

Level
Regulating
Valve type

Type LCD2 • LCD3 Level Regulating Valve

For
liquid



Standard direction of assembly

Features

- Float and valve body connect each other directly.
Easy to use and everlasting due to simple construction which is installed tank directly.
- Control the level correctly and quickly
- Double seated valve allows superior characteristics
- Inspection hole allows to inspect internal without taking off the valve.

Specifications

Type	Internal float		External float	
Model	LCD2		LCD3	
Flow	Outflow	Inflow	Outflow	Inflow
Size	25 – 100			
Inlet max. pressure	1.0MPa			
Max. temperature	185°C			
Material	Body, casing	Cast iron		
	Valve disc, seat	Stainless steel		
	Float	Stainless steel		
Viscosity	200mm ² /s			
Specific gravity	Min. 0.9			
Connection	Flanged JIS10KFF			
Min.controllable flow	Approx. 10% of rated flow			
Seat leakage	0.5% of rated flow or less			

Note : Stainless cast steel body is available on request

Cv values

Size	25	40	50	65	80	100
Max. differential pressure (MPa)	0.9	0.7	0.6	0.45	0.4	0.3
Cv	6	10	16	23	35	50

Dimensions and weights

(mm, kg)

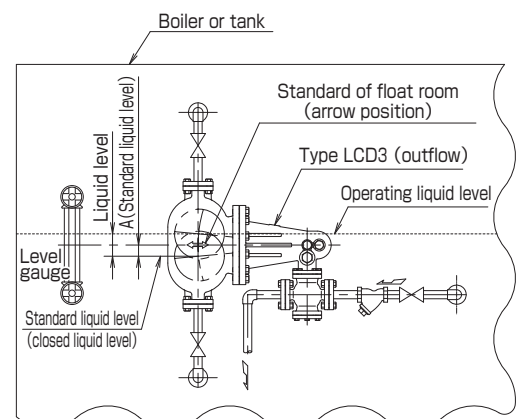
Size	25	40	50	65	80	100
L	180	195	200	220	250	310
H ₁	107	117	117	122	145	160
H ₂	207	217	217	222	244	259
Weight	LCD2	48	52	52	60	135
	LCD3	88	95	95	100	175

Outflow type : The valve will open by the level rising.

Liquid level is controlled by discharging.

Inflow type : The valve will open by the level falling.
Liquid level is controlled by supplying.

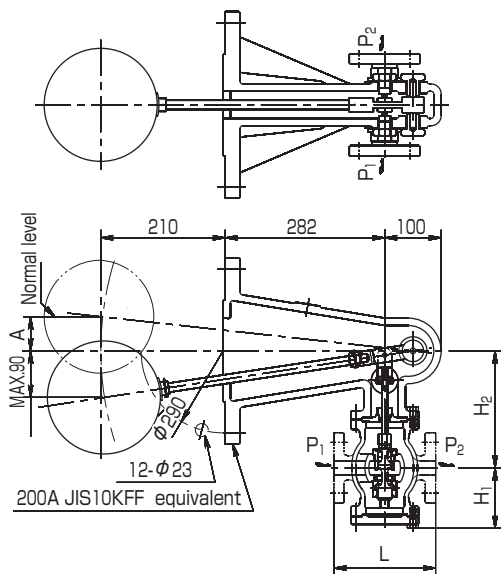
Installation example



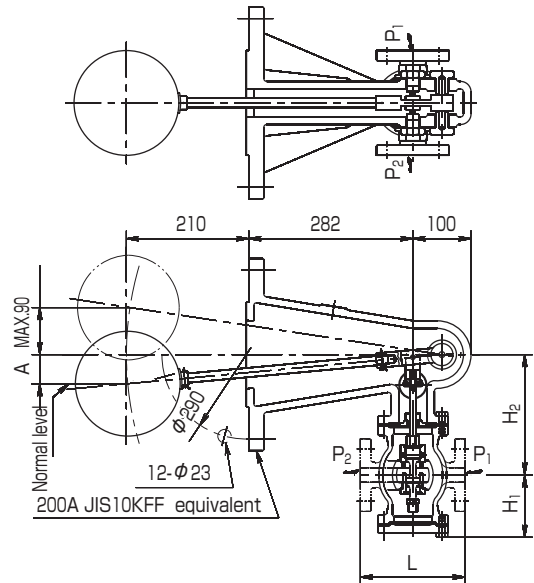
Remark : Direction between the valve body and the float room is different from the standard (upper photograph).

Type LCD2 • LCD3 Level Regulating Valve

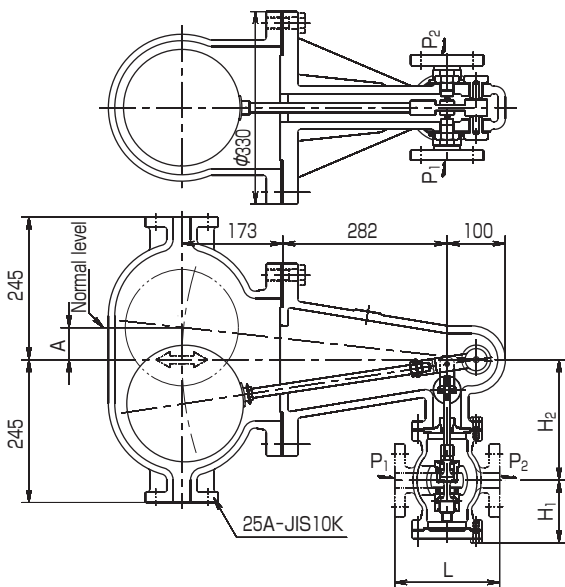
Construction



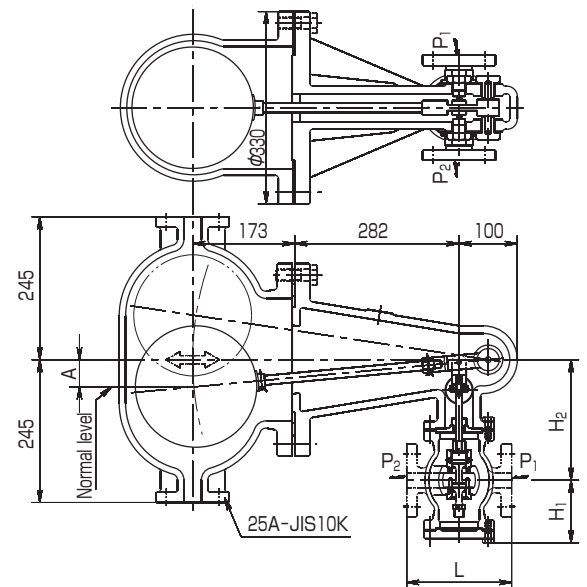
LCD2 (Internal float : Inflow, Push-down open)



LCD2 (Internal float : Outflow, Push-down close)



LCD3 (External float : Inflow, Push-down open)



LCD3 (External float : Outflow, Push-down close)

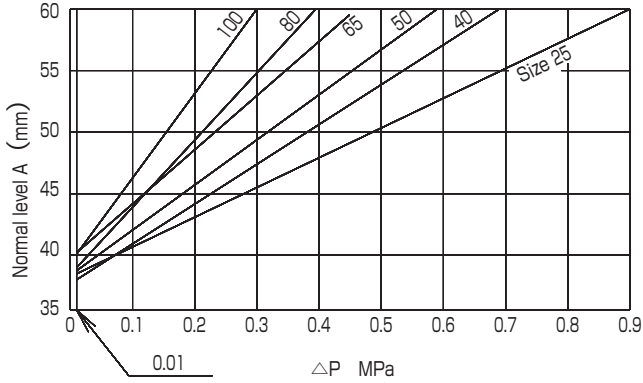
Operation

1. Level regulating valve consist of float and casing to detect liquid level, lever frame work to transmit float movement to valve disc and body to control the flow.
2. Push-down close valve is applied for outflow and push-down open valve is applied for inflow.
3. In case of outflow, rising liquid level make float and lever to rise up, discharge liquid by valve opening and it will make liquid level fall down. Falling level make valve to close and decrease discharge flow.
4. In case of inflow, falling liquid level make float and lever to fall down, supply liquid by valve opening and it will make liquid level rise up. Rising level make valve to close and decrease supply flow.

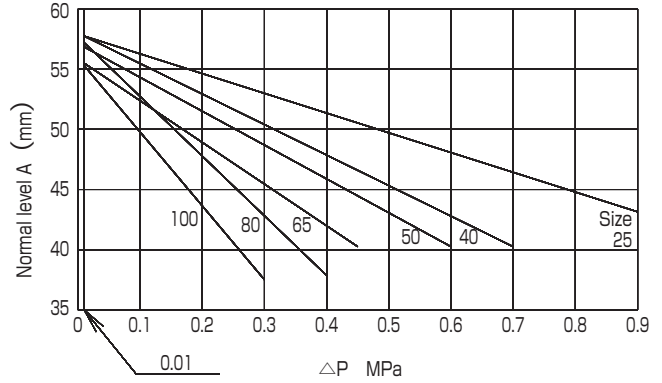
Type LCD2 • LCD3 Level Regulating Valve

Normal level A

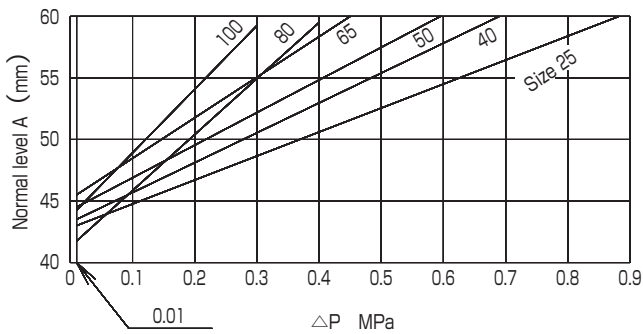
Following charts show the required level A against pressure difference.



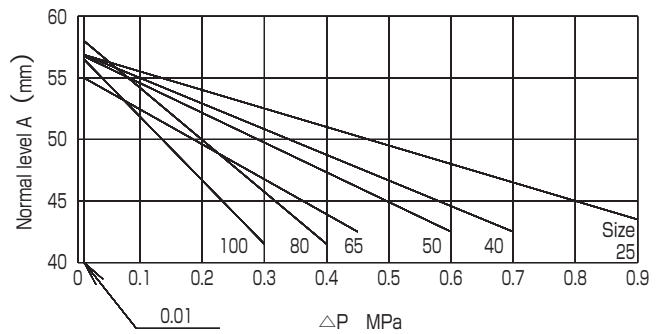
LCD2 (Internal float : Inflow, Push-down open)



LCD2 (Internal float : Outflow, Push-down close)



LCD3 (External float : Inflow, Push-down open)



LCD3 (External float : Outflow, Push-down close)

Sizing

1. Please select suitable size by Cv calculation.
2. Excess pressure difference prevent normal operation.
3. Each construction and part except assembling work are same for both inflow type and outflow type.

Inquiry

Please specify followings at inquiry.

1. Inflow or outflow
2. Valve size or piping size
3. Fluid information : Name, inlet pressure, temperature, flow (max., nor., min.), viscosity
4. Max. allowable pressure drop of valve at max. flow
5. Control range and accuracy of liquid level
6. Material for fluid contact if necessary
7. Connection code
8. Others

Level switch

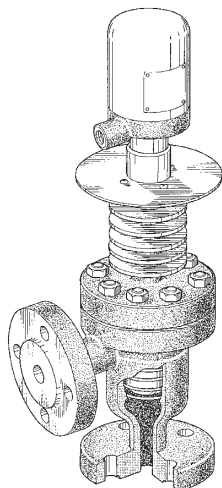
Level switch

Level switch is used for transmitting the liquid level.

Model SLG



Model SLDI



Model SLS



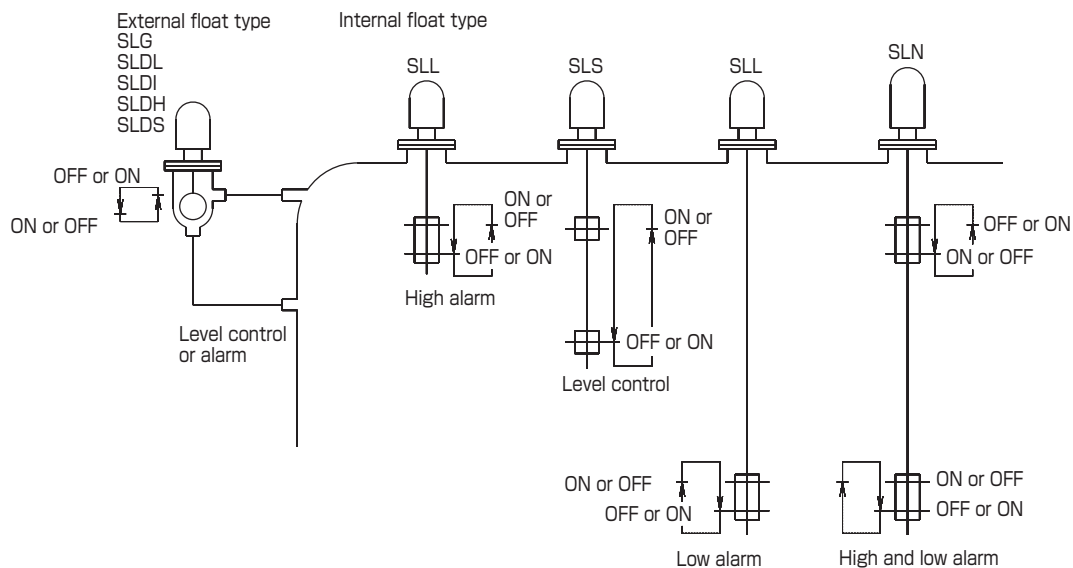
Model SLL



Model SLN



Installation example



Operating

Liquid level is detected by float.
The switch mechanism transmit the pre-setted level.

Tolerance and differential (mm)

Model	Tolerance	Differential
SLS	Within ± 10	(150 – 5550) ± 20
SLL		55 ± 20
SLN		10 $^{+15}_{-5}$
SLG	Within ± 5	10 $^{+15}_{-5}$
SLDL	Within ± 7	20 ± 10
SLDI		
SLDH		
SLDS		

Level switch

Specifications of body and float

Float	Switch housing	Model ⁽²⁾ (³)	Fluid			Size and connection	Material	
			Max. press. (MPa)	Max. temp. (°C) ⁽⁵⁾	Min. specific gravity		Body	Float
Internal float	Splash proof type ⁽¹⁾ Water tight type	SLS○	1.0	100	0.8	100A Flanged JIS10K	Cast iron Carbon steel	Stainless steel
		SLL○						
		SLN□						
External float	Splash proof type ⁽¹⁾ Water tight type	SLG○	1.0	183	0.85	25A – Flanged JIS10K	Cast iron	Stainless steel
			2.0	215	0.85 ⁽⁴⁾	25A – Flanged JIS20K or 25A – Socket weld	Cast steel	
		SLDL○	2.0	215	0.8		25A – Socket weld ⁽⁶⁾	
		SLDI○	6.3	279	0.75	Carbon steel		
		SLDH○	10.0	310	0.7			
		SLDS○	14.3	337.3	0.618			

Note : (1) Complied with JIS C 0920

(2) Switch model is applied on ○ and □. 3 or 4 for ○ and 6 or 8 for □.

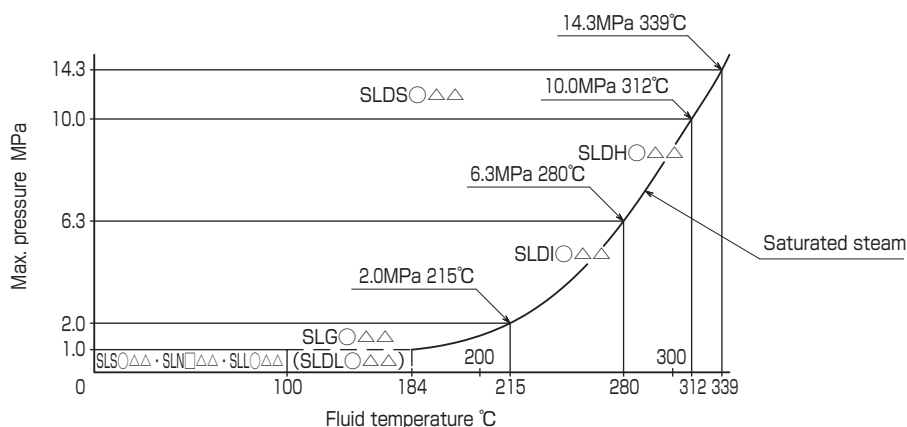
(3) "3" means one(1) micro-switch SPDT built-in, "4" means two(2) micro-switches built-in, "6" means two(2) stage micro-switches built-in, "8" means two (2) × two(2) stage micro-switch built-in.

(4) Above 0.8 is available.

(5) Max. temperature shows for fluid.

(6) Flange connection for SLDI and SLDH is available on request.

Max.fluid pressure and temperature



Switch model is applied on ○ and □.
3 or 4 for ○ and 6 or 8 for □.

△△ apply SA, MA, HA, MAR, HAR (for alternative current), SD or MD (for direct current) as following table which is depending on ambient temperature.

Max. temperature of switch mechanism

Following table shows for splash proof and water tight switch housing.

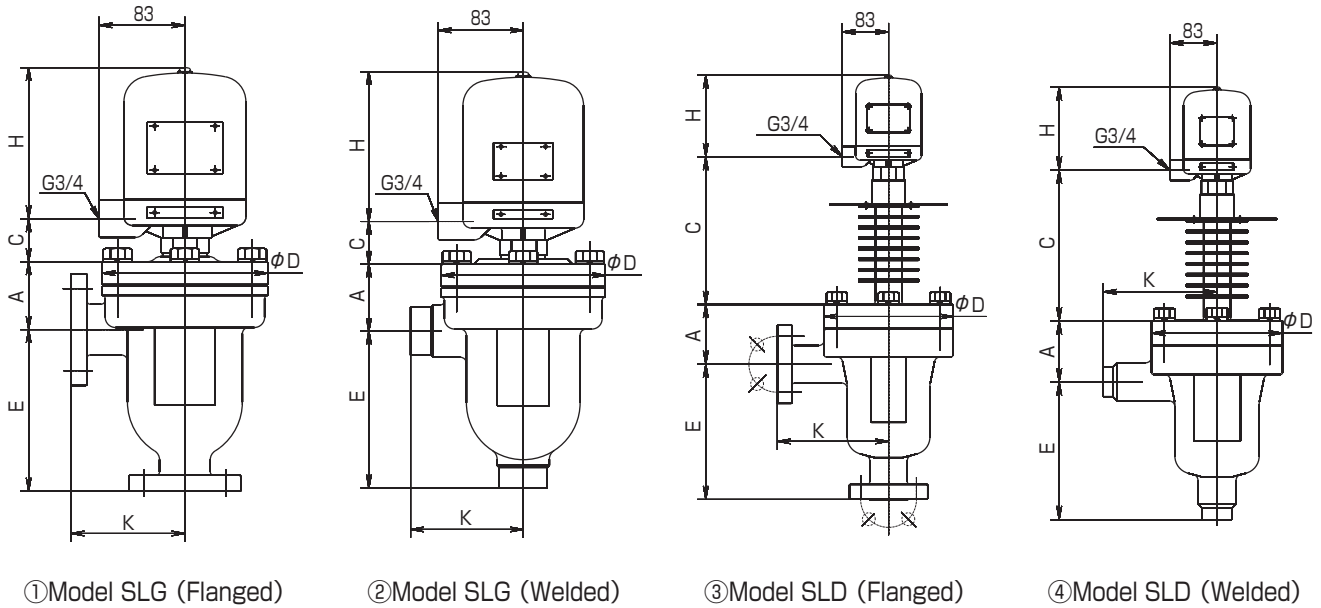
Ambient temperature °C	100	150	215	280	312	339
60	SLG○MA SLDL○MA SLL○MA SLS○MA SLN□MA	SLG○HA SLDL○HA	SLG○HAR SLDL○HAR	SLDI○HA	SLDH○HA	SLDS○HA
45	SLG○SA SLDL○SA SLL○SA SLS○SA SLN□SA	SLG○MA SLDL○MA	SLG○MAR SLDL○MAR	SLDI○MA	SLDH○MA	SLDS○MA
0						

Remarks 1. SA is for normal temperature, HA is for medium temperature and HA is for high temperature.

2. For direct current, SD substitute for SA and MD substitute for MA.

Type Level switch

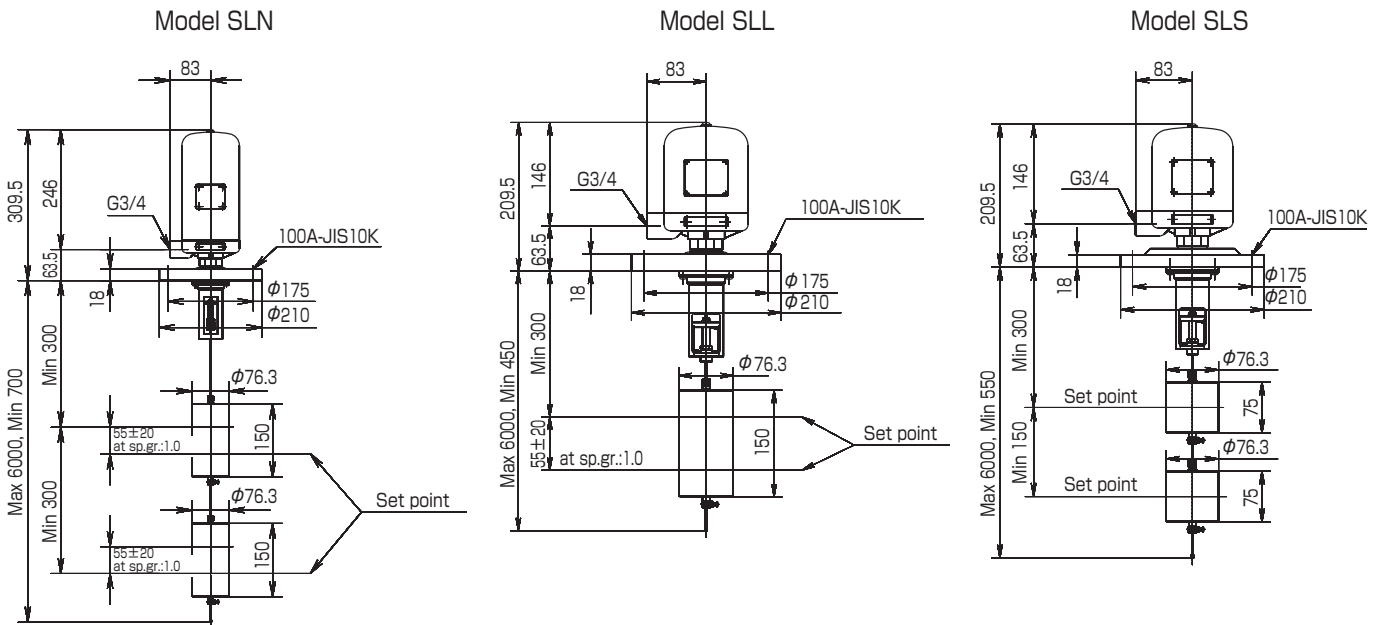
Dimensions for external float type



(mm)

No.	Model	Dimension				Body material	Size and connection
		E	A	K	D		
①	SLG○SA, MA	153	61.5	110	150	Cast iron	25A – JIS10K RF
	SLG○SA, MA, HA	155	65.5	128	160	Cast steel	25A – JIS20K RF
	SLDL○SA, MA, HA	180	65.5	135	170		25A – JIS20K RF
②	SLG○SA, MA, HA	153	65.5	110	160	Cast steel	Socket weld 25A – Sch40
	SLDL○SA, MA, HA	180	65.5	135	170		
③	SLDI○MA, HA	200	93	165	200	Cast steel	25A – JIS63K RF
	SLDH○MA, HA	242	108	200	230		25A ANSI1500 RF
④	SLDI○MA, HA	200	93	165	200	Cast steel	Socket weld 25A – Sch80
	SLDH○MA, HA	242	108	200	230		Socket weld 25A – Sch160
	SLDS○MA, HA	300	144	160	205	Carbon steel	Socket weld 25A – Sch160

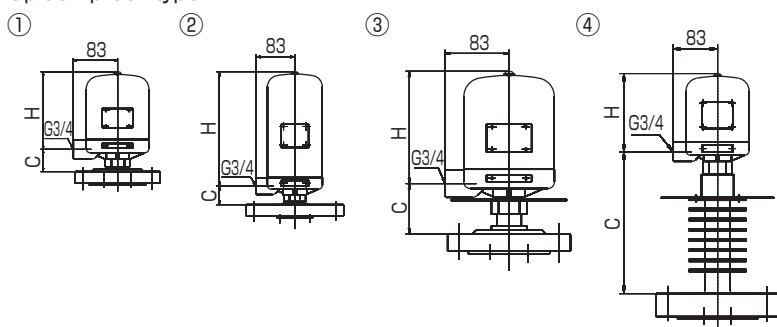
Dimensions for internal float type



Level switch

Dimensions for switch housing

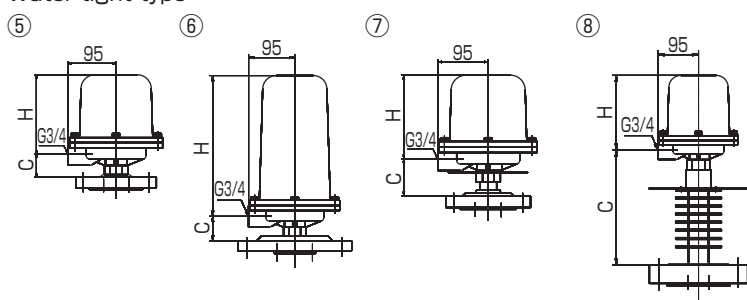
1. Splash proof type



● Splash proof type (For indoor)

Complied with JIS C 0920 : No indication of leakage at the test of vertical watering, for 180degrees area, 10minutes and at installed position.

2. Water tight type



● Water tight type (For outdoor)

Complied with JIS C 0920 : No indication of leakage at the test of watering from any direction, by the 12.5mm nozzle and 10m statcal head, 15minutes and at installed position.

Switch housing No.	Model (Splash proof type)	Dimension		Switch housing No.	Type (Water tight type)	Dimension	
		H	C			H	C
①	SLG○SA, MA, HA, 10K	146	45.5	⑤	SLG○SA, MA, HA, 10K	158	45.5
	SLG○SA, MA, HA, 20K		41.5		SLG○SA, MA, HA, 20K		41.5
	SLDLOSA, MA, HA		45.5		SLDLOSA, MA, HA		49.5
	SLLOSA, MA				SLLOSA, MA		
	SLSOSA, MA				SLSOSA, MA		
②	SLN□SA, MA	246	⑥	SLN□SA, MA	258		
③	SLG○MAR, HAR, 10K	146	69.5	⑦	SLG○MAR, HAR, 10K	158	73.5
	SLG○MAR, HAR, 20K		65.5		SLG○MAR, HAR, 20K		69.5
	SLDL○MAR, HAR		66.5		SLDL○MAR, HAR		
④	SLDI○MA, HA	146	264	⑧	SLDI○MA, HA	158	268
	SLDH○MA, HA	206			192	SLDH○MA, HA	
	SLDS○MA, HA					SLDS○MA, HA	196

Remark : Switch model is applied on ○ and □. 3 or 4 for ○ and 6 or 8 for □.

Electrical rating

Connection : SPDT

Model	Max. temperature (°C) (¹)	Rating	
		Resistance load	Induction load
SA	70°C	AC125V, 250V:15A DC125V:0.5A DC250V:0.25A	AC125V, 250V:10A DC125V:0.05A DC250V:0.03A
MA	120°C	AC125V, 250V:15A DC125V:0.5A DC250V:0.25A	AC125V, 250V:15A DC125V:0.05A DC250V:0.03A
HA	260°C	AC125V, 250V:1A DC30V:1A DC125V:0.5A	AC125V, 250V:1A DC30V:1A DC125V:0.4A
SD(²)	70°C	DC125V:10A DC250V:3A	DC125V:6A DC250V:1.5A
MD(²)	120°C	DC125V:10A DC250V:3A	DC125V:6A DC250V:1.5A

SA, MA and HA use micro-switch for AC (available for DC).

SD and MD are large rating for DC.

DC switch mechanism for HA is not produced by FUSHIMAN.

Note (¹) : Affect on switch and not fluid temperature.

(²) : AC is available.

Level switch

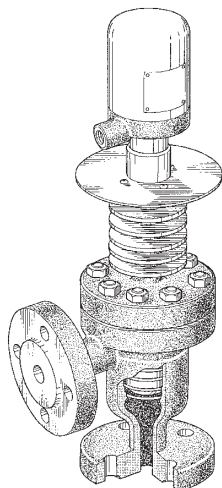
Level switch

Level switch is used for transmitting the liquid level.

Model SLG



Model SLDI



Model SLS



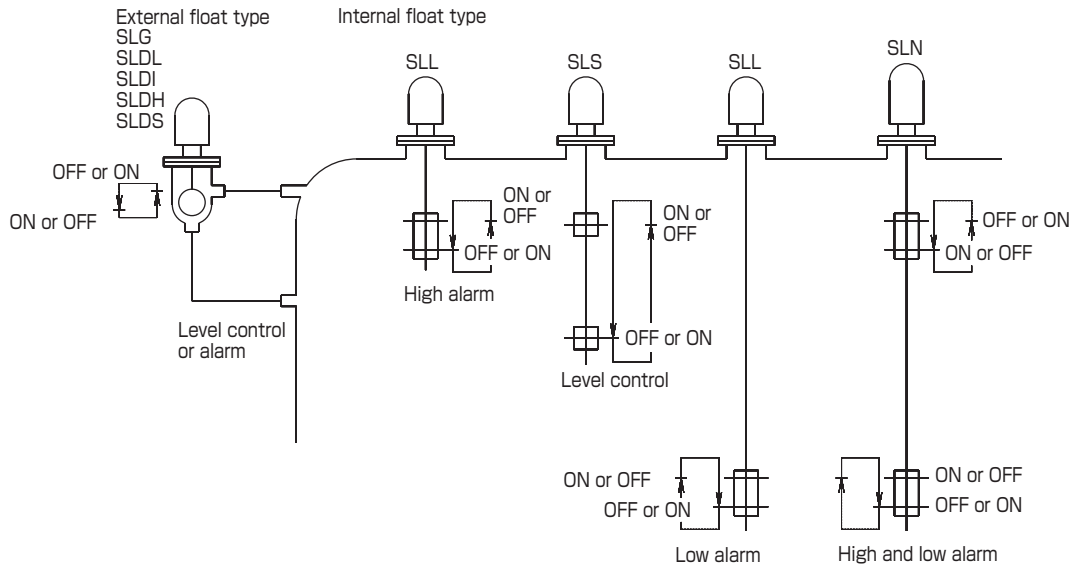
Model SLL



Model SLN



Installation example



Operating

Liquid level is detected by float.
The switch mechanism transmit the pre-setted level.

Tolerance and differential (mm)

Model	Tolerance	Differential
SLS	Within ± 10	(150 – 5550) ± 20
SLL		55 ± 20
SLN		10 $^{+15}_{-5}$
SLG	Within ± 5	10 $^{+15}_{-5}$
SLDL	Within ± 7	20 ± 10
SLDI		
SLDH		
SLDS		

Level switch

Specifications of body and float

Float	Switch housing	Model ⁽²⁾ ⁽³⁾	Fluid			Size and connection	Material	
			Max. press. (MPa)	Max. temp. (°C) ⁽⁵⁾	Min. specific gravity		Body	Float
Internal float	Splash proof type ⁽¹⁾ Water tight type	SLS○	1.0	100	0.8	100A Flanged JIS10K	Cast iron Carbon steel	Stainless steel
		SLL○						
		SLN□						
External float	Splash proof type ⁽¹⁾ Water tight type	SLG○	1.0	183	0.85	25A – Flanged JIS10K	Cast iron	Stainless steel
			2.0	215	0.85 ⁽⁴⁾	25A – Flanged JIS20K or 25A – Socket weld	Cast steel	
		SLDL○	2.0	215	0.8		25A – Socket weld ⁽⁶⁾	
		SLDI○	6.3	279	0.75	Carbon steel		
		SLDH○	10.0	310	0.7			
		SLDS○	14.3	337.3	0.618			

Note : ⁽¹⁾ Complied with JIS C 0920

⁽²⁾ Switch model is applied on ○ and □. 3 or 4 for ○ and 6 or 8 for □.

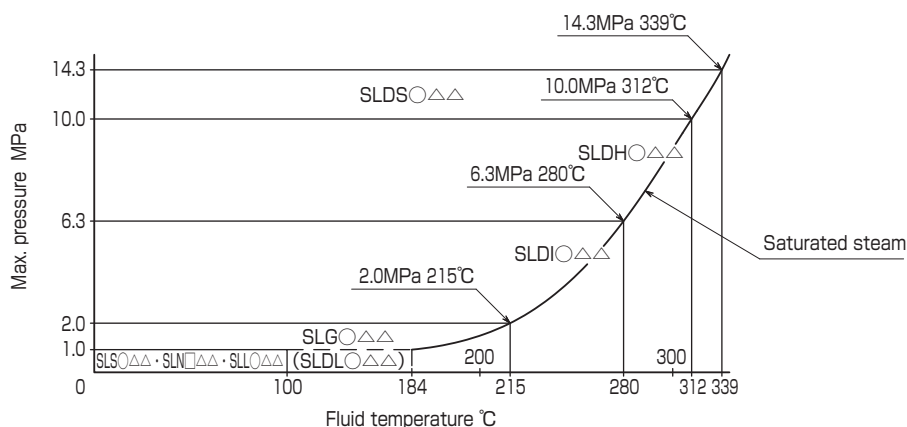
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⁽⁴⁾ Above 0.8 is available.

⁽⁵⁾ Max. temperature shows for fluid.

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Max.fluid pressure and temperature



Switch model is applied on ○ and □.
3 or 4 for ○ and 6 or 8 for □.

△△ apply SA, MA, HA, MAR, HAR (for alternative current), SD or MD (for direct current) as following table which is depending on ambient temperature.

Max. temperature of switch mechanism

Following table shows for splash proof and water tight switch housing.

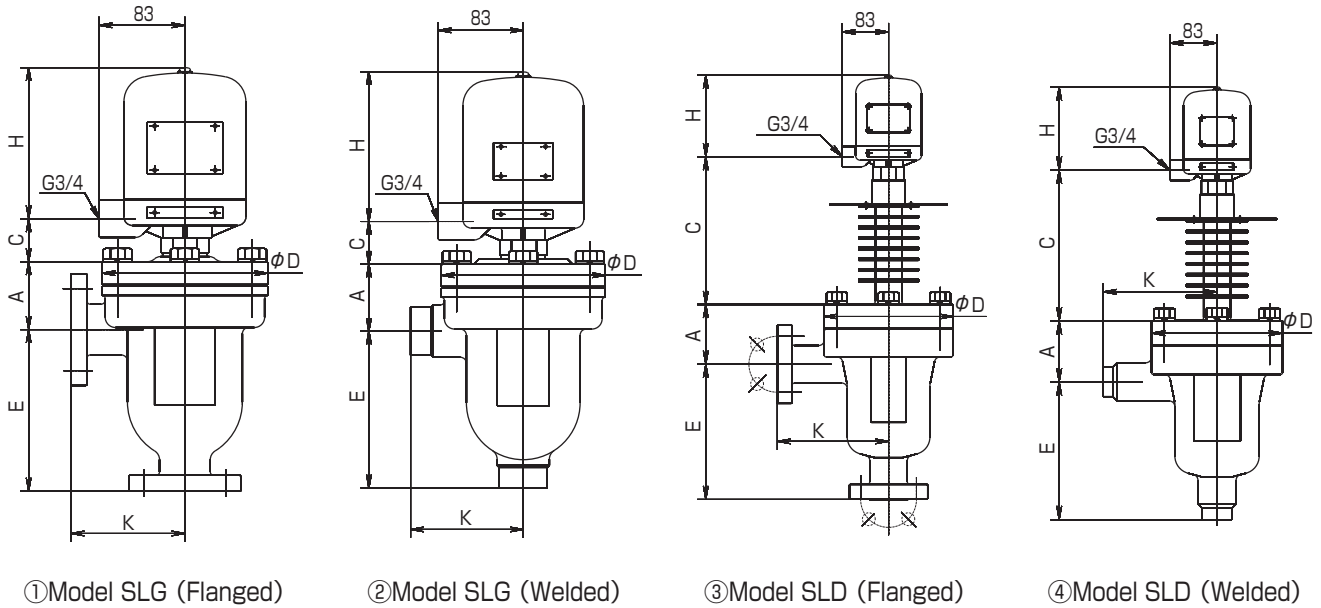
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45	SLG○SA SLDL○SA SLL○SA SLS○SA SLN□SA	SLG○MA SLDL○MA	SLG○MAR SLDL○MAR	SLDI○MA	SLDH○MA	SLDS○MA
0						

Remarks 1. SA is for normal temperature, HA is for medium temperature and HA is for high temperature.

2. For direct current, SD substitute for SA and MD substitute for MA.

Type Level switch

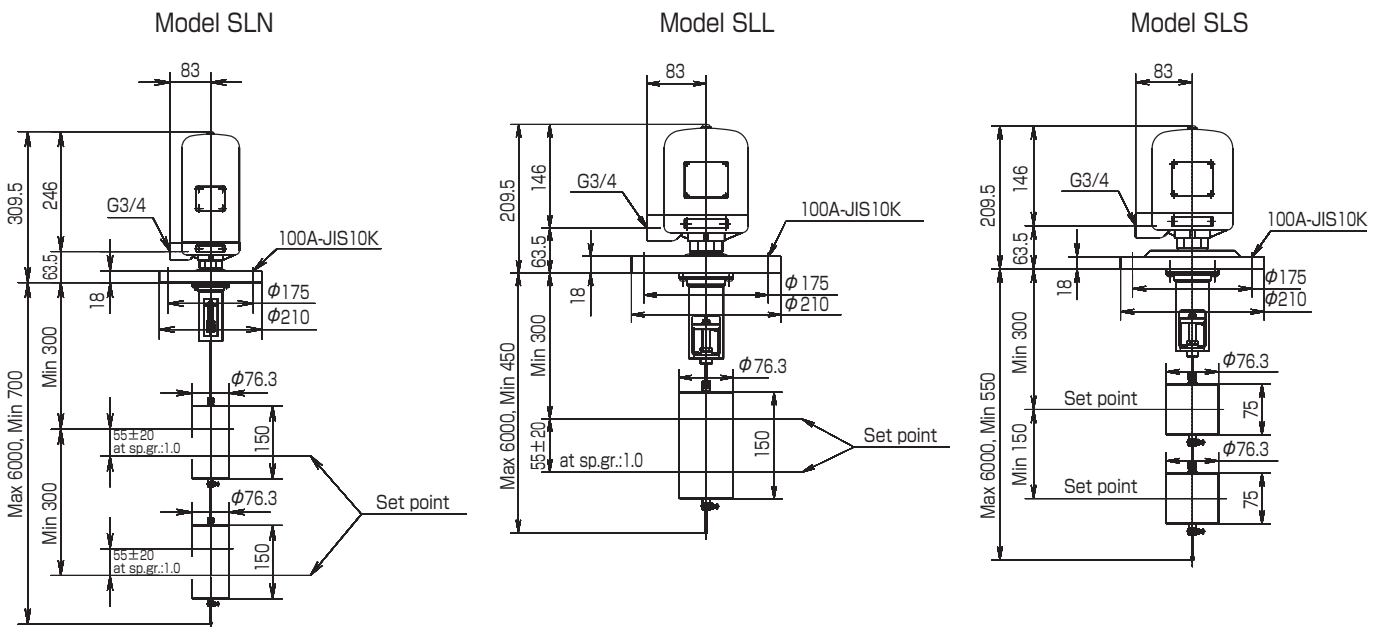
■ Dimensions for external float type



(mm)

No.	Model	Dimension				Body material	Size and connection
		E	A	K	D		
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	SLG○SA, MA, HA	155	65.5	128	160	Cast steel	25A – JIS20K RF
	SLDL○SA, MA, HA	180	65.5	135	170		25A – JIS20K RF
②	SLG○SA, MA, HA	153	65.5	110	160	Cast steel	Socket weld 25A – Sch40
	SLDL○SA, MA, HA	180	65.5	135	170		
③	SLDI○MA, HA	200	93	165	200	Cast steel	25A – JIS63K RF
	SLDH○MA, HA	242	108	200	230		25A ANSI1500 RF
④	SLDI○MA, HA	200	93	165	200	Cast steel	Socket weld 25A – Sch80
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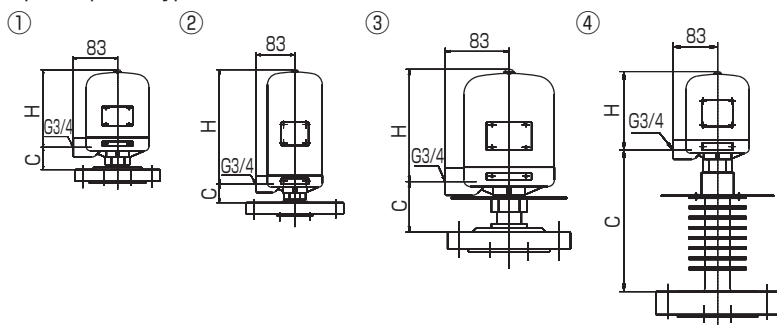
■ Dimensions for internal float type



Level switch

Dimensions for switch housing

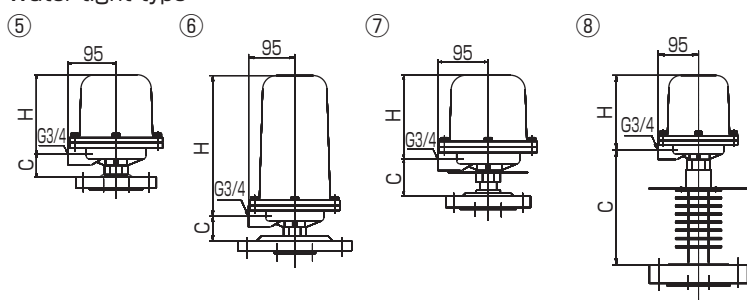
1. Splash proof type



● Splash proof type (For indoor)

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2. Water tight type



● Water tight type (For outdoor)

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Switch housing No.	Model (Splash proof type)	Dimension		Switch housing No.	Type (Water tight type)	Dimension	
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	SLSOSA, MA				SLSOSA, MA		
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	SLDH○MA, HA	206			192	SLDH○MA, HA	
	SLDS○MA, HA				SLDS○MA, HA	196	

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Electrical rating

Connection : SPDT

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MA	120°C	AC125V, 250V:15A DC125V:0.5A DC250V:0.25A	AC125V, 250V:15A DC125V:0.05A DC250V:0.03A
HA	260°C	AC125V, 250V:1A DC30V:1A DC125V:0.5A	AC125V, 250V:1A DC30V:1A DC125V:0.4A
SD(²)	70°C	DC125V:10A DC250V:3A	DC125V:6A DC250V:1.5A
MD(²)	120°C	DC125V:10A DC250V:3A	DC125V:6A DC250V:1.5A

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