

Mining



Petrochemical



Cement



Steel



Power generation



Pharmaceutical



Water/wastewater



Food and beverage



Pulp and paper



Chemicals



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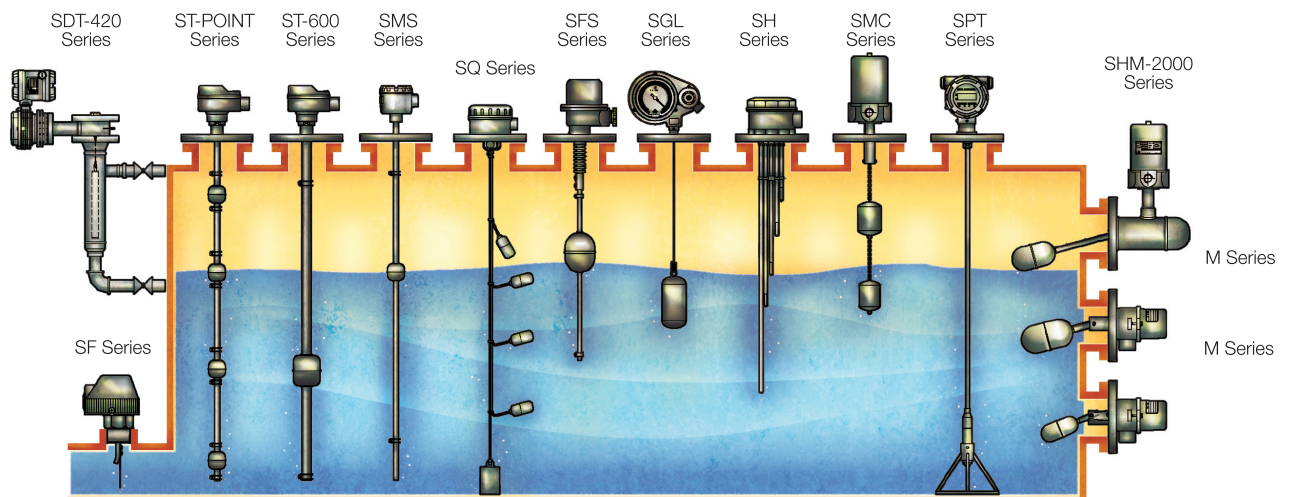
Thermal Power Plant

Solid Type

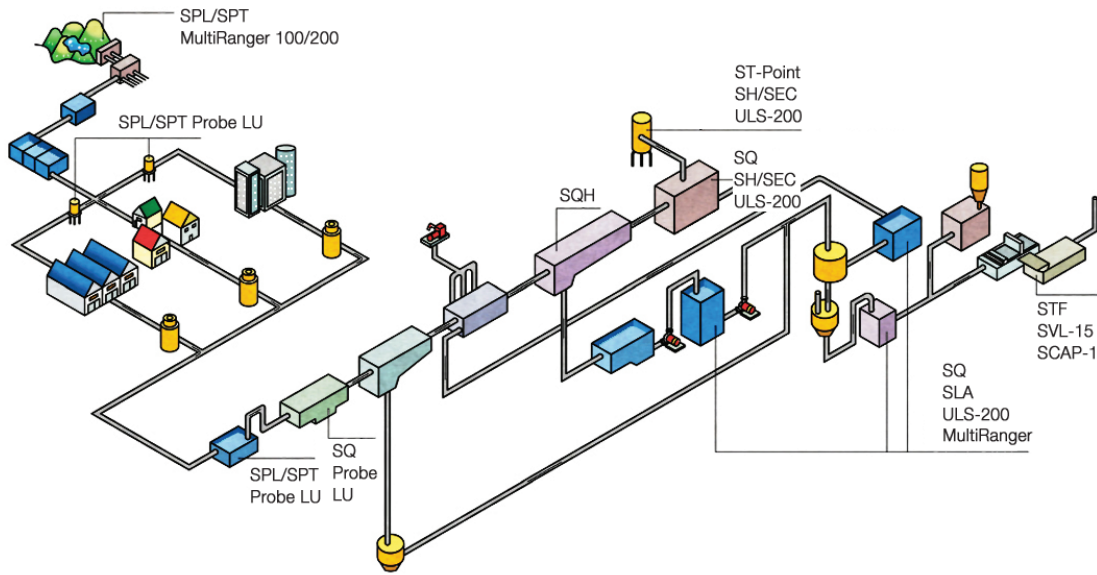


Type of Applications

Liquid Type



Water Treatment

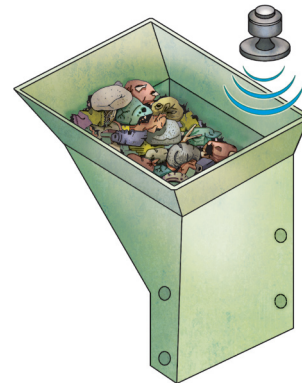


Garbage Incineration Plant

1. Garbage Charging Hopper

Model : LR-560

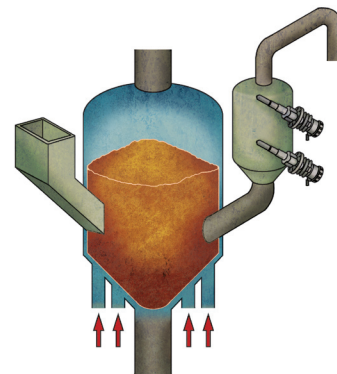
The LR-560 detects High and Low level of garbage in the charging hopper to control the crane operation and avoid back fire from the incinerator.



2. Fluidized Firing Incinerator

Model : SCAP-1/SRF-900.600

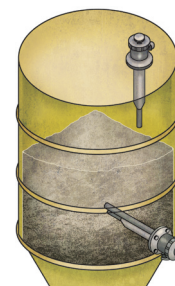
The all detects hot sand level to enhance the rate of combustion.



3. Lime Level Detection at Exhaust Gas Treatment

Model : SVL-15 (for High Low level.)

The SVL is ideal for the detection of lime. We recommend to use the SVL-15 Guard type, protective shield is provided against heavy load, for low level detection.



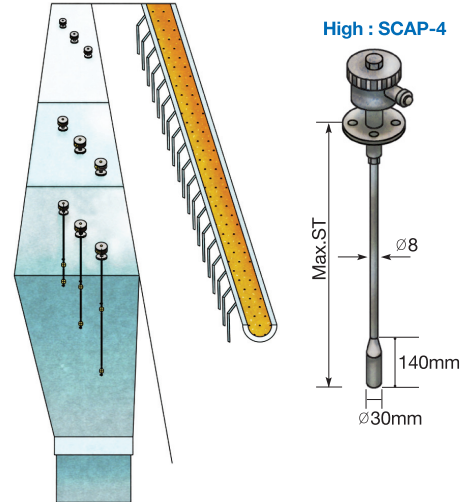
Iron & Steel

1. Storage Bunker for Sub-Raw Material

Model : SCAP-4/SRF-900

Features :

- Withstand high tensile load
- Unaffected by dust and build up
- Withstands high abrasion



2. Plug Chute Detection at Sintering Furnace

Model : STT

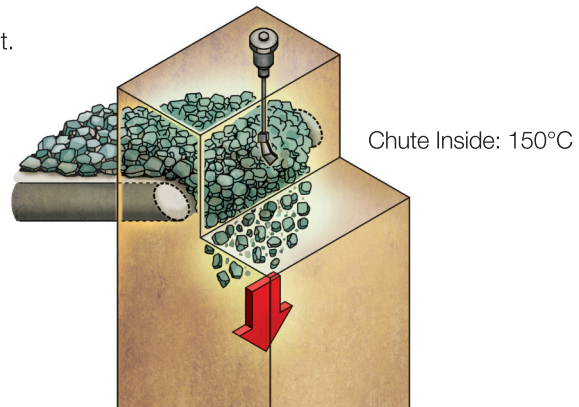
Features : Unaffected by high temperature and dust.

Max Temp : 150°C

Rope Length : Max.5000mm

Tensile Load : 1800kgf

Contact Angle : 20±1°



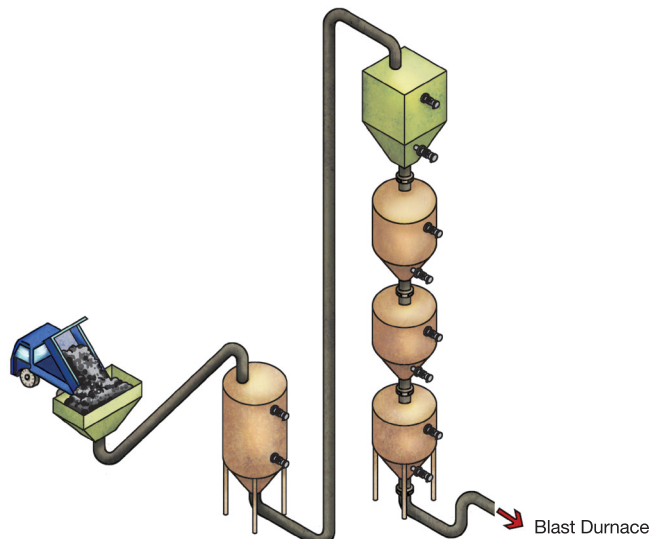
Sintering Furnace or cement conveyor

3. Pulverized Coal Injection

Model : SRF-600SS-10U/SCAP-1/SVL/STF

Features :

- Withstand high abrasion & pull load
- Housing and probe separation

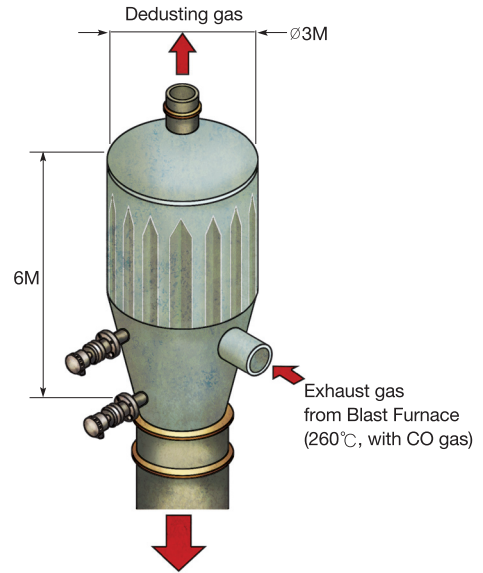
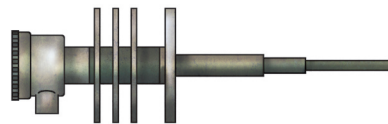


4. Fly Ash in Dust Collector

Model : SRF-600-10U

Features :

- Remote control amplifier to avoid gas leakage
- Immune build up onto the electrode

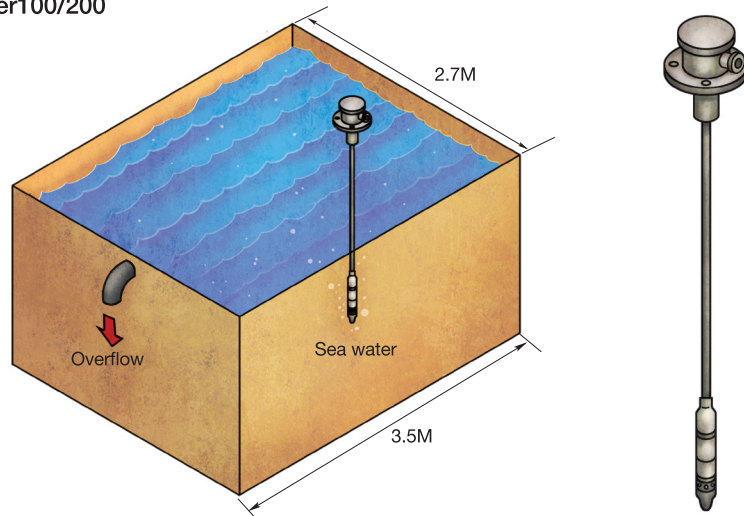


5. Cooling Pump Pit at Blast Furnace

Model : SPL & SPT/SMS/Multiranger100/200

Features :

- High corrosive compatibility
- High accuracy

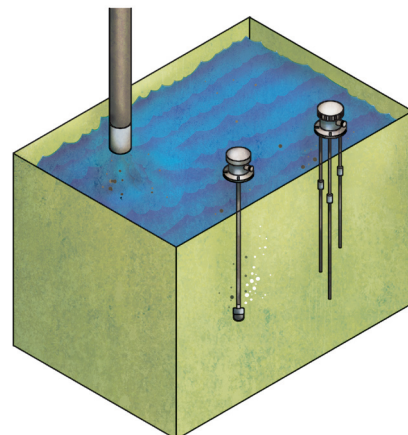


6. Acid/Waste Acid at Pickling Line

Model : SLA & ST-600 (For Continuous Level)

Model : SEC & ST-Point (For point detection)

- NaOH : 316SS
- Sodium Orthosilicate : 316SS
- HCl : Hastelloy-C/PTFE
- H₂SO₄ : Hastelloy-C/PTFE
- Zn-Ni Alloy plating : Hastelloy-C/PTFE
- Zn-Fe Alloy plating : Hastelloy-C/PTFE
- Zn-Fe Alloy plating : Hastelloy-C/PTFE
- Phosphate : 316SS
- Percolate : 316SS
- Bonderite : 316SS
- CrO₃ : Titanium/PTFE



Beer Typical Applications

1. Storage

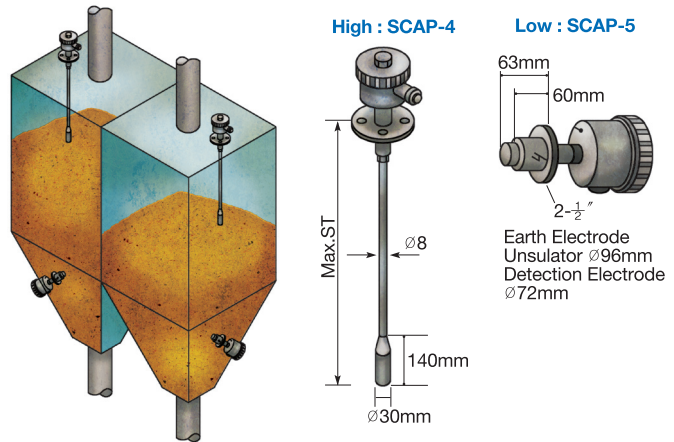
Model : SCAP-4/SPS/LR260 (For high level)

Model : SCAP-5/STF (For low level)

Detection of : Malt, Rice, Grits and Corn starch.

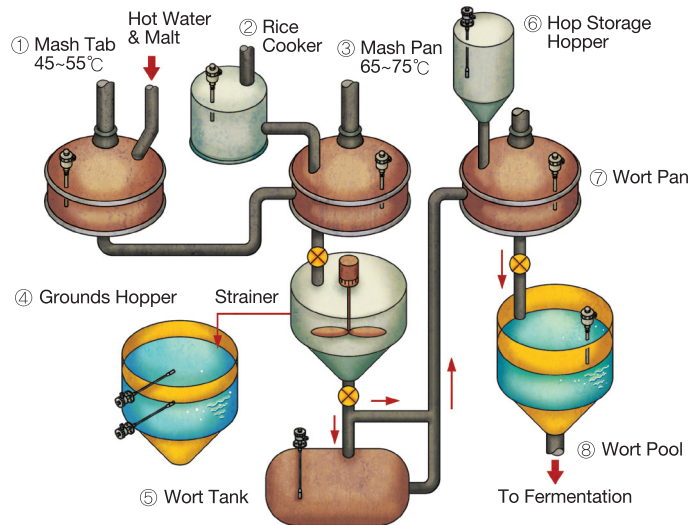
Features :

- Withstand high abrasion
- Withstand high lateral load/tensile load.
- Withstands high abrasion



2. Charge

- | | |
|----------------------|----------------------------------|
| ① Mash Tab | : SCAP-1/STF |
| ② Rice Cooker | : SCAP-1/STF |
| ③ Mash Pan | : SCAP-1/STF |
| ④ Grounds Hopper | : SCAP-1/STF |
| ⑤ Wort Tank | : SCAP-4/STF |
| ⑥ Hop Storage Hopper | : (H)SCAP-4/STF
(L)SCAP-1/STF |
| ⑦ Wort Pan | : SCAP-1/STF |
| ⑧ Wort Pool | : SCAP-1/STF |



SCAP-1 is recommended for foam detection of ⑦ wort pan. The utilizing a ③ 50mm plate, the probe surface area is expanded to detect foam easily.

3. Fermentation

① Fermentation Tank : SCAP-1/STF/SVL-15/SPS+

Features :

- One probe construction prevents to soak raw beer into electrode.
- Anti-dew treatment.

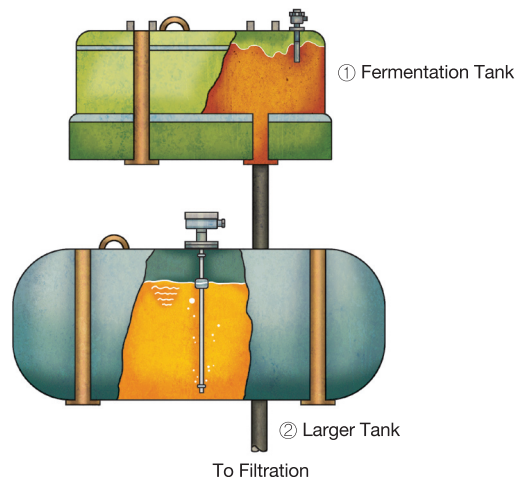
② Larger Tank : SMS-200/SMS-300

Feature :

High accuracy $\pm 0.5\text{mm}$ or $\pm 0.05\%$ F.S.

Working Temperature of SMS-200 is up to 80°C ,

Working Temperature of SMS-300 is up to 200°C



Sugar

1. Storage

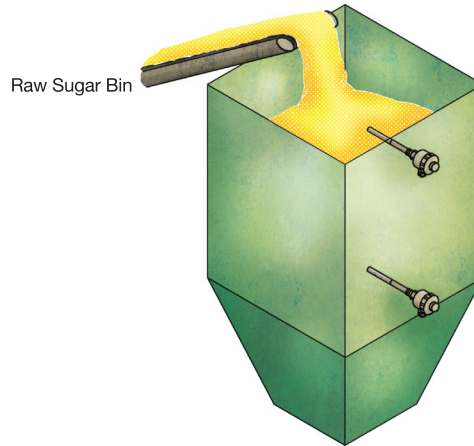
Model : SVL-15/SRF-900/STF

Features :

- Self-cleaning
- Unaffected by build up
- Mechanically strong

Other application for :

- Raw Sugar Lump Crusher
- Lime storage silo at carbonation



2. Affinitation & Melter

①, ② and ③

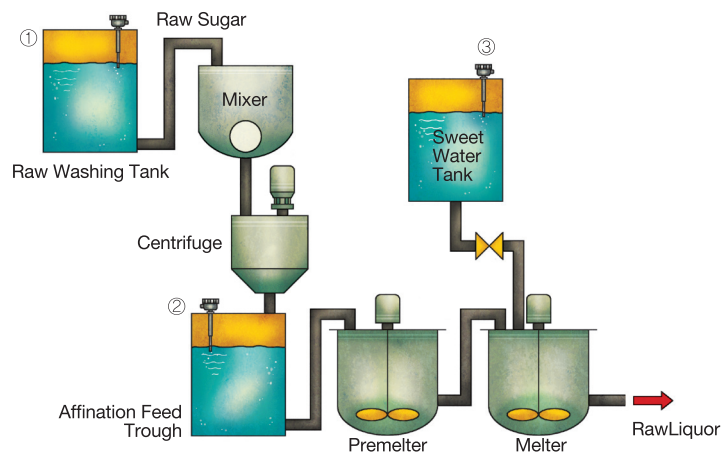
Model : SCAP-1/STF

Features :

- No moving parts.
- Unaffected by build up and suspended solids.
- No initial calibration required.

Other application for :

- Melter liquor strainer tank
- Melter liquor buffer tank
- Syrup pump tank
- Final Molasses storage tank



3. Carbonatization

①, ②, ③, ④ and ⑤

Model : SCAP-1/STF

Features :

- Suitable for both liquids and solids.
- No moving parts.
- Unaffected by build up.
- No initial calibration required.

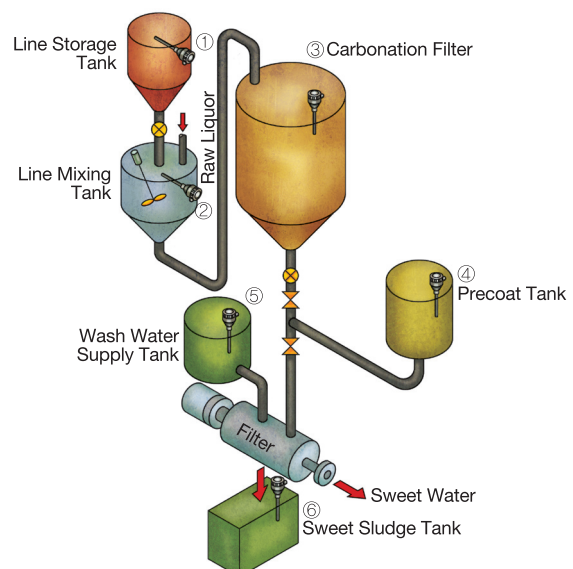
Other application for :

- Evaporator
- Saturation tank
- Polishing Filter
- Filter Acid
- Treatment

⑥ Model : SCAP-1/STF

Features :

- Self-compensation for heavy conductive build up.
- No moving parts.



4. Bleaching

① and ③

Model : SCAP-1/STF

Features :

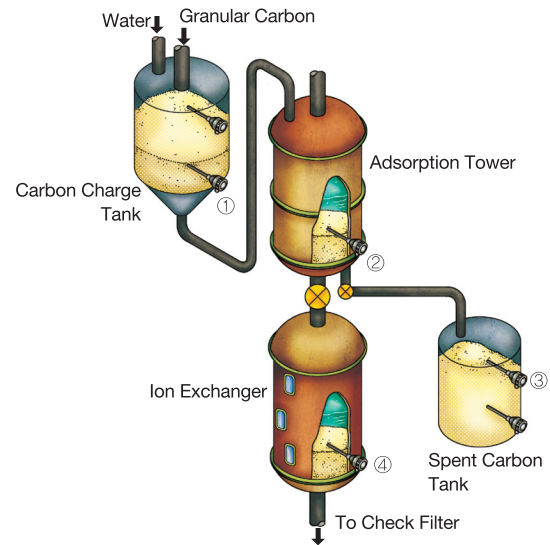
- Self-compensation for heavy conductive build up.
- No moving parts.

② and ④

Model : SVL-15/STF

Features :

- Level detection of sediments under liquids.



5. Boiling

①, ② and ③

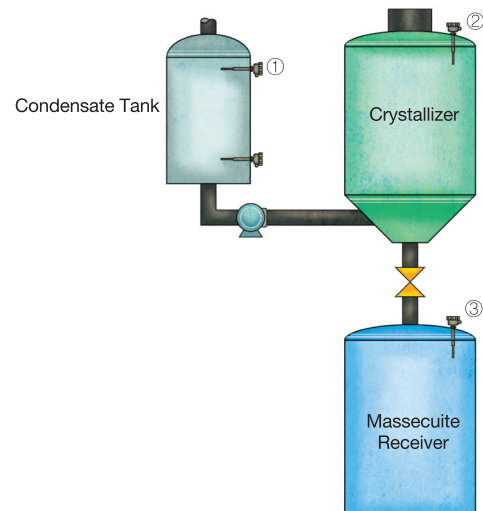
Model : SCAP-1/STF/SRF-900

Features :

- Self-compensation for heavy conductive build up.
- No moving parts.

Other application for :

- Vacuum Seed Receiver
- Strike Receiver



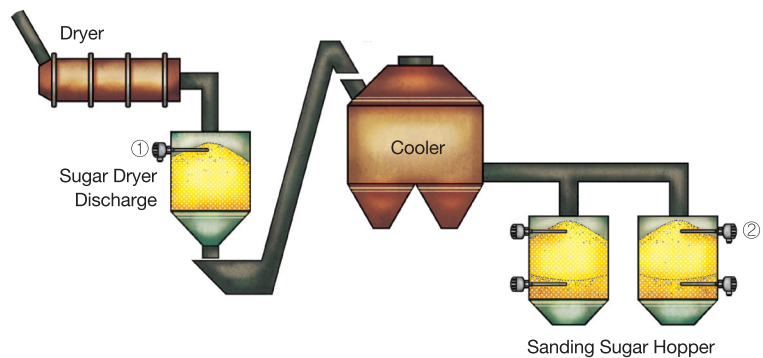
6. Dryer

① and ②

Model : SVL-15/STF/SRF-900

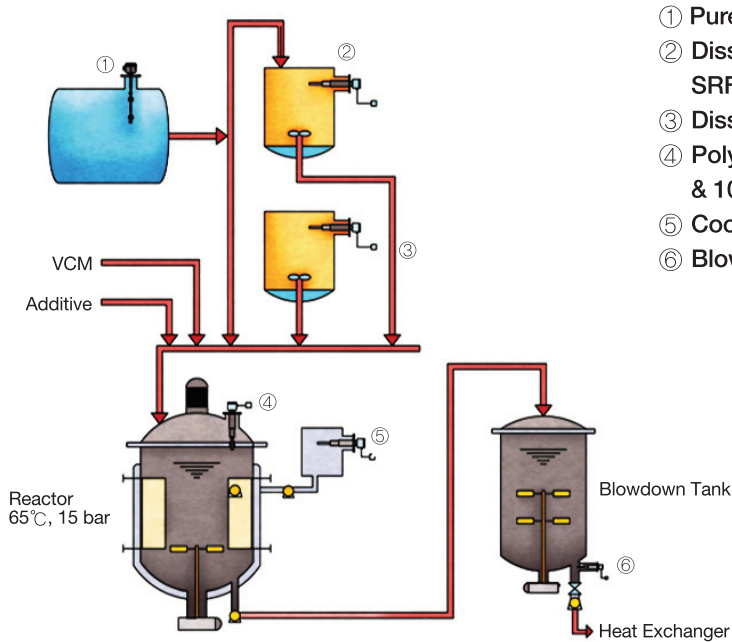
Features :

- Self-cleaning.
- Unaffected by build up.
- Mechanically strong.



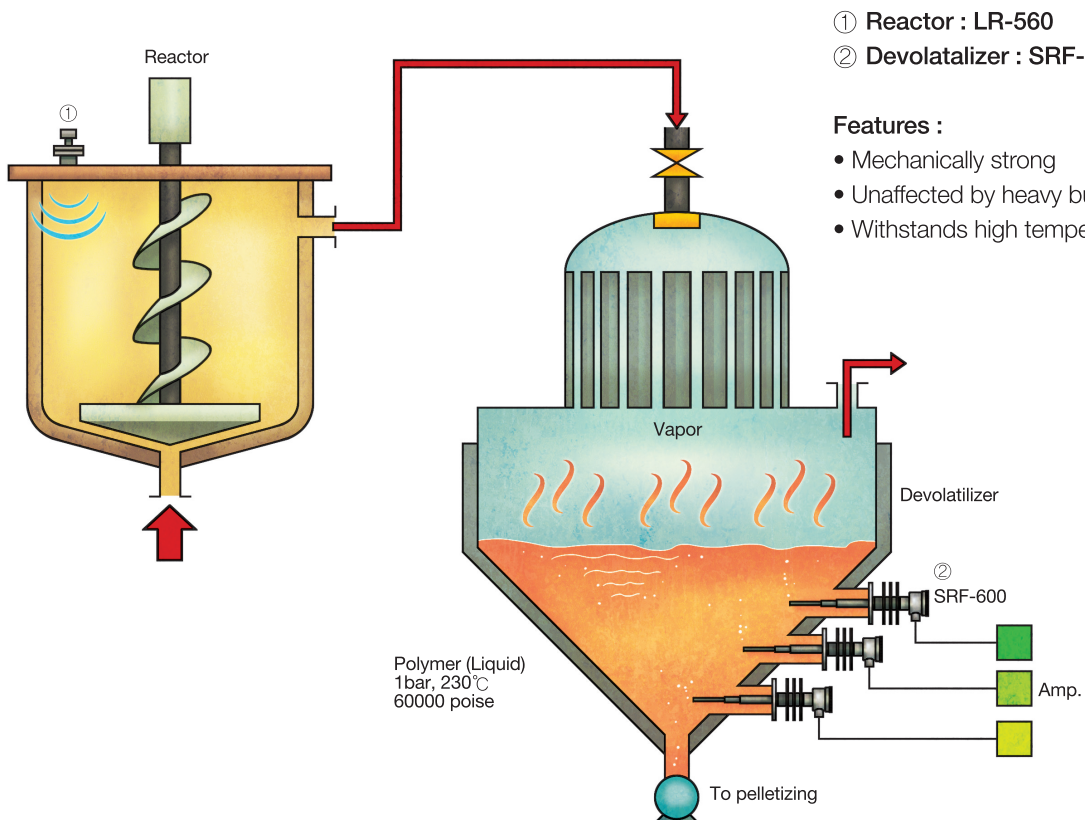
Plastics

1. Suspension Polymerization Processing of PVC



- ① Pure water tank : ST-Point
- ② Dissolution tank for dispersing agent : SRF-600 & 10U
- ③ Dissolution tank for buffer : SRF-600 & 10U
- ④ Polymerizer (High level & Foam) : SRF-600 & 10U/LR-560 #400 buffing, pressure-proof
- ⑤ Cooling water for jacket : SRF-600 & 10U
- ⑥ Blow-down Tank : SRF-600 & 10U

2. Melt Polymer of ABS Manufacturing Process



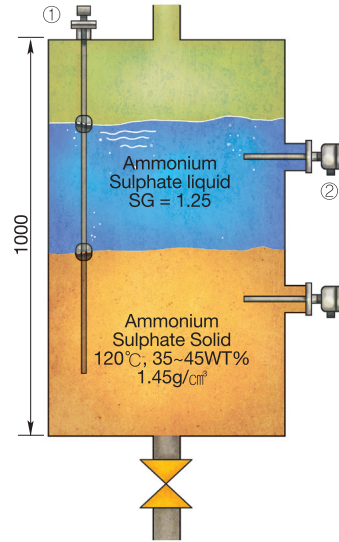
- ① Reactor : LR-560
- ② Devolatilizer : SRF-600 & 10U

Features :

- Mechanically strong
- Unaffected by heavy build up
- Withstands high temperature

3. Sediments Under Liquid of CAPROLACTAM Process

- ① Transmitter : SMS
- ② Switch : SVL/STF
 SVL/STF can generally detect a precipitation under water, when its bulk density is more then 0.2g/cm^3



4. Crystallizing and Drying System of PET

- ① Crystallizing Hopper : $150\sim 160^\circ\text{C}$
- ② Drying Hopper : 130°C , 3~5 hours

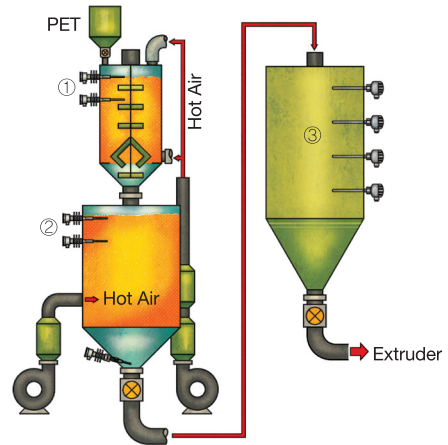
Model : SCAP-1/SRF-900

Features :

- High sensitivity; Stable/STF operation
- Mechanically strong : $\varnothing 27$ probe
- Unaffected by static electricity

- ③ Chip silo

Model : SVL-15



5. PVC Pellet at Automatic Packer

Model : SVL-25/SRF-900/STF-T (for storage hopper)

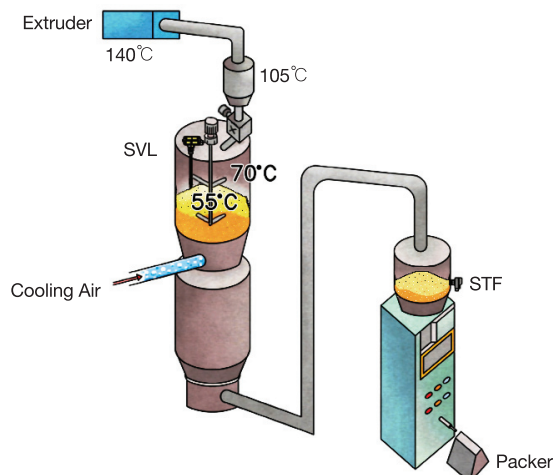
Features :

- Withstands high temperature up to 150°C (option 180°C)
- Self-cleaning action
- Easy maintenance(Visible status LED & Check point)

Model : STF for packer

Features :

- Compact and Rugged construction
- Self-cleaning action
- Easy maintenance (Visible status LED & Check point)



Cement

1. Storage Bunker for Raw Materials

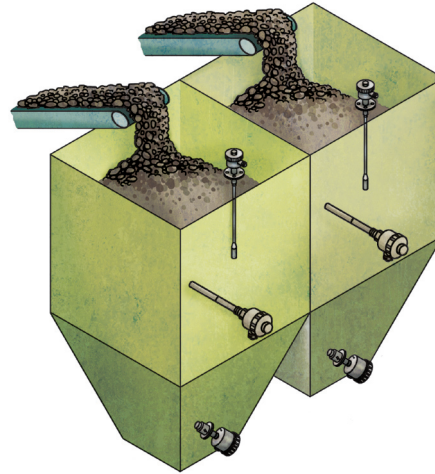
Model : SCAP-4/SRF-900/SPS+ (For High level)

Model : SCAP-1/SRF-900/SPS+ (For Middle level)

Model : SCAP-5/SRF-900/SPS+ (For Low level)

Features :

- Withstand high abrasion
- Unaffected by build up
- Withstand high lateral load/tensile load
- Static electricity immunity



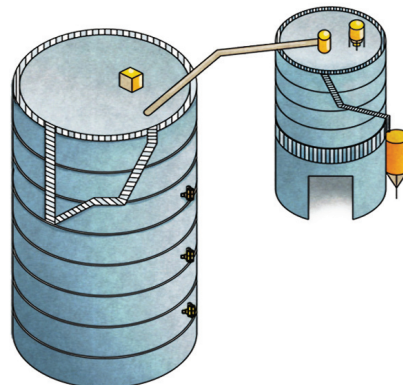
2. Cement Silo at Finishing Process

Model : SVL-15/STF/SPS+ (High level)

Model : SVL-15 Guard type/STF (Low level)

Features :

- Self-cleaning function
- Unaffected by dust
- Built-in protective shield for probe
- SVL-25(Pipe extension) or SVL-35(Cable extension) is available for HH level at top mounting.

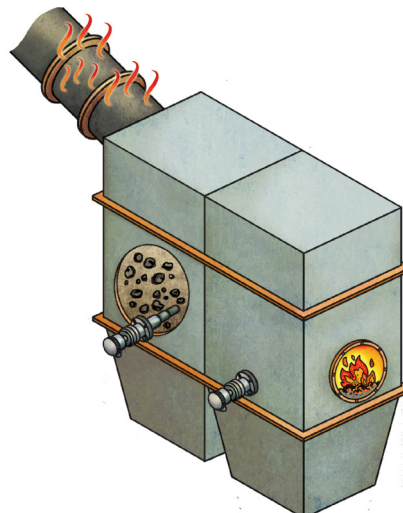


3. Low Level Detection of Hot Clinker

Model : SRF-900/600

Features :

- Rugged probe withstands heavy static load.
- Patented sensitivity selection minimizes the probe extension length.
- Stable operation up to 500°C by using the 5 radiation-fins and the ceramic insulator.



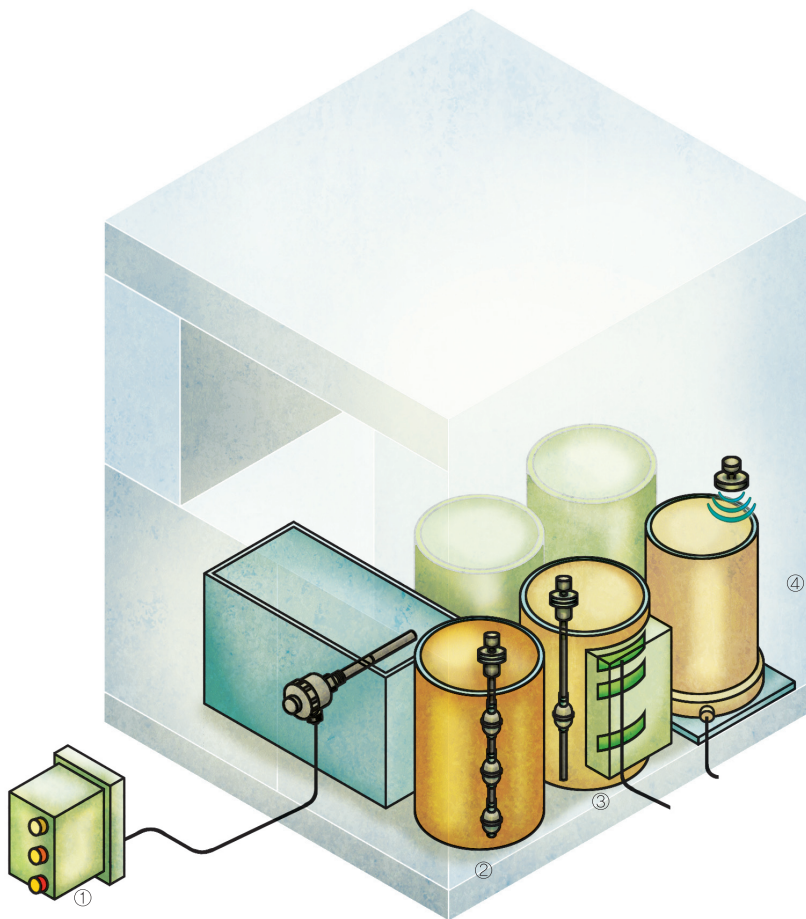
Semiconductor Manufacturing Process/Etching System

- ① SRF-600/STF/Multiranger100/200 (Contact) for overspill protection of waste
- ② SOL series (Contact) by using 316SS, PP, PTFE, PVC
- ③ SMS (Contact) for level detection of solvents.
- ④ Probe LR/LR250 (Non-contact) for level detection of solvents.

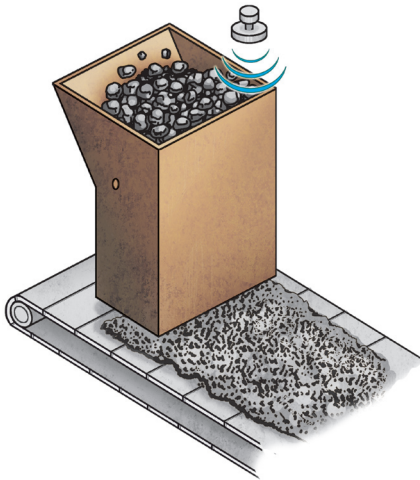
Chemicals and solvents for etching process is very corrosive. We provide contact type (①, ②, ③) and/or non-contact type (④), depending on applications.

Unlike a proximity switch our capacitance SCAP series offers following advantages

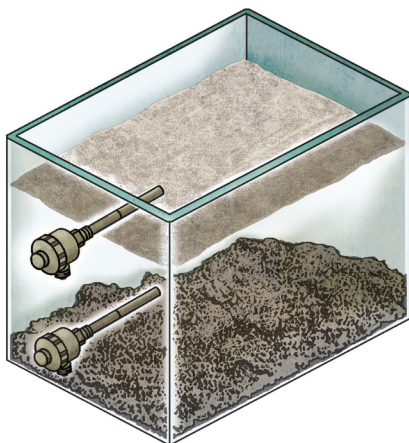
- Sensitivity can be tune on site.
- Operation is not affected by mist, power fluctuation, mutual interference between two sensors, foul or coating onto the probe face, and so on.
- One-push tuning minimizes calibration/maintenance time.



Thermal Power Plant



- ① **Model : LR-560 (Coal Storage Hopper)**
The LR-560 detects coal in the chute.



- ② **Model : SVL/SRF-900/SCAP/STF (Coal Recovery System)**
Coal level detection under water The SVL, vibration sensor, detects coal level under water.

Model : SCAP-1

Overspill protection

The SCAP, capacitive sensor, is not affected by the coating of suspended coal powder on the water.

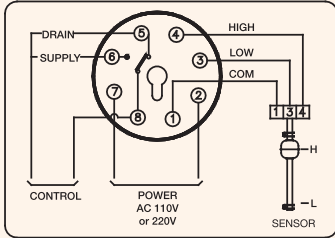


- ③ **Model : SRF-900 (Fly Ash)**
The patented sensitivity selection of the SRF shows stable operation for fly ash(Max. 500°C) which dielectric constant is very small(5~30pF) Single probe construction is mechanically strong.

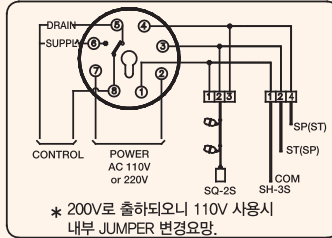
■ Wiring Diagram

■ Multi-Wire Level Controller (Rack/Socket Mount)

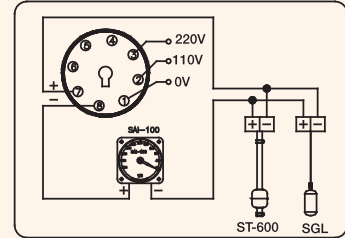
SLC-100U



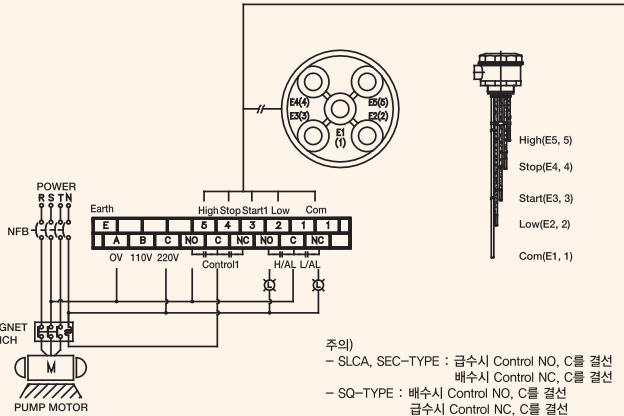
SEC-3U/SQ-2U



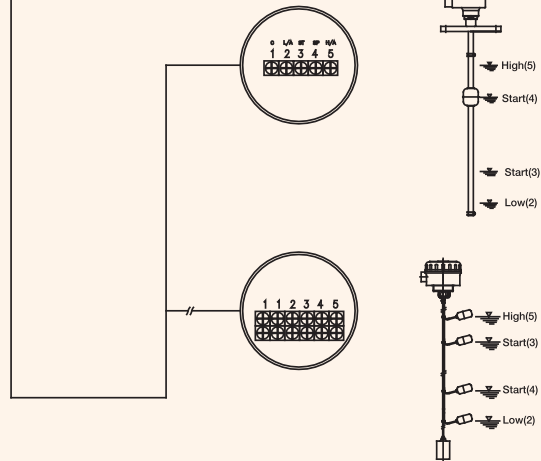
SLI-100U



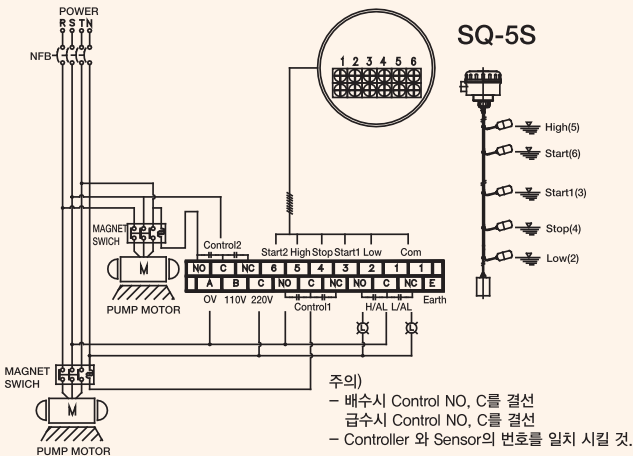
■ Multi-Wire Level Controller (Wall Mount)



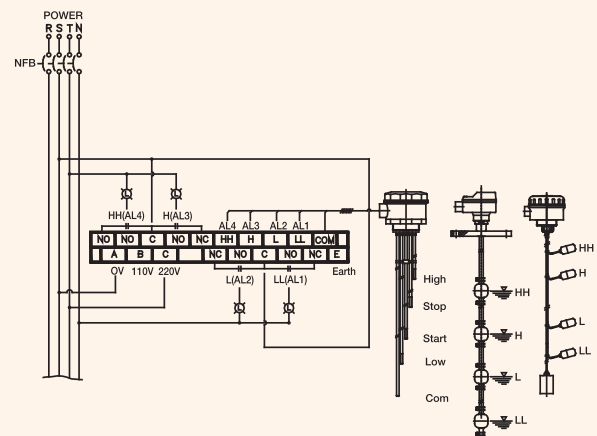
SQ-4U-5W, SEC-5U-5W Controller에 SQ-3S, SH-4S 결선시에는 Controller의 Com과 Low단자를 Short 시켜주십시오.



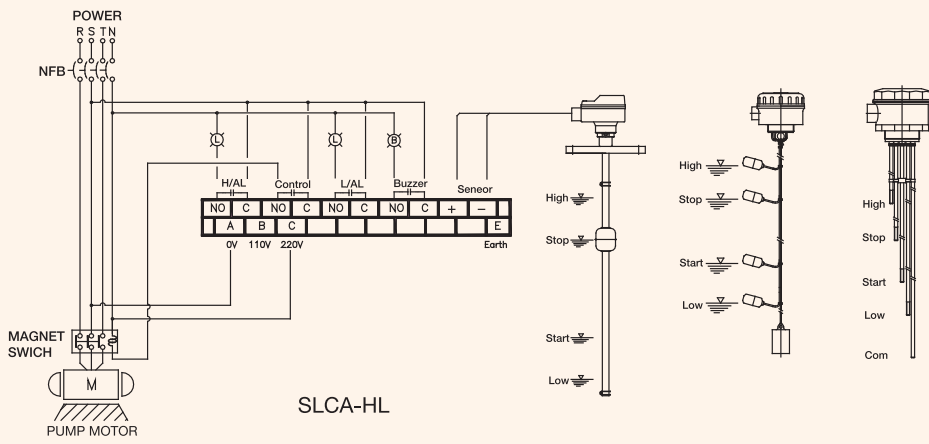
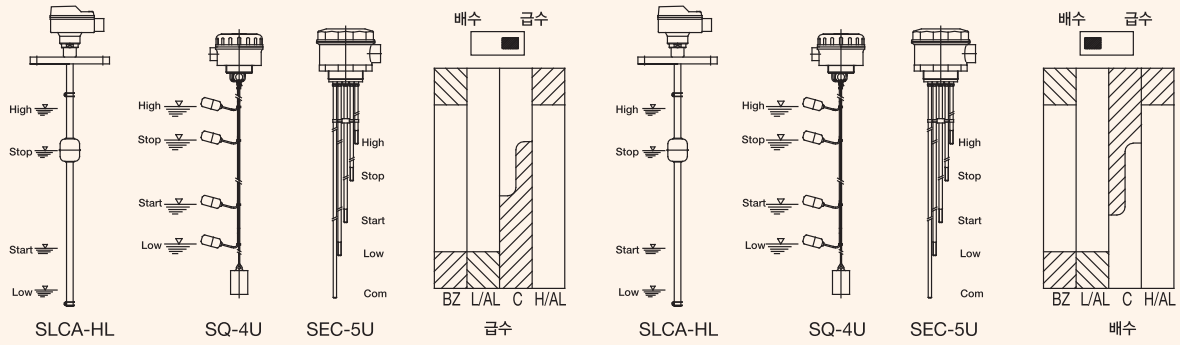
SQ-2ST-6W



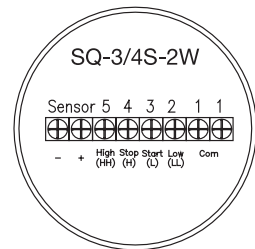
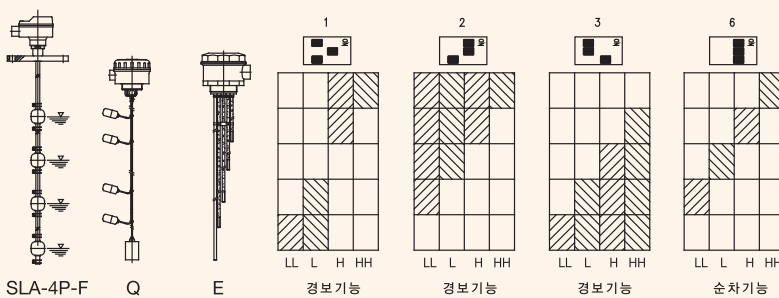
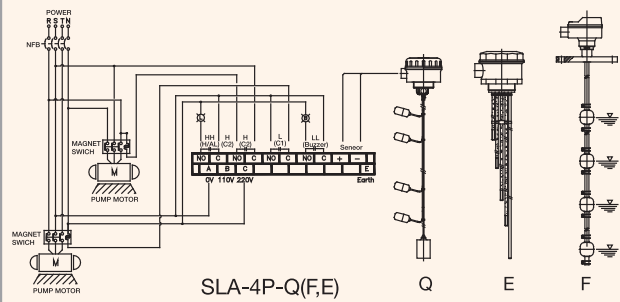
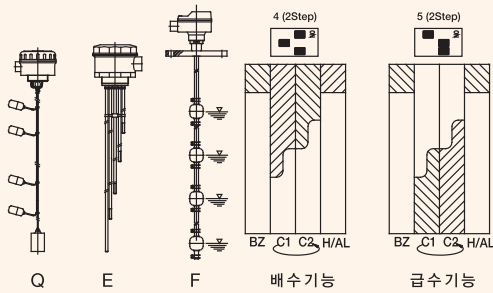
SMA-4P-5W



■ 2-Wire Level Controller (Rack Mount) (SLCA-HL, SQ-4U, SEC-5U)



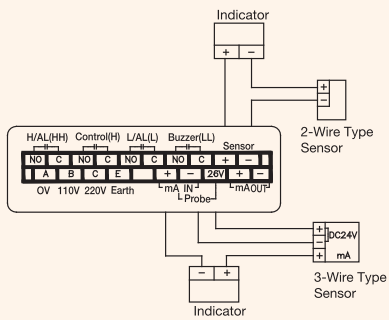
■ 2-Wire Level Controller (Rack Mount) (SLA-4P, Q/E/F)



- 1 : COM
- 2 : LL (BZ)
- 3 : L (C1)
- 4 : H (C2)
- 5 : HH(H/AL)

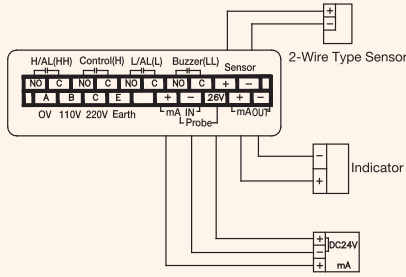
■ 2-Wire Level Controller (Rack Mount) / SLIC-4P

1. STANDARD

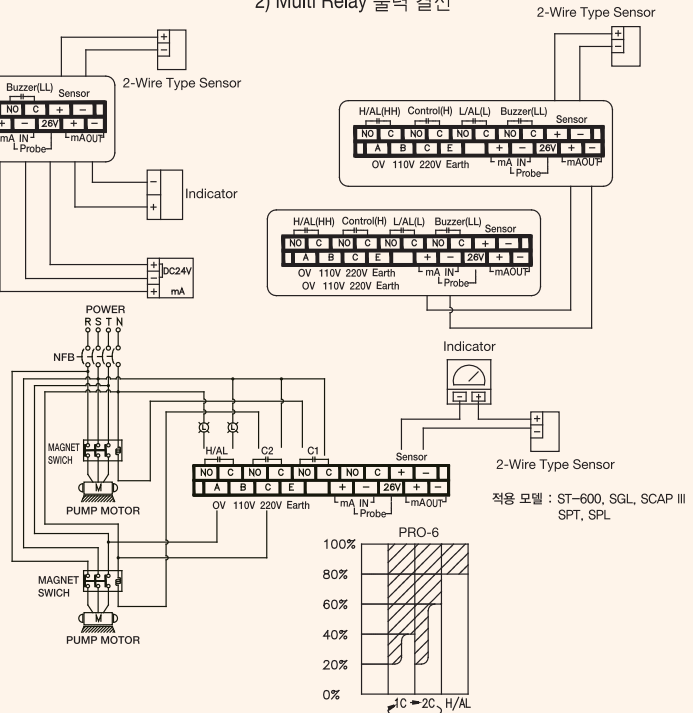


2. OPTION

1) 일반적 결선

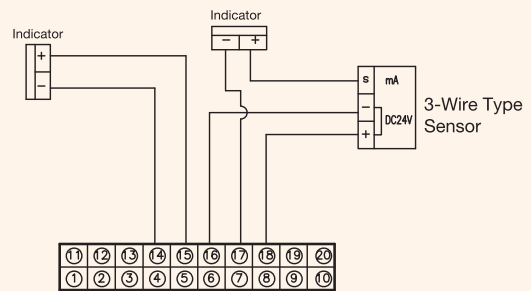
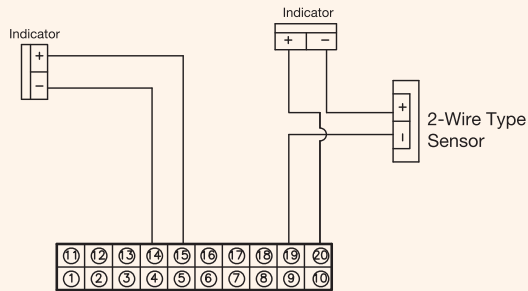


2) Multi Relay 출력 결선

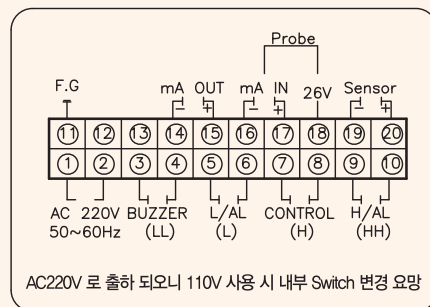
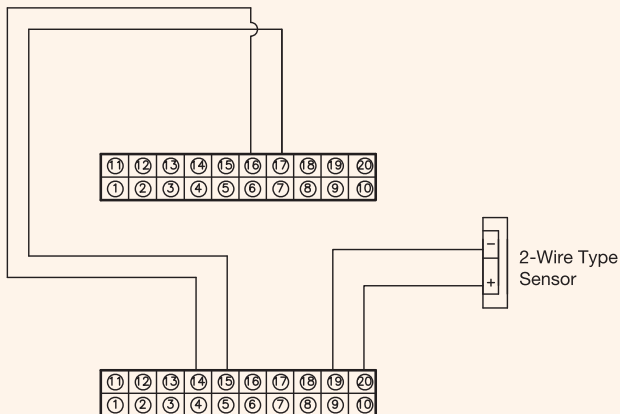


■ 2-Wire Level Controller (Panel Mount) / SLIC-4PD

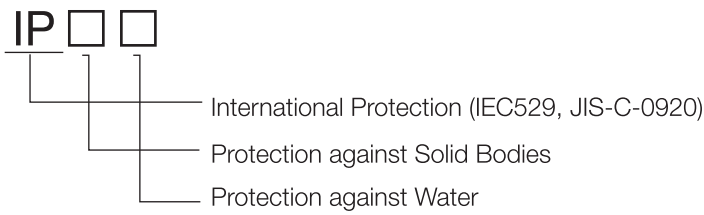
1. 2-Wire/3-Wire



2. Multi Wire


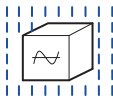
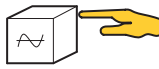
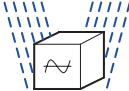
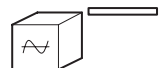
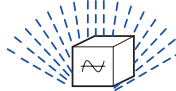

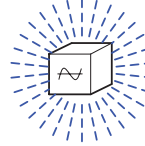

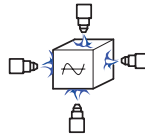

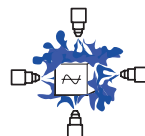



■ Explanation of "IP" Ratings



Conversion of NEMA type Enclosures to IEC Classifications (Reference)

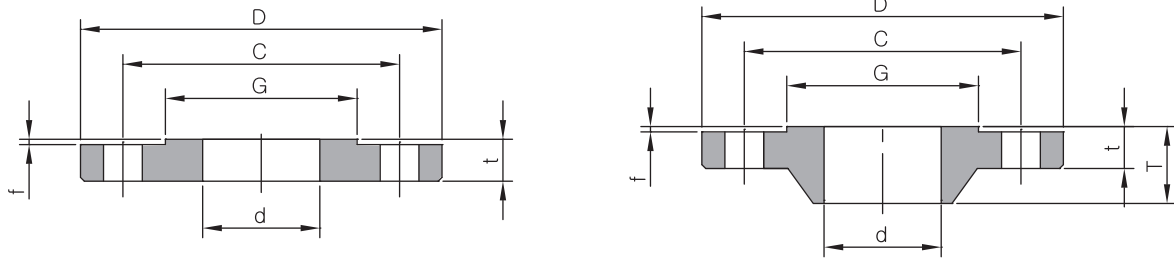
IEC	IP10	IP11	IP54	IP14	IP54	IP56	IP52	IP67	IP52	IP54
NEMA	1	2	3	3R	3S	4&4X	5	6&6P	12&12K	13

Protection against Solid Bodies			Protection against Water		
Code	Explanation		Code	Explanation	
0	No protection.		0	No protection.	
1		Protected against solid body larger than 50mm. (eg. accidental contact with the hand)	1		Protected against vertically falling drop of water. (condensation)
2		Protected against solid body larger than 12mm. (eg. finger of the hand)	2		Protected against drop of water falling at up to 15° from the vertical.
3		Protected against solid body larger than 2.5mm. (eg. tools and wires)	3		Protected against drop of rain water at up to 60° from the vertical.
4		Protected against solid body larger than 1mm. (eg. tools and small wires)	4		Protected against splashed of water from all directions.
5		Protected against dust (no harmful deposit) Complete protection from solid bodies.	5		Protected against jets of water from all directions 12.5mm core-nozzle 10m head 3m distance.
6		Completely protected against dust. Complete protection from solid bodies.	6		Protected against jets of water of similar force to heavy seas as 5 but 1.3m distance.
			7.8		Protected against the effects of dimension at specified pressure. 7 - limited time 8 - unlimited time

Type of Applications

■ Specification of Flange

KS/JIS Code



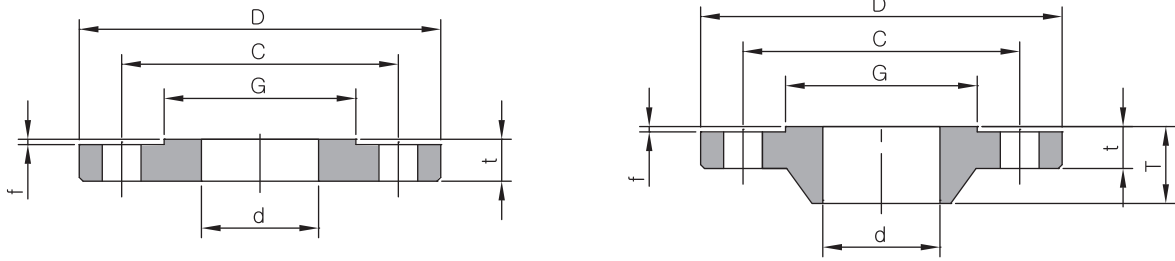
KS B 1503 /JIS B 2220 : 2012

Unit : mm

Class	Size	D	t	f	G	T	d	Bolting			
								C	Number of Holes	Diam. of Holes	Bolt Size
KS/JIS 5K	10	75	9	1	39	24	17.8	55	4	12	M10
	15	80	9	1	44	25	22.2	60	4	12	M10
	20	85	10	1	49	28	27.7	65	4	2	M10
	25	95	10	1	59	30	34.5	75	4	12	M10
	32	115	12	2	70	33	43.2	90	4	15	M12
	40	120	12	2	75	34	49.1	95	4	15	M12
	50	130	14	2	85	36	61.1	105	4	15	M12
	65	155	14	2	110	39	77.1	130	4	15	M12
	80	180	14	2	121	41	90.0	145	4	19	M16
	100	200	16	2	141	41	115.4	165	8	19	M16
	125	235	16	2	176	43	141.2	200	8	19	M16
	150	265	18	2	206	49	166.6	230	8	19	M16
	200	320	20	2	252	53	218	280	8	23	M20
	250	385	22	2	317	61	269.5	345	12	23	M20
	300	430	22	2	360	62	321.0	390	12	23	M20
	350	480	24	3	403	73	358.1	435	12	25	M22
400	540	24	3	463	76	409	495	16	25	M22	
450	605	24	3	523	79	460	555	16	25	M22	
500	655	24	3	573	79	511	605	20	25	M22	

Class	Size	D	t	f	G	T	d	Bolting			
								C	Number of Holes	Diam. of Holes	Bolt Size
KS/JIS 10K	10	90	12	1	46	29	17.8	65	4	15	M12
	15	95	12	1	51	31	22.2	70	4	15	M12
	20	100	14	1	56	32	27.7	75	4	15	M12
	25	125	14	1	67	36	34.5	90	4	19	M16
	32	135	16	2	76	38	43.2	100	4	19	M16
	40	140	16	2	81	38	49.1	105	4	19	M16
	50	155	16	2	96	40	61.1	120	4	19	M16
	65	175	18	2	116	44	77.1	140	4	19	M16
	80	185	18	2	126	45	90.0	150	8	19	M16
	100	210	18	2	151	45	115.4	175	8	19	M16
	125	250	20	2	182	47	141.2	210	8	23	M20
	150	280	22	2	212	53	166.6	240	8	23	M20
	200	330	22	2	262	58	218	290	12	23	M20
	250	400	24	2	324	65	269.5	355	12	25	M22
	300	445	24	3	368	68	321.0	400	16	25	M22
	350	490	26	3	413	79	358.1	445	16	25	M22
	400	560	28	3	475	85	409	510	16	27	M24
	450	620	30	3	530	90	460	565	20	27	M24
500	675	30	3	585	99	511	620	20	27	M24	

KS/JIS Code



KS B 1503 /JIS B 2220 : 2012

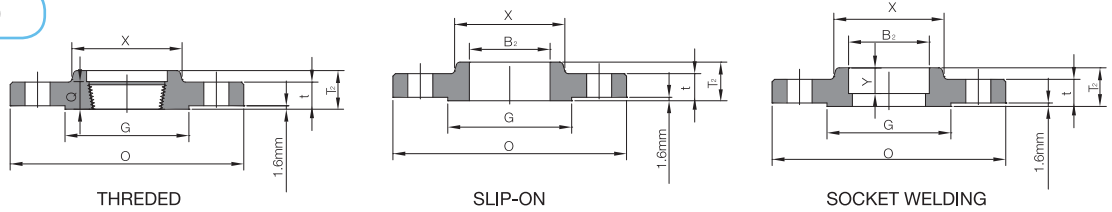
Unit : mm

Class	Size	D	t	f	G	T	d	Bolting			
								C	Number of Holes	Diam. of Holes	Bolt Size
KS/JIS 20K	10	90	14	1	46	33	17.8	65	4	15	M12
	15	95	14	1	51	34	22.2	70	4	15	M12
	20	100	16	1	56	36	27.7	75	4	15	M
	25	125	16	1	67	38	34.5	90	4	19	M16
	32	135	18	2	76	41	43.2	100	4	19	M16
	40	140	18	2	81	41	49.1	105	4	19	M16
	50	155	18	2	96	42	61.1	120	8	19	M16
	65	175	20	2	116	48	77.1	140	8	19	M16
	80	200	22	2	132	51	90.0	160	8	23	M20
	100	225	24	2	160	58	115.4	185	8	23	M20
	125	270	26	2	195	64	141.2	225	8	25	M22
	150	305	28	2	230	73	166.6	260	12	25	M22
	200	350	30	2	275	77	218	305	12	25	M22
	250	430	34	2	345	87	269.5	380	12	27	M24
	300	480	36	3	395	94	321.0	430	16	27	M24
	350	540	40	3	440	110	358.1	480	16	33	M30
	400	605	46	3	495	123	409	540	16	33	M30
450	675	48	3	560	134	460	605	20	33	M30	
500	730	50	3	615	136	511	660	20	33	M30	

Type of Applications

Class	Size	D	t	f	G	T	d	Bolting			
								C	Number of Holes	Diam. of Holes	Bolt Size
KS/JIS 30K	10	110	16	1	52	-	17.8	75	4	19	M16
	15	115	18	1	55	45	22.2	80	4	19	M16
	20	120	18	1	60	45	27.7	85	4	19	M16
	25	130	20	1	70	48	34.5	95	4	19	M16
	32	140	22	2	80	52	43.2	105	4	19	M16
	40	160	22	2	90	54	49.1	120	4	23	M20
	50	165	22	2	105	57	61.1	130	8	19	M16
	65	200	26	2	130	69	77.1	160	8	23	M20
	80	210	28	2	140	73	90.0	170	8	23	M20
	100	240	32	2	160	76	115.4	195	8	25	M22
	125	275	36	2	195	86	141.2	230	8	25	M22
	150	325	38	2	235	95	166.6	275	12	27	M24
	200	370	42	2	280	102	218	320	12	27	M24
	250	450	48	2	345	118	269.5	390	12	33	M30
	300	515	52	3	405	127	321.0	450	16	33	M30
	350	560	54	3	450	134	358.1	495	16	33	M30

CLASS 150

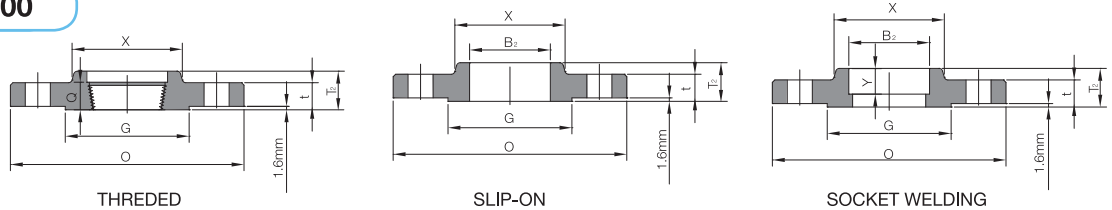


ANSI 150 lbs
ANSI B16.5 FORGED FLANGED

Unit : mm

Size (inch)	Out-Side Diam. of Flange	Thick-ness of Flange	Thick-ness Lap Joint	Diam. of HUB Base	O.D of Raised Face	Diam. of HUB Base	Length Through Hub			Thread Length	Bore		
							Welding Neck	Slip-On Threaded Socket	Lap Joint		Welding Neck/Socket Welding	Slip-On Threaded Socket	Lap Joint
O	t	t	X	G	A	Q	B1	B2	B3				
1/2	90	9.6	11.2	30	34.9	21.3	46	14	16	16	15.8	22.2	22.9
3/4	100	11.2	12.7	38	42.9	26.7	51	14	16	16	20.9	27.7	28.2
1	110	12.7	14.3	49	50.8	33.4	54	16	17	17	26.6	34.5	34.9
1 1/4	115	14.3	15.9	59	63.5	42.2	56	19	21	21	35.1	43.2	43.7
1 1/2	125	15.9	17.5	65	73	48.3	60	21	22	22	40.9	49.5	50
2	150	17.5	19.1	78	92.1	60.3	62	24	25	25	52.5	61.9	62.5
2 1/2	180	20.7	22.3	90	104.8	73	68	27	29	29	62.7	74.6	75.4
3	190	22.3	23.9	108	127	88.9	68	29	30	30	77.9	90.7	91.4
3 1/2	215	22.3	23.9	122	139	101.6	70	30	32	32	90.1	103.4	104.1
4	230	22.3	23.9	135	157.2	114.3	75	32	33	33	102.3	116.1	116.8
5	255	22.3	23.9	164	185.7	141.3	87	35	36	36	128.2	143.8	144.4
6	280	23.9	25.4	192	215.9	168.3	87	38	40	40	154.1	170.7	171.4
8	345	27	28.6	246	269.9	219.1	100	43	44	44	202.7	221.5	222.2
10	405	28.6	30.2	305	323.8	273	100	48	49	49	254.6	276.2	277.4
12	485	30.2	31.8	365	381	323.8	113	54	56	56	304.8	327	328.2
14	535	33.4	35	400	412.8	355.6	125	56	79	57	To be Specified by Pur-chaser	359.2	360.2
16	595	35	36.6	457	469.9	406.4	125	62	87	64		410.5	411.2
18	635	38.1	39.7	505	533.4	457	138	67	97	68		461.8	462.3
20	700	41.3	42.9	559	584.2	508	143	71	103	73		513.1	514.4
24	815	46.1	47.7	663	692.2	610	151	81	111	83		616	616

CLASS 300

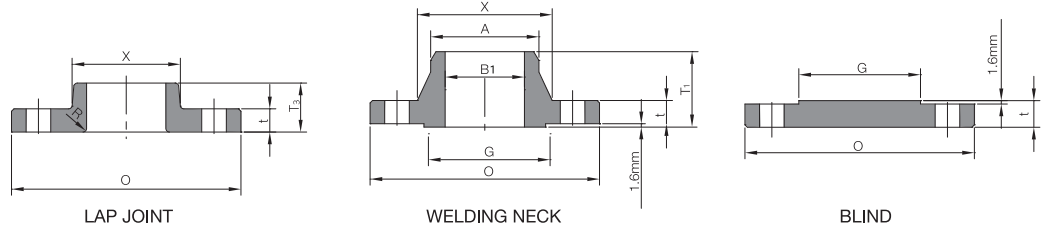


ANSI 300 lbs
ANSI B16.5 FORGED FLANGED

Unit : mm

Size (inch)	Out-Side Diam. of Flange	Thick-ness of Flange	Thick-ness Lap Joint	Diam. of HUB Base	O.D of Raised Face	Diam. of HUB Base	Length Through Hub			Thread Length	Bore			
							Welding Neck	Slip-On Threaded Socket	Lap Joint		Welding Neck/Socket Welding	Slip-On Threaded Socket	Lap Joint	Counter Bore Min. Threaded
O	t	t	X	G	A	Q	B1	B2	B3	B				
1/2	95	12.7	14.3	38	34.9	21.3	51	21	22	16	15.8	22.2	22.9	23.6
3/4	115	14.3	15.9	48	42.9	26.7	54	24	25	16	20.9	27.7	28.2	29
1	125	15.9	17.5	54	50.8	33.4	56	25	27	18	26.6	34.5	34.9	35.8
1 1/4	135	17.5	19.1	64	63.5	42.2	60	25	27	21	35.1	43.2	43.7	44.4
1 1/2	155	19.1	20.7	70	73	48.3	62	29	20	23	40.9	49.5	50	50.3
2	165	20.7	22.3	84	92.1	60.3	68	32	33	29	52.5	61.9	62.5	63.5
2 1/2	190	23.9	25.4	100	104.8	73	75	37	38	32	62.7	74.6	75.4	76.2
3	210	27	28.6	117	127	88.9	78	41	43	32	77.9	90.7	91.4	92.2
3 1/2	230	28.6	30.2	133	139.7	101.6	79	43	44	37	90.1	103.4	104.1	104.9
4	255	30.2	31.8	146	157.2	114.3	84	46	48	37	102.3	116.1	116.8	117.6
5	280	33.4	35	178	185.7	141.3	97	49	51	43	128.2	143.8	144.4	144.4
6	320	35	36.6	206	215.9	168.3	97	51	52	47	154.1	170.7	171.4	171.4
8	380	39.7	41.3	260	269.9	219.1	100	60	62	51	202.7	221.5	222.2	222.2
10	445	46.1	47.7	321	323.8	273	116	65	95	56	254.6	276.2	277.4	276.2
12	520	49.3	50.8	375	381	323.8	129	71	102	61	304.8	327	328.2	328.6
14	585	52.4	54	425	412.8	355.6	141	75	111	64	To be Specified by Pur-chaser	359.2	360.2	360.4
16	650	55.6	57.2	483	469.9	406.4	144	81	121	69		410.5	411.2	411.2
18	710	58.8	60.4	533	533.4	457	157	87	130	70		461.8	462.3	462
20	775	62	63.5	587	584.2	508	160	94	140	74		513.1	514.4	512.8
24	915	68.3	69.9	702	692.2	610	167	105	152	84		616	616	614.4

CLASS 150



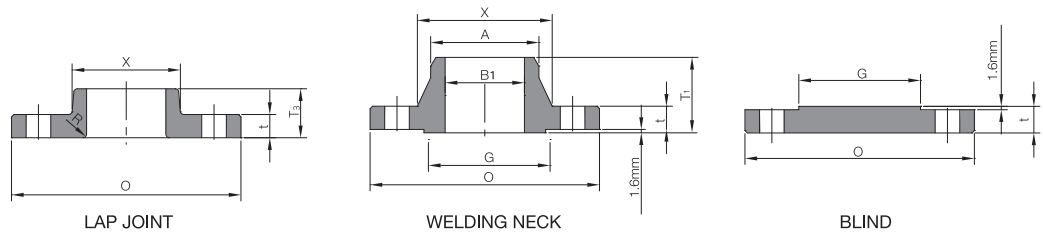
ANSI 150 lbs

ANSI B16.5 FORGED FLANGED

Unit : mm

Radius of Fillet	Depth of Socket	DRILLING			LENGTH OF BOLTS				APPROXIMATE WEIGHT(kg)			
		Bolt Circle Diam.	Number of Holes	Daim. of Holes	Daim. of Bolt (inch)	Machine Bolt (Raised Face)	Stud Bolt Length		Welding Neck	Slip-On/ Threaded	Lap Joint	Blind
R	Y					2mm Raised Face	Ring Joint					
3	10	60.3	4	15.9	1/2	50	55	-	0.51	0.47	0.51	0.47
3	11	69.9	4	15.9	1/2	50	65	-	0.73	0.58	0.64	0.63
3	13	79.4	4	15.9	1/2	55	65	75	1.07	0.86	0.93	0.94
5	14	88.9	4	15.9	1/2	55	70	85	1.4	1.08	1.16	1.23
6	16	98.4	4	15.9	1/2	65	70	85	1.81	1.41	1.51	1.62
8	17	120.7	4	19.1	5/8	70	85	95	2.59	2.26	2.38	2.64
8	19	139.7	1	19.1	5/8	75	90	100	4.28	3.43	3.6	4.06
10	21	152.4	4	19.1	5/8	75	90	100	5.18	3.87	4.04	4.9
10	22.4	177.8	8	19.1	5/8	75	90	100	5.45	4.99	4.99	5.9
11	24.1	190.5	8	19.1	5/8	75	90	100	7.32	5.75	5.96	7.41
11	23.9	215.9	8	22.2	3/4	85	95	110	8.91	6.22	6.44	8.76
13	26.9	241.3	8	22.2	3/4	85	100	115	11.26	7.38	7.59	11.31
13	31.8	298.5	8	22.2	3/4	90	110	120	17.68	12.36	12.66	19.92
13	33.3	362	12	25.4	7/8	100	115	125	24.79	17.1	16.78	29.39
13	39.6	431.8	12	25.4	7/8	100	120	135	38.98	27.68	28.3	43.7
13	41.4	476.3	12	28.6	1	115	135	145	51.71	35.2	41.5	59.42
13	44.5	538.8	16	28.6	1	115	135	145	64.41	42.18	52.98	77.11
13	49.3	577.9	16	31.8	1 1/8	125	145	160	74.84	49.71	59	94.8
13	54.1	635	20	31.8	1 1/8	140	160	170	89.36	65.5	72.12	123.38
13	63.5	749.3	20	34.9	1 1/4	150	170	185	119.66	90.5	99.02	188.24

CLASS 300



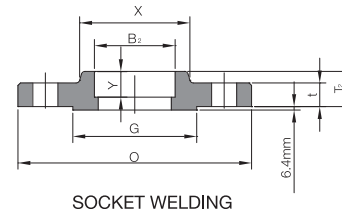
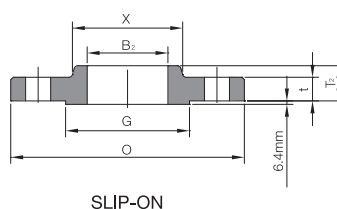
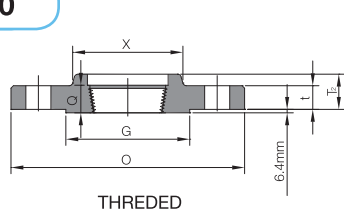
ANSI 300 lbs

ANSI B16.5 FORGED FLANGED

Unit : mm

Radius of Fillet	Depth of Socket	DRILLING			LENGTH OF BOLTS				APPROXIMATE WEIGHT(kg)			
		Bolt Circle Diam.	Number of Holes	Daim. of Holes	Daim. of Bolt (inch)	Machine Bolt (Raised Face)	Stud Bolt Length		Welding Neck	Slip-On/ Threaded	Lap Joint	Blind
R	Y					2mm Raised Face	Ring Joint					
3	10	66.7	4	15.9	1/2	55	65	75	0.78	0.62	0.61	0.62
3	11	82.6	4	19.1	5/8	65	75	90	1.34	1.15	1.15	1.16
3	13	88.9	4	19.1	5/8	65	75	90	1.64	1.39	1.38	1.42
5	14	98.4	4	19.1	5/8	70	85	95	2.06	1.67	1.66	1.79
6	16	114.3	4	22.2	3/4	75	90	100	3.06	2.53	2.52	2.68
8	17	127.7	8	19.1	5/8	75	90	100	3.4	2.8	2.79	3.09
8	19	149.2	8	22.2	3/4	85	100	115	5.31	4.25	4.22	4.75
10	21	168.3	8	22.2	3/4	90	110	120	7.32	5.81	5.78	6.79
10	22.4	184.2	8	22.2	3/4	95	110	125	8.17	7.72	7.72	9.53
11	24.1	200	8	22.2	3/4	95	115	125	11.3	10.13	10.07	12
11	23.9	235	8	22.2	3/4	110	120	135	15.12	12.58	12.52	15.96
13	26.9	269.9	12	25.4	3/4	110	120	140	19.68	16.04	15.95	21.2
13	31.8	330.2	12	28.6	7/8	120	140	150	30.48	24.5	24.37	34.6
13	33.3	387.4	16	31.8	1	140	160	170	43.74	34.16	39.92	55.34
13	39.6	450.8	16	31.8	1 1/8	145	170	185	64.41	51.26	58.7	78.9
13	41.4	514.4	20	34.9	1 1/8	160	180	190	88.3	71.12	83.46	107.05
13	44.5	571.5	20	34.9	1 1/4	165	190	205	112.94	90.4	106.14	139.25
13	49.3	628.6	24	34.9	1 1/4	170	195	210	138.34	109	133.95	176.9
13	54.1	685.8	24	34.9	1 1/4	185	205	220	167.37	136	157.65	223.17
13	63.5	812.8	24	41.3	1 1/2	205	230	255	135.41	204	204.4	342

CLASS 600



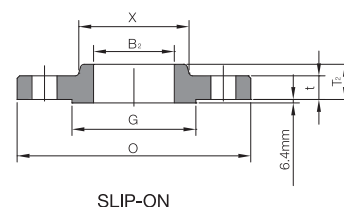
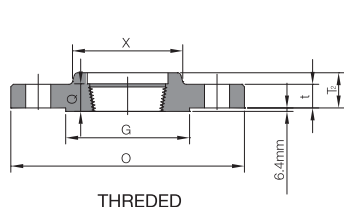
ANSI 600 lbs

ANSI B16.5 FORGED FLANGED

Unit : mm

Size (inch)	Out-Side Diam. of Flange	Thick-ness of Flange	Diam. of HUB Base	O.D of Raised Face	Diam. of HUB Base	Length Through Hub			Thread Length	Bore			
						Welding Neck	Slip-On Threaded Socket	Lap Joint		Welding Neck/Socket Welding	Slip-On Threaded Socket	Lap Joint	Counter Bore Min. Threaded
O	t	X	G	A				Q					
1/2	95	14.3	38	34.9	21.3	52	21	22	16	To be Specified by Pur-chaser	22.2	22.9	23.6
3/4	115	15.9	48	42.9	26.7	57	25	25	16		27.7	28.2	29
1	125	17.5	54	50.8	33.4	62	27	27	18		34.5	34.9	35.8
1 1/4	135	20.7	64	63.5	42.2	67	29	29	21		43.2	43.7	44.4
1 1/2	155	22.3	70	73	48.3	70	32	32	23		49.5	50	50.3
2	165	25.4	84	92.1	60.3	73	37	37	29		61.9	62.5	63.5
2 1/2	190	28.6	100	104.8	73	79	41	41	32		74.6	75.4	76.2
3	210	31.8	117	127	88.9	83	46	46	35		90.7	91.4	92.2
3 1/2	230	35	133	139.7	101.6	86	49	49	40		103.4	104.1	104.9
4	275	38.1	152	157.2	114.3	102	54	54	42		116.1	116.8	117.6
5	330	44.5	189	185.7	141.3	114	60	60	48		143.8	144.4	144.4
6	355	47.7	222	215.9	168.3	117	67	67	51		170.7	171.4	171.4
8	420	55.6	273	269.9	219.1	133	76	76	58		221.5	222.2	222.2
10	510	63.5	343	323.8	273	152	86	111	66		276.2	277.4	276.2
12	560	66.7	400	381	323.8	156	92	117	70		327	328.2	328.6
14	605	69.9	432	412.8	355.6	165	94	127	74		359.2	360.2	360.4
16	685	76.2	495	469.9	406.4	178	106	140	78		410.5	411.2	411.2
18	745	82.6	546	533.4	457	184	117	152	80		461.8	462.3	462
20	815	88.9	610	584.2	508	190	127	165	83		513.1	514.4	512.8
24	940	101.6	718	692.2	610	203	140	184	93		616	616	614.4

CLASS 900



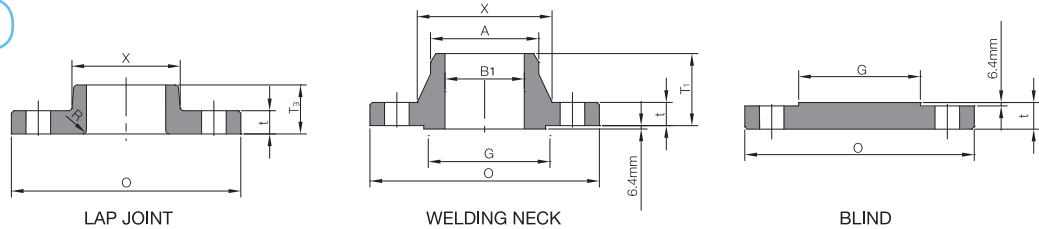
ANSI 900 lbs

ANSI B16.5 FORGED FLANGED

Unit : mm

Size (inch)	Out-Side Diam. of Flange	Thick-ness of Flange	Diam. of HUB Base	O.D of Raised Face	Diam. of HUB Base	Length Through Hub			Thread Length	Bore			
						Welding Neck	Slip-On Threaded Socket	Lap Joint		Welding Neck/Socket Welding	Slip-On Threaded Socket	Lap Joint	Counter Bore Min. Threaded
O	t	X	G	A				Q					
1/2	120	22.3	38	34.9	21.3	60	32	32	23	To be Specified by Pur-chaser	22.2	22.9	23.6
3/4	130	25.4	44	42.9	26.7	70	35	35	26		27.7	28.2	29
1	150	28.6	52	50.8	33.4	73	41	41	29		34.5	34.9	35.8
1 1/4	160	28.6	64	63.5	42.2	73	41	41	31		43.2	43.7	44.4
1 1/2	180	31.8	70	73	48.3	83	44	44	32		49.5	50	50.3
2	215	38.1	105	92.1	60.3	102	57	57	39		61.9	62.5	63.5
2 1/2	245	41.3	124	104.8	73	105	64	64	48		74.6	75.4	76.2
3	240	38.1	127	127	88.9	102	54	54	42		90.7	91.4	92.2
4	290	44.5	159	157.2	114.3	114	70	70	48		116.1	116.8	117.6
5	350	50.8	190	185.7	141.3	127	79	79	54		143.8	144.4	144.4
6	380	55.6	235	215.9	168.3	140	86	86	58		170.7	171.4	171.4
8	470	63.5	298	269.9	219.1	162	102	114	64		221.5	222.2	222.2
10	545	69.9	369	323.8	273	184	108	127	72		276.2	277.4	276.2
12	610	79.4	419	381	323.8	200	117	143	77		327	328.2	328.6
14	640	85.8	451	412.8	355.6	213	130	156	83		359.2	360.2	360.4
16	705	88.9	508	469.9	406.4	216	133	165	86		410.5	411.2	411.2
18	785	101.6	565	533.4	457	229	152	190	89		461.8	462.3	462
20	855	108	622	584.2	508	248	159	210	93		513.1	514.4	512.8
24	1040	139.7	749	692.2	610	292	203	267	102		616	616	614.4

CLASS 600



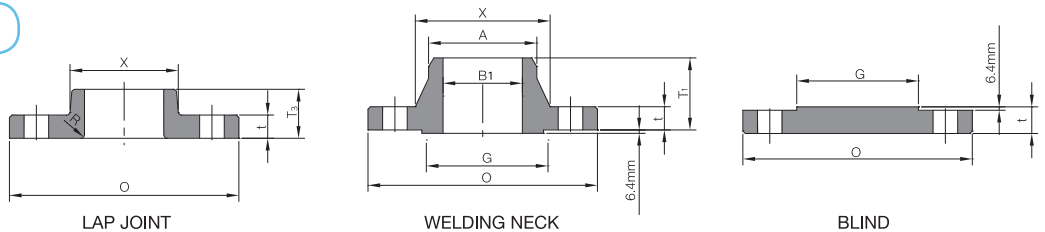
ANSI 600 lbs

ANSI B16.5 FORGED FLANGED

Unit : mm

Radius of Fillet	Depth of Socket	DRILLING			LENGTH OF BOLTS				APPROXIMATE WEIGHT(kg)			
		Bolt Circle Diam.	Number of Holes	Daim. of Holes	Daim. of Bolt (inch)	Machine Bolt (Raised Face)	Stud Bolt Length		Welding Neck	Slip-On/ Threaded	Lap Joint	Blind
R	Y						2mm Raised Face	Ring Joint				
3	10	66.7	4	15.9	1/2	70	75	75	0.9	0.91	0.8	0.91
3	11	82.6	4	19.1	5/8	85	90	90	1.59	1.4	1.36	1.4
3	13	88.9	4	19.1	5/8	85	90	90	1.9	1.7	1.59	1.81
5	14	98.4	4	19.1	5/8	90	95	95	2.49	2.27	2.04	2.04
6	16	114.3	4	22.2	3/4	100	110	110	3.63	3.1	2.95	3.4
8	17	127	8	19.1	5/8	100	110	110	4.54	3.63	3.63	4.4
8	19	149.2	8	22.2	3/4	115	120	120	6.35	5.44	4.99	6.8
10	21	168.3	8	22.2	3/4	120	125	125	8.16	7.26	6.35	8.9
10	22.4	184.2	8	25.4	7/8	135	140	140	11.8	9.53	9.08	13.17
11	24.1	215.9	8	25.4	7/8	140	145	145	16.78	14.97	14.06	18.6
11	23.9	266.7	8	28.6	1	160	165	165	30.87	28.5	27.5	30.84
13	26.9	292.1	12	28.6	1	165	170	170	36.77	36.32	35.38	38
13	31.8	349.2	12	31.8	1 1/8	185	190	190	50.8	44	50.8	62.2
13	33.3	431.8	16	34.9	1 1/4	210	215	215	86.26	76.2	74	102
13	39.6	489	20	34.9	1 1/4	215	220	220	102.51	97.52	108.86	132
13	41.4	527	20	38.1	1 3/8	230	235	235	121.56	102	111	158
13	44.5	603.2	20	41.3	1 1/2	250	255	255	177.06	149.82	165.71	224.73
13	49.3	654	20	44.5	1 5/8	265	275	275	215.65	180.1	194	285
13	54.1	723.9	24	44.5	1 5/8	280	285	290	267.86	231.54	258.78	365
13	63.5	838.2	24	50.8	1 7/8	325	330	335	372	330	362	533.45

CLASS 900



ANSI 900 lbs

ANSI B16.5 FORGED FLANGED

Unit : mm

Radius of Fillet	DRILLING			LENGTH OF BOLTS				APPROXIMATE WEIGHT(kg)			
	Bolt Circle Diam.	Number of Holes	Diam. of Holes	Diam. of Bolt (inch)	Stud Bolt Length			Welding Neck	Slip-On/ Threaded	Lap Joint	Blind
R					Male and Female / Tongue and Groove	7mm Raised Face	Ring Joint				
3	82.6	4	22.2	3/4	100	110	110	2.1	1.81	1.81	1.9
3	88.9	4	22.2	3/4	110	115	115	2.72	2.4	2.3	2.7
3	101.6	4	25.4	7/8	120	125	125	3.86	3.41	3.4	4.09
5	111.1	4	25.4	7/8	120	125	125	4.54	3.41	4.09	4.54
6	123.8	4	28.6	1	135	140	140	5.9	5.45	5.4	5.9
8	165.1	8	25.4	7/8	140	145	145	10.89	9.98	9.53	11.34
8	190.5	8	28.6	1	150	160	160	16.33	15.8	13.15	16
10	190.5	8	25.4	7/8	140	145	145	15	11.8	11.34	13.17
11	235	8	31.8	1 1/8	165	170	170	23.13	23.2	22.6	24.5
11	279.4	8	34.9	1 1/4	185	190	190	38.5	37.65	36.74	39.46
13	317.5	12	31.8	1 1/8	185	190	195	49.89	48.3	47.5	51.5
13	393.7	12	38.1	1 3/8	215	220	220	79.45	75	86	89
13	469.9	16	38.1	1 3/8	230	235	235	118.04	111.13	125.64	131.54
13	533.4	20	38.1	1 3/8	250	255	255	157	146	167	187
13	558.8	20	41.3	1 1/2	265	275	280	181.6	172.36	180.07	224.07
13	616	20	44.5	1 5/8	280	285	290	224.73	192.95	211.11	272.4
13	685.8	20	50.8	1 7/8	320	325	335	308.72	272.4	295.1	385.9
13	749.3	20	54	2	345	350	360	376.82	331.42	367.74	488
13	901.7	20	66.7	2 1/2	430	440	455	685	632	700	905

■ Specification of Pipe

CARBON AND ALLOY STEEL PIPE

Unit : mm

Nominal Wall Thickness and Inside Diameter																	
Nominal Pipe Size		Out-Side Dia.		S.G.P		Schedule 10		Schedule 20		Schedule 30		Schedule 40		Schedule 60		Schedule 80	
				Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.
A	B	A	B	t	A	t	A	t	A	t	A	t	A	t	A	t	A
6	1/8	10.5	10.29	2	6.5	-	-	-	-	-	-	1.7	7.1	-	-	2.4	5.7
8	1/4	13.8	13.72	2.3	9.2	-	-	-	-	-	-	2.2	9.4	-	-	3	7.8
10	3/8	17.3	17.14	2.3	12.7	-	-	-	-	-	-	2.3	12.7	-	-	3.2	10.9
15	1/2	21.7	21.34	2.8	16.1	-	-	-	-	-	-	2.8	16.1	-	-	3.7	14.3
20	3/4	27.2	26.67	2.8	21.6	-	-	-	-	-	-	2.9	21.4	-	-	3.9	19.4
25	1	34	33.40	3.2	27.6	-	-	-	-	-	-	3.4	27.2	-	-	4.5	25
32	1 1/4	42.7	42.16	3.5	35.7	-	-	-	-	-	-	3.6	35.5	-	-	4.9	32.9
40	1 1/2	48.6	48.26	3.5	41.6	-	-	-	-	-	-	3.7	41.2	-	-	5.1	38.4
50	2	60.5	60.32	3.8	52.9	-	-	-	-	-	-	3.9	52.7	-	-	5.5	49.5
65	2 1/2	76.3	73.02	4.2	67.9	-	-	-	-	-	-	5.2	65.9	-	-	7	62.3
80	3	89.1	88.9	4.2	80.7	-	-	-	-	-	-	5.5	78.1	-	-	7.6	73.9
90	3 1/2	101.6	101.6	4.2	93.2	-	-	-	-	-	-	5.7	90.2	-	-	8.1	85.4
100	4	114.3	114.3	4.5	105.3	-	-	-	-	-	-	7.1	102.3	-	-	8.6	97.1
125	5	139.8	141.3	4.5	105.3	-	-	-	-	-	-	8.2	126.6	-	-	9.5	120.8
150	6	165.2	168.3	5	155.2	-	-	-	-	-	-	9.3	151	-	11.0	143.2	-
200	8	216.4	219.08	5.8	204.7	-	-	6.4	203.5	7	202.3	10.3	199.9	10.3	195.7	12.7	190.9
250	10	267.4	273.05	6.6	254.2	-	-	6.4	254.6	7.8	251.8	11.1	248.8	12.7	242	15.1	237.2
300	12	318.5	323.8	6.9	304.7	-	-	6.4	305.7	8.4	301.7	12.7	297.3	14.3	289.9	17.4	283.7
350	14	355.6	355.6	7.9	339.6	6.4	342.8	7.9	339.8	9.5	336.6	14.3	333.4	15.1	325.4	19	317.6
400	16	406.4	406.4	7.9	390.6	6.4	393.6	7.9	390.6	9.5	387.4	15.1	381	16.7	373	21.4	363.6
450	18	457.2	457.2	7.9	441.4	6.4	444.4	7.9	441.4	11.1	435	14.3	428.6	19	419.2	23.8	408.6
500	20	508	508.2	7.9	492.2	6.4	495.2	9.5	489	12.7	482.6	15.1	477.8	20.6	466.8	26.2	455.6
600	24	609.6	558.8	-	-	6.4	596.8	9.5	590.6	14.3	581	17.5	574.6	24.6	560.4	30.9	547.8

STAINLESS STEEL PIPE

Unit : mm

Nominal Wall Thickness and Inside Diameter																		Nominal Pipe Size	
Nominal Pipe Size		Out-Side Dia.		Schedule 5		Schedule 10		Schedule 20		Schedule 40		Schedule 80		Schedule 120		Schedule 160			
				Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.		
A	B	A	B	t	A	t	A	t	A	t	A	t	A	t	A	t	A	B	
6	1/8	10.5	10.29	1	8.5	1.2	8.1	1.5	7.5	1.7	7.1	2.4	5.7	-	-	-	-	6	1/2
8	1/4	13.8	13.72	1.2	11.4	1.65	10.5	2	9.8	2.2	9.4	3	7.8	-	-	-	-	8	1/4
10	3/8	17.3	17.14	1.2	14.9	1.65	14	2	13.3	2.3	12.7	3.2	10.9	-	-	-	-	10	3/4
15	1/2	21.7	21.34	1.65	18.4	2.1	17.5	2.5	16.7	2.8	16.1	3.7	14.3	-	-	4.7	12.3	15	1/2
20	3/4	27.2	26.67	1.65	23.9	2.1	23	2.5	22.2	2.9	21.4	3.9	19.4	-	-	5.5	16.2	20	3/4
25	1	34	33.40	1.65	30.7	2.8	28.4	3	28	3.4	27.2	4.5	25	-	-	6.4	21.2	25	1
32	1 1/4	42.7	42.16	1.65	39.4	2.8	37.1	3	36.7	3.6	35.5	4.9	32.9	-	-	6.4	29.9	32	1 1/4
40	1 1/2	48.6	48.26	1.65	45.3	2.8	43	3	42.6	3.7	41.2	5.1	38.4	-	-	7.1	34.4	40	1 1/2
50	2	60.5	60.32	1.65	57.2	2.8	54.9	3.5	53.5	3.9	52.7	5.5	49.5	-	-	8.7	43.1	50	2
65	2 1/2	76.3	73.02	2.1	72.1	3	70.3	3.5	69.3	5.2	65.9	7	62.3	-	-	9.5	57.3	65	2 1/2
80	3	89.1	88.9	2.1	84.9	3	83.1	4	81.1	5.5	78.1	7.6	73.9	-	-	11.1	66.9	80	3
90	3 1/2	101.6	101.6	2.1	97.4	3	95.6	4	93.6	5.7	90.2	8.1	85.4	-	-	12.7	76.2	90	3 1/2
100	4	114.3	114.3	2.1	110.1	3	108.3	4	106.3	6	102.3	8.6	97.1	11.1	92.1	13.5	87.3	100	4
125	5	139.8	141.3	2.8	134.2	3.4	133	5	129.8	6.6	126.6	9.5	120.8	12.7	114.4	15.9	108	125	5
150	6	165.2	168.3	2.8	159.6	3.4	158.4	5	155.2	7.1	151	11	143.2	14.3	136.2	18.2	128.8	150	6
200	8	216.4	219.08	2.8	210.7	4	208.3	6.5	203.3	8.2	199.9	12.7	190.9	18.2	179.9	23	170.3	200	8
250	10	267.4	273.05	3.4	260.6	4	259.4	6.5	254.4	9.3	248.8	15.1	237.2	21.4	224.6	28.6	210.2	250	10
300	12	318.5	323.8	4	310.5	4.5	309.5	6.5	305.5	10.3	297.9	17.4	283.7	25.4	267.7	33.3	254.9	300	12
350	14	355.6	355.6	4	347.6	5	345.6	8	339.6	11.1	333.4	19	317.6	27.8	300	35.7	284.2	350	14
400	16	406.4	406.4	4.5	397.4	5	396.4	8	390.4	12.7	381	21.4	363.6	30.9	344.6	40.5	325.4	400	16
450	18	457.2	457.2	4.5	448.2	5	447.2	8	441.2	14.3	428.6	23.8	409.6	34.9	387.4	45.2	366.8	450	18
500	20	508	508.2	5	498	5.5	497	9.5	489	15.1	477.8	26.2	455.6	38.1	431.8	40	408	500	20
600	24	609.6	558.8	5.5	598.6	6.5	596.6	9.5	590.6	17.5	574.6	30.9	547.8	45.9	517.8	59.5	490.6	600	24

Unit : mm

Nominal Wall Thickness and Inside Diameter															
Schedule 100		Schedule 120		Schedule 140		Schedule 160		STD		Ex-Stg		XX-Stg		Nominal Pipe Size	
Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.	Wall Thick-ness	Wall Outside I.D.		
t	A	t	A	t	A	t	A	t	A	t	A	t	A	A	B
-	-	-	-	-	-	-	-	1.7	7.1	2.4	5.7	-	-	6	1/8
-	-	-	-	-	-	-	-	2.2	9.4	3	7.8	-	-	8	1/4
-	-	-	-	-	-	-	-	2.3	12.7	3.2	10.9	-	-	10	3/8
-	-	-	-	-	-	4.7	12.3	2.8	16.1	3.7	14.3	7.5	6.7	15	1/2
-	-	-	-	-	-	5.5	16.2	2.9	21.4	3.9	19.4	7.8	11.6	20	3/4
-	-	-	-	-	-	6.4	21.2	3.4	27.2	4.5	25	9.1	15.8	25	1
-	-	-	-	-	-	6.4	29.9	3.6	35.5	4.9	32.9	9.7	23.3	32	1 1/4
-	-	-	-	-	-	7.1	34.4	3.7	41.2	5.1	38.4	10.2	28.2	40	1 1/2
-	-	-	-	-	-	8.7	43.21	3.9	52.7	5.5	49.5	11.1	38.3	50	2
-	-	-	-	-	-	9.5	57.3	5.2	65.9	7	62.3	14	48.3	65	2 1/2
-	-	-	-	-	-	11.1	66.9	5.5	78.1	7.6	73.9	15.2	58.7	80	3
-	-	-	-	-	-	12.7	76.2	5.7	90.2	8.1	85.4	16.2	69.2	90	3 1/2
-	-	11.1	92.1	-	-	13.5	87.3	6	102.3	8.6	97.1	17.1	80.1	100	4
-	-	12.7	114.4	-	-	15.9	108	6.6	126.6	9.5	120.8	19	101.8	125	5
-	-	14.3	136.6	-	-	18.2	128.8	7.1	151	11	143.2	21.9	121.4	150	6
15.1	186	18.2	179.9	20.6	175.1	23	170.3	8.2	199.9	12.7	190.9	22.2	171.9	200	8
18.2	231	21.1	224.6	25.4	216.6	28.6	210.2	9.3	248.8	12.7	242	25.4	216.6	250	10
21.4	275.7	25.4	267.7	28.6	261.3	33.3	251.9	9.5	299.5	12.7	293.1	25.4	267.7	300	12
23.8	308	27.8	300	31.8	292	35.7	284.2	9.5	336.6	12.7	330.2	25.4	-	350	14
26.2	354	30.9	344.6	36.5	333.4	40.5	325.4	9.5	387.4	12.7	381	-	-	400	16
29.4	298.4	34.9	387.4	39.7	377.8	45.2	366.8	9.5	438.2	12.7	431.8	-	-	450	18
32.5	443	38.1	431.8	44.5	419	50	408	9.5	489	12.7	482.6	-	-	500	20
38.9	531.8	45.9	517.8	52.4	504.8	59.5	490.6	9.5	590.6	12.7	584.2	-	-	600	24

Type of Applications

■ Comparison of ASTM Specifications and Similar Standards

Steel Composition	ASTM Specification and Grade			KS Specification and Grade			
	Marking Symbol	Pipe	Plate	Forging	Marking Symbol	Pipe	Plate
Carbon Steel	-	A120	A283-A	-	SPP	SPP	SB41
	-	A53-B	A284	-	PS38(W), PS38, PT38(W), PT38	SPPS38	SWS41B
	-	A53-B	A284	-	PS42(W), PS42, PT42(W), PT42	SPPS42	SWS41B
					HT38, HT38(W)	SPHT38	SBB42
	WPB	A106-B	A515-60 or 70 A516-60 or 70	A105	HT42, HT42(W)	SPHT42	SBB42
	WPC	A106-C	A515-70 A516-70	A105	HT49, HT49(W)	SPHT49	SBB49
Low Temperature Steel	WPL6	A333 and A334-6	A516-60	A350-LF2	PL39	STPL39	SLAL39
	WPL3	A333 amd A334-3	A203-D	A350-LF3	-	-	-
	WPL9	A333 and A334-9	A203-A	A350-LF9	-	-	-
Alloy Steel	WP1	A335-P1	A204-B	A182-F1	PA12, FA12	SPA12	SBB46M
	WP12	A335-P12	A387-12	A182-F12	PA22, FA22	SPA22	SCMV2
	WP11	A335-P11	A387-11	A182-F11	PA23, FA23	SPA23	SCM23
	WP22	A335-P22	A387-22	A182-F22	PA24, FA24	SPA24	SCMV4
	WP5	A335-P5	A387-5	A182-F5	PA25, FA25	SPA25	SCMV6
	WP7	A335-P7	A387-7	A182-F7	-	-	-
	WP9	A335-P9	A387-9	A182-F9	-	-	-
	WP91	A335-P91	A387-91	A182-F91	-	-	-
Stainless Steel	WP304	A312-TP304	A240-Type 304	A182-F304	STS3074, STS304W, STS304F	STS304TP	STS304
	WP304H	A312-TP304H	A240-Type 304H	A182-F304H	-	-	-
	WP304L	A312-TP304L	A240-Type 304L	A182-F304L	STS304L, STS304LW, STS304LF	STS304LTP	STS304L
	WP309	A312-TP309	A240-Type 309S	-	STS309S, STS309SW, STS309SF	STS309STP	STS309S
	WP310	A312-TP310	A240-Type 310S	A182-F310	STS310S, STS310W, STS310SF	STS310STP	STS310S
	WP316	A312-TP316	A240-Type 316	A182-F316	STS316, STS316W, STS316F	STS316TP	STS316
	WP316H	A312-TP316H	A240-Type 316H	A182-F316H	STS316H, STS316HF	STS316HTP	-
	WP316L	A312-TP316L	A240-Type 316L	A182-F316L	STS316L, STS316LW, STS316LF	STS316LP	STS316L
	WP317L	A312-TP317L	A240-Type 317L	A182-F317L	STS317L, STS317LW	STS317LTP	STS317L
	WP321	A312-TP321	A240-Type 321	A182-F321	STS321, STS321W, STS321F		
	WP321H	A312-TP321H	A240-Type 321H	A182-F321H	-	-	-
	WP347	A312-TP347	A240-Type 347	A182-F347	STS347, STS347W, STS347F	STS347TP	STS347
	WP347H	A312-TP347H	A240-Type 347H	A182-F347H	STS347H, STS347HF	STS347HTP	-

JIS Specification and Grade			B.S. Specification and Grade	DIN	Steel Composition
Marking Symbol	Pipe	Plate	Pipe	Plate	
FSGP or SGP		SS400	1387-M	2440-ST33-1	Carbon Steel
PG370(W), PS370(W), PT370(W), PT370	STPG370	SM41B	3602-ERW 23	1626-ST37	Carbon Steel
PG410(W), PS410(W), PT410(W), PT410	STPG410	SM41B	3602-ERW 27	-	Carbon Steel
PS370, PT370(W)	STPG370	SB42	3602-Steel 23	17175-ST35.8	Carbon Steel
PS410, PT410(W)	STPG410	SB42	3602-Steel 27	17175-ST45.8	Carbon Steel
PS480, PT480(W)	STPT480	SB49	3602-Steel 35	-	Carbon Steel
PL380(W)	STPT380	-	3603-Steel 27 LT 30	-	Carbon Steel
PL450(W)	STPL450	-	3603-Steel 503 LT 100	-	3 1/2% Ni Steel
PL690(W)	STPL690	-	-	-	2% Ni-1% Cu Steel
PA12(W), FA12	STPA12	-	-	17175-15 Mo3	Carbon-Molybdenum Steel
PA22(W), FA22	STPA22	-	3603-HF620	17175-13 Cr Mo44	1% Cr-1/2% Molybdenum Steel
PA23(W), FA23	STPA23	-	3603-HF621	-	1 1/4% Cr-1/2% Molybdenum Steel
PA24(W), FA24	STPA24	SCMV4	3603-HF622,27	17175-10 Cr Mo910	2 1/4% Cr-1% Molybdenum Steel
PA25(W), FA25	STPA25	-	3603-HF625	-	5% Cr-1/2% Molybdenum Steel
-	-	-	-	-	7% Cr-1/2% Molybdenum Steel
PA26(W), FA26	STPA26	-	-	-	9% Cr-1% Molybdenum Steel
-	-	-	-	-	9% Cr-1% Mo-0.2%V+Cb+N
SUS304, SUS304W, SUS304F	SUS304TP	SUS304	3605-801	17440-X5 Cr Ni189	18% Cr-8% Ni Steel
SUS304H, SUS304HF	SUS304HTP	-	3605-811	-	18% cR-8% Ni-(0.04-0.10)% C Steel
SUS304L, SUS304LW	SUS304LTP	SUS304L	3605-811L	17440-X2 Cr Ni189	18% Ni-0.035% C Steel
SUS309S, SUS309SW, SUS309SF	SUS309STP	SUS309S	-	-	22% Cr-12% Ni Steel
SUS310S, SUS310SW, SUS310S	SUS310STP	SUS310S	3605-805S	-	25% Cr-20% Ni Steel
SUS316, SUS316W, SUS316F	SUS316TP	SUS316	3605-845	17440-X5 Cr Ni Mo1810	18% Cr-8% Ni-Mo Steel
SUS316H, SUS316HF	SUS316HTP	-	3605-855	-	18% Cr-8% Ni-Mo(0.04-0.10)% C Steel
SUS316L, SUS316L	SUS316LTP	SUS316L	3605-845L	17440-X2 Cr Ni Mo1810	18% Cr-8% Ni-Mo-0.035% C Steel
SUS317L	SUS317LTP	SUS317L	-	-	18% Cr-12% Ni-3.5% Mo-Low C
SUS321, SUS321W, SUS321F	SUS321TP	SUS321	3605-822Ti	17440-X10 Cr Ni Ti189	18% Cr-8% Ni-Ti Steel
SUS321H, SUS321HF	SUS321HTP	-	3605-832Ti	-	18% Cr-8% Ni-Ti-(0.04-0.10)% C Steel
SUS347, SUS347W, SUS347F	SUS347TP	SUS347	3605-822Nb	17440-X1 Cr Ni Nb189	18% Cr-8% Ni-Cb+Ta C Steel
SUS347H, SUS347HF	SUS347HTP	-	3605-832Nb	-	18% Cr-8% Ni-Cb+ Ta(0.04-0.10)% C Steel

■ Chemical Resistance Chart for Water Treatment

This chart suggests suitable materials of float and electrode for some typical water treatment's liquids. This information should be used as a general guide, and the final choice should be determined from actual application conditions.

A : No effect - Good B : Moderate effect - Need product modification C : Severe effect - Not recommended

*1: ABS float with PVC cable

Model			Float with rigid stem				Float with cab	Electrode			Remarks
			Model ST				Model SQ	Model SEC			
Name of liquid	°C	bar	316SS	PVC	PP	PTFE	*1	316SS	Hastelloy B/C	Titanium	
Water & Soft water	50	open	A	A	A	A	A	A	A	A	Model SEC can not use in distilled water.
		2	A	A	A	A	B	B	B	B	
	90	open	A	C	A	A	B	B	B	B	
		2	A	C	C	A	B	B	B	B	
Pure water	50	open	A	A	A	A	C	C	C	C	316SS float causes pitting corrosion in Ultra-pure water
		2	A	A	A	A	C	C	C	C	
	90	open	A	C	C	A	C	C	C	C	
		2	A	C	C	A	C	C	C	C	
	150	10	A	C	C	C	C	C	C	C	
Chlorine water	50	open	C	A	A	A	C	C	A	A	
		2	C	A	A	A	C	C	B	B	
	90	open	C	C	C	A	C	C	A	A	
		2	C	C	C	A	C	C	B	B	
Acid-free Sewage pH7 without slurry with oil	50	open	A	A	A	A	A	A	A	A	Max Pressure (bar) for : PVC float : 2 316SS float : 10 Model SQ : 2 SEC/PVE Mtg : 2 SEC/SUS Mtg : 10
		2	A	A	A	A	B	B	B	B	
	90	open	A	C	C	A	C	B	B	B	
		2	A	C	C	A	C	B	B	B	
Acid-free Sewage pH7 with slurry without oil	50	open	B	A	A	B	B	B	A	A	
		2	B	A	A	B	B	A	B	B	
	90	open	B	C	C	B	C	B	B	B	
		2	B	C	C	B	C	B	B	B	
Acid-free Sewage pH7 without slurry with oil	50	open	A	B	B	B	B	B	C	C	If sewage contains a lot of oil, cable of SQ may stiffen. Capacitance. Model SCAP. is available.
		2	A	B	B	B	B	C	C	C	
	90	open	A	C	C	B	C	C	C	C	
		2	A	C	C	B	C	C	C	C	
Acid-free Sewage pH7 with slurry with oil	50	open	B	B	B	B	B	C	C	C	
		2	B	B	B	B	B	C	C	C	
	90	open	B	C	C	B	C	C	C	C	
		2	B	C	C	B	C	C	C	C	
Sewage with Sodium Hypochlorite (NaClO)	50	open	C	A	A	A	C	C	A	C	PVC, PTFE and Hastelloy-C are unaffected.
		2	C	A	A	A	C	C	B	C	
	90	open	C	C	C	A	C	C	B	C	
		2	C	C	C	A	C	C	B	C	
Sewage with Caustic soda (NaOH)	50	open	A	A	A	A	C	A			
		2	A	A	A	A	C	B			
	90	open	A	C	C	A	C	B			
		2	A	C	C	A	C	C			
Sewage with weakly acid & alkaline (pH5-6 or 8-9)	50	open	C	A	A	A	A	C	A		SQ can use.
		2	C	A	A	A	A	C	B		
	90	open	C	C	C	A	C	C	B		
		2	C	C	C	A	C	C	B		
Sewage with strong acid & alkaline (pH1-4 or 10-14)	50	open	C	A	A	A	C	C	A		SQ can not use.
		2	C	A	A	A	C	C	B		
	90	open	C	C	C	A	C	C	B		
		2	C	C	C	A	C	C	B		

A : No effect - Good B : Moderate effect - Need product modification C : Severe effect - Not recommended

*1: ABS float with PVC cable

Model Condition			Float with rigid stem				Float with cab	Electrode			Remarks
			Model ST				Model SQ	Model SEC			
Name of liquid	°C	bar	316SS	PVC	PP	PTFE	*2	316SS	Hastelloy B/C	Titanium	
Sludge water pH7 with suspended solids	50	open	C	C	C	C	A	C	C	C	Capacitance, Model SCAP. Or Pneumatic, Model SFP, are available.
		2	C	C	C	C	B	C	C	C	
	90	open	C	C	C	C	C	C	C	C	
		2	C	C	C	C	C	C	C	C	
Sludge water pH5-9 with suspended solids	50	open	C	C	C	C	C	C	C	C	
		2	C	C	C	C	C	C	C	C	
	90	open	C	C	C	C	C	C	C	C	
		2	C	C	C	C	C	C	C	C	
	150	10	C	C	C	C	C	C	A	A	
Sea water	50	open	C	A	A	A	C	C	B	B	
		2	C	A	A	A	C	C	B	C	
	90	open	C	C	A	A	C	C	C	C	
		2	C	C	C	A	C	C	C	C	
Oils : Light or Heavy	50	open	B	C	C	C	C	C	C	C	Note Max. viscosity for 316SS float.
		2	B	C	C	C	C	C	C	C	
	90	open	A	C	C	C	C	C	C	C	
		2	A	C	C	C	C	C	C	C	
Oils : Vegetable	50	open	A	C	C	C	C	C	C	C	SEC can not use because of nonconductive.
		2	A	C	C	C	C	C	C	C	
	90	open	A	C	C	C	C	C	C	C	
		2	A	C	C	C	C	C	C	C	
Oils : Tubine	50	open	A	C	C	C	C	C	C	C	SQ can not use because of cable stiffen.
		2	A	C	C	C	C	C	C	C	
	90	open	A	C	C	C	C	C	C	C	
		2	A	C	C	C	C	C	C	C	
Aluminum Sulfate AL ₂ (SO ₄) ₃	50	open	C	A	A	A	C	A	A	A	
	90	open	C	C	A	A	C	C	B	B	
Calcium Chloride	50	open	B	A	A	A	B	B	A	A	
Calcium Hydroxide Ca(OH) ₂	50	open	B	A	A	A	B	B	A	A	
	50	open	B	C	B		B	B	B	B	
Chromic acid OrO ₃ 3	10%	50	open	C	A	A	A	C	C	B	A
		90	open	C	C	C	A	C	C	B	A
	20%	50	open	C	A	C	A	C	C	B	A
		90	open	C	C	C	A	C	C	B	A
30%	50	open	C	C	C	A	C	C	C	B	
Ferric Chloride FECl ₃	50	open	C	A	A	A	C	C	B	A	
	90	open	C	C	A	A	C	C	C	B	
Ferric Sulfate Fe ₂ (SO ₄) ₃	50	open	C	A	A	A	C	C	B	B	
	90	open	C	C	A	A	C	C	C	C	
Ferrous Sulfate FeSO ₄	50	open	C	A	A	A	C	C	B	A	
	90	open	C	C	A	A	C	C	C	B	
Hydrochloric acid HCl	15%	50	open	C	A	A	A	C	C	A	C
		90	open	C	C	A	A	C	C	B	C
	25%	50	open	C	A	A	A	C	C	A	C
		90	open	C	C	A	A	C	C	B	C
	35%	50	open	C	A	A	A	C	C	A	C
		90	open	C	C	A	A	C	C	B	C

Type of Applications

A : No effect - Good B: Moderate effect - Need product modification C: Severe effect - Not recommended
 *1: ABS float with PVC cable

Type of Applications

Model Condition				Float with rigid stem				Float with cab	Electrode			Remarks
				Model ST				Model SQ	Model SEC			
Name of liquid	°C	bar	316SS	PVC	PP	PTFE	*2	316SS	Hastelloy B/C	Titanium		
Hydrogen peroxide H ₂ O ₂	5%	50	open	A	C	C	A	C	A	A	B	304SS can use up to 50°C
	35%	90	open	A	C	C	A	C	A	A	B	
Nitric acid HNO ₃	10%	50	open	A	A	A	A	C	A	B	A	Titanium is better for high temp & concentrated application.
		90	open	B	C	A	A	C	B	C	B	
	25%	50	open	A	A	A	A	C	A	B	A	
		90	open	B	C	A	A	C	B	C	B	
	50%	50	open	A	A	A	A	C	A	B	A	
		90	open	B	C	A	A	C	B	C	B	
	98%	50	open	C	C	C	A	C	C	B	A	
		90	open	C	C	C	B	C	C	C	C	
Phosphoric acid H ₃ PO ₄	25%	50	open	A	A	A	A	C	A	A	C	
		90	open	C	C	A	A	C	C	B	C	
	50%	50	open	A	A	A	A	C	A	A	C	
		90	open	C	C	B	A	C	C	B	C	
	75%	50	open	A	A	A	A	C	A	A	C	
		90	open	C	C	C	A	C	C	B	C	
Poly Aluminum Chloride PVC			open	A	A	A		C	A	A		
			open	C	C	A		C	C	C		
Sodium Hydroxide (Caustic soda) NaOH	25%	50	open	A	A	A		C	A			
		90	open	A	C	A		C	B			
	50%	50	open	A	A	A		C	A			
		90	open	A	C	A		C	B			
Sodium Hypochlorite NaClO	10%	50	open	C	A	A		C	C	A	A	
		90	open	C	C	A		C	C	B	B	
	20%	50	open	C	A	A		C	C	A	A	
		90	open	C	C	A		C	C	B	B	
Sulfuric Hypochlorite H ₂ SO ₄	30%	50	open	C	A	A		C	C	A	C	PTFE is better for 98% concentration
		90	open	C	C	A		C	C	B	C	
	60%	50	open	C	A	A		C	C	B	C	
		90	open	C	C	A		C	C	B	C	
	90%	50	open	C	B	A		C	C	A	C	
		90	open	C	C	A		C	C	B	C	
	98%	50	open	C	B	C		C	C	A	C	
		90	open	C	C	C		C	C	B	C	

■ Anticorrosive Specification of Sensor Material as Following Density and Temperature of Chemicals

Chemicals	Concentration(%)	Temp ℃	304SS	316SS	PVC	PTFE
황산 Sulfuric acid H ₂ SO ₄	30	20	x	x	◎	◎
		60	x	x	◎	◎
		100				◎
	60	20	x	x	◎	◎
		60	x	x	◎	◎
		100				◎
	90	20	x	x	◎	◎
		60		x	○	◎
		100				○
	98	20	○	○	○	○
		60		○	x	○
		100				○
Fuming	20	○	○	x	○	
	60	x	○			
	100					
염산 Hydrochloric acid HCl	15	20	x	x	◎	◎
		60			◎	◎
		100				◎
	25	20	x	x	◎	◎
		60			◎	◎
		100				◎
	35	20	x	x	◎	◎
		60			○	◎
		100				◎
인산 Phosphoric acid H ₃ PO ₄	10	20	◎	◎	◎	◎
		60	◎	◎	◎	◎
		100				◎
	50	20	◎	◎	◎	◎
		60	◎	◎	○	◎
		100				◎
	80	20	◎	◎	◎	◎
		60	◎	◎	◎	◎
		100				◎
질산 Nitric acid HNO ₃	10	20	◎	◎	◎	◎
		60	◎	◎	◎	◎
		100				◎
	30	20	◎	◎	◎	◎
		60	◎	◎	○	◎
		100				◎
	50	20	◎	◎	◎	◎
		60	○	○	○	◎
		100				◎
70	20	◎	◎	◎	◎	
	60		○	△	◎	
	100				◎	
98	20			x	◎	
	60				○	
	100				△	
중크롬산 Chrome acid H ₂ CrO ₄	10	20	x	x	◎	◎
		60			◎	◎
		100				◎
	30	20	x	x	○	◎
		60			x	◎
		100				◎
	50	20	x	x	△	◎
		60				◎
		100				◎
해수 Sea Water	20	x	x	◎	◎	
	60			◎	◎	
	100				◎	

Chemicals	Concentration(%)	Temp ℃	304SS	316SS	PVC	PTFE
플루오르화 수소산 Hydro fluorine acid HF	30	20	x	x	◎	◎
		60			△	◎
		100				◎
	40	20	x	x	○	◎
		60			x	◎
		100				◎
50	20	x	x	○	◎	
	60			x	◎	
	100				◎	
초산 Acetic acid CH ₃ COOH	20	20	○	◎	◎	◎
		60			△	◎
		100				◎
	50	20	○	◎	◎	◎
		60			△	◎
		100				◎
	80	20	△	○	◎	◎
		60		△	△	◎
		100				◎
가성 소다 Caustic Soda (Sodium Hydroxide) NaOH	15	20	◎	◎	◎	◎
		60	○	◎	◎	◎
		100	x	x		
	30	20	◎	◎	◎	◎
		60	○	○	◎	◎
		100	x	x		◎
	50	20	◎	◎	◎	◎
		60	○	○	◎	◎
		100	x	x		
염소산 소다 Hypochloric Soda NaClO	5	20	x	x	◎	◎
		60	x	△	○	◎
		100				
	10	20	x	x	◎	◎
		60			○	◎
		100				
13	20	x	△	◎	◎	
	60			○	◎	
	100					
Crude petroleum	원유	20			◎	◎
		60			○	◎
		100				◎
Heavy Oil	중유	20	◎	◎	◎	◎
		60	◎	◎		
		100	◎	◎		◎
Petroleum	석유	20	◎	◎	◎	◎
		60		○	△	◎
		100				◎
Gasoline	휘발유	20	◎	◎		◎
		60	◎	◎		◎
		100				
Machine Oil	기계유	20	◎	◎	◎	◎
		60	◎	◎	◎	◎
		100				◎
Plant Oil	식물유	20	◎	◎		◎
		60				◎
		100				◎
Methyl alcohol CH ₃ OH	메틸알콜	20	○	○	◎	◎
		60			○	◎
		100				◎
Ethyl alcohol C ₂ H ₅ OH	에틸알콜 (주정)	20	○	○	◎	◎
		60	○	○	○	◎
		100				◎

Type of Applications