

Fornax equatorial large telescope mechanics user manual

FOR

FORNAX 5x:

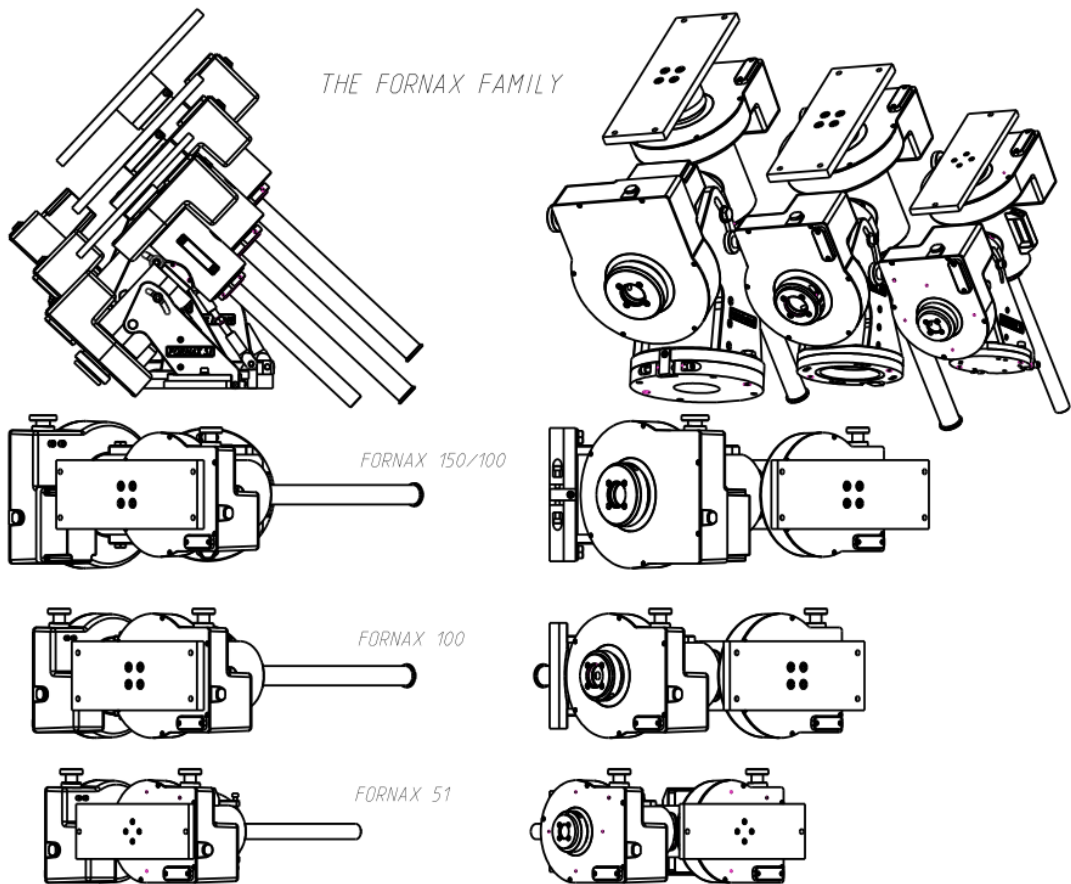
FORNAX 51, FORNAX 52, FORNAX 55

FORNAX 10x:

FORNAX 100, FORNAX 101, FORNAX 102, FORNAX 105

FORNAX 15x:

FORNAX150/100, FORNAX 100, FORNAX 101, FORNAX 102, FORNAX 105



Introduction to the mechanics

Fornax mechanics are designed for precise movement of medium and large telescopes. Constructed entirely of stainless metal materials, the housing is sealed against dust and water, so there's no need to worry about delicate and sensitive parts of the drive and therefore a very long life without maintenance.

The mechanism is perfectly suited to the highest demands of today's astrophotography.

The basic models typically have a periodic error of $\pm 5''$ (1 period 7.5 minutes), which can be further improved by the use of closed-loop guiding and precise positioning encoders and control electronics to manage them appropriately. The control electronics are not part of the mechanism.

Main types and tabular data of the mechanism

The different types of equatorial telescope mechanics (Fornax 5x, 10x, 15x) of the manufacturer Fornax can be considered as identical in terms of end-use and operation.

The differences are in the physical dimensions, the design of the washer that holds the base of the mechanics and the maximum permissible load resulting from the differences in size.

Detailed data are given in the annexes.

Before you start the installation, please familiarise yourself with the data and dimensions of your mechanics, which you will find in the annex, as well as with the markings used.

Symbols used in the instructions

Before you start, familiarise yourself with the icons used in this manual



WARNING: Warn of situations that could cause injury to yourself or others



CAUTION: draws attention to situations that may cause damage to your device or other devices



CAUTION: draws attention to situations that may cause damage to your device or other devices

The mechanics consist of the main parts as described in the size data: the main pieces:

- mechanics,
- support platform, support disc (column top)
- counterweight shaft.



When assembling the telescope mechanism, pay special attention to the assembly due to the heavy weight of the elements! They can cause an accident if dropped. Heavy weights can only be moved by a sufficient number of people at a time. There is a risk of pinching when assembling the components.



Select and use the correct tools for assembly according to the dimensions.



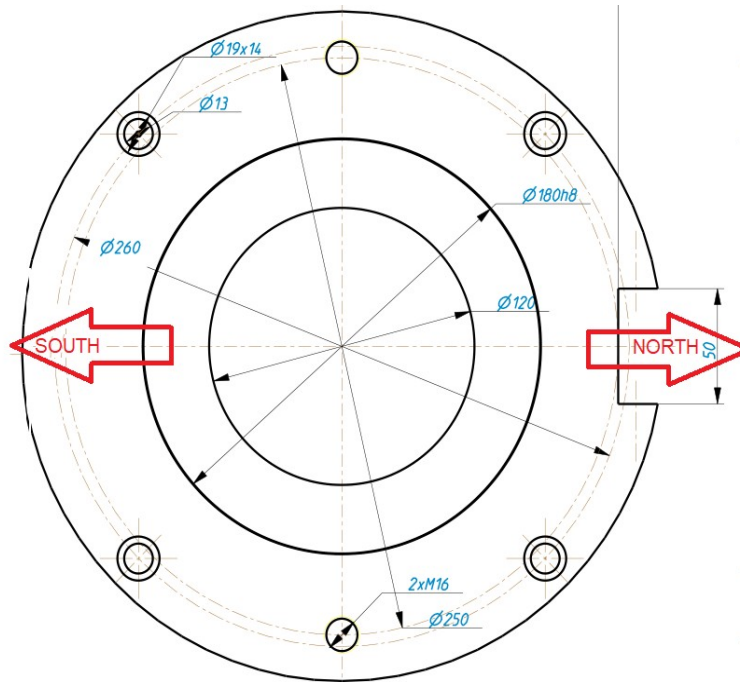
Take extra care to ensure that the binoculars and polar binoculars are always pointed in a direction that does not face the Sun!

WARNING

NEVER LOOK INTO THE SUN WITH BINOCULARS! THE INTENSE LIGHT OF THE SUN CAUSES PERMANENT EYE DAMAGE! VIEW THE SUN ONLY THROUGH A SUITABLE FILTER! NEVER USE SENSORS THAT CAN BE PLACED IN FRONT OF THE EYE! DO NOT USE THE BINOCULARS TO PROJECT AN IMAGE OF THE SUN, AS THE HEAT ACCUMULATING IN THE TUBE MAY DAMAGE THE BINOCULARS AND CAUSE A FIRE HAZARD!

Assembling and preparing the mechanics for use

The first step in assembly is to fix the support disc (column top) for the mechanism to the pre-set pillar of the appropriate size and load capacity by means of Allen screws through the hole in such a way that the notch used for horizontal adjustment is located in a northerly direction.



For proper operation, try to position the washer as horizontally as possible and orient it as accurately as possible according to the cardinal points.

In the next step, tighten the fixing bolts of the washer (pillar top).

The next step is to lift the mechanism onto the washer.



WARNING Attention! Due to the heavy weight of the mechanics, pay attention to the number of persons allowed to lift and/or the load capacity of the hoist, crane, hoist.

The height of the pillar may require the prior installation of a safety mounting platform. When setting up, pay attention to the safety limits and the load-bearing capacity of the platform, as well as to a stable, tip-over-free set-up. Mount the mechanism on the pillar in such a way that the horizontal adjusting nose, rotating around the vertical axis, is positioned in the slit of the support pillar and faces north.



Mechanics on the washer

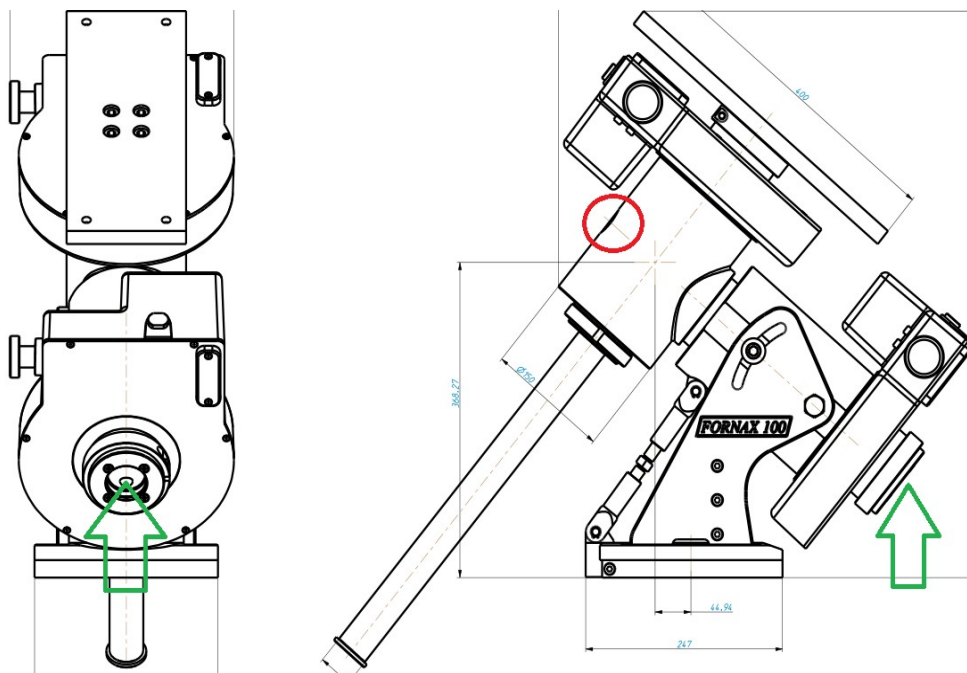
Insert the Allen screws with a chisel head corresponding to the threaded hole of the washer into the grooved screw profile on both sides of the base of the mechanism and fix them in such a way that the mechanism can be rotated around the vertical axis, but cannot fall off the pillar!

In the next step, insert a suitably sized allen or socket head cap screw into each of the 2 horizontally located threaded holes in the recessed part of the washer (pillar top). Do not drive them in until they hit the nose, the threaded end of the screw should not touch the nose part. The mechanism should be rotatable about its vertical axis until it strikes the nose in either direction.

The next step is to adjust the "height" of the mechanism to the geographic width.

Height adjustment begins by slightly loosening the Allen screws located in the grooves in the two side walls. The height can be adjusted by turning the nut between the base plate and the side walls of the mechanism up and down.

The next step is to unscrew a cap made of right-handed bakelite-like material on the part of the mechanism marked with a red ring.



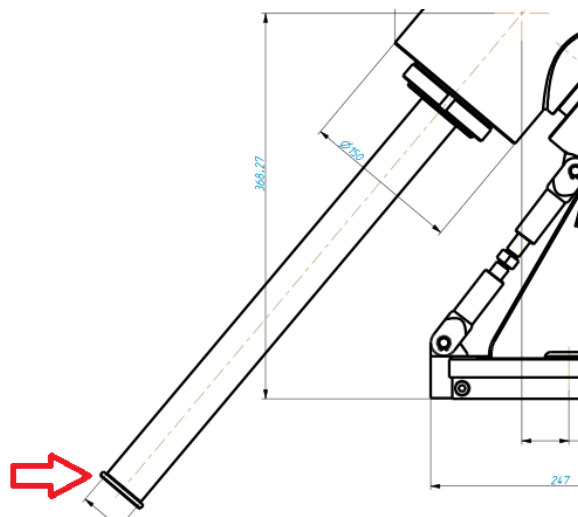
Threaded cap on the mechanism for alignment to the visual pole

If you have an (optional) polarscope, you can use it later for accurate polar alignment. Insert the polarscope into the hole marked with a green arrow so that the eyepiece is on the outside. With the cap off, you will be able to look through the hole or through the polarscope at the location indicated by the green arrows when the axes are in the correct position. Adjust the position of the mechanics using the handwheel knobs located on each half of the two mechanics.

The adjustment is correct when you can see through the hole in the mechanics at the position indicated by the green arrow.

Once aligned to the correct pole (horizontal-vertical), drive the two allen or captive screws on either side of the mechanical washer to reach and secure the nose. Tighten the two height-locking allen screws previously loosened on the two holes. Tighten the tapl fixing screws. Replace and screw in the pole cap made of bakelite-like material.

The next step is to install the counterweight shaft.



Screw the counterweight shaft into the mechanism until it is fixed.

Unscrew the "anti-fall" serrated screw (red arrow) at the end of the counterweight shaft to allow the counterweights to be mounted on the shaft.



Due to the heavy weight of the counterweights, be careful when dropping or putting them on, they may cause injury!

When installing the counterweights, tighten the counterweight fixing screws with sufficient torque to ensure that they do not fall off after installation.

After the correct number and weight of counterweights have been installed, always tighten the "anti-drop" notched screw (marked with a red arrow) properly.

In the next step, place and properly secure the telescope on the platform.



For the long and proper functioning of the mechanism, always balance the payload and counterweights according to the rules of the trade.

SPECIFICATIONS

SPECIFICATION OF FORNAX 5x EQUATORIAL MOUNT

Mount weight	35 kg
Max payload capacity:	50kg (counterweight excluded)
Photographic payload:	30 kg (counterweight excluded)
Overall dimensions:	220 x 470 x 540 mm
Shaft diameter:	60mm, anodised aluminium alloy
Bearings:	diameter 95mm, high precision tapered roller bearings in X layout
Gear:	diameter 194mm, 1 modul, bronze, 192 teeth
Worm:	diameter 22mm, multiple thread, grinded, hardened, corrosion proof steel (KO13)
Periodic Error:	< +/- 6 arc seconds
Periodic Error (with encoders):	< +/- 0.5 arc seconds
Stepper Motors:	200-phase step / rev., 1.3Nm
Voltage and Current:	12V DC, 3.5A peak power consumption at max. load
Step-resolution:	0.25 arc seconds / step with MC3 and 0,03 arc seconds / step with OC5
Maximum speed:	4 degrees / second
Counterweight holder shaft: diameter:	33.7mm (1,3267" KO33 tube) and length 470mm

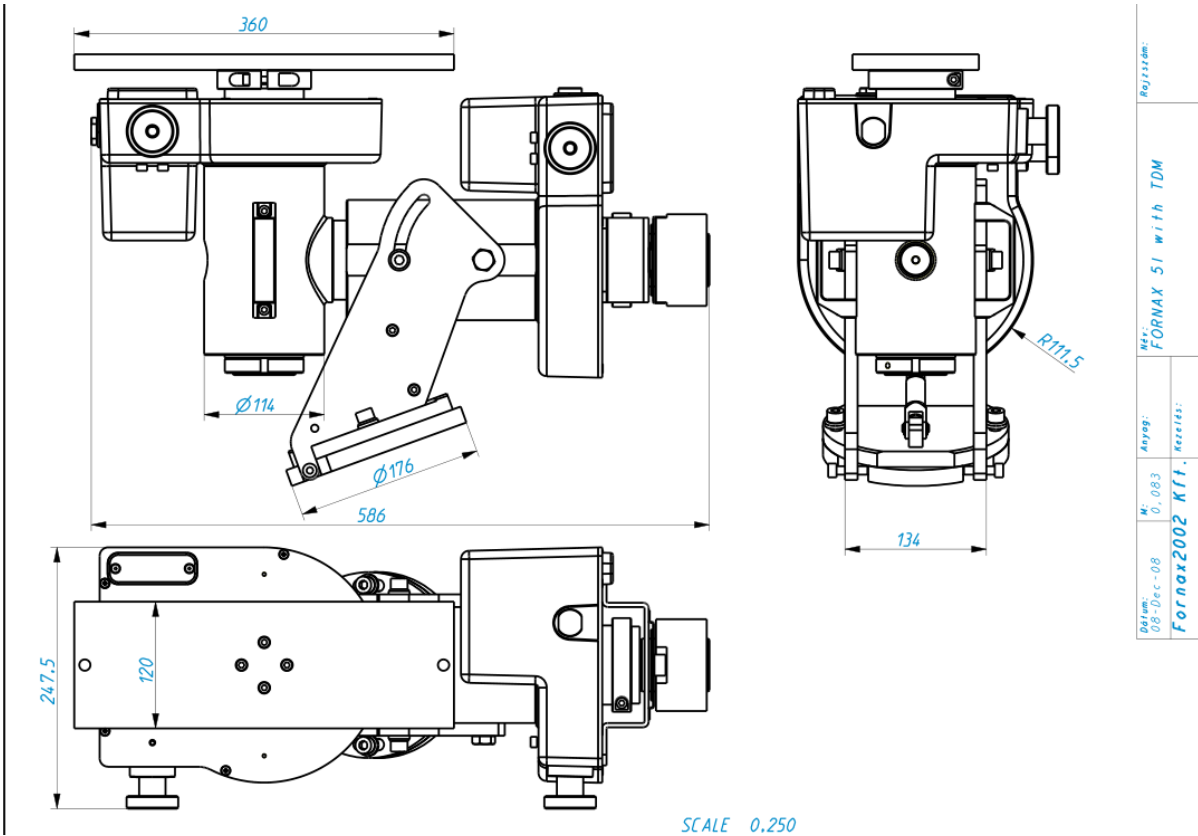
SPECIFICATION OF FORNAX 10x EQUATORIAL MOUNT

Mount weight	50 kg
Max payload capacity:	90 kg (counterweight excluded)
Photographic payload:	70 kg (counterweight excluded)
Overall dimensions:	270 x 696 x 525 mm
Shaft diameter:	80 mm, anodised aluminium alloy
Bearings:	diameter 125mm, high precision tapered roller bearings in X layout
Gear:	diameter 242.5mm, 1.25 modul, bronze, 192 teeth
Worm:	diameter 33mm, multiple thread, grinded, hardened, corrosion proof steel (KO13)
Periodic Error:	< +/- 6 arc seconds
Periodic Error (with encoder):	< +/- 0.5 arc seconds
Stepper Motors	200-phase step / rev., 1.7Nm
Voltage and Current:	24V DC, 3.5A peak power consumption at max. load
Step-resolution:	0.25 arc seconds / step with MC3 and 0,03 arc seconds / step with OC5
Maximum speed:	4 degrees / second
Counterbalance holder tube:	diameter 42.4mm (1.25" KO33 tube) x length 570mm

SPECIFICATION OF FORNAX 15x EQUATORIAL MOUNT

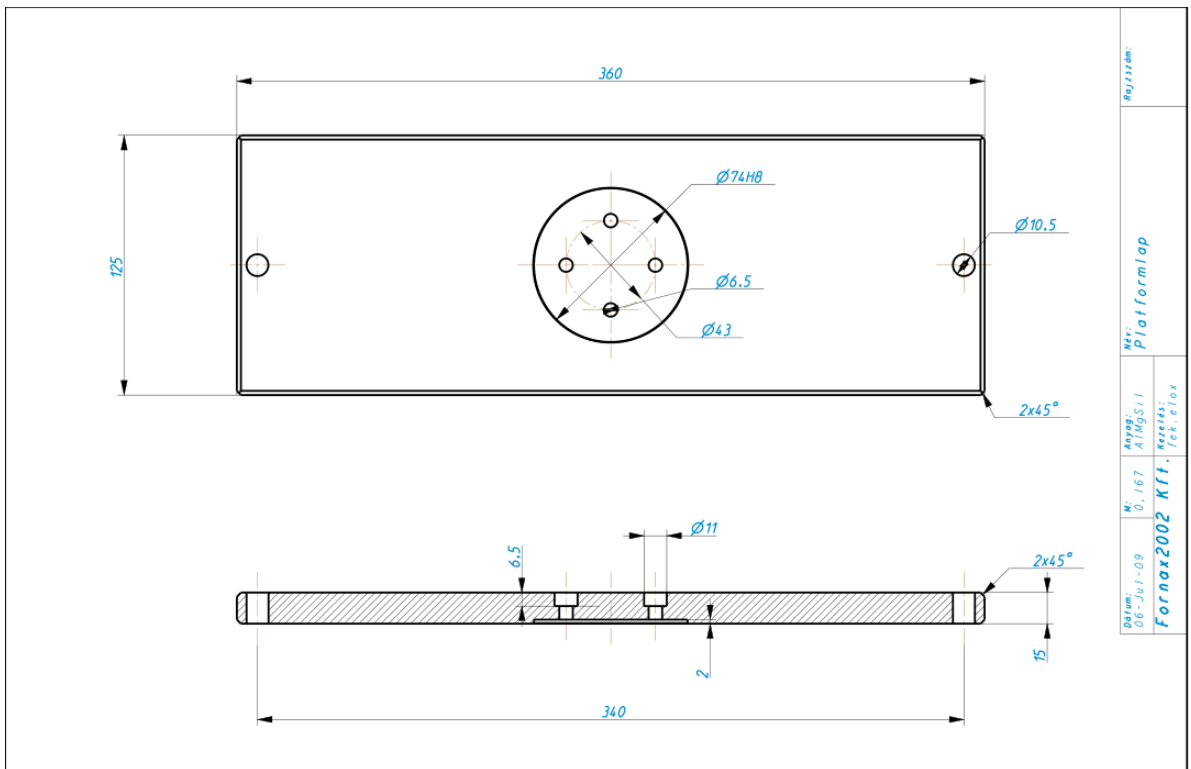
Mount weight	70 kg
Max payload capacity:	120 kg (counterweight excluded)
Photographic payload:	90 kg (counterweight excluded)
Overall dimensions:	320 x 584 x 770 mm
Shaft diameter:	100mm, anodised aluminium alloy
Bearings:	diameter 150mm, high precision tapered roller bearings in X layout
Gear:	diameter 292.5mm, 1.5 modul, bronze, 192 teeth
Worm:	diameter 33mm, multiple thread, grinded, hardened, corrosion proof steel (KO13)
Periodic Error:	< +/- 6 arc seconds
Periodic Error (with encoders):	< +/- 0.5 arc seconds
Stepper Motors	200-phase step / rev., 1.7Nm
Voltage and Current:	24V DC, 3.5A peak power consumption at max. load
Step-resolution:	0.25 arc seconds / step with MC5 and 0,03 arc seconds / step with OC5
Maximum speed:	4 degrees / second
Counterbalance holder tube:	diameter 42.4mm (1.25" KO33 tube) x length 570mm

Dimension drawings Fornax 5x



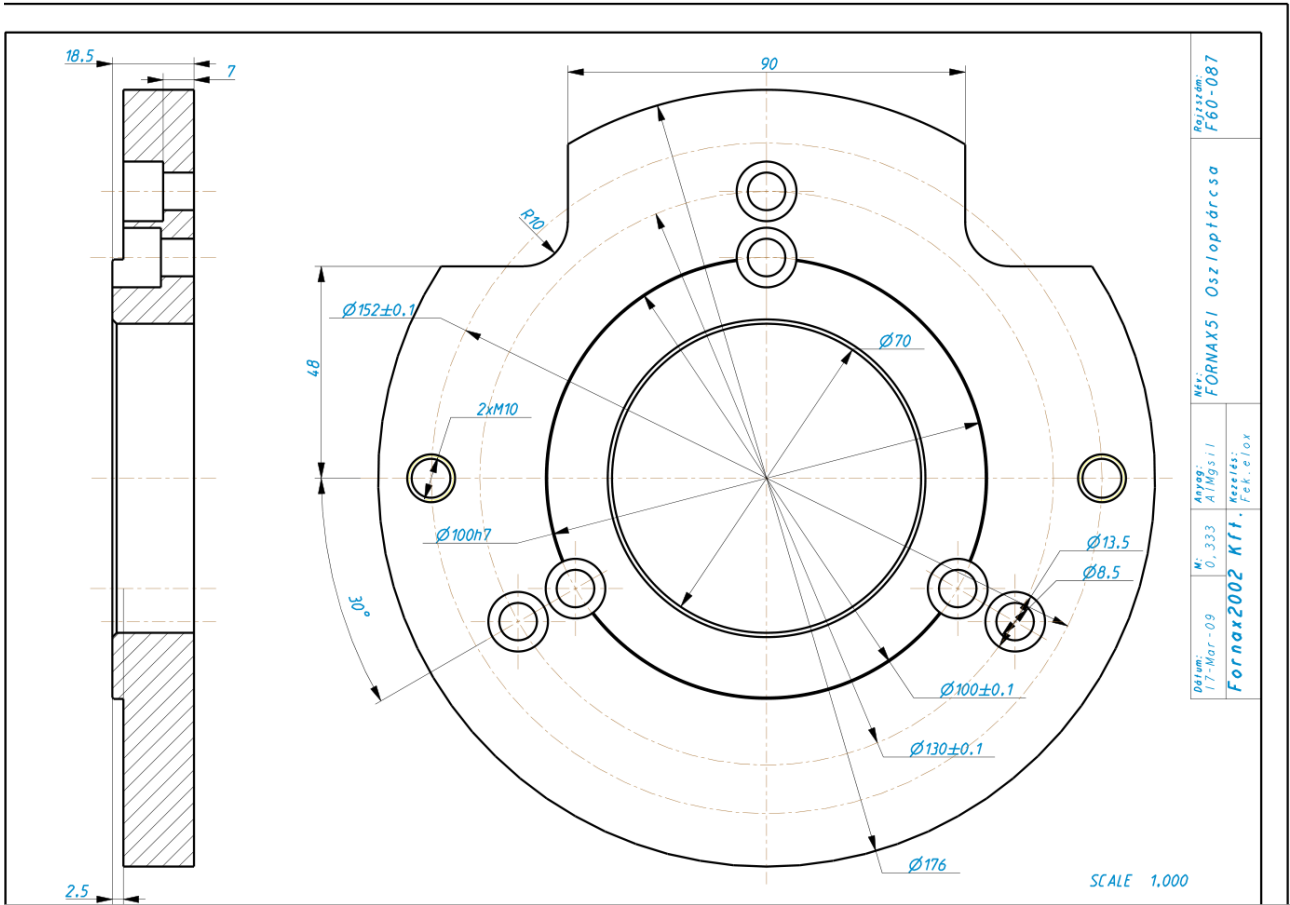
Revisjon:	08-Dec-08	Nr:	0.083	Antag:		Revisjon:	
						Nr:	FORNAX 5I with TDM
						Revisjon:	
							Fornax2002 Kft., Kerecs:

Fornax 5x mechanics sizes



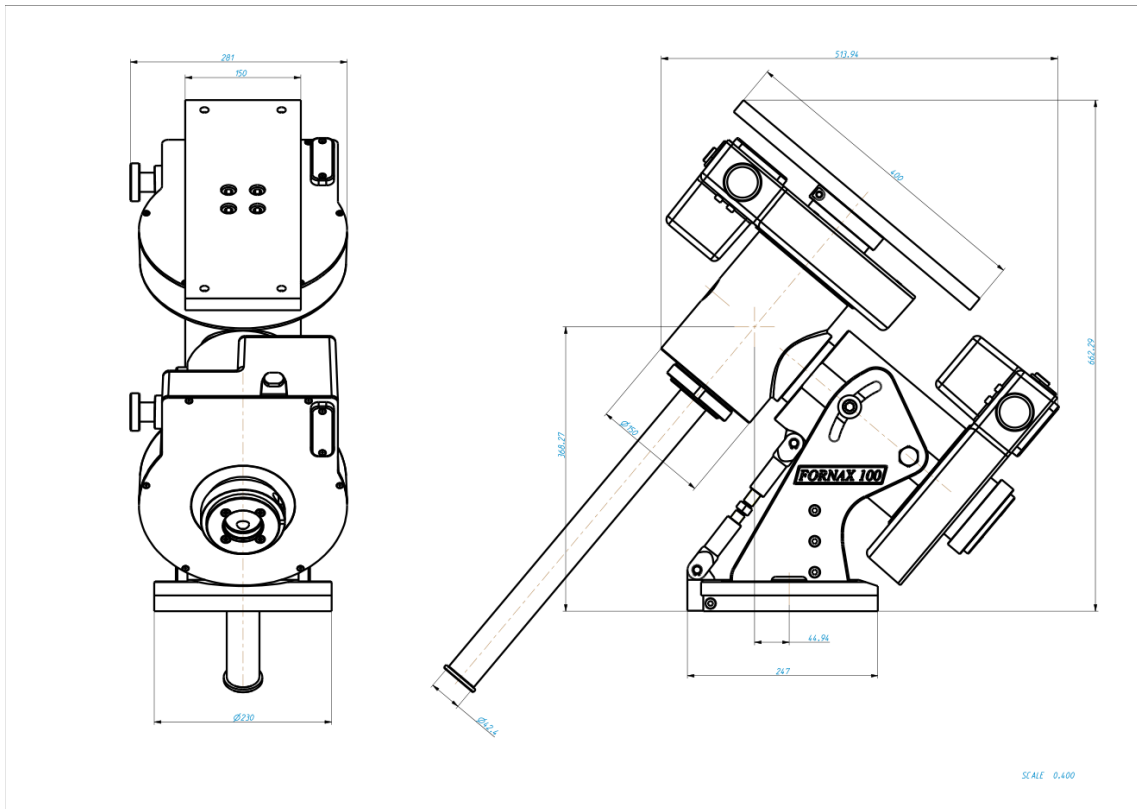
Revisjon:		Antag:	ATMG511	Revisjon:	
		Nr:	0.167	Nr:	Platformlap
				Revisjon:	
					Fornax2002 Kft., Kerecs:

Fornax 5x platform dimensions

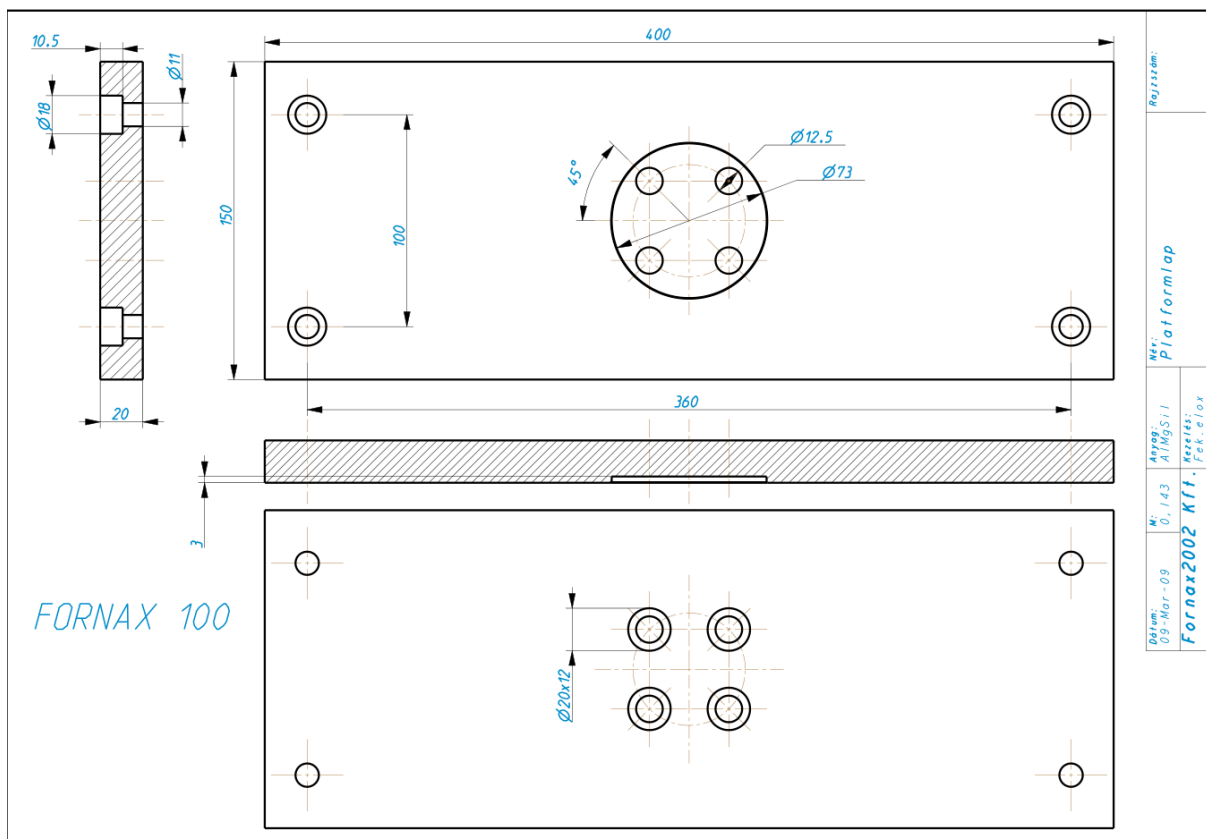


Fornax 5x pillar washer (pillar roof) dimensions

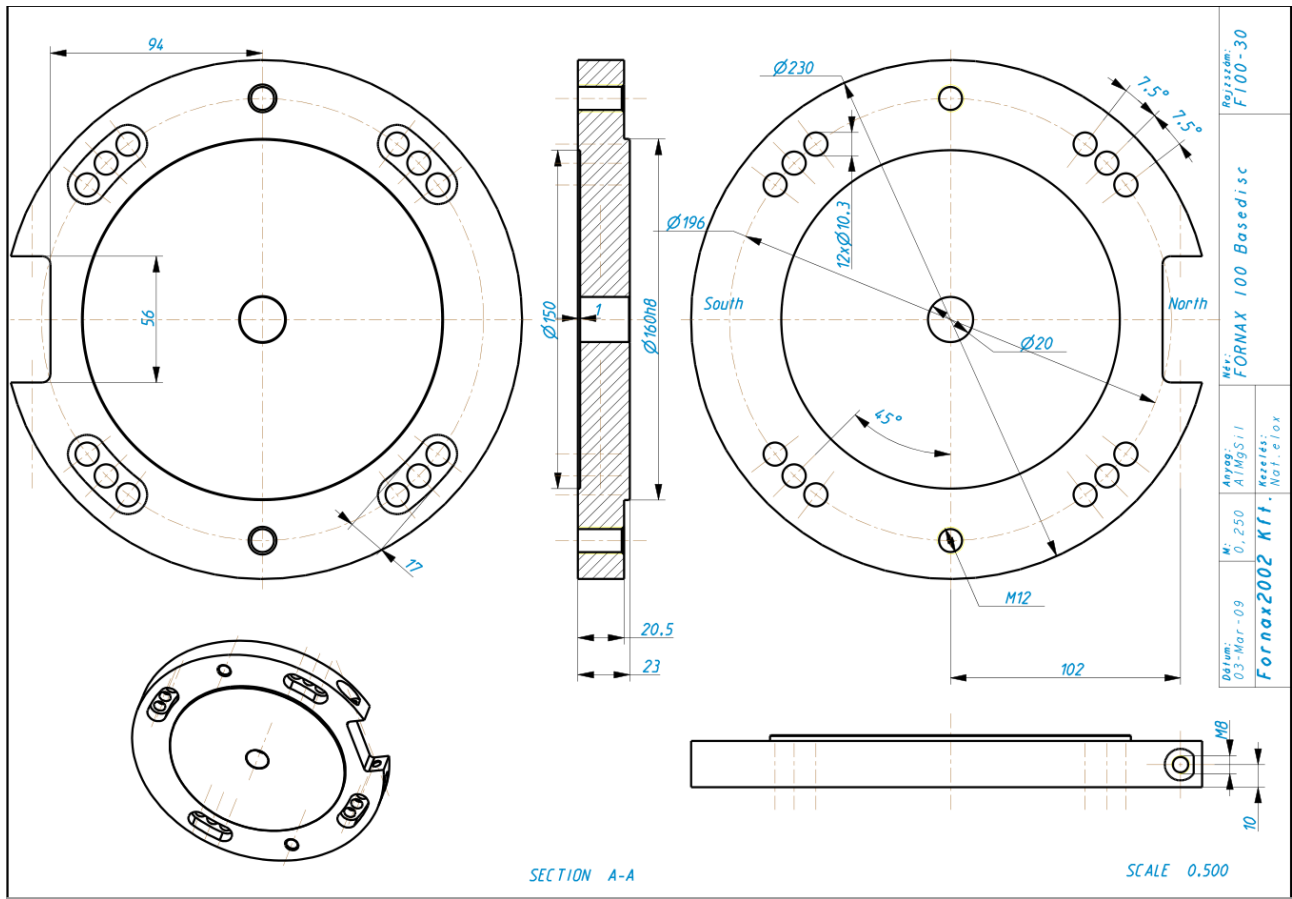
Fornax 10x



Fornax 10x mechanika méretek



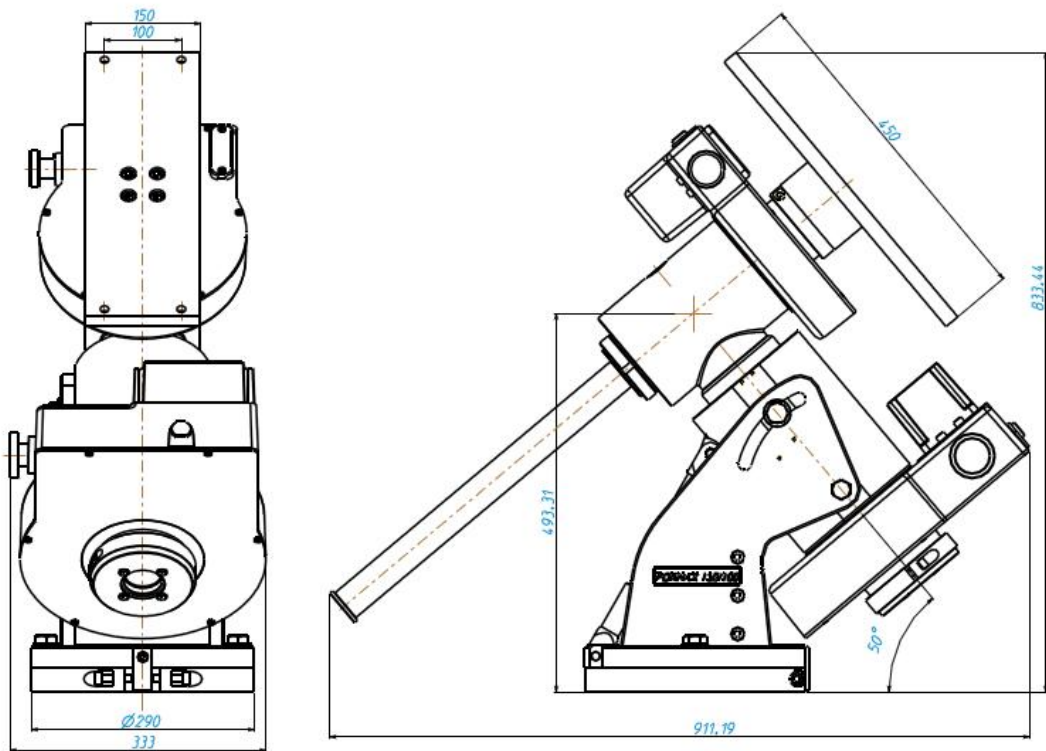
Fornax 10x mechanics sizes



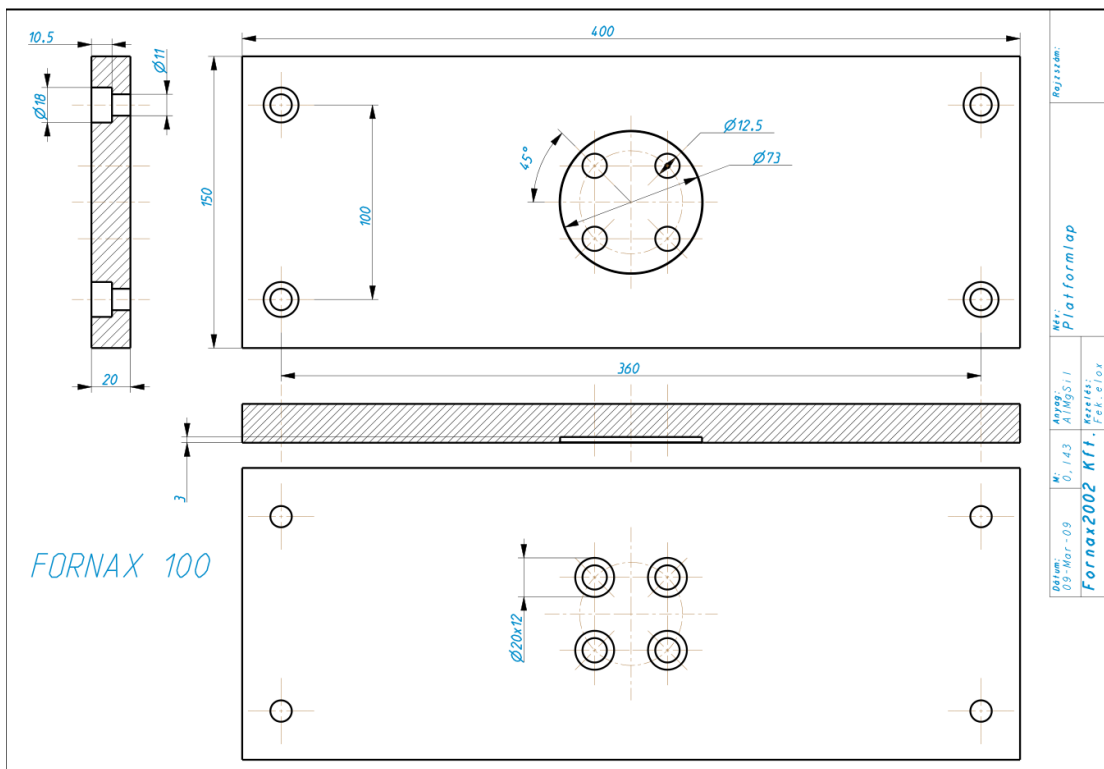
Fornax 10x pillar washer (pillar top) dimensions

Regizem: F100-30
Mat: FORNAX 100 Basedisc
Anyag: AlMgSi1
M: 0,250
Dařum: 03-Mar-09
Fornax2002 Kft. Keszlet: Nat. e/ox

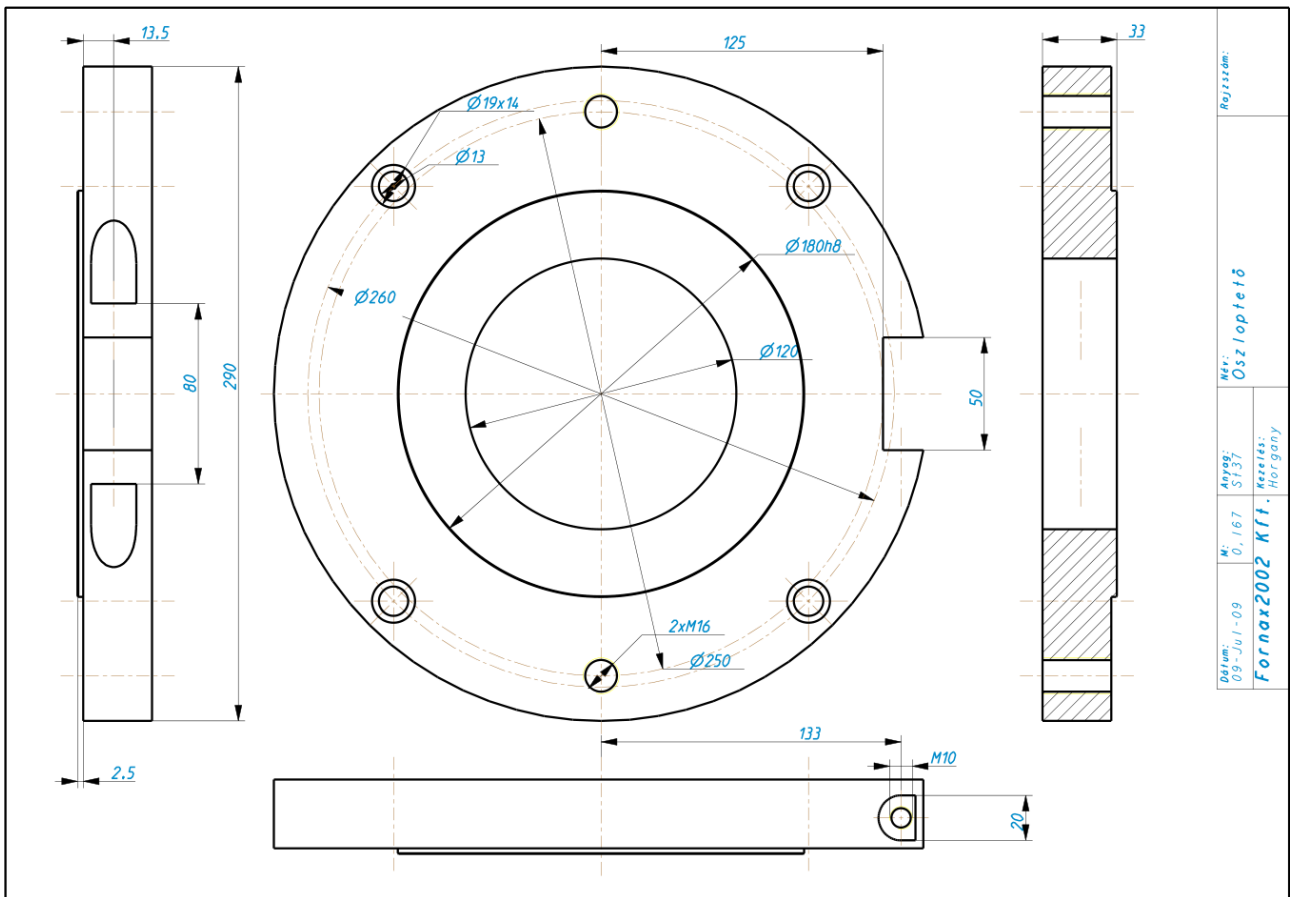
Fornax 15x



Fornax 150 mechanics sizes



Fornax 150/100 platform dimensions



Fornax 150 pillar washer (pillar roof) dimensions

WARRANTY INFORMATIONS

No Risk, 100% Money Back Guarantee

We want you to feel safe and confident when you purchase our products, for this reason we offer all our customers a No Risk, 100% Money Back Guarantee for the following products:

LighTrack II mount, LighTrack II + Polarscope, LighTrack II Full Set, FMW-200 Wedge, HM-5 polarscope.

If at any time within 30 days of receiving your order, you are not 100% satisfied, you may return it to us for a refund. No questions asked. Any items damaged due to reasons not covered under warranty cannot be accepted back for refund under our 30 Day Money Back Guarantee. Also, associated shipping fees are not refundable. NOTE: this guarantee only applies to orders placed on Fornax Mounts's webstore at fornaxmounts.com. The buyer pays the back shipping costs.

Product warranty coverage

Fornax Mounts (Fornax 2002 Ltd.) warrants all Fornaxmounts products to be free of all defects in material and workmanship for 1 year from the date of purchase. This warranty extends to the original buyer (only or and each successive buyer within the warranty period). Within the period of this warranty Fornax Mounts will repair or replace, free of charge : any part proving defective in material or workmanship. All warranty repairs and service must be performed by an authorized Fornaxmounts service facility.

WARRANTY EXCLUSIONS : This warranty does not apply to any costs, repairs, or services for the following :

- Repairs necessitated by use other than normal use
- Damage resulting from misuse, abuse, accidents, alterations, or improper use
- Corrective work necessitated by repairs made by anyone other than an authorized Fornaxmounts technician.

Returns policy

Fornax Mounts wants you to be fully satisfied with your purchase. If for any reason you are not satisfied with your purchase, you may return the item(s) for a full refund, less shipping and handling fees. Please read the details below for more information.

Standard Return

Fornax Mounts customers may return merchandise purchased from Fornax Mounts up to thirty (30) days after receipt of merchandise for a full refund of the purchase price. A full refund will be given provided the product is returned in new condition, complete in its original packaging, with all warranty cards, accessories, manuals, etc. included. Shipping charges will not be refunded unless the return is a result of Fornax Mounts error.

Many of the products we sell qualify for free-shipping with purchase. In instances where these products are being returned, the costs paid by Fornax Mounts during original delivery will be deducted from the credit and/or refund resulting from the return. Additionally, Fornax Mounts is not responsible for the costs of return shipment to our facilities. If your return relates to an initially-defective product, please see section 4 below.

If you wish to return merchandise for a refund or exchange, it is required that you call or e-mail us.

When the product is received and inspected, Fornax Mounts will contact you via phone or email to confirm receipt of the item. Upon inspection, if there are any issues or questions regarding the condition of the returned product we will notify you at that time.

Any merchandise that does not arrive in new condition will be subject to a minimum 10% restocking fee. Missing parts, packaging, instructions, warranty cards, etc., as well as damage or other detrimental effects to merchandise, will result in higher restocking fees. Restocking fees will be determined by Fornax Mounts after inspecting the merchandise. To avoid damage to the manufacturer's original, labeled packaging (which will affect credit/refund value), customers must outer-box the merchandise they are returning to Fornax Mounts. Please do not write, place labels or stickers on the manufacturer's original packaging. If the product was not outer-boxed by Fornax Mounts when shipping to you, as is sometimes the case with larger merchandise, this requirement does not apply; but in this case, please do not write upon or otherwise mark the original packaging, other than with the return-shipping label.

Returns will not be accepted after 30 days without prior approval from Fornax Mounts management. Fornax Mounts will work with customers who have special circumstances, especially in regards to gifts, but reserves the right to refuse returns after thirty (30) days has elapsed.

Fornax Mounts Shipping Error

In the unlikely event that you receive the wrong item(s) from Fornax Mounts, please contact us by phone or e-mail. Fornax Mounts will arrange to have the incorrect item(s) picked up from your home or office, and we will ship the correct item(s) to you at no additional cost. The customer will never pay additional shipping if Fornax Mounts is at fault.

Product Damaged in Shipment

Customers should always inspect packages and their contents as soon as possible after delivery. If there are any shipping damages, the customer must report the damage immediately to the carrier of the package (UPS etc.). The carrier will arrange to inspect the package and return the box and its contents to Fornax Mounts. We will send a replacement as soon as we have confirmation that the damaged order is on its way back to Fornax Mounts.

Defective Merchandise

If you receive an item you believe to be defective, please contact Fornax Mounts via phone or e-mail and we will discuss the problem with you. We will do our best to resolve the problem as quickly as possible. Standard return policy applies if the item is returned for a refund.

For any other warranty informations please contact us!

Phone and e-mail:

+36 30 9441 748

+36 30 515 31 36

info@fornaxmounts.com