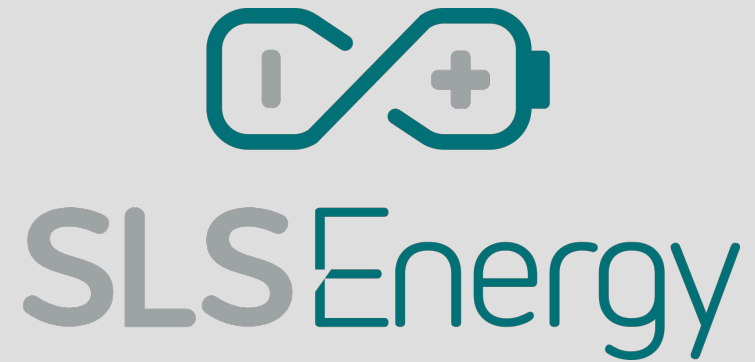




One module. Four products.

A standardised, solderless second-life battery pack architecture for electric mobility and energy storage

September 2026

SLS Energy

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Website: slsenergy.io | LinkedIn & X: @SLSEnergy



Three costs every regional pack builder pays today

1

Every builder starts over

Each manufacturer designs or adopts its own pack from scratch. Parts are ordered in small bespoke batches, so nobody reaches the volume that hugely brings the price down.

2

Cells are joined by welding

Spot welding needs a machine, a trained operator and consistent cells. Across the seven companies surveyed it is the largest single source of assembly failures.

3

Welding is also the slow step

It is the biggest consumer of assembly time. Producers welding by hand take substantially longer per pack than those using automated joining.

The result

High cost per pack, long lead times and no shared supply base. Standardising the building block, not the product, is the way out.



One standard module scaled into four products



Standard cell module

192 Wh

3.2 V, 60 Ah. Twenty 3 Ah cells held in parallel by compression, with no welded joint anywhere in the stack.

One holder with 21 positions, 7 by 3. Vehicle packs fill 20 for connection symmetry, the stationary pack fills all 21 for 63 Ah. Same part, two fill levels.

E-bicycle

0.77 kWh

4 modules | 80 cells

E-motorcycle

2.30 kWh

12 modules | 240 cells

E-tricycle

2.30 kWh

12 modules | 240 cells

Stationary storage

3.23 kWh

16 modules | 336 cells

The e-motorcycle and e-tricycle packs are the same pack. Pack energy is set by how many modules go in, not by redesigning the pack.



Solderless: cells are clamped, not welded

The conventional way

- Cells are permanently welded to metal strips
- Needs a welding machine, power and a skilled operator
- A weak weld is usually found only after the pack is closed
- One failed cell can write off the whole pack
- The pack cannot be opened, serviced or separated at end of life

Our approach

- Cells are held in a frame and connected by compression
- Brackets, stud screws and adjusting screws set the clamping force
- Assembled with hand tools, so no welding equipment is needed
- Every connection is visible and can be checked and re-torqued
- The pack opens, so a single module can be replaced

No welding equipment

A workshop can assemble to the same standard as a factory

Repairable

A weak module is swapped instead of scrapping the pack

Recoverable

The pack separates cleanly at true end of life



Why this matters most for second-life cells

Cells arrive with a history

Retired cells vary in capacity and condition. A clamped joint lets us match, sort and re-match modules as we learn more about each batch.

Packs stay alive longer

When one module weakens, it is replaced in minutes. The rest of the pack keeps working, which is the whole point of second life.

Value is recovered

Nothing is permanently bonded, so cells, steel and electronics all separate cleanly for recycling rather than going to waste together.

Design intent: the pack should be as easy to take apart as it is to put together.



One kit of parts behind all four products

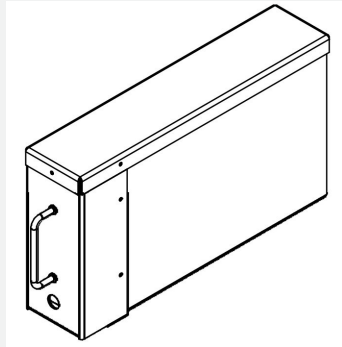
Part	E-bicycle	E-motorcycle	E-tricycle	Stationary	Part numbers
Cell module	4	12	12	16	1
Battery management system	1	1	1	1	1
Bracket set	4	4	4	4	1
Stud screw	11	11	11	11	1
Bracket bolt	8	8	8	8	1
Adjusting screw	4	4	4	4	1
Switch	1	1	1	1	1
Connector	1	1	1	1	1
Main enclosure	Slim	Common	Common	Common	2
Terminal and BMS cover	Slim	Cut-outs	Cut-outs	Deep	3
Top cover	Slim	Short	Short	Long	3
Total distinct part numbers					16

One identical component in every pack that uses it

Variants sharing one cross section, hole pattern and fastener set

Designed separately, these four products would carry forty part numbers. Built on this architecture they carry sixteen.

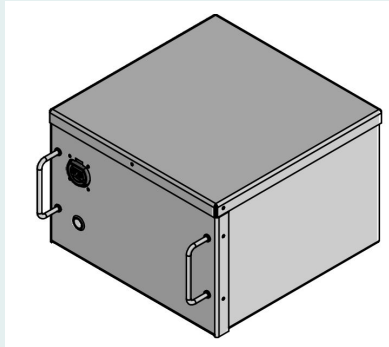
One pressed body serves three of the four products



E-bicycle

Slim body

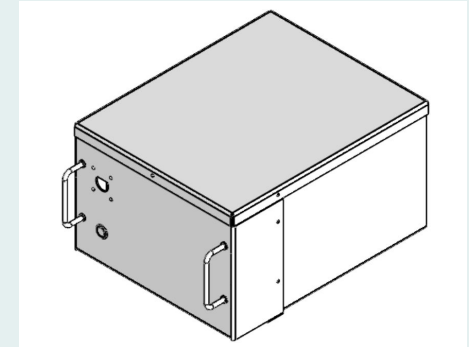
4 modules



E-motorcycle and e-tricycle

Common body

12 modules



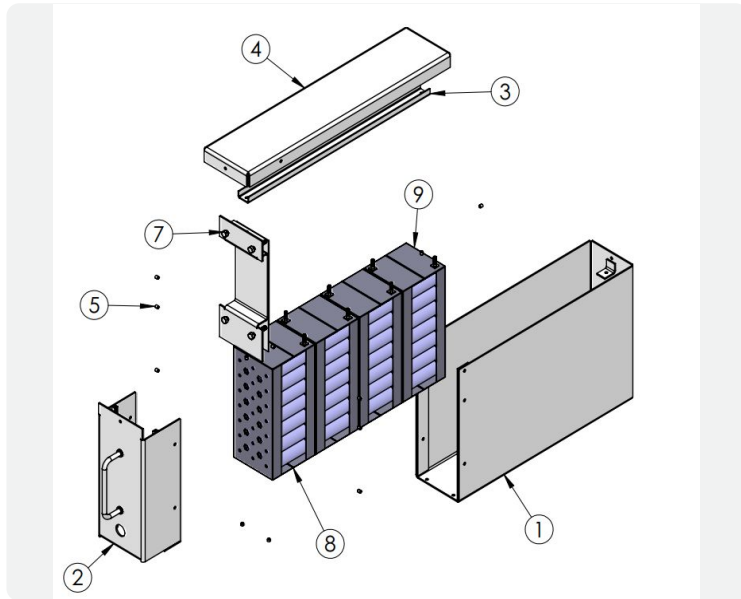
Stationary storage

Common body

16 modules

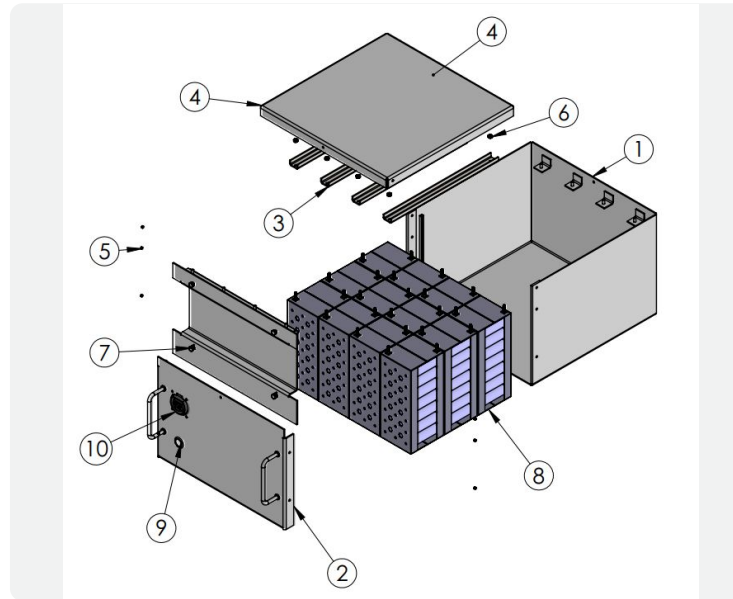
The stationary pack does not use a bigger box. It uses the identical 306 by 303 by 210 mm pressed body as the vehicle packs, with the same hole pattern, and gains room for four more modules through a deeper terminal and BMS cover.

Identical build sequence whichever product it is



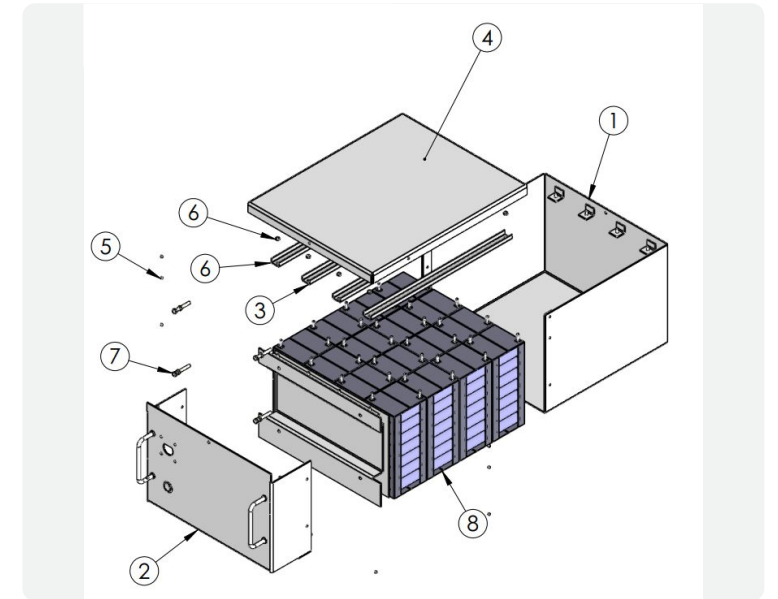
E-bicycle

4 modules



E-motorcycle and e-tricycle

12 modules



Stationary storage

16 modules

Load the modules into the frame, set the brackets, tighten the stud and adjusting screws, fit the covers. The same four steps, the same tools and the same training, whatever the product.



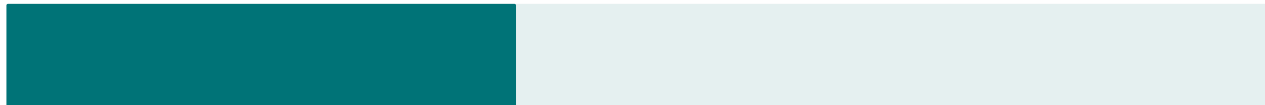
Sixteen part numbers instead of forty

Four packs designed independently



40 part numbers

This standardised architecture



16 part numbers

60%

fewer unique parts to
design, tool, certify, stock
and repair

8 part numbers are one identical component in every pack, including the cell module.
The remaining 8 are sheet metal drawn on one common body and one hole pattern.

Counting every line on the four bills of materials, including the battery management system, the switch and the connector. Fewer part numbers means fewer drawings, fewer suppliers to qualify, fewer test reports and a much smaller spare parts inventory for whoever adopts the standard.



What 100 MWh of shared demand actually orders

The companies that responded to the initiative survey project roughly 110 MWh of pack demand for 2026. This is what 100 MWh of it orders, at the product mix they reported.

10.4M

cells

Fixed by the energy alone.
The product mix does not
change this number.

513,000

modules

One module design and one
part number, populated to 20
or 21 cells.

41,000

packs

Every one of them sharing
the same BMS, switch,
connector, brackets and
fastener set.

38,600

common bodies

From one press tool, instead
of three tools running 10,000
to 14,500 each.

Reported mix: 33% e-tricycle, 32% e-motorcycle, 33% stationary, 2% e-bicycle. Also on the order: 939,000 fasteners on three part numbers, and 163,000 brackets.

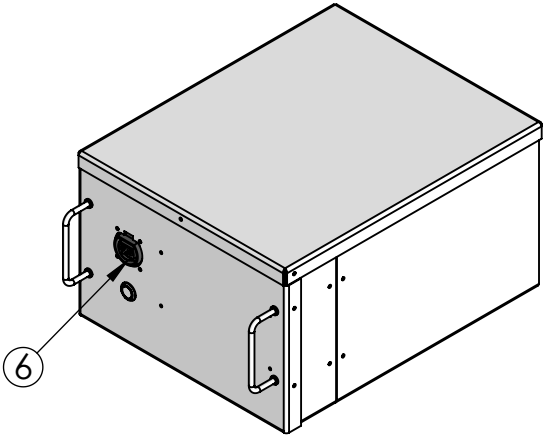
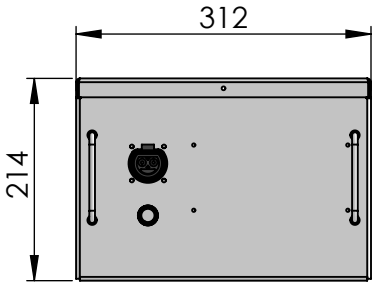
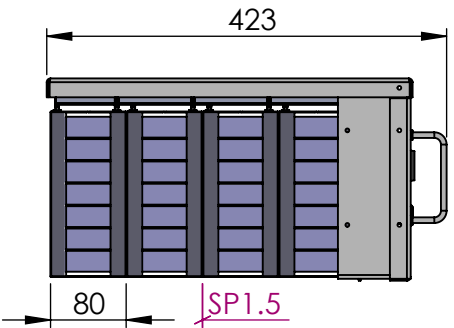
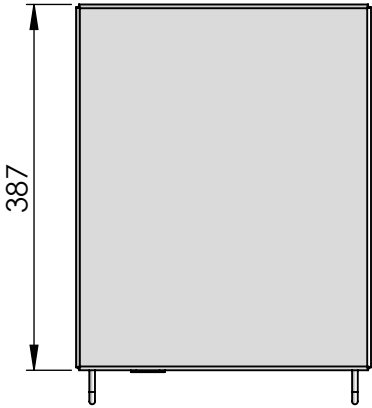
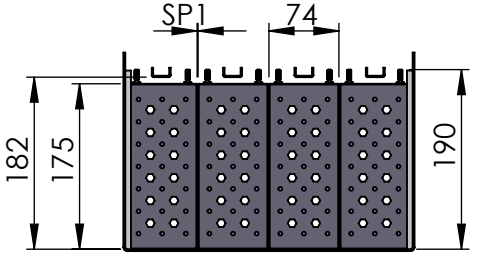
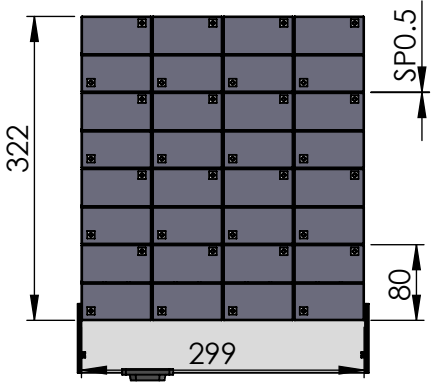
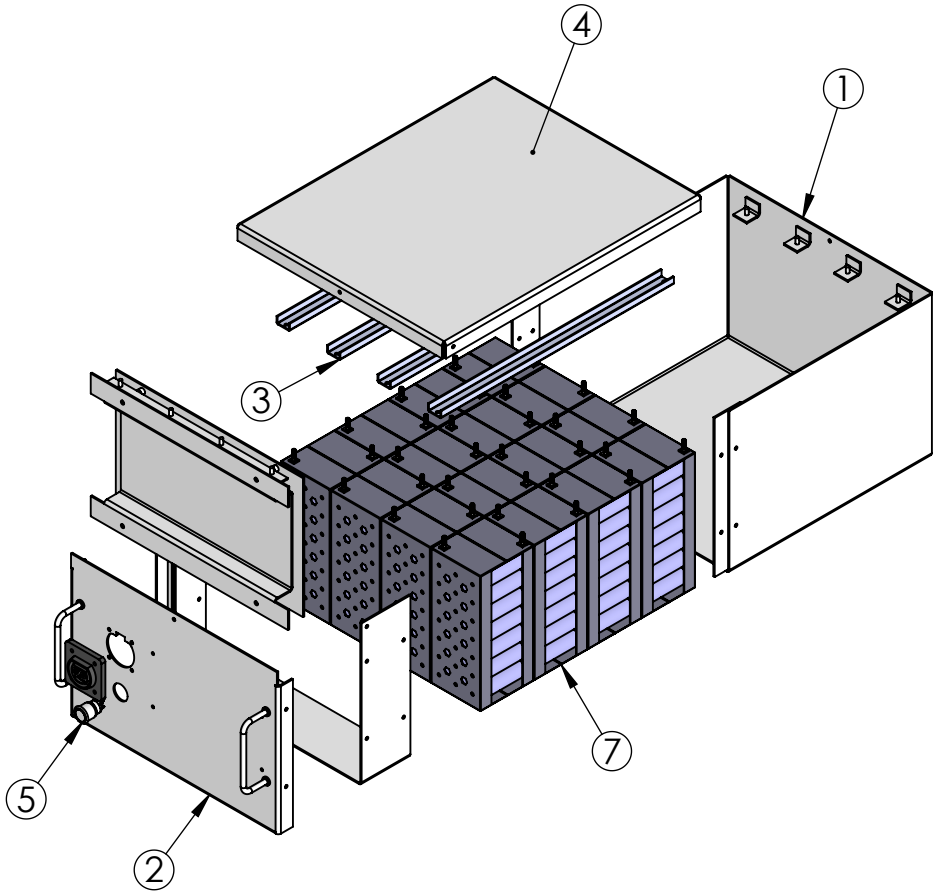
This is the mechanism behind the target of up to 50 percent lower assembly cost: pool the demand that already exists across these companies onto one specification, then buy and build at that combined volume.

Standardise the module, not the product.

Four products. One solderless building block. Forty part numbers reduced to sixteen. One supply chain to build in the region.

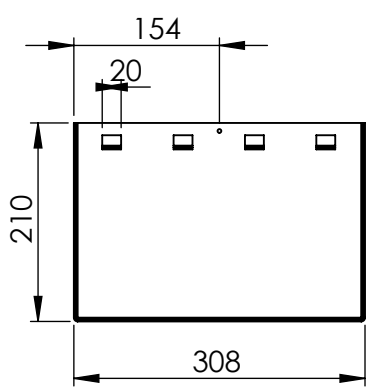
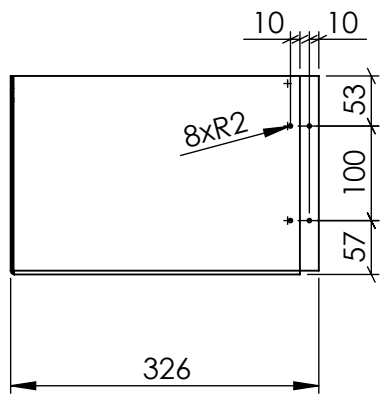
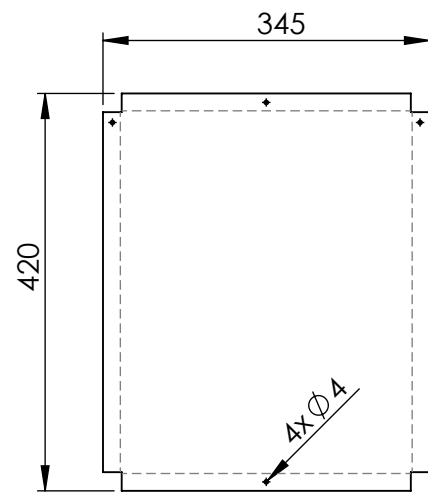
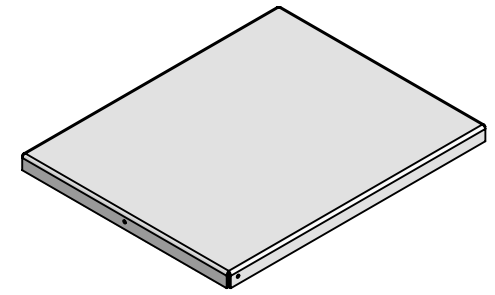
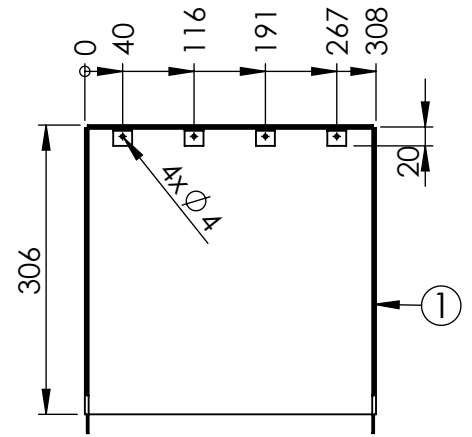
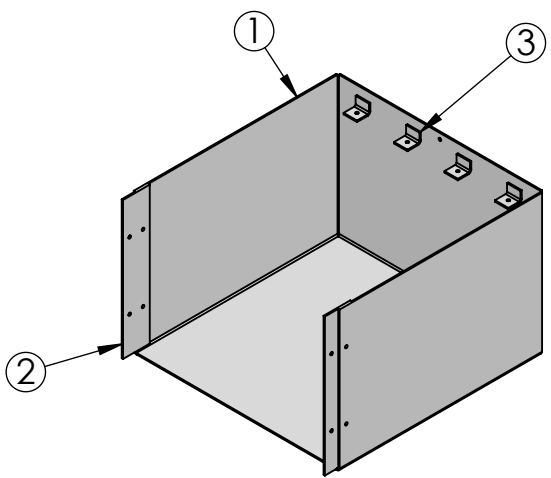
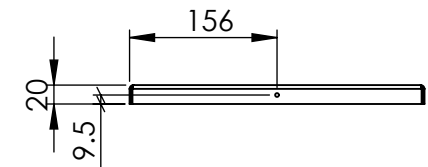
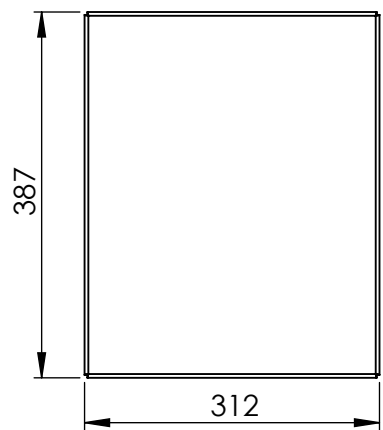
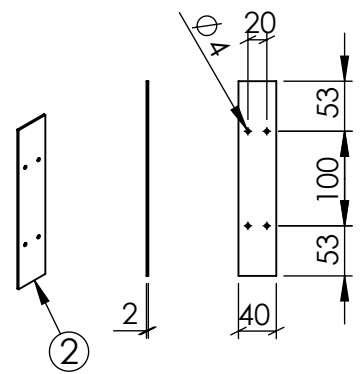
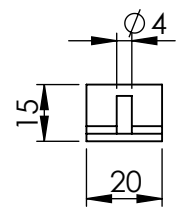
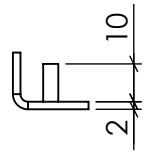
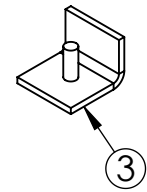


NO.	ITEM DECRPTION	QTY
1	Main Body	1
2	Front Cover	1
3	Bracket set	4
4	Top Cover	1
5	Switch	8
6	Connector	4
7	Cell Module	16



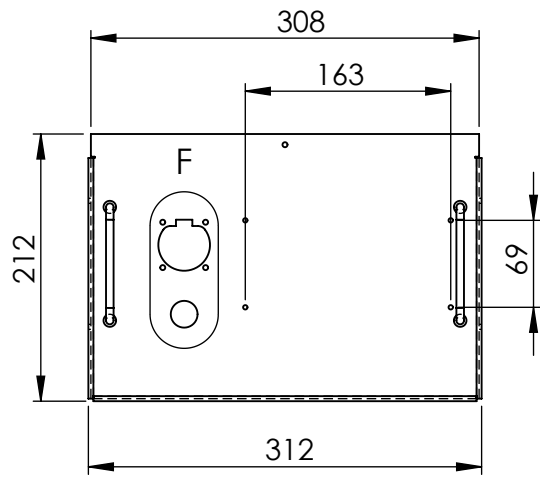
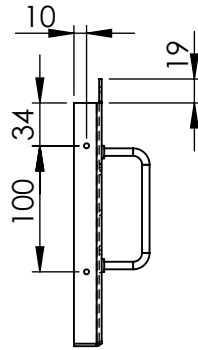
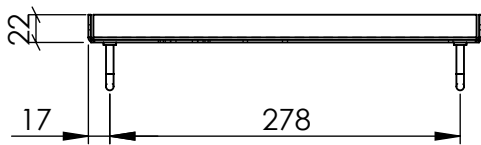
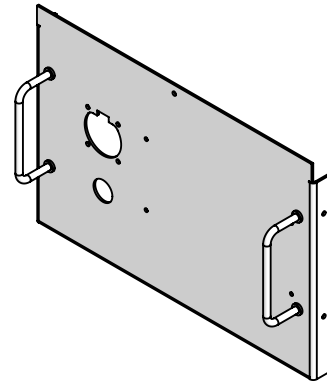
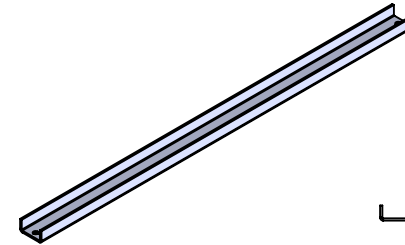
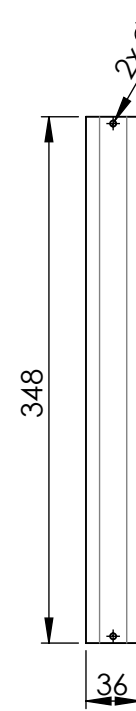
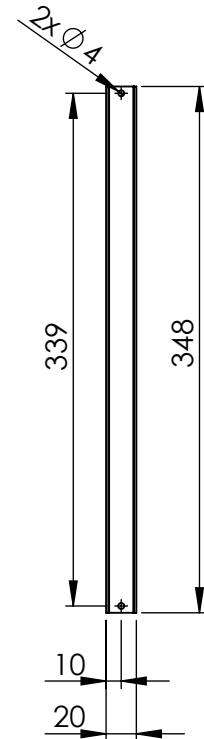
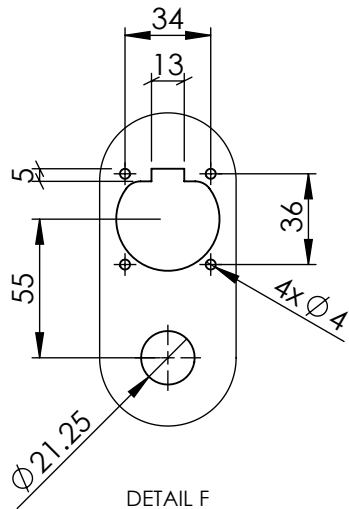
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DRAWN	Revision	Material	WEIGHT:	DATE	
B-Axis Ltd	002	Plain carbon Steel	11.00 Kg	11/09/2026	
CHKD & APPVD	SCALE:	SHEET		1 OF 11	
SLS E. Ltd	1:8				

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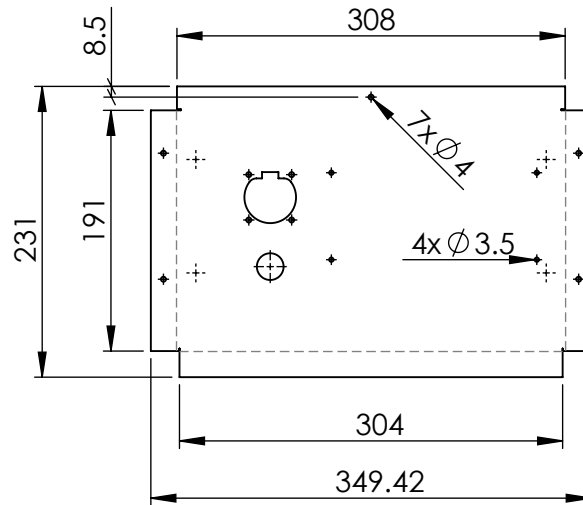


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DRAWN B-Axis Ltd	Revision 002	Material Plain carbon Steel	WEIGHT: DATE 07/09/2026
CHKD & APPVD SLS E. Ltd	SCALE: 1:8	SHEET 2 OF 11	

8 7 6 5 4 3 2 1



DETAIL F
SCALE 1 : 3



Title
16S Front Cover and Bracket

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS

DRAWN
B-Axis Ltd

Revision
002

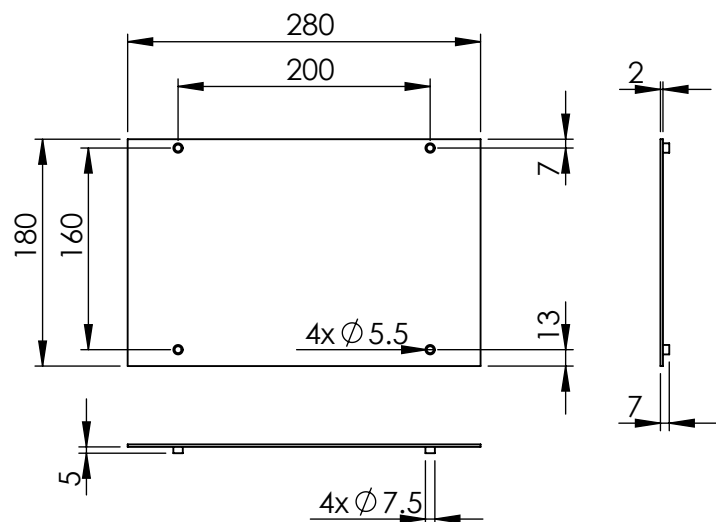
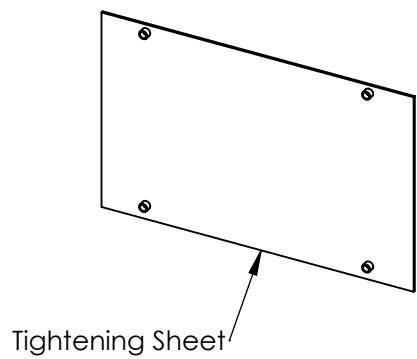
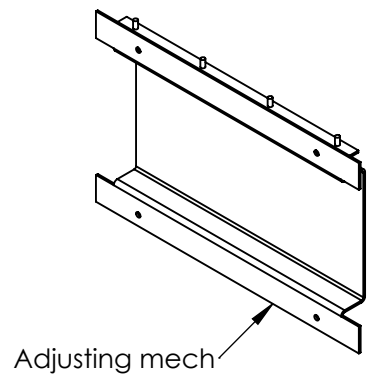
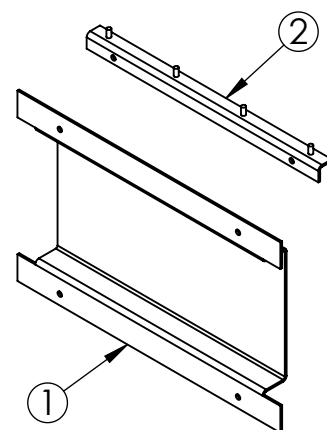
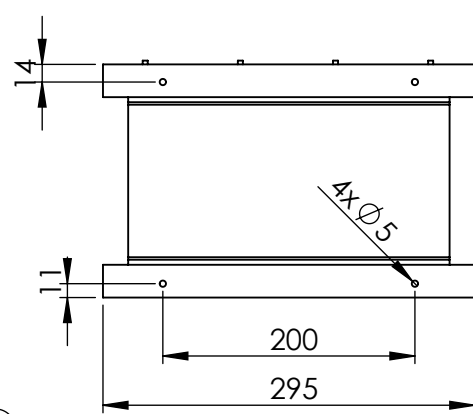
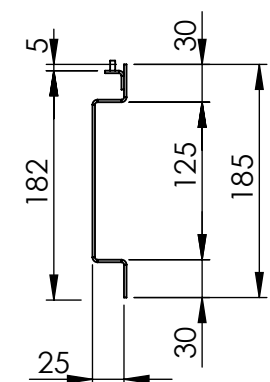
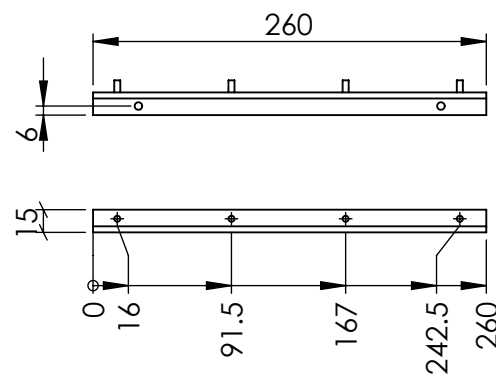
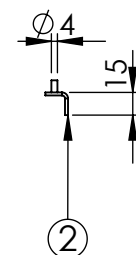
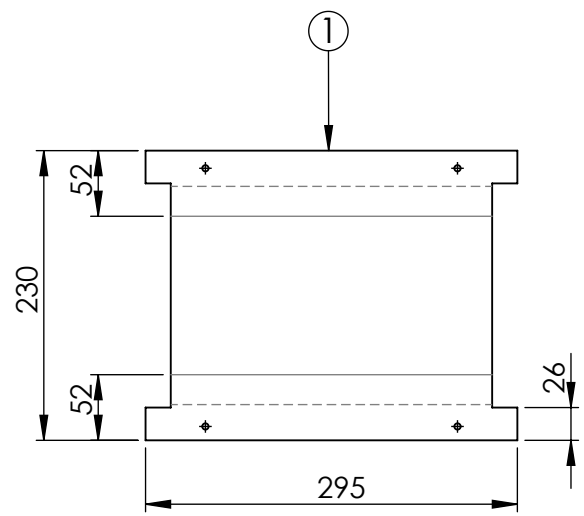
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WEIGHT: DATE
07/09/2026

CHKD & APPVD
SLS E. Ltd

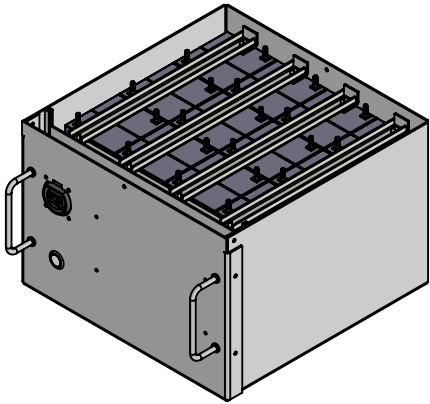
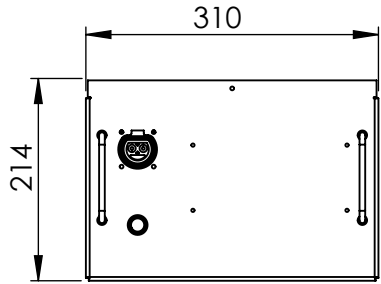
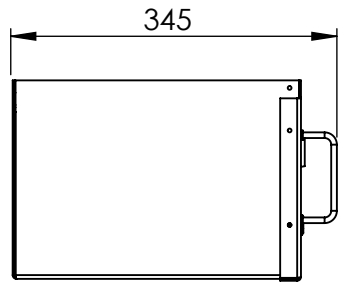
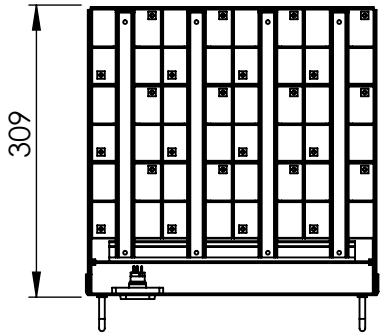
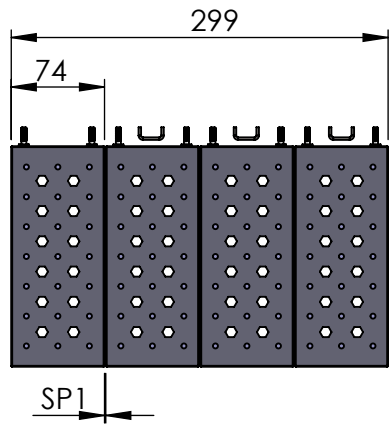
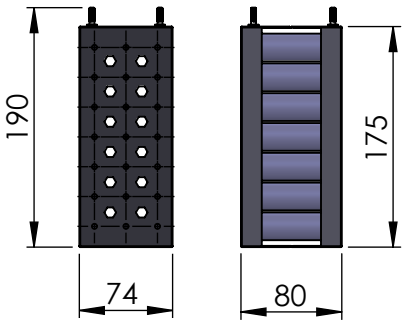
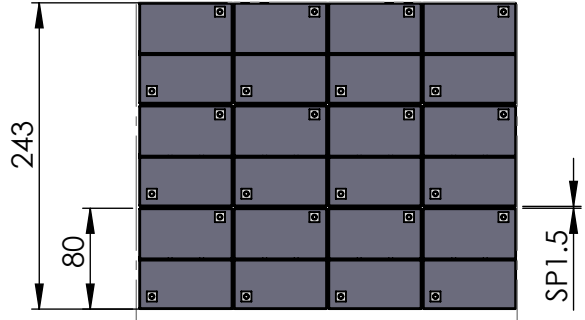
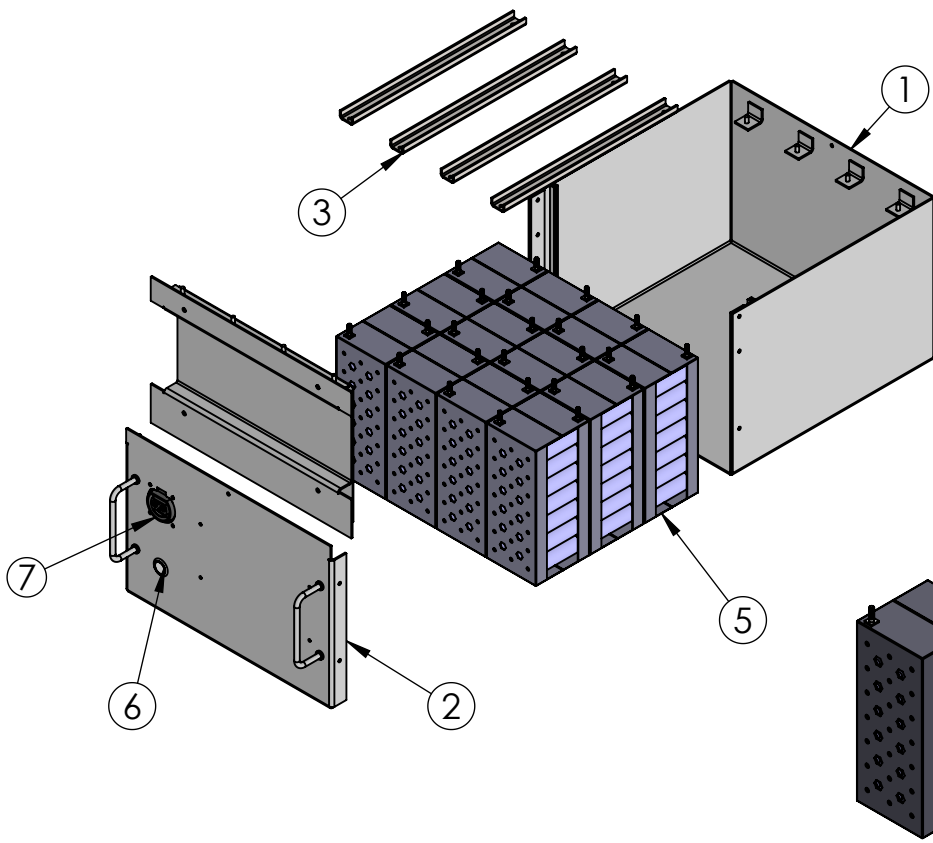
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1:6

SHEET
3 OF 11



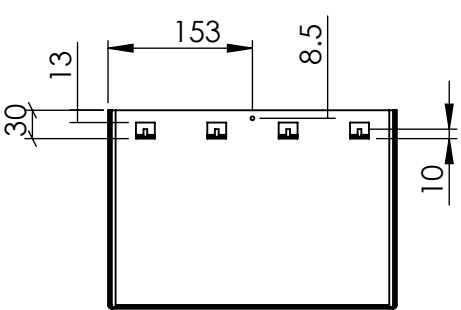
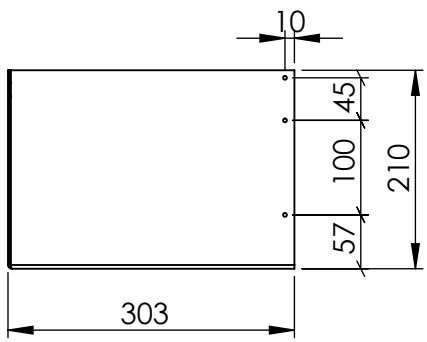
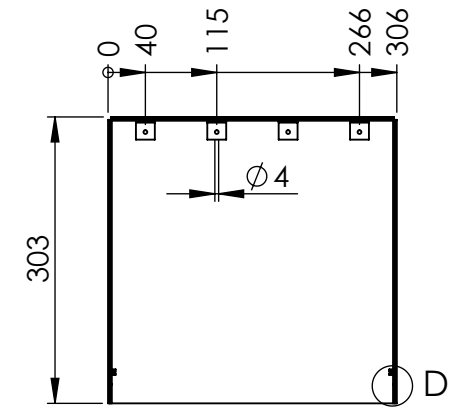
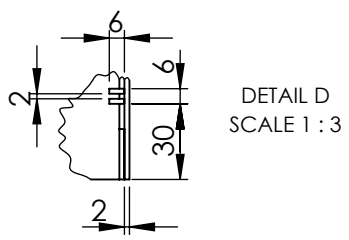
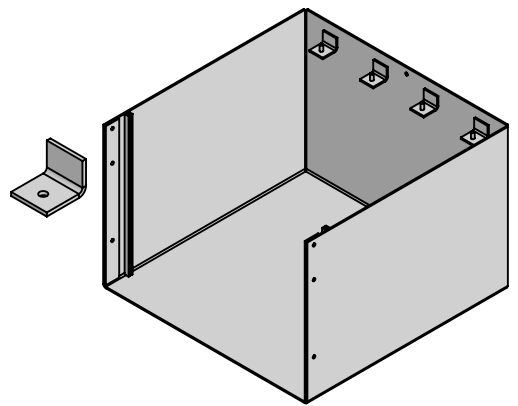
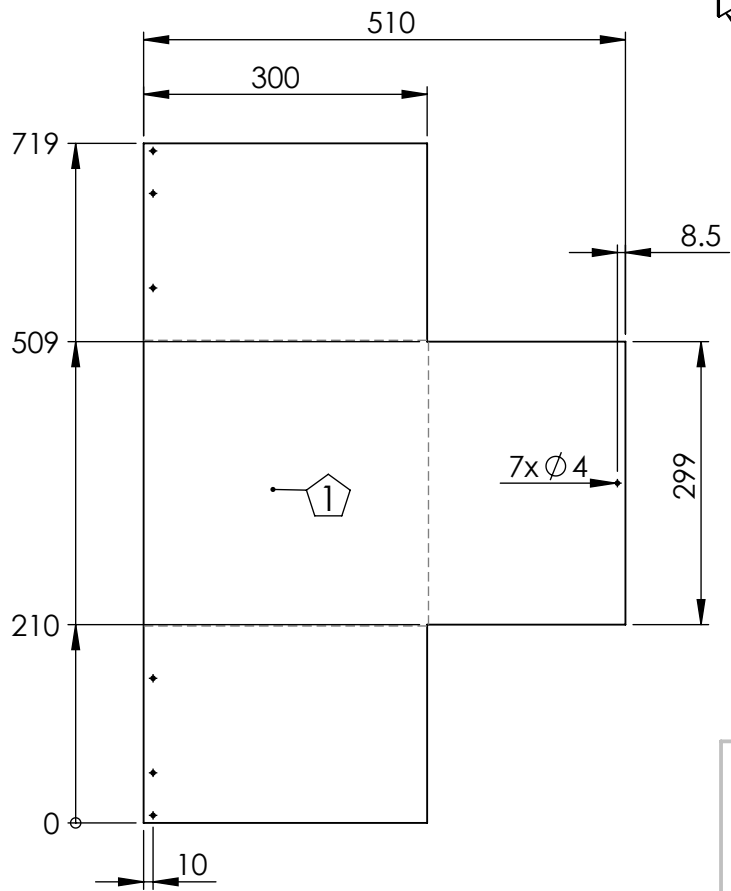
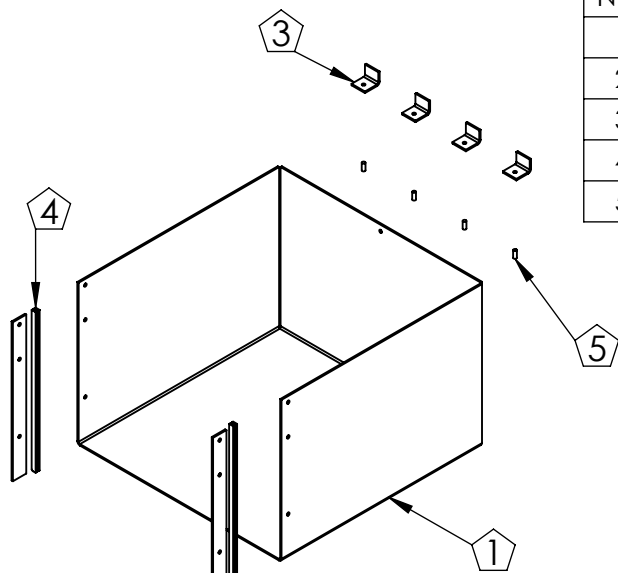
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	DRAWN B-Axis Ltd	Revision 002	Material Plain carbon Steel	WEIGHT: 	DATE 07/09/2026
	CHK'D & APP'VD SLS E. Ltd	SCALE: 1:6	SHEET 4 OF 11		

NO.	ITEM DECRPTION	QTY
1	Main Enclosure	1
2	Terminal Cover	1
3	Bracket set	4
4	Top Cover	1
5	Cell Module	16
6	Switch	1
7	Connector	1

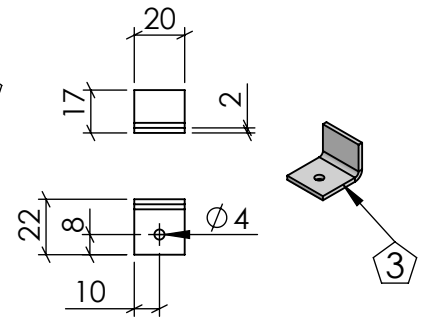
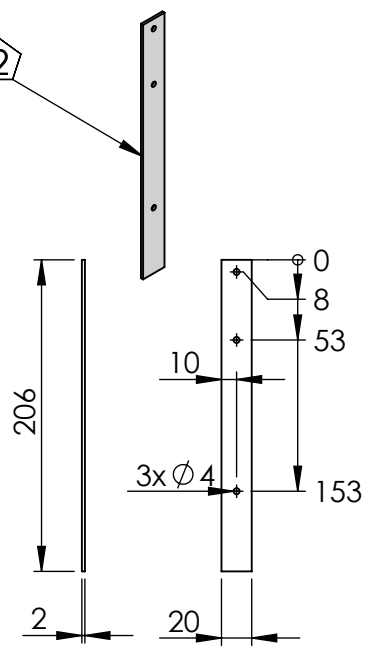
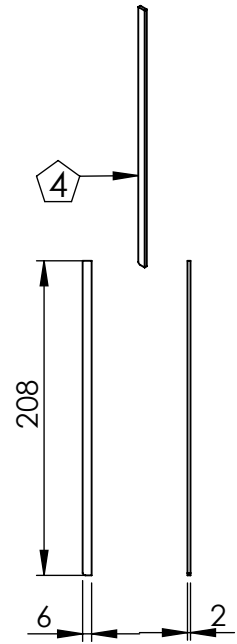


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DRAWN B-Axis Ltd	Revision 002	Material Plain carbon Steel	WEIGHT:	DATE 11/09/2026	
CHKD & APPVD SLS E. Ltd	SCALE: 1:8	SHEET 5 OF 11			

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NO.	DESCRIPTION	QTY.
1	PLATE, 210 x 303 x 305.5	1
2	Sheet	4
3	PLATE, 2 x 20 x 206	2
4	M4 Hex Screw	4
5	Sheet	4



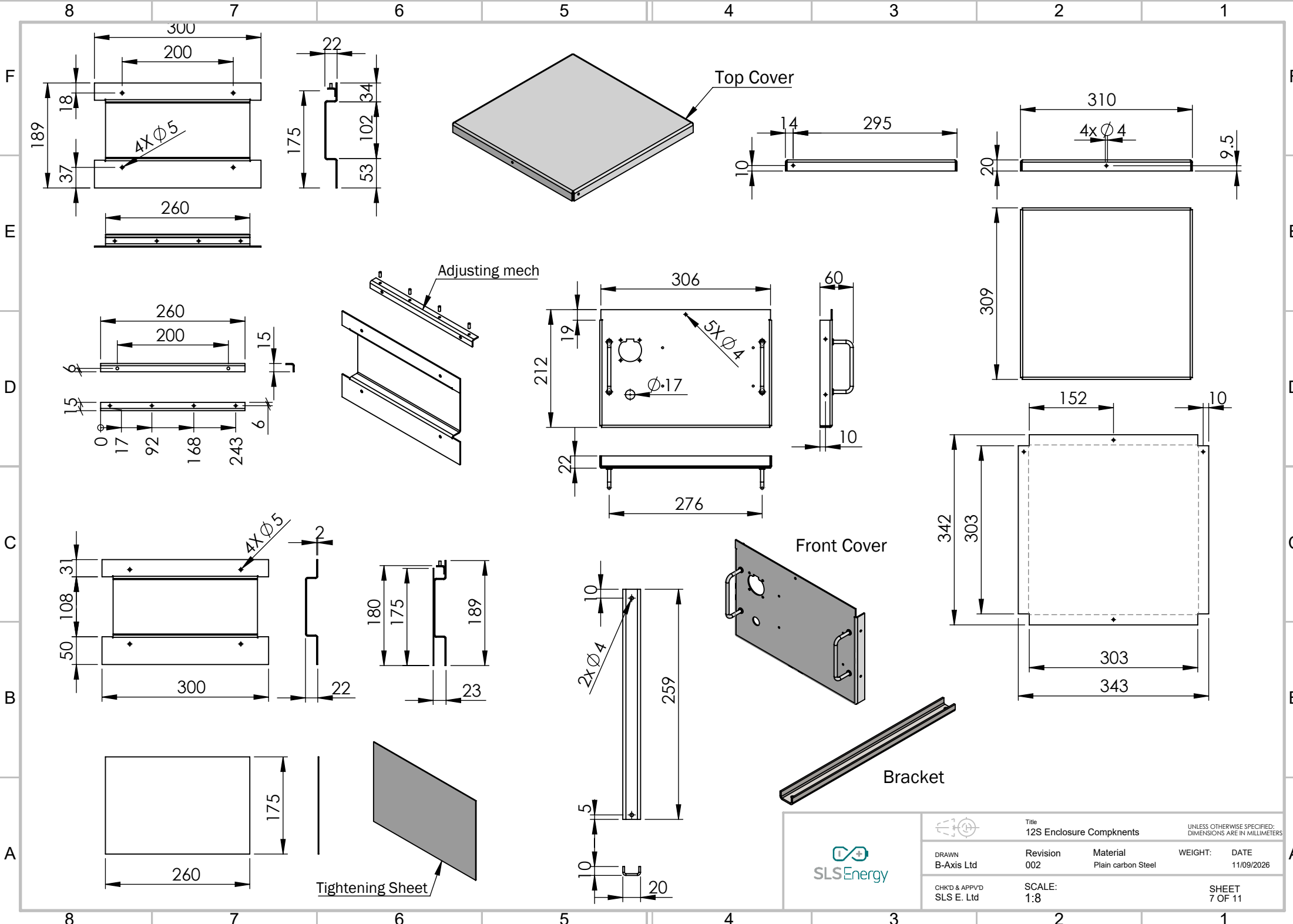


12S Enclosure Base

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS

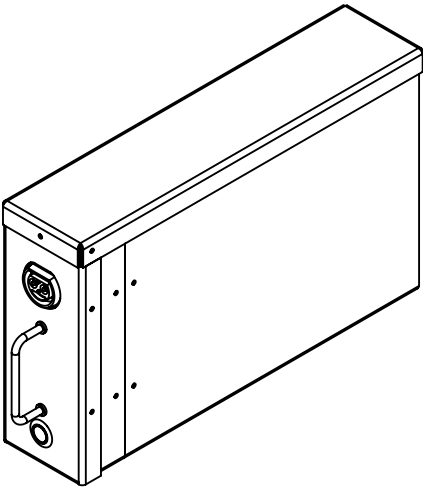
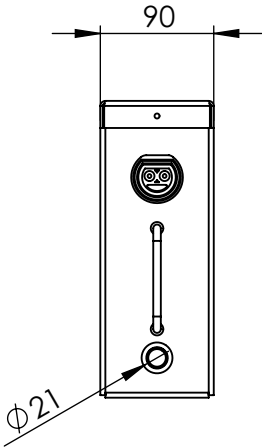
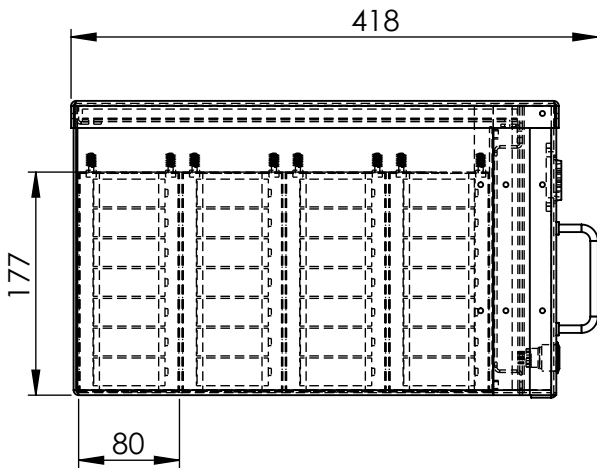
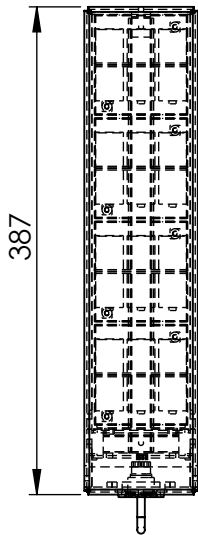
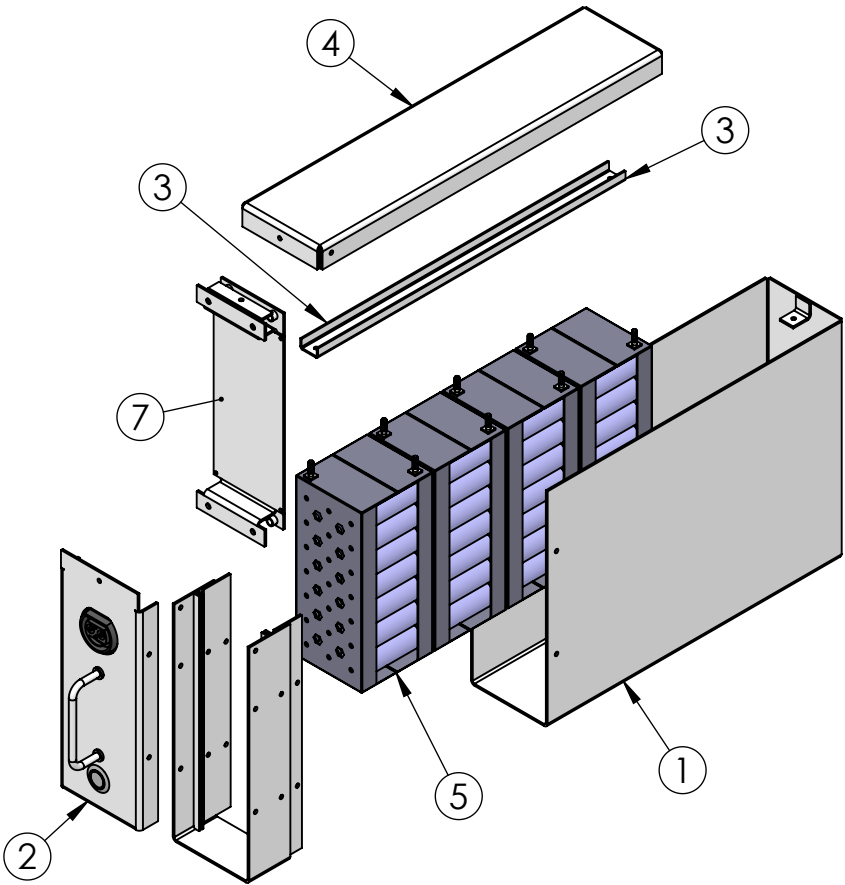
DRAWN B-Axis Ltd	Revision 002	Material Plain carbon Steel	WEIGHT: DATE 11/09/2026
CHKD & APPVD SLS E. Ltd	SCALE: 1:8	SHEET 6 OF 11	

8 7 6 5 4 3 2 1



			Title 12S Enclosure Compknents		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS	
	DRAWN B-Axis Ltd	Revision 002	Material Plain carbon Steel	WEIGHT:	DATE 11/09/2026	A
	CHKD & APPV'D SLS E. Ltd	SCALE: 1:8	SHEET 7 OF 11			

NO.	ITEM DECRPTION	QTY
1	Main Enclosure	1
2	Front Cover	1
3	Bracket	41
4	Top Cover	1
5	Cell Module	16
6	Switch	1
7	Connector	1



Title
12S E-Bike

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS

DRAWN
B-Axis Ltd

Revision
002

Material
Plain carbon Steel

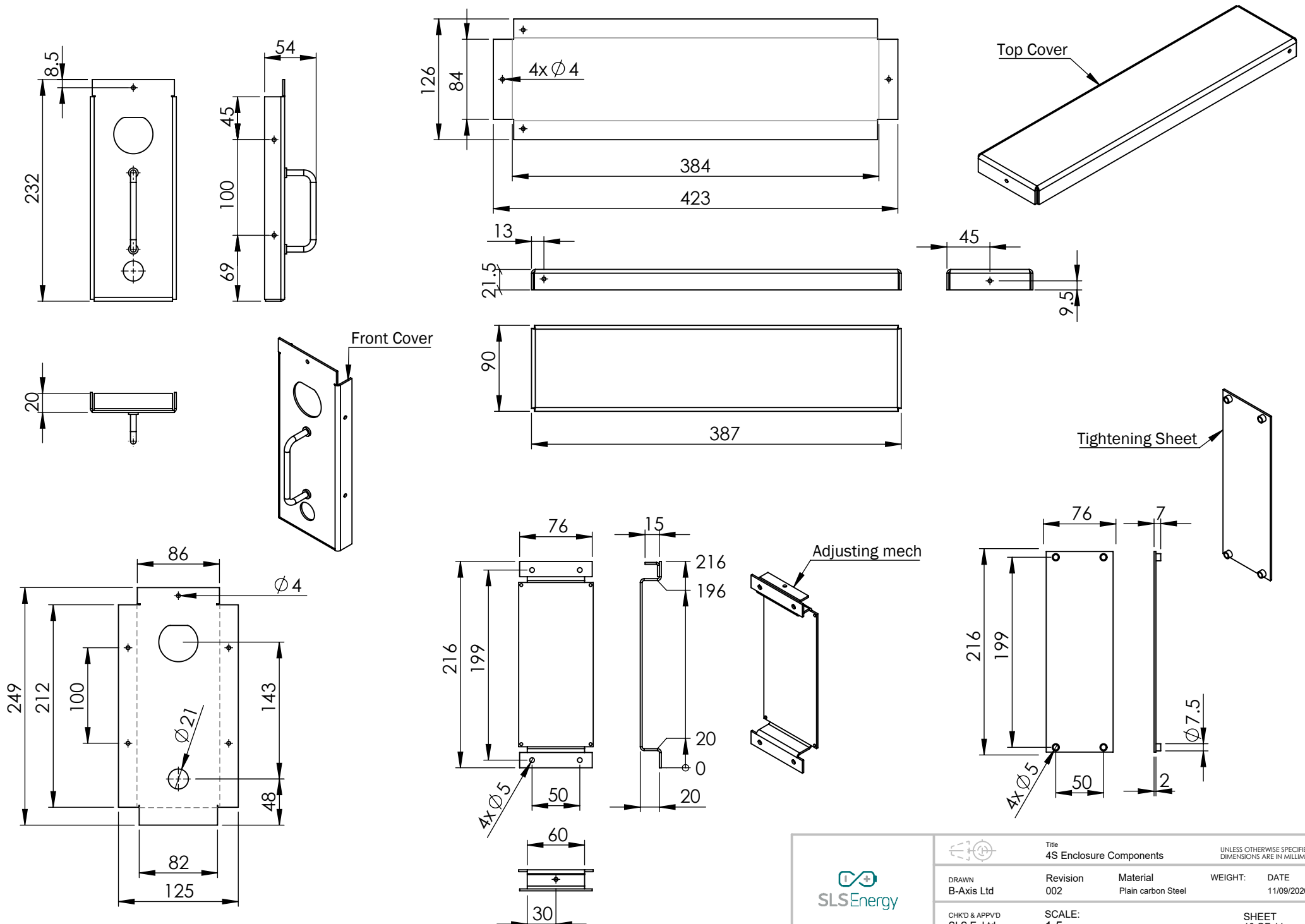
WEIGHT: DATE
11/09/2026

CHKD & APPVD
SLS E. Ltd

SCALE:
1:6

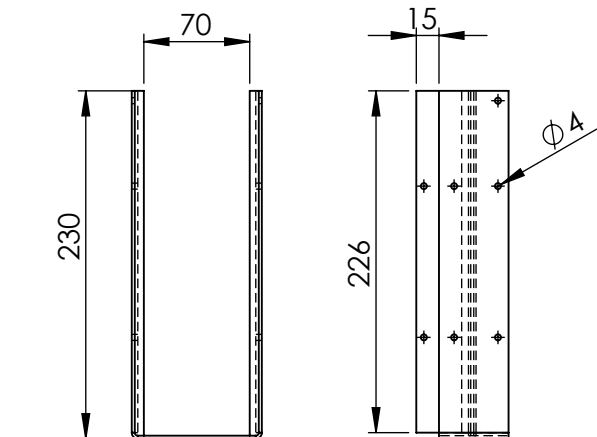
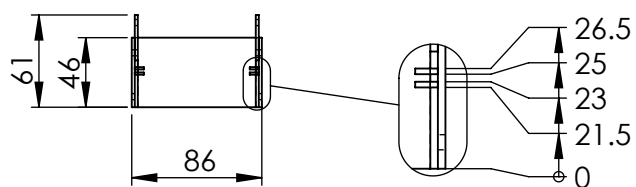
SHEET
8 OF 11

F
E
D
C
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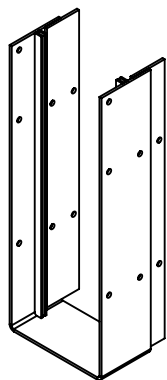
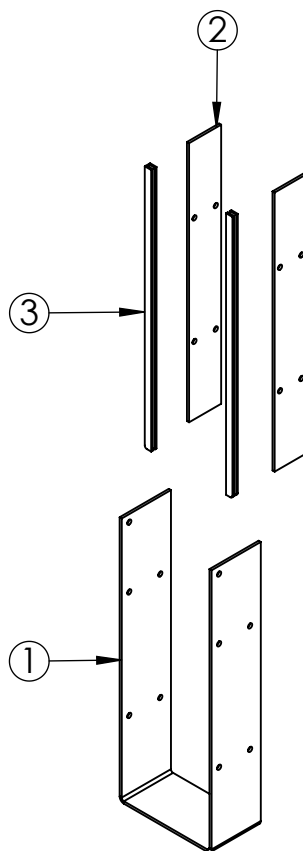
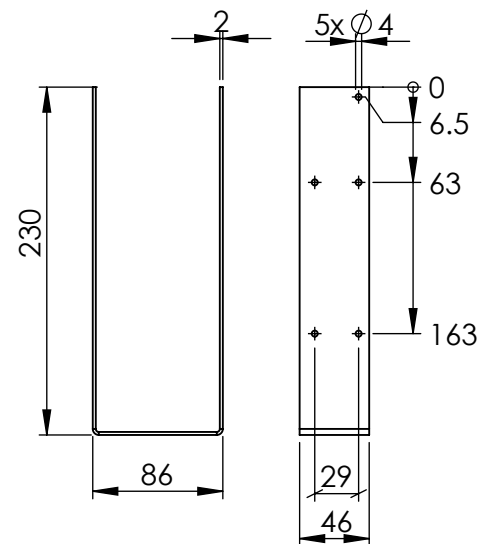
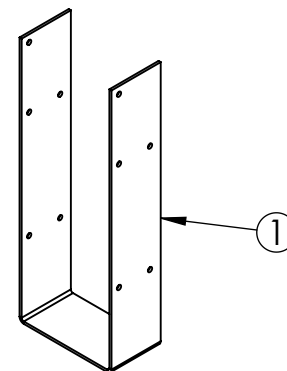
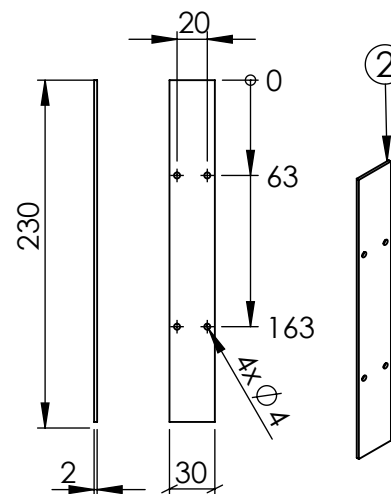
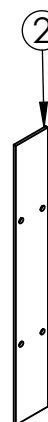
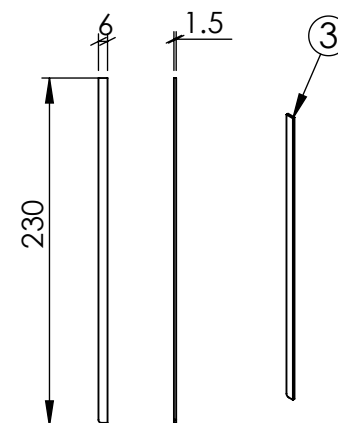


	Title 4S Enclosure Components		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS	
	DRAWN B-Axis Ltd	Revision 002	Material Plain carbon Steel	WEIGHT: DATE 11/09/2026
	CHKD & APPVD SLS E. Ltd	SCALE: 1:5	SHEET 10 OF 11	

F
E
D
C
B
A



DETAIL H
SCALE 1 : 2



Title
4S Middle Connector

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS

DRAWN
B-Axis Ltd

Revision
002

Material
Plain carbon Steel

WEIGHT:
0.66 kg

DATE
11/09/2026

CHKD & APPVD
SLS E. Ltd

SCALE:
1:5

SHEET
11 OF 11