

Liquid Level Indicating Controller

Model KFLB

OVERVIEW

Indicating transmitters and indicating controllers with transmitters are also available as well as indicating controllers. The controllers are available either in a local type to set the set-point value manually with a knob on the instrument or in a cascade type (remote type) to set the set-point value with a pneumatic set-point signal. Model KFLB Liquid Level Indicating Controllers are displacement type instruments for the measurement and control of such process variables as liquid levels, boundary surfaces, and specific gravities.

FEATURES

- A wide variety of elements materials and control mechanisms are available to meet various applications.
- The unit has a pneumatic circuit board and a sturdy, heat-resistant weatherproof case, thereby greatly improving durability and reliability.
- The pneumatic circuit board system allows the user to readily add or eliminate control mechanisms and units, thereby enhancing system modification and expansion flexibility.
- Interchangeable parts are used to the maximum practical extent, thereby reducing the number of spare parts to be kept in stock.
- Able to cover wide ranges of temperatures, pressure, and specific gravities.



APPLICATIONS

- To a level measurement of the reaction, the distillation, the drying and the recovery unit.
- Boundary surfaces and specific gravity measurement.
- To the measurement in the cryogenic services (liquefied gas etc. of min. -196°C) and high temperature (max. $+400^{\circ}\text{C}$) services.
- To the measurement in high vacuum (min. -101.3 kPa) and high pressure (max. 15 MPa) services.

STANDARD SPECIFICATIONS

Range of standard measuring setting range

Table 1. Model KFLB measuring ranges

Range (mm)	Range of measuring setting range (mm)
0 - 300	Set applicable within left side range.
0 - 350	
0 - 400	
0 - 450	
0 - 500	
0 - 600	
0 - 700	
0 - 800	
0 - 1000	
0 - 1200	
0 - 1500	
0 - 2000	

Range of specific gravity

- 1) For level measurement: 0.1 to 1.6
- 2) For interface measurement, use the difference in specific gravity as calculated by the following equation.

When the specific gravity of upper layer liquid is γ_2 , and lower layer liquid is γ_3 ,

$$\gamma_2 < \gamma_3, \quad 0.4 \leq \gamma_2, \gamma_3 \leq 1.6, \quad 0.1 \leq \gamma_3 - \gamma_2 \leq 1.2 \text{ See Figure 1.}$$

The maximum difference in specific gravity is 1.2.

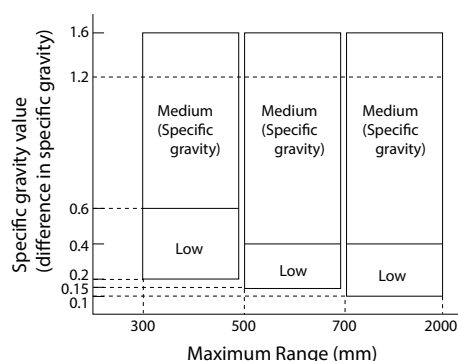


Figure 1. Range of Specific gravity

Medium: Up to JIS 63K, ANSI/JPI600 are available as standard
Low: Up to JIS 30K, ANSI/JPI300 are available as standard

If a range beyond those listed here is required, please consult an Azbil Corp. sales representative.

For details, see Table 2 and Table 3.

Working pressure range

It is possible to use from -101.3 kPa up to each flange pressure rating.

(Maximum JIS63K or ANSI/JPI600#), for ANSI/JPI900# is also available with some condition.

Process connection

Flange connections

External chamber type

Connection

Side-side flanged,
Side-bottom flanged,
Top-side flanged,
Top-bottom flanged

Flange size

2 inches or 1-1/2 inch RF,
2 inches or 1-1/2 inch RTJ (for ANSI / JPI 600#)

Internal float type

Connection

Top flanged

Flange size

3 inches RF, 4 inches RF, 5 inches RF,
3 inches or 1-1/2 inch RTJ (for ANSI / JPI 600#)

Materials

Refer to "Table 3, 4 Material" on page 3

Meter specification

Refer to "Table 5 Meter specification" on page 4

Mounting

Direct mount to the process with flanges

Weight

Approx. 52kg (Range300mm Pressure rating 10K, 150)

Table 2. Float test pressure (Material: SUS316L)

Model	Measuring range (mm)	Medium specific gravity (KFLB_ - 61)			Low specific gravity (KFLB_ - 62)			
		Float diameter (mm)	Over load pressure (MPa)	Flange pressure rating float diameter	Float diameter (mm)	Over load pressure (MPa)	Flange pressure rating float diameter	
03	0-300	55	15.0	Max. JIS63K, ANSI/JPI600	95	7.8	Max. JIS30K, ANSI/JPI300	
A3	0-350							
04	0-400							
A4	0-450							
05	0-500							
06	0-600	45			85	3.2	Max. JIS10K, ANSI/JPI150	
07	0-700							
08	0-800							
10	0-1000							
12	0-1200	30						65
15	0-1500							
20	0-2000							

Float weight : 3 kg (Medium specific gravity type)

(The weight difference depending on the specific gravity in case of the medium specific gravity type and the low specific gravity type in boundary surface meter as the specific gravity measurement type.)

Table 3. Material

Part	Model (temp. range)	U	M	A	E	D
		(350 to 400 °C)	(200 to 350 °C)	(0 to 200 °C)	(0 to 200 °C)	(-196 to 0 °C)*1
Instrument section / Case	ADC12					
Instrument section / Door	Polyester with fiberglass					
Instrument section / Door-Glass	Reinforced Glass (Thickness : 3 mm)					
Radiation Fin	SC450			-		
Extension	-			SCPH2		SCS13
Torque tube	NCF600TP				SUS316L	
Float	SUS316L					
Gasket	Spiral gasket (filler material: expanded graphite)					
Bolt	SNB7 (can be changed to SUS304 by specifying Y131)					SUS304
Nut	S45C (can be changed to SUS304 by specifying Y131)					SUS304

Table 4. Material

Part	Main material specifications	Material
Torque tube housing	Carbon steel *2	SFVC2A
	SUS304 equivalent	SUSF304
	SUS316 equivalent	SUSF316
	SUS316L equivalent	SUSF316L
Bonnet (integrated)	Carbon steel *2	SCPH2
	SUS304 equivalent	SCS13A
	SUS316 equivalent	SCS14A
	SUS316L equivalent	SCS16A
Bonnet (welded)	Carbon steel *2	Bonnet: SCPH2, flange: SFVC2A
	SUS304 equivalent	Bonnet: SCS13A, flange: SUSF304
	SUS316 equivalent	Bonnet: SCS14A, flange: SUSF316
	SUS316L equivalent	Bonnet: SCS16A, flange: SUSF316L
Bonnet with a flange on top	Carbon steel *2	Bonnet: SCPH2, flange: SFVC2A, top pipe: STPT370 or STPG370
	SUS304 equivalent	Bonnet: SCS13A, flange: SUSF304, top pipe: SUS304TP
	SUS316 equivalent	Bonnet: SCS14A, flange: SUSF316, top pipe: SUS316TP
	SUS316L equivalent	Bonnet: SCS16A, flange: SUSF316L, top pipe: SUS316LTP
Chamber	Carbon steel *2	Top flange: SFVC2, main pipe: STPT370 or STPG370, connection flange: SFVC2
	SUS304 equivalent	Top flange: SUSF304, main pipe: SUS304TP, connection flange: SUSF304, connection pipe: SUS304TP, bottom: SUSF304
	SUS316 equivalent	Top flange: SUSF316, main pipe: SUS316TP, connection flange: SUSF316, connection pipe: SUS316TP, bottom: SUSF316
	SUS316L equivalent	Top flange: SUSF316L, main pipe: SUS316LTP, connection flange: SUSF316L, connection pipe: SUS316LTP, bottom: SUSF316L

*1. The Model can also be used in the 0-200 °C range.

*2. It cannot be used for low-temperature Models (Model No.: D).

Note: Materials shown in the table above are for standard Models. Other materials can be used in special Models.

Table 5. Meter specification

Item		Specification
Indicator section	Indicating angle	44 deg.
	Scale length	150 mm
	Pointers	PV: Red, SV: Green
	Output gauge	Scale: 0 to 200 kPa, Indicating accuracy: $\pm 3\%$ F.S.
Setting section	Local setting	Internal or external setting with a setting dial.
	Remote setting	With pneumatic signal of 20 to 100 kPa
	Setting range	0 to 100% F.S.
Controller section	Control actions	P + Manual reset, PI, PID, PD + Manual reset, PI + Batch, on-off, Differential gap, P + External reset, PD + External reset
	Proportional band (P)	5 to 500% (Direct or reverse action)
	Internal time (I)	0.05 to 30 min.
	Derivative time (D)	0.05 to 30 min.
	Differential gap	1 to 100% F.S., adjustable
	Batch setting pressure	60 to 110 kPa, adjustable
	External reset pressure	20 to 110 kPa, adjustable
	Manual reset pressure	0 to 100% F.S., adjustable (by pneumatic pressure setting)
Standard specification	Output	20 to 100 kPa, 0 or corresponding to supply air pressure (on-off, differential gap)
	Minimum load	I.D. 4 mm \times 3 m + 20 cm ²
	Supply air pressure	140 \pm 14 kPa
	Air consumption (50% output balanced)	Indicating transmitter: 5 L/min (normal) Indication only: 5 L/min (normal) Indicating controller: 5 L/min (normal) Indication only: 5 L/min (normal) Indicating transmitting and controller: 9 L/min (normal)
	Saturated air supply capacity	Transmitter output: 40 L/min (normal), Controller output: 40 L/min (normal), Manual control output: 30 L/min (normal)
	Air piping connections	Rc1/4 (PT1/4 internal thread) or 1/4NPT internal thread
	Ambient temperature	-30 to +80°C, refer to Table 4.
	Relative humidity	10 to 90% RH
	Case and door	Enclosure : Waterproof and dust tight, NEMA3, IEC IP54
		Material : Case Diecast aluminum Door..... Polyester with fiberglass Door-glass . Reinforced glass (3 mm thick)
		Case finish : Baked acrylic finish (for corrosion-resistant or silver finish, refer to "Optional specifications")
		Color of finish : Case Light beige (munsell 4Y7.2 / 1.3) Door..... Light gray (munsell N8)

Operating temperatures

Table 6. Operating temperature range (°C)

	Standard operating range	Normal operating range	Limit operating range	Transportation storing range
Ambient temperature	23 ±2	-30 to +80	-40 to +85	-40 to +85
Liquid temperature	23 ±2	-196 to +400	-196 to +400	-40 to +85

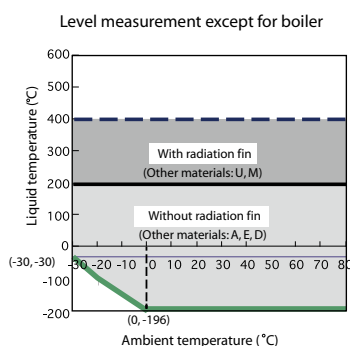


Figure 2.

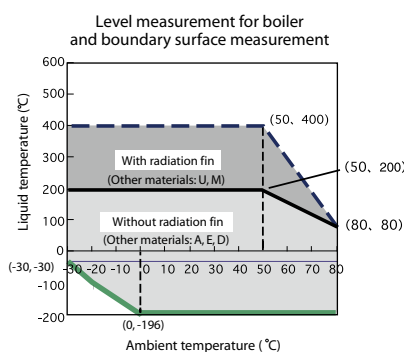


Figure 3.

PERFORMANCE

Standard characteristic (within the range of specific gravity in Figure 1, under standard operating condition)

Transmission accuracy	: ± 0.5% F.S.
Indication accuracy	: ± 1.0% F.S.
Repeatability	: 0.3% F.S.
Dead Band	: ± 0.1% F.S.

Optional specifications

Internal manual loader (with auto/manual transfer switch)

Consists of a manual control regulator, a two-position transfer switch and a balance check button.

With external manual SP setting knob

A setting knob is mounted on the door. SP can be adjusted externally.

Water and oil free treatment (Only the SUS material) Range 1000 mm or less

Remove the moisture and the oil from the wetted part.

Oil free treatment (Only the SUS material) Range 1000 mm or less

Remove the oil from the wetted part.

Test report

The result of visual checks and input output characteristics etc. for test (three points) of the level instrument is described and submitted.

Five point check

The measuring point of input output characteristics described to the test report is changed from 3 points (0, 50, 100%) to 5 points (0, 25, 50, 75, 100%).

Mil sheet

Test result of the chemical composition, the heat treatment condition, and the mechanical property of the element material (torque tube housing, bonnet, and chamber) with charge number of material is submitted.

Pressure Regulator with air filter (RA1B)

Regulator with the filter + φ 40 pressure gauge is supplied. (Supply pressure; 200 to 1035 kPa, output 140 kPa and pressure gauge; 0 to 200 kPa)

Dye check

The result of testing for the penetrant inspection in the weld of the element material (bonnet and chamber) is submitted.

Without Float

The float is not supplied. Please specify if the existing float of our company KQP□1□, or KFL□00 - □1, or NQP31□ or NQP21□ is reused.

Without chamber

The chamber is not supplied. Please specify if the existing chamber of our company KQP□1□, or KFL□00 - □1, or NQP31□ or NQP21□ is reused.

Optional semi-standard and special specifications

Stainless steel bolts (Y131)

SUS304 bolts are used for the main body assembling. The connection standard based on High-pressure gas regulation goods with JIS10K, ANSI150, and JPI150 it becomes a special requirement. Please consult to our sales.

Corrosion-prevention and silver painting (Y138)

Prevent corrosion (acrylic baking) finishing (Y138A)
Resistant against corrosive atmosphere

Preventive corrosion resistant (epoxy baking) finishing (Y138B)

Resistant against corrosive liquid.

Silver general (acrylic baking) finish (Y138C)

Resistant of heating up of equipment by direct sunshine or radiant heat.

Silver preventive corrosion (acrylic baking) finishing (Y138D)

Protection of heating up of equipment and corrosive atmosphere.

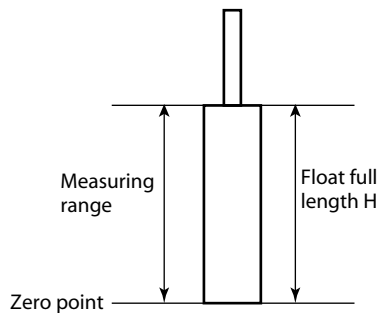
Note) The silver finishing is not suitable for alkaline atmosphere.

ATTENTION

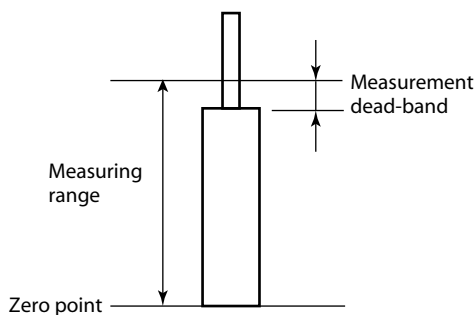
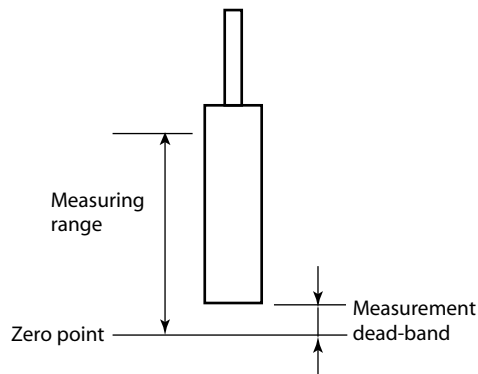
Attention in usage

- In the following cases, our standard displacement type level instrument might be unsuitable to the usage because it produces it with measuring range = float length H. 0% or around 100% levels are detected in the normal operation. When output signals are the continuous output signals of 4mA or less or 20mA or more.
- Set the float bottom to the zero point when you execute the actual liquid adjustment after the displacement type level instrument is installed at the job site. The output change doesn't generate if the measurement fluid does not contact with the float on the structure of the instrument. Might it cause in the lower limit or the upper limit of the measuring range when setting it to the zero point excluding the float bottom and trouble be caused in the measurement dead-band or characteristic of the linearity.

An appropriate adjusting method: Set the float bottom to the zero point.



An improper adjusting method: Set it to the zero point excluding the float bottom.



Attention in installation

⚠ WARNING

- When install it, the gasket of process connection is required to set without run off the edge.
- It causes a liquid leakage and the output error. Please do not use it excluding pressure, the temperature, and connected standard for which this specification sheet specified. It might cause a big accident because of damage and a liquid leakage.

⚠ CAUTION

- Please do not use this instrument for the work stand etc. after install it. The equipment might be damaged and it causes the injury.
- Please do not appropriate the tool etc. to the glass part of the display. It is likely to injure damaging the glass.
- Please set it up correctly. When the installation is insufficient, it might violate the output error and the corresponding rule.
- Because this instrument is a heavy lift, the work stand is noted, and the safety shoe is worn. Please do and do the installation operation.

MODEL SELECTION

Model KFL__ - I II III - IV V VI VII VIII IX X XI XII XIII XIV - Options *9

		Basic model no. *7	Selections										Options	
		KFLB												
Model	Torque tube	KFLB											X	No options
Function	Indicating transmitter	0											M	Internal manual loader (with A/M switch)
	Indicating controller (local type)	1											K	With external manual SP setting knob
	Indicating transmitter and controller (local type)	2											4	Water and oil free treatment (only the SUS material) Range 1000 mm or less
	Indicating controller (cascade type)	3											5	Oil free treatment (only the SUS materials) Range 1000 mm or less
	Indicating transmitter and controller (cascade type)	4											6	Test report *10
	No selection	0											7	Five point check *10
	P + Manual reset	1											8	Mil sheet
	PI	2											B	Dye check
	PID	3											C	Without float *5
	PD + Manual reset	4											D	Without chamber *6
	PI + Batch	5											R	Pressure Regulator with air filter (RA1B)
	On-Off	6												
	Differential gap	7												
	P + External reset	8												
	PD + External reset	9												
Specific gravity	For medium specific gravity		6	1										
	For low specific gravity *1		6	2										
Range of standard measuring setting range (mm)	0 - 300 (0.2 ≤ low sp.gr. < 0.6, 0.6 ≤ medium sp.gr. ≤ 1.6)				0	3								
	0 - 350 (0.2 ≤ low sp.gr. < 0.6, 0.6 ≤ medium sp.gr. ≤ 1.6)				A	2								
	0 - 400 (0.2 ≤ low sp.gr. < 0.6, 0.6 ≤ medium sp.gr. ≤ 1.6)				0	4								
	0 - 450 (0.2 ≤ low sp.gr. < 0.6, 0.6 ≤ medium sp.gr. ≤ 1.6)				A	4								
	0 - 500 (0.15 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				0	5								
	0 - 600 (0.15 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				0	6								
	0 - 700 (0.1 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				0	7								
	0 - 800 (0.1 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				0	8								
	0 - 1000 (0.1 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				1	0								
	0 - 1200 (0.1 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				1	2								
	0 - 1500 (0.1 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				1	5								
	0 - 2000 (0.1 ≤ low sp.gr. < 0.4, 0.4 ≤ medium sp.gr. ≤ 1.6)				2	0								
	Other		X	X										
Process connection	External chamber type, side-side flanged (S-S)					1								
	External chamber type, side-bottom flanged (S-B)					2								
	External chamber type, top-bottom flanged (T-B)					3								
	External chamber type, top-side flanged (T-S)					4								
	Internal float type, top flanged (T) L1 dimensions must be specified.					5								
	Other		X											
Element materials	Carbon steel					1								
	SUS304 equivalent					2								
	SUS316 equivalent					3								
	SUS316L equivalent					4								
	Other		X											
Other materials *3 (Temperature range *2)	Torque tube: Inconel (350 to 400°C) (with radiation fin)						U							
	Torque tube: Inconel (200 to 350°C) (with radiation fin)						M							
	Torque tube: Inconel (0 to 200°C)						A							
	Torque tube: SUS316L (0 to 200°C)						E							
	Torque tube: SUS316L (-196 to 0°C) *2						D							
	Other		X											
Working pressure range *8	JIS 10K						1							
	JIS 20K						2							
	JIS 30K						3							
	JIS 63K						4							
	ANSI 150 (RF smoothness)						A							
	ANSI 150 (RF serration)						B							
	ANSI 300 (RF smoothness)						C							
	ANSI 300 (RF serration)						D							
	ANSI 600 (RF smoothness)						E							
	ANSI 600 (RTJ)						F							
	JPI 150						G							
	JPI 300						H							
	JPI 600						J							
	JPI 600 (RTJ)						K							
	Other *4		X											
Flange size	1-1/2 inch (40 mm) (Applicable to external chamber type)						1							
	2 inches (50 mm) (Applicable to external chamber type)						2							
	3 inches (80 mm) (Applicable to internal chamber type) (only medium specific gravity)						3							
	4 inches (100 mm) (Applicable to internal chamber type)						4							
	5 inches (125 mm) (Applicable to internal chamber type) (only low specific gravity) *1						5							
	Other		X											
Air piping connections	Rc1/4 (PT1/4 internal thread) (Nameplate: Japanese)							A						
	1/4NPT internal thread (Nameplate: English)							B						
Unit / Pneumatic signal	kgf/cm ² / 0.2-1 kgf/cm ²												1	
	psi/ 3-15 psi												2	
	bar/ 0.2-1.0 bar												3	
	Pa/ 20-100 kPa												4	
	Pa/ 19.6-98.1 kPa												8	

Note) *1~10: refer to next page.

Note

- *1) Pressure rating “4”, “E”, “F”, “J”, and “K” cannot be selected for 5 inches/125 mm or the low density.
- *2) When other material is “D”
- ① Even 0-200°C can be used.
 - ② The element materials “1” cannot be selected.
- *3) The float material is as follows.

Other material code	Float material
U, M, A, E, D	SUS316L

Bolt/nut material is as follows.

Other material code	Bolt/nut material
U, M, A, E	SNB7/S45C *
D	SUS304/SUS304

(Note)* If Y131 is specified, bolt/nut material of the sign * is changeable to SUS304/SUS304.

- *4) Class900 is required consultation with our sales.
Class1500 or more cannot be produced.
- *5) Please specify the float model number if reusing an existing Azbil Corporation float, model NQI, KFLB, KQP, or NQP. Please note the following :
- (1) The selectable precondition as optional specification “C” for the existing product, “liquid level measurement specification: medium specific gravity”. Model number shall be NQI31□, NQI21□, KQP□1□, KFL□00-□1, NQP31□ or NQP21□ without Z.
 - (2) Note that the existing float diameter smaller than the standard specification
 - (3) Please confirm the dimensions of the existing float, and confirm the accuracy of measurement using the following formula.

- Characteristics of the standard model KFLB

	Weight “Mf” of the measured fluid which is displaced by the float		
	Mf ≥ 400	400 > Mf ≥ 200	200 > Mf
Accuracy (%FS)	±0.5	±1.0	Accuracy is not guaranteed

(Note) *This accuracy table is common for all KFLB models regardless of liquid level measurement, interface measurement or gravity measurement specifications.

- Formula for checking accuracy

$$Mf = \frac{\pi/4 \times D^2 \times H \times \gamma \times \rho_{std} \times 10^3}{1 + 2.04 \times 10^7 \times \pi \times D^2 \times \gamma \times \rho_{std}} \text{ (g)}$$

Where D : Float diameter (mm)
H : Measuring range (float length, mm)
 γ : Specific gravity
 ρ_{std} : Standard density, $\rho_{std} = 1 \text{ (g/cm}^3\text{)}$
 π : Circular constant

- Reference: Formula for Genesis buoyant by float

$$F = \rho \times V \times G = Mf \times G$$

Where ρ : Density of the ambient fluid (measuring fluid)
V : Volume of the ambient fluid (measuring fluid) which the float displaced
G : Gravitational acceleration
Mf : Weight of the measuring fluid, which is displaced by the float

- *6) Please specify the existing chamber model number.
However, the following attention is needed. The replaced model number must be without “Z” of our model KQP□1□, KFL□00-□1, and NQP31□ and NQP21□. if “Z” included in the model number, the connection standard of the chamber and the bonnet are required ANSI / JPI 50, 300, 600 RF and the flange size (nominal size) is 3 inches respectively.
- *7) Please fill in “Z” on a basic model number end, and specified the range at the specific gravity measurement.
- *8) It is JIS and JPI (JPI 600 RTJ is excluded) is RF flange.
- *9) If included semi-standard specification (Y□) Please fill in the “Y” sign on a basic model number end, and put Y number other. Please consult to our sales if required the combination of two Y spec. or more.
- *10) Specify option code “7”, if expand the measuring point of input output characteristics described to the test report from 3 points (0,50,100%) to 5 points (0,25,50,75,100%). Option code “7” cannot be specified alone.

- * Please specify the following when you order.

• Model number
KFLB□□ - □□□□□□□□□□ - □

- Liquid name =
- Type of gas =

• Specific gravity (fill in below the decimal point 3 digit.)
For level meter =
For boundary surface meter: Upper layer liquid =
Lower layer liquid =
For specific gravity meter :
the range of the specific gravity of the measurement.=

- Temperature Normal = °C
MIN = °C
Design temperature = °C
- Pressure Normal = MPa
MAX = MPa
Design pressure = MPa

- The dimension from the lower side of the bonnet flange to upper part of float (L1) =
Round off below the decimal point, and fill it in by the unit of mm.
Please consult to our sales separately for L1 > 1500 mm.

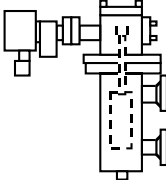
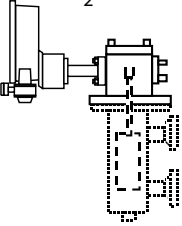
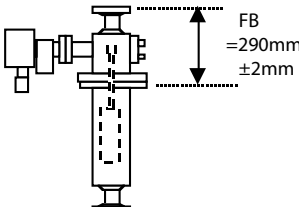
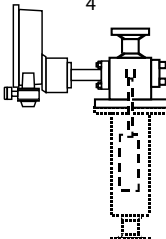
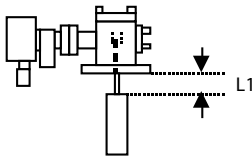
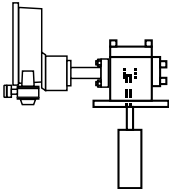
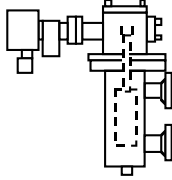
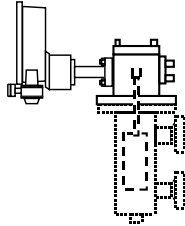
□ : Specify, and fill in.

Notes for replacement

Notes for replacement of an Azbil product with the KFLB *4 *5

Products to be replaced: NQI310, NQI210 *1 *2

KQP_10, NQP310, NQP210 *1 *2 *3

When reusing the current chamber	Connection type	SIS/SIB	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select option D, "Without chamber." 2. Other specifications must be the same as for the NQI. <p>Model number of the current meter NQI310-1-----</p> <p>KFLB model number KFLB__-61__1____-D 2</p> <p>For external type, Side – Side</p>  
		TIB/TIS	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select option D, "Without chamber." 2. Other specifications must be the same as for the NQI. <p>Requirements</p> <ul style="list-style-type: none"> · FB must be 290 mm \pm 2 mm · If FB is not 290 mm \pm 2 mm, please contact the Azbil Group.*4 <p>Model number of the current meter NQI310-3-----</p> <p>KFLB model number KFLB__-61__3____-D 4</p> <p>For external float type (Top – Bottom)</p> <p>FB =290mm \pm2mm</p>  
		T	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select connection type 5, "Internal Top." 2. Do not select option D, "Without chamber." 3. Other specifications must be the same as for the NQI. <p>Requirement</p> <ul style="list-style-type: none"> · Be sure to specify dimension L1 <p>Model number of the current meter NQI310-5-----</p> <p>KFLB model number KFLB__-61__5____-</p> <p>L1</p>  
			<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select option C, "Without oat" and D, "Without chamber." 2. Other specifications must be the same as for the NQI. <p>Requirement</p> <ul style="list-style-type: none"> · If the connection type is Internal Top, be sure to specify dimension L1. <p>Model number of the current meter NQI310-1-----</p> <p>KFLB model number KFLB__-61_____-CD</p> <p>For external type, Side – Side</p>  

Note) *1. If the model number includes "Z," check that the chamber and bonnet are connected with ANSI/JPI Class 150, 300, or 600 RF flanges with an inner (nominal) diameter of 3B. If another type of flange is used, please contact us.

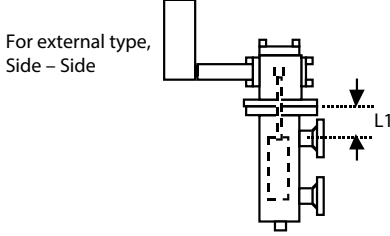
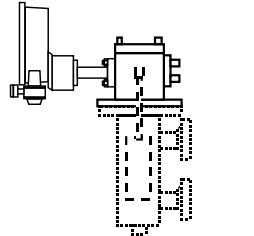
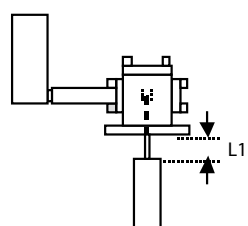
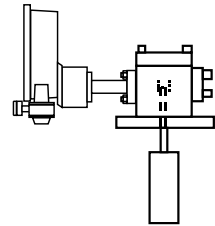
*2. For interface measurement and specific gravity measurement applications, please contact the Azbil Group.

*3. If FB is not 290 mm \pm 2 mm, please inform us of the production and model numbers of the current meter.

*4. The length of L1 (from the bottom of the bonnet flange to the top of the float) is based on the production drawing of the float that we delivered. If the chamber has been specially calibrated for your use, please measure and specify the precise length of L1.

*5. If there is an elevation or suppression setting for the current meter, or if the measurement range differs from the height of the float, measure and specify the precise length of L1.

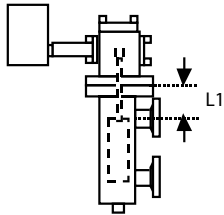
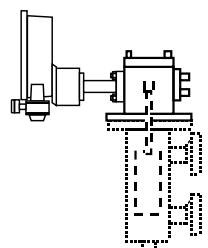
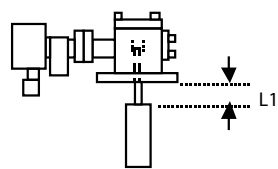
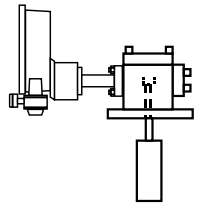
Notes for replacement of an Azbil product with the KFLB ^{*4 *5}Products to be replaced: "782" Models ^{*1 *3}

When reusing the current chamber	Connection type	S / S / B	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select connection type 5, "Internal Top." 2. Do not select option D, "Without chamber." 3. Select pressure rating 1, (JIS 10K) or 3 (JIS 30K). 4. Select a flange size that is appropriate for the chamber pipe outer diameter of the 782 Model. 5. For other Model numbers, check the specifications of the 782 meter and select the appropriate numbers. <p>If there are customized specifications that are not indicated by the Model number, please inform us of the specifications.</p> <p>Requirements</p> <ul style="list-style-type: none"> · Be sure to measure and specify dimension L1. · For interface measurement and specific gravity measurement applications, please contact the Azbil Group. ^{*3} <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Model number of the current meter</p> <p>782__-__-__1__-__</p> <p>For external type, Side – Side</p>  </div> <div style="text-align: center;"> <p>KFLB model number</p> <p>KFLB__-61__5__1__-__ (JIS10K)</p> <p>KFLB__-61__5__3__-__ (JIS30K)</p>  </div> </div>
When replacing with an internal oat (top) Model	Connection type	T	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select connection type 5, "Internal Top." 2. Do not select option D, "Without chamber." 3. For other Model numbers, check the specifications of the 782 meter and select the appropriate numbers. <p>If there are customized specifications that are not indicated by the Model number, please inform us of the specifications.</p> <p>Requirements</p> <ul style="list-style-type: none"> · Be sure to measure and specify dimension L1. · For interface measurement and specific gravity measurement applications, please contact the Azbil Group. ^{*3} <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Model number of the current meter</p> <p>782__-__-__5__-__</p>  </div> <div style="text-align: center;"> <p>KFLB model number</p> <p>KFLB__-61__5__-__-__</p>  </div> </div>

Note) ^{*1}. For interface measurement and specific gravity measurement applications, please contact the Azbil Group. ^{*3}^{*2}. If FB is not 290 mm \pm 2 mm, please inform us of the production and Model numbers of the current meter.^{*3} The old float cannot be reused.^{*4} The length of L1 (from the bottom of bonnet flange to the top of the float) is based on the production drawing of the float that we delivered. If the chamber has been specially calibrated for your use, please measure and specify the precise length of L1.^{*5} If elevation or suppression is set for the current meter, or if the measurement range differs from the height of the float, measure and specify the precise length of L1.

Notes when replacing a product made by other manufacturers *3 *4

Products to be replaced: Other manufacturer's product (replacement is possible if (1) the pressure rating and flange diameter of the KFLB internal top models are appropriate for the flanges between the chamber and bonnet, and (2) dimension L1 can be specified. If the conditions cannot be satisfied, please contact us.) *1 *2

When reusing the current chamber	Connection type SIS/SIB	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select connection type 5, "Internal Top." 2. Do not select option D, "Without chamber." <p>Requirements</p> <ul style="list-style-type: none"> • Check and specify the pressure rating and flange diameter. • Check the flange standard from the marking on the current meter. • If the flange and gasket between the chamber and bonnet are of a standard other than JIS, ANSI, or JPI, check and specify the structure. • Be sure to specify dimension L1. • For interface measurement and specific gravity measurement applications, please contact the Azbil Group. *1 <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>For external type, Side – Side</p>  </div> <div style="text-align: center;"> <p>KFLB model number KFLB__-61__5_____-__</p>  </div> </div>
When replacing with an internal oat (top) model	Connection type T	<p>Notes when selecting an KFLB Model</p> <ol style="list-style-type: none"> 1. Select connection type 5, "Internal Top." 2. Do not select option D, "Without chamber." <p>Requirements</p> <ul style="list-style-type: none"> • Check and specify the pressure rating and flange diameter on the dimensional drawing of the current meter. • Be sure to specify dimension L1. • For interface measurement and specific gravity measurement applications, please contact the Azbil Group. *1 <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>Current meter</p>  </div> <div style="text-align: center;"> <p>KFLB model number KFLB__-61__5_____-__</p>  </div> </div>

Note) *1. Please prepare documents that describe the specifications, structure and dimensions of the current liquid level meter and the measurement conditions for the fluid.

*2. The old float cannot be reused.

*3. L1 will be based on the manufacturer's specifications for the product. If the chamber has been specially calibrated for your use, please measure and specify the precise length of L1.

*4. If there is an elevation or suppression setting for the current meter, or if the measurement range differs from the height of the float, measure and specify the precise length of L1.

DIMENSIONS

External Chamber type

S-S: Side - Side

[Unit: mm]

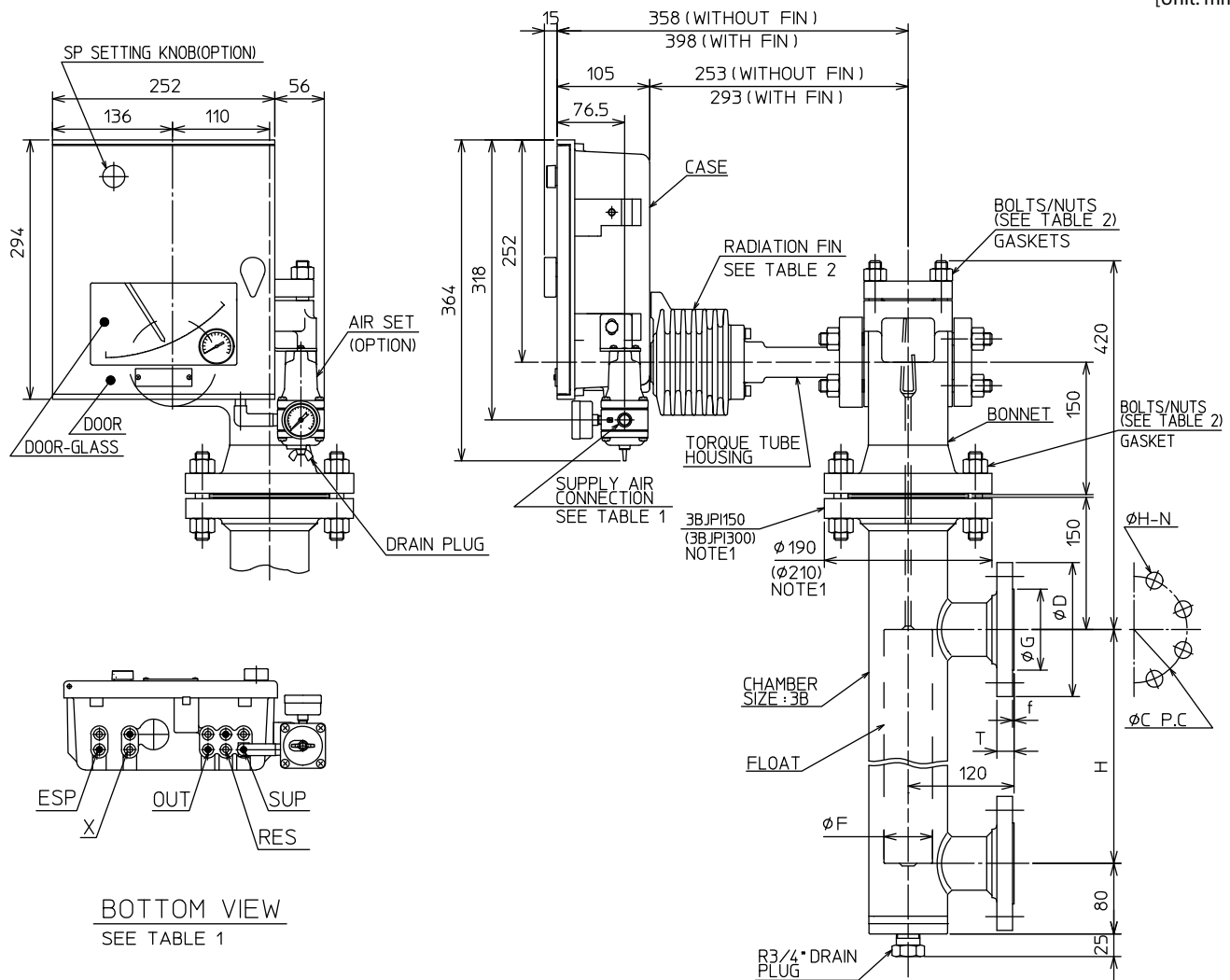


TABLE 1: AIR CONNECTION ※a

SYMBOL	LEGEND
⊙	Rc1/4
●	1/4NPT INTERNAL THREAD
ESP	EXTERNAL SP SIGNAL
X	TRANSMITTING SIGNAL
OUT	CONTROLLED SIGNAL
RES	EXT. RESET SIGNAL
SUP	SUPPLY AIR PRESSURE

※a:FOR MANUAL RESET PROVISION,
SUP AND RES HAVE BEEN
PRECONNECTED.

TABLE 2: BOLTS/NUTS MATERIALS

MODEL No.	BOLTS/NUTS MATERIALS	RADIATION FIN
U,M	SNB7/S45C ※b	WITH
A,E	SNB7/S45C ※b	WITHOUT
D	SUS304/SUS304	WITHOUT

BOLTS/NUTS MATERIALS MARKED
WITH *b SHALL BE SUS304/SUS304
WHEN Y131 IS SPECIFIED.

TABLE 3: CONNECTION FLANGE DIMENSIONS

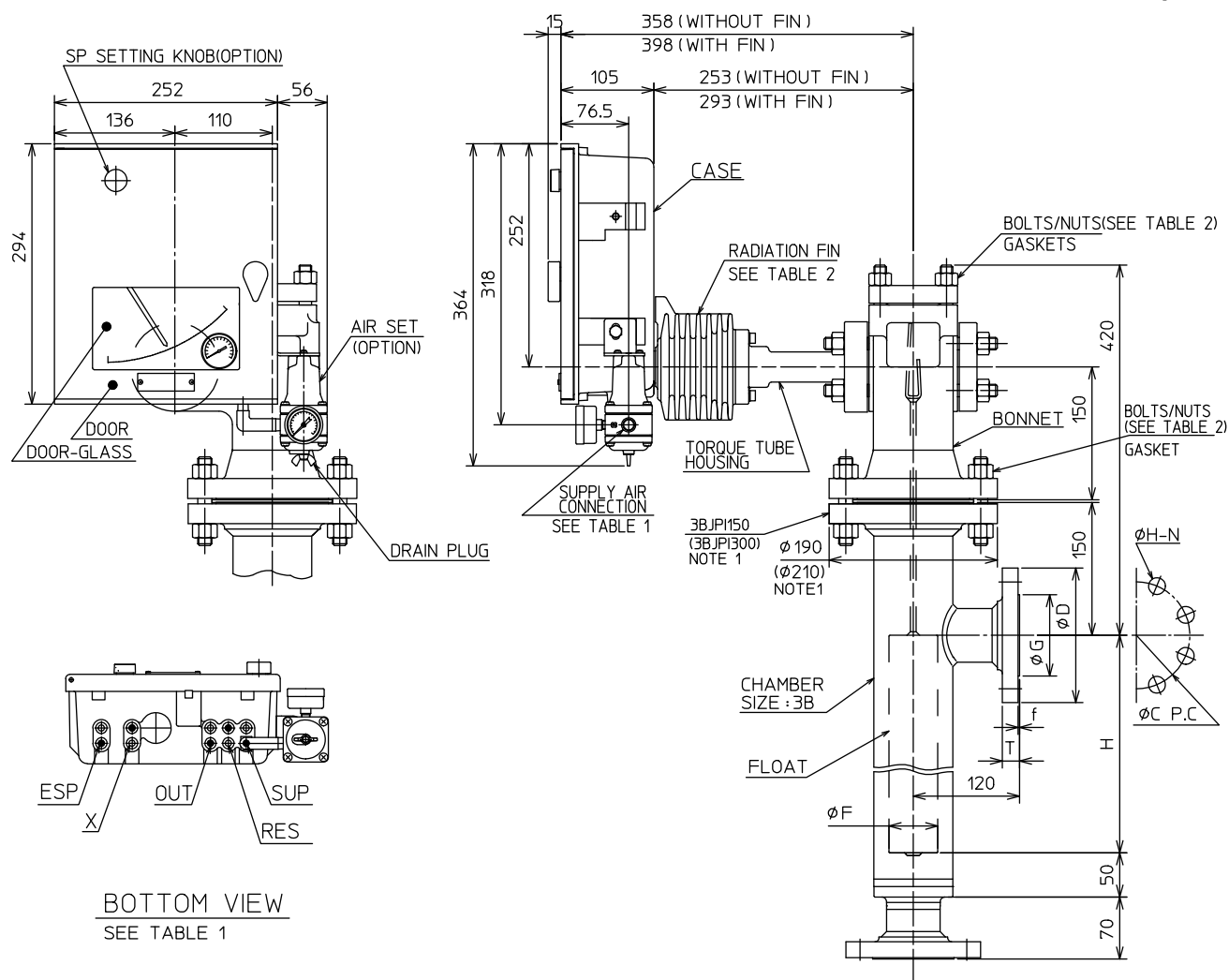
FLANGE RATING		ØD	ØG	T	f	ØC	ØH-N
40A	JIS10K RF	140	81	16	2	105	19-4
50A		155	96	16	2	120	19-4
11/2B	JPI 150 RF ANSI	127	73.2	17.6	1.6	98.6	16-4
2B		152	91.9	19.1	1.6	120.6	19-4
40A	JIS20K RF	140	81	18	2	105	19-4
50A		155	96	18	2	120	19-8
40A	JIS30K RF	160	90	22	2	120	23-4
50A		165	105	22	2	130	19-8
11/2B	JPI 300 RF ANSI	155	73.2	20.6	1.6	114.3	22-4
2B		165	91.9	22.4	1.6	127	19-8

TABLE4 :FLOAT DIMENSION
FLOAT WEIGHT

MEASURING RANGE (mm)	H	ΦF	WEIGHT (kg)
0~300	300	55	3.0
0~350	350		
0~400	400		
0~450	450		
0~500	500		
0~600	600	45	
0~700	700		
0~800	800		
0~1000	1000		
0~1200	1200	30	
0~1500	1500		
0~2000	2000		

S-B: Side - Bottom

[Unit: mm]



BOTTOM VIEW
SEE TABLE 1

TABLE 1: AIR CONNECTION ※a

SYMBOL	LEGEND
◎	Rc1/4
●	1/4NPT INTERNAL THREAD
ESP	EXTERNAL SP SIGNAL
X	TRANSMITTING SIGNAL
OUT	CONTROLLED SIGNAL
RES	EXT. RESET SIGNAL
SUP	SUPPLY AIR PRESSURE

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TABLE 2: BOLTS/NUTS MATERIALS

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U,M	SNB7/S45C ※b	WITH
A,E	SNB7/S45C ※b	WITHOUT
D	SUS304/SUS304	WITHOUT

BOLTS/NUTS MATERIALS MARKED
WITH ※b SHALL BE SUS304/SUS304
WHEN Y131 IS SPECIFIED.

TABLE 3: CONNECTION FLANGE DIMENSIONS

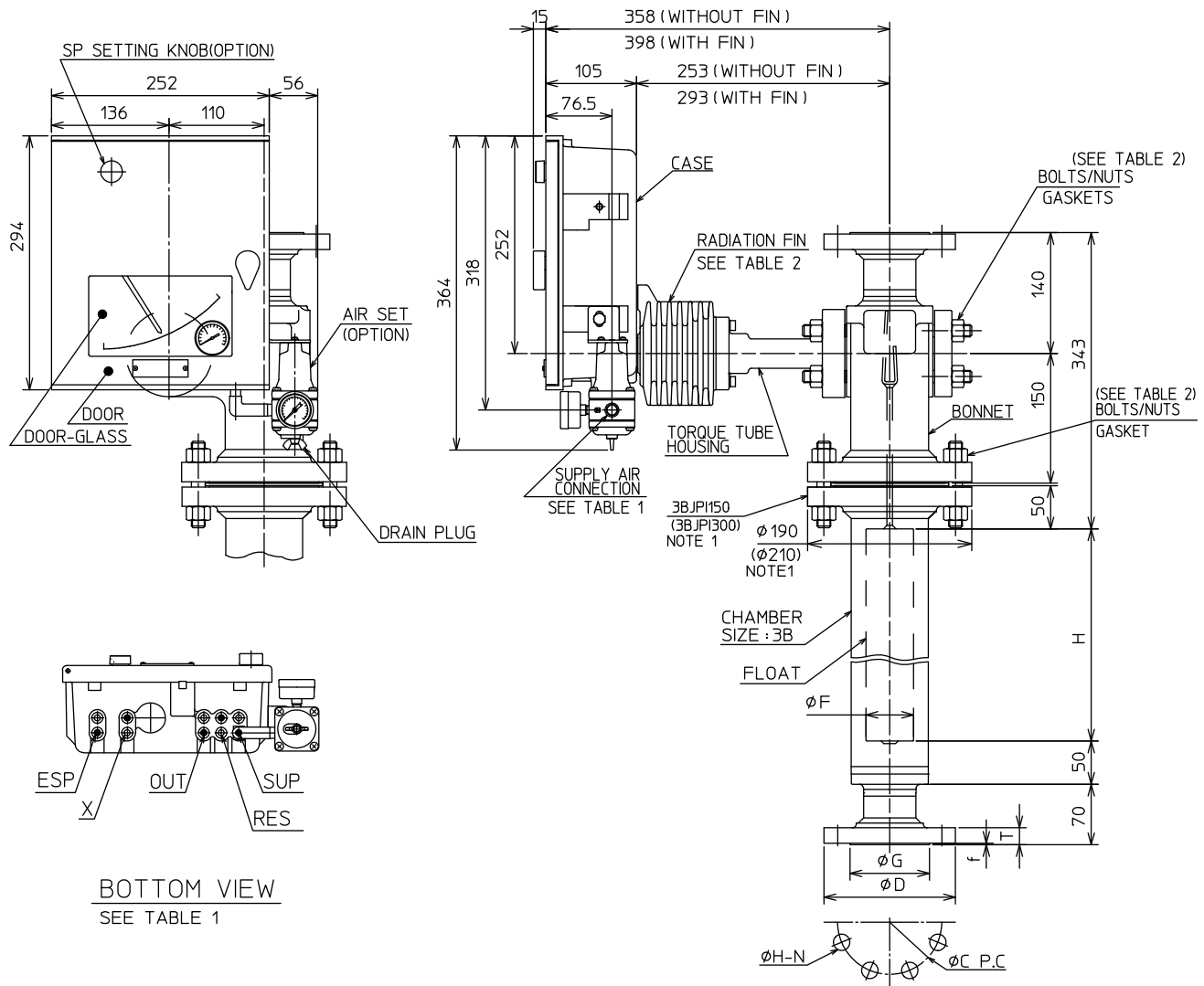
FLANGE RATING	ØD	ØG	T	f	ØC	ØH-N
40A	140	81	16	2	105	19-4
50A	155	96	16	2	120	19-4
1 1/2 B	127	73.2	17.6	1.6	98.6	16-4
2B	152	91.9	19.1	1.6	120.6	19-4
40A	140	81	18	2	105	19-4
50A	155	96	18	2	120	19-8
40A	160	90	22	2	120	23-4
50A	165	105	22	2	130	19-8
1 1/2 B	155	73.2	20.6	1.6	114.3	22-4
2B	165	91.9	22.4	1.6	127	19-8

TABLE 4: FLOAT DIMENSION
FLOAT WEIGHT

MEASURING RANGE (mm)	H	ØF	WEIGHT (kg)
0~300	300	55	3.0
0~350	350		
0~400	400		
0~450	450		
0~500	500	45	3.0
0~600	600		
0~700	700		
0~800	800		
0~1000	1000	30	3.0
0~1200	1200		
0~1500	1500		
0~2000	2000		

T-B: Top-Bottom

[Unit: mm]



BOTTOM VIEW
SEE TABLE 1

TABLE 1: AIR CONNECTION ※a

SYMBOL	LEGEND
◎	Rc1/4
●	1/4NPT INTERNAL THREAD
ESP	EXTERNAL SP SIGNAL
X	TRANSMITTING SIGNAL
OUT	CONTROLLED SIGNAL
RES	EXT. RESET SIGNAL
SUP	SUPPLY AIR PRESSURE

※a: FOR MANUAL RESET PROVISION,
SUP AND RES HAVE BEEN
PRECONNECTED.

TABLE 2: BOLTS/NUTS MATERIALS

MODEL No.	BOLTS/NUTS MATERIALS	RADIATION FIN
U,M	SNB7/S45C ※b	WITH
A,E	SNB7/S45C ※b	WITHOUT
D	SUS304/SUS304	WITHOUT

BOLTS/NUTS MATERIALS MARKED
WITH ※b SHALL BE SUS304/SUS304
WHEN Y131 IS SPECIFIED.

TABLE 3: CONNECTION FLANGE DIMENSIONS

FLANGE RATING		φD	φG	T	f	φC	φH-N
40A	JIS10K RF	140	81	16	2	105	19-4
50A		155	96	16	2	120	19-4
11/2B	JPI 150 RF ANSI	127	73.2	17.6	1.6	98.6	16-4
2B		152	91.9	19.1	1.6	120.6	19-4
40A	JIS20K RF	140	81	18	2	105	19-4
50A		155	96	18	2	120	19-8
40A	JIS30K RF	160	90	22	2	120	23-4
50A		165	105	22	2	130	19-8
11/2B	JPI 300 RF ANSI	155	73.2	20.6	1.6	114.3	22-4
2B		165	91.9	22.4	1.6	127	19-8

TABLE 4: FLOAT DIMENSION
FLOAT WEIGHT

MEASURING RANGE (mm)	H	φF	WEIGHT (kg)
0~300	300	55	3.0
0~350	350		
0~400	400		
0~450	450		
0~500	500		
0~600	600	45	3.0
0~700	700		
0~800	800		
0~1000	1000		
0~1200	1200		
0~1500	1500	30	3.0
0~2000	2000		

T-S: Top - Side

[Unit: mm]

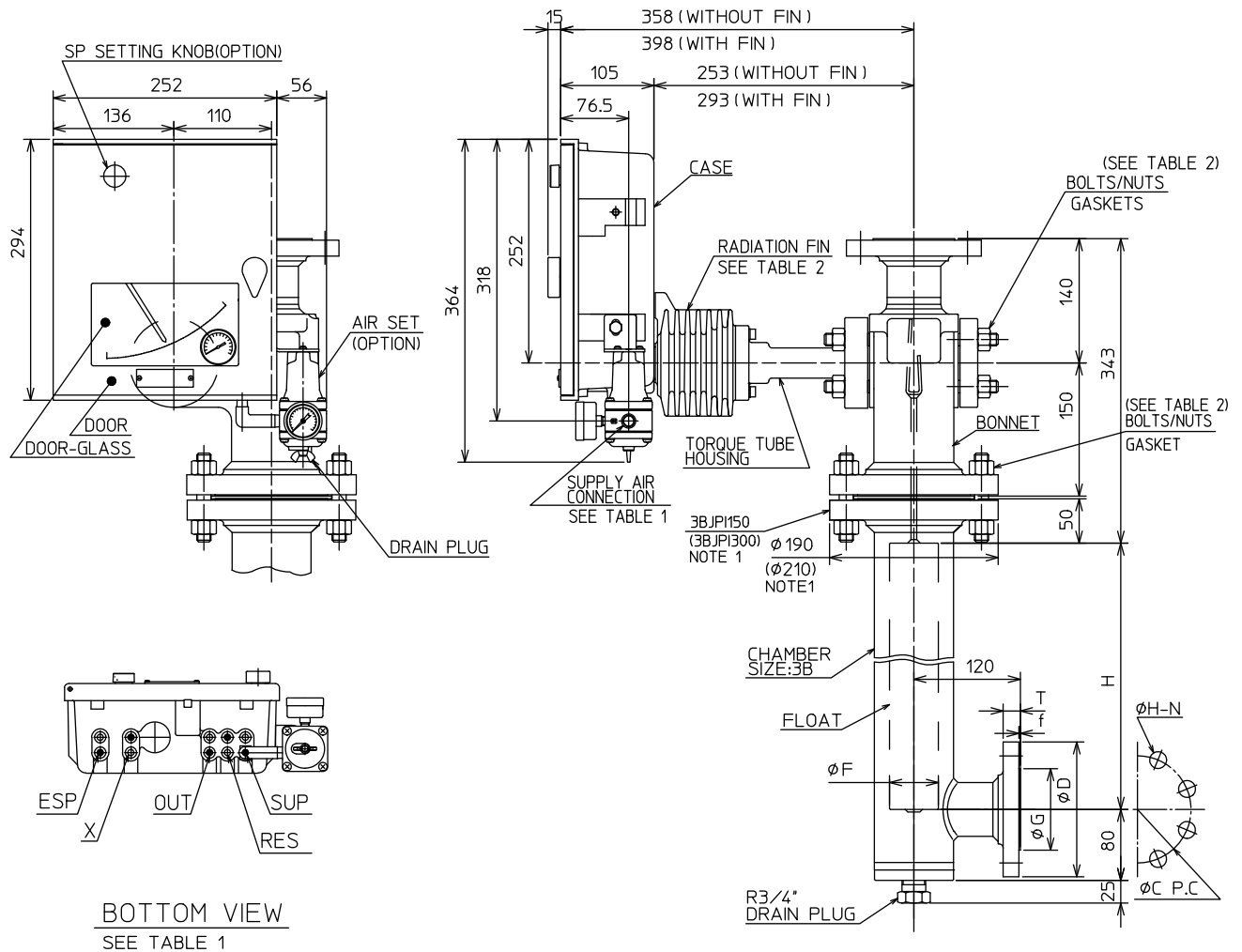


TABLE 1: AIR CONNECTION ※a

SYMBOL	LEGEND
◎	Rc1/4
●	1/4NPT INTERNAL THREAD
ESP	EXTERNAL SP SIGNAL
X	TRANSMITTING SIGNAL
OUT	CONTROLLED SIGNAL
RES	EXT. RESET SIGNAL
SUP	SUPPLY AIR PRESSURE

※a: FOR MANUAL RESET PROVISION,
SUP AND RES HAVE BEEN
PRECONNECTED.

TABLE 2: BOLTS/NUTS MATERIALS

MODEL No.	BOLTS/NUTS MATERIALS	RADIATION FIN
U,M	SNB7/S45C ※b	WITH
A,E	SNB7/S45C ※b	WITHOUT
D	SUS304/SUS304	WITHOUT

BOLTS/NUTS MATERIALS MARKED
WITH ※b SHALL BE SUS304/SUS304
WHEN Y131 IS SPECIFIED.

TABLE 3: CONNECTION FLANGE DIMENSIONS

FLANGE RATING		ϕD	ϕG	T	f	ϕC	$\phi H-N$
40A	JIS10K RF	140	81	16	2	105	19-4
50A		155	96	16	2	120	19-4
1 1/2B	JPI 150 RF	127	73.2	17.6	1.6	98.6	16-4
2B		152	91.9	19.1	1.6	120.6	19-4
40A	JIS20K RF	140	81	18	2	105	19-4
50A		155	96	18	2	120	19-8
40A	JIS30K RF	160	90	22	2	120	23-4
50A		165	105	22	2	130	19-8
1 1/2B	JPI 300 RF	155	73.2	20.6	1.6	114.3	22-4
2B		165	91.9	22.4	1.6	127	19-8

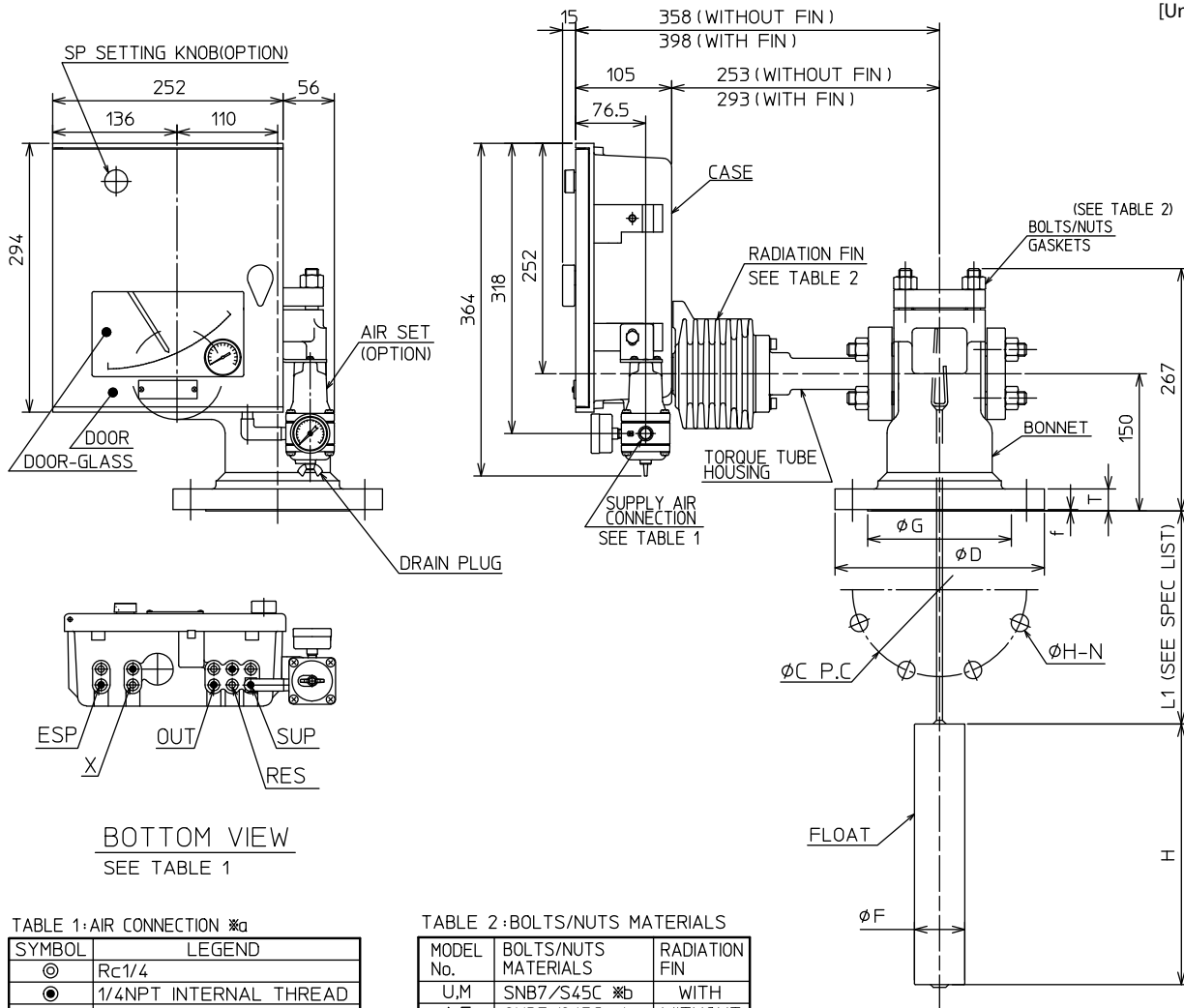
TABLE 4: FLOAT DIMENSION
FLOAT WEIGHT

MEASURING RANGE (mm)	H	ϕF	WEIGHT (kg)
0~300	300	55	3.0
0~350	350		
0~400	400		
0~450	450		
0~500	500		
0~600	600	45	3.0
0~700	700		
0~800	800		
0~1000	1000	30	3.0
0~1200	1200		
0~1500	1500		
0~2000	2000		

Internal Chamber type

T: TOP Connection

[Unit: mm]



BOTTOM VIEW
SEE TABLE 1

TABLE 1: AIR CONNECTION *a

SYMBOL	LEGEND
⊙	Rc1/4
⊙	1/4NPT INTERNAL THREAD
ESP	EXTERNAL SP SIGNAL
X	TRANSMITTING SIGNAL
OUT	CONTROLLED SIGNAL
RES	EXT. RESET SIGNAL
SUP	SUPPLY AIR PRESSURE

*a: FOR MANUAL RESET PROVISION,
SUP AND RES HAVE BEEN
PRECONNECTED.

TABLE 2: BOLTS/NUTS MATERIALS

MODEL No.	BOLTS/NUTS MATERIALS	RADIATION FIN
U.M	SNB7/S45C *b	WITH
A.E	SNB7/S45C *b	WITHOUT
D	SUS304/SUS304	WITHOUT

BOLTS/NUTS MATERIALS MARKED
WITH *b SHALL BE SUS304/SUS304
WHEN Y131 IS SPECIFIED.

TABLE 3: CONNECTION FLANGE DIMENSIONS

FLANGE RATING	φD	φG	T	f	φC	φH-N
80A	185	126	18	2	150	19-8
100A	210	151	18	2	175	19-8
3B	190	127	23.9	1.6	152.4	19-4
4B	229	157.2	23.9	1.6	190.5	19-8
80A	200	132	22	2	160	23-8
100A	225	160	24	2	185	23-8
80A	210	140	28	2	170	23-8
100A	240	160	32	2	195	25-8
3B	210	127	28.5	1.6	168.1	22-8
4B	254	157.2	31.8	1.6	200.2	22-8

TABLE 4: FLOAT DIMENSION
FLOAT WEIGHT

MEASURING RANGE (mm)	H	φF	WEIGHT (kg)
0~300	300	55	3.0
0~350	350	55	3.0
0~400	400	55	3.0
0~450	450	55	3.0
0~500	500	55	3.0
0~600	600	45	3.0
0~700	700	45	3.0
0~800	800	45	3.0
0~1000	1000	45	3.0
0~1200	1200	30	3.0
0~1500	1500	30	3.0
0~2000	2000	30	3.0

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Azbil Corporation
Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: <https://www.azbil.com/>

azbil

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