

# **ITS 300 & 500 SERIES POSITION MONITORING SWITCH**

## **INSTALLATION AND OPERATION MANUAL**

(Explosion proof Ex d IIC T6)

(Manual Revision Jul. 2011)



**(Doc no: ITS00312-M)**

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Position monitoring switch ITS300 & 500 series  
Installation and operating manual (ITS-00312-M)

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## 1. Introduction

Many thanks for purchasing our ITS300 or ITS500 series Limit Switch Box!

For safe and proper operation, please read this manual carefully before using it and save it for reference.

- The Installation & Operation Manual should be provided to the end-user.
- The Installation & Operation Manual is subject to change due to quality improvements, without notice.
- The Installation & Operation Manual should not be duplicated or reproduced for any purpose without written approval from I-Tork Controls Ltd.

## 2. Manufacturer Warranty

- For safety, it is imperative to follow instructions in the manual. It is not the manufacturer's liability for any damages which are caused by the users' negligence.
- It is not the manufacturer's liability for any damages for accidents which are caused by any alteration or modification of the product and parts. If alteration or modification is necessary, please contact the manufacturer in advance.
- Manufacturer warrants the product from the date of original retail purchase of the product for One year, except as otherwise stated.
- Manufacturer warranty will not cover the products if the products have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; damages that occurs in shipment, due to act of God, failure due to power surge, and cosmetic damage. Improper or incorrectly performed maintenance or report voids this Limited Warranty.
- For detailed warranty information, please contact the corresponding local I-Tork distributors or main office in Korea.

## Safety Precautions

- ITS300/500 is designed for use in explosive gas atmosphere. The user must follow explosion proof procedures and safety precautions.
- For unused power connectors, please make sure to use blind plugs which are explosion proof certified. (Ex d II C )
- If cover must be opened for any reason, the power must be turned off and wait for at least 30 seconds.
- When applying power, please make sure to use flame proof proven sealing fitting and/or cable glands.

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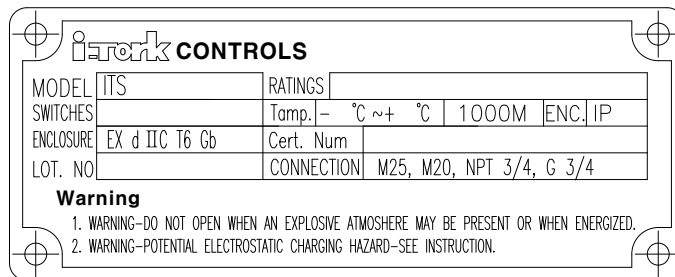
# i-Tork POSITION MONITORING SWITCH

(Ex d II C) (It is the user's responsibility to ensure appropriate Explosion proof fittings/cable glands are used)

### 3. PRODUCTION DESCRIPTION

- ITS300/500 position monitoring switch is used for the valve and actuators which rotate 90 degree's quarter turn. The first function of ITS300/500 is to provide visual indication of current position of valve and actuator. Dome indicator unit shows current position by color indication. If there is full red color indication, current position of valve or actuator is fully closed position, and yellow is on fully open position. Different Color indication combination can be provided to suit customer's specific requirement
- Secondly, ITS300/500 provides electrical signal at the fully open or closed position by activating mechanical switches (SPDT and DPDT), or Proximity sensors and other magnetic sensors which independently makes function. Switches vary in a wide range and construction to meet customer's requirement.
- ITS300/500 has the function of a direction free installation on different valves, and generally no need to adjust position of the internal cams to activate the switches as long as 0 at close and 90 at open because of adjustable cam. If it is required, customer can adjust it easily with finger or hand watching its movement. Red is for close position and Yellow is for open position.
- Enclosure is Certified to IEC 60079-0 and IEC 60079-1 and so can be used in Zone 1, 2, gas group IIA , IIB and IIC without any problem.

### 4. Label Description



- |                    |                                            |
|--------------------|--------------------------------------------|
| <b>Model:</b>      | <b>Indicate the model number</b>           |
| <b>Enclosure:</b>  | <b>Indicate the explosion proof grade</b>  |
| <b>Switch:</b>     | <b>Indicate the switch or sensor type</b>  |
| <b>Rating:</b>     | <b>Indicate the allowable input rating</b> |
| <b>Lot no.:</b>    | <b>According to purchase order</b>         |
| <b>Connection:</b> | <b>Indicate the cable entry size</b>       |

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## 5. Suffix Symbols

### I-TORK POSITION MONITORING SWITCHES 'ITS'SERIES CODING SYSTEM

ITS -

MAKER MODEL

SWITCH OR SENSOR NAME	APPLICABLE
0 : 2 - SPDT	ITS100~500
1 : 3 - SPDT	ITS100~500
2 : 4 - SPDT	ITS100~500
3 : 2 - SPST	ITS100~500
4 : 2 - DPDT	ITS300~500
5 : 2 - SPDT + OUTPUT(0~1K OHM)	ITS300~500
6 : 2 - SPDT + OUTPUT(4~20mA)	ITS300~500
7 : AUTONICS(PS17-5DNU)	ITS100~500
8 : P&F(NJ2-V3-N)	ITS100~500
M : MONAS SENSOR	ITS300~500

0 : Mechanical Switches

1 : Proximity Sensores

MODEL (TYPE) : 100 / 300 / 500

ITS : I-TORK POSITION MONITORING SWITCHES 'ITS'SERIES

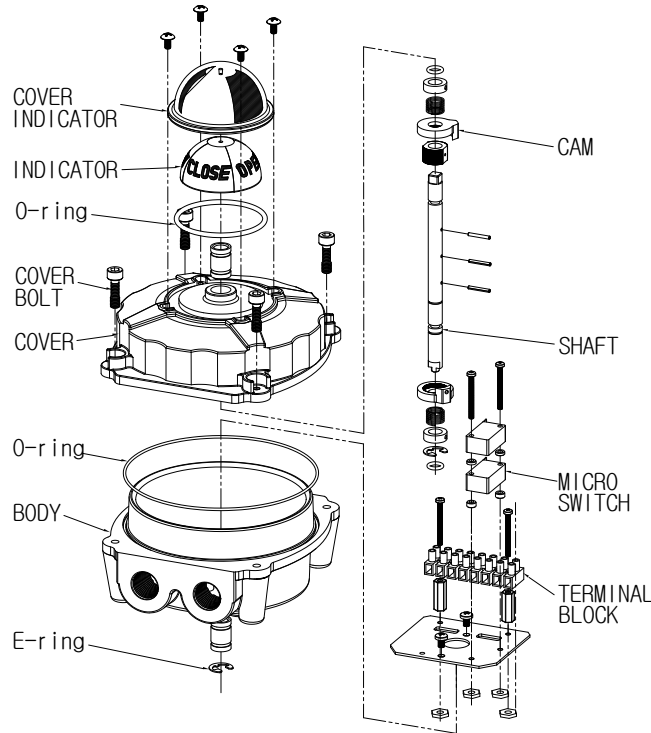
## 6. Specification

MODEL	ITS-1XX	ITS-3XX	ITS-5XX
SWITCH TYPE	Mechanical Switch (2-SPDT)	Mechanical Switch (2-SPDT)	Mechanical Switch (2-SPDT)
	—	Proximity Sensors (P&F, AUTONICS)	Proximity Sensors (P&F, AUTONICS)
		DPDT Switch	DPDT Switch
		Magnetic Sensors Position Transmitter	Magnetic Sensors Position Transmitter
Switch Rating	Mechanical Switch AC : 16A 1/2HP 125/250V AC DC : 125V DC, 0.3A 250V DC		
	Autonics Sensor (PST17-5DNU)– 12~24VDC (Allowable Voltage: 10~30VDC)		
	P&F Sensor (NJ-V3-N)– 8VDC		
	Mechanical DPDT Switch AC : 125/250VAC 10A 480VAC 2A 1/8HP 125VAC 0.25HP 250VAC DC : 0.5A 125VDC 0.25A 250VDC		
Terminal Block	8 Point	8~12 Point	8~12 Point
IP Class	IP 67		
Explosion Proof	Ex d IIC T6		
Ambient Temp.	-20°C ~ +60°C		
Cable Entry	1/2(NPT,PT,PF), M20	M20, M25, G3/4, NPT3/4	
Mounting Bracket	Stainless Steel acc.to VDI/VCE3845, NAMUR, SS1, SS2, as Standard		
Material	Aluminum Diecasting		SUS316L
Weight	1kg	2kg	3kg

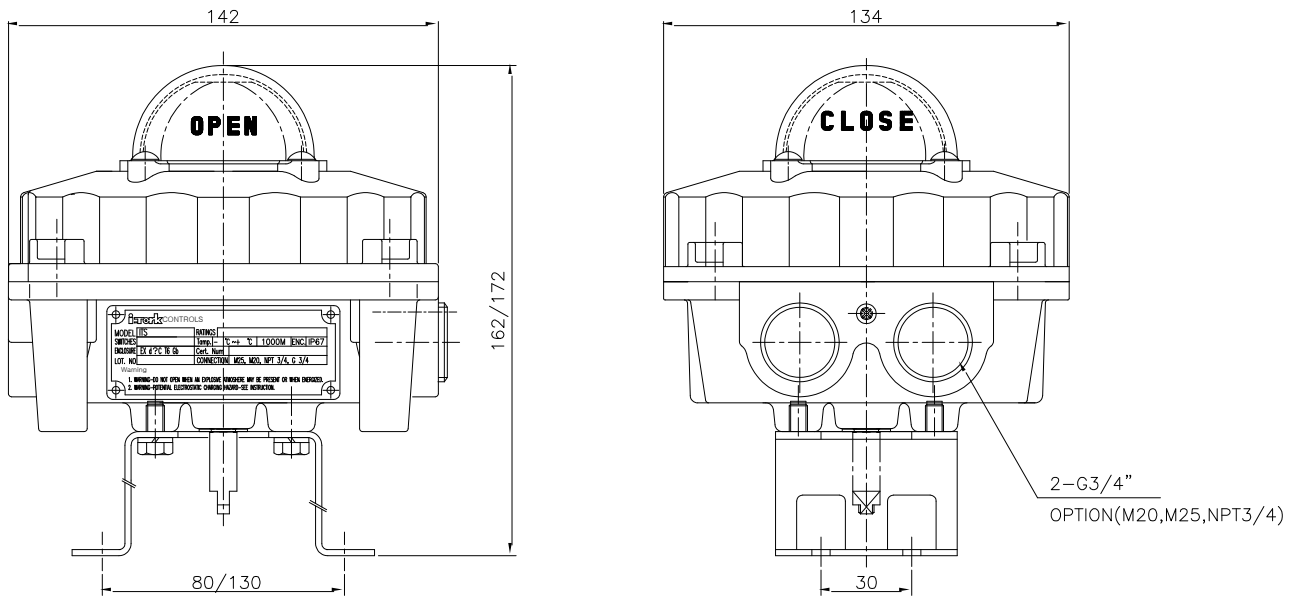
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# i-Tork POSITION MONITORING SWITCH

## 7. Parts and Assembly



## 8. Dimensions



## 9. INSTALLATION

### Safety Warning

- All input and supply pressure to valve, actuator, and other related devices must be turned off when installing.
- Please check the switch type and rating on the label on ITS300/500 enclosure, and be careful not to electrically exceed the switch rating.

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# i-Tork POSITION MONITORING SWITCH

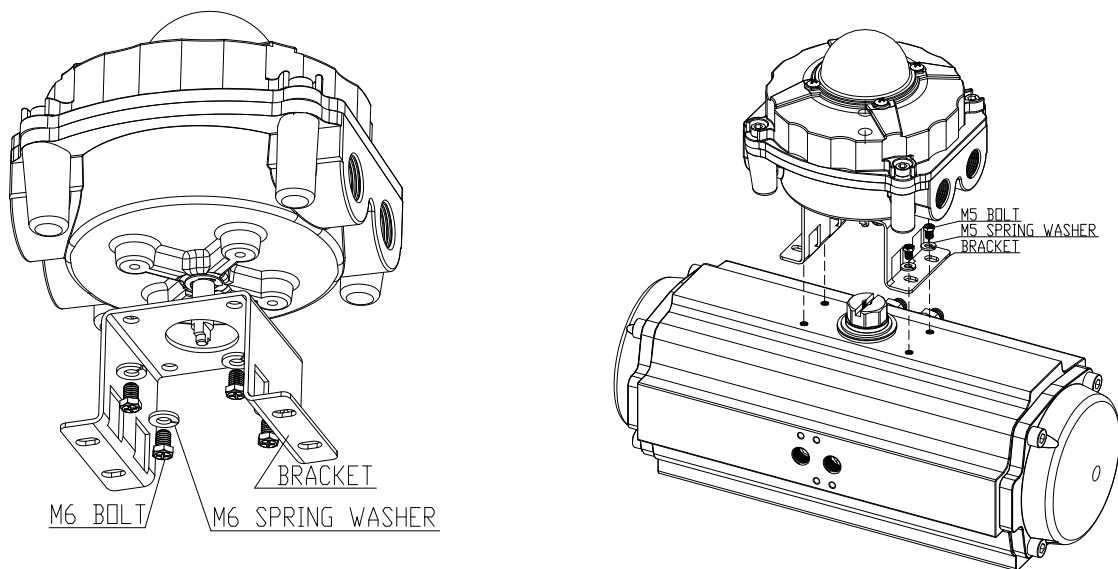
- All installation and maintenance should be done by authorized personnel only.
- ITS300/500 is designed for use in explosive gas atmosphere. The end-user must follow the explosion proof procedures and safety precautions.
- Please make sure there is no explosive gas or material present before the installation.

**Caution :** In order to avoid unexpected accident, serious injury and property damage, make sure to cut all power supply to the actuator and valve before inspection, maintenance and repair , Ambient temperature : -20°C ~+60°C

Direction and positioning of installation: No limitation excluding hazardous area.

## **ITS300/500 Installation**

Proper size of Mounting bracket is required for mounting ITS300/500 on valve or actuator. Standard Mounting bracket is supplied together with ITS, but in case of requirement by customer for special application, please refer to the drawing inside of the body. The most important thing in mounting is to align the shaft of valve (or actuator) with ITS' shaft. ITS's shaft is done according to NAMUR standard, so that it may suitable for various applications without further modification.



## **10. Connection – Power**

### **Safety Warning**

- Please make sure there is no explosive gas or material present before the installation.
- While the cover is open, the power should be turned off and wait for at least 30 seconds.
- For unused power connectors, please make sure to use the blind plugs which are explosion proof certified.
- When connecting power, please ensure the use of flameproof proven sealing fitting and/or cable glands.
- Please make sure the polarities are correct.
- Don't use too much force when pulling the cable, and make sure the cable doesn't peel off.
- Electrostatic Hazard: Clean Cover indicator only with a damp cloth. Do not clean with solvents.

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# i-Tork POSITION MONITORING SWITCH

- Ground Connection: Ground Connection is provided on the external surface. This Connection should be used to connect the enclosure metal work to the Equi-potential Bonding System/Earth. This is in addition to any Protective Earth Terminals provided inside the enclosure.

It must be sized in accordance with local rules for electrical installations and not be smaller than 4mm<sup>2</sup>.

- Electrical wiring must be done according to the specification of international standard or local specific regulation.

ITS300/500 provides 2 - PF3/4" (Other thread sizes are optional) conduits for the wiring and by using approved explosion proof couplings, ensures tight sealing and explosion proof function.

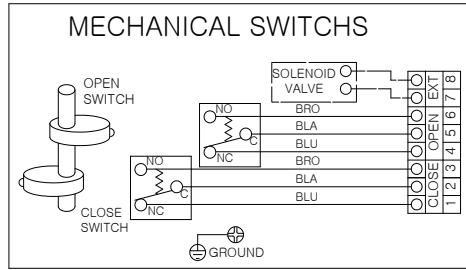
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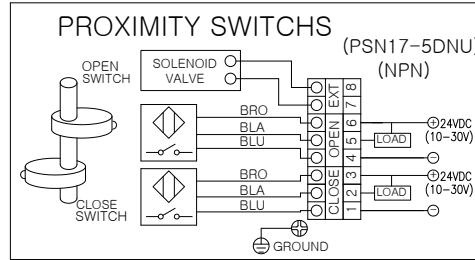


# i-Tork POSITION MONITORING SWITCH

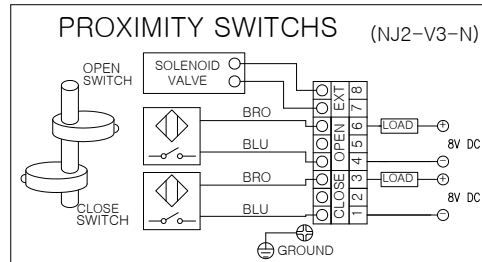
## Mechanical Type(2 SPDT )



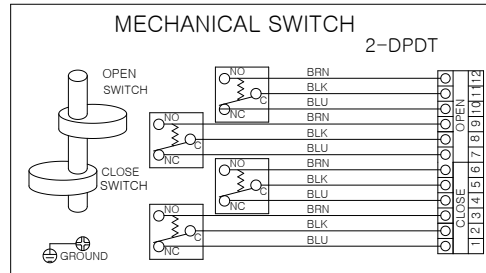
## Proximity Type(NPN Sensor )



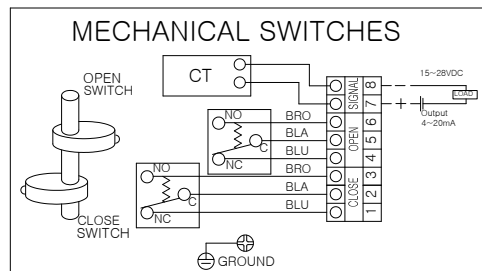
## Proximity Type(P&F NJ2-V3-N )



## Mechanical Type(2 DPDT )



## Position Transmitter Type



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## 11. SWITCH AND EAST SET CAM SET

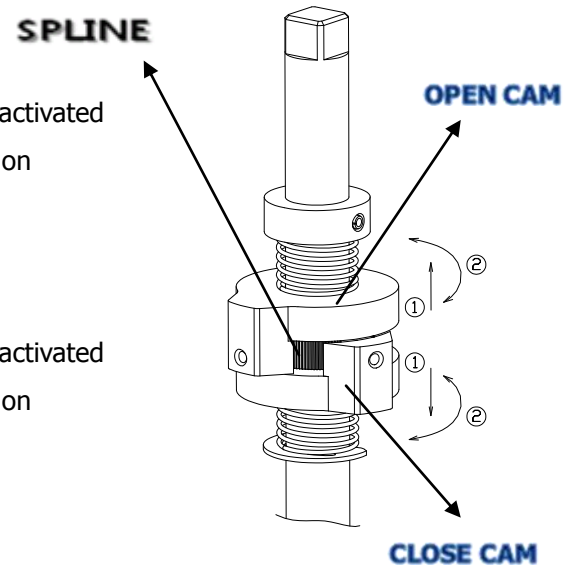
- Before setting, the power should be turned off.  
Switch set can be made by multimeter resistance, applying an electric current test, buzzer, bulb test.

### Adjustment – Upper CAM

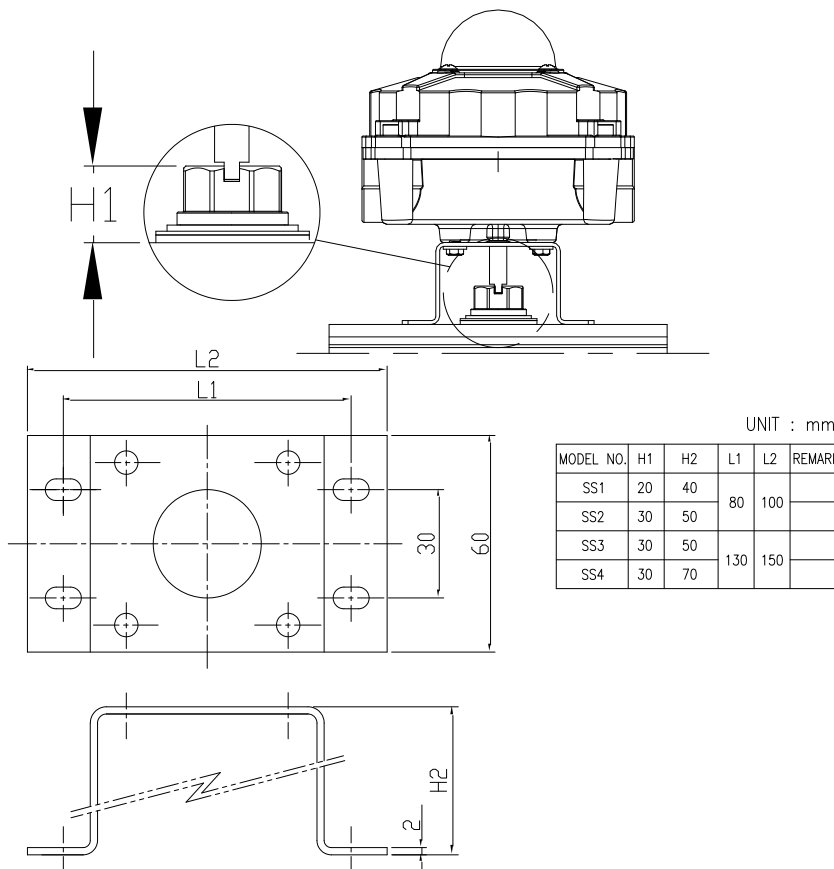
- Settle the actuator or valve where you want to set
- Lift up the Upper Cam (Green - Open)  
and turn right or left to the preferred position until the switch is activated and release the cam; Then the cam will come back to the spline on the shaft by loading the Spring.

### Adjustment – Lower CAM

- Push down the Lower Cam (Red - Close)  
and turn right or left to the preferred position until the switch is activated and release the cam; Then the cam will come back to the spline on the shaft by loading the Spring.



### Bracket



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# i-Tork POSITION MONITORING SWITCH

## Rating Table for ITS300 & ITS500

ITS MODEL	ALLOWABLE VOLTAGE	RATED CURRENT(A)	RATED CAPPARCITY (w)	ITS MODEL	ALLOWABLE VOLTAGE	RATED CURRENT(A)	RATED CAPPARCITY (w)
ITS300 ITS500	125VAC	3	373	ITS301 ITS501	125VAC	3	373
	250VAC	1.5	373		250VAC	1.5	373
	125VDC	0.6			125VDC	0.6	
	250VDC	0.3			250VDC	0.3	
ITS302 ITS502	125VAC	3	373	ITS303 ITS503	125VAC	3	373
	250VAC	1.5	373		250VAC	1.5	373
	125VDC	0.6			125VDC	0.6	
	250VDC	0.3			250VDC	0.3	
ITS304 ITS504	125VAC	0.75	93.25	ITS305 ITS505	125VAC	3	373
	250VAC	0.75	186.5		250VAC	1.5	373
	480VAC	2			125VDC	0.6	
	125VDC	0.5			250VDC	0.3	
	250VDC	0.25		ITS31M ITS51M	24VAC	3	
125VAC	3	373	240VAC		0.5		
ITS306 ITS506	250VAC	1.5	373	24VDC	2		
	125VDC	0.6					
	250VDC	0.3					

ITS MODEL	SENSOR NAME	ALLOWABLE VOLTAGE	CONTROL OUTPUT(mA)
ITS310 ITS510	PSN17-5DNU	12~24VDC	Less than 200
	PSN17-5DPU	12~24VDC	Less than 200
	PSN17-5DOU	24VDC	2~100
ITS311 ITS511	NJ2-V3-N	8VDC	
	MBB3-V3-Z4	50~60VDC	4~100

## Wire Standard

전선관의 규격은 AWG 20이상 AWG 16이하로 사용할 것.

규격(AWG)	Cross Section(mm²)	Allowable Current A(참고치)
20	0.518	4.5
19	0.653	7~16
18	0.823	16
17	1.04	12~19
16	1.31	19

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