



R82[®]

x:panda shape

Clinical assessment guide



How to use this guide

Our goal is that this guide will be a practical and chronological guide for clinicians when working with the x:panda shape seating system. This guide does not replace the user manual. The guide is divided into the following topics:

- Assessment
- Prescription
- Fitting of the seating system

Icons

In this guide you will see different icons that will give you different types of information:



Considerations or information to the prescriber.



Measurements and examinations that will guide your decision making.



Choice of, or possible adjustments to the main product or accessories.

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Aim of x:panda shape

The x:panda shape has been developed as a multi-configurable and adjustable seating solution for users who need additional support to maintain or control their posture.

In the most elementary version, the x:panda shape seat provides users with basic postural support in the seated position. Additional support to the pelvic region and thighs, trunk, neck and head can be added using a wide range of accessories. The seating system is used with a wheelchair frame for indoor and/or outdoor use, which will provide support to the ankle and foot.

The rigid seat and back support of the seating system provide a good, stable seating position and an excellent base for additional postural support.

This clinical assessment guide can be used to support professionals when ordering a new x:panda shape seating system, or when refitting the seating system for a new user. For additional training in assessment, prescription and fitting of seating systems and wheelchairs we recommend the Wheelchair Service Training Package developed by the World Health Organization.

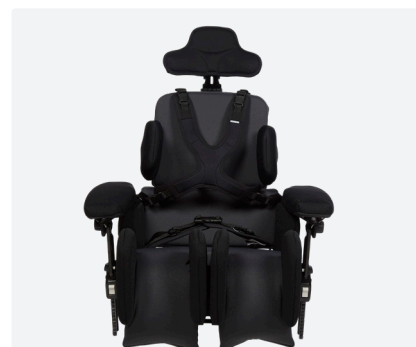
Below are three examples of x:panda shape in three different configurations with different accessories - from basic to comprehensive postural support.



x:panda shape with simple seat plate, pelvis support, outer knee supports for simple seating.



x:panda shape with simple seat plate, fixed side supports, pelvis support and outer knee supports for simple seating.



x:panda shape with advanced seat plates, pelvis support, Y-hip belt, inner- and outer knee supports, swing away side supports, torso vest, arm supports and head support.



Advice to give to your clients!

Advise the caregiver to seek support to adjust the seat in the following cases:

- Users hit growth spurts and it suddenly seems that none of their clothes fit them anymore. This will most likely also be the case with their assistive devices.
- Users who receive a percutaneous endoscopic gastrostomy (PEG) tube will often rapidly gain weight, which lead to a need to adjust their assistive devices.
- Users who undergo orthopaedic surgery or have large changes in their medication (baclofen or botulinum toxin) might experience large changes in their body structure or functions, and thereby a need to change the support provided by their assistive devices.

Assessment

This section will guide you through relevant assessments and measurements to prescribe and adjust the R82 x:panda shape to the needs of an individual user.

Lifestyle and environment

The 'lifestyle and environment' part of the assessment form gathers information about where the user lives and the things that he/she needs to do in their seating system. This takes place as a user and family interview. It

is important to consider how the seat and any additional postural supports provided will help the user to manage to the best of their abilities considering their immediate environment and lifestyle.



Question	Answer	
Where will the seating system be used?	<input type="checkbox"/>	Home
	<input type="checkbox"/>	Institution
	<input type="checkbox"/>	Outdoors
For how many hours per day will the seating system be used?	<input type="checkbox"/>	Hours
When out of the seating system, how is the user positioned?	<input type="checkbox"/>	Lying
	<input type="checkbox"/>	Standing
	<input type="checkbox"/>	Sitting
Transfer in and out of the seating system	<input type="checkbox"/>	Independent
	<input type="checkbox"/>	Standing
	<input type="checkbox"/>	Lifted
	<input type="checkbox"/>	Other
Does the user use private/public transport in motor vehicles	<input type="checkbox"/>	Yes
	<input type="checkbox"/>	No

Sitting posture in existing seating system

If the user already has a seating system or a wheelchair, it is important to find out if this is meeting his or her needs. The information can help guide decision regarding prescription of the new seating system.

A good starting point is to assess the quality of posture using the Posture and Postural Ability Scale (PPAS).

It can detect postural asymmetries at an early stage and can evaluate changes in the quality of posture for interventions using seating systems and specific accessories. Furthermore, it can be useful to assess

whether the user is relaxed and comfortable. For users who are non-verbal, the Face, Legs, Activity Cry, Consolability (FLACC) Behavioural Pain Scale can be applied.

The support provided by the existing seating system is described and the need for support from the x:panda shape seating system is predicted. See table on the next page.

When the user is moved to a mat for assessment, look at the condition of the existing device. Are there signs of asymmetric wear? If you notice anything unusual, ask the user or their caregivers about it.



Classification of quality of posture using the Posture Ability Scale

Frontal view	Yes 1 point	No 0 point	Sagittal view	Yes 1 point	No 0 point
Head in midline			Head in midline		
Trunk symmetrical			Trunk symmetrical		
Pelvis neutral			Pelvis neutral		
Legs separated and straight relative to pelvis			Hips mid-position (90°)		
Arms resting by side			Knees mid-position (90°)		
Weight evenly distributed			Feet mid-position/flat on floor		
Total score			Total score		





FLAAC

Face, Legs, Activity Cry, Consolability Behavioural Pain Scale.

FLAAC is a behavioural pain assessment scale used for nonverbal or preverbal patients who are unable to self-report their level of pain. Pain is assessed through observation of 5 categories including face, legs, activity, cry, and consolability.

Reference: Crellin DJ, Harrison D, Santamaria N, Babi FE. Systematic review of the Face, Legs, Activity, Cry and Consolability scale for assessing pain in infants and children: is it reliable, valid, and feasible for use? Pain. 2015 Nov;156(11):2132-2151. doi: 10.1097/j.pain.0000000000000305. PMID: 26207651.



Support from existing and future seating system		Current seating system (x)	x:panda shape (x)
Seat	Position with hip abduction		
	Position with asymmetrical hip positioning (wind-sweeping)		
	Asymmetrical seat depth (unequal leg length)		
Pelvis support	Wedges		
	Pelvis or hip support		
	Belt for pelvis support		
Leg support	Inner knee supports		
	Pommel		
	Outer knee supports		
Trunk support	Side support		
	Vest		
Arm positioning	Upper arm supports		
	Arm supports		
	Tray		
Head support	Head support		
Leg support	Asymmetrical lower leg length (unequal leg length)		
	Asymmetrical positioning of the feet		
	Calf support		
	Foot strap		

 Seat plates for advanced seating are needed

How to ensure correct measurements



- Always keep the tape measure straight.
- Position the user on a firm surface in a seated position, if possible.
- Measure the user while wearing their typical every day clothes. Consider if there need to be space for thicker clothing or body-worn aids such as a brace.

Seat depth

Measure from the back of the buttock to behind the knee. Reduce the measurement by 2 cm; this is your seat depth.

Seat width

Measure from the widest point of one side of the hip to the widest point of the other hip; this is your seat width.

Back height

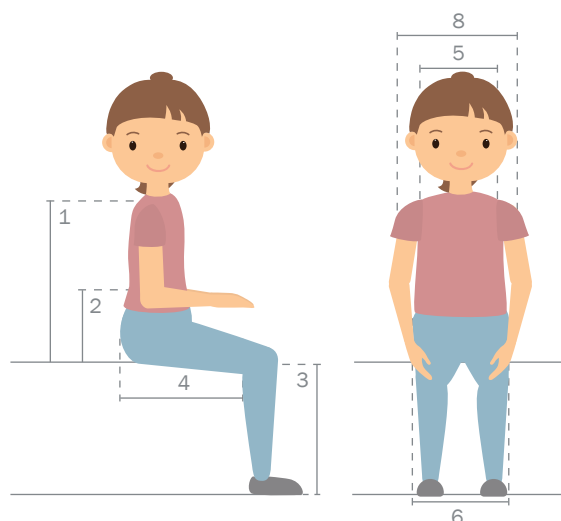
Measure from the seat surface to the top of the shoulder; this is your back height.

Chest width

Measure from one side of the trunk to the other side of the trunk, at the height at which you want to position your side supports; this is your chest width.

Arm height

Measure from the seat surface to the elbow/forearm, with the elbow flexed at 80–90°; this is your arm height.



Lower leg length

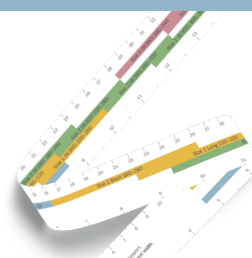
Ensure that the feet are flat on the floor. Measure from the floor to behind the knee; this is your lower leg length.

Body weight

To avoid not exceeding the weight limit of the seat and base/frame you need to measure the body weight of the user.

A tape measure for measurements 1, 4, 5 and 6 is available from R82 to guide your choice of size, seat width, seat depth, back height, and back width of the x:panda shape.

Additional measures are often needed in conjunction with the fitting.



No.	Type	Measurement
1	Back height	
2	Arm height	R: L:
3	Lower leg length	R: L:
4	Seat depth	R: L:
5	Chest width	
6	Seat width	
7	Body weight	
8	Shoulder width	

Prescription of x:panda shape seat

In this section you will be guided in prescribing the right size and adjustment of seat and back, as well as the cushions needed for the seat, and the lower and upper back.

The seat and back of the x:panda shape provide a firm supporting surface which aims to support the user in maintaining and controlling the position of the body and head, despite of impairments in body structures and functions.

The x:panda shape offers individually adjusted positioning to support the user's pelvic region and thighs. The support is provided by positioning the lower back, seat plate or seat plates to match the users' measurements and optional accessories: seat wedges, hip or pelvis supports, and inner- & outer knee supports.

When ordering a new x:panda shape we recommend that you choose the largest possible size that enables you to achieve the effective seat width needed to meet the user's needs. Prescription of the size and type of support from the seat and back takes place in stages, as outlined in the next sections.



The prescription is done in steps:

1. Seat depth
2. Seat width
3. Seat cushions
4. Lower back cushion
5. Type of back recline
6. Type of upper back mounting
7. Upper back: Back height – width
8. Spacer block
9. Upper back and spacer block cushion



Seat

The purpose of the seat is to provide a stable surface for the pelvis and thighs, ensure pressure distribution and accommodate joint positioning and any difference in leg length. The seat prescription will depend on the needs of the individual user and provide the best possible options for movement and weight shifting, or to limit movement and help the user control muscle activity, to enable functioning.

The choice between seat plate for simple seating or seat plates for advanced seating is determined according to the user's needs. The seat plates for advanced seating can accommodate users who need an asymmetrical seat depth (unequal leg length), a position with hip joint abduction or asymmetrical hip positioning (wind-sweeping), or wedges for seat pit or inner knee supports.



Seat plate for simple seating



Seat plates for advanced seating



x:panda shape with seat plates for advanced seating.



Seat plates for advanced seating adjusted for unequal leg length



Seat plates for advanced seating adjusted to the hip joints in abduction



Seat plates for advanced seating adjusted for asymmetrical hip positioning.

Seat depth

The seat depth should match the user, to ensure a support area that is as large as possible, to support pressure distribution. The seat depth is adjusted in stages:

1. Determine the position of the back in relation to the front edge of the seat, to obtain the best seat depth range. The back can be mounted on the seat base in two different positions (short leg and long leg positions), which impacts the available seat depth range.
2. Position the seat plate or seat plates on the seat base at the position where a specific seat depth length is obtained. Keep in mind that the depth of the lower back cushion, reduces the total seat depth. Also keep in mind that the seat cushion increases the seat depth by approximately 3-5 cm (depending on the size of the seat) when placed on the seat.



Size and position	Seat depth range	Choice (x)
Size 1 short	160-260 mm	
Size 1 long	220-320 mm	
Size 2 short	240-360 mm	
Size 2 long	300-420 mm	
Size 3 short	350-490 mm	
Size 3 long	410-550 mm	



x:panda shape mounted in short leg and long leg position.



Seat width

The seat width should match the user. The effective seat width is determined by the hip or pelvis supports, which aim to prevent sideways sliding in the seat, thereby compromising the postural position in the seat.

The seat width is determined by a range of adjustments and decisions:

- The setting of the seat base and lower back width
- The position of hip or pelvis supports that will reduce the effective seat width by 40–100 mm
- The type and size of seat plate or seat plates.

The seat width is adjusted in stages:

1. Choose the width of the seat base and lower back width which allows you to achieve the effective seat width needed.
2. Position the hip or pelvis supports to achieve the seat width needed.



Size	Type of seat plate		Seat base and lower back width	Effective seat width range**	Choice (x)
	Advanced seating	Simple seating			
1	For size 1	W: 250*	220 mm	120-180 mm	
		W: 300	260 mm	160-220 mm	
			300 mm	200-260 mm	
2	For size 2	W: 320	280 mm	180-240 mm	
			320 mm	220-280 mm	
		W:400	360 mm	260-320 mm	
			400 mm	300-360 mm	
3	For size 3	W:420	380 mm	280-340 mm	
			420 mm	320-380 mm	
		W: 500	460 mm	360-420 mm	
			500 mm	400-460 mm	

* Infant seating, ** With hip or pelvis supports.

Seat cushion

There are two types of seat cushions. One type without split for simple seating and one type with split, primarily for advanced seating .

The thickness of the foam in the seat cushions will differ, depending on the size of the seat. There is 30 mm of foam in size 1, 40 mm of foam in size 2, and 50 mm of foam in size 3.

The difference in thickness is due to the difference in maximum user mass .



Choice of seat cushion

For advanced seating we recommend a cushion with split and for simple seating we recommend a cushion without split. If you need simple seating AND a pommel, we recommend using a cushion with split, for easier mounting of the pommel and to avoid the cushion being too bulky.



Seat cushion	Choice (mm)
Based on seat width	
Type	Choice (x)
Simple seating	
Advanced seating (split cushion)	
Cover and colour	Choice (x)
Red	
Grey	
Black, wipeable	

Lower back cushion	Choice (x)
Based on seat width	
Individual sizing (state width)	
Consider individual sizing if you do not use hip or pelvis supports. You can consider going one size up for lower back cushion, compared to seat width, since you do not need room for adjustment of hip or pelvis support.	
Cover and colour	Choice (x)
Red	
Grey	
Black, wipeable	

Back

The back support helps maintain the user in an upright neutral position, allows sufficient space for the shape of the body, distributes forces, and provides the user with a stable base from which he or she can function. The height of the back support depends on the user's trunk stability, control, and functional requirements and resources.

Back recline (adjusting the back support rearwards) can help accommodate hips that cannot bend to neutral sitting posture (the trunk to thigh angle is greater than 90°); fixed posterior pelvis tilt; and fixed bend posture of the lower trunk. Furthermore, the x:panda shape is available with a dynamic back that absorbs the energy of extensions and allows the user to return to an upright seating position, without compromising the position of the pelvis. The x:panda shape comes with 5 different types of back recline.

Back recline



Fixed back position of 90°

A fixed hip/back angle of 90° with no possibility of adjusting it.



Recline in steps (5° per step)

Recline in steps makes it possible to adjust the recline in 5° steps. The adjustments will be made using tools. This solution can be useful for users who need a fixed hip angle, but where it is still possible to alter the hip angle in 5° steps.



Adjustable stepless recline

With adjustable stepless recline the back can be angled from -10° to 30°, which makes it possible to have a hip angle that matches the hip range of movement of the individual user. A matching hip angle can make it easier for the user to be positioned in the seat and get their buttocks all the way back in the seat. This can make it easier for the user to maintain the pelvis in a neutral position and, thereby minimising the risk of an anterior or posterior tilt of the pelvis.



Adjustable stepless recline with dynamic back

The dynamic back absorbs the energy of extensions and allows the user to return to an upright seating position, without compromising the position of the pelvis. The point for rotation (recline of the back) is close to the axis of the hips which means that the back support maintains the correct position and minimizes shear.



Adjustable stepless recline with adjustable dynamic

It is possible to adjust the resistance. The resistance goes from 1 to 10, where 5 is the zero point. With the resistance adjusted to 1, there is approximately 35% less resistance than at the zero point; and vice versa, there is approximately 35% greater resistance at 10. Adjustable dynamic makes it possible to alter the resistance during the day or for a longer period, if the energy of the extensor thrust is more pronounced in some periods compared to others. If the seat is reused and has multiple users during its lifetime, it is also possible to adjust the dynamic, to fit the needs of different users.



Lock of dynamic back recline

The dynamic versions of back recline is available with lock of dynamic. Lock of dynamic is required if the seating system is used for transport.



Advise on the back

Lock of dynamic back

Lock of dynamic back is required if the seat is used for transport in motor vehicles. Lock of dynamic can also be useful in other situations such as eating/feeding or when communicating with certain kinds of augmentative and alternative communication devices. The lock of dynamic cannot be retrofitted.

Toolless/daily adjustment kit

Makes it possible to recline the back without the use of tools.



Types of back recline	Choice (x)
Fixed back position of 90° (no recline)	
Recline in steps (5° per step)	
Adjustable stepless recline	
Adjustable stepless recline, toolless	
Adjustable stepless recline with dynamic*	
Adjustable stepless recline with dynamic, toolless*	
Adjustable stepless recline with dynamic, lock of dynamic	
Adjustable stepless recline with dynamic, lock of dynamic, toolless	
Adjustable stepless recline with adjustable dynamic*	
Adjustable stepless recline with adjustable dynamic, toolless*	
Adjustable stepless recline with adjustable dynamic, lock of dynamic	
Adjustable stepless recline with adjustable dynamic, lock of dynamic, toolless	

* this configuration is not approved for transport

Upper back mounting

Two types of upper back mounting are available: without quick release and with quick release. The quick release mounting enables quick and easy removal of the upper back.

Removal of the upper back gives the opportunity to challenge the user's postural control and balance of the upper body (trunk, arms and head) and thereby facilitates the activation of the trunk and back muscles.

The quick release mounting can be used with therapy kit tubes and spacer block for 60 mm extra back height.



Without quick release upper back mounting



With quick release mounting



With quick release mounting, therapy kit tubes and spacer block

Upper back: height and width

The choice of upper back is determined according to the user's needs. The effective chest width depends on the use of, and type of, side supports.



No.	Type	Measurement
3	Back height	
4	Chest width	

Trunk support and therapy seating

The level of trunk control can be determined using the Segmental Assessment of Trunk Control Scale (SATCo). When the upper back is removed, the seat can be used for therapy seating. Read more in our infographic poster.



Back height

The height of the back support depends on the user's trunk stability, control and functional requirements and resources. The back height will usually be aligned with the top of the shoulder blade. However, some users might need less support or might progressively gain control, which would allow the back height to decrease.

The back height can be guided by the Segmental Assessment of Trunk Control Scale (SATCo). With the overall aim of optimising functioning, the back height can be positioned at the level of trunk control to that compensates fully for limitations in trunk control, or right below the level of control, so as to allow the user to challenge and develop their trunk control.



x:panda shape with upper back and spacer block.



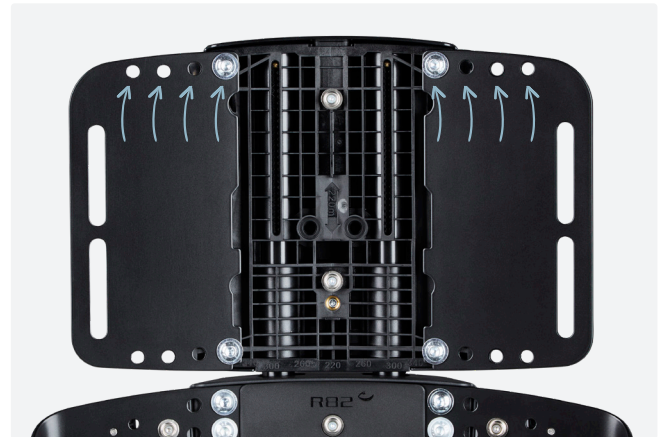
Upper back size	Grow potential*	Total back height (lower + upper back)			Choice (x)
		x:panda shape size			
		1	2	3	
140 mm	90 mm	280-370 mm			
180 mm	100 mm	320-420 mm	340-440 mm		
220 mm	110 mm	360-470 mm	380-490 mm	420-530 mm	
270 mm	130 mm		430-560 mm	470-600 mm	
340 mm	150 mm			540-690 mm	

* Growth including use of spacerblock

Upper back width

The width of the back support depends on the user's trunk stability, control and functional requirements and resources. The back width will usually be aligned with the chest width and the type of side supports needed. If the back width is wider than the chest width this might compromise the user's arm movements.

The upper back of the x:panda shape can be adjusted to two to four different widths, depending on the upper back size.



x:panda shape back support. The four width adjustments are marked with the arrows.



Feature	Choice (x)
No side supports	
Fixed side supports	
Swing-away side supports	



Upper back size	Upper back width	Effective chest width with side supports		Choice (x)
		Fixed	Swing-away	
140 mm	180 mm	130-180 mm	80-280 mm	
	220 mm	170-220 mm	120-320 mm	
180 mm	180 mm	130-180 mm	80-280 mm	
	220 mm	170-220 mm	120-320 mm	
	260 mm	210-260 mm	160-360 mm	
220 mm	220 mm	170-220 mm	120-320 mm	
	260 mm	210-260 mm	160-360 mm	
	300 mm	250-300 mm	200-400 mm	
	340 mm	290-340 mm	240-440 mm	
270 mm	260 mm	210-260 mm	160-360 mm	
	300 mm	250-300 mm	200-400 mm	
	340 mm	290-340 mm	240-440 mm	
	380 mm	330-380 mm	280-480 mm	
340 mm	300 mm	250-300 mm	200-400 mm	
	340 mm	290-340 mm	240-440 mm	
	380 mm	330-380 mm	280-480 mm	
	420 mm	370-420 mm	320-420 mm	

The measurements for effective chest width with side supports in the table is based on the widest distance between the side supports.



Spacer block

When the upper back is adjusted to more than 60 mm above the lower back, a spacer block can be mounted. A spacer block will give a larger area of support and thereby better stability and distribution of pressure.

Height	Spacer block width	Choice (x)
55 mm	180 mm	
55 mm	220 mm	
55 mm	260 mm	
55 mm	300 mm	
55 mm	340 mm	
55 mm	380 mm	
55 mm	420 mm	



Upper back cushion and spacer block cushion

The size of the upper back cushion and spacer block cushion is based on the height and width of the upper back and the width of the spacer block.

Upper back cushion	Choice (x)
Size	
Based on upper back height and width	
Cover and colour	
Red	
Grey	
Black, wipeable	

Spacer block cushion	Choice (x)
Size	
Based on spacer block width	
Cover and colour	
Black, wipeable	
Black	

Prescription of postural supports

Postural supports are attached to the seat or to the back of the seating system and are used to support the user's body structure and functions. Postural supports are considered and prescribed in the following steps:

1. Pelvis positioning
2. Leg positioning
3. Trunk positioning
4. Arm positioning
5. Head positioning

Head positioning

The overall aim is to enable the user to maintain a neutral upright position of the head and to control the movement of the head and neck within the user's range of control. A supported and aligned head position can enable the user to be an active part of many everyday activities, such as eating and communication.

Trunk positioning

Posterior trunk support is provided by the back support, but additional trunk support can be necessary for the user. The aim is to support the trunk in the user's neutral upright position, so that the head balances over the pelvis.

Arm positioning

The purpose of arm and hand positioning is to allow the user to expand the base of support and to "close the kinetic chain" between the trunk and the support surface.

Pelvis positioning

The pelvis is the support base and the foundation from which the body can move to function. The aim is to achieve a neutral position, or to compensate for a lack of flexibility to ensure the user's upright neutral position.

Leg positioning

Together with the pelvis, the legs should provide a stable base of support from which the body can move to function. The aim is to support the user to maintain the hips and legs in their neutral position.



Pelvis positioning

The pelvis is often the starting point for prescription of postural supports. In the seated position, the pelvis is the support base and the foundation from which the body can move to function. The aim is to achieve a neutral position, or to compensate for a lack of flexibility to ensure the user's upright neutral position.

The x:panda shape offers different types of postural supports for pelvis positioning. The user might need one or several types of support to achieve the most optimal solution.

Wedges for seat pit

The seat wedges create a gentle contour in the seat and enhance function and pressure distribution by accommodating the ischial tuberosities and by increasing the contact area between the user and the cushion, providing pelvis stability and control through optimal positioning. The seat wedge combined with a y-hip belt and hip/pelvis support provides a three point support for the pelvis.

The seat wedge should cover one -half to two -thirds of the seat depth. As the user grows, the seat wedges need to be reviewed, so that they still offer sufficient support. The seat wedges come in seven different sizes, and each have a range in length; the smallest size 40 mm and the largest size 130 mm, allowing the wedge to 'grow' with the user and seat depth.



x:panda shape with wedges for seat pit

Learn more about how to adjust the wedges for seat pit in our infographic poster.



Type			Simple seating	Advanced seating
Wedges for seat pit			○	●
Types	Width	Length	Height	Choice (x)
For size 1, short	115 mm	70-110 mm	20 mm	
For size 1, medium	135 mm	110-175 mm	30 mm	
For size 1, long	135 mm	120-200 mm	45 mm	
For size 2, medium*	150 mm	130-220 mm	35 mm	
For size 2, long*	150 mm	140-240 mm	50 mm	
For size 3, medium**	200 mm	150-260 mm	40 mm	
For size 3, long**	200 mm	170-300 mm	55 mm	

* Also useable on size 1, width 300 mm. ** Also useable on size 2, width 400 mm.

● = Available for, ○ = not available for.

Pelvis and hip supports

Pelvis supports and hip supports create a supporting surface that will prevent sideways movement in the seat and reduce the tendency for the pelvis to tilt sideways. Both types can be adjusted when the user is positioned in the seat. The support area is 100x110 mm, 140x130 mm or 180x150 mm. The cushions come with covers in black wipeable or black.

The back-mounted pelvis support is mounted on the lower back of the seat and has 20 mm of neoprene beneath the cover, leaving no sharp edges around the hip and pelvis area. The pelvis support follows the back recline movement, for example if a dynamic back is activated.

The side-mounted hip support is mounted on the side of the seat and has 8 mm of neoprene beneath the cover, which gives firm pressure at the hip. The hip support does not follow the back reclining movement. The hip support is slightly curved in a lateral direction, which can be useful when used with the hips and legs in an abducted position.



Pelvis support



Hip support



Pelvis or hip supports

	Simple seating	Advanced seating	Choice (x)
Pelvis support	•	•	
Hip supports	•	•	

• = Available for, ○ = not available for

Size	Choice (x)
Based on seat size	
Individual sizing (write size)	

Belt for pelvis support

Belts for support of the pelvis provide an anterior support surface and can be used by those who need support in maintaining a stable base, and can ensure that the user remains seated during use. Using support for the pelvic area can help maintain stability and enable the user to engage in activities with the upper body, arms, and hands.

The Y-hip belt maintains a stable pelvic position by providing support at two angles, down and back. It aims to maintain a neutral pelvic position and to prevent the user from tilting the pelvis out of position and sliding forwards in the seat.



Y-hip belt

The pelvis belt gives a backwards pull on the pelvis. The fabric of the pelvis belt covers the area from the top of the pelvis to the seat. It aims to prevent the user from sliding forwards and out of the seat. It is suitable for smaller users.

With a large number of fix locks at the seat base, it is possible to mount the belt in the position that provides the user with the optimal support.



Pelvis belt



Fix locks at the seat base for mounting of belt.



Belt for pelvis

	Simple seating	Advanced seating	Choice (x)
Y-hip belt	●	●	
Pelvis belt	●	●	
Other type of belt	●	●	

● = Available for, ○ = not available for

Belt for pelvis support

Learn more about the vests and belts from R82 in our online material.



Leg supports

Together with the pelvis, the legs should provide a stable base of support from which the body can move to function. If the legs are contracted or move uncontrollably, they can affect the posture of the pelvis and the rest of the body. We provide support for the legs with the aim of supporting the user to maintain the hips and legs in their neutral position.

Inner knee supports, pommel and outer knee supports are often used together with pelvis or hip supports. Always position the legs within their range of movement and consider any structural changes in the body's function, such as decreased joint range of motion, or dislocated or subluxated joints.

If the legs are moved towards the midline (adducted) and turned in (internally rotated) the purpose of the inner knee supports or pommel is to prevent tightness and contractures, and to protect the knees and skin from being irritated or developing pressure ulcers.

If the legs are moved outwards (abducted) and turned out (externally rotated), but flexibly, the purpose of the outer knee supports is to place the legs in a neutral position (5–8° of abduction). If the hips and legs are fixed, the intended purpose is to prevent further turning and

spreading out, to provide support to minimise tightness and contractures.

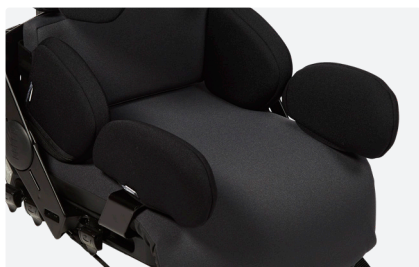
The outer knee supports for advanced seating with a flip-down function ensure 'easy access' for the user when combined with the pommel, with quick release and swing-away side supports.

The leg supports should be positioned to allow for the shape of the thighs and knees. Furthermore, it is important to consider the quality of the contact area where the supports will be in contact with the user. The contact area includes the shape, size, amount of tissue and bony prominences of the user.



Positioning of the legs and feet

The positioning of the hips and knees, and the flexibility and range of movement, determine the position of the lower legs and feet. If the user is positioned with hip abduction, it should be made sure that the foot plate is large enough to accommodate the position of the feet.



x:panda shape with outer knee supports for simple seating.



x:panda shape with inner knee supports and outer knee supports for advanced seating.



x:panda shape with pommel and outer knee supports for advanced seating with flip-down function.



Leg supports for the x:panda shape

Leg supports for the x:panda shape	Simple seating	Advanced seating	Choice (x)
Inner knee supports	○	●	
Pommel	●	●	
Outer knee supports for simple seating	●	○	
Outer knee supports for advanced seating	○	●	
Outer knee supports for advanced seating with flip-down	○	●	

● = Available for, ○ = not available for

Trunk support

After supporting the pelvis and accommodating the hips and legs, the next step is to ensure the right type and amount of support for the trunk.

Posterior trunk support is provided by the lower back, upper back and maybe a spacer block. If the support provided is not sufficient it can be necessary to consider the prescription of additional postural supports.

The back should support the trunk in the user's neutral upright position, so that the head balances over the pelvis. It might be necessary to adjust the back recline and/or the seat plane angle to enable the user to maintain a neutral upright position.

Side supports can provide guidance and stability in the lateral direction and a vest can provide anterior trunk support.

Side supports

The x:panda shape can be fitted with three types of side supports: fixed, swing-away, or swing-away and angle-adjustable. All side supports can be used with seat plates for simple and advanced seating.

Side supports provide postural support by embracing the trunk of the user. By providing postural support, they enhance the user's opportunity to use their arms for everyday activities.

For a user with a sideway curved trunk (scoliosis), one side support may be lower than the other, to provide support where needed. Remember that when providing side supports for a user with scoliosis, pelvis or hip supports on both sides should also be provided.

The x:panda shape side supports are configured with a fitting, a cushion, and a cover.

Fittings

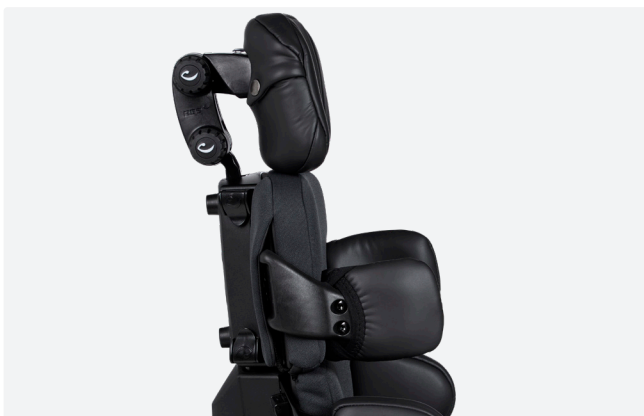
The three types of fittings are all slightly curved, which allows the arms to be moved freely, if the width of the upper back is adjusted to the user. The fittings allows the side supports to be adjusted in width, depth, and height, to secure the best fit.

Fixed side supports can reduce the effective back/chest width by up to 50 mm, and swing-away side supports can reduce or increase the effective back/chest width by up to 100 mm.

Swing-away and angle-adjustable side supports can be adjusted to accommodate the asymmetrical trunk and ensure the best fit. The cushions can be angled from approximately -90° to $+30^{\circ}$ in relation to the upper back.

Cushions

The cushions are slightly curved and follow the shape of the trunk for a snugger fit. The cushions can be adjusted backward and forward. For the larger sizes, it is possible to alter the height at which the cushion is mounted on the fitting. The cushions are prepared for a chest belt. There are two types of cushions – rectangular and square. The rectangular cushions are suitable for users who rotate their trunk and therefore need the support to reach around their ribcage. The square cushions can cover a large area of the trunk, both in height and width, which means that the pressure from the user's body can be distributed over a larger area, which can be suitable for users who need continuous support.



x:panda shape with side supports: fixed fitting, square cushion and black, wipeable cover.



x:panda shape with side supports: swing-away angle-adjustable fitting, square cushion and black cover.



Side supports

Fitting		Choice (x)
Fixed		
Swing-away		
Swing-away and angle-adjustable		
Cushion	Size	Choice (x)
Rectangular	L:110 x H:80 mm	
	L:150 x H:90 mm	
	L:190 x H:90 mm	
Square	L:110 x H:100 mm	
	L:130 x H:130 mm	
	L:150 x H:160 mm	
	L:170 x H:200 mm	
Cover		
Black, wipeable		
Black		



Easy access

Swing-away side supports, pommel with quick release and flip-down outer knee supports can be used together to ensure “easy access” to the seat, which can be valuable for users who are hoisted into the seat, and to avoid collision with the accessories.

Vests

Anterior trunk support from a torso or cross vest for users who need support in maintaining an upright position of the upper body and head. Using support for the trunk area can help maintain a position where the user is able to remain in a better position for interaction.

The torso vest provides a firm and flexible hold against the chest. The cross vest provides a firm and flexible hold against the chest and the sides of the trunk. It aims to prevent the user from falling forwards or moving sideways.

With a large number of fix locks at the lower back and upper back, it is possible to mount the vest in the position that gives the user optimum support. With

brackets for wider strap guidance it is possible to alter the angle for the mounting of the upper part of the vest, and with brackets for higher strap guidance it is possible to mount the vest above the top of the upper back.



Torso vest and cross vest



Ensure a stable pelvis when using a vest

Always ensure that the pelvis is sufficiently stabilised when applying anterior trunk support from a vest. If the pelvis is not properly stabilised, the user can slide down in the seat.

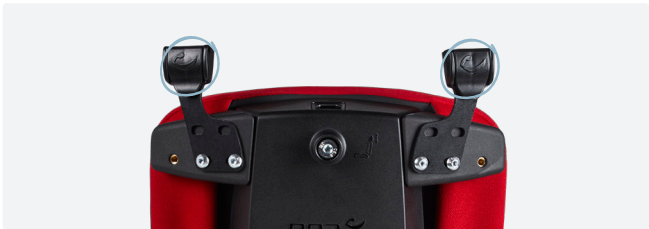
- The torso and cross vest should always be combined with products and/or accessories that maintain the position of the body by supporting the knees, pelvis, or chest.
- Always ensure adequate space between the vest and the users' neck to prevent suffocation.



Fix locks at the lower back and upper back for mounting of vest.



Brackets for strap guidance, wider (accessory)



Brackets for strap guidance, higher (accessory).

Arm positioning

The purpose of arm and hand positioning is to allow the user to expand the support base and to “close the kinetic chain” between the trunk and the support surface. If the user leans heavily on the arm support or tray, it can be necessary to reconsider the prescription of trunk support, to reduce the need for support from the arm support or tray.

The support surface can be provided with upper arm supports, arm supports or a tray.

Upper arm supports

Upper arm supports can provide extra postural support and stability for users who extend their upper arms, or who experience difficulties maintaining the position of the upper arms. The upper arm supports are mounted either directly on the upper back or on the fixed side support, and can be adjusted in height. They can be fixed or adjustable.

Arm supports

Arm supports provide extra postural support for the user as they expands the base of support.

The arm supports can easily be dis-mounted and are needed for mounting of trays.

Tray

The support surface provided by a tray can be used to stabilise the position of the trunk through the arms. Furthermore, a tray makes it possible for the user to place food and drink on it, play with toys, or use as a holder for augmentative communication.



Upper arm supports



Arm support



Tray

Head support

The posture and position of the trunk will affect the user's ability to maintain and control the position of the head. The head support for the x:panda shape is intended to provide support for the posterior surface of the head, to prevent excessive extension, rotation, or lateral flexion of the head. The overall aim is to enable the user to maintain a neutral upright position of the head and to control the movement of the head and neck within the user's range of control. For some users it is also relevant to consider the need for daily adjustment or easy removal of the head support.

A supported and aligned head position can enable the user to be an active part of many everyday activities, such as eating and communication.

If it is difficult to achieve adequate support for the head, it can be necessary to reconsider the prescription of the support provided for the pelvis, leg, trunk and arms, and the impact of gravity through the back recline and tilt (seat plane angle).

The head support for x:panda shape is a combination of:

- Type of head support
- A turtle neck system
- Length of rod
- Type of cover

Types of head support



The curved head support is slightly curved from the midline to the sides, and it provides support at the back of the head. It is suitable for users who need temporary support or who needs to be tilted.



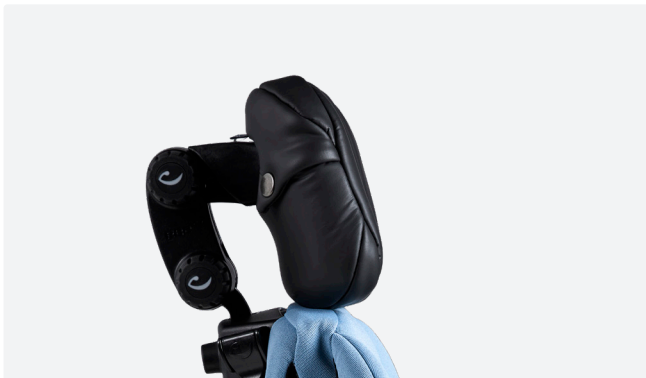
The anatomical head support is contoured at the back and has two fingers at the sides. The contoured back fits the back of the head, and the two fingers will provide support at the edge of the skull and, thereby providing support to maintaining the head in midline and in an upright position. This is suitable for a user who needs substantial support to maintain the position of the head.



Existing head supports

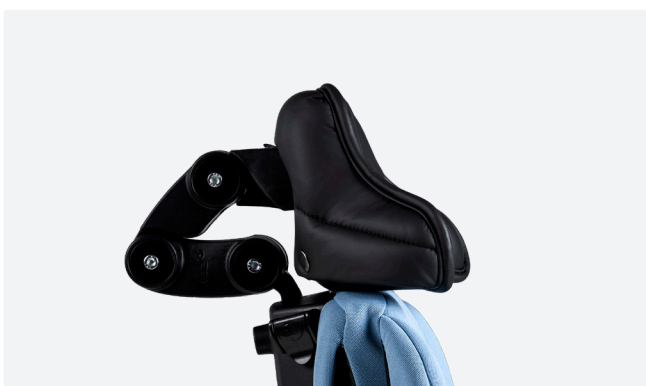
The existing range of R82 head supports can be used on the x:panda shape as an alternative to the x:panda shape head support.

Turtle neck system



The standard turtle neck system

Provides two rotation points that allow for many degrees of freedom and an individual fit for the user. The rod allows for adjustments upwards and downwards, and the turtle neck system allows for adjustments laterally, as well as forwards, backwards, upwards, and downwards.



The extended turtle neck system

Provides three rotations points that allow for many degrees of freedom and an individual fit for the user. The rod allows for adjustments upwards and downwards, and the turtle neck system allows for adjustments laterally, as well as forwards, backwards, upwards, and downwards.



The 3D system

This makes it possible to adjust the head support to fit the individual user, and to accommodate an asymmetrical position. With the 3D system, the head support can be adjusted in all directions. The 3D head support can be mounted on the standard turtle neck system or the extended turtle neck system.

Length of rod

The rod is available in short, medium, and long, allowing for a height adjustment of 80 mm, 120 mm, or 160 mm from the upper surface of the upper back.

Type and colour

The cushion covers are available in black wipeable, or black.

Daily adjustment kits are available for height and angle adjustment of the head support.



Head supports

Type of head support	Choice (x)
Curved, W:180 x H:130 mm	
Curved, W:260 x H:260 mm	
Anatomical, small	
Anatomical, medium	
Anatomical, large	
Type of turtle neck system	Choice (x)
Standard	
Extended	
Standard with 3D	
Extended with 3D	
Length of rod	Choice (x)
Short, 80 mm of height adjustability, for all upper back heights	
Medium, 120 mm of height adjustability, for upper back heights: 180, 220, 270 and 340 mm	
Long, 160 mm of height adjustability, for upper back heights: 270 and 340 mm	
Cover and colour	Choice (x)
Black, wipeable	
Black	



Prescription of a frame for x:panda shape

R82 have frames for indoor and outdoor use. The frames are developed for our modular seating systems. All of our frames allow for adjustment of the seat plane angle. Each size of the x:panda shape can be combined with several different frames. The seat can be mounted directly on the frame, or by using an adaptor. Use the frame and seat combination sheet to see the maximum user mass for each combination. Furthermore, x:panda shape can be used in combination with frames from other manufacturers.

When deciding on the type of frame, the following considerations might be useful:

Environment: indoor or outdoor?

The frames are for indoor use or for indoor and outdoor use.

Transport in motor vehicles

The High-low:xo outdoor frame, Multi Frame, Multi Frame:x, Stingray Frame and Combi Frame:x comply with the international transit wheelchair standard ISO 7176-19 and can be used with seat units that comply with ISO 16840-4, such as the x:panda shape. If the x:panda shape has dynamic back recline, lock of dynamic is needed for the seat to be approved for transport purposes.

Height adjustment

Height adjustment is probably the single most important feature of the High-low:xo frames. It allows the user to be positioned close to the floor, to be at eye-level with their peers, or at table height to join in at the dinner table with their family. The Strong Base base allows the x:panda shape size 3 to be height-adjusted to 210–250 mm. A large range of accessories is available for our frames, such as leg and foot supports, attachments for vent trays, oxygen bottle holders, handles and push braces.



Seat & frame combinations

Learn more about the different combination possibilities in our seat and frame overview.



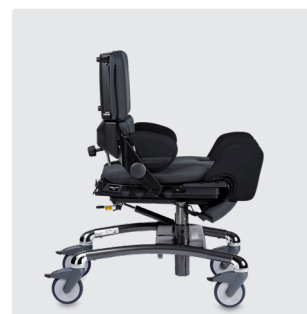
High-low:xo indoor and outdoor frames



Stingray Frame



Combi Frame:x, Multi Frame:x & Multi Frame wheelchair frames



Strong Base

Ankle and foot positioning

Depending on the user's needs, different types of foot plates can be chosen. For all types of frames, it is possible to have either one foot plate for both feet, or an individual adjustable foot support.

Individual adjustable foot supports can be useful if the user has an uneven lower leg length, or if there is a need for individual adjustment for each foot, e.g., a different range of motion in the ankle joint. If advanced seat plates are adjusted in wind-sweeping, individual foot supports are most often needed.



High-low:xo size 1 indoor with foot plate, wombat model.



High-low:xo size 3 indoor with individually adjustable foot supports.



Fitting

During fitting of the seating system and the frame, the professionals who are responsible for the product solution must make sure that the seating system is set up to accommodate the user's need for support in an upright neutral position, and that the setting of the seating system are comfortable for the user.

For some users, fittings can be made in one session, although for more complex seating solutions, additional sessions might be needed, to make small adjustments or find new solutions to challenging experiences between sessions. Furthermore, it might be necessary to instruct caregivers to make small adjustments to the seating system themselves, if large day-to-day variation in muscle tone and functional abilities is exists.

Fitting of the seating system takes place in stages.

Prepare the product solution for the fitting session

- Adjustment of the seat, back support, and frame
- Mounting and adjustment of postural supports and other accessories

Fitting together with the user and caregiver

- Minor adjustment of the seat, back support, and frame
- Adjustment of postural supports and other accessories



Inform the user and caregiver

Inform the user, caregiver, and other professionals about the fitting.

Allow them to prepare for the fitting session, by informing them about the planned activities, and that you expect that the user will have to get into and out of the seating system multiple times during the session.

Prepare the product solution for the fitting session

Mounting of parts and accessories and provisional adjustments can be prepared before the fitting session with the user.

A checklist has been prepared for each step. The relevance of each step will depend on the prescription of seat, postural supports, and accessories.

Go to video playlist with how-to videos for the x:panda shape



	Done/checked
Seat depth: adjustment of the back in short or long leg position	
Seat depth: position the seat plate or seat plates on the seat base	
Seat width: seat base and lower back width	
Seat width: mounting and positioning of hip or pelvis supports	
Back recline: positioning of recline	
Back recline: adjustment of dynamic	
Mounting of upper back	
Adjustment of back height	
Mounting of spacer block	
Adjustment of upper back width	
Mounting of leg supports (Inner knee supports, pommel and outer knee supports)	
Mounting of wedges for seat pit	
Mounting of belt for pelvis support	
Mounting of side supports	
Mounting of vest	
Mounting of arm positioning (upper arm support, arm supports and tray)	
Mounting of head support	
Mounting of seat and lower back cushion	
Mounting of upper back cushion and spacer block cushion	

Fitting together with the user and caregiver

The correct fit of the x:panda shape can be difficult to determine and will in most cases be a 'best possible' fit, where advantages and disadvantages of decisions or adjustments affect each other and also the user's ability to maintain or control a position.

Assess the quality of posture using the Posture and Postural Ability Scale (PPAS) and compare with the score of for the existing seating system.



Sitting posture in x:panda

Classification of quality of posture using the Posture and Postural Ability Scale

Frontal view	Yes (1 point)	No (0 point)	Done/checked	Yes (1 point)	No (0 point)
Head in midline			Head in midline		
Trunk symmetrical			Trunk in neutral position		
Pelvis neutral			Pelvis neutral		
Legs separated and straight relative to pelvis			Hips in mid-position (90°)		
Arms resting by side			Knees in mid-position (90°)		
Weight evenly distributed			Feet in mid-position/flat on floor		
Total score			Total score		



Involve the user and caregiver

Inform the user, caregiver, and other professionals about the adjustments that you make during the fitting. Involve the user and caregiver by asking them about their experiences and opinions. Inform the user and caregiver about when the product solution should be adjusted or reconsidered, and let them know whom to contact.



Cleaning and maintenance

Inform the user and caregiver about daily cleaning and maintenance of the seating system and refer them to the user manual for further information.



Check the product solution with the user and caregiver

Use your hands to check the fit and any pressure points between the user and the seating system.

Static check	Done/checked
Seat depth: At least a 20-mm gap between the back of the knee joint and the front of the cushion.	
Seat width: Should fit closely, but comfortably.	
Pelvis positioning: Is the pelvis upright and level? Check under the user's buttocks and under the belt.	
Hip positioning: Is the system set up for neutral, abduction or asymmetrical positioning as prescribed?	
Leg supports: Check that there are no high-pressure points between the user and the leg supports.	
Back recline: Check the resistance provided by the dynamic back support.	
Back height: The back should provide sufficient support for the user to maintain an upright position.	
Upper back width and side supports: At least 50 mm between the armpits for side support.	
Vest: Check the upper attachment points and ensure a space between the vest and the user's neck.	
Height of arm support and tray: Check that the user's arms are in 80-90° elbow flexion when positioned at the arm support / tray.	
Head support: Check that the user's head is balanced and in upright position.	
Active check while the users is moving their arms or head	Done/checked
Fit and posture: Does the movement cause the user to change their posture?	
Function (arm or head positioning or movement)	
Active check during movement of the seating system and frame	Done/checked
Fit and posture: Does the movement cause the user to change their posture?	
Function (arm or head positioning or movement)	



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