YAMATAKE **Specification**

Smart ALTJ 3000
Immersion Type Liquid Level Transmitter

JTL220/230 (for City Water)
JTL221/231 (for Sludge or Waste Water)
JTL222/232 (for Seawater)

Introduction

Smart ALTJ3000, incorporating a compound semiconductor sensor and a microcomputer, is an immersion type liquid level transmitter designed to enable high-accuracy measurement of liquid levels. This indicator is usable in water supply reservoirs, wells, dams, rivers, and seawater inlets, as well as in waste water tanks, waste water pump wells, sludge storage tanks, and sewage tanks in sewage treatment stations. Parameters and settings of the indicator (range, damping time constant, constant-current output, and others) can be remote-controlled from the instrument room via SFC (Smart Field Communicator).

Types usable for sludge or seawater are provided with protective diaphragms (optional specification for seawater types) on the outer circumferences of metal diaphragms for protection against sewage or sludge contained in the liquids.

Standard Specifications

Item	Specifications
Measuring Span	JTL22□: 3 to 100 kPa {0.3 to 10 mH_2O} JTL23□: 70 to 700 kPa {7 to 70 mH_2O}
Setting Range	JTL22□: 0≤URV(*1)≤100 kPa {10 mH_2O}, 0≤LRV(*2)≤100 kPa {10 mH_2O} JTL23□: 0≤URV≤700 kPa {70 mH_2O}, 0≤LRV≤700 kPa {70 mH_2O}
Output	4 to 20mA DC
Accuracy	Percentage with respect to x (kPa, {mH_2O}) that represents the URV or LRV, or span, whichever is greatest of the calibrated range. JTL22□: ±0.25% ..... When x is 12.5 kPa {1.25 mH_2O} or greater. [With protective diaphragms ... ±0.5%] $\pm\{0.05+(0.2\times\frac{12.5}{x})\}$% ..... When x is less than 12.5 kPa {1.25 mH_2O}. (With damping effected) [With protective diaphragms ... $\pm\{0.1+(0.4\times\frac{12.5}{x})\}$%] JTL23□: ±0.25% ..... When x is 210 kPa {21 mH_2O} or greater. [With protective diaphragms ... ±0.5%] $\pm\{0.05+(0.2\times\frac{210}{x})\}$% ..... When x is less than 210 kPa {21 mH_2O}. (With damping effected) [With protective diaphragms ... $\pm\{0.1+(0.4\times\frac{210}{x})\}$%]
Supply Voltage and Load Resistance	17.6 to 45V DC (See Figure 2.)
Overpressure Limit	JTL22□: 300 kPa {30 mH_2O} max. JTL23□: 1050 kPa {105 mH_2O} max.

(*1): URV denotes the value for 100% (20 mA DC) output.
(*2): LRV denotes the value for 0% (4 mA DC) output.
(*3): Refer to the temperature effect diagram (Figure 3).

Item	Specifications
Operating Temperature Range	Sensor (wetted parts): Normal operating conditions; −5 to +55°C Operative limits (For short period); −5 to+60°C Transportation and storage conditions; −40 to +85°C Relay box: Normal operating conditions; −5 to +55°C Operative limits (For short period); −30 to +80°C Transportation and storage conditions; −40 to +85°C Power supply box: Normal operating conditions; 10 to 40°C Operative limits (For short period); 0 to 50°C Transportation and storage conditions; −40 to +70°C
Operating Humidity Range	Relay box, power-supply box: 10 to 90% RH
Temperature Effect(*3) **(Shift with respect to setting range)**	Percentage with respect to x (kPa, {mH_2O}) that represents the URV or LRV, or span, whichever is greatest of the setting range. JTL22□: Zero shift; $\pm\{0.15+(0.8\times\frac{12.5}{x})\}$ %/30°C change [With protective diaphragms; $\pm\{0.15+(32\times\frac{12.5}{x})\}$ %/30°C change] Combined shift (Including zero and span shifts); ±1.3%/30°C change .... When x is 12.5 kPa {1.25 mH_2O} or greater. $\pm\{0.4+(0.9\times\frac{12.5}{x})\}$ %/30°C change ..... When x is less than 12.5 kPa {1.25 mH_2O} [With protective diaphragms; $\pm\{0.4+(33\times\frac{12.5}{x})\}$ %/30°C change .... When x is 3 to 100 kPa {0.3 to 10 mH_2O}] JTL23□: Zero shift; $\pm\{0.15+(0.2\times\frac{210}{x})\}$ %/30°C change [With protective diaphragms; $\pm\{0.15+(1.9\times\frac{210}{x})\}$ %/30°C change] Combined shift (Including zero and span shifts); ±0.7%/30°C change .... When x is 210 kPa {21 mH_2O} or greater. $\pm\{0.4+(0.3\times\frac{210}{x})\}$ %/30°C change ..... When x is less than 210 kPa {21 mH_2O} [With protective diaphragms; $\pm\{0.4+(2\times\frac{210}{x})\}$ %/30°C change .... When x is 70 to 700 kPa {7 to 70 mH_2O}]
Power Supply	Sensor: 24V DC, Power supply box (option): 100V AC 50/60Hz (AC to 24V DC conversion)
Power Consumption	DC supply: 50mA, AC supply (Option): 70mA
Stability Against Supply Voltage Change	0.005% FS/V
Induction Lightning Arrester	Standard equipment (Sensor, Relay box, and Power supply box)
Dead Time	Approx. 0.4 sec.
Damping Time Constant	Adjustable within range of 0.4 to 32 sec. in 10 steps. (At 25°C)
Relay Box Structure	JIS C0920 Weatherproof, JIS F8001 Class 1 Splashproof, Class 3 Splashproof
Relay Box Electrical Conduit Connection	G½
Materials	Models for city water or sludge Sensor body, weight, chain: SUS304 Diaphragm: SUS316L Protective diaphragm: Chloroprene rubber Models for seawater Sensor housing: Cupro nickel (C7060T) Diaphragm: Hastelloy C Other wetted metal parts: Aluminum bronze (C6191) Protective diaphragm: Chloroprene rubber (optional specification) Relay box Aluminum alloy
Finish	Relay box: Baked acryl paint (corrosion-resistant paint as standard)
Paint Color	Relay box: Light beige (Munsell 4Y7.2/1.3), Power supply box: Dark beige (Munsell 10YR4.7/0.5)
Installation	Sensor: Set in water (on water bottom). (Weight attachable, except models for seawater.) Relay box: Mounted on 2-inch pipes or wall. Power supply box ; Wall
Sensor Cable	Structure: Hollow cable, 2-core shield (stranded), with 3 reinforcing wires O.D: 17mm, Allowable bending radius: 30cm, Sheath material: Polyethylene
Weight	Sensor: Approx. 2kg, Relay box: Approx. 1.5kg, Power supply box: Approx. 1.5kg Weight: Approx. 6kg, Chain: 0.26kg/m, Hollow cable: 0.26kg/m

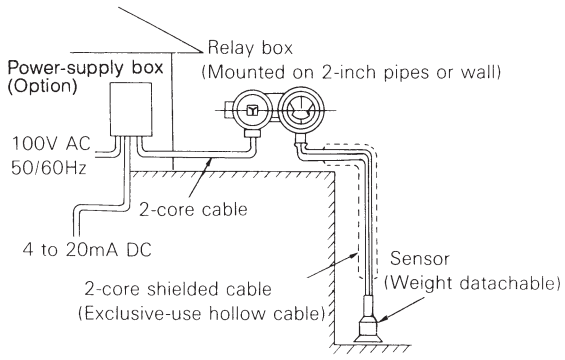
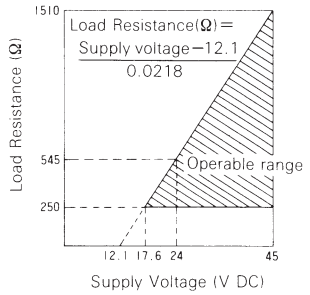


Figure 1. System Configuration Diagram



Note: For communication with SFC, a load resistance of 250 ohms or more is required

Figure 2. Supply Voltage vs. Load Resistance Characteristics

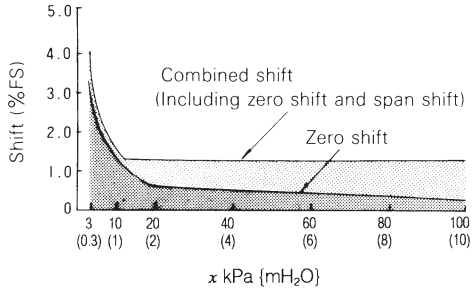


Figure 3-1. Type JTL22□

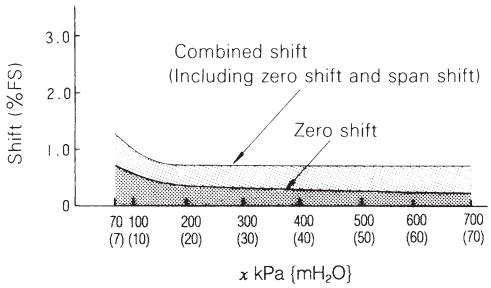


Figure 3-2. Type JTL23□

Figure 3. Temperature Effect (30°C Change) Range (without Protective Diaphragms)

Model Number Table

Sensor

Basic Model No.	Selections		Options I	Options II	Description
	Cable Length	Relay Box Type			
JTL220					Measuring span : 3~100kPa {0.3 to 10m}, models for city water
JTL221					Measuring span : 3~100kPa {0.3 to 10m}, models for sludge or waste water
JTL222					Measuring span : 3~100kPa {0.3 to 10m}, models for seawater
JTL230					Measuring span : 70~700kPa {7 to 70m}, models for city water
JTL231					Measuring span : 70~700kPa {7 to 70m}, models for sludge or waste water
JTL232					Measuring span : 70~700kPa {7 to 70m}, models for seawater
	-05				5m (Only with JTL22□)
	-10				10m
	≀				≀ (See Note 1)
	-90				90m
		S			Wall-mounted type
		T			2-inch pipe mounted type
			-X		No option
			-B		Corrosion-proof finish for relay box
			-F05		Cable-retaining flange JIS10K-50mm
			-F08		Cable-retaining flange JIS10K-80mm
			-F10		Cable-retaining flange JIS10K-100mm
			-M		Built-in indicating meter
			-G		Built-in indicating meter in engineering unit (See Note 4)
			-N		½NPT electrical conduit connection
			-P		With protective diaphragm (models for seawater only, standard equipment on models for sludge)
			-R		Wetted metal parts buffed (inapplicable to models for seawater)
			-W05		Chain length (with wieght) 5m (only with JTL22□) (Excluding models for seawater)
			≀		(See Note 2) (Excluding models for seawater)
			W80		Chain length (with weight) 80m (Excluding models for seawater)
			E15		Weight Diameter ϕ150 (See Note 3) (Excluding models for seawater)
			E20		Weight Diameter ϕ200 (See Note 3) (Excluding models for seawater)
			E25		Weight Diameter ϕ250 (See Note 3) (Excluding models for seawater)
				-XX	No option
				-A5	Burnout feater (Upper limit of value at abnormal condition)
				-A6	No burnout feature

Note 1 ; Option "Cable Length"

Model No.	Cable Length
-15	15m
-20	20m
-25	25m
-30	30m
-40	40m
-50	50m
-60	60m
-70	70m
-80	80m
-90	90m

Note 2 ; Option "Chain Length"

Model No.	Chain Length (with Weight)
-W10	10m (Excluding models for seawater)
-W15	15m (Same as above)
-W20	20m (Same as above)
-W25	25m (Same as above)
-W30	30m (Same as above)
-W40	40m (Same as above)
-W50	50m (Same as above)
-W60	60m (Same as above)
-W70	70m (Same as above)
-W80	80m (Same as above)

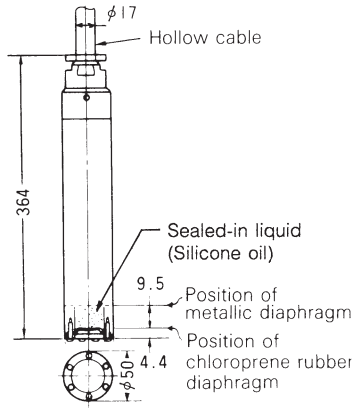
Note 3 ; Weight Diameter ϕ300 is attached as standard, in case of this option is not shown.

Note 4 ; Specify the engineering unit.

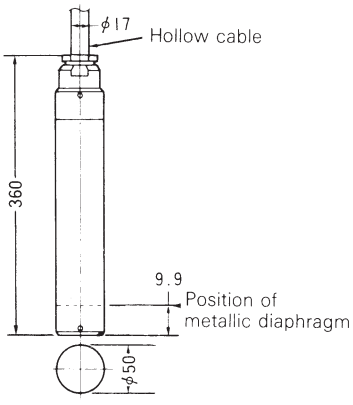
Option:
Power-supply Box

Basic Model No.	Selection	Option	Description
KLPS 10			Standard type (100V AC power supply)
KLPS 11			Only lightning-protective circuit is incorporated (when 24V DC is supplied from another power source)
	−X		No selection
		−X	No option

With Protective Diaphragm



Without Protective Diaphragm



With Weight

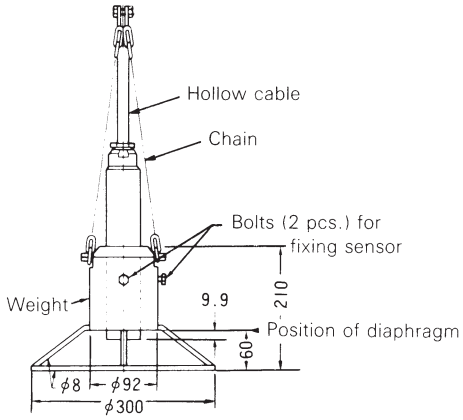
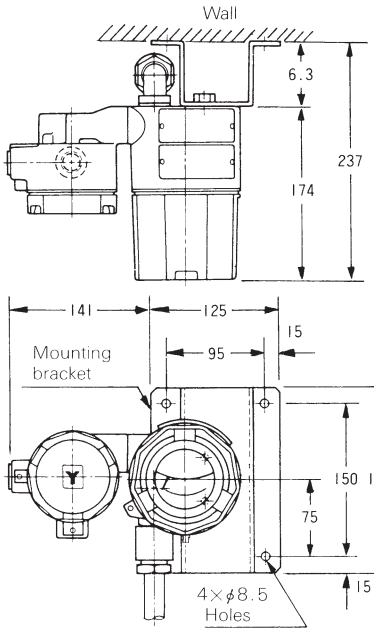


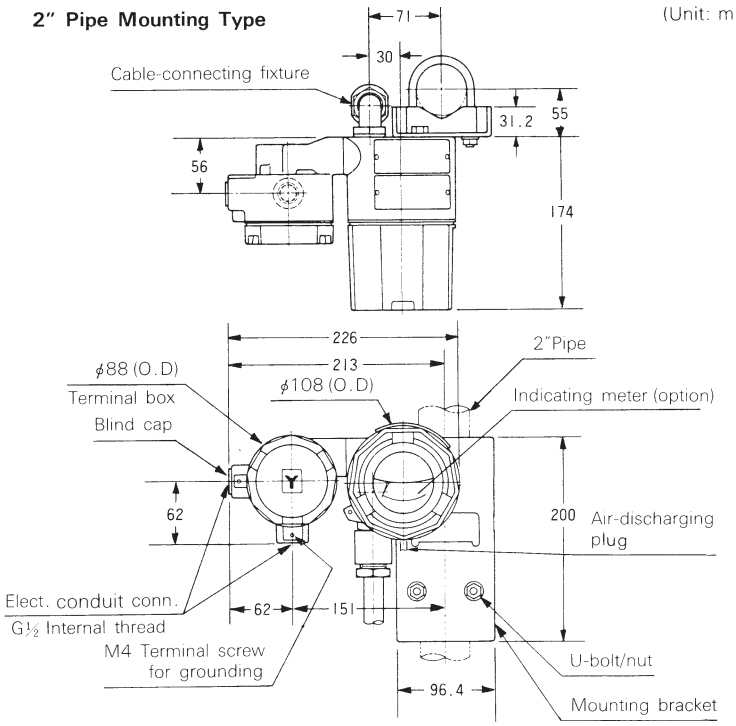
Figure 4. Dimension Drawing (Sensor)

Wall Mounting Type



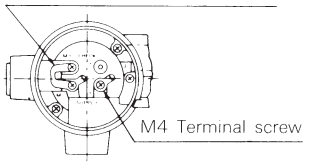
2" Pipe Mounting Type

(Unit: mm)

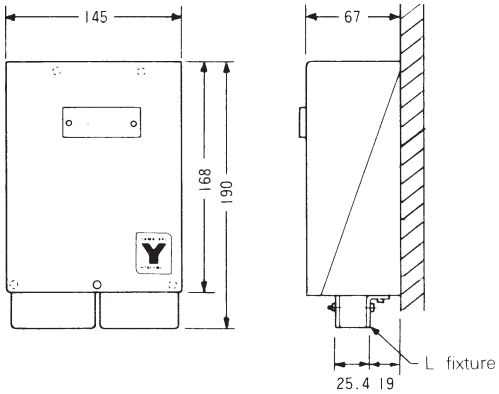


Terminal Connection

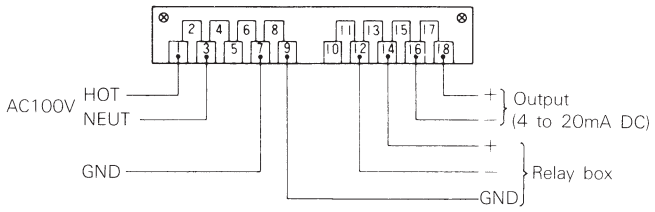
To use an external indicating meter, disconnect the jumper bar from the M terminals and connect in its place the lead wires of the external indicating meter.



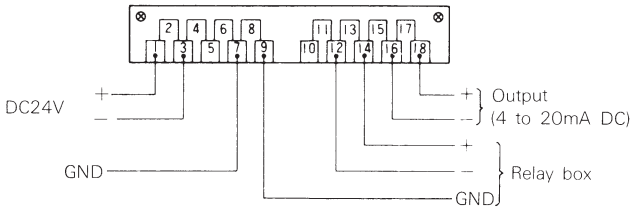
Relay Box



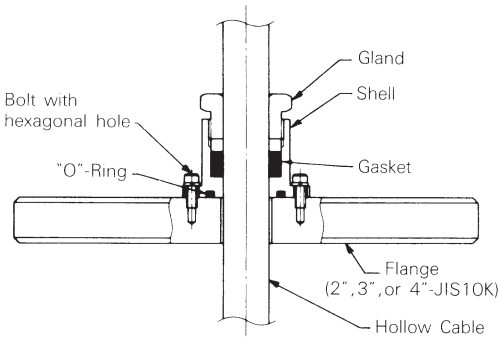
KLPS10 Terminals



KLPS11 Terminals



Power Supply Box



Cable-Retaining Flange

Figure 5. Dimension and Terminal Connection Drawing (Relay Box, Power Supply Box)

YAMATAKE

Savemation

Saving through Automation

Yamatake Corporation

Totate international Building
2-12-19 Shibuya
Shibuya-ku, Tokyo 150-8316
Japan
Tel : 81-3-3486-2310
Fax : 81-3-3486-2593

http://www.yamatake.com/