

SAMWHA



SAMWHA

SAM

WHA

SAMWHA

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SAMWHA LIGHTING

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Section A

SAMWHA FLEX



SAMWHA FLEX Features

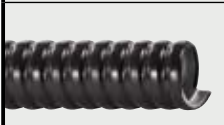
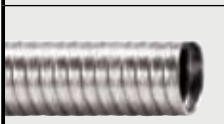
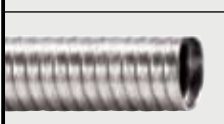
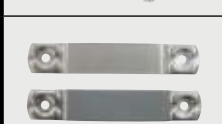
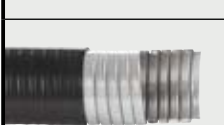
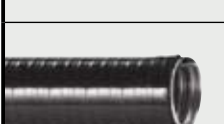
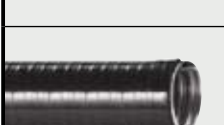
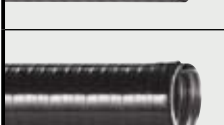
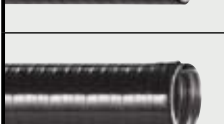
SAMWHA provides the best quality products suitable for the future environment.

Applications :

These flexible metal conduits are to be used at the job sites under the conditions as follows:

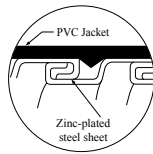
1. KIS, KMS- For electric wirings at the operating fields causing vibration and movement
2. SIS, SMS- For electric wirings at the areas demanding corrosion-resistance at wet surroundings.
3. KIH, KMH, KIC, KMC- For electric wirings at high and low surrounding temperatures.
4. KIO, KMO- For electric wirings at oily surroundings.
5. KIV, KMV- For electric wirings at the areas with fire-hazard in surroundings.
6. KUS- For electric wirings at the fields which need grounding a short circuit current safely
7. KPS- For electric tubings at the operations calling for especially more flexibility to machine tools

SAMWHA FLEX INDEX (Class 1 flexible metal conduits and accessories)

	KIS(High tensility) KS certified 7		KIO, KMO, SIO, SMO Oil-resistant 15
	KMS(General waterproof) KS certified 7		KIB, KMB, SIB, SMB SUS wire 16
	SIS(High tensility, waterproof) Stainless steel 8		KFBG (Waterproof), KS certified KFBT (Waterproof), UL listed 17
	SMS (General waterproof) Stainless steel 8		KFUG (Waterproof), KS certified KFUT (Waterproof), UL listed 17
	KI (High tensility, non-waterproof) KS certified 9		KF90AG (Waterproof), KS certified KF90AT (Waterproof), UL listed 18
	KM (General non-waterproof) KS certified 9		KF45AG (Waterproof), KS certified KF45AT (Waterproof), UL listed 18
	SI (High tensility non-waterproof) Stainless steel 10		KFNG (Non-waterproof) KS certified 18
	SM (General non-waterproof) Stainless steel 10		SADDLE 19
	KUS(UL Type waterproof) UL listed 11		LOCK NUT 19
	KPS (Oil resistant for machine tools) P.P string inserted 11		FERRULE 19
	KIV, KMV, SIV, SMV Flameproof 12		MS Connector 20
	KIH, KMH, SIH, SMH Heat resistant 12		MS Adapter & plug 21
	KIC, KMC, SIC, SMC Coldproof 14		SUNFLEX (Optical fiber & flexible for communication) 22

KIS(High tensility waterproof flexible metal conduit)

KS C 8422



[CORE structure]

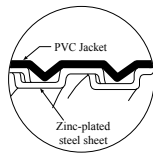
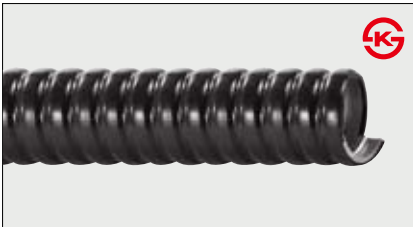
- Superior in tensility, compression strength, and being waterproof.
- Suitable for the job sites causing movement and vibration and calling for tensility.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
KIS	#10	1/4"	10.0	15.0	50	-	-	12
	#12	3/8"	12.3	17.7	50	-	-	17
	#16	1/2"	15.8	21.1	50	19	16	20
	#22	3/4"	20.8	26.4	50	25	22	25
	#28	1"	26.4	33.2	30	31	28	21
	#36	1-1/4"	35.0	42.0	30	39	36	29
	#42	1-1/2"	40.0	47.7	20	51	42	27
	#54	2"	51.3	59.7	20	63	54	33
	#70	2-1/2"	63.0	72.3	10	75	70	25
	#82	3"	78.0	88.7	10	-	82	30
	#104	4"	101.6	113.8	6	-	104	27
	#130	5"	126.4	140.6	6	-	-	-

● Proper temperature for use : -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

KMS(General waterproof)

KS C 8422



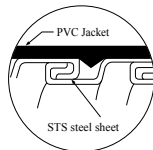
[CORE structure]

- Superior with an neat aspect in curvature radius, flexibility, being waterproof and no creases when bend.
- General purpose conduit used in all sorts of industrial equipments, machine tools, automated machine and tools etc..

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
KMS	#10	1/4"	10.0	15.0	50	-	-	9.5
	#12	3/8"	12.3	17.7	50	-	-	10.5
	#16	1/2"	15.8	21.1	50	19	16	15
	#22	3/4"	20.8	26.4	50	25	22	18
	#28	1"	26.4	33.2	30	31	28	14
	#36	1-1/4"	35.0	42.0	30	39	36	22
	#42	1-1/2"	40.0	47.7	20	51	42	15
	#54	2"	51.3	59.7	20	63	54	19
	#70	2-1/2"	63.0	72.3	10	75	70	16.5
	#82	3"	78.0	88.7	10	-	82	18
	#104	4"	101.6	113.8	6	-	104	24

● Proper temperature for use : -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

SIS(Stainless Steel High tensility waterproof flexible metal conduit)



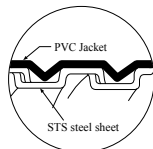
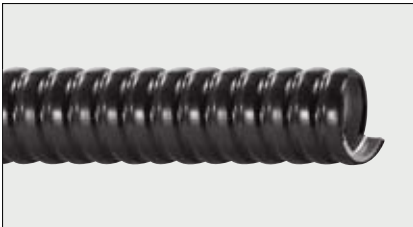
[CORE structure]

- Superior with a neat aspect in tensility, compression strength, uniform quality, being salt-resistant and waterproof.
- Suitable for Shipbuilding and the seas plants, freight vessels for LNG etc. calling for tensility and corrosion resistance

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
SIS	#10	1/4"	10.0	15.0	50	-	-	10
	#12	3/8"	12.3	17.7	50	-	-	16
	#16	1/2"	15.8	21.1	50	19	16	18
	#22	3/4"	20.8	26.4	50	25	22	23
	#28	1"	26.4	33.2	30	31	28	18
	#36	1-1/4"	35.0	42.0	30	39	36	27
	#42	1-1/2"	40.0	47.7	20	51	42	24
	#54	2"	51.3	59.7	20	63	54	32
	#70	2-1/2"	63.0	72.3	10	75	70	23
	#82	3"	78.0	88.7	10	-	82	28
	#104	4"	101.6	113.8	6	-	104	25
	#130	5"	126.4	140.6	6	-	-	-

● Proper temperature for use: -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

SMS(Stainless Steel General waterproof flexible metal conduit)



[CORE structure]

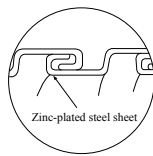
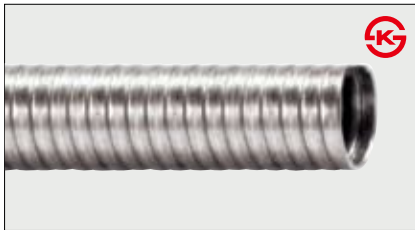
- Superior with a neat aspect in being salt-resistant and waterproof, curvature radius, flexibility, and no creases when bended.
- Suitable for Shipbuilding and the seas plants, freight vessels for LNG etc. calling for corrosion resistance

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
SMS	#10	1/4"	10.0	15.0	50	-	-	9
	#12	3/8"	12.3	17.7	50	-	-	10
	#16	1/2"	15.8	21.1	50	19	16	14
	#22	3/4"	20.8	26.4	50	25	22	16
	#28	1"	26.4	33.2	30	31	28	13
	#36	1-1/4"	35.0	42.0	30	39	36	20
	#42	1-1/2"	40.0	47.7	20	51	42	14
	#54	2"	51.3	59.7	20	63	54	18
	#70	2-1/2"	63.0	72.3	10	75	70	12
	#82	3"	78.0	88.7	10	-	82	15
	#104	4"	101.6	113.8	6	-	104	16

● Proper temperature for use: -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

KI(High tensility non-waterproof flexible metal conduit)

KS C 8422



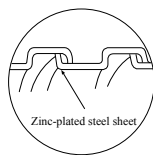
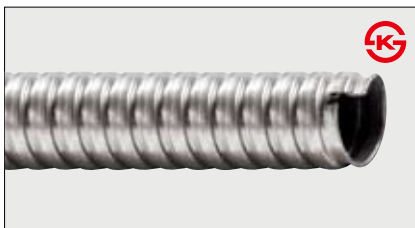
[CORE structure]

- Superior with a neat aspect in tensility, compression strength and uniform quality.
- Suitable for indoor electric wirings in all sorts of industrial equipments and machine tools and cable protection requiring especially mechanical strength.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
KI	#10	1/4"	10.0	13.2	50	-	-	8
	#12	3/8"	12.3	15.6	50	-	-	10
	#16	1/2"	15.8	19.1	50	19	16	12
	#22	3/4"	20.8	24.2	50	25	22	17
	#28	1"	26.4	31.1	30	31	28	14
	#36	1-1/4"	35.0	39.7	30	39	36	22
	#42	1-1/2"	40.0	44.7	20	51	42	16
	#54	2"	51.3	56.0	20	63	54	20
	#70	2-1/2"	63.0	69.0	10	75	70	18
	#82	3"	78.0	85.4	10	-	82	23
	#104	4"	101.6	109.2	6	-	104	17
	#130	5"	126.4	134.9	6	-	-	-

KM(General non-waterproof flexible metal conduit)

KS C 8422

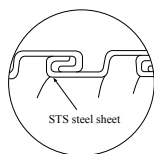
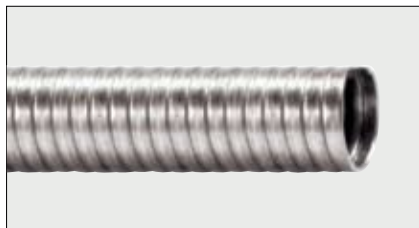


[CORE structure]

- Superior with a neat aspect in curvature radius, flexibility and uniform quality.
- Commonly suitable for indoor electric wirings in all sorts of cable protection and indoor wiring works for buildings and plants.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
KM	#10	1/4"	10.0	13.2	50	-	-	6
	#12	3/8"	12.3	15.6	50	-	-	7
	#16	1/2"	15.8	19.1	50	19	16	10
	#22	3/4"	20.8	24.2	50	25	22	12
	#28	1"	26.4	31.1	30	31	28	10
	#36	1-1/4"	35.0	39.7	30	39	36	16
	#42	1-1/2"	40.0	44.7	20	51	42	11
	#54	2"	51.3	56.0	20	63	54	14
	#70	2-1/2"	63.0	69.0	10	75	70	11
	#82	3"	78.0	85.4	10	-	82	13
	#104	4"	101.6	109.2	6	-	104	14

SI(Stainless Steel High tensility non-waterproof flexible metal conduit)

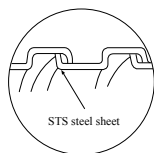
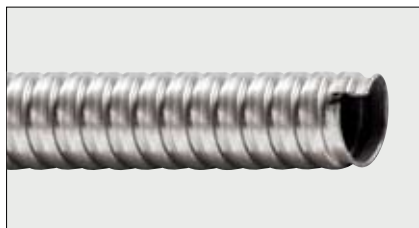


[CORE structure]

- Superior with a neat aspect in being corrosion-resistant, tensility, compression strength and uniform quality.
- Suitable for indoor works calling for corrosion-resistance and tensility.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
SI	#10	1/4"	10.0	13.2	50	-	-	6
	#12	3/8"	12.3	15.6	50	-	-	9
	#16	1/2"	15.8	19.1	50	19	16	10
	#22	3/4"	20.8	24.2	50	25	22	15
	#28	1"	26.4	31.1	30	31	28	11
	#36	1-1/4"	35.0	39.7	30	39	36	17
	#42	1-1/2"	40.0	44.7	20	51	42	13
	#54	2"	51.3	56.0	20	63	54	19
	#70	2-1/2"	63.0	69.0	10	75	70	15
	#82	3"	78.0	85.4	10	-	82	17
	#104	4"	101.6	109.2	6	-	104	14
	#130	5"	126.4	134.9	6	-	-	-

SM(Stainless Steel General non-waterproof flexible metal conduit)



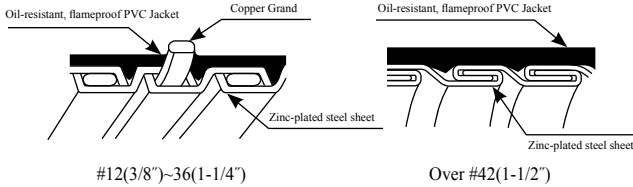
[CORE structure]

- Superior with a neat aspect in corrosion-resistance, curvature radius, flexibility and uniform quality.
- Suitable for common use in indoor wiring works calling for corrosion-resistance.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
SM	#10	1/4"	10.0	13.2	50	-	-	5
	#12	3/8"	12.3	15.6	50	-	-	6
	#16	1/2"	15.8	19.1	50	19	16	7
	#22	3/4"	20.8	24.2	50	25	22	10
	#28	1"	26.4	31.1	30	31	28	9
	#36	1-1/4"	35.0	39.7	30	39	36	12
	#42	1-1/2"	40.0	44.7	20	51	42	10
	#54	2"	51.3	56.0	20	63	54	12
	#70	2-1/2"	63.0	69.0	10	75	70	9
	#82	3"	78.0	85.4	10	-	82	10
	#104	4"	101.6	109.2	6	-	104	11

KUS(UL listed liquid tight flexible metal conduit)

UL File No. E201391



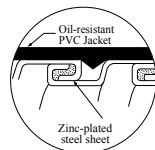
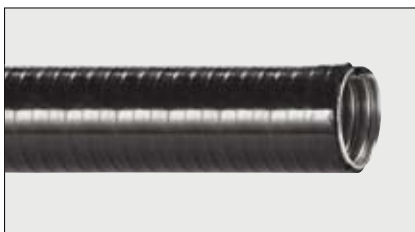
- #12 ~ #36 of KUS, UL listed, have a structure of minimizing the electric resistance of Sunflex tube and of grounding a short-circuit current by bending a zinc-plated steel sheet in the square lock shape and putting a copper wire inside the core.

- [Note] : #42(1-1/2\") ~ #104(4\") of KUS need separate grounding wires according to article 351 of NEC(National Electric Code of America)

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (M)	Min. Inn. Curv. Radius		Threads			Weight (Kg / Roll)
						Static status	Kinetic status	CTC	CTG	ANSI	
KUS	#12	3/8"	12.30	17.7	20	50	100	-	-	-	8
	#16	1/2"	15.80	21.1	20	80	160	19	16	1/2	9.8
	#22	3/4"	20.85	26.4	20	100	200	25	22	3/4	16
	#28	1"	26.45	33.2	20	140	280	31	28	1	20
	#36	1-1/4"	35.05	42.0	20	180	360	39	36	1-1/4	24
	#42	1-1/2"	40.00	47.7	20	180	360	51	42	1-1/2	27
	#54	2"	51.30	59.7	20	270	540	63	54	2	33
	#70	2-1/2"	63.00	72.5	10	350	700	75	70	2-1/2	25
	#82	3"	78.00	88.4	10	400	800	-	82	3	30
	#104	4"	101.60	113.8	6	500	1,000	-	104	4	27

● Proper temperature for use : -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

KPS(Flexible metal conduit for machine tools)



[CORE structure]

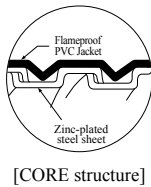
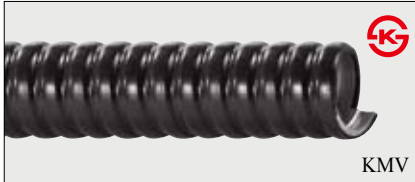
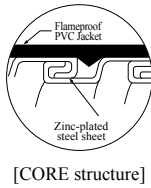
- Superior in flexibility with Polypropylene(P.P) string inserted structure and mitigating cracks at a minimum curvature limit point.
- Suitable for machine tool wirings with proper mechanical strength and excellent flexibility.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)
						CTC	CTG	
KPS	#16	1/2"	15.8	21.1	50	19	16	16
	#22	3/4"	20.8	26.4	50	25	22	19
	#28	1"	26.4	33.2	30	31	28	15
	#36	1-1/4"	35.0	42.0	30	39	36	23
	#42	1-1/2"	40.0	47.7	20	51	42	16
	#54	2"	51.3	59.7	20	63	54	20

● Proper temperature for use : -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

KIV, KMV (Flameproof flexible)

KS C 8422

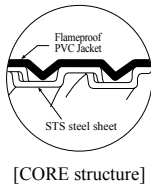
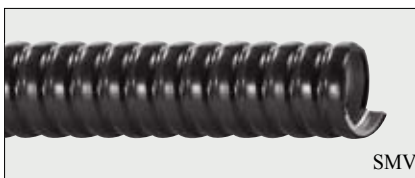
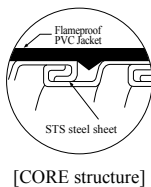
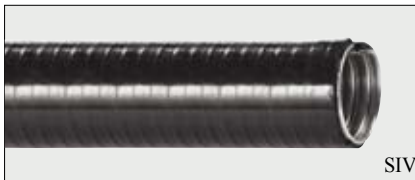


- SAMWHA FLEX “V” series which obstruct and retard the spread of a fire are low poisonous and pro-environmental products reducing the production of toxic gas.
- Suitable for electric wirings to prevent fires in subways, walled and crowded areas.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	KIV	KMV
KIV KMV	#10	1/4"	10.0	15.0	50	-	-	12	9.5
	#12	3/8"	12.3	17.7	50	-	-	17	10.5
	#16	1/2"	15.8	21.1	50	19	16	20	15
	#22	3/4"	20.8	26.4	50	25	22	25	18
	#28	1"	26.4	33.2	30	31	28	21	14
	#36	1-1/4"	35.0	42.0	30	39	36	29	22
	#42	1-1/2"	40.0	47.7	20	51	42	27	15
	#54	2"	51.3	59.7	20	63	54	33	19
	#70	2-1/2"	63.0	72.3	10	75	70	25	16.5
	#82	3"	78.0	88.7	10	-	82	30	18
	#104	4"	101.6	113.8	6	-	104	27	24

● Proper temperature for use : -15° ~ 90° ● Instant maximum temperature : -20° ~ 120°

SIV, SMV (Stainless Steel Flameproof flexible)



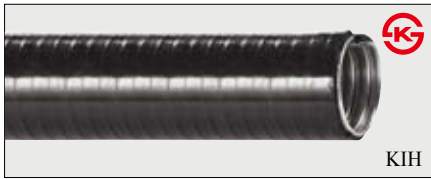
- SAMWHA FLEX “V” series which obstruct and retard the spread of a fire are low poisonous flameproof, corrosion-resistant and pro-environmental reducing the production of toxic gas.
- Suitable for electric wirings to prevent fires in subways, walled and crowded areas.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	SIV	SMV
SIV SMV	#10	1/4"	10.0	15.0	50	-	-	10	9
	#12	3/8"	12.3	17.7	50	-	-	16	10
	#16	1/2"	15.8	21.1	50	19	16	18	14
	#22	3/4"	20.8	26.4	50	25	22	23	16
	#28	1"	26.4	33.2	30	31	28	18	13
	#36	1-1/4"	35.0	42.0	30	39	36	27	20
	#42	1-1/2"	40.0	47.7	20	51	42	24	14
	#54	2"	51.3	59.7	20	63	54	32	18
	#70	2-1/2"	63.0	72.3	10	75	70	23	12
	#82	3"	78.0	88.7	10	-	82	28	15
	#104	4"	101.6	113.8	6	-	104	35	16

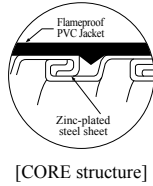
● Proper temperature for use : -15° ~ 90° ● Instant maximum temperature : -20° ~ 120°

KIH, KMH (Flameproof flexible)

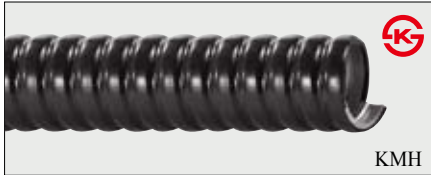
KS C 8422



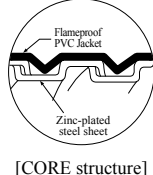
KIH



[CORE structure]



KMH



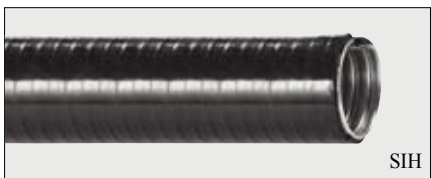
[CORE structure]

- Flameproof conduits not affected by high surrounding temperature.
- Suitable for electric wirings calling for mechanical strength such as tensility and curvature at the areas in high surrounding temperatures.

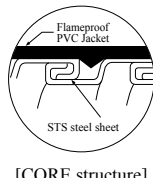
Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	KIH	KMH
KIH KMH	#10	1/4"	10.0	15.0	50	-	-	12	9.5
	#12	3/8"	12.3	17.7	50	-	-	17	10.5
	#16	1/2"	15.8	21.1	50	19	16	20	15
	#22	3/4"	20.8	26.4	50	25	22	25	18
	#28	1"	26.4	33.2	30	31	28	21	14
	#36	1-1/4"	35.0	42.0	30	39	36	29	22
	#42	1-1/2"	40.0	47.7	20	51	42	27	15
	#54	2"	51.3	59.7	20	63	54	33	19
	#70	2-1/2"	63.0	72.3	10	75	70	25	16.5
	#82	3"	78.0	88.7	10	-	82	30	18
	#104	4"	101.6	113.8	6	-	104	27	27

● Proper temperature for use : -15° ~ 105° ● Instant maximum temperature : -20° ~ 120°

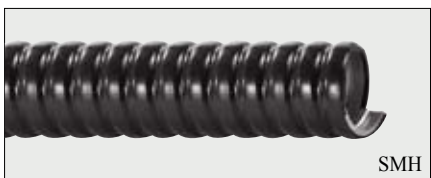
SIH, SMH(Stainless Steel Flameproof flexible)



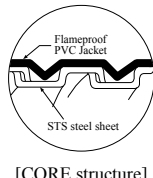
SIH



[CORE structure]



SMH



[CORE structure]

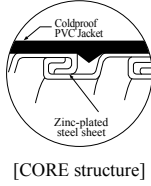
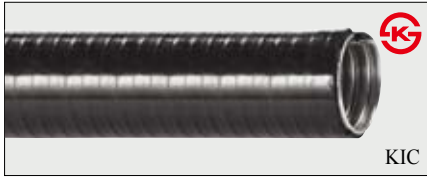
- Flameproof corrosion-resistant conduit not transformed at high surrounding temperatures.
- Suitable for tubing calling for corrosion-resistance at high surrounding temperatures.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	SIH	SMH
SIH SMH	#10	1/4"	10.0	15.0	50	-	-	10	9
	#12	3/8"	12.3	17.7	50	-	-	16	10
	#16	1/2"	15.8	21.1	50	19	16	18	14
	#22	3/4"	20.8	26.4	50	25	22	23	16
	#28	1"	26.4	33.2	30	31	28	18	13
	#36	1-1/4"	35.0	42.0	30	39	36	27	20
	#42	1-1/2"	40.0	47.7	20	51	42	24	14
	#54	2"	51.3	59.7	20	63	54	32	18
	#70	2-1/2"	63.0	72.3	10	75	70	23	12
	#82	3"	78.0	88.7	10	-	82	28	15
	#104	4"	101.6	113.8	6	-	104	25	16

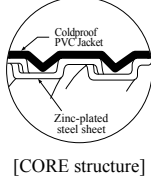
● Proper temperature for use : -15° ~ 105° ● Instant maximum temperature : -20° ~ 120°

KIC, KMC (Coldproof flexible)

KS C 8422



■ Coldproof conduits not transformed at a low surrounding temperature.

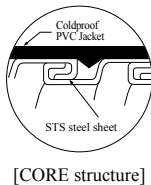
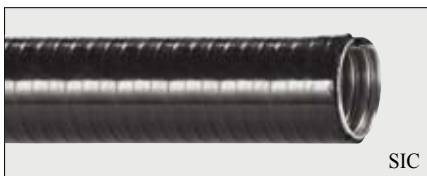


■ Suitable for electric wirings calling for mechanical strength such as tensility and curvature at the areas in a low surrounding temperature.

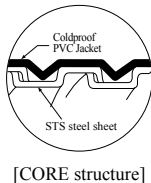
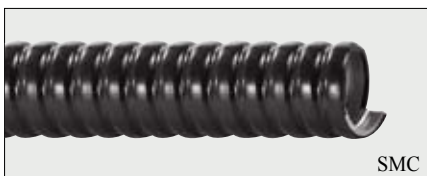
Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	KIC	KMC
KIC KMC	#10	1/4"	10.0	15.0	50	-	-	12	9.5
	#12	3/8"	12.3	17.7	50	-	-	17	10.5
	#16	1/2"	15.8	21.1	50	19	16	20	15
	#22	3/4"	20.8	26.4	50	25	22	25	18
	#28	1"	26.4	33.2	30	31	28	21	14
	#36	1-1/4"	35.0	42.0	30	39	36	29	22
	#42	1-1/2"	40.0	47.7	20	51	42	27	15
	#54	2"	51.3	59.7	20	63	54	33	19
	#70	2-1/2"	63.0	72.3	10	75	70	25	16.5
	#82	3"	78.0	88.7	10	-	82	30	18
	#104	4"	101.6	113.8	6	-	104	27	27

● Proper temperature for use : -40° ~ 60° ● Instant maximum temperature : -45° ~ 120°

SIC, SMC(Stainless Steel Coldproof flexible)



■ Coldproof corrosion-resistant conduits not transformed at low surrounding temperatures.



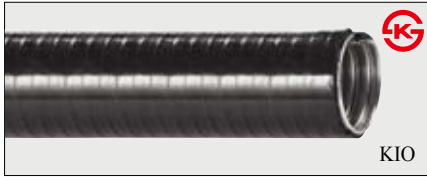
■ Suitable for tubing calling for corrosion-resistance at cold surrounding temperatures.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	SIC	SMC
SIC SMC	#10	1/4"	10.0	15.0	50	-	-	10	9
	#12	3/8"	12.3	17.7	50	-	-	16	10
	#16	1/2"	15.8	21.1	50	19	16	18	14
	#22	3/4"	20.8	26.4	50	25	22	23	16
	#28	1"	26.4	33.2	30	31	28	18	13
	#36	1-1/4"	35.0	42.0	30	39	36	27	20
	#42	1-1/2"	40.0	47.7	20	51	42	24	14
	#54	2"	51.3	59.7	20	63	54	32	18
	#70	2-1/2"	63.0	72.3	10	75	70	23	12
	#82	3"	78.0	88.7	10	-	82	28	15
	#104	4"	101.6	113.8	6	-	104	25	16

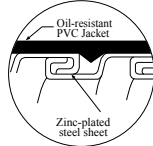
● Proper temperature for use : -40° ~ 60° ● Instant maximum temperature : -45° ~ 120°

KIO, KMO (Oil-resistant flexible)

KS C 8422



KIO



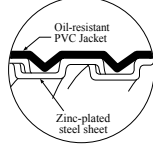
[CORE structure]

■ Oil-resistant conduits not transformed in oily environment.

■ Suitable for electric wirings in oily areas calling for mechanical strength such as tensility and curvature.



KMO

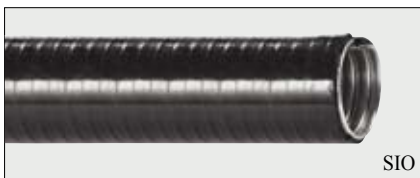


[CORE structure]

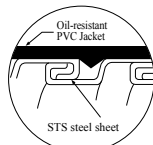
Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	KIO	KMO
KIO KMO	#10	1/4"	10.0	15.0	50	-	-	12	9.5
	#12	3/8"	12.3	17.7	50	-	-	17	10.5
	#16	1/2"	15.8	21.1	50	19	16	20	15
	#22	3/4"	20.8	26.4	50	25	22	25	18
	#28	1"	26.4	33.2	30	31	28	21	14
	#36	1-1/4"	35.0	42.0	30	39	36	29	22
	#42	1-1/2"	40.0	47.7	20	51	42	27	15
	#54	2"	51.3	59.7	20	63	54	33	19
	#70	2-1/2"	63.0	72.3	10	75	70	25	16.5
	#82	3"	78.0	88.7	10	-	82	30	18
	#104	4"	101.6	113.8	6	-	104	27	27

● Proper temperature for use : -15° ~ 60° ● Instant maximum temperature : -20° ~ 120°

SIO, SMO(Stainless Steel Oil resistant flexible)



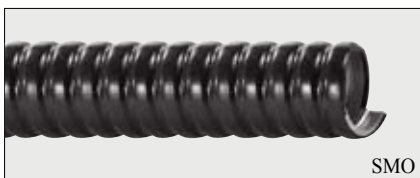
SIO



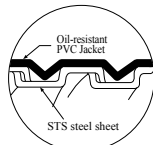
[CORE structure]

■ Corrosion-resistant oilproof conduits not transformed in oily environment.

■ Suitable for electric wirings in oily environment calling for corrosion-resistance.



SMO

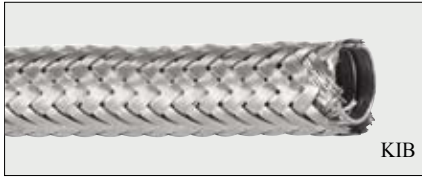


[CORE structure]

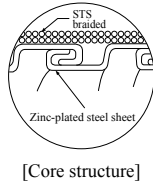
Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	SIO	SMO
SIO SMO	#10	1/4"	10.0	15.0	50	-	-	10	9
	#12	3/8"	12.3	17.7	50	-	-	16	10
	#16	1/2"	15.8	21.1	50	19	16	18	14
	#22	3/4"	20.8	26.4	50	25	22	23	16
	#28	1"	26.4	33.2	30	31	28	18	13
	#36	1-1/4"	35.0	42.0	30	39	36	27	20
	#42	1-1/2"	40.0	47.7	20	51	42	24	14
	#54	2"	51.3	59.7	20	63	54	32	18
	#70	2-1/2"	63.0	72.3	10	75	70	23	12
	#82	3"	78.0	88.7	10	-	82	28	15
	#104	4"	101.6	113.8	6	-	104	25	16

● Proper temperature for use : -15° ~ 60° ● Instant maximum temperature : -20° ~ 120°

KIB, KMB (Braided flexible)



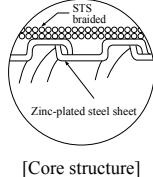
KIB



[Core structure]



KMB

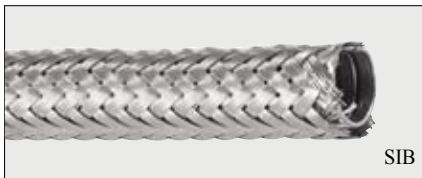


[Core structure]

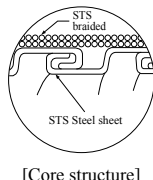
- Conduits protected by Braids on Samwha Flex with durability and flexibility.
- Suitable to electric wirings for protection of the electric wire used for complex bent parts such as vibratile and movable parts in all sorts of industrial equipments, plants, ships and automobiles.

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	KIB	KMB
KIB KMB	#12	3/8"	12.3	16.9	50	-	-	17	15
	#16	1/2"	15.8	20.4	50	19	16	19	17
	#22	3/4"	20.8	25.4	50	25	22	25	22
	#28	1"	26.4	32.3	30	31	28	23	21
	#36	1-1/4"	35.0	41.0	30	39	36	30	27
	#42	1-1/2"	40.0	45.9	20	51	42	24	20
	#54	2"	51.3	57.2	20	63	54	29	25

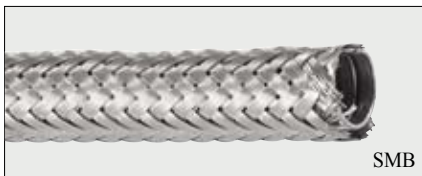
SIB, SMB(Stainless Steel Braided flexible)



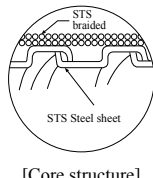
SIB



[Core structure]



SMB



[Core structure]

- Conduits protected by STS Braids on SI, SM Samwha Flex with superiority in corrosion-resistance, durability and flexibility.
- Suitable to tubing for protection of the electric wires used around the complex bent parts such as vibratile and movable parts in all sorts of industrial equipments, plants, ships and automobiles calling for corrosion-resistance..

Size		Dimensions	Min. Inner Dia.	Outer Dia.	Roll Length (m)	Threads		Weight (Kg / Roll)	
						CTC	CTG	SIB	SMB
SIB SMB	#12	3/8"	12.3	16.9	50	-	-	16	14
	#16	1/2"	15.8	20.4	50	19	16	17	16
	#22	3/4"	20.8	25.4	50	25	22	24	21
	#28	1"	26.4	32.3	30	31	28	21	20
	#36	1-1/4"	35.0	41.0	30	39	36	28	26
	#42	1-1/2"	40.0	45.9	20	51	42	22	19
	#54	2"	51.3	57.2	20	63	54	28	24

SAMWHA FLEX Accessories



File No. E201392



KSC 8459

- Commonly used with all types of Samwha Sunflex Conduits and suitable to general electric tubing especially to machine tools providing solidity in connection with Samwha Flex Conduits .
- The material of standard products is Zinc, but other materials such as brass and stainless steel are available.

Connector(Waterproof) - KFBG

KSC 8459



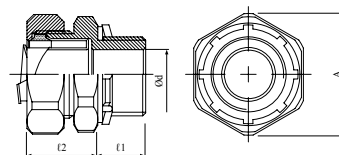
KS Type KFBG(Zn)



KS Type KFBG(B)



UL Type KFBT



Size		KFBG	KFBC	KFBT	Dimensions	KS Type Dimension				Weight (g / EA)
		Male Thread	Male Thread	Male Thread		l1	l2	Ød	A	
KFBG KFBC KFBT	#10	CTG 16	CTC 19	-	1/4"	14	21	14.3	29	44
	#12	CTG 16	CTC 19	NPT 1/2	3/8"	14	23	14.3	32	56
	#16	CTG 16	CTC 19	NPT 1/2	1/2"	14	25	14.3	36	72
	#22	CTG 22	CTC 25	NPT 3/4	3/4"	14	27	19.0	41	104
	#28	CTG 28	CTC 31	NPT 1	1"	16	32	25.0	48	160
	#36	CTG 36	CTC 39	NPT 1-1/4	1-1/4"	16	36	33.5	59	246
	#42	CTG 42	CTC 51	NPT 1-1/2	1-1/2"	18	41	39.0	68	350
	#54	CTG 54	CTC 63	NPT 2	2"	20	44	50.0	81	518
	#70	CTG 70	CTC 75	NPT 2-1/2	2-1/2"	24	49	64.5	102	834
	#82	CTG 82	-	NPT 3	3"	26	52	76.5	121	1256
	#104	CTG 104	-	NPT 4	4"	30	69	98.5	153	2150
	#130	PF 130	-	NPT 5	5"	35	71	124.0	177	-

Combination Coupling(Waterproof) - KFUG

KSC 8459



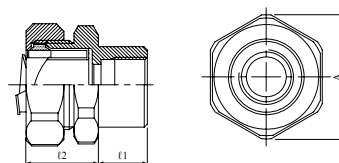
KS Type KFUG(Zn)



KS Type KFUG(B)



UL Type KFUT



Size		KFUG	KFUC	KFUT	Dimensions	KS Type Dimensions			Weight (g / EA)
		Female Thread	Female Thread	Female Thread		l1	l2	A	
KFUG KFUC KFUT	#10	CTG 16	CTC 19	-	1/4"	14	21	29	60
	#12	CTG 16	CTC 19	NPT 1/2	3/8"	14	23	32	62
	#16	CTG 16	CTC 19	NPT 1/2	1/2"	19	25	36	72
	#22	CTG 22	CTC 25	NPT 3/4	3/4"	22	27	41	102
	#28	CTG 28	CTC 31	NPT 1	1"	25	32	48	148
	#36	CTG 36	CTC 39	NPT 1-1/4	1-1/4"	28	36	59	226
	#42	CTG 42	CTC 51	NPT 1-1/2	1-1/2"	28	41	68	322
	#54	CTG 54	CTC 63	NPT 2	2"	32	44	81	470
	#70	CTG 70	CTC 75	NPT 2-1/2	2-1/2"	24	49	102	784
	#82	CTG 82	-	NPT 3	3"	29	52	121	1212
	#104	CTG 104	-	NPT 4	4"	32	69	153	1856

90 Connector(Waterproof) - KF90°AG

KSC 8459



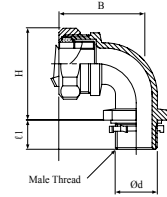
KS Type KF 90° AG (Zn)



KS Type KF 90° AG (B)



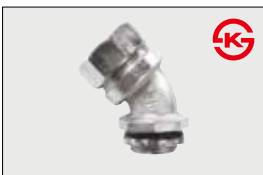
UL Type KF 90° AT



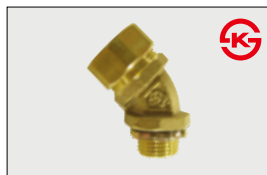
Size		KF90° AG	KF90° AT	Dimensions	KS Type Dimensions				Weight (g / EA)
		Male Thread	Male Thread		ℓ1	Ød	B	H	
KF90° AG	#10	CTG 16	-	1/4"	14	14.5	35	31	80
	#12	CTG 16	NPT 1/2	3/8"	14	14.5	38	35	90
	#16	CTG 16	NPT 1/2	1/2"	14	14.5	42	39	108
	#22	CTG 22	NPT 3/4	3/4"	14	19.0	48	45	156
	#28	CTG 28	NPT 1	1"	16	24.0	56	53	260
	#36	CTG 36	NPT 1-1/4	1-1/4"	16	32.0	65	64	464
	#42	CTG 42	NPT 1-1/2	1-1/2"	18	38.0	75	73	630
	#54	CTG 54	NPT 2	2"	20	50.0	86	88	1042
KF90° AT	#70	CTG 70	NPT 2-1/2	2-1/2"	23	65.0	132	113	1670
	#82	CTG 82	NPT 3	3"	26	77.0	146	130	2461
	#104	CTG 104	NPT 4	4"	30	101.0	171	162	4140

45 Connector(Waterproof) - KF45°AG

KSC 8459



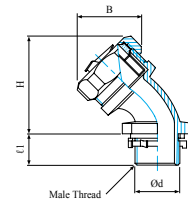
KS Type KF 45° AG (Zn)



KS Type KF 45° AG (B)



UL Type KF 45° AT



Size		KF45° AG	KF45° AT	Dimensions	KS Type Dimensions				Weight (g / EA)
		Male Thread	Male Thread		ℓ1	Ød	B	H	
KF45° AG	#10	CTG 16	-	1/4"	14	14.5	29	40	80
	#12	CTG 16	NPT 1/2	3/8"	14	14.5	32	44	100
	#16	CTG 16	NPT 1/2	1/2"	14	14.5	35	48	112
	#22	CTG 22	NPT 3/4	3/4"	14	19.0	40	54	166
	#28	CTG 28	NPT 1	1"	16	24.0	47	64	286
	#36	CTG 36	NPT 1-1/4	1-1/4"	16	32.0	54	73	248
	#42	CTG 42	NPT 1-1/2	1-1/2"	18	38.0	61	83	510
	#54	CTG 54	NPT 2	2"	20	50.0	70	95	788
KF45° AT	#70	CTG 70	NPT 2-1/2	2-1/2"	23	65.0	106	131	1622
	#82	CTG 82	NPT 3	3"	26	77.0	118	147	2260
	#104	CTG 104	NPT 4	4"	30	101.0	139	176	4344

Non-Liquid Tight Straight Connector(Non-waterproof) - KFNG

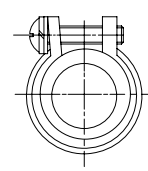
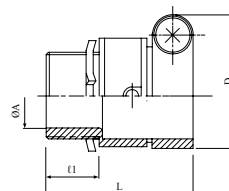
KSC 8459



#10~#22



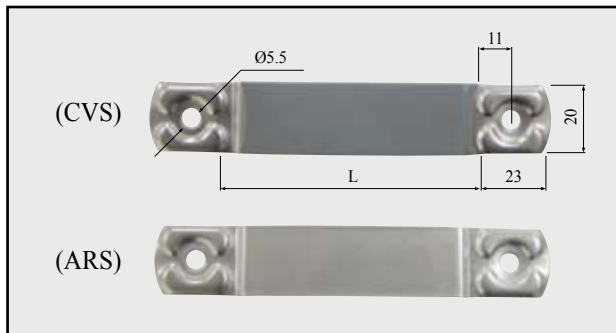
#28~#54



CTG			Dimensions	L	ℓ1	D	ØA	Weight (g / EA)
Size		Male Thread						
KFNG	#10	CTG 16	1/4"	26	12	25	9.4	30
	#12	CTG 16	3/8"	26	12	25	11.5	20
	#16	CTG 16	1/2"	38	12	32	14.8	40
	#22	CTG 22	3/4"	39	12	38	19.7	60
	#28	CTG 28	1"	48	16	54	25.0	110
	#36	CTG 36	1-1/4"	50	16	66	33.0	150
	#42	CTG 42	1-1/2"	59	17	73	39.0	210
	#54	CTG 54	2"	60	18	85	50.0	280

Stainless Multi-purpose Saddle

- Universal stainless steel saddles which can support Samwha Flex by bundling 1~3 of them.
- Universal saddles include ARS-standard type and CVS type which protects Samwha Flex by special vinyl coating on L part of ARS to prevent them from damages.
- Use 2 layers of saddles where strength is required.
- Various types of saddles depending on length are available for all kinds of cables and wires



Installing method					
Type of installation	One support	One side support	Hanging support	Two supports	3 supports
Calculation formula for L	$\frac{\pi D}{2} + D$	$\frac{3\pi D}{4} + D$	πD	$\frac{\pi D}{2} + 2D$	$\frac{\pi D}{2} + 3D$

- (Note) 1. In relation between the nominal size on the universal saddle selection table and the saddle length, for example, in case the tube with outer diameter of nominal size #15 has one support, the length of the saddle becomes 38 according to the formula. Therefore, if the tube with outer diameter #23 has one support, the nominal size of the saddle becomes 23 regardless of the selection list.
2. In case of a method other than one support mounting method, after getting the saddle length L by the L calculation formula find the approximation of the saddle length L on the selection table and select the nominal size.

For example, in case L is 87 by the calculation formula, the nominal size becomes 34 because the approximation of 87 is 86 on the universal selection table.

Lock Nut



Ferrule

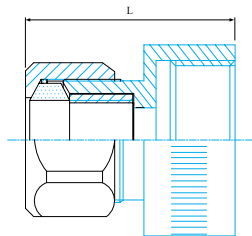


Universal Saddle Selection Table

Nominal Size	saddle Length L(mm)	SAMWHA FLEX in common				
		One support	One side support	Hanging support	Two supports	3 supports
#(15)	(38)	#10				
#17	44	#12				
#19	49		#10	#10		
#21	54	#16		#12	#10	
#23	59		#12			
#25	64			#16	#12	
#27	69	#22	#16			#10
#29	74				#16	
#31	80					#12
#32	82			#22		
#34	86	#28	#22			
#36	93				#22	#16
#40	103			#28		
#42	108	#36				
#44	113		#28			
#47	121				#28	#22
#48	123	#42				
#51	131			#36		
#56	144		#36			
#58	149			#42	#36	
#60	154	#54				#28
#62	159		#42			
#63	162				#42	
#71	183	#70		#54		
#75	193					#36
#76	195		#54			
#83	213				#54	
#85	218					#42
#88	226	#82		#70		
#91	234					
#100	257	#92			#70	
#105	270			#82		#54
#139	357	#130		#104	#92	

MS Connector MAS-MS/MS Connector

- MS connectors can connect flexibles with cannon plugs and simplify wires of connecting circuits.
- Applications : Servomotors, machine tools, communication and military equipments and aerial navigation.

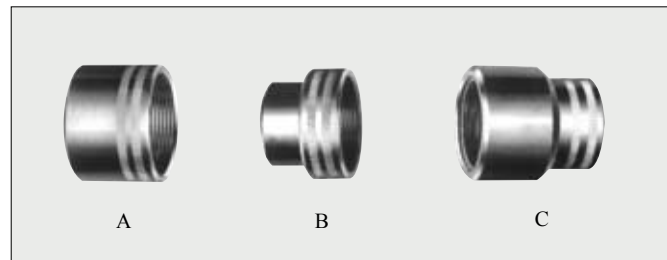
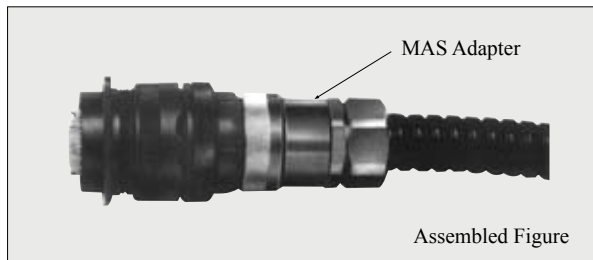


Assembled Figure

Nominal Size				V.M.S Connecting Thread	Interlocked Thread Length (mm)	L (mm)
Size	MS Size	Flexible Size				
SH-MS	10S-12	10S	12	1/2. 28 UNEF	10.0	34
	12-12	12	12	5/8. 24 UNEF	10.0	34
	14-12	14	12	3/4. 20 UNEF	10.0	34
	14-16	14	16	3/4. 20 UNEF	10.0	35
	16-16	16	16	7/8. 20 UNEF	10.0	35
	16-22	16	22	7/8. 20 UNEF	10.0	35
	18-12	18	12	1. 20 UNEF	10.0	34
	18-16	18	16	1. 20 UNEF	10.0	35
	20.22-12	20.22	12	1-3/16. 18 UNEF	10.0	34
	20.22-16	20.22	16	1-3/16. 18 UNEF	10.0	35
	20.22-22	20.22	22	1-3/16. 18 UNEF	10.0	35
	20.22-28	20.22	28	1-3/16. 18 UNEF	10.0	43
	24.28-22	24.28	22	1-7/16. 18 UNEF	10.0	43
	24.28-28	24.28	28	1-7/16. 18 UNEF	10.0	35
	24.28-36	24.28	36	1-7/16. 18 UNEF	10.0	46
	32-22	32	22	1-3/4. 18 UNS	11.5	42
	32-28	32	28	1-3/4. 18 UNS	11.5	43
	32-36	32	36	1-3/4. 18 UNS	11.5	46
	32-42	32	42	1-3/4. 18 UNS	11.5	51
	36-22	36	22	2. 18 UN	13.0	42
	36-28	36	28	2. 18 UN	13.0	43
	36-36	36	36	2. 18 UN	13.0	46
	36-42	36	42	2. 18 UN	13.0	51
	40-28	40	28	2-1/4. 16 UN	13.0	43
	40-36	40	36	2-1/4. 16 UN	13.5	46
	40-42	40	42	2-1/4. 16 UN	13.5	51
	40-54	40	54	2-1/4. 16 UN	13.5	54
	44-54	44	54	2-1/2. 16 UN	14.5	54
	48-70	48	70	3. 16 UN	14.5	54

MAS-MS/MS Adapter & Plug

- MAS-MS/MS adapters can connect flexible connectors with cannon plugs (MS connectors) and the connecting space with MS connectors allows repairs easy.
- Brass and aluminum are available.
- Applications : Servomotors, machine tools, communication and military equipments and aerial navigation.

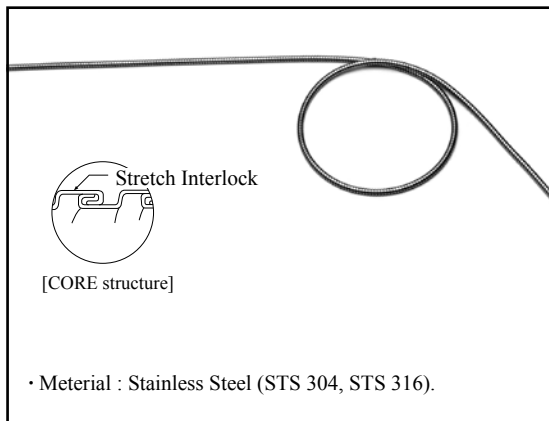
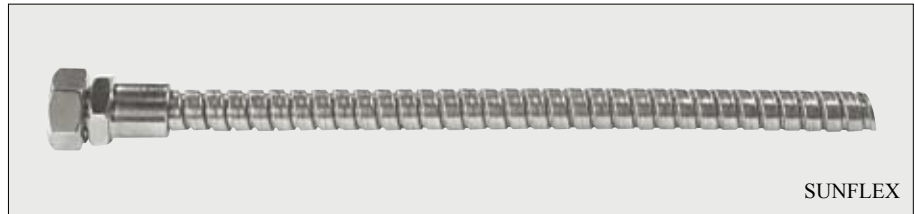


Nominal Size		Connector Thread Size		Cannonplug Joint Thread		D	A	B Thread Length Le	V Thread Length Le	L3	L4	L	Form
Conn-ector	MS Size	CTG	Inch	MS Standard MS Size	V Thread Standard			L1	L2				
16	MS 10	16	1/2	8S.10S.10	1/2.28 UNEF	19	26	15	10	17	8	25	C
16	MS 12	16	1/2	10SL.12	5/8.24 UNEF	20	26	15	10	17	8	25	C
16	MS 14	16	1/2	14S.14	3/4.20 UNEF	26	26	15	10			25	A
16	MS 16	16	1/2	16S.16	7/8.20 UNEF	26	26	15	10			25	A
16	MS 18	16	1/2	18	1.20 UNEF	30	30	15	10			25	A
16	MS 20/22	16	1/2	20.22	3/16.18 UNEF	34	26	15	10	13	12	25	B
16	MS 24/28	16	1/2	24.28	7/16.18 UNEF	42	26	18	10	15	13	28	B
16	MS 32	16	1/2	32	1-3/4.18 UNEF	50	34	13	10	18	17	35	B
22	MS 18	22	3/4	18	1.20 UNEF	30	30	15	10			25	A
22	MS 20/22	22	3/4	20.22	1-3/6.18 UNEF	34	34	15	10			25	A
22	MS 24/28	22	3/4	24.28	1-7/6.18 UNEF	42	32	17	13	15	15	30	B
22	MS 32	22	3/4	32	1-3/4.18 UNEF	50	34	17	10	18	17	35	B
28	MS 20/22	28	1	20.22	1-3/6.18 UNEF	38	38	17	13			30	A
28	MS 24/28	28	1	24.28	1-7/16.18 UNEF	42	42	17	13			30	A
28	MS 32	28	1	32	1-3/4.18 UNS	50	40	20	10	15	15	30	B
36	MS 24/28	36	1-1/4	24.28	1-7/16.18 UNEF	50	50	20	10			30	A
36	MS 32	36	1-1/4	32	1-3/4.18 UNS	50	50	20	10			30	A
36	MS 36	36	1-1/4	36	2.18 UNS	57	48	20	10	15	15	30	B
42	MS 32	42	1-1/2	32	1-3/4.18 UNEF	57	57	20	10			30	A
42	MS 36	42	1-1/2	36	2.18 UNS	57	57	20	10			30	A
42	MS 40	54	2	40	2-1/4.16 UN	65	65	22	13			35	A

STRETCHY TYPE

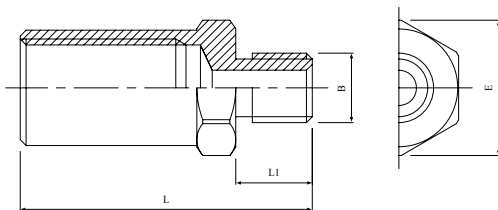
SUNFLEX (Optical Fiber and Flexibles for Communication)

- Superior with a neat aspect in tensility, compression strength, corrosion-resistance, light weight and flexibility
- Suitable for protecting optical fiber and lead wires for communication



Nominal size		Inner Diameter	Outer Diameter	Length of Roll (M)
SM	#3	3.3	4.8	200
	#4	4.0	5.8	200
SI	#5.5	5.5	7.5	100
	#8	8.0	10.5	100
	#10	10.0	12.8	50
	#12	12.0	15.3	50
	#14	14.0	16.7	50
	#16	16.0	19.0	50

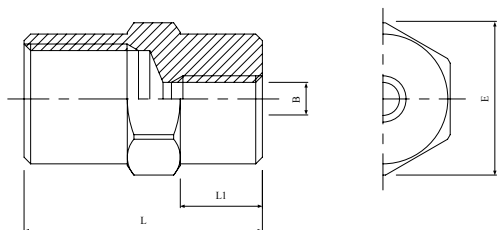
BOX CONNECTOR(For SI-TUBE) - SIBG



Material : STS, Brass, steel

Size		Dimensions			
		B	E	L	L1
SIBG	#5.5	M8×1.0P	12	20	7
	#8	M12×1.25P	16	22	8
	#10	M14×1.25P	18	24	8
	#12	M16×1.5P	20	27	9
	#14	M18×2.5P	22	33	12
	#16	M22×2.5P	27	37	14

UNION COUPLING(For SI - TUBE) - SIUG



Material : STS, Brass, steel

Size		Dimensions			
		B	E	L	L1
SIUG	#5.5	M8×1.0P	12	22	8
	#8	M12×1.25P	16	23	9
	#10	M14×1.25P	18	26	10
	#12	M16×1.5P	20	29	11
	#14	M18×2.5P	22	35	14
	#16	M22×2.5P	27	39	16



Section B



SAMWHA PLICA

SAMWHA PLICA Features

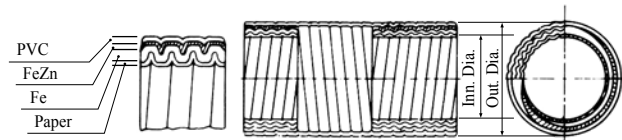
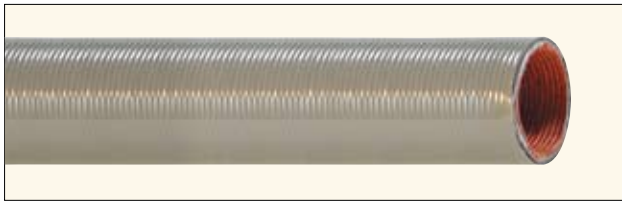
SAMWHA leads the advanced technology with constant efforts and challenges

1. Samwha plica tubes have superiority in tensility, compression strength, flexibility, current resistance, being liquid tight and corrosion resistance.
2. There is neither length limit nor threads needed.
3. They are easy to carry and bend with a bare hand freely.
4. They are composed of special zinc plated fiber and superior in corrosion resistance, and being liquid tight and earthquake-proof.
5. No tools needed for installation and easy to cut and process them.

SAMWHA PLICA INDEX (Class 2 flexible metal conduits and accessories)

	PV (Samwha plica, waterproof) 25		WUG (Waterproof accessories) Union coupling 27
	PVH (Heat-resistant Samwha plica, waterproof) 25		WAG (Waterproof accessories) Angle box connector 27
	PE (Cold-resistant Samwha plica, waterproof) 25		BG (Non-waterproof accessories) Box connector 28
	PZ (Samwha plica, non-waterproof) 26		KG (Non-waterproof) Combination coupling 28
	PS (Samwha plica, non-waterproof) Stainless steel ... 26		BP (End treatment accessories) Plica bushing 28
	PVS (Samwha plica, waterproof) Stainless steel ... 26		WBG (Waterproof accessories) Union box connector 27
			Plica knife 28

PV (Waterproof Samwha plica)

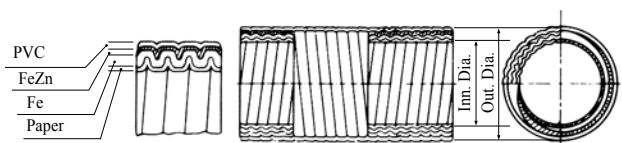


Samwha plica PV is coated on PZ by a special close adherent method with the PVC which has superiority in being water and weather proof, corrosion-resistance and chemicals-resistance in addition to the original features of Samwha plica PZ. It is broadly used especially for outdoor exposed electric tubings, constructional machinery and ships in electric wirings

Size		Min. Inn. Dia.	Out. Dia.	Roll Length (m)	Thread			Weight (Kg / Roll)
					CTC	CTG	Soft vinyl	
PV	#10	9.2	14.9	50	-	-	-	13
	#12	11.4	17.7	50	-	-	-	18
	#15	14.1	20.6	50	-	-	VE - 14	22
	#17	16.6	23.1	50	19	16(1/2")	VE - 16	29
	#24	23.8	30.4	50	25	22(3/4")	VE - 22	38
	#30	29.3	36.5	25	31	28(1")	VE - 28	25
	#38	37.1	44.9	25	39	36(1-1/4")	VE - 36	30
	#50	49.1	56.9	20	51	42(1-1/2")	VE - 42	31
	#63	62.6	71.5	10	63	54(2")	VE - 54	22
	#76	76.0	85.3	10	75	70(2-1/2")	VE - 70	28
	#83	81.0	90.9	10	-	82(3")	VE - 82	29
	#101	100.2	110.1	6	-	104(4")	-	24

● Proper temperature for use : -30° ~ 60° ● Instant maximum temperature : -35° ~ 120°

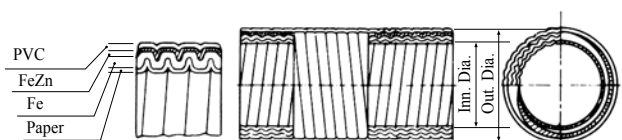
PVH (Heat-resistant Samwha plica)



PUH is coated on PZ with PVC which has superiority in flexibility at high temperature like PV. It is suitable for electric wirings at fields with high surrounding temperature.

● Proper temperature for use : -15° ~ 105°
● Instant maximum temperature : -20° ~ 120°

PE (Coldproof Samwha plica)



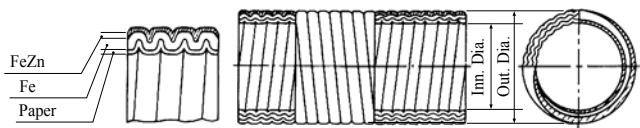
PE is coated on PZ with PVC which has superiority in flexibility at low temperature like PV. It is suitable for electric wirings at fields with low surrounding temperature.

● Proper temperature for use : -40° ~ 60°
● Instant maximum temperature : -45° ~ 120°

PZ(Non-waterproof)



Samwha plica PZ is class 2 flexible metal conduit with outer layer made of zinc-plated steel sheet and with inner part of insulating paper calling for safety, workability, external neat aspect in wirings of electrical appliances.

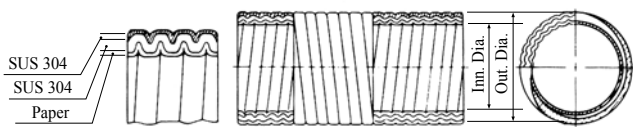


Nominal Size		Min. Inn. Dia.	Out. Dia.	Roll Length (m)	Thread			Weight (Kg / Roll)
					CTC	CTG	Soft Vinyl	
PZ	#10	9.2	13.3	50	-	-	-	10
	#12	11.4	16.1	50	-	-	-	14
	#15	14.1	19.0	50	-	-	VE - 14	16
	#17	16.6	21.5	50	19	16(1/2")	VE - 16	22
	#24	23.8	28.8	50	25	22(3/4")	VE - 22	33
	#30	29.3	34.9	25	31	28(1")	VE - 28	19
	#38	37.1	42.9	25	39	36(1-1/4")	VE - 36	25
	#50	49.1	54.9	20	51	42(1-1/2")	VE - 42	24
	#63	62.6	69.1	10	63	54(2")	VE - 54	17
	#76	76.0	82.9	10	75	70(2-1/2")	VE - 70	20
	#83	81.0	88.1	10	-	82(3")	VE - 82	22
	#101	100.2	107.3	6	-	104(4")	-	16

PS (Stainless Steel Samwha plica)



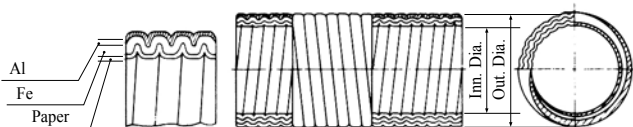
STS, which is made of stainless steel in the external and middle layers, has superiority in corrosion-resistance and is suitable for ships and electric wirings at fields producing acid and alkali.



PVS (Stainless Steel Waterproof Samwha plica)



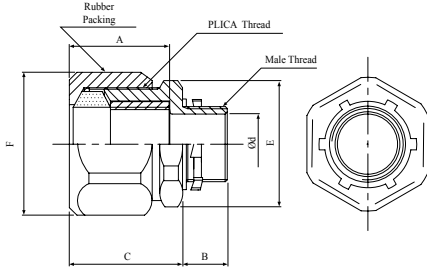
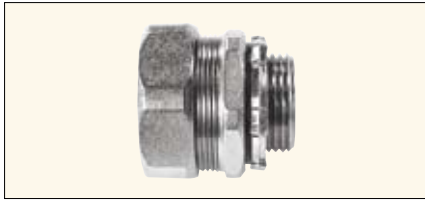
PVS is coated on PS(stainless steel non-waterproof Samwha plica) by a special close adherent method with the PVC which has superiority in being weather proof and added with special features such as corrosion-resistance and chemicals-resistance in addition to the original features of Samwha plica PS. It is used for ships in electric wirings as well as at fields producing acid and alkali.



Accessories (Waterproof)

UNION BOX CONNECTOR(Waterproof) - WBG

(Unit : mm)

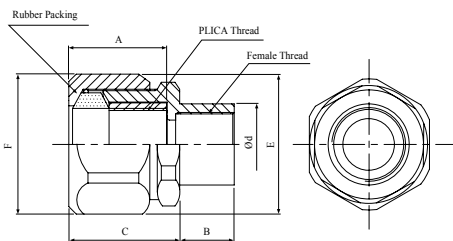


Material : Zn, Brass, STS

Size		Compatible Plica Tube		A	B	C	Ød	E	F	Conduit Thread	Weight (g / EA)
											Male Thread
WBG	#10	PV	#10	24	12	26	14.5	29	33	CTG 16(1/2")	80
	#12		#12	24	12	26	14.5	29	33	CTG 16(1/2")	70
	#15		#15	24	12	27	14.5	35	38	CTG 16(1/2")	100
	#17		#17	23	12	27	14.5	35	38	CTG 16(1/2")	90
	#24		#24	26	12	31	20.0	42	47	CTG 22(3/4")	130
	#30		#30	29	16	33	27.0	50	53	CTG 28(1")	190
	#38		#38	33	16	34	34.0	61	64	CTG 36(1-1/4")	300
	#50		#50	34	18	37	40.0	73	78	CTG 42(1-1/2")	410
	#63		#63	40	18	39	52.0	89	97	CTG 54(2")	690
	#76		#76	44	18	47	66.0	106	113	CTG 70(2-1/2")	1070
	#83		#83	44	20	52	78.0	114	122	CTG 82(3")	1320
	#101		#101	56	23	55	101.0	133	141	CTG 104(4")	1710

UNION COUPLING (Waterproof) - WUG

(Unit : mm)

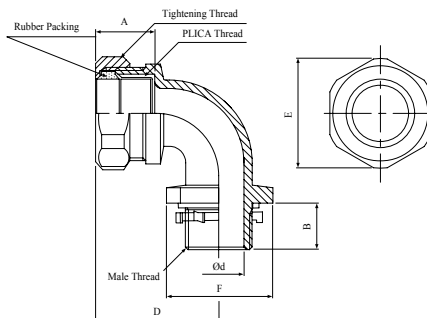


Material : Zn, Brass, STS

Size		Compatible Plica Tube		A	B	C	Ød	E	F	Conduit Thread	Weight (g / EA)
											Female Thread
WUG	#10	PV	#10	24	17	26	26.0	29	33	CTG 16(1/2")	80
	#12		#12	24	17	26	26.0	29	33	CTG 16(1/2")	80
	#15		#15	24	17	27	26.0	35	38	CTG 16(1/2")	80
	#17		#17	23	17	27	26.0	35	38	CTG 16(1/2")	100
	#24		#24	26	19	31	31.0	42	47	CTG 22(3/4")	130
	#30		#30	29	23	33	38.0	50	53	CTG 28(1")	190
	#38		#38	33	28	34	47.0	61	64	CTG 36(1-1/4")	320
	#50		#50	34	28	37	53.0	73	78	CTG 42(1-1/2")	410
	#63		#63	40	32	39	66.0	89	97	CTG 54(2")	740
	#76		#76	44	36	47	82.5	106	113	CTG 70(2-1/2")	1110
	#83		#83	44	39	52	95.0	114	122	CTG 82(3")	1340
	#101		#101	56	45	55	124.0	133	141	CTG 104(4")	2090

ANGLE BOX CONNECTOR(Waterproof) - WAG

(Unit : mm)

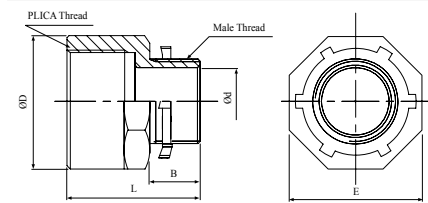
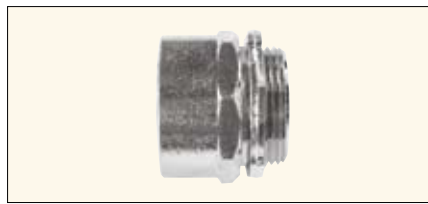


Material : Zn, Brass

Size		Compatible Plica Tube		A	B	D	E	Ød	F	Conduit Thread	Weight (g / EA)
											Male Thread
WAG	#10	PV	#10	24	14	51	33	14.5	32	16(1/2")	120
	#12		#12	24	14	51	33	14.5	32	16(1/2")	120
	#15		#15	24	14	51	38	14.5	32	16(1/2")	140
	#17		#17	23	14	51	38	14.5	32	16(1/2")	140
	#24		#24	25	14	59	47	20.0	39	22(3/4")	200
	#30		#30	29	16	69	53	27.0	47	28(1")	330
	#38		#38	33	16	83	64	34.0	60	36(1-1/4")	1020
	#50		#50	34	18	91	78	40.0	63	42(1-1/2")	1340
	#63		#63	40	18	108	97	52.0	82	54(2")	1120
	#76		#76	40	18	120	113	66.0	96	70(2-1/2")	1460
	#83		#83	42	20	130	121	78.0	109	82(3")	1760
	#101		#101	48	23	140	135	101.0	150	104(4")	2270

Accessories (Non-waterproof)

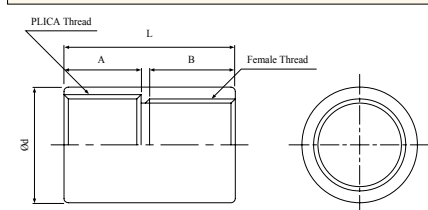
BOX CONNECTOR(Non-waterproof) - BG



Material : Zn

(Unit : mm)										
Size		Compatible Plica Tube		B	L	E	ØD	Ød	Conduit Thread	Weight (g / EA)
									Male Thread	
BG	#10	PZ	#10	12	30	26	18.0	13.0	CTG 16(1/2")	40
	#12		#12	12	30	26	21.0	14.0	CTG 16(1/2")	40
	#15		#15	12	30	26	24.0	14.5	CTG 16(1/2")	40
	#17		#17	12	32	29	26.5	14.5	CTG 16(1/2")	40
	#24		#24	12	35	36	34.0	20.0	CTG 22(3/4")	70
	#30		#30	16	39	43	40.0	27.0	CTG 28(1")	90
	#38		#38	16	42	54	50.0	34.0	CTG 36(1-1/4")	150
	#50		#50	18	47	66	61.0	39.0	CTG 42(1-1/2")	210
	#63		#63	18	55	82	76.5	51.0	CTG 54(2")	320
	#76		#76	18	57	96	90.0	66.5	CTG 70(2-1/2")	460
	#83		#83	20	59	102	96.0	76.0	CTG 82(3")	520
	#101		#101	23	67	126	117.0	101.0	CTG 104(4")	920

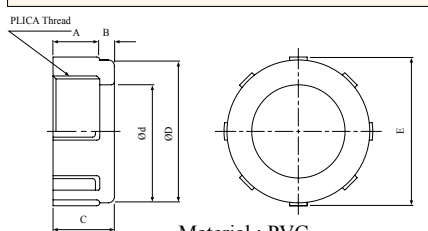
COMBINATION COUPLING - KG



Material : Zn

(Unit : mm)									
Size		Compatible Plica Tube		A	B	Ød	L	Conduit Thread	Weight
								Female Thread	(g / EA)
KG	#10	PZ	#10	15	19	26	37	CTG 16(1/2")	63
	#12		#12	15	19	26	37	CTG 16(1/2")	80
	#15		#15	15	19	26	37	CTG 16(1/2")	50
	#17		#17	17	20	26	40	CTG 16(1/2")	40
	#24		#24	18	22	33	44	CTG 22(3/4")	70
	#30		#30	20	25	40	49	CTG 28(1")	120
	#38		#38	23	28	50	56	CTG 36(1-1/4")	90
	#50		#50	23	28	62	56	CTG 42(1-1/2")	140
	#63		#63	28	37	76	70	CTG 54(2")	220
	#76		#76	30	38	90	73	CTG 70(2-1/2")	290
	#83		#83	33	40	95	78	CTG 82(3")	253
#101	#101	38	45	120	87	CTG 104(4")	491		

PLICA BUSHING - BP



Material : PVC

(Unit : mm)									
Size		Compatible Plica Tube		A	B	C	ØD	Ød	E
BP	#10	PZ	#10	11	3	14	17.5	9.4	20
	#12		#12	11	3	14	20.5	10.9	23
	#15		#15	11	3	14	23.5	13.6	26
	#17		#17	12	4	16	26.4	16.3	29
	#24		#24	13	4	17	33.7	23.3	36
	#30		#30	14	5	19	40.2	28.8	43
	#38		#38	16	5	21	48.7	37.1	52
	#50		#50	16	6	22	61.2	48.6	65
	#63		#63	18	6	24	75.2	61.2	79
	#76		#76	22	6	28	89.6	74.0	94
	#83		#83	24	7	31	98.3	82.0	102

PLICA KNIFE Features



- ① It takes only 1/5 of force in cutting a pipe comparing with a band saw
- ② Cut-off parts are neat and tidy so that trimming is unnecessary.
- ③ Easy to carry and trim the inner diameter with the handle after work.



Section C



SAMWHA GLAND

SAMWHA GLAND Features

SAMWHA is always ready to cope with any demands from its customers and market change promptly and positively.

1. Samwha Gland acquired CE mark in pursuit of stability of quality for the first time in Korea.
2. It has neat outer aspect and superior functions.
3. It meets customers' demands with a variety of functional items.

SAMWHA GLAND INDEX

ARMOURED CABLE GLAND		Explosionproof Type Packing Cable Glands	
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ARMOURED CABLE GLAND Baseefa03ATEX0412X [CE(ATEX) Explosionproof Certificate Acquired]

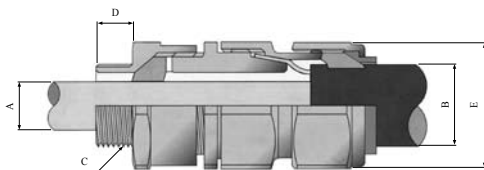
A mass production system was established a few years ago for the entire trade sizes and types of armoured cable glands for ships and the sea plants which had either been produced by some domestic firms on made to order base by small quantity or depended on imports.

The superiority of the quality for Samwha Cable Gland-E1FW was internationally recognized by acquisition of CE certificate issued by Baseefa-an ATEX Notified Body for EC Type Examination Certificate and Quality Assurance.

※ The material for standard type is brass and other diverse materials are available.

E1FW Industrial Gland - Outdoor Waterproof, Explosionproof Type

E1W Industrial Gland - Outdoor Waterproof

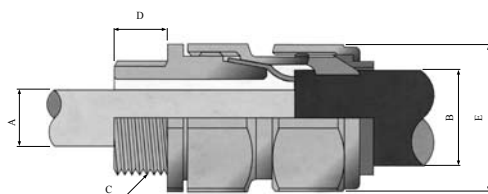
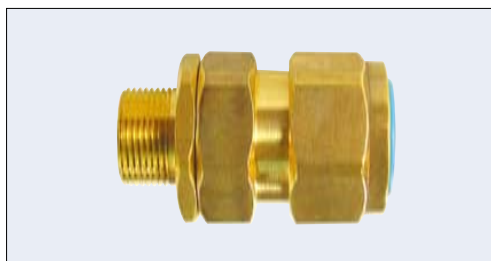


- SWA Armoured Cable Gland for Electric Wires
- Outdoor, Waterproof Earthquake-proof (IP66)
- 2 Parts (Outer Jacket, Inner Diameter) Dual Waterproof Structure

Size		Dimensions					Armour Wire Dia	Weight
		C(Male Thread)	D	E	A	B		
					Cable Dia	Cable Dia		
E1FW E1W	20/16	M 20	15	29	3.1 - 8.6	8.0 - 13.4	0.9	199
	20S	M 20	15	31	7.0 - 11.6	12.0 - 15.9	0.9/1.25	224
	20	M 20	15	33	11.0 - 13.9	15.0 - 20.9	0.9/1.25	230
	25	M 25	15	44	13.0 - 19.9	20.0 - 27.4	1.25/1.60	406
	32	M 32	15	53	19.0 - 24.2	26.5 - 31.9	1.60/2.00	644
	40	M 40	15	61	25.0 - 32.1	33.0 - 40.4	1.60/2.00	877
	50S	M 50	15	67	31.5 - 38.1	39.0 - 46.7	2.00/2.50	1033
	50	M 50	15	77	36.5 - 44.0	45.5 - 53.1	2.00/2.50	1359
	63S	M 63	15	82	42.5 - 47.3	52.0 - 57.4	2.50	1605
	63	M 63	15	88	48.5 - 55.9	58.0 - 65.9	2.50	1638
	75S	M 75	15	99	54.5 - 61.9	64.0 - 72.1	2.50	2380
	75	M 75	15	110	60.5 - 67.9	71.0 - 78.5	2.50/3.15	3060
	90	M 90	15	132	67.5 - 79.3	78.5 - 90.4	3.15	4800

CW Industrial Gland - Outdoor Waterproof, Dust-proof

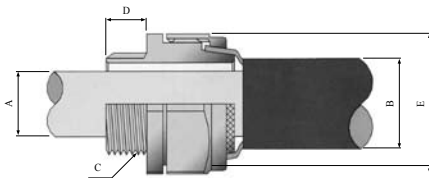
Ex d II C



- SWA Armoured Cable Gland for Electric Wires
- Outdoor, Waterproof Earthquake-proof (IP66)
- 1 Part (Outer Jacket) Waterproof, Dust-proof

Size		Dimensions					Armour Wire Dia	Weight
		C(Male Thread)	D	E	A	B		
					Cable Dia	Cable Dia		
CW	20/16	M 20	15	29	8.6	8.0 - 13.4	0.9	161
	20S	M 20	15	31	11.6	12.0 - 15.9	0.9/1.25	177
	20	M 20	15	33	13.9	15.0 - 20.9	0.9/1.25	167
	25	M 25	15	44	19.9	20.0 - 26.2	1.25/1.60	305
	32	M 32	15	53	26.2	25.6 - 33.9	1.60/2.00	455
	40	M 40	15	61	32.1	33.0 - 40.4	1.60/2.00	615
	50S	M 50	15	67	38.1	39.0 - 46.7	2.00/2.50	771
	50	M 50	15	77	44.0	45.5 - 53.1	2.00/2.50	966
	63S	M 63	15	82	49.9	52.0 - 59.4	2.50	1166
	63	M 63	15	88	55.9	58.0 - 65.9	2.50	1191
	75S	M 75	15	99	61.9	64.0 - 72.1	2.50	1751
	75	M 75	15	110	67.9	71.0 - 78.5	2.50/3.15	2280
	90	M 90	15	132	79.3	78.5 - 90.4	3.15	3550

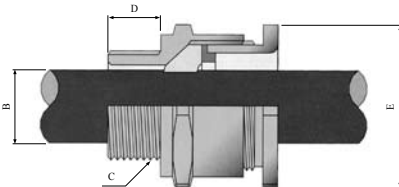
BW Light-duty Industrial Gland - Indoor Non-waterproof Type



- SWA Armoured Cable Gland for Electric Wires
- Indoor, Non-waterproof Dust-proof Type
- Light-duty Armoured Cable Gland

Size		Dimensions					Armour Wire Dia	Weight/g
		C(Male Thread)	D	E	A	B		
					Cable Dia	Cable Dia		
BW	20S	M 20	15	31	11.6	16.1	0.9/1.25	112
	20	M 20	15	33	13.9	21.1	0.9/1.25	146
	25	M 25	15	44	19.9	27.4	1.25/1.60	252
	32	M 32	15	53	26.2	34.4	1.60/2.00	405
	40	M 40	15	61	32.1	42.4	1.60/2.00	515
	50S	M 50	15	67	38.1	50.1	2.00/2.50	609
	50	M 50	15	77	44.0	55.7	2.00/2.50	764
	63S	M 63	15	82	50.0	62.4	2.50	870
	63	M 63	15	88	55.9	68.2	2.50	1059
	75S	M 75	15	99	61.9	76.8	2.50	1508
	75	M 75	15	110	67.9	82.9	2.50/3.15	1974

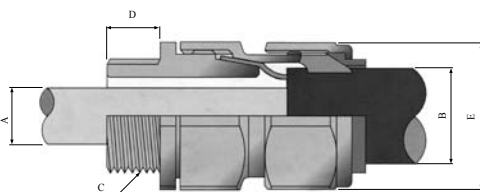
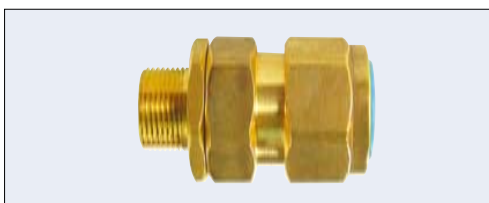
A2 Industrial Gland - For General Electric Wires



- General Cable Gland for Electric Wires
- Outdoor Waterproof, Dust-proof Type (IP66)
- Convenient and prompt installation

Size		Dimensions				Weight/g
		C(Male Thread)	D	E	Cable Dia A	
A2	20/16	M 20	15	25.0	3.1 - 8.6	104
	20S	M 20	15	30.0	7.0 - 11.6	116
	20	M 20	15	31.0	11.0 - 13.9	114
	25	M 25	15	40.0	13.0 - 19.9	180
	32	M 32	15	47.0	19.0 - 24.2	297
	40	M 40	15	56.0	25.0 - 32.1	432
	50S	M 50	15	64.0	31.5 - 38.1	503
	50	M 50	15	72.0	36.5 - 44.0	625
	63S	M 63	15	77.0	42.5 - 47.3	771
	63	M 63	15	88.0	48.5 - 55.9	777
	75S	M 75	15	99.0	54.5 - 61.9	1100
	75	M 75	15	110.0	60.5 - 67.9	1298
	90	M 75	15	122.0	67.5 - 79.3	2160

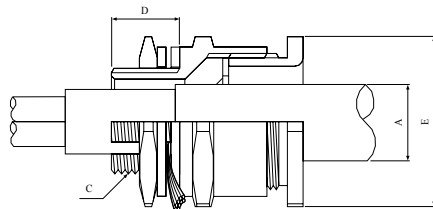
CX/Z Industrial Gland - Outdoor, Dust-proof Type



- Braided or steel tap armour(S.T.A).
- Outdoor, Waterproof Dust-proof Type (IP66)
- 1 Part (Outer Jacket) Waterproof, Dust-proof Structure

Size		Dimensions					Brand/ STA Thickness Max	Weight/g
		C(Male Thread)	D	E	A	B		
					Cable Dia	Cable Dia		
CX/Z	20/16	M 20	15	24.4	8.6	8.0 - 13.4	0.85	161
	20S	M 20	15	26.6	11.6	12.0 - 15.9	0.85	177
	20	M 20	15	33.3	13.9	15.0 - 20.9	0.9	167
	25	M 25	15	40.5	19.9	20.0 - 26.2	1.25	305
	32	M 32	15	51.0	26.2	25.6 - 33.9	1.4	455
	40	M 40	15	61.0	32.1	33.0 - 40.4	1.4	615
	50S	M 50	15	66.5	38.1	39.0 - 46.7	1.4	771
	50	M 50	15	77.7	44.0	45.5 - 53.1	1.4	966
	63S	M 63	15	83.2	49.9	52.0 - 59.4	1.5	1166
	63	M 63	15	88.7	55.9	58.0 - 65.9	1.5	1191
	75S	M 75	15	101.6	61.9	64.0 - 72.1	1.5	1752
	75	M 75	15	111.1	67.9	71.0 - 78.5	1.5	2280
	90	M 90	15	128.6	79.3	78.5 - 90.4	1.6	3550

CXT Industrial Gland -For Braided Electric Wires, Outdoor Waterproof, Dust-proof Type



- Cable Gland for Braided Electric Wires
- Outdoor Waterproof, Dust-proof Type (IP66)
- Convenient and Prompt Installation

Size		Dimensions				Weight/g
		C(Male Thread)	D	E	Cable Dia A	
CXT	20/16	M 20	15	24	3.1 - 8.6	110
	20S	M 20	15	26	6.1 - 11.6	120
	20	M 20	15	30	6.5 - 13.9	120
	25	M 25	15	40	11.1 - 19.9	200
	32	M 32	15	45	17.0 - 26.2	310
	40	M 40	15	55	22.0 - 32.1	450
	50S	M 50	15	61	29.5 - 38.1	530
	50	M 50	15	66	35.6 - 44.0	650

Wiping C/G



Standard Thread Selection Table by Cable Gland Size

SIZE	ISO Metric	NPT or NPSM		P.G		PF/BSP	
		Standard	Specialty	Standard	Specialty	Standard	Specialty
16	M 16	1/2"	3/4"	11	9, 13.5	-	-
20/16	M 20	1/2"	3/4"	11	9, 13.5	1/2"	-
20S	M 20	1/2"	3/4"	13.5	11, 16	1/2"	-
20	M 20	1/2"	3/4"	16	11, 13.5, 21	1/2"	3/4"
25	M 25	3/4"	1"	21	-	3/4"	1"
32	M 32	1"	1-1/4"	29	-	1"	1-1/4"
40	M 40	1-1/4"	1-1/2"	36	29	1-1/4"	1-1/2"
50S	M 50	1-1/2"	2"	36	42	1-1/2"	-
50	M 50	2"	2-1/2"	42	48	2"	-
63S	M 63	2"	2-1/2"	48	-	2"	-
63	M 63	2-1/2"	3"	-	-	2-1/2"	-
75S	M 75	2-1/2"	3"	-	-	2-1/2"	-
75	M 75	3"	3-1/2"	-	-	3"	3-1/2"
90	M 90	3"	3-1/2"	-	-	3"	3-1/2"

Accessories



LOCK NUT



SHROUD



LOCK NUT PADING

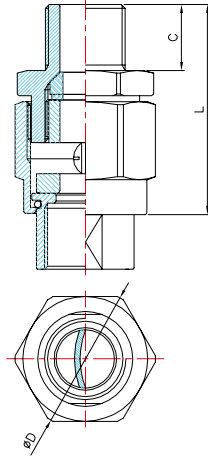


EARTH TAG

Explosionproof Type Packing Cable Gland

ECG

Class1, Division1 Ex d II C

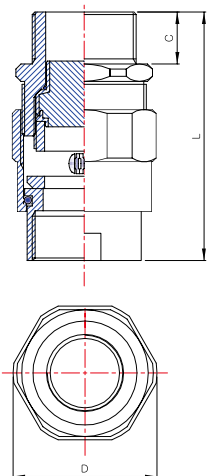


Material(Standard) : Brass + Ni Plated
(Specialty) : STS, Steel, Al

Size	C	L [Refer- ence]	D	Compatible Cable(ØA)	Conduit Thread T. T1	Weight (g / EA)
#16	17	64	38	7.0-11.0	CTG 16(1/2")	14
#22	17	66	41	10.5-15.0	CTG 22(3/4")	17
#28	21	72	53	16.5-21.3	CTG 28(1")	25
#36	21	83	58	20.6-27.0	CTG 36(1-1/4")	32
#42	26	92	67	23.7-29.0	CTG 42(1-1/2")	39
#54	27	93	79	30.9-39.0	CTG 54(2")	50
#70	30	94	99	40.3-51.0	CTG 70(2-1/2")	62
#82	30	109	122	52.6-63.0	CTG 82(3")	76
#104	31	125	144	64.2-75.0	CTG 104(4")	87

ECG (CB TYPE)

Class1, Division1 Ex d II C

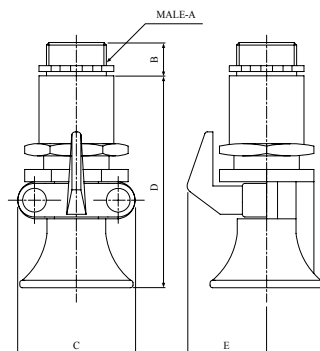


Material(Standard) : Brass + Ni Plated
(Specialty) : STS, Steel, Al

Size	C	L [Refer- ence]	D	Compatible Cable(ØA)	Conduit Thread T. T1	Weight (g / EA)
#16	17	64	38	1.0-8.5	CTG 16(1/2")	14
#22	17	66	41	1.0-13.0	CTG 22(3/4")	17
#28	21	72	53	1.0-19.0	CTG 28(1")	25
#36	21	83	58	1.0-26.0	CTG 36(1-1/4")	32
#42	26	92	67	1.0-32.0	CTG 42(1-1/2")	39
#54	27	93	79	1.0-40.0	CTG 54(2")	50
#70	30	94	99	1.0-50.0	CTG 70(2-1/2")	62
#82	30	109	122	1.0-62.0	CTG 82(3")	76
#104	31	125	144	1.0-74.0	CTG 104(4")	87

EGB (Bell Mouth Type)

Class1, Division1 & 2, Ex d II C

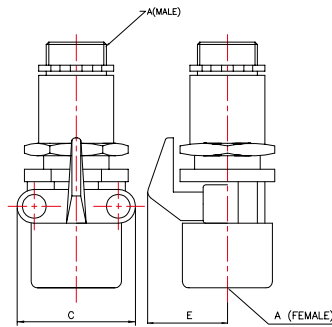


Material : Al Diecasting & Al Casting

Size	Dimensions				Compatible Cable	Conduit Thread A	Weight (g / EA)
	B	C	D	E			
# 16	18	49	73	25	9.0~11.5	CTG 16	150
# 22	18	50	90	26	11.0~16.0	CTG 22	200
# 28	24	58	95	27	14.0~20.0	CTG 28	280
# 36	26	76	138	42	26.0~27.0	CTG 36	590
# 42	26	85	155	47	27.5~32.5	CTG 42	740
# 54	27	94	148	55	33.5~43.5	CTG 54	1300
# 70	30	110	170	62	48.0~55.0	CTG 70	5100
# 82	40	130	180	65	47.0~67.5	CTG 82	6300
# 104	45	160	240	85	82.0~90.0	CTG 104	1500

EGC

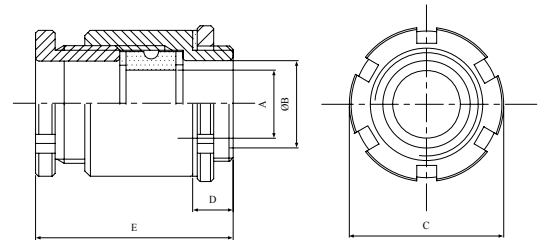
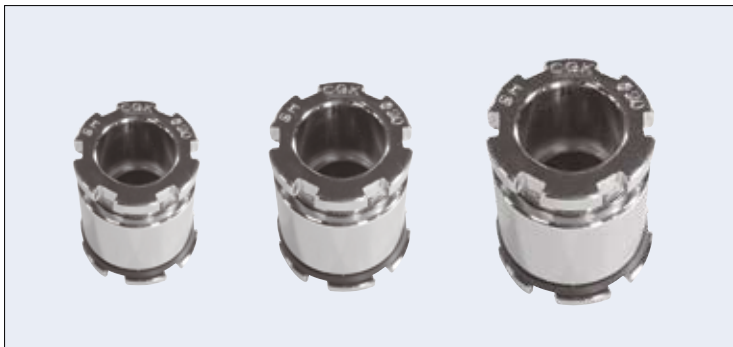
Class1, Division1 & 2, Ex d II C



Size		Dimensions				Compatible Cable	Conduit Thread A, A1	Weight (g / EA)
		B	C	D	E			
EGC	# 16	18	49	73	25	9.0~11.5	CTG 16	200
	# 22	18	50	80	26	11.0~16.0	CTG 22	250
	# 28	24	58	95	27	14.0~20.0	CTG 28	300
	# 36	26	76	125	42	26.0~27.0	CTG 36	600
	# 42	26	85	145	47	27.5~32.5	CTG 42	750
	# 54	27	94	148	55	33.5~43.5	CTG 54	1400
	# 70	30	110	160	62	48.0~55.0	CTG 70	5500
	# 82	40	130	160	65	47.0~67.5	CTG 82	7200
	# 104	45	160	200	85	82.0~90.0	CTG 104	8000

Material : Al Diecasting & Al Casting

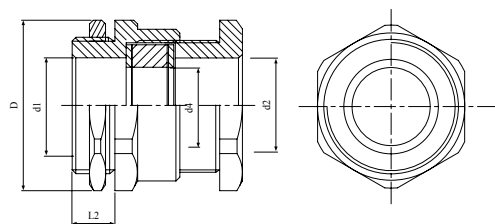
KS (JIS) Type Cable Gland



Material : Brass + Ni Plated

Size		Dimensions					CONDUIT SCREW	Weight (g / EA)
		(A) RANGE OF APPLI-CABLES	ØB	ØC	D	E		
CGK	#10	4.0 to 8.0	10.0	28.0	11.0	43.0	3/8"	80
	#15	6.4 to 11.0	15.0	31.0	11.0	47.0	CTG 16	120
	#20	9.5 to 15.0	20.0	37.0	11.0	50.0	CTG 22	170
	#25	14.0 to 20.0	25.0	45.0	11.0	58.0	CTG 28	290
	#30	19.0 to 26.0	30.0	56.0	12.0	65.0	CTG 36	460
	#35	24.5 to 30.0	40.0	63.0	12.0	67.0	CTG 42	540
	#40	28.5 to 34.0	40.0	63.0	12.0	67.0	CTG 42	460
	#45	33.0 to 40.0	50.0	76.0	12.0	72.0	CTG 54	952
	#50	38.5 to 44.0	50.0	76.0	12.0	72.0	CTG 54	780
	#55	43.0 to 50.0	60.0	95.0	12.0	84.0	CTG 70	1630
	#60	49.0 to 56.0	60.0	95.0	12.0	84.0	CTG 70	1450
	#65	54.5 to 60.0	75.0	110.0	15.0	94.0	CTG 82	2410
	#70	58.5 to 64.0	75.0	110.0	15.0	94.0	CTG 82	2230
	#75	63.0 to 70.0	75.0	110.0	15.0	94.0	CTG 82	1970
	#80	68.5 to 74.0	85.0	130.0	15.0	102.0	CTG 92	3420
	#85	72.5 to 78.0	85.0	130.0	15.0	102.0	CTG 92	3210
	#90	76.5 to 81.0	95.0	140.0	20.0	125.0	CTG 104	4150
	#95	80.0 to 86.0	95.0	140.0	20.0	125.0	CTG 104	3970
	#100	84.5 to 100.0	102.0	140.0	20.0	135.0	CTG 104	

DIN Type Cable Gland - DIN 46320



Material : Brass + Ni Plated

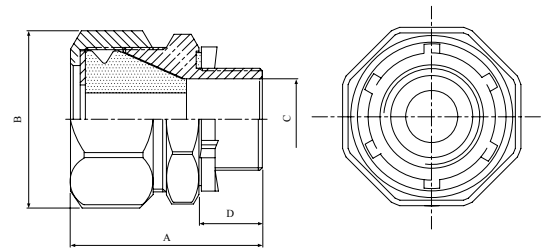
Size		BODY PACKING	BODY		GLAND	LOCK NUT	CONDUIT SCREW	Weight (g / EA)
		d4	d1	L2	d2	D	pg	
CGD	#7	6	9.0	6.0	9.0	16.0	Pg 7	20
	#9	8	12.0	7.0	12.0	22.0	Pg 9	20
	#11	10	14.0	7.0	14.0	25.0	Pg 11	30
	#13.5	10	16.0	7.0	16.0	27.0	Pg 13.5	40
	#16	13	18.0	7.0	18.0	29.0	Pg 16	50
	#21	16	24.0	8.0	24.0	35.0	Pg 21	70
	#29	21	32.0	8.0	32.0	44.0	Pg 29	110
	#36	27	42.0	9.0	42.0	55.0	Pg 36	170
	#42	35	48.0	10.0	48.0	61.0	Pg 42	220
	#48	41	53.0	10.0	53.0	67.0	Pg 48	280

PVC Cable Gland (NEC)



Size	Compatible Cable
NEC - 01 - 8A	4 ~ 7
NEC - 01 - 12A	6 ~ 9
NEC - 01 - 16A	7 ~ 15
NEC - 01 - 20A	13 ~ 19
NEC - 01 - 28A	20 ~ 31
NEC - 01 - 36A	31 ~ 34

Cable Connector CGC

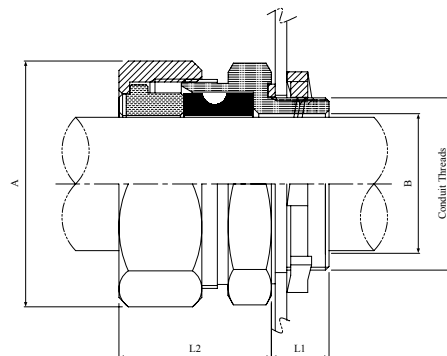


Material : Brass

Size			Dimensions				Cord Range Dia	Conduit Thread	Weight (g / EA)
			A	B	C	D			
CGC	#16	A B C	41.0	35.5	15.0	14.0	3.5 to 6.5 6.5 to 9.5 9.5 to 12.7	CGC 16	100
	#22	A B C D	41.0	40.0	19.0	14.0	3.5 to 6.5 6.5 to 9.5 9.5 to 12.7 12.7 to 16.0	CGC 22	137
	#28	A B C D	51.0	48.5	25.0	16.0	9.5 to 12.7 12.7 to 16.0 16.0 to 19.0 19.0 to 22.5	CGC 28	218
	#36	A B C D E	55.0	59.0	34.0	17.0	19.0 to 22.5 22.5 to 25.5 25.5 to 28.5 28.5 to 32.0 30.2 to 32.0	CGC 36	299
	#42	A B C D E	56.0	68.5	39.0	18.0	22.5 to 25.5 25.5 to 28.5 28.5 to 32.0 32.0 to 35.0 32.0 to 36.0	CGC 42	409
	#54	A B C D E	63.0	80.5	50.0	20.0	28.5 to 32.0 32.0 to 36.0 36.0 to 40.0 36.0 to 41.5 40.0 to 44.5	CGC 54	567
	#70	A B C D E F G	94.0 (106.5)	102.5	62.5	24.0 (36.5)	36.0 to 40.0 40.0 to 44.5 41.5 to 47.5 44.5 to 49.5 49.5 to 54.5 47.5 to 55.5 55.5 to 60.0	CGC 70	1190
	#82	A B	103.0 (112.0)	120.0	76.0	27.2 (36.5)	49.5 to 55.5 55.5 to 63.5	CGC 82	1945
	#104	A B	123.0 (131.0)	147.0	100.0	32.0 (40.0)	63.5 to 76.0 76.0 to 89.0	CGC 104	2930
	#130	A B	125.0 (131.0)	177.0	124.0	39.0 (45.0)	89.0 to 108.0	CGC 130	-

■ Multi-Core Type Cable Glands are made to order.

Cable Connector CCG



Material : Zn, Brass

Size			Dimensions(mm)				Cord Range Dia	Conduit Thread	Weight (g / EA)
			A	B	L1	L2			
CCG	#16	A	36.0	14.3	14.0	25.0	7.0 to 12.7	CTG 16	80
	#22	A	41.0	19.0	14.0	27.0	11.0 to 16.0	CTG 22	110
	#28	A	48.7	25.0	16.0	32.5	16.0 to 22.5	CTG 28	170
	#36	A B	59.3	33.5	18.0	36.0	21.0 to 26.0 25.0 to 31.0	CTG 36	260
	#42	A	68.0	39.0	18.0	41.0	31.0 to 37.0	CTG 42	370
	#54	A	81.3	50.0	18.0	44.0	37.0 to 44.5	CTG 54	540
	#70	A B C	102.0	64.5	24.0	49.0	44.0 to 50.0 49.0 to 55.0 54.0 to 60.0	CTG 70	860
	#82	A B	121.0	76.5	27.0	52.0	59.0 to 65.0 66.0 to 73.0	CTG 82	1300
	#104	A B C	153.0	98.5	31.0	69.0	72.0 to 78.0 78.0 to 85.0 85.0 to 92.0	CTG 104	2200
	#130	A B C	177.0	124.0	39.0	71.0	92.0 to 100.0 100.0 to 108.0 108.0 to 116.0	CTG 130	-



Section D



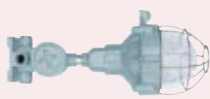
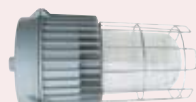
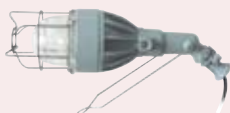
SAMWHA LIGHTING

SAMWHA LIGHTING Features

SAMWHA pursues a safe and pleasant lighting environment with the best quality products

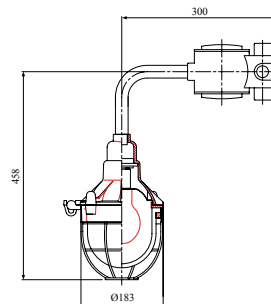
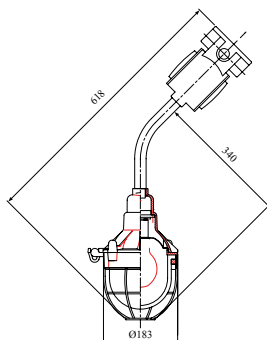
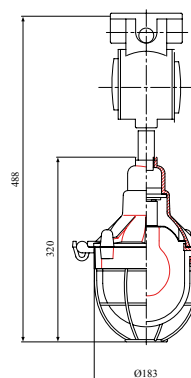
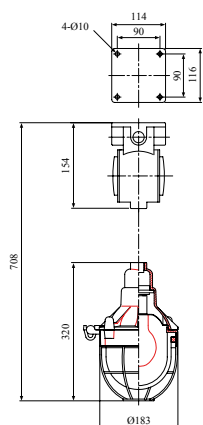
1. Supplying a mild and pleasant atmosphere in good designs.
2. Providing a natural light flattering objects and shining brighter visually.
3. Displaying a clear light and a lighting effect through transparent glass.

SAMWHA LIGHTING INDEX

	Explosionproof Type Incandescent Electric Lamp (JIS Type) 41		Explosionproof Type Fluorescent Fixture 51
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Explosionproof Type Incandescent Lamp (JIS TYPE)

Ex d II B



Materials

- Body Corrosionproof Aluminum
- Globe Heatproof Strengthened Glass
- Safety, Guard Stainless Steel
- Reflector Pure(High Class) Aluminum(Polished)
- Mounting Box Diecasting Aluminum
- Pole Steel Pipe

Type	Lamp watt(w)	Catalogue No.	Weight(kg)
Pendant	100 W	ILES 11	4.7
Pendant	200 W	ILES 12	4.7
ceiling	100 W	ILES 21	4.3
ceiling	200 W	ILES 22	4.3
40° Bracket	100 W	ILES 31	4.7
40° Bracket	200 W	ILES 32	4.7
90° Bracket	100 W	ILES 41	4.7
90° Bracket	200 W	ILES 42	4.7
Pole	100 W	-	-
Pole	200 W	-	-

Explosionproof Type Incandescent Lamp (UL TYPE)

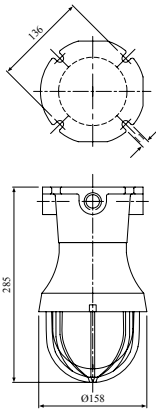
Ex d IIB

SAMWHA LIGHTING

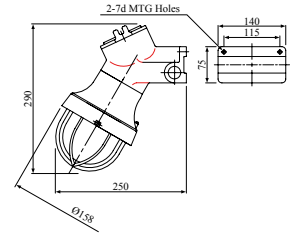
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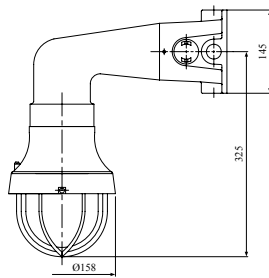
Ceiling Type



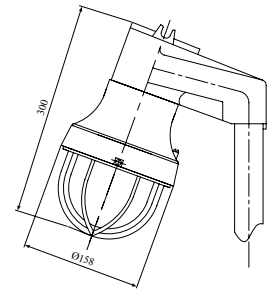
40° Bracket Type



90° Bracket Type



Stanchion Type



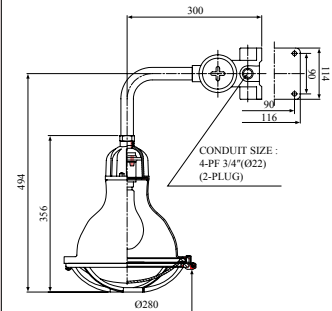
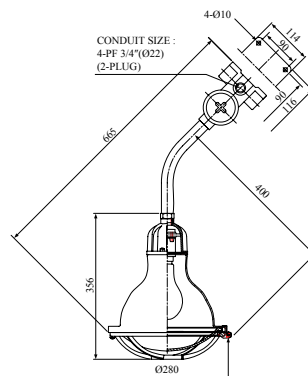
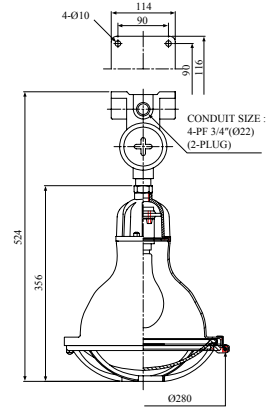
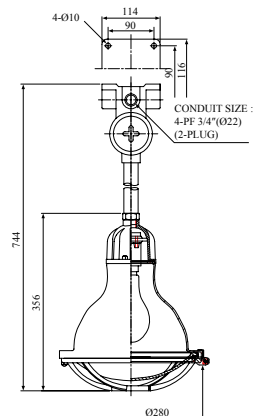
Materials

- Body Corrosionproof Aluminum
- Globe Heatproof Strengthened Glass
- Safety, Guard Cast Aluminum(Aluminum Casting)
- Reflector Pure(High Class) Aluminum(Gloss Aluminum(Aluminum Casting) Treatment)
- Mounting Box Aluminum Casting
- Gasket(Packing) Asbestos Slice

Type	Lamp watt(w)	Catalogue No.	Weight(kg)
Ceiling	100 W	ILEU 21	-
Ceiling	200 W	ILEU 22	-
40° Bracket	100 W	ILEU 31	3.2
40° Bracket	200 W	ILEU 32	3.2
90° Bracket	100 W	ILEU 41	5
90° Bracket	200 W	ILEU 42	5
Stanchion	100 W	ILEU 51	3.5
Stnanchion	200 W	ILEU 52	3.5

Explosionproof Type Incandescent Lamp

Ex e II



Materials

- Body Steel Sheet(Aluminum Plated)
- Top Housing Aluminum Casting(Cast Aluminum)
- Globe Contracted Glass (Silicic Glass)
- Globe Frame Aliminum Casting (Cast Aluminum)
- Pole Steel Pipe
- Mounting Box Diecasting Aluminum

Type	Lamp watt(w)	Catalogue No.	Weight(kg)
Pendant	100 W	ILIN 11	5
Pendant	200 W	ILIN 12	5
ceiling	100 W	ILIN 21	4.7
ceiling	200 W	ILIN 22	4.7
40° Bracket	100 W	ILIN 31	5
40° Bracket	200 W	ILIN 32	5
90° Bracket	100 W	ILIN 41	5
90° Bracket	200 W	ILIN 42	5
Pole	100 W	-	-
Pole	200 W	-	-

Explosionproof Type Natrium & Metal Halide Lamp(JIS TYPE)

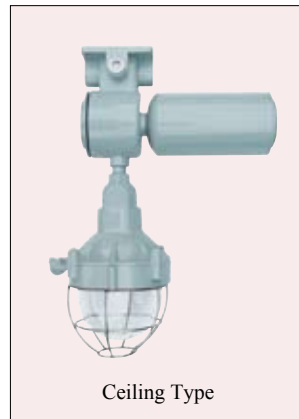
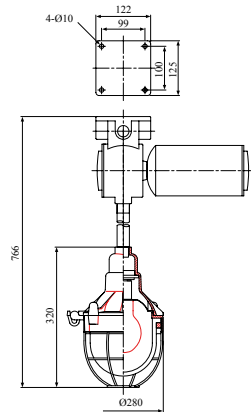
Ex d IIB

SAMWHA LIGHTING

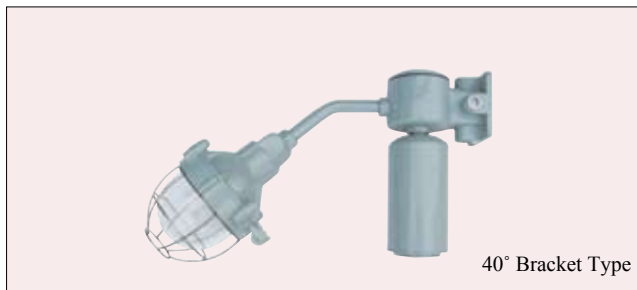
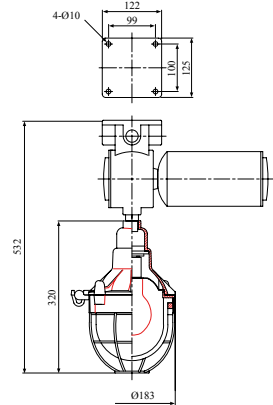
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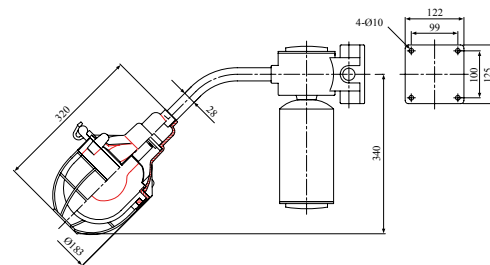
Pendant Type



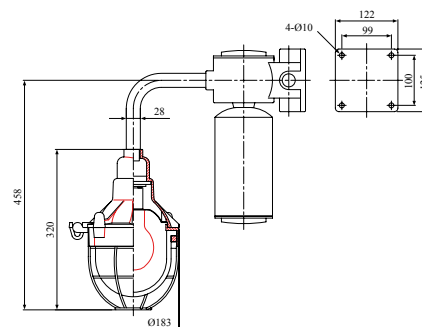
Ceiling Type



40° Bracket Type



90° Bracket Type



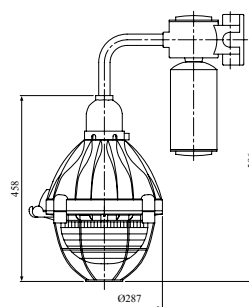
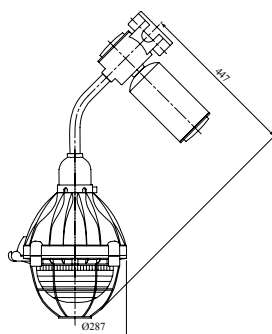
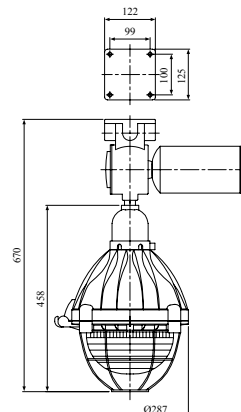
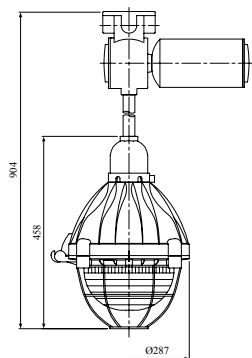
Materials

- Body Diecasting Aluminum
- Globe Heatproof Strengthened Glass
- Guard Stainless Steel
- Reflector High Class Aluminum(Polished)
- Ballast Housing Steel
- Pole Steel Pipe
- Mounting Box Diecasting Aluminum/Cast Iron

Type	Sodium		Metal Halide		Weight(kg)
	Lamp Watt(W)	Catalogue No.	Lamp Watt(W)	Catalogue No.	
Pendant	100 W	SLES 11	100 W	MLES 11	11.5
ceiling	100 W	SLES 21	100 W	MLES 21	11
40° Bracket	100 W	SLES 31	100 W	MLES 31	11.5
90° Bracket	100 W	SLES 41	100 W	MLES 41	11.5
Pole	100 W	-	100 W	-	-

Explosionproof Type Natrium & Metal Halide Lamp(JIS TYPE)

Ex d IIB



Materials

- Body Cast Aluminum(Aluminum Casting)
- Globe Heatproof Strengthened Glass
- Guard Stainless Steel
- Reflector High Class Aluminum(Polished)
- Ballast Housing Steel
- Pole Steel Pipe
- Mounting Box Diecasting Aluminum/Cast Iron

Type	Sodium		Metal Halide		Weight(kg)
	Lamp Watt(W)	Catalogue No.	Lamp Watt(W)	Catalogue No.	
Pendant	150 - 200 W	SLES 12	250(175) W	MLES 12	16.8
Pendant	250 - 400 W	SLES 14	400 W	MLES 14	23.5
ceiling	150 - 200 W	SLES 22	250(175) W	MLES 22	16.5
ceiling	250 - 400 W	SLES 24	400 W	MLES 24	23
40° Bracket	150 - 200 W	SLES 32	250(175) W	MLES 32	16.8
40° Bracket	250 - 400 W	SLES 34	400 W	MLES 34	23.5
90° Bracket	150 - 200 W	SLES 42	250(175) W	MLES 42	16.8
90° Bracket	250 - 400 W	SLES 44	400 W	MLES 44	23.5
Pole	150 - 200 W	-	250(175) W	-	-
Pole	250 - 400 W	-	400 W	-	-

Explosionproof Type Natrium & Metal Halide Lamp (UL TYPE)

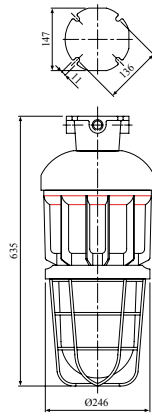
Ex d IIB

SAMWHA LIGHTING

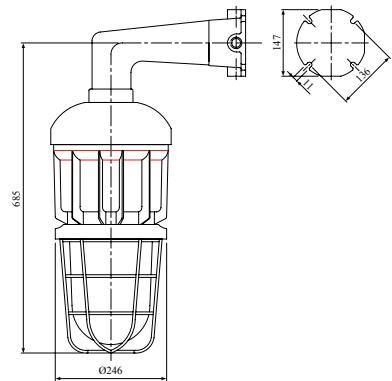
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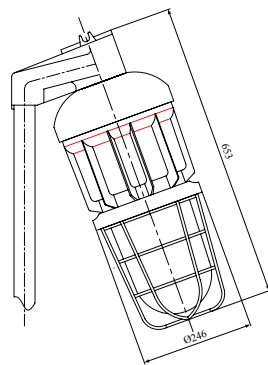
Ceiling Type



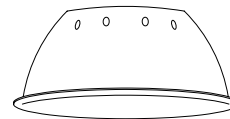
90° Bracket Type



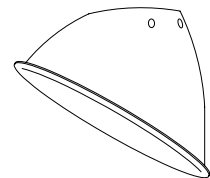
Stanchion Type



Optional



Dome Type



Angle Type

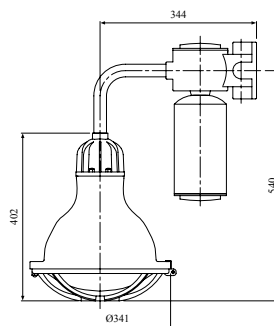
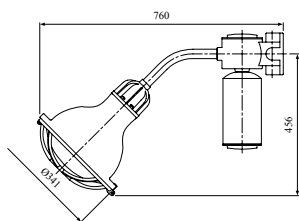
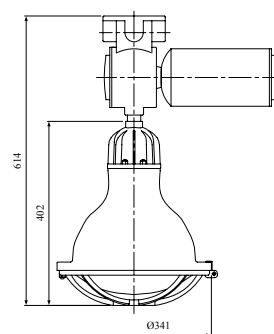
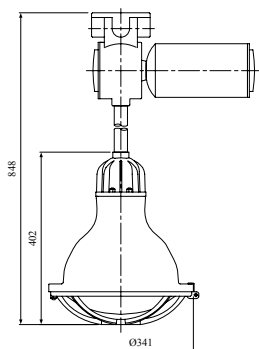
Materials

- Body Cast Aluminum(Aluminum Casting)
- Cover Cast Aluminum(Aluminum Casting)
- Guard Cast Aluminum(Aluminum Casting)
- Globe Holder Cast Aluminum(Aluminum Casting)
- Ballast Housing Cast Aluminum(Aluminum Casting)
- Globe Heatproof Strengthened Glass

Type	Sodium		Metal Halide		Weight(kg)
	Lamp Watt(W)	Catalogue No.	Lamp Watt(W)	Catalogue No.	
ceiling	150 - 200	SLEU 22	250(175)	MLEU 22	15
ceiling	250 - 400	SLEU 24	400	MLEU 24	15
90° Bracket	150 - 200	SLEU 42	250(175)	MLEU 42	17
90° Bracket	250 - 400	SLEU 44	400	MLEU 44	17
Stanchion	150 - 200	SLEU 52	250(175)	MLEU 52	15.5
Stanchion	250 - 400	SLEU 54	400	MLEU 54	15.5
Pole	150 - 200	-	250(175)	-	-
Pole	250 - 400	-	400	-	-

Explosionproof Type Natrium & Metal Halide Lamp

Ex e II

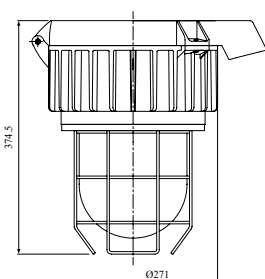
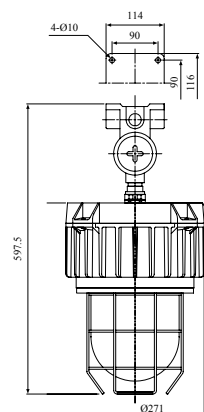
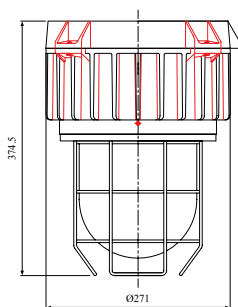


Materials

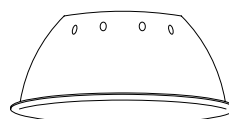
- Body Steel & Aluminum
- Top Housing Diecasting Aluminum
- Globe Heatproof Strengthened Glass
- Globe Frame Cast Aluminum(Aluminum Casting)
- Pole Steel Pipe
- Mounting Box Cast Aluminum(Aluminum Casting)

Type	Sodium		Metal Halide		Weight(kg)
	Lamp watt(w)	Catalogue No.	Lamp watt(w)	Catalogue No.	
Pendant	100	SLIN 11	100	MLIN 11	11
Pendant	250	SLIN 12	250(175)	MLIN 12	11.8
Pendant	400	SLIN 14	400	MLIN 14	13
ceiling	100	SLIN 21	100	MLIN 21	10.7
ceiling	250	SLIN 22	250(175)	MLIN 22	11.3
ceiling	400	SLIN 24	400	MLIN 24	12.7
40° Bracket	100	SLIN 31	100	MLIN 31	11
40° Bracket	250	SLIN 32	250(175)	MLIN 32	11.8
40° Bracket	400	SLIN 34	400	MLIN 34	13
90° Bracket	100	SLIN 41	100	MLIN 41	11
90° Bracket	250	SLIN 42	250(175)	MLIN 42	11.8
90° Bracket	400	SLIN 44	400	MLIN 44	13
Pole	100	-	100	-	-
Pole	250	-	250(175)	-	-
Pole	400	-	400	-	-

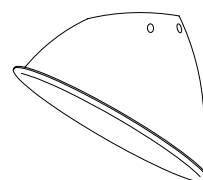
Sealed Type Natrium & Metal Halide Lamp (VJ TYPE)



Optional



Dome Type



Angle Type

Materials

- Body & Hood Cast Aluminum(Aluminum Casting)
- Globe Heatproof Many-sided Glass
- Guard Stainless Steel
- Reflector Steel(Enameled)

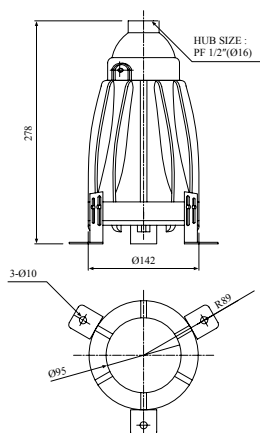
Type	Lamp watt(W)	Catalogue No.	Weight(kg)
Pendant	250(175) W	MLVJ 12	14
Pendant	400 W	MLVJ 14	14
ceiling	250(175) W	MLVJ 22	13
ceiling	400 W	MLVJ 24	13
Stanchion	250(175) W	MLVJ 52	14.5
Stanchion	400 W	MLVJ 54	14.5

Explosionproof Type Tank Light

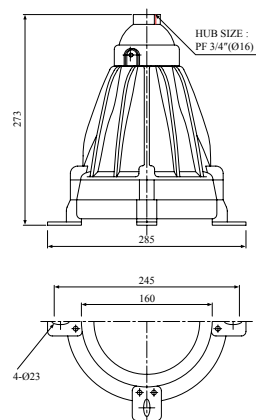
Ex d IIB



100 W



200 W



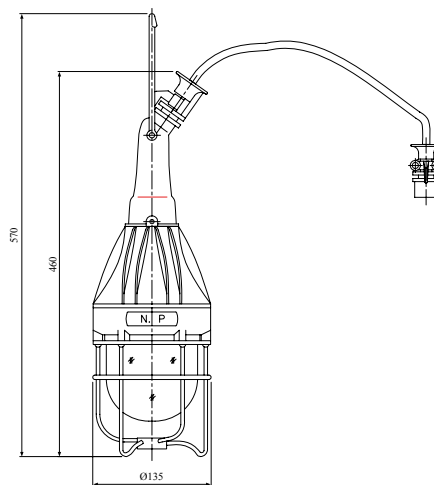
Materials

- Body Cast Aluminum(Aluminum Casting)
- Glass Heatproof Glass
- Reflector High Class Aluminum(Polished)

Lamp watt(W)	Hub Size	Weight(kg)
100	22(3/4 ")	2.3
200	22(3/4 ")	4.5

Explosionproof Type Working Light

Ex d IIB



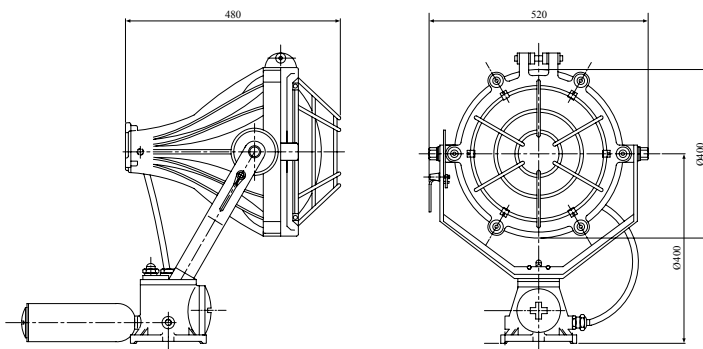
Materials

- Body Cast Aluminum(Aluminum Casting)
- Globe Heatproof Strengthened Glass
- Guard Stainless Steel

Lamp watt(W)	Weight(kg)
100 W	2.5
200 W	2.5

Explosionproof Type Light Projector

Ex d IIB



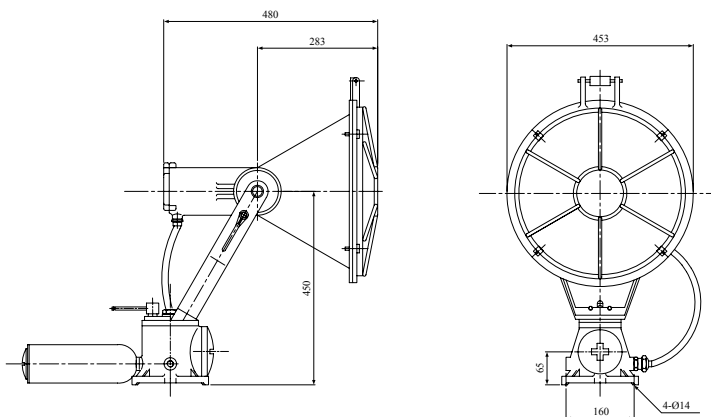
Materials

- Body Aluminum Casting
- Glass Chemicals-proof Glass
- Safety Guard Steel/Brass
- Reflector Aluminum(Polished)
- Ballast Housing Steel
- Wiring Tube Explosion Type Flexible
- Support Steel
- Mounting Box Aluminum Casting

Sodium	Metal Halide	Weight(kg)
Lamp (W)	Lamp (W)	
150(200) W	250(175) W	38.5
250 W	400 W	38.5

Explosionproof Type Light Projector

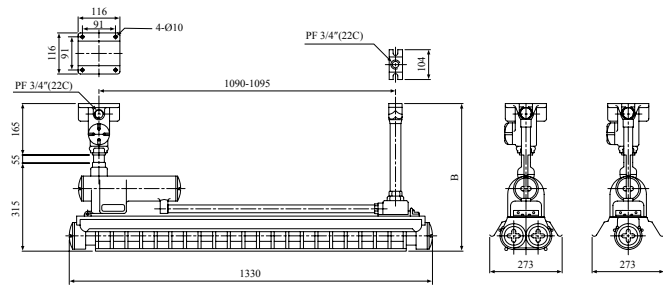
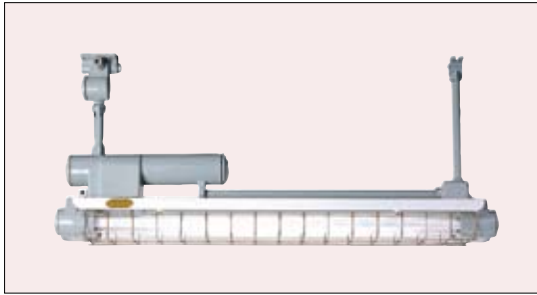
Ex e II



Sodium	Metal Halide	Weight(kg)
Lamp (W)	Lamp (W)	
150(200) W	250(175) W	13
250 W	400 W	15

Explosionproof Type Fluorescent Lamp Fixture

Ex d II



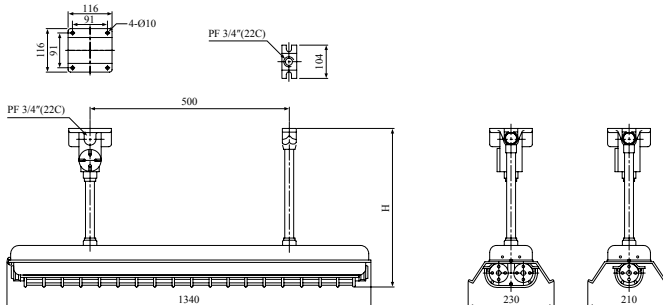
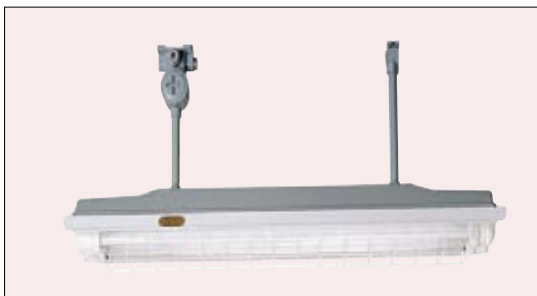
Materials

- Ballast Housing Aluminum Casting
- Lamp Holder Cover ... Aluminum Casting
- Lamp Cover Heatproof Strengthened Glass
- Safety Guard Steel(Zinc/Enameled)
- Reflector Steel(Flameproof Enameled)
- Pole Steel Pipe
- Mounting Box Diecasting Aluminum/ Cast Iron

Furnished	Lamp Size	Voltage(V)	Weight(kg)	
			Pendant Type	Ceiling Type
1 - FL20 2 - FL40	20×1	100 - 110	17	16.5
	20×1	200 - 220	17	16.5
	20×2	100 - 110	18	17.5
	20×2	200 - 220	18	17.5
1 - FLR40 2 - FLR40	40×1(32W)	100 - 110	19	18.5
	40×1(32W)	200 - 220	19	18.5
	40×2(32W)	100 - 110	20.5	20
	40×2(32W)	200 - 220	20.5	20

Explosionproof Type Fluorescent Lamp Fixture

Ex e II



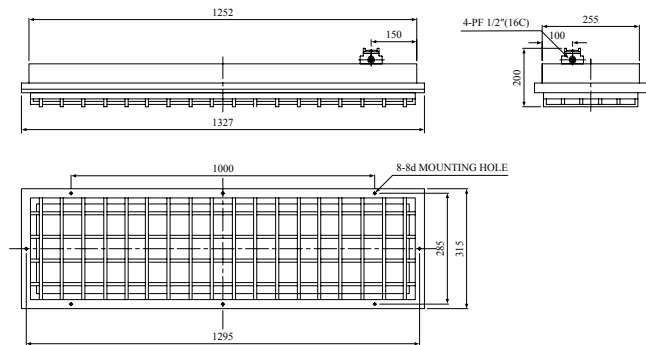
Materials

- Body Steel
- Lamp Holder Cover, Lamp Cover Heatproof Strengthened Glass
- Safety Guard Steel(Electroplated)
- Reflector Steel(Flameproof Enameled)
- Pole Steel Pipe
- Mounting Box Diecasting Aluminum/ Cast Iron

Furnished	Lamp Size	Voltage(V)	Weight(kg)	
			Pendant Type	Ceiling Type
1 - FL20 2 - FL40	20×1	100 - 110	7.5	7
	20×1	200 - 220	7.5	7
	20×2	100 - 110	8.5	8
	20×2	200 - 220	8.5	8
1 - FLR40 2 - FLR40	40×1(32W)	100 - 110	9.5	9
	40×1(32W)	200 - 220	9.5	9
	40×2(32W)	100 - 110	11	10.5
	40×2(32W)	200 - 220	11	10.5

Explosionproof Type Fluorescent Lamp (Recessed Type)

Ex e II

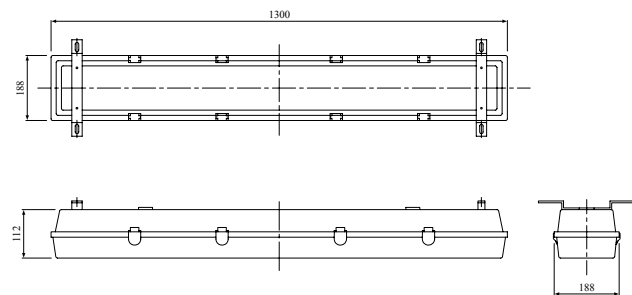


Materials

- Body Steel
- Lamp Holder Cover Plastics
- Lamp Cover Silicic Acid Glass
- Safety Guard Steel(Electroplated)
- Reflector Steel(Heatproof Enameled)
- Terminal Box Aluminum Casting

Lamp	Voltage(V)	Weight(kg)
1 - FL20	100 - 110	10
1 - FL20	200 - 220	10
2 - FL40	100 - 110	11
2 - FL40	200 - 220	11
1 - FL40	100 - 110	17
1 - FL40	200 - 220	17
2 - FL40	100 - 110	19
2 - FL40	200 - 220	19
3 - FL40	100 - 110	20
3 - FL40	200 - 220	20
4 - FL40	100 - 110	21
4 - FL40	200 - 220	21

Sealed Type Fluorescent Lamp Fixture



Materials

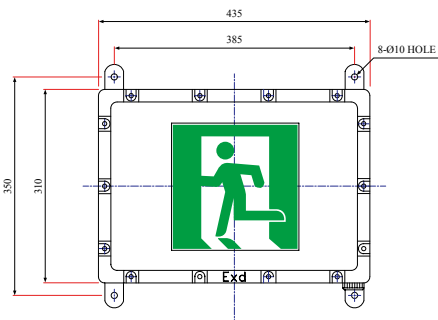
- Body Polyester
- Reflector Steel(Polished)
- Support Stainless Steel
- Suppoty Stainless Steel
- Gasket(Packing) Silicon Rubber

Lamp Furnished	Lamp Size	Voltage(V)
1 - FL20 2 - FL20	20×1	100 - 110
	20×1	200 - 220
	20×2	100 - 110
	20×2	200 - 220
1 - FLR40 2 - FLR40	40×1	100 - 110
	40×1	200 - 220
	40×2	100 - 110
	40×2	200 - 220

Explosionproof Type Fire-Fighting Equipment

Explosionproof Type Leading Lamp

Ex d IIB



Materials

- Main Box & Ballast Housing Aluminum Casting
- Terminal Box Aluminum Casting
- Indicating Window Glass
- Color Munsell : 7.5BG(6/1.5) & Red

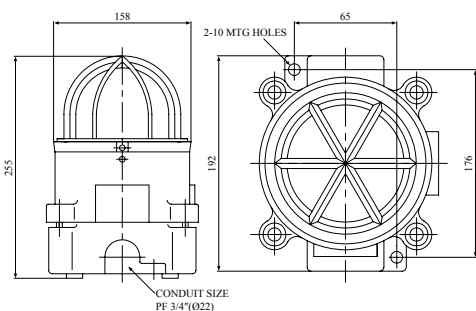
Specifications

- Voltage AC 110/220V
- Ampere 0.26/0.14A
- Wattage Wattage
- Emergency Operating Time 30/min

Type	Rated Voltage	Lamp Type	Weight(kg)
Small Size	AC220V/62mA/4W	CCFL	13kg
Medium Size	AC220V/100mA/8W	CCFL	30kg

Explosionproof Type Flashing Light

Ex d IIB



Materials

- Body Aluminum Casting
- Globe Heatproof Strengthened Glass
- Safety Guard Diecasting Aluminum
- Bell Diecasting Aluminum
- Terminal Box Cast Iron
- Pole Steel Pipe
- Base Cast Iron

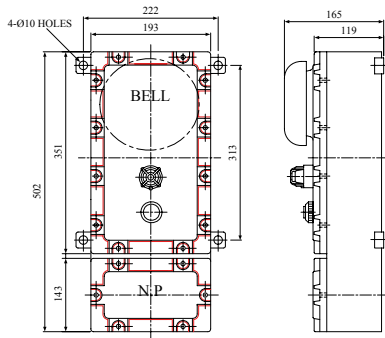
Specification

	Integral Battery Type	Mains Supply Type
Rated Voltage (V)	4.5V DC	100 or 220V AC
Lamp (Flashlight Lamp)	2.5V 0.5A	3.8V 0.5A
Sound Level of Bell (at 1m)	93dB or more	93dB or more
Number of Flashings	150/min	180/min

Source of Supply	Type	Rated Voltage(V)	Weight(kg)
Integral Battery (3×SUM-1)	Wall Mounting	4.5V DC	7
Integral Battery (3×SUM-1)	Standing	4.5V DC	-
Main Supply	Wall Mounting	110V AC	7
Main Supply	Wall Mounting	220V AC	7
Main Supply	Standing	110V AC	-
Main Supply	Standing	220V AC	-

Explosionproof Type Manual Transmitter

Ex d IIB



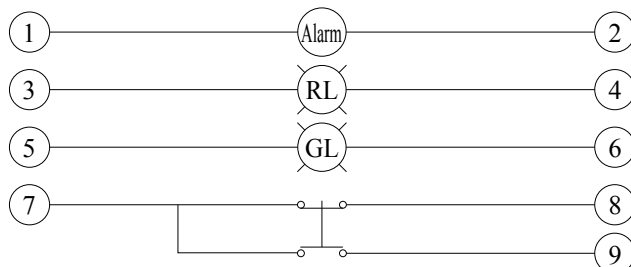
Materials

- Body Aluminum Casting Iron
- Cover Aluminum Casting

Specifications

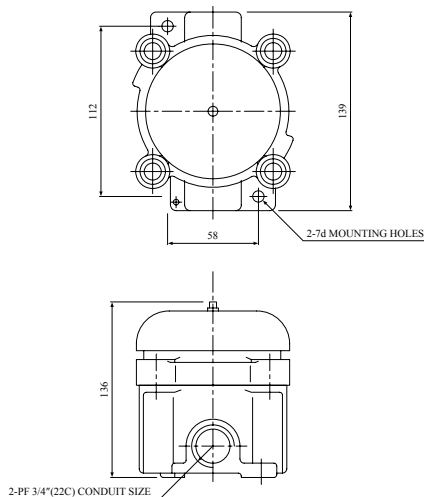
- Voltage DC 24V
- Circuit Ampere DC 24V
- Pilot Lamp Rating DC 24V 1W
- Emergency Push Button Rating 250V 6A
- Intensity of Bell 90dB

Wiring Diagram



Explosionproof Type Bell Signal

Ex d IIB



Materials

- Body Diecasting Aluminum
- Bell Cast Brass
- Terminal Box Diecasting Aluminum

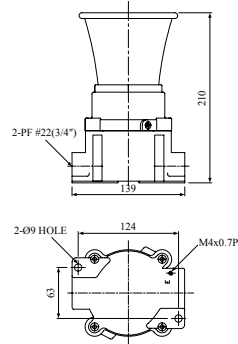
Specification

Rated Voltage (V)	Approximate Wattage (W)	Frequency (Hz)	Sound Level (at 1m) (dB)
100 · 100AC	20 W	50/60	90 or more
200 · 220AC	20 W	50/60	90 or more
24 AC	10 W	50/60	90 or more
24 DC	13 W	50/60	90 or more
100DC	13 W	50/60	90 or more

Rated Voltage (V)	Time Rating (min)	Weight(kg)
100 · 110 AC	15	1.5
200 · 220 AC	15	1.5
24 AC	15	1.5
24 DC	15	1.5
100DC	15	1.5

Explosionproof Type Horn Signal

Ex d IIB



Materials

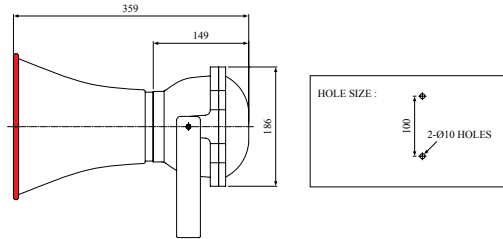
- Body Aluminum Casting Iron
- Terminal Box Aluminum Casting

Specifications

- Voltage 24V
- Frequency 50/60Hz
- Wattage 20W
- Intensity of Sound 97dB or more
- Operating Time 15 minute
- Weight 2kg

Explosionproof Type Horn Speaker

Ex d IIB

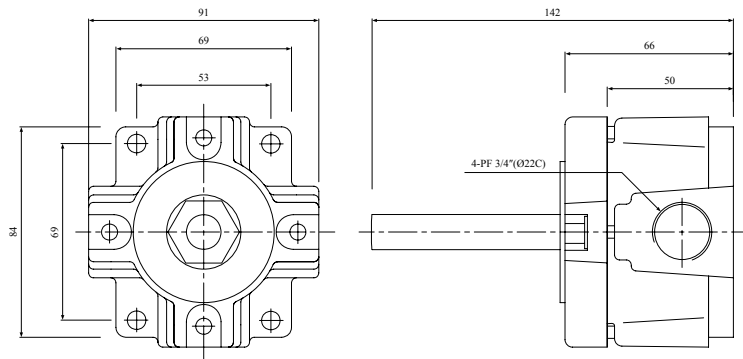


Materials

- Body Aluminum Casting Iron
- Specifications 15W 8 ohm
- Weight 4.2kg

Explosionproof Type Sensor

Ex d IIB

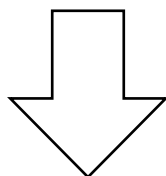


Materials

- Body Diecasting Aluminum
- Cover Diecasting Aluminum
- Point of Contact 2.4DC 0.1A
- Temperature 60°C, 70°C, 80°C, 90°C, 100°C, 120°C, 150°C
- Weight 1kg

Lamp Fixture Models & Marking Table

Sequence ①		Sequence ②		Sequence ③		Sequence ④		Sequence ⑤		Sequence ⑥	
Lamp Fixture Type		Lighting		Explosionproof Type		Standard Classification		Lamp Fixture Type		WATTS	
Type	Marks	Type	Marks	Type	Marks	Type	Marks	Type	Marks	Type	Marks
Incandescent Electric Lamp	I	Lighting	L	Explosion proof Type	E	JIS Type	S	Pendant	1	100	1
Natrium Lamp	S					UL Type	U				
Metal Lamp	M			Increased Safety Type	I			Celling	2	200	2
Tank Light	T										
Working Lamp	W										
Light Projector	FD			Bracket 90°	4			250(175)			
Fluorescent Lamp	F									Others (Sealed Type)	VJ
Leading Lamp	E										



Increased Safety Type Metal Halide Lamp (Pendant Type) 250(175W)

MLIN12	M	Metal Halide Lamp
	L	Lighting
	I	Increased Safety Explosionproof Type
	N	
	1	Pendant Type
	2	250(175W)



Section E



SAMWHA ENCLOSURE

SAMWHA ENCLOSURE Features

SAMWHA concentrates all out efforts upon manufacturing the topnotch items.

1. Samwha Enclosures are superior products which passed the tests conducted by an official examination body and stability of which is secured by the Authorities concerned.
2. Samwha Enclosures have neat aspect and superior capability.

SAMWHA ENCLOSURE INDEX

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	Circular Tumbler Switch 69		PC Control Box 79
	Rectangular Tumbler Switch 70		Pull Box 79

Explosionproof Control Type Control Unit

Class1, Division1, Ex d IIB



Push Button Switch

- Voltage AC 250V
- Ampere 6A
- Marking ON. OFF

Lock Type Push Button Switch

- Voltage AC 250V
- Ampere 6A
- Marking ON. OFF
- Features Key Lock

Selector Switch

- Voltage AC 250V
- Ampere 6A
- Marking 2.3 Position

Cam Switch

- Voltage AC 250V
- Ampere 6A
- Marking 2.3 Position
6-Positions
- Maximum 12-Notches

Tumbler Switch

- Voltage AC 550V
- Ampere 3A
- Marking ON. OFF

Pilot Lamp

- Transformer 110V,
220V primary
- Lamp 18V 2W
- Color Red, Green
White, Yellow

Ammeter Unite

- Type Moving iron type
- Size 74mm round
- Max. Direct Rating 30A

Buzzer Signal

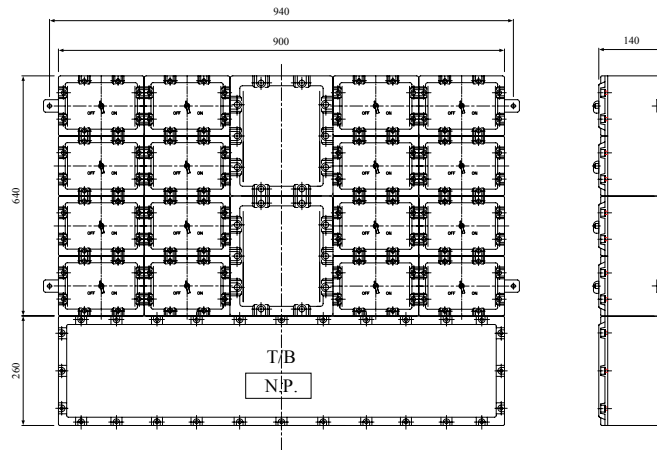
- Voltage AC 110V
AC 220V
- Max. Act. Time 10minute
- Electric Power 220VA

Unit Symbols

Symbols	Description
(PB)	ON, OFF Push button switches. AC500V 3A
K (PB)	Key Locked type ON, OFF Push button switches. AC250V 6A
(SS)	Selector switches. AC250V 6A 2&3 notch positions
(PL)	Pilot Lamps AC110V 220V 18V 2W, Red, Green, White Color globe
(MI)	Meter boxes Ampermeter & Volt meters 5A 15A 30/5A 300/5A
(Z I)	Buzzer Signales AC110V 220V, DC12V 24V
(CS)	Cam Switches AC250V 6A max. position-6 Max. notch-12

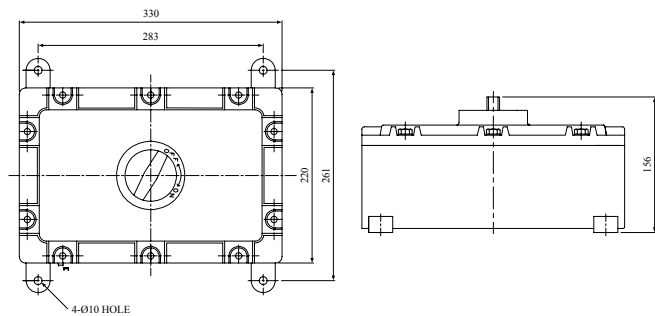
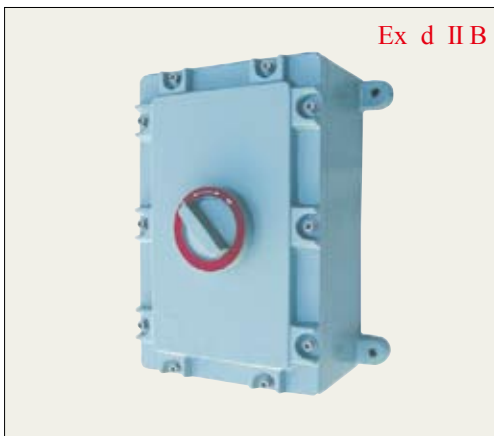
Panel Board

Class1, Division1, Ex d IIB



Circuit Breaker Panel

Class1, Division1, Ex d IIB



Flameproof FCB Circuit Breakers-For General Circuits

Frame Size (A)	Rated Current (A)	Weight(kg)
30	5, 10, 15, 20, 30	11.5
50	15, 20, 30, 50	11.5
100	60, 75, 100	11.5
225	125, 150, 200 or 225	30
600	300, 400, 500 or 600	40

Material

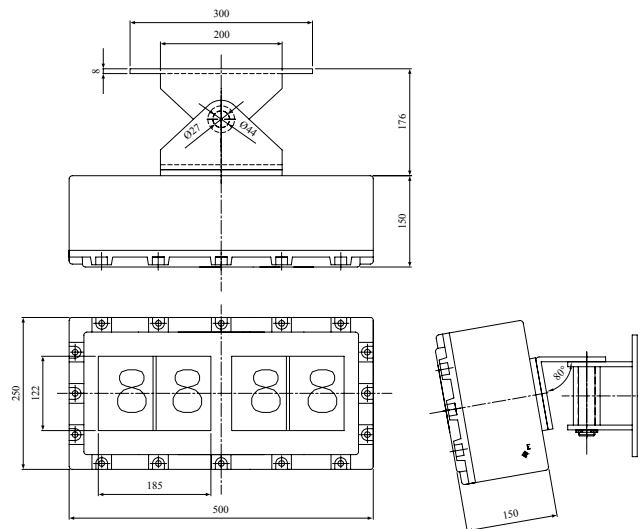
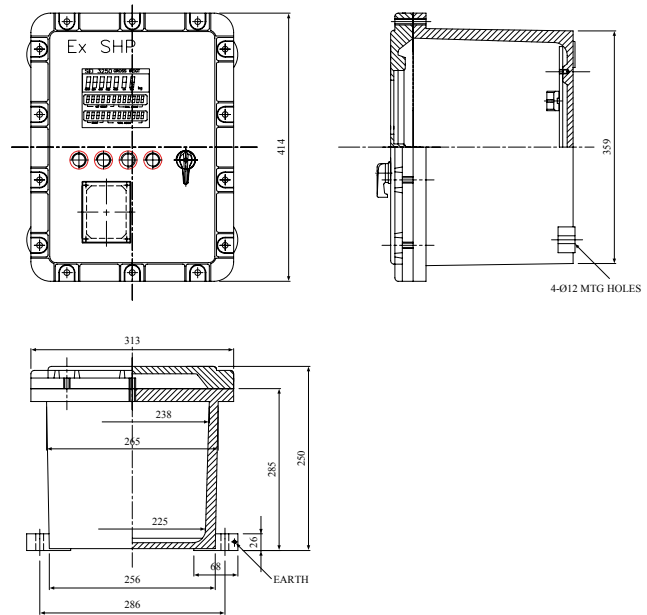
- Body Aluminum Casting
- Cover Aluminum Casting
- Handle Aluminum/Brass Casting

Details Circuit Breakers

Frame Size (A)	30	50	100	225	600
Number of Poles	3	3	3(4)	3(4)	3(4)
Rated Voltage (V) - AC	550	460	460	600	600
Rated Voltage (V) - DC	-	-	250	-	-
Rated Current (A) at Ambient Temp. 40°C	5, 10, 15, 20 or 30	15, 20, 30 or 50	65, 75 or 100	125, 150, 200 or 225	300, 400, 500 or 600
Rated Interrupting Capacity (A) - 220V AC	2500	5000	7500	85000	85000
Rated Interrupting Capacity (A) - 460V AC	2500	2500	5000	42000	42000
Rated Interrupting Capacity (A) - 550V AC	1500	-	-	35000	35000
Rated Interrupting Capacity (A) - 250V DC	-	-	7500	40000	-

Indicator Panel

Class1, Division1, Ex d IIB



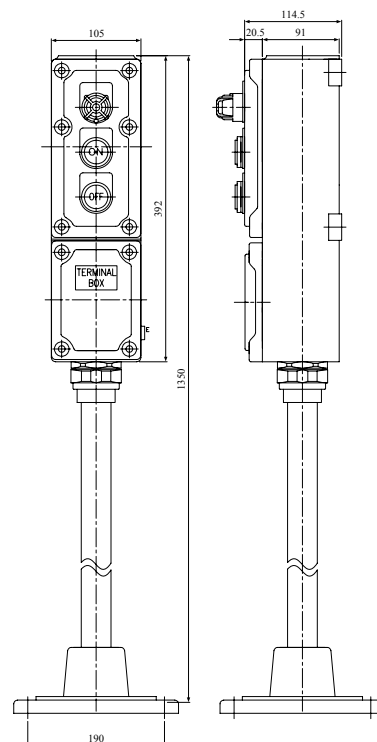
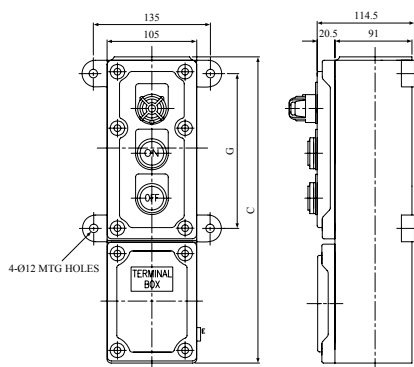
Material

- Body Aluminum Casting
- Cover Aluminum Casting
- See-Thru Window Plane Glass

■ A variety of types are available by a made to order basis according to wiring sizes, positions and the sizes of indicating window.

Explosionproof Type Combination Station

Class1, Division1, Ex d II B



Material

- Body Aluminum Casting
- Cover Aluminum Casting
- Terminal Box Aluminum Casting
- Standing Base Aluminum Casting
- Pole Steel Pipe

Combination Stations

								Dimensions	
								C	G
Arrangement								232	86
Weight (kg)									
Wall Mounting	SECW 1	SECW 2	SECW 3	SECW 4	SECW 5	SECW 6	SECW 7		
Standing	SECS 1	SECW 2	SECS 3	SECS 4	SECS 5	SECS 6	SECS 7	306	136
Arrangement									
Weight (kg)									
Wall Mounting	SECW 8	SECW 9	SECW 10	SECW 11	SECW 12	SECW 13	SECW 14		
Standing	SECS 8	SECS 9	SECS 10	SECS 11	SECS 12	SECS 13	SECS 14	306	136
Arrangement									
Weight (kg)									
Wall Mounting	SECW 15	SECW 16	SECW 17	SECW 18	SECW 19	SECW 20	SECW 21		
Standing	SECS 15	SECS 16	SECS 17	SECS 18	SECS 19	SECS 20	SECS 21		

Explosionproof Type Combination Station

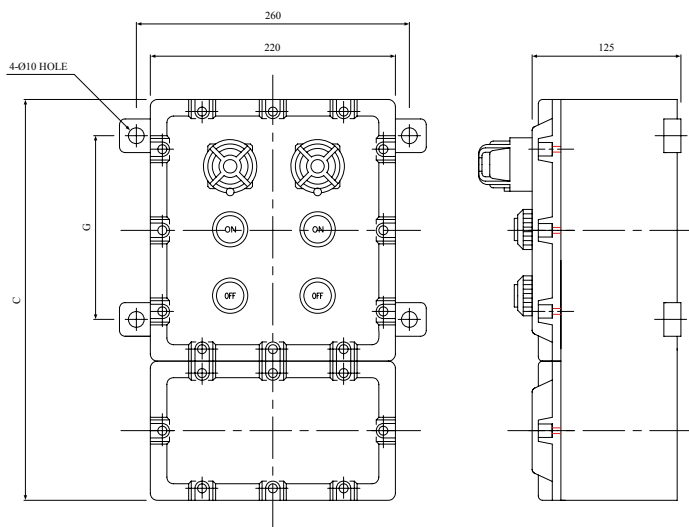
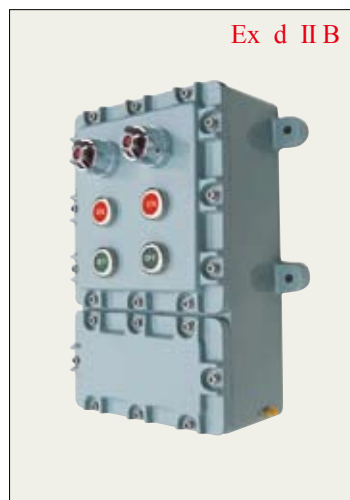
Class1, Division1, Ex d II B

Combination Stations

Arrangement Weight (kg)								Dimensions	
								C	G
								356	186
Wall Mounting	SECW 22	SECW 23	SECW 24	SECW 25	SECW 26	SECW 27	SECW 28	356	186
Standing	SECS 22	SECW 23	SECS 24	SECS 25	SECS 26	SECS 27	SECS 28		
Arrangement Weight (kg)								406	236
Wall Mounting	SECW 29	SECW 30	SECW 31	SECW 32	SECW 33	SECW 34	SECW 35		
Standing	SECS 29	SECS 30	SECS 31	SECS 32	SECS 33	SECS 34	SECS 35	406	236
Arrangement Weight (kg)									
Wall Mounting	SECW 36	SECW 37	SECW 38	SECW 39	SECW 40	SECW 41	SECW 42	456	286
Standing	SECS 36	SECS 37	SECS 38	SECS 39	SECS 40	SECS 41	SECS 42		

Explosionproof Type Combination Station

Class1, Division1, Ex d II B



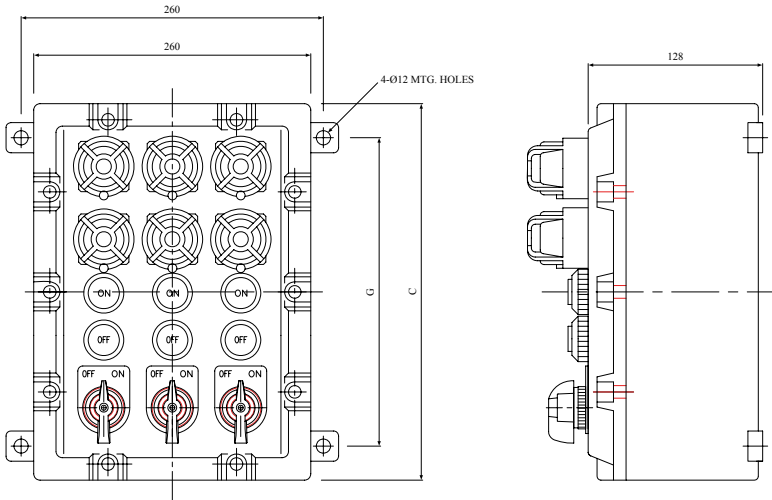
Material

- Body Aluminum Casting
- Cover Aluminum Casting
- Terminal Box Aluminum Casting
- Standing Base Aluminum Casting
- Pole Steel Pipe

Combination Stations

Arrangement Weight (kg)					Dimensions	
					C	G
					376	196
Wall Mounting	SECW 43	SECW 44	SECW 45	SECW 46		
Standing	SECS 43	SECS 44	SECS 45	SECS 46		
					476	296
Wall Mounting	SECW 47	SECW 48	SECW 49	SECW 50		
Standing	SECS 47	SECS 48	SECS 49	SECS 50		

Explosionproof Type Combination Station Class1, Division1, Ex d II B



Material

- Body Aluminum Casting
- Cover Aluminum Casting
- Terminal Box Aluminum Casting
- Standing Base Aluminum Casting
- Pole Steel Pipe

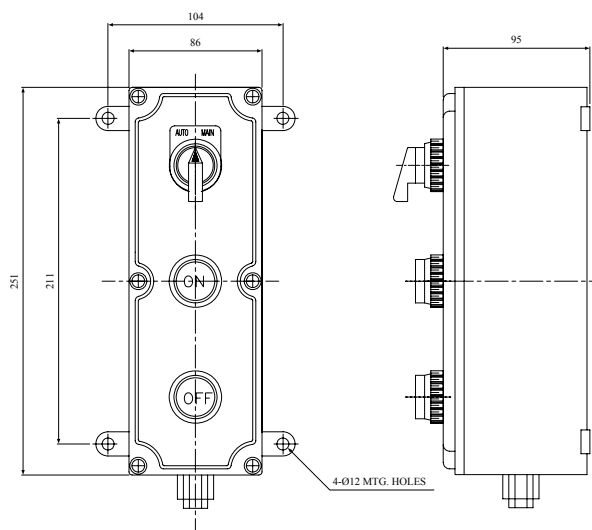
Combination Stations

Arrangement Weight (kg)				Dimensions	
				C	G
				376	196
Wall Mounting	SECW 51	SECW 52	SECW 53		
Standing	SECS 51	SECS 52	SECS 53		
Arrangement Weight (kg)				476	296
Wall Mounting	SECW 54	SECW 55	SECW 56		
Standing	SECS 54	SECS 55	SECS 56		

Sealed Type Combination Station

Ex DP II

Ex DP II



Material

- Body Aluminum Diecasting
- Cover Aluminum Diecasting
- Standing Base Aluminum Diecasting
- Pole Steel Pipe

Specifications

- Ammeter(Moving iron type)
SIZE : 65mm Round
Max. Rated Ampere 30A
- Push Button 5A 250V/3A 500V AC
- Pilot Lamp 110, 220 or 440V AC, SL 18V 2W
- Selector Switch 110V or 220V 6A

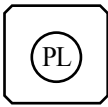
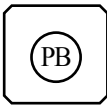
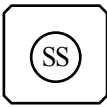
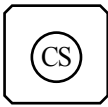
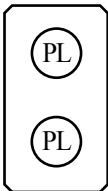
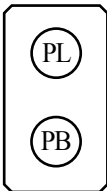
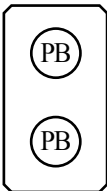
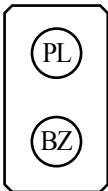
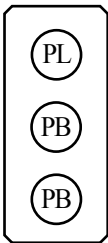
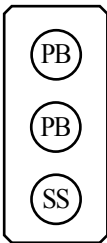
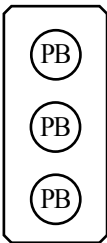
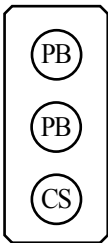
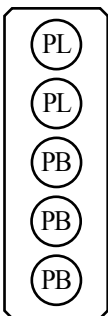
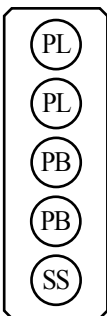
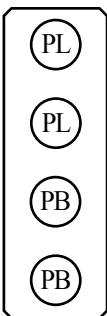
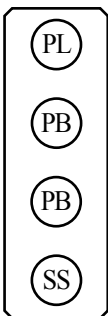
Unit Symbols

Symbols	Description
(PB)	ON, OFF Push button switches. AC500V 3A
K (PB)	Key Locked type ON, OFF Push button switches. AC250V 6A
(SS)	Selector switches. AC250V 6A 2&3 notch positions
(PL)	Pilot Lamps AC110V 220V 18V 2W, Red, Green White Color globe
(MI)	Meter boxes Ampermeter & Volt meters 5A 15A 30/5A 300/5A
(ZI)	Buzzer Signales AC110V 220V, DC12V 24V
(CS)	Cam Switches AC250V 6A max. position-6 Max. notch-12

Sealed Type Combination Station

Ex DP II

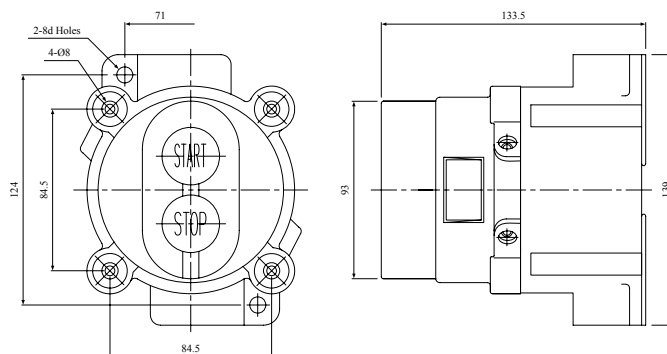
Combination Stations

Arrangement Weight (kg)				
Wall Mounting	SDCW 01	SDCW 02	SDCW 03	SDCW 04
Standing	SDCS 01	SDCS 02	SDCS 03	SDCS 04
Arrangement Weight (kg)				
Wall Mounting	SDCW 05	SDCW 06	SDCW 07	SDCW 08
Standing	SDCS 05	SDCS 06	SDCS 07	SDCS 08
Arrangement Weight (kg)				
Wall Mounting	SDCW 09	SDCW 10	SDCW 11	SDCW 12
Standing	SDCS 09	SDCS 10	SDCS 11	SDCS 12
Arrangement Weight (kg)				
Wall Mounting	SDCW 13	SDCW 14	SDCW 15	SDCW 16
Standing	SDCS 13	SDCS 14	SDCS 15	SDCS 16

Explosionproof Type Push Button Switch

Class1, Division 1, Ex d II C

Ex d II C



Material

- Main Enclosure Diecasting Aluminum
- Terminal Box Diecasting Aluminum
- Pillar(Pole) Steel Pipe
- Base Aluminum Casting

Specifications

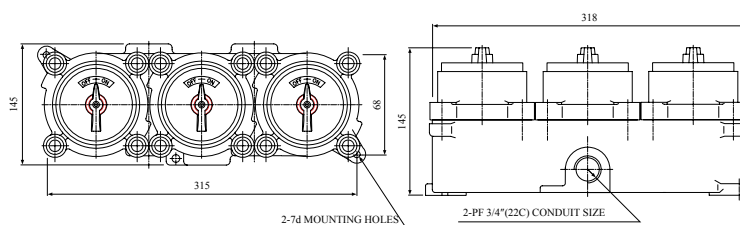
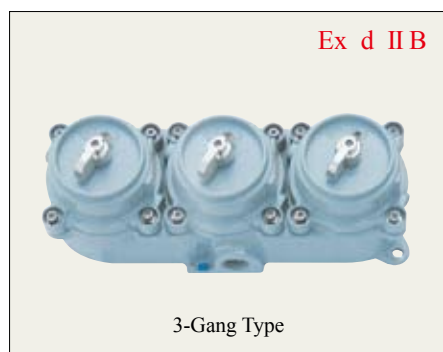
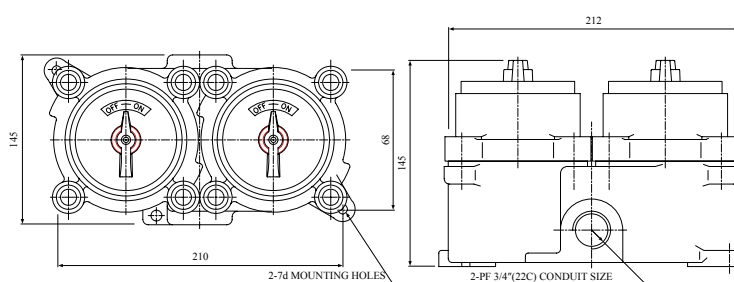
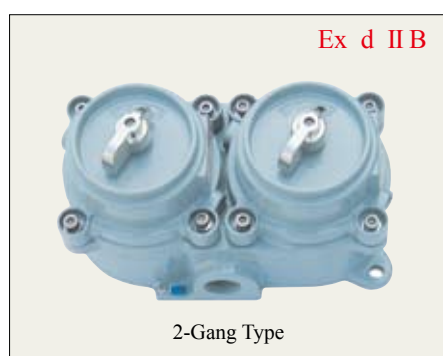
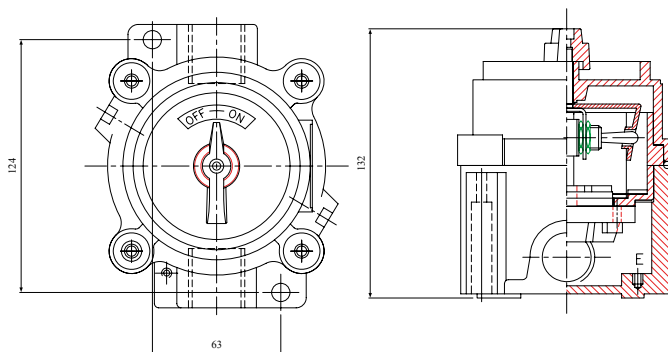
- Voltage 500 V AC
- Ampere 10A at 110V AC 4A at 24V DC
6A at 220V AC 1.5A at 48V DC
3A at 500V AC 0.8A at 110V DC
0.4A at 220V DC
- Marking ON (Normally open contact), or
OFF (Normally closed contact)

Push Buttons

No. of Gangs	Button Marking			Wall Mounting Type		Standing Type	
				Catalog No.	Weight(kg)	Catalog No.	Weight(kg)
1	ON - OFF			SEP-B 01	1.5	SEP-B 07	1.5
2	ON - ON	OFF - OFF		SEP-B 02	3	SEP-B 08	3
2	ON - OFF	ON - OFF		SEP-B 03	3	SEP-B 09	3
3	ON	ON	ON	SEP-B 04	4.5		
3	ON - OFF	ON - ON	OFF - OFF	SEP-B 05	4.5		
3	ON - OFF	ON - OFF	ON - OFF	SEP-B 06	4.5		

Circular Tumbler Switch

Class1, Division 1, Ex d II B



Material

- Body Aluminum Casting
- Terminal Box Aluminum Casting

Specifications

- Voltage 250V AC
- Ampere 20A
- Electrode Double pole (2-pole), or
Single pole changeover (3-way)

Tumbler Switches

No. of Gangs	Polarity			Weight(kg)
1	2 - Pole			1.5
1	3 - Way			1.5
2	2 - Pole	2 - Pole		2.7
2	2 - Pole	3 - Way		2.7
2	3 - Way	3 - Way		2.7
3	2 - Pole	2 - Pole	2 - Pole	4.5
3	2 - Pole	2 - Pole	3 - Way	4.5
3	2 - Pole	3 - Way	3 - Way	4.5
3	3 - Way	3 - Way	3 - Way	4.5

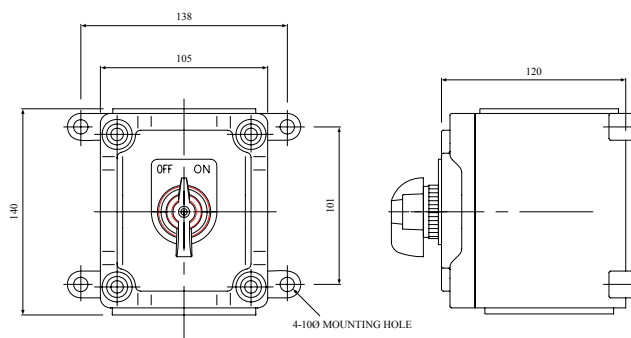
Rectangular Tumbler Switch

Class1, Division 1, Ex d II B

Ex d II B



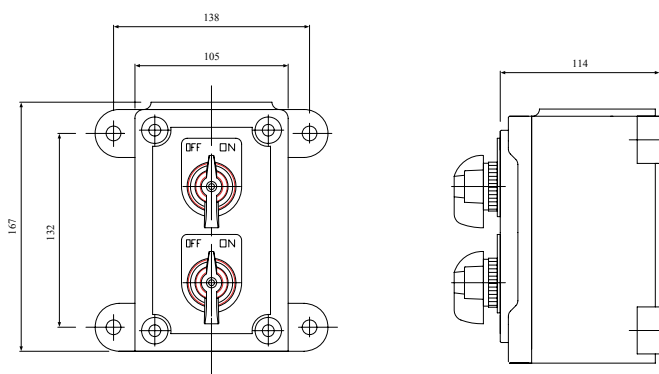
1-Gang Type



Ex d II B



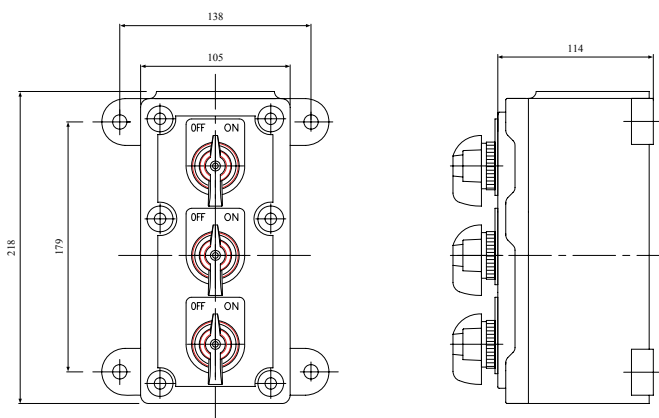
2-Gang Type



Ex d II B



3-Gang Type



Material

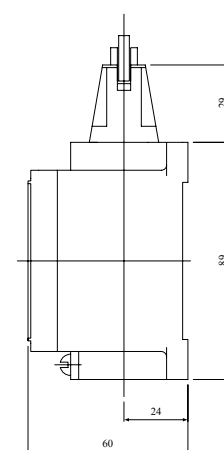
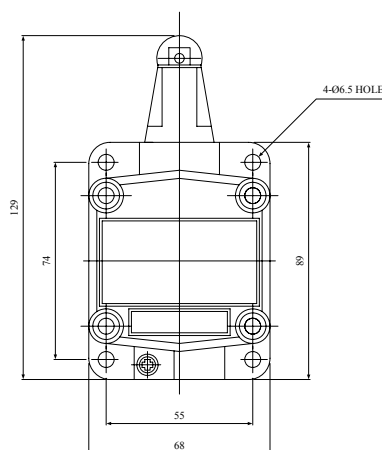
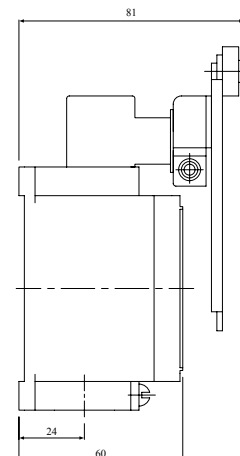
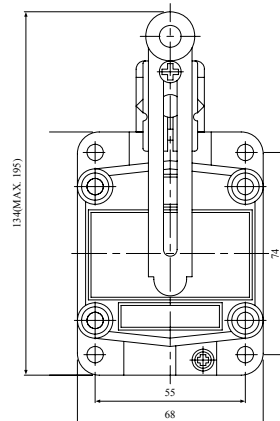
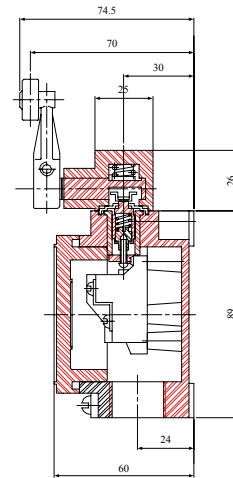
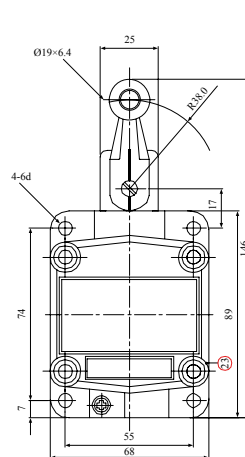
- Body Diecasting Aluminum
- Terminal Box Diecasting Aluminum
- Pillar(Pole) Steel Pipe
- Base Aluminum Casting

Specifications

- Voltage 500 V AC
- Ampere 6A at 110V AC 8A at 24V DC
 5A at 220V AC 4A at 48V DC
 4A at 440V AC 2A at 110V DC
 3A at 500V AC 1A at 220V DC
- Position 2 or 3
- Handle Flower type, Pistol type

Limit & Foothold Switch

Class1, Division 1, Ex d II B



Material

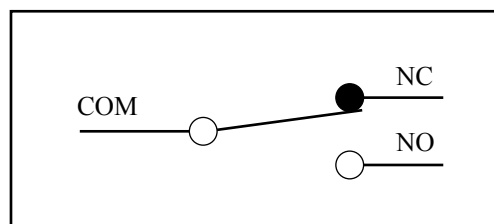
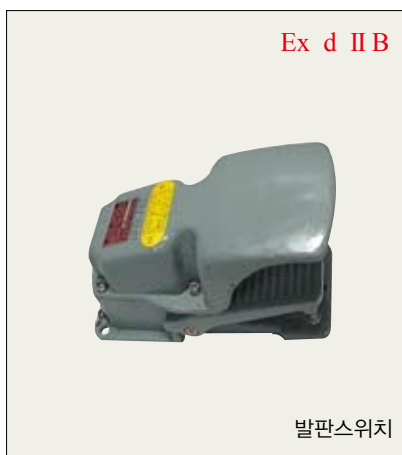
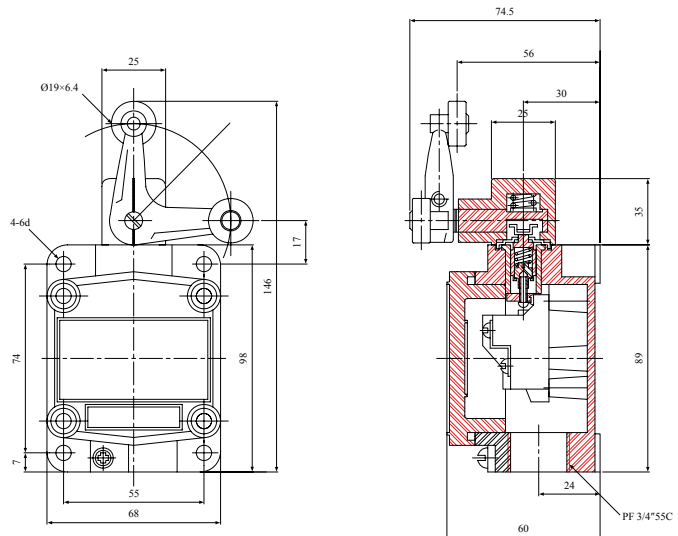
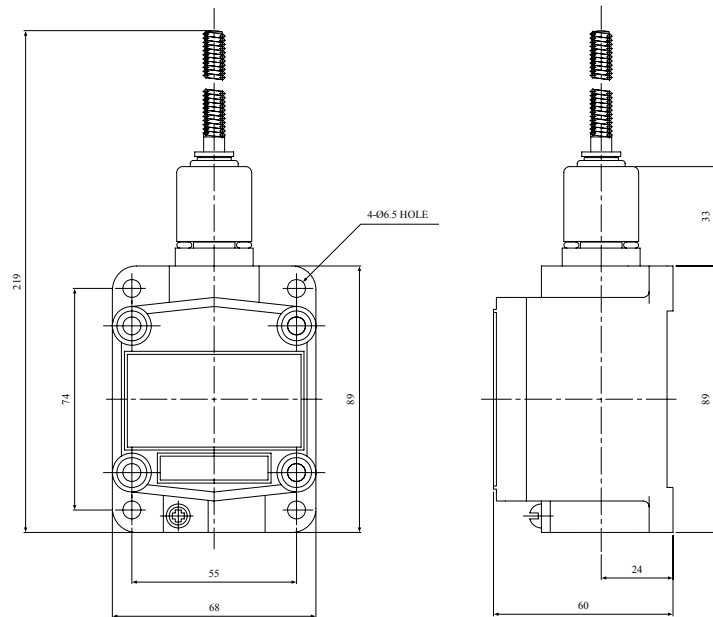
- Body Diecasting Aluminum
- Cover Diecasting Aluminum
- Lever Stainless Steel

Specifications

- Voltage 500 V AC
- Ampere 6A at 110V AC 8A at 24V DC
 5A at 220V AC 4A at 48V DC
 4A at 440V AC 2A at 110V DC
 3A at 500V AC 1A at 220V DC

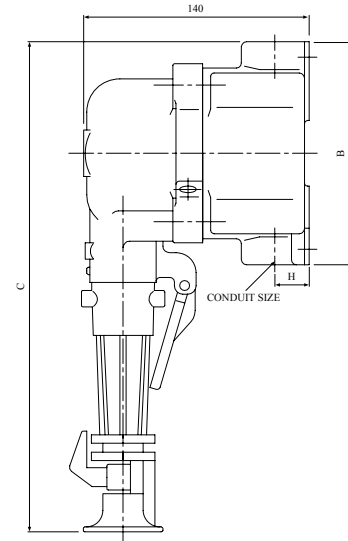
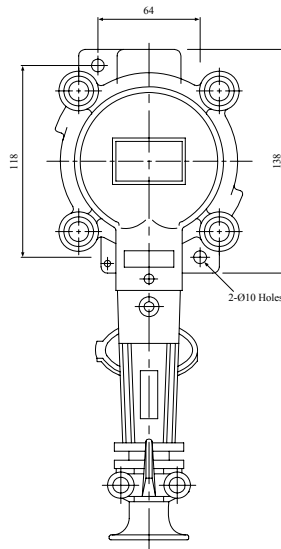
Limit & Foorhold Switch

Class1, Division 1, Ex d II B



Explosionproof Type Plugs & Receptacles (15A)

Class1, Division 1, Ex de II B



Material

- Body Diecasting Aluminum
- Terminal Box Diecasting Aluminum
- Plug Case Diecasting Aluminum

Specifications

- Voltage 250V AC
- Ampere 15A
- Pin Composition 3(2 Pole + Earth)
4(3 Pole + Earth)

Dimensions(mm)

Conduit Size	B	C	H
16(1/2")	140	302	17
22(3/4")	140	302	20
28(1")	145	305	24

Selection Table of Rubber Packings for Cable Entries

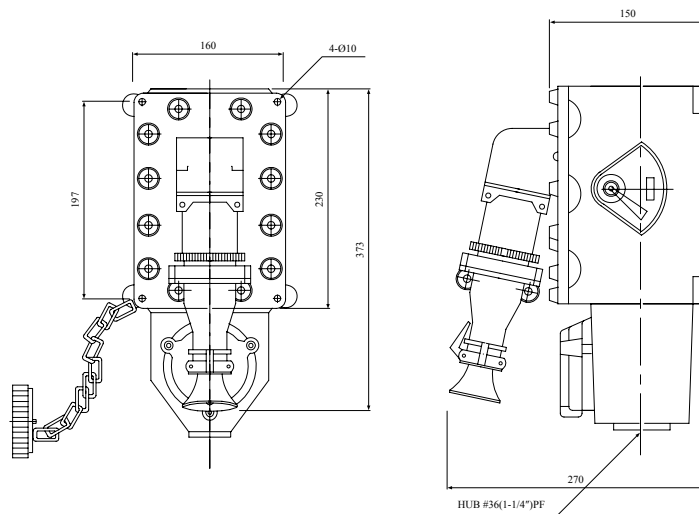
Packing No.	Nominal Diameter of Cable	Suitable Chlorprene Sheathed Portable Power Cable, Class3
15S	13 to 15mm	
16S	15 to 16mm	3 core 0.75 mm ²
17S	16.5 to 17mm	3 core 2.0 mm ²

※ Standard Types are supplied in 17S packing.

Plugs & Socket with Switch 15~20Amps

Rated Voltage(V)	Rated Current(A)	Number of Pins	Catalog No.	Weight(kg)
250	15	3(2 Pole + Earth)	SEPR - 2021	2
250	6	4(3 Pole + Earth)	SEPR - 2022	2

Explosionproof Type Plugs & Receptacle and Circuit Breakers(30A) Class1, Division 1, Ex d II B



Material

- Body Aluminum Casting
- Terminal Box Aluminum Casting
- Plug Case Aluminum Casting

Specification

Rated Voltage (V)	Rated Current (V)	Number of Pins	Rated Interrupting Capacity
220V AC	30A	3(2-Pole + Earth), or 4(3-Pole + Earth)	5000A at 220V AC
460V AC	30A	4(3 - Pole + Earth)	2500A at 460 AC

Selection Table of Rubber Packings for Cable Entries

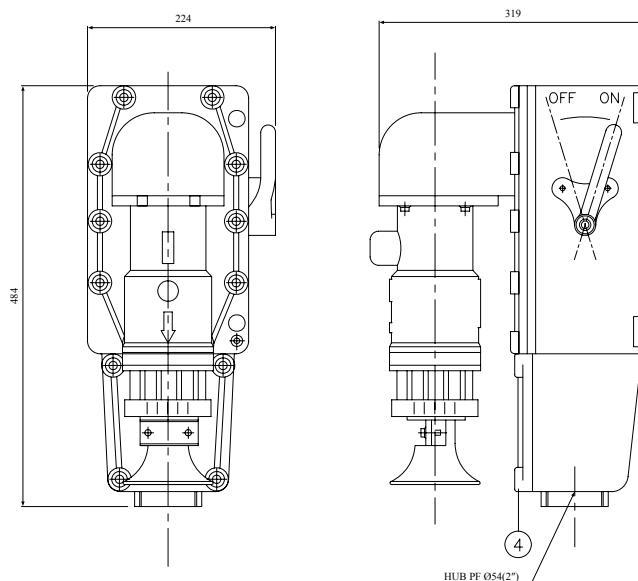
Packing No.	Nominal Diameter of Cable	Suitable Chlorprene Sheathed Portable Power Cable, Class3
28 - 18	16 to 18mm	3 core 2.0 mm ²
28 - 20	18 to 20mm	3 core 3.5 mm ² , 4 core 2.0mm ²
28 - 21	20 to 21mm	3 core 5.5 mm ² , 4 core 3.5mm ²
28 - 22	21 to 22mm	3 core 8 mm ² , 4 core 5.5mm ²

※ Standard Types are supplied in 28-21 packing.

Frameproof Receptacles & Plugs with Circuit Breaker 30 Amps

Rated Voltage (V)	Conduit Entry		Catalog No.		Weight(kg)
	Position	Size	3 - Pin	4 - Pin	
220	Top	22(3/4")	SEPR - 3011	SERB - 3021	11
220	Top	28(1")	SEPR - 3012	SERB - 3022	11
220	Bottom	22(3/4")	SEPR - 3013	SERB - 3023	11
220	Bottom	28(1")	SEPR - 3014	SERB - 3024	11
220	Top & Bottom	22(3/4")	SEPR - 3015	SERB - 3025	13.5
220	Top & Bottom	28(1")	SEPR - 3016	SERB - 3026	13.5
460	22(3/4"), 28(1") Top, Bottom, or Top or Bottom			SERB - 3027	

Explosionproof Type Plugs & Receptacle and Circuit Breakers(100A) Class1, Division 1, Ex de II B



Material

- Body Aluminum Casting
- Terminal Box Aluminum Casting
- Plug Case Aluminum Casting

Specifications

- Voltage 460V AC/250V DC
- Ampere 60, 75 or 100A
- Pin Composition 4(3-Pole + 1 Earth)
- Capacity 15000 A at 460V AC
10000 A at 250V AC

Selection Table of Rubber Packings for Cable Entries

Packing No.	Nominal Diameter of Cable	Suitable Chloroprene Sheathed Portable Power Cable, Class3
54 - 37	33 to 37mm	4 core 22mm ²
54 - 41	37 to 41mm	
54 - 44	41 to 44mm	4 core 38mm ²

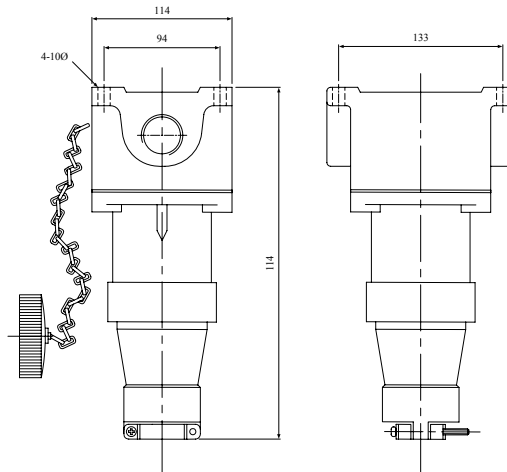
※ Standard Types are supplied in 54-44 packing.

Frameproof Plugs & Receptacles with Circuit Breaker 100 Amps

Rated Voltage (V)	Rated Current (A)	Entry Position	Catalog No.	Weight(kg)
460 AC 250 DC	60	Top	SEPR - 6011	54
	60	Bottom	SEPR - 6012	54
	60	Top and Bottom	SEPR - 6013	62
	75	Top	SEPR - 7501	54
	75	Bottom	SEPR - 7502	54
	75	Top and Bottom	SEPR - 7503	62
	100	Top	SEPR - 10051	54
	100	Bottom	SEPR - 10052	54
	100	Top and Bottom	SEPR - 10053	62

Sealed Type Plugs & Receptacles (30A)

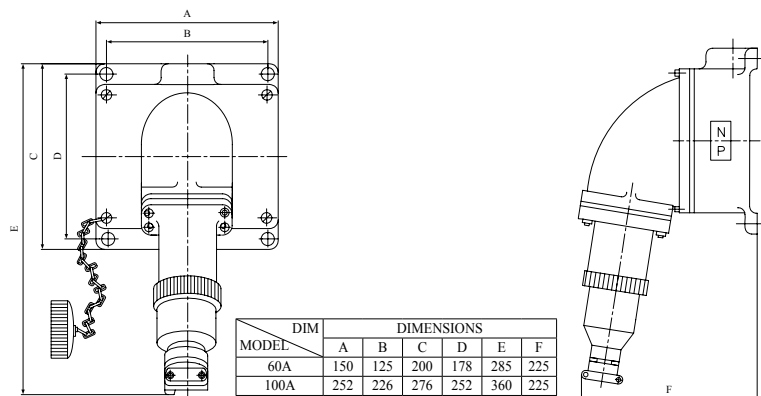
Ex DPe II



Conduit Entry		Catalog No.		Weight(kg)
Position	Size	3-Pin	4-Pin	
Top	22(3/4")	SDPR 11	SDPR 21	3
Top	28(1")	SDPR 12	SDPR 22	3
Bottom	22(3/4")	SDPR 13	SDPR 23	3
Bottom	28(1")	SDPR 14	SDPR 24	3
Top and Bottom	22(3/4")	SDPR 15	SDPR 25	3
Top and Bottom	28(1")	SDPR 16	SDPR 26	3

Sealed Type Plugs & Receptacles (60A, 75A, 100A)

Ex DPe II



Material

- Body Aluminum Casting
- Terminal Box Aluminum Casting
- Plug Case Aluminum Casting

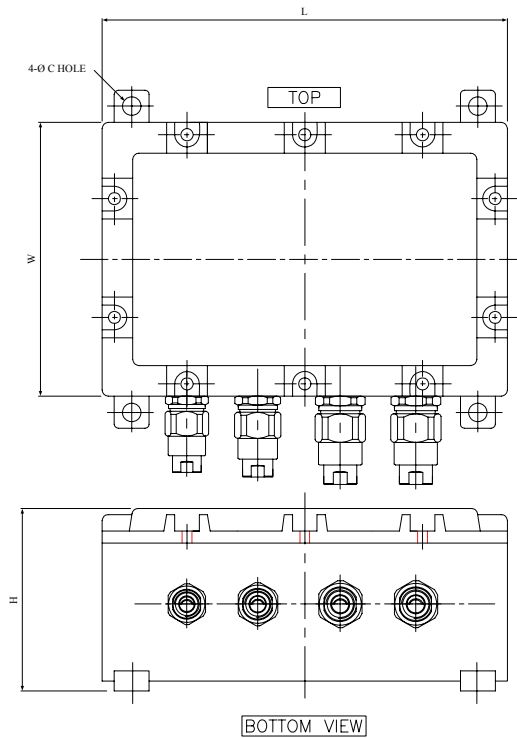
Specifications

- Voltage 460V AC/250V DC
- Ampere 15, 20, 30A 60A or 75A
- Pin Composition 4(3-Pole + 1 Earth)

Rated Voltage (V)	Rated Current (A)	Number of Pins	Catalog No.	Weight(kg)
460AC 250DC	60	2P	SDPR - 6011	4.5
	60	3(2-Pole+Earth)	SDPR - 6012	4.5
	60	4(3-Pole+Earth)	SDPR - 6013	4.5
	75	2P	SDPR - 7501	4.5
	75	3(2-Pole+Earth)	SDPR - 7502	4.5
	75	4(3-Pole+Earth)	SDPR - 7503	4.5
	100	2P	SDPR - 10051	4.5
	100	3(2-Pole+Earth)	SDPR - 10052	4.5
	100	4(3-Pole+Earth)	SDPR - 10053	4.5

Explosionproof Type Terminal Boxes

Class1, Division 1, Ex d IIB



Material

- Body Aluminum Casting
- Cover Aluminum Casting
- Hinge Stainless Steel
- Handle Stainless Steel

Explosion Proof Type

Catalogue No.	Dimension				Terminal Block (Max. Q,TY)	Rating Of Terminal Block
	L	W	H	C		
D-151512	150	150	120	Ø 10	10P	AC 600V
D-221612	220	150	120	Ø 10	20P	
D-222212	220	220	120	Ø 10	20P	
D-222215	220	220	150	Ø 10	30P	
D-302215	300	220	150	Ø 12	30P	
D-303017	300	300	170	Ø 12	30P	
D-303023	300	300	230	Ø 12	40P	
D-312215	310	220	150	Ø 12	40P	
D-353013	350	300	130	Ø 12	40P	
D-353018	350	300	180	Ø 12	40P	
D-403022	400	300	220	Ø 13	60P	
D-404025	400	400	250	Ø 13	60P	
D-503021	500	300	210	Ø 13	80P	
D-5040235	500	400	235	Ø 13	80P	
D-505024	500	500	240	Ø 13	80P	
D-604024	600	400	240	Ø 15	80P	
D-606020	600	600	200	Ø 15	80P	
D-706028	700	600	280	Ø 15	100P	
D-807028	800	700	280	Ø 15	100P	
D-905527	900	550	270	Ø 15	150P 이상	
D-1109026	1100	900	260	Ø 15	150P 이상	
D-1208050	1200	800	500	Ø 15	150P 이상	

(The dimensions may vary from real products)

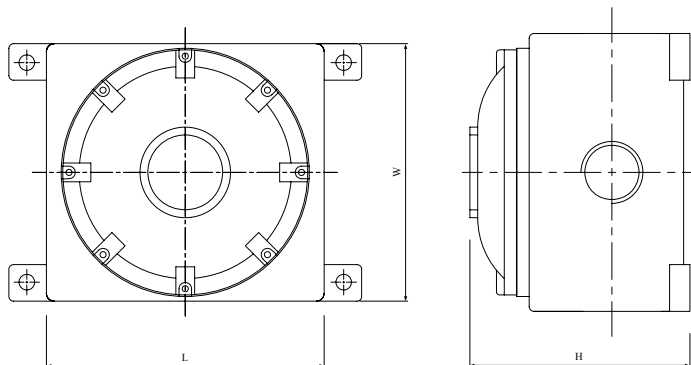
※ Please be advised that box sizes should be selected after the size and quantity of Hub confirmed.

※ Special types are manufactured by made to order basis.

Explosionproof Type Junction Boxes

Class1, Division 1, Ex d II C

Ex d II C

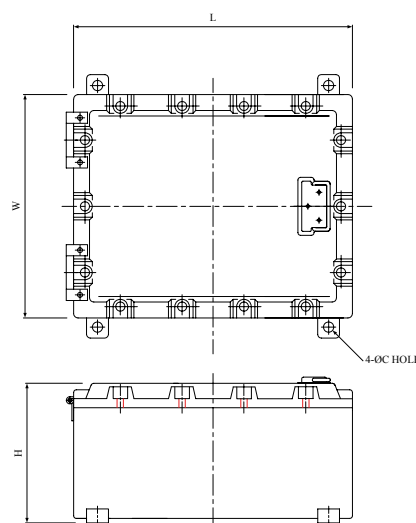


Catalogue No.	Dimension		
	L	W	H
II C - 252015	250	200	150
II C - 303018	300	300	180
II C - 353015	350	300	150
II C - 555025	550	500	250

Explosionproof Type Terminal Boxes

Class1, Division 2, Ex e II

Ex e II



Increased Safety Type

Catalogue No.	Dimension				Terminal Block (Max. Q,TY)	Rating Of Terminal Block
	L	W	H	C		
e-151512	150	150	120	Ø 10	10P	AC 600V 20A-100A
e-221512	220	150	120	Ø 10	20P	
e-302215	300	220	150	Ø 12	20P	
e-303017	300	300	170	Ø 12	20P	
e-353018	350	300	180	Ø 10	40P	
e-403022	400	300	220	Ø 13	40P	
e-5030235	500	400	235	Ø 13	40P	

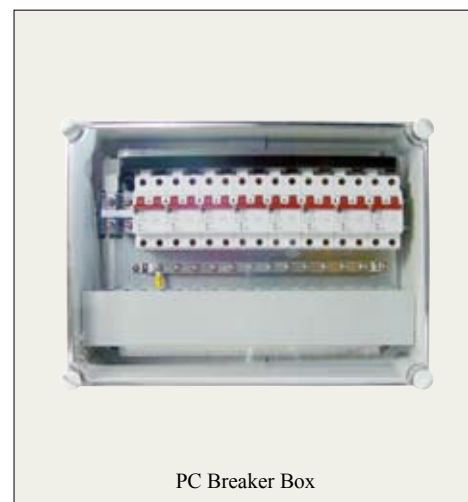
(The dimensions may vary from real products)

- ※ Please be advised that box sizes should be selected after the size and quantity of Hub confirmed.
- ※ Special types are manufactured by made to order basis.

Stainless Steel Sealed Type Junction Boxes



PC Control Boxes



Steel Pull Boxes (Zinc-plated or H.D.G)



W/L/H Type	Width	Length	Height
SH - 1	100	100	50
SH - 2	100	100	75
SH - 3	100	100	100
SH - 4	150	150	100
SH - 5	150	150	150
SH - 6	200	200	100
SH - 7	200	200	150
SH - 8	200	200	200
SH - 9	250	250	100
SH - 10	250	250	150
SH - 11	250	250	200

W/L/H Type	Width	Length	Height
SH - 12	300	300	100
SH - 13	300	300	150
SH - 14	300	300	200
SH - 15	300	300	300
SH - 16	400	400	150
SH - 17	400	400	200
SH - 18	400	400	300
SH - 19	500	500	200
SH - 20	500	500	300
SH - 21	600	600	300
SH - 22	600	600	400

※ Special types are manufactured by made to order basis.



Section F



SAMWHA EXFITTING

SAMWHA EXFITTING Features

SAMWHA pursues its customers' satisfaction with a future-oriented thought and a person-centered management.

1. Samwha Exfittings are superior products which passed the tests conducted by an official examination body and stability of which is secured by the Authorities concerned.
2. Samwha Exfittings have neat aspect and superior capability.

SAMWHA EXFITTING INDEX

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Increased Safety Type Elbows & Tees

Class1, Division 1, Ex e II

Ex e II



LC F7 Type

LC Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LC	#16	16 (1/2")	142	38	45	0.6
	#22	22 (3/4")	154	43	49	0.8
	#28	28 (1")	183	56	60	1.2
	#36	36 (1-1/4")	195	65	74	1.5
	#42	42 (1-1/2")	218	71	82	2.2
	#54	54 (2")	245	80	98	3.2
	#70	70 (2-1/2")	275	97	114	5.0
	#82	82 (3")	305	110	128	6.0
	#104	104 (4")	333	135	153	9.0

Ex e II



LB F7 Type

LB Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LB	#16	16 (1/2")	123	38	64	0.6
	#22	22 (3/4")	133	38	74	0.8
	#28	28 (1")	160	45	86	1.2
	#36	36 (1-1/4")	170	56	98	1.5
	#42	42 (1-1/2")	193	76	112	2.2
	#54	54 (2")	215	77	124	3.2
	#70	70 (2-1/2")	249	97	146	5.0
	#82	82 (3")	278	110	159	6.0
	#104	104 (4")	305	133	177	9.0

Ex e II



LL F7 Type

LL Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LL	#16	16 (1/2")	123	60	45	0.6
	#22	22 (3/4")	133	64	52	0.8
	#28	28 (1")	160	80	68	1.2
	#36	36 (1-1/4")	172	91	76	1.5
	#42	42 (1-1/2")	193	99	84	2.2
	#54	54 (2")	217	111	95	3.2
	#70	70 (2-1/2")	247	130	114	5.0
	#82	82 (3")	278	142	128	6.0
	#104	104 (4")	305	165	154	9.0

Ex e II



LR F7 Type

LR Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LR	#16	16 (1/2")	123	60	45	0.6
	#22	22 (3/4")	133	64	51	0.8
	#28	28 (1")	157	81	63	1.2
	#36	36 (1-1/4")	172	91	75	1.5
	#42	42 (1-1/2")	193	101	84	2.2
	#54	54 (2")	217	111	95	3.2
	#70	70 (2-1/2")	247	131	114	5.0
	#82	82 (3")	278	143	128	6.0
	#104	104 (4")	305	165	154	9.0

Increased Safety Type Elbows & Tees

Class1, Division 1, Ex e II

Ex e II



LT F7 Type

LT Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LT	#16	16 (1/2")	142	60	45	0.65
	#22	22 (3/4")	154	64	49	0.9
	#28	28 (1")	183	80	60	1.4
	#36	36 (1-1/4")	195	92	72	1.7
	#42	42 (1-1/2")	218	102	82	2.4
	#54	54 (2")	245	112	98	3.5
	#70	70 (2-1/2")	275	125	114	5.7
	#82	82 (3")	305	138	128	6.8
	#104	104 (4")	333	168	153	10.0

Ex e II



LX F7 Type

LX Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LX	#16	16 (1/2")	150	75	40	0.8
	#22	22 (3/4")	167	82	46	1.1
	#28	28 (1")	193	96	96	1.6
	#36	36 (1-1/4")	217	112	112	2.0
	#42	42 (1-1/2")	264	133	133	2.7
	#54	54 (2")	312	158	158	4.0

Ex e II



LTB F7 Type

LTB Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
LTB	#16	16 (1/2")	140	38	64	0.65
	#22	22 (3/4")	154	43	72	0.9
	#28	28 (1")	183	56	84	1.4
	#36	36 (1-1/4")	195	65	95	1.7
	#42	42 (1-1/2")	218	71	105	2.4
	#54	54 (2")	245	80	124	3.5
	#70	70 (2-1/2")	275	97	146	
	#82	82 (3")	305	110	155	
	#104	104 (4")	333	135	177	

Exd IIC



SFB Type

SFB Elbows

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			L	W	H	
SFB	#16	16 (1/2")	157	70	102	2.7
	#22	22 (3/4")	157	70	102	2.9
	#28	28 (1")	230	102	133	4.5
	#36	36 (1-1/4")	236	102	133	4.7
	#42	42 (1-1/2")	315	127	182	13
	#54	54 (2")	320	127	182	13.5
	#70	70 (2-1/2")	430	142	240	16.5
	#82	82 (3")	430	142	240	16.5
	#104	104 (4")	670	180	298	18.6

Aluminum Increased Safety Type Elbows & Tees

Class1, Division 1, Ex e II



LB Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (g)
			L	W	H	
LB (AL)	#16	16 (1/2")	109	40	58	207
	#22	22 (3/4")	122	46	65.5	262
	#28	28 (1")	142.5	57	77	450
	#36	36 (1-1/4")	170	66	101	779
	#42	42 (1-1/2")	190	73	109	1015
	#54	54 (2")	220	84	123	1548



LL Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (g)
			L	W	H	
LL (AL)	#16	16 (1/2")	109	40	56	203
	#22	22 (3/4")	122	46	64	264
	#28	28 (1")	142.5	57	76.5	445
	#36	36 (1-1/4")	169.5	66	92	781
	#42	42 (1-1/2")	192	73	99	1003
	#54	54 (2")	220	84	110	1523



LR Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (g)
			L	W	H	
LR (AL)	#16	16 (1/2")	109	56	40	201
	#22	22 (3/4")	122	64	46	261
	#28	28 (1")	142.5	76.5	57	446
	#36	36 (1-1/4")	169	92	66	774
	#42	42 (1-1/2")	190.5	99	73	1002
	#54	54 (2")	221	110	84	1511



LT Series Heavy Duty Conduit Outlet Bodies

Size		Conduit Size	Dimensions (mm)			Weight (g)
			L	W	H	
LT (AL)	#16	16 (1/2")	122	56	43	219
	#22	22 (3/4")	136	64	47.5	286
	#28	28 (1")	158	77	57.5	473
	#36	36 (1-1/4")	194.5	92.5	74	819
	#42	42 (1-1/2")	216	99.5	83	1063
	#54	54 (2")	250	110	96	1625

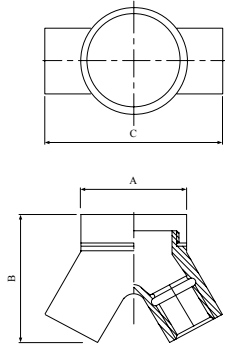
Explosionproof Type Elbows & Tees

Class1, Division 1, Ex d IIC

Ex d IIC



SXB Type



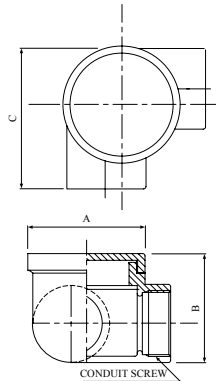
SXB Elbow Series

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			A	B	C	
SXB	#16	16 (1/2")	65	63	90	0.8
	#22	22 (3/4")	65	73	100	0.85
	#28	28 (1")	65	86	114	1.05
	#36	36 (1-1/4")	85	102	133	1.4
	#42	42 (1-1/2")	85	114	148	1.7
	#54	54 (2")	102	130	165	2.4
	#70	70 (2-1/2")	138	155	218	4.2
	#82	82 (3")	138	175	237	5.3

Ex d IIC



SXL Type



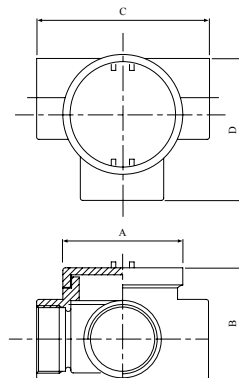
SXL Elbow Series

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			A	B	C	
SXL	#16	16 (1/2")	65	56	80	0.85
	#22	22 (3/4")	65	62	82	0.95
	#28	28 (1")	65	70	84	0.1
	#36	36 (1-1/4")	85	88	105	1.5
	#42	42 (1-1/2")	85	95	113	1.7
	#54	54 (2")	102	114	130	2.7
	#70	70 (2-1/2")	138	134	166	4.6
	#82	82 (3")	138	147	180	5.6

Ex d IIC



SXT Type



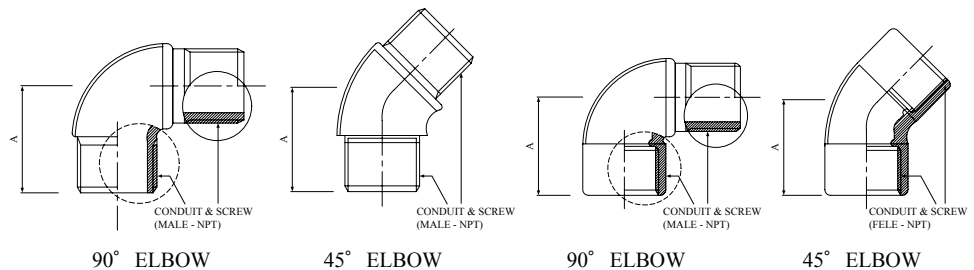
SXT Elbow Series

형 번		Conduit Size	Dimensions (mm)				Weight (kg)
			A	B	C	D	
SXT	#16	16 (1/2")	65	56	95	80	0.95
	#22	22 (3/4")	65	62	97	82	1.05
	#28	28 (1")	65	70	103	84	1.15
	#36	36 (1-1/4")	85	88	125	105	1.7
	#42	42 (1-1/2")	85	95	142	113	2.0
	#54	54 (2")	102	114	158	130	2.9
	#70	70 (2-1/2")	138	134	216	166	4.8
	#82	82 (3")	138	147	240	180	6.1

Ex d IIC



내압방폭 엘보



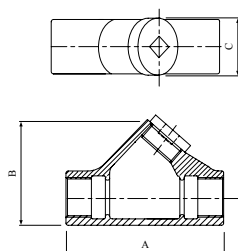
Explosionproof Type Sealing Fittings

Class1, Division 1, Ex d IIC

Ex d IIC



SVF Type



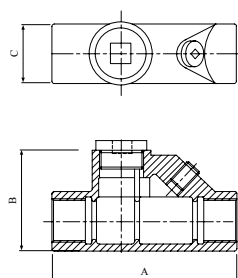
SVF Series (Vertical Type)

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			A	B	C	
SVF	#16	16 (1/2")	81	60	33	0.5
	#22	22 (3/4")	96	72	38	0.6
	#28	28 (1")	105	80	46	0.8
	#36	36 (1-1/4")	127	100	57	1.3
	#42	42 (1-1/2")	143	109	63	1.8
	#54	54 (2")	163	136	80	2.8
	#70	70 (2-1/2")	185	153	93	3.7
	#82	82 (3")	205	185	108	5.2
	#104	104 (4")	231	207	135	6.7

Ex d IIC



SHF Type



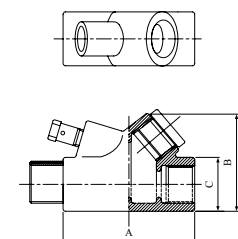
SHF Series (Horizontal Type)

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			A	B	C	
SHF	#16	16 (1/2")	94	46	32	0.55
	#22	22 (3/4")	94	50	38	0.65
	#28	28 (1")	110	60	44	0.93
	#36	36 (1-1/4")	128	72	55	1.3
	#42	42 (1-1/2")	140	86	62	1.95
	#54	54 (2")	158	100	76	2.6
	#70	70 (2-1/2")	190	114	89	3.8
	#82	82 (3")	216	138	108	5.3
	#104	104 (4")	248	154	133	7.2

Ex d IIC



SVD Type



SVD Series (Drain Type)

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			A	B	C	
SVD	#16	16 (1/2")	85	64	32	0.6
	#22	22 (3/4")	84	72	38	0.7
	#28	28 (1")	110	83	45	0.95
	#36	36 (1-1/4")	130	100	57	1.6
	#42	42 (1-1/2")	143	112	63	2.1
	#54	54 (2")	160	136	77	2.8
	#70	70 (2-1/2")	190	152	88	4.3
	#82	82 (3")	216	180	108	5.5
	#104	104 (4")	247	230	133	8.2

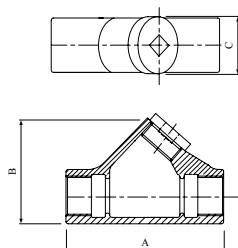
Aluminum Explosionproof Type Sealing Fittings

Class1, Division 1, Ex d IIC

Ex d IIC



SVF Type



AL SVF Series (Vertical Type)

Size		Conduit Size	Dimensions (mm)			Weight (kg)
			A	B	C	
SVF (AL)	#16	16 (1/2")	82	55.3	31	141
	#22	22 (3/4")	90	65	36	198
	#28	28 (1")	98	76	43	290
	#36	36 (1-1/4")	106	94	55	446
	#42	42 (1-1/2")	114	105	61	543
	#54	54 (2")	136	130	75	1012

Accessories



Sealing Compound

Ex d IIC



Drain Plugs
(SHAP - Type)

Ex d IIC



Breathers
(SHB - Type)

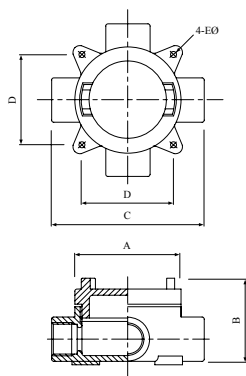
Ex d IIC



Plugs

Explosionproof Type Round Junction Boxes

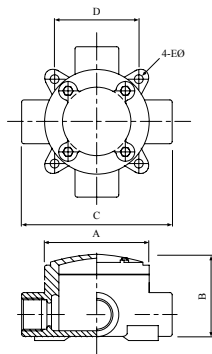
Class1, Division 1, Ex d II C



Size		Conduit Size	Dimensions (mm)					Weight (g)
			A	B	C	D	E	
SERB	#16	16 (1/2")	95	69	134	85	7	1800
	#22	22 (3/4")	95	75	134	85	7	1900
	#28	28 (1")	95	83	138	85	7	1900
	#36	36 (1-1/4")	125	100	170	106	9	3100
	#42	42 (1-1/2")	125	107	170	106	9	3100
	#54	54 (2")	160	135	228	142	10	6400

Increased Safety Type Round Junction Boxes

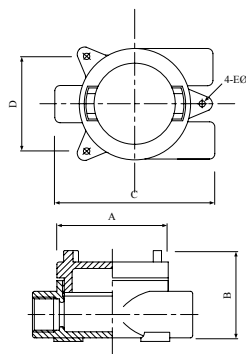
Class1, Division 1, Ex e II



Size		Conduit Size	Dimensions (mm)					Weight (g)
			A	B	C	D	E	
SIRB	#16	16 (1/2")	95	59	134	83	7	1800
	#22	22 (3/4")	95	63	134	83	7	1800
	#28	28 (1")	95	76	138	83	7	2000
	#36	36 (1-1/4")	125	85	170	83	9	3400
	#42	42 (1-1/2")	125	95	170	83	9	3800
	#54	54 (2")	160	118	228	83	10	5400

Explosionproof Special Type Round Junction Boxes

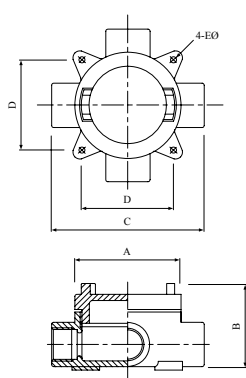
Class1, Division 1, Ex d II C



Size		Conduit Size	Dimensions (mm)				Weight (g)
			A	B	C	D	
SERB-01	#16	16 (1/2")	123	105	188	105	1800
	#22	22 (3/4")	123	105	188	105	1800
	#28	28 (1")	123	105	188	105	2000

Aluminum Explosionproof Type Round Junction Boxes

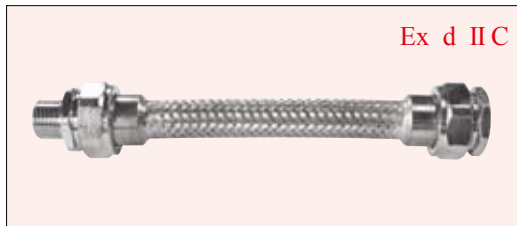
Class1, Division 1, Ex d II C



Size		Conduit Size	Dimensions (mm)					Weight (g)
			A	B	C	D	E	
SERB (A)	#16	16 (1/2")	101.5	88	144	84	9	910
	#22	22 (3/4")	101.5	88	144	84	9	910

Explosionproof Type Flexible Fittings

Class1, Division 1, Ex d II C



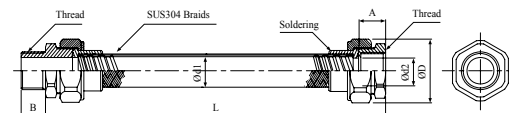
Ex d II C

Feature : This fitting, which has superiority in stability and flexibility by using seamless conduits, passed the rigorous requirements of the tests and inspections conducted by a nationally recognized examination body.

Applications : Recommended for narrow complicated electric wirings at Zone 1 hazardous areas based on the requirements of the explosionproof standards and regulations for factory electric facilities and gas & vapor.

Materials

- Flexible Tube Stainless Steel
- End Fittings Brass & STS, Steel
- Finishes Ni electro plated with chromate finish



Size	Length (L)	A		B		ØD	Ød1	Ød2	CTG	NPT Thread	Weight(g)
		CTG	NPT	CTG	NPT						
EPF	#16	500 mm ~ 1,000 mm	16	17	20.0	38	20.0	13.4	CTG 16	NPT (1/2")	650
	#22		16	17	20.0	46	27.1	19.1	CTG 22	NPT (3/4")	955
	#28		19	21	25.0	54	34.8	25.4	CTG 28	NPT (1")	1320
	#36		20	21	26.0	65	42.1	39.3	CTG 36	NPT (1-1/4")	1755
	#42		20	26	26.0	78	49.1	39.3	CTG 42	NPT (1-1/2")	2600
	#54		23	27	27.0	98	63.0	51.8	CTG 54	NPT (2")	3630
	#70		26	31	39.0	100	78.0	65.2	CTG 70	NPT (2-1/2")	5180
	#82		30	31	41.0	118	92.0	76.5	CTG 82	NPT (3")	6630
	#104		30	31	44.0	154	121.0	101.0	CTG 104	NPT (4")	9810

Increased Safety Type Flexible Fitting

Class1, Division 2, Ex e II



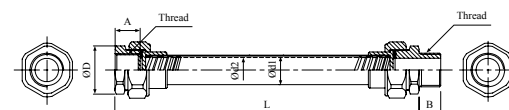
Ex e II

Feature : This fitting, which has superiority in stability and flexibility by using Samwha Plica Conduits, passed the rigorous requirements of the tests and inspection conducted by a nationally recognized examination body.

Applications : Recommended for narrow complicated electric wirings at Zone 2 hazardous areas based on the requirements of the explosionproof standards and regulations for factory electric facilities and gas & vapor.

Materials

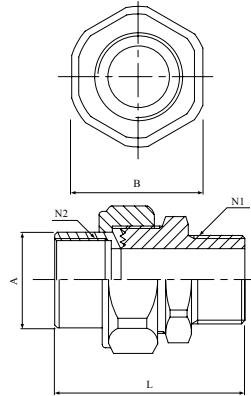
- Flexible Tube 'PLICA Tube' with PVC covering(pv)
- End Fittings Brass, STS, An, Steel
- Finishes Zinc electro plated



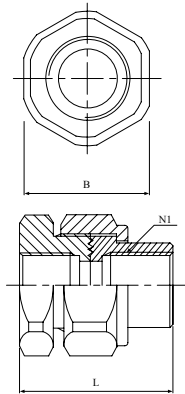
Size		Length (L)	A	B	ØD	Ød1	Ød2	CTG	Weight(g)
PVF	#17	500 mm ~ 1,000 mm	16	17	35	23.1	16.6	CTG 16 (1/2")	736
	#24		16	17	41	30.4	23.8	CTG 22 (3/4")	1028
	#30		19	21	50	36.5	29.3	CTG 28 (1")	1400
	#38		20	21	61	44.9	37.1	CTG 36 (1-1/4")	2032
	#50		20	26	73	56.9	49.1	CTG 42 (1-1/2")	2608
	#63		23	27	85	71.5	62.6	CTG 54 (2")	4276
	#76		26	31	106	85.3	76.0	CTG 70 (2-1/2")	5552
	#83		30	31	116	90.9	81.0	CTG 82 (3")	6324
	#101		30	31	145	110.1	100.2	CTG 104 (4")	7180

Explosionproof Type Union Couplings

Class1, Division 1 & 2, Ex d IIC



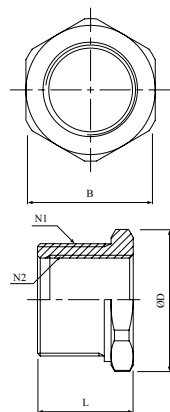
Size	L	B	CTG	Weight (g)
#16	55	32	CTG 16(1/2")	188
#22	57	38	CTG 22(3/4")	234
#28	66	46	CTG 28(1")	376
#36	69	56	CTG 36(1-1/4")	654
#42	80	64	CTG 42(1-1/2")	842
#54	84	74	CTG 54(2")	1096
#70	97	90.5	CTG 70(2-1/2")	1468
#82	100	105	CTG 82(3")	1936
#104	104	133	CTG 104(4")	3924



Size	L	B	CTG	Weight (g)
#16	39	32	CTG 16(1/2")	140
#22	40	38	CTG 22(3/4")	180
#28	45	46	CTG 28(1")	270
#36	48	56	CTG 36(1-1/4")	500
#42	54	64	CTG 42(1-1/2")	630
#54	57	74	CTG 54(2")	800
#70	67	90.5	CTG 70(2-1/2")	1050
#82	70	105	CTG 82(3")	1350
#104	73	133	CTG 104(4")	1970

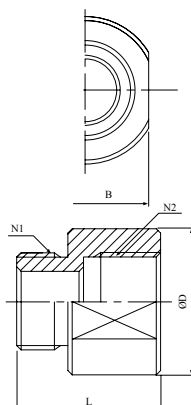
Explosionproof Type Adaptor & Socket

Class1, Division 1 & 2, Ex d IIC



Size	B	ØD	L	CTG		Weight (g)
				N1	N2	
22×16	30	33	23	CTG 22(3/4")	CTG 16(1/2")	42
28×22	35	38	27	CTG 28(1")	CTG 22(3/4")	96
36×28	46	49	28	CTG 36(1-1/4")	CTG 28(1")	180
42×36	50	53	33	CTG 42(1-1/2")	CTG 36(1-1/4")	210
54×42	62	64.5	35	CTG 54(2")	CTG 42(1-1/2")	315
70×54	78	82	38	CTG 70(2-1/2")	CTG 54(2")	646
82×70	90	94	41	CTG 82(3")	CTG 70(2-1/2")	1317
104×82	115.5	119.5	41	CTG 104(4")	CTG 82(3")	1588

Special Types are available by made of order.



Size	B	ØD	L	CTG		Weight (g)
				N1	N2	
16×22	29	31	36	CTG 16(1/2")	CTG 22(3/4")	66
22×28	36	38	39	CTG 22(3/4")	CTG 28(1")	106
28×36	45	47	44	CTG 28(1")	CTG 36(1-1/4")	162
36×42	51	53	44	CTG 36(1-1/4")	CTG 42(1-1/2")	168
42×54	62.5	64.5	53	CTG 42(1-1/2")	CTG 54(2")	240
54×70	80	82	61	CTG 54(2")	CTG 70(2-1/2")	416
70×82	92	96	64	CTG 70(2-1/2")	CTG 82(3")	606
82×104	117	120	65	CTG 82(3")	CTG 104(4")	766

Special Types are available by made of order.

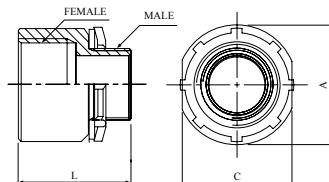
Explosionproof Type Hubs

Class1, Division 1 & 2, Ex d II C

Ex d II C



Hub



Size	Conduit Thread		A	L	C	Weight (g / EA)
	MALE	FEMALE				
HUB	#16	1/2"	26.0	36.0	25.0	60
	#22	3/4"	31.0	36.0	29.0	100
	#28	1"	38.0	43.0	36.0	150
	#36	1-1/4"	47.0	44.0	45.0	160
	#42	1-1/2"	54.0	55.0	52.0	240
	#54	2"	66.0	61.0	63.0	400
	#70	2-1/2"	83.0	65.0	80.0	600
	#82	3"	95.0	66.0	92.0	750
	#104	4"	119.5	66.0	116.0	900

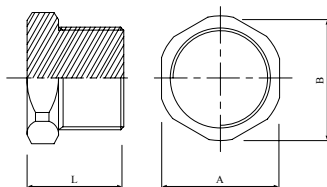
Plug

Class1, Division 1 & 2, Ex d II C

Ex d II C

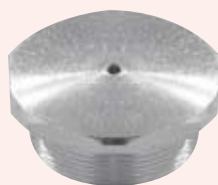


Plug

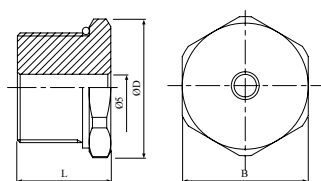


Size		Conduit Thread	A	B	L	Weight (g / EA)
FPG	#16	1/2"	24	26	23	62
	#22	3/4"	30	33	23	99
	#28	1"	35	38	27	172
	#36	1-1/4"	46	49	28	302
	#42	1-1/2"	50	53	33	442
	#54	2"	62	64.5	35	668
	#70	2-1/2"	78	82	38	1458
	#82	3"	90	94	41	1889
	#104	4"	115.5	119.5	41	3192

Drain Plug



Drain Plug

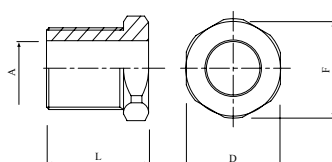


Size		Conduit Thread	B	ØD	L	Weight (g / EA)
FPGD	#16	1/2"	25	28	22	60
	#22	3/4"	30	33	22	90
	#28	1"	35	39	26	160
	#36	1-1/4"	46	49	28	290
	#42	1-1/2"	50	54	30	430
	#54	2"	63	67	32	650
	#70	2-1/2"	79	82	40	1430
	#82	3"	93	97	42	1860
	#104	4"	125	129	45	3170

Chase Nipple



Chase Nipple



Size		Conduit Thread	A	D	F	L	Weight (g / EA)
FNGC	#16	1/2"	14.0	24.0	26.0	23.0	38
	#22	3/4"	19.0	30.0	33.0	23.0	42
	#28	1"	25.0	35.0	38.0	27.0	96
	#36	1-1/4"	33.0	46.0	49.0	28.0	180
	#42	1-1/2"	39.0	50.0	53.0	33.0	210
	#54	2"	51.0	62.0	65.0	35.0	315
	#70	2-1/2"	62.0	78.0	82.0	38.0	46
	#82	3"	77.0	90.0	95.0	41.0	1317
	#104	4"	102.0	115.5	120.0	41.0	1588

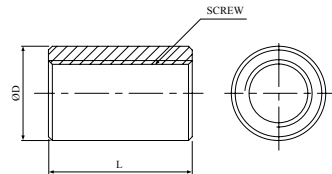
Explosionproof Type Couplings

Class1, Division 1 & 2, Ex d II C

Ex d II C



Couplings

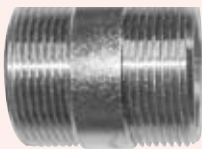


Size		Conduit Thread	ØD	L	Weight (g / EA)
SVC	#16	1/2"	25	38	82
	#22	3/4"	31	44	173
	#28	1"	37	50	202
	#36	1-1/4"	47	56	367
	#42	1-1/2"	55	56	375
	#54	2"	68	64	559
	#70	2-1/2"	84	72	690
	#82	3"	97	80	746
	#104	4"	123	90	842

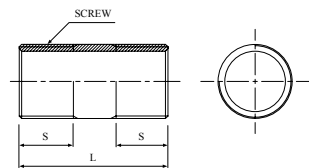
Explosionproof Type Nipple

Class1, Division 1 & 2, Ex d II C

Ex d II C



Nipple



Size		Conduit Thread	S	L	Weight (g / EA)
FNG	#16	1/2"	17	44	84
	#22	3/4"	17	44	117
	#28	1"	20	55	200
	#36	1-1/4"	20	55	238
	#42	1-1/2"	20	55	281
	#54	2"	25	65	450
	#70	2-1/2"	25	65	720
	#82	3"	30	80	1142
	#104	4"	35	90	1296

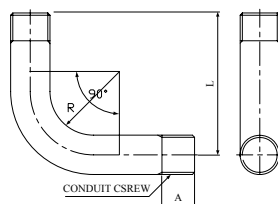
Normal Bend

Class1, Division 1 & 2, Ex d II C

Ex d II C



Normal Bend

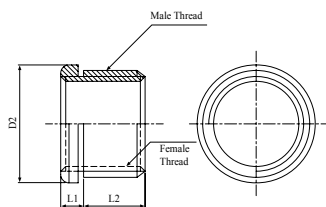


Size		Conduit Thread	A	L	R	Weight (g / EA)
SNB	#16	1/2"	19	150	90	270
	#22	3/4"	22	180	110	425
	#28	1"	25	215	140	670
	#36	1-1/4"	28	250	170	994
	#42	1-1/2"	28	295	210	1350
	#54	2"	32	345	235	2200
	#70	2-1/2"	36	425	275	3400
	#82	3"	40	510	310	5000
	#104	4"	45	645	395	9700
	#130	5"	45	800	500	
	#150	6"	50	930	600	

DIN Type Adaptors



DIN Type Adaptors

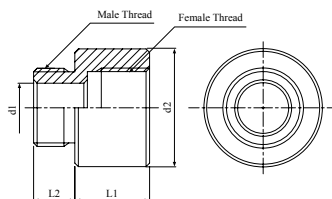


Size		PG Thread		D2	L1	L2	Weight (g / EA)
		Male Thread	Female Thread				
APG	#9	pg 9	pg 7	17.0	2.5	6.0	
	#11	pg 11	pg 9	20.0	3.0	6.0	
	#13.5	pg 13.5	pg 11	23.0	3.0	7.5	
	#16	pg 16	pg 13.5	25.0	3.0	7.5	
	#21	pg 21	pg 16	30.0	3.5	8.0	
	#29	pg 29	pg 21	40.0	4.0	8.0	
	#36	pg 36	pg 29	50.0	4.5	9.5	
	#42	pg 42	pg 36	57.0	6.0	10.0	
	#48	pg 48	pg 42	63.0	6.0	11.5	

DIN Type Socket



DIN Type Socket

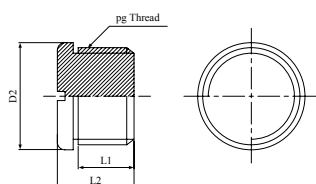


Size		PG Thread		d1	d2	L1	L2	Weight (g / EA)
		Male Thread	Female Thread					
SPG	#9	pg 7	pg 9	10.0	17.0	10.5	6.0	
	#11	pg 9	pg 11	12.5	20.0	11.0	6.0	
	#13.5	pg 11	pg 13.5	15.0	23.0	12.5	6.5	
	#16	pg 13.5	pg 16	17.0	25.0	13.5	6.5	
	#21	pg 16	pg 21	18.5	30.0	15.0	7.0	
	#29	pg 21	pg 29	24.0	40.0	16.5	8.0	
	#36	pg 29	pg 36	32.0	50.0	19.5	9.0	
	#42	pg 36	pg 42	42.0	57.0	22.0	10.0	
	#48	pg 42	pg 48	48.0	63.0	23.0	10.0	

DIN Type Plug



DIN Type Plug



Size		PG Thread	D2	L1	L2	Weight (g / EA)
PPG	#7	pg 7	14	5.5	8	
	#9	pg 9	17	6	8.5	
	#11	pg 11	20	6	9	
	#13.5	pg 13.5	23	7.5	10.5	
	#16	pg 6	25	7.5	10.5	
	#21	pg 21	30	8	11.5	
	#29	pg 29	40	8	12	
	#36	pg 36	50	9.5	14	
	#42	pg 42	57	10	16	
	#48	pg 48	63	11.5	17.5	



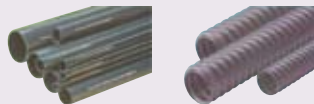
Section G



SAMWHA CONDUIT FITTING

SAMWHA is always ready to cope with any demands from its customers promptly and positively.

SAMWHA CONDUITFITTING INDEX

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Steel Pipes

KS Pipe

KS C 8401-1997

Size (mm)	Out. Dia (mm)	Out. Dia. Tolerance (mm)	Appr. Thickness (mm)	Inn. Dia. (mm)	Weight (kg/m)	L of Interlocked Thread (mm)	
						Max.	Min.
16	21.0	± 0.3	2.3	16.4	1.06	19	16
22	26.5	± 0.3	2.3	21.9	1.37	22	19
28	33.3	± 0.3	2.5	28.3	1.90	25	22
36	41.9	± 0.3	2.5	36.9	2.43	28	25
42	47.8	± 0.3	2.5	42.8	2.79	28	25
54	59.6	± 0.3	2.8	54.0	3.92	32	28
70	75.2	± 0.3	2.8	69.6	5.00	36	32
82	87.9	± 0.3	2.8	82.3	5.88	40	36
★92	100.7	± 0.4	3.5	93.7	8.39	42	36
104	113.4	± 0.4	3.5	106.4	9.48	45	39

ANSI Pipe

ANSI C 80.1-1983, ANSI C 80.2-1983

Size	Inn. Dia.		Out. Dia		Appr. Thickness		L except Socket		Min. Wgt. of 10 pc with Socket	
	in.	mm	in.	mm	in.	mm	ft. & in.	m	lb.	kg
3/8	0.493	12.5	0.675	17.1	0.091	2.31	9-11-1/2	3.04	51.5	23.36
1/2	0.632	16.1	0.840	21.3	0.104	2.64	9-11-1/4	3.03	79.0	35.83
3/4	0.836	21.2	1.050	26.7	0.107	2.72	9-11-1/4	3.03	105.0	47.63
1	1.063	27.0	1.315	33.4	0.126	3.20	9-11	3.02	153.0	69.40
1-1/4	1.394	35.4	1.660	42.2	0.133	3.38	9-11	3.02	201.0	91.17
1-1/2	1.624	41.2	1.900	48.3	0.138	3.51	9-11	3.02	249.0	112.95
2	2.083	52.9	2.375	60.3	0.146	3.71	9-11	3.02	332.0	150.60
2-1/2	2.489	63.2	2.875	73.0	0.193	4.90	9-10-1/2	3.01	527.0	239.05
3	3.090	78.5	3.500	88.9	0.205	5.21	9-10-1/2	3.01	682.6	309.63
3-1/2	3.570	90.7	4.000	101.6	0.215	5.46	9-10-1/4	3.00	831.0	376.94
4	4.050	102.9	4.500	114.3	0.225	5.72	9-10-1/4	3.00	972.3	441.04
5	5.073	128.9	5.563	141.3	0.245	6.22	9-10	3.00	1313.6	595.85
6	6.093	154.8	6.625	168.3	0.266	6.76	9-10	3.00	1745.3	791.67

Accessories for Steel Pipes

Half Saddle



Size	Rigid Conduit Size	Weight (kg)
120	12 (3/8")	
160	16 (1/2")	
220	22 3/4"	
280	28(1")	
360	36 (1-1/4")	
420	42 (1-1/2")	
540	54 (2")	
700	70 (2-1/2")	
820	82 (3")	
920	92 (3-1/2")	
1040	104 (4")	

Saddle



Size	Rigid Conduit Size	Weight (kg)
123	12 (3/8")	
163	16 (1/2")	
223	22 3/4"	
283	28(1")	
363	36 (1-1/4")	
423	42 (1-1/2")	
543	54 (2")	
703	70 (2-1/2")	
823	82 (3")	
923	92 (3-1/2")	
1043	104 (4")	

Pipe Clamp



Size	Rigid Conduit Size	Weight (g)
16	16 (1/2")	31
22	22 3/4"	38
28	28(1")	41
36	36 (1-1/4")	60
42	42 (1-1/2")	67
54	54 (2")	76
70	70 (2-1/2")	92
82	82 (3")	115
104	104 (4")	140

U Bolt



Size	Rigid Conduit Size	Weight (kg)
12	12 (3/8")	
16	16 (1/2")	
22	22 3/4"	
28	28(1")	
36	36 (1-1/4")	
42	42 (1-1/2")	
54	54 (2")	
70	70 (2-1/2")	
82	82 (3")	
92	92 (3-1/2")	
104	104 (4")	

Lock Nut



Size	Rigid Conduit Size	Weight (g)
16	16 (1/2")	7
22	22 3/4"	10
28	28(1")	14
36	36 (1-1/4")	16
42	42 (1-1/2")	20
54	54 (2")	30
70	70 (2-1/2")	57
82	82 (3")	81
104	104 (4")	135

Clamp Back



Size	Rigid Conduit Size	Weight (kg)
12	12 (3/8")	
16	16 (1/2")	
22	22 (3/4")	
28	28 (1")	
36	36 (1-1/4")	
42	42 (1-1/2")	
54	54 (2")	
70	70 (2-1/2")	
82	82 (3")	
92	92 (3-1/2")	
104	104 (4")	

Accessories for Steel Pipes

SLCC Clamp



Size	Rigid Conduit Size	Weight (kg)
16	16 (1/2")	
22	22 3/4"	
28	28(1")	
36	36 (1-1/4")	
42	42 (1-1/2")	
54	54 (2")	
70	70 (2-1/2")	
82	82 (3")	
92	92 (3-1/2")	
104	104 (4")	

Pipe Hanger



Size	Rigid Conduit Size	Weight (kg)
16	16 (1/2")	
22	22 3/4"	
28	28(1")	
36	36 (1-1/4")	
42	42 (1-1/2")	
54	54 (2")	
70	70 (2-1/2")	
82	82 (3")	
92	92 (3-1/2")	
104	104 (4")	

Pi Rack, Clip



Pi Rack



Clip

Size	Rigid Conduit Size	Weight (kg)
16	16 (1/2")	
22	22 3/4"	
28	28(1")	
36	36 (1-1/4")	
42	42 (1-1/2")	
54	54 (2")	

Grounding Bushing



Material : Zinc & Casting

Size	Rigid Conduit Size	Weight (kg)
16	16 (1/2")	
22	22 3/4"	
28	28(1")	
36	36 (1-1/4")	
42	42 (1-1/2")	
54	54 (2")	
70	70 (2-1/2")	
82	82 (3")	
92	92 (3-1/2")	
104	104 (4")	

Insulating Bushing



Material : Zinc & Casting

Size	Rigid Conduit Size	Weight (kg)
16	16 (1/2")	10
22	22 3/4"	15
28	28(1")	24
36	36 (1-1/4")	39
42	42 (1-1/2")	54
54	54 (2")	76
70	70 (2-1/2")	101
82	82 (3")	182
104	104 (4")	335

Channel



Size	Length	Finish	Weight (kg)
39×22×1.2T	1,200	Electro Zinc-plated	
42×25×1.6T	1,200	Electro Zinc-plated	
42×25×1.6T	1,200	Hot-Dip Zinc-Galvanized	
42×25×2.6T	3,000	Hot-Dip Zinc-Galvanized	
42×42×2.6T	3,000	Hot-Dip Zinc-Galvanized	8
84×42×2.6T	3,000	Hot-Dip Zinc-Galvanized	16

Recessed Type Switch Box & Outlet Box

1Way Switch Box & Connecting Box



Switch Cone Cover



Switch Flat Cover



2 Way Switch Box & Connecting Box



Raised Vol. Switch Cone Cover



Square Flat Cover



Octagon Outlet Box & Connecting Box



Octagon Raised Cover



Octagon Flat Cover



Outlet Box & Connecting Box



Exposed Switch Box



Ring Type Box



Exposed Waterproof Outlet Boxes & Switch Boxes & Grounding Bars



2P 15A 110V 2 Gang Single



2P 15A 220V 1 Gang



2P 15A 300V



2P 15A 110V 2 Gang Duplex



2P 15A 220V Duplex



3P 30A 300V, 3P 50A 300V



2P 15A 110V 2 Gang Triple



2P 15A 220V Triple



4P 30A 300V

Exposed Waterproof Switch



1P 3A 300V Single, 3P 6A 300V



1P 6A 300V Duplex, 3P 6A 300V



1P 6A 300V Triple, 3P 6A 300V

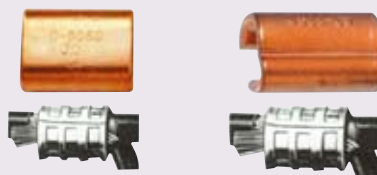
Grounding Bars and Grounding Connectors, Grounding Terminals



Grounding Bar

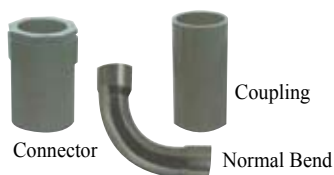


Grounding Connector



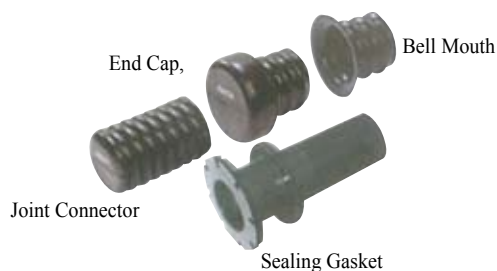
Grounding Terminal

PVC Connectors (HI PIPE)



Size	Conduit SIZE	Inn. Dia.	Out. Dia.	Thick-ness	L/pcs (M)	Weight (g/m)
HI 16	1/2"	18	22	2.0	4	180
HI 22	3/4"	22	26	2.0	4	216
HI 28	1"	28	34	3.0	4	418
HI 36	1-1/4"	35	42	3.5	4	605
HI 42	1-1/2"	40	48	4.0	4	791
HI 54	2"	51	60	4.5	4	1.122
HI 70	2-1/2"	67	76	4.5	4	1.445
HI 82	3"	77	89	5.9	4	2.202
HI 100	4"	100	114	6.5	4	3.138

ELP Corrugated Pipes

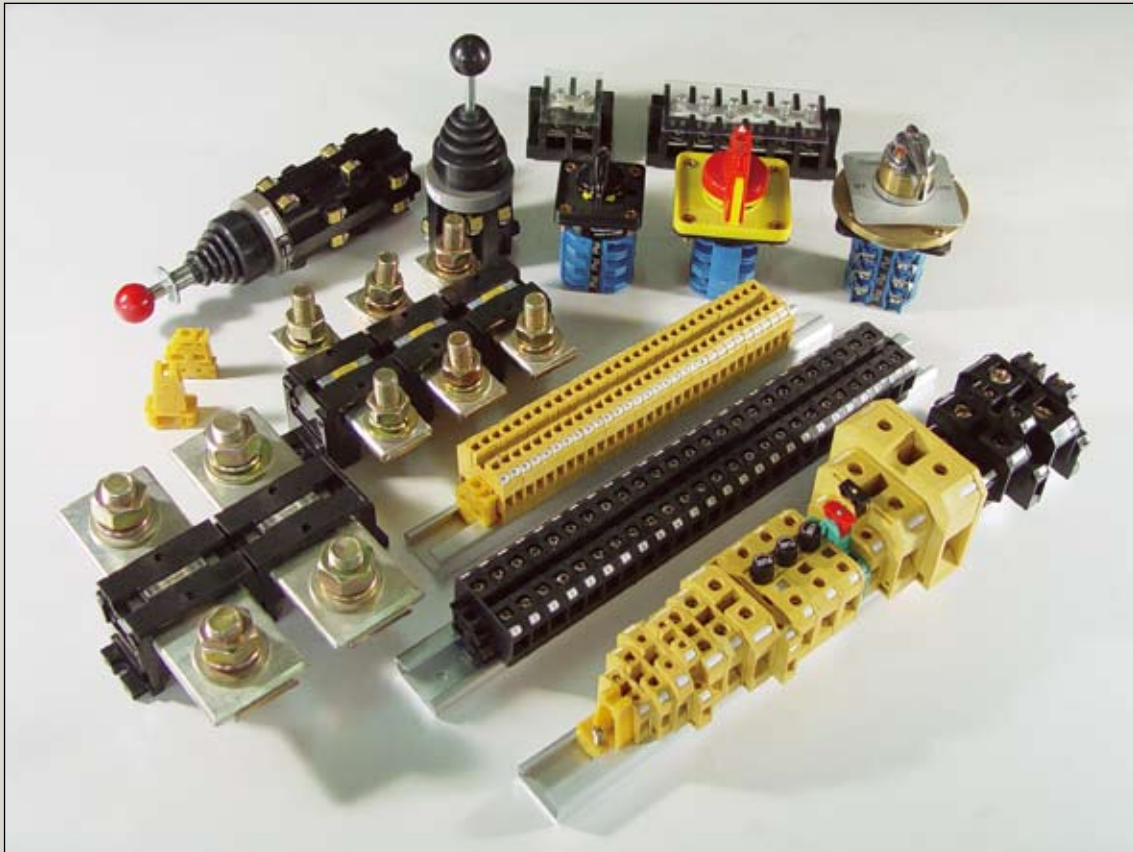


Size	Inn. Dia.	Out. Dia.	L/Roll (M)	Weight (g/m)
ELP 30	30 ± 2.0	40 ± 2.0	100	172
ELP 40	40 ± 2.0	53.5 ± 2.0	100	243
ELP 50	50 ± 2.5	64.5 ± 2.5	100	354
ELP 65	60 ± 2.5	84.5 ± 2.5	100	525
ELP 80	80 ± 3.0	105 ± 3.0	100	738
ELP 100	100 ± 4.0	130 ± 4.0	100	1010
ELP 125	125 ± 4.0	160 ± 4.0	50	1428
ELP 150	150 ± 4.0	188 ± 4.0	50	2040
ELP 175	175 ± 4.0	230 ± 4.0	30	3930
ELP 200	200 ± 4.0	260 ± 4.0	30	4670

PE Pipes



Size	Conduit SIZE	Inn. Dia.	Out. Dia.	Thick-ness	L/Roll (M)	Weight (g/m)
PE 16	1/2"	16	21.0	2.5	100	153
PE 22	3/4"	22	27.5	2.75	90	177
PE 28	1"	28	34.0	3.0	90	245
PE 36	1-1/4"	36	42.0	3.0	60	329
PE 42	1-1/2"	42	48.0	3.0	60	405
PE 54	2"	53	60.0	4.8	40	593
PE 70	2-1/2"	68	76.0	4.8	40	864
PE 82	3"	79	79.0	6.3	40	1260



Section H



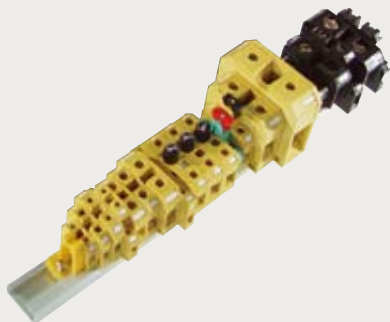
SAMWHA CONTROL UNIT

SAMWHA CONTROL UNIT Features

1. Convenient to cable wirings without disassembling parts in a clip-on & pull-off installing structure.
2. Easy to change any terminal blocks regardless of number of terminals with a clip-on assembly method.
3. Superior to insulation and heat-resistance with excellent PBT from safety's point of view.
4. Samwha Cam Switches meet its customers' needs.

SAMWHA CONTROL UNIT INDEX

Terminal Block (105 Page)



Lug Less Type
Lug Type
Fuse Type
Switch Type
Bus Bar Type
Sectional Type
C.T Common Type

Cam Switch (110 Page)



Voltmeter Switch (V/S)
Ammeter Switch (A/S)
Volt-Ammeter Switch (V.A/S)
Pad Lock Type

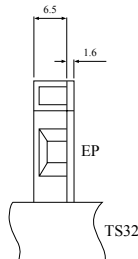
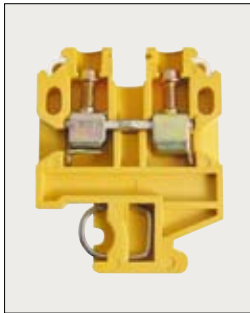
Mono Lever Switch (119 Page)



Short Lever Switch
Long Lever Switch
Locking Lever Switch

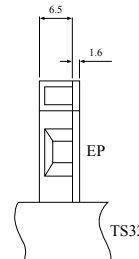
Terminal Block - Lugless Type

SH-STB 2.5C



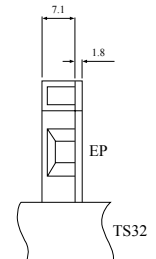
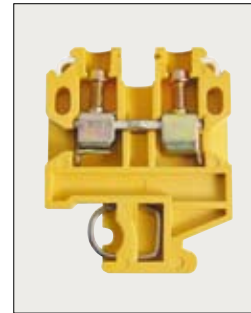
Cat. No.	1020
Weight (kg/100)	0.78
Std. Pack	20
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	8.5mm Min. 0.5 to 3.5mm ²
Volt	600V
Amp	20A
Cable Size	2.5SQ 12AWG
Block Size (W×H)	28×38.5

SH-STB 4C



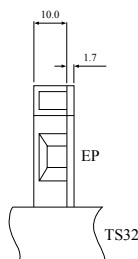
Cat. No.	1027
Weight (kg/100)	1.17
Std. Pack	20
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	11.0mm Min. 0.5 to 5.5mm ²
UL Approvals	1987. AWG 18 to 12 600V
Volt	
Amp	27A
Cable Size	4SQ 10AWG
Block Size (W×H)	37×45

SH-STB 6C



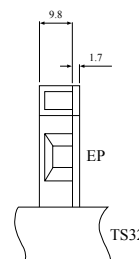
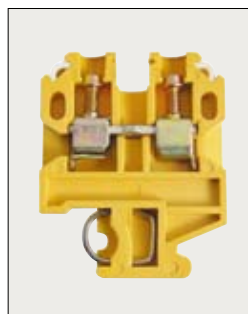
Cat. No.	1036
Weight (kg/100)	1.60
Std. Pack	20
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	13.0mm Min. 0.5 to 5.5mm ²
Volt	750V
Amp	36A
Cable Size	6SQ 10AWG
Block Size (W×H)	41×49.5

SH-STB 10C



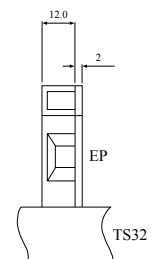
Cat. No.	1047
Weight (kg/100)	2.37
Std. Pack	10
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	13.5mm Min. 0.5 to 8mm ²
UL Approvals	1987. AWG 16 to 8 600V
Volt	
Amp	47A
Cable Size	10SQ 8AWG
Block Size (W×H)	40×47

SH-STB 16C



Cat. No.	1065
Weight (kg/100)	2.47
Std. Pack	10
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	13.5mm Min. 3.5 to 14mm ²
Volt	750V
Amp	65A
Cable Size	16SQ 6AWG
Block Size (W×H)	42×49.5

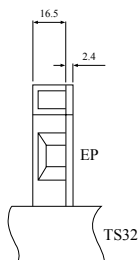
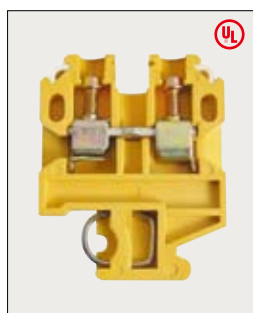
SH-STB 25C



Cat. No.	1087
Weight (kg/100)	3.65
Std. Pack	10
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	14.5mm Min. 5.5 to 22mm ²
UL Approvals	1987. AWG 16 to 6 600V
Volt	
Amp	87A
Cable Size	25SQ 4AWG
Block Size (W×H)	40×47

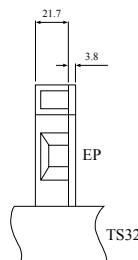
Terminal Block - Lugless Type

SH-STB 50C



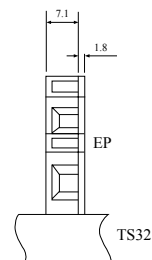
Cat. No.	1143
Weight (kg/100)	8.53
Std. Pack	6
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable	19.5mm Min.
Within the Range of Cable	8 to 50mm ²
UL Approvals	1987, AWG 12 to 4 600V
Volt	
Amp	143A
Cable Size	50SQ 2AWG
Block Size (W×H)	58×65

SH-STB 70C



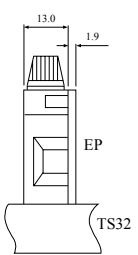
Cat. No.	1220
Weight (kg/100)	18.2
Std. Pack	3
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable	26mm Min.
Within the Range of Cable	14 to 60mm ²
Volt	750V
Amp	220A
Cable Size	70SQ 2AWG
Block Size (W×H)	74×76

SH-STB 2.5D



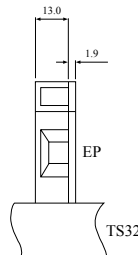
Cat. No.	1120
Weight (kg/100)	1.74
Std. Pack	10
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable	8.0/9.5mm Min.
Within the Range of Cable	0.5 to 3.5mm ²
Volt	380V
Amp	20A
Cable Size	2.5SQ 12AWG
Block Size (W×H)	51.5×56

SH-STB 1.2FW



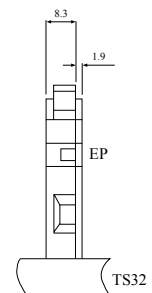
Cat. No.	1011-110Volt 1012-220Volt
Weight (kg/100)	4.26
Std. Pack	6
Application Fuse	5×20mm
With Indicating LED	
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable	13.0mm Min.
Within the Range of Cable	0.5 to 14mm ²
Volt	500V
Amp	10A
Cable Size	6SQ 10AWG
Block Size (W×H)	54×58.5

SH-STB 1.2F



Cat. No.	1010
Weight (kg/100)	4.07
Std. Pack	6
Application Fuse	5×20mm
110 or 220V, DC 24V	
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable	13.0mm Min.
Within the Range of Cable	0.5 to 14mm ²
Volt	500V
Amp	10A
Cable Size	6SQ 10AWG
Block Size (W×H)	54×58.5

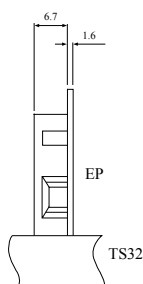
SH-STB 1.6T



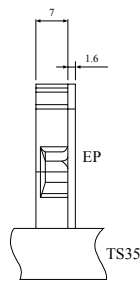
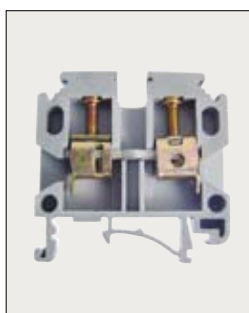
Cat. No.	1016
Weight (kg/100)	2.29
Std. Pack	10
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable	12.0mm Min.
Within the Range of Cable	0.5 to 8mm ²
Volt	600V
Amp	16A
Cable Size	4SQ 12AWG
Block Size (W×H)	43×70.5

Terminal Block - Lugless Type

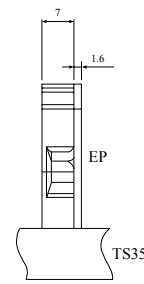
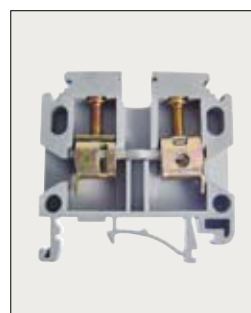
SH-STB 1.6R



SH-STB 4U



SH-STB 6U



Cat. No.	2416
Weight (kg/100)	1.55
Std. Pack	20
Insulating Material	Polybutylene Terephthalate/UL94 V-0
Stripping Length of Cable Within the Range of Cable	13.0mm Min. 0.5 to 0.55mm ²
Volt	500V
Amp	16A
Cable Size	4SQ 12AWG
Block Size (W×H)	58×44.5

Cat. No.	7027
Weight (kg/100)	1.0
Std. Pack	20
Insulating Material	Nylon sw
Stripping Length of Cable Within the Range of Cable	11.0mm Min. 0.5 to 5.5mm ²
Volt	750V
Amp	27A
Cable Size	4SQ 10AWG
Block Size (W×H)	41.5×42
AWG 18 to 12 600V	

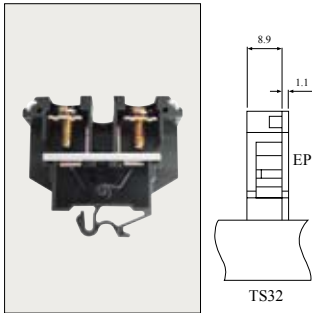
Cat. No.	7036
Weight (kg/100)	1.1
Std. Pack	20
Insulating Material	Nylon sw
Stripping Length of Cable Within the Range of Cable	13.0mm Min. 0.5 to 5.5mm ²
Volt	750V
Amp	36A
Cable Size	6SQ 10AWG
Block Size (W×H)	42×42
AWG 18 to 12 600V	

Accessories

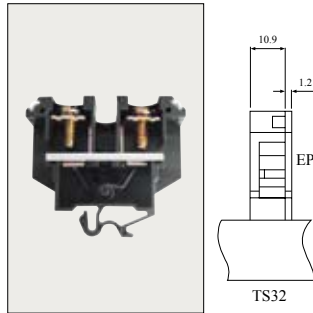


Terminal Block - Lug Type

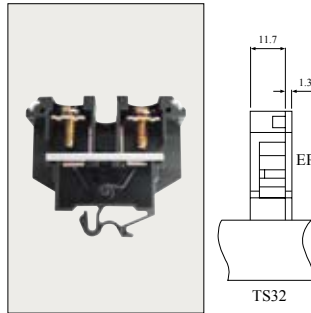
SH-STB 015L



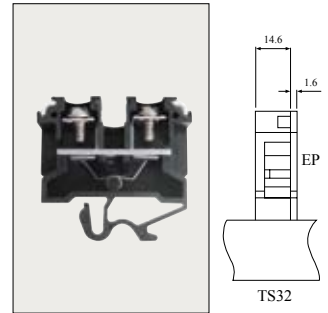
SH-STB 025L



SH-STB 035L



SH-STB 065L



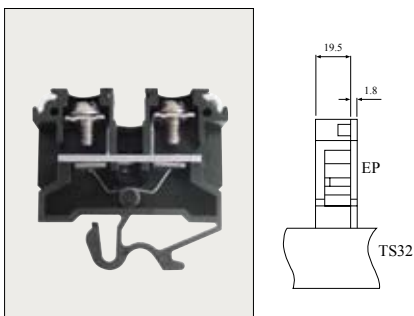
Cat. No.	3015
Weight (kg/100)	1.00
Std. Pack	20
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	15A
Cable Size	4SQ 12AWG
Block Size (W×H)	39×37

Cat. No.	3025
Weight (kg/100)	1.40
Std. Pack	20
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	25A
Cable Size	6SQ 10AWG
Block Size (W×H)	42×38.5

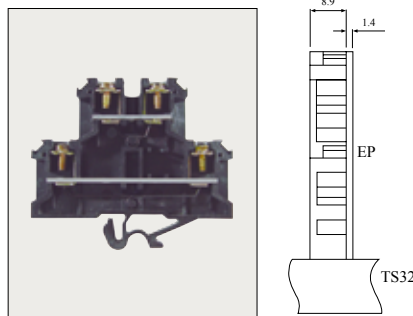
Cat. No.	3035
Weight (kg/100)	1.71
Std. Pack	20
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	35A
Cable Size	10SQ 8AWG
Block Size (W×H)	45.5×42

Cat. No.	3065
Weight (kg/100)	3.30
Std. Pack	10
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	65A
Cable Size	16SQ 6AWG
Block Size (W×H)	53×51

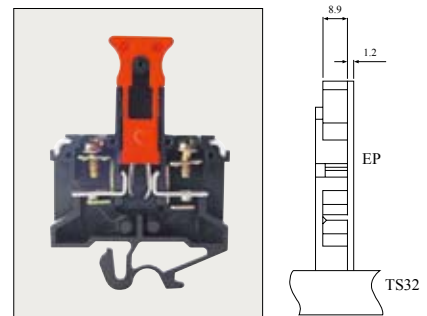
SH-STB 110L



SH-STB 015LD



SH-STB 015LT



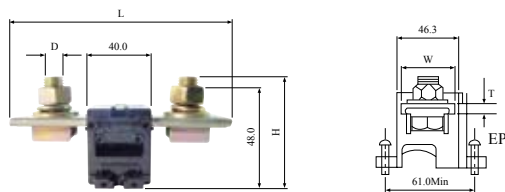
Cat. No.	3110
Weight (kg/100)	3.32
Std. Pack	6
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	110A
Cable Size	35SQ 24AWG
Block Size (W×H)	64×56

Cat. No.	3115
Weight (kg/100)	2.30
Std. Pack	10
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	15A
Cable Size	4SQ 12AWG
Block Size (W×H)	70×60

Cat. No.	3215
Weight (kg/100)	1.40
Std. Pack	10
Application Cable Lug	
Insulating Material	Nylon 6/UL94 V-0
Volt	600V
Amp	15A
Cable Size	4SQ 12AWG
Block Size (W×H)	43×61

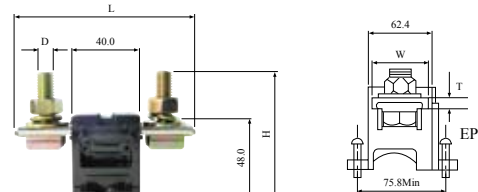
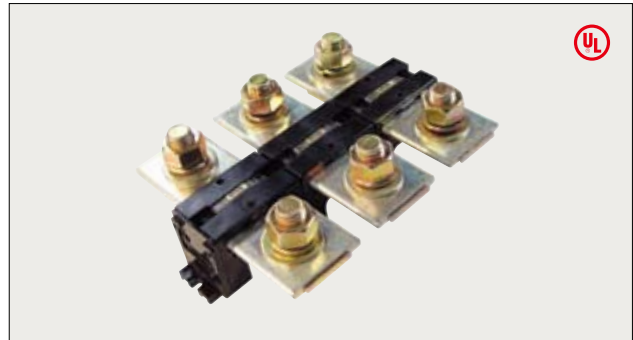
Terminal Block - Busbar Type

100B~300B



Cat. No.	5100	5200	5300
Weight (kg/100)	18.80	24.85	32.12
Std. Pack	3	3	3
Insulating Material	Polycarbonate		
UL Approvals	1987. AWG 4 to 2/0 600V		
	100B	200B	300B
Height H	56	60	66
Bolt D	M18	M10	M12
Length L / W / T	105 / 30 / 3	105 / 30 / 4	105 / 30 / 5
Amp	100A	200A	300A
Cable Size	2AWG 38SQ	3/0AWG 80SQ	250AWG 125SQ

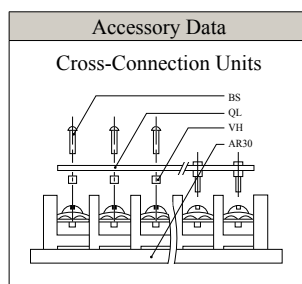
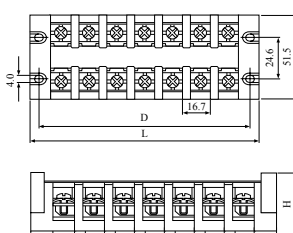
400B~600B



Cat. No.	5400	5500	5600
Weight (kg/100)	55.35	64.25	73.18
Std. Pack	3	3	3
Insulating Material	Polycarbonate		
UL Approvals	1987. AWG 3/0 to 4/0 600V		
	400B	500B	600B
Height H	70	70	70
Bolt D	M16	M16	M16
Length L / W / T	145 / 40 / 4	145 / 50 / 5	145 / 50 / 6
Amp	400A	500A	600A
Cable Size	400AWG 200SQ	500AWG 250SQ	600AWG 325SQ

Terminal Block - Sectional Type

Test Terminal Block, C.T Common Terminal



	STB 30E - 3	STB 30E - 6	STB 30E - 10	STB 30E - 12	STB 20E - 16CT
Cat. No.	6303	6306	6310	6312	6206
Weight (kg/100)	12.14	21.25	32.72	37.65	24.13
Std. Pack	3	1	1	1	1
Length L	70.0	120.0	186.0	218.5	120.0
Length H	35.5	35.5	35.5	35.5	41.0
Mounting Distance D	59.0	109.0	175.0	208.5	109.5

	STB 30E	STB 20E - 16CT
Volt	600V	600V
Amp	30A	20A
Cable Size	10AWG 5.5SQ	10AWG 5.5SQ
Insulating Material	Phenol	
Within the Range of Cable	2 to 8 mm ²	
Standard Poles of Block	3, 6, 10 and 12 poles	
UL Approvals	1987.AWG 14 to 10 600V	

Cam Switches



Samwha Cam Switches

- Voltmeter Switches (V / S)
- Ammeter Switches (A / S)
- Volt-Ammeter Switches (V .A / S)



- Control Switches (C / S)
- Selector Switches (S / S)
- Pad Lock Type
- Special Ordering



Samwha Cam Switch Features :

Samwha Cam Switches are manufactured to meet its customers' needs. Functionally voltmeter switches, ammeter switches, volt-ammeter switches, control switches, selector switches and also by made to order special types are available.

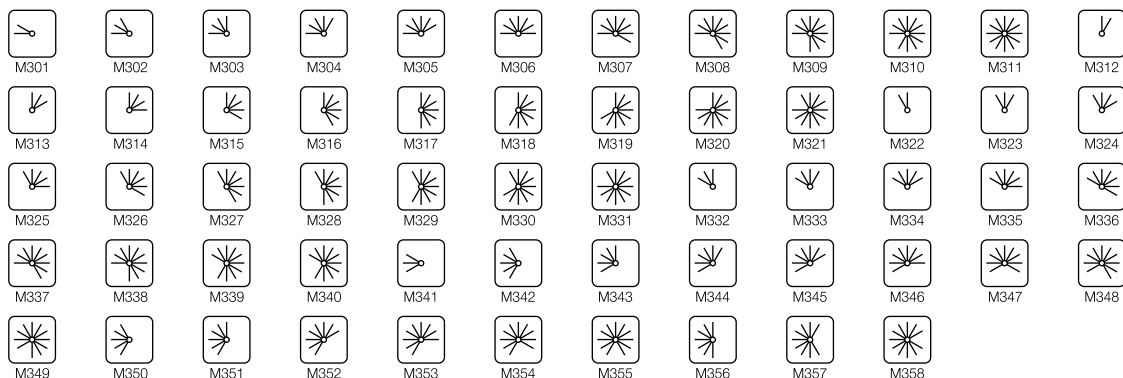
Samwha Cam Switches are manufactured for max. 12 grips with 24 contacts and 12A & 24A. A variety of handles are available.

Switch Positions

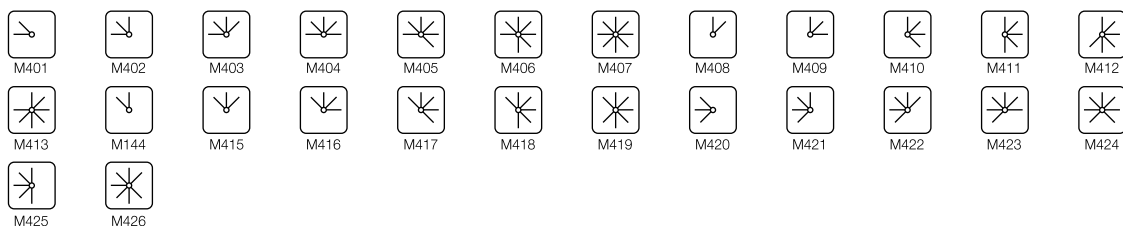
Manual return type

Samwha Cam Switches are capable for up to max. 12 grips with diverse angles of 30°, 45°, 60°, 90° providing various positions.

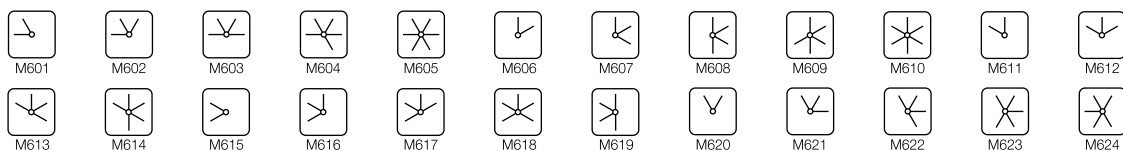
Switching angle 30°



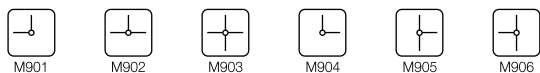
Switching angle 45°



Switching angle 60°

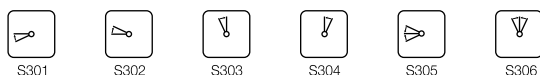


Switching angle 90°

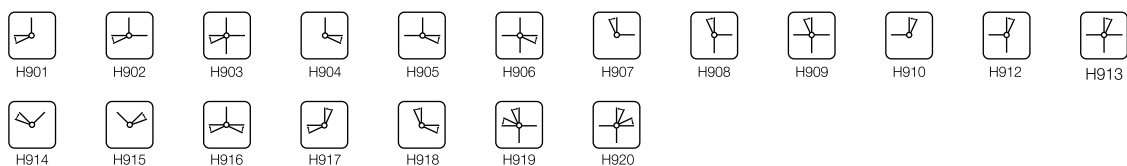


Spring return type

Switching angle 30°

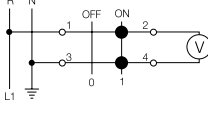
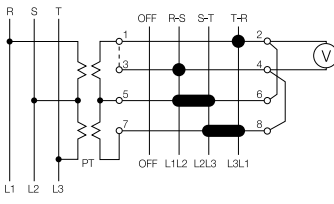
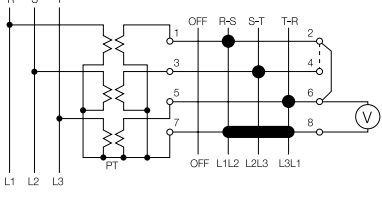
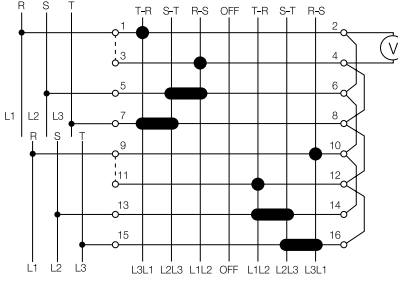
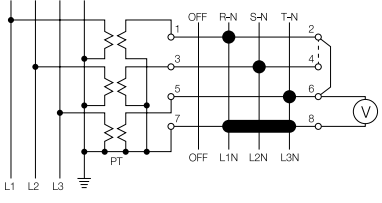
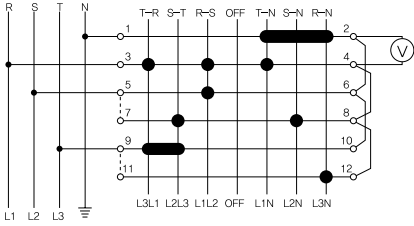


Switching angle 90° manual and 30° spring return.



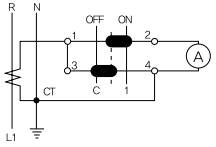
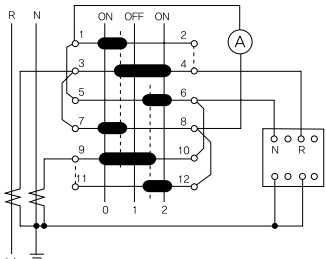
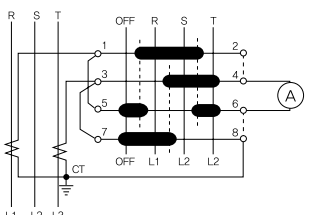
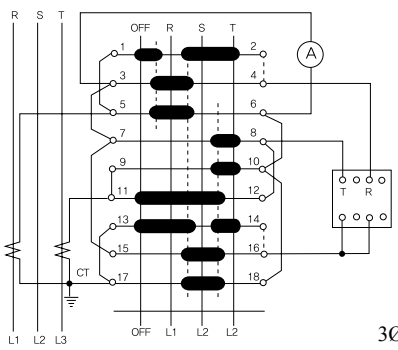
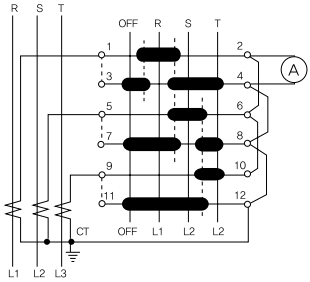
Standard Switch Functions

Voltmeter switches (V/S)

Type	Function	Escutcheon Plate	Stages	Connecting diagram
SH-CVS-2W	1 phase 2 wires. 1 phase to neutral.	   	1	 1Ø2W
SH-CVS-3W	3 phases 3 wires. 3 phases to phase. with 2 potential transformers	 	2	 3Ø3W 2PT
SH-CVS-3WT	3 phases 3 wires. 3 phases to phase with 3 potential transformers.			 3Ø3W 3PT
SH-CVS-3WD	2 lines 3 phases 3 wires. 2 separates 3 phases to phase with center OFF	 	4	 3Ø3W
SH-CVS-4W	3 phases 4 wires. 3 phases to neutral with 3 potential transformers	 	2	 3Ø4W 3PT
SH-CVS-34W	3 phases 3 and 4 wires. 3 phases to phase and 3 phases to neutral with center OFF	 	3	 3Ø3 & 4W

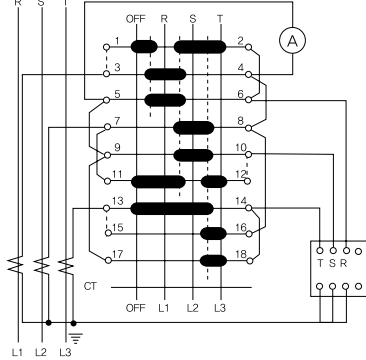
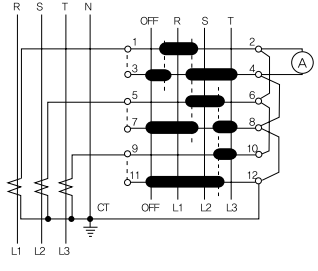
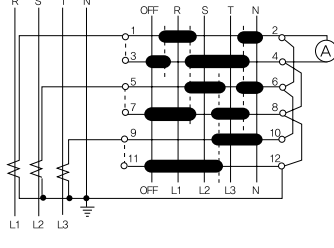
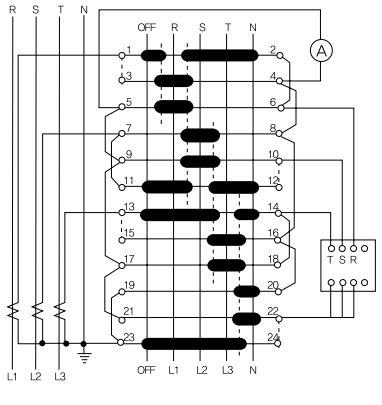
Standard Switch Functions

Voltmeter switches (V/S)

Type	Function	Escutcheon Plate	Stages	Connecting diagram
SH-CAS-2W	1 phase 2 wires. 1 current transformer.	   	1	 1Ø2W 1CT
SH-CAS-2WL	1 phase 2 wires. 2 current transformers.	   	3	 1Ø2W 2CT
SH-CAS-3WL	3 phases 3 wires. 2 current transformers.	 	2	 3Ø3W 2CTW
SH-CAS-3WL			5	 3Ø3W 2CT
SH-CAS-3WT	3 phases 3 wires. 3 current transformers.		3	 3Ø3W 3CT

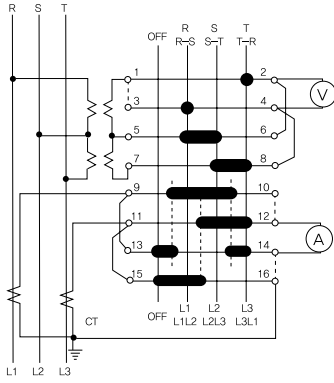
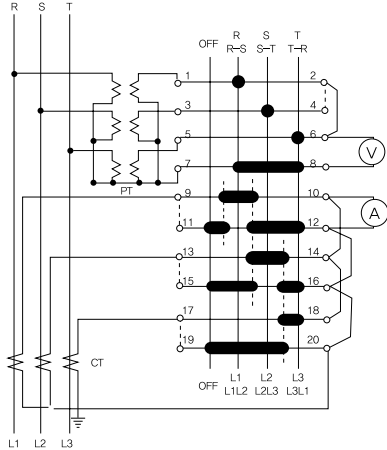
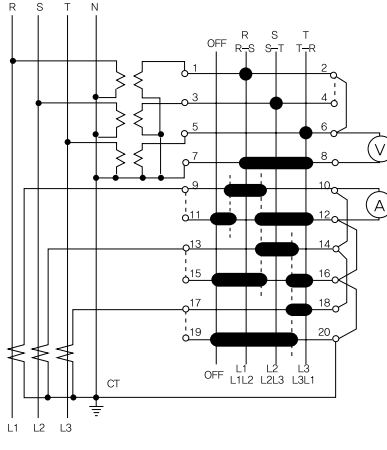
Standard Switch Functions

Ammeter switches (A/S)

Type	Function	Escutcheon Plate	Stages	Connecting diagram
SH-CAS-3WK	3 phases 3 wires. 3 current transformers.	 A 409  A 410	5	 3Ø3W 3CT
SH-CAS-4W	3 phases 4 wires. 3 current transformers.		3	 3Ø4W 3CT
SH-CAS-4WN	3 phases 4 wires. 3 current transformers.	 V 411  A 412	3	 3Ø4W 3CT
SH-CAS-4WL	5 step switch with NEUTRAL position.		6	 3Ø4W 3CT

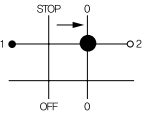
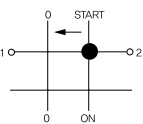
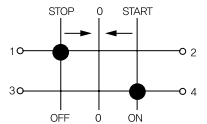
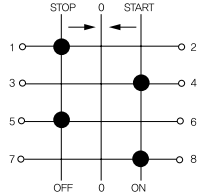
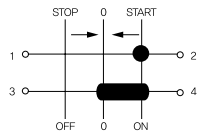
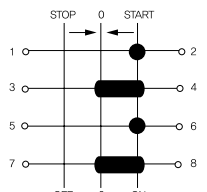
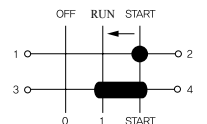
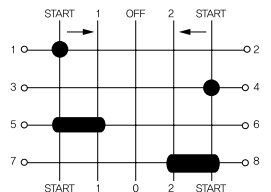
Standard Switch Functions

Volt-Ammeter switches (V.A/S)

Type	Function	Escutcheon Plate	Stages	Connecting diagram
SH-CVAS-3W	3 phases voltage 3 phases current 3 wires. 2 potential trans- formers and current transformers	 VA 401  VA 402	4	 3Ø3W 2PT & CT
SH-CVAS-3WT	3 pharases voltage 3 phases current 3 wires. 3 potential trans- formers and current transformers.		5	 3Ø3W 3PT & CT
SH-CVAS-4W	3 phases voltage 3 phases current 4 wires. 3 potential trans- formers and current transformers.	 VA 403  VA 404	5	 3Ø4W 3PT & CT

Standard Switch Functions

Control switches (C/S)

Type	Function	Escutcheon Plate	Stages	Connecting diagram
SH-CCS-211S	Stop switch with spring return from STOP position.	 C 301  C 302	1	
SH-CCS-212S	Start switch with spring return from START position.	 C 303  C 304	1	
SH-CCS-313S	Circuit breaker control switch. Stop-start switch with spring return from STOP and START positions.	 C 305  C 306	1	
SH-CCS-324S		 C 307	2	
SH-CCS-315S		 C 308  C 309	1	
SH-CCS-326S		 C 310	2	
SH-CCS-311H	Stop-start switch with spring return from START to RUN	 C 911  C 912	1	
SH-CCS-522H	Stop-start switch with spring return to RUN for 2 units.	 C 913  C 914	2	

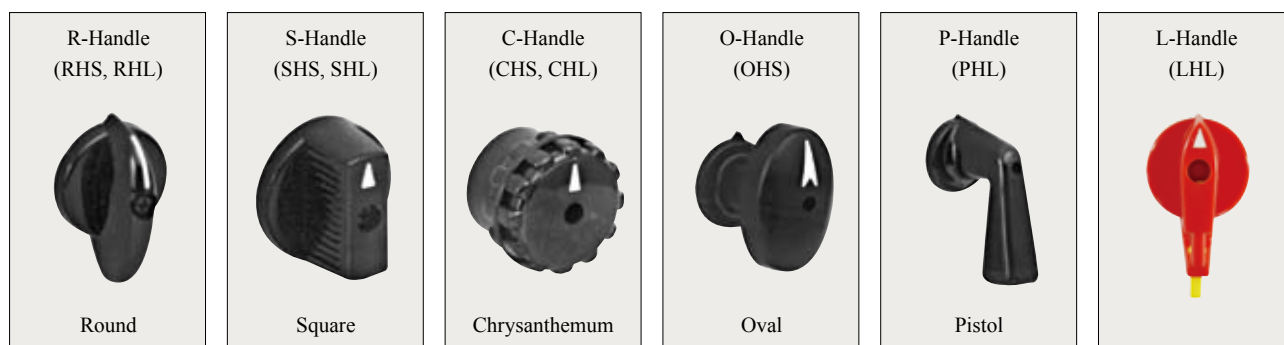
Standard Switch Functions

Control switches (C/S)

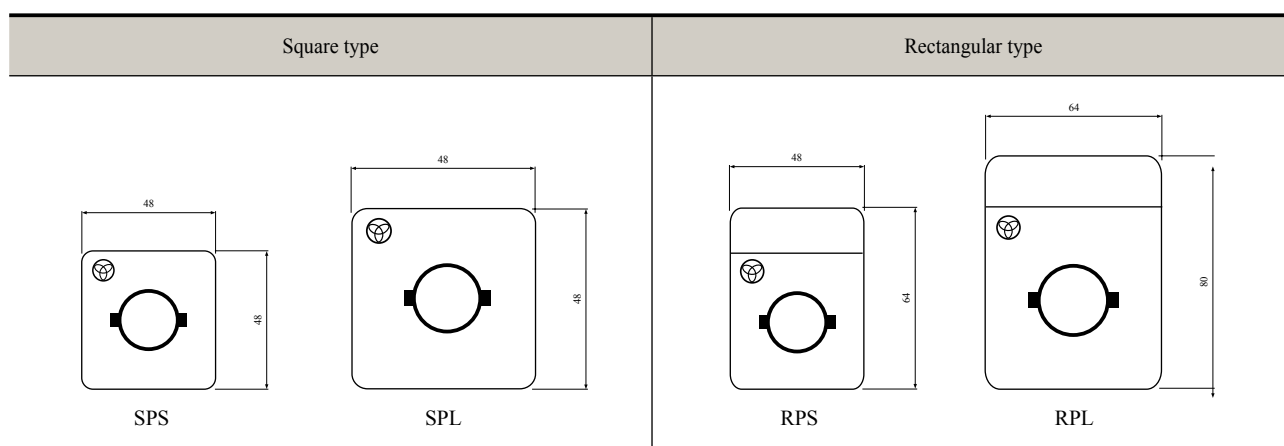
Type	Function	Escutcheon Plate	Stages	Connecting diagram
SH-CCS-321M	Motor reversing switch 1 phase 2 wires.		2	
SH-CCS-332M	Motor reversing switch 3 phases 3 wires.		3	
SH-CCS-343M	Pole-changing in two-speed motors with one winding. 3 phases 3 wires. Pos. 1; low speed. Pos. 2; high speed.		4	
SH-CCS-464M	Pole-changing in three-speed motors with two windings and one common winding for speed 1 and 2. 3 phases 3 wires.		6	
SH-CCS-565M	Pole-changing and reversing of two-speed motors with one winding. 3 phases 3 wires. Pos. 1; low speed. Pos. 2; high speed.		6	

Accessories

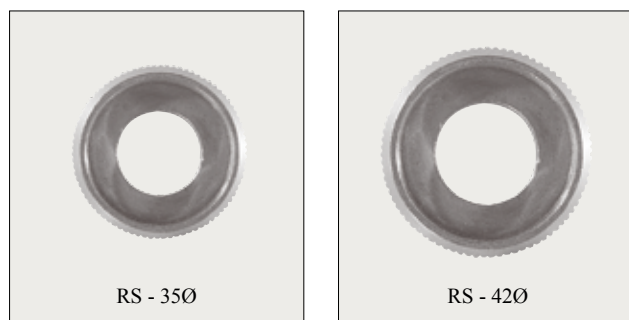
Handle



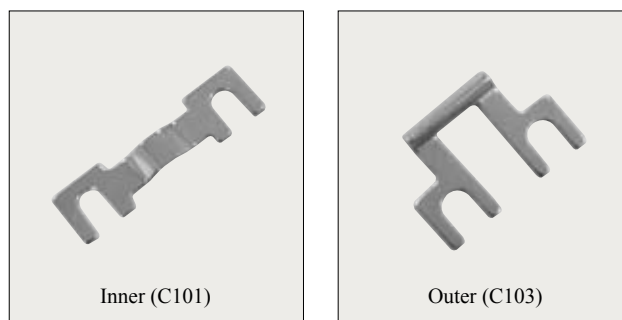
Face Plate



Face Ring



Connecting Link



Shaft Sealing Cover



Mono Lever Switch



Short-Lever Switch



Long-Lever Switch

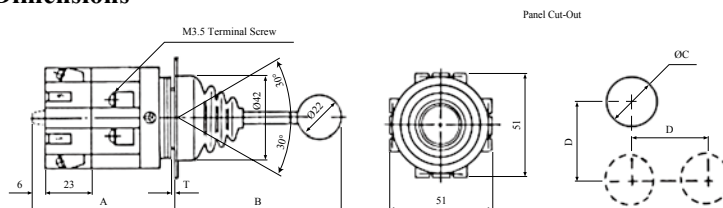


Interlocking-Lever Switch

The contact block contains two pairs of double-break silver contacts, available with 1a1b(1NO-1NC), 2a(2NO), or 2b(2NC) contacts.

Up to four contact blocks can be mounted on an operating base.

■ Dimensions



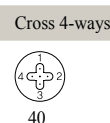
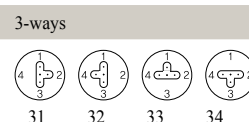
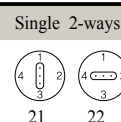
Lever Type	A Number of Block				B Lever Length	T Panel Thickness	ØC Mounting Hole	D Min. Distance of Mounting Center
	1 Block	2 Block	3 Block	4 Block				
Short-Lever	47	70	93	116	63	0.8 to 6	30.5 ^{+0.5} _{-0.5}	70
Long-Lever	47	70	93	116	83	0.8 to 6	30.5 ^{+0.5} _{-0.5}	110
Interlocking -Lever	47	70	93	116	83	0.8 to 6	30.5 ^{+0.5} _{-0.5}	110

■ **Specifications** Selectable for each operating way

Rating	Lever Directions	Lever Returns	Lever Center Locking	Lever Handle Colors	Number of Contact block	Contats
600V 10A	Single 2-ways 3-ways cross 4-ways	Manual and Spring Return	With and Without Locking	Black Green Red	1 to 4	1a (1No) 1b (1NC) 1a1b (1NO-1NC) 2a (2NO) 2b (2NC)

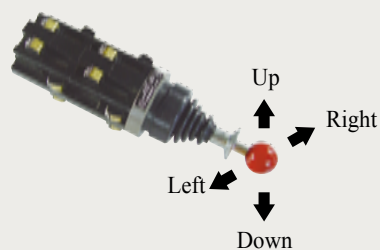
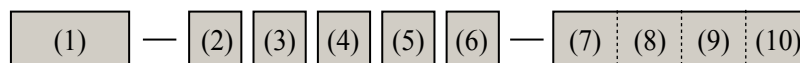
Black Type	Contacts
LB 11	1a1b (1NO-1NC)
LB 20	2a (2NO)
LB 02	2b (2NC)

■ Lever Directions



■ **Ordering Data** When ordering, specify items (1) through (10) as the designation ordering code below.

Ordering code :



Lever Directions for each operating position

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Type	Lever Directions	Lever Returns	Lever Center Locking	Lever Length	Lever Handle Color	UP	Right	Down	Left
						Contacts on each way			
SHML: Samwha Mono- Lever Switch (30mm)	21, 22: Single2-ways 31,32,33,34: 3-ways 40: Cross 4-ways	M:Manual Return S:Spring Return	L:With Locking N:Without Locking	X: Short- Lever Y: Long-Le- ver	B:Black G:Green R:Red	00: None 10:1a(1NO), 01:1b(1NC) 11:1a1b(1NO-1NC) 20:2a(2NO), 02:2b(2NC)			

e.g. SHMC-40SNFX-P3234

EC-02-A01	KS A 14001 : 2004 ISO 14001 : 2004	QC-42-A(1)	KS A 9001 : 2001 ISO 9001 : 2000	KSC 8422 No. 7318 KSC 8429 No. 11361	File No. E10831 File No. E209191 File No. E203192	CE No. B060401ATEX00128	

SAMWHA POWER PANEL Features

1. High Voltage Power Supplying Closure Units provide superior functions, reliance and stability with VCB installed.
2. Low Voltage Power Supplying Closure Units minimize an installing space with built-in ACBs providing easy installation, operation and maintenance.
3. A standardized design for Electromotor Controlling Units makes changes and increases of capacity easy.

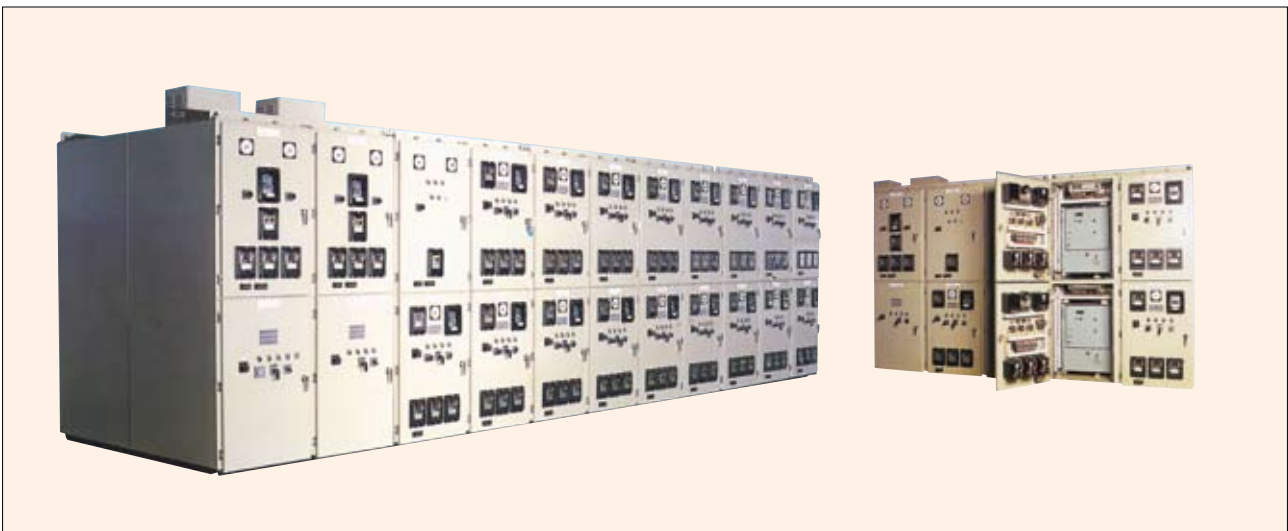
SAMWHA POWER PANEL INDEX

	Ultra High Voltage Power Supplying Closure Unit 123
	High Voltage Power Supplying Closure Unit 123
	T.R Unit 123
	Low Voltage Power Supplying Closure Unit 124
	MCC Unit 124
	Low Voltage Electromotor Control Unit 124

Ultra High Voltage Power Supplying Closure Unit



High Voltage Power Supplying Closure Unit



T.R Unit



Low Voltage Power Supplying Closure Unit



MCC Unit



Low Voltage Electromotor Control Unit



Section J



SAMWHA Technical Data

SAMWHA Technical Data Table

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1. Class 1 Flexible Metal Conduit KS Standard

Item Size	The 1st Class Flexible Metal Conduit Non-waterproof Type KS Standard						
	Min. Inn. Dia.	Out. Dia.(Norm)	Out. Dia.(Tolerance)	Max. Curv. Dia. (m/m)	Steel Min. Thick.		Tension Load (kgf)
					Standard Type	Applied Type	
#10	9.7	13.1	12.6 ~ 1.36	100	0.3	0.25	70
#12	12.2	15.3	14.6 ~ 16.0	102	0.3	0.25	70
#16	15.8	19.1	18.4 ~ 19.8	165	0.3	0.25	90
#22	20.8	24.1	23.4 ~ 24.8	216	0.3	0.25	90
#28	26.4	30.8	30.1 ~ 31.5	330	0.3	0.25	90
#36	35.0	39.0	38.0 ~ 40.0	406	0.35	0.3	90
#42	40.0	44.8	43.8 ~ 45.8	457	0.35	0.3	136
#54	51.3	56.0	55.0 ~ 57.0	565	0.35	0.3	136
#70	62.9	69.0	68.0 ~ 70.0	749	0.4	0.35	136
#82	77.9	84.7	83.2 ~ 86.2	889	0.4	0.35	136
#104	101.6	108.6	107.1 ~ 110.1	1219	0.4	0.35	136

Item Size	Class 1 Flexible Metal Conduit Waterproof Type KS Standard					
	Min. Inn. Dia.	Out. Dia.(Norm)	Out. Dia.(Tolerance)	Max. Curv. Dia. (m/m)	PVC Thickness	Tension Load (kgf)
#10	9.7	15.0	14.5 ~ 15.5	100	0.8	70
#12	12.2	17.4	16.5 ~ 18.3	102	0.8	90
#16	15.8	20.7	19.8 ~ 21.6	165	0.8	90
#22	20.8	26.1	25.2 ~ 27.0	216	0.8	90
#28	26.4	32.8	31.9 ~ 33.7	330	0.9	90
#36	35.0	41.3	40.1 ~ 42.5	406	0.9	90
#42	40.0	47.4	46.2 ~ 48.6	457	1.0	136
#54	51.3	59.4	58.2 ~ 60.6	565	1.0	136
#70	62.9	72.1	70.9 ~ 73.3	749	1.3	136
#82	77.9	87.5	85.8 ~ 89.2	889	1.3	136
#104	101.6	112.9	111.2 ~ 114.6	1219	1.6	136

2. Armoured Cable Gland Selection Table

PVC/SWA/PVC TO BS 6346:1989

Stranded Copper Conductors 600/1000 Volts

PVC

(PVC Applied when PVC Armoured Cables are used.)



CABLE SPECIFICATION				CABLE GLAND SPECIFICATION			
Conductor Area mm	Number of cores	Nominal Diameters		INDOOR	OUTDOOR	OUTDOOR	FLAMEPROOF
		Under Armour mm	Overall mm	BW Gland Kit	CW Gland Kit	E1W Gland	E1FW Gland
1.5	2	7.7	12.3	20S	20/16	20/16	20/16
	3	8.2	12.8		20S	20S	20S
	4	8.9	13.5				
	7	10.6	15.2				
	12	13.9	19.4	20	20	20	
	19	16.5	22.2	25	25	25	
	27	20.1	26.7	32	32	32	32
37	22.4	29.2	32		32	32	
2.5	2	9.0	13.6	20S	20S	20S	20S
	3	9.5	14.1				
	4	10.4	15.0				
	7	12.5	18.0				
	12	16.7	22.4	20	20	20	
	19	20.0	26.6	25	25	25	
	27	23.9	30.7	32	32	32	
4	2	10.5	15.1	20S	20S	20S	20S
	3	11.2	15.8				
	4	12.3	17.8				
	2	11.7	16.5				
	3	12.5	18.0				
	4	13.7	19.2				
	10	2	14.4	20.1	25	25	25
3		15.5	21.2	25		25	25
4		17.1	22.8				
16	2	16.2	21.9	25	25	25	25
	3	17.4	23.1		25	25	25
	4	19.7	26.3				
25	2	20.1	26.7	32	32	32	32
	3	21.6	28.2		32	32	32
	4	23.9	30.7				
35	2	22.6	29.4	32	32	32	32
	3	24.2	31.0				
	4	26.9	33.9				
50	2	20.8	33.9	32	32	32	32
	3	23.5	27.8				
	4	27.4	30.5				
70	2	23.4	30.4	32	32	32	32
	3	27.0	35.0	40	40	40	40
	4	31.0	39.2				
95	2	27.3	35.5	40	40	40	40
	3	31.1	39.3				
	4	35.9	44.3				
120	2	29.6	38.0	40	40	40	40
	3	33.8	42.2	50S	50S	50S	50S
	4	39.5	49.3	50	50	50	50
150	2	32.7	41.3	50S	50S	50S	50S
	3	37.7	47.5	50	50	50	50
	4	43.6	53.6		63S	63S	63S
185	2	36.6	46.4	50S	50S	50S	50S
	3	41.9	51.9	50	50	50	50
	4	48.8	59.0	63S	63S	63S	63S
240	2	41.2	51.2	50	50	50	50
	3	47.6	57.8	63S	63S	63S	63S
	4	55.1	65.7	63	63	63	63
300	2	46.0	56.4	63S	63S	63S	63S
	3	52.6	63.2	63	63	63	63
	4	61.0	72.0	75S	75S	75S	75S
400	2	52.1	61.9	63	63	63	63
	3	58.6	69.6	75S	75S	75S	75S
	4	68.4	81.3	-	90	90	90

XLPE/SWA/PVC TO BS5467:1989 AND LSF/SWA/LSF TO BS 6724:1990

Stranded Copper Conductors 600/1000 Volts

XLPE/LSF

(Applied when XLPE/LSF Armoured Cable Glands are used.)



CABLE SPECIFICATION				CABLE GLAND SPECIFICATION			
Conductor Area mm	Number of cores	Nominal Diameters		INDOOR	OUTDOOR	OUTDOOR	FLAMEPROOF
		Under Armour mm	Overall mm	BW	CW	E1W Gland	E1FW Gland
1.5	2	8.1	12.5	20S	20/16	20/16	20/16
	3	8.6	13.0		20S	20S	20S
	4	9.4	14.0			20S	20S
	7	11.3	15.9	25	25	25	25
	12	14.7	20.2		25	25	25
	19	17.5	23.2	32	25	25	25
	27	21.3	27.9		32	32	32
2.5	37	23.8	30.6	20S	20S	20S	20S
	2	9.0	13.6				
	3	9.5	14.1				
	4	10.4	15.0	20	20	20	20
	7	12.5	17.1	25	25	25	25
	12	16.7	22.4	32	32	32	32
	19	20.0	26.6	40	40	40	40
4	27	23.9	30.7	20S	20	20	20
	37	27.0	33.8				
	2	10.1	14.7				
6	3	10.7	15.3	20	20	20	20
	4	11.8	16.4				
	11.3	15.9	20.0				
10	2	13.2	18.0	25	25	25	25
	3	14.0	19.5				
	4	15.6	21.1				
16	2	14.5	20.0	25	25	25	25
	3	15.5	21.2				
	4	17.2	22.9				
25	2	18.4	24.1	32	32	32	32
	3	20.1	26.7				
	4	22.3	28.9				
35	2	21.3	27.9	32	32	32	32
	3	22.8	29.6				
	4	25.3	32.1				
50	2	19.0	25.8	32	32	32	32
	3	21.7	28.5				
	4	25.0	32.0				
70	2	22.0	29.0	40	40	40	40
	3	25.2	32.2				
	4	29.5	37.7				
95	2	25.1	33.1	50S	50S	50S	50S
	3	28.8	37.0				
	4	33.3	41.7				
120	2	27.9	36.1	40	40	40	40
	3	32.0	40.4				
	4	37.5	47.1				
150	2	30.9	39.3	50	50	50	50
	3	35.9	45.5				
	4	41.6	51.4				
185	2	34.9	44.7	50S	50S	50S	50S
	3	40.0	49.8				
	4	46.4	56.6				
240	2	39.0	49.0	63	63	63	63
	3	44.9	55.1				
	4	52.6	63.0				
300	2	43.8	53.5	75S	75S	75S	75S
	3	49.8	60.2				
	4	58.0	68.8				
400	2	48.4	59.0	75	75	75	75
	3	55.8	66.6				
	4	65.4	78.1				

3. Types of threads and recommended boring dimensions per thread types

■ Grand Classification of Threads : Threads can be classified into M(Meter) system threads and Inch system threads.
Marking and description for M and Inch System Threads are as below.

1. M(Meter) System Threads

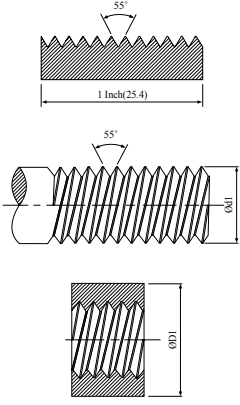
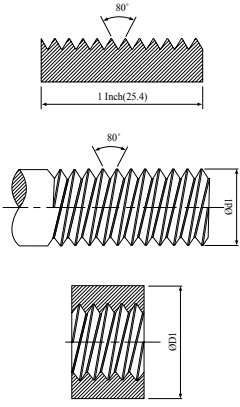
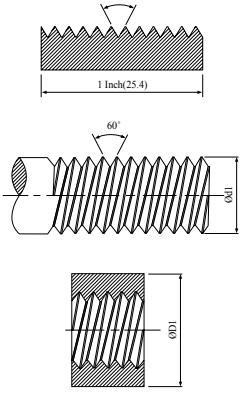
M16 × 1.5P

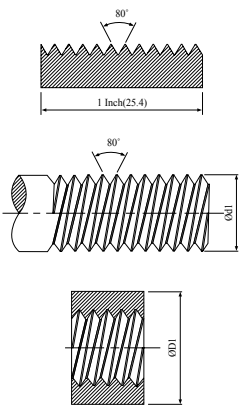
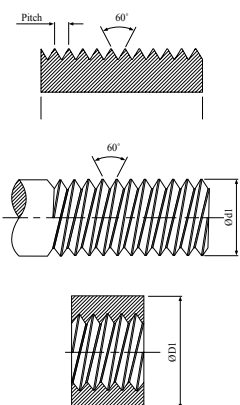
Pitch : Interval between threads
(Pitch Measured by a Gauge)
Outer male threads measured by a Vernier Caliper

2. Inch System Threads

3/4" × 11 Thread. per pitch

Number of threads per 1Inch
(Measured by a Pitch Gauge for Inch)
Nominal size of male threads (A comparison with the table is required after a measurement)

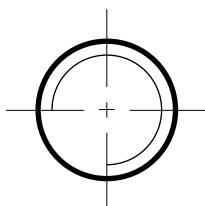
Types of Threads	Shapes and Dimensions of Threads	Features					Major Applications	Related Samwha Products
CTG Conduit Thread KS B 0223		Angles of Threads		55°			• Mainly used for the connecting parts of thick steel pipes and conduit tools	• WBG, WUG, WAG (For Class 2 Conduits). KFBG, KFUG, KFAG(For Class 1 Conduits). • Used as CTG threads for accessories of Samwha Flexible Tubes and Plica Tube Connectors
		Nominal Size		Number of Threads per 1 Inch				
		Size	No. of Threads	M Out. Dia.	F Inn. Dia.	Recommended Boring Dimensions		
		#16(1/2")	14	20.95	19.02	22		
		#22(3/4")	14	26.44	24.50	28		
		#28(1")	11	33.24	30.76	35		
		#36(1-1/4")	11	41.91	39.42	43.5		
		#42(1-1/2")	11	47.80	45.31	49		
		#54(2")	11	59.61	57.12	61		
		#70(2-1/2")	11	75.18	72.69	78		
#82(3")	11	87.88	85.39	90				
#104(4")	11	113.03	110.54	115				
CTC (CTC Conduit Threads) KS B 0223		Angles of Threads		80°			• Mainly used to the connecting parts of thin steel sheets and conduit tools.	• WBC, WUC, WAC (For Class 2 Conduits). KFBC, KFUC, KFAC(For Class 1 Conduits). • Used as CTC Threads for accessories of Samwha Flexible Tubes and Plica Tube Connectors
		Nominal Size		Number of Threads per 1 Inch				
		Size	No. of Threads	M Out. Dia.	F Inn. Dia.	Recommended Boring Dimensions		
		19	16	19.10	17.80	20		
		25	16	25.40	24.10	26.5		
		31	16	31.80	30.50	33		
		39	16	38.10	36.80	39		
		51	16	50.80	49.50	52		
		63	16	63.50	62.20	65		
		75	16	76.20	74.90	78		
NPT (Tapered Threads of American Standard) ANSI B 2.1		Angles of Threads		60°			• Used to the parts calling for strong Interlock such as gas and oil pipes)	• Used to products on order. (For conduit threads for special type BG & UG, and Explosionproof connectors.
		Nominal Size		Number of Threads per 1 Inch				
		Size	No. of Threads	M Out. Dia.	F Inn. Dia			
		#16(1/2")	14	21.33	18.32			
		#22(3/4")	14	26.67	23.66			
		#28(1")	11-1/2	33.40	29.69			
		#36(1-1/4")	11-1/2	42.16	38.45			
		#42(1-1/2")	11-1/2	48.26	44.52			
		#54(2")	11-1/2	60.32	56.55			
		#70(2-1/2")	8	73.02	67.61			
		#82(3")	8	88.90	83.52			
		#104(4")	8	114.30	108.69			

Types of Threads	Shapes and Dimensions of Threads	Features					Major Applications	Related Samwha Products
PG Threads (DIN 40430)		Angles of Threads		80°			•Used for Connecting Threads of Thin Steel Sheets. (For Small Connectors or Cable Glands)	•PG-CABLE GLAND •Small Connectors (Products on Order) •German PIPE Standard
		Nominal Size		No. of Threads per 1 Inch				
		Size	No. of Threads	M Out. Dia.	F Inn. Dia.	Recommended Boring Dimensions		
		7	20	12.5	11.28	13		
		9	18	15.2	13.86	16		
		11	18	18.6	17.26	19.5		
		13.5	18	20.4	19.06	21.5		
		16	18	22.5	21.16	23.5		
		21	16	28.3	26.78	29.5		
		29	16	37.0	35.48	38		
		36	16	47.0	45.48	48		
		42	16	54.0	52.48	55		
		48	16	59.3	57.78	61		
BS Threads (BS 3643)		Angles of Threads		60°			•Used for Products on Order as a BS Pipe Thread Standard	•Samwha Armoured Cable Glands
		Nominal Size		Indication by Pitch				
		Size	Pitch	M Out. Dia.	F Inn. Dia.	Recommended Boring Dimensions		
		#16(M16)	1.5	16	14.4	17		
		#20(M20)	1.5	20	18.4	21		
		#25(M25)	1.5	25	23.4	26		
		#32(M32)	1.5	32	30.4	33		
		#40(M40)	1.5	40	38.4	42		
		#50(M50)	1.5	50	48.4	52		
		#63(M63)	1.5	63	61.4	65		
		#75(M75)	1.5	75	73.4	77		

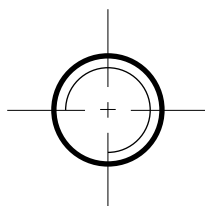
Matters to be attended when Threads measured.

- ▶ Pitch generally stands for the interval between threads.
- ▶ Use the average value of the figures to come up with by turning the thread part 2~3 times when measuring outer and inner diameters of threads.
- ▶ The first and end parts of NPT are not parallel with an angle of 1/16.
- ▶ The first 3~4 threads can be tightened by hand and the rest by a wrench or other tools to tighten up when interlocking male and female threads of NPT.
- ▶ Generally, nominal sizes of male threads are outer diameters of male threads and those of female threads are the outer diameters of the male threads which female threads match to

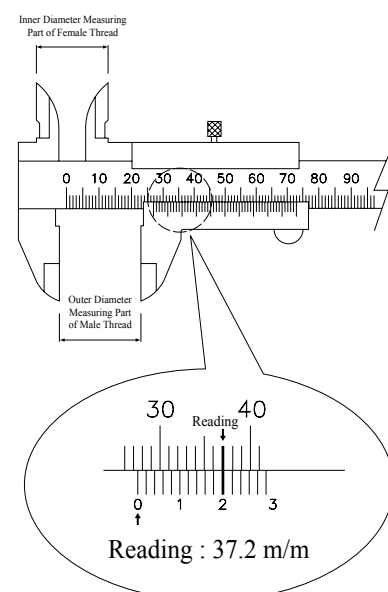
Male Thread Drawing Illustration



Female Thread Drawing Illustration



Instruction in a Vernier Caliper



4. General Information for the Explosionproof

1. Explosionproof Enclosure Overview

Explosionproof Enclosure Symbols

Types		Symbols
Explosionproof Enclosure Types	Flameproof	d
	Oil Immersion	o
	Pressurized	p
	Increased Safety	e
	Intrinsic Safety	ia, ib
	Speical Explosionproof	s

Max. Surface Temperature and its Class

Types	Symbols
Excess of 300 less than 450	T1
Excess of 200 less than 300	T2
Excess of 135 less than 200	T3
Excess of 100 less than 135	T4
Excess of 85 less than 100	T5
Less than 85	T6

Explosionproof Class Marking (For example) Gas and Vapor : Exd II B T4 IP54

EX					
Explosionproof Enclosure	Symbols	Explosionproof Enclosure	Symbols	Temperature Class	Protection Class
Explosionproof	d	Industrial (II)	Gas vapor	T1	IP 00
Pressurized	p		Gas vapor	T2	
Increased Safety	e		Gas vapor	T3	
Oil Immersion	o		Dust	T4	
Intrinsic Safety	ia, ib		Dust	T5	
Special	s		Dust	T6	
Special Dustproof	SDP				
Regular Dustproof	DP				
Dustproof Specialty	XDP				

Classification of Hazardous Areas in Various Countries

	Constant Hazardous Atmosphere	Ordinarily Intermittent Hazardous Atmosphere	Extraordinarily Hazardous Atmosphere
ICE / CENELEC / EUROPE	Zone 0	Zone 1	Zone 2
NORTHAMERICA	Division 1	Division 1	Division 2
KOREA / JAPAN	Class 0 Area	Class 1 Area	Class 2 Area

Explosionproof Structure Marking in Various Countries

Countries	Explosion-proof	Oil Immersion	Pressurized	Increased Safety	Intrinsic Safety	Special	Powder Filling
KOREA	Exd	Exo	Exp	Exe	Exi	Exs	-
BRITISH	FLP				FLP		
GERMANY	Exd	Exo	Ext	Exe	Exi	Exs	Exq
AUSTRIA	Exd	Exo	Exe	Exi	Exs	Exq	
FRANCE	-	-	-	-	-	-	-
ITALY	Exd	Exo	Exp	Exe	Exi		Exq
SWISS	Exd	Exo	Exf	Exe		Exs	
SWEDEN	Xt	Xo	Xv	Xh	Xi	Xs	

Gas Classification in Various Countries

Korea, Japan	IEC	Germany	U.S.A.
< Explosionproof Class 1 > Methane, Ammonia, Carbon-Monoxide, Benzene, Gasoline, Propane Gas	< Group of Enclosure I > Methane	< Explosion Class 1 > Methane, Ammonia, Carbon Monoxide, Benzene, Gasoline, Propane Gas	< Group A > Acetylene
< Explosionproof Class 2 > Coal Gas, Ethylene, Ethylene Oxide, 1.3 Butadiene	< Group of Enclosure II A > Ammonia, Carbon-Monoxide, Acetone, Ethanol, Methanol	< Explosion Class 2 > Ethylene, Ethylene Chloride, Ethylene Oxide, City Gas	< Group B > Butadiene, Ethylene Oxide, Hydrogen, Propylene Oxide
< Explosionproof Class 3 > Hydrogen Gas, Hydro-Acetylene Gas, Sulfurated Carbon	< Group of Enclosure II B > 1.3 Butadiene, Ethylene, Ethylene Oxide, City Gas	< Explosion Class 3 > 3a : Hydrogen 3b : Sulfurated Carbon 3c : Acetylene	< Group C > Acetaldehyde, Ethylene, Isoprene, Ethyl, Propane
	< Group of Enclosure II C > Hydrogen Gas		< Group D > Methane, Ammonia, Benzene, Propane,

2. Explosionproof Regulations

Explosionproof General Information

	European Community	North America
Hazardous Category	Explosive Mixture Group I : Explosive Gas in Mines Group II : Other Areas outside Mines	Explosionproof Mixture blended with Oxygen Class I : Gas and Vapor Class II : Dust Class III : Fibroid Material
Explosive Hazard caused by Sparks (Classified by Gas)	Classification of Explosionproof Forms Intrinsic Explosionproof/Flameproof On & Off Device Classification by degree of explosion depending on min. ignition and igniting Power Group I : Methane Group II : A Propane Group II : B Ethylene Group II : C Hydrogen, Acetylene	Classification by Igniting Power Class I Group : A Acetylene B Hydrogen C Ethylene D Methane Class II Group : E Acetylene F Coal Dust G Crane Dust Class III Group : no grouping
Igniting hazard caused by hot surface (Classification by temperature)	Classification by IEC 78-8 Regulation depending on max. surface temperature at surrounding temperature of less than 40℃ : T1≤450℃ T2≤300℃ T3≤200℃ T4≤135℃ T5≤100℃ T6≤85℃	
Classification of Hazardous Areas	Classification by possibility of Explosion is as follows :	
	Germany(U.K) : Gas, Vapor, Fog : Gas and Dust Zone 0 Constant, Long-Term 1 Intermittent } Division 1 2 Occasional, Short-Period : Division 2 Dust : Zone 10(Z) Long-Term or Frequently 11(Y) Short-Period	
	Notes : (Refer to IEC79-10) : If Constant, Long-Term >1000h/year. If Intermittent 10 · · 1000h/year, Occasional, Short-Period >10h/year	
Safety Features	The peculiar figures to classify inflammable gases and vapor by igniting power, temperature and point are as follows:	
	DIN VDE 0165/2.91 Append. A BS 5345 Part 1	NFPA 497M CSA Nr. C22-1
Certification	PTB Physikalish-Technische Bundesanstalt BVS Bergbauversuchsstrecke BASEEFA British Approvals Service For Electrical Equipment In Flammable Atmospheres	UL Underwriters Laboratories Association(USA) FM Factory Mutual Research(USA) CSA Canadian Standards Association
Installing Requirements	DIN VDE 0165/2.91 BS 5345 Part 4 And other nationally valid regulation	NFPA 70 National Electric Code Art.500 NFPA 493 Standard for Intrinsically safe operation

4. Explosionproof General Information

3. Classification of Hazardous Areas

The areas below are classified as hazardous areas..

- The areas where there is possibility that ignitable vapor or inflammable gases exist easily.
- The areas where liquid with igniting points less than 40℃ is handled and stored.
- The areas where a cloud of dust is produced and accumulated on the surface of machinery and tools or on the floor.

Classification of Gas Hazardous Areas is determined as follows:

A. Class 0 Area

- The Interior of Facilities
- The interior of pit with ignitable and inflammable liquid existing
- The Areas where vapor containing igniting materials or inflammable gases stay constantly or for a long period of time.

B. Class 1 Area

- The Areas generating a hazardous environment easily in normal situation.
- The Areas generating often a hazardous environment caused by operations, maintenances or leakages.
- The Areas where a discharge of inflammable materials and an electric mechanical trouble occur simultaneously at a mishap to part of facilities.
- The Areas causing a leakage through a tubing structure installed at the areas with insufficient ventilation
- The Areas the surfaces of which are lower than surrounding lands and in which gases and vapor stay.
- The Areas generating a hazardous environment occasionally or intermittently in a normal situation.

C. Class 2 Area

- The Areas Not causing leakages easily through a tubing structure installed at the areas with insufficient ventilation.
- The Areas with either a sufficient ventilation system or working facilities causing leakages only at malfunctions such as gasket and packing troubles.
- The open areas connected directly with Class 1 Areas, or the areas connected with Class 1 Areas by ducts, trenches and pipes and possible to take in gases and vapor through these equipments.
- The areas in which a forced ventilation system is equipped and a hazardous environment can be generated at a ventilation facility trouble or in an abnormal situation.

4. Explosionproof Electric Machinery and Tools Selection

The Principles to select Explosionproof Electric Machinery and Tools - The Selection Method by Gas Hazard Classification

A. Class 0 Area

- Intrinsic Safety Explosionproof Enclosure (Exi) or Flameproof Enclosure (Exd).
- An explosionproof enclosure for which the fact that electric sparks, arcs or high temperature generated in a normal situation or at accidents (disconnection, short circuit, etc.) don't ignite explosive gases and vapor is secured by an igniting test and others.
- An explosionproof enclosure designed to fit Class 0 areas.

B. Class 1 Area

- An enclosure used for Class 0 areas.
- Flameproof enclosure (Exd).
An enclosure which can endure a pressure when explosive gases and vapor explode inside receptacles and has no hazard of igniting outdoor explosive vapor through the open parts of connecting surfaces.
- Pressurized Explosionproof Enclosure (Exp).
An enclosure which prevents explosive gases and vapor from flowing in the receptacle with the inner part pressure maintained by filling protective gases such as fresh air or non-inflammable gases in it.
- Oil Immersion Explosionproof Enclosure (Exo).
An enclosure which eliminates a hazard of igniting explosive gases and vapor existing above the oil surface by immersing the parts of electric machinery and tools which produce sparks, arcs in oil.

C. Class 2 Area

- Class 0 and 1 Area Enclosure
- Increased Safety Explosionproof Enclosure (Exe).
An enclosure safety of which has been increased in mechanical, electric construction and temperature rising in order to prevent explosionproof gases and vapor from being ignited by sparks, arcs and high temperatures in a normal operation
- Non-inflammable Explosionproof Enclosure (Exp).
As a mounted lighting fixture without switches producing sparks such as a commutator and a slim ring, it is a non-explosionproof type with guards to prevent parts at high temperature from falling and its maximum surface temperature does not exceed 80 % of an igniting temperature of applicable materials in a normal operation.
- An explosionproof enclosure designed specially for Class 2 areas.

5. Types of Enclosures

1. IEC : Ex d II B T4 IP55

Currently used in Korea, Japan and European areas.

• Explosionproof Marking

Ex	d	II	B	T4	IP55
Explosionproof Equipment	Type of Protection	Purpose Classification	Gas Class	Temperature Class	Protection Class

• Types of Enclosures

Type	Definition	Symbol
Explosionproof Enclosure	A type of enclosure withstanding an internal explosion of a flammable mixture which has penetrated into the interior without suffering from damages and causing ignition.	Ex d
Pressurized Enclosure	A type of enclosure which intercepts inflow of explosive gases or vapor in it by filling protective gases.	Ex p
Increase Safety Enclosure	A type of enclosure safety of which has been increased in mechanical, electric construction and temperature rising in order to prevent igniting causes from being produced.	Ex e
Oil Immersion Enclosure	A type of enclosure which eliminates a hazard of igniting explosive gases and vapor by immersing the parts producing sparks, arcs in oil.	Ex o
Intrinsic Safety Enclosure	A type of enclosure which prevents igniting causes from being produced such as sparks, arcs or high temperatures in a normal situation or accidents (disconnection, short circuit, etc.)	Ex ia Ex ib
Non-Sparking Enclosure	A type of enclosure neither to ignite surrounding explosive gases or vapor in a normal operation nor to cause inflammable malfunctions.	Ex n
Encapsulation Type Enclosure	A type of enclosure the parts of which, producing sparks and high temperature, are sealed with compound.	Ex m
Powder Filling Enclosure	A type of enclosure which prevents gases from inflow and ignition by fixing the parts producing sparks etc. and filling the surroundings of the parts with replenishing materials.	Ex q
Special Type Enclosure	A type of enclosure which prevents explosive gases and vapor from being ignited by other methods.	Ex s
Special Dustproof Enclosure	A type of enclosure which prevents dust from penetrating inside the receptacle through cracks and seams of it.	Ex SDP
Regular Dustproof Enclosure	A type of enclosure through cracks and seams of which penetration of dust is constrained.	Ex DP
Dustproof Specialized Type Enclosure	A type of enclosure dust and explosion-proof capability of which is confirmed with other methods.	Ex XDP

• Purpose Classification

II : For mines

II : For factory and industry

• Classification of Explosive Gases

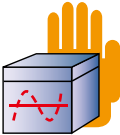
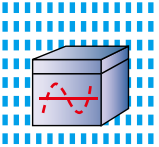
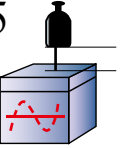
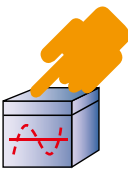
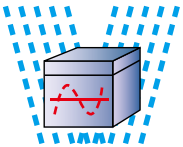
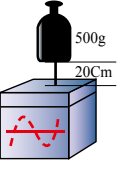
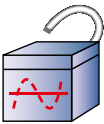
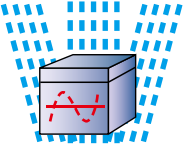
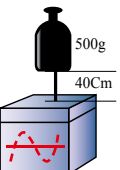
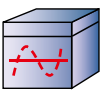
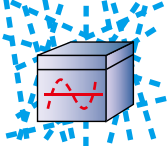
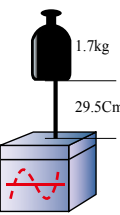
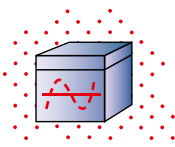
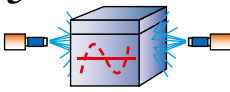
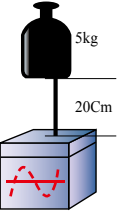
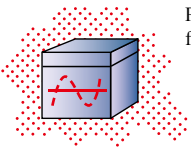
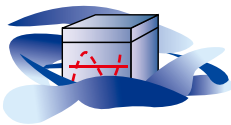
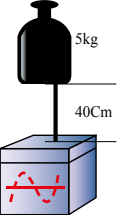
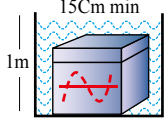
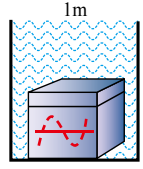
Classification of Explosive Gases	A	B	C
Scope of Max. Safety Gap	0.9mm and over	Over 0.5mm less than 0.9mm	0.5 mm and less
Min. Igniting Voltage(Intrinsic Safety)	Over 0.8	Over 0.45 less than 0.8	Less than 0.45
Applied Enclosure(Explosionproof, Intrinsic, Non-sparking)	II A	II B	II C
Representative Gases	Ammonia, Carbon Monoxide, Benzene, Acetone, Methanol, Propane	Butadiene, Ethylene, Diethyl Ether, Ethylene Oxide, City Gas	Acetylene, Hydrogen, Sulfurated Carbon

• Max. Surface Temperature and its Class

Scope of Max. Surface Temperature °C	Temperature Class
Over 300 less than 450	T1
Over 200 less than 300	T2
Over 135 less than 200	T3
Over 100 less than 135	T4
Over 85 less than 100	T5
Less than 85	T6

• Ingression Protection Class

(Ingress Protection class of enclosures according to IEC-529 standard)

Protection Degree for Solid Body		Protection Degree for Liquid		Protection Degree for physical Impact	
IP	Test	IP	Test	IK	Test
0	 Not protected	0	 Not protected	00	 Not protected
1	 Protection against solid bodies bigger than 50 mm	1	 Protection against vertical raindrops	01-05	 Impact < 1 joule
2	 Protection against solid bodies bigger than 12 mm	2	 Protection against raindrops at an angle of 15 degrees	06	 Impact = 1 joule
3	 Protection against solid bodies bigger than 2.5 mm	3	 Protection against spray at angles up to 60 degrees	07	 Impact = 2 joule
4	 Protection against solid bodies bigger than 1 mm	4	 Protection against spray at multi-angles	08	 Impact = 5 joule
5	 Protection against dust	5	 Protection against water spray in every direction at a low pressure	09	 Impact = 10 joule
6	 Protection against dust	6	 Protection against water spray in every direction at a high pressure	10	 Impact = 20 joule
		7	 15Cm min 1m Protection against a submergence up to 15 cm~1m		
		8	 1m Protection against a water pressure under submergence for a long period of time		

2. NEC : Class 1, Division 2, Groups B, C, D. (Currently used in the American continent)

• Explosionproof Marking Classification

Class 1	Division 2	Groups B, C, D
Classification of Hazardous Materials	Hazardous Areas	Class of Hazardous Materials

• Classification of Hazardous Materials

Class	Class of Materials	Representative areas
I	Gas, Vapor	Factories, Petrochemical factories, Dry areas, Painting plants, spraying areas Petroleum dispensing areas, Gas handling facilities, Aviation shed
II	Inflammable dust	Grain warehouses, starch handling, fireworks handling, Flour and feed manufacturing factories, Pulverizing machines, Coal manufacturing areas
III	Inflammable fibers, Fur scraps	wood-working area, Textile manufacturing factories, cotton-gin, cotton-seed mill, Flax manufacturing areas

• Classification of Hazardous Areas

Division 2	Division 0	Division 1
Areas	Hazardous areas in a normal situation	Hazardous areas in an abnormal situation

• Class of Hazardous Materials

Class	Group	Applicable Substances
I	A	acetylene
	B	Hydrogen
	C	Ethylene
	D	hexane, propane, benzene - A colorless liquid collected from coal tar, gasoline
II	E	Metal Dust (A mixture of Aluminum, Magnesium etc.)
	F	carbon black, coal, dust, coke dust
	G	flour, starch, grain dust

※ Classification of NEC and IEC

- Group A : Acetylene

Group B : C related gases except Acetylene

Group C : IIB related gases

Group D : IIA related gases

- Since classifying methods are different from IEC, some gases belong to different groups.

• Classification of Hazardous Areas

- Zone 0 : An area of generating or having a potentiality of hazardous atmosphere constantly in a normal situation.

For example) The upper space in a receptacle containing inflammable liquid, the inside of a receptacle containing inflammable gases, pit trenches in which inflammable liquid stays

- Zone 1 : An area in which there is a potentiality of generating a hazardous atmosphere in a normal situation

For example) Around Zone 0 area, oil feeders, and connecting parts to open at operations

- Zone 2 : An area where an hazardous atmosphere continues for a short period of time in an abnormal situation

For example) Around Zone 1 area, connecting parts of facilities and sealings of pumps

• Applications of Explosionproof Enclosures for Hazardous Areas

Area	Intrinsic safety		Explosionproof	Pressurized	Increased Safety	Oil Immersion
	ia	ib				
Zone 0	○	-	-	-	-	-
Zone 1	○	○	○	○	△	○
Zone 2	○	○	○	○	○	○
Explosionproof Dust Hazardous Area	Special Dustproof Enclosure					
Combustible Dust Hazardous Area	Special Dustproof Enclosure, Regular Dustproof Enclosure					

※ Increased Safety Enclosure : Applying to Zone 2 only domestically (Applying to Zone 1 in IEC)

• NEMA Protection Class

NEMA Code No.	Details of the Related Provisions
1	Indoor use providing a protection against a contact with built-in equipments and a limited amount of fallout.
2	Indoor use providing a protection against a limited amount of fallout and raindrops.
3	Outdoor use providing a protection against dust, rain and sleet by wind without any damages caused by refrigeration.
3R	Outdoor use providing a protection against pouring rain and sleet.
3S	Outdoor use providing a protection against wind dust, rain, and sleet with outer parts of equipments working in an ice-covered condition.
4	Indoor or outdoor use providing a protection against splashing water, wind dust, rain and water sprayed through hose without any damages caused by refrigeration.
4X	Indoor or outdoor use providing corrosion-resistance and a protection against splashing water, wind dust, rain and water sprayed through hose without any damages caused by refrigeration.
6	Indoor or outdoor use providing a protection against an ingress of water under a submersion in a limited depth of water without any damages caused by refrigeration.
6P	Indoor or outdoor use providing a protection against an ingress of water under a submersion in a limited depth of water.
11	Indoor use providing a protection by oil immersion against corrosion of enclosures caused by corrosive liquid and gases.
12, 12K	Indoor use providing a protection against dust, fallout and droppings of noncorrosive liquids.
13	Indoor use providing a protection against dust, water spray and noncorrosive coolants.

■ The contents of this catalogue can be changed without notice.

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