RiGO801 – Laboratory Requirements

2018-09-26

Air Conditioning

According to EN 13032 – 1 and LM-79-08 the temperature in the environment of the DUT needs to be 25°C +/- 1°C during the measurement. EN 13032-4 requires 25°C +/- 1.2°C for SSL light sources.

The air turbulences closed to temperature sensitive illuminants should not exceed 0.2 m/s (EN 13032 – 1) or 0.25 m/s (EN 13032-4). LM-79-08 just requires a negligible influence of air movement on the light output stability of the DUT.

The relative humidity should be below 50%.

Darkening

All room elements should be painted black with special low reflectivity paint. A black carpet with low reflectivity is recommended for the floor (e.g. Web Point 600, OBJECT CARPET GmbH, http://www.object-carpet.de). Subdivisions, if they are necessary, can be realized with black curtains (e.g. Molton).

Lighting

Sufficient room lighting is required for handling the parts at the center of the goniometer as well as in order to align them. During the alignment process using the measuring camera external light is useful, coming from two orthogonal directions. These lights must be mounted above or below the height of the camera at horizontal position.

Make sure that the light sources, which are in use, do not cause any back reflection during the Measurement. To do so darkening baffles, even motorized, or curtains can be used.

External Vibrations

External Vibrations (e.g. created by production machinery or forklifts etc.) can be harmful to the measurements. The reason for this is the attachment of the goniometer to the floor as well as to the roof. Vibrations at the upper goniometer holder can introduce vibrations to the measuring objects top mount and cause bad conditions for proper measurements. The same influence is given due to vibrations coming from the floor and using the bottom mount mode.

Place of the computer workstation and cabling

The PC by itself is integrated in the control cabinet. The keyboard, mouse and monitor are placed on an extra table as operator station. Furthermore the control cabinet contains the motor controller and the optional components like power supply and measurement devices. Those devices should be viewable and reachable from the operator station.

For the procedure of the measurement setup it is recommended to have visual contact between operator station and goniometer. If it is not possible to have an extra room (e.g. with a window) a curtain should be installed between goniometer and operator station.

The distance from the control cabinet to the goniometer is limited by the maximum cable lengths. There are two sets of cables running from the goniometer to the control cabinet. One

set comes out of the upper holder of the goniometer (about 50 mm diameter at all). The other one comes out of the base of the goniometer socket (about 40 mm diameter at all). **The maximum cable length from the top fixing point to the socket of the switching cabinet is 10m.** The bottom cables are not critical (15m). The way of the cables should be discussed with TechnoTeam in advance. The cable laying should be prepared to the installation and is to be done by the customer.

Power Supply for the Electronic Enclosure

The control cabinet contains the goniometer drive controller, the PC and optional equipment such as power supply units (AC/DC) and measurement devices (e.g. power analyzer). The goniometer drive controller usually operates with a supply of 230V/50Hz fused with 16A but it also works with at least 180 V and a frequency range of 48 to 62 Hz. Transformers can be used inside if the voltage available is too low. Due to a leakage current of more than 3.5mA caused by the servo amplifiers a fault-current circuit breaker with at least 30mA (or none) must be used.

The mains supply cable to the cabinet can be realized as direct cable to a clamp or as a plug connection to an AC outlet. If a plug is used it must be an industrial plug equivalent to IEC 60309, L+N+PE, 6H

Inside the controller is an emergency stop coupled branch point of the 230V input. From here via a fault-current circuit breaker of 30mA the additional devices are connected, if they are part of the order. Therefore, if the emergency stop is used, those units will be separated from the input. Optionally those units can be connected to a different circuit.

The PC has its own standard power cable.

Upper Goniometer Fixing

The Goniometer needs a fixed upper mounting point. At this point, a flange is mounted, which goes through a pendulum bearing. The outer goniometer frame rotates around this flange. In order to mount the flange at customer site, TechnoTeam delivers a special upper fixing plate as a simple mechanical interface.

The fixing interface to this plate needs to be prepared by the customer. For installation of the plate please consider the following specifications.

Static loads

Basically a vertical force is exerted to the upper mounting point. This force is introduced trough the singular weights of the fixing plate, the flange, the top mount object holder and the test object. All fastening elements weigh about 50 kg, the allowed maximum weight is also 50 kg. The overall maximum load is 100 kg. The vertical displacement of the upper fixing point should be less than 0.5 mm at the maximum load.

If the balance point of the test object is off-center, an additional torsional moment is introduced. Based on an eccentrically placed mass of 25 kg, with a distance of 600 mm, the resulting torque is 150Nm. This Torque should not have a significant influence to the axis of the Goniometer, i.e. to the axis of the flange. A Torque of 150 Nm should cause a distortion of the upper fastening plane which is less than 0.02°.

Dynamic Properties

The drives of both goniometer axes can generate light vibrations of the outer frame in a range of a few 10 Hz., depending on the driving speed. Those vibrations may cause resonances in the upper fixing construction. Coming from these construction elements the vibrations are then transferred to the test object support rod that may vibrate with an amplitude that influences the stability of the test object.

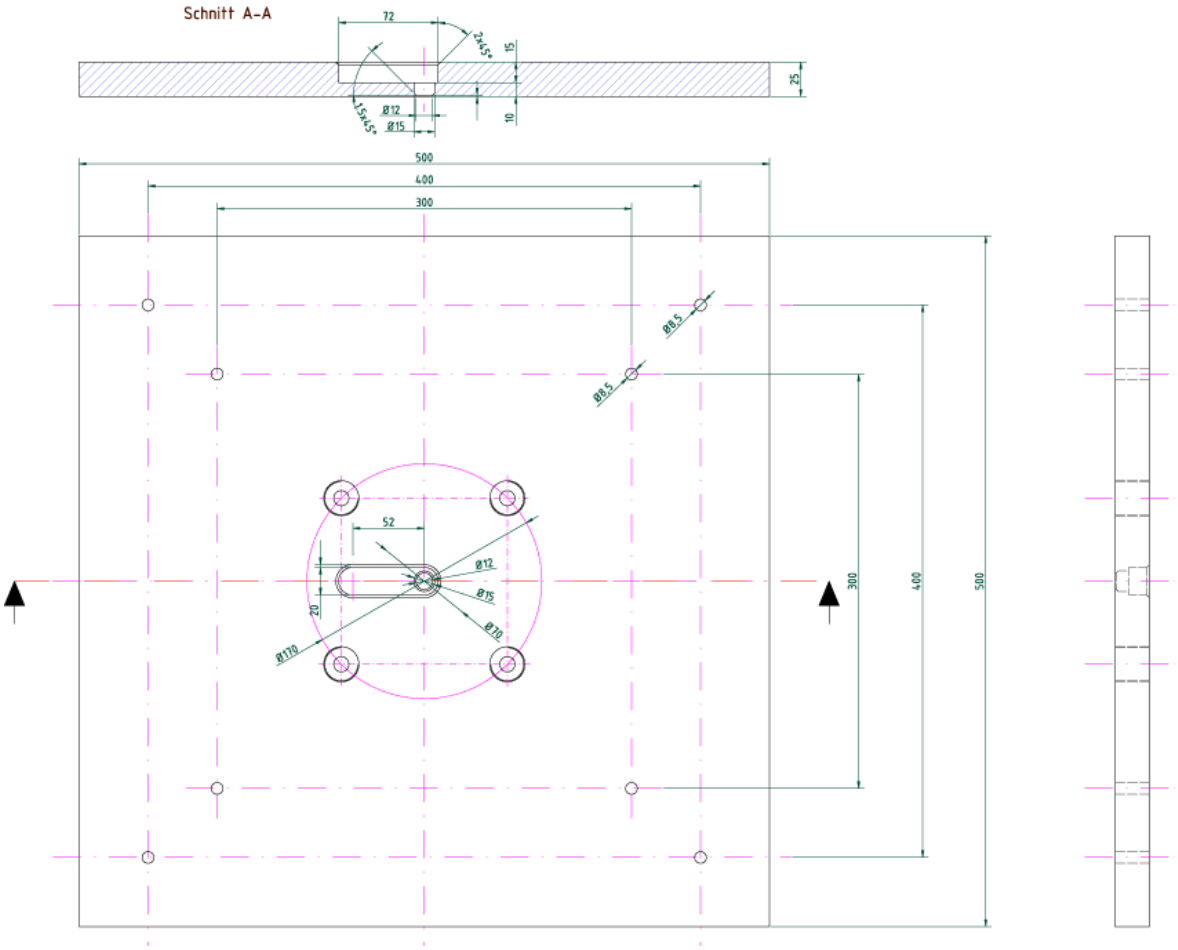
To minimize those effects damping elements (rubber buffers) are integrated in the upper flange mounting. In Case it is not possible to attach the upper fixing pate directly to the roof, the appropriate construction should be realized as stable and stiff as possible. To achieve this, over-dimensioning and/or using stiffening bracings is strongly recommended.

Conclusion

The construction should be sufficient if you consider a maximal deposition of 0.5 mm, at 1000 N and a maximal distortion of 0.02° in any direction, at 150 Nm and use additional over-dimensioning.

Upper fixing plate

For dimensions of the upper fixing plate (aluminum) see the following drawing.
It is not necessary to bring the plate in an exact horizontal position due to the levelling screws that can be used to bring the flange in an exact vertical position.



To attach the upper fixing plate to the roof construction the 8 outer wholes are provided. We recommend a steel plate with the same (outer) pattern. In case you prefer a different own solution, please keep a sufficient distance to the inner wholes for the levelling screws. It is also possible to add individual holes to the plate during the installation.

Height

The bottom of the upper fixing plate (Thickness is 25 mm) must be in a certain height, depending on the model of the goniometer. The Tolerance for this height is +/- 25 mm.

Please refer to the drawing for the correct values.

Distance to the walls

The minimal rotation area of the goniometer is defined by the radius of the back side of the camera housing that is nearly the same radius as of the drive mounted at the outer frame. Of course there should be some secure space added to these minimal dimensions. Please refer to the drawings to get the recommended dimensions.

To reduce the influence of stray light caused by the side walls a larger distance to the walls is preferable (e.g. 2 or 3 m).

Safeguarding

The moving goniometer axes results to a risk of injury. Thus safeguarding of the hazard zone is a must. The goniometer control unit includes a safety control device (Pilz PNOZ S5) that is connected to appropriate safety barrier installations (e.g. safety matts, light curtain, door contact). The activation of a safety barrier causes an emergency stop of the axes followed by the deactivation of the servo amplifiers.

There are two principle scenarios of a goniophotometer installation. The best choice is a separate room for only the goniometer and the operator located outside. The entry door is equipped with a safety switch. More complex safeguarding is required in case the goniometer and operator are in the same room. Here the hazard zone can be guarded by using light curtains, safety mats or a fence (with a gate and a switch).

The following figure shows an example installation.

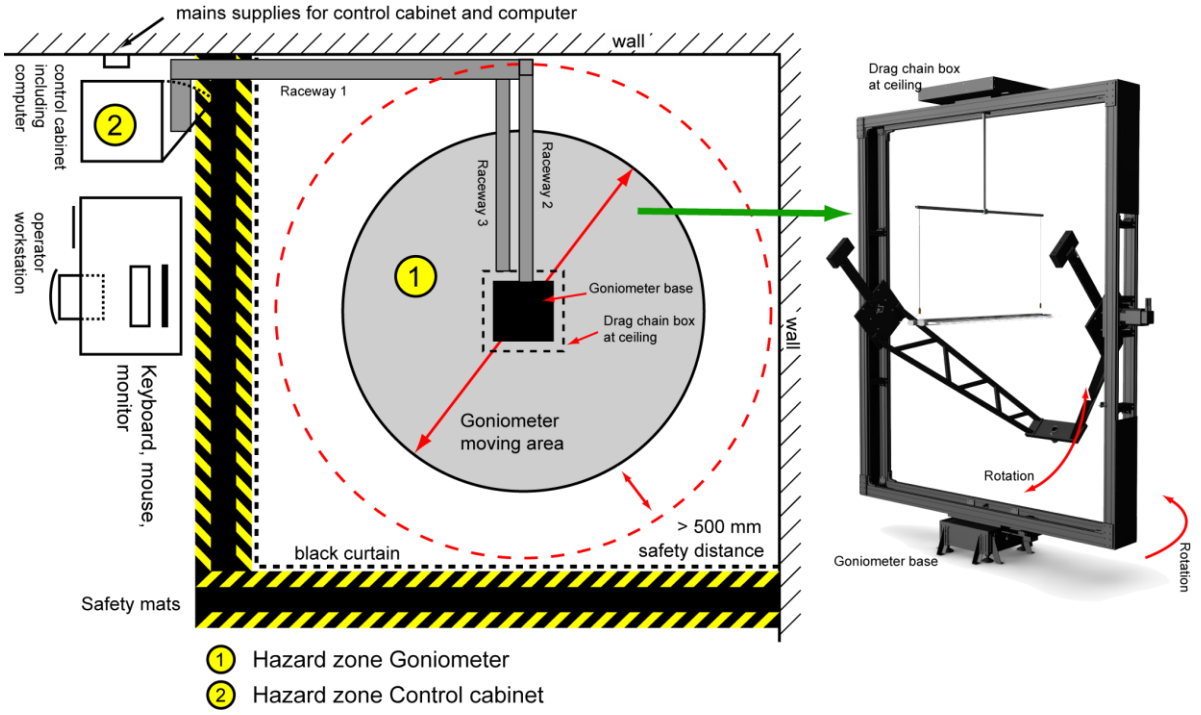
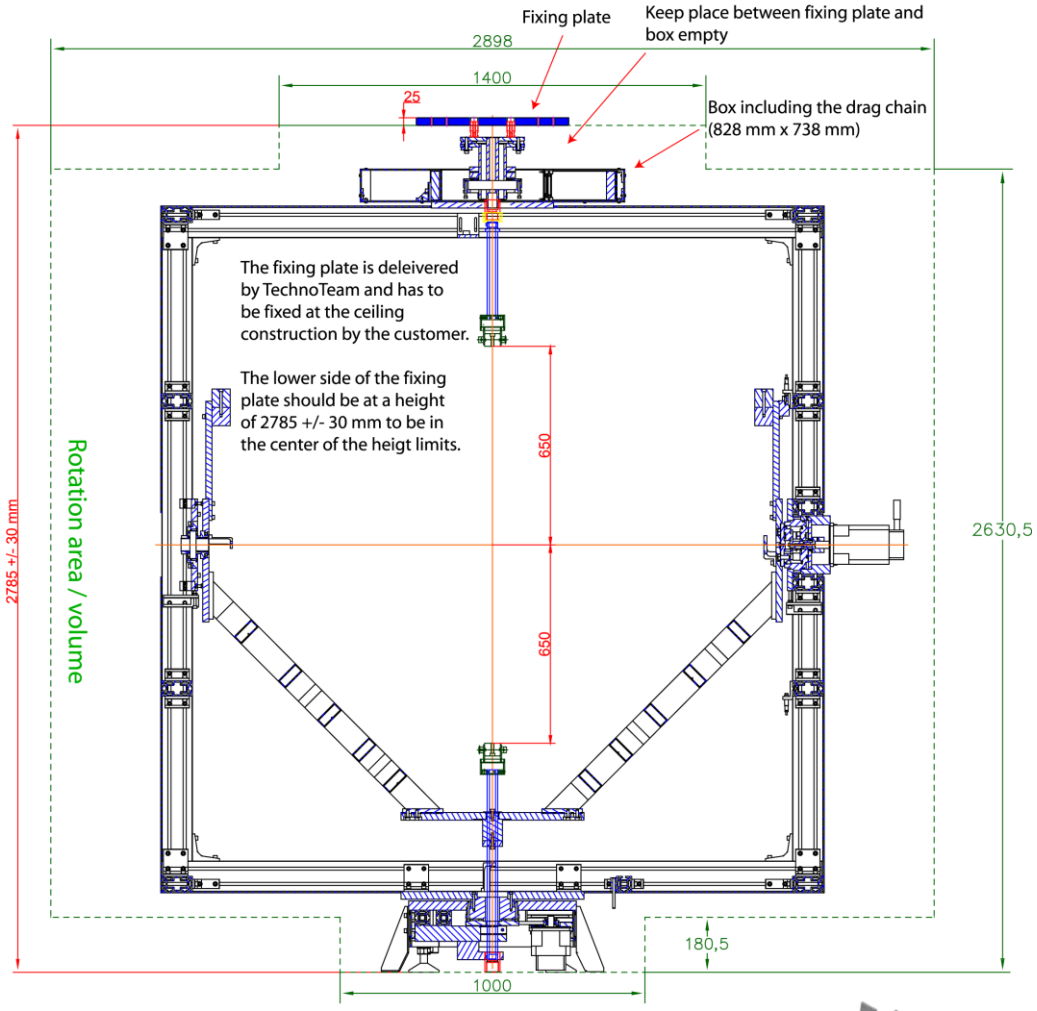


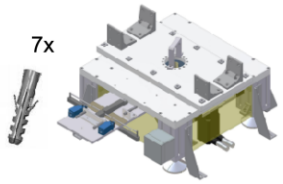
Figure 1: Operating area only separated by a curtain. Safety mats, light curtains or fences are required.

RiGO801 – 1400

RiGO801 - 1400
Date: 2013-10-21

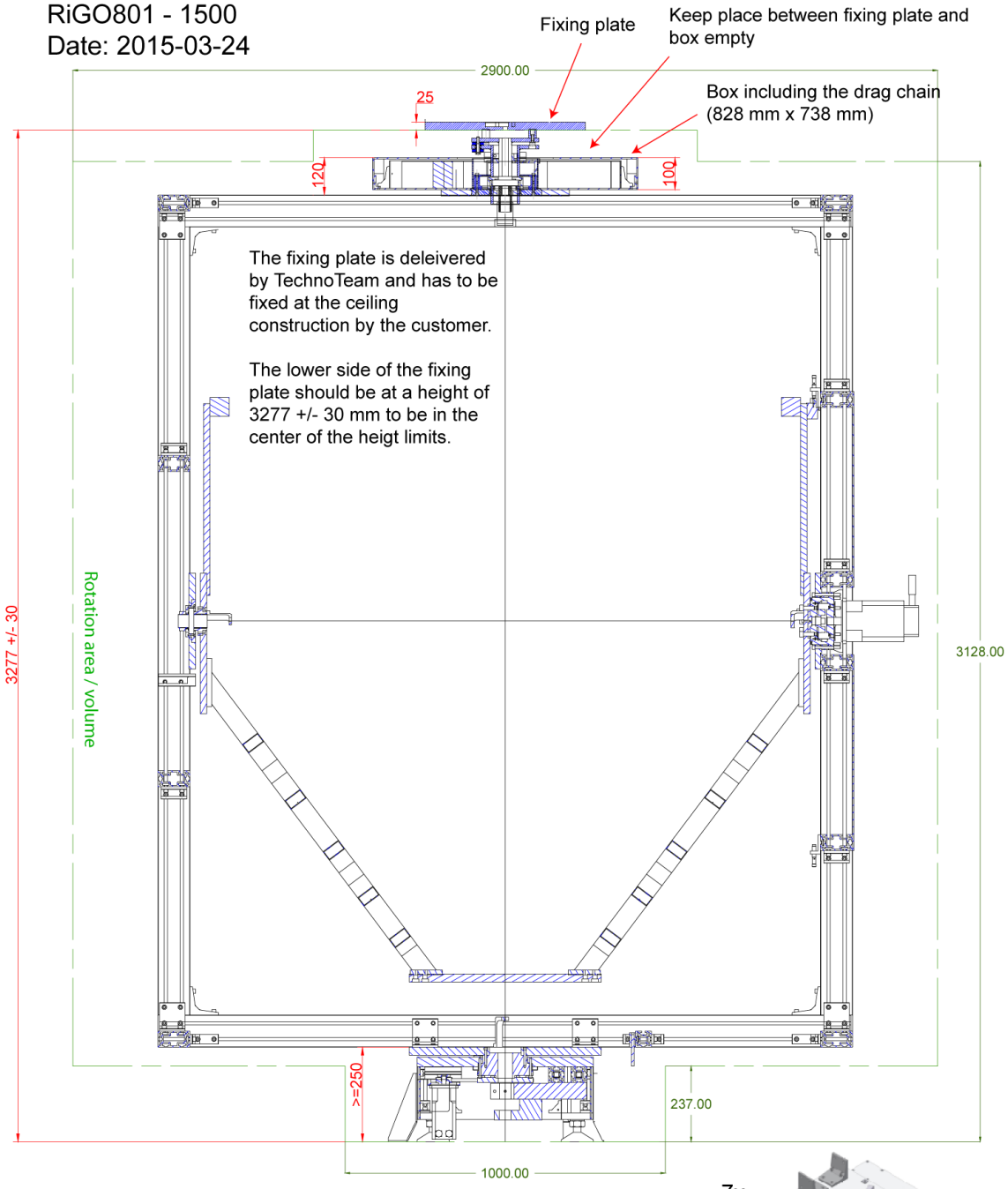


The foot is fixed at 7 aluminium bend parts which are fixed at the ground.
The necessary holes for the anchors are drilled during the installation.
The anchors and screws can be supplied by TechnoTeam, the drill equipment should be provided by the customer.



RiGO801 – 1500

RiGO801 - 1500
Date: 2015-03-24



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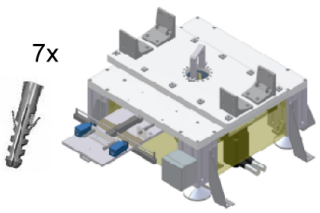
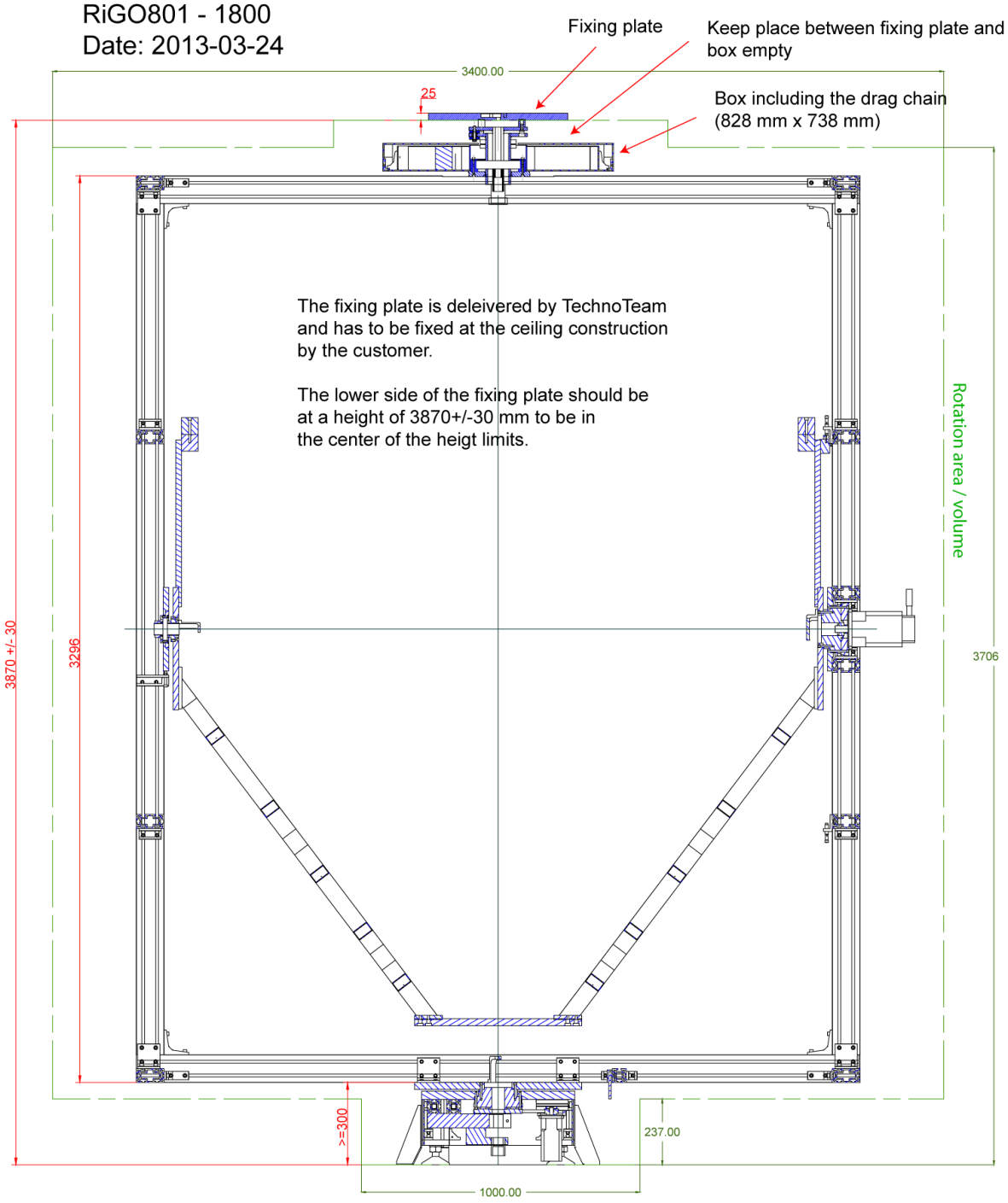
7x

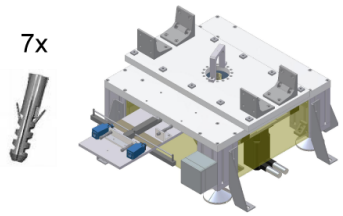


RiGO801 – 1800

RiGO801 - 1800
Date: 2013-03-24

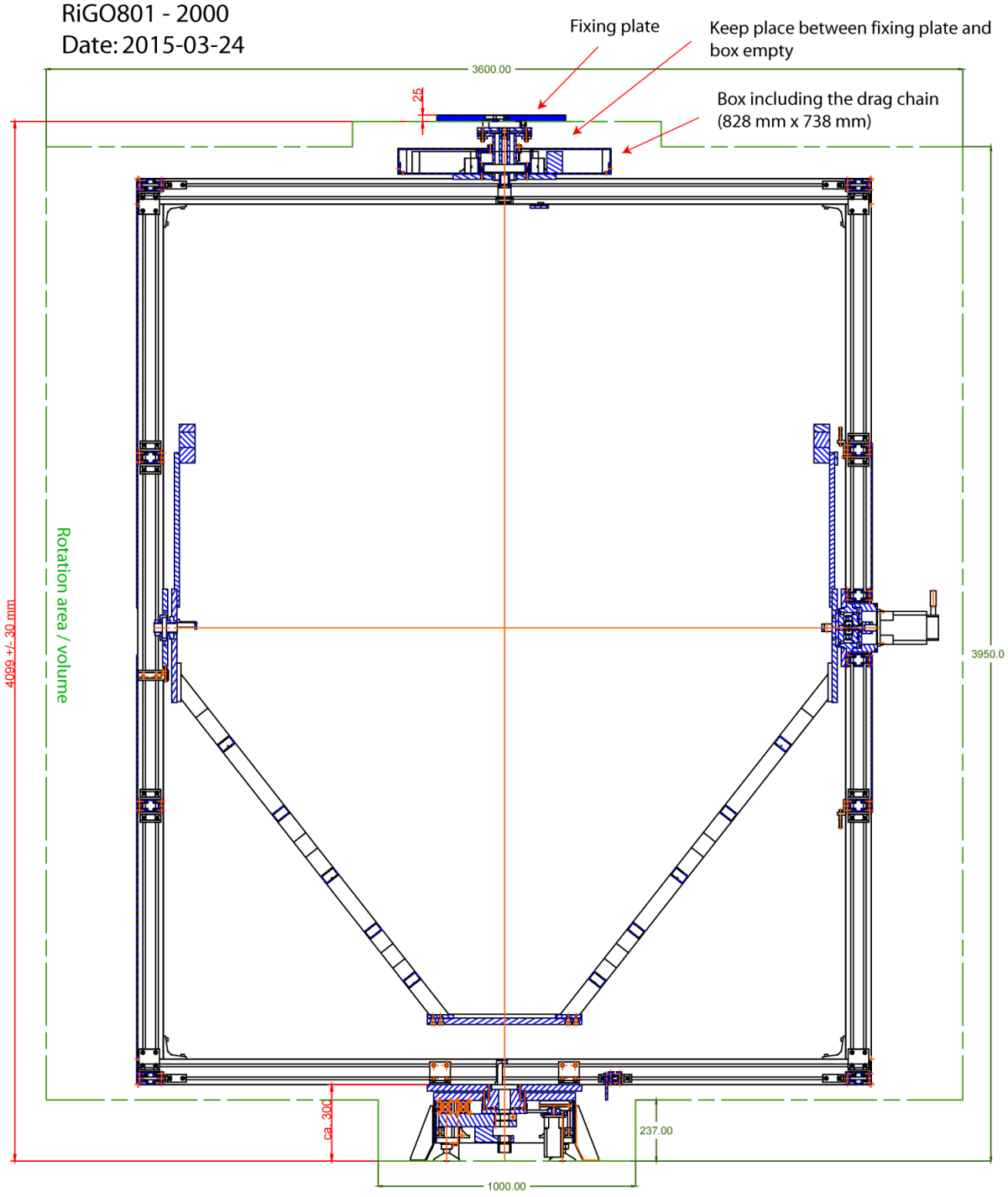


The foot is fixed at 7 aluminium bend parts which are fixed at the ground. The necessary holes for the anchors are drilled during the installation. The anchors and screws can be supplied by TechnoTeam, the drill equipment should be provided by the customer.

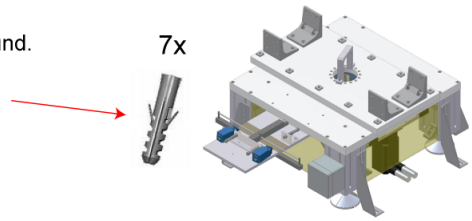


RiGO801 – 2000

RiGO801 - 2000
Date: 2015-03-24



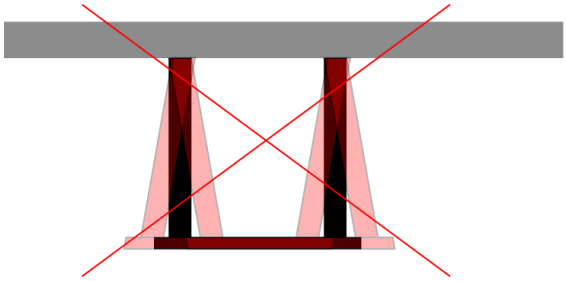
The foot is fixed at 7 aluminium bend parts which are fixed at the ground. The necessary holes for the anchors are drilled during the installation. The anchors and screws can be supplied by TechnoTeam, the drill equipment should be provided by the customer.

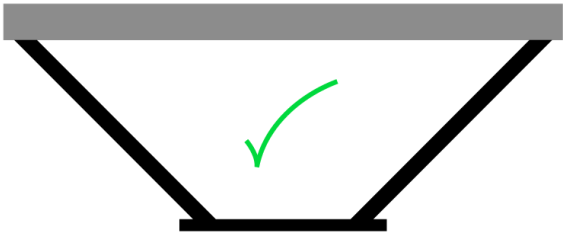


Example constructions

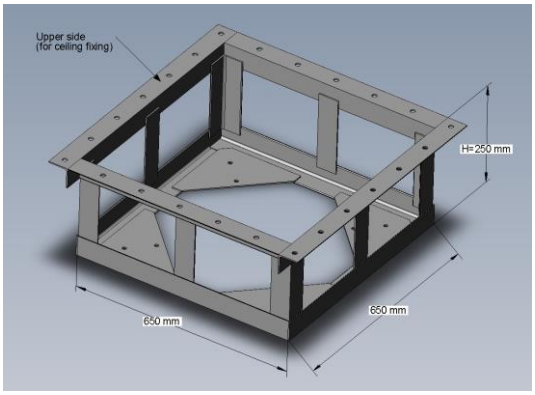
Attachment to the ceiling

If possible, the best and easiest solution is to attach the upper fixing plate to the ceiling. If the ceiling is already at the correct height, the plate can just be fixed directly, otherwise a construction between ceiling and the plate must be used. Here it is required to consider basic issues of framework constructions, which is mainly to use triangular stabilization structures.



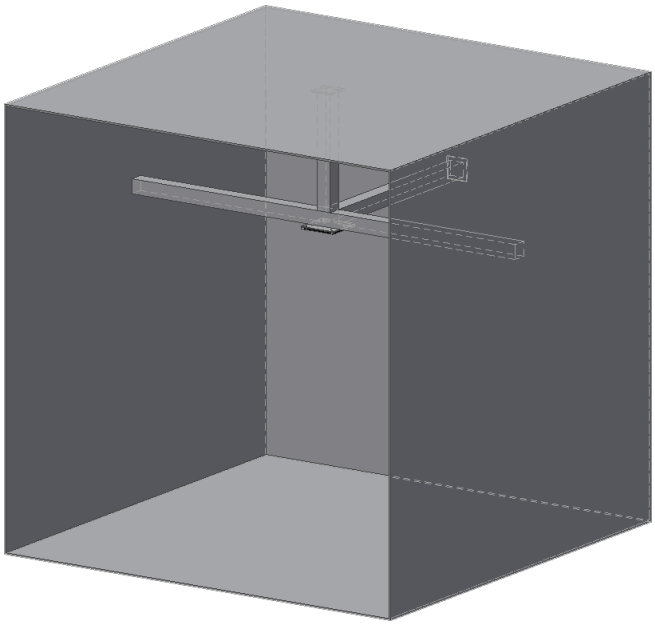


Some examples:



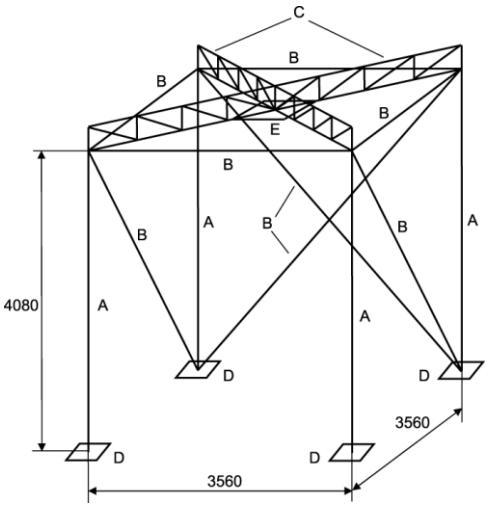
Steel profiles to walls and ceiling

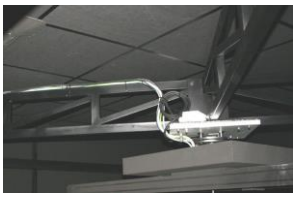
The following figure shows an example construction based on steel profiles attached to the side walls and the ceiling. The minimum requirement is the stabilization of the upper attachment point along three directions. Thus the steel profile to the right wall can be left because it is over-determined.



Portal framework

The following construction is suitable for a room that has no stable walls or ceiling. In this case the only solution is to build a portal using steel profiles. The triangular framework structure is very important!





- Rectangular frame of steel hollow profiles. Inner volume HxWxD: 4080mm x 3560mm x 3560mm (Example construction for RiGO801 – 2000).
- A: Vertical steel beam
- B: Cross-members and stabilizing diagonal elements. Hollow profiles in rectangular shape, longer side vertically oriented.
- C: Framework, quadratic hollow profiles
- D: Floor fixing plates
- E: Plate for mounting the upper fixing plate (see above). For the required height please refer to model specific drawings above.
- All elements have to be dimensioned according to the static and dynamic requirements listed above.

- All elements must be painted matt black.

Fixing to the floor

The base of the goniometer is fixed to the basement by standard dowels. The maximum length of the used screws is 80 mm. The holes are drilled by TechnoTeam personnel during the installation. The drilling equipment should be provided by the customer.