DISPLACER TYPE LEVEL SWITCH

HM-90(30) Series

HSB ISO 14001 HSB ISO 9001 ASME Kepic

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Overview

HM-90(30) Series is a Displacer Type Level Switch installing on the top of tank, operated with the usage of buoyancy to the displacer and spring tension. It is generally used to control liquid level for high temperature and pressure process with On/Off contact signal.

Characteristics

- Strong structure and long life cycle
- Easy installation
- Applicable to explosion area (Ex-Proof version)
- Widely used to detect various liquid levels
- Available to use for high temperature and pressure process

Operation Principle

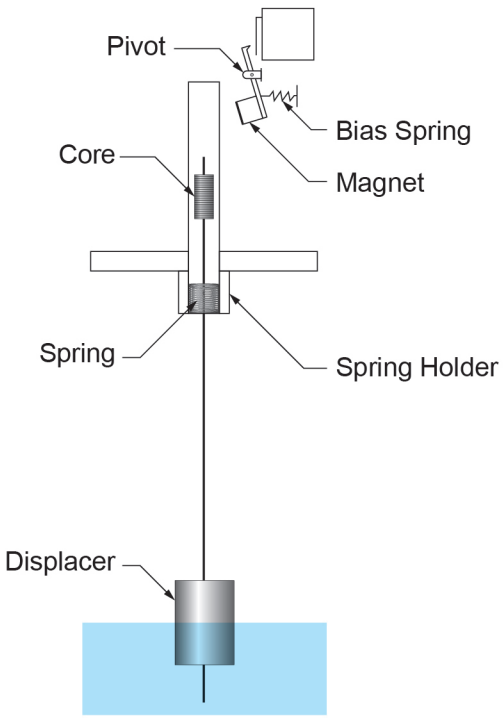
Displacer Type Level Switch is operated based on Archimedes principle that the weight of objects in liquid becomes lighter as much as the weight of liquid flowing over. That object is called by displacer instead of float because it is impossible to float for itself. When a displacer is immersed in a liquid, displacer becomes lighter due to a buoyancy force and this force is transferred to spring. While the loosened spring is constructed due to the gained buoyancy force, rising core moves a magnet by magnetism and finally switch is operated.

As described in below [Fig 1] and [Fig 2], the buoyancy force F can be expressed by the following equation.

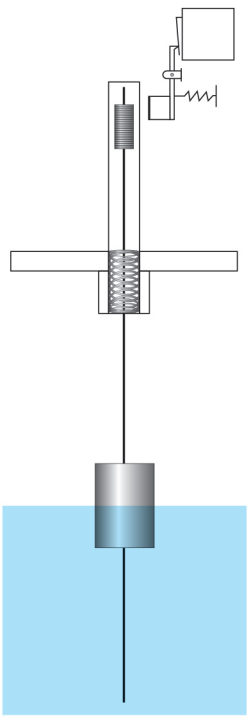
$F = r \times s \times l$

[r=Specific gravity of liquid, s=Cross section area of displacer, l=Buoyancy of submerged displacer]

As the displacer is immersed in a liquid [Fig 2], displacer becomes lighter due to a buoyancy force and this force is transferred to spring. After that, the compressed spring [Fig 1] by the weight of displacer is loosened [Fig 2] due to the gained buoyancy force and then the core rises. The rising core moves the magnet and it activates the switch.



[Fig 1]



[Fig 2]

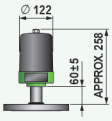
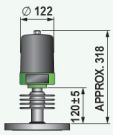
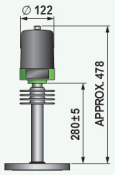
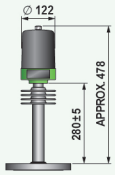
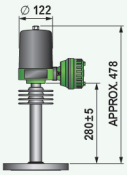
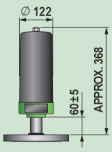
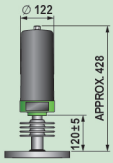
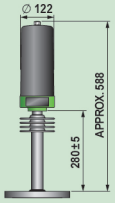
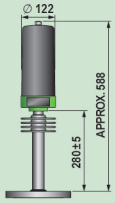
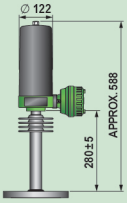
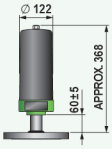
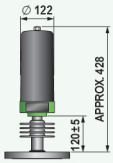
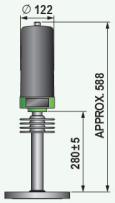
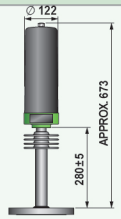
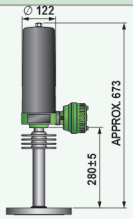
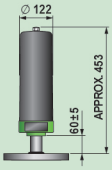
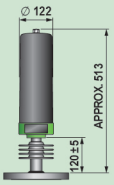
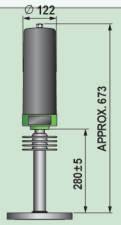
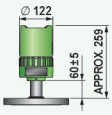
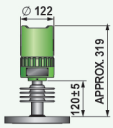
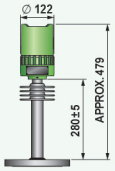
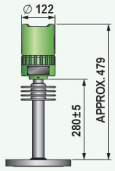
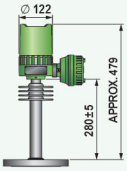
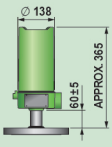
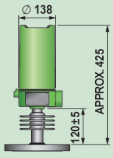
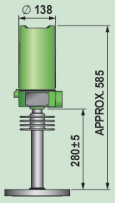
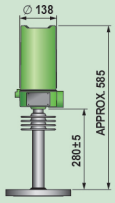
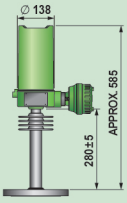
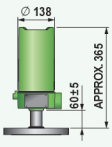
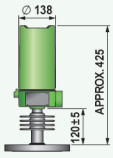
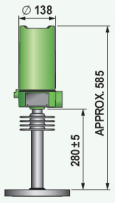
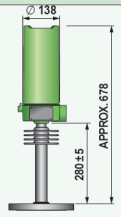
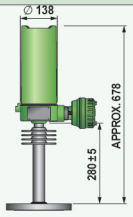
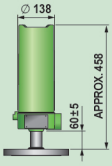
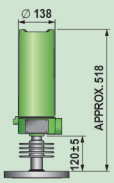
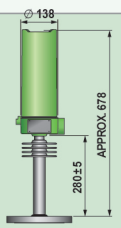
Specification

Model	HM-90	HM-90-Ex	HM-90H	HM-90H-Ex
Mounting	Flange (std.)			
Installation	Top			
Switch Type	Micro Switch			
Contact Rating	AC 250V 15A, DC 125V 0.5A		AC 250V 15A, DC 125V 0.5A (Max. 200°C)	
			AC 250V 5A, DC 125V 0.5A (Max. 350°C)	
			AC 250V 1A, DC 125V 0.4A (Max. 500°C)	-
Output	SPDT / DPDT			
Wetted Part Material	SUS 316L			
Process Connection	80A JIS 10K RF / SUS 304 (std.)			
Enclosure	Weather Proof (IP65)	Ex-Proof (Ex d IIC T4, IP65)	Weather Proof (IP65)	Ex-Proof (Ex d IIC T4, IP65)
Process Pressure	10kg/cm^2 ~ 63kg/cm^2 (900#)			
Process Temperature	Max. 120°C		Max. 500°C	Max. 350°C
Housing Material	C.S + Aluminum (std.)	Aluminum	C.S + Aluminum (std.)	Aluminum
Conduit Connection	PF 3/4″(F) (std.)			
Length	2,000mm (std.)			
Specific Gravity	more than 0.8			

Model	HM-30
Mounting	Flange (std.)
Installation	Top
Switch Type	Micro Switch
Contact Rating	AC 250V 15A, DC 125V 0.5A
Output	1-SPDT / DPDT (H/L Control)
Wetted Part Material	SUS 304
Process Connection	50A JIS 10K FF (6T) / SUS 304 (std.)
Enclosure	Weather Proof (IP65)
Process Pressure	ATM (std.)
Process Temperature	Max. 120°C
Housing Material	C.S + Aluminum
Conduit Connection	PF 3/4″(F) (std.)
Length	2,000mm (std.)
Specific Gravity	more than 0.8

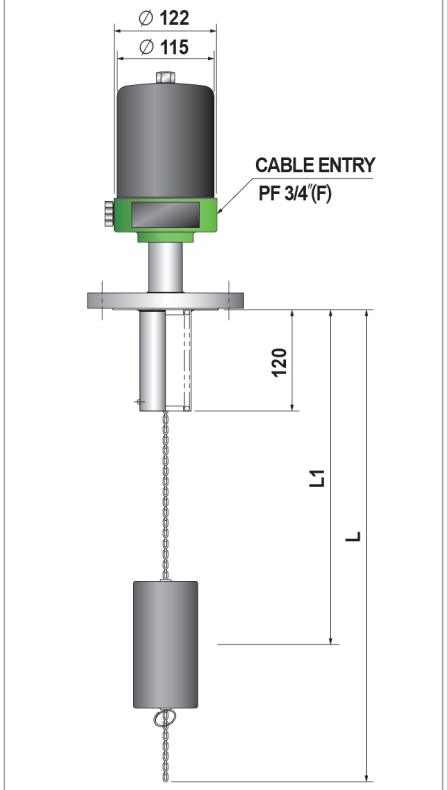
▶ **Order Code** can be printed at our website (www.hitrol.com)

Dimension of Housing as per Temperature

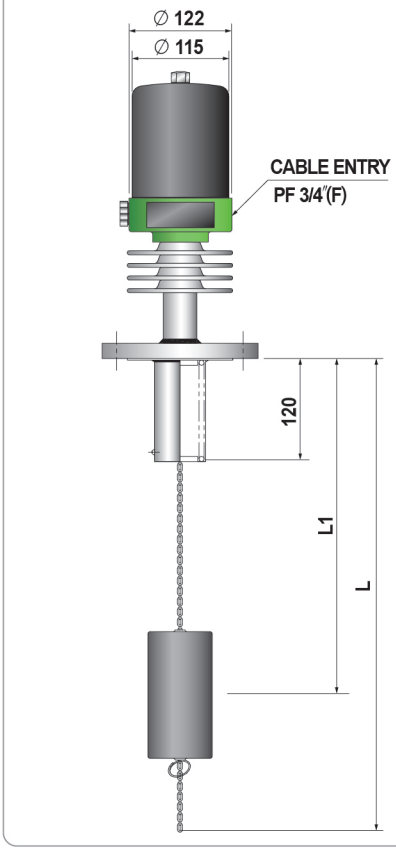
Operating Temperature	~120°C	~200°C	~350°C	~500°C	~500°C External Terminal Box (Opt.)
CS+Aluminum Housing (Switch 1EA)					
CS+Aluminum Housing (Switch 2EA)					
CS+Aluminum Housing (Switch 3EA)					
CS+Aluminum Housing (Switch 4EA)					
Aluminum Housing (Switch 1EA)					
Aluminum Housing (Switch 2EA)					
Aluminum Housing (Switch 3EA)					
Aluminum Housing (Switch 4EA)					

Dimension

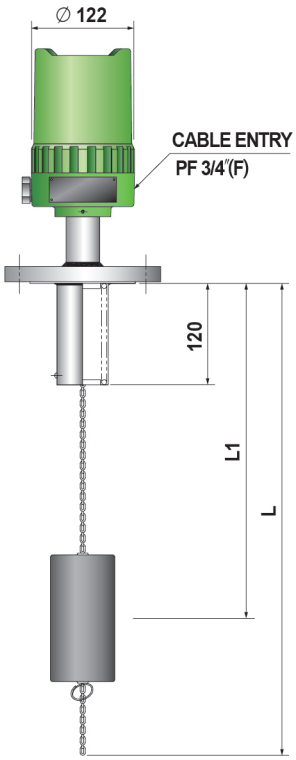
Standard Version (HM-90)



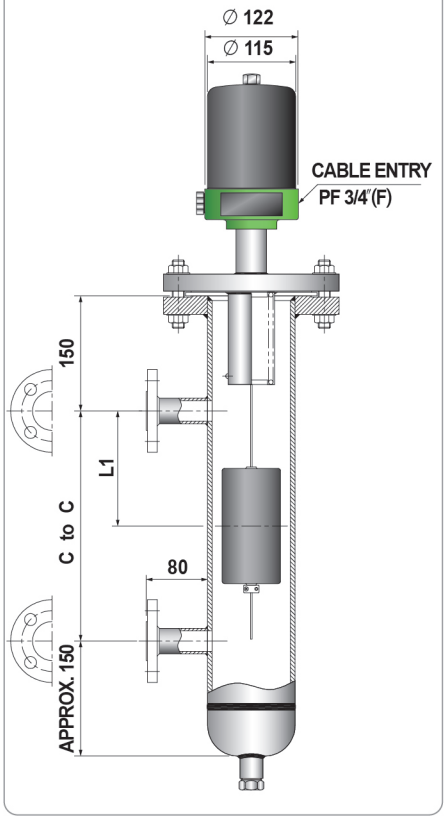
High Temp. Version (HM-90H)



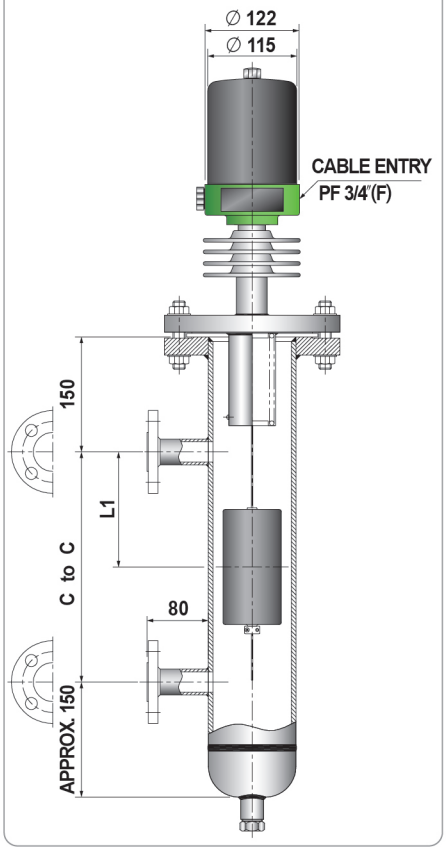
Ex-Proof Version (HM-90-Ex)



Standard Version (HM-90B)



High Temp. Version (HM-90BH)



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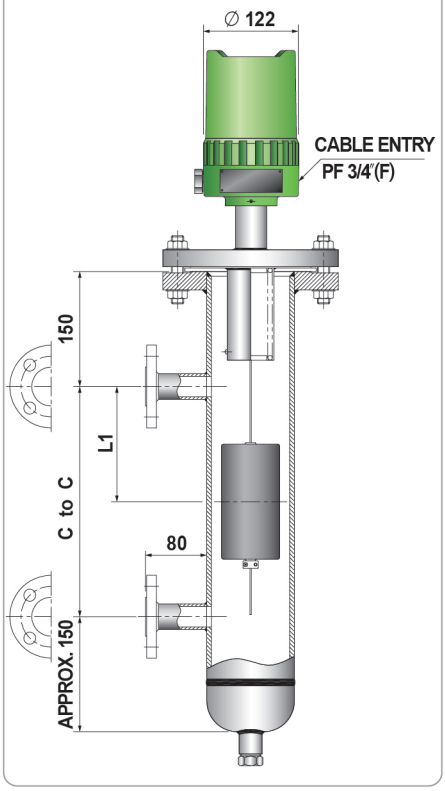
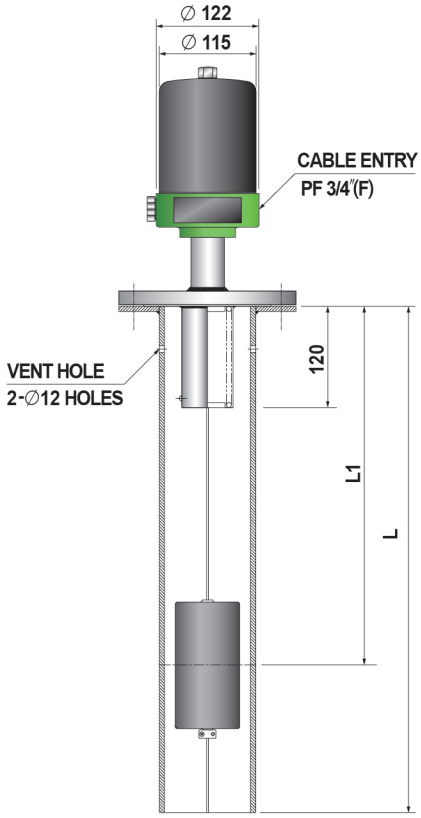


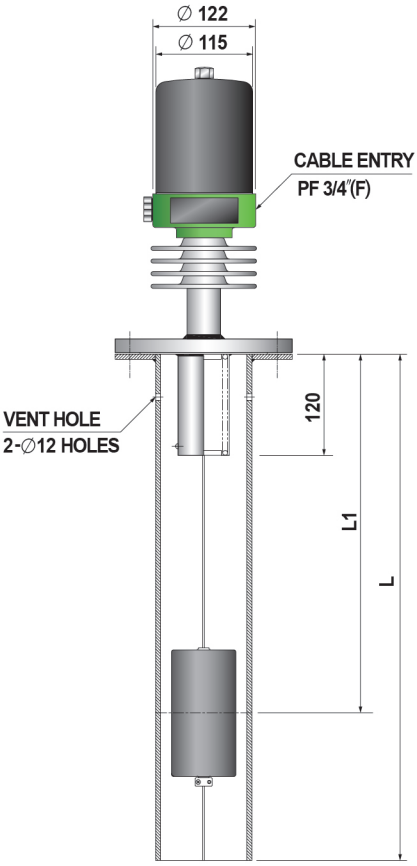
■ Actual product may have a tolerance slightly.

Dimension

Standard Version (HM-90A)



High Temperature Version (HM-90AH)



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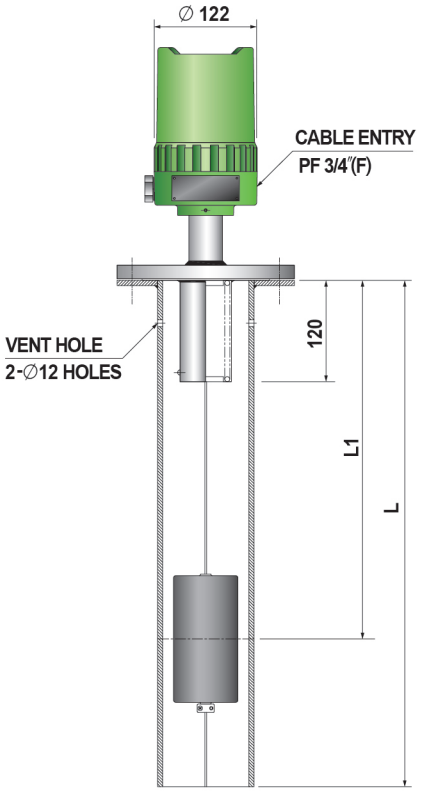
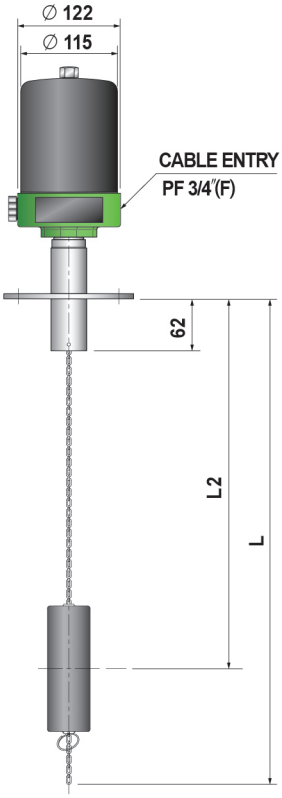


Standard Version (HM-30)

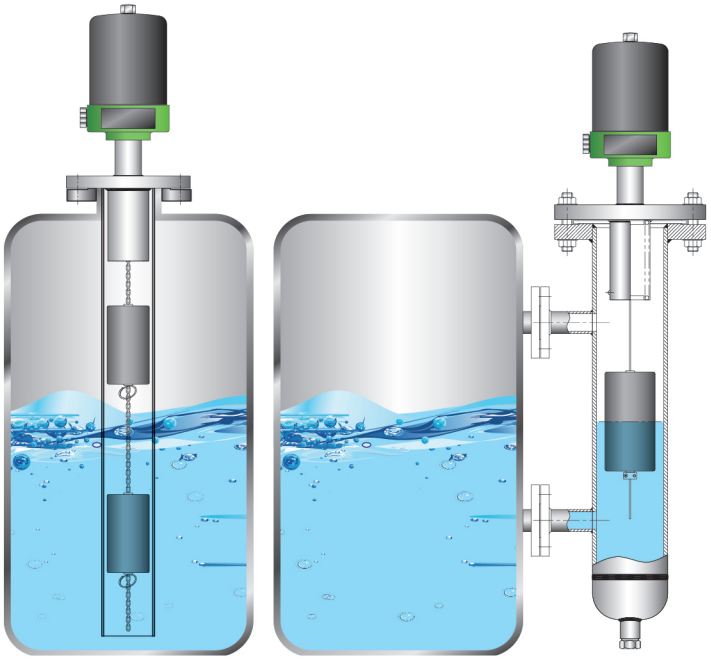


■ Actual product may have a tolerance slightly.

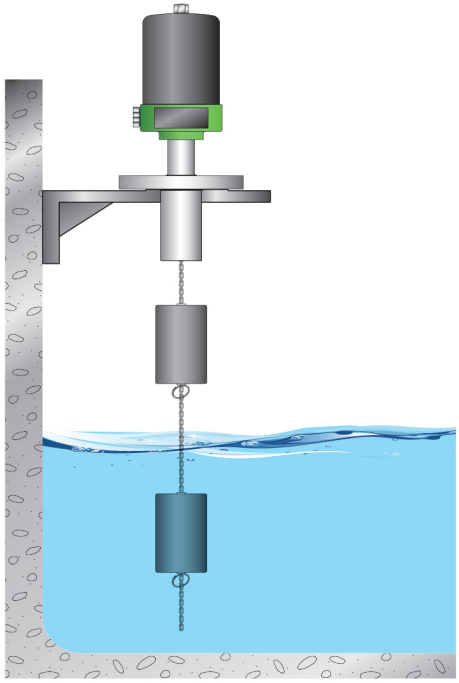
Installation

■ Below recommendation should be considered when installation.

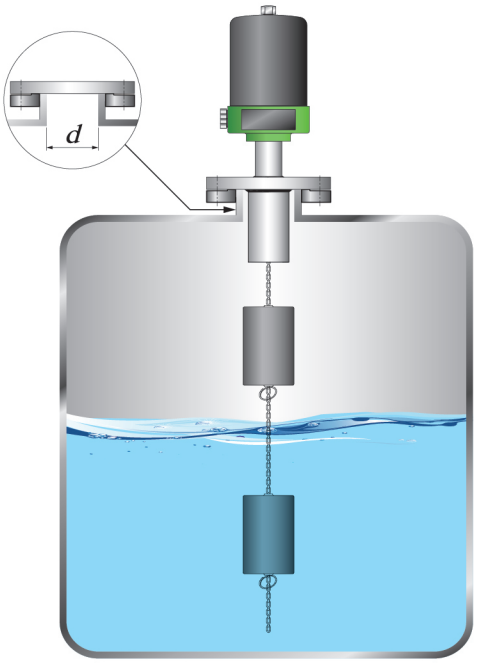
Product should be installed at the place far from inlet in order to avoid the malfunction.



Protection tube or external chamber should be applied if there is a flow or slopping of the medium in the tank.



Bracket should be installed with the product when the installation on the concrete as per above figure.



Inner diameter (“d”) of tank nozzle should be larger than the outer diameter of float as per above figure.

※ The standard specify gravity for setting of product is 0.8 and 1, so that the tolerance might be occurred depend on the usage environment. If user want to measure in an accurate measurement, user have to do the setting at the site based on site condition.

DISPLACER TYPE LEVEL SWITCH

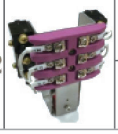
HM-90(30) Series

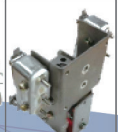
01 Applicable to various liquids

02 Applicable to high temperature and pressure

03 Strong structure and long life cycle

04 TERMINAL BLOCK is different depending on the temperature(OPT. CERAMIC TERMINAL BLOCK)

Std. Type	Opt. Type	Process Temperature	Contact Rating
		~ 200°C	AC 250V, 15A DC 125V, 0.5A
		~ 350°C	AC 250V, 5A DC 125V, 0.5A

Std. Type	Opt. Type	Process Temperature	Contact Rating
	 + External terminal block	~ 500°C	AC 250V, 1A DC 125V, 0.4A

hitrol@hitrol.com | www.hitrol.com

* Design of product can be changed for upgrade without notice.