



리미트 스위치 ▶ LIMIT SWITCH

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Center for Nuclear Equipment and Machinery

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Daejeon, Korea

CERTIFICATE OF CONFORMANCE

Customer : Yongsung Electric Co., Ltd.
Specimen : YSHL1x Series(Limit Switch, x: 1,2,3) with YSEC149 Series(ECSA),
YSML1x Series(x: 1,2,3) with YSEC149 Series
Test period : 2008.08.19 ~ 2008.11.03
Qualification Report : KIMM-QR08-04 Rev.0
Cert. No. : KIMM-CC08-04

The limit switch with ECSA manufactured by Yongsung Electric Co., Ltd. was qualified for application of Kori, YoungGwang, UIChin, SinKori and SinWolsung nuclear power plant in compliance with the requirement of IEEE Std 323-1974/1983/2003, IEEE Std 382-1985/1996 and IEEE Std 344-1987/2004. We certify that the test specimen, YSHL1x and YSML1x Series with YSEC149, can perform its safety function in the following conditions;

Normal Condition	Accident Condition
<ul style="list-style-type: none"> Qualified Life : 43.53 years at 130 °F (54.4 °C) Pressure : Atmosphere Relative Humidity : 90 % Radiation, TID : 2.2 x 10⁶ Gy, gamma ray Vibration : 0.75 g, 5 Hz ~ 100 Hz 	<ul style="list-style-type: none"> Seismic : 15.0 g peak and 8.4 g ZPA DBE (LOCA/MSLB) during 1 year <ul style="list-style-type: none"> Max. Temp. : 376.5°F (191.4 °C) Max. Pressure : 67.3 pisp (463.9 kPa) Max. Humidity : 100 %, Steam Chemical Spray : Boron solution 4,400 ppm with 0.35 gpm/ft² (DBE Test is not applicable to Limit Switch of YSML 1x Series)

2008. 11. 07

Director, Quality Assurance
Approved Chang-dae Park

Director, CNEM
Chi-sung Song

CERTIFICATE OF CONFORMANCE

DATE : May, 17, 2002

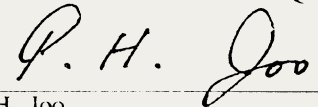
CERT. NO. CC-SECOQ-031

CUSTOMER : Yongsung Electric Co., Ltd.
PROJECT No. : X211A
ITEMS QUALIFIED : Limit Switch
MODEL No. : YSHL-23

We, SECO, certify that the above item manufactured by Yongsung Electric Co., Ltd. have been properly qualified for use in the following service conditions of nuclear power plants in accordance with the SECO's Quality Assurance Program and in compliance with the requirements of IEEE 323-1983, IEEE 344-1987 and IEEE 382-1985 :

- QUALIFIED LIFE : 41 Years @104°F (40°C)
15 Years @140°F (60°C)
- TEMPERATURE : Max. 140°F@normal condition
- RELATIVE HUMIDITY : Max. 90%@normal condition
- PRESSURE : Atmospheric (0 Psig)@normal condition
- RADIATION, TID : 2.2E6 Gy gamma (TID)
- SEISMIC : 15g peak and 6.5g ZPA
- ACCIDENT : Max. Temp. : 403°F (206°C)
(LOCA/MSLB) Max. Humidity : 100% Super Steam
Max. Pressure : 57 Psig

SAEHAN ENGINEERING & QUALIFICATION CO., LTD


P. H. Joo
Director, Quality Assurance


S. S. Ko
President, SECO

Qualification Report: QR-X211A-2 (Rev. 0)

양식 S-5-1-1 (Rev.0)

CERTIFICATE OF CONFORMANCE

DATE : November 30, 2000

CERT. NO. CC-SECOQ-009

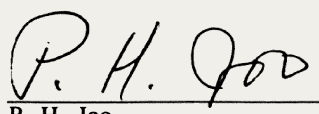
CUSTOMER : Yongsung Electric Co., Ltd

ITEMS QUALIFIED : Limit Switch
Model No. : YS-ML-11
YS-ML-23

We, SECO, certify that the above items manufactured by Yongsung Electric Co., Ltd. have been properly qualified for use in the following service conditions of nuclear power plants in accordance with the SECO's Quality Assurance Program and in compliance with the requirements of IEEE 323-1983, IEEE 344-1987 and IEEE 382-1985 :

- QUALIFIED LIFE : 41 Years @104°F (40°C)
15 Years @140°F (60°C)
- TEMPERATURE : Max. 140°F (60°C)
- RELATIVE HUMIDITY : Max 100%
- PRESSURE : 0 psig (Atmospheric)
- RADIATION : 2.0E06 Gy gamma(TID)
- SEISMIC : 15g peak and 6.5g ZPA

SAEHAN ENGINEERING & QUALIFICATION CORPORATION


P. H. Joo
Director, Quality Assurance


S. S. Ko
President, SECO

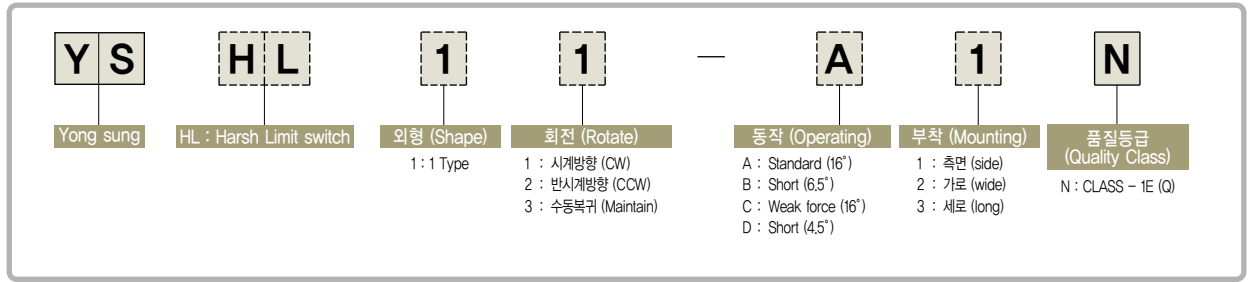
QUALIFICATION REPORT : QR-X211A-1

양식 S-5-1-1 (Rev.0)

1-1 리미트 스위치 (HARSH ZONE) LIMIT SWITCH(HARSH ZONE)-HL SERIES



:: 형식 구분도 - Type Classification Diagram ... YSHL1 Type



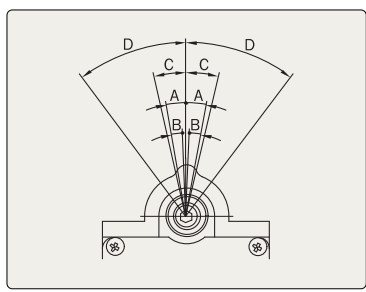
:: 기기 검증 조건 - Equipment Qualification Condition

조 건 (Condition)	정 상 (Normal)	사 고 (Accident)
기 간 (Duration)	40 years	1 Year
압 력 (Pressure)	0 psig (Atmospheric)	Peak 413.7 kPa (60 psig)
온 도 (Temperature)	Max. 54.4 °C (130 °F)	Peak 206 °C (403 °F)
상대습도 (Relative humidity)	Max. 90 %	Max. 100 %
방사능 (Radiation)	1 X 10 ⁴ Gy	2 X 10 ⁶ Gy (TID)
지 진 (Seismic)	-	15g peak 8.4g ZPA
설계기준사건 (DBE)	-	LOCA/MSLB, HELB
CODE & S.T.D	IEEE 323:1983/2003, IEEE 344:1987/2004, IEEE 382:1985/1996 KEPIC END 1100:2000/2005, KEPIC END 2000:2000/2005 KEPIC END 3700:2000/2005	

:: 특징 - Features

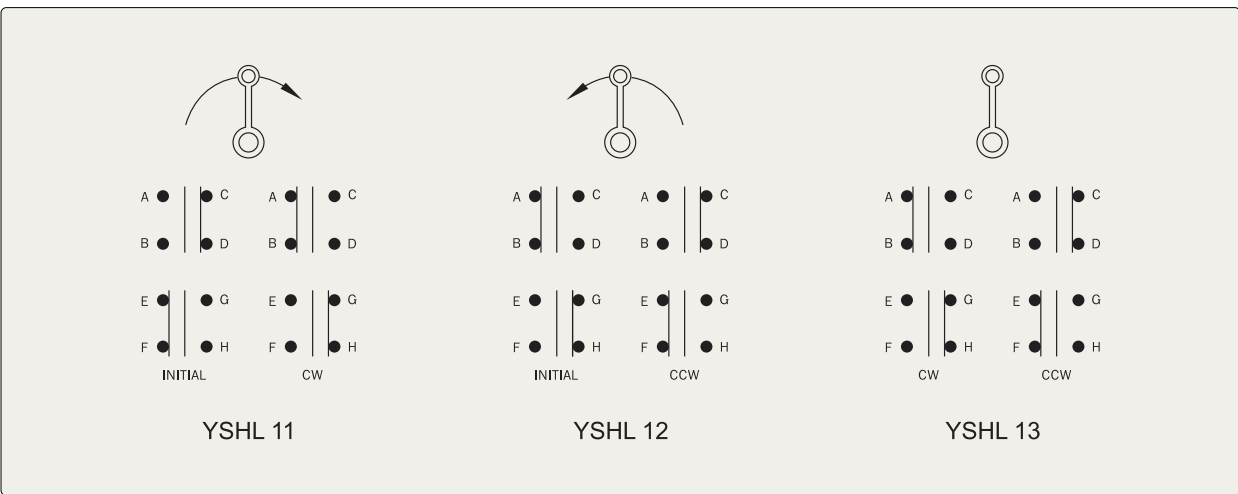
- 고온, 고압 및 내방사능 설계
- 내진 및 진동 설계
- 화학약품 살수에 견디도록 설계
- Designed to resist high temperature, pressure and radiation
- Designed to resist seismic and vibration
- Designed to resist chemical spray

:: 동작 - Operating



기호 (Mark)	설명 (Dicription)	A type	B type	C type	D type
A	동작각도 (Trip travel)	16°	6.5°	16°	4.5°
B	복귀각도 (Reset travel)	14°	4°	14°	2.5°
C	권장각도 (Recommended travel)	20°	10°	20°	8°
D	최대동작각도 (Total travel)	39.5°	34.7°	39.5°	33.5°
	조작력(최대) (Torque (max.))	30 kg-cm (26 lb-in)	37 kg-cm (32 lb-in)	14 kg-cm (12 lb-in)	30 kg-cm (26 lb-in)

:: 접점 구성도 - Contact Form



:: 접점 정격 - Contact Rating

정격 절연전압 (Rated insulation voltage)	AC 600V, DC 250V			
정격 통전전류 (Rated thermal current)	30A			
정격전압 (Rated voltage)	125V	250V	480V	600V
정격전류 - AC, 저항부하 (Rated current-AC, R load)	20A	15A	10A	5A
정격전류 - DC, 저항부하 (Rated current-DC, R load)	5A	1.5A	-	-

:: 성능 개요 - Performance Summary

절연저항 (Insulation resistance)	100MΩ 이상 (DC 500V MEG.) Above 100MΩ (DC 500V MEG.)
접촉저항 (Contact resistance)	50mΩ 이하 (초기치) Below 50mΩ (Initial value)
내전압 (Withstand voltage)	AC 2,500V/1min

:: 부품 재질 - Part Materials

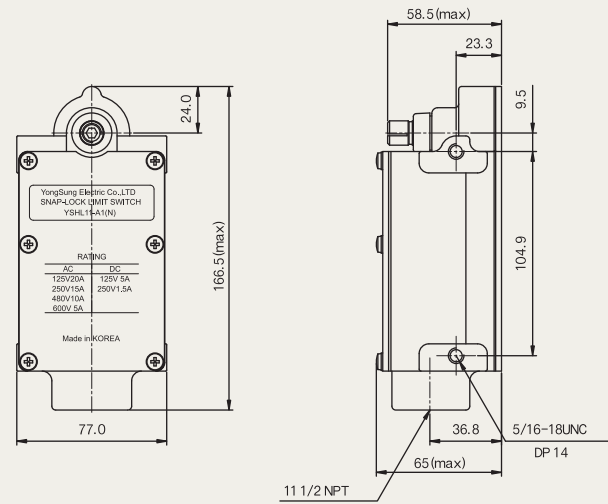
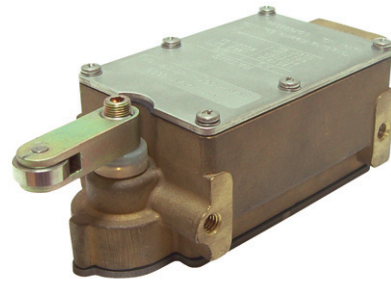
부 품 (Part)	재 질 (Materials)
뚜 껍 (Cover)	스테인리스강 (Stainless steel)
부착판 (Mounting plate)	스테인리스강 (Stainless steel)
몸 체 (Housing)	청동 (Bronze)
접 점 (Contact)	은합금/금도금 (Gold plated silver alloy)
스위치 몸체 (Switch body)	BMC
가스켓 (Gasket)	EPDM



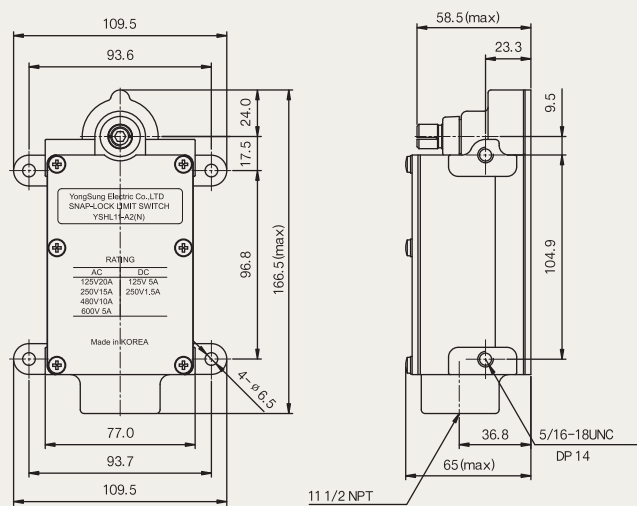
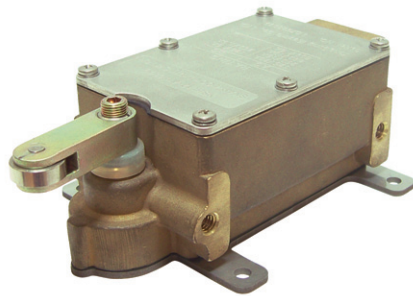
:: 외형 치수도 - Shape Dimensions

(unit : mm)

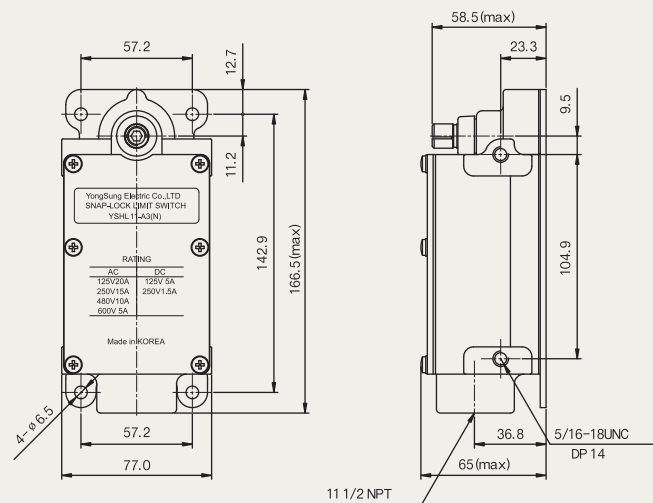
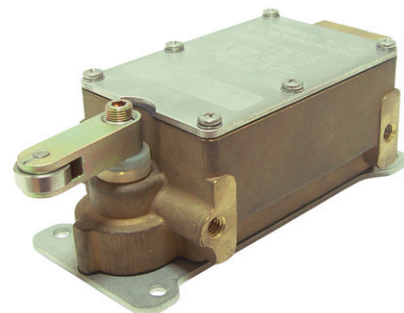
측면부착형 (Side mounting)
YSHL1X-X1 type



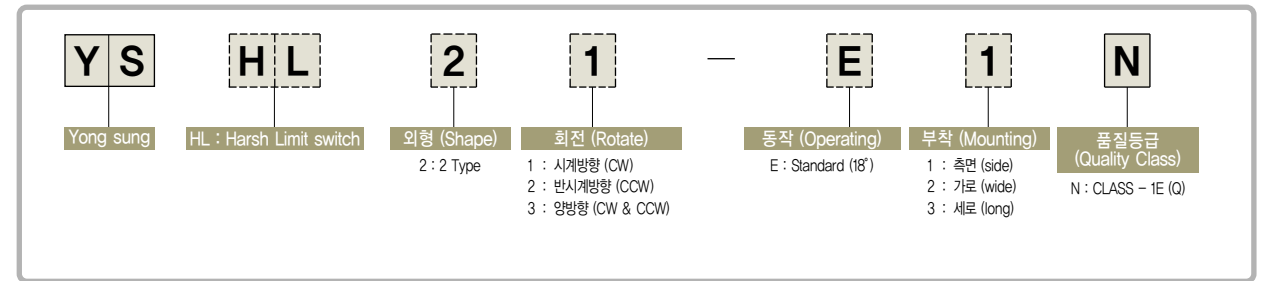
가로부착형 (Wide mounting)
YSHL1X-X2 type



세로부착형 (Long mounting)
YSHL1X-X3 type



:: 형식 구분도 - Type Classification Diagram ... YSHL2 Type



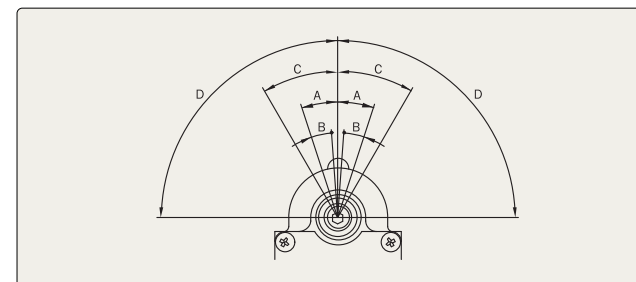
:: 기기 검증 조건 - Equipment Qualification Condition

조건 (Condition)	정상 (Normal)	사고 (Accident)
기간 (Duration)	40 °C (104 °F) at 41 years 60 °C (140 °F) at 15 years	1 Year
압력 (Pressure)	0 psig (Atmospheric)	Peak 393 kPa (57 psig)
온도 (Temperature)	Max. 60 °C (140°F)	Peak 206 °C (403 °F)
상대습도 (Relative humidity)	Max. 90 %	Max. 100 %
방사능 (Radiation)	1 X 10 ⁴ Gy	2 X 10 ⁶ Gy (TID)
지진 (Seismic)	-	15g peak 6.5g ZPA
설계기준사건 (DBE)	-	LOCA/MSLB
CODE & S.T.D	IEEE 323:1983, IEEE 344:1987, IEEE 382:1985 KEPIC END 1100:2000, KEPIC END 2000:2000 KEPIC END 3700:2000	

:: 특징 - Features

- 고온, 고압 및 내방사능 설계
- 내진 및 진동 설계
- 화학약품 살수에 견디도록 설계
- Designed to resist high temperature, pressure and radiation
- Designed to resist seismic and vibration
- Designed to resist chemical spray

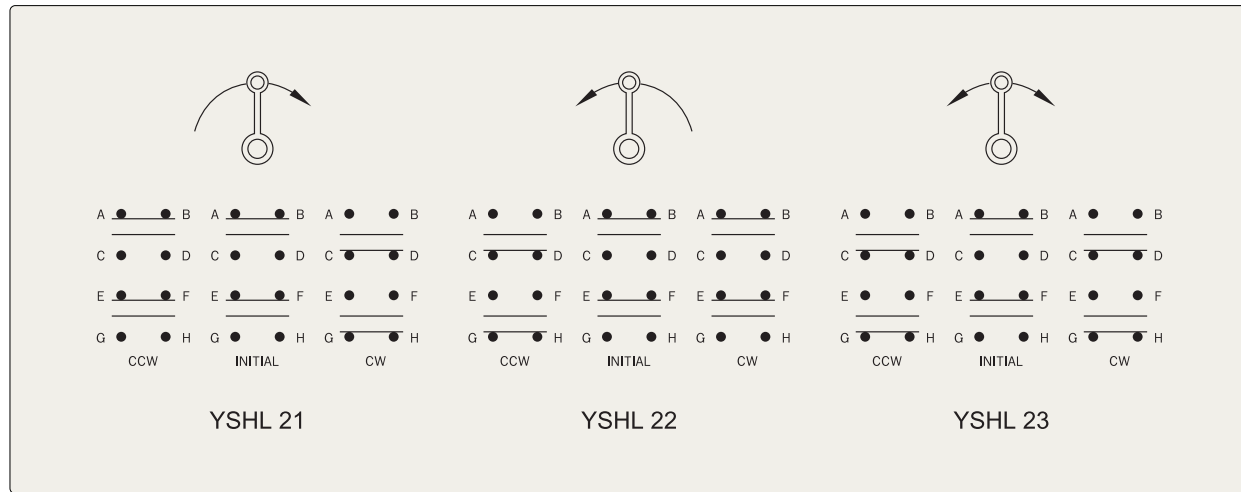
:: 동작 - Operating



기호 (Mark)	설명 (Dicription)	E type
A	동작각도 (Trip travel)	18°
B	복귀각도 (Reset travel)	14°
C	권장각도 (Recommended travel)	30°
D	최대동작각도 (Total travel)	90°
	조작력(최대) (Torque (max.))	31 kg-cm (27 lb-in)

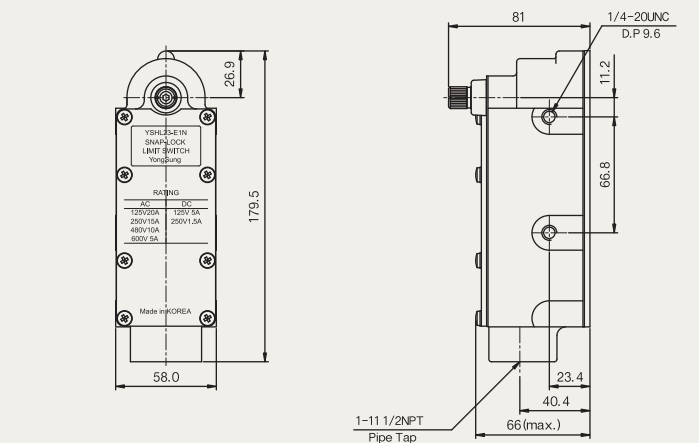
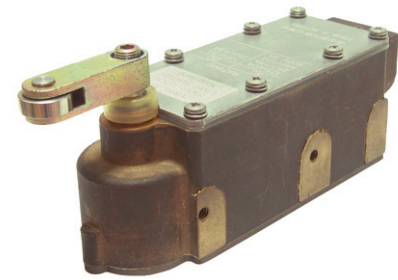


:: 접점 구성도 - Contact Form

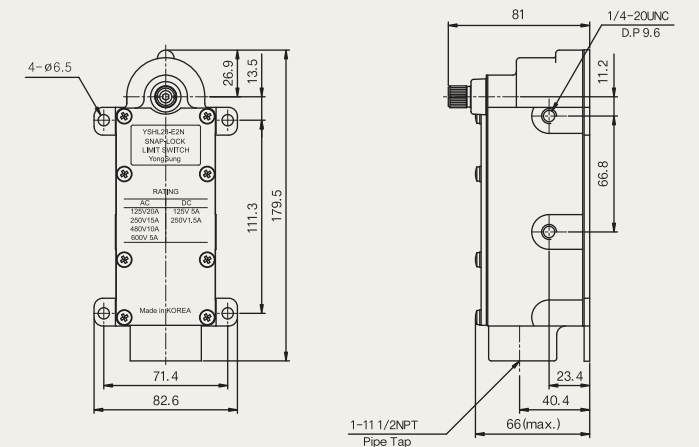
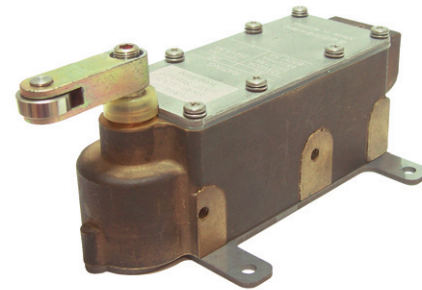


:: 외형 치수도 - Shape Dimensions (unit:mm)

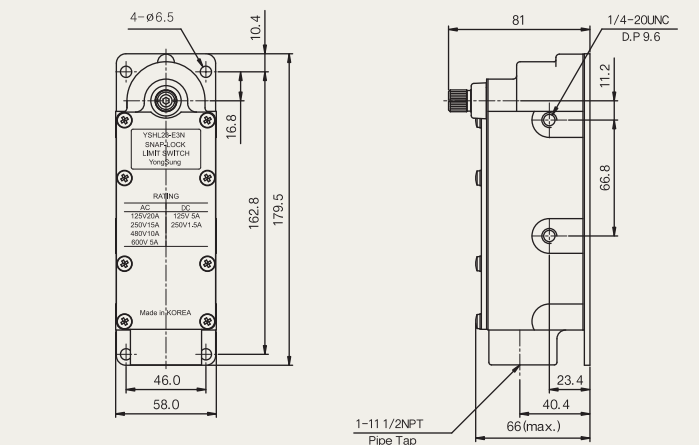
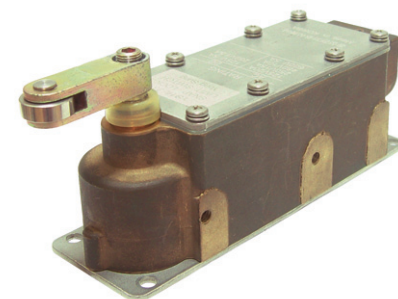
측면부착형 (Side mounting)
YSHL2X-X1 type



가로부착형 (Wide mounting)
YSHL2X-X2 type



세로부착형 (Long mounting)
YSHL2X-X3 type



:: 접점 정격 - Contact Rating

정격 절연전압 (Rated insulation voltage)	AC 600V, DC 250V			
정격 통전전류 (Rated thermal current)	30A			
정격전압 (Rated voltage)	125V	250V	480V	600V
정격전류 - AC, 저항부하 (Rated current-AC, R load)	20A	15A	10A	5A
정격전류 - DC, 저항부하 (Rated current-DC, R load)	5A	1.5A	-	-

:: 성능 개요 - Performance Summary

절연저항 (Insulation resistance)	100MΩ 이상 (DC 500V MEG.) Above 100MΩ (DC 500V MEG.)
접촉저항 (Contact resistance)	50mΩ 이하 (초기치) Below 50mΩ (Initial value)
내전압 (Withstand voltage)	AC 2,500V/1min

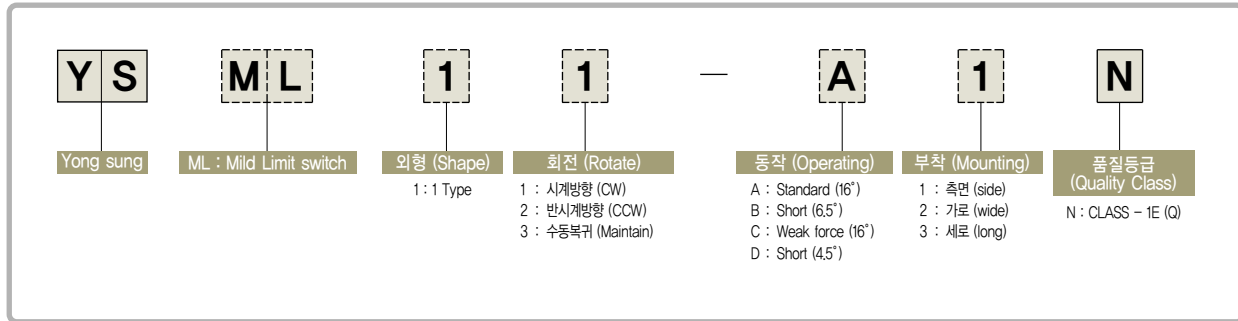
:: 부품 재질 - Part Materials

부 품 (Part)	재 질 (Materials)
뚜 껍 (Cover)	스테인리스강 (Stainless steel)
부착판 (Mounting plate)	스테인리스강 (Stainless steel)
몸 체 (Housing)	청동 (Bronze)
접 점 (Contact)	은합금/금도금 (Gold plated silver alloy)
스위치 몸체 (Switch body)	PHENOL
가스켓 (Gasket)	SILICONE (PVMQ)

1-2 리미트 스위치 (MILD ZONE) LIMIT SWITCH (MILD ZONE) - ML SERIES



:: 형식 구분도 - Type Classification Diagram ... YSML1 Type



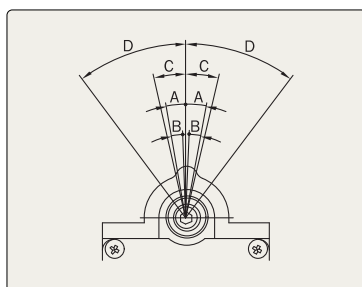
:: 기기 검증 조건 - Equipment Qualification Condition

조 건 (Condition)	정 상 (Normal)
기 간 (Duration)	40 years
압 력 (Pressure)	0 psig (Atmospheric)
온 도 (Temperature)	Max. 54.4 °C (130 °F)
상대습도 (Relative humidity)	Max. 90 %
방사능 (Radiation)	2 X 10 ⁶ Gy (TID)
지 진 (Seismic)	15g peak 8.4g ZPA
CODE & S.T.D	IEEE 323:1983/2003, IEEE 344:1987/2004, IEEE 382:1985/1996 KEPIC END 1100:2000/2005, KEPIC END 2000:2000/2005 KEPIC END 3700:2000/2005

:: 특징 - Features

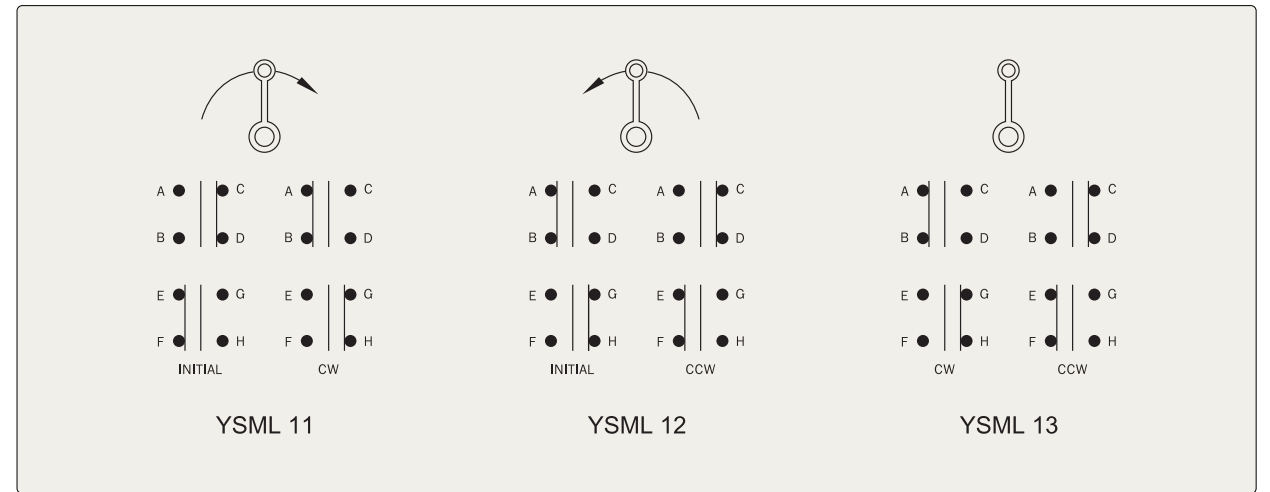
- 고온, 고압 및 내방사능 설계
- 내진 및 진동 설계
- Designed to resist high temperature, pressure and radiation
- Designed to resist seismic and vibration

:: 동작 - Operating



기호 (Mark)	설명 (Dicription)	A type	B type	C type	D type
A	동작각도 (Trip travel)	16°	6.5°	16°	4.5°
B	복귀각도 (Reset travel)	14°	4°	14°	2.5°
C	권장각도 (Recommended travel)	20°	10°	20°	8°
D	최대동작각도 (Total travel)	39.5°	34.7°	39.5°	33.5°
	조작력(최대) (Torque (max.))	30 kg-cm (26 lb-in)	37 kg-cm (32 lb-in)	14 kg-cm (12 lb-in)	30 kg-cm (26 lb-in)

:: 접점 구성도 - Contact Form



:: 접점 정격 - Contact Rating

정격 절연전압 (Rated insulation voltage)	AC 600V, DC 250V			
정격 통전전류 (Rated thermal current)	30A			
정격전압 (Rated voltage)	125V	250V	480V	600V
정격전류 - AC, 저항부하 (Rated current-AC, R load)	20A	15A	10A	5A
정격전류 - DC, 저항부하 (Rated current-DC, R load)	5A	1.5A	-	-

:: 성능 개요 - Performance Summary

절연저항 (Insulation resistance)	100MΩ 이상 (DC 500V MEG.) Above 100MΩ (DC 500V MEG.)
접촉저항 (Contact resistance)	50mΩ 이하 (초기치) Below 50mΩ (Initial value)
내전압 (Withstand voltage)	AC 2,500V/1min

:: 부품 재질 - Part Materials

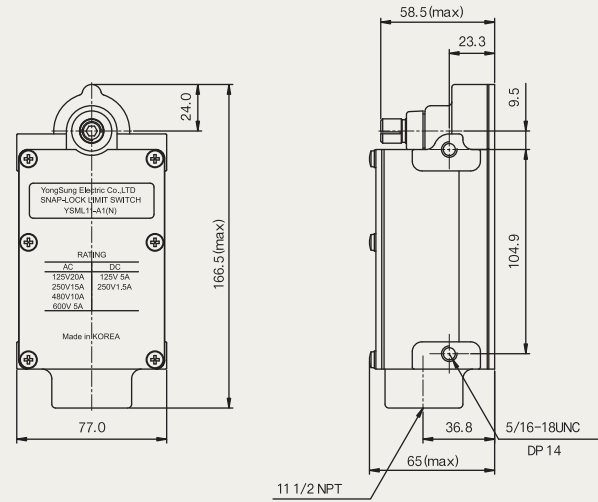
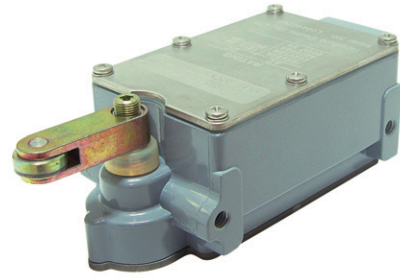
부 품 (Part)	재 질 (Materials)
뚜 꺽 (Cover)	스테인리스강 (Stainless steel)
부착판 (Mounting plate)	스테인리스강 (Stainless steel)
몸 체 (Housing)	아연합금 (Zinc alloy)
접 점 (Contact)	은합금/금도금 (Gold plated silver alloy)
스위치 몸체 (Switch body)	BMC
가스켓 (Gasket)	EPDM



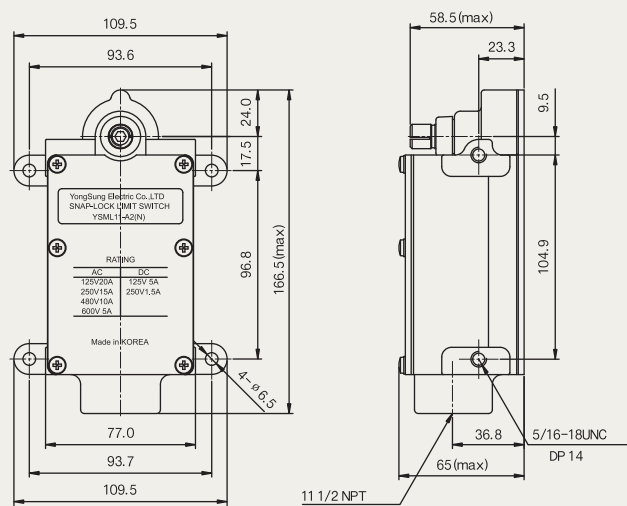
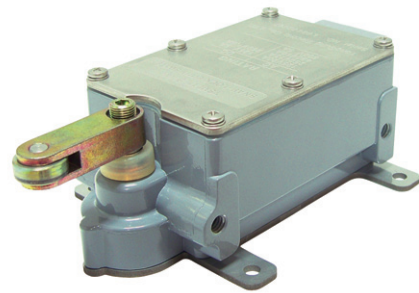
:: 외형 치수도 - Shape Dimensions

(unit : mm)

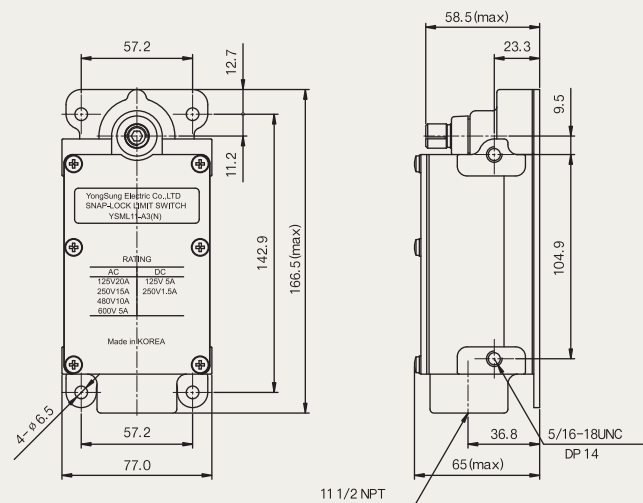
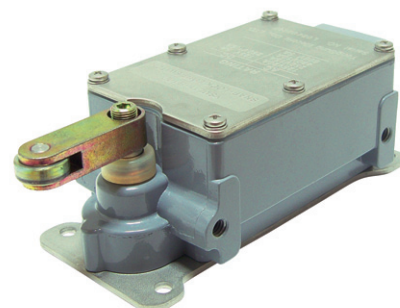
측면부착형 (Side mounting)
YSML1X-X1 type



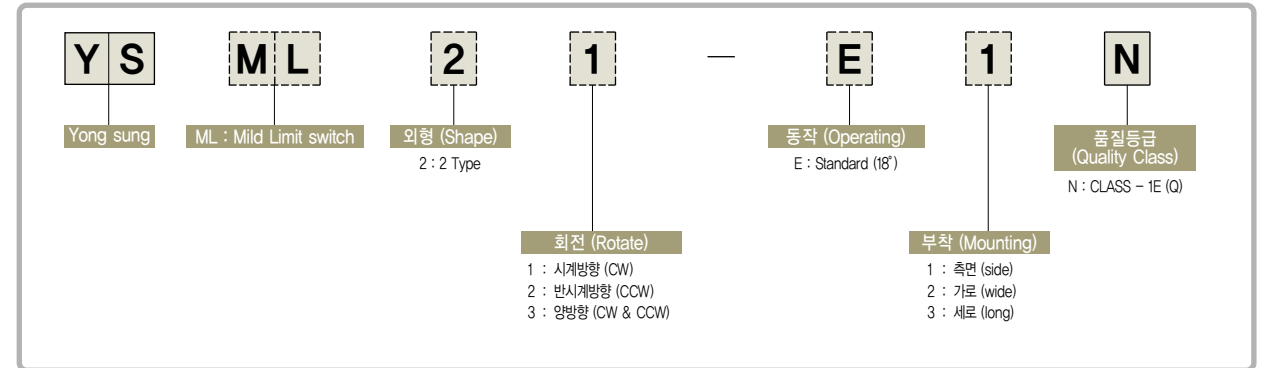
가로부착형 (Wide mounting)
YSML1X-X2 type



세로부착형 (Long mounting)
YSML1X-X3 type



:: 형식 구분도 - Type Classification Diagram ... YSML2 Type



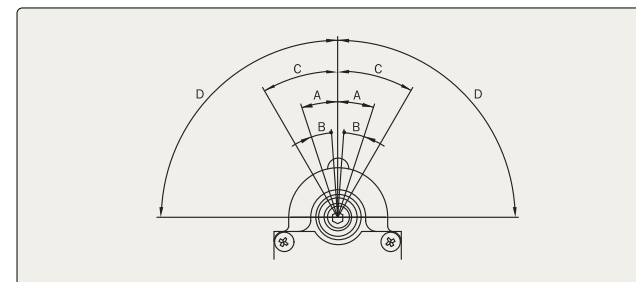
:: 기기 검증 조건 - Equipment Qualification Condition

조 건 (Condition)	정 상 (Normal)
기 간 (Duration)	40 °C (104 °F) at 41 years, 60 °C (140 °F) at 15 years
압 력 (Pressure)	0 psig (Atmospheric)
온 도 (Temperature)	Max. 60 °C (140°F)
상대습도 (Relative humidity)	Max. 90 %
방사능 (Radiation)	2 X 10 ⁶ Gy (TID)
지 진 (Seismic)	15g peak 6.5g ZPA
CODE & S.T.D	IEEE 323:1983, IEEE 344:1987, IEEE 382:1985 KEPIC END 1100:2000, KEPIC END 2000:2000 KEPIC END 3700:2000

:: 특징 - Features

- 고온, 고압 및 내방사능 설계
- 내진 및 진동 설계
- Designed to resist high temperature, pressure and radiation
- Designed to resist seismic and vibration

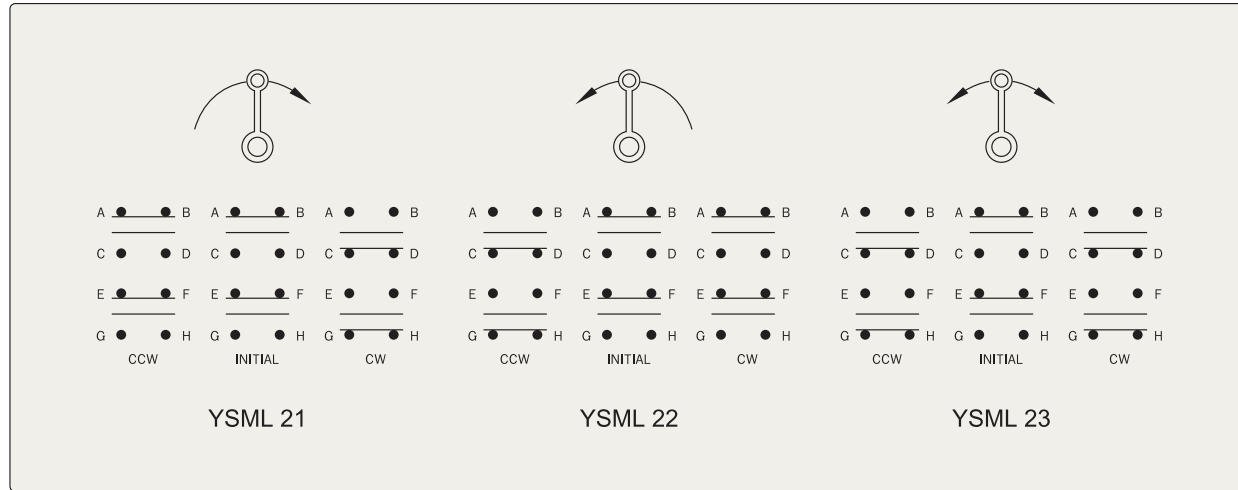
:: 동작 - Operating



기호 (Mark)	설명 (Description)	E type
A	동작각도 (Trip travel)	18°
B	복귀각도 (Reset travel)	14°
C	권장각도 (Recommended travel)	30°
D	최대동작각도 (Total travel)	90°
	조작력(최대) (Torque (max.))	31 kg-cm (27 lb-in)



:: 접점 구성도 - Contact Form



:: 접점 정격 - Contact Rating

정격 절연전압 (Rated insulation voltage)	AC 600V, DC 250V			
정격 통전전류 (Rated thermal current)	30A			
정격전압 (Rated voltage)	125V	250V	480V	600V
정격전류 - AC, 저항부하 (Rated current-AC, R load)	20A	15A	10A	5A
정격전류 - DC, 저항부하 (Rated current-DC, R load)	5A	1.5A	-	-

:: 성능 개요 - Performance Summary

절연저항 (Insulation resistance)	100MΩ 이상 (DC 500V MEG.) Above 100MΩ (DC 500V MEG.)
접촉저항 (Contact resistance)	50mΩ 이하 (초기치) Below 50mΩ (Initial value)
내전압 (Withstand voltage)	AC 2,500V/1min

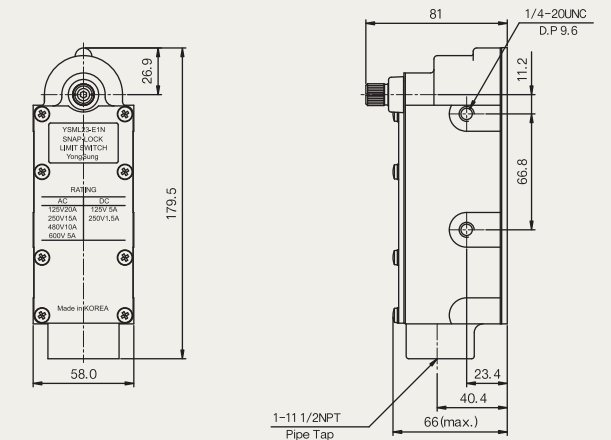
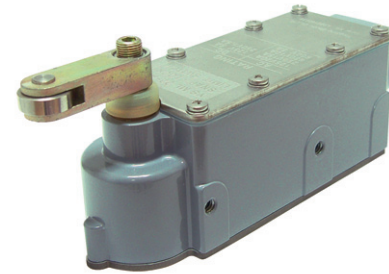
:: 부품 재질 - Part Materials

부 품 (Part)	재 질 (Materials)
뚜 껍 (Cover)	스테인리스강 (Stainless steel)
부착판 (Mounting plate)	스테인리스강 (Stainless steel)
몸 체 (Housing)	아연합금 (Zinc alloy)
접 점 (Contact)	은합금/금도금 (Gold plated silver alloy)
스위치 몸체 (Switch body)	PHENOL
가스켓 (Gasket)	SILICONE(PVMQ)

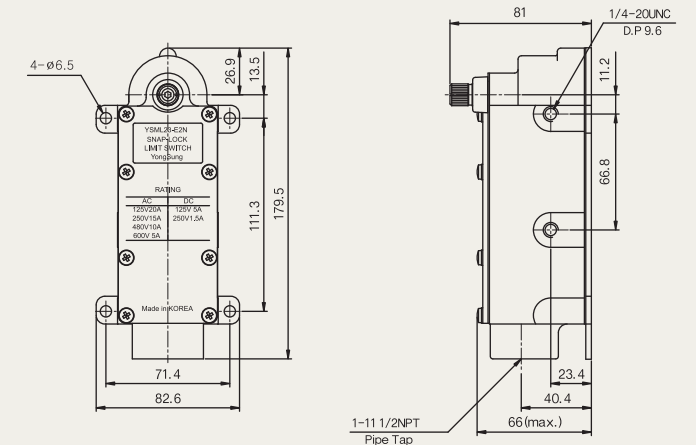
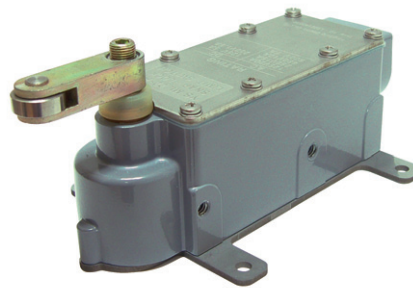
:: 외형 치수도 - Shape Dimensions

(unit:mm)

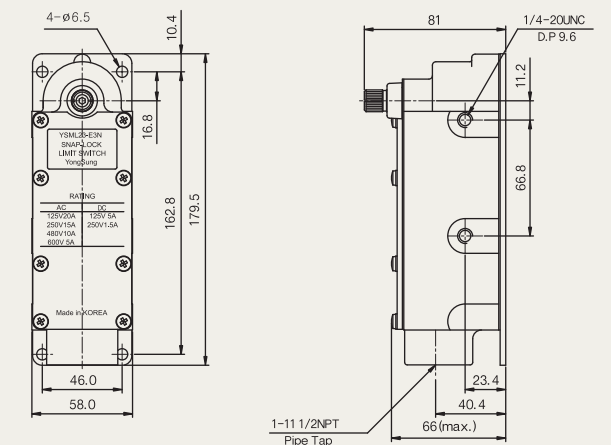
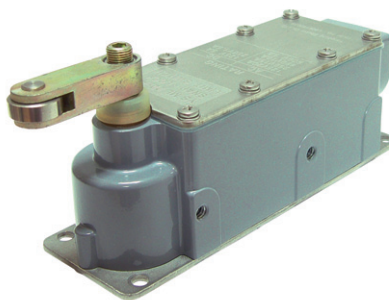
**측면부착형 (Side mounting)
YSML2X-X1 type**



**가로부착형 (Wide mounting)
YSML2X-X2 type**



**세로부착형 (Long mounting)
YSML2X-X3 type**

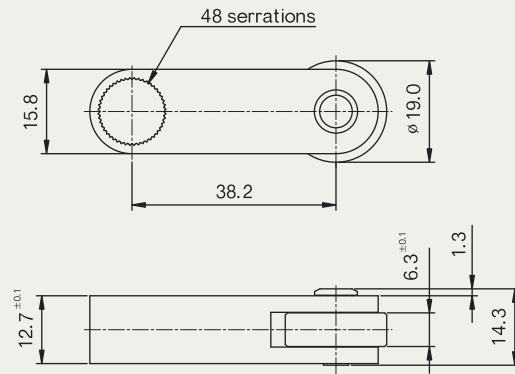


1-3 ◀ 리미트 스위치 레버 LIMIT SWITCH LEVER



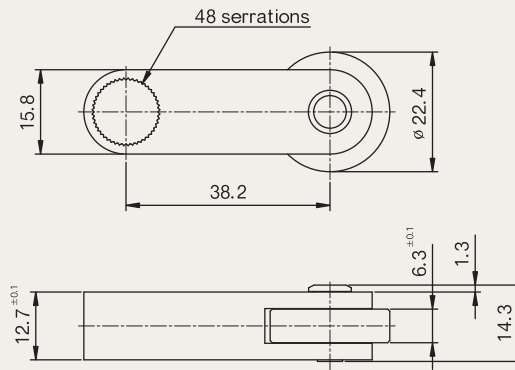
:: 외형 치수도 - Shape Dimensions (unit: mm)

YSLLS-A1 : 표준형 (Standard Type)



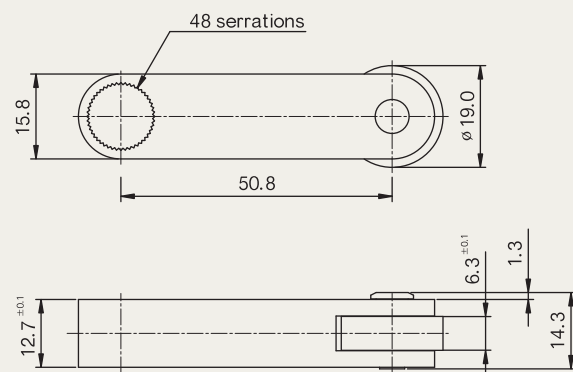
부품 (Part)	재질 (Material)
레버 (Lever)	탄소강 (Carbon steel)
롤러 (Roller)	스텐리스강 (Stainless steel)

YSLLS-A2 : 주문형 (Order Type)



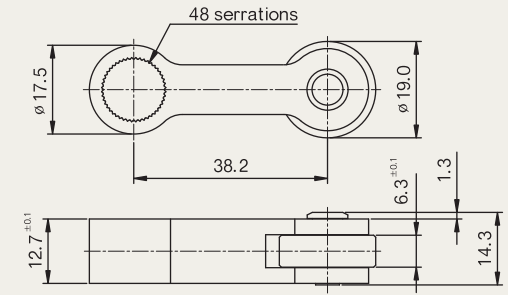
부품 (Part)	재질 (Material)
레버 (Lever)	탄소강 (Carbon steel)
롤러 (Roller)	스텐리스강 (Stainless steel)

YSLLS-A3 : 주문형 (Order Type)



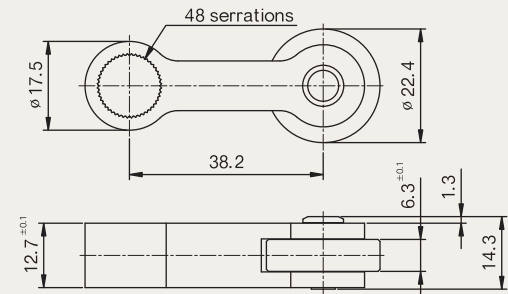
부품 (Part)	재질 (Material)
레버 (Lever)	탄소강 (Carbon steel)
롤러 (Roller)	스텐리스강 (Stainless steel)

YSLLS-B1 : 주문형 (Order Type)



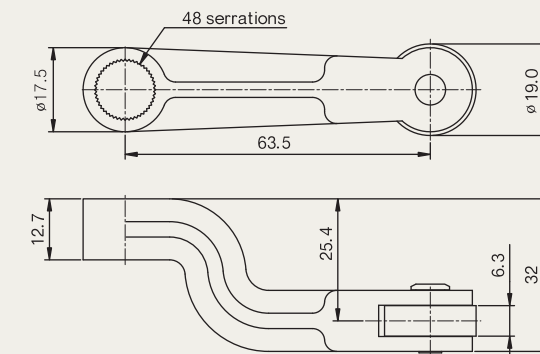
부품 (Part)	재질 (Material)
레버 (Lever)	탄소강 (Carbon steel)
롤러 (Roller)	스텐리스강 (Stainless steel)

YSLLS-B2 : 주문형 (Order Type)



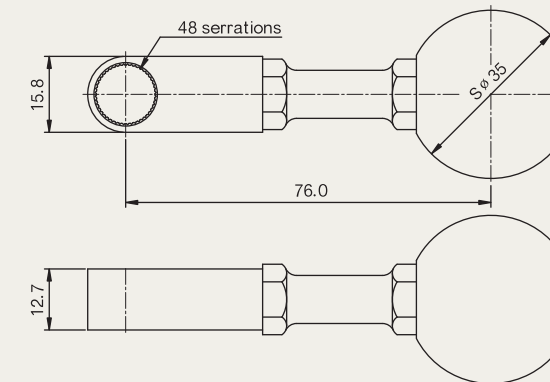
부품 (Part)	재질 (Material)
레버 (Lever)	탄소강 (Carbon steel)
롤러 (Roller)	스텐리스강 (Stainless steel)

YSLLS-C1 : 주문형 (Order Type)



부품 (Part)	재질 (Material)
레버 (Lever)	청동 (Bronze)
롤러 (Roller)	스텐리스강 (Stainless steel)

YSLLS-M1 : 주문형 (Order Type)



부품 (Part)	재질 (Material)
레버 (Lever)	탄소강 (Carbon steel)
볼 (Ball)	페놀수지 (Phenol)