

PROTECTION CLASS (IP RATING)

IP67
is

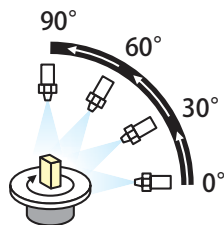
● IEC60529 standard is a system for classifying the degrees of protection provided by the enclosures of electrical equipment, such as against dust and water.

IP

First digit : Solid particle protection

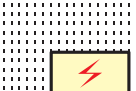
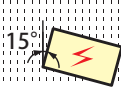
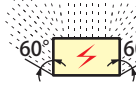
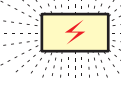
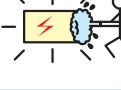
No.	Protection against ingress of solid foreign objects	Protection against access to hazardous parts
0	No Protection	No Protection
1	 Protected against solid objects over 50mm.	 Protected against accidental touch by a large surface of the body, such as by hands. (Tested with a 50mm diameter steel ball.)
2	 Protected against solid objects over 12.5mm.	 Protected against accidental touch by fingers or similar objects (Tested with a 12mm diameter, 80mm long articulated finger)
3	 Protected against solid objects over 2.5mm.	 Protected against accidental touch by tools or thick wires. (Tested with a 2.5mm diameter, 100mm long bar)
4	 Protected against solid objects over 1.0mm.	 Protected against accidental touch by most wires and screws. (Tested with a 1.0mm diameter, 100mm long wire)
5	 Protected against dust; limited ingress, no harmful deposits.	
6	 Complete protection against dust.	

69K



80 to 100 barrel steam jets at 80°C (±5°C) from a 0°, 30°, 60°, and 90° angle, at a distance of 100 ~ 150mm for 30 sec x 5 sets

Second digit: Liquid ingress protection

No.	Protection against ingress of liquid
0	No Protection
1	 Dripping water (vertically falling drops) for 10 minutes.
2	 Vertically dripping water when tilted at 15° for 10 minutes (2.5 minutes per position).
3	 Spraying water (at any angle) of 0.07l/min up to 60° from the vertical for 10 minutes.
4	 Spraying water of 0.07l/min from all directions for 10 minutes.
5	 Jets of water projected by a φ6.3 nozzle of 12.5l / min from all directions at 1 min / 1m for at least 3 minutes.
6	 Powerful jets of water projected by a φ12.3 nozzle of 100l / min from all directions at 1 min / 1m for at least 3 minutes.
7	 Immersion, up to 1 meter depth (for 30 mins).
8	 Immersion (test depth and duration beyond IPX7 requirements)

A point of note for Waterproof Boxes

- For outdoor use, direct sunlight will accelerate the degradation of the box. For more information, please see page Outdoor Use - 1.
- For customers planning to attach their own original mounting brackets onto the waterproof boxes, it is recommended to mill larger holes with enough clearance to attach the bracket. If the milled hole and clearance is too small, it may cause irreparable damage to the box.
- Waterproof boxes made of Polycarbonate or ABS plastic material may be damaged if certain types of washing chemicals, solvents, oils, or thread locking adhesives are present on the box. Furthermore, paint not suitable to be used on plastic materials may also cause damage.

IP67 WEARABLE ENCLOSURE

A stylish design enclosure with wrist strap,
perfect solution for wearable devices.

SMW series



**Stylish and luxurious mirror
finish enclosure body**



**Water-repellent comfortable
silicone wrist strap**



High water resistance of IP67 withstands submersion in 1m depth for 30 minutes.

Degradation resistant silicone gasket for long-lasting performance.



Tabbed battery and coin battery holder can be installed.



For various wearable IoT devices

Suitable for small IoT devices including LoRaWAN and Sigfox, detectors, RFID tags, GPS terminals and others.

Environmental sensor



Access control system



GPS tracker



Emergency alert system



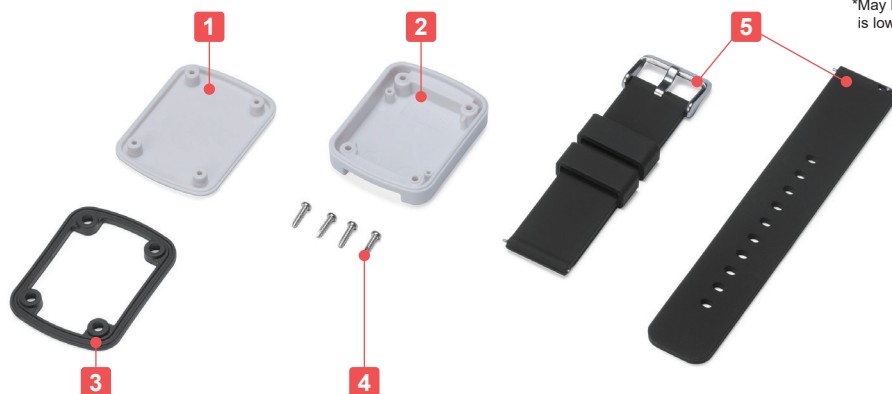


- Wearable enclosure with IP67 waterproof rating (30min / 1m-depth).
- Off-white models are made of weather-resistant ASA material. Suitable for devices intended to be used under direct sunlight.
- Stylish and easy-to-wear design that suits any situations.
- Suitable for detectors, GPS terminals, RFID devices, small IoT devices and others.

Technical Data

Protection class : IP67 (30min / 1m-depth)
 Operating temperature
 Black (ABS) : -10°C ~ +60°C
 Off-white (ASA) : -30°C ~ +60°C
 Recommended torque : SMW-46□ : 0.2N • m
 SMW-50□ : 0.35N • m

*May become brittle and break under impact when temperature is lowered close to -30°C.



Components

No.	Part name	Pcs	Material	Color / Finish
1	Top cover	1	ABS (UL94HB)	Black / Polished
			ASA (UL94HB)	Off-white / Polished
2	Bottom cover	1	ABS (UL94HB)	Black / Polished
			ASA (UL94HB)	Off-white / Polished
3	Gasket	1	Silicon	Black
4	Tapping screw	4	Stainless steel	Unfinished
5	Wrist strap	1	Silicon • Stainless steel	Black • Polished

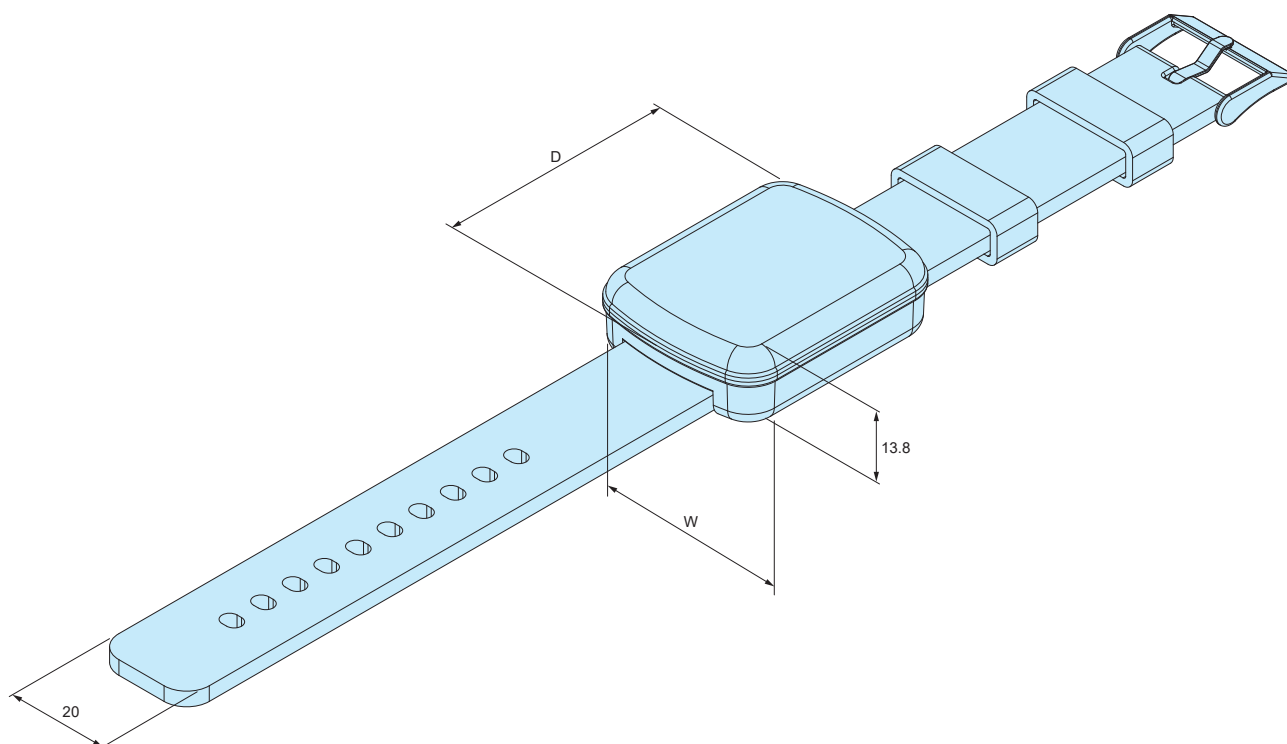
Accessories (Optional parts)



PCB mounting screw
EM-1.6
See page 398

SMW dimensions

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



Product no. / Details

Product no.		External dimensions		Weight (g)
● Black	● Off-white	W	D	
SMW-46B	SMW-46W	36	46	28
SMW-50B	SMW-50W	44	50	30.5

Accessories (Optional parts) – COIN CELL BATTERY HOLDERS



- Various coin cell battery holders can be stored.
See coin cell battery holders on our website for more details.
- Chart on the right is based upon mounting onto a 1.0mm thick PCB and attached to the top cover.
- Please note that depending on the mounting location, PCB may not be able to be properly affixed on.

COMPATIBLE COIN CELL BATTERY HOLDERS CHART

Product no.	Compatible coin cell battery holders
SMW-46□	PB621 BK-879 • 2032M BS-M-1225 • BS-S-1225 • SMTM1632
SMW-50□	PB621 BK-879 • 5067 • 2430SM • 2032M BS-M-1225 • BS-S-1225 • SMTM1632 • 2032

IP67 PORTABLE CASE WC series



● The protection rating against dust and water which applies to the enclosure used for electrical equipment, represented with a code based on the IEC60529 standard.

IP6x : No ingress of dust; complete protection against contact (dust tight)

IPx7 : No ingress of water when submerged up to a depth of 1 m for 30 min

High waterproof performance with both TPE and silicone gasket

ABS and TPE double-shot molded top & bottom covers allow for a good waterproof seal.

The durable silicone gasket maintains the battery lid seal.

Insert nut and screw help to maintain the waterproofing performance of the battery compartment even after repeated opening/closing.

Great protection by TPE sides

Side grips of TPE material provide a comfortable grip and protection against drop impact.



Available in 3 different color combinations



APPLICATION EXAMPLE

Best for outdoor use as a remote control, RFID tag, compact GPS, wireless device, simplified measurement gadget and more.

Multi-function Infrared Remote Controller



Emergency Call Receiver / Transmitter



Long Range Keyfob Remote Controller



GPS Vehicle Tracker



Custom embossed or standard overlay sheets with low initial costs are available

Waterproof performance may be lost by drilling/milling holes or cut-outs for buttons or switches on waterproof enclosures. Use an IP rated overlay sheet, or membrane keypad in order to allow the milled area to remain waterproof.



- Advantage 1** Reduce initial cost with digital inkjet printing.
- Advantage 2** Reduce initial tooling cost for cutting die with digital cutting plotter.
- Advantage 3** Reduce initial tooling cost for embossing with in-house mold processing.
- Advantage 4** Shorter lead-time made possible by having all production be in-house.

*applicable to small quantity orders



- Double shot injection molded TPE Grip and ABS Body.
- New CR2450/CR2477 battery compartment model added. Case with a CR2032 coin battery, 2x AAA battery compartment and no battery types are also available.
- TPE side grip provides not only a comfortable grip, but also protects from drop impact.
- Suitable to be used as a remote controller, key fob, wireless device, RFID tag, and so on.
- See page 31 for coin battery contact installation steps.

Technical Data

Protection class : IP67
 Operating temperature : -10°C ~ +50°C
 Recommended torque :
 WC72 • 90 • 100 : 0.06 ~ 0.08 N • m
 WC105 : 0.13 ~ 0.15 N • m

WC72-□, WC90-□, WC100-20



WC105-28

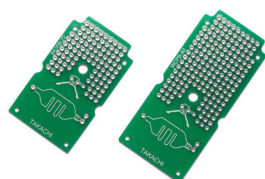


Components

No.	Part name	Pcs	Material	Color / Finish
1	Top cover	1	ABS UL94HB : Elastomer	Black & Black • Black & Marine • White & Light gray
2	Bottom cover	1	ABS UL94HB : Elastomer	Black & Black • Black & Marine • White & Light gray
3	Battery lid*	1	ABS UL94HB	Black • White
4	Battery contact*	1 set	WC72 • WC90 • WC100 : Stainless steel SUS304 WC105 : Brass • Hard steel wire	Nickel plated
5	O-ring*	1	Silicone	Black
6	Screw	7	Stainless steel SUS304	Unfinished

*Not applicable to the N (no battery compartment type) models.

Accessories (Optional parts)



Exclusive PCB WCPB series
See page 33



Strap STPS series
See page 34



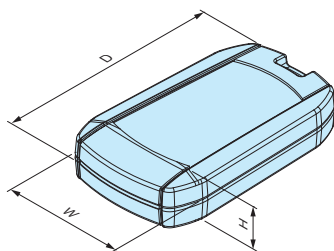
PCB mounting screw EM-1.6
See page 398



Neodymium magnet NMG series
See page 392

WC dimensions

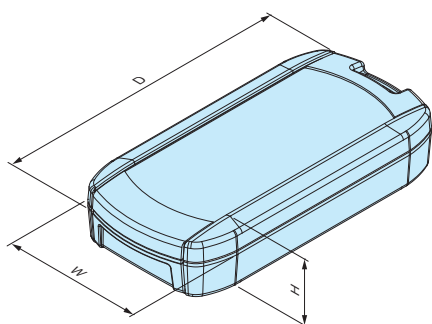
WC72-□, WC90-□



Battery Compartment Types

Type	N	C	R	F2
	None	CR2032 × 1	CR2450 / 2477 × 1	AAA × 2
Battery Compartment				

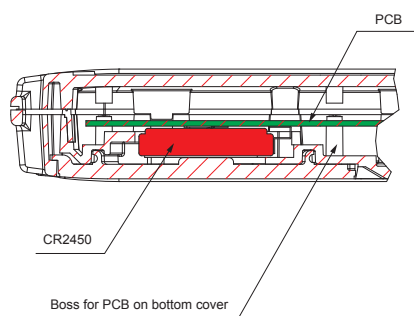
WC100-20, WC105-28



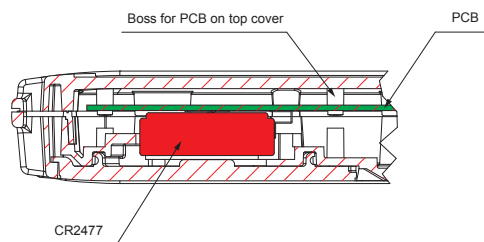
Color Type

Code	B B	B M	W L
Body	Black	Black	White
Grip	Black	Marine	Light gray
Color			

CR2450 × 1 on WC100-20-R -□□ (PCB on bottom cover)



CR2477 × 1 on WC100-20-R -□□ (PCB on top cover)



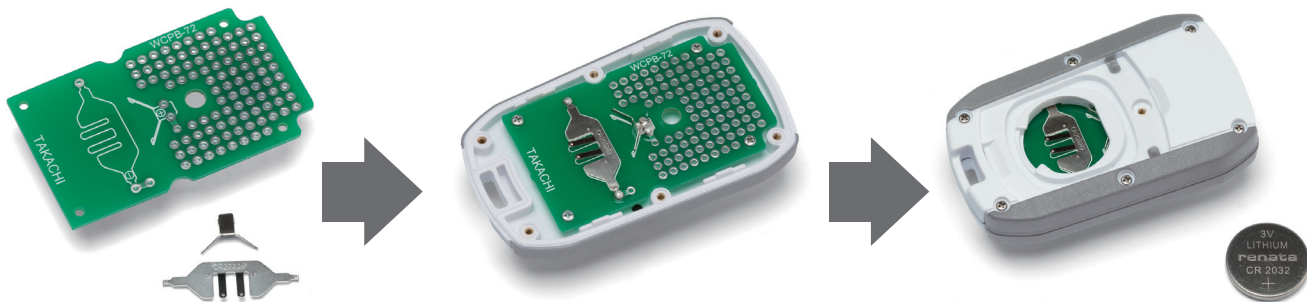
*Not compatible with Renata CR2477N battery

Product no. / Details

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

Product no.	W	H	D	Battery Compartment	Weight (g)
WC 72-15-N -□□	43	15.5	72	None	18.5
WC 72-15-C -□□	43	15.5	72	CR2032	22
WC 72-21-N -□□	43	21.5	72	None	22
WC 72-21-C -□□	43	21.5	72	CR2032	25.5
WC 90-15-N -□□	44.2	15.7	90	None	23
WC 90-15-C -□□	44.2	15.7	90	CR2032	26.5
WC 90-21-N -□□	44.2	21.7	90	None	27
NEW WC100-20-N -□□	49	20.5	100	None	35
NEW WC100-20-R -□□	49	20.5	100	CR2450×1 / CR2477×1	40
WC105-28-N -□□	50.5	28.2	105	None	47
WC105-28-F2-□□	50.5	28.2	105	AAA × 2	58.5

Coin Battery Contact Installation Steps



Solder the contacts onto the PCB. Install the PCB on the top or bottom cover.

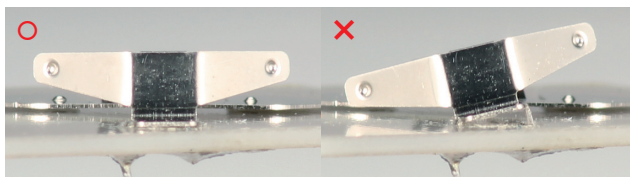
All set!

CAUTION

- When installing the battery terminal, make sure that it is parallel to the PCB. The battery may become stuck if installed at an angle. In addition, when mounting PCB, use a 1mm PCB. Please note batteries cannot be used with PCB thicker than 1mm.



- Battery direction is incised on the inner side of the battery lid.



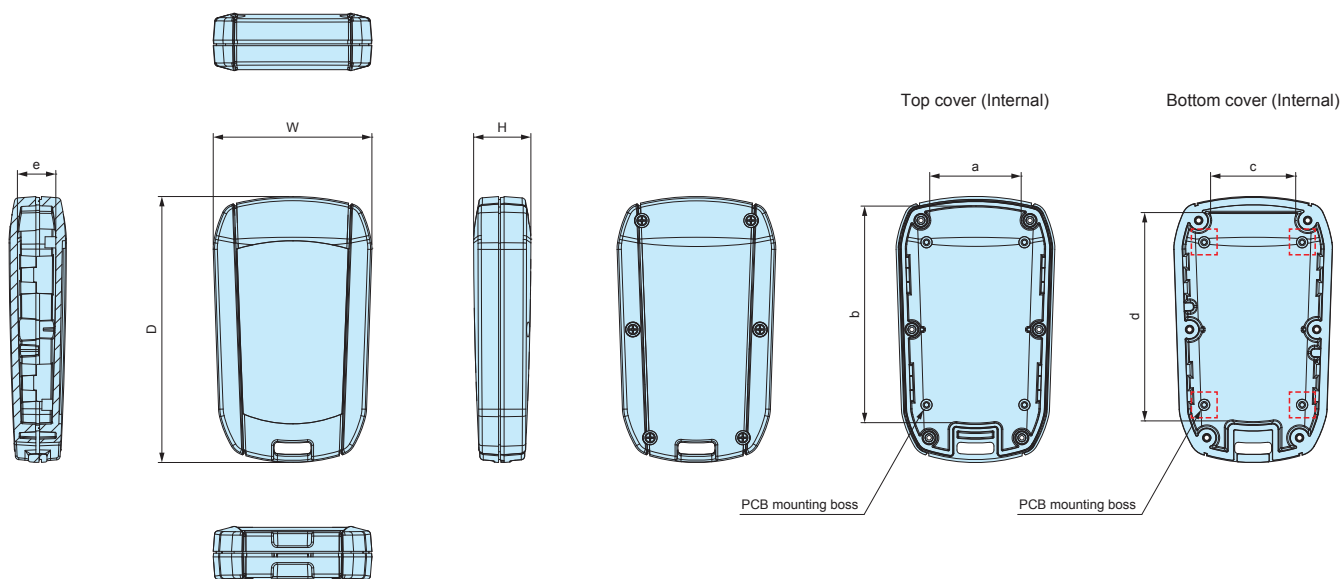
WC dimensions

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

WC72-15-N / WC72-21-N
WC90-15-N / WC90-21-N
WC100-20-N / WC105-28-N

*WC72-15-N and WC90-15-N have no bosses for PCB on bottom cover.

*WC100-20-N and WC105-28-N have different design from shown in the figure.



Product no.	W	H	D	a	b	c	d	e
WC 72-15-N-□□	43	15.5	72	24.7	58.6	23.6	58.4	10.4
WC 72-21-N-□□	43	21.5	72	24.7	58.6	23	56.3	16.3
WC 90-15-N-□□	44.2	15.7	90	26.1	76.6	25	76.4	10.4
WC 90-21-N-□□	44.2	21.7	90	26.1	76.6	24.4	74.3	16.4
WC100-20-N-□□	49	20.5	100	29	84.4	27.7	81.6	14.5
WC105-28-N-□□	50.5	28.2	105	26.4	87.9	24.2	84.1	22.4

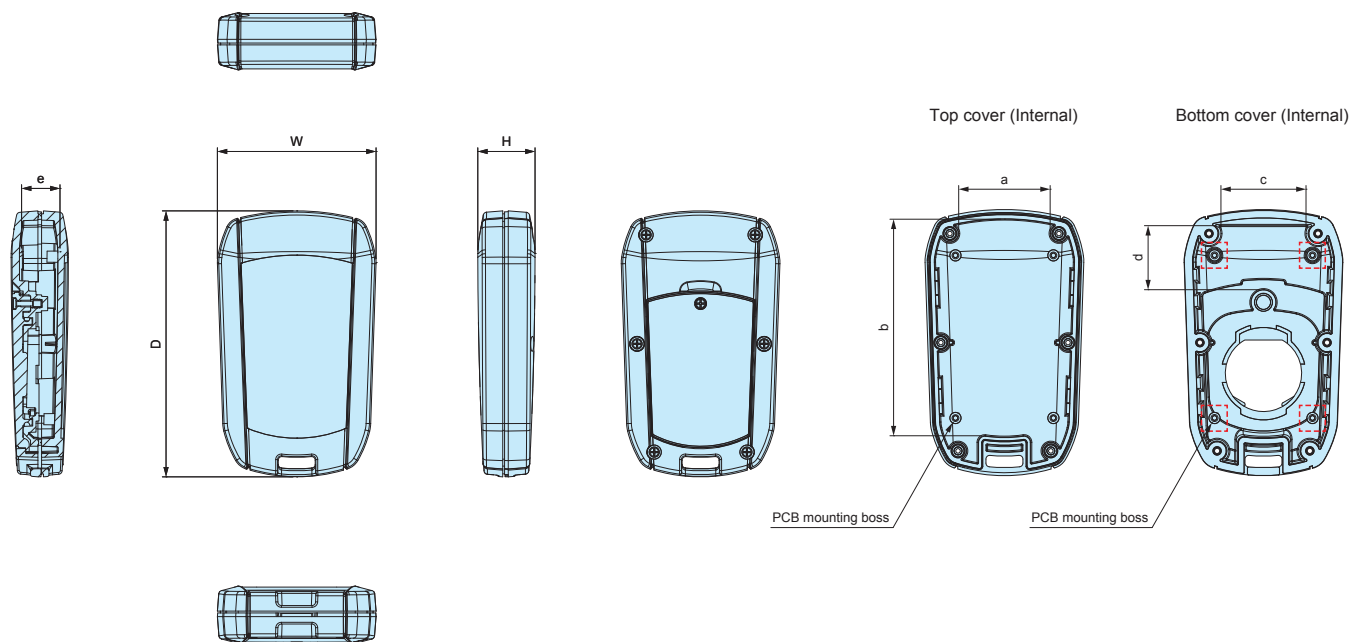
WC dimensions

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

WC72-15-C / WC72-21-C
WC90-15-C / WC100-20-R

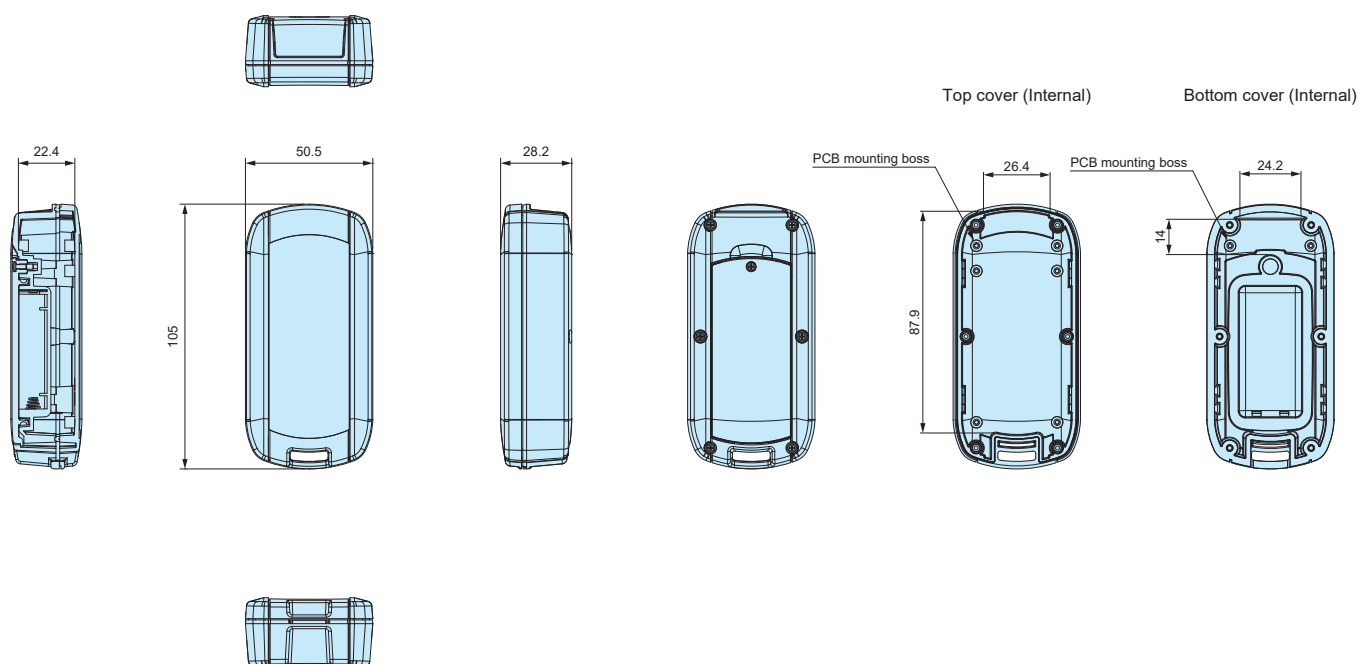
*WC72-21-C and WC100-20-R have bosses for PCB on bottom cover.

*WC100-20-R has different design from shown in the figure.



Product no.	W	H	D	a	b	c	d	e
WC 72-15-C-□□	43	15.5	72	24.7	58.6	23.8	19	10.4
WC 72-21-C-□□	43	21.5	72	24.7	58.6	23	17.3	16.3
WC 90-15-C-□□	44.2	15.7	90	26.1	76.6	25	36.9	10.4
WC100-20-R-□□	49	20.5	100	29	84.4	27.7	31.3	14.5

WC105-28-F2-□□



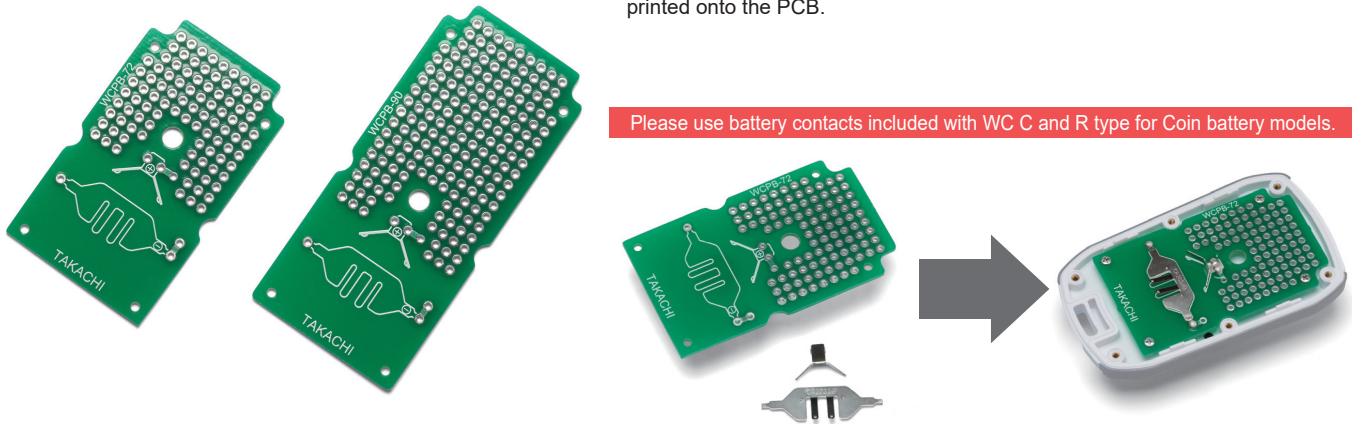


WCPB series

EXCLUSIVE PCB for WC

- Exclusive PCB for WC C and R type for Coin battery models.
- Glass epoxy board (FR-4), through-holes on both sides, 2.54mm hold pitch.
- Designed with a battery contact hole. Battery contact position and direction are printed onto the PCB.

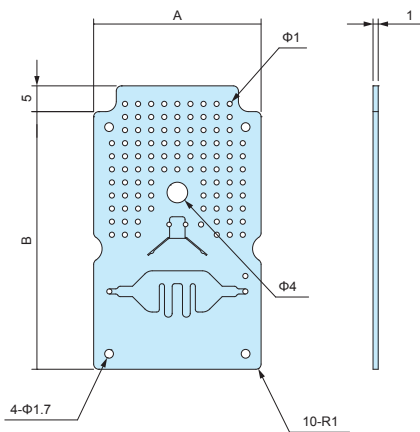
Please use battery contacts included with WC C and R type for Coin battery models.



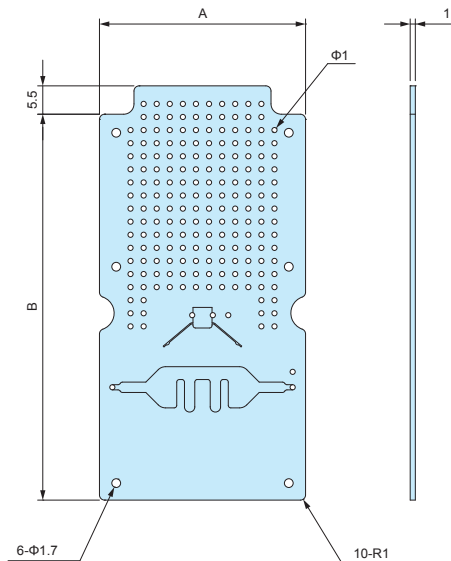
WCPB dimensions

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

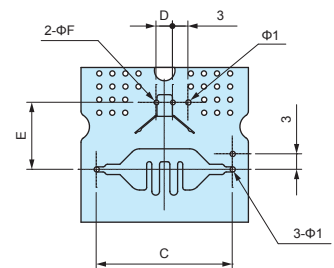
WCPB-72 / WCPB-90



WCPB-100



Battery contact position details



Note : Holes (4-Φ1.7) for PCB mounting bosses are un-soldered.

Components

Part name	Pcs	Material	Color / Finish
PCB	1	Glass epoxy (FR-4) t=1.0	Through-hole • Lead-free solder resist
Screw	4 or 6	Steel (Tapping M1.6-4)	Steel (Tapping M1.6-4)

Product no. / Details

Product no.	A	B	C	D	E	F	Screw pcs	Suitable models
WCPB- 72	32.5	49.8	26.4	3.2	13	0.9	4	WC72-15-C • WC72-21-C
WCPB- 90	32.9	68	26.4	3.2	13	0.9	4	WC90-15-C
NEW WCPB-100	40	74.9	35	4	14	1	6	WC100-20-R

WH series

IP67 WATERPROOF HAND-HELD ENCLOSURE



● The protection rating against dust and water which applies to the enclosure used for electrical equipment, represented with a code based on the IEC60529 standard.

IP6x : No ingress of dust; complete protection against contact (dust tight)

IPx7 : No ingress of water when submerged up to a depth of 1 m for 30 min

High waterproof performance with a silicone gasket

High elasticity and good durability for maintaining waterproofing capability.
Built-in insert nut use for great long lasting water protection even after frequent opening and closing. Battery compartment is also waterproofed.
Various battery compartment types are available, ranging from AAA x2 to AA x6.

Side grip provides great protection

Elastic TPE grips provide a more secured hold.
Side grips are designed to be on the sides and corners of the enclosure to minimize drop impact.



Available in 10 different color combinations



Information on waterproofing overlay sheets



APPLICATION EXAMPLE

Ultrasonic Thickness Gauge



Note that waterproofing will be lost if a hole is made for button or switch on waterproof enclosures.
Please utilize a waterproof (IP67 rated equivalent) membrane keypad or switch, or overlay sheet for maintaining IP67.
See page Custom-11 and 12 for further details on digital printed overlay.



APPLICATION EXAMPLE

Suitable for industrial measuring instruments, transceivers, controllers, medical equipment and more.

Portable Signal Generator



Wireless CO₂ Microclimate Sensor



Wireless Food Probe Sensor



Wireless Temperature Detector



Sigfox Network Measurement Device

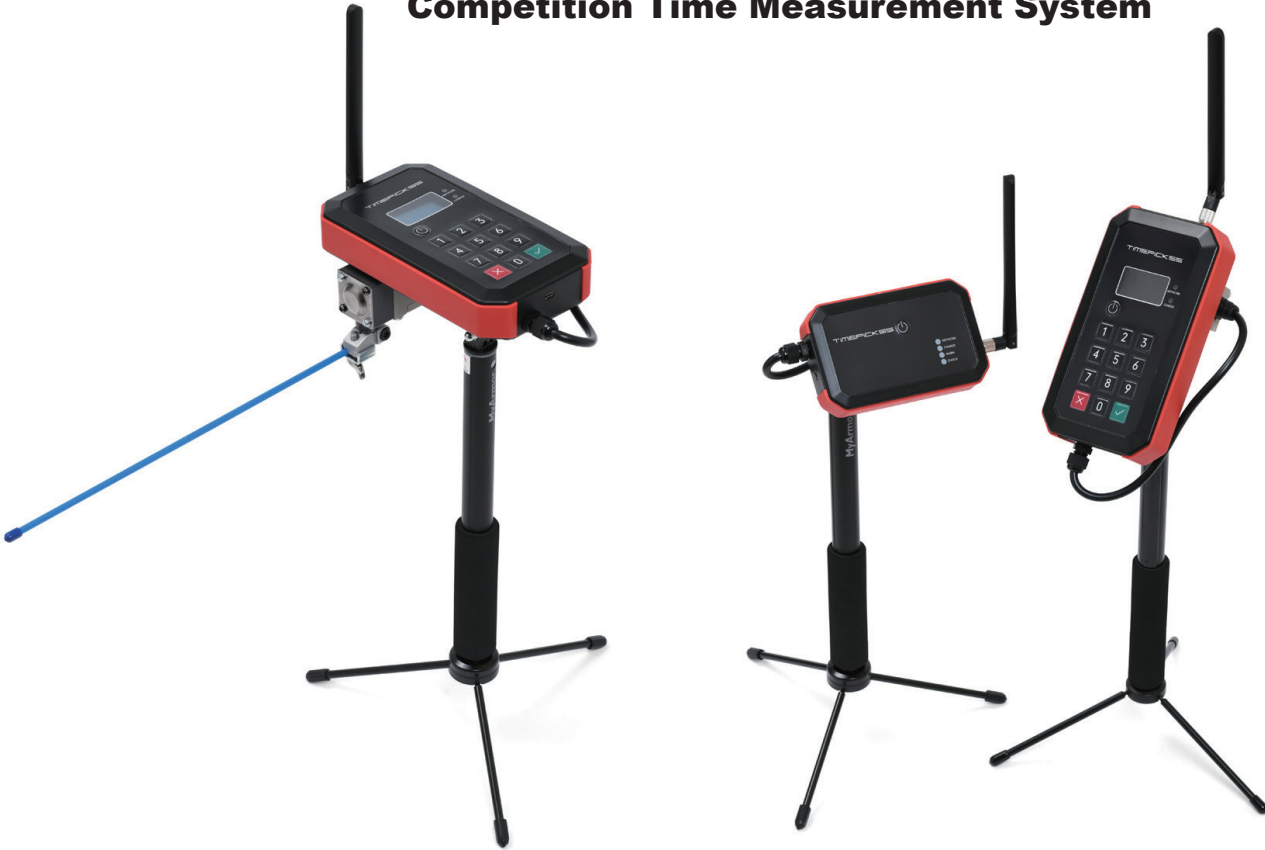


IoT Temperature Monitoring Sensor for HACCP



*See page 23 for further details on Sigfox.

Competition Time Measurement System



Portable Airflow Meter



Honey Bee Tracker



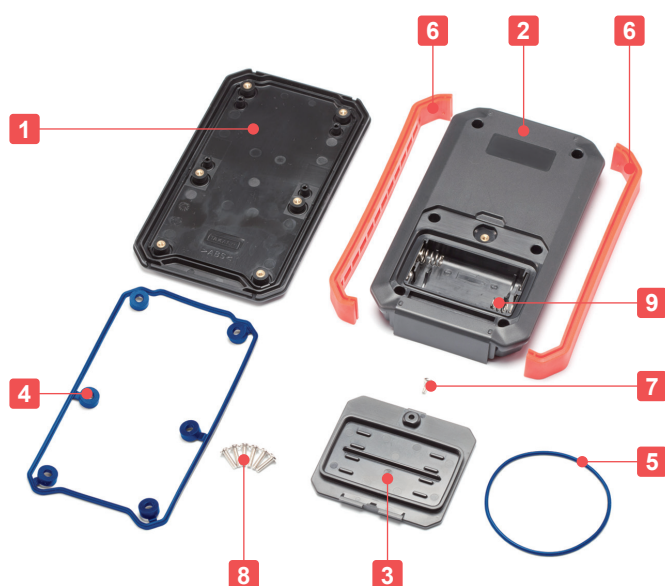
Digital X-ray System





Technical Data

Protection class : IP67
 Operating temperature : -10°C ~ +60°C
 Recommended torque:
 0.2N • m ~ 0.3N • m
 (2kgf • cm ~ 3kgf • cm)



- Stylish and elegantly designed with chamfered edge construction.
- IP67 protection class enclosure.
- Manufactured from flame-resistant ABS UL94V-0 material.
- 8 different internal compartment types are available: AAA x 2, AAA x 3, AAA x 4, AA x 2, AA x 3, AA x 4, AA x 6 and no battery type. Battery compartments have positive (+) / negative (-) pole mark to prevent incorrect insertion.
- The TPE side grips are available in 5 unique colors, and function as an anti-slip grip pad and drop impact protection.

Components

No.	Part name	Pcs	Material	Color / Finish
1	Top cover	1	ABS UL94V-0	Off-white • Black
2	Bottom cover	1	ABS UL94V-0	Off-white • Black
3	Battery cover *	1	ABS UL94V-0	Off-white • Black
4	Gasket	1	Silicone	N • F2 • F3 • M4 type : Black
5	O-ring *	1	Silicone	M2 • M6 type : Blue M3 • F4 • type : Light gray
6	Side grip	2	TPE	Black • Light gray • Navy • Red • Yellow
7	Battery cover screw *	1	Stainless steel M2.5-8	Unfinished
8	Screw	6	Stainless steel M2.5-10	Unfinished
9	Battery contact *	1 set	Brass	Nickel plated

*Not applicable to the N (no battery compartment type) models.

Accessories (Optional parts)



PCB mounting screw EM-2.3
See page 398



Tapping standoff TPS series
See page 397



Cable gland
See page 181 ~ 193



Neodymium magnet NMG series
See page 392

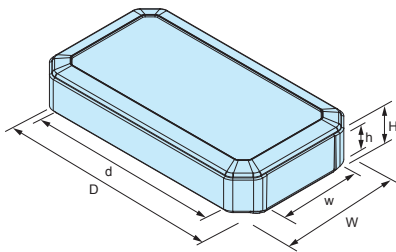
Battery Compartment Types

Type	N None	F2 AAA x 2	F3 AAA x 3	F4 AAA x 4	M2 AA x 2	M3 AA x 3	M4 AA x 4	M6 AA x 6
Battery Compartment								

Color Type

Code	[B][B] Black / Black	[B][L] Black / Light gray	[B][N] Black / Navy	[B][R] Black / Red	[B][Y] Black / Yellow
Color					
Code	[W][B] Off-white / Black	[W][L] Off-white / Light gray	[W][N] Off-white / Navy	[W][R] Off-white / Red	[W][Y] Off-white / Yellow
Color					

WH dimensions



Product no. / Details

Product no.	External dimensions			Internal dimensions			Battery compartment	Weight (g)
	W	H	D	w	h	d		
WH125-20-N -□□	79	20	126	39	9	107.7	None	101.0
WH125-20-F2 -□□	79	20	126	60	9	46.4	AAA x 2	102.0
WH125-20-F3 -□□	79	20	126	60	9	35.9	AAA x 3	109.0
WH125-28-N -□□	79	28	126	39	17	106.3	None	119.0
WH125-28-F2 -□□	79	28	126	60	17	46.4	AAA x 2	121.0
WH125-28-F3 -□□	79	28	126	60	17	35.9	AAA x 3	127.0
WH145-20-N -□□	88	20	146	45	8	129.6	None	125.5
WH145-20-F4 -□□	88	20	146	69.4	8	36.5	AAA x 4	129.5
WH145-25-N -□□	88	25	146	45	13	129.6	None	137.5
WH145-25-M2 -□□	88	25	146	69.2	13	51.5	AA x 2	161.5
WH145-25-M3 -□□	88	25	146	69.2	13	36.5	AA x 3	159.5
WH145-33-N -□□	88	33	146	45	21	129.6	None	162.0
WH145-33-M2 -□□	88	33	146	69.2	21	51.5	AA x 2	180.5
WH145-33-M3 -□□	88	33	146	69.2	21	36.5	AA x 3	181.5
WH170-25-N -□□	95	25	171	51	13	154.4	None	169.0
WH170-25-M4 -□□	95	25	171	73.2	13	54.8	AA x 4	195.0
WH170-33-N -□□	95	33	171	50.9	21	150.7	None	191.0
WH170-33-M4 -□□	95	33	171	73.2	21	54.8	AA x 4	220.0
WH190-25-N -□□	126	25	191	81	13	170.3	None	226.0
WH190-25-M6 -□□	126	25	191	107.6	13	72.6	AA x 6	276.0
WH190-33-N -□□	126	33	191	81	21	170.3	None	252.0
WH190-33-M6 -□□	126	33	191	107	21	72.3	AA x 6	307.0

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

WSC series

IP67 SLOPED PLASTIC CASE



Ergonomic design and streamlined shape

Best suited for desktop operation with its sloped surface.

2 different inclined angles, 13° and 18° are available to select for various operating environments.

Streamlined shape enables the unit to be gripped better when used as a handheld instrument.



2 angles : 13° and 18°

Photo : 13° type



IP67 water- and dust-proof structure that can withstand various environments

High elasticity and good durability for maintaining waterproofing capability.

Built-in insert nut use for long-lasting protection even after frequent opening and closing.



APPLICATION EXAMPLE

Medical Measurement Device • Medical Controller



Transmitter • Network Equipment



RFID Card Reader



RFID Reader for ICT Entry/Exit System "KIDSNA connect" for Daycare/Preschool



Information on waterproofing after hole milling for switches

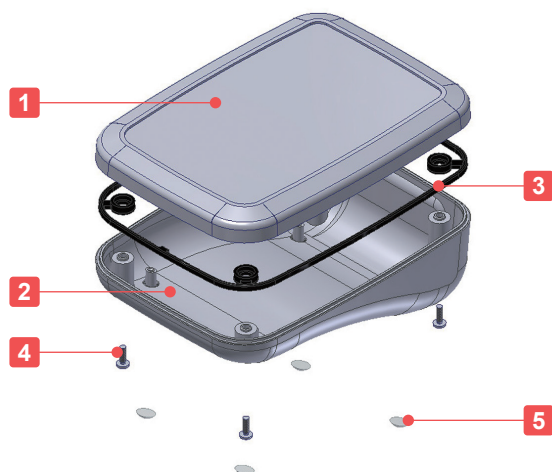
The waterproof performance will be lost once hole or cutout is machined on an IP rated enclosure. To ensure it remains waterproof after hole/cutout machining, IP rated membrane pad or overlay is required.



Information on affixing of cables into waterproof enclosures

Please utilize a cable gland from our available range of cable gland accessories.





Technical Data

Protection class : IP67
 Operating temperature : -10°C ~ +60°C
 Recommended torque : 0.2 ~ 0.3N • m

- Suitable as a desktop controller or measurement instrument with its ergonomic design.
- Streamlined shape enables the unit to be gripped better when used as a handheld instrument.
- IP67 protection class allows the unit to be used outdoors or under environments with water splashes, such as for medical research or measuring equipment.

Components

No.	Part name	Pcs	Material	Color / Finish
1	Top Cover	1	Flame-resistant ABS UL94V-0	Off-white • Black
2	Bottom base	1	Flame-resistant ABS UL94V-0	Off-white • Black
3	Gasket	1	Silicone	Black
4	Screw	4	Stainless steel binding head M2.5-8	Unfinished
5	Rubber feet	4	Polyurethane	Transparent

Accessories (Optional parts)



PCB mounting screw EM series
See page 398



Adhesive standoff AST series
See page 394



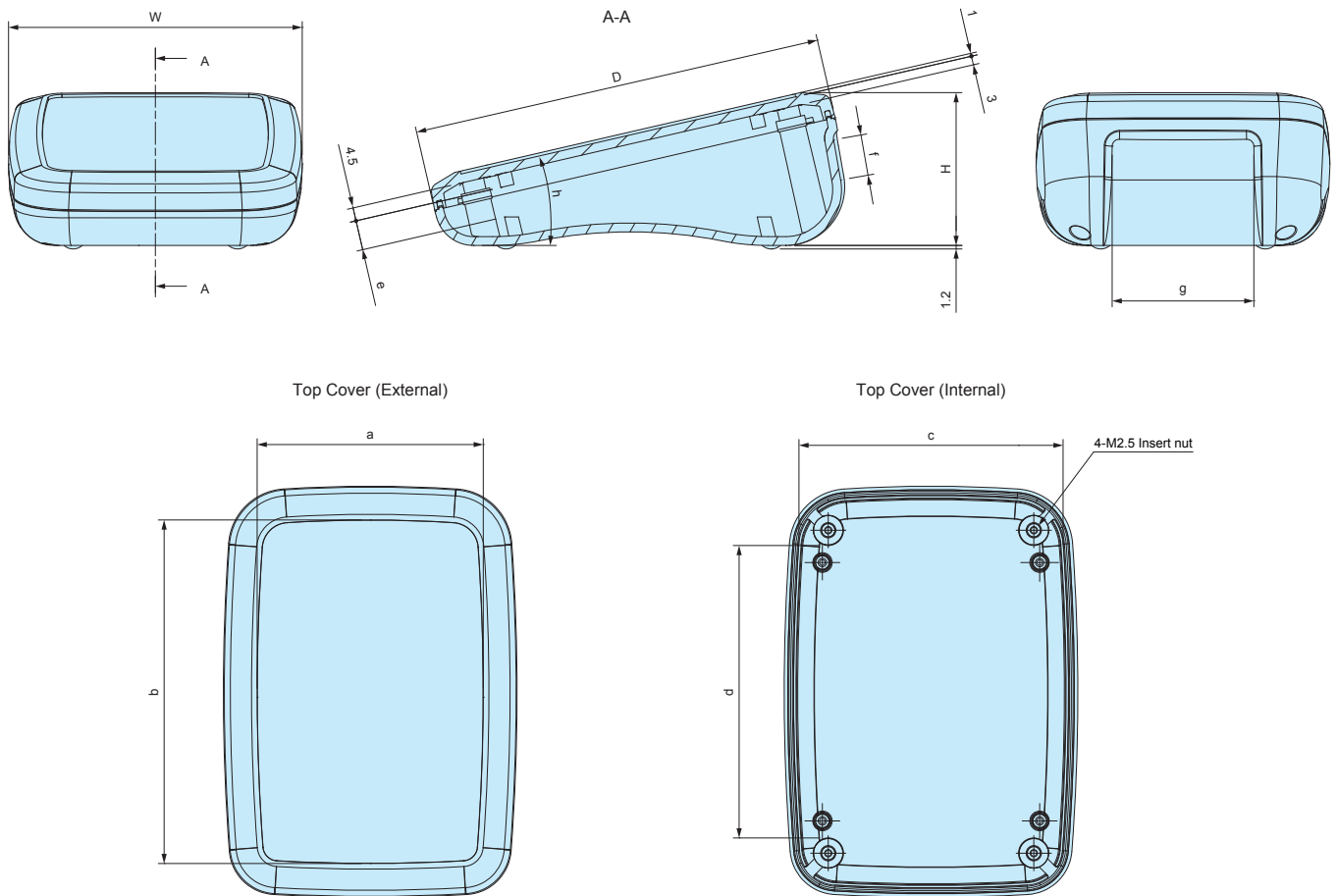
TORX screw MR series
See page 398



Cable gland
See page 181 ~ 193

WSC dimensions

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



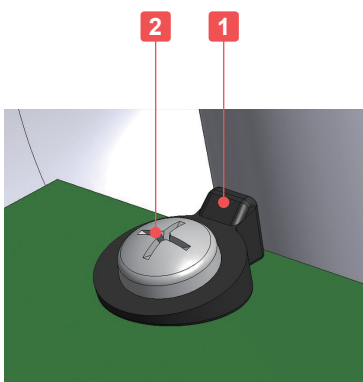
Product no. / Details

Product no.		Dimensions										Face angle	Weight (g)
● Off-white	● Black	W	D	H	a	b	c	d	e	f	g	h	
WSC10-14-5W	WSC10-14-5B	100	140	52	77	117	87	100	10	13.9	48.2	13°	145
WSC10-14-7W	WSC10-14-7B	100	140	72	77	117	87	100	22	27.4	48.2	18°	168
WSC14-14-5W	WSC14-14-5B	140	140	52	117	117	128	100	10	13.8	80.5	13°	190
WSC14-14-7W	WSC14-14-7B	140	140	72	117	117	128	100	22	27.4	80.5	18°	218
WSC18-14-5W	WSC18-14-5B	175	140	52	152	117	163	95	11.3	13.8	103.5	13°	234
WSC18-14-7W	WSC18-14-7B	175	140	72	152	117	163	95	23.7	27.4	103.5	18°	262

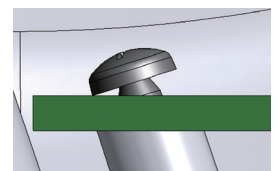
Accessories (Optional parts)

WSP-M2.3

INCLINED SPACER for WSC



- Due to the sloped shape of the WSC series, boss-tops are also angled. Therefore when mounting PCB on, some gap between the screw head and PCB surface will occur as shown in the diagram. WSP-M2.3 helps to fill the gap.
- EM-2.3-8 as PCB mounting screws are available for bosses in bottom base. (See page 398)



Components

No.	Part name	Pcs	Material	Color / Finish
1	Inclined spacer	4	POM	Black
2	Screw (Tapping M2.3-8)	4	Steel	Trivalent chromate

■ Recommended torque : 0.1N • m

Product no. / Details

Product no.	Suitable models	Pack of
WSP-M2.3	WSC (for bottom base PCB boss)	4

NANO SERIES

WATERPROOF PORTABLE CASE

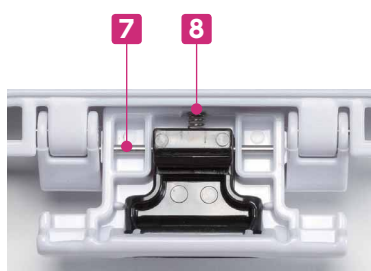


- IP65 waterproof compact and stylish case.
- Slit holes on both sides for strap or belt.
- Suitable for storing small electric devices such as mobile phones, wireless devices, portable radios, and so on.



Technical Data

Protection class : IP65
Operating temperature : -20℃~+60℃



Latch (lock mechanism) side



Hinge Side

● How To Use Strap



Insertion of clip into the case



Use as handy strap



Insert strap end into the loop after clip insertion.



Fix it to the belt loop, etc.

Components

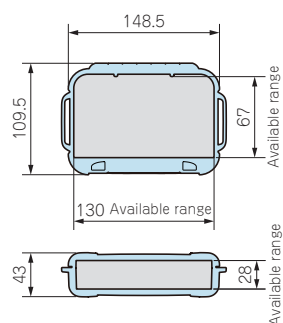
No.	Part name	Material
1	Cover · Base	Polycarbonate
2	Protective net	Silicone
3	Lock lever	Polycarbonate
4	Corner guard	Elastomer
5	Gasket	Elastomer
6	Strap	Nylon · Nylon 66
7	Latch pin	Stainless steel
8	Spring	Stainless steel
9	Pressure relief valve (※)	Nylon 66 · PTFE

※ Waterproof pressure relief valve enables pressure within the case to be equalized with the surrounding, allowing it to be opened with ease, while keeping it waterproof.

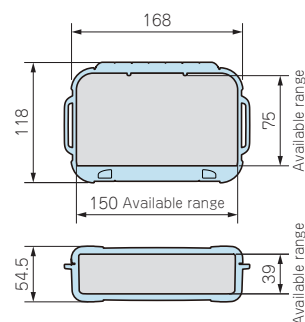
NANO dimensions

■ Drawings below are reference examples only.
DXF/DWG/PDF drawings available on our website.

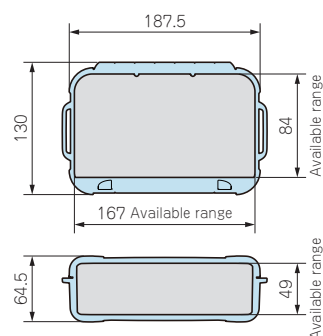
NANO 310



NANO 320



NANO 330



Product no. / Dimensions

Product no.					Dimensions (External)			Dimensions (Internal)			Weight (g)
● Black	● White	● Clear	● Lime	● Marine	W	D	H	w	d	h	
NANO310B	NANO310W	NANO310C	NANO310L	NANO310M	148.5	109.5	43	130	67	28	265
NANO320B	NANO320W	NANO320C	NANO320L	NANO320M	168	118	54.5	150	75	39	350
NANO330B	NANO330W	NANO330C	NANO330L	NANO330M	187.5	130	64.5	167	84	49	450

※Cross out products are discontinued.

Applicable for use as electronic and communication devices

PCB can be installed with PCB mounting screw MT series.
NANO series can also be used as a pole mounted communication device.



Accessories(Optional parts)



Aluminium panel NKAP series
See page NKAP-1~NKAP-2



PCB mounting screw MT series
See page NKAP-1



Nameplate sticker NKST series
See page NANUK-ACC-3



NKAP SERIES

ALUMINIUM PANEL for NANO • NK • NKK

NEW SIZE



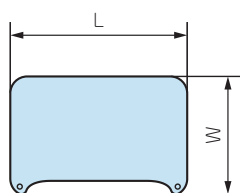
Optional aluminium panel can be used as a controller control / display, measuring device, transmitter, and so on.



NKAP dimensions

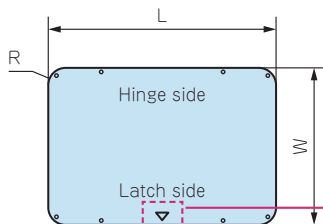
NANO series

Slide insert and screw fastening



NK • NKK series

Required screws vary based on size



※Install panel with ▽ marking towards the latch.

Components

No.	Part name	Material
1	Panel	Aluminium (Anodized)
2	Screw	Stainless steel

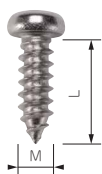


Product no. / Dimensions

Product no.	Suitable case	Thickness	L	W	R	▽ marking	Screw pcs	Weight (g)
NKAP310	NANO310	2	136.2	90.6	13	—	2	59
NKAP320	NANO320	2	156.8	100.4	15.7	—	2	75
NKAP330	NANO330	2	175.9	112.2	17	—	2	94
NKAP903	NK903	1.5	198.5	136.5	15	—	4	109
NKAP904	NK904	1.5	226	163.5	18	—	4	149
NKAP905	NK/NKK905	1.5	257	207	21.5	—	4	214
NEW NKAP908	NK/NKK908	1.5	250.9	200.1	18	—	4	203
NEW NKAP909	NK909	1.5	304.7	190.4	18	—	4	234
NKAP910	NK910 base side	2	346	244.5	17	—	4	452
NKAP910C	NK910 cover side	1.5	339.5	238	14	—	4	329
NKAP915	NK / NKK915	2	368.5	254	28	○	8	496
NKAP918	NK / NKK918	2	397.5	268.5	27	—	8	574
NKAP920	NK / NKK920	2	399.5	285	28	○	8	606
NEW NKAP923	NK / NKK923 base side	2	446.3	309.1	28	—	8	737
NEW NKAP923C	NK / NKK923 cover side	2	438.3	301.1	23.5	—	8	704
NKAP925	NK/NKK925	2	451.5	318	28	○	8	760
NKAP930	NK/NKK930	2	476	350.5	27	○	8	880
NKAP933	NK/NKK933	2	477.5	352	27	—	8	908
NKAP935	NK/NKK935	2	535	301.5	26.5	○	8	855
NKAP940	NK/NKK940	2	526.5	374	27	○	10	1,050
NKAP945	NK/NKK945	2	576.5	450	26.5	○	10	1,395
NEW NKAP950	NK/NKK950	2	540.8	409.1	27	—	10	1,179
NEW NKAP960	NK/NKK960	2	579.7	454.2	27	—	10	1,402

MT SERIES

PCB MOUNTING SCREW for NANO



- PCB should be the same size as NKAP series aluminium panel.
- Insert PCB into groove (see diagram to the right) and screw into the screw marking.

Product no. / Dimensions

Product no.	M	L	Pcs
MT2.6-8T	2.6	8	2

Material : Stainless steel

CUSTOMIZATION on ALUMINIUM PANEL

- Customization services such as CNC milling, punching press, digital inkjet printing, silkscreen printing, and engraving on NKAP panel are available.
- Custom colors can also be performed either through anodization, or painting.



- Self-clinching Standoff/Stud/Nut or Welded Fastener customization is available.



- An original control panel with machined aluminum panel and overlay sheet can be performed.



MULTI-FUNCTION EXTRUDED ALUMINIUM CASE

EXPT • EXP • EXPE • EXW • EXPF • EXEF • EXWF series

The following series, by utilizing similar extrusion frames, are available in 7 different types, such as IP65-rated, EMC-shielded versions, and more. 73 different sizes are available.

CORNER GUARD

EXP series Page 225 ~ 226



FLANGED

EXPF series Page 233 ~ 234



IP65 CORNER GUARD

EXW series Page 169 ~ 170



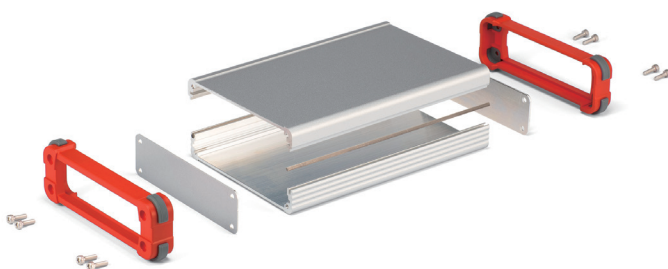
IP65 FLANGED

EXWF series Page 167 ~ 168



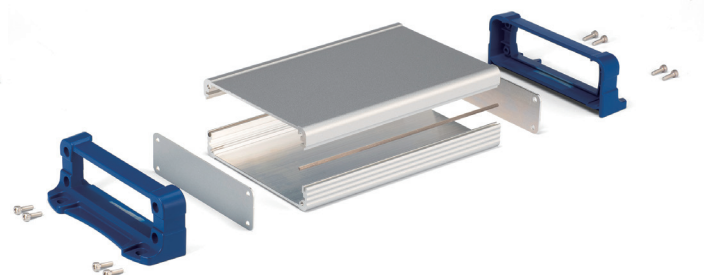
EMC CORNER GUARD

EXPE series Page 227 ~ 228



EMC FLANGED

EXEF series Page 235 ~ 236



WITH TILT LEG

EXPT series Page 229 ~ 230



Custom length available in 0.1mm intervals



16 COLOR COMBINATIONS

EXP series is available in 2 different body frame and 8 different exterior frame colors for a total of 16 different color types.



APPLICATION EXAMPLE

Measuring Instrument



Accessories (Optional parts)
Tilt leg TLW series
See page 239

Network / Communication Box



Controller



Ultrasonic Thickness Gauge



Radio Communication Tester

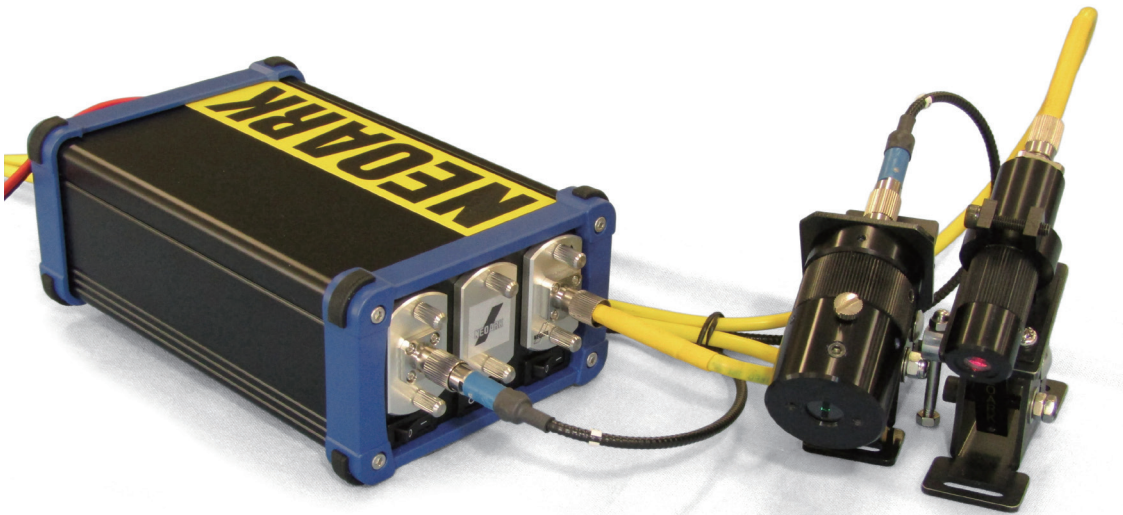
Tank Gauging System Interface Unit



Battery Monitoring System



Fiber Laser Projector



Desktop Load Cell Amplifier



ORAC Controller



Peristaltic DC Pump



Multi-Show Controller





- IP65 is made possible by the sealing of between top & bottom covers and end panels with gaskets.
- Available in 39 different sizes and 6 different color combinations by 2 body frame and 3 end panel colors.
- Custom length is available.

Technical Data

Protection class : IP65

■ Not suitable for environments with direct rainfall.

Operating temperature: -10°C ~ +60°C

Included screws

EXW7-□, 9-□ models : M2.5-8 x 8 pcs

EXW12-□, 15-□ models: M3-10 x 8 pcs

※Hexagonal wrench included.

Components

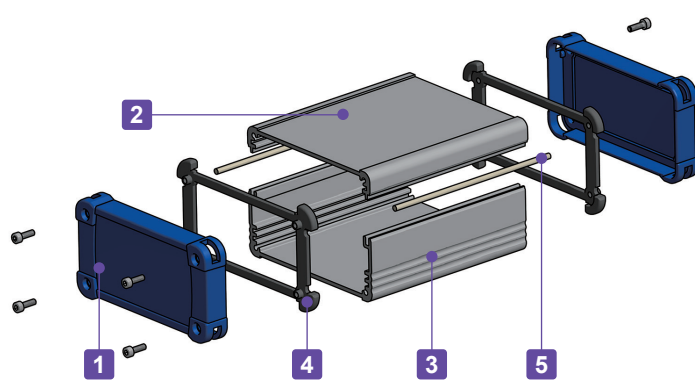
No.	Part name	Pcs	Material	Color / Finish
1	Panel	2	PC+ABS Flame-resistant	Black • Gray / Unpainted Navy / Painted
2	Top cover	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
3	Bottom cover	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
4	Panel gasket	2	Silicone	Dark gray • Black • Charcoal gray*
5	Cover gasket	2	Silicone sponge	White gray
6	Screw (Hexagonal)	8	Stainless steel	Unfinished

*Dark gray and black color panel gasket will be changed to charcoal gray upon depletion of inventory.

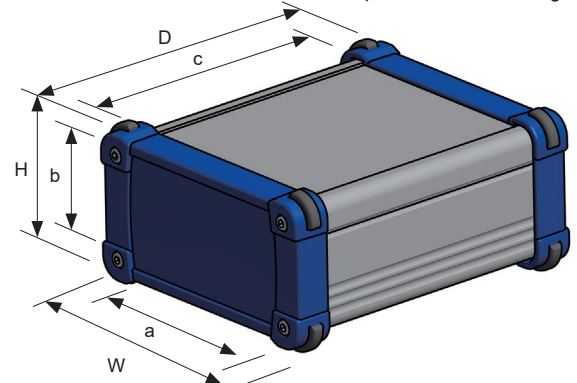
Color Type

Code	[S][B] Silver / Black	[S][G] Silver / Gray	[S][N] Silver / Navy
Color			
Code	[B][B] Black / Black	[B][G] Black / Gray	[B][N] Black / Navy
Color			

EXW dimensions



■ DXF/DWG/PDF/STP drawings available on our website.
※c = Top / Bottom cover length.



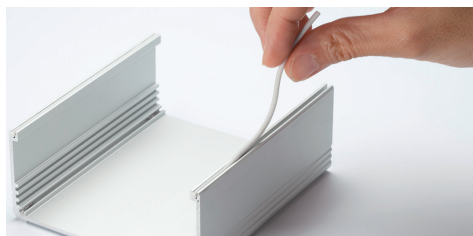
Product no. / Details

■ Listed D dimension may vary due to expansion and contraction of gasket from screw tightening.
■ Please suffix color code at the end of the product number.

Product no.	External dimensions			Internal dimensions		
	W	H	D	a	b	c
EXW 7- 3- 6□□	69	34	57	47	20	46
EXW 7- 3- 9□□	69	34	84	47	20	73
EXW 7- 3-11□□	69	34	107	47	20	96
EXW 7- 4- 6□□	69	44	57	47	30	46
EXW 7- 4- 9□□	69	44	84	47	30	73
EXW 7- 4-11□□	69	44	107	47	30	96
EXW 7- 6- 6□□	69	59	57	47	45	46
EXW 7- 6- 9□□	69	59	84	47	45	73
EXW 7- 6-11□□	69	59	107	47	45	96
EXW 9- 4- 7□□	89	39	68	67	25	56
EXW 9- 4-10□□	89	39	98	67	25	86
EXW 9- 4-13□□	89	39	128	67	25	116
EXW 9- 5- 7□□	89	49	68	67	35	56
EXW 9- 5-10□□	89	49	98	67	35	86
EXW 9- 5-13□□	89	49	128	67	35	116
EXW 9- 6- 7□□	89	64	68	67	50	56
EXW 9- 6-10□□	89	64	98	67	50	86
EXW 9- 6-13□□	89	64	128	67	50	116
EXW12- 4- 9□□	116	41	87	89	24	74
EXW12- 4-13□□	116	41	127	89	24	114
EXW12- 4-18□□	116	41	173	89	24	160
EXW12- 6- 9□□	116	56	87	89	39	74
EXW12- 6-13□□	116	56	127	89	39	114
EXW12- 6-18□□	116	56	173	89	39	160
EXW12- 7- 9□□	116	71	87	89	54	74
EXW12- 7-13□□	116	71	127	89	54	114
EXW12- 7-18□□	116	71	173	89	54	160
EXW15- 5-11□□	151	46	106	107	29	93
EXW15- 5-15□□	151	46	146	107	29	133
EXW15- 5-20□□	151	46	196	107	29	183
EXW15- 6-11□□	151	61	106	107	44	93
EXW15- 6-15□□	151	61	146	107	44	133
EXW15- 6-20□□	151	61	196	107	44	183
EXW15- 8-11□□	151	81	106	107	64	93
EXW15- 8-15□□	151	81	146	107	64	133
EXW15- 8-20□□	151	81	196	107	64	183
EXW15-10-11□□	151	101	106	107	84	93
EXW15-10-15□□	151	101	146	107	84	133
EXW15-10-20□□	151	101	196	107	84	183

■ Custom length is available

How to install cover gaskets



■ Insert cover gaskets into the joint-grooves on both sides of the bottom cover.

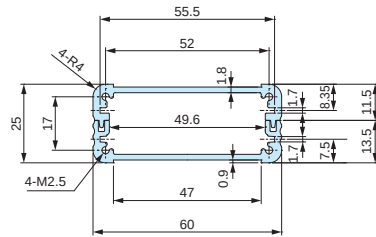


■ Ensure that a small portion of the cover gaskets protrude out in order to maintain connections with the end panels.

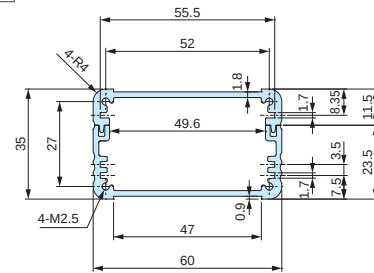
Cross-section view of top & bottom covers

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

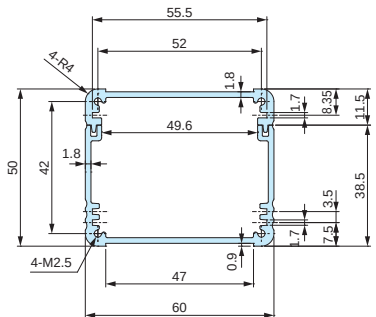
EXP • EXPE • EXW • EXPF • EXEF • EXWF7-3-□
EX6-3-□



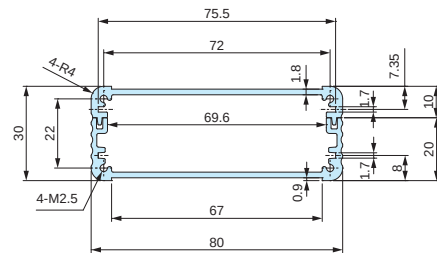
EXP • EXPE • EXW • EXPF • EXEF • EXWF7-4-□
EX6-4-□



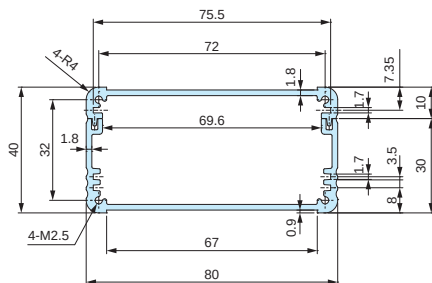
EXP • EXPE • EXW • EXPF • EXEF • EXWF7-6-□
EX6-5-□



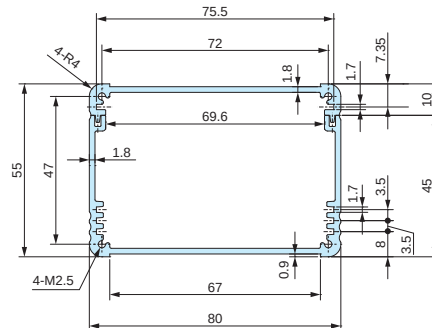
EXP • EXPE • EXW • EXPF • EXEF • EXWF9-4-□
EX8-3-□



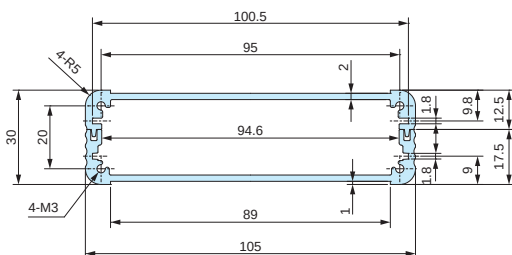
EXP • EXPE • EXW • EXPF • EXEF • EXWF9-5-□
EX8-4-□



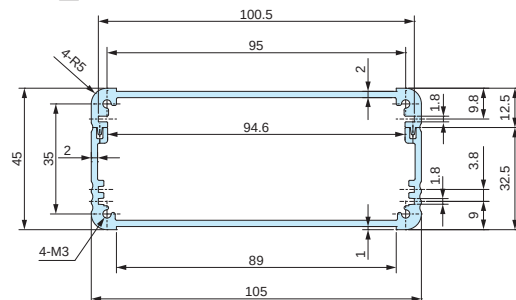
EXP • EXPE • EXW • EXPF • EXEF • EXWF9-6-□
EX8-6-□



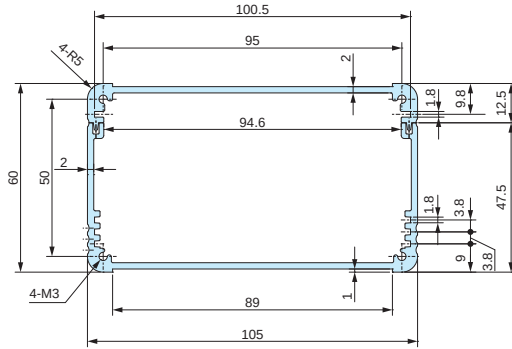
EXP • EXPE • EXW12-4-□
EXPF • EXEF • EXWF11-4-□
EX11-3-□



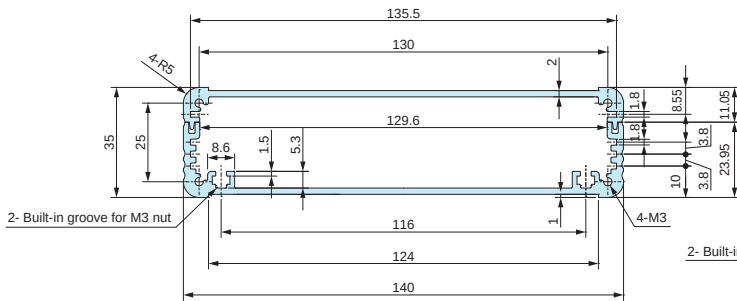
EXP • EXPE • EXW12-6-□
EXPF • EXEF • EXWF11-6-□
EX11-5-□



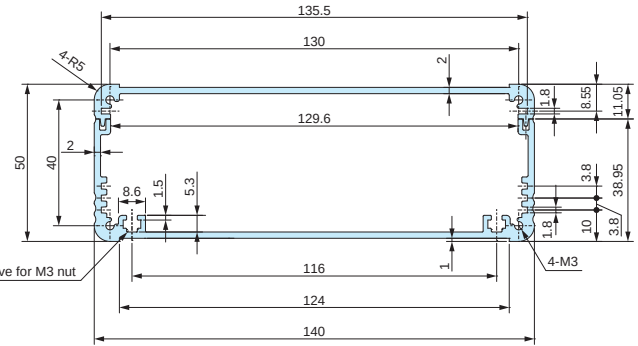
EXP • EXPE • EXW12-7-□
 EXPF • EXEF • EXWF11-7-□
 EX11-6-□



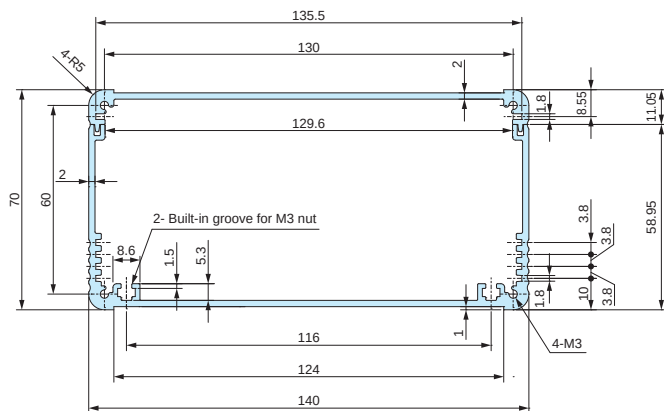
EXP • EXPE • EXW • EXPF • EXEF • EXWF15-5-□
 EX14-4-□



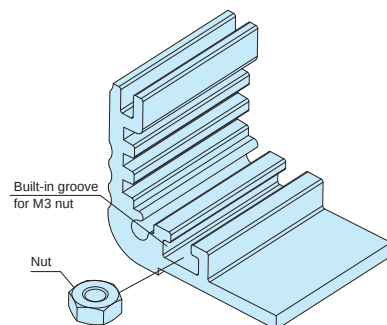
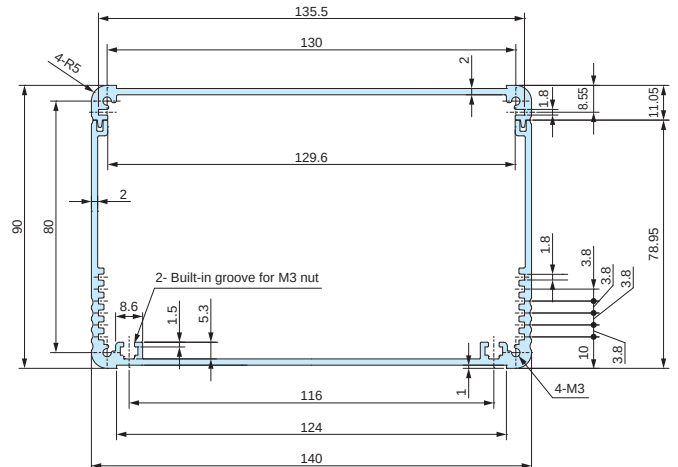
EXP • EXPE • EXW • EXPF • EXEF • EXWF15-6-□
 EX14-5-□



EXP • EXPE • EXW • EXPF • EXEF • EXWF15-8-□
 EX14-7-□



EXP • EXPE • EXW • EXPF • EXEF • EXWF15-10-□
 EX14-9-□

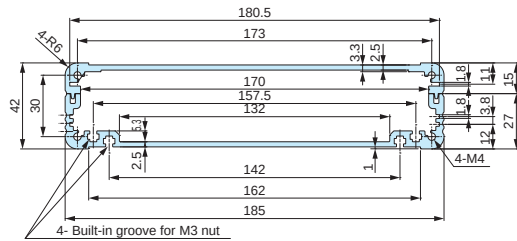


■ Optional sliding nut is available to be used
 for width 140mm or larger bottom covers.
 See page 221 for further details.

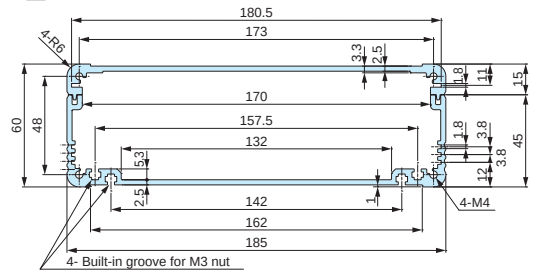
Cross-section view of top & bottom covers

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

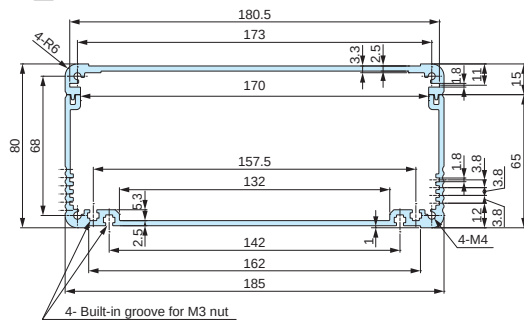
EXPT • EXP • EXPE • EXPF • EXEF • EXWF20-6-□
EX19-4-□



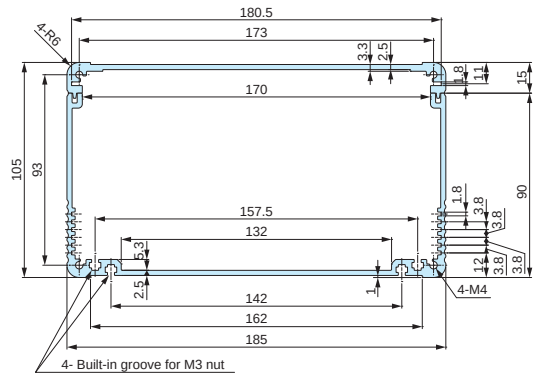
EXPT • EXP • EXPE20-7-□
EXPF • EXEF • EXWF20-8-□
EX19-6-□



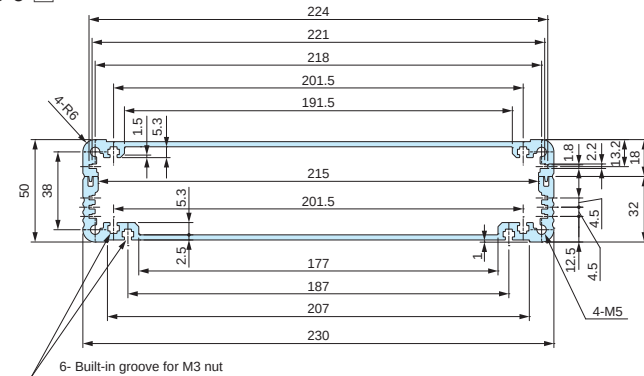
EXPT • EXP • EXPE20-9-□
EXPF • EXEF • EXWF20-10-□
EX19-8-□



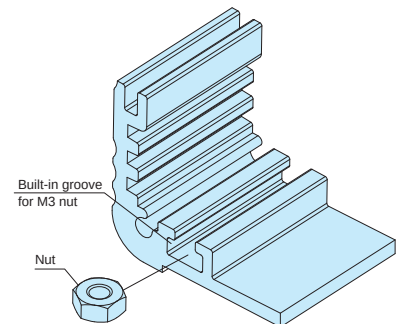
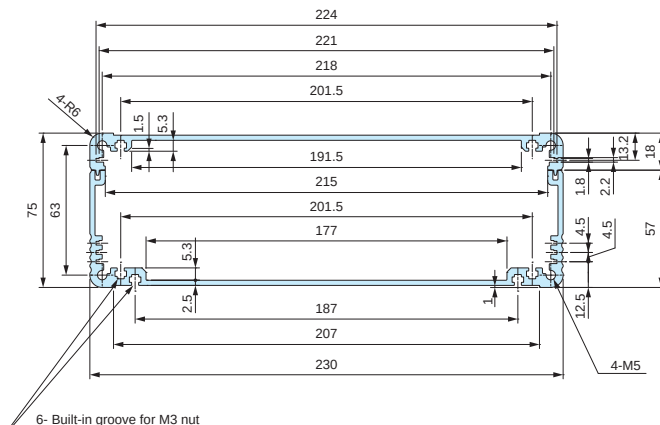
EXPT • EXP • EXPE • EXPF • EXEF • EXWF20-12-□
EX19-11-□



EXPT • EXP • EXPE24-6-□
EXPF • EXEF • EXWF24-7-□
EX23-5-□



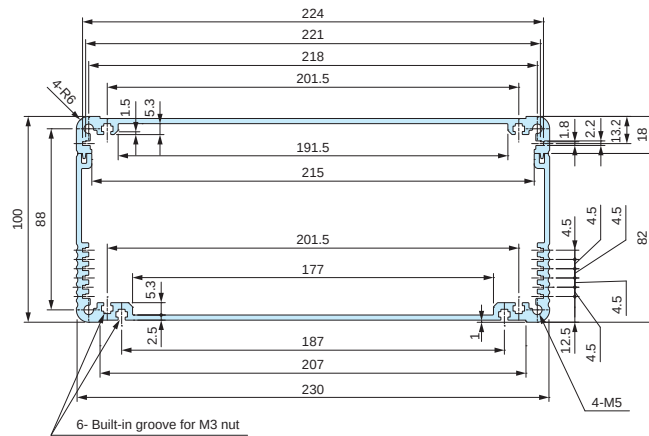
EXPT • EXP • EXPE • EXPF • EXEF • EXWF24-9-□
EX23-8-□



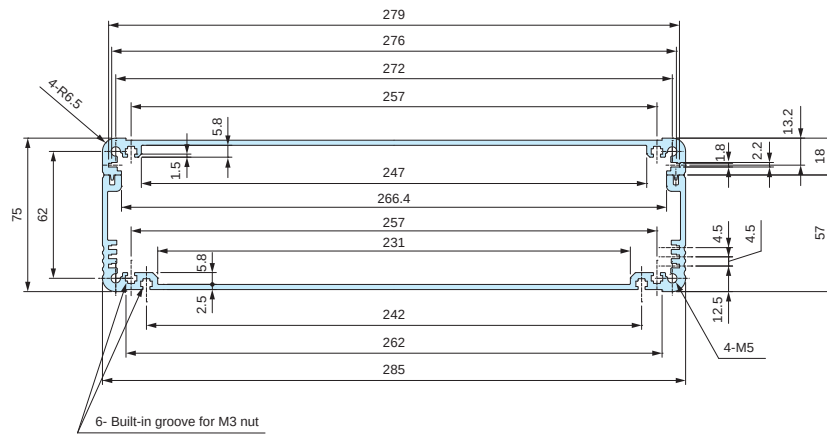
■ Optional sliding nut is available to be used for width 140mm or larger bottom covers.

See page 221 for further details.

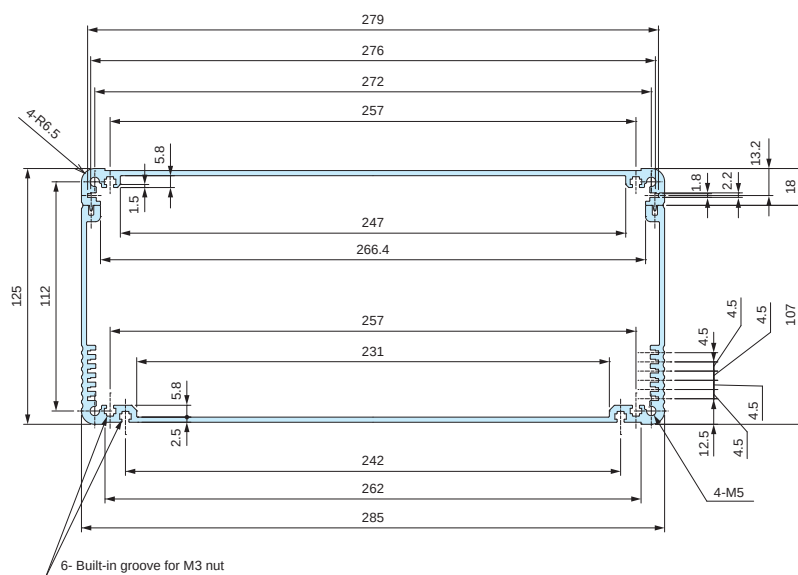
EXPT • EXP • EXPE24-11-
EXPF • EXEF • EXWF24-12-
EX23-10-



EXPT • EXP • EXPE • EXPF • EXEF • EXWF30-9-☐
EX29-8-☐

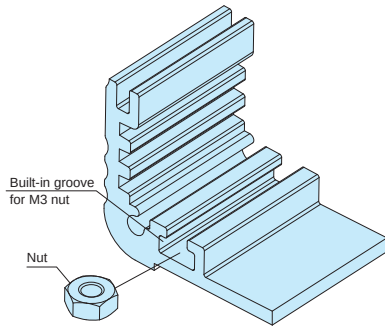


EXPT • EXP • EXPE • EXPF • EXEF • EXWF30-14-☐
EX29-13-☐

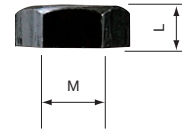


MT-3N

SLIDING NUT for EX□ • EXH□



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 EXPT • EXP • EXPE • EXW • EXPF • EXEF • EXWF • EX models with width 140mm or larger bottom covers, as well as with width 230mm and 285mm top covers, on all EXH • EXHE • EXHF • EXHFE models with width 140mm or larger bottom covers, as well as all heat-sink top covers.

EXEG series

EMC SHIELDING FABRIC-OVER-FOAM GASKET

- Exclusive EMC shielding fabric-over-foam gasket for EXPE • EXEF • EXHE • EXHFE models.

Suitable Models

Product no.	Suitable models
EXEG-2.5	EXPE7-□, 9-□, 12-□, 15-□, EXEF7-□, 9-□, 11-□, 15-□ EXHE8-□, 11-□, 14-□, EXHFE8-□, 11-□, 14-□
EXEG-3.2	EXPE20-□, 24-□, 30-□, EXEF20-□, 24-□ EXHE19-□, 23-□, 29-□, EXHFE19-□, 23-□, 29-□

Product no. / Dimensions

Product no.	Dimensions	Pack of
EXEG-2.5	Φ2.5×500mm	1
EXEG-3.2	Φ3.2×500mm	1

Length tolerance = +/- 10%



- Material / Color : Conductive fiber • TPE / Metallic gray

EX series APPLICATION EXAMPLE

Tube Amplifier

Product by MJ Audio Technology



IoT Relay Module

Product by Bunnyhop (Japan)



Premain Power Amplifier

Product by AY-densi (Japan)



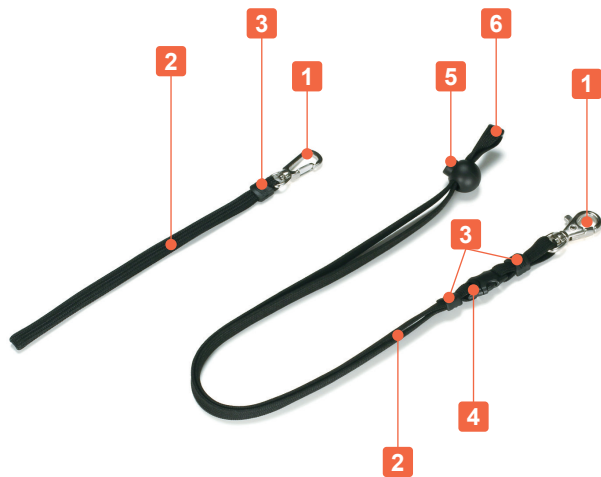
USB Edge Node

Product by SHINWA (Japan)



STP series

STRAP



- Strap with a metal hook
- Recommended to be used with CR key ring.

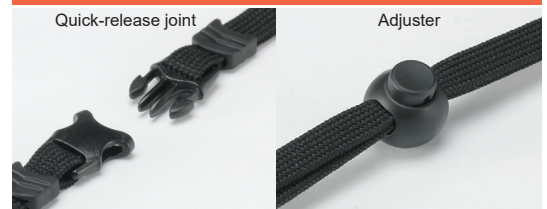
Wrist strap (STP-200)



Neck strap (STP-450)



Neck strap detail



- Only the neck strap has a joint and an adjuster.

Components

No.	Part name	Pcs	Material	Color / Finish
1	Metal hook	1	Diecast zinc & steel	Nickel plated
2	Strap	1	Nylon / Polyester	Black
3	Cap	1 / 2	Polyurethane / Elastomer	Black
4	Joint (Neck strap only)	1	Polyacetal	Black
5	Adjuster (Neck strap only)	1	Nylon	Black
6	Clamp (Neck strap only)	1	PE	Black

Product no. / Details

Product no.	Strap width	Strap length	Strap material	Cap material
STP-200	8	200	Nylon	Polyurethane x 1
STP-450	10	450	Polyester	Elastomer x 2

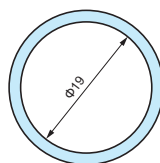
CR-20

KEY RING

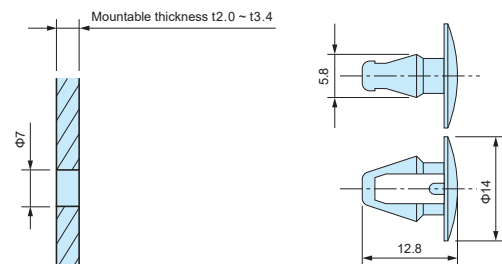


- Hole milling is required for case installation.

CR-20 dimensions



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

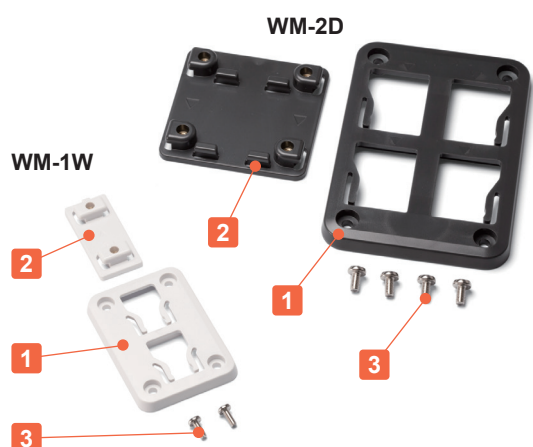


Components

Part name	Material	Color / Finish
Ring	SWRM 6 Steel	Nickel plated
Insert clip	Nylon	Black

Product no. / Details

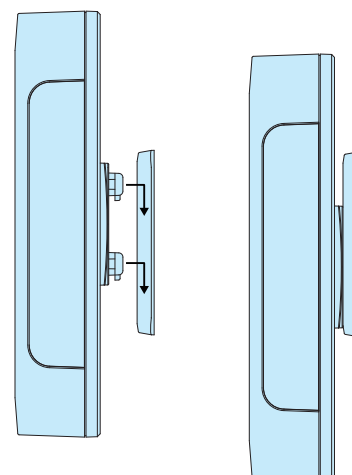
Product no.	Ring Φ	Installation hole	Mounting thickness
CR-20	Φ19	Φ7	t2.0 ~ t3.4

WM series**SUSPENSION BRACKET**

Installation example



How to install



- Plastic wall mounting bracket. Easy attachment and removal.
- Large and small bracket types are available.
- Applicable to be used on plastic or metallic enclosures with a panel thickness of 0.8 ~ 3.5mm.
- To attach the suspension hook onto the enclosure, hole milling is required.
- Please be aware of the insertion direction of the suspension hook against the mounting base when attaching.
- DXF/DWG/PDF/STP drawings available on our website.

Technical Data

Max load : WM-1 - 2kg
WM-2 - 5kg

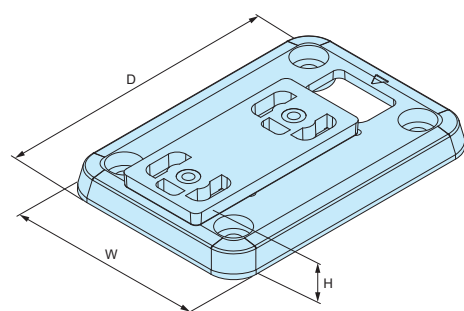
* The max load values listed are static load values only. Use caution when handling.

Components

No.	Name	Pcs	Material	Color / Finish
1	Mounting base	1	PC + ABS UL94HB	Off-white • Dark gray
2	Suspension hook	1	PC + ABS UL94HB	Off-white • Dark gray
3	Screw	2 (WM-1) 4 (WM-2)	Steel	Nickel plated

Included Screw

WM-1□ : Bind M3-8
WM-2□ : Bind M4-88

**Product no. / Details**

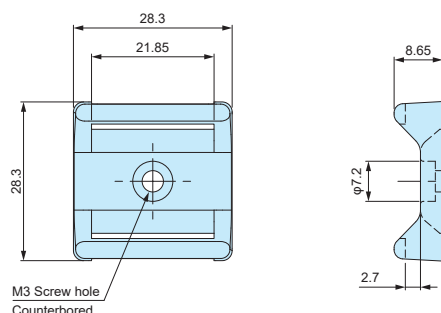
Product no.		W	H	D	Mountable thickness	Weight (g)
● Off-white	● Dark gray					
WM-1W	WM-1D	45	9	65	t0.8~t3.5	11.5
WM-2W	WM-2D	80	11	115	t0.8~t3.5	48

PMB-1**POLE MOUNTING BRACKET**

Installation example



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



- Small size pole mounting bracket suitable for indoor use.
- Installation screws (M3 size) are separately sold. See page HES • HOS • MT for compatible MT3-4 screws.
- Minimum applicable pole diameter is $\Phi 35$.
- Use SNB • PKB • SCT mounting belt to install onto a pole.

Product no. / Details

Material / Color : PA66+GF (UL94HB) / Black

Product no.	Maximum load (kg)	Weight (g)	Pack of
PMB-1	1	3 (1 piece)	2

AW • AWN • AWP series

IP68 ALUMINIUM ENCLOSURE

AW • AWN • AWP series are highly functional aluminium enclosures which are IP68 (24 hours / 1m depth immersion) rated with heat dissipating heat-sink fins.

34 sizes available. Standard, Flanged, Shielding, and Silicone protector types are available.

Suitable for LED power supply, industrial camera, controller or measuring instrument where waterproof and cooling performance are crucial.

APPLICATION EXAMPLE

Waterproof Boating Network Modular System



GNSS Receiver



Heavy Duty Portable Hardness Tester



LoRa Wan Gateway



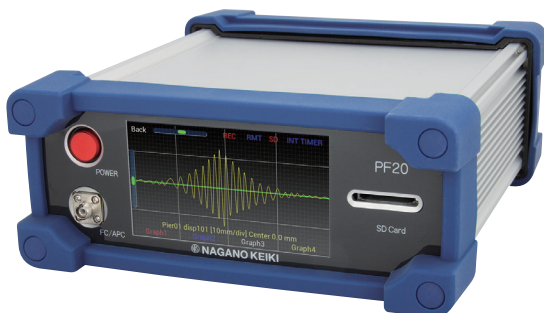
Radio-Control Electronic Exploder



Pin Hole Detector



FBG Data Logger



Data Logger with 3G Modem Report Function



Custom Length Available

Flexible frame length from 50mm to 700mm in 0.1mm intervals.

No minimum order quantity and short lead time for small quantity order.

See our website for further details.





- IP68 and heat dissipation enclosure. Designed with flanged end panels.
- PCB or chassis is mounted by sliding it horizontally into an inner-grooved body frame.
- Designed for a tough environment where waterproof and heat countermeasures are required.
- Suitable for outdoor use such as LED power supplies and junction boxes.

Technical Data

Protection class : IP68 (24 hours/1m depth)
 Operating temperature : -40°C ~ +105°C
 Recommended torque : 1.0N • m

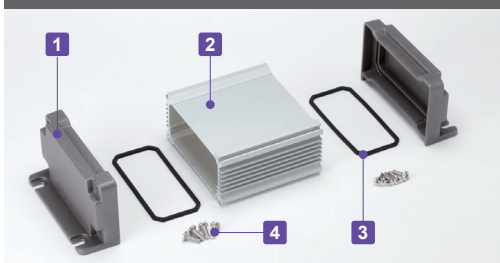
Normal N type Components

No.	Part name	Pcs	Material	Color / Finish
1	Flanged end panel	2	Diecast aluminium ADC12	Metallic gray • Black / Powder coated
2	Body frame	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
3	Gasket	2	Silicone	Black
4	Screw	8	Stainless steel	Unfinished

EMC Shielded E type Components

No.	Part name	Pcs	Material	Color / Finish
1	Flanged end panel	2	Diecast aluminium ADC12	Silver • Black / Painted (Unfinished inside)
2	Body frame	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
3	Gasket	2	Conductive silicone	Black
4	Screw	8	Stainless steel	Unfinished

Normal - N type



Color type



Metallic gray / Silver

N G S



Black / Silver

N B S

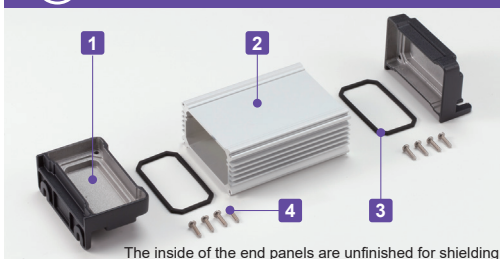


Black / Black

N B B



EMC Shielded - E type



Color type



Silver / Silver

E S S



Black / Silver

E B S

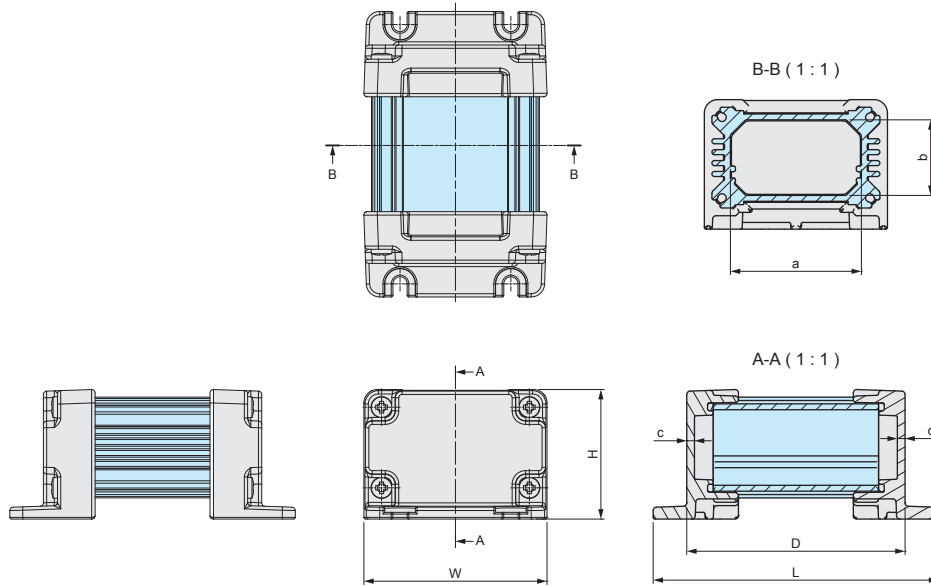


Black / Black

E B B

AW dimensions

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



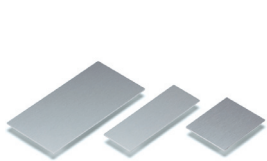
Product no. / Details

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

Product no.	W	H	D	L	a	b	c	Weight (g)
AW 5-4- 7□□□	54.6	38.6	65	85	39	22.5	2.3	128.5
AW 5-4- 9□□□	54.6	38.6	85	105	39	22.5	2.3	149
AW 5-4-11□□□	54.6	38.6	110	130	39	22.5	2.3	175
AW 5-4-14□□□	54.6	38.6	135	155	39	22.5	2.3	201.5
AW 7-7- 8□□□	65.8	70.8	80	106	47	51	2.5	294.5
AW 7-7-11□□□	65.8	70.8	110	136	47	51	2.5	350
AW 7-7-15□□□	65.8	70.8	150	176	47	51	2.5	424.5
AW 7-7-20□□□	65.8	70.8	200	226	47	51	2.5	517
AW 7-7-25□□□	65.8	70.8	250	276	47	51	2.5	610
AW 8-5- 9□□□	80.8	50.8	90	116	62	31	2.5	289.5
AW 8-5-12□□□	80.8	50.8	115	141	62	31	2.5	330.5
AW 8-5-14□□□	80.8	50.8	140	166	62	31	2.5	372
AW 8-5-18□□□	80.8	50.8	175	201	62	31	2.5	429.5
AW 9-9-10□□□	86.3	92	100	129	66.5	66.5	3	560.5
AW 9-9-13□□□	86.3	92	125	154	66.5	66.5	3	633.5
AW 9-9-17□□□	86.3	92	170	199	66.5	66.5	3	764.5
AW 9-9-22□□□	86.3	92	220	249	66.5	66.5	3	910.5
AW 9-9-28□□□	86.3	92	275	304	66.5	66.5	3	1,071
AW11-6-11□□□	106.3	62	110	139	86.5	36.5	3	526.5
AW11-6-15□□□	106.3	62	150	179	86.5	36.5	3	625
AW11-6-19□□□	106.3	62	190	219	86.5	36.5	3	723.5
AW11-6-24□□□	106.3	62	240	269	86.5	36.5	3	847
AW12-8-11□□□	120	77	105	134	100.2	51.5	3	614.5
AW12-8-14□□□	120	77	140	169	100.2	51.5	3	720.5
AW12-8-17□□□	120	77	179.5	208.5	100.2	51.5	3	840
AW12-8-22□□□	120	77	215	244	100.2	51.5	3	947.5
AW16-9-14□□□	156.3	87	135	164	136.5	61.5	3	945.5
AW16-9-18□□□	156.3	87	175	204	136.5	61.5	3	1,092.5
AW16-9-23□□□	156.3	87	225	254	136.5	61.5	3	1,275.5
AW16-9-28□□□	156.3	87	275	304	136.5	61.5	3	1,459
AW21-9-17□□□	206.3	87	170	199	186.5	61.5	3	1,303
AW21-9-21□□□	206.3	87	210	239	186.5	61.5	3	1,473.5
AW21-9-26□□□	206.3	87	260	289	186.5	61.5	3	1,686.5
AW21-9-31□□□	206.3	87	310	339	186.5	61.5	3	1,899.5

■ Custom length is available.

Accessories (Optional parts)



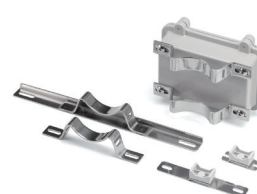
Mounting plate AWC series
See page 166



Hexagon socket head screw HCS series
See page 166



Cable gland
See page 181 ~ 193



Pole mounting bracket SSK series
See website



Protective vent CVP • PMF series
See page 195 ~ 200



- IP68 and heat dissipation enclosure design. Selectable in both Normal and EMC Shielded type.
- The extruded aluminium frame and diecast aluminium panels make it extremely suitable to be used in harsh environments where waterproofing and heat dissipation is essential.
- PCB or chassis can be mounted by sliding it horizontally into inner-grooved body frame.
- Suitable for measuring instruments, industrial control boxes, industrial camera housings, and other applications.

Technical Data

Protection class : IP68 (24 hours/1m depth)
Operating temperature : -40°C ~ +105°C
Recommended torque : 1.0N • m

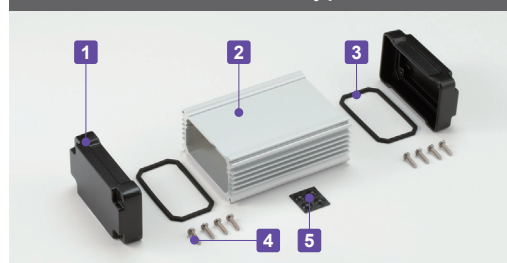
Normal N type Components

No.	Part name	Pcs	Material	Color / Finish
1	End panel	2	Diecast aluminium ADC12	Metallic gray • Black / Powder coated
2	Body frame	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
3	Gasket	2	Silicone	Black
4	Screw	8	Stainless steel	Unfinished
5	Rubber feet	4	Polyurethane	Black

EMC Shielded E type Components

No.	Part name	Pcs	Material	Color / Finish
1	End panel	2	Diecast aluminium ADC12	Silver • Black / Painted (Unfinished inside)
2	Body frame	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
3	Gasket	2	Conductive silicone	Black
4	Screw	8	Stainless steel	Unfinished
5	Rubber feet	4	Polyurethane	Black

Normal - N type



Color type



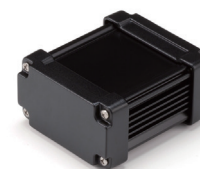
Metallic gray / Silver

N G S



Black / Silver

N B S

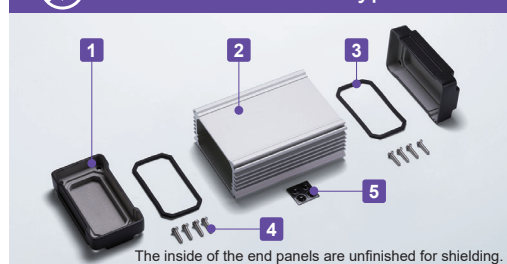


Black / Black

N B B



EMC Shielded - E type



Color type



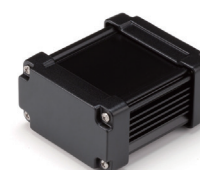
Silver / Silver

E S S



Black / Silver

E B S

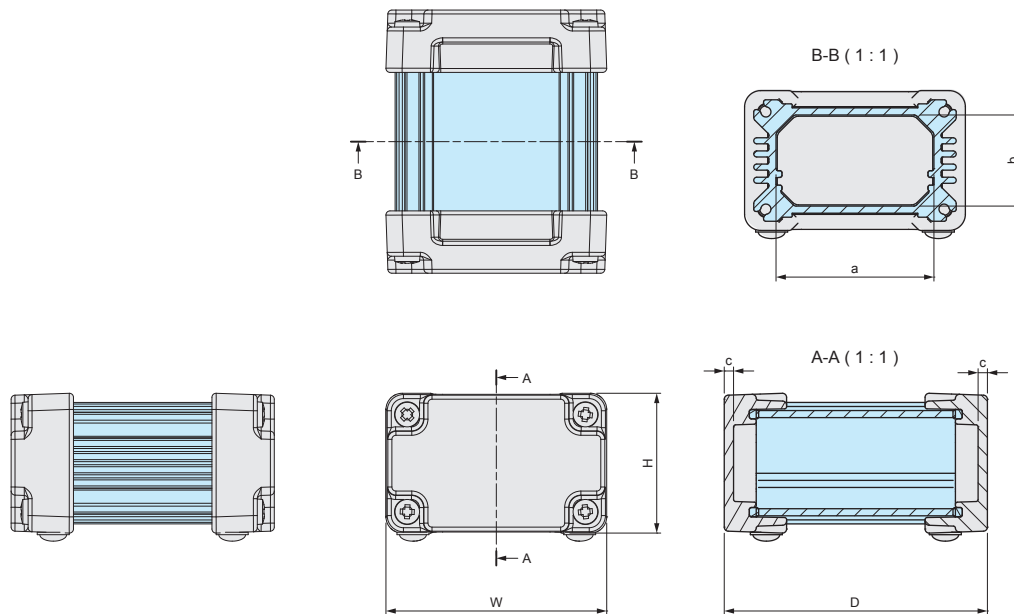


Black / Black

E B B

AWN dimensions

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



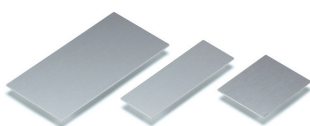
Product no. / Details

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

Product no.	W	H	D	a	b	c	Weight (g)
AWN 5-4- 7□□□	54.6	34.6	65	39	22.5	2.3	118.5
AWN 5-4- 9□□□	54.6	34.6	85	39	22.5	2.3	139
AWN 5-4-11□□□	54.6	34.6	110	39	22.5	2.3	165
AWN 5-4-14□□□	54.6	34.6	135	39	22.5	2.3	191.5
AWN 7-7- 8□□□	65.8	65.8	80	47	51	2.5	272.5
AWN 7-7-11□□□	65.8	65.8	110	47	51	2.5	328
AWN 7-7-15□□□	65.8	65.8	150	47	51	2.5	402.5
AWN 7-7-20□□□	65.8	65.8	200	47	51	2.5	495
AWN 7-7-25□□□	65.8	65.8	250	47	51	2.5	588
AWN 8-5- 9□□□	80.8	45.8	90	62	31	2.5	259.5
AWN 8-5-12□□□	80.8	45.8	115	62	31	2.5	300.5
AWN 8-5-14□□□	80.8	45.8	140	62	31	2.5	342
AWN 8-5-18□□□	80.8	45.8	175	62	31	2.5	399.5
AWN 9-9-10□□□	86.3	86.3	100	66.5	66.5	3	521.5
AWN 9-9-13□□□	86.3	86.3	125	66.5	66.5	3	594.5
AWN 9-9-17□□□	86.3	86.3	170	66.5	66.5	3	725.5
AWN 9-9-22□□□	86.3	86.3	220	66.5	66.5	3	871.5
AWN 9-9-28□□□	86.3	86.3	275	66.5	66.5	3	1,032
AWN11-6-11□□□	106.3	56.3	110	86.5	36.5	3	479.5
AWN11-6-15□□□	106.3	56.3	150	86.5	36.5	3	578
AWN11-6-19□□□	106.3	56.3	190	86.5	36.5	3	676.5
AWN11-6-24□□□	106.3	56.3	240	86.5	36.5	3	800
AWN12-8-11□□□	120	71.3	105	100.2	51.5	3	590.5
AWN12-8-14□□□	120	71.3	140	100.2	51.5	3	696.5
AWN12-8-17□□□	120	71.3	179.5	100.2	51.5	3	816
AWN12-8-22□□□	120	71.3	215	100.2	51.5	3	923.5
AWN16-9-14□□□	156.3	81.3	135	136.5	61.5	3	871.5
AWN16-9-18□□□	156.3	81.3	175	136.5	61.5	3	1,018.5
AWN16-9-23□□□	156.3	81.3	225	136.5	61.5	3	1,201.5
AWN16-9-28□□□	156.3	81.3	275	136.5	61.5	3	1,385
AWN21-9-17□□□	206.3	81.3	170	186.5	61.5	3	1,261
AWN21-9-21□□□	206.3	81.3	210	186.5	61.5	3	1,431.5
AWN21-9-26□□□	206.3	81.3	260	186.5	61.5	3	1,644.5
AWN21-9-31□□□	206.3	81.3	310	186.5	61.5	3	1,857.5

■ Custom length is available.

Accessories (Optional parts)



Mounting plate AWC series
See page 166



Hexagon socket head screw HCS series
See page 166



Cable gland
See page 181 ~ 193

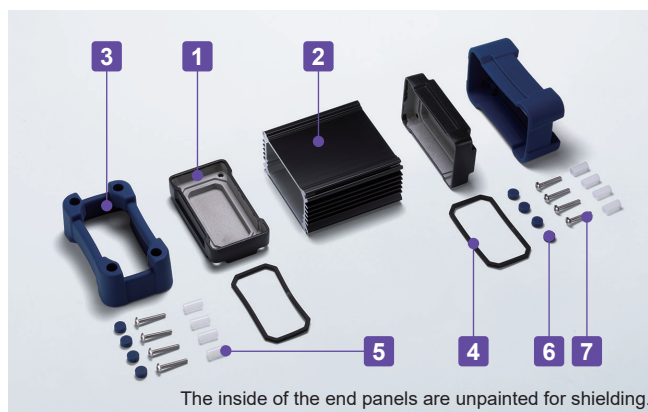


Silicone protector AWSP series
See page 165



Technical Data

Protection class : IP68 (24 hours/1m depth)
 Operating temperature : -40°C ~ +105°C
 Recommended torque : 1.0N • m



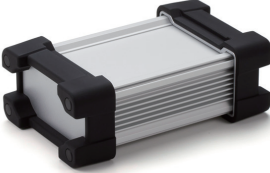
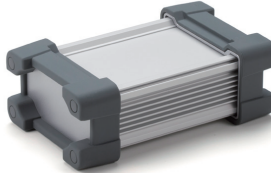
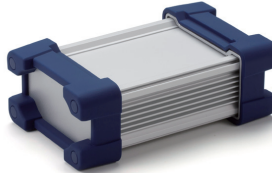
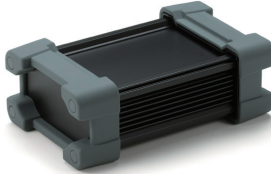
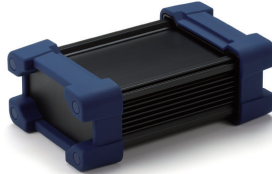
- Strong impact resistant enclosure with tough silicone boot protectors.
- Specifically designed with heat dissipation effect, EMC shielding and IP68 rating.
- PCB or chassis can be horizontally mounted by sliding into an inner-grooved body frame.
- Available in 25 sizes and 6 different color combinations. Selectable from a total of 150 different combinations.
- Suitable for measuring instruments, industrial control boxes, industrial camera housings, and other applications.

Components

No.	Part name	Pcs	Material	Color / Finish
1	End panel	2	Diecast aluminium ADC12	Silver • Black / Painted (Unfinished inside)
2	Body frame	1	Extruded aluminium A6063S-T5	Silver • Black / Anodized with clear coating
3	Protector	2	Silicone	Black • Gray • Navy
4	Conductive gasket	2	Conductive silicone	Black
5	Spacer	8	Resin	White
6	Blind cap	8	Silicone	Black • Gray • Navy
7	Screw	8	Stainless steel	Unfinished

- AWP series utilizes AWN series E type enclosures.
 If N type is required, kindly purchase the enclosure and silicone protector separately.

Color Type

Code	S B Silver / Black	S G Silver / Gray	S N Silver / Navy
Color			
Code	B B Black / Black	B G Black / Gray	B N Black / Navy
Color			

Product no. / Details

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

Product no.	W	H	D	※ Thermal resistance rate (°C/W)	Weight (g)
AWP 8-5- 9□□	87.4(80.8)	53.6(45.8)	114 (90)	5.97	353.5
AWP 8-5-12□□	87.4(80.8)	53.6(45.8)	139(115)	5.01	394.5
AWP 8-5-14□□	87.4(80.8)	53.6(45.8)	164(140)	4.37	436
AWP 8-5-18□□	87.4(80.8)	53.6(45.8)	199(175)	3.76	493.5
AWP 9-9-10□□	93.9(86.3)	95.1(86.3)	130(100)	3.1	693
AWP 9-9-13□□	93.9(86.3)	95.1(86.3)	155(125)	2.63	766
AWP 9-9-17□□	93.9(86.3)	95.1(86.3)	200(170)	2.12	897
AWP 9-9-22□□	93.9(86.3)	95.1(86.3)	250(220)	1.79	1,043
AWP 9-9-28□□	93.9(86.3)	95.1(86.3)	305(275)	1.54	1,203.5
AWP11-6-11□□	113.9(106.3)	65.1(56.3)	140(110)	4.52	652.5
AWP11-6-15□□	113.9(106.3)	65.1(56.3)	180(150)	3.62	751.5
AWP11-6-19□□	113.9(106.3)	65.1(56.3)	220(190)	3.08	850
AWP11-6-24□□	113.9(106.3)	65.1(56.3)	270(240)	2.64	973
AWP12-8-11□□	127.6(120)	80.1(71.3)	135(105)	3.6	778.5
AWP12-8-14□□	127.6(120)	80.1(71.3)	170(140)	2.93	885
AWP12-8-17□□	127.6(120)	80.1(71.3)	209.5(179.5)	2.47	1,004.5
AWP12-8-22□□	127.6(120)	80.1(71.3)	245(215)	2.18	1,112
AWP16-9-14□□	163.9(156.3)	90.1(81.3)	165(135)	2.64	1,094
AWP16-9-18□□	163.9(156.3)	90.1(81.3)	205(175)	2.2	1,240.5
AWP16-9-23□□	163.9(156.3)	90.1(81.3)	255(225)	1.86	1,424
AWP16-9-28□□	163.9(156.3)	90.1(81.3)	305(275)	1.63	1,607.5
AWP21-9-17□□	213.9(206.3)	90.1(81.3)	202(170)	2.3	1,571.5
AWP21-9-21□□	213.9(206.3)	90.1(81.3)	242(210)	1.99	1,742
AWP21-9-26□□	213.9(206.3)	90.1(81.3)	292(260)	1.72	1,955.5
AWP21-9-31□□	213.9(206.3)	90.1(81.3)	342(310)	1.54	2,168.5

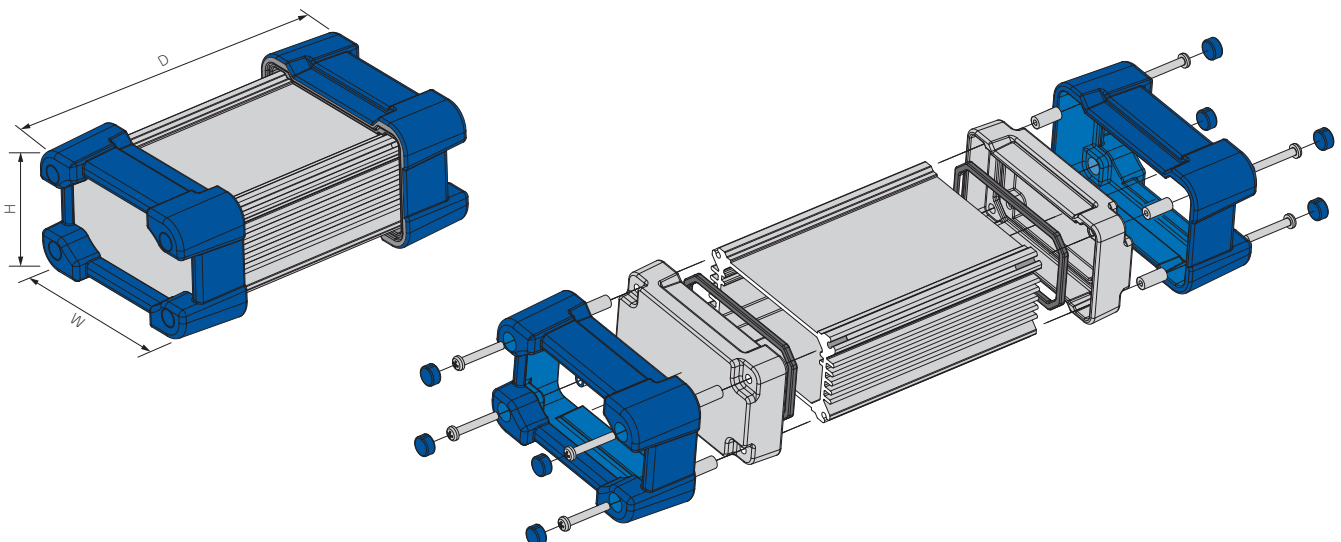
■ () value = enclosure dimension.

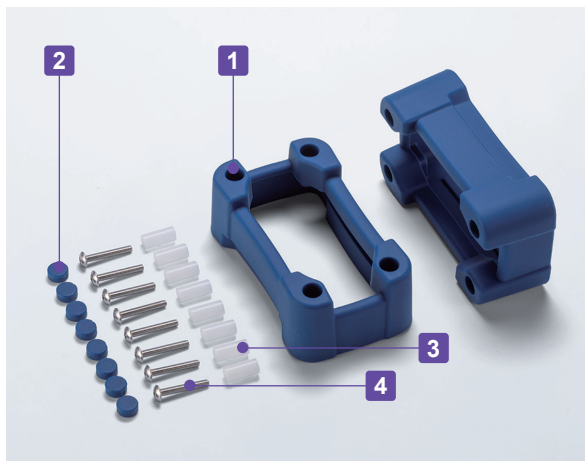
※ Thermal resistance test condition

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

AWP dimensions

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



AWSP series**SILICONE PROTECTOR for AWN**

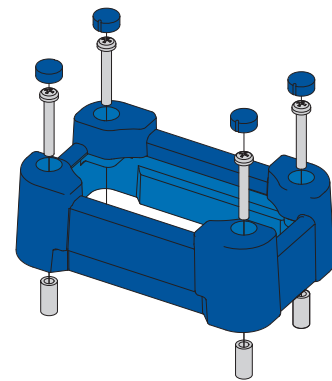
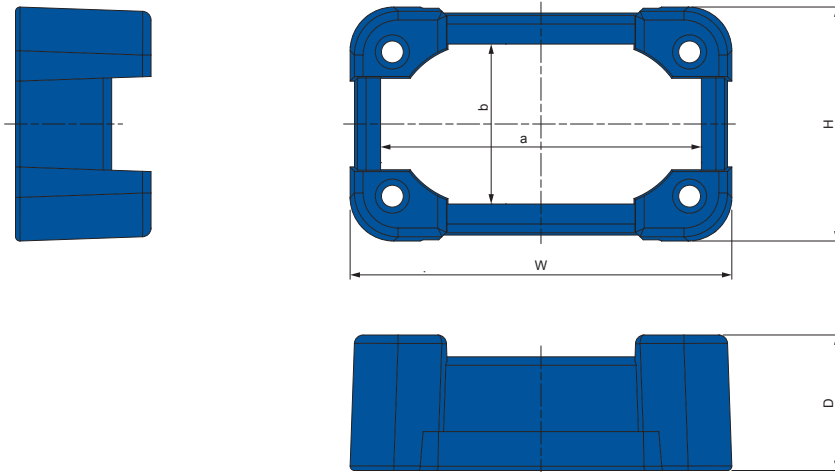
Color Type

Code	B Black	G Gray	N Navy
Color			

■ Silicone protector for AWN series.

AWSP dimensions

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

**Components**

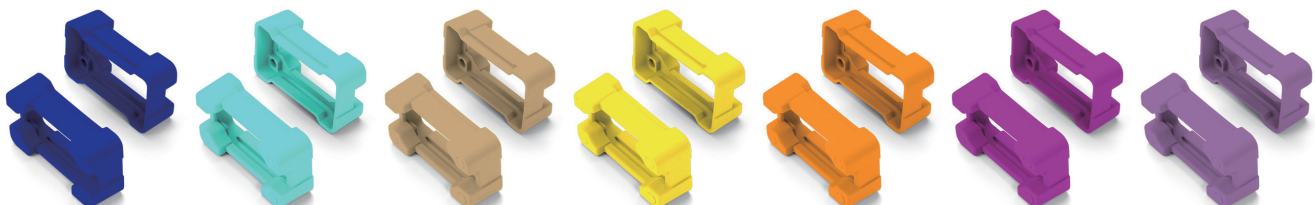
No.	Part name	Pcs	Material	Color / Finish
1	Protector	2	Silicone	Black • Gray • Navy
2	Blind cap	8	Silicone	Black • Gray • Navy
3	Spacer	8	POM	White
4	Screw	8	Stainless steel	Unfinished

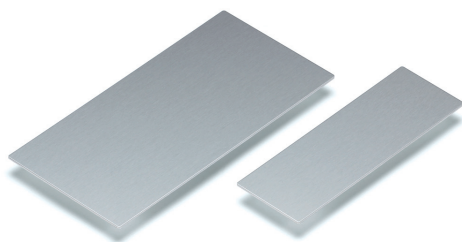
Product no. / Details

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

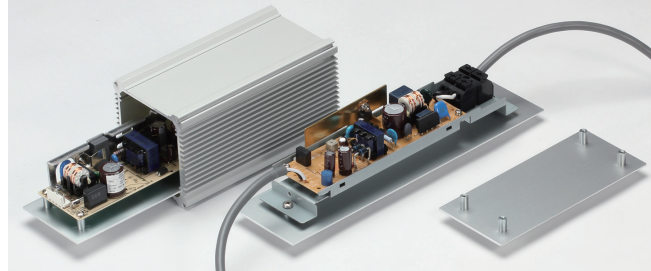
Product no.	W	H	D	a	b	Screw size	Suitable models	Weight (g)
AWSP 8-5□	87.4	53.6	31	73.4	36.6	M3	AWN 8-5-□	100.5
AWSP 9-9□	93.9	95.1	35.5	76.9	75.1	M4	AWN 9-9-□	184.5
AWSP11-6□	113.9	65.1	35.5	96.9	45.1	M4	AWN11-6-□	186
AWSP12-8□	127.6	80.1	35.5	110.6	60.1	M4	AWN12-8-□	201
AWSP16-9□	163.9	90.1	35.5	145.9	69.1	M4	AWN16-9-□	235
AWSP21-9□	213.9	90.1	39.5	192.9	66.1	M5	AWN21-9-□	333

■ Protect switches and/or connectors on end panels from impact when dropped, etc. Custom color is available from just 1 set. For 250 sets or more, manufacturing costs will be similar to a standard color. Please inquire for more details. For custom color order, please specify **PANTONE®** color code.

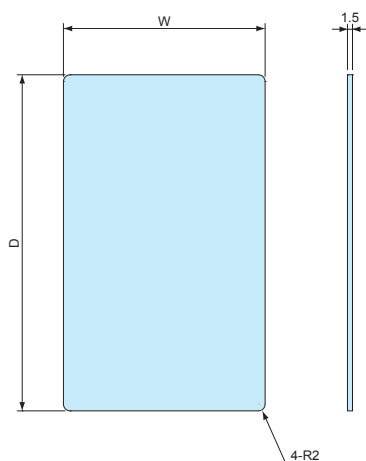


AWC series**ALUMINIUM MOUNTING PLATE for AW • AWN • AWP • AWA**

APPLICATION EXAMPLE



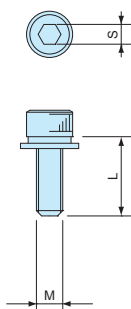
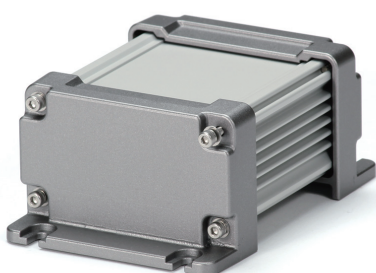
- Material: Aluminium A1050P t=1.5 / Silver anodized
- Mounting plate for AW, AWN, AWP, and AWA enclosures.
- Utilize for mounting PCB, power supply, terminal blocks, etc.

AWC dimensions

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

Product no. / Details

Product no.	W	D	Suitable models
AWC 5- 7	38.9	49.2	AW • AWN 5-4- 7
AWC 5- 9	38.9	69.2	AW • AWN 5-4- 9
AWC 5-11	38.9	94.2	AW • AWN 5-4-11
AWC 5-14	38.9	119.2	AW • AWN 5-4-14
AWC 7- 8	47	64	AW • AWN 7-7- 8 • AWA 6-6- 7
AWC 7-11	47	94	AW • AWN 7-7-11 • AWA 6-6-10
AWC 7-15	47	134	AW • AWN 7-7-15 • AWA 6-6-14
AWC 7-20	47	184	AW • AWN 7-7-20 • AWA 6-6-19
AWC 7-25	47	234	AW • AWN 7-7-25 • AWA 6-6-24
AWC 8- 9	61.8	74	AW • AWN • AWP 8-5- 9 • AWA 8-4- 8
AWC 8-12	61.8	99	AW • AWN • AWP 8-5-12 • AWA 8-4-10
AWC 8-14	61.8	124	AW • AWN • AWP 8-5-14 • AWA 8-4-13
AWC 8-18	61.8	159	AW • AWN • AWP 8-5-18 • AWA 8-4-16
AWC 9-10	66.5	81	AW • AWN • AWP 9-9-10 • AWA 8-8- 9
AWC 9-13	66.5	106	AW • AWN • AWP 9-9-13 • AWA 8-8-11
AWC 9-17	66.5	151	AW • AWN • AWP 9-9-17 • AWA 8-8-16
AWC 9-22	66.5	201	AW • AWN • AWP 9-9-22 • AWA 8-8-21
AWC 9-28	66.5	256	AW • AWN • AWP 9-9-28 • AWA 8-8-26
AWC11-11	86.5	90.6	AW • AWN • AWP11-6-11 • AWA10-5-10
AWC11-15	86.5	130.6	AW • AWN • AWP11-6-15 • AWA10-5-14
AWC11-19	86.5	170.6	AW • AWN • AWP11-6-19 • AWA10-5-18
AWC11-24	86.5	220.6	AW • AWN • AWP11-6-24 • AWA10-5-23
AWC12-11	100.2	85.6	AW • AWN • AWP12-8-11 • AWA12-7- 9
AWC12-14	100.2	120.6	AW • AWN • AWP12-8-14 • AWA12-7-12
AWC12-17	100.2	160.1	AW • AWN • AWP12-8-17 • AWA12-7-17
AWC12-22	100.2	195.6	AW • AWN • AWP12-8-22 • AWA12-7-20
AWC16-14	136.3	115.6	AW • AWN • AWP16-9-14 • AWA15-8-12
AWC16-18	136.3	155.6	AW • AWN • AWP16-9-18 • AWA15-8-16
AWC16-23	136.3	205.6	AW • AWN • AWP16-9-23 • AWA15-8-21
AWC16-28	136.3	255.6	AW • AWN • AWP16-9-28 • AWA15-8-26
AWC21-17	186.1	147.8	AW • AWN • AWP21-9-17 • AWA20-8-15
AWC21-21	186.1	187.8	AW • AWN • AWP21-9-21 • AWA20-8-19
AWC21-26	186.1	237.8	AW • AWN • AWP21-9-26 • AWA20-8-24
AWC21-31	186.1	287.8	AW • AWN • AWP21-9-31 • AWA20-8-29

HCS series**HEXAGON SOCKET HEAD SCREW for AW • AWN**

- Hexagon socket head screws for fastening the end panels of AW and AWN enclosures.
- Utilize for tamper-resistance functionality or for an elegant sleek look.

Product no. / Details

Product no.	M	L	S	Material	Pack of
HCS3-12S	3	12	2.5	Stainless steel	8
HCS4-12S	4	12	3	Stainless steel	8
HCS5-12S	5	12	4	Stainless steel	8

NMG series**NEODYMIUM MAGNET****Round magnet**

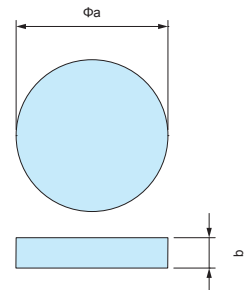
■ DXF/DWG/PDF drawings available on our website.



- Material / Finish: Neodymium / Nickel plated
- Please attach using a strong adhesive.

Product no. / Details

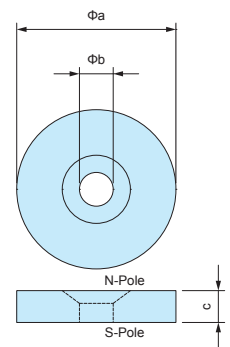
Product no.	a	b	Weight (g)	Flux Density	Absorption
NMG3-15N	15	3	4	214.4 mT	2.44 kgf
NMG3-20N	20	3	7.1	170.7 mT	3.26 kgf
NMG5-22N	22	5	11.4	247.2 mT	5.91 kgf
NMG5-25N	25	5	18.4	221.9 mT	6.89 kgf

NMG dimensions**Round magnet with countersunk hole**

- Please fasten with a screw.

**Product no. / Details**

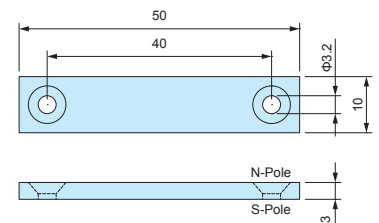
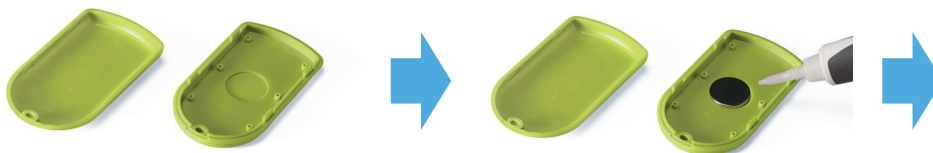
Product no.	a	b	c	Countersunk size	Weight (g)	Flux Density	Absorption
NMG3-15M3	15	3.2	3	M3	3.8	214.3 mT	2.33 kgf
NMG3-20M3	20	3.2	3	M3	6.9	170.6 mT	3.17 kgf
NMG5-22M4	22	4.3	5	M4	13.7	247.2 mT	5.68 kgf
NMG5-25M5	25	5.3	5	M5	17.6	221.9 mT	6.58 kgf

**Rectangular magnet with countersunk holes**

- Please fasten with a screw.

**Product no. / Details**

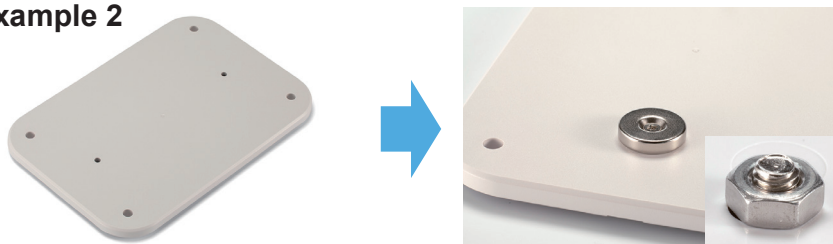
Product no.	a	b	c	Countersunk size	Weight (g)	Flux Density	Absorption
NMG3-50M3	50	10	3	M3	11.3	210.0 mT	9.1 kgf

**Example 1** The magnetic force remains strong even through plastic.

Make recessed pocket on the inside wall.

Glue on.

Attach onto a metallic surface.

Example 2

Make holes

Fasten with a screw and nut.

Attach onto a metallic surface.

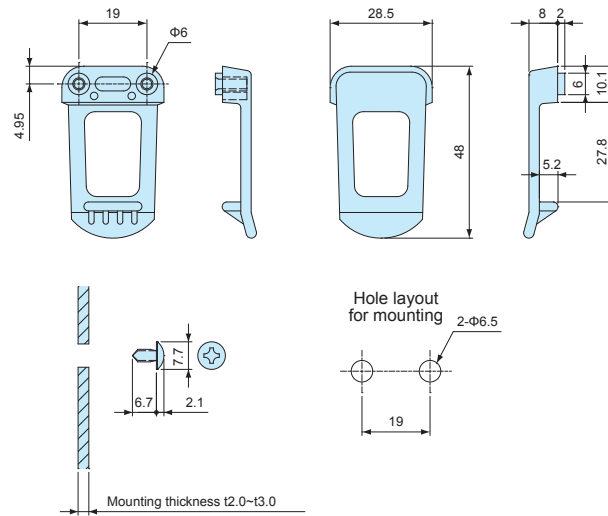
CAUTION: Handle with care to avoid personal injury or damage to the magnet.

GDH series**PLASTIC BELT CLIP**

Installation example

GDH dimensions

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

**Components**

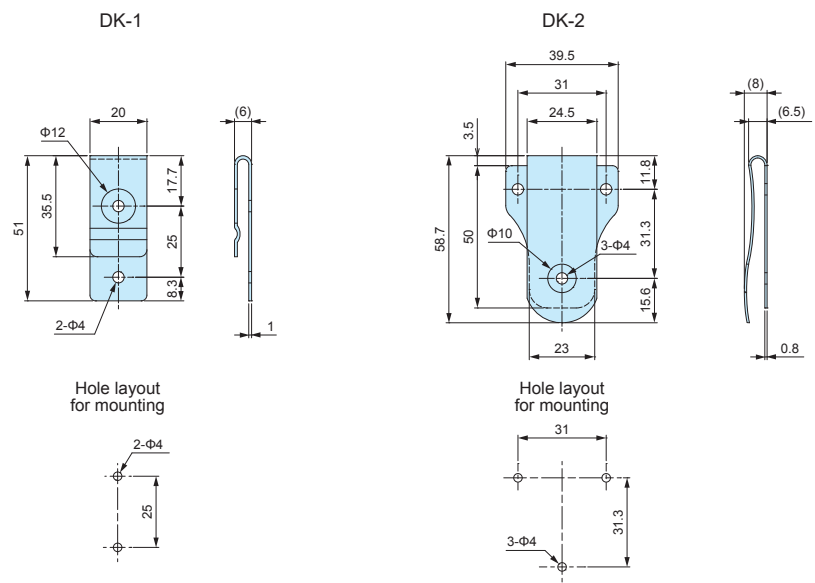
No.	Part name	Pcs	Material	Color / Finish
1	Clip	1	ABS UL94HB	White • Black
2	Screw	2	Steel M3.5-6	Zinc plated

Product no. / Details

Product no.		W	H	D
● White	● Black			
GDH-1W	GDH-1B	28.5	10	48

DK series**STEEL BELT CLIP****DK dimensions**

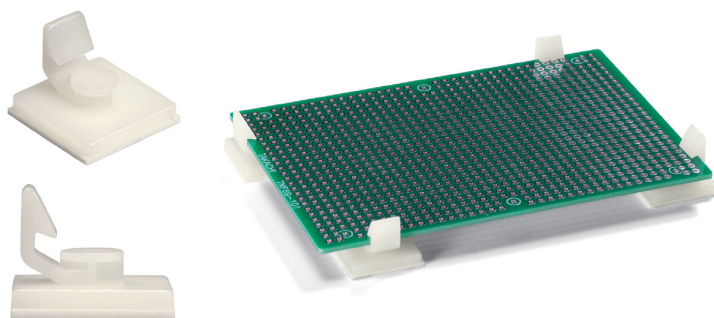
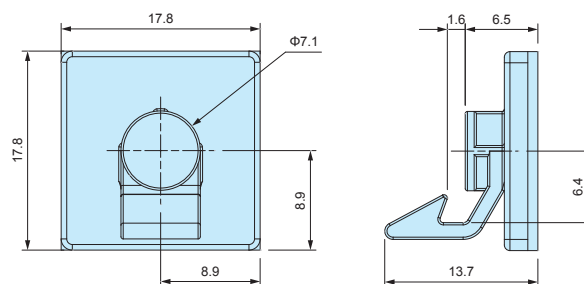
■ DXF/DWG/PDF drawings available on our website.

**Product no. / Details**

Product no.	Material	Finish
DK-1	Steel SPCC t=1.0	Chrome plated
DK-2	Steel SPCC t=0.8	Chrome plated

ULCK series**SCREWLESS PCB ADHESIVE STANDOFF**

Application example

**ULCK dimensions**

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

- Securing of a 1.6mm thick PCB made easy by simply snapping it in.
- Adhesive standoff can be freely and easily affixed on.
- Once removed, it cannot be adhered on again.

Product no. / Details

■ Material / Color : PA66 UL94V-2 / Natural

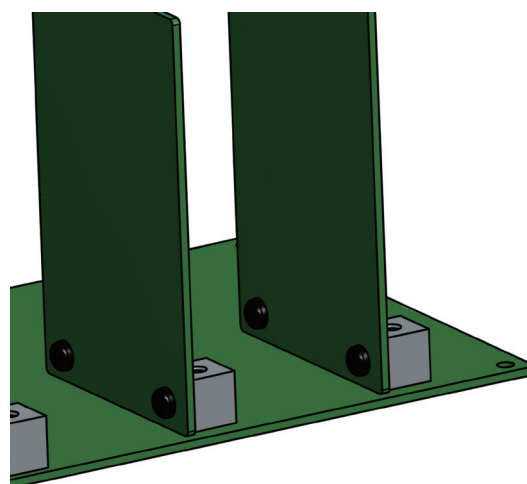
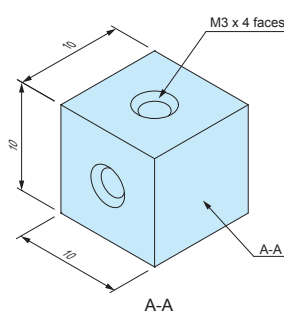
Product no.	Weight (g)	Pack of
ULCK-6.4	1.3 (1 pc)	4

CUBE series**CUBE STANDOFF**

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

CUBE10-M3

CUBE10-M4



- 10mm threaded cube shape standoff with a thread on 4 faces.
- M3 and M4 thread models available.
- Conveniently usable when installing PCB or metal plate upright.
- CUBE can also be used to make a simple housing by vertically aligning the plates.

Product no. / Details

■ Zinc diecast : Glossy barrel finish

Product no.	Pack of
CUBE10-M3	2
CUBE10-M4	2
CUBE10-M3-P	20
CUBE10-M4-P	20

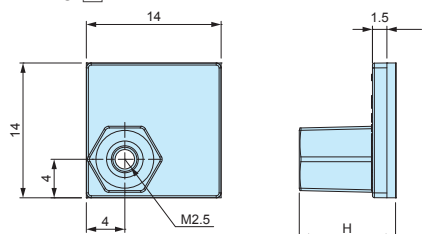
AST series**INSERT NUT ADHESIVE STANDOFF**

- Double-sided adhesive tape allows the standoff to be mounted quickly and easily; allows PCB mounting in non-boss enclosures.
- Convenient for installing PCBs into enclosures without the need for customization.
- Please ensure that surface is cleaned and grease-free before adhering.
- Once removed, it cannot be adhered on again.

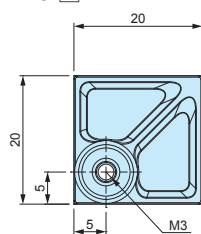
AST dimensions

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

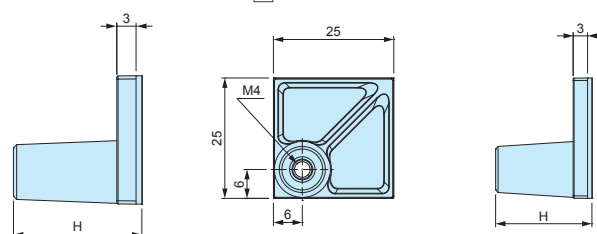
AST2.5-□



AST3-□



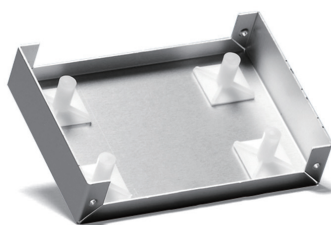
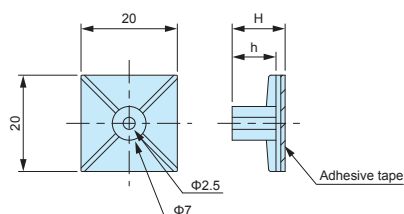
AST4-□

**Product no. / Details****Bulk package**

Product no	H dimension	Included screw	Recommended PCB thickness (mm)	Recommended torque (N · m)	Weight (g)	Pack of	Product no	Pack of
AST2.5-5B	5	M2.5-5 pan head	1.0 ~ 2.0	0.3	0.6 (1 piece)	4	AST2.5-5B-P	100
AST2.5-10B	10	M2.5-5 pan head	1.0 ~ 2.0	0.3	0.8 (1 piece)	4	AST2.5-10B-P	100
AST3-6B	6	M3-6 pan head	1.0 ~ 3.0	0.4	1.5 (1 piece)	4	AST3-6B-P	100
AST3-10B	10	M3-6 pan head	1.0 ~ 3.0	0.4	1.6 (1 piece)	4	AST3-10B-P	100
AST3-15B	15	M3-6 pan head	1.0 ~ 3.0	0.4	1.8 (1 piece)	4	AST3-15B-P	100
AST3-20B	20	M3-6 pan head	1.0 ~ 3.0	0.4	2.1 (1 piece)	4	AST3-20B-P	100
AST4-10.5B	10.5	M4-8 pan head	1.0 ~ 3.5	0.8	2.6 (1 piece)	4	AST4-10.5B-P	50
AST4-20B	20	M4-8 pan head	1.0 ~ 3.5	0.8	3.2 (1 piece)	4	AST4-20B-P	50

- Base material / color : Nylon 66 (UL94V-2) / Black
- Nut • screw material / finish : Steel / Trivalent chromate

- Bulk packaging is available. See "Bulk package" column above.
- Screws are not included for bulk packages.

ASR series**ADHESIVE PCB STANDOFF****ASR dimensions**

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

Technical Data

Recommended torque : 0.4N · m

- M3 tapping screw use adhesive standoff. Recommended to be used with EM-3 or EM-3-6 self-tapping screws (See page 398).
- Please ensure that surface is cleaned and grease-free before adhering.
- Once removed, it cannot be adhered on again.

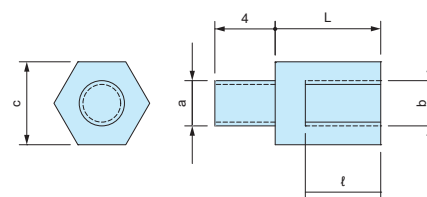
Product no. / Details

■ Material / Color: Nylon 66 (UL94V-2) / Natural

Product no	H	h	Weight (g)	Pack of
ASR- 5	5.1	3.1	0.9 (1 piece)	10
ASR- 6	6.4	4.4	1.0 (1 piece)	10
ASR- 7	7.2	5.1	0.9 (1 piece)	10
ASR- 8	8.1	6.3	0.9 (1 piece)	10
ASR- 9	9	7	1.0 (1 piece)	10
ASR-11	11	9	1.0 (1 piece)	10
ASR-13	12.7	10.7	1.2 (1 piece)	10
ASR-14.5	14.7	12.8	1.1 (1 piece)	10
ASR-16	15.9	13.9	1.3 (1 piece)	10
ASR-19	19.1	17.1	1.4 (1 piece)	10

TPS series

TAPPING STANDOFF



■ Tapping screw head allows for easy installation onto existing enclosure boss mount.

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

■ 4 different sizes available : M2.3, M2.6, M3 and M4 size.

Product no. / Details

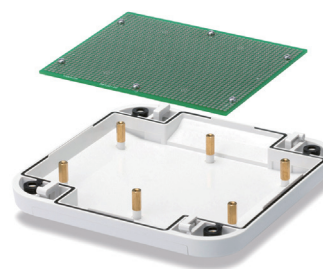
■ Material / Finish : Brass / Unfinished

Product no.	Screw size (a)	Screw size (b)	c	L	ℓ	Weight (g)	Pack of	Suitable models
TPS-M2.3-4	2.3	M2.3	5	4	3	0.7	4	WH series • PFE series LC • LCE • LCS • LCT series PF • PFF series (M2.3 boss models) TW • TWN • TWF series (M2.3 boss models) WP series (M2.3 boss models)
TPS-M2.3-5	2.3	M2.3	5	5	3	0.9	4	
TPS-M2.3-6	2.3	M2.3	5	6	4	1	4	
TPS-M2.3-7	2.3	M2.3	5	7	5	1.2	4	
TPS-M2.3-8	2.3	M2.3	5	8	6	1.3	4	
TPS-M2.3-10	2.3	M2.3	5	10	6	1.7	4	
TPS-M2.3-12	2.3	M2.3	5	12	6	2	4	PF • PFF series (M2.6 boss models) WP series (M2.6 boss models)
TPS-M2.6-4	2.6	M2.6	5	4	3	0.7	4	
TPS-M2.6-5	2.6	M2.6	5	5	3	0.8	4	
TPS-M2.6-7	2.6	M2.6	5	7	5	1.1	4	
TPS-M2.6-10	2.6	M2.6	5	10	6	1.6	4	SU • OP TWS • TW • TWN • TWF series (M3 boss models)
TPS-M2.6-12	2.6	M2.6	5	12	6	2	4	
TPS-M3-4	3	M3	5.5	4	3	0.8	4	
TPS-M3-5	3	M3	5.5	5	3	1.1	4	
TPS-M3-6	3	M3	5.5	6	4	1.2	4	
TPS-M3-7	3	M3	5.5	7	5	1.3	4	
TPS-M3-8	3	M3	5.5	8	5	1.6	4	BCAS • BCAP • BCPC • BCPK series (M4 boss models) BCAR • BCPR series (M4 boss models) SPCP • SPCM • WG • WGV • WGPC
TPS-M3-10	3	M3	5.5	10	6	1.9	4	
TPS-M3-12	3	M3	5.5	12	6	2.3	4	
TPS-M4-6	4	M4	7	6	4	2	4	
TPS-M4-10	4	M4	7	10	6	3.1	4	
TPS-M4-15	4	M4	7	15	8	4.7	4	
TPS-M4-20	4	M4	7	20	10	6.5	4	



■ Please use a suitable sized socket driver to both secure and loosen the tapping standoff.

Installation example



MT series

PCB MOUNTING SCREWS for TPS



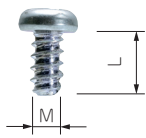
■ Pan head PCB mounting Screws for TPS tapping standoffs.

Product no. / Details

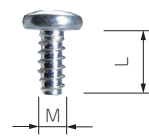
Product no.	M	L	Material	Finish	Pack of
MT2.3-4	2.3	4	Steel	Trivalent chromate	20
MT2.3-6	2.3	6	Steel	Trivalent chromate	20
MT2.6-4	2.6	4	Steel	Trivalent chromate	20
NEW MT2.6-6	2.6	6	Steel	Trivalent chromate	20
MT3-4	3	4	Steel	Trivalent chromate	20
NEW MT3-6	3	6	Steel	Trivalent chromate	20
NEW MT4-4	4	4	Steel	Trivalent chromate	20
NEW MT4-6	4	6	Steel	Trivalent chromate	20

EM series**PCB MOUNTING SCREW**

Pan head



Bind head



- Self-tapping screws for mounting PCB on bosses or standoffs.
- EM-3-6 self-tapping screws are suitable for mounting 1.6mm or thicker PCB.

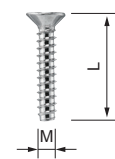
Product no. / Details

■ Material / Finish : Steel / Trivalent chromate

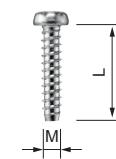
Product no.	M	L	Head type	Suitable models	Pack of
EM-1.6	1.6	4	Pan	SMW • CSS • CS SIC • SIM • WC • PS (M1.6 boss models)	50
EM-2	2	5	Pan	PS • TW • TWN • TWF SIC • SIM • PF • WC • WP (M2 boss models)	50
NEW EM-B2	2	5	Bind	SIC • SIM (M2 boss models) SIC • SIM6-12-□ (when installing PCB46-101)	50
EM-2.3	2.3	6	Pan	DRC • WH • LC • LCT • LCS • LCE • PFE WSC (Top cover bosses) PF • PFF (M2.3 boss models) TW • TWN • TWF (M2.3 boss models) WP (M2.3 boss models)	50
EM-2.3-8	2.3	8	Pan	WSC (Bottom base bosses)	50
EM-2.6	2.6	6	Pan	PF • PFF • WP (M2.6 boss models)	50
EM-3	3	5	Pan	SU • OP	50
EM-3-6	3	6	Pan	TWS • TW • TWN • TWF (M3 boss models)	50

MR series**TORX SCREW**

Flat head



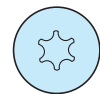
Pan head



With pin



★ Without pin



- Self-tapping torx screws for securing of the enclosure.

★ : MR1.6-6S, MR2.6-10□, MR3-5Z□ and MR3-14□ are without pin.

Product no. / Details

★ Mark = Without pin

Product no.	M	L	Head no.	Head style	Material	Finish	Suitable models	Pack of
MR1.6-6S★	1.6	6	T3	Pan	Steel	Nickel plated	CSS • CS	20
MR2.5-8PS	2.5	8	T8	Pan	Steel	Nickel plated	PF • PFE • PFF (M2.5 size)	20
MR2.6-10S★	2.6	10	T8	Flat	Steel	Nickel plated	TW • TWN (M2.6 size)	20
MR2.6-10B★	2.6	10	T8	Flat	Steel	Black trivalent chromate	TWF (M2.6 size)	20
MR2.6-12PS	2.6	12	T8	Pan	Steel	Nickel plated	MX • MXA • MXB • MXF (M2.6 size)	20
MR2.6-14PS	2.6	14	T8	Pan	Steel	Nickel plated	LCT • LCS • LC115-F2 / F3 LCT • LCS • LC145S-F6	20
MR2.6-14S	2.6	14	T8	Flat	Steel	Nickel plated	LCT • LCS • LC115H-F2 / F3 / M2 / 9V LCT • LCS • LC135-F4 / M2 / M3 / 9V LCT • LCS • LC135H-F4 / M2 / M3 / 9V LCT • LCS • LC145-F6 / M2 / M4 LCT • LCS • LC145H-F6 / M2 / M4 LCT • LCS • LC165-M4 LCT • LCS • LC165H-M4	20
MR2.6-18S	2.6	18	T8	Flat	Steel	Nickel plated	LCT • LCS • LC115-N / F2 / F3 LCT • LCS • LC145S-F6 / 145S-N LCE115-N TW • TWN7-2-11 / 7-4-11 / 7-5-11 TWF7-2-11 / 7-4-11 / 7-5-11 / 8-2-8 / 8-4-8	20
MR-1S	3	5	T10	Flat	Steel	Nickel plated	LCT • LCS • LC115H-N / F2 / F3 / M2 / 9V LCT • LCS • LC135-N / F4 / M2 / M3 / 9V LCT • LCS • LC135H-N / F4 / M2 / M3 / 9V LCT • LCS • LC145-N / F6 / M2 / M4 LCT • LCS • LC145H-N / F6 / M2 / M4 LCT • LCS • LC165-N / M4 LCT • LCS • LC165H-N / M4 LCE115H-N • LCE135-N • LCE145H-N • LCE165H-N	20
MR-1B	3	5	T10	Flat	Steel	Black trivalent chromate	UC	20
MR3-5ZS★	3	5	T10	Slotted raised countersunk	Steel	Nickel plated	FC • HY • HYR • HYRH (M3 size)	20
MR3-5ZB★	3	5	T10	Flat	Steel	Black trivalent chromate	CF	20
MR3-8PS	3	8	T10	Pan	Steel	Nickel plated	PF • PFE • PFF (M3 size)	20
MR3-14S★	3	14	T10	Flat	Steel	Nickel plated	TW • TWN (M3 size)	20
MR3-14B★	3	14	T10	Flat	Steel	Black trivalent chromate	TWF (M3 size) MX • MXA • MXB • MXF (M3 size)	20



- Weatherproof cable gland equipped with high ultraviolet and degradation resistant silicone sealing insert and O-ring.
- Recommended to use outdoors where waterproofing is critical.
- Protection class equivalent to IP67.

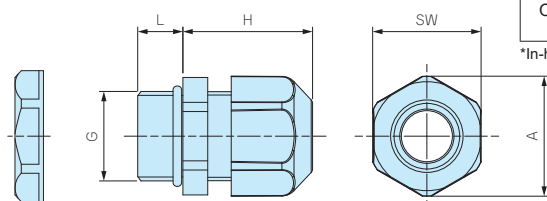
Components

■ PA = Polyamide

No.	Part name	Material
1	Cap	PA66 UL94V-2
2	Sealing insert	Silicone
3	Connector	PA66 UL94V-2
4	O-ring	Silicone
5	Lock nut	PA66 UL94V-2

RMW dimensions

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



Technical Data

Protection class : Equivalent to IP67*
Operating temperature : -20°C ~ +80°C

*In-house test

Cap design varies by size



RMW40 or smaller



RMW50

- Lock nut is not included for RMW10S-6.

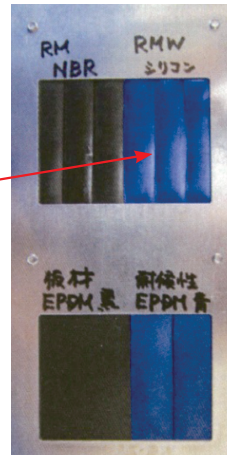
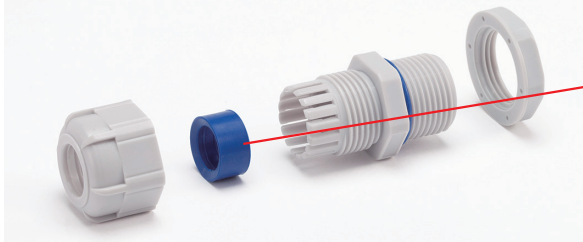
Please drill a proper thread hole into the enclosure for installation.

Product no. / Details

Product no.		G		Cable range		L	H Max	SW	A	Pack of
● Black	● Light gray	Thread size	Mounting hole	Min	Max					
RMW8L-2.5B	RMW8L-2.5S	M8×1.25	Φ8.2	1	2.5	13	19.5	12	13.6	1
RMW8L-4B	RMW8L-4S	M8×1.25	Φ8.2	2.5	4	13	19.5	12	13.6	1
RMW10S-6B	RMW10S-6S	M10×1.5	—	3	6	8	20.5	13	14.6	1
RMW10L-6B	RMW10L-6S	M10×1.5	Φ10.2	3	6	13	20.5	13	14.6	1
RMW12S-7B	RMW12S-7S	M12×1.5	Φ12.2	3.5	7	9	20.5	16	17.7	1
RMW12L-7B	RMW12L-7S	M12×1.5	Φ12.2	3.5	7	14.5	20.5	16	17.7	1
RMW16S-8B	RMW16S-8S	M16×1.5	Φ16.2	4	8	9	23.5	19.2	21.3	1
RMW16L-8B	RMW16L-8S	M16×1.5	Φ16.2	4	8	15	24	19.2	21.3	1
RMW20S-12B	RMW20S-12S	M20×1.5	Φ20.2	6	12	10	29	24.3	26.8	1
RMW20L-12B	RMW20L-12S	M20×1.5	Φ20.2	6	12	15	28.5	24.3	26.8	1
RMW25L-17B	RMW25L-17S	M25×1.5	Φ25.2	11	17	15	35	33.3	36.8	1
RMW32L-21B	RMW32L-21S	M32×1.5	Φ32.3	13	21	15	38	36.1	39.8	1
RMW40L-27B	RMW40L-27S	M40×1.5	Φ40.3	18	27	18	43.5	46.1	51.2	1
RMW50L-38B	RMW50L-38S	M50×1.5	Φ50.4	27	38	20	50.5	60	66.5	1
RMW10L-6B-P	RMW10L-6S-P	M10×1.5	Φ10.2	3	6	13	20.5	13	14.6	100
RMW12S-7B-P	RMW12S-7S-P	M12×1.5	Φ12.2	3.5	7	9	20.5	16	17.7	100
RMW12L-7B-P	RMW12L-7S-P	M12×1.5	Φ12.2	3.5	7	14.5	20.5	16	17.7	100
RMW16S-8B-P	RMW16S-8S-P	M16×1.5	Φ16.2	4	8	9	23.5	19.2	21.3	100
RMW16L-8B-P	RMW16L-8S-P	M16×1.5	Φ16.2	4	8	15	24	19.2	21.3	100
RMW20S-12B-P	RMW20S-12S-P	M20×1.5	Φ20.2	6	12	10	29	24.3	26.8	100
RMW20L-12B-P	RMW20L-12S-P	M20×1.5	Φ20.2	6	12	15	28.5	24.3	26.8	100

RMW series silicone sealing insert weatherproof test report

Object: Cut into a piece of the silicone sealing insert from RMW series and attach it onto an aluminium plate.
For comparison, NBR sealing insert from our RM and EPDM sealing insert from another manufacturer is also attached.



Before



After

Testing conditions

Equipment : 7.5kW Super Xenon Weather Meter SX75 (Suga Test Instruments Co., Ltd.- <http://www.sugatest.co.jp/english/>)
Conditions : JIS B7754 : 1991

Testing with an authorized Xenon arc lamp weathering test equipment under the conditions denoted below.

Irradiance : 180W/m^2 at 300-400nm

Black Panel Temperature : $63\pm 3^\circ\text{C}$ Humidity Range : $50\pm 10\%$

Cycle Conditions : 120 minutes cycle (18 minutes irradiation + water spray - 102 minutes irradiation)

2,000 hours (equivalent to a period of 4 years under natural conditions)

Time period :

Total radiant exposure : 1296MJ/m^2

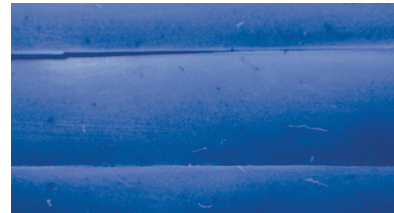
Test result (visual / touch inspection)

Silicone sealing insert material : No cracks, no gloss transition, no powder - no appearance change at all. Flexibility remains unchanged.

Before



After

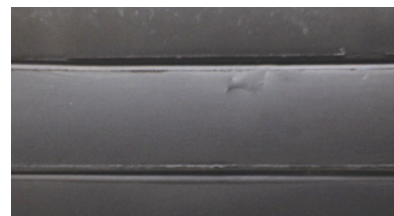


NBR material from our RM series : Lost glossiness on the surface and material is stiffened.

Before

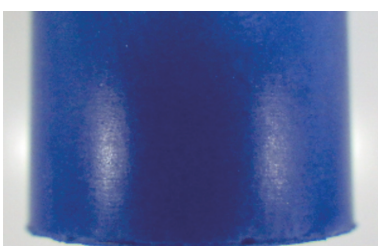


After

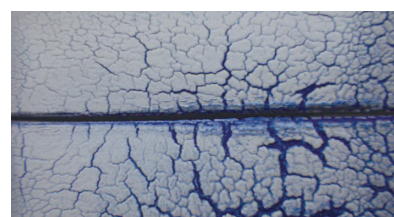


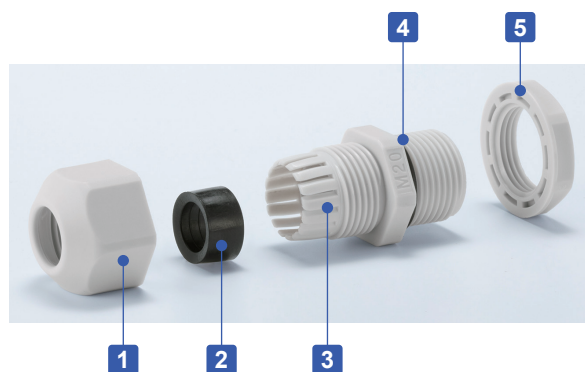
EPDM material from weatherproof cable gland of another manufacturer : Cracked, color drastically faded and powder appeared on the surface.

Before



After





- Low cost cable glands made from polyamide material.
- Wide selection, for M8 ~ M63, suitable for $\Phi 1\text{mm} \sim \Phi 44\text{ mm}$ cable.
- High oil resistant NBR rubber sealing and O-ring.
- Protection class equivalent to IP67.

Technical Data

Protection class : Equivalent to IP67*
Operating temperature : $-20^{\circ}\text{C} \sim +80^{\circ}\text{C}$

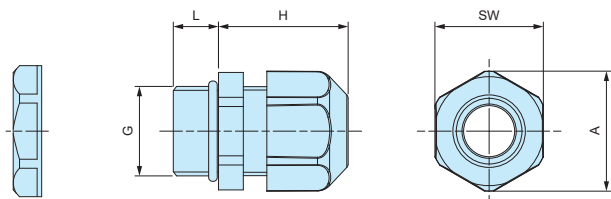
*In-house test

Components

■ PA = Polyamide

No.	Part name	Material
1	Cap	PA66 UL94V-2
2	Sealing insert	NBR
3	Connector	PA66 UL94V-2
4	O-ring	NBR
5	Lock nut	PA66 UL94V-2

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



- Lock nut is not included for RM8S-2.5, 8S-4, and 10S-6 models.

Please drill an appropriate thread hole into the enclosure for installation.

Cap design varies by size



Product no. / Details

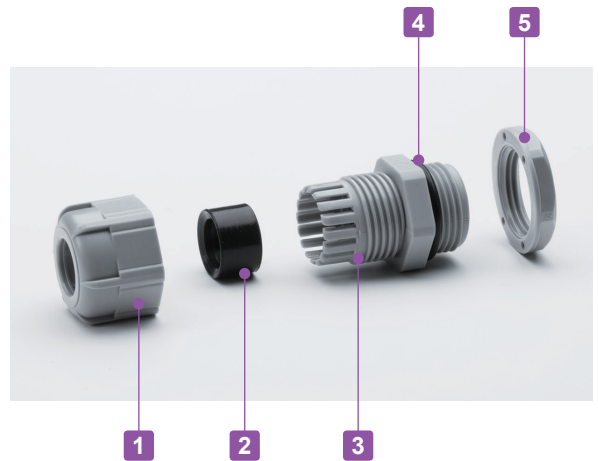
Product no.		G		Cable range		L	H Max	SW	A	Pack of
● Black	● Light gray	Thread size	Mounting hole	Min	Max					
RM8S-2.5B	RM8S-2.5S	M8×1.25	—	1	2.5	7.5	19.5	12	13.6	1
RM8L-2.5B	RM8L-2.5S	M8×1.25	$\Phi 8.2$	1	2.5	13	19.5	12	13.6	1
RM8S-4B	RM8S-4S	M8×1.25	—	2.5	4	7.5	19.5	12	13.6	1
RM8L-4B	RM8L-4S	M8×1.25	$\Phi 8.2$	2.5	4	13	19.5	12	13.6	1
RM10S-6B	RM10S-6S	M10×1.5	—	3	6	8	20.5	13	14.6	1
RM10L-6B	RM10L-6S	M10×1.5	$\Phi 10.2$	3	6	13	20.5	13	14.6	1
RM12S-7B	RM12S-7S	M12×1.5	$\Phi 12.2$	3.5	7	9	20.5	16	17.7	1
RM12L-7B	RM12L-7S	M12×1.5	$\Phi 12.2$	3.5	7	14.5	20.5	16	17.7	1
RM16S-8B	RM16S-8S	M16×1.5	$\Phi 16.2$	4	8	9	23.5	19.2	21.3	1
RM16L-8B	RM16L-8S	M16×1.5	$\Phi 16.2$	4	8	15	24	19.2	21.3	1
RM20S-12B	RM20S-12S	M20×1.5	$\Phi 20.2$	6	12	10	29	24.3	26.8	1
RM20L-12B	RM20L-12S	M20×1.5	$\Phi 20.2$	6	12	15	28.5	24.3	26.8	1
RM25L-17B	RM25L-17S	M25×1.5	$\Phi 25.2$	11	17	15	35	33.3	36.8	1
RM32L-21B	RM32L-21S	M32×1.5	$\Phi 32.3$	13	21	15	38	36.1	39.8	1
RM40L-27B	RM40L-27S	M40×1.5	$\Phi 40.3$	18	27	18	43.5	46.1	51.2	1
RM50L-38B	RM50L-38S	M50×1.5	$\Phi 50.4$	27	38	20	50.5	60	66.5	1
RM63L-44B	RM63L-44S	M63×1.5	$\Phi 63.4$	37	44	20	53	68	75.5	1
RM10L-6B-P	RM10L-6S-P	M10×1.5	$\Phi 10.2$	3	6	13	20.5	13	14.6	100
RM12S-7B-P	RM12S-7S-P	M12×1.5	$\Phi 12.2$	3.5	7	9	20.5	16	17.7	100
RM12L-7B-P	RM12L-7S-P	M12×1.5	$\Phi 12.2$	3.5	7	14.5	20.5	16	17.7	100
RM16S-8B-P	RM16S-8S-P	M16×1.5	$\Phi 16.2$	4	8	9	23.5	19.2	21.3	100
RM16L-8B-P	RM16L-8S-P	M16×1.5	$\Phi 16.2$	4	8	15	24	19.2	21.3	100
RM20S-12B-P	RM20S-12S-P	M20×1.5	$\Phi 20.2$	6	12	10	29	24.3	26.8	100
RM20L-12B-P	RM20L-12S-P	M20×1.5	$\Phi 20.2$	6	12	15	28.5	24.3	26.8	100
RM25L-17B-P	RM25L-17S-P	M25×1.5	$\Phi 25.2$	11	17	15	35	33.3	36.8	100

RPG SERIES

POLYAMIDE CABLE GLAND

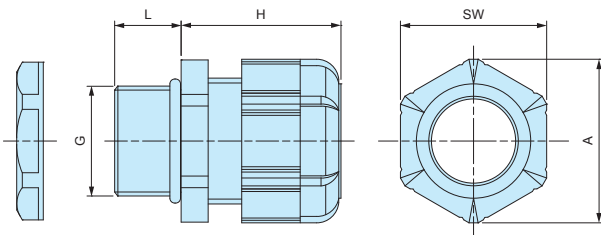


IP67



- Inexpensive cable glands made from polyamide material with PG threading.
- High oil resistant NBR rubber sealing and O-ring.
- IP67 protection class.

RPG dimensions



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

Components

■ PA = Polyamide

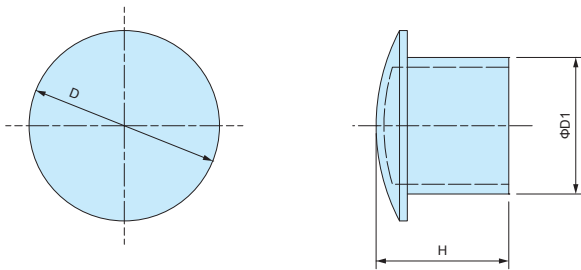
No.	Part name	Material
1	Cap	PA66 UL94V-2
2	Sealing insert	NBR
3	Connector	PA66 UL94V-2
4	O-Ring	NBR
5	Lock-nut	PA66 UL94V-2

Technical Data

Protection class: IP67
Operating temperature: -20°C ~ +80°C

Product no. / Dimensions

Product no.		G			Cable range		L	H Max	SW	A	Pack of
● Black	● Gray	Thread size	Thread dia.	Mounting hole	Min	Max					
RPG7-7B	RPG7-7G	PG7	12.5	Φ12.7	3	7	9	20.5	16	17.7	1
RPG9-8B	RPG9-8G	PG9	15.2	Φ15.4	4	8	9	23.5	19	21	1
RPG11-10B	RPG11-10G	PG11	18.6	Φ18.8	5	10	9	26	22	24	1
RPG13.5-11B	RPG13.5-11G	PG13.5	20.4	Φ20.6	6	11	10	29	24	26.4	1
RPG16-14B	RPG16-14G	PG16	22.5	Φ22.7	8	14	10	30	26.7	29.5	1
RPG21-18B	RPG21-18G	PG21	28.3	Φ28.5	13	18	12	35	33	36.5	1
RPG29-25B	RPG29-25G	PG29	37	Φ37.2	18	25	12	41.5	42	46.5	1

SP SERIES**SEALING PLUG****SP dimensions**

■ Material : Nylon

- Sealing plug for cable glands when not in use.
- Maintain a waterproof seal when plugged into the sealing insert on cable glands.

Product no. / Dimensions

Product no.	D	D1	H	Suitable cable glands	Pack of
SP-12	10.2	6	15.5	RMW12, RM12, RMW16, RM16, RPG7, RPG9	10
SP-16	15.6	9.5	15.5	RMW20, RM20, RPG11, RPG13.5	10
SP-20	19.6	13.5	16.5	RPG16	10
SP-25	24.4	17.5	17	RMW25, RM25, RMW32, RM32, RPG21	5
SP-40	32.5	24.5	17.5	RMW40, RM40, RPG29	5
SP-50	47.2	38.9	17.6	RMW50, RM50	5



- High water protection IP68 (1bar / 30min) polyamide cable gland.
- Wide selection, for M8 ~ M50, suitable for $\Phi 2.5\text{mm}$ ~ $\Phi 42\text{ mm}$ cable.
- Super tough and superior heat resistant PA6GF (glass fiber filled PA6) material on cap and connector.
- Safer halogen free, eco-friendly product.

Technical Data

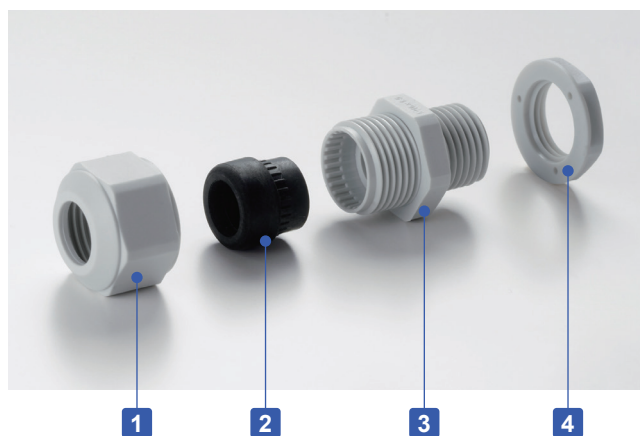
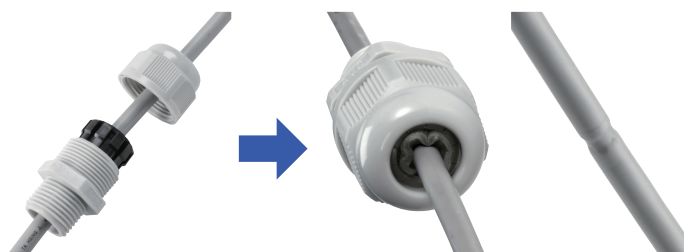
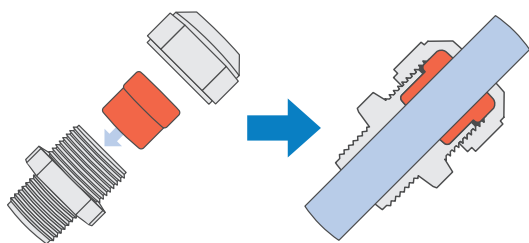
Protection class : IP68 1bar / 30min
 Operating temperature : -20°C ~ +100°C
 Compliant with EN50262 Ver. A

AG series

Thicker sealing insert evenly hold a cable by having a larger holding area.
 Remains durable even after repeated tightening / loosening.

Lamellar insert type

If over-tightened, it can cause the rubber bush or cable to deform, which can allow water to seep in.



Components

■ PA6GF = Polyamide6 Glass Fiber Filled

No.	Part name	Material
1	Cap	PA6GF
2	Sealing insert	TPE
3	Connector	PA6GF
4	Lock nut	PA6

■ Lock nut is not included for M8 and M10 sizes.

Please drill an appropriate thread hole into the enclosure for installation.

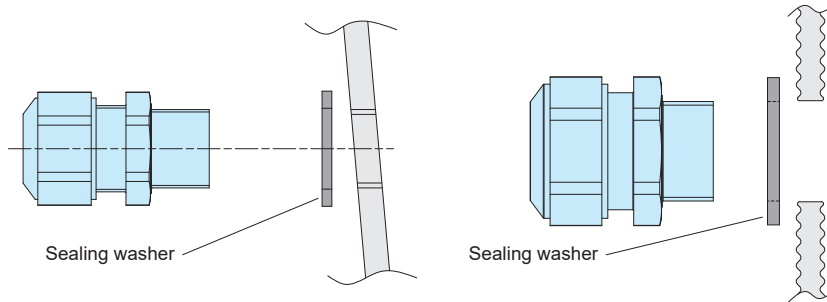
- Appropriate tightening torque varies by each cable diameter. Tighten the cap until top of the sealing insert forms a small bead between the cap and the cable.



■ No optional sealing washer is required when installing on an even surface because of the built-in waterproof rib.

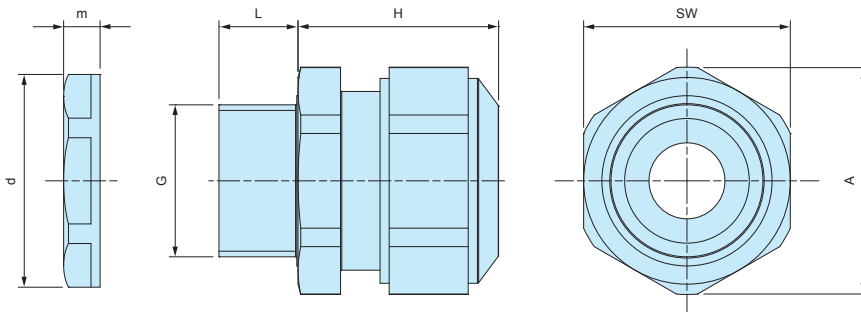
■ An optional sealing washer is required when installing on an uneven surface. (See website for more information on the optional sealing washer AGP series)

Waterproof rib



AG dimensions

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



■ Lock nut is not included for M8 and M10 sizes.

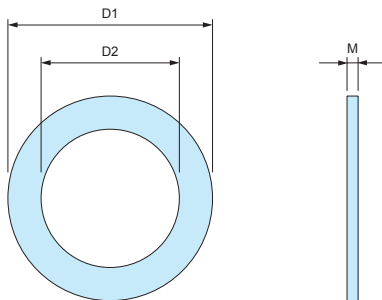
Please drill an appropriate thread hole into the enclosure for installation.

Product no. / Details

Product no.		G		Cable range		L	H Max	SW	A	d	m	Pack of
● Black	● Light gray	Thread size	Mounting hole	Min	Max							
AG8-3.5B	AG8-3.5S	M8×1.0	—	2.5	3.5	10	17	12	13.2	—	—	1
AG8-5B	AG8-5S	M8×1.0	—	3.5	4.7	10	17	12	13.2	—	—	1
AG10-6B	AG10-6S	M10×1.0	—	4	6	10	19	15	16.5	—	—	1
AG12-5B	AG12-5S	M12×1.5	Φ12.2	3.5	4.7	12	23.5	17	18.7	18.8	5	1
AG12-6.5B	AG12-6.5S	M12×1.5	Φ12.2	5	6.5	12	23	17	18.7	18.8	5	1
AG12-8B	AG12-8S	M12×1.5	Φ12.2	6.5	7.8	12	23	17	18.7	18.8	5	1
AG16-10B	AG16-10S	M16×1.5	Φ16.2	8	10	12	26	21	23.1	24.3	5	1
AG20-15B	AG20-15S	M20×1.5	Φ20.2	11	15	13	27	27	29.7	29	6	1
AG25-16B	AG25-16S	M25×1.5	Φ25.2	12.5	16	13	34	34	37.4	36	6.7	1
AG25-20B	AG25-20S	M25×1.5	Φ25.2	16	20	13	34	34	37.4	36	6.7	1
AG32-25.5B	AG32-25.5S	M32×1.5	Φ32.3	21	25.5	15	36	41	45.6	46	8	1
AG40-28.5B	AG40-28.5S	M40×1.5	Φ40.3	24	28.5	15	41	50	55.4	53.5	9	1
AG40-33B	AG40-33S	M40×1.5	Φ40.3	28.5	33	15	41	50	55.4	53.5	9	1
AG50-37B	AG50-37S	M50×1.5	Φ50.4	33	37	16	45	60	65.5	66	9.6	1
AG50-42B	AG50-42S	M50×1.5	Φ50.4	37	42	16	45	60	65.5	66	9.6	1

AGP SERIES**SEALING WASHER for AG • AGSP**

- Sealing washer for AG series.
- Made from oil resistant NBR material.
- Use in the case of installation on a rough or uneven surfaces.
- Selectable in 7 sizes (from M12 to M50)
- Sealing washer is not necessary for installation on flat surfaces.

AGP Dimensions

- Material : NBR

**Product no. / Dimensions**

Product no.	D1	D2	M	Suitable cable gland	Pack of
AGP-12	20	12	1.6	AG12	10
AGP-16	23.5	16.5	2.0	AG16	10
AGP-20	29	20	2.0	AG20	10
AGP-25	37	25	2.0	AG25	10
AGP-32	44	32	2.2	AG32	5
AGP-40	52	40	2.2	AG40	5
AGP-50	64	50	3.1	AG50	5

THA45 series

IP68 SEAMLESS CABLE GLAND

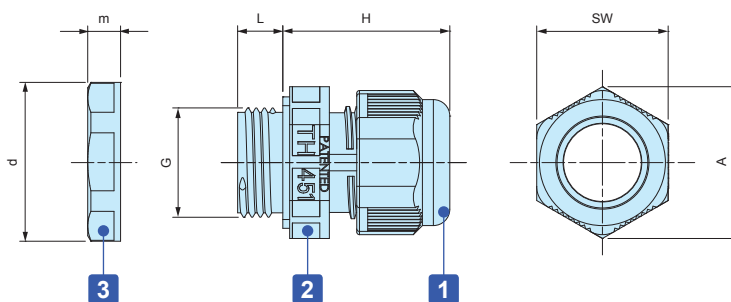
IP68



Seamless construction of connector and sealing insert for superb waterproof performance.



THA45 dimensions



Technical Data

Protection class : IP68 5bar/1h (1 hour / 50m depth)
Operating temperature : -40°C ~ +125°C
EN50262 VarA compliant

Color

Code	[L] Light gray / Gray	[B] Black / Gray	[G] Black / Green
Color			

Components

■ PA66 = Polyamide 66
■ PA66GF = Glass fiber filled polyamide 66

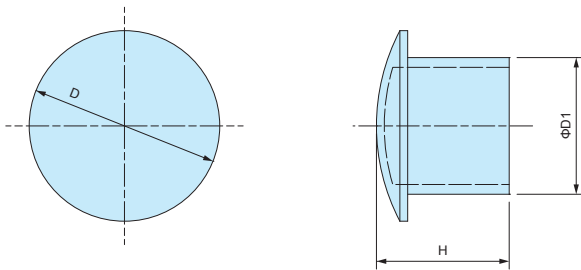
No.	Part name	Material
1	Cap	*PA66 • PA66GF
2	Connector	PA66 • TPE
3	Lock nut	PA66

*PA66 material for THA452-25 models.

Product no. / Details

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

Product no.	G			Cable range		L	H Max	SW	A	d	m	Pack of
	Thread size	Thread diameter	Mounting hole	Max	Min							
THA450-16S□	M16×1.5	15.3	Φ15.7	5	7.5	8	29.5	19	21.6	24	5	1
THA450-16L□	M16×1.5	15.3	Φ15.7	7.5	9.5	8	29.5	19	21.6	24	5	1
THA451-20□	M20×1.5	20	Φ20.2	10.5	14	8	31	24	26.3	26.5	7	1
THA451-20-2□	M20×1.5	20	Φ20.2	Φ6×2		8	31	24	26.3	26.5	7	1
THA452-25□	M25×1.5	25	Φ25.2	14	17	8	34	29	32	35.2	6	1

SP SERIES**SEALING PLUG****SP dimensions**

■ Material : Nylon

- Sealing plug for cable glands when not in use.
- Maintain a waterproof seal when plugged into the sealing insert on cable glands.

Product no. / Dimensions

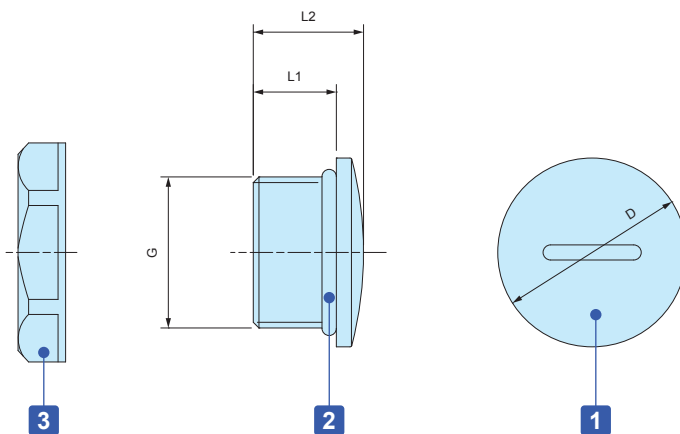
Product no.	D	D1	H	Suitable cable glands	Pack of
SP-12	10.2	6	15.5	RMW12, RM12, RMW16, RM16, RPG7, RPG9	10
SP-16	15.6	9.5	15.5	RMW20, RM20, RPG11, RPG13.5	10
SP-20	19.6	13.5	16.5	RPG16	10
SP-25	24.4	17.5	17	RMW25, RM25, RMW32, RM32, RPG21	5
SP-40	32.5	24.5	17.5	RMW40, RM40, RPG29	5
SP-50	47.2	38.9	17.6	RMW50, RM50	5

SHP series**BLIND PLUG with O-ring**

IP67



- A hole plug for sealing holes that are not in use.
- IP67 rating is achieved through the use of a lock nut.
- Waterproofing is not guaranteed when directly secured through thread holes.

SHP dimensions

A gloss-like finish distinctive to injection molded products may be visible in certain areas of the black color type. This does not affect the performance of the product.

Components

■ PA = Polyamide

No.	Part name	Material
1	Housing	PA66 (UL94V-2)
2	O-ring	NBR
3	Lock nut	PA66 (UL94V-2)

Product no. / Details

Product no.		G		D	L1	L2	Pack of
● Black	● Light gray	Thread size	Mounting hole				
SHP-12B	SHP-12S	M12×1.5	Φ12.2	Φ16	9	12.2	1
SHP-16B	SHP-16S	M16×1.5	Φ16.2	Φ20	9	12.2	1
SHP-20B	SHP-20S	M20×1.5	Φ20.2	Φ25	11	14.6	1
SHP-25B	SHP-25S	M25×1.5	Φ25.2	Φ30	11	14.5	1
SHP-32B	SHP-32S	M32×1.5	Φ32.3	Φ38	11	15	1
SHP-40B	SHP-40S	M40×1.5	Φ40.3	Φ46	12	16	1

RSP series**STRAIN RELIEF CABLE GLAND**

- A total of 14 models available for selection.
- Strain relief cap protects cables by preventing it from bending beyond its limit and breaking.
- Economical price but high waterproofing capability equivalent to IP67.

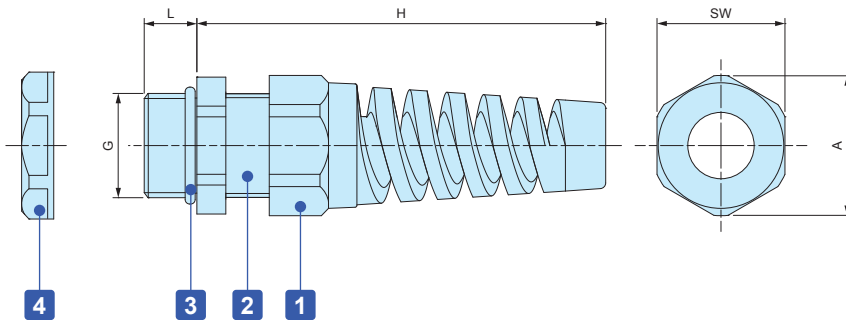
Technical Data

Protection class : Equivalent to IP67*
 Operating temperature : -20°C ~ +80°C

*In-house test

RSP dimensions

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

**Components**

■ PA = Polyamide

No.	Part name	Material
1	Strain relief cap	PA66 UL94V-2
-	Sealing insert	NBR
2	Connector	PA66 UL94V-2
3	O-ring	NBR
4	Lock nut	PA66 UL94V-2

Product no. / Details

Product no.		G		Cable range		L	H	SW	A	Pack of
● Black	● Light gray	Thread size	Mounting hole	Min	Max					
RSP 8-2.5B	RSP 8-2.5S	M 8×1.25	Φ 8.2	1	2.5	10.5	48	12.1	13.8	1
RSP 8-4B	RSP 8-4S	M 8×1.25	Φ 8.2	2.5	4	10.5	48	12.1	13.8	1
RSP10-6B	RSP10-6S	M10×1.5	Φ10.2	3	6	12.2	54	13.1	14.5	1
RSP12-6B	RSP12-6S	M12×1.5	Φ12.2	3.5	6	9	62	16	17	1
RSP16-8B	RSP16-8S	M16×1.5	Φ16.2	4	8	9	69	19.5	21	1
RSP20-11B	RSP20-11S	M20×1.5	Φ20.2	6	11	10	82	24	26	1
RSP25-16B	RSP25-16S	M25×1.5	Φ25.2	11	16	12	102	33	36	1



- L-shape cable gland with M type threads.
- Allow wires to be routed vertically.
- Equivalent to IP67 protection class.

Technical Data

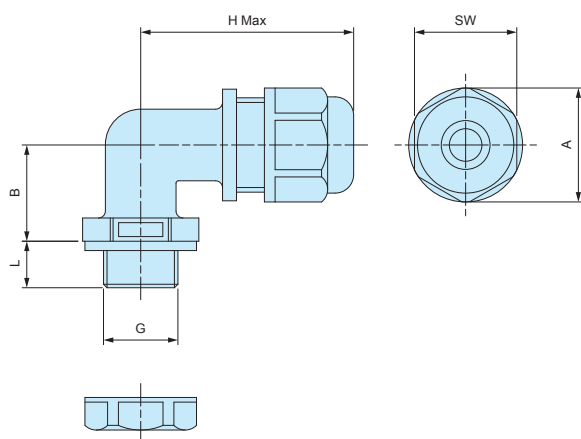
Protection class : Equivalent to IP67*
Operating temperature : -20°C ~ +80°C

*In-house test

Components

No.	Part name	Material
1	Cap	PA66
2	Sealing Insert	NBR/PA66
3	Connector	PA66
4	O-ring	NBR
5	Lock Nut	PA66

REL dimensions



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

Installation example



Product no. / Details

Product no.	G		Cable range		H Max	L	SW	A	B	Pack of
	Thread size	Mounting hole	Min	Max						
● Black										
REL16- 7B	M16×1.5	Φ16.1	5	7	45.8	10	22	24.5	20.7	1
REL16-10B	M16×1.5	Φ16.1	8	10	45.8	10	22	24.5	20.7	1
REL20-11B	M20×1.5	Φ20.1	7	11	52.4	15	27.3	30.8	24.9	1
REL20-14B	M20×1.5	Φ20.1	11	14	52.4	15	27.3	30.8	24.9	1
REL25-16B	M25×1.5	Φ25.1	12	16	58	15	33.2	36.8	29.5	1
REL25-18B	M25×1.5	Φ25.1	15	18	58	15	33.2	36.8	29.5	1
REL32-22B	M32×1.5	Φ32.1	18	22	70	15	41	45.7	33.9	1

RMH series

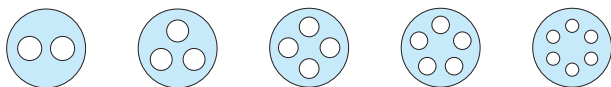
MULTI-HOLE CABLE GLAND



- Multihole cable gland with M threads.
- Multiple cables can be protected with single cable gland.
- Equivalent to IP65 protection class.
- Please use cables of the same diameter.



Up to a maximum of 6 cables can be protected with 1 cable gland.



Technical Data

Protection class : equivalent to IP65
Operating temperature : -20°C ~ +80°C

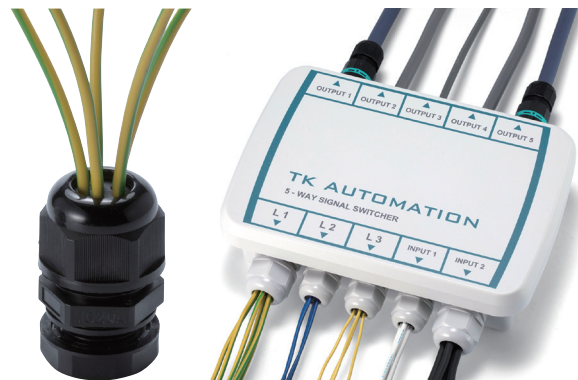
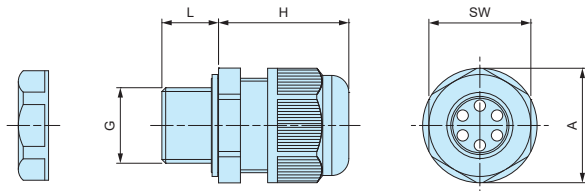
*In-house test

Components

No.	Part name	Material
1	Cap	PA66 UL94V-2
2	Sealing insert	NBR/PA66 UL94V-2
3	Connector	PA66 UL94V-2
4	O-ring	NBR
5	Lock nut	PA66 UL94V-2

RMH dimensions

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



Installation Examples

Product no. / Details

Product no.		G		Cable range		No. of holes	L	H	SW	A	Pack of
● Black	● Light gray	Thread size	Mounting hole	Min.	Max.						
RMH12-2B	RMH12-2S	M12×1.5	Φ12.2	2.5	3	2	9.4	26	18.9	21.2	1
RMH12-3B	RMH12-3S	M12×1.5	Φ12.2	2	2.5	3	9.4	26	18.9	21.2	1
RMH12-4B	RMH12-4S	M12×1.5	Φ12.2	2	2.5	4	9.4	26	18.9	21.2	1
RMH16-2B	RMH16-2S	M16×1.5	Φ16.2	3	4	2	15	29	22	24.7	1
RMH16-3B	RMH16-3S	M16×1.5	Φ16.2	3	4	3	15	29	22	24.7	1
RMH16-4B	RMH16-4S	M16×1.5	Φ16.2	2	3	4	15	29	22	24.7	1
RMH16-5B	RMH16-5S	M16×1.5	Φ16.2	2	2.5	5	15	29	22	24.7	1
RMH16-6B	RMH16-6S	M16×1.5	Φ16.2	1.5	2	6	15	29	22	24.7	1
RMH20-2B	RMH20-2S	M20×1.5	Φ20.2	4.5	6	2	15	34.5	27	30.3	1
RMH20-3B	RMH20-3S	M20×1.5	Φ20.2	4	5	3	15	34.5	27	30.3	1
RMH20-4B	RMH20-4S	M20×1.5	Φ20.2	4	4.5	4	15	34.5	27	30.3	1
RMH20-5B	RMH20-5S	M20×1.5	Φ20.2	3	4	5	15	34.5	27	30.3	1
RMH20-6B	RMH20-6S	M20×1.5	Φ20.2	2	3	6	15	34.5	27	30.3	1
RMH25-2B	RMH25-2S	M25×1.5	Φ25.2	6	8	2	15	37.5	33	37	1
RMH25-3B	RMH25-3S	M25×1.5	Φ25.2	5	7	3	15	37.5	33	37	1
RMH25-4B	RMH25-4S	M25×1.5	Φ25.2	4	6	4	15	37.5	33	37	1
RMH25-5B	RMH25-5S	M25×1.5	Φ25.2	4.5	5.5	5	15	37.5	33	37	1
RMH25-6B	RMH25-6S	M25×1.5	Φ25.2	3	4.5	6	15	37.5	33	37	1
RMH32-2B	RMH32-2S	M32×1.5	Φ32.3	8.5	11	2	15	44	42	46.5	1
RMH32-3B	RMH32-3S	M32×1.5	Φ32.3	9	10	3	15	44	42	46.5	1
RMH32-4B	RMH32-4S	M32×1.5	Φ32.3	8	9	4	15	44	42	46.5	1
RMH32-5B	RMH32-5S	M32×1.5	Φ32.3	6	8	5	15	44	42	46.5	1
RMH32-6B	RMH32-6S	M32×1.5	Φ32.3	5.5	7	6	15	44	42	46.5	1

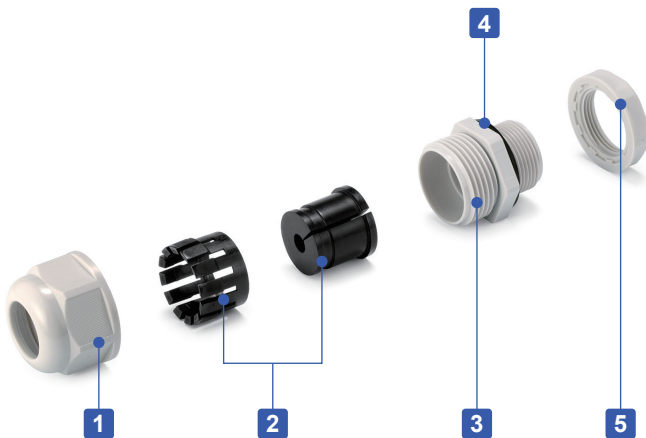


- Split type sealing insert can protect cables with connector.

Technical Data

Protection class : Equivalent to IP67*
Operating temperature : -20°C ~ +80°C

*In-house test

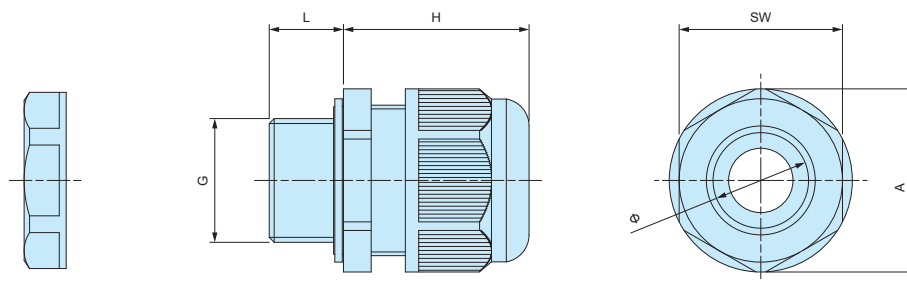


Components

No.	Part name	Material
1	Cap	PA66 (UL94V-2)
2	Sealing Insert	Silicone / PA66 (UL94V-2)
3	Connector	PA66 (UL94V-2)
4	Sealing Washer	Silicone
5	Lock Nut	PA66 (UL94V-2)

RSC dimensions

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



Product no. / Details

Product no.		G		Cable range		L	H Max	SW	A	Φ	Pack of
● Black	● Light gray	Thread size	Mounting hole	Min	Max						
RSC25-6.5B	RSC25-6.5S	M25×1.5	Φ25.2	5	6.5	15	37.5	33	37	19	1
RSC25-10.5B	RSC25-10.5S	M25×1.5	Φ25.2	7.5	10.5	15	37.5	33	37	19	1
RSC32-6.5B	RSC32-6.5S	M32×1.5	Φ32.3	5	6.5	15	44	42	46.5	25	1
RSC32-10.5B	RSC32-10.5S	M32×1.5	Φ32.3	7.5	10.5	15	44	42	46.5	25	1



- Economical metal cable gland.
- Equivalent to IP67 protection class.
- Wide selection available from M12 ~ M32.

Technical Data

Protection class : Equivalent to IP67*
Operating temperature : -20°C ~ +80°C

*In-house test

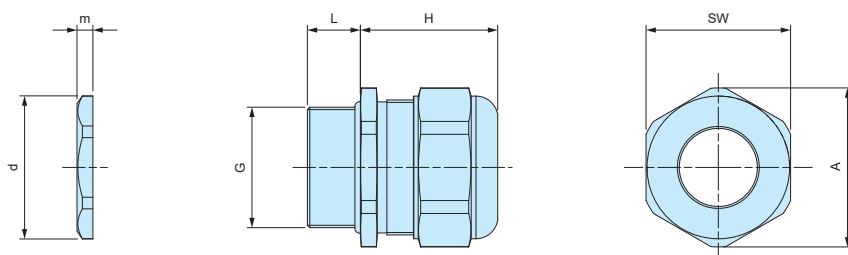


Components

No.	Part name	Material	Color / Finish
1	Cap	Brass	Nickel plated
2	Sealing Insert	TPE	Black
3	Connector	Brass	Nickel plated
—	O-ring	NBR	Black
4	Lock Nut	Brass	Nickel plated

RMC dimensions

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



Product no. / Details

Product no.	G		Cable range		L	H Max	SW	A	d	m	Pack of
	Thread size	Mounting hole	Min	Max							
RMC12-6.5	M12×1.5	Φ12.2	5	6.5	10	18	15	16.5	15.4	2.5	1
RMC12-7.5	M12×1.5	Φ12.2	6.5	7.5	10	18	15	16.5	15.4	2.5	1
RMC16-8	M16×1.5	Φ16.2	6.5	8	10	23	18	19.7	19.7	2.8	1
RMC16-10.5	M16×1.5	Φ16.2	8	10.5	10	23	18	19.7	19.7	2.8	1
RMC20-11	M20×1.5	Φ20.2	9.5	11	10	23.5	24	26.4	24.2	3.2	1
RMC20-14.5	M20×1.5	Φ20.2	11	14.5	10	23.5	24	26.4	24.2	3.2	1
RMC25-16	M25×1.5	Φ25.2	14	16	11	28.5	30	33	29.7	3.3	1
RMC25-19	M25×1.5	Φ25.2	16	19	11	28.5	30	33	29.7	3.3	1
RMC32-21	M32×1.5	Φ32.3	18	21	13	30.5	36	39.6	37.4	3.5	1
RMC32-25.5	M32×1.5	Φ32.3	21	25.5	13	30.5	36	39.6	37.4	3.5	1



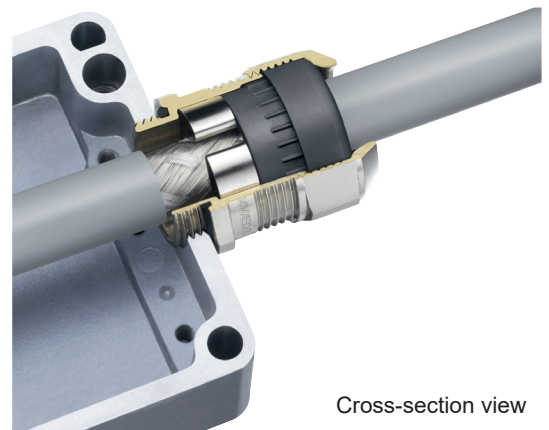
- Optimal contact spring provides excellent shield contact and the smallest possible transfer impedance.
- Clawed lock nut makes a good EMC shield contact possible on conductive enclosures.
- Shape of the contact spring not only allows for a large clamping range to the shield but also enables easy and faster installation and re-installation.
- 2-piece detachable sealing inserts can be adapted to the wider existing cable diameter on site.
(AGE12 available only with 1-piece sealing insert)

Technical Data

Protection class : IP68 2bar / 30min, IP69K
 Operating temperature : -60°C ~ +100°C
 Compliant with IEC62444 Var. A

Cable Range

No.	Sealing insert type	
	Assembled	Detached
AGE16-10.5	Φ 6 ~ Φ 7.5	Φ 7.5 ~ Φ10.5
AGE20-15	Φ 8 ~ Φ10.5	Φ10.5 ~ Φ15
AGE25-20	Φ12.5 ~ Φ15	Φ15 ~ Φ20
AGE32-25	Φ17 ~ Φ20	Φ20 ~ Φ25

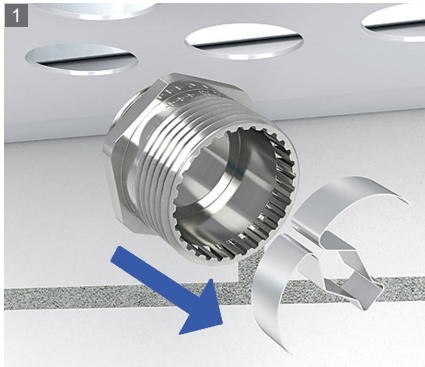


Cross-section view

Components

No.	Part name	Material	Color / Finish
1	Cap	Brass	Nickel plated
2	Sealing insert	TPE	Black
3	Connector	Brass	Nickel plated
4	Contact spring	Stainless steel	Unfinished
-	O-Ring	NBR	Black
5	Lock-nut	Brass	Nickel plated

INSTALLATION Instruction



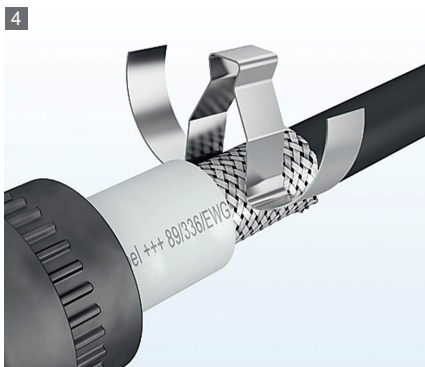
Remove the contact spring from the connector.



Install the connector onto the enclosure.



Strip the cable.



Clip the contact spring on the shielded cable.



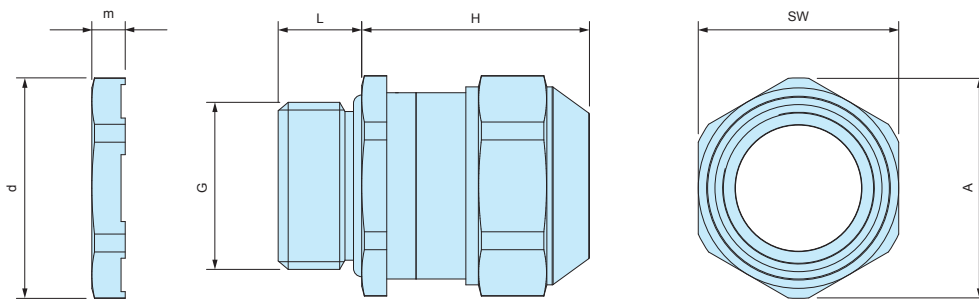
Pass the cable through the sealing insert and cap.



Tighten the cap to complete.

AGE dimensions

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



Product no. / Details

Product no.	G		Cable range		L	H Max	SW	A	d	m	Pack of
	Thread size	Mounting hole	Min	Max							
AGE12-5	M12×1.5	Φ12.2	3.5	5.0	10	22	15	16.5	16.5	3.5	1
AGE12-6.5	M12×1.5	Φ12.2	5.0	6.5	10	22	15	16.5	16.5	3.5	1
AGE16-10.5	M16×1.5	Φ16.2	6.0	10.5	10	25	18	20	21	3.5	1
AGE20-15	M20×1.5	Φ20.2	8.0	15.0	10	27	24	26.5	26.5	4	1
AGE25-20	M25×1.5	Φ25.2	12.5	20.0	11	33	30	33	33	4	1
AGE32-25	M32×1.5	Φ32.3	17.0	25.0	13	34	36	39.5	39.5	5	1

AGH SERIES

HEAT RESISTANT METAL CABLE GLAND



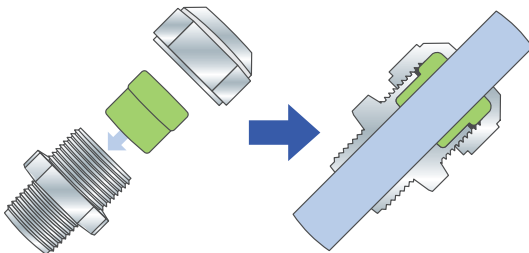
- Heat resistant sealing insert made of FPM material. Resistant up to 200°C
- IP68 1bar / 30min high performance waterproof cable gland.

Technical Data

Protection class : Protection class IP68 1bar / 30min
 10m depth immersion in 30 minutes
 Operating temperature : -40°C ~ +200°C
 Compliant with EN50262 Var. A

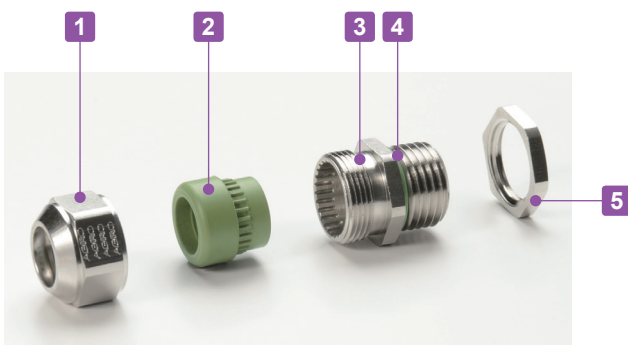
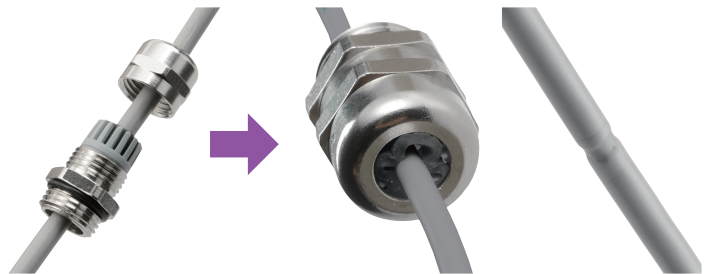
AGH series

Thicker sealing insert evenly clasp onto the cable by having a larger area.
 Remains durable even after repeated tightening / loosening.

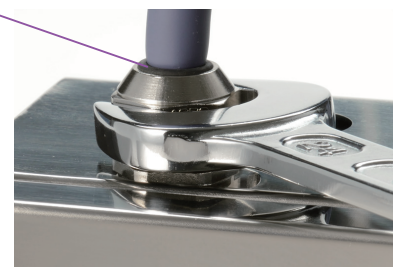


Conventional cable gland

If over-tightened, it can cause the rubber bush or cable to deform,
 which may allow water to seep in.



- Tightening torque varies depending on the cable diameter.
 Tighten until the sealing insert protrudes slightly from the cap.

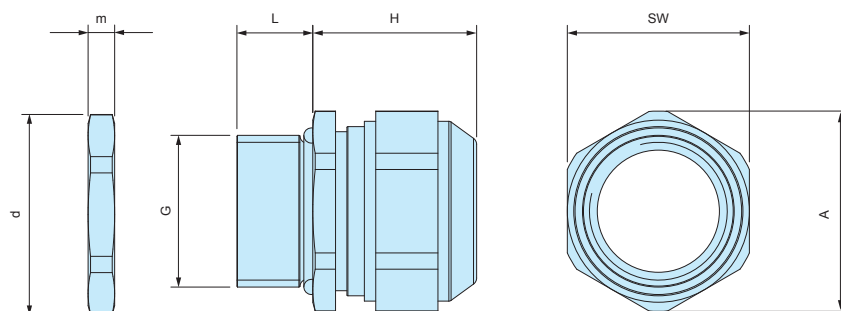


Components

No.	Part name	Material	Color / Finish
1	Cap	Brass	Nickel plated
2	Sealing insert	FPM	Green
3	Connector	Brass	Nickel plated
4	O-Ring	FPM	Green
5	Lock-nut	Brass	Nickel plated

AGH dimensions

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



Product no. / Dimensions

Product no.	G		Cable range		L	H Max	SW	A	d	m	Pack of
	Thread size	Mounting hole	Min	Max							
AGH10-6	M10×1.5	Φ10.2	4.0	6.0	10	15	13	14.3	14.2	3	1
AGH12-8	M12×1.5	Φ12.2	6.5	8.0	10	17	15	16.5	16.5	3	1
AGH16-10.5	M16×1.5	Φ16.2	8.0	10.5	10	20	18	20	21	3	1
AGH20-15	M20×1.5	Φ20.2	11.0	15.0	10	23	24	26.5	26.3	3.5	1
AGH25-20	M25×1.5	Φ25.2	16.0	20.0	11	27	30	33	33	4	1
AGH32-25.5	M32×1.5	Φ32.3	21.0	25.5	13	28.5	36	39.7	39.7	4	1

IP68



- High water protection IP68 (1bar / 30min) metal cable gland.
- Wide selection, for M6 ~ M50.
Suitable for $\Phi 2$ mm ~ $\Phi 42$ mm cable.

Technical Data

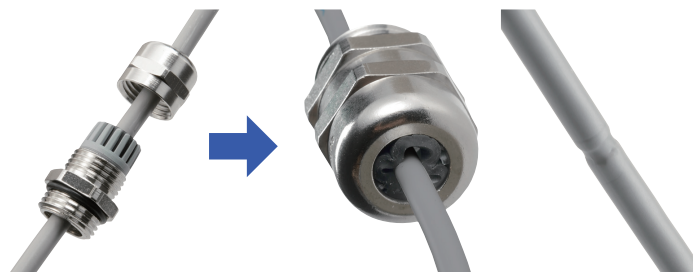
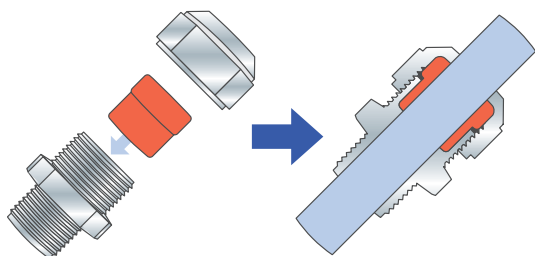
Protection class : IP68 1bar / 30min
 Operating temperature : -40°C ~ +100°C
 Compliant with EN50262 Ver. A

AGM series

Thicker sealing insert evenly hold a cable by having a larger holding area.
 Remains durable even after repeated tightening / loosening.

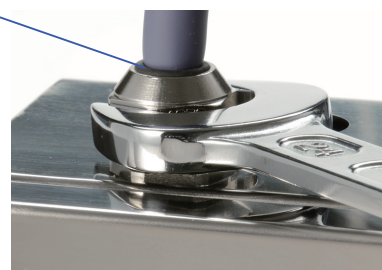
Lamellar insert type

If over-tightened, it can cause the rubber bush or cable to deform,
 which can allow water to seep in.



- Appropriate tightening torque varies by each cable diameter.

Tighten the cap until top of the sealing insert forms a small bead between the cap and the cable.

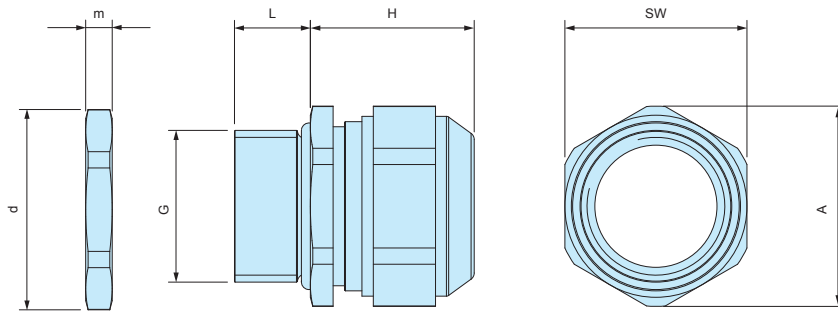


Components

No.	Part name	Material	Color / Finish
1	Cap	Brass	Nickel plated
2	Sealing insert	TPE	Black
3	Connector	Brass	Nickel plated
-	O-ring	NBR	Black
4	Lock nut	Brass	Nickel plated

AGM dimensions

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

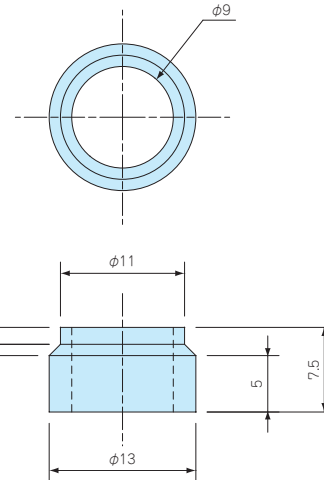


Product no. / Details

Product no.	G		Cable range		L	H Max	SW	A	d	m	Pack of
	Thread size	Mounting hole	Min	Max							
AGM6-2.5	M6×1.0	Φ6.2	2	2.5	8	12	8	9	10	2.8	1
AGM6-3	M6×1.0	Φ6.2	2.5	3.0	8	12	8	9	10	2.8	1
AGM6-3.5	M6×1.0	Φ6.2	3.0	3.5	8	12	8	9	10	2.8	1
AGM8-5	M8×1.25	Φ8.2	3.5	4.7	10	14	11	12	12	3	1
AGM10-6	M10×1.5	Φ10.2	4.0	6.0	10	15	13	14.3	14	2.8	1
AGM12-8	M12×1.5	Φ12.2	6.5	8.0	10	17	15	16.5	16.5	2.8	1
AGM16-10.5	M16×1.5	Φ16.2	8.0	10.5	10	21	18	20	21	3	1
AGM20-15	M20×1.5	Φ20.2	11.0	15.0	10	23	24	26.5	26.5	3.5	1
AGM25-20	M25×1.5	Φ25.2	16.0	20.0	11	28	30	33	33	4	1
AGM32-25.5	M32×1.5	Φ32.3	21.0	25.5	13	29.5	36	39.5	39.5	4	1
AGM40-28.5	M40×1.5	Φ40.3	24.0	28.5	13	32	46	50.7	51	5	1
AGM40-33	M40×1.5	Φ40.3	28.5	33.0	13	32	46	50.7	51	5	1
AGM50-37	M50×1.5	Φ50.4	33.0	37.0	14	34	55	59.7	60	5.5	1
AGM50-42	M50×1.5	Φ50.4	37.0	42.0	14	34	55	59.7	60	5.5	1

RB-9

RUBBER BUSH



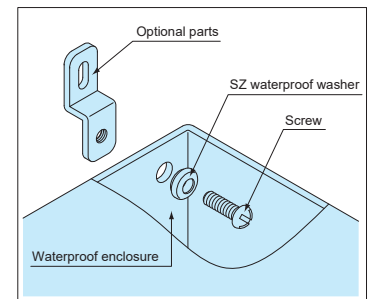
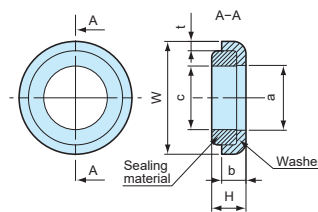
- Rubber bush for TMC series terminal junction box.
- Applicable for $\phi 8 \sim \phi 9$ mm diameter cable.

Product no. / Details

Product no.	Material	Color	Cable range	Pack of
RB-9	NBR	Black	$\phi 8 \sim \phi 9$ mm	2

SZ series

WATERPROOF WASHER



- Waterproof washer for screwing onto waterproof boxes.
- NBR sealing material has superior oil resistance (N models only).
- Silicone sealing material has wider operating temperature with superior temperature and water resistance (S models only).

Technical Data

Water pressure resistance :
M3 ~ M16
0.98MPa (10kgf/cm²) / 1 hour

- Shape of the sealing material vary by product.

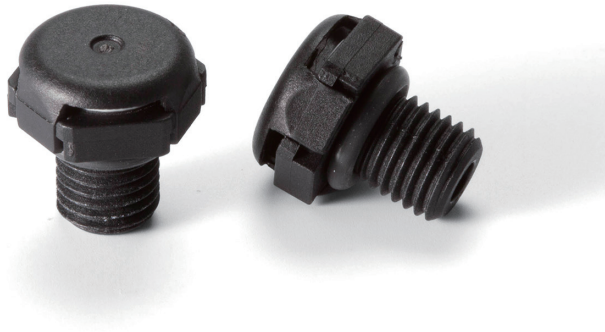
Product no. / Details

Product no.	W	H	a	b	c	t	Washer material	Sealing material	Color	Screw size	Pack of
SZ- 3N	7	2.7	3.2	2.2	3.1	0.5	SUS304	NBR	Black	M 3	1
SZ- 3S	7	2.7	3.2	2.2	3.1	0.5	SUS304	Silicone	Brown	M 3	1
SZ- 4N	8	2.8	4.2	2.1	4.1	0.5	SUS304	NBR	Black	M 4	1
SZ- 4S	8	2.8	4.2	2.1	4.1	0.5	SUS304	Silicone	Brown	M 4	1
SZ- 5N	9.5	3.6	5.2	2.7	5.1	0.8	SUS304	NBR	Black	M 5	1
SZ- 5S	9.5	3.6	5.2	2.7	5.1	0.8	SUS304	Silicone	Brown	M 5	1
SZ- 6N	11.5	4	6.2	3	6.2	1	SUS304	NBR	Black	M 6	1
SZ- 6S	11.5	4	6.2	3	6.2	1	SUS304	Silicone	Brown	M 6	1
SZ- 8N	15.2	3.8	8.2	3.2	8.2	1	SUS304	NBR	Black	M 8	1
SZ- 8S	15.2	3.8	8.2	3.2	8.2	1	SUS304	Silicone	Brown	M 8	1
SZ-10N	18	5.3	10.2	4	10.2	1.5	SUS304	NBR	Black	M10	1
SZ-10S	18	5.3	10.2	4	10.2	1.5	SUS304	Silicone	Brown	M10	1
SZ-12N	24	6.1	14.2	4.8	12.2	1.5	SUS304	NBR	Black	M12	1
SZ-12S	24	6.1	14.2	4.8	12.2	1.5	SUS304	Silicone	Brown	M12	1
SZ-16N	30	6.8	18.4	5.3	16	1.9	SUS304	NBR	Black	M16	1
SZ-16S	30	6.8	18.4	5.3	16	1.9	SUS304	Silicone	Brown	M16	1
NEW SZ-3N-P	7	2.7	3.2	2.2	3.1	0.5	SUS304	NBR	Black	M 3	50
NEW SZ-3S-P	7	2.7	3.2	2.2	3.1	0.5	SUS304	Silicone	Brown	M 3	50
NEW SZ-4N-P	8	2.8	4.2	2.1	4.1	0.5	SUS304	NBR	Black	M 4	50
NEW SZ-4S-P	8	2.8	4.2	2.1	4.1	0.5	SUS304	Silicone	Brown	M 4	50
NEW SZ-5N-P	9.5	3.6	5.2	2.7	5.1	0.8	SUS304	NBR	Black	M 5	50
NEW SZ-5S-P	9.5	3.6	5.2	2.7	5.1	0.8	SUS304	Silicone	Brown	M 5	50

PMF-6B

SMALL PROTECTIVE VENT

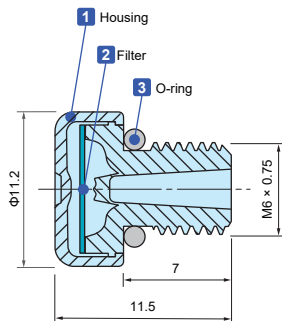
IP68



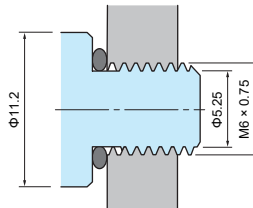
Application example

- Small and screw-in protective vent suitable for compact, and hand-held type devices.
- IP68 protection class (water depth 2 meters / 60 mins) and $-40^{\circ}\text{C} \sim +150^{\circ}\text{C}$ operating temperature range allows it to be used in various environments.
- Suitable for enclosures with capacities of 2.0 litres or under.
- For outdoor use, installation on the side of the enclosure unit is recommended.

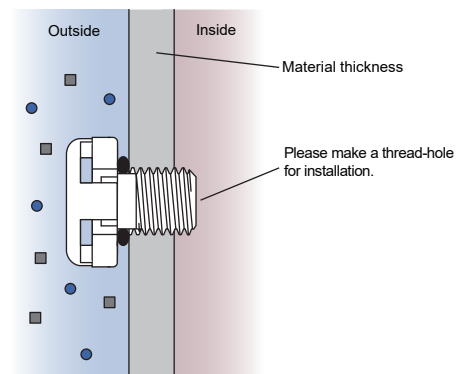
PMF-6B dimensions



Hole milling drawings



Installation drawings



Technical Data

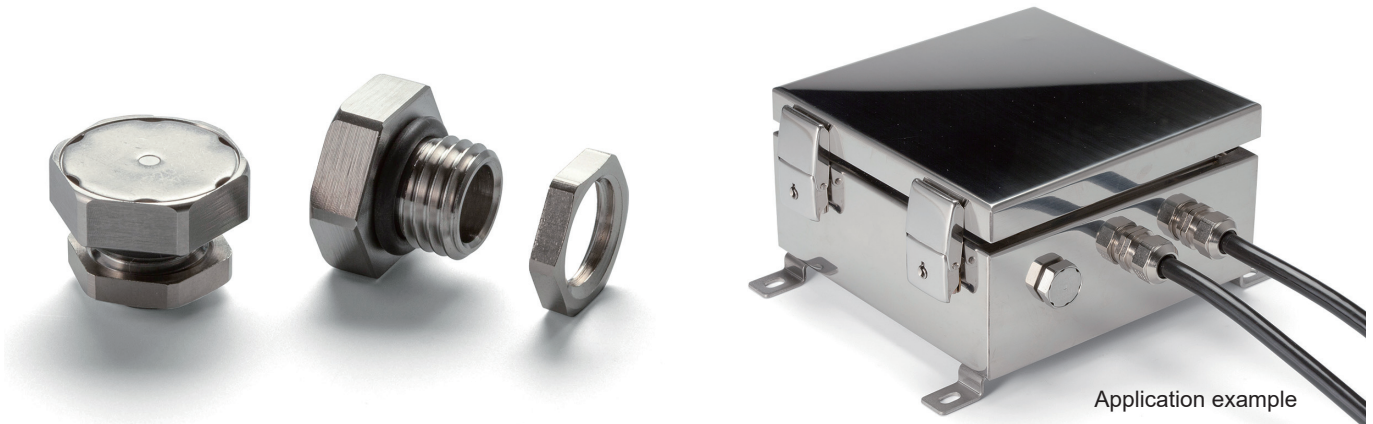
Airflow	300ml / min ($\text{dp} = 7 \text{ kPa}$)
Recommended Torque	$0.2 \sim 0.4 \text{ N} \cdot \text{m}$
Certifications	IEC60529 (Protection class test) : IP66 • IP67 • IP68 IEC60068-2-1, 2, 14 (Heat resistance test) : $-40^{\circ}\text{C} \sim +150^{\circ}\text{C}$ IEC60068-2-78 (Humidity test) : $85^{\circ}\text{C} \cdot 85\% \text{ humidity} \cdot 1000 \text{ hours}$ IEC60068-2-64 (Vibration test) UL94V-0 (Flame-resistant) • UL746C f1

Product no. / Details

Product no.	Material			G	
● Black	1 Housing	2 Filter	3 O-ring	Thread size	Mount hole
PMF-6B	PA6 (Body) • PA66 (Cap)	PTFE	Silicone	M6 x 0.75	—

PMF-12M

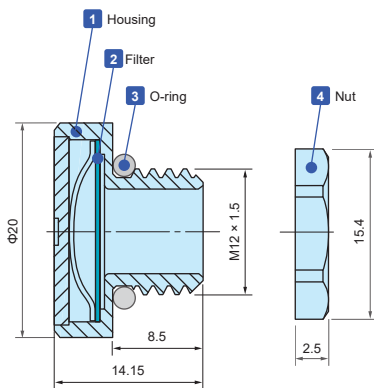
STAINLESS STEEL PROTECTIVE VENT



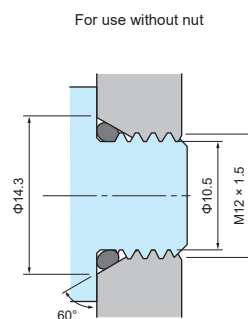
Application example

- Stainless steel protective vent for superior durability and chemical resistance.
- IP68 protection class (water depth 2 meters / 60 mins) and $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ operating temperature range allows it to be used in various environments.
- Suitable for enclosures with capacities of 20 litres or under.
- For outdoor use, installation on the side of the enclosure unit is recommended.

PMF-12M dimensions

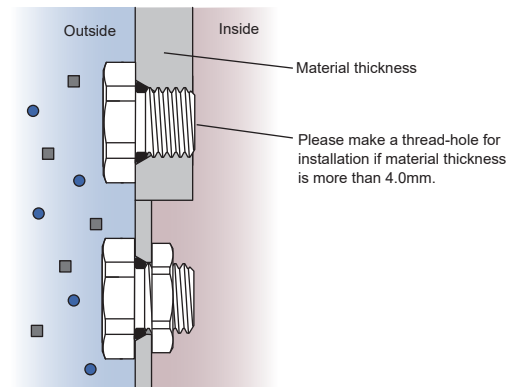


Hole milling drawings



- While $\Phi 12.2\text{mm}$ through-hole is sufficient for installation, 60° angle tapered hole is recommended to prevent deformation of the O-ring.

Installation drawings



- If used with a lock nut, material thickness should not exceed 4.0mm.

Technical Data

Airflow	1600ml / min ($\text{dp} = 7 \text{ kPa}$)
Recommended Torque	$0.6 \sim 1.2 \text{ N} \cdot \text{m}$
Certifications	IEC60529 (Protection class test) : IP66 • IP67 • IP68 • IP69K IEC60068-2-1, 2, 14 (Heat resistance test) : $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ IEC60068-2-78 (Humidity test) : $85^{\circ}\text{C} \cdot 85\% \text{ humidity} \cdot 1000 \text{ hours}$ IEC60068-2-64 (Vibration test)

Product no. / Details

Product no.	Material				G		Nut SW
	1 Housing	2 Filter	3 O-ring	4 Nut	Thread size	Mount hole	
PMF-12M	Stainless steel	PTFE	Silicone	Brass • Nickel plated	M12 x 1.5	$\Phi 12.2$	15

PMF series

PROTECTIVE VENT

Pressure Equalization / Ventilation



Application Example

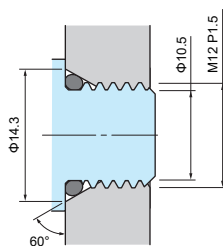
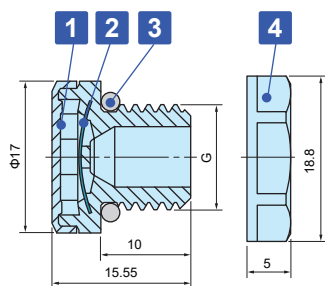
- Protective vent protects the enclosure from deformation by equalizing internal and external pressure differences, as well as venting the gas generated within the enclosure.
- IP68 protection class (water depth 2 meters / 60 mins) with an operating temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ allows them to be used in harsh environments.
- PMF-12 and PMF-12HS models are suitable for up to 5 and 50 liters respectively.
- Recommended to be installed at the sides of the enclosure.
- Use in industrial and electrical / electronic products only; not suitable to be used in medical, food and beverage, and cosmetic industries and related industrial equipment.

PMF dimensions

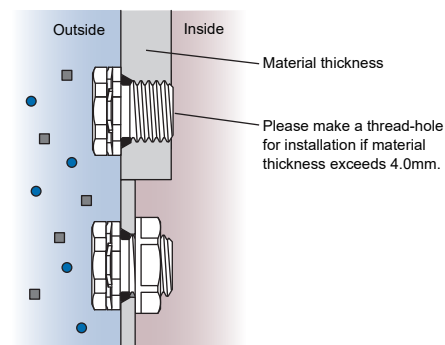
Hole milling drawings

Installation drawings

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



- Recommended for prevention of O-ring deformation during tightening.
If tightened with a lock nut, a standard through-hole is sufficient for installation.



- If used with a lock nut, material thickness should not exceed 4.0mm.

Technical Data

Product no.	PMF-12	PMF-12HA
Airflow	450ml / min (dp = 7kPa)	4,000ml / min (dp = 7kPa)
Recommended torque	0.6 ~ 0.8N · m	0.6 ~ 0.8N · m
Certifications	IEC60529 (Protection class test) : IP65 • IP66 • IP67 • IP68 • IP69K IEC60068-2-1, 2, 14 (Heat resistance test) : $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ IEC60068-2-78 (Humidity test) : $85^{\circ}\text{C} \cdot 85\%$ humidity • 1,000 hours IEC60068-2-11, 52 (Salt spray test) IEC60068-2-64 (Vibration test) GR-3108-CORE (Corrosive gas test) UL94V-0 (Flame-resistant) • UL746C f1	

Product no. / Details

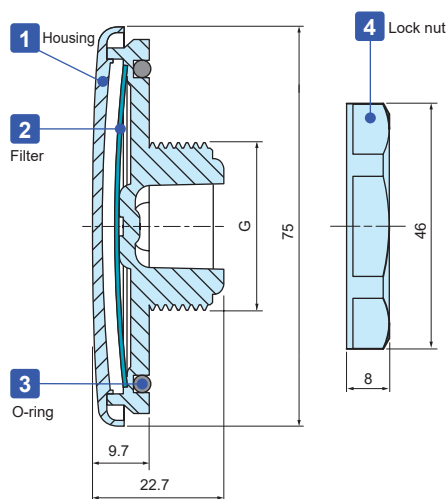
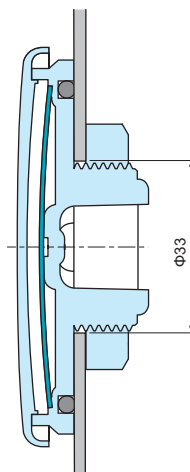
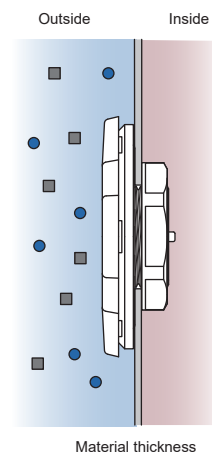
Product no.		Material				G		Lock nut
● Light gray	● Black	1 Housing	2 Filter	3 O-ring	4 Lock nut	Thread size	Mount hole	SW
PMF-12S	PMF-12B	PA66 / 6	PTFE	Silicone	PA66 (UL94V-2)	M12 x P1.5	Φ12.2	17
PMF-12HAS	PMF-12HAB	PA66 / 6	PTFE	Silicone	PA66 (UL94V-2)	M12 x P1.5	Φ12.2	17

PMF-32S**LARGE PROTECTIVE VENT****Pressure Equalization / Ventilation**

Application Example

- Maintains exceptionally high airflow in extra-large enclosures with volumes of up to 200 liters in an outdoor environment.
- Protective vent protects the enclosure from deformation by equalizing internal and external pressure differences, as well as venting the gas generated within the enclosure.
- Simple and flat design allows it to be used on a wide variety of enclosure types.
- IP68 protection class rated (water depth 2 meters / 60 mins) with an operating temperature range of $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ allows it to be used in harsh environments.
- Compliant with Solar industry testing IEC62108 standards.
- Recommended to be installed at the sides of the enclosure.
- Use in industrial and electrical / electronic products only; not suitable to be used in medical, food and beverage, and cosmetic industries and related industrial equipment.

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

PMF-32 dimensions**Hole milling drawings****Installation drawings**

■ If used with a lock nut, material thickness should not exceed 5.0mm.

Technical Data

Airflow	16ℓ / min (dp = 1.2kPa)
Recommended torque	5 N · m
Certifications	IEC529, 2nd (Protection class test) : IP66 • IP67 • IP68 • IP69K IEC60068-2-1, 2, 14 (Heat resistance test) : $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ IEC60068-2-78 (Humidity test) : 85°C • 85% humidity • 1,000 hours IEC60068-2-11, 52 (Salt spray test) IEC60068-2-64 (Vibration test) IEC62108, 10.8 • 9 (Solar industry test) : Freezing • High temperature tes • Hail impact test GR-3108-CORE (Corrosive gas test) UL94V-0 (Flame-resistant) • UL746C f1

Product no. / Details

Product no.	Material				G			Lock nut SW
	1 Housing	2 Filter	3 O-ring	4 Lock nut	Thread size	Thread diameter	Mount hole	
PMF-32S	Polycarbonate	PTFE	Silicone	PA66	M32 x P1.5	Φ32	Φ33	41.5

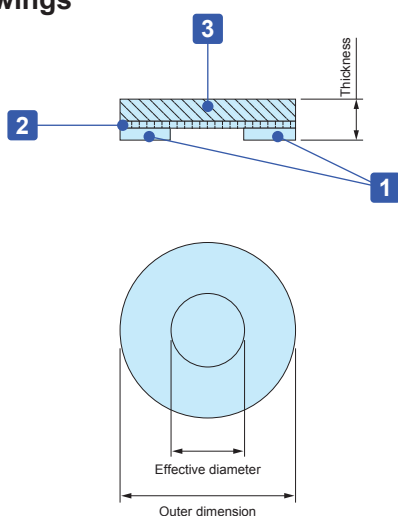
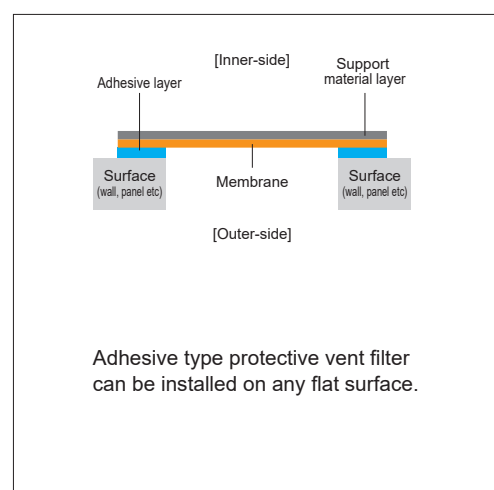
VE8 series**ADHESIVE PROTECTIVE VENT FILTER****Technical Data**

Protection class : Dustproof IP6X
 Waterproof IPX4, IPX7
 Airflow : 3,300ml/min/cm² (at 7Kpa)
 Operating temperature : -40°C ~ +100°C

- Vent filter protects the enclosure from deformation by equalizing internal and external pressure differences, as well as venting the gas generated within the enclosure.
- Allows water vapor molecules to diffuse through the microporous membrane.
- Highly water and oil repellent membrane protects electronic components from water, corrosive liquids, salts and dust.
- Easy installation adhesive filter.
- Recommended to be adhered onto flat plastic or metallic surfaces.

CAUTION

- Install only on the inner surface of the case / box with the membrane and adhesive side facing outwards.
- An initial period of 24 hours is required for the adhesive to properly bond to the surface. Avoid using the vent filter with a heavy load.
- Please do not adhere onto the top-side of enclosures. Rain water etc. will collect on the filter, which will weaken the adhesive seal and prevent proper ventilation.
- After degreasing and cleaning, adhere the filter without touching the center part of the vent filter.
- Use in industrial and electrical / electronic products only; not suitable to be used in medical, food and beverage, and cosmetic industries and related industrial equipment.

VE8 drawings**Installation drawings****Components**

No.	Part name	Material	Color
1	Adhesive	Acrylic adhesive	Transparent
		Silicon adhesive (VE82029S, VE82029S-S)	
2	Filter	ePTFE (Oil-repellent type)	White
3	Support material	Polyester fabric	White

Product no. / Details

Product no.	Outer dimension (Φ-mm)	Effective diameter (Φ-mm)	Thickness (mm)	Sales unit
VE80308	7.6	3.3	0.26	8 pcs (per pack)
VE80814	14.0	8.0	0.26	4 pcs (per pack)
VE81221	21.5	12.5	0.26	4 pcs (per pack)
VE82029S	29.0	20.0	0.35	2 pcs (per pack)
VE80308-S	7.6	3.3	0.26	96 pcs (per sheet)
VE80814-S	14.0	8.0	0.26	56 pcs (per sheet)
VE81221-S	21.5	12.5	0.26	20 pcs (per sheet)
VE82029S-S	29.0	20.0	0.35	10 pcs (per sheet)

VSC SERIES

ADHESIVE PROTECTIVE VENT FILTER



Technical Data

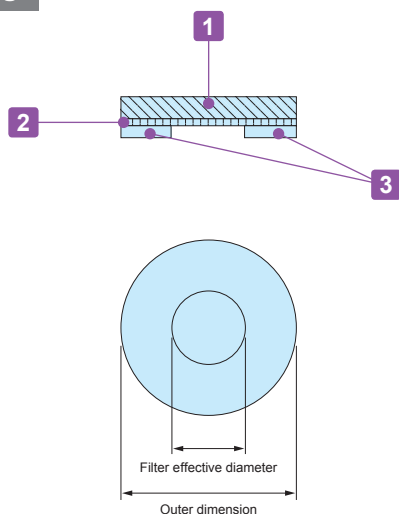
Water Entry Pressure (WEP): $\geq 20.0\text{kPa}$
 Airflow: $450\text{cc}/\text{cm}^2 \cdot \text{min}$ at 1.29Kpa

- Prevents ingress of a variety of contaminants, such as water, dust and other particles.
- Allows water vapor molecules to diffuse through the microporous membrane.
- Recommended to be adhered onto flat plastic or metallic surfaces.

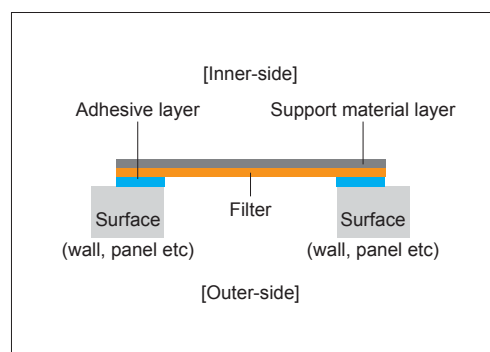
NOTE

- Surface must be wiped dry before adhering.
- An initial period of a few hours is required for the adhesive to properly bond to the surface.
- Please do not adhere onto the top-side of enclosures. Rain water etc will collect on the filter, which will weaken the adhesive seal and prevent ventilation.

Drawing



Installation drawing



Components

No.	Part name	Material	Color
1	Adhesive	Acrylic adhesive	Transparent
2	Filter	PTFE	White
3	Support material	Polyester fabric	White

Product no. / Dimensions

Product no.	Outer dimension (Φ)	Filter effective diameter (Φ)	Thickness	Sales unit
VSC075	7.5	4.0	0.35	5 pcs (per pack)
VSC130	13.0	8.0	0.35	4 pcs (per pack)
VSC240	24.0	16.0	0.35	4 pcs (per pack)
VSC075-S	7.5	4.0	0.35	100 pcs (per sheet)
VSC130-S	13.0	8.0	0.35	56 pcs (per sheet)
VSC240-S	24.0	16.0	0.35	20 pcs (per sheet)



- Torque wrench with interchangeable head.
- Suitable for the tightening of cable glands requiring a specific torque.
- Open end interchangeable head (spanner head) TWE series available separately.
- Spanner head is not included.

Product no. / Details

Product no.	Length	Torque range (N · m)	Increments (N · m)
TWH0.5-5	215	0.5 ~ 5.0	0.05

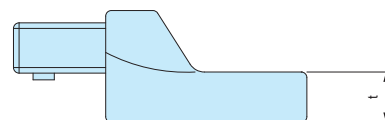
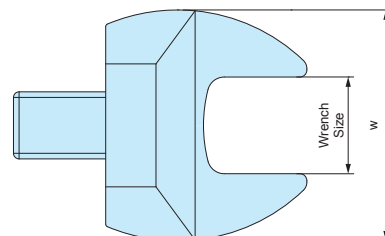
Notes

The torque wrench is not subject to RoHS regulations.

Since it is an OEM product and not a JIS-compliant product, no calibration services or inspection reports, etc. are provided.

When tightening, proceed first with a low value (half of the reference) of the recommended torque, and set the appropriate tightening torque for the cable and mounting part that will be tightened thereafter.

Please read the operation manual (refer to TAKACHI website) before use to ensure correct and safe usage of the product.



- Dedicated open end interchangeable head for TWH series.
- Various interchangeable heads are available to fit a range of cable gland sizes.

Product no. / Details

Product no.	Wrench size	w	t
TWE- 8	8	27	6
TWE- 9	9	27	6
TWE-11	11	27	6
TWE-12	12	30	6
TWE-13	13	31	6
TWE-15	15	40	9
TWE-16	16	40	9
TWE-17	17	41	9
TWE-18	18	42	9
TWE-19	19	42	10
TWE-21	21	47	10

Product no.	Wrench size	w	t
TWE-22	22	52	10
TWE-23	23	53	11
TWE-24	24	55	11
TWE-27	27	58	13
TWE-29	29	58	13
TWE-30	30	65	14
TWE-32	32	65	14
TWE-33	33	65	14
TWE-34	34	70	15
TWE-36	36	72	15

Note: These open end head is not subject to RoHS regulations.

Suitable TWE model

RM • RMW series

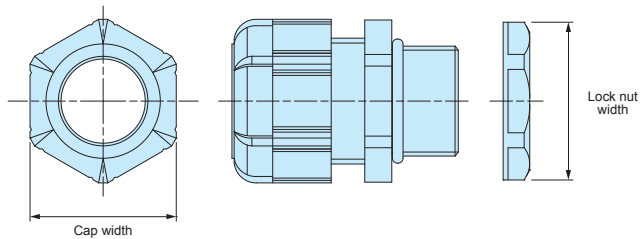
Product no.	Cap width	Suitable model	Lock nut width	Suitable model
RM8S-2.5	11.8	TWE-12	–	n/a
RM • RMW8L-2.5	11.8	TWE-12	12.6	TWE-13
RM8S-4	11.8	TWE-12	–	n/a
RM • RMW8L-4	11.8	TWE-12	12.6	TWE-13
RM • RMW10S-6	13	TWE-13	–	n/a
RM • RMW10L-6	13	TWE-13	14.8	TWE-15
RM • RMW12S-7	16	TWE-16	17	TWE-17
RM • RMW12L-7	16	TWE-16	17	TWE-17
RM • RMW16S-8	19	TWE-19	22	TWE-22
RM • RMW16L-8	19	TWE-19	22	TWE-22
RM • RMW20S-12	24	TWE-24	26.2	n/a
RM • RMW20L-12	24	TWE-24	26.2	n/a
RM • RMW25L-17	33	TWE-33	32.6	n/a
RM • RMW32L-21	36	TWE-36	40.3	n/a
RM • RMW40L-27	45.7	n/a	51	n/a
RM • RMW50L-38	60	n/a	61.2	n/a
RM63L-44	68	n/a	73.4	n/a

RPG series

Product no.	Cap width	Suitable model	Lock nut width	Suitable model
RPG7-7	16	TWE-16	18.7	TWE-19
RPG9-8	19	TWE-19	21.8	TWE-22
RPG11-10	22	TWE-22	23.7	TWE-24
RPG13.5-11	24	TWE-24	27	TWE-27
RPG16-14	26.7	TWE-27	29.8	TWE-30
RPG21-18	33	n/a	35.8	TWE-36
RPG29-25	42	n/a	45.8	n/a

RSP series

Product no.	Cap width	Suitable model	Lock nut width	Suitable model
RSP12-6	16	TWE-16	17	TWE-17
RSP16-8	19.5	n/a	22	TWE-22
RSP20-11	24	TWE-24	26.2	n/a
RSP25-16	33	TWE-33	32.6	n/a



Note 1) ""n/a"" indicates no suitable spanner head size and torque value available.

Note 2) Dimensions of Cap and Lock nut width are in mm.

AG series

Product no.	Cap width	Suitable model	Lock nut width	Suitable model
AG8-3.5	12	TWE-12	–	n/a
AG8-5	12	TWE-12	–	n/a
AG10-6	15	TWE-15	–	n/a
AG12-5	17	TWE-17	17	TWE-17
AG12-6.5	17	TWE-17	17	TWE-17
AG12-8	17	TWE-17	17	TWE-17
AG16-10	21	TWE-21	22	TWE-22
AG20-15	27	TWE-27	27	TWE-27
AG25-16	34	TWE-34	33	TWE-33
AG25-20	34	TWE-34	33	TWE-33
AG32-25.5	41	n/a	42	n/a
AG40-28.5	50	n/a	48	n/a
AG40-33	50	n/a	48	n/a
AG50-37	60	n/a	59	n/a
AG50-42	60	n/a	59	n/a

AGM series

Product no.	Cap width	Suitable model	Lock nut width	Suitable model
AGM6-2.5	8	TWE-8	9	TWE- 9
AGM6-3	8	TWE-8	9	TWE- 9
AGM6-3.5	8	TWE-8	9	TWE- 9
AGM8-5	11	TWE-11	11	TWE-11
AGM10-6	13	TWE-13	13	TWE-13
AGM12-8	15	TWE-15	15	TWE-15
AGM16-10.5	18	TWE-18	19	TWE-19
AGM20-15	24	TWE-24	24	TWE-24
AGM25-20	30	TWE-30	30	TWE-30
AGM32-25.5	36	TWE-36	36	TWE-36
AGM40-28.5	46	n/a	51	n/a
AGM40-33	46	n/a	51	n/a
AGM50-37	55	n/a	60	n/a
AGM50-42	55	n/a	60	n/a

AGE series

Product no.	Cap width	Suitable model	Lock nut width	Suitable model
AGE12-5	15	TWE-15	15	TWE-15
AGE12-6.5	15	TWE-15	15	TWE-15
AGE16-10.5	18	TWE-18	19	TWE-19
AGE20-15	24	TWE-24	24	TWE-24
AGE25-20	30	TWE-30	30	TWE-30
AGE32-25	36	n/a	36	n/a

AGH series

Product no.	Cap width	Suitable model	Lock nut width	Suitable model
AGH10-6	13	TWE-13	13	TWE-13
AGH12-8	15	TWE-15	15	TWE-15
AGH16-10.5	18	TWE-18	19	TWE-19
AGH20-15	24	TWE-24	24	TWE-24
AGH25-20	30	TWE-30	30	TWE-30
AGH32-25.5	36	TWE-36	36	TWE-36

TWH0.5-5 Torque Wrench Operation Manual

1 For Safety Use

Safety Precautions

Please read this manual carefully before use while following operation instructions.

The manufacturer / retailer etc. will not be are not liable for any personal injuries, damage to the product, or other property damage, etc. caused by improper use.

Warnings



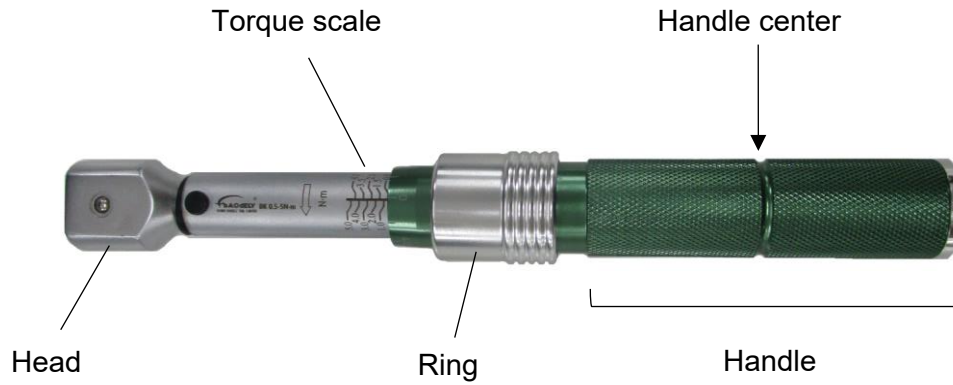
- Do not use beyond the maximum torque value. This may cause damage and injury.
- Do not use the torque wrench as a hammer or lever, or applying strong impact.
- Do not modify or disassemble the torque wrench. These may cause strength or accuracy problems, which may lead to accidents and injuries.
- Before use, check for damage, cracks, rust, or deformation. These may cause damage and injury.
- Do not use the torque wrench to loosen nuts or caps as it is a precision instrument.
- Do not operate the torque wrench with oily or greasy hands. This may cause your hands to slip while tightening, leading to accidents or injuries.
- Wear safety glasses or other eye protection while using.
- Be careful not to hit your hands or elbows on surrounding objects when working with a torque wrench.
- Do not use the torque wrench underwater or in the sea.
- When working on elevated platforms, take measures to prevent torque wrenches from falling.

Cautions



- Set the torque before each use.
- Do not lower the scale below the minimum.
- Do not use it outside of the torque scale range.
- Every time before setting the torque, ensure that the handle lock is in the unlock position first before rotating the handle.
- Grip the center of the handle to tighten. Gripping the edge of the handle may cause incorrect torque value.
- Tighten slowly while applying minimal force. Otherwise applied torque value may be incorrect.
- Stop tightening after hearing, or feeling a clicking sound or sensation. Further tightening may result in overtorque.
- Do not use parts such as a pipe to extend the handle.
- Do not drop the torque wrench or apply strong impact.
- Do not use in high temperature and humid environments.
- After use, set the torque wrench to the minimum value.
- After use, remove dirt, dust, mud, oil, water, etc. before storing.
- Store in a dry place when not in use for an extended period of time.

2 Components



3 How to use

① Push and hold the ring down to unlock.	② Turn the handle.
 A blue arrow points downwards towards the green ring, indicating the action to push it down.	 Two blue curved arrows indicate the handle is being rotated. Text: · Turn the handle while the ring is in the unlock position.
③ Adjust to required torque.	④ Release the ring.
 A red arrow points to the green ring, indicating adjustment. The torque scale is visible with markings from 1.0 to 5.0 N·m.	 A blue arrow points upwards towards the green ring, indicating the action to release it. Text: · The ring will spring back to its original (lock) position.

TAKACHI ELECTRONICS ENCLOSURE CO., LTD.

TEL. +81-48-222-5409

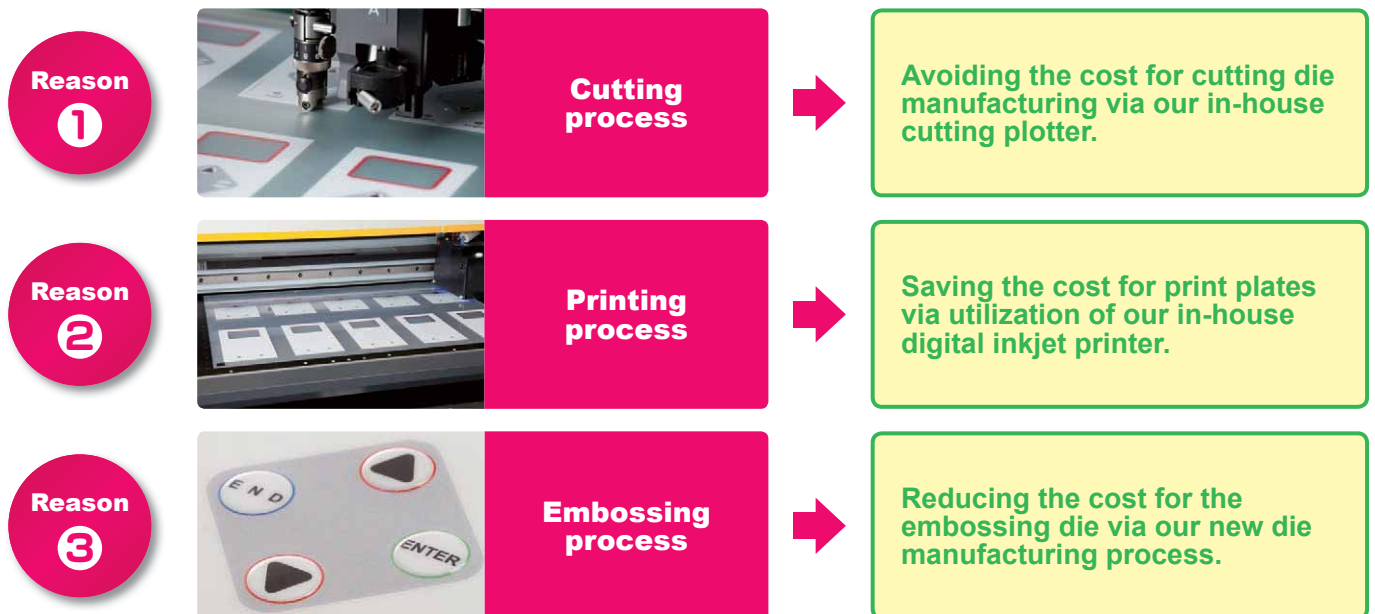
<https://www.takachi-enclosure.com/>

2023.10

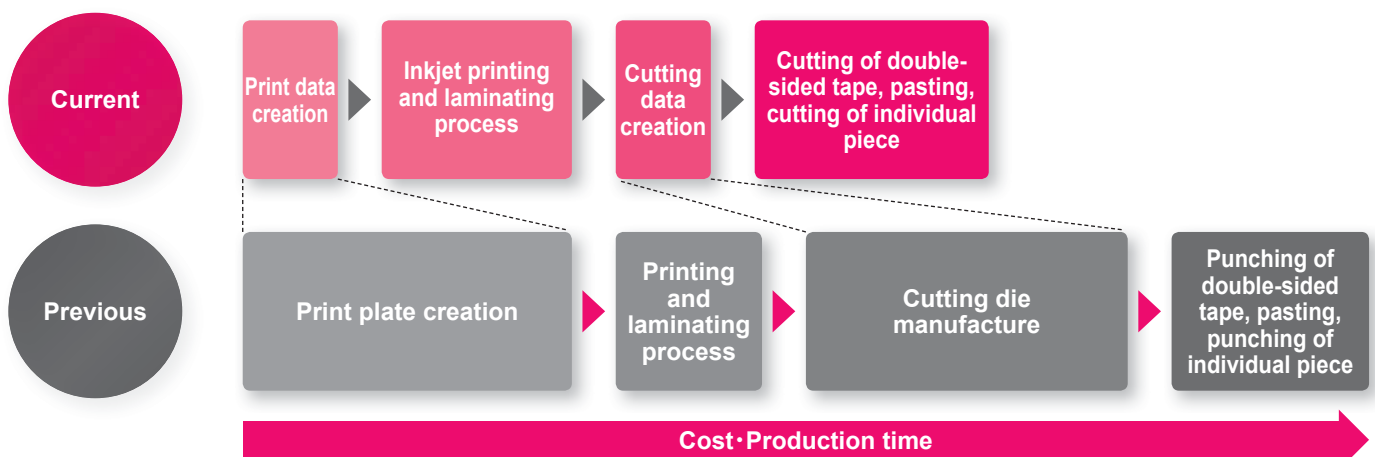
DIGITAL PRINTED OVERLAY



● 3 reasons for low initial costs



● Comparison of current and previous manufacturing methods



PRODUCTION PROCESS



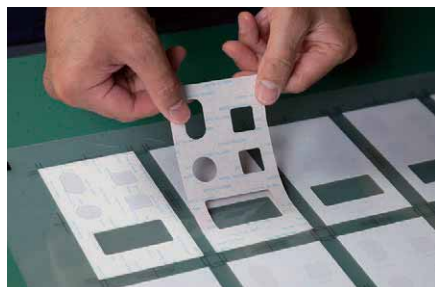
1. Inkjet printing on film



2. Laminating



3. Cutting double-sided tape



4. Sticking double-sided tape on printed film



5. Cutting the sheet to size



6. Embossing



7. Machining on enclosure



8. Sticking overlay sheet onto enclosure



9. Complete

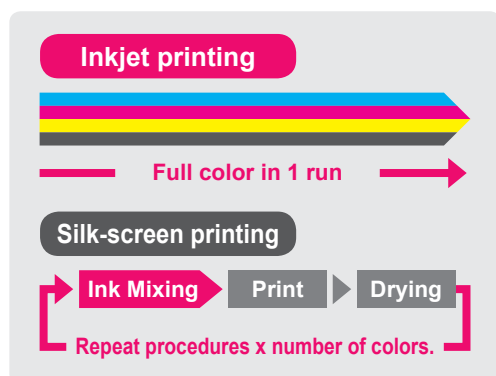
CUSTOMIZATION EXAMPLE



INKJET PRINTING



Full color digitally designed image
can be printed in 1 run.
No cost difference regardless of the
number of colors used.



Low printing cost
Full color print possible
in small quantities

Inkjet printing	1 run only for full color print			
Printing cost Full color				
Silk-screen printing	Printing cost x number of colors			
Printing cost Color 1	Printing cost Color 2	Printing cost Color 3	Printing cost Color 4	

High quality printing of photo image and color gradation.

Print photo images in maximum 1,800 x 1,800 dpi quality.

Pictures, logos and unique designs with color gradation can be recreated in a high quality print.



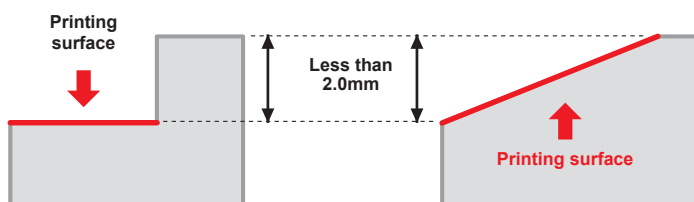
Maximum printable enclosure size



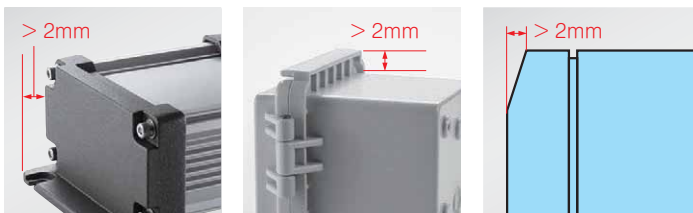
Printable on surfaces with height differential

Printing is possible on recessed, sloped and rounded sections.

Gap difference is less than 2.0mm.



*Not suitable if height difference is more than 2.0mm.



Printed example



CNC MACHINING

CNC milling is a form of computer controlled machining. Similar in operation to drilling and cutting, it is able to create various hole styles and shapes by using a rotating cutting tool to bore into the object.



- Mainly used for plastic, aluminium die-cast, and aluminium extrusion material types.
- Able to perform milling for various shapes and sizes.
- Recommended for small quantity customization.

