



WATERPROOF ENCLOSURES



Requirement of a Thermoplastic Enclosure for Industrial Application

Industrial standard thermoplastic enclosures are suitable for housing electrical and electronics of up to 1000V. The thermoplastic enclosures should be able to provide:

1. Protection for the User from Electrical Shock Protection.

The electrical insulating capability of a plastic material is measured by the dielectric strength measured in kilo-volt per milli-meter (kV/mm). Dielectric strength is defined by the maximum voltage required to cause a dielectric breakdown.

A thermoplastic enclosure has 2 layers of electrical insulating (double-insulation) protection:

- The cover of the enclosure which is made of insulating thermoplastic material.
- The air distance between the thermoplastic cover and the electrical switching device e.g. contactor which can cause arcing when switching high current. The arc can cause a "flash-over" through the air layer and the thermoplastic cover prevents the human operator from being electrocuted by the arc.

2. Protection against natural environment from Dust & Damp (IP)

The thermoplastic enclosure which housed the electrical equipment housed must be available to prevent dust and liquid from entering the housing. The dust and damp can cause electrical short circuit to the electrical equipment. The Index of Protection (IP) as according to IEC529 / EN60529 refers to the level of dust/damp protection to indicate whether the enclosure is suitable for indoor or outdoor application.

3. Protection against Mechanical Impact (IK).

The thermoplastic enclosure must also provide sufficient mechanical protection for the electrical equipment. The protection against mechanical impact is measured by the (IK) as according to EN5012.

4. Protection against Fire.

- The thermoplastic enclosure should be flame retardant / self-extinguishing. The plastic should "self-extinguish" within a short time when the flame is no longer present. The standard for self-extinguishing is UL94.
- The thermoplastic enclosure should be halogen-free. During a fire, certain plastic material containing halogen elements (fluorine, chlorine, bromine, iodine and astat) may release substances that are toxic to humans in the form of toxic fumes.

5. Protection against Hot and Cold Temperature.

The control panel needed to be operated in very hot temperature e.g. hot desert environment or very cold environment. Hence the thermoplastic enclosure must be able to withstand extreme temperature.

6. Protection against Chemical Corrosion.

Plastic corrosion occurs when bonds between the organic molecules making up the structure are affected by various corrosive environment caused by the presence of chemicals. The corrosion will cause the mechanical and electrical properties to deteriorate.

Chemical Resistance	ABS
Alkalis	++++
Acid	+
Saltish Environment	++
Petroleum	+
Hydraulic Oil	+++++
Solvents	+
Cooling Fluids	+++++

Degree of Protection:

+++++ Very good protection + Poor protection

Technical Specification of Saipwell ABS Enclosure

Technical Specifications	Junction Box Type DS-AG	Cabinet Type DS-AGS
Enclosure	ABS Grey RAL7035	ABS Grey RAL7035
RoHS Compliance	Yes	Yes
Index of Protection	IP66	IP65
Mechanical Protection	IK10	IK10
Chemical Protection		
Acid (Low concentration)	++++	++++
Alkalis (High concentration)	++++	++++
Hydraulic Oil	+++++	+++++
Cooling Fluid	+++	+++
Alcohol		
Self - extinguishing	UL94 HB40	UL94 HB40
Halogen-free	Yes	Yes
Operating Temperature	-25°C to +60°C	-25°C to +60°C

Technical Characteristic

- IK10 Mechanical Impact Strength
- Operating Temperature – 25°C to +60°C
- Self-extinguishing UL94 V-HB40



Outdoor Junction Box (ABS Grey Cover / Grey Base)

Index of Protection	Height H (mm)	Width W(mm)	Depth D(mm)	Box Reference	Mounting Y (mm)	Mounting X (mm)	Mounting Plate Reference
	110	80	70	9SW-PAG-0811	90	60	-
	110	80	85	9SW-PAG-0811-1	90	60	-
	125	125	75	9SW-PAG-1212-S	109	109	9SW-PAG-1212PMP
	125	125	100	9SW-PAG-1212	109	109	9SW-PAG-1212PMP
	130	80	70	9SW-PAG-0813	110	60	-
	130	80	85	9SW-PAG-0813-1	110	60	-
	175	125	75	9SW-PAG-1217	109	158	9SW-PAG-1217PMP
	175	125	100	9SW-PAG-1217-1	109	158	9SW-PAG-1217PMP
	180	80	65	9SW-PAG-0818	160	60	-
	250	80	65	9SW-PAG-0825	230	60	-
	250	80	85	9SW-PAG-0825-1	230	60	-
	170	140	95	9SW-PAG-1417	152	122	9SW-PAG-1417PMP
	200	150	100	9SW-PAG-1520	182	132	9SW-PAG-1525PMP
	200	150	130	9SW-PAG-1520-1	182	132	9SW-PAG-1520PMP
	250	150	100	9SW-PAG-1525	232	132	9SW-PAG-1520PMP
	250	150	130	9SW-PAG-1525-1	232	132	9SW-PAG-1525PMP
	280	190	130	9SW-PAG-2819	254	164	9SW-PAG-2819PMP
	280	190	180	9SW-PAG-2819-1	254	164	9SW-PAG-2819PMP
	280	280	130	9SW-PAG-2828	254	254	9SW-PAG-2828PMP
	280	280	180	9SW-PAG-2828-1	254	254	9SW-PAG-2828PMP
	380	280	130	9SW-PAG-3828	354	254	QSW-PAG-3828PMP
	380	280	180	9SW-PAG-3828-1	354	254	9SW-PAG-3828PMP



9SW DS-AG-0811



9SW DS-AG-1417



9SW DS-AG-2819



9SW DS-AG-2828

*Thermoplastic base plate

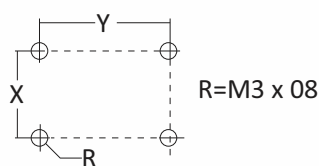
Outdoor Cabinet Enclosure (ABS Grey Cover / Grey Base) with Stainless Steel Hinges / Clasp

Index of Protection	Height H (mm)	Width W(mm)	Depth D(mm)	Box Reference	Mounting Y (mm)	Mounting X (mm)	Mounting Plate Reference
	170	140	90	9SW DS-AGS-1417	152	122	9SW DS-AG1417PMP
	200	150	100	9SW DS-AGS-1520	182	132	9SW DS-AG1525PMP
	200	150	130	9SW DS-AGS-1520-01	182	132	9SW DS-AG1520PMP
	250	150	100	9SW DS-AGS-1525	232	132	9SW DS-AG1525PMP
	250	150	130	9SW DS-AGS-1525-01	232	132	9SW DS-AG1525PMP
	280	190	130	9SW DS-AGS-2819	254	164	9SW DS-AG2819PMP
	280	190	180	9SW DS-AGS-2819-01	254	164	9SW DS-AG2819PMP
	280	280	130	9SW DS-AGS-2828	254	254	9SW DS-AG2828PMP
	280	280	180	9SW DS-AGS-2828-01	254	254	9SW DS-AG2828PMP
	380	280	130	9SW DS-AGS-3828	354	254	9SW DS-AG3828PMP
	380	280	180	9SW DS-AGS-3828-01	354	254	9SW DS-AG3828PMP

*Thermoplastic base plate



9SW DS-AGS-2819



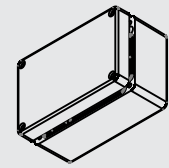
Mounting Dimension
Mounting screws 4 x M3x8

Aluminium Die Case Waterproof Boxes

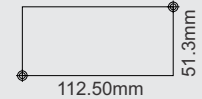


- Aluminum alloy die-casting forming, high temperature resistant, Corrosion-Proof, can be used in harsh environments.
- Applicable: Terminal box, Distribution Box, Instrument Box, Signal Junction Box, Stope, Coastal factories, Sewage Treatment Works and other environments.
- Protection: IP66

Part Number 9SW-MAL-FA2-3	Hole opening on cover		Value-Added Variances
	Ø16mm	Ø22mm	
Box outer dimension: 125 x 80 x 58mm Mounting holes distances: 112.5 x 51.3mm	1	-	9SW-MAL-FA2-3-116
	-	1	9SW-MAL-FA2-3-122
	2	-	9SW-MAL-FA2-3-216
	-	2	9SW-MAL-FA2-3-222
	3	-	9SW-MAL-FA2-3-316



Mounting dimension
(2 x M4 screw)



ACCESSORIES FOR ENCLOSURES



Waterproof Nylon Cable Gland

Material: Grey Polyamide (PA6) • Sealing Material: EDPM • IP rating: IP68

Cable Gland Thread Size	Cable Size mm ²	Thread OD (AG)	Thread Length (GL)	Height (H)	Reference
M12	3 - 6.5	12	8	21	9HT RKSP-M12A-GY-PA6-PM
M16	4 - 8	16	8	22	9HT RKSP-M16A-GY-PA6-PM
M20	6 - 12	20	9	27	9HT RKSP-M20A-GY-PA6-PM
M25	13 - 18	25	11	31	9HT RKSP-M25A-GY-PA6-PM
M32	18 - 25	32	11	39	9HT RKSP-M32A-GY-PA6-PM
M40	22 - 32	40	13	48	9HT RKSP-M40A-GY-PA6-PM
M50	32 - 38	50	15	49	9HT RKSP-M50A-GY-PA6-PM
M63	37 - 44	63	15	49	9HT RKSP-M63A-GY-PA6-PM

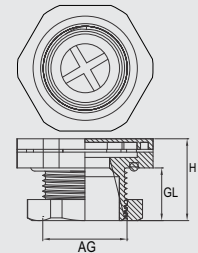
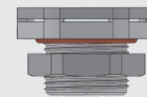
* M12 ~ M63 Brass cable gland available on request



RSV-M Ventilation Plug

Material: Polyamide (PA66) + 25% Glass Fibre • Sealing Material: EDPM • IP rating: Ip68 • Air permeability • Anti-UV: level 4-5 • Flammability: UL94 v0

Specification	Thread		Height (H) mm	Air Permeability (ml/min@0.07bar)	Reference
	OD (AG)	Length (GL)			
M10 x 10	10mm	08mm	13.2 ± 0.3	13.2 ± 0.3	9HT RVS--M10*1.0-IP66
M12 x 15	12mm	10mm	16.0 ± 0.3	16.0 ± 0.3	9HT RVS--M12*1.5-IP66
M24 x 15	24mm	15mm	23.4 ± 0.4	23.4 ± 0.4	9HT RVS--M24*1.5-IP66
M40 x 15	40mm	15mm	22.0 ± 0.4	22.0 ± 0.4	9HT RVS--M40*1.5-IP66



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