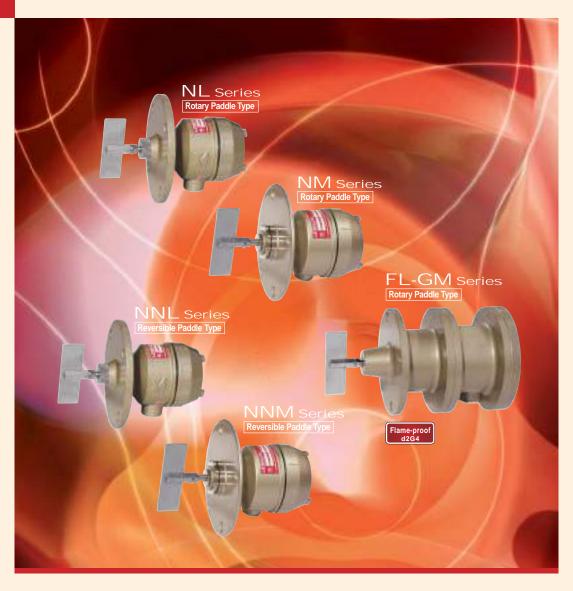
ROTARY PADDLE TYPE LEVEL SWITCH

Model NL/NM/FL-GM/NNL/NNM SERIES



Uncomparable models developed based on our abundant technology experiences and long-term achievments in the market. A variety of products are lined up.

We assure that you will be able to find an optimum model



ROTARY PADDLE TYPE LEVEL SWITCH



Level Switch you can use in versatile applications, exclusively for powders.

As it is easy to handle, it operates stably for a long period of time. It is a best selling line for having gained customers confidence and expanded sales record in the market.



Standard type for detecting powder, versatile usages.



NM Series

Cost effective, standard type with no excessive functions.



FL-GM Series

Various models of Explosion-proof Type.





NNL Series

The original switching system enables the amazing long life of the motor.



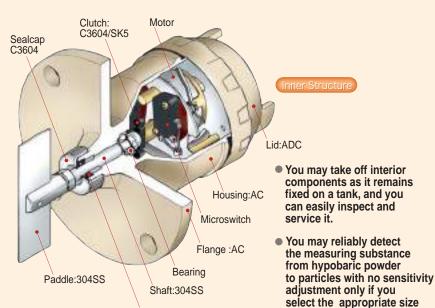
NNM Series

Reversible Type, Highly cost effective. A standard model of rotary type level switch that continously keeps evolving.

Covering a wide range of applications with various models.

Rotary Paddle Type NL/NM Series

- You may easily adjust torque when taking off the Lid.
- It prevents powder from intruding from the axis with oilseal and thrust -teflon packing.
- The clutch system helps prevent the motor from being broken even when the paddle is overloaded.



Oilseal:NBR

■ Principle Of Operation

A rotating paddle, being loaded by sediments in a tank, activates a limit switch and brings contact output and motor rotation to a halt at the same time. With no load by sediments, the motor resumes rotation. When the paddle is overloaded or suffers strong shock, a clutch system prevents the motor from being broken by letting out excessive load and shock.

■ Standard Specification

Power Source: 100-110VAC or 200-220VAC 50/60Hz

Power Consumption: 4W

Contact Capacity: 250VAC 5A Resistance Load

Rate of Rotation: 1r.p.m/50Hz

Allowable Temperature : below 50°C (in a tank)

Withstand Voltage: 1500VAC one minute for

in between terminal and housing

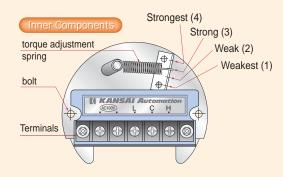
Detection Torque: 1470-1764N · m×10-4

Allowable Pressure: 19.6kPa

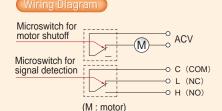
Color : Gold

Process Connection: G1B or Equivalent to JIS 5K 65A

Enclosure Rating: IP55 or equivalent



of the paddle.

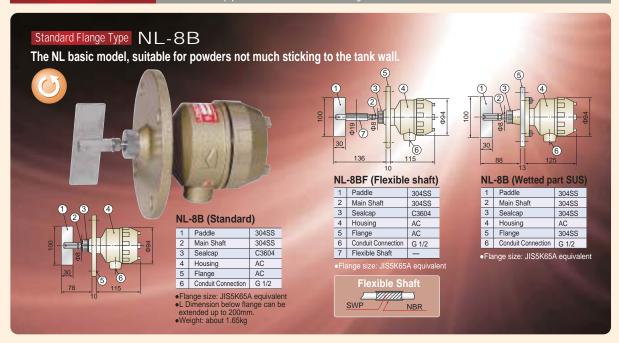




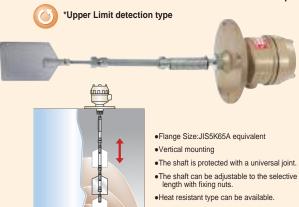


The basic model of Rotary Type Level Switch that can be applied to all and every conditions.

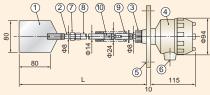
Wetted parts can be made of 304SS or 316SS



Adjustable Shaft Type NL-8BA The shaft can be adjustable to the selective length with fixing nuts. Even if the repose angle is not available, in advance it can optimally be adjusted on site.

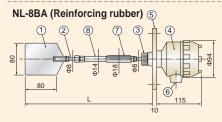






1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Lock Nut	C3604
8	Protective Tube	SGP
9	Spring	SWP
10	Universal Joint	SS400

Weight: about 2.2kg (Max.L=1000)



1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Spring	NBR
1	Universal Joint	SS400
8	Protective Tube	SGP
- Weight: about 2 Oka (May L. 100		

Weight: about 2.2kg (Max.L=1000)

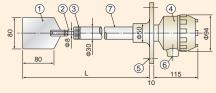
Protective-tube extension type

NL-8BS

When the repose angle is greater, there is much build-up on the tank-wall and so on, vertical, horizontal and diagonal mounting can be selected.



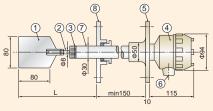
NL-8BS (Protective tube extension)



1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

•Weight: about 2.0kg (L=200)

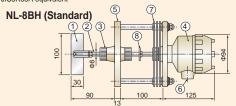
NL-8BS (Sliding flange/specified Ldimension)



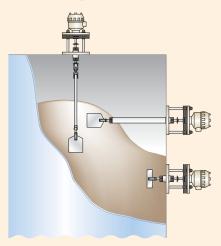
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS
8	Sliding Flange	SS400

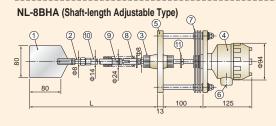




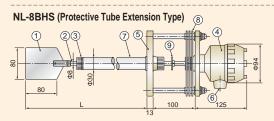


1	Paddle	304SS	
2	Main Shaft	304SS	
3	Sealcap	C3604	
4	Housing	AC	
5	Flange	SS400	
6	Conduit Connection	G 1/2	
7	Radiation Fin	ALP	
8 Rotation Check Board AC			
Weight: about 4.4kg			





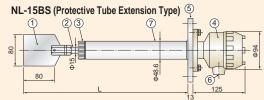
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Radiation Fin	ALP
8	Spring	SWP
9	Universal Joint	SS400
10	Protective Tube	SGP
11	Rotation Check Board	AC



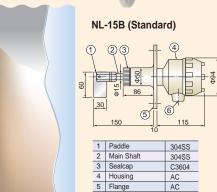
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Protective Tube	304SS
8	Radiation Fin	ALP
9	Rotation Check Board	AC

Withstand Load Type NL-15B Lower limit detection of a large tank. Level switch of withstand load type, mounted in a lower part of silo. Both heat resistant and protective tube extension type can be manufactured. Flange size: JIS5K65A equivalent



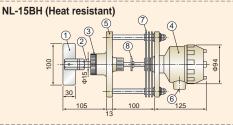


1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

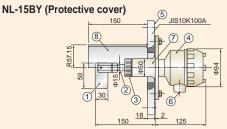


6 Conduit Connection G 1/2

•Weight: about 2.2kg



1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Radiation Fin	ALP
8	Rotation Check Board	AC



1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Boss	AC
8	Protective Cover	SGP

Inner Tank Hanging Type NL-8DA Suspended in a tank with 40A pipe. Can be used under varied conditions.



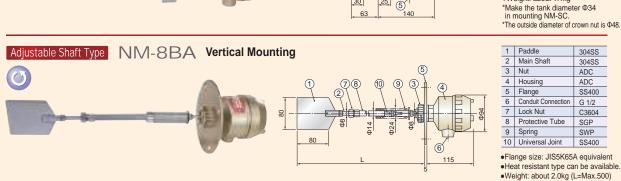


1 2 3 4 g 5 6 6 6 7 3 7 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 2 3 7 3 3 3 3

1	Paddle	304SS
2	Main Shaft	304SS
3	Housing	AC
4	Mounting Screw	G1-1/2
5	Conduit Connection	G 1/2

- •Suspend it in a tank with 40A pipe. •Advise us of the length of lead cable. (Standard 350mm)
- Weight: about 1.3kg







1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	ADC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

- •The L dimensions below flange can be made from over 200mm.
- Heat resistant type can be available.Weight: about 2.2kg (L=200)



30

6

10

100

1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	ADC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Radiation Fin	ALP

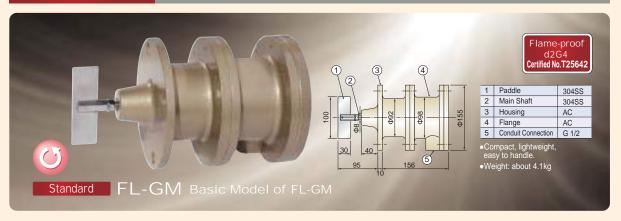
- •Flange size: JIS5K65A equivalent •The L dimensions below flange can be extended up to 200mm.
- Both Shaft-length adjustable and protective tube extension types can be available.
- •Weight: about 2.7kg

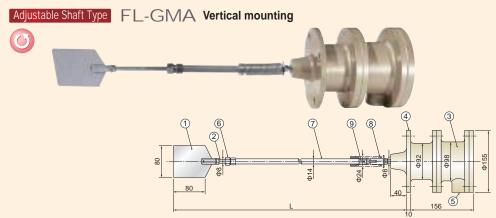


1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	ADC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

- •Flange size: JIS5K65A equivalent
- •The standard angle is 45°
 *It is possible to specify the angle.
 •Weight: about 2.2kg (L=200)



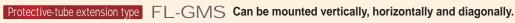




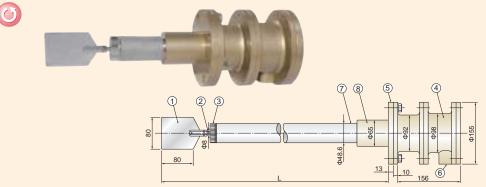


1	Paddle	304SS
2	Main Shaft	304SS
3	Housing	AC
4	Flange	AC
5	Conduit Connection	G 1/2
6	Lock Nut	C3604
7	Protective Tube	SGP
8	Spring	SWP
9	Universal Joint	95400

- •Flange size: JIS5K65A equivalent •Heat resistant type can be available. •Weight: about 4.5kg (L=Max500)





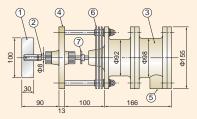


1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Protective Tube	304SS
8	Boss	SS400

- •Flange size: JIS5K65A equivalent
- Heat resistant type can be available.
 The L dimensions below flange can be made from over 200mm.









1	Paddle	304SS
2	Main Shaft	304SS
3	Housing	AC
4	Flange	SS400
5	Conduit Connection	G 1/2
6	Radiation Fin	ALP
7	Rotation Check Board	AC

- •Flange size: JIS5K65A equivalent
- Heat resistant type can be available.
 The L dimensions below flange can be extended up to 200mm.

 But the latest the state of the state of
- Both Shaft-length adjustable and protective tube extension types can be available.

Removal of expendable mechanical parts from an internal motor comes up with a long life surpassing other Rotary Paddle Type level switches as well as the stability.

Reversible Paddle Type

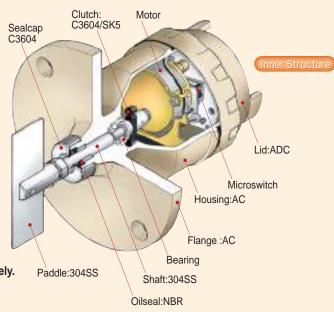
NNL/NNM Series

It is highly effective in such processes as excessive On/Off operations.

Flowing materials to be measured.

Fast powder replacement for a small tank.

These processes often require the level switch's detecting operations, thus curtailing the life of the motor extremely. These series, however, secure the long life of the motor unit.



Principle Of Operation

Utilizing the switching system we developed on the basis of our experiences and accomplishments in the market, it has offered the highly stable and reliable detection regardless of its paddle rotating direction.

A rotating paddle, being loaded by sediments in a tank, activates a micro switch and brings contact output and motor rotation to a halt at the same time.

With no load by sediments, the motor resumes rotation.

When the paddle is overloaded or suffer strong shock, a clutch system prevents the motor from being broken by letting out excessive load and shock.

■ Standard Specification

Power Source : 100 –110VAC or

200-220VAC 50/60Hz

Power Consumption: 4W

Contact Capacity: 250VAC 3A Resistance Load

Rate of Rotation : 1 r.p.m/50Hz

Allowable Temperature: below 50°C (in a tank)
Withstand Voltage: 1500VAC one minute for

% in between terminal and housing **Detection Torque** : about 1000–2800N \cdot m×10⁻⁴

Allowable Pressure: 19.6kPa

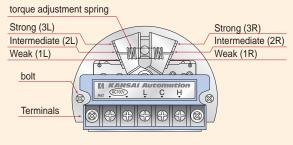
Color : Gold

Process Connection: G1B or Equivalent to JIS 5K 65A

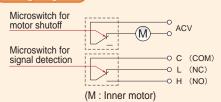
Enclosure Rating: IP55 or equivalent



Inner Components



Wiring Diagram



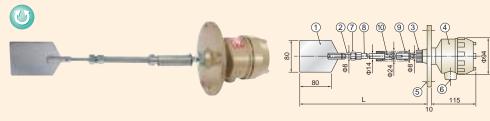


Basic Model of Reversible Rotary-paddle Type, longer lasting and highly stable.

Wetted parts can be made of 304SS or 316SS



Adjustable Shaft Type NNL-8BA Vertical mounting



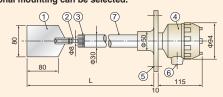
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Lock Nut	C3604
8	Protective Tube	SGP
9	Spring	SWP
10	Universal Joint	SS400

- Flange size: JIS5K65A equivalent
- Heat resistant type can be manufactured.Weight: about 2.2kg (L= Max1000)

Protective-tube extension type NNL-8BS

When the repose angle is greater, there is much build-up on the tank-wall and so on, vertical, horizontal and diagonal mounting can be selected.



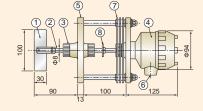


1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

- Flange size: JIS5K65A equivalent
 The L dimensions below flange can be made from over 200mm.
- Sliding flange of the gland packing type can be manufactured.
 Heat resistant type can be available.
- •Weight: about 2.0kg (L=200)







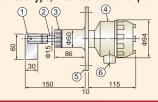
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Radiation Fin	ALP
8	Rotation Check Board	AC

- •Flange size: JIS5K65A equivalent
- Special version of max 1000°C
 Both Shaft-length adjustable and protective
- tube extension types can be available.
- •Weight: about 4.4kg

Withstand Load Type | N | L - 15 | Level switch of withstand load type, mounted in a lower part of silo.







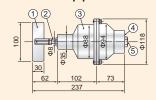
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	AC
5	Flange	AC
6	Conduit Connection	G 1/2

- •Flange size: JIS5K65A equivalent Heat resistant type and protective tube extension type can be available.

 Weight: about 2.2kg

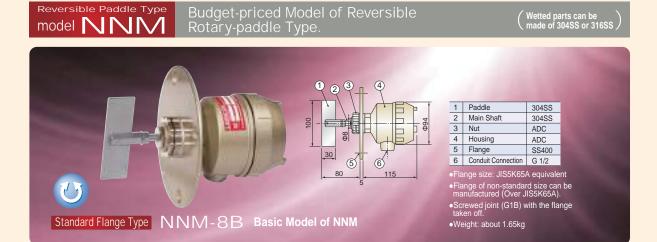






1	Paddle	304SS
2	Main Shaft	304SS
3	Housing	AC
4	Mounting Screw	G1-1/2
5	Conduit Connection	G 1/2

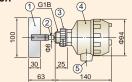
- Advise us of the length of lead cable. (Standard 350mm)
- •Weight: about 1.3kg



Screwed Joint Type NN-SC Small Hopper Level Switch





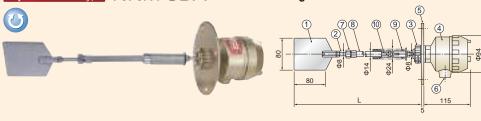


1	Paddle	304SS
2	Main Shaft	304SS
3	Nut	ADC
4	Housing	ADC
5	Conduit Connection	G 1/2

- Mounting G1B
- •Weight: about 1.1kg

 *Make the tank diameter Φ34 in mounting NNM-SC.
- *The outside diameter of crown nut is $\Phi48$.

Adjustable Shaft Type NNM-8BA Vertical Mounting

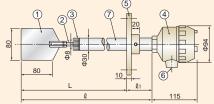


1	Paddle	304SS
2	Main Shaft	304SS
3	Nut	ADC
4	Housing	ADC
5	Flange	SS400
6	Conduit Connection	G 1/2
7	Lock Nut	C3604
8	Protective Tube	SGP
9	Spring	SWP
10	Universal Joint	SS400

- •Flange size: JIS5K65A equivalent
- Heat resistant type can be available.Weight: about 2.0kg (L=Max.500)

Protective-tube extension type NNM-8BS Adjust the L dimensions by sliding flange





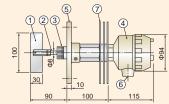
1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	ADC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

- •Flange size: JIS5K65A equivalent
- The L dimensions below flange can be made from over 200mm.
 Heat resistant type can be available.
- •Weight: about 2.2kg (L=200)

Heat Resistant Type NNM-8BH Operating temperature in a tank:below 180°C





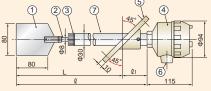


1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	ADC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Radiation Fin	ALP

- •Flange size: JIS5K65A equivalent •The L dimensions below flange
- can be extended up to 200mm.
- Both Shaft-length adjustable and protective tube extension types can be available.
- •Weight: about 2.7kg

Diagonal Flange Type \mathbb{NNM} -8BN(S) Best to mount at the conical area directly.

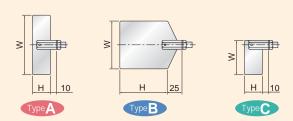




1	Paddle	304SS
2	Main Shaft	304SS
3	Sealcap	C3604
4	Housing	ADC
5	Flange	AC
6	Conduit Connection	G 1/2
7	Protective Tube	304SS

- Flange size: JIS5K65A equivalent
- •The standard angle is 45°
 *It is possible to specify the angle.
- •Weight: about 2.2kg (L=200)

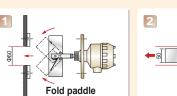
Paddle Shape

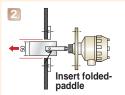


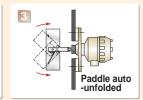
Paddle No.	W×H (mm)	Shape	when not specified
1	80×30	Α	
2	100×30	A (Standard)	
3	128×25	A	8B, Type-A (100×30)
4	140×30	Α	8BA, Type B (80×80)
5	128×80	А	
6	80×80	B (Standard)	*NNL/NNM model
7	128×60	В	common spec.
8	60×30	C (Standard)	
9	150×50	D	

^{*}In case of light gravity, products of cross-paddle type or unfolding-paddle type can be manufactured.

*Paddles other than listed above can be manufactured. H dimensions of unfolding paddle should be 50 as the minimum.







*You may note: L is 31 when H is 50. L is 26 when H is 60. L is 23 when H is 80.

Paddle Shape Selection Table by Specific Gravity

 $W \times H \text{ (mm)}$

80×30

100×30

128×25

140×30

128×80

128×60

60×30

80×80

Even if the unfolding paddle is made larger to measure low specific gravity products, it is possible to attach it on a tank without any special modifications, depending on the structure of the paddle. (Possibly make the bore diameter larger than Φ60)

Type **F**

With flexible shaft

Min Specific Gravity

NL Model

2.81

1.44

0.83

0.53

0.26

1.06

0.35

1.44

L Dimensions Table (Shaft-length Adjustable Type/NL)



No.	Max dim.(mm)	Min Dim.(mm)	No.	Max dim.(mm)	Min Dim.(mm)
1	500	374	5	2,500	1,374
2	1,000	624	6	3,000	1,624
3	1,500	874	7	4,000	2,124
4	2,000	1,124	8	5,000	2,624

L Dimensions (Protective-tube Extension Type)

NM-8BS NNM-8BS

Type D

Mounting unfolding -paddle





- With regard to L-dimensions other than listed above, you may use a longer one by one size and slide the flange toward the paddle as necessary. Accordingly 1 gets longer to the extent
- 3. When a specific dimension paddle is used, you may basically slide the flange in the same manner as described in the item 2.
- 4. Products whose length of L is over 1000 may be manufactured upon request.

Paddle Length shape below flange	A 100×30	
L	Q	Q1
135~200 (200)	230	230-L (30)
201~300 (300)	330	330-L (30)
301~400 (400)	430	430-L (30)
401~500 (500)	530	530-L (30)
501~600 (600)	630	630-L (30)
601~700 (700)	730	730-L (30)
701~800 (800)	830	830-L (30)
801~900 (900)	930	930-L (30)
901~1000 (1000)	1030	1030-L (30)

В 8	0×80
Q	Q 1
295	295-L (95)
395	395-L (95)
495	495-L (95)
595	595-L (95)
695	695-L (95)
795	795-L (95)
895	895-L (95)
995	995-L (95)
1095	1095-L (95)
	295 395 495 595 695 795 895

NM-8BHS NNM-8BHS

Н

Гуре 🔘 🗋 Special Unfolding Paddle

Shape

В

3

4

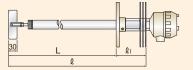
5

6

8

150

1. L dimensions of standard stock are 200, 300, 1000 only.



- With regard to L-dimensions other than listed above, you may use a longer one by one size and slide the flange toward the paddle as necessary. Accordingly £1 gets longer to the extent
- 3. When a specific dimension paddle is used, you may basically slide the flange in the same manner as described in the item 2.
- 4. Products whose length of L is over 1000 may be manufactured upon request.

Length shape below flange	A 100×30	
L	Q	Q 1
135~200 (200)	300	300-L (100)
201~300 (300)	400	400-L (100)
301~400 (400)	500	500-L (100)
401~500 (500)	600	600-L (100)
501~600 (600)	700	700-L (100)
601~700 (700)	800	800-L (100)
701~800 (800)	900	900-L (100)
801~900 (900)	1000	1000-L (100)
901~1000 (1000)	1100	1100-L (100)

Paddle Length shape below flange	B 80×80	
L	Q	Q 1
200~265 (200)	365	365-L (165)
266~365 (300)	465	465-L (165)
366~465 (400)	565	565-L (165)
466~565 (500)	665	665-L (165)
566~665 (600)	765	765-L (165)
666~765 (700)	865	865-L (165)
766~865 (800)	965	965-L (165)
866~965 (900)	1065	1065-L (165)
966~1065 (1000)	1165	1165-L (165)

Type Designation

Type of Detection Unit

- Protective-tube extension type
- Flexible shaft type
- Adjustable Shaft Type
- Protective cover type
- Heat resistant type
- Diagonal flange type

Type of Body

- 8B Main Shaft Φ8
- 10B Main Shaft Φ10
- 15B Main Shaft Φ15
- GM Withstand-pressure explosion-proof, Cable-conduit threaded
- SC Screwed-joint (small hopper) (Shaft Φ8 or Φ10)
- DA Inner Tank Hanging Type (with 5-core cable in 350mm long for external connection)

Name of Series

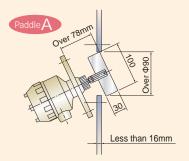
NM

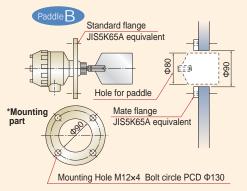
Standard Model Explosion-proof

FL NNL

Reversible Model NNM

Paddle Mounting







Line of business

- Rotary Paddle Type Level Switch
- Vibration Type Level Switch
- Swing Type Level Switch Acoustic Level Switch
- Capacitance Type Level Switch
- Capacitive Proximity Sensor
- Capacitance Type Level Indicator
- Diaphragm Type Level Switch
- Tilt Switch
- Leak Type Level Switch
- Microwave Type Switch
- Sounding Bob Type Level Indicator Ultrasonic Flow meter

- Conductance Type Level Switch
- Float Switch • Float Type Level Indicator

Rate of Rotation: 0.83r.p.m(50Hz) / 1.00r.p.m(60Hz)

Allowable Temperature: 0-50°C (no freezing) Heat resistant (0-120°C)

Rotation Direction : Clockwise (Viewing from paddle)

- Ultrasonic Type Level Indicator
- Equipments For Conveyor Lines
- Dust Monitor System
- Zirconia Oxygen Analyzer
- Laser Type Level Indicator
- RADAR Type Level Indicator
- On-line Sensors for Accurate Liquid Analysis
- Flow Switch

*Please be sure to read USER'S GUIDE, Installation & Operation Instructions before using the instrument

*The specifications herein may be subject to change without advance notice.

Color : Gold Setscrew: G 3/4B (material ADC)

Locknut: Hexagonal nut (opposite side 35mm,

thickness 10mm, material ADC)

Cable length : 500mm (max)

*Wetted parts made of stainless steel can be available.

SGS

All-round Manufacturer of Level Controllers for Powder, Granules and Liquid KANSAI Automation Co., Ltd.

2-14, Togano-cho, Kita-ku, Osaka 530-0056, Japan TEL. 81-6-6312-2071 FAX. 81-6-6314-0848 e-mail: infoe@kansai-automation.co.jp

http://www.kansai-automation.co.jp

Tokyo Branch: 1-29-6, Hamamatsu-cho, Minato-ku. Tokyo 105-0013, Japan TEL. 81-3-5777-6931 FAX. 81-3-5777-6933

Nagoya Office: 3-31-27, Uchiyama, Chigusa-ku, Nagoya 464-0075, Japan TEL. 81-52-741-2432 FAX. 81-52-741-1588

Kyushu Office: 1-2-39, Asano, Kokura Kita-ku, Kitakyushu 802-0001, Japan TEL. 81-93-511-4741 FAX. 81-93-511-4580

