**CONTROLS AND ADJUSTMENTS:** more adjustments can be made here is the general list: Powerhead/Accessory Chair/Positioning Chair/Controller/Standard Powerhead Adjustments

\*\*\*THE ATTRIBUTES ARE IN CAPITAL LETTERS: … [default values] the values and data type are blue\*\*\*

**FROM ER-DIAGRAMM: EXERCISE:** consideration for Safe Operation of Biodex

Torque, Angular Speed, Force

* **useful items from this section:**
  + EXERCISE: choose one exercise from
  + MUSCLE: which muscles are used, not only one, more likely the flexor and extensor:
    - name of the active muscles as string

… for proper testing techniques

* **for proper testing techniques:**
  + REPETITION: how many repetitions have been done
    - continuous scale, float

**Powerhead:** positioning controls and adjustments – are the same for single and double

* + POWERHEAD\_ORIENTATION: rotation horizontal plane
    - [0°, 45°, 60°, 75°, 90°, 105°, 120°, 135°, 180°], fixed, therefore floating-point number
  + POWERHEAD­\_TILT: rotation on the vertical plane (tilt upward or downward), can be read at the tilt scale
    - [0°, 20°, 15° (shaft down), 16°, 30° (20° to 30°), 35° (shaft up), 55°, 70°, 90° (shaft up)] = those are the predefined … but I think other angles are also possible to set, therefore **continuous** scale (float) is appropriate
  + POWERHEAD­­\_HEIGHT: can be raised or lowered – can looked up at the Powerhead height Scale
    - can be raised or lowered over a range of 14’’ inch (ca. 35,56cm), therefore continuous/float
  + POWERHEAD\_POSITION: single chair only – the position horizontally left right from the positioning chair – look up at the powerhead position scale
    - can be moved freely: continuous scale = float
  + POWERHEAD\_ATTACHMENT: which attachments have been used during the exercise
    - [different types of attachments, = name of the attachments] … string, pull-down
* **Chair Adjustments:**
  + SEAT\_HEIGHT: lower or raise the height of the seat
    - can be moved freely in inch: continuous scale = float
  + SEAT\_ORIENTATION: rotation in the horizontal plane
    - [0°, 15°, 30°, 45°, 90°, 135°, 150°, 165°, 180°]: fixed values, float
  + SEAT\_TILT: adjust the seat back angle, seatback angle from vertical to horizontal
    - [15°, 30° (15° to 30°), 90° (fully reclined)]: allows full continuous range of seatback angle, float
  + SEAT\_POSITION: positioning of the chair in relation to the powerhead
    - seat can be moved along the travel: continuous scale, float
* **Controller:** 
  + CONTROLLER\_MODE: one of the five modes:
    - [Setup, Passive, Eccentric, Isokinetic or Isometric]: given values, string, pull-down
  + CONTROLLER\_CUSHION: prevents movement out of range of motion
    - [hard or soft]: but specific levels can be chosen, string
  + CONTROLLER\_SENSITIVITY: powerhead acceleration-response to torque
    - [A, B, C, D, E]: given values, string, pull-down
  + CONTROLLER\_ROM\_LIMIT: in setup mode to select range of motion limits
    - the values will be set by the system itself: continuous scale, float
    - upper and lower ROM, two separate values
  + CONTROLLER\_ROM\_PERCENTAGE: how many percent of the range of motion setup can be attained in each direction
    - values from 0% to 100% possible: therefore, continuous scale, float
  + CONTROLLER\_ECCENTRIC\_SPEED: sets the angular velocity in the Eccentric Mode
    - unit: degree/second: continuous scale, float
  + CONTROLLER\_PASSIVE\_SPEED: sets the angular velocity for the Passive Mode
    - unit: degree/second: continuous scale, float
  + CONTROLLER\_TOURQUE\_LIMITS: maintains to be below certain torque level, which are specified by the operator at the dial
    - unit: foot-pound of torque: continuous scale, float
    - lbf\*ft
  + CONTROLLER\_PAUSE: sets up time delay when the same motion is repeated
    - from zero seconds to ten seconds: continuous scale, float
  + CONTROLLER\_ISOKINETICSPEED: max. allowable velocities for each direction in the Isokinetic Mode
    - unit: degree/second: continuous scale, float

**SETUP AND POSITIONING: gehört noch zu Settings** The following section details BIODEX System 2 setup and positioning for each of the standard test and exercise patterns.

* **Knee: Extension/Flexion:**
  + HIP\_FLEXION: how the patient sits on the seat, thigh-angle
    - [0°, 45, 60°, 75°, 85°, 90°]: degree: continuous scale, float
* **Knee: Tibial Internal/External Rotation**
  + FOOTPLATE\_TILT: how it is positioned forward/backward in the sagittal axis
    - [0°, 45°]: degree: continuous scale, float
  + ANKLE\_FLEXION: how it is positioned forward/backward in the sagittal axis
    - [0°, 75°, 90° (75°-90°)]: degree: continuous scale, float
  + KNEE\_FLEXION: how it is positioned forward/backward in the sagittal axis
    - [0°, 30°, 45° (30°-45°), 60°, 90°]: degree: continuous scale, float
* **Shoulder: Extension/Flexion**
  + SHOULDER\_ABDUCTION: … [0°, 15°, 25°]: degree: continuous scale, float
* **Shoulder: Abduction/Adduction**
  + SHOULDER\_FLEXION: … [0°]: degree: continuous scale, float
* **~~Elbow: Extension/Flexion~~**
  + ~~POSITIONING\_CHAIR\_ORIENTATION: … [90°]: degree: continuous scale, float~~
* **Forearm: Pronation/Supination**
  + ELBOW\_FLEXION: … [90°]: degree: continuous scale, float