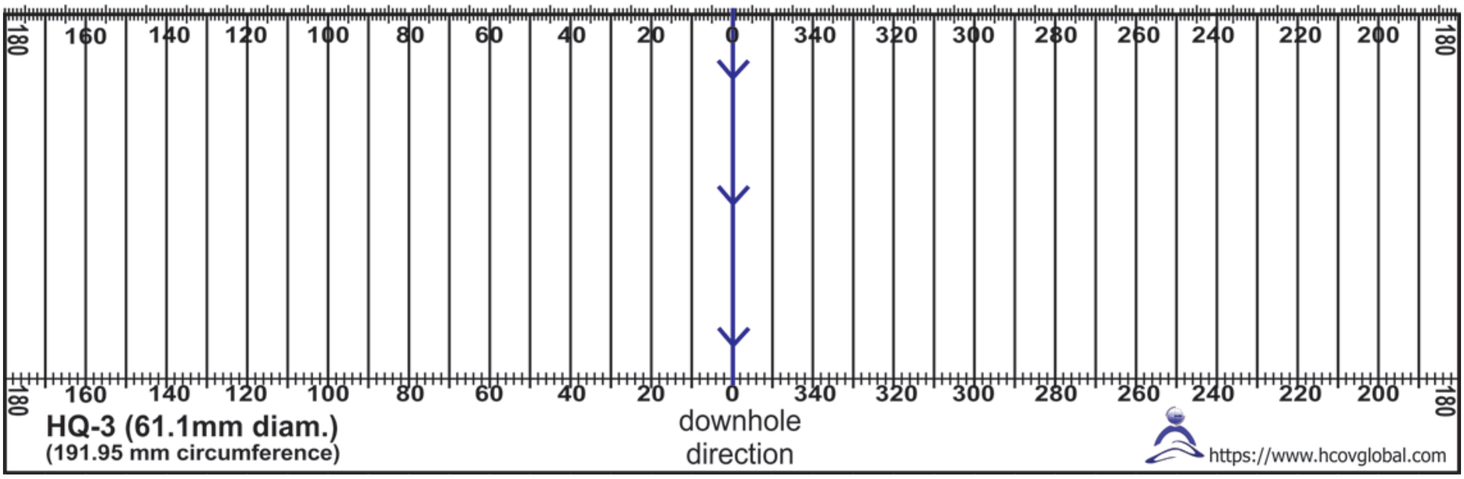
HQ VARIANT (62.1MM DIAM; 195.09MM CIRCUMFERENCE)
ALPHA-BETA PROTRACTOR



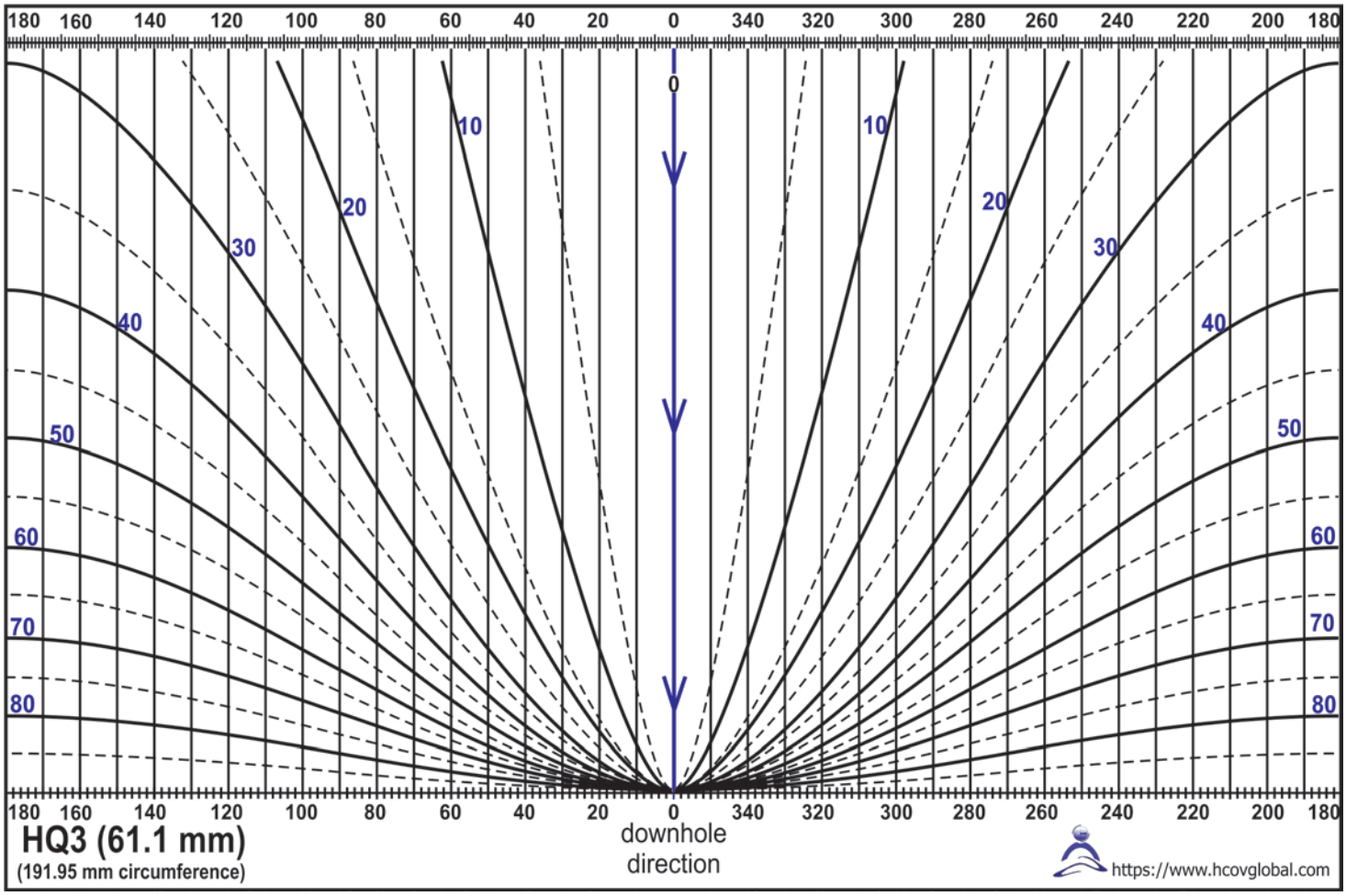
HQ-3 (61.1MM DIAM; 191.95MM CIRCUMFERENCE) BETA PROTRACTOR



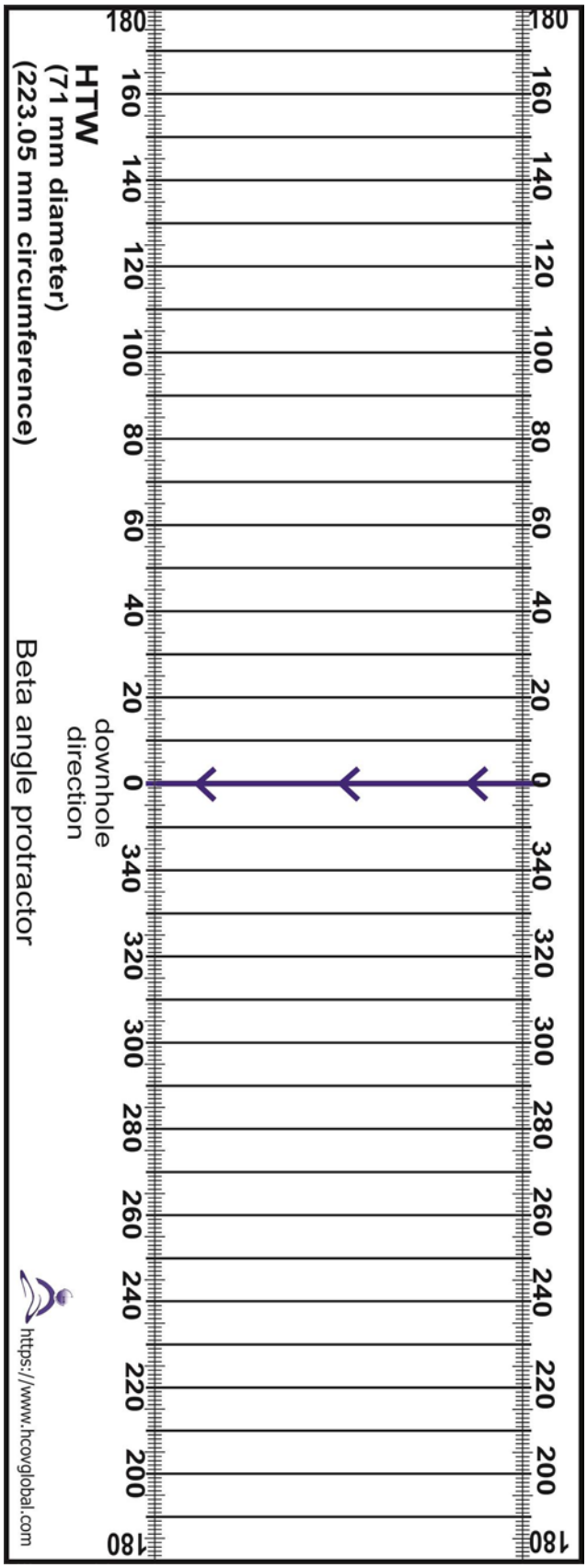


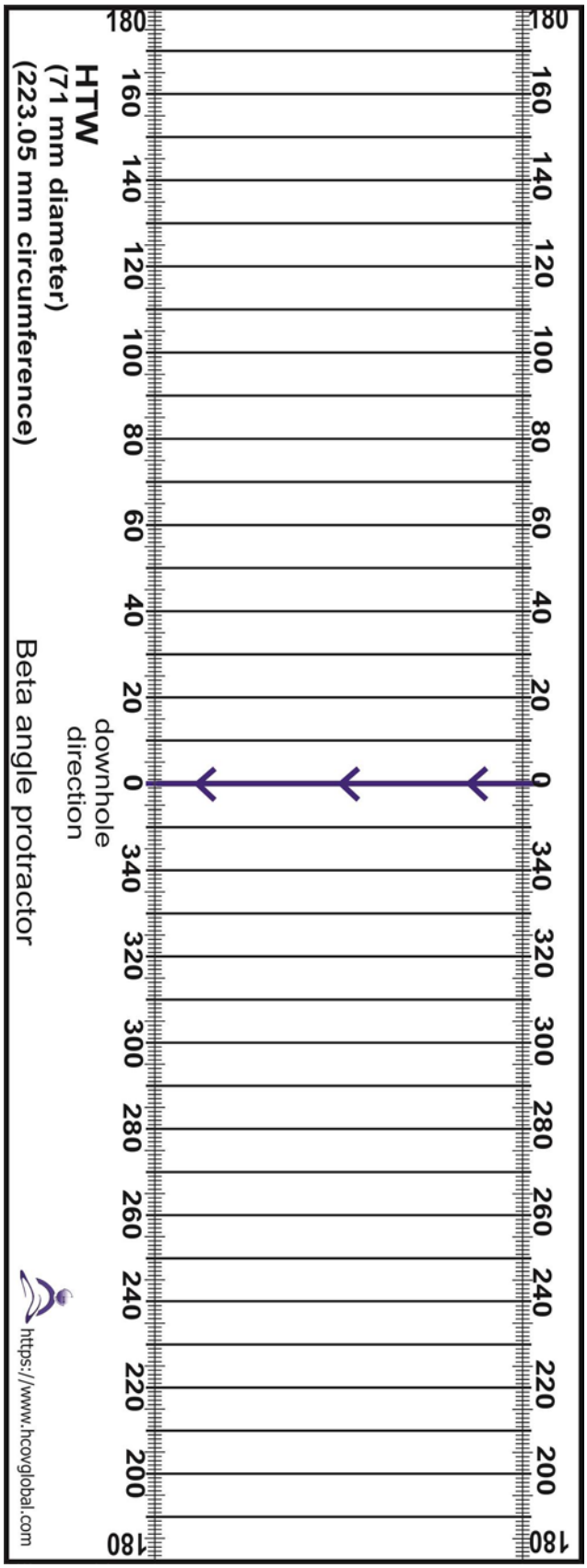


HQ-3 (61.1MM DIAM; 191.95MM CIRCUMFERENCE) ALPHA- BETA PROTRACTOR

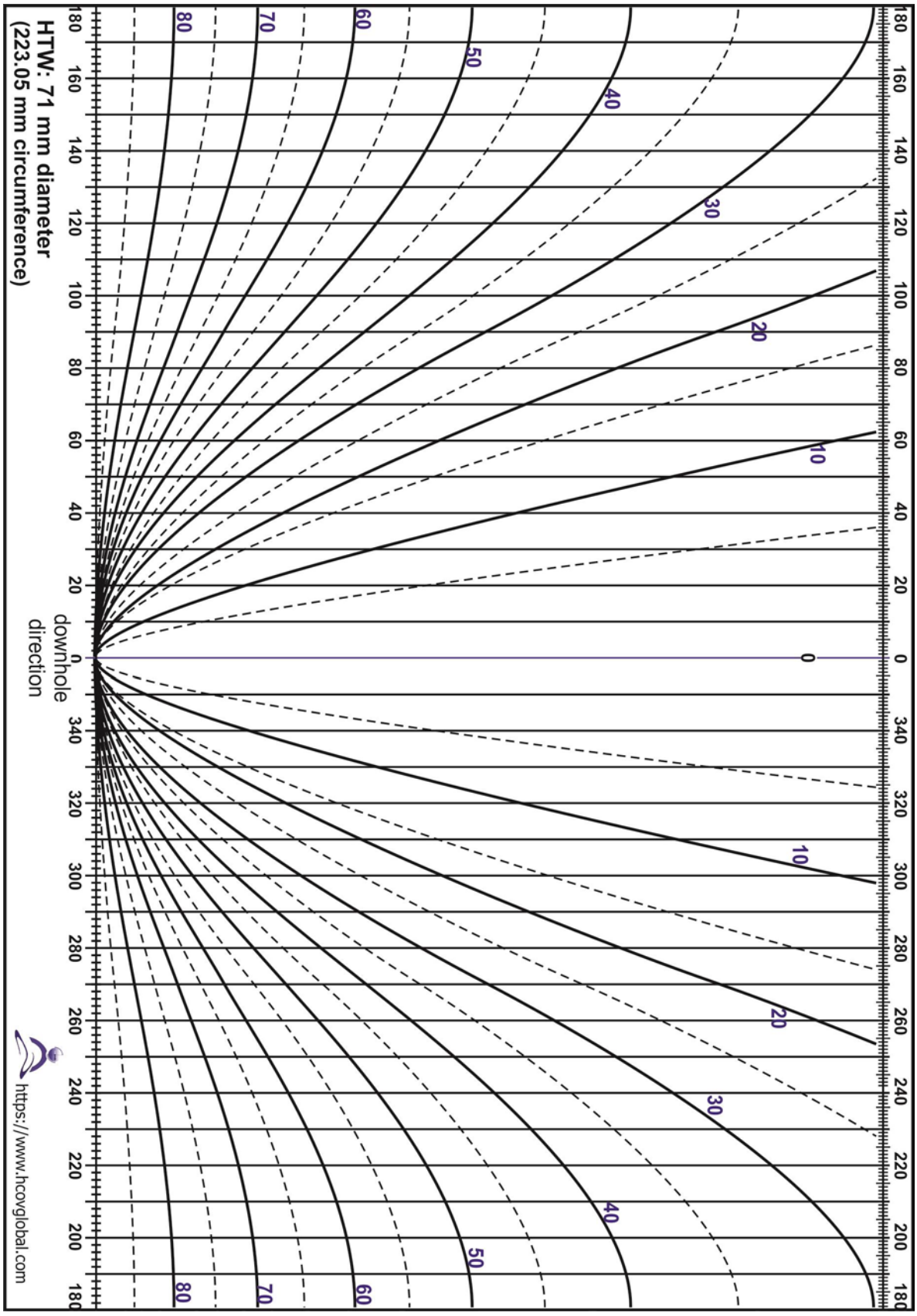


HTW (71MM DIAM; 223.05MM CIRCUMFERENCE) BETA PROTRACTOR

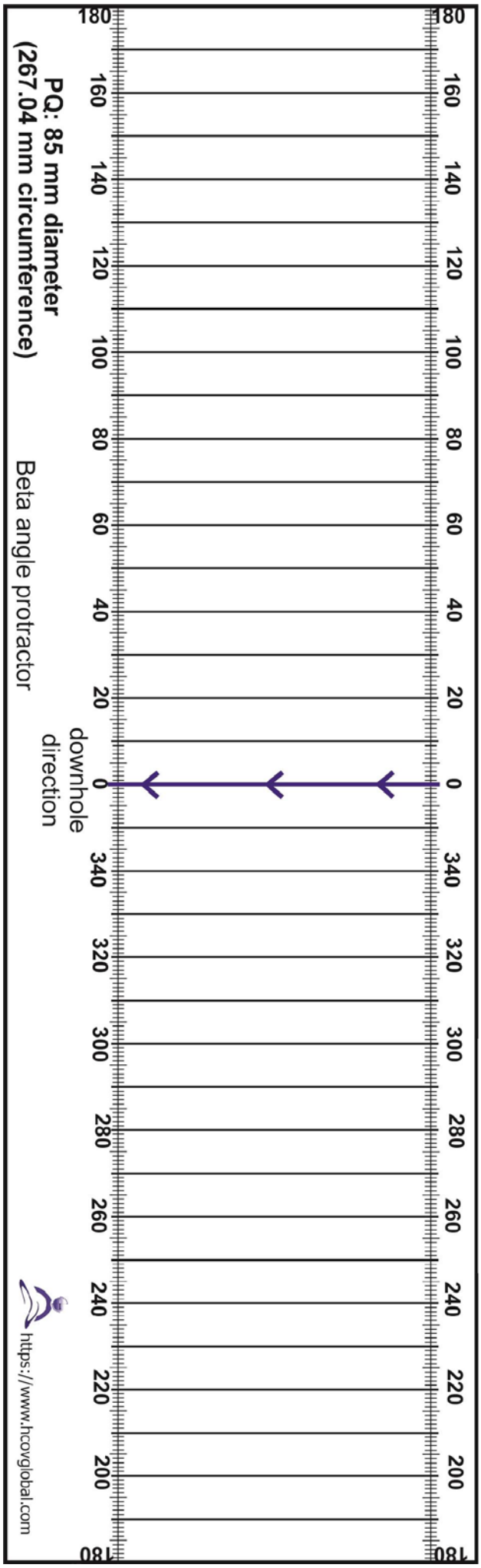




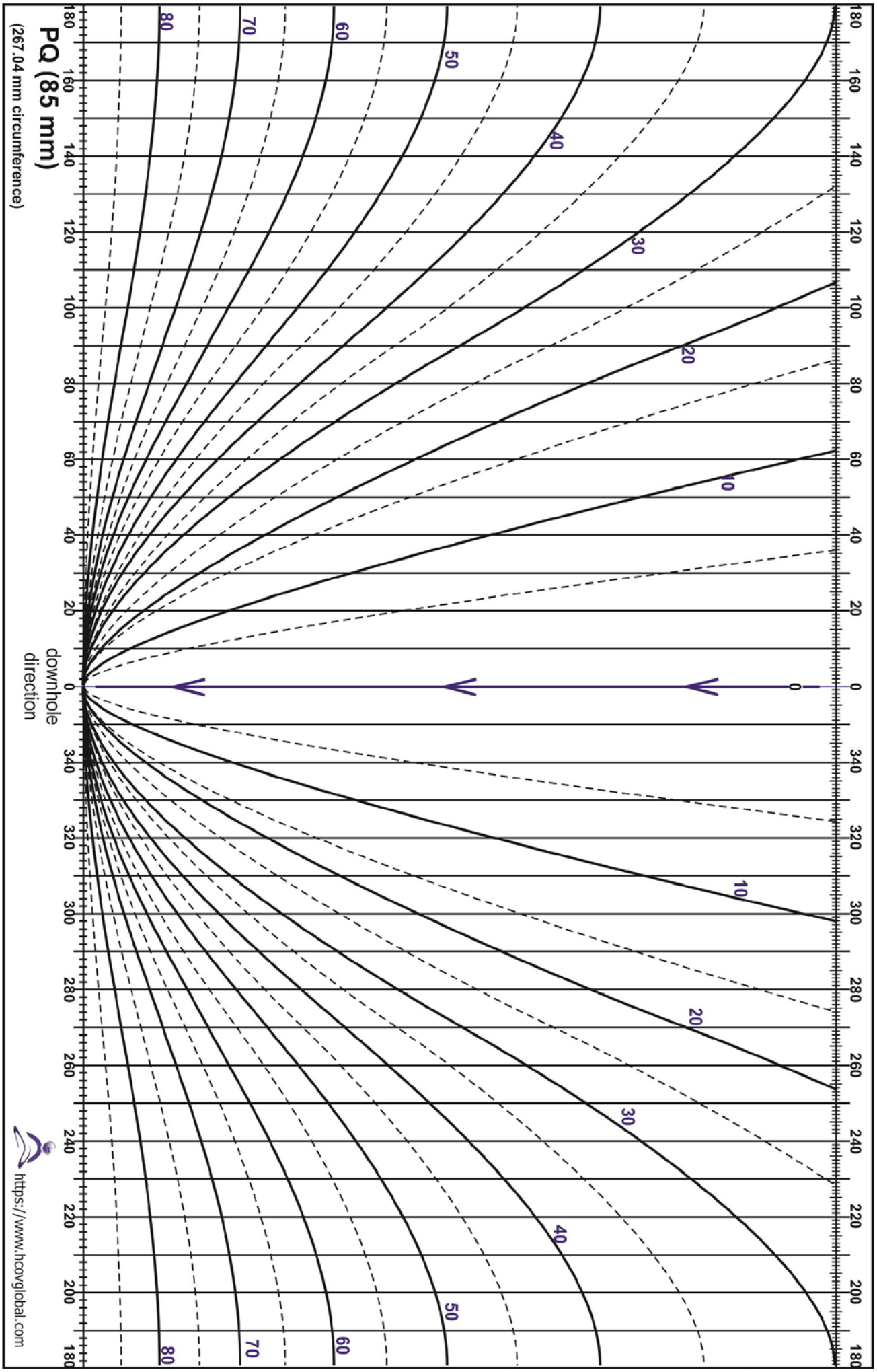
HTW (71MM DIAM; 223.05MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR



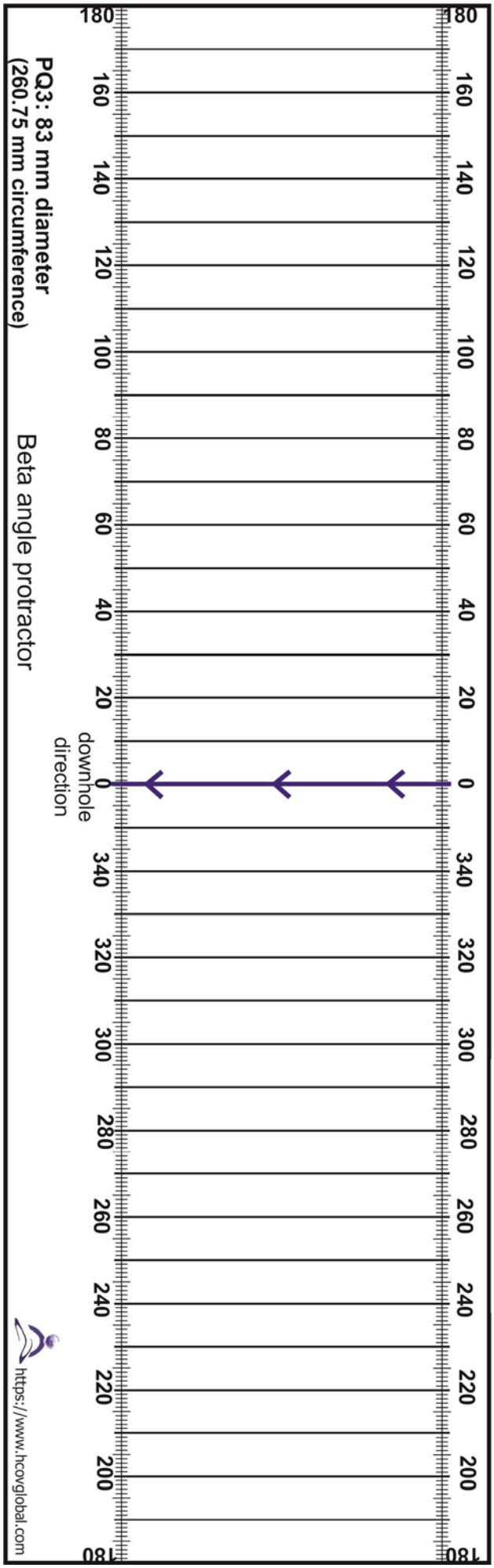
PQ (85MM DIAM; 267.04MM CIRCUMFERENCE)
BETA PROTRACTOR

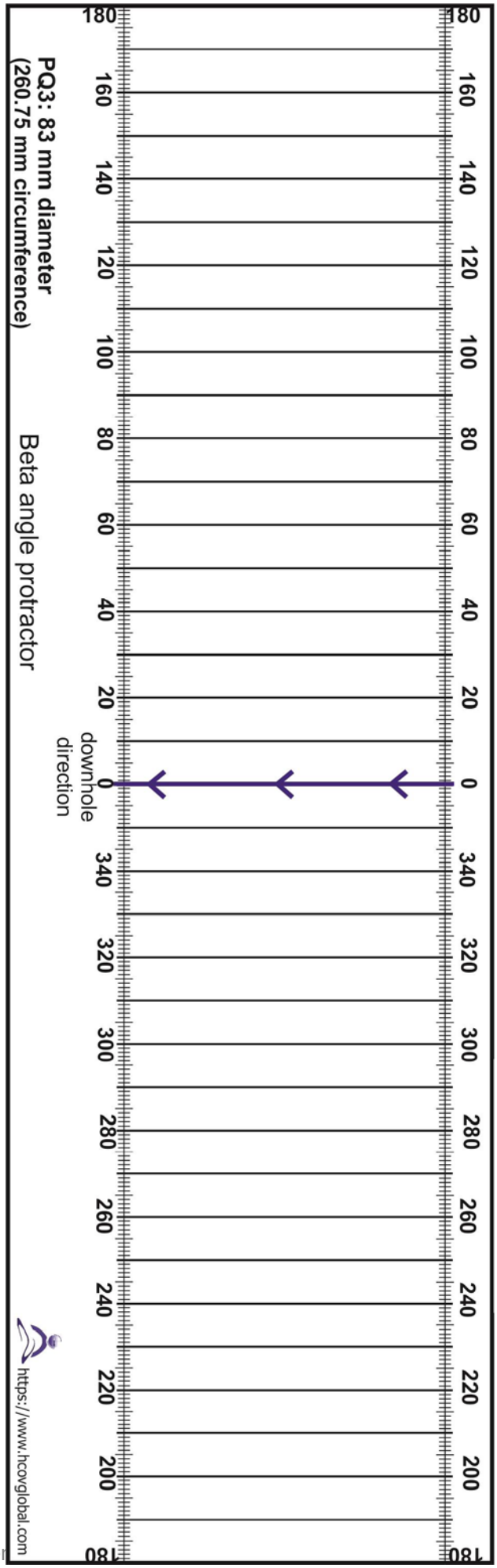


PQ (85MM DIAM; 267.04MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR

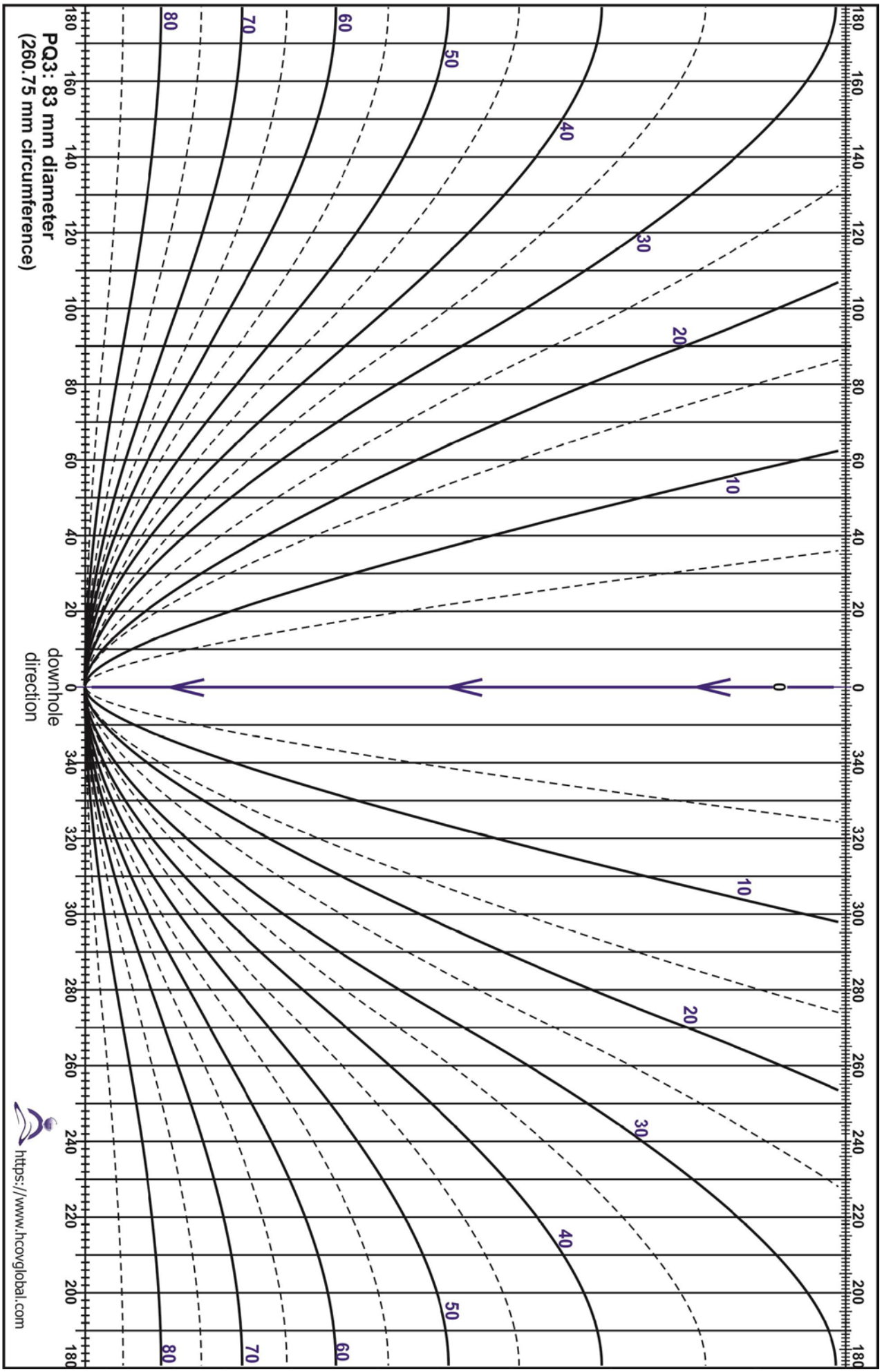


PQ-3 (83MM DIAM; 260.75MM CIRCUMFERENCE) BETA PROTRACTOR





PQ-3 (83MM DIAM; 260.75MM CIRCUMFERENCE) ALPHA-BETA PROTRACTOR



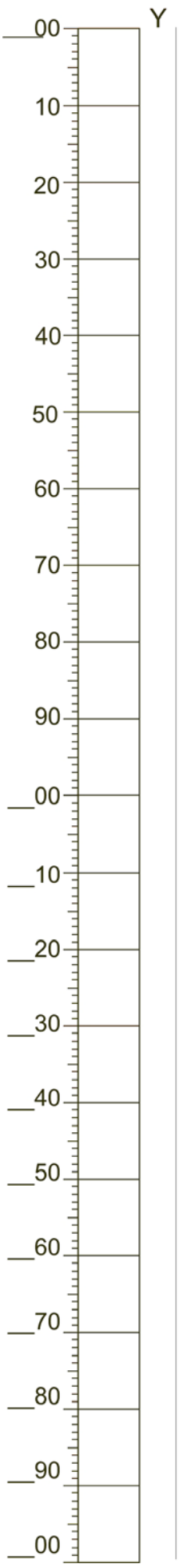
SUMMARY LOGGING TEMPLATES

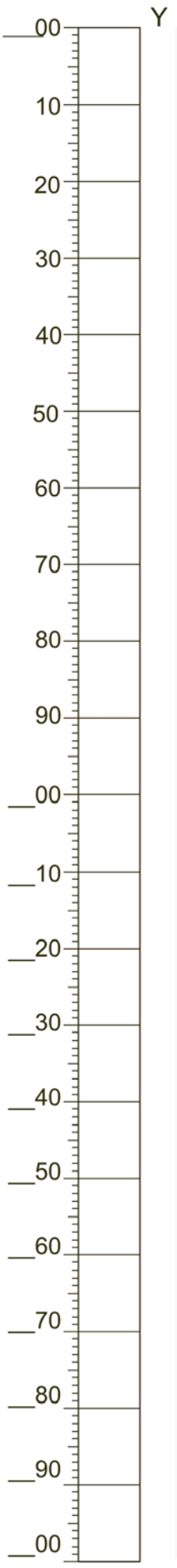
The following pages contain logging templates at different scales for rapid low-resolution summary logging of drill-core.

Hole:_____ _____ _____

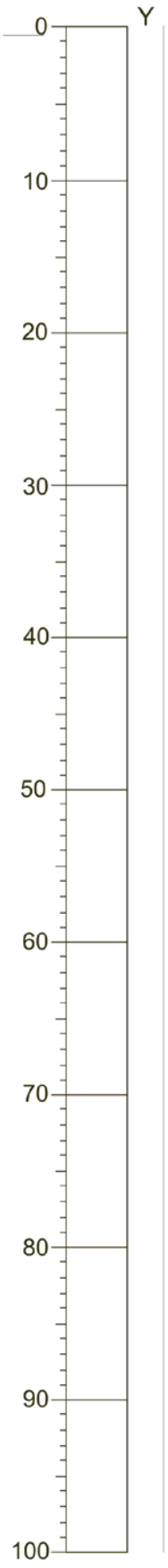
00	α	β	Notes	00	α	β	Notes	00	α	β	Notes
10				10				10			
20				20				20			
30				30				30			
40				40				40			
50				50				50			
60				60				60			
70				70				70			
80				80				80			
90				90				90			
00				00				00			
10				10				10			
20				20				20			
30				30				30			
40				40				40			
50				50				50			
60				60				60			
70				70				70			
80				80				80			
90				90				90			
00				00				00			

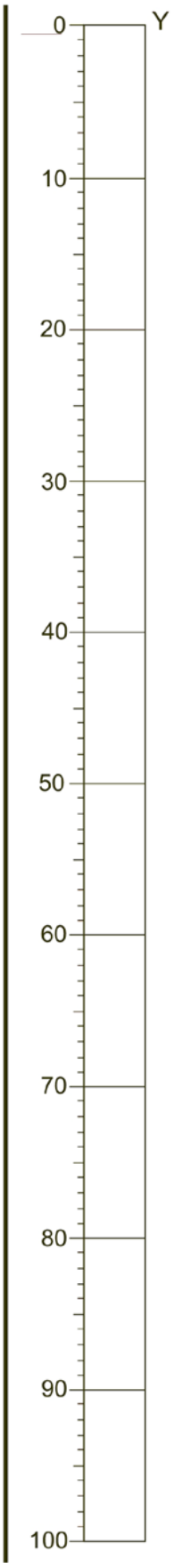
Hole:_____


Y
00
10
20
30
40
50
60
70
80
90
00
10
20
30
40
50
60
70
80
90
00


Y
00
10
20
30
40
50
60
70
80
90
00
10
20
30
40
50
60
70
80
90
00

Hole:_____





ABOUT THE AUTHOR

Rod Holcombe (PhD, FGSA), MAIG) is an Adjunct Professor of Structural Geology at the University of Queensland and a founding member of HCOV Global, a consortium of consultants to the minerals exploration industry.

Rod is a specialist in the structural analysis and 3D modelling of complex metamorphic terranes and shear zones with over 45 years' experience in Precambrian and Phanerozoic terranes in Australasia, south-east Asia, North and South America, East and West Africa, northern Europe, Siberia and the Russian Far East, and Tethyan systems of the Balkans and sub-Caucasus.

Rod is the author of a textbook *Mapping and structural geology in mineral exploration: where theory hits the fan* (distributed from: https://www.holcombe.net.au/book/rodh-book.html);,

a number of software packages, both free and commercial, (distributed from: https://www.holcombe.net.au/software/), as well as other professional products distributed from: https://www.hcovglobal.com/downloads

Rod trades under the name **HCOVGlobal**
ABN: 29863107460
PO Box 1618 Mudgeeraba Qld 4213 Australia
Ph +61 (0)402 859 610
email: rod@holcombe.net.au

HOLCOMBE COUGHLIN OLIVER VALENTA GLOBAL

HCOV Global (https://www.hcovglobal.com) is a consortium of four independent international geological consultancies (European and Australian-based) servicing resource industries world-wide. A shared background in structural geology is our common link, but each Principal brings specialist skills that gives us expertise over a large range of problems. We provide solutions both as independent consultancies and in collaboration. The other members are:

Tim Coughlin (MSc, PhD, FAusIMM), a structural geologist with particular experience in frontier target generation and risk analysis in emerging and developing countries.

Nick Oliver (PhD; FSEG; M AusIMM; M GeolSocAm; M GeolSocAus; MSGA), a structural and hydrothermal systems geologist, particularly in complex environments.

Rick Valenta (PhD, FAusimm, P. Geo, MAICD), a structural geologist and specialist in the structural interpretation of geophysical datasets, 3D modelling of mineralised systems, regional project generation, and advanced exploration of known prospects.

See https://www.hcovglobal.com/about-us for more detail