WAVE

Manual
Version3 09/2017

All what you need to know
including connectors pinout

Betz

betz-tools.com
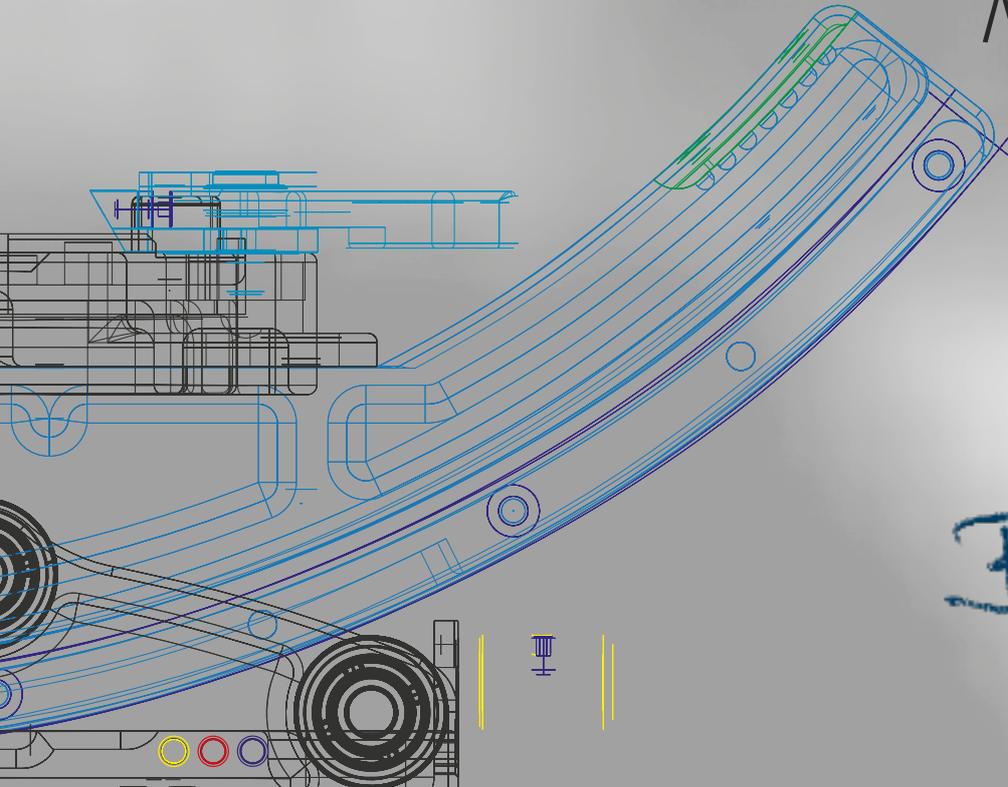
No Warranty claims if any of these points will be neglected!

Dovetail and Quicklok

Keep in mind:

There are many dovetails from different manufacturers out there which seems that they fit into the quicklock but be aware:
Check for proper clamping on the slope surface of the dovetail and also the clamping mechanism.
The camerabody which is mounted on the dovetail and is protruding beyond the plate should never contact the quicklock clamping plate and the mechanism.

Dovetailplate should have a minimum height of 9mm/0.36"
Unproper fit of the dovetail will damage or destroy the clamping mechanism which may cause a change of the complete quicklockplate.

See Detail
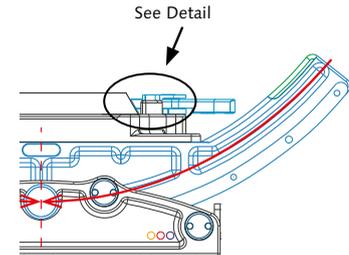
GOOD
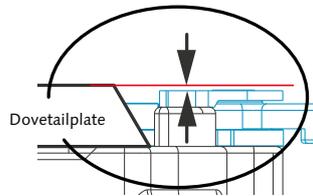
Dovetailplate

Hight Distance to Quicklok

BAD
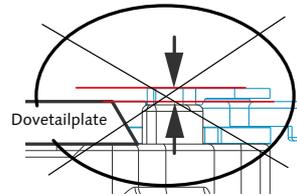
Dovetailplate

No Hight Distance to Quicklok
Dovetailplate under Minimum Hight

BAD
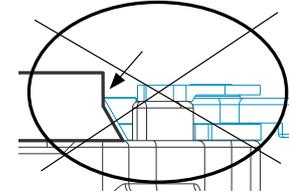
Sample for bad Clamping
on some XCS Side to Side Plates

Rear　　　A　　　Front
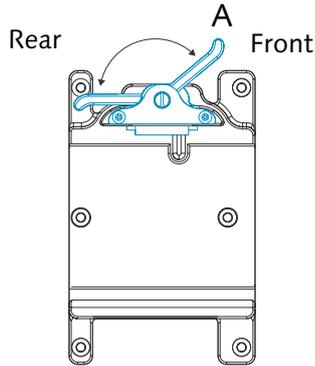
Mounting Template

142mm
5,59"

40mm
1,57"

77mm
3"
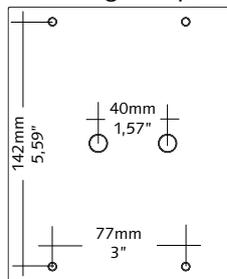
Attach camera with mounted dovetail plate and make sure that all mounted parts Lens, Accessories and the Camera itself are perfectly fixed and nothing can start to vibrate (like a tuning fork).

Make sure that the clamp lever on the stage faces to the rear (A) so that the clamping is open. After the camera snaps in, the clamp lever snaps to the front. The camera is now protected against sliding out.
Never close or operate the closer mechanism by force.
By pulling the clamp lever towards stage rear, approximate fore/aft balance can now be achieved by sliding the camera on the stage.

The clamping lever should lock the camera even before being pressed to the final stop!

In case the camera can still be moved even though the lever is pressed until stop caused of tolerances of the different dovetailplates a spacer has to be put under the compensation.
(see maintenance)

To remove the camera, the dovetail clamp must be opened by pulling the clamp lever fully to stage Rear.

Mounting the Wave onto a device:
Bottom side you will find two 3/8" threads the distance is standard on all camera accessories and also four M5 threads.

No Warranty claims if any of these points will be neglected!

Engage Lockpin only here

Roller Guides
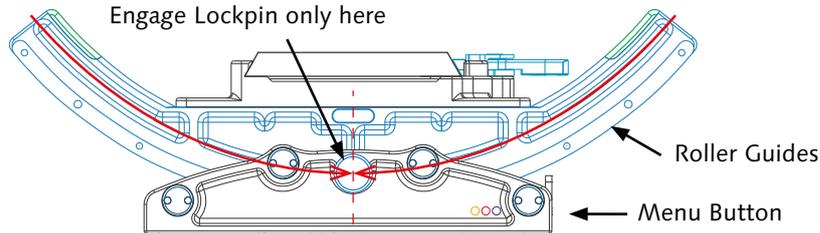
Menu Button

Engage Lockpin always next to the lock position or
just push the menu button shortly the Wave will Roll automatic to the center !

The lockpin is for mechanical and also electronical lock. When you lock the Pin in some position and scratch it all the way to its mechanical lock for sure you will damage the pins and the surface of the Wave. So please always lock the pin next or in center of its mechanical lock or just push the menu button shortly as described.
First damage fault is that the electronic lock contact will be out of function which will cause major problems (see Trouble Shooting) RED Led has always be constantly on, when the Lockpin is Locked!

Keep Rollers and Guides always clean!

Roller Guides and some Quicklok parts are made out of hardened steel and might get rusty on its surface when they are long term exposed in salty water/air or very high humidity.
If this happens or even better before take a cleaning rag with a little bit of oil (any kind) and clean it.

The camera weight should always be adjusted in the radius of the center of gravity! (A)
This will cause a more stable and centered operating on mechanical camera stabiliser devices!

Use our WaveRider Plate or Motors and Accessories to keep the Cameras hight and rotating point Balanced
to the optical axis.

A
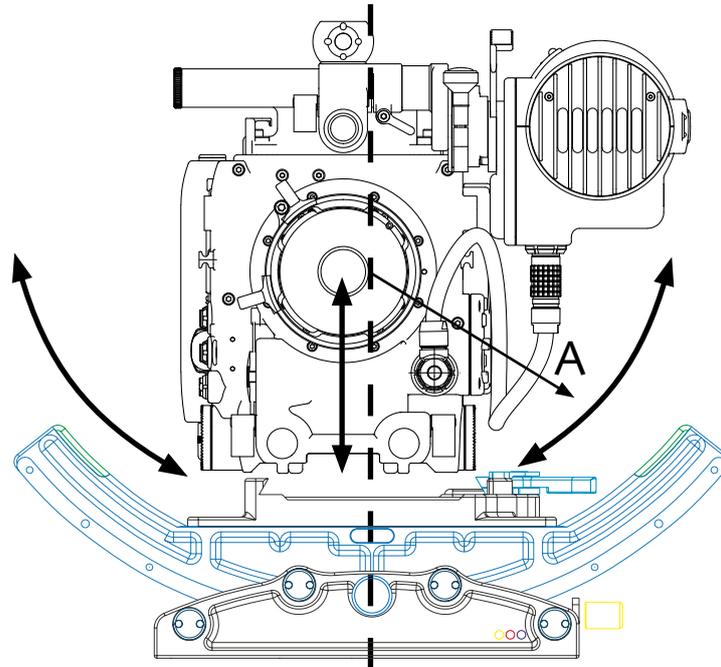
In upside down mode never mount the camera on its handle!
This way of mounting will cause vibrations. It is easy to flip the picture.
see also https://vimeo.com/betztools

Contents

- Wave should be in a more or less leveled position before connecting to power.
- Green Power LED flashes keep Wave in position "Zero" Initialisation runs for about 5 sec.
- When the Lock Pin is mechanical engaged the Red LED **must** be on which says motor power is off
  (if not see trouble shooting).
- **"Upside Down mode"** Lock Pin must be engaged before turning 180°.

Lock Pin
unlock pull and turn

Spirit level

LOCK PIN

CAN
M-POWER
LOCKED
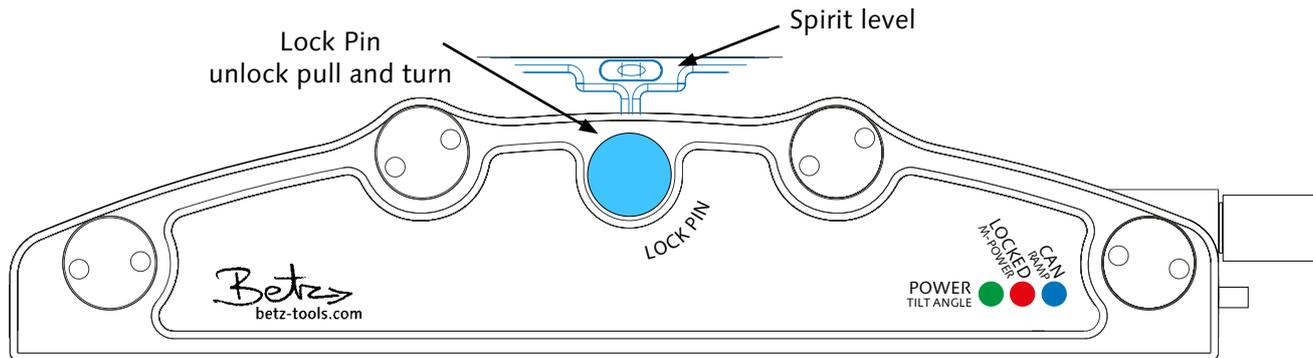
POWER
TILT ANGLE

Power LED: On = Ready to go.
             Flashing = "Zero" Initialisation (ca. 5 sec.).
Locked LED: On = Must be ON when Lock Pin is engaged.
             Flashing = Fault (see trouble shooting) or Restart.
CAN LED: On = External CAN-Device is connected.
             Restart after unplugging CAN-Device.

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Fine adjustment Horizon
and Menu Setups

DC Power Input:
(Please see also Technical Datas)
10 - 36 Volt
Power Consumption:
500mA peak 2,5A

Menu, Setup and
bring to Center Button

M-POWER
RAMP →
Setup

Horizon

↓ max.

Made in Germany

#160313   SD-Card   USB   CAN   10-36 V DC IN

Serial#

Slot Micro SD-Card
for Software upgrades
use max. 32GB

USB-B
for factory Set Up

GND   CANL

+12V   CANH

Lemo 0B 304
soldering side connector

+12V

GND

Lemo 1B 303
soldering side connector

BT CAN-BUS
External control via our
CAN-Velo (see 6)

Connector
Pinout

From a certain point of the Tilt Angle it doesn't make sense to stabilize the horizon. For this reason the stabilization of the horizon will be frozen in a defined Tilt Angle.
The Tilt Angle can be adjusted individually as follows.

Horizon

Setup

max.

SD-Card   USB

Push Button
Setup

Push Button Setup 3 sec. ➤ Push Button Setup ➤ Push Button Setup 3 sec. ➤ Push Button Setup

| All LEDs on Menu started | Green Tilt Angle | Green flashes Bring device in desired Tilt-position | short flashing Tilt Angle stored |

see also https://vimeo.com/betztools
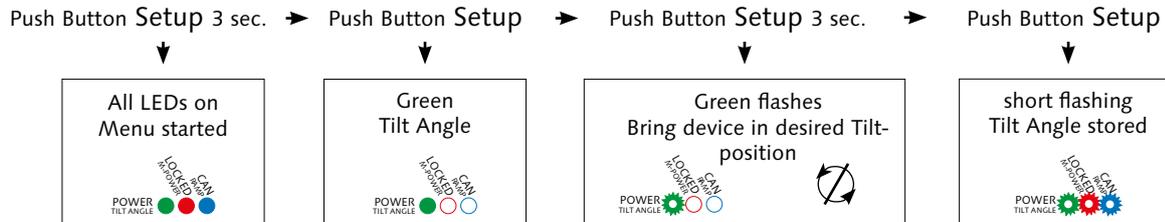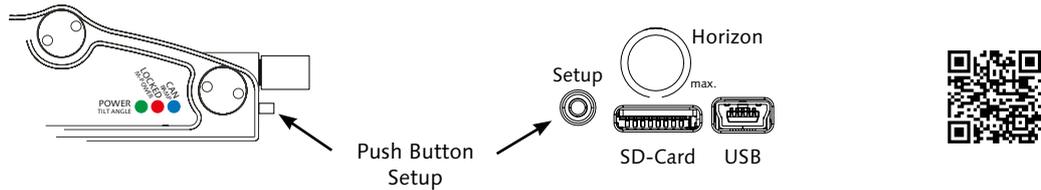
The basic setting for the motor power is fine for a wide range of camera weights.
If the power is adjusted too strong you will feel it in jerkily movements or a vibration.
If the power is adjusted too weak you will see it in creeping movements to the end point.
The motor power can be adjusted very easily as follows.

Adjustment Knob

Horizon

Setup

max.

Push Button
Setup

SD-Card   USB

POWER
TILT ANGLE

Push Button Setup 3 sec.	→	Push Button Setup	→	Push Button Setup	→	Push Button Setup 3 sec.	→	Push Button Setup
All LEDs on Menu started		Green Tilt Angle		Red Setup M-Power		Red flashes set M-Power via Poti		short flashing M-Power stored

see also https://vimeo.com/betztools
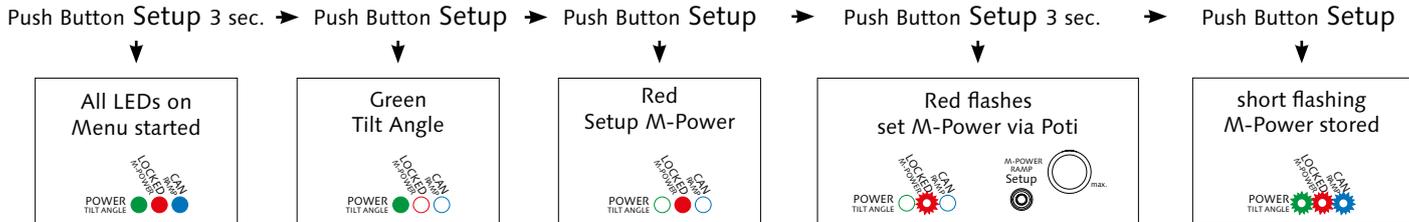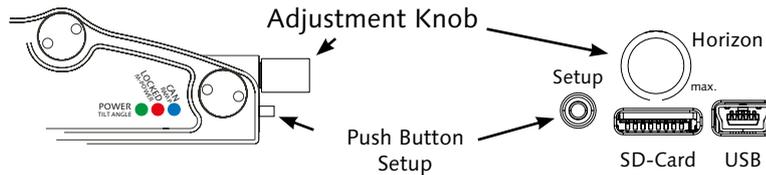
Ramp is the speed when the frozen Horizon switches from the adjusted Tilt Angle back to stabilization.
Ramp can be adjusted very easily as follows:
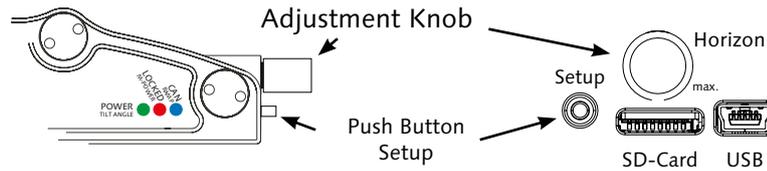
Adjustment Knob

Horizon

Setup

max.

Push Button
Setup

SD-Card   USB

POWER
TILT ANGLE

Push Button Setup 3 sec. ➤ Push Button Setup ➤ Push Button Setup ➤ Push Button Setup ➤ Push Button Setup 3 sec. ➤ Push Button Setup

All LEDs on Menu started	Green Tilt Angle	Red M-Power	Blue Setup Ramp	Blue flashes set Ramp via Poti	short flashing Ramp stored

POWER TILT ANGLE

M-POWER RAMP Setup max.

see also https://vimeo.com/betztools
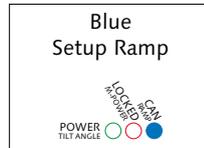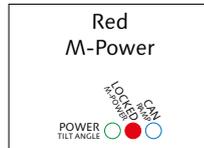
- If the device CAN-Velo is connected you can control following functions:
- Control the Horizon +- 25° and keep it stabilized in the chosen position.
- Control the Horizon +- 25° and keep it fixed in the chosen position.

M-POWER
RAMP →

Horizon
↓ max.

Setup

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#160313   SD-Card   USB   CAN   10 - 36 V DC IN

CE

GND   CANL

+12V   CANH

Lemo 0B 304
soldering side connector

CAN-Velo
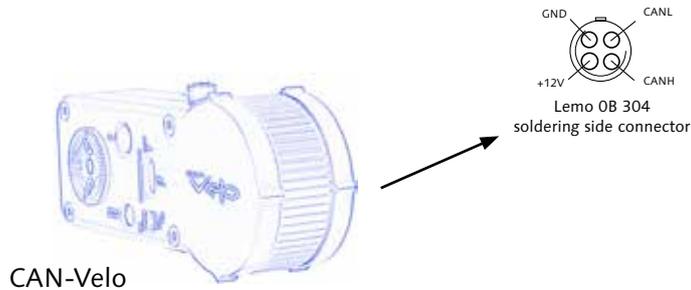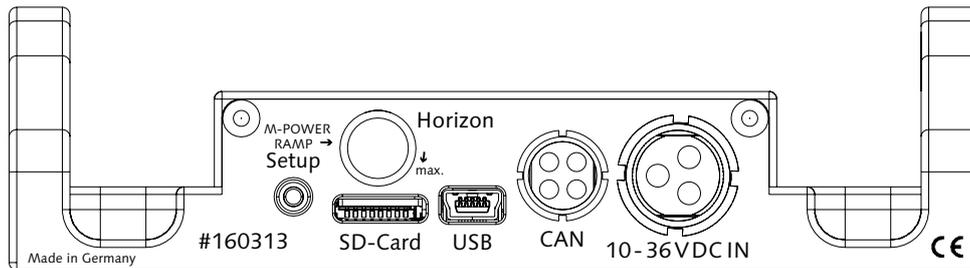
7   Zero-Recalibrating

**BEFORE STARTING PLEASE BE AWARE NEGLECTING ONE OF THE FOLLOWING POINTS
CAN ERASE THE FIRMWARE AND WAVE HAS TO BE SEND BACK TO THE FACTORY.**
- NEVER UNPLUG OR SWITCH OFF THE POWER SUPPLY WHILST DOING ZERO ADJUSTMENT
  (WHICH YOU ALWAYS HAVE TO DO AFTER SOFTWARE UPGRADE)!
- CHECK LOCK PIN OF PROPER WORKING (RED LED MUST BE ON WHEN LOCKED)!

**If in any case you cannot bring the horizon in a leveled position whilst the Wave itself is on a leveled
surface, means the level is not anymore adjustable in its range with the "fine adjustment horizon knop".**

Zero-Recalibrating:
Preparation for recalibrating the "zero position":
It is very Important that the power supply is designed for 3 Amp. at 14 Volt.
It is very Important that the Wave is placed on a solid and horizon oriented level surface.
The Quicklockplate has to be placed in mechanical "zero position" (see spirit level 1).
The Lock Pin must not be locked. Power supply is switched off.

- Push "Set up" Button and hold, switch on power.
- Release "Set up" Button when Green and Blue LED is permanent on.
- The electronical "Zero Position" will now be adjusted.
- When Red LED flashes fast, engage Lock Pin, Red LED **must** be permanent on.
- Wave determines now the mechanical "Zero Position" and stores it into the flash-memory.
- Wait until Green LED flashes slow and the Red LED is permanent on.
- Setup is now finished. Switch off power supply and restart the Wave.

see also https://vimeo.com/betztools

8 Accelometer-Recalibrating

If in any case the Wave drifts intensive on wipe pans or on fast turns or you maybe have big Temperature differences while working:

Accelometer-Recalibrating:
It is very Important that the Wave is placed on a solid and horizon oriented level surface.

- Switch on power with the Lokpin not engaged.
- Wait till green power LED is permanent on.
- Engage the Lokpin and wait till Green LED flashes, Red LED on.
- Push the "Set up" Button till Green LED is flashing faster.
- Keep fingers off till all three Green/Red/Blue LEDS flashing once shortly. (needs up to 20 seconds).
- End of calibration.

Relock the Lokpin and start to work.

see also https://vimeo.com/betztools

9   Software-Update

**BEFORE STARTING PLEASE BE AWARE NEGLECTING ONE OF THE FOLLOWING POINTS
CAN ERASE THE FIRMWARE AND WAVE HAS TO BE SEND BACK TO THE FACTORY.**
- NEVER UNPLUG OR SWITCH OFF THE POWER SUPPLY WHILST UPLOADING NEW SOFTWARE
  VIA MICRO SD CARD IT WILL DESTROY THE MAIN PROCESSOR BOARD !!
- THE SD-CARD MUST BE COMPLETELY EMPTY ONLY THE fw_wave.hex FILE SHOULD BE SHOWN.

Updating software via "micro" SD-Card
- Upload the software (hexfile) which you got via e-mail from us onto your SD-Card.
- The card mustn't be a higher storage than 32GB ! More GB doesn't work.
- Be aware that only this file f**w_wave.hex** is on your card.
- Power supply should be designed for 3 Amp. at 14 Volt.
- Lock Pin must not be locked. Power supply is switched off.

- Slide the SD-Card into the slot (right side control panel see 2).
- Connect Wave onto power.
- Green and Blue LED must be on. Software will be uploaded (if not see trouble shooting 10).
- Blue LED off Green LED on software is uploaded.
- Finish now by switch off power.
- Disconnect SD-Card from slot

A Zero-Recalibrating has to be done by following the points see 7

see also https://vimeo.com/betztools

10   Trouble Shooting

Red LED not on when Lock Pin is mechanical locked.
- Problem of electrical contact pin - Push Lock Pin more in.
- Small pin on Lock Pin damaged - Send-in for service.

The electronic doesn't switch off in locked position and also the zero setting and software uploads are not possible anymore. So be always aware if the Pin is locked and the RED LED isn't on try to push the lockpin harder in or search for the mechanical problem described as above.

Green-Red-Blue LED permanent on when powering up Wave.
- Software in flash not found - Upload software again via micro SD-Card - make Zero Recalibration.

Green LED flashes / Red Locked LED flashes 1 or 2 times.
- Switch off Wave - Upload software again via micro SD-Card - make Zero Recalibration.
- If the error remains please contact the manufacturer.

Software-Update Green and Blue LED on but Red LED is flashing constantly.
- Software on SD-Card not found - check on card for a proper file writing fw_wave.hex
- Erase all other software on this SD-Card.

Zero Calibrating flashing Red LED keeps flashing.
- Electrical contact missing - Always check Lock Pin for electrical contact befor starting to calibrate.
- Without electrical contact no calibrating - send-in for service.

see also https://vimeo.com/betztools

10   Trouble Shooting

Warning!
Disassembling the Wave will result that the unit has to be returned to the manufacturer for an electronical and mechanical reset.

see also https://vimeo.com/betztools

The Wave is a maintenance-free sturdy electromechanical device. To guarantee a proper function you
have to comply the following points:
- Keep the eight roller guidance and the roller track clean!
- If the camera rocker hooks or the roller guidance gets loose please ask how to service and to adjust.

Isn't that easy?

Quicklockplate:
The locking mechanism should be treated/cleaned occasionally with a resin-free oil (e.g. gun oil).

Placing a spacer which can be ordered at Betz-Tools (Spacer for Quicklock) in the locking mechanism:

unscrew screws
remove cover plate

unscrew screws
place spacer in-between
main spacer and slider
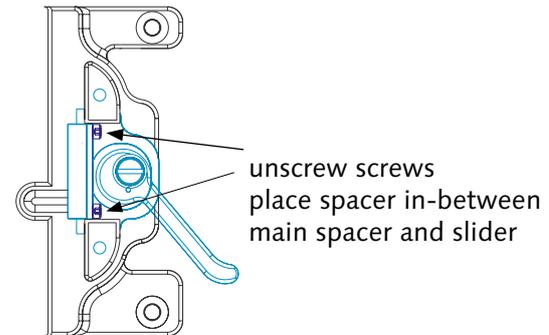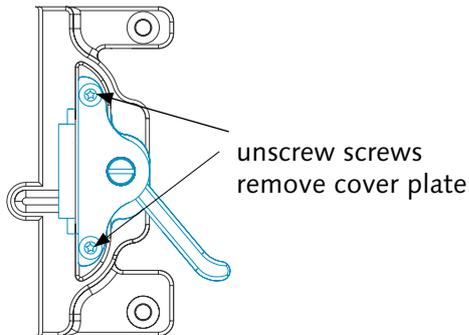
12   Technical Datas

Power source: DC 10 - 18 Volt Wave Version # 1603xx
Power source: DC 10 - 36 Volt Wave Version # 1604xx / 180xxx

Power consumption: 500mA peak 1,5A

Horizon Stabilisation: +25° / -25°

Weight: 1,25 Kg (3lb)

Overall size: 29 x 13 x 9 cm (11.4" x 5.1" x 3.5")

FCC Compliance:
Wave complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) Wave may not cause harmful interference, and (2) Wave accepts any interference received, including interference that may cause undesired operation.

CE Compliance:

Wave complies with NF EN 50081-1 Emissions / NF EN 50081-1 Immunity. Operation is subject to the following conditions: Wave may not cause harmful interference, and Wave accepts any interference received, including interference that may cause undesired operation.

Any Question

https://vimeo.com/betztools