

EXH • EXHE • EXHF • EXHFE series

HEAT-SINK ALUMINIUM ENCLOSURE

EXH • EXHE • EXHF • EXHFE series are aluminium enclosures with a highly efficient heat-sink top cover. Suitable to be used as fanless PC, power amplifier, and power supply box where heat dissipation is required. Wide range of 64 different sizes available with EMC shielded and flanged models.



Waved surface heat-sink fins for maximum cooling performance!

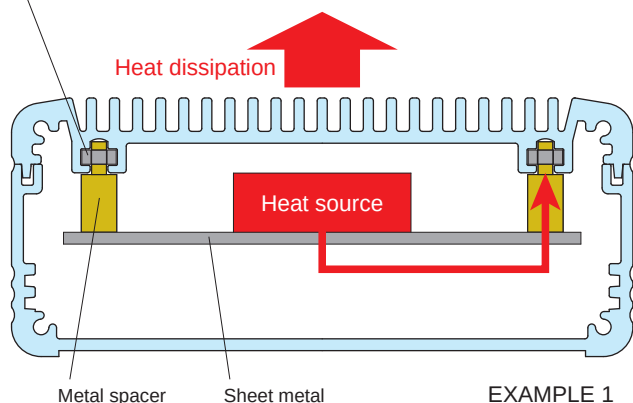
- Each heat-sink fin has a waved surface construction for maximum cooling performance.

Waved Surface

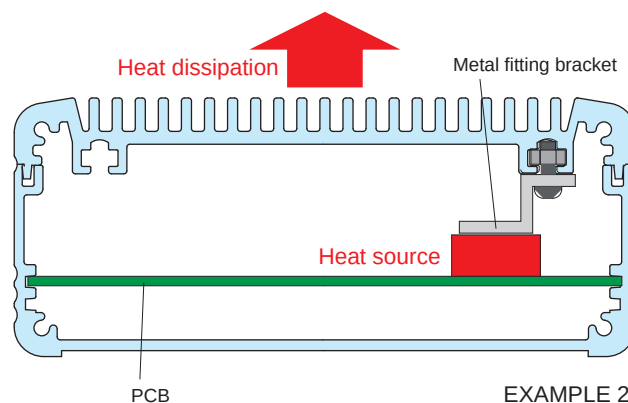


HEAT DISSIPATION EXAMPLE

- EXH series has grooves to put M3 nuts inside its heat-sink cover. It is possible to construct a heat conduction route from your heat source to heat-sink cover easily for better heat dissipation performance.



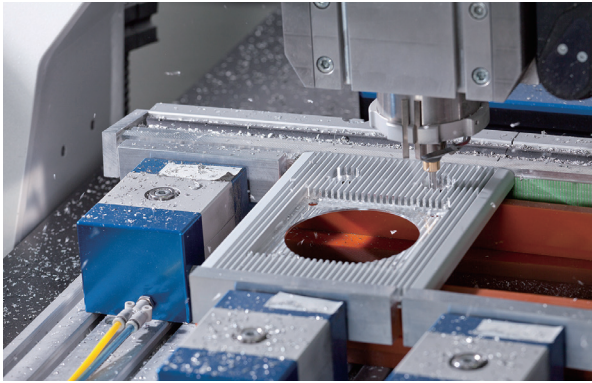
EXAMPLE 1



EXAMPLE 2

CUSTOMIZATION EXAMPLE

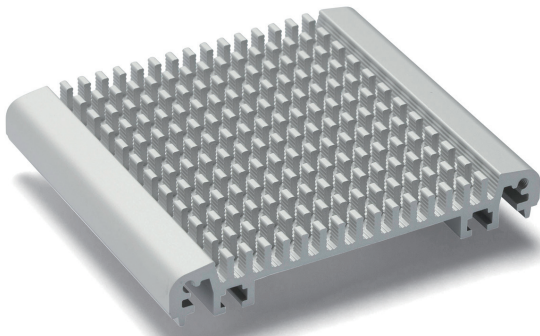
CNC Machining on Heat-sink Cover



Heat-sink plates can be customized with our high speed CNC machines.



Pin Shaped Fin Customization



Pin shaped heat-sink fin can be customized for better cooling performance.

Color Anodization

Various colors, such as blue, red, orange, green or purple can be anodized as per your requirements.



■ Not all colors and shades of colors are possible.

Custom Length Available



APPLICATION EXAMPLE

Stabilized Diode Laser

Controller



Laser Head



IoT Gateway



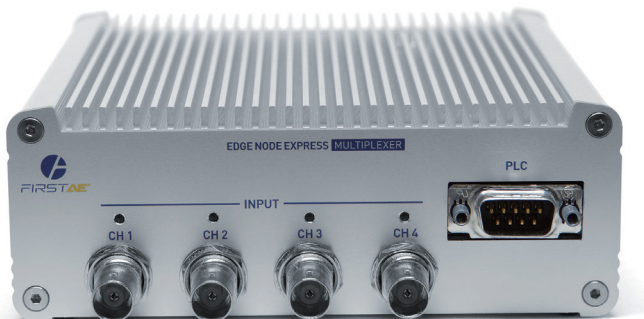
UPS Battery Monitoring System



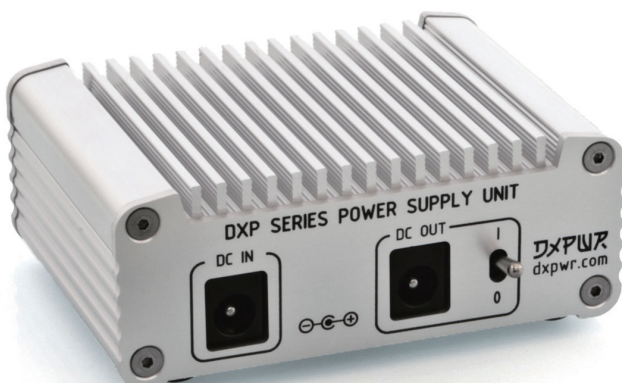
All-in-one Edge Node



4 Channel Power Switching Edge Node



Ultra Low Noise Regulation Power Supply



EXHF series

FLANGED HEAT-SINK ALUMINIUM ENCLOSURE

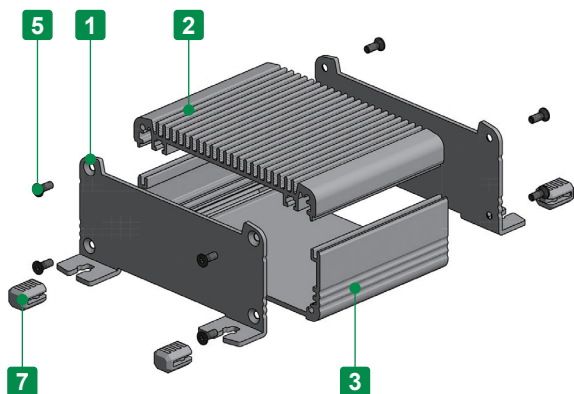


Heat
Resistant

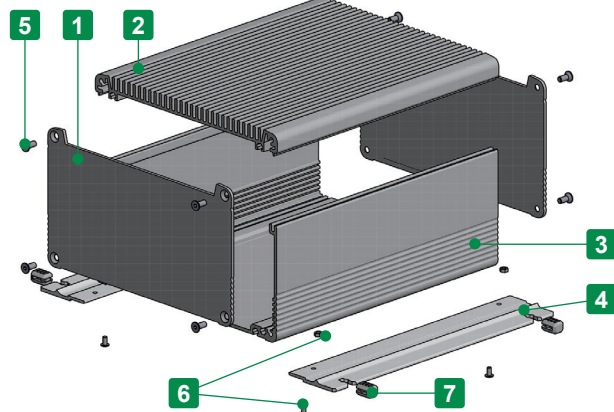


- Equipped with flanged bracket for easy wall mounting.
- Aluminum enclosure equipped with a highly efficient heat-sink top cover.

EXHF8-□, 11-□, 14-□



EXHF19-□, 23-□, 29-□



Components

No.	Part name	Pcs	Material	Color / Finish
1	Flanged panel (EXHF8-□, 11-□, 14-□) Panel (EXHF19-□, 23-□, 29-□)	2	Aluminium A1050P	Metallic silver / Painted (Unfinished inside) : Black / Anodized
2	Heat-sink top cover	1	Extruded aluminium A6063S-T5	Metallic silver / Painted (Unfinished inside) : Black / Anodized
3	Bottom frame	1	Extruded aluminium A6063S-T5	Metallic silver / Painted (Unfinished inside) : Black / Anodized
4	Flange bracket	2	Extruded aluminium A6063S-T5	Metallic silver / Painted • Black / Anodized
5	Panel screw (Hexagonal)	8	Stainless steel	Unfinished
6	Flange screw & nut	4 each	Steel	Black trivalent chromate
7	Rubber feet	4	Silicone	Black

Color Type

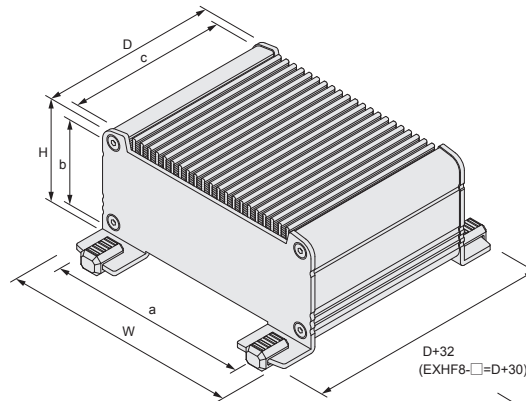
Code	S S Silver / Silver	B B Black / Black
Color		

Included screws
EXHF8-□ models : M2.5-8 x 8 pcs
EXHF11-□, 14-□ models : M3-8 x 8 pcs
EXHF19-□ models : M4-10 x 8 pcs
EXHF23-□, 29-□ models : M5-10 x 8 pcs
※Hexagonal wrench included

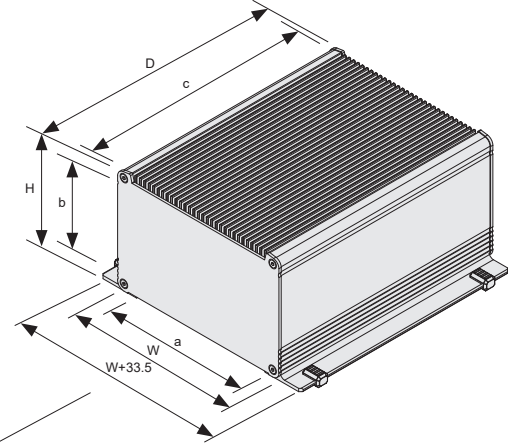
EXHF dimensions

■ DXF/DWG/PDF/STP drawings available on our website.

EXHF8-□, 11-□, 14-□



EXHF19-□, 23-□, 29-□



※c = Heat-sink top cover / Bottom frame length.

*Rubber feet dimensions are not included.

Product no. / Details

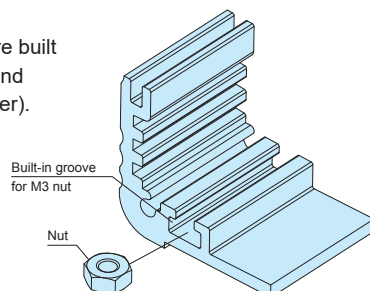
■ Please suffix color code at the end of the product number.

Product no.	External dimensions			Internal dimensions			※Thermal resistance rate (°C/W)
	W	H	D	a	b	c	
EXHF 8-3- 6□□	80.6	32.8	60	66	15	56	7.32
EXHF 8-3- 9□□	80.6	32.8	90	66	15	86	5.65
EXHF 8-3-12□□	80.6	32.8	120	66	15	116	4.72
EXHF 8-4- 6□□	80.6	42.8	60	66	25	56	7.32
EXHF 8-4- 9□□	80.6	42.8	90	66	25	86	5.65
EXHF 8-4-12□□	80.6	42.8	120	66	25	116	4.72
EXHF 8-6- 6□□	80.6	57.8	60	66	40	56	7.32
EXHF 8-6- 9□□	80.6	57.8	90	66	40	86	5.65
EXHF 8-6-12□□	80.6	57.8	120	66	40	116	4.72
EXHF11-3- 8□□	106	33.1	78	88.5	14	74	4.82
EXHF11-3-12□□	106	33.1	118	88.5	14	114	3.72
EXHF11-3-16□□	106	33.1	164	88.5	14	160	3.03
EXHF11-5- 8□□	106	48.1	78	88.5	29	74	4.82
EXHF11-5-12□□	106	48.1	118	88.5	29	114	3.72
EXHF11-5-16□□	106	48.1	164	88.5	29	160	3.03
EXHF11-6- 8□□	106	63.1	78	88.5	44	74	4.82
EXHF11-6-12□□	106	63.1	118	88.5	44	114	3.72
EXHF11-6-16□□	106	63.1	164	88.5	44	160	3.03
EXHF14-4-10□□	141	38.1	97	101.8	24.3	93	3.4
EXHF14-4-14□□	141	38.1	137	101.8	24.3	133	2.75
EXHF14-4-19□□	141	38.1	187	101.8	24.3	183	2.27
EXHF14-5-10□□	141	53.1	97	101.8	39.3	93	3.4
EXHF14-5-14□□	141	53.1	137	101.8	39.3	133	2.75
EXHF14-5-19□□	141	53.1	187	101.8	39.3	183	2.27
EXHF14-7-10□□	141	73.1	97	101.8	59.3	93	3.4
EXHF14-7-14□□	141	73.1	137	101.8	59.3	133	2.75
EXHF14-7-19□□	141	73.1	187	101.8	59.3	183	2.27
EXHF14-9-10□□	141	93.1	97	101.8	79.3	93	3.4
EXHF14-9-14□□	141	93.1	137	101.8	79.3	133	2.75
EXHF14-9-19□□	141	93.1	187	101.8	79.3	183	2.27

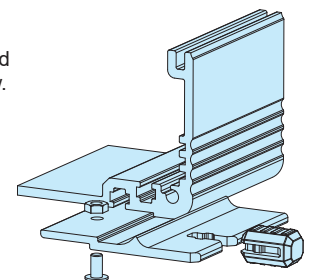
※Thermal resistance test condition

- Ambient air cooling.
- Heat-sink fins are set perpendicular to the ground with temperature at 60°C.
- Painted aluminium extrusion.
- Heat source is applied on the opposite side (inner side) of the fins.

- Grooves for M3 sliding nut are built into the heat-sink top cover and bottom frame (140mm or wider). Optional nut is available.



- Flange bracket is installed as per the diagram below.

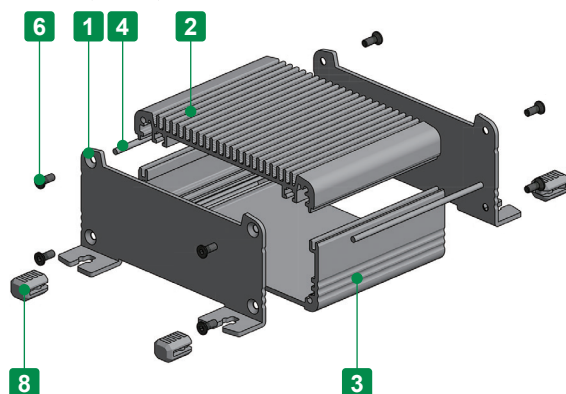


■ Custom length is available.

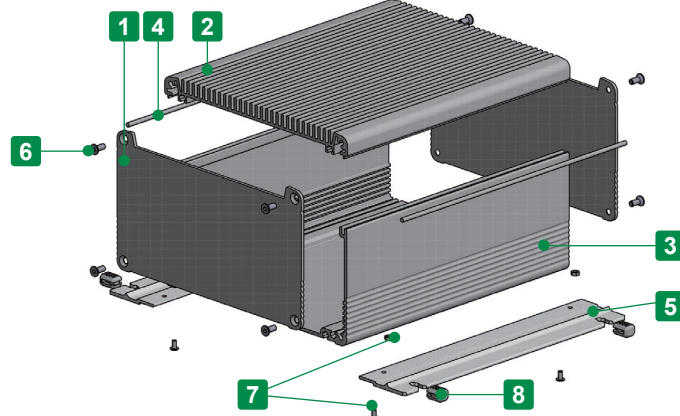
EXHFE series**FLANGED HEAT-SINK ALUMINIUM EMC SHIELDED ENCLOSURE**

- EMC shielding is achieved by having the unfinished internal parts of the enclosure, as well as the fabric-over-foam gasket, in contact with one another.
- Aluminium enclosure equipped with a highly efficient heat-sink top cover.
- Equipped with flanged bracket for easy wall mounting.

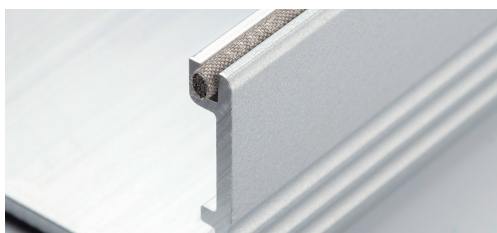
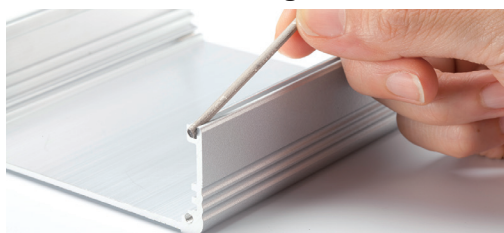
EXHFE8-□, 11-□, 14-□



EXHFE19-□, 23-□, 29-□

**Components**

No.	Part name	Pcs	Material	Color / Finish
1	Flanged panel (EXHFE8-□, 11-□, 14-□) Panel (EXHFE19-□, 23-□, 29-□)	2	Aluminium A1050P	Metallic silver / Painted (Unfinished inside)
2	Heat-sink top cover	1	Extruded aluminium A6063S-T5	Metallic silver / Painted (Unfinished inside)
3	Bottom frame	1	Extruded aluminium A6063S-T5	Metallic silver / Painted (Unfinished inside)
4	Fabric-over-foam gasket	2	Conductive fabric : TPE	Metallic gray
5	Flange bracket	2	Extruded aluminium A6063S-T5	Metallic silver / Painted
6	Panel screw (Hexagonal)	8	Stainless steel	Unfinished
7	Flange screw & nut	4 each	Steel	Black trivalent chromate
8	Rubber feet	4	Silicone	Black

How to install shield gaskets

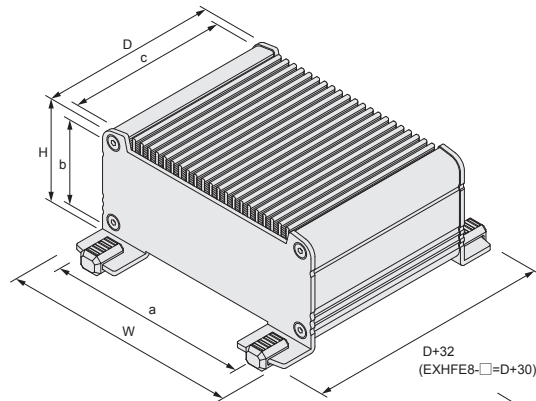
- Insert fabric-over-foam gaskets into the joint-grooves on both sides of the bottom cover.
- Ensure that a small portion of the fabric-over-foam gaskets protrude out in order to maintain connections with the end panels.

Included screws
 EXHFE8-□ models : M2.5-8 x 8 pcs
 EXHFE11-□, 14-□ models : M3-8 x 8 pcs
 EXHFE19-□ models : M4-10 x 8 pcs
 EXHFE23-□, 29-□ models : M5-10 x 8 pcs
 ※ Hexagonal wrench included

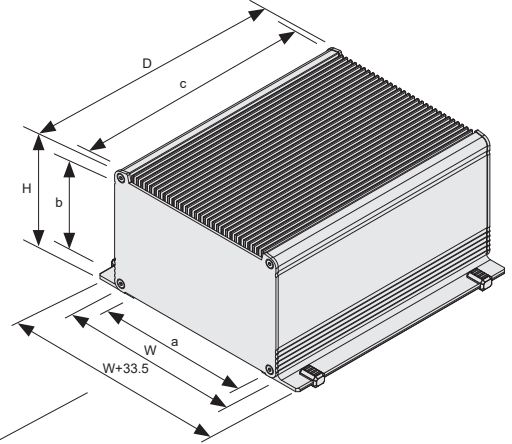
EXHFE dimensions

■ DXF/DWG/PDF/STP drawings available on our website.

EXHFE8-□, 11-□, 14-□



EXHFE19-□, 23-□, 29-□



※c = Heat-sink top cover / Bottom frame length.

*Rubber feet dimensions are not included.

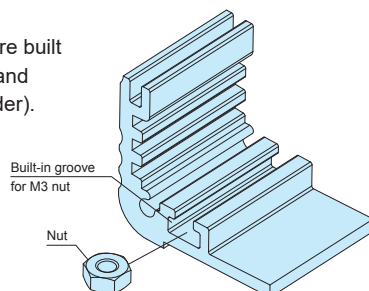
Product no. / Details

Product no.	External dimensions			Internal dimensions			※Thermal resistance rate (°C/W)
	W	H	D	a	b	c	
EXHFE 8-3- 6SS	80.6	32.8	60	66	15	56	7.32
EXHFE 8-3- 9SS	80.6	32.8	90	66	15	86	5.65
EXHFE 8-3-12SS	80.6	32.8	120	66	15	116	4.72
EXHFE 8-4- 6SS	80.6	42.8	60	66	25	56	7.32
EXHFE 8-4- 9SS	80.6	42.8	90	66	25	86	5.65
EXHFE 8-4-12SS	80.6	42.8	120	66	25	116	4.72
EXHFE 8-6- 6SS	80.6	57.8	60	66	40	56	7.32
EXHFE 8-6- 9SS	80.6	57.8	90	66	40	86	5.65
EXHFE 8-6-12SS	80.6	57.8	120	66	40	116	4.72
EXHFE11-3- 8SS	106	33.1	78	88.5	14	74	4.82
EXHFE11-3-12SS	106	33.1	118	88.5	14	114	3.72
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EXHFE11-6- 8SS	106	63.1	78	88.5	44	74	4.82
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EXHFE14-9-14SS	141	93.1	137	101.8	79.3	133	2.75
EXHFE14-9-19SS	141	93.1	187	101.8	79.3	183	2.27

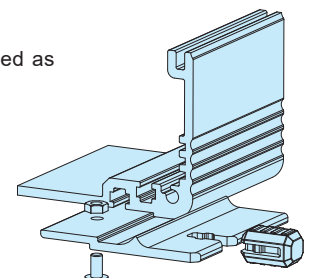
※ Thermal resistance test condition

- Ambient air cooling.
- Heat-sink fins are set perpendicular to the ground with temperature at 60°C.
- Painted aluminium extrusion.
- Heat source is applied on the opposite side (inner side) of the fins.

- Grooves for M3 sliding nut are built into the heat-sink top cover and bottom frame (140mm or wider). Optional nut is available.



- Flange bracket is installed as per the diagram below.



EF series**WALL MOUNTING BRACKET for EX • EXH • EXHE**

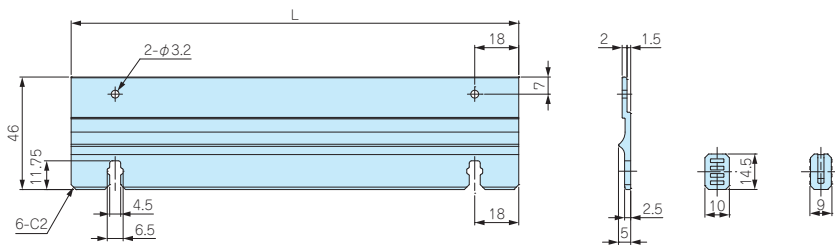
Installation Example



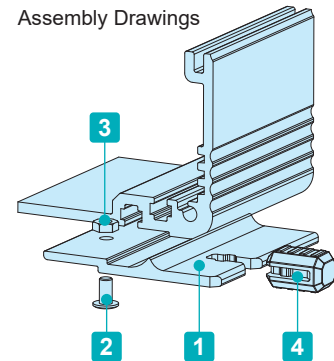
- Wall mounting bracket for EX, EXH, and EXHE series. Applicable only for width 185, 230, and 285mm bottom covers.
- Easy installation by inserting the nuts into built-in grooves on EX, EXH, and EXHE bottom cover.
- Rubber feet are included to hide the mounting cutouts when not used for wall mounting, and act as feet stabilizers for desktop use.

EF dimensions

■ DXF/DWG/PDF/STP drawings available on our website.



Assembly Drawings

**Components**

No.	Part name	Pcs	Material	Color / Finish
1	Bracket	2	Extruded aluminium A6063S-T5	Metallic silver / Painted • Black / Anodized
2	Screw	4	Steel	Black trivalent chromate
3	Nut	4	Steel	Black trivalent chromate
4	Rubber feet	4	Silicone	Black

Product no. / Details

Product no.		L	Suitable models
● Metallic silver	● Black		
EF19-13S	EF19-13B	119.5	EX • EXH • EXHE19-□-13
EF19-18S	EF19-18B	171.5	EX • EXH • EXHE19-□-18
EF19-23S	EF19-23B	224.5	EX • EXH • EXHE19-□-23
EF19-29S	EF19-29B	279.5	EX • EXH • EXHE19-□-29
EF23-15S	EF23-15B	146.5	EX • EXH • EXHE23-□-15
EF23-21S	EF23-21B	206.5	EX • EXH • EXHE23-□-21
EF23-27S	EF23-27B	266.5	EX • EXH • EXHE23-□-27
EF23-33S	EF23-33B	326.5	EX • EXH • EXHE23-□-33
EF29-23S	EF29-23B	227.5	EX • EXH • EXHE29-□-23
EF29-30S	EF29-30B	297.5	EX • EXH • EXHE29-□-30
EF29-38S	EF29-38B	377.5	EX • EXH • EXHE29-□-38

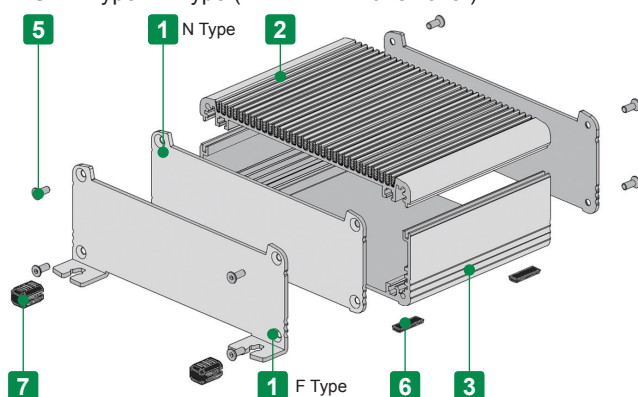


- Selectable in 19 different Width / Height types, with adjustable length (depth) in 1mm intervals from 40 to 500mm (80 to 500mm for flanged type).
N (no flange type) and F (flange type) are available.
- Custom sized aluminium enclosure equipped with a highly efficient heat-sink top cover.
- Suitable to be used as a fanless PC, power amplifier, power supply etc., where heat dissipation is required.

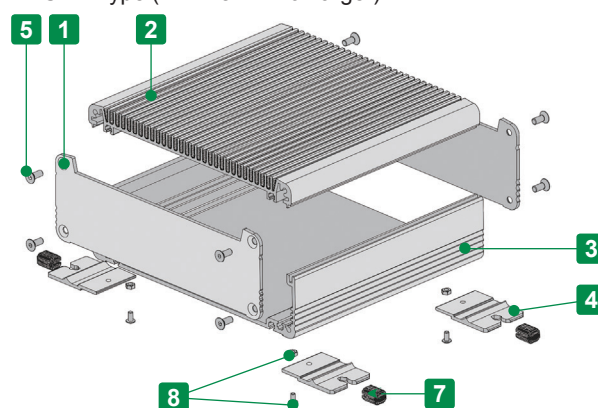


- Each heat-sink fin is constructed in a wave-like shape to maximize the heat dissipation effect.

EXHS N Type • F Type (W = 141mm or smaller)



EXHS F Type (W = 187mm or larger)



Components

No.	Part name	Pcs	Material	Color / Finish
1	Panel (N Type • F Type - W = 187mm or larger) Flange panel (F Type - W = 141mm or smaller)	2	Aluminium A1050P	Metallic silver / Painted (Unfinished inside) : Black / Anodized
2	Heat-sink top cover	1	Extruded aluminium A6063S-T5	Metallic silver / Painted : Black / Anodized
3	Bottom frame	1	Extruded aluminium A6063S-T5	Metallic silver / Painted : Black / Anodized
4	Flange bracket (F Type - W = 187mm or larger)	4	Extruded aluminium A6063S-T5	Metallic silver / Painted : Black / Anodized
5	Panel screw (Hexagonal)	8	Stainless steel	Unfinished
6	Rubber feet (N Type only)	4	Polyurethane • Synthetic rubber	Black
7	Rubber feet Insert (F type only)	4	Silicone	Black
8	Flange screw & nut (F Type - W = 187mm or larger)	4	Steel	Black trivalent chromate

■ See page EXHS-4 ~ EXHS-6 for Heat-sink top cover / Bottom frame dimensions.

■ Rubber feet material : Polyurethane : EXHS81-31-□ ~ 187-107-□ models • Synthetic rubber : EXHS232-52-□ ~ 288-128-□ models.

Product Number

To determine the product number, fill in the □ with detail 1 ~ 3 on page EXHS-2.

Product no. EXHS □ - □ □ □

 1 W-H 1 D length 2 Flange type 3 Color type

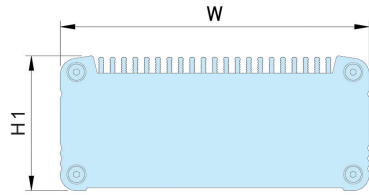
Example : W-H = 106-46.4 , D = 123 mm, no flange type, and S color.

EXHS 106 - 46 - 123 N S

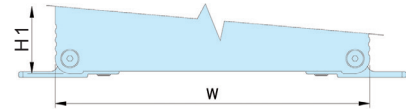
1 Dimensions

Width-Height dimension

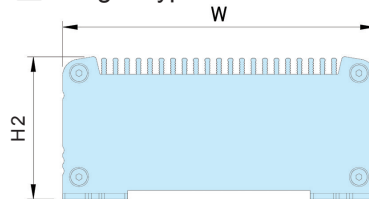
N No flange type



F Flanged type (187-□, 232-□, 288-□)



F Flanged type (81-□, 106-□, 141-□)



To select a Width-Height dimension number from the table below.

W-H No.	W	H1	H2
81- 31	80.6	30.7	32.8
81- 41	80.6	40.7	42.8
81- 56	80.6	55.7	57.8
106- 31	106	31.1	33.1
106- 46	106	46.1	48.1
106- 61	106	61.1	63.1
141- 36	141	36.1	38.1
141- 51	141	51.1	53.1
141- 71	141	71.1	73.1
141- 91	141	91.1	93.1
187- 44	186.5	43.5	73.1
187- 62	186.5	61.5	—
187- 82	186.5	81.5	—
187-107	186.5	106.5	—
232- 52	232	52	—
232- 77	232	77	—
232-102	232	102	—
NEW 288- 78	287.5	77.5	—
NEW 288-128	287.5	127.5	—

■ **N** (No flange type) and **F** (Flanged type) is selectable. Refer to **2 Flange** selection below.

D length

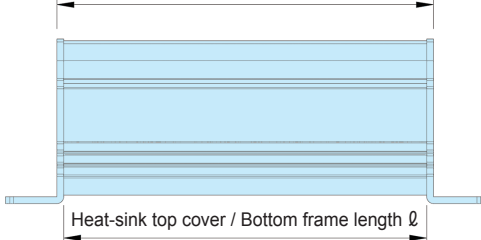
D length 40 ~ 500mm (1mm intervals)

※F type (W 187mm or larger) 80 ~ 500mm



Heat-sink top cover / Bottom frame length $\varnothing$

D length 40 ~ 500mm (1mm intervals)



Heat-sink top cover / Bottom frame length $\varnothing$

To specify D length in 1mm interval between 40 ~ 500 mm.

N No flange type

F Flanged type (187-□, 232-□, 288-□)

W-H No.	$\varnothing$
81-□	D-4
106-□	D-4
141-□	D-4
187-□	D-5
232-□	D-6
288-□	D-6

■ Both panel thickness added on
Top cover/Bottom frame length is D length.

F Flanged type (81-□, 106-□, 141-□)

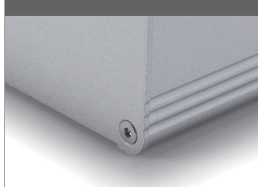
■ D length can be specified in 0.1mm intervals with cutting tolerances at ± 0.3 mm.
Cutting tolerance for 1.0 mm intervals shall be ± 0.2 mm.

■ See page EXHS-4 ~ EXHS-6 for detail dimensions

2 Flange

To select a flange type from the 2 types below.

N No flange



F Flanged

W-H No. 141-□ or smaller
(Flanged panel)



W-H No. 187-□ or larger
(Flange bracket)



3 Color

To select a color type from the 2 combinations below.

Code	S Silver / Silver	B Black / Black
Color		

Lead Time

Custom Size Only
Custom Size + Hole Milling

10 business days (1 ~ 10 pcs)
15 business days (1 ~ 10 pcs)

Order Inquiry

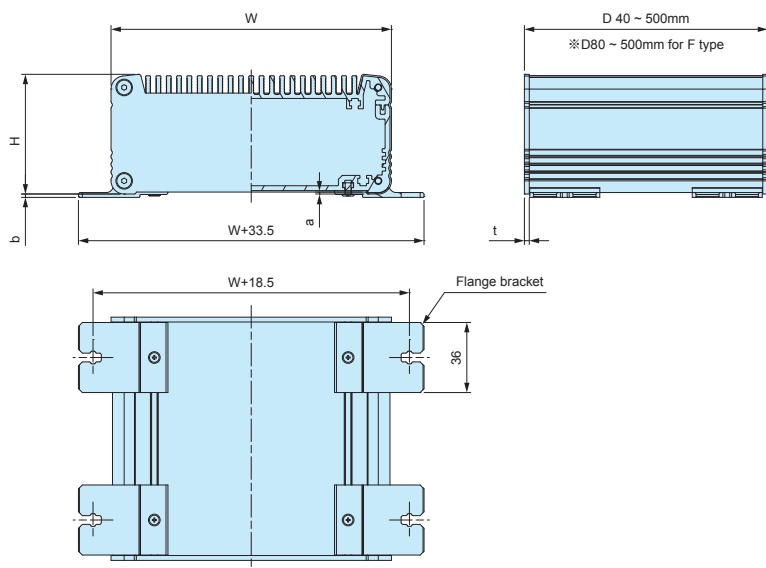
For more information, contact us here at sales@takachi-el.co.jp

EXHS dimensions

■ DXF/DWG/PDF drawings available on our website.

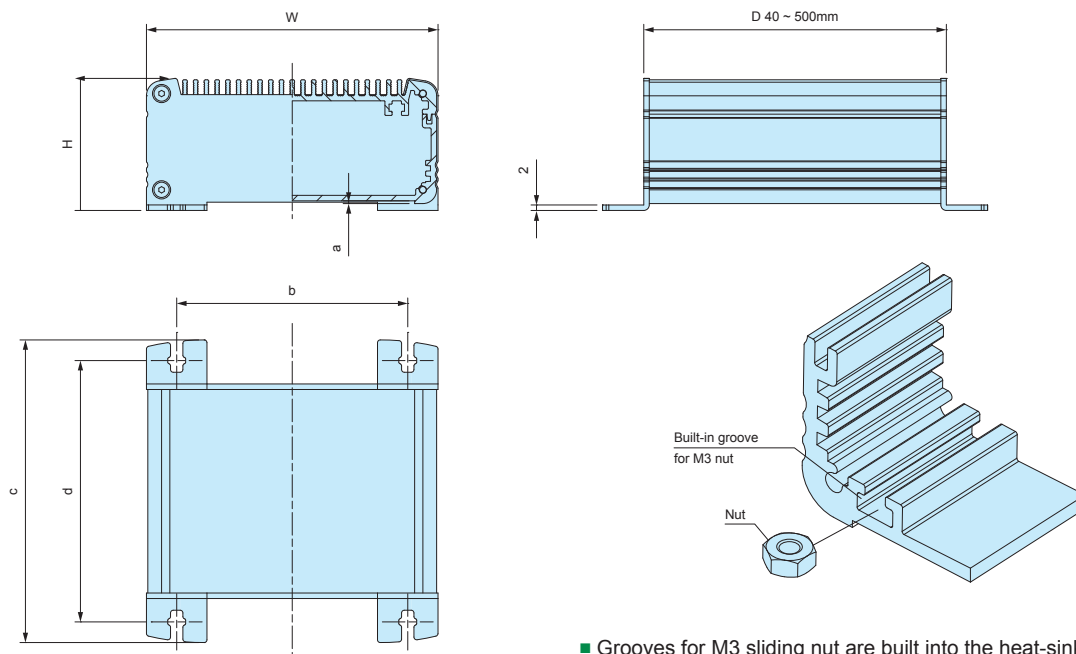
EXHS N type / F type (187-□ • 232-□ • 288-□)

※No flange bracket comes with N type.



Product no.	W	H	a	b	t
EXHS 81- 31-□	80.6	30.7	0.9	—	2
EXHS 81- 41-□	80.6	40.7	0.9	—	2
EXHS 81- 56-□	80.6	55.7	0.9	—	2
EXHS106- 31-□	106	31.1	1	—	2
EXHS106- 46-□	106	46.1	1	—	2
EXHS106- 61-□	106	61.1	1	—	2
EXHS141- 36-□	141	36.1	1	—	2
EXHS141- 51-□	141	51.1	1	—	2
EXHS141- 71-□	141	71.1	1	—	2
EXHS141- 91-□	141	91.1	1	—	2
EXHS187- 44-□	186.5	43.5	1	1.75	2.5
EXHS187- 62-□	186.5	61.5	1	1.75	2.5
EXHS187- 82-□	186.5	81.5	1	1.75	2.5
EXHS187-107-□	186.5	106.5	1	1.75	2.5
EXHS232- 52-□	232	52	1	1.5	3
EXHS232- 77-□	232	77	1	1.5	3
EXHS232-102-□	232	102	1	1.5	3
EXHS288- 78-□	287.5	77.5	1	1.25	3
EXHS288-128-□	287.5	127.5	1	1.25	3

EXHS F type (81-□ • 106-□ • 141-□)



Included screws

EXHS81-□ models : M2.5-8x8pcs

EXHS106-□,141-□ models : M3-8x8pcs

EXHS187-□ models : M4-10x8pcs

EXHS232-□, 288-□ models : M5-10x8pcs

※Hexagonal wrench included.

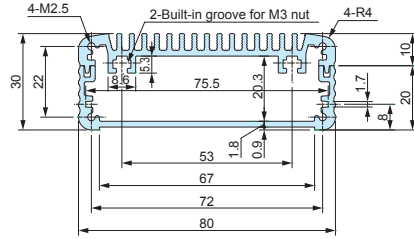
■ Grooves for M3 sliding nut are built into the heat-sink top cover and bottom frame (140mm or wider).
Optional nut is available.

Product no.	W	H	a	b	c	d
EXHS 81- 31-□F	80.6	32.8	0.9	62.6	D+30	D+15
EXHS 81- 41-□F	80.6	42.8	0.9	62.6	D+30	D+15
EXHS 81- 56-□F	80.6	57.8	0.9	62.6	D+30	D+15
EXHS106- 31-□F	106	33.1	1	84	D+32	D+17
EXHS106- 46-□F	106	48.1	1	84	D+32	D+17
EXHS106- 61-□F	106	63.1	1	84	D+32	D+17
EXHS141- 36-□F	141	38.1	1	119	D+32	D+17
EXHS141- 51-□F	141	53.1	1	119	D+32	D+17
EXHS141- 71-□F	141	73.1	1	119	D+32	D+17
EXHS141- 91-□F	141	93.1	1	119	D+32	D+17

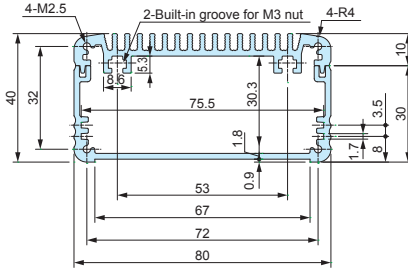
Cross-section view of heat-sink top cover & bottom frame

■ DXF/DWG/PDF drawings available on our website.

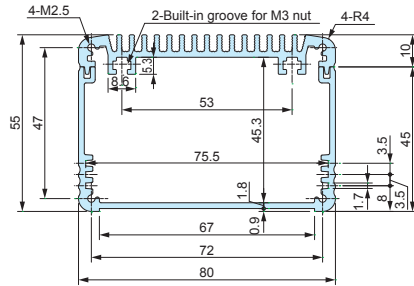
EXHS81-31-□



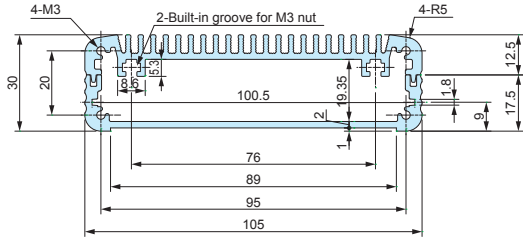
EXHS81-41-□



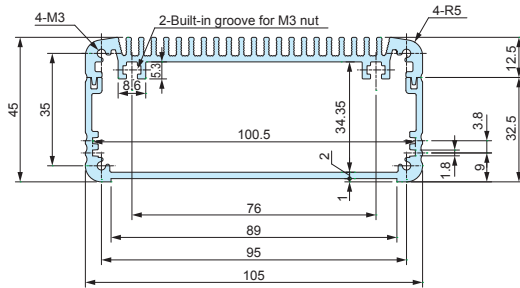
EXHS81-56-□



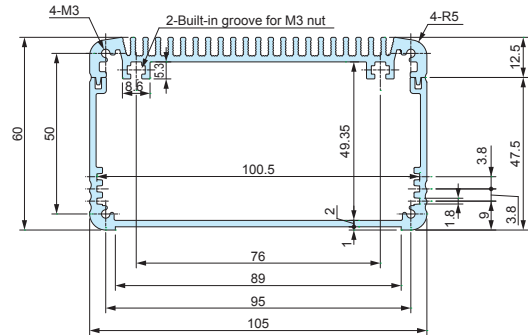
EXHS106-31-□



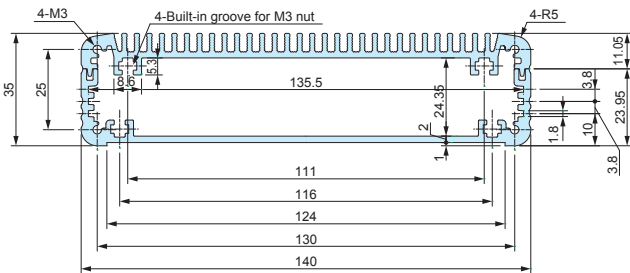
EXHS106-46-□



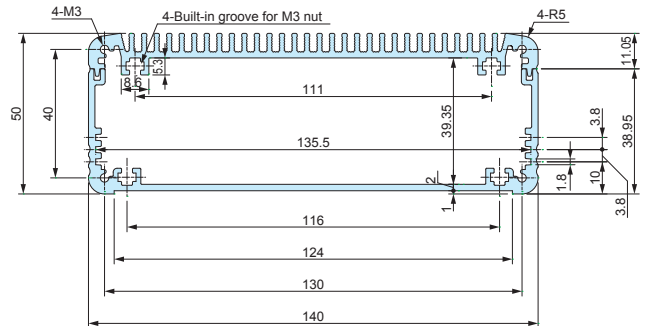
EXHS106-61-□



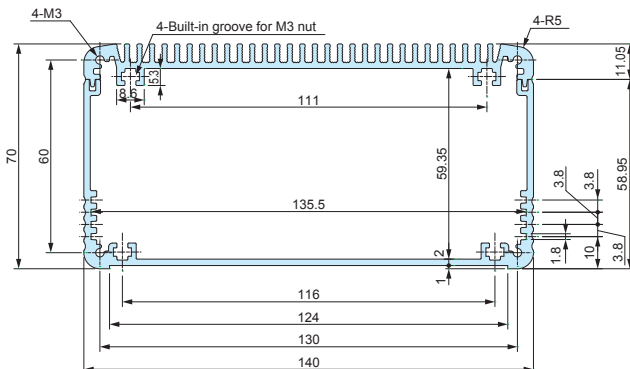
EXHS141-36-□



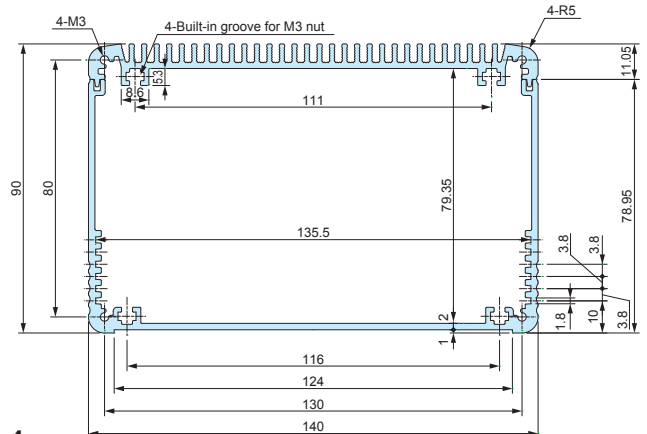
EXHS141-51-□



EXHS141-71-□



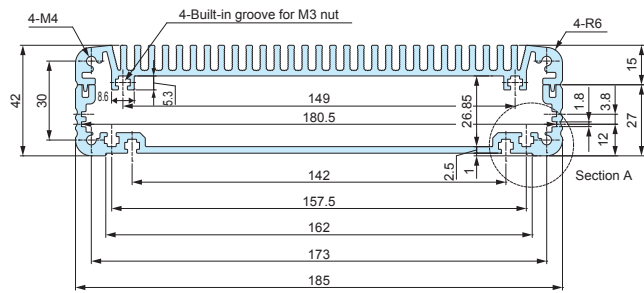
EXHS141-91-□



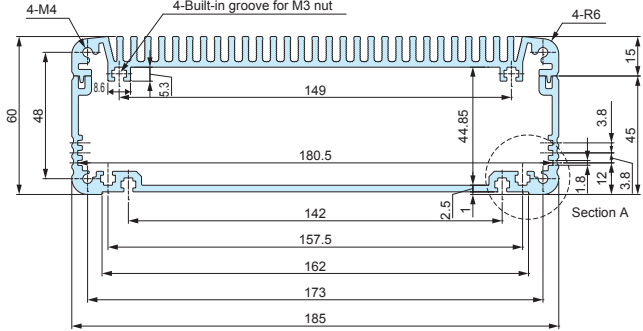
Cross-section view of heat-sink top cover & bottom frame

■ DXF/DWG/PDF drawings available on our website.

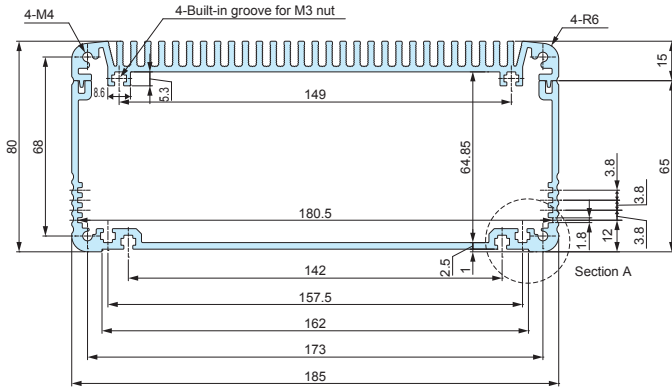
EXHS187-44-□



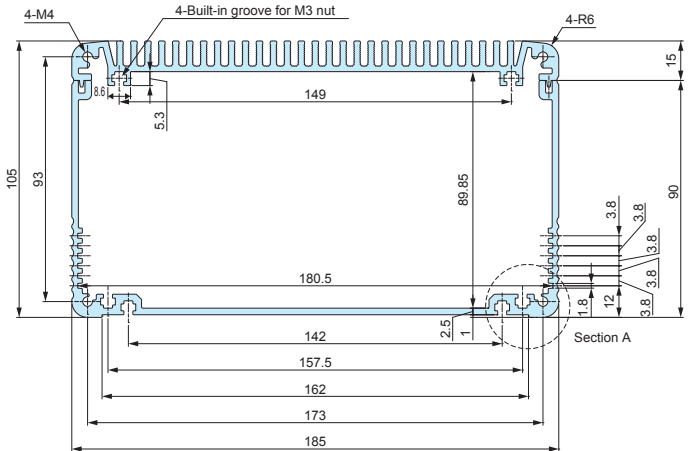
EXHS187-62-□



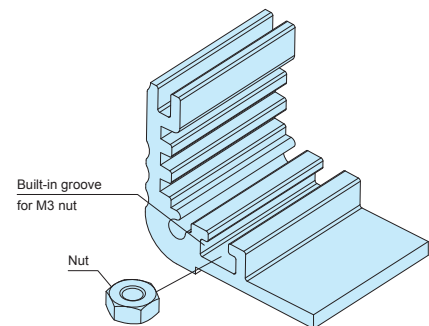
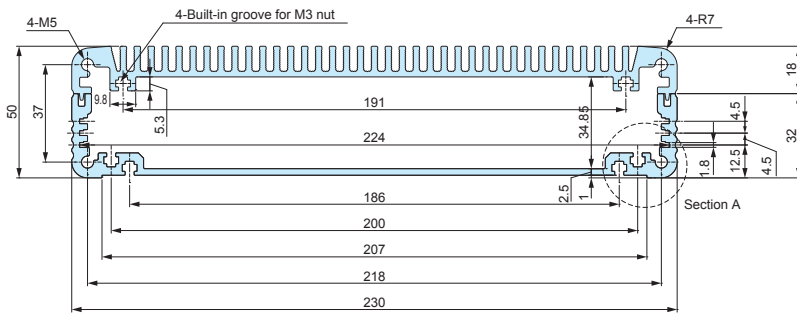
EXHS187-82-□



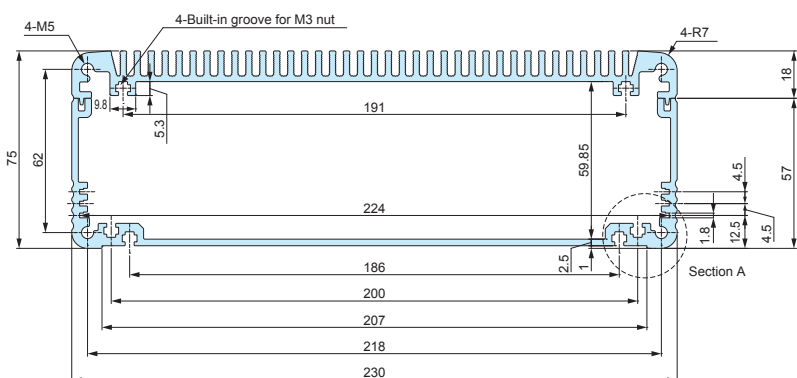
EXHS187-107-□



EXHS232-52-□

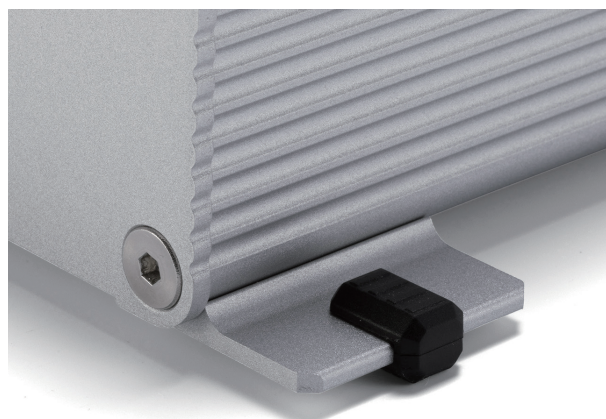
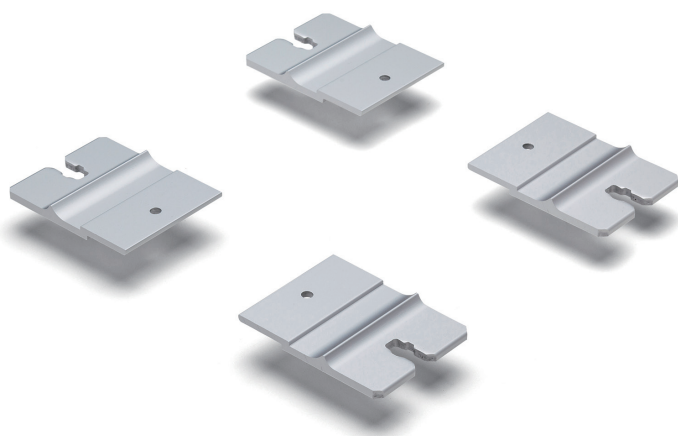


EXHS232-77-□

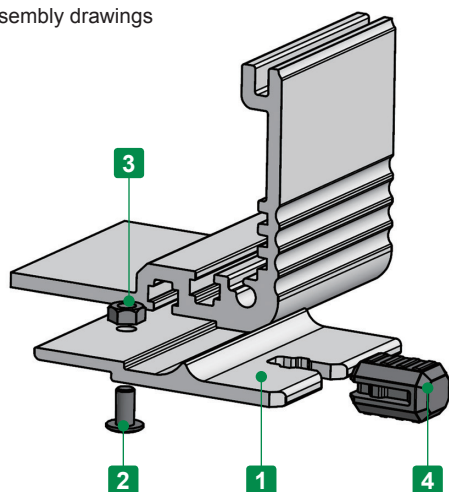


■ Optional M3 nut is available.
Sliding nut can be used on all EXHS models with width 140mm and larger bottom covers, as well as all heat-sink top covers.
See page EF-36 • MT-3N for MT-3N optional M3 nut.

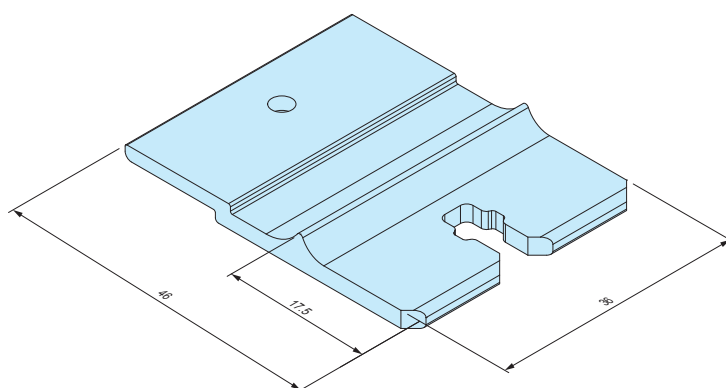
※See page EXHS-6 for detailed dimensions of Section A

EF-36 series**WALL MOUNTING BRACKET for EXS • EXHS**

Assembly drawings



Utilize rubber feet inserts when placing on tables or flat surfaces.

EF-36 dimensions

■ DXF/DWG/PDF/STP drawings available on our website.

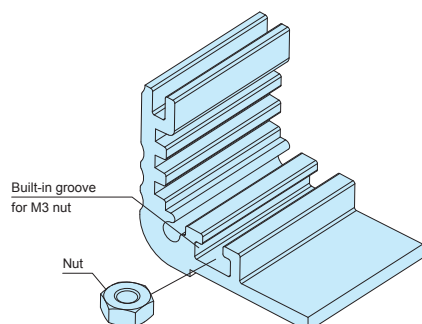
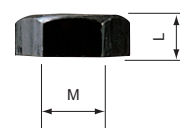
Components

No.	Part name	Pcs	Material	Color / Finish
1	Bracket	4	Extruded aluminium A6063S-T5	Metallic silver / Painted : Black / Anodized
2	Screw (Slim head M3-6)	4	Steel	Black trivalent chromate
3	Nut (For M3 screw)	4	Steel	Black trivalent chromate
4	Insert rubber feet	4	Silicone	Black

Product no.

Product no.	
● Metallic silver / Painted	● Black / Anodized
EF-36S	EF-36B

■ Applicable to be used on EXS series with 185mm or larger bottom covers, and EXHS series with 187mm or larger bottom covers.

MT-3N**SLIDING NUT for EXPS • EXPFS • EXWS • EXWFS • EXS • EXHS****MT-3N dimensions****Product no. / Dimensions**

Product no.	M	L	Material	Finish	Pack of
MT-3N	3	2.4	Steel	Black trivalent chromate	50

■ Sliding nut can be used on all EXPS • EXPFS • EXWS • EXWFS • EXS models with width 140mm or larger bottom covers and with width 230mm and 285mm top covers, as well as on all EXHS models with width 140mm or larger bottom covers and on all heat-sink top cover sizes.