

# LED illumination

for machine  
Vision System



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# **LED illumination**

for machine  
Vision System



1F 체력단련실 & 카페테리아



2~5F 사무실



2~5F 사무실



4F 테스트룸

## “가족같은 기업, 친구 같은 파트너”

### (주) 알트시스템

(주) 알트시스템은 머신비전 조명 전문 기업으로 고객의 니즈에 맞는 제품과 서비스를 제공합니다. 알트시스템의 최우선 가치는 가족같은 회사, 집 같은 일터입니다. 직원들이 회사에서 편하고 행복을 느끼으로써 그 가치와 신뢰를 고객과도 함께 나눌 수 있다는 간단한 생각에서 시작되었습니다. 언제나 신뢰할 수 있는 행복한 파트너가 되도록 항상 노력하겠습니다.

### I Overview

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### I History

<b>2019</b>	6월	ALT - LF1 Controller 개발완료
	5월	사옥 완공 및 본사 이전 (화성시 여울로 4길 32-1)
<b>2018</b>	11월	상표 등록 출원 / ALT-E64RS/E64STP - Controller Series 개발완료
	9월	ALT-Trigger-Distributor 개발완료
	8월	ALT-ADL2-W400-777CH controller 개발완료
	8월	기술혁신형 중소기업 INNOBIZ 인증
	3월	Smart factory+ automation world 2018 참가
	2월	ALT-OBMC controller 개발완료
<b>2017</b>	6월	특허 출원 (동형 조명 검사 장치)
<b>2016</b>	5월	Tamron 국내 총판 계약 체결
	3월	Smart factory+ automation world 2016 참가
<b>2014</b>	3월	Smart factory+ automation world 2014 참가
	1월	(주)알트시스템 법인 전환
<b>2013</b>	12월	벤처기업 인증
	9월	기업부설연구소 인가
	6월	본사 및 사업장 이전 (화성시 동탄지성로 316 플라리온스퀘어 B동 3층)
<b>2009</b>	7월	(주)알트시스템 설립



4~5F 회의실



## 고객 맞춤 테스트 및 설계

다양한 제품과 그 제품들의 다양한 특성으로 인해, 획득한 영상에서 원하는 대상을 최대한 부각 시키기 위해서는 실제 샘플을 통한 테스트 후 기구 조건과 환경을 감안한 맞춤 설계가 가장 효율적인 조명 선정 방법입니다.

알트시스템은 최적의 이미지 구현을 위해 언제나 직접 테스트 하실 수 있도록 개방된 테스트룸을 운영 중이며, 광학 솔루션 요청시 다양한 조명을 알트시스템의 광학 및 조명 전문가를 통해 테스트하여 검사 조건에 부합되는 최적의 조명을 선정해 드립니다.



### 고객사의 의뢰

요구 분해능, FOV, 기구적 제한 조건 및  
대상물체에서의 요구된 검사항목 검토



### 카메라 및 렌즈 선정

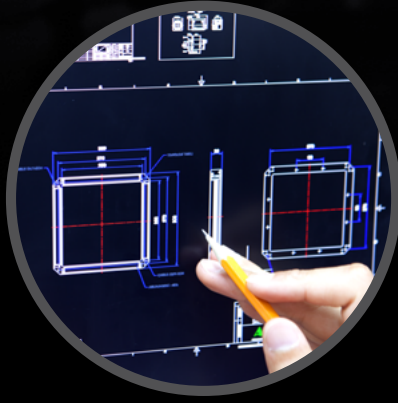
광학 및 기구적 요구 조건에 따라 선정

알트시스템만의 차별화 된  
고객 맞춤 샘플 테스트와 설계



### 샘플 테스트

조명을 이용한 최적의 이미지  
조건 구현을 위한 다양한 테스트 실시



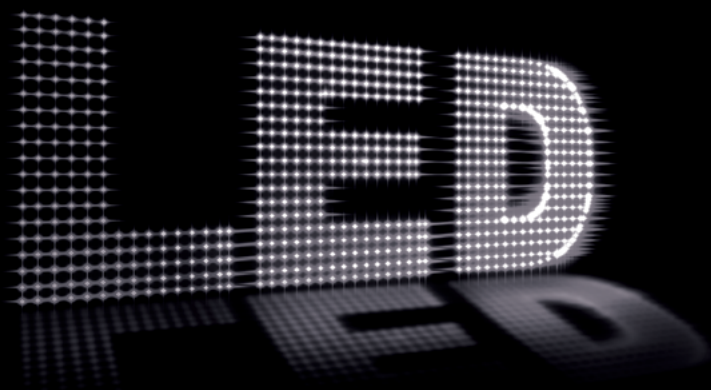
### 조명 개발 및 광학계 구성 도면 작성

최적의 조건에 부합하는 조명 설계 및 개발



### 테스트 리포트 제공

제작된 제품 테스트 결과 고객사에 제공



## LED 조명의 특징



### 빠른 응답성

LED는 10u sec 이내에 최대 발광이 가능하여 스트로브 및 카메라와 동기화 시켜 사용할수도 있다.



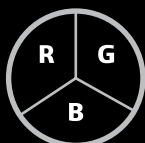
### 소비전력이 낮아 효율이 높다

LED 조명은 낮은 전원 소비로 인해 통상의 조명에 비해 많게는 10배 가량 전력 소비를 절감할 수 있어 유지 비용에 있어 효율적이다.



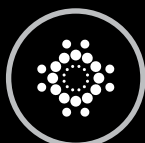
### 수명이 길다 (약 20,000시간)

할로겐 등의 통상적인 조명이 많게는 한 달에 한번 램프를 교체해 주어야 하는 것에 비해 LED 조명은 약 10,000~30,000시간을 지속적으로 발광하여 사용할 수 있어 유지보수 비용 및 편의에 있어 월등한 장점을 발휘한다.



### 색상 선택이 용이

Object에 따라 다양한 파장의 색상을 선택하여 쉽게 검사 및 측정 환경에 최적의 조명 선택이 가능하다.

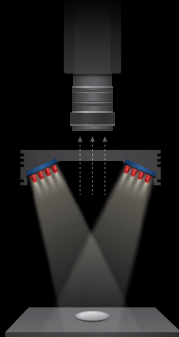


### 조명의 모양을 자유로이 제작

할로겐 등에 비해 LED는 소자 자체에서 발광하여 다양한 모양으로 조명을 설계 제작할 수 있다. 이로 인해 검사 및 측정 환경에 최적의 빛의 조사각을 선택하여 최적의 조명을 선택할 수 있다.



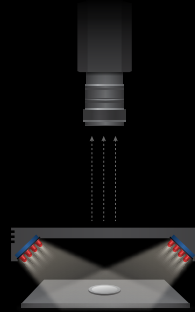
## LED 조명의 특징



### DIRECT LIGHT

조명이 대상 물체를 직접 비추는 형태로  
확연한 그림자를 만들어 높은 콘트라스트를  
필요로 할 때 유용한 조명이다. 하지만 반사율이  
높은 물체에서는 사용이 어려울 수 있다.

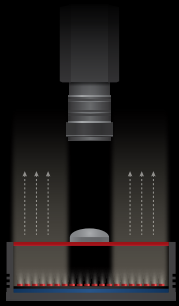
ARL/ARF Series



### LOW ANGLE LIGHT

조명을 낮은 각도로 설치하여 표면의  
돌출부 등에 빛이 반사되어 배경은  
검게하고 엷지 및 이물, 스크래치 등을  
밝게 부각시켜 주는 조명이다.

ARL-LA, ARL-FLA Series



### BACK LIGHT

조명이 대상물체의 뒤에서 발광하여 배경은  
밝고 대상물체는 어둡게 만드는 조명형태이다.  
외형측정 및 반투명체의 마크인식등에  
가장 일반적으로 사용되는 조명이다.

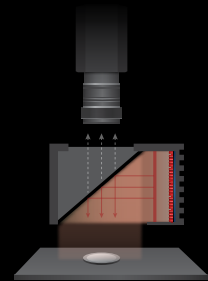
ACL/ACL2/ACLF Series



### DIFFUSE LIGHT

빛을 난반사시켜 그림자가 제거된  
부드러운 이미지를 얻기위해 많이 사용  
되는 조명이다. 유리 등 반사율이 심한  
대상물체에도 적합하다.

ADL/ADRL/ADQL Series

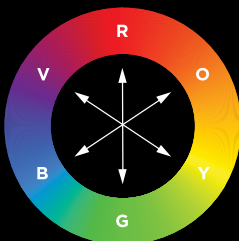


### COAXIAL LIGHT

조명 내부의 하프미러를 통해 카메라의 시야와  
동일한 각도로 빛을 발광하는 조명으로 유리 등  
반사율이 높은 제품의 검사와 검사 영역에  
외부 빛으로 인해 그림자가 발생하는 경우 유용하다.

AFV/AFV2 Series

## 색상의 선택



흑백과 컬러 카메라에서 White/Red/  
Blue 색상의 조명을 조사할 경우 동일  
색상은 더욱 밝게 보색은 어둡게 표현되  
는 것을 볼 수 있다.

조명의 형태를 선택 후 최적의 이미지 프로세싱을 위해  
조명의 색상을 선택해야 한다.

물체는 빛의 색상을 다르게 반사하거나 흡수한다. 이를 이용하여 원하는 부위를 강조하거나  
보이지 않게 처리할 수 있다. 대표적인 방법이 보색을 이용하는 방법으로 대상물체와 동일한 색상의  
빛을 조사한 경우 대상물체가 환하게 표시되며 보색의 빛을 조사한 경우 어둡게 표현된다.





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## DIRECT RING LIGHT



## APPLICATION

기판 및 부품 검사와 위치 결정, 인쇄 검사, 인쇄면 얼룩 흡집 검사, 측정 검사, OCR, 라벨검사

## ARL/ARF SERIES

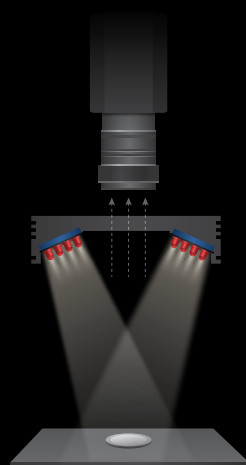
Bright field illumination 중 가장 범용적인 용도로 사용되는 조명 방식입니다.

360도 링에 배열된 LED로 중심 부근을 향해 빛을 집중함으로써 매우 밝고 균일한 빛을 중심부에 조사할 수 있습니다.

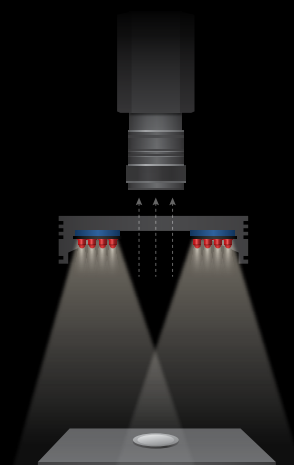
### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES

**ARL Series** 플렉서블한 기판을 이용하여 LED에 용도에 맞는 경사를 주어 중심부에 균일한 빛을 집중 조사하여 어느 방향에서든 균일한 빛을 조사할 수 있도록 설계

**ARF Series** LED를 원형으로 수직 조사하여 WD가 긴 경우 또는 넓은 영역에 빛을 고르게 조사할 수 있도록 설계



ARL



ARF

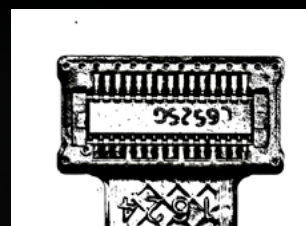
Object Image



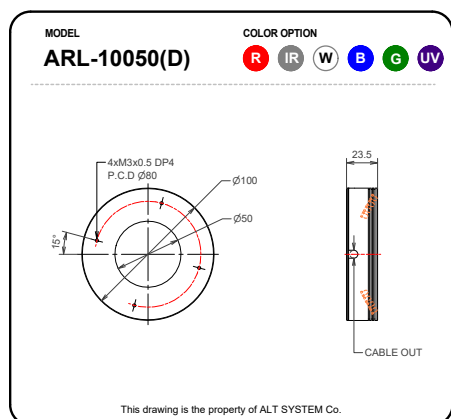
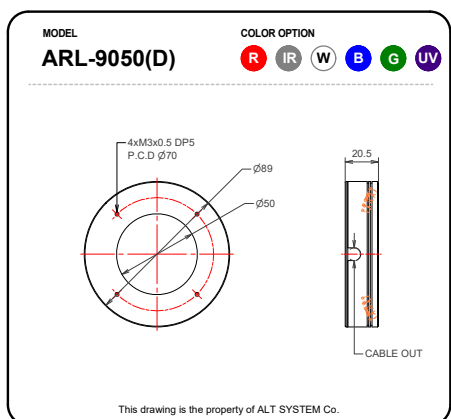
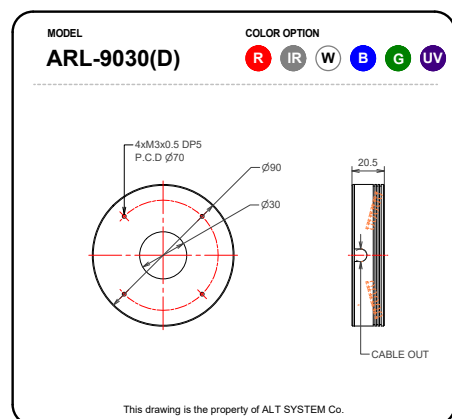
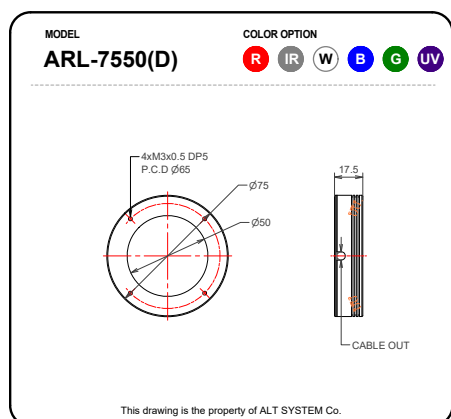
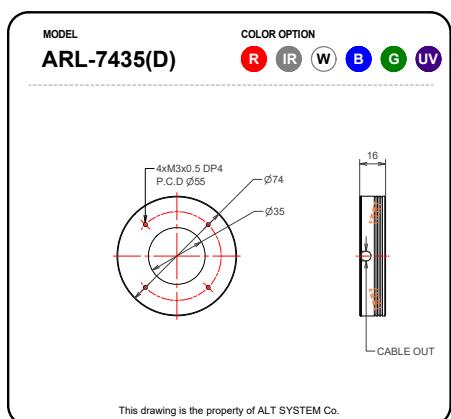
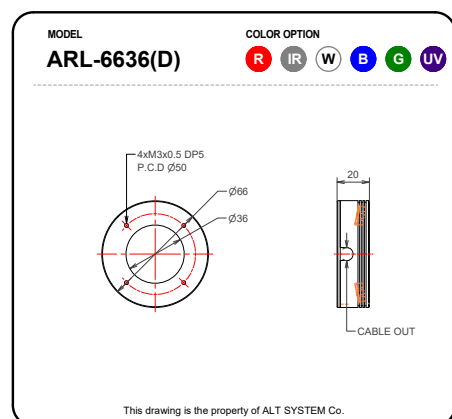
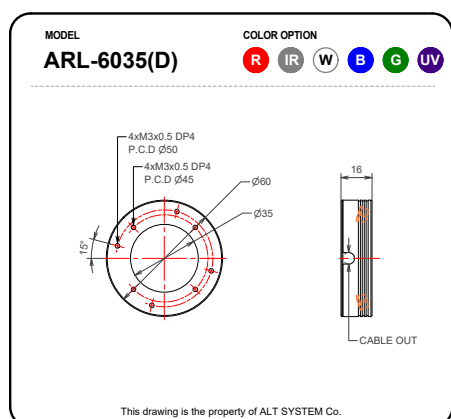
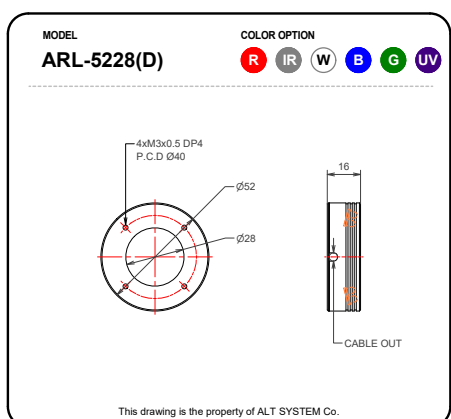
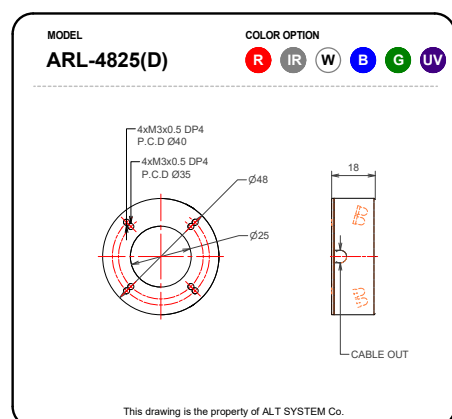
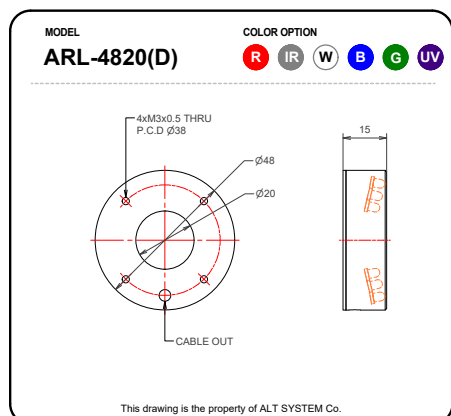
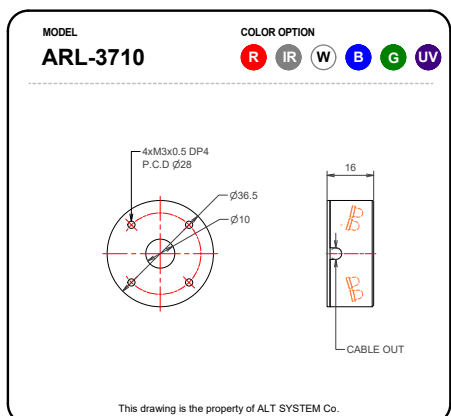
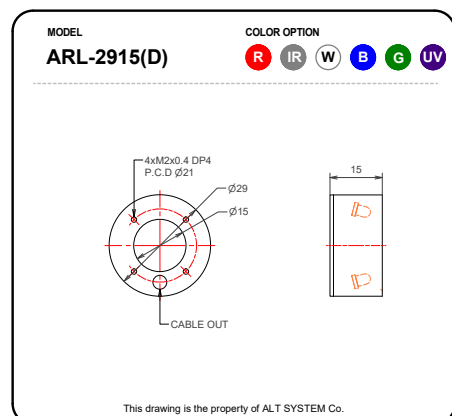
ARL Image



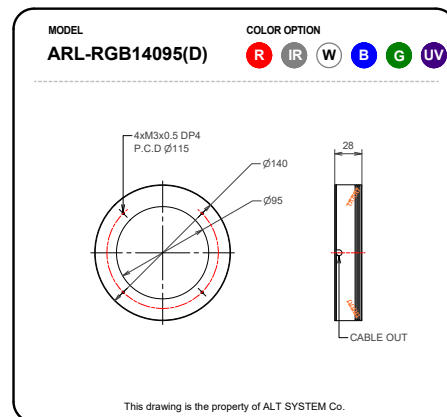
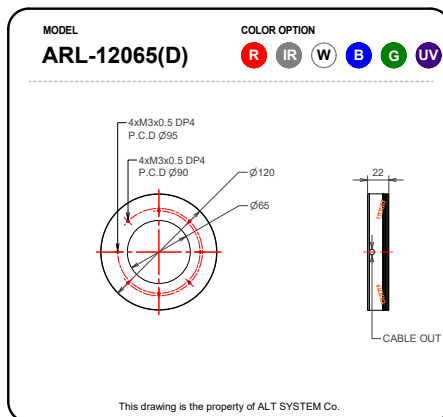
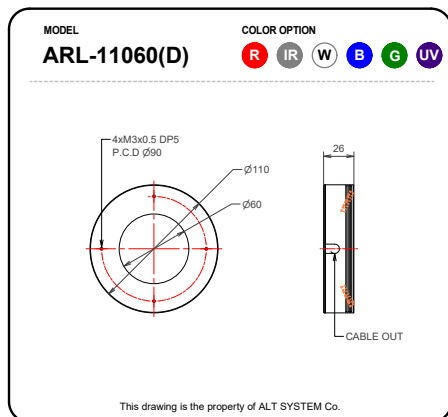
ARF Image



# ARL SERIES

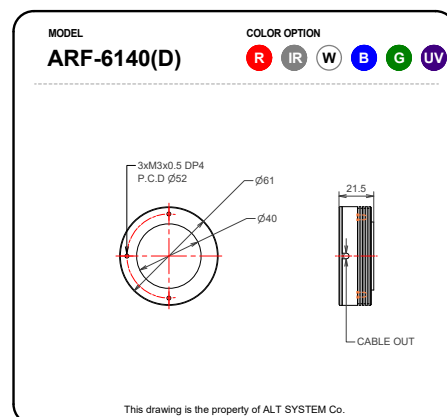
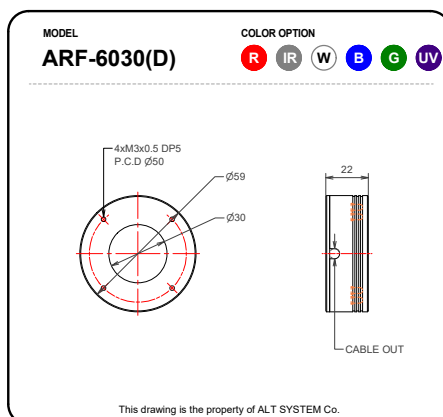
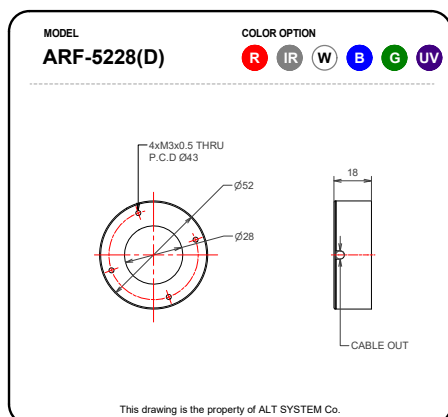
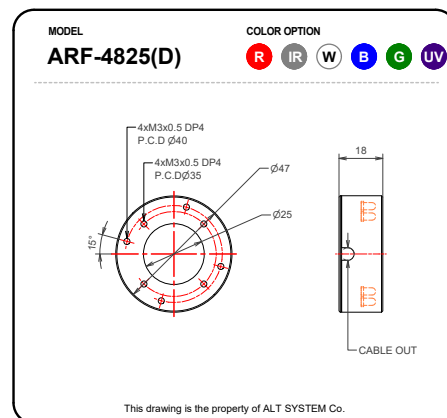
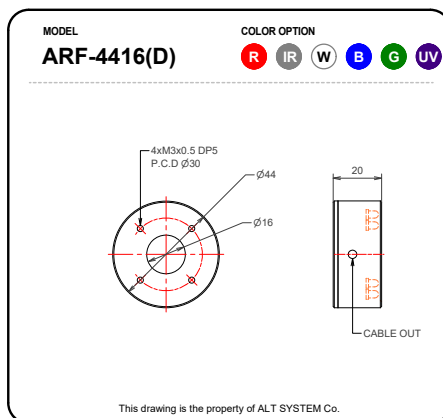
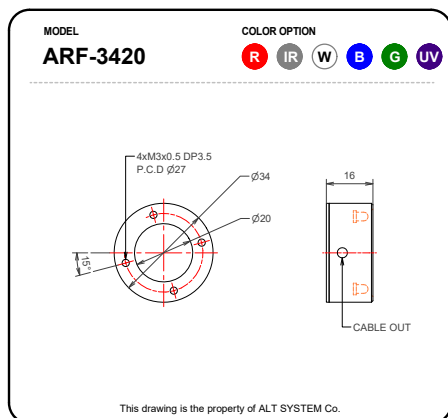




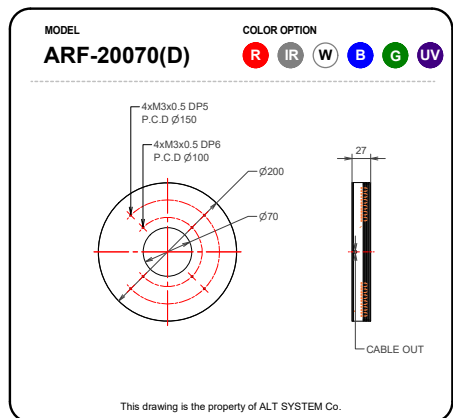
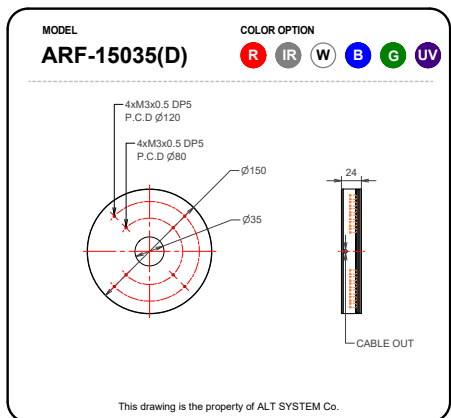
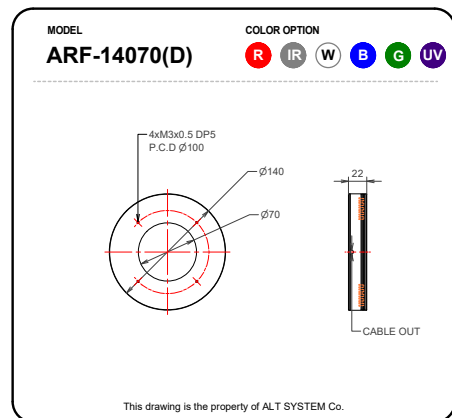
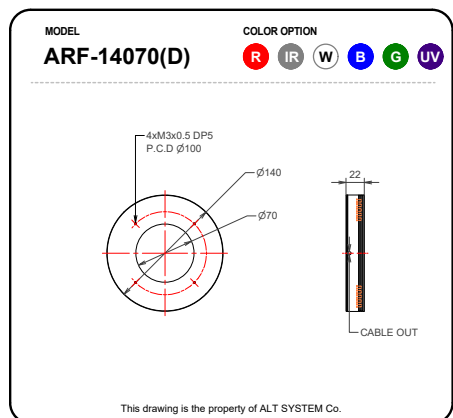
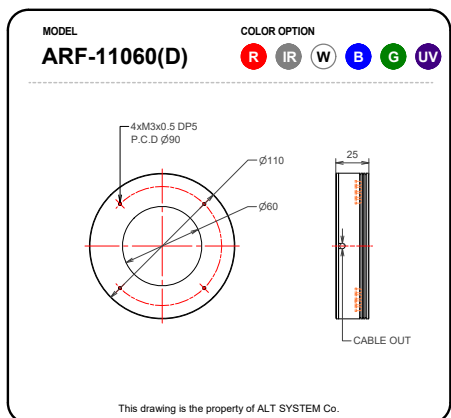
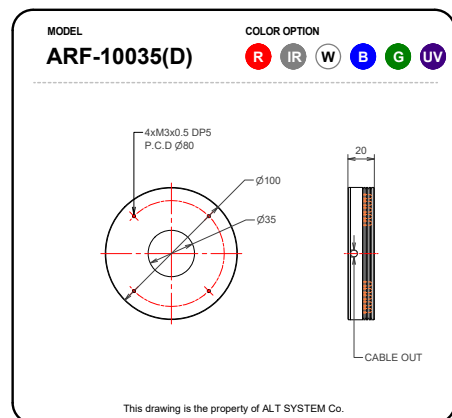
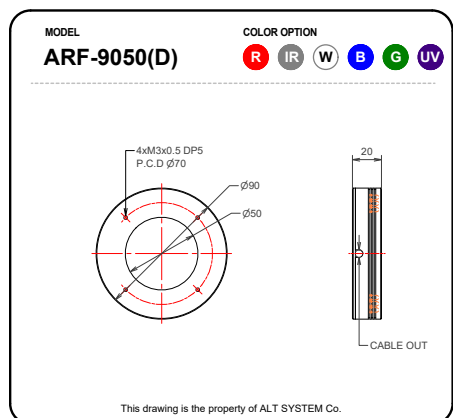
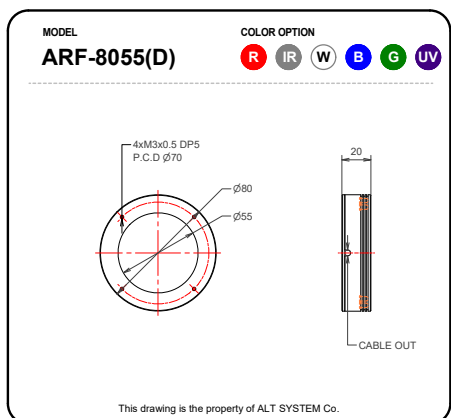
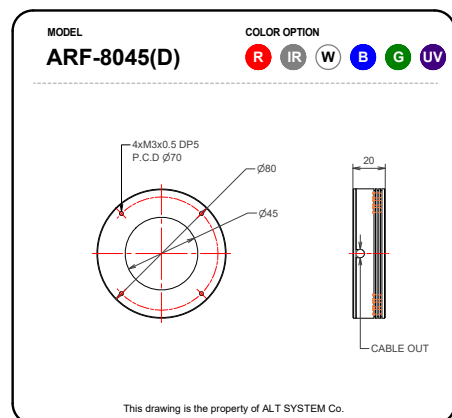
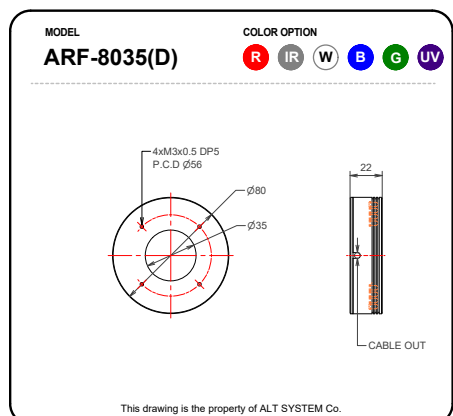
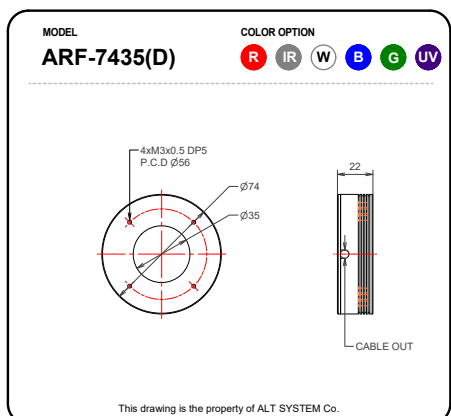
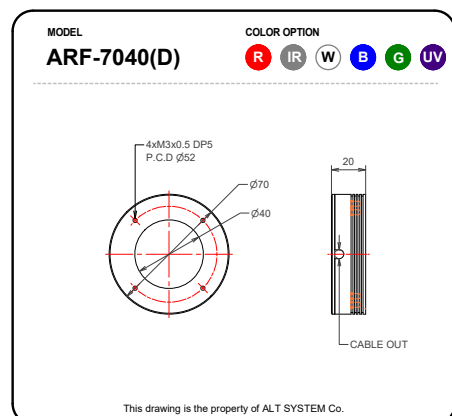


DIRECT RING LIGHT

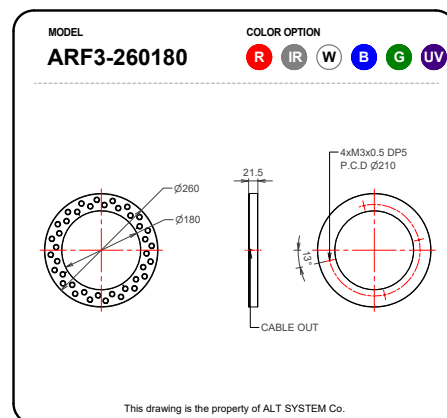
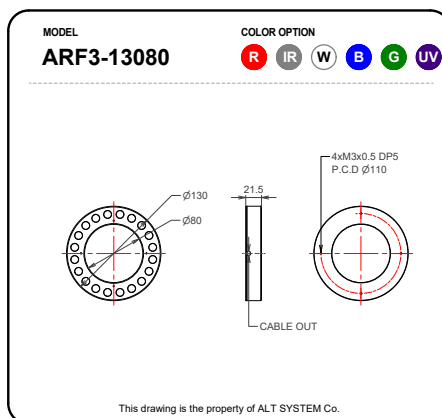
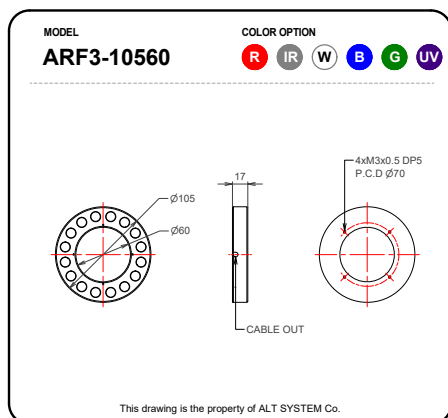
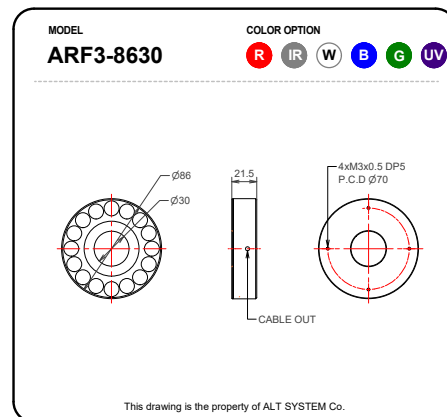
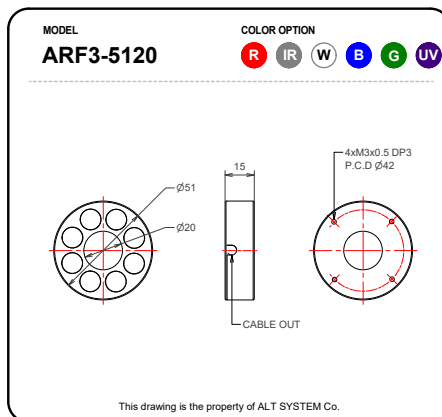
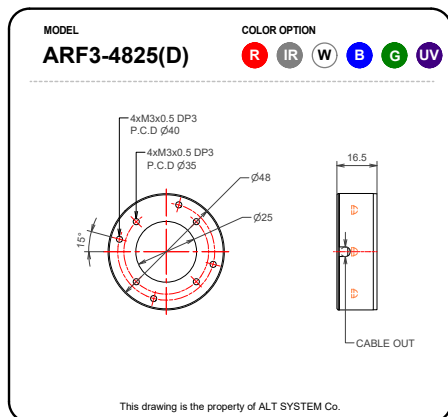
# ARF SERIES



# ARF SERIES



# ARF3 SERIES



ALT  
advanced light technology

DIRECT RING  
LOW ANGLE LIGHTS



APPLICATION

각종 edge 검출, 표면의 찍힘 및 흠집 검사, BGA의 납땜 볼 위치 및 형상, 면적 검사 등

## ARL-LA/ARL-FLA SERIES

모든 각도는 유연한 회로 기판을 사용하여 생성될 수 있습니다.

광학적 특징은 낮은 각도에서 대상체의 중심을 향해 직사광선으로 명확하게 추출할 수 있습니다.

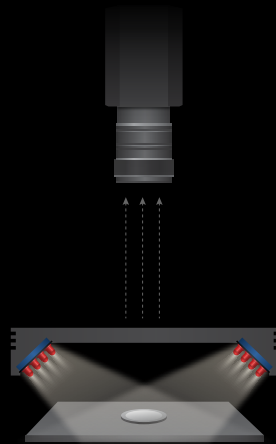
### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES

#### ARL-LA Series

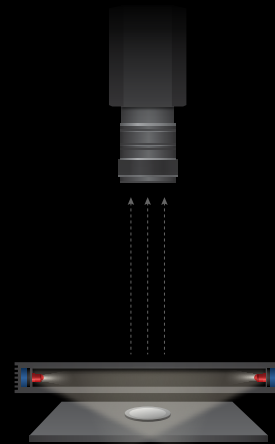
조명이 매우 낮은 각도에서 수평에 가깝게 빛을 조사하여 유리나 같은 광택 및 반사율이 높은 대상물체에서도 영상에 영향을 받지 않고 아주 작은 스크래치, 각인, 요철, 엣지 등을 명확하게 볼 수 있습니다.

#### ARL-FLA Series

초박형 설계로 두께 10mm를 구현함으로써 좁은 공간에서도 대상 물체와의 거리 5~10mm 공간에 설치 가능합니다. 다양한 기판 및 반사율이 높은 대상 물체에서도 이물 및 엣지를 검출 할 수 있습니다.



ARL-LA



ARL-FLA

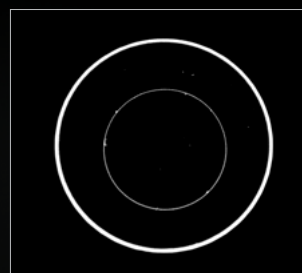
Object Image



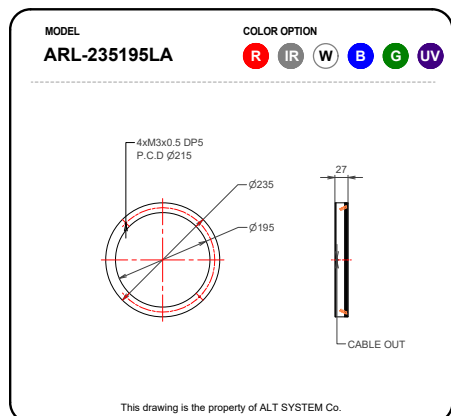
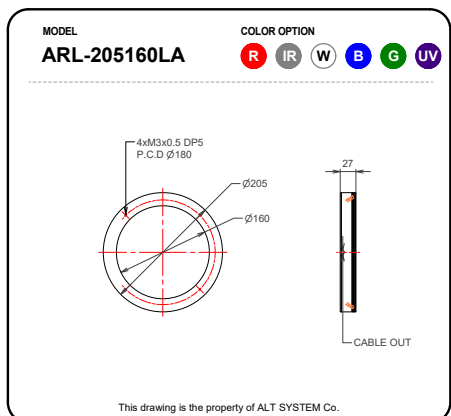
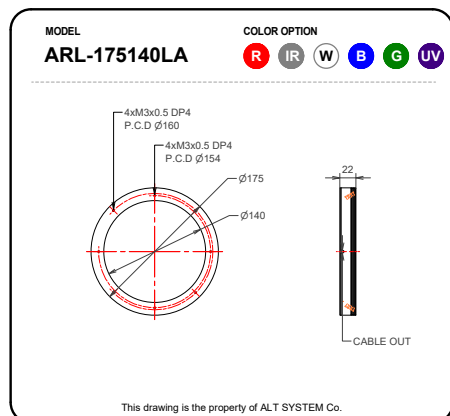
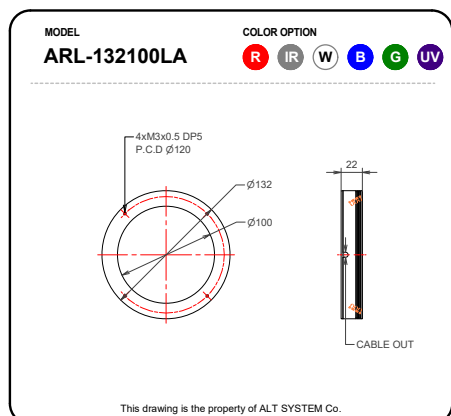
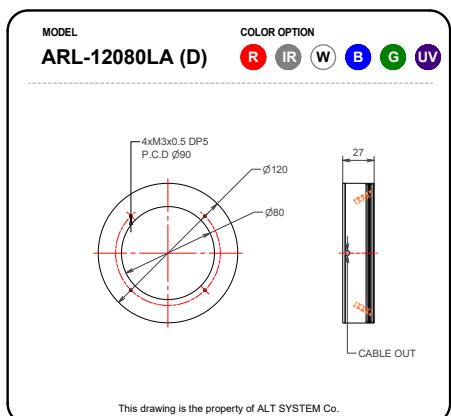
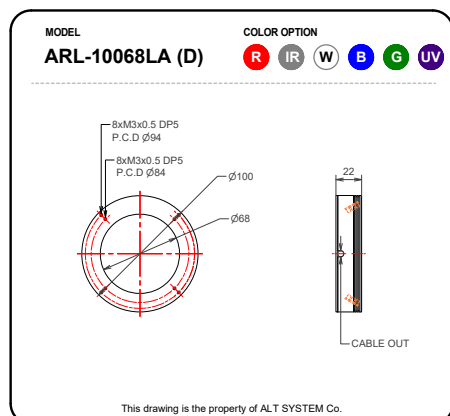
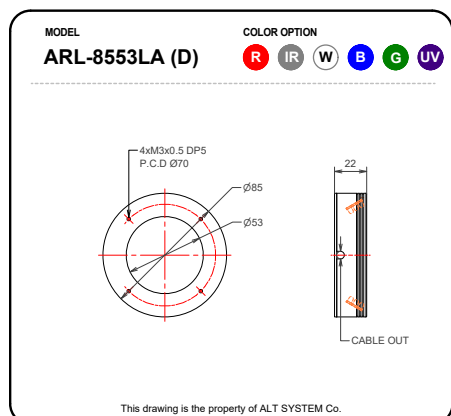
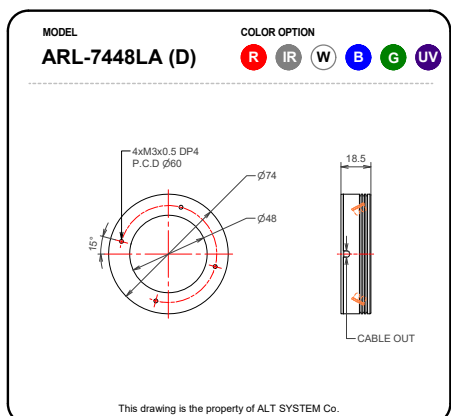
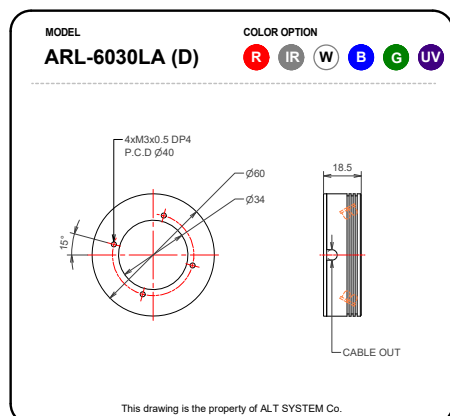
ARL-LA Image



ARL-FLA Image

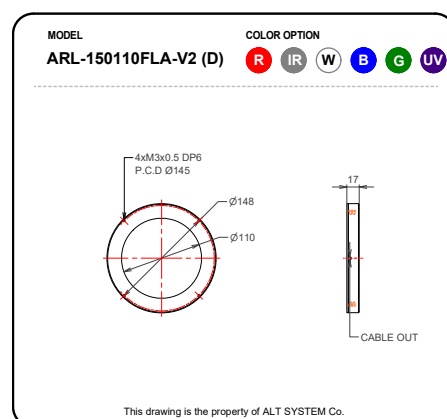
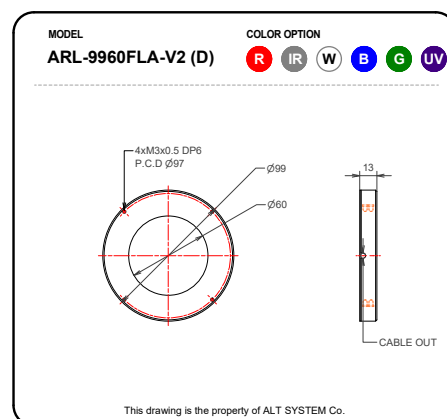
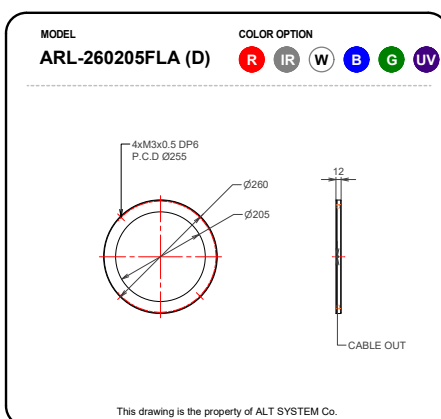
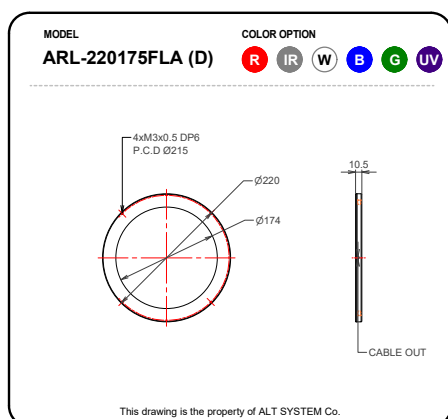
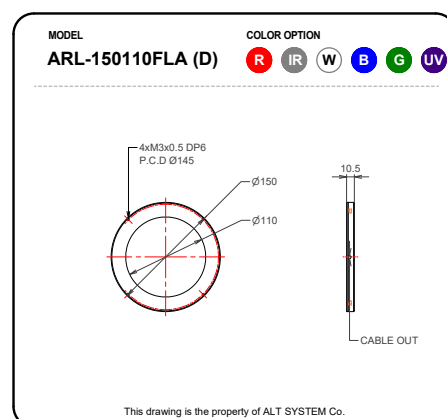
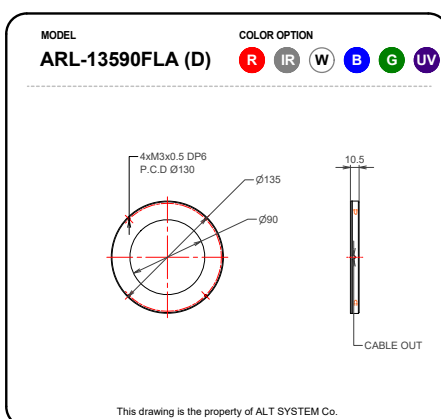
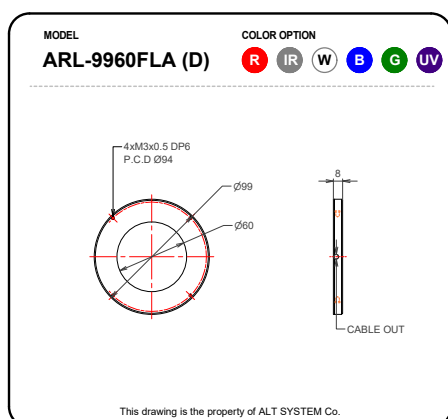
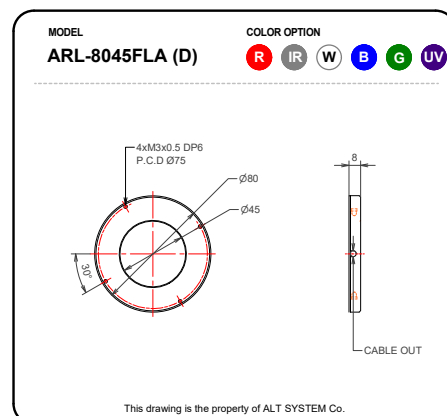
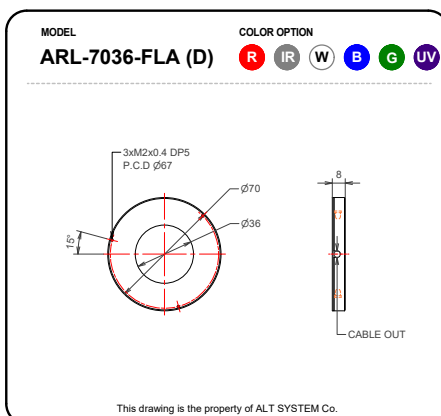
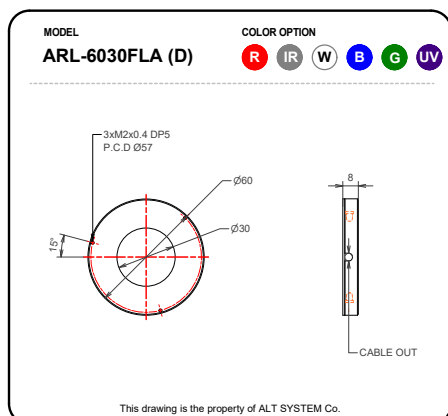


# ARL-LA SERIES





# ARL-FLA SERIES



## D I F F U S E D   M U L T I   A N G L E R I N G   L I G H T S



### A P P L I C A T I O N

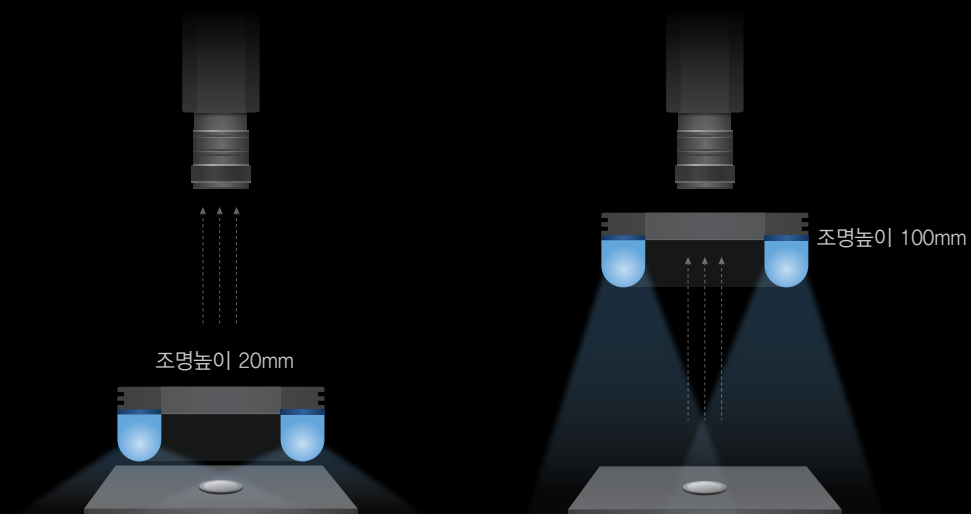
부품검사, 인쇄검사, 문자인식, 외관검사, 각종 edge 검출 등

## ARM SERIES

조명의 높이를 움직이는 것만으로 다양한 최적의 이미지를 얻을 수 있는 복합 기능 조명입니다.  
 독특한 디자인의 확산판으로 180°의 조사 각도를 가지는 복합 조명으로 거리를 떨어뜨려 설치할 경우  
 일반 링조명의 특성을 가지며, 물체에 가까이 설치할 경우, Low Angle의 조명의 특성을 가진 이미지를  
 얻을 수 있습니다.

일반 링 조명과 Low Angle 조명의 특성을 함께 가지고 있는 멀티 조명으로 하나의 조명으로  
 다양한 특성의 이미지를 얻을 수 있습니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



Object Image



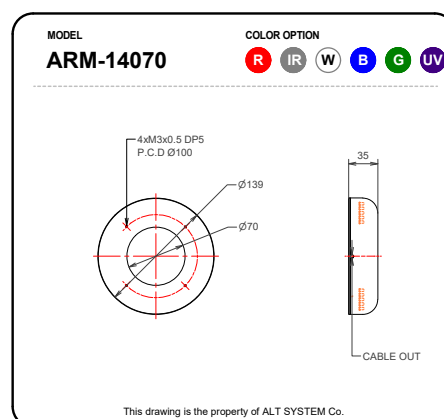
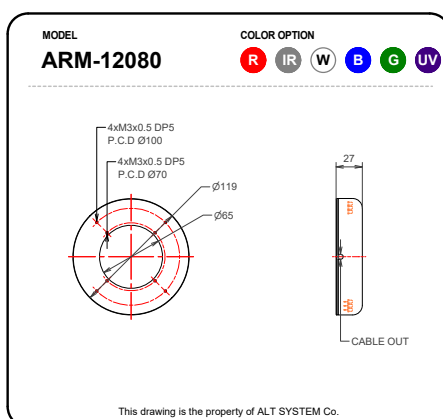
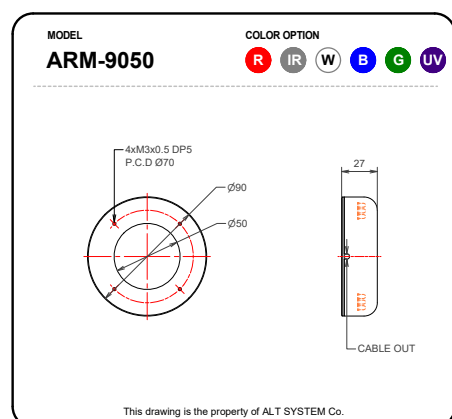
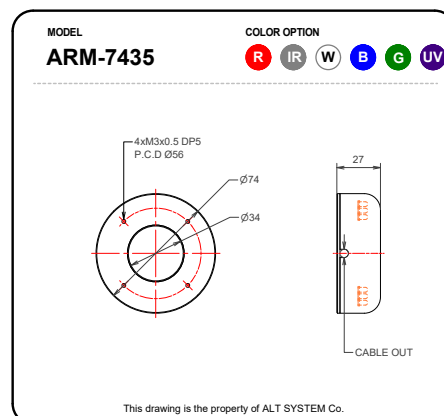
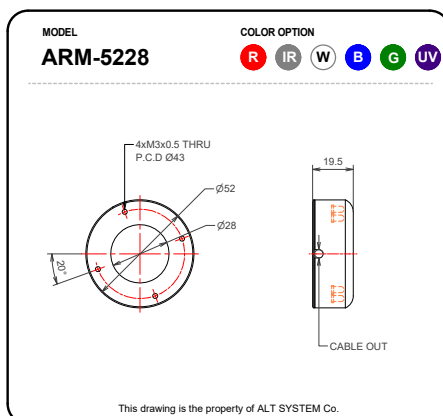
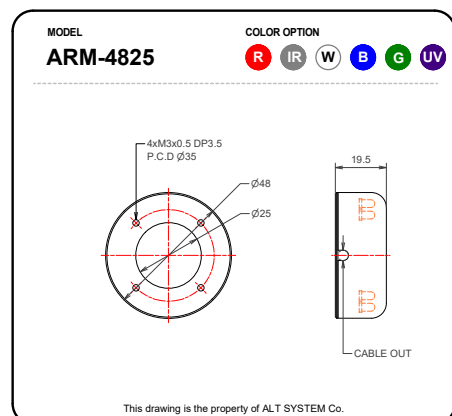
ARM (LWD 20mm)



ARM (LWD 100mm)



# ARM SERIES





SHADOWLESS DIFFUSED  
RING LIGHTS



APPLICATION

각종 형상인식, 금속 제품의 표면검사, 플라스틱 캡 이물검사 등



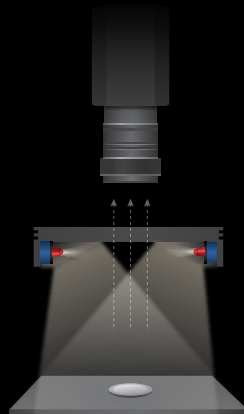
## ADRL/ADRF SERIES

간접조명으로 직접 빛을 비추는 조명에 비해 균일성을 대폭 향상시킨 제품입니다.

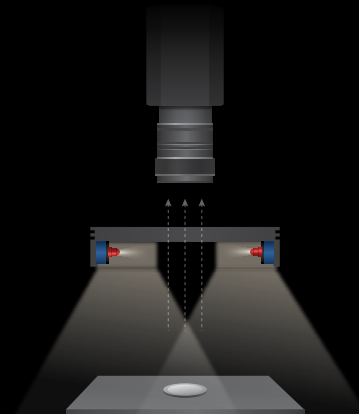
도광확산링 옆 사이드에서 빛을 조사하여 빛을 산란 시킨 후 반사막으로 통해 대상물체를 균일하게 비춤으로써 그림자가 없는 이미지를 얻는데 사용할 수 있습니다.

특수 가공된 도광확산판을 사용하여 대상물체에 매우 균일한 빛을 조사함으로써 경면체의 마킹 뿐 아니라 파손 등도 정확히 확인할 수 있습니다. 간접 확산광을 이용함으로써 반사율이 높은 비닐 등에서 발생할 수 있는 헐레이션(Halation) 억제할 수 있습니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



ADRL



ADRF

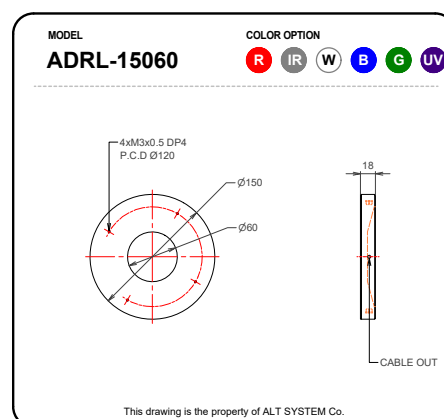
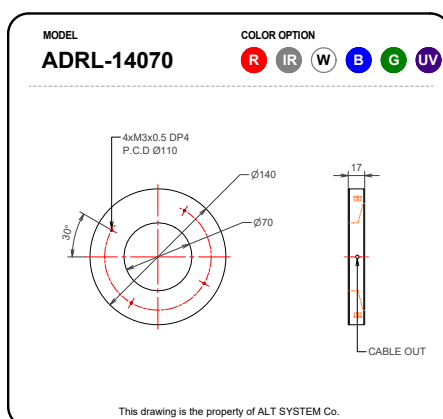
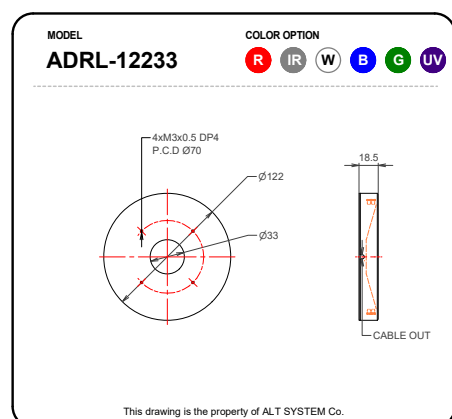
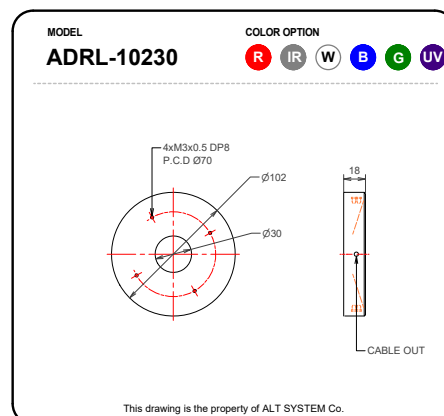
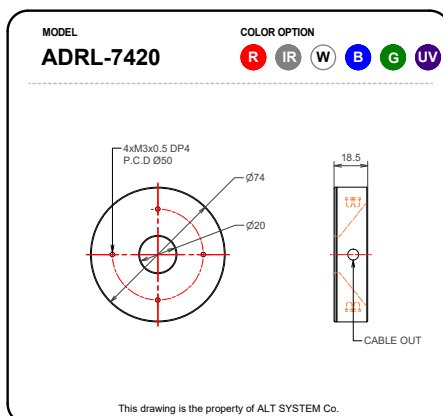
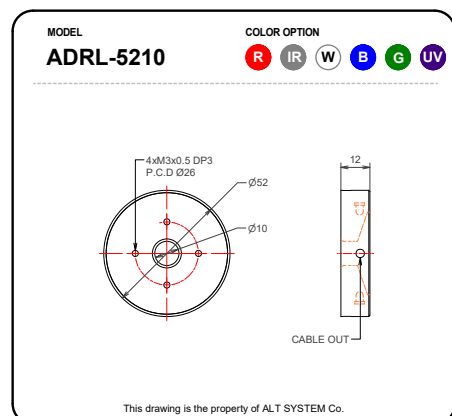
Object Image



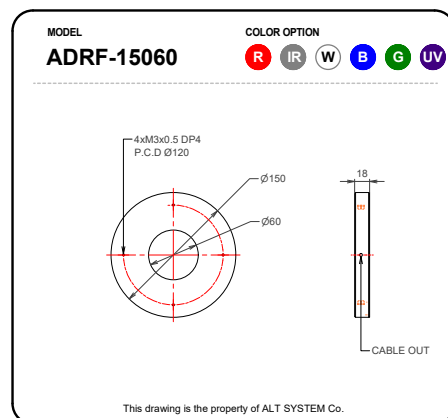
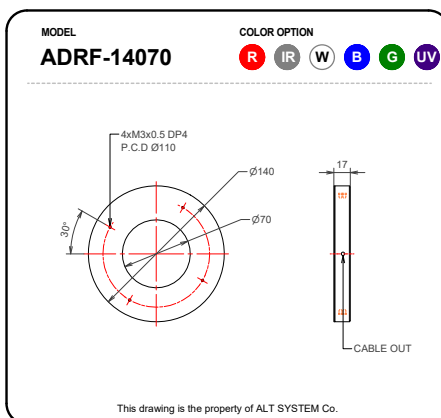
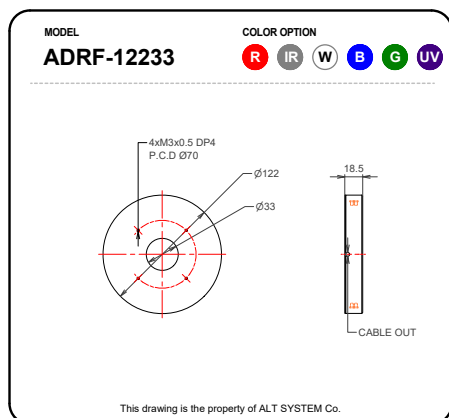
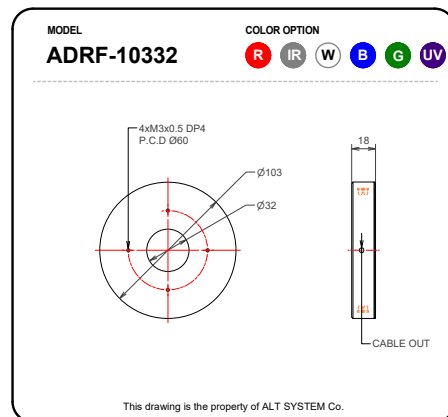
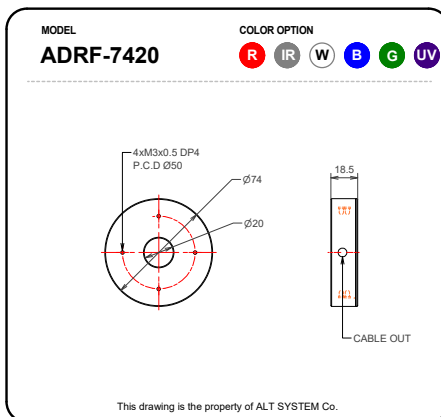
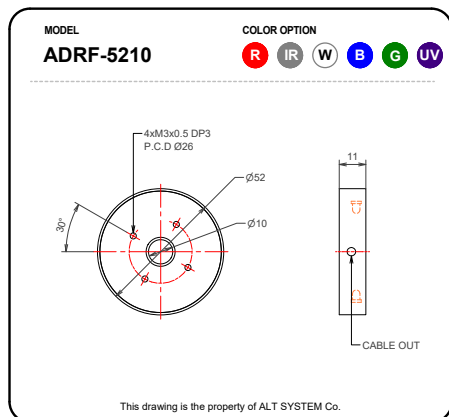
ADRL Image



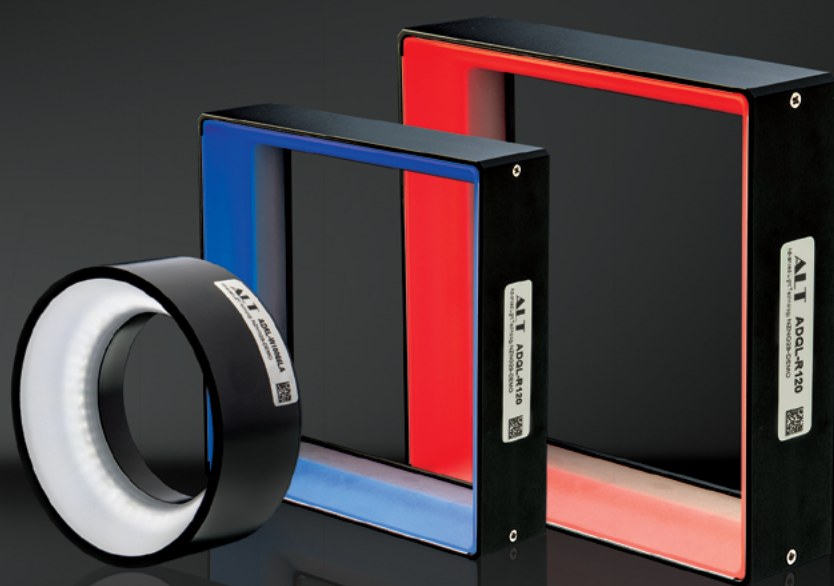
# ADRL SERIES



# ADRF SERIES



SHADOWLESS DIFFUSED  
LOW ANGLE LIGHTS



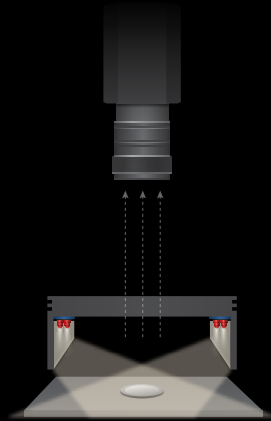
APPLICATION

경면 제품의 엣지 검사, IC 날인 검사, BGA, QFP 검사 등

## ADRL-LA/ADQL SERIES

원형과 사각의 Low Angle 간접 조명으로 도광확산링을 통해 부드러운 빛을 낮은 각도로  
균일하게 조사함으로써 LED 광원의 모양이 노출되지 않고 그림자를 억제하며 문자와 크랙을 검사할 수 있습니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



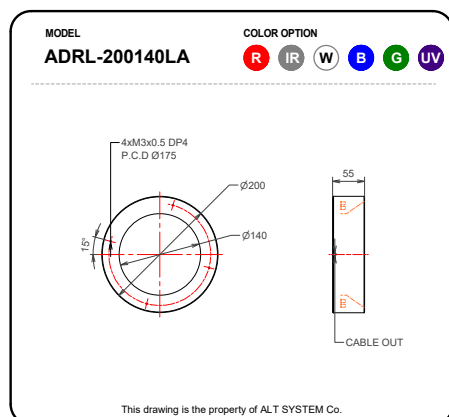
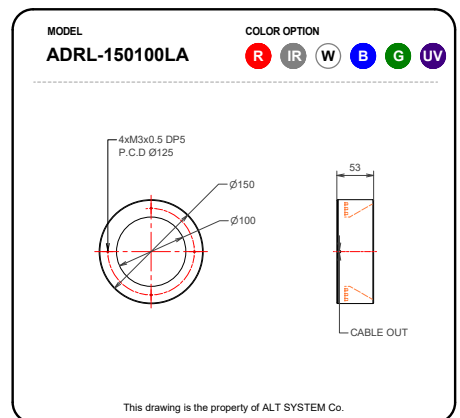
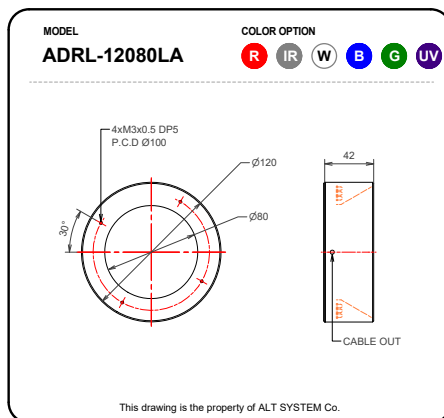
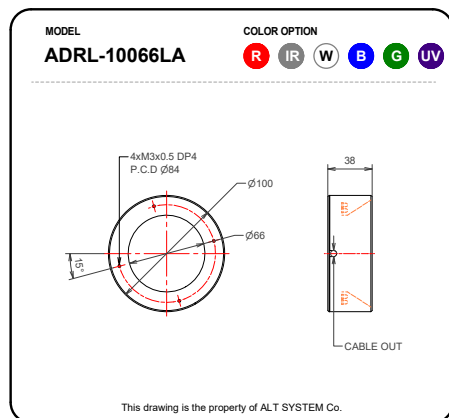
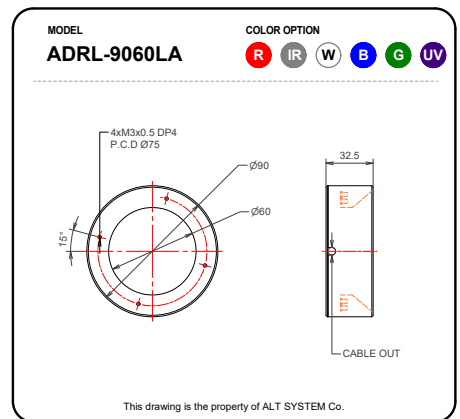
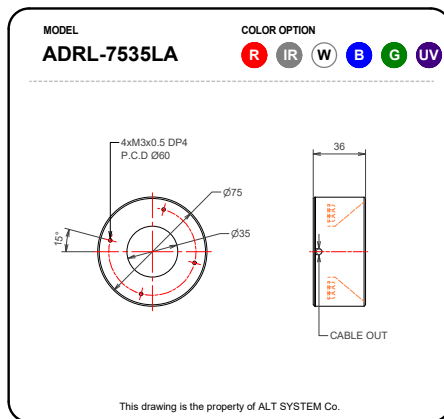
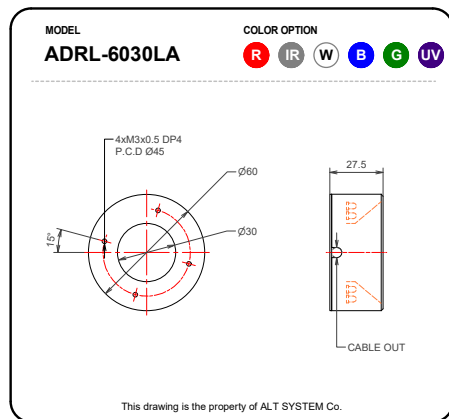
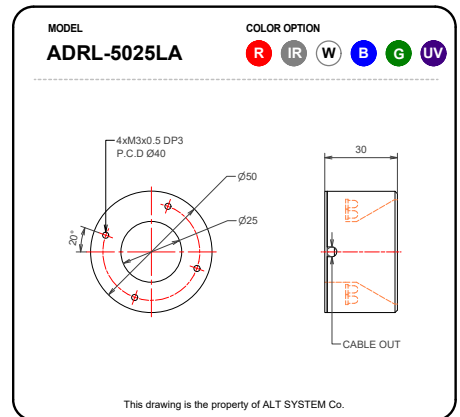
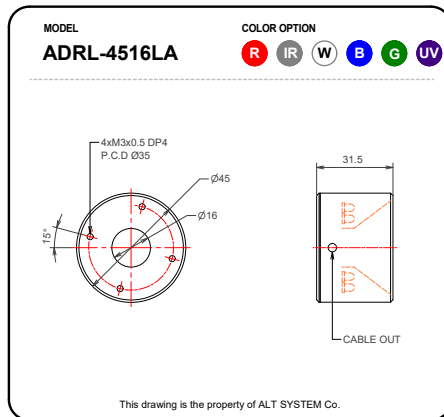
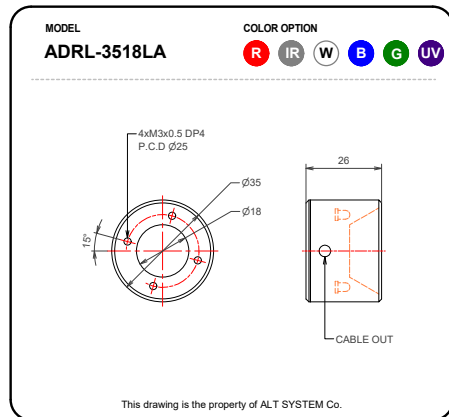
Object Image



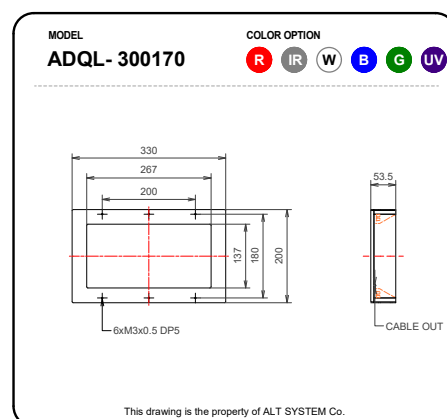
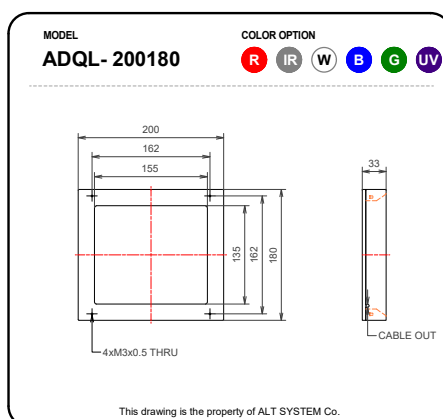
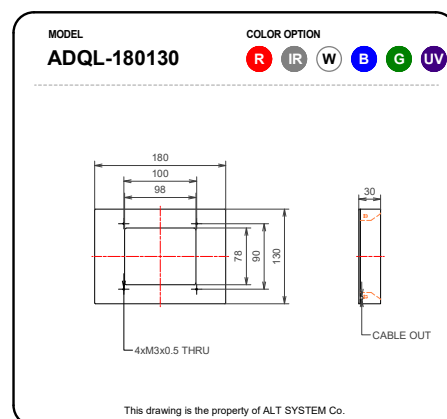
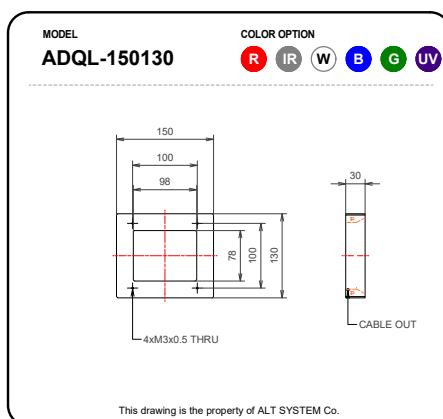
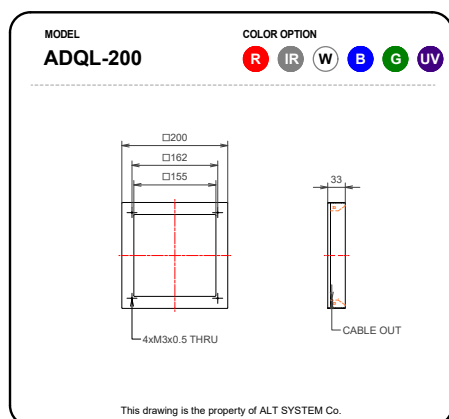
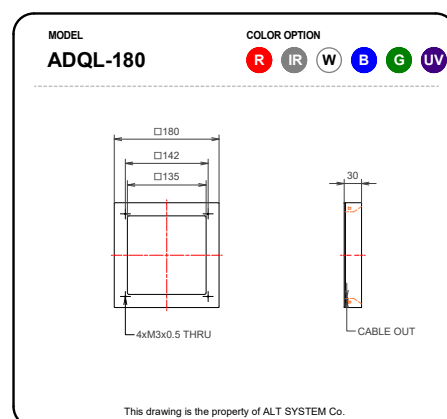
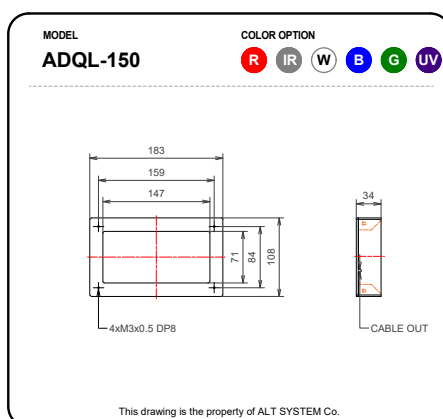
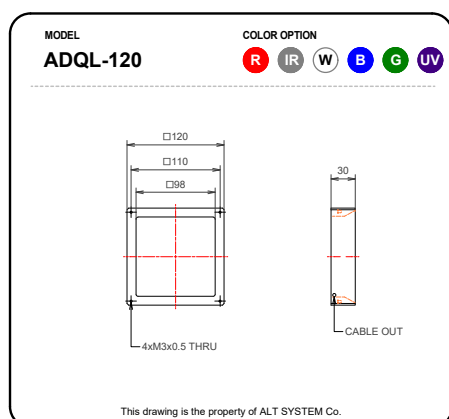
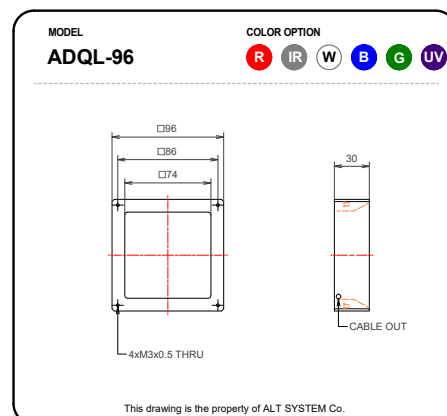
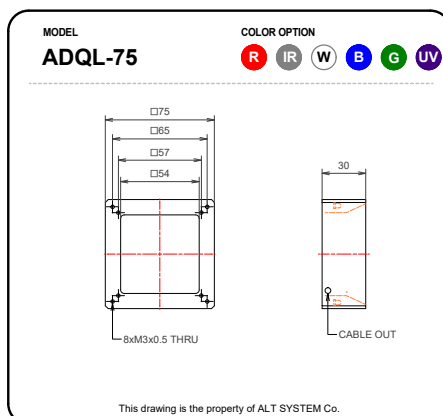
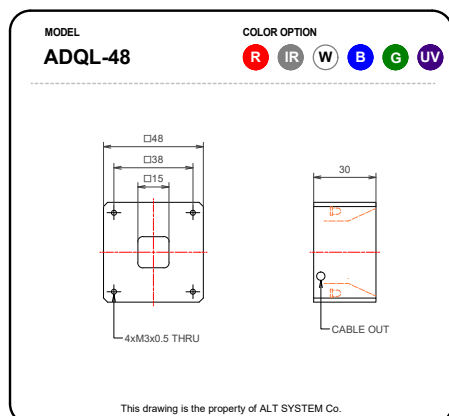
ADRL-LA Image



# ADRL-LA SERIES



# ADQL SERIES





SHADOWLESS DIFFUSED RING LIGHTS

# ADQL-F SERIES

MODEL

ADQL-48F

COLOR OPTION

R

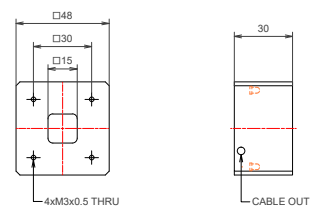
IR

W

B

G

UV



This drawing is the property of ALT SYSTEM Co.

MODEL

ADQL-75F

COLOR OPTION

R

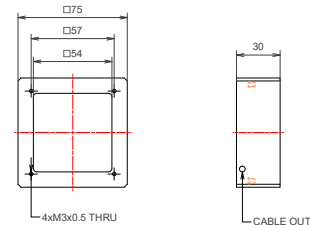
IR

W

B

G

UV



This drawing is the property of ALT SYSTEM Co.

MODEL

ADQL-90F

COLOR OPTION

R

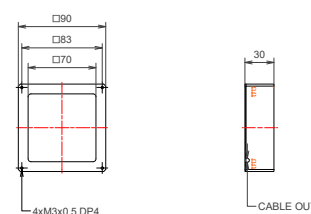
IR

W

B

G

UV



This drawing is the property of ALT SYSTEM Co.

MODEL

ADQL-120F

COLOR OPTION

R

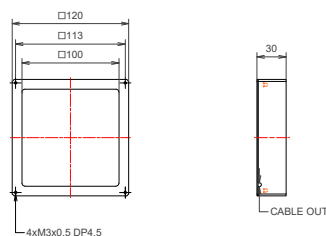
IR

W

B

G

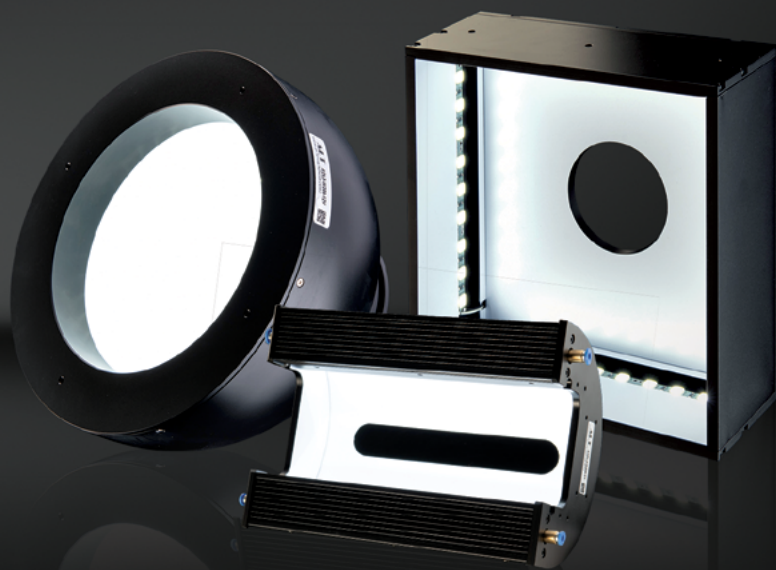
UV



This drawing is the property of ALT SYSTEM Co.



S H A D O W L E S S  
D O M E L I G H T S



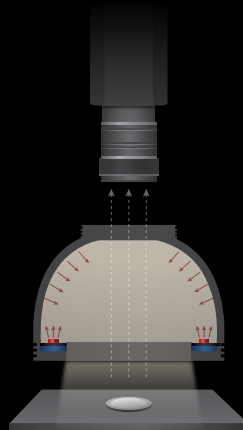
A P P L I C A T I O N

유리 등 경면체의 문자 검사, 곡면 또는 굴곡진 표면의 검사 등

## ADL SERIES

반구 형상의 돔 내부에 빛을 조사하여 반사되는 부드럽고 균일한 빛을 방출하는 조명입니다.  
곡면에 반사된 빛이 여러 각도의 방향성을 가져 부드럽고 그림자 없는 이미지를 얻을 수 있습니다.  
곡면 위나 돌출된 대상물과 반사율이 높은 물체의 검사에 매우 유용합니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



Object Image



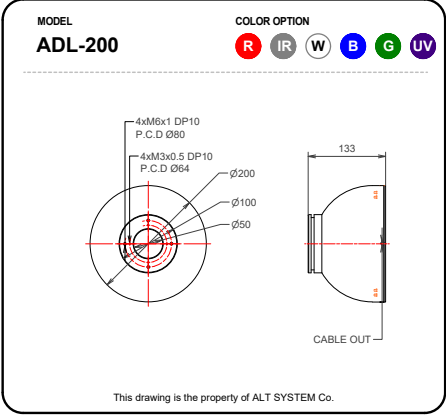
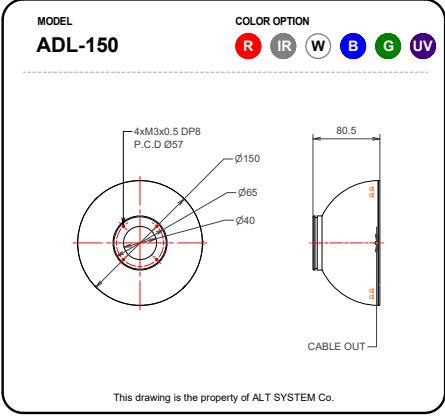
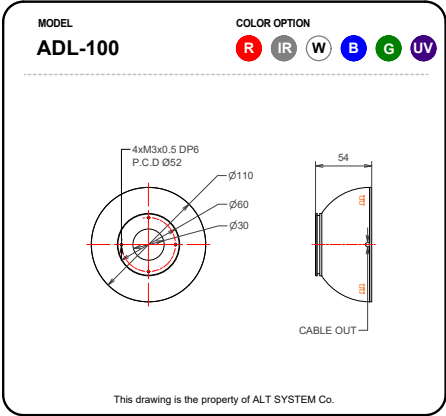
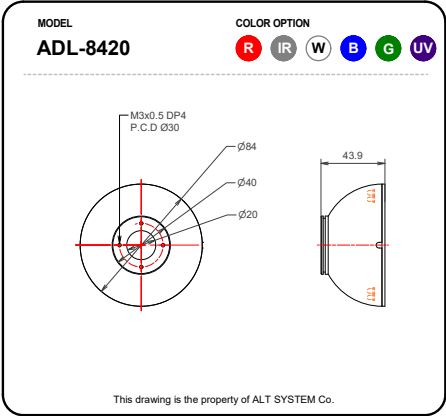
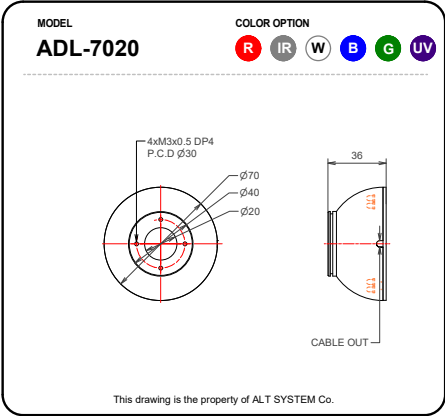
ARF Image



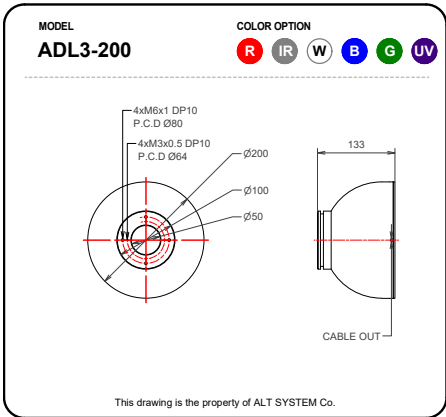
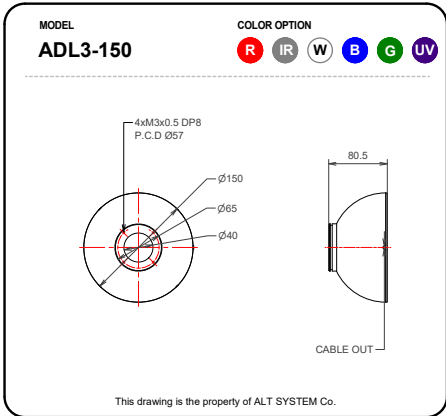
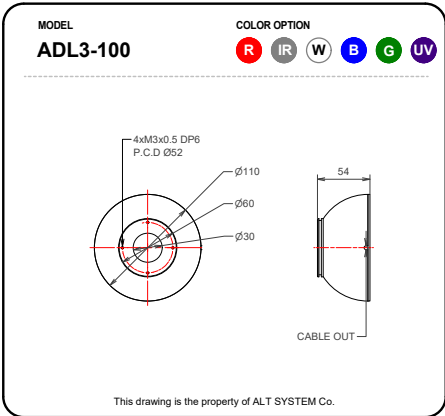
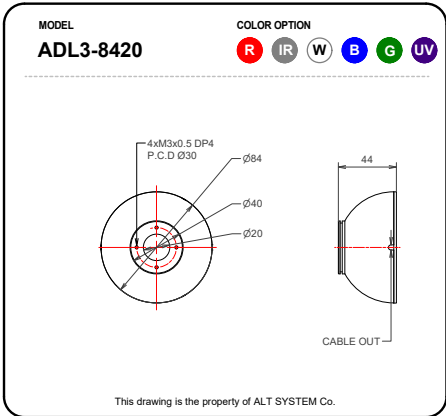
ADL Image



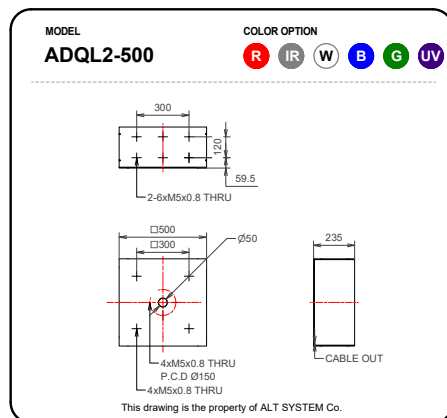
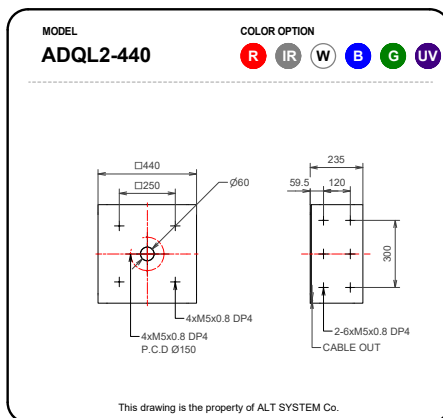
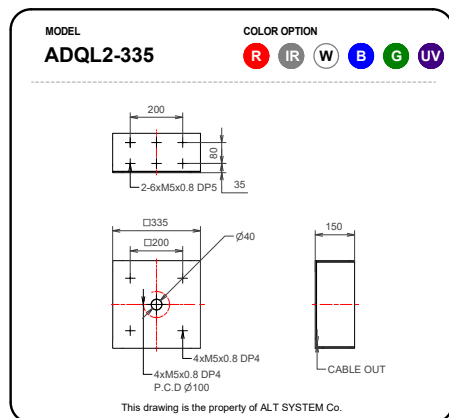
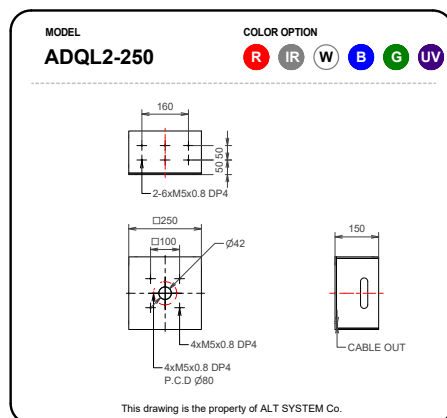
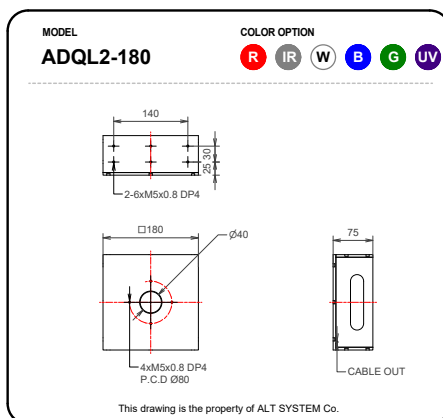
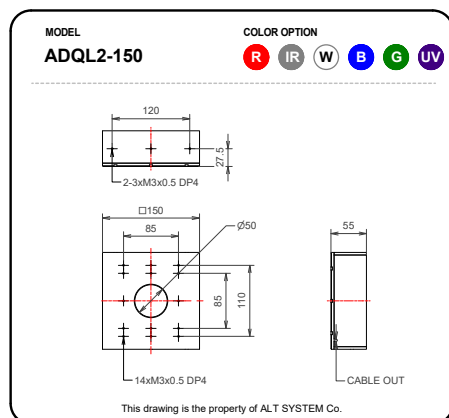
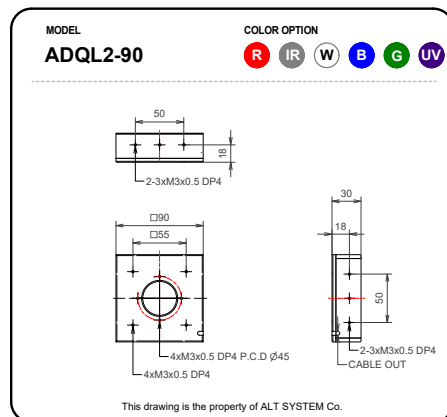
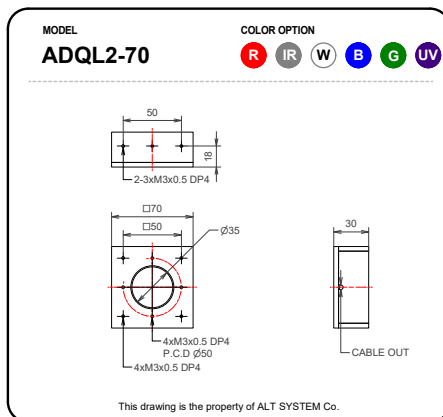
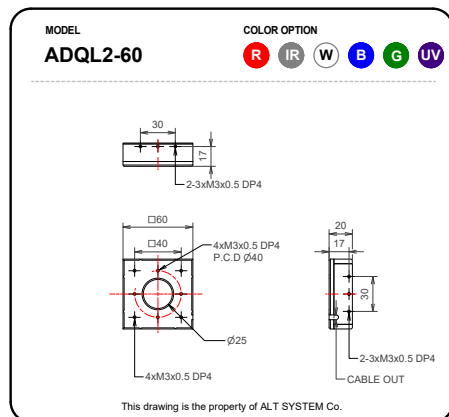
ADL SERIES



# ADL3 SERIES

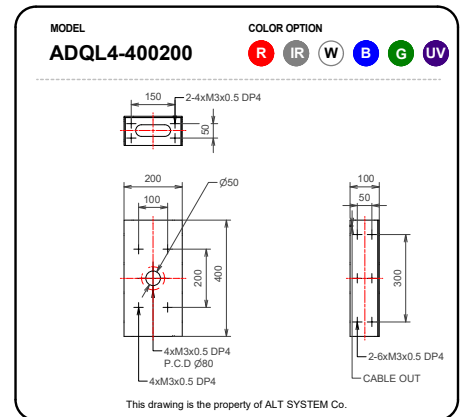
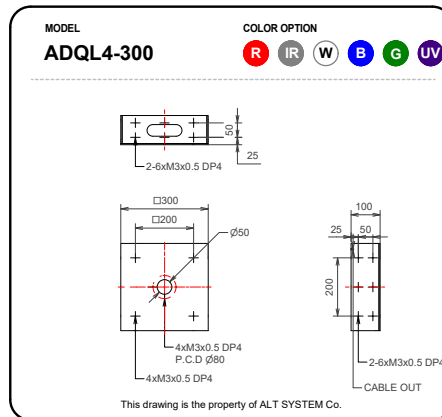
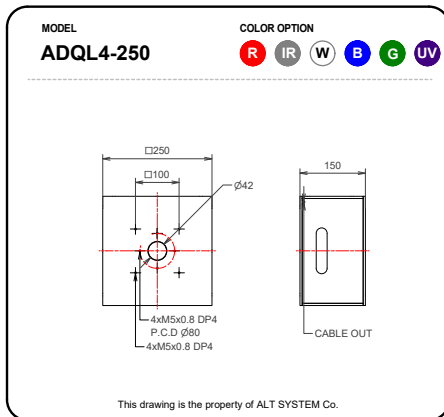


# ADQL2 SERIES





# ADQL4 SERIES



ALT

advanced light technology

M U L T I - A N G L E  
D I R E C T   L I G H T S



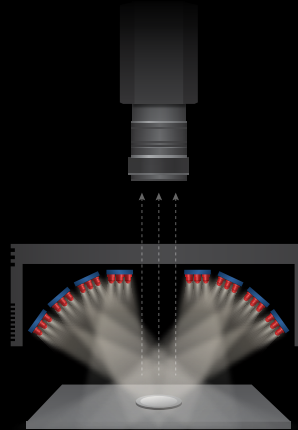
A P P L I C A T I O N

표면스크레치 검사, 라인스캔 돔 조명, 알루미늄 용접 검사, 굴곡있는 제품의 검사를 단일 조명으로  
여러 파장과 다양한 각도의 광학 구성이 필요한 경우

## AML SERIES

반구 형상의 돔 형태 조명으로 Flexible 기판을 사용하여 LED 광원이 대상물체에 직접 조사하도록 설계되어 그림자 없는 영상을 얻을 수 있습니다. 채널 별로 분리도 가능하여 각도에 따라 다른 파장대를 혼합하여 다양한 형태의 검사가 가능한 복합조명으로도 사용 가능합니다.

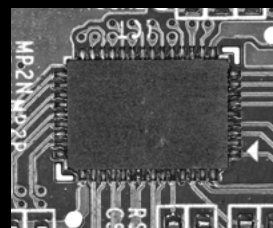
### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



Object Image



AML-ARL Image



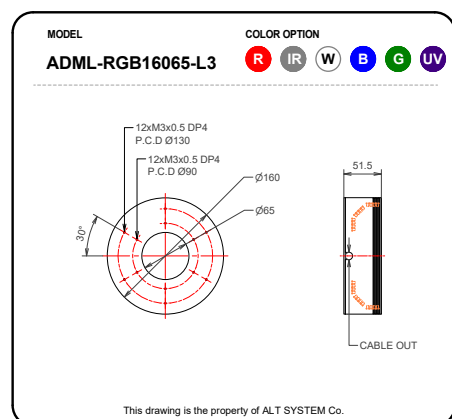
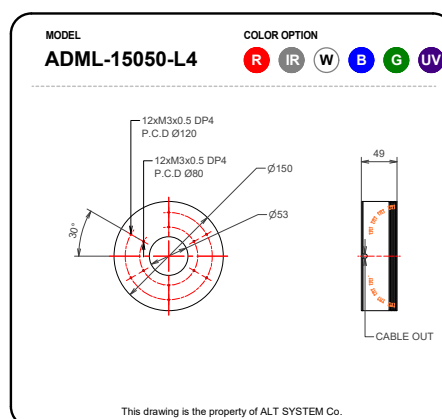
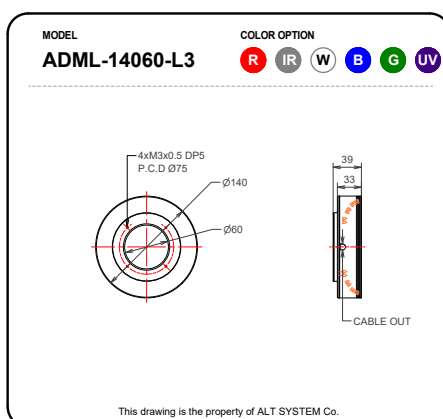
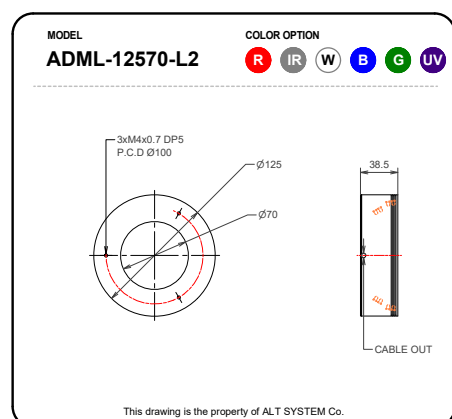
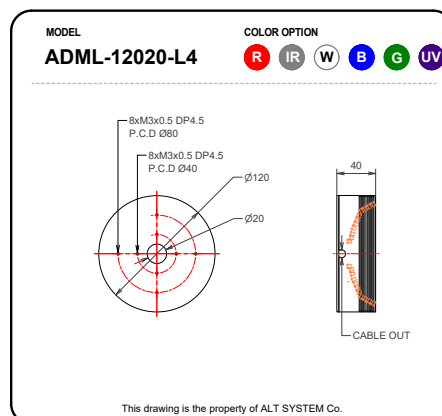
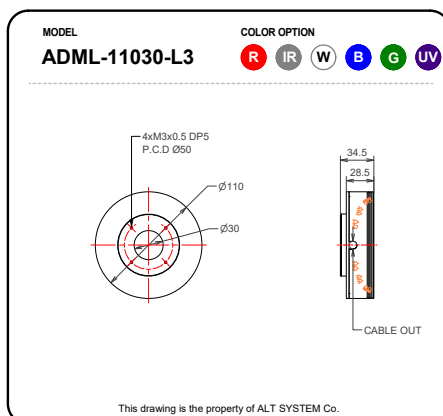
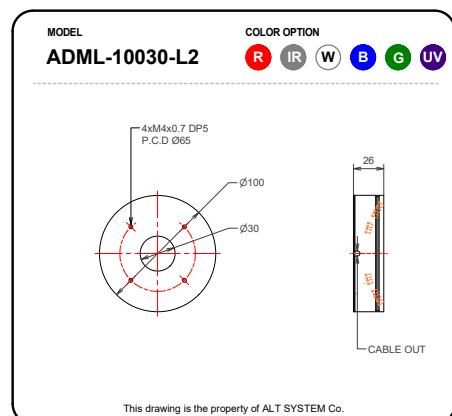
AML-LA Image

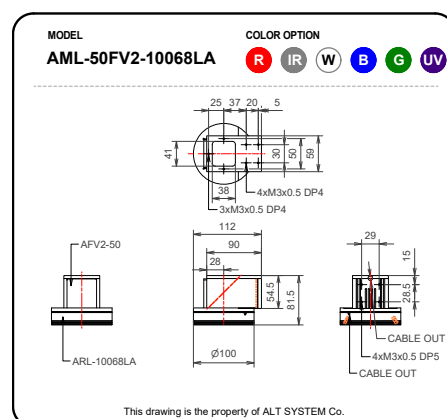


AML-FLA Image



# ADML SERIES





## DIRECT BAR LIGHTS



## APPLICATION

형상인식, 크랙검사, 부품검사, OCR, 치수측정 등

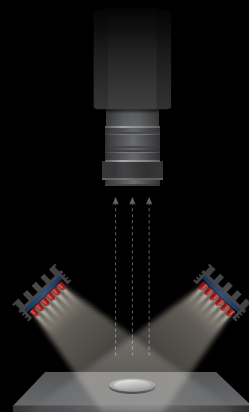


## ABL/AQL SERIES

Bar type 조명으로 취부 시 조명의 각도를 마음대로 설치할 수 있어 광범위한 용도로 사용되는 조명입니다. 특히 사각의 하우징을 이용한 AQL Series는 4면에 바조명을 설치함으로써 용도에 따라 각기 원하는 각도 또는 동일 각도로 설치하여 다양한 이미지를 얻을 수 있습니다.

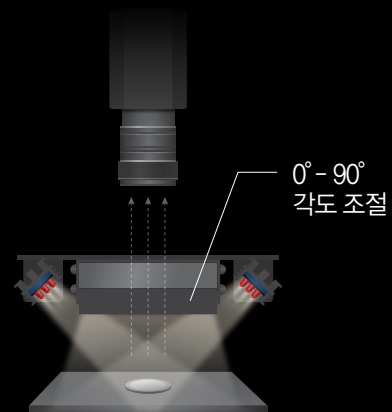
알루미늄과 효과적인 방열 구조로 제품의 수명을 극대화 하였으며, AQL Series는 4면의 바조명을 각기 움직일 수 있을 뿐 아니라 광량의 제어도 선택에 따라 개별 혹은 동시에 제어 할 수 있습니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



ABL

Object Image



AQL

AQL Image



# ABL5 SERIES

**MODEL**  
**ABL5-4020(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-5020(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-6020(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-6620(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-7020(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-8020(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-8820(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-10020(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-11320(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-13820(D)**

**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

**MODEL**  
**ABL5-16020(D)**

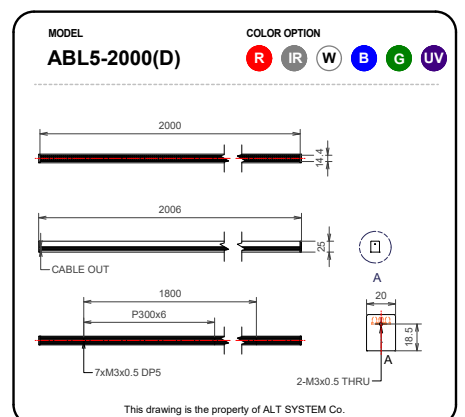
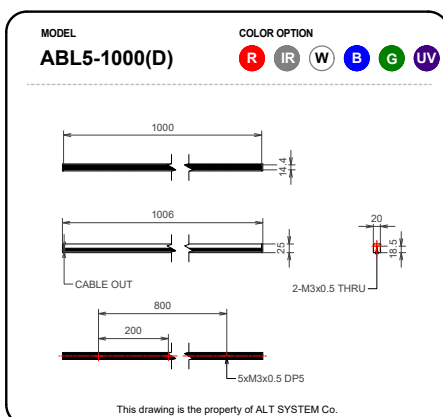
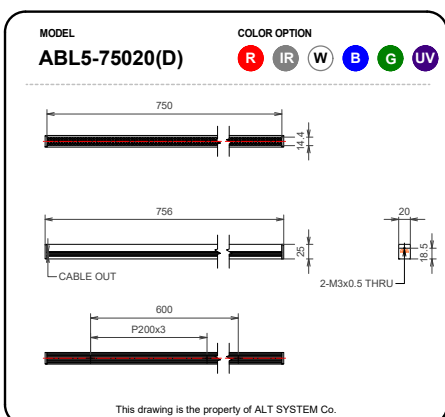
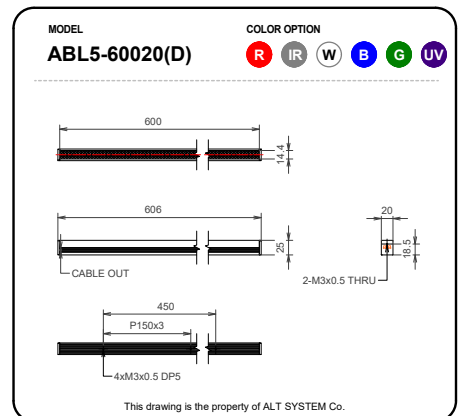
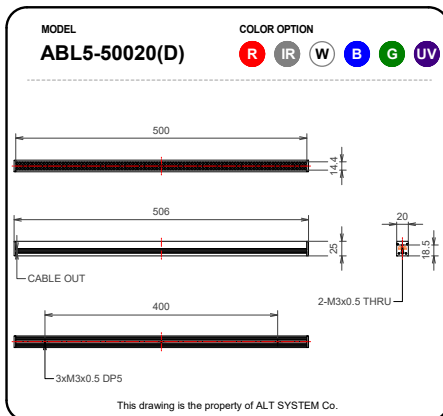
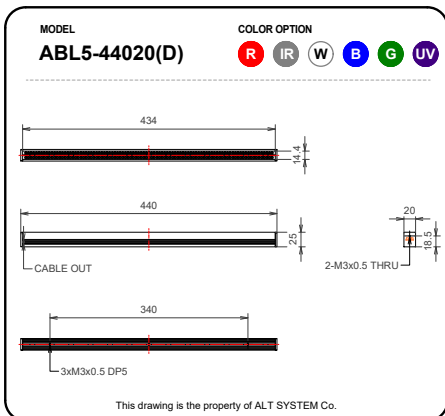
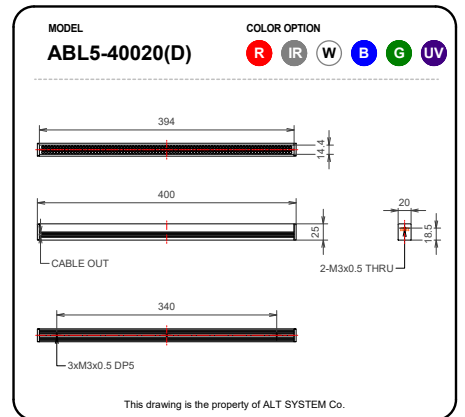
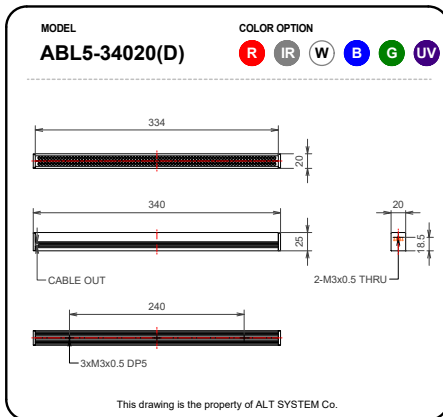
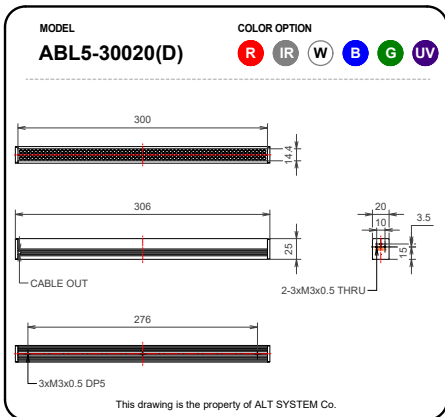
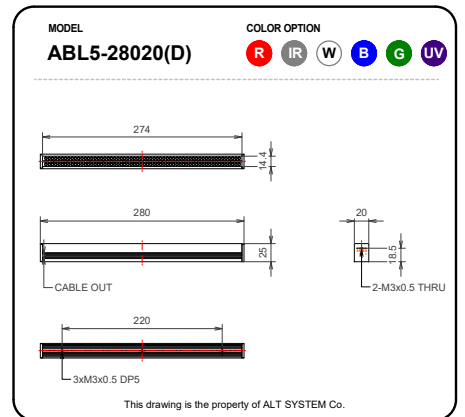
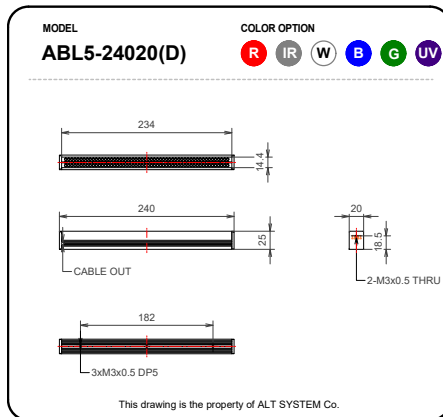
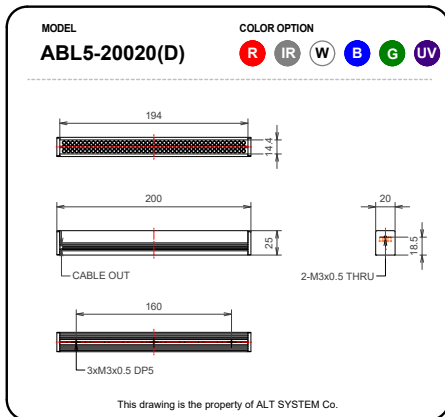
**COLOR OPTION**  
R IR W B G UV

This drawing is the property of ALT SYSTEM Co.

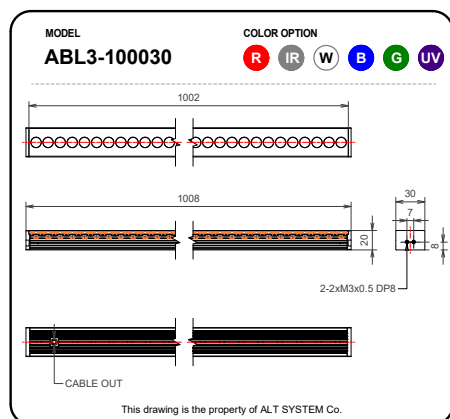
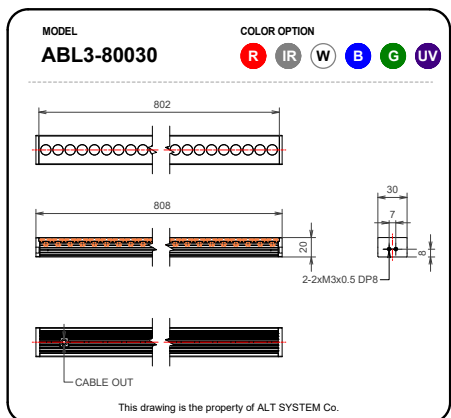
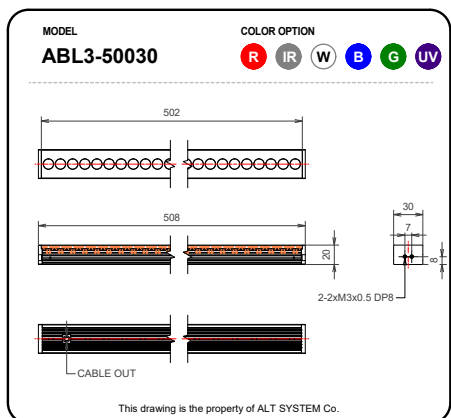
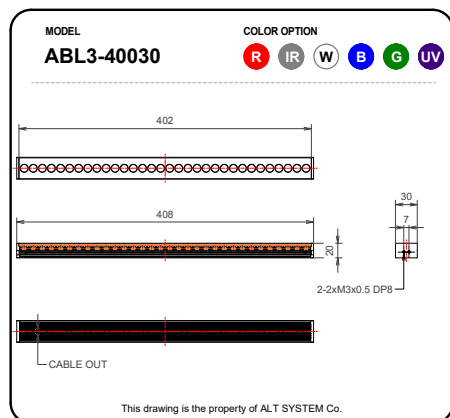
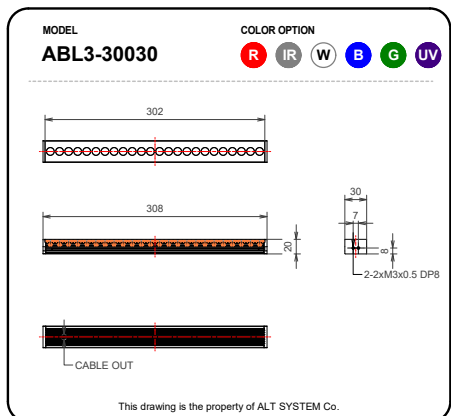
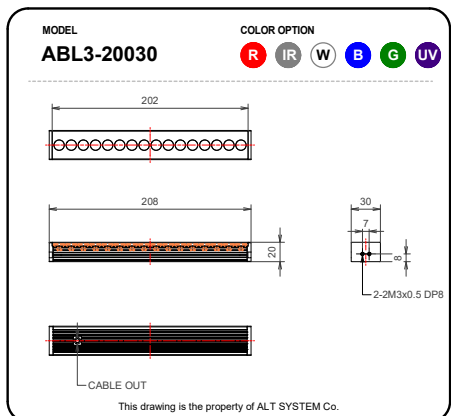
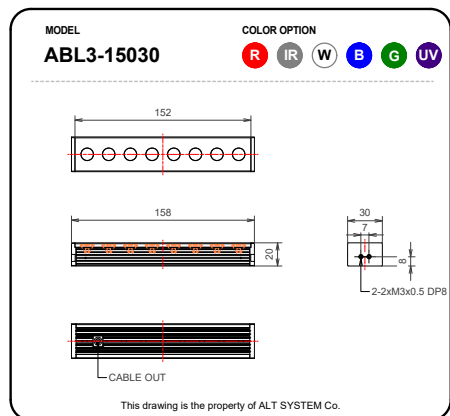
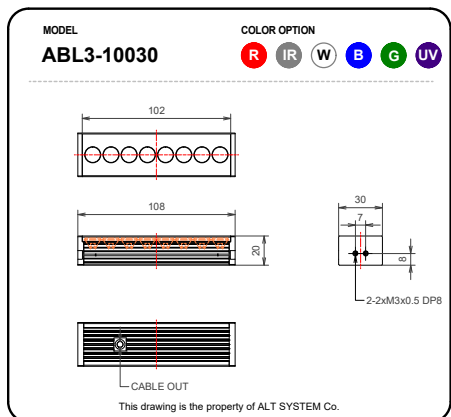
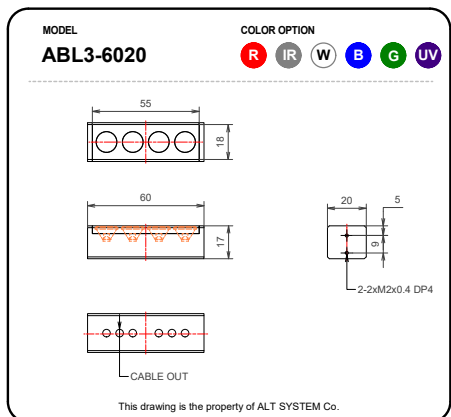
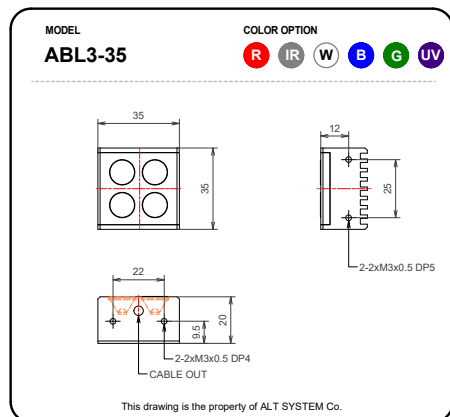
**MODEL**  
**ABL5-18020(D)**

**COLOR OPTION**  
R IR W B G UV

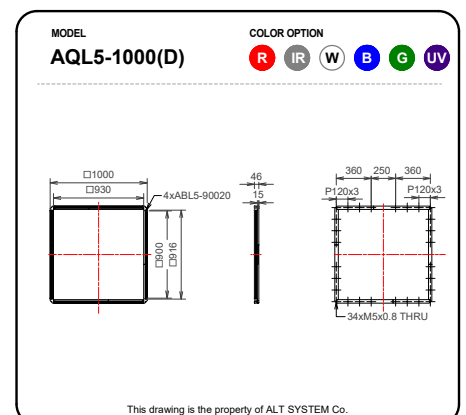
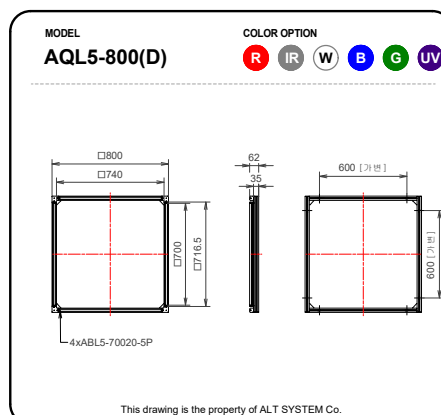
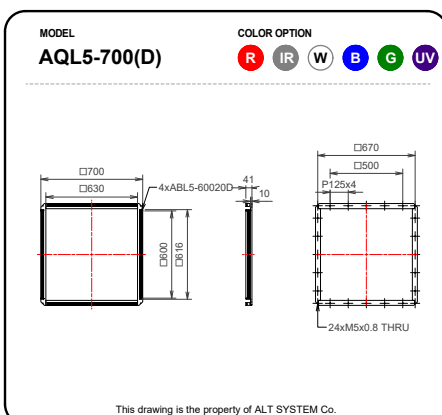
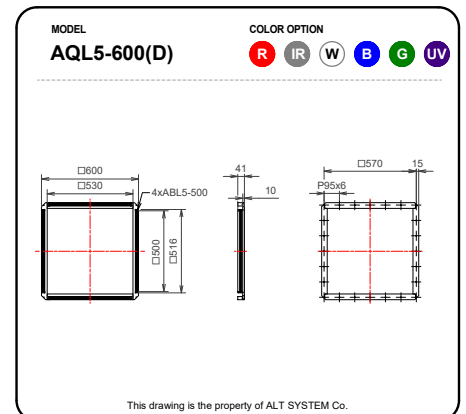
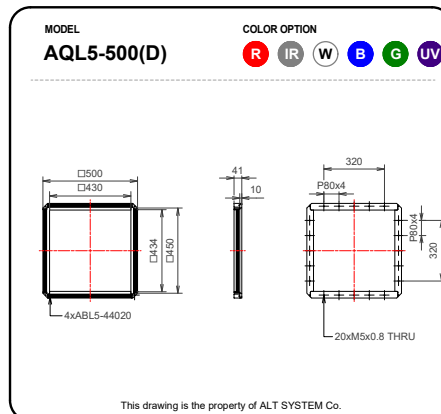
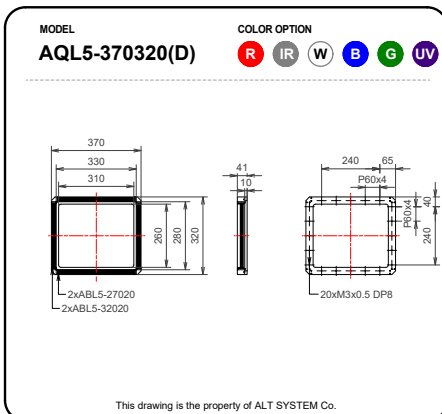
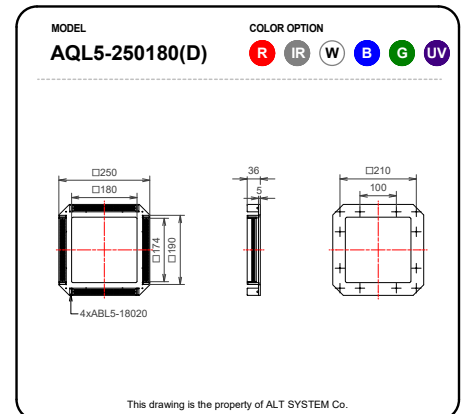
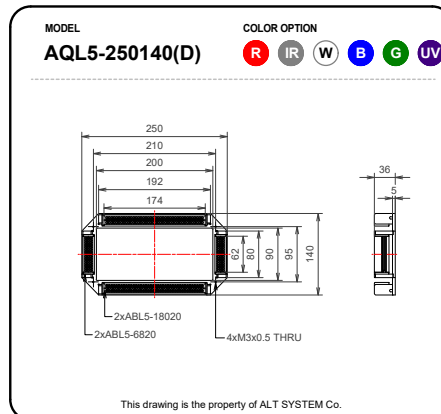
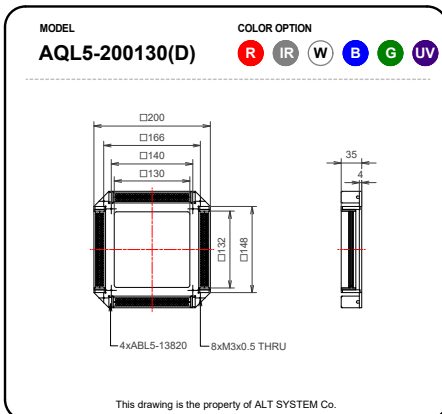
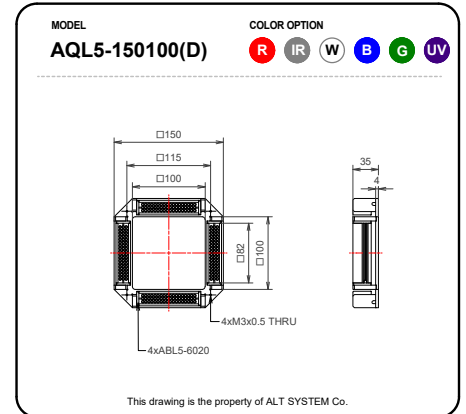
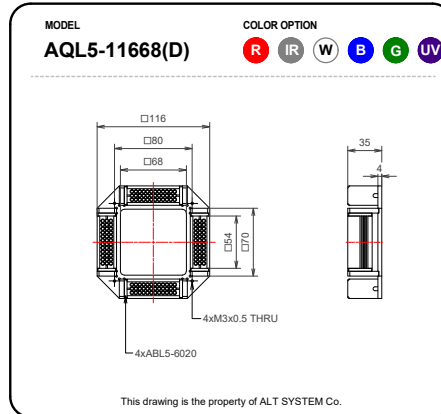
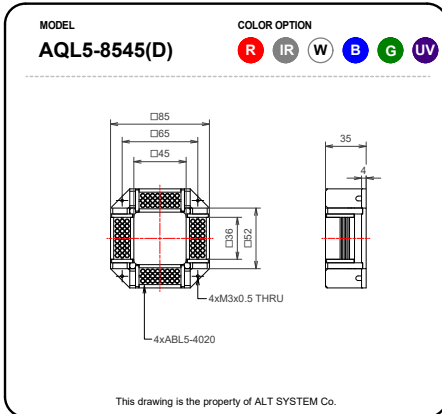
This drawing is the property of ALT SYSTEM Co.



# ABL3 SERIES

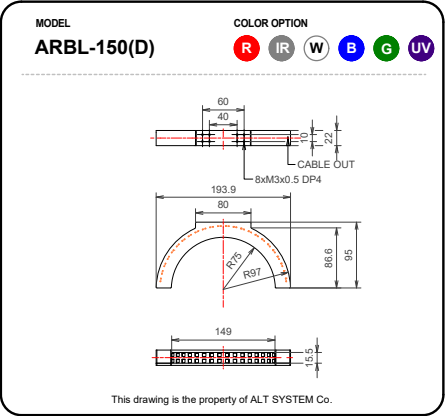
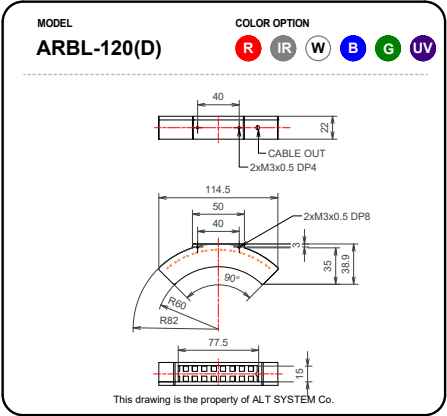


# AQL5 SERIES



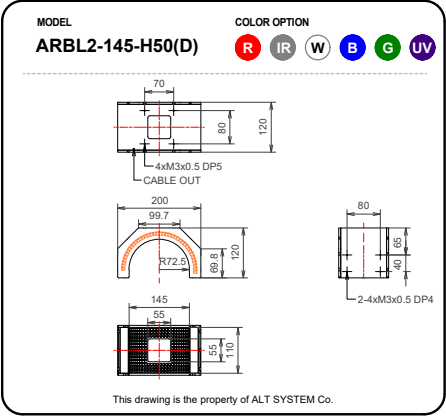
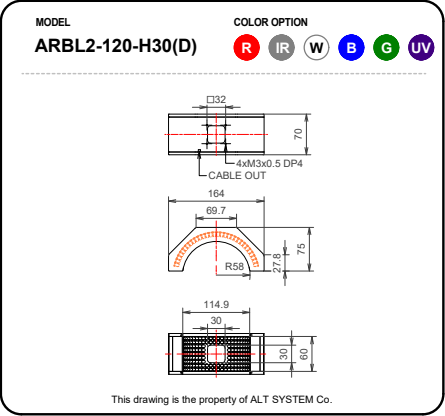
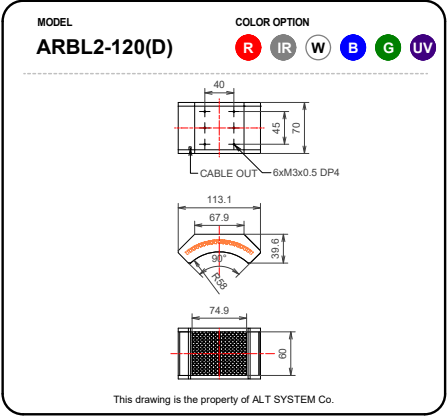
DIRECT BAR LIGHTS

# ARBL SERIES



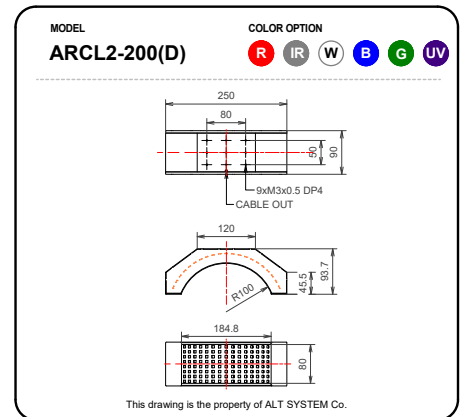
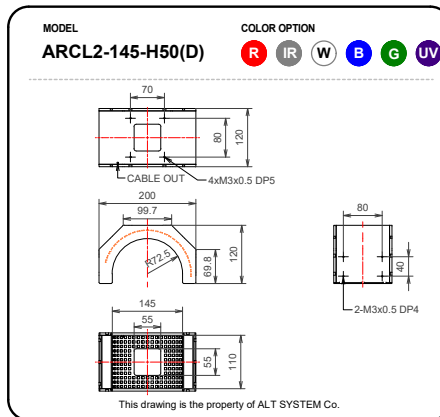
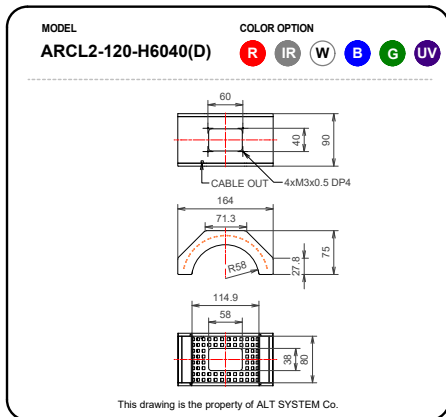
DIRECT BAR LIGHTS

# ARBL2 SERIES





# ARCL2 SERIES



**ALT**  
advanced light technology

## COAXIAL BOX LIGHTS



## APPLICATION

형상인식, 크랙검사, 부품검사, OCR, 치수측정 등

## AFV/AFV2 SERIES

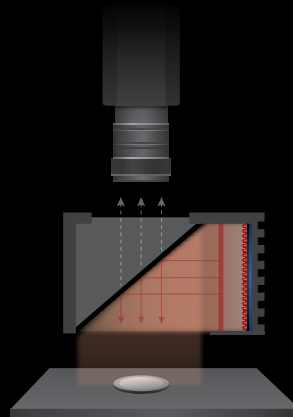
렌즈의 시야각과 조명의 입사각이 일치하는 조명입니다.

면상에 배열된 LED의 빛은 확산판을 통해 균일하게 조사되어 Water 등 반사율이 좋은 제품의 검사에 적합합니다.

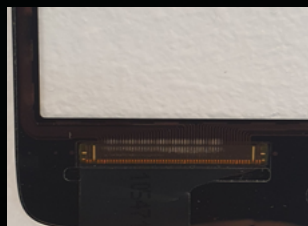
무반사코팅된 특수 하프미러를 사용하여 잔상을 억제하였으며, 선택에 따라 무반사 코팅 처리된

광학 커버를 설치하여 먼지 등 이물의 유입을 방지할 수 있습니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



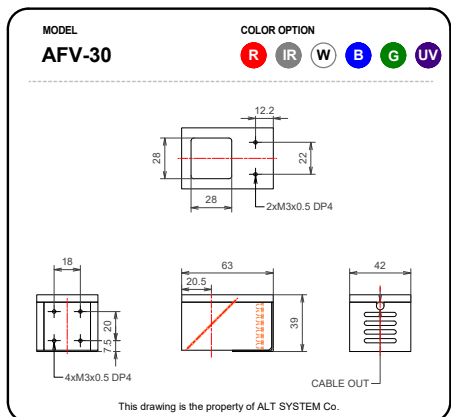
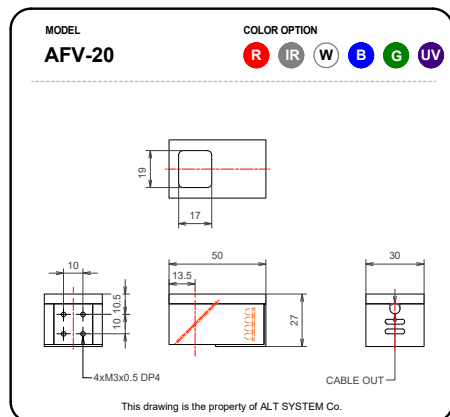
Object Image



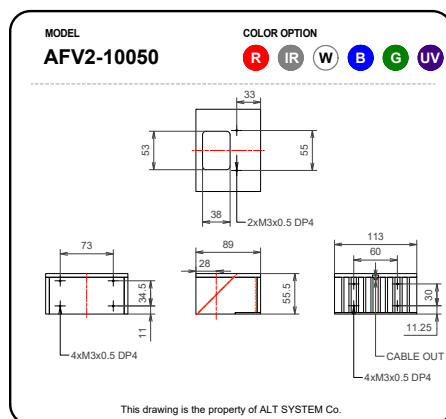
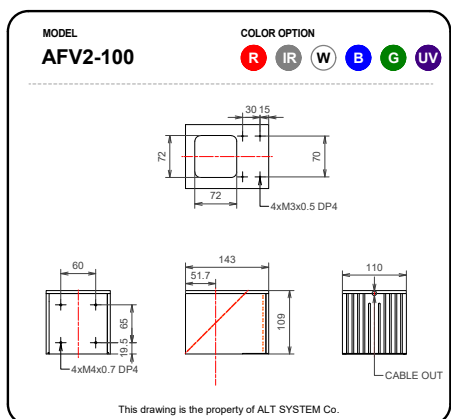
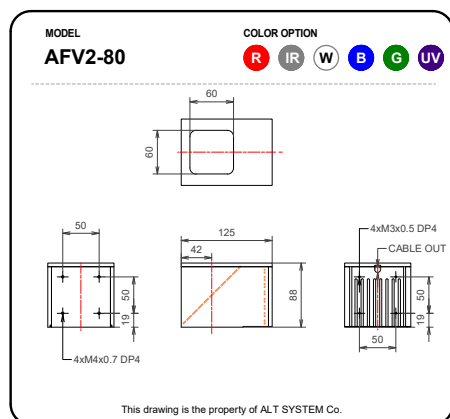
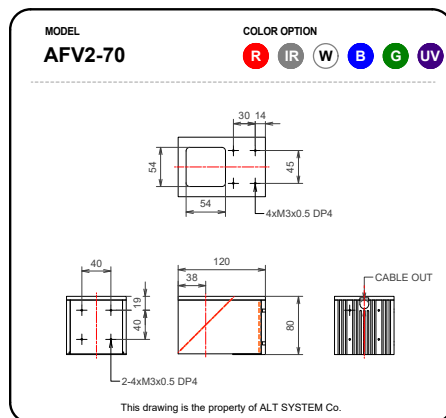
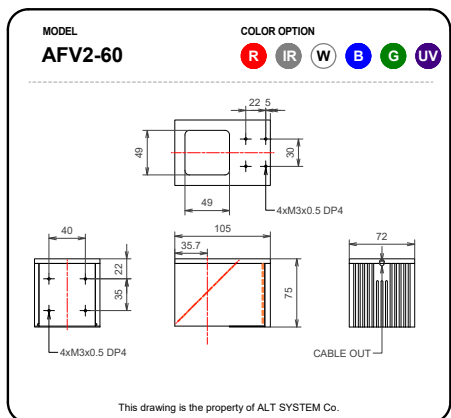
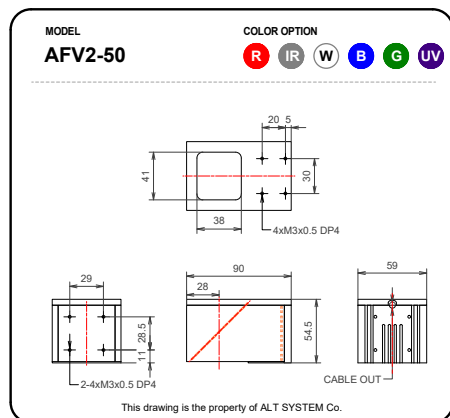
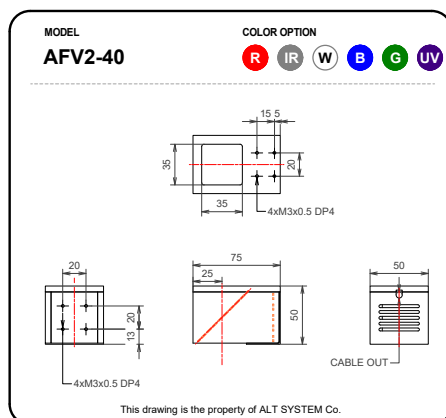
AFV Image

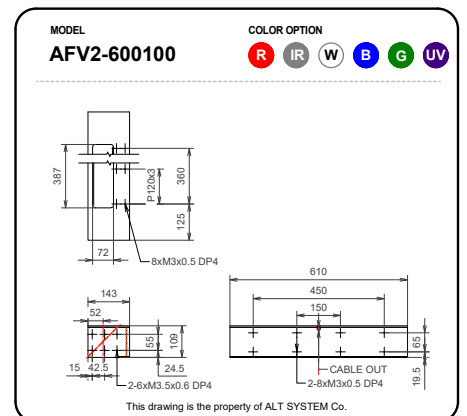
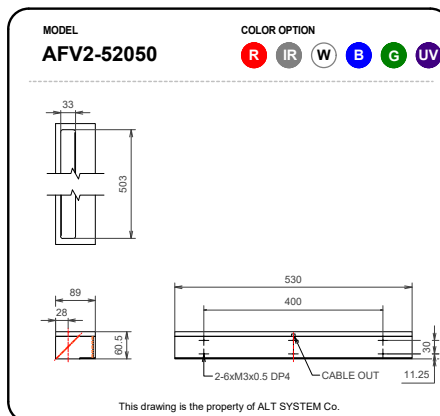
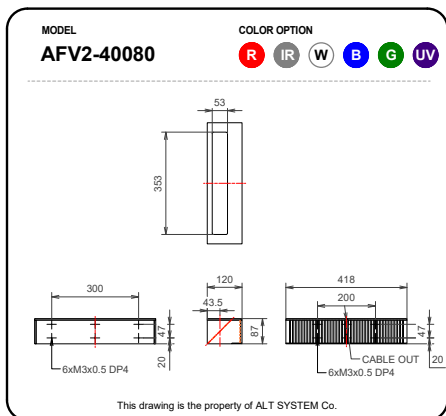
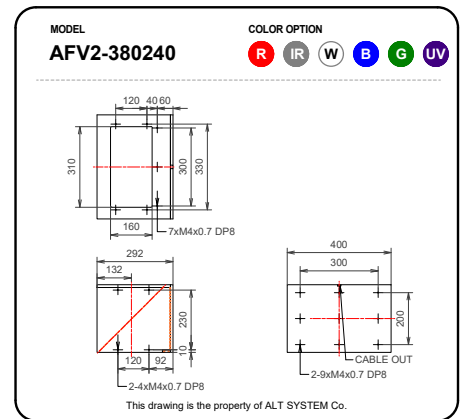
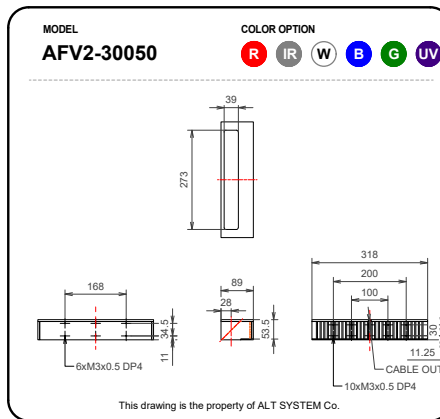
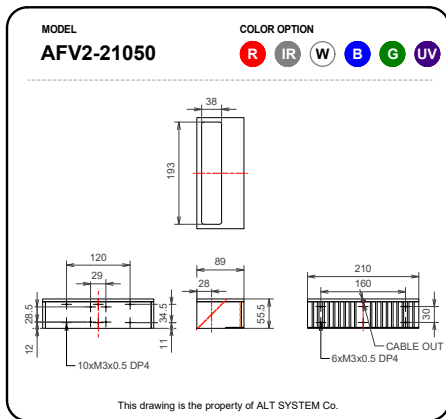
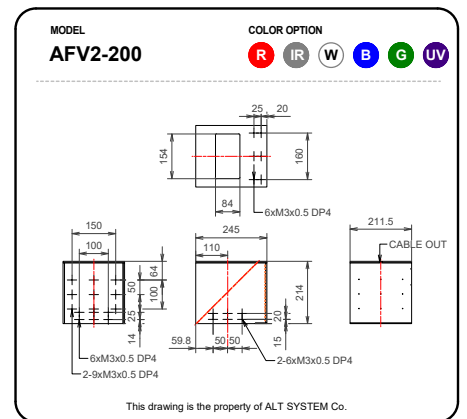
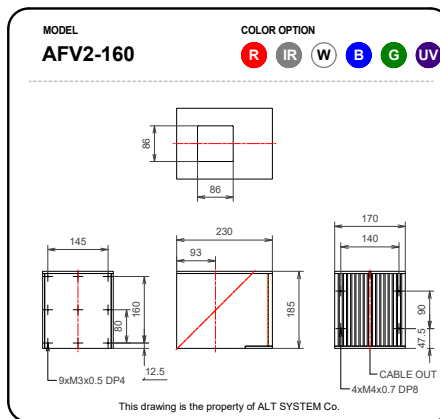
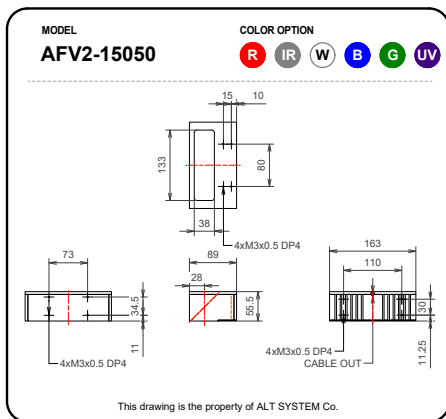
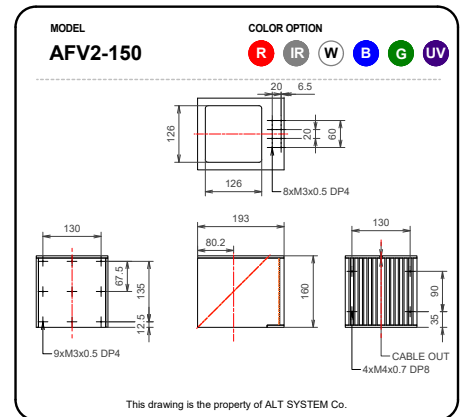
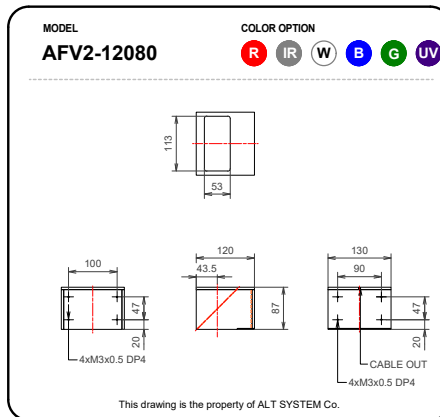
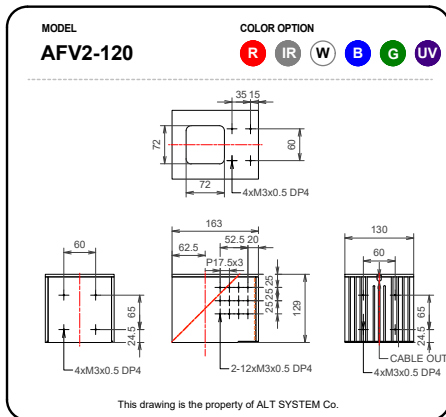


# AFV SERIES

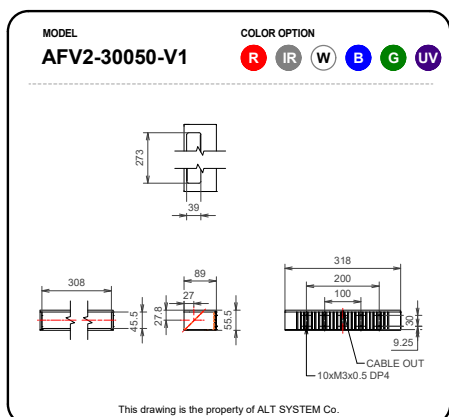
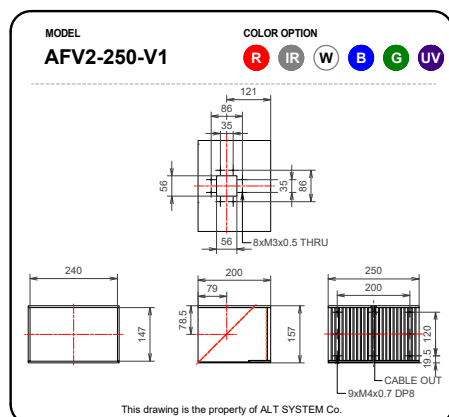
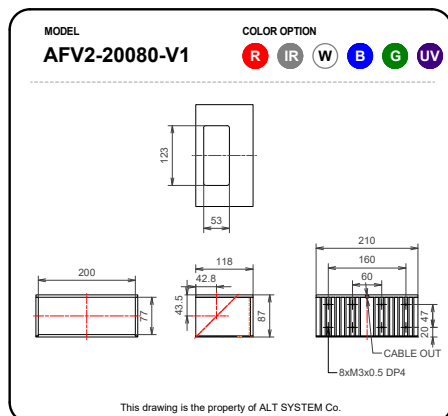
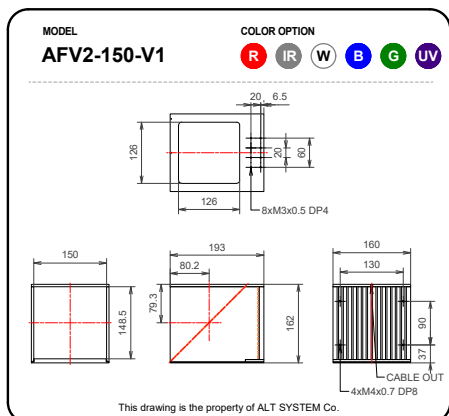
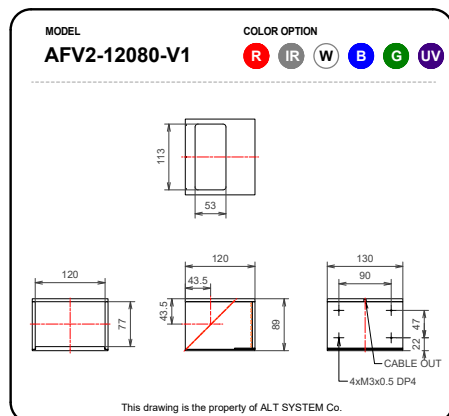
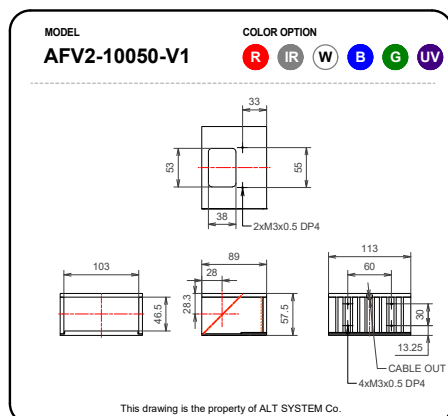
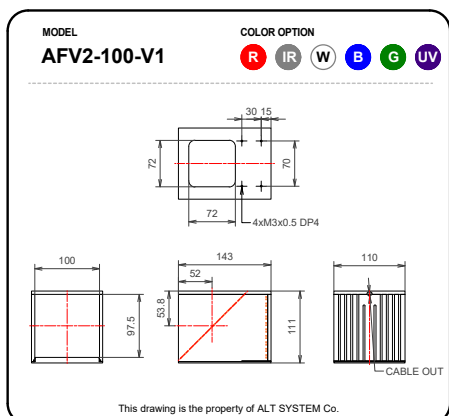
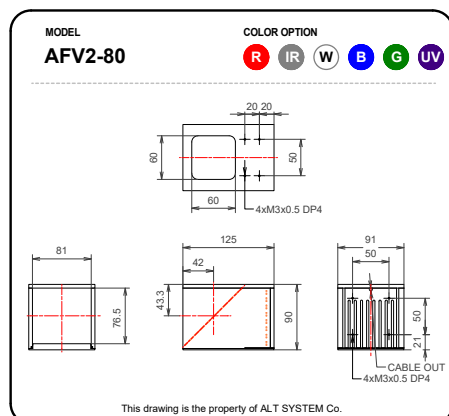
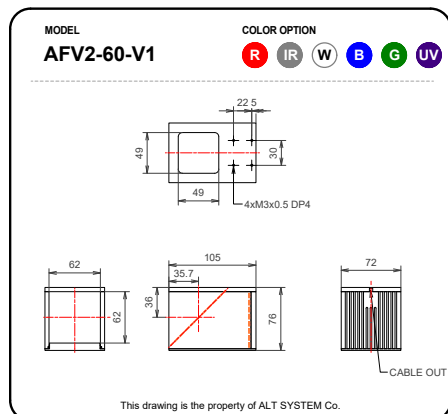
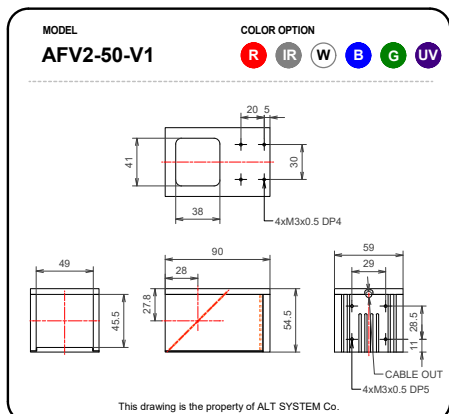
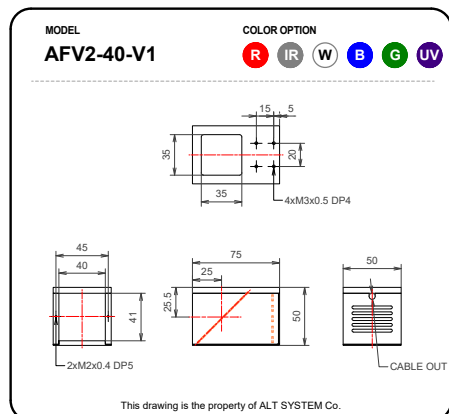


# AFV2 SERIES





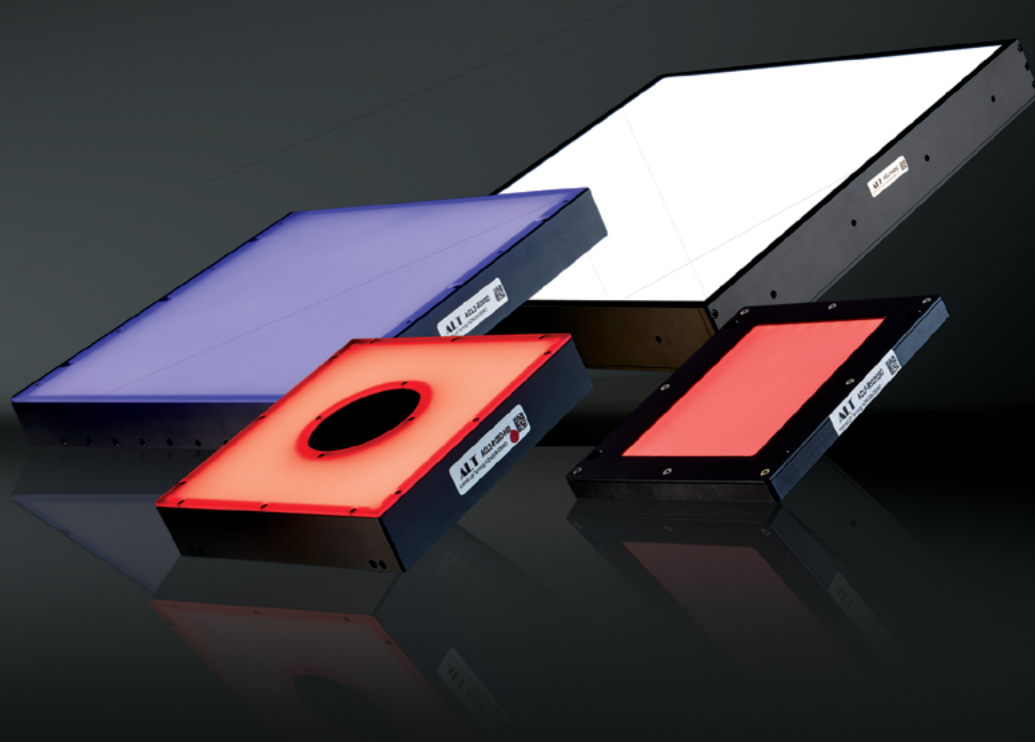
# AFV2-V1 SERIES







## B A C K L I G H T S



## A P P L I C A T I O N

다양한 실루엣 검사, 리드프레임 검사, 전자부품 외관 검사, 투명 필름의 오염 검사

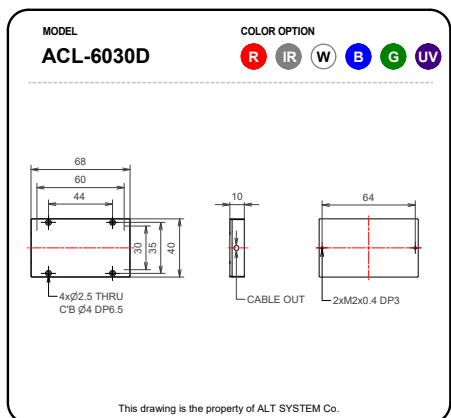
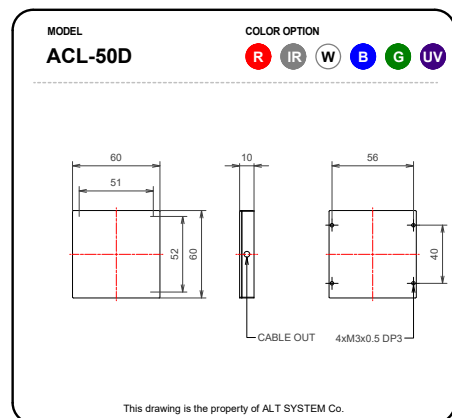
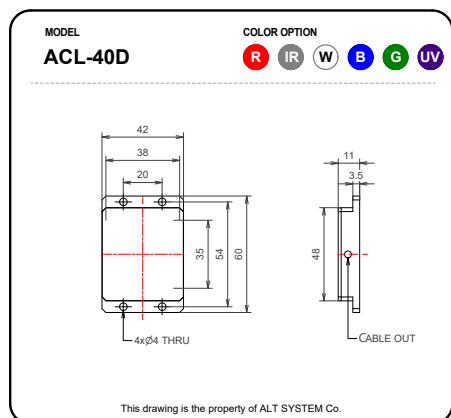
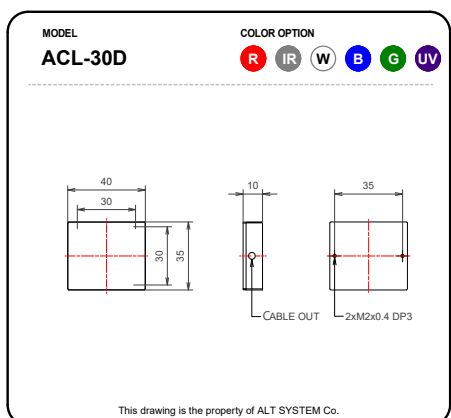
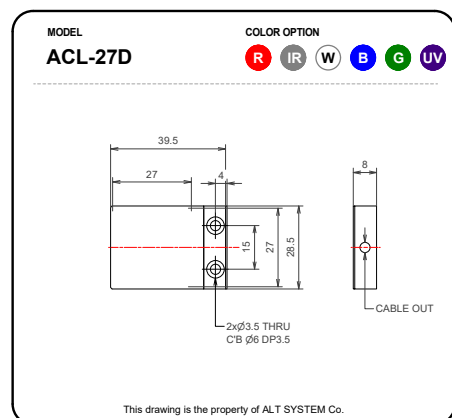
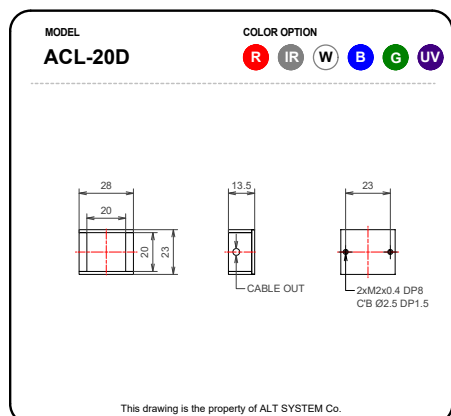
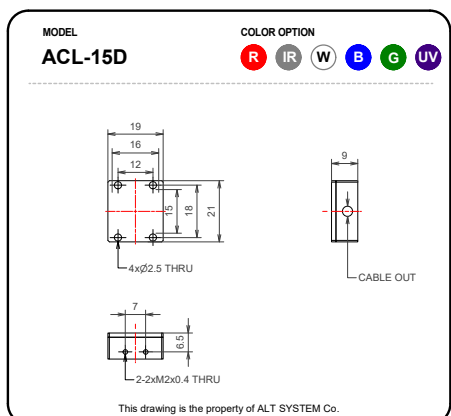
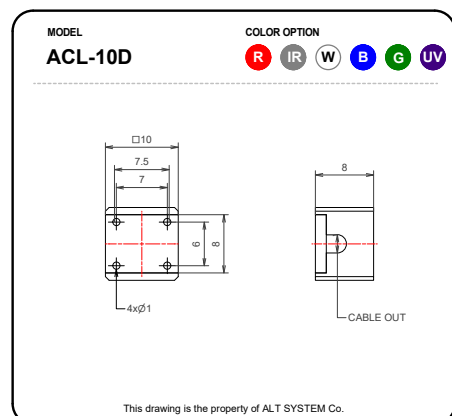
## ACL/ACL2/ACL4/ACLF SERIES

투과형 Back light 조명으로 발광면 바로 아래에 LED를 정밀하게 배치하고 발광면에 높은 균일성을 보장하는 확산판을 사용하여 고위도 균일한 빛을 조사할 수 있는 조명입니다.

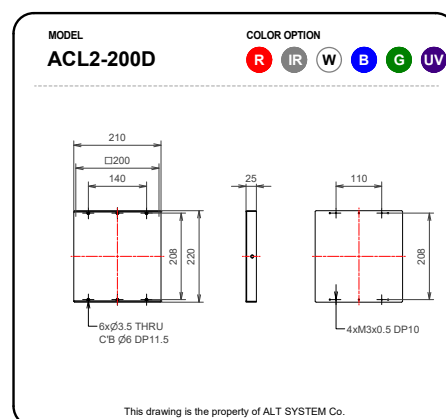
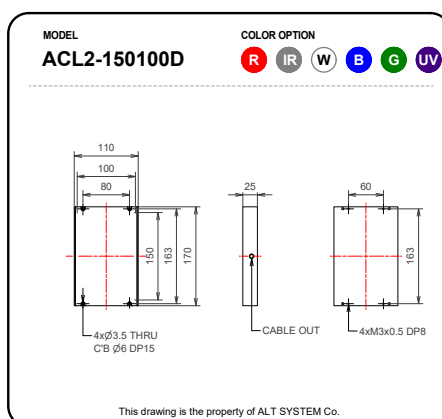
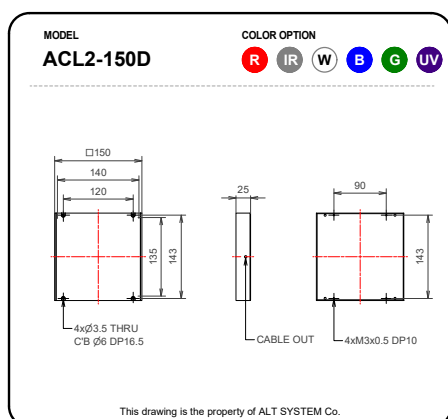
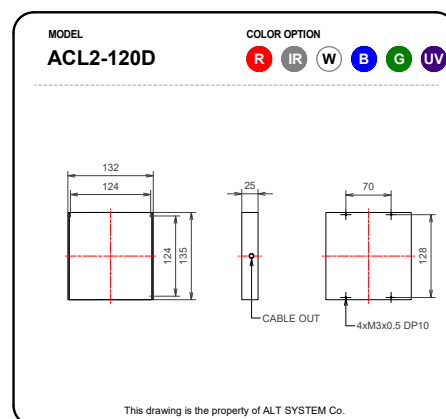
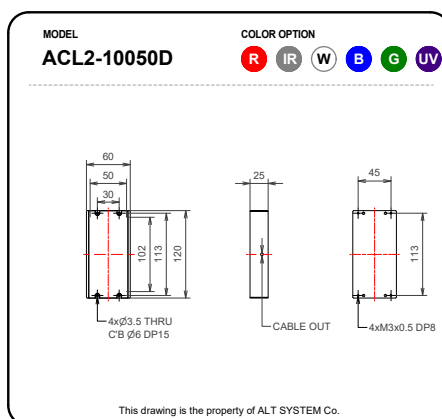
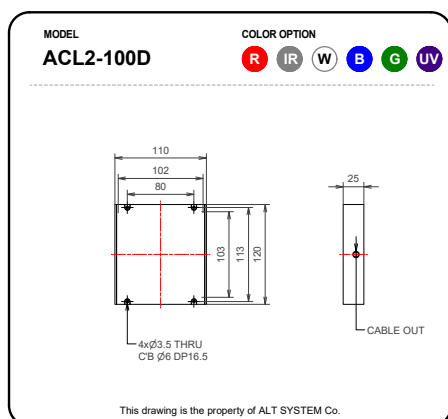
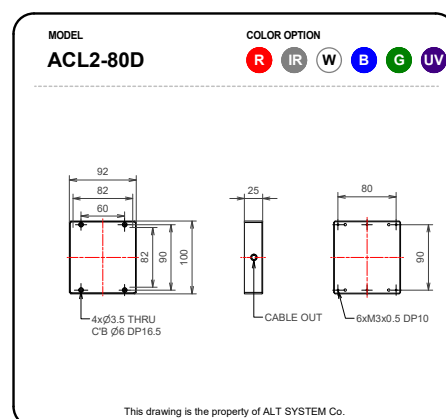
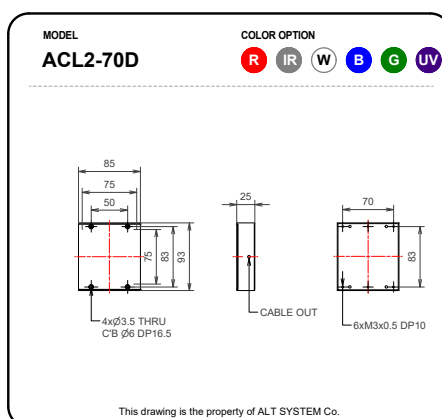
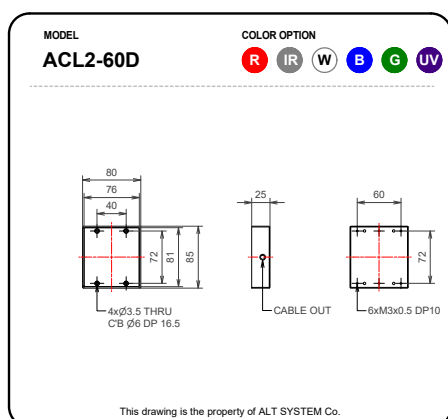
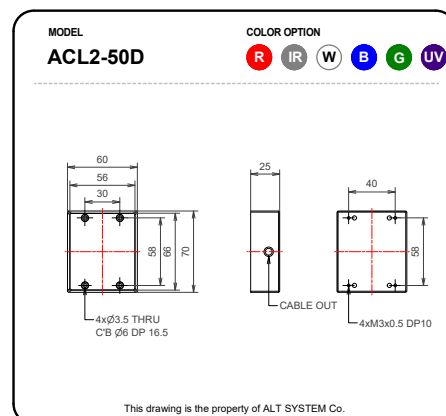
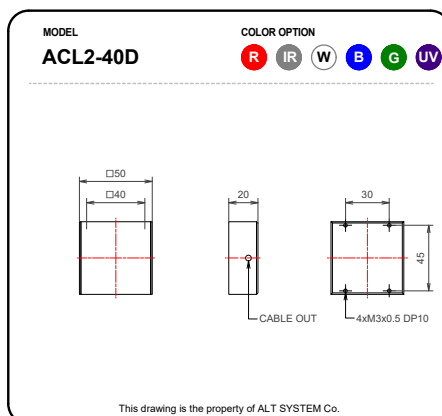
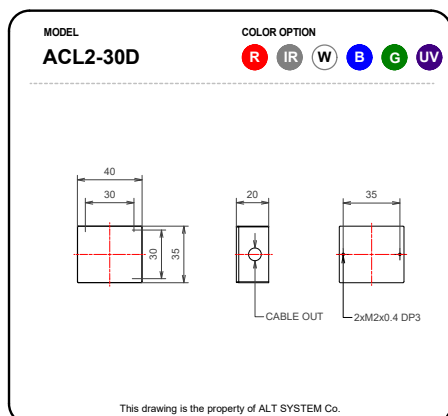
### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES



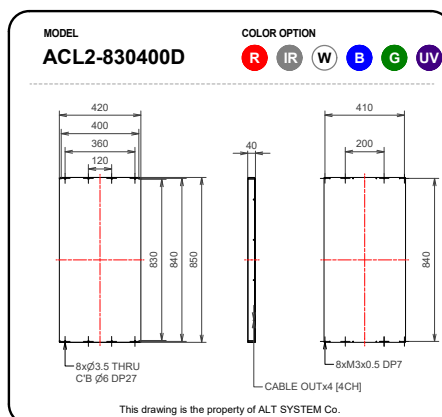
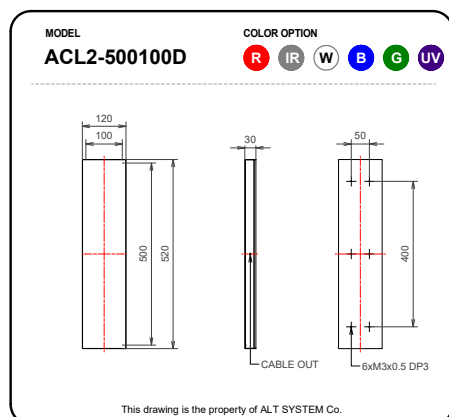
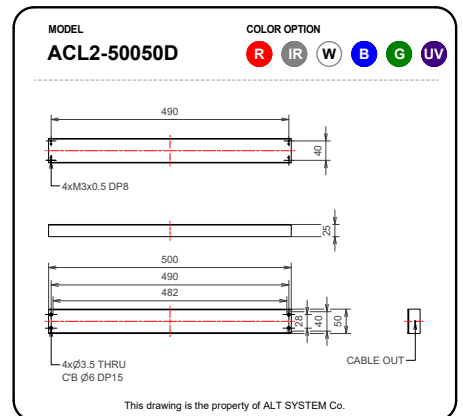
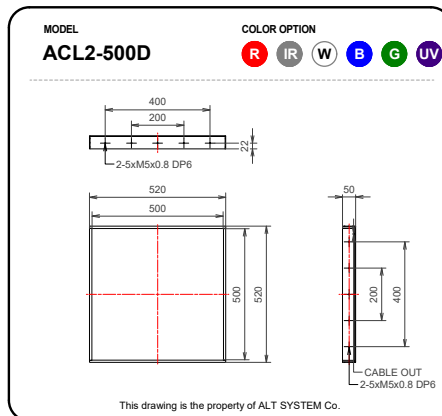
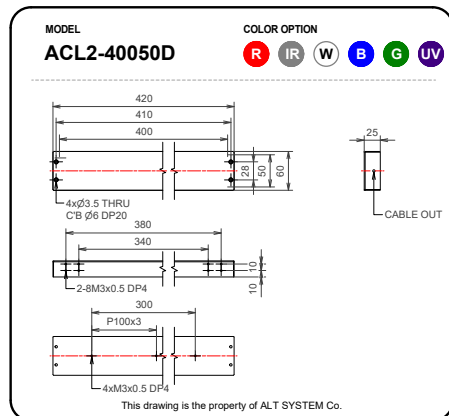
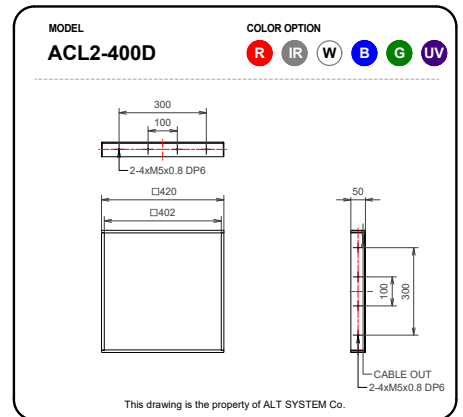
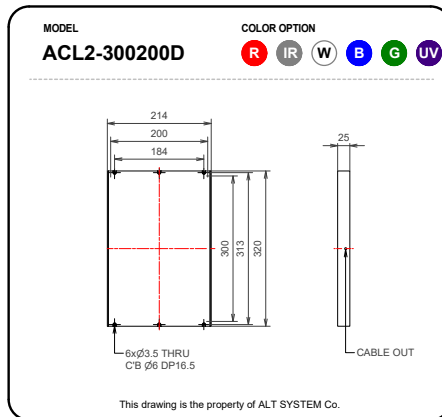
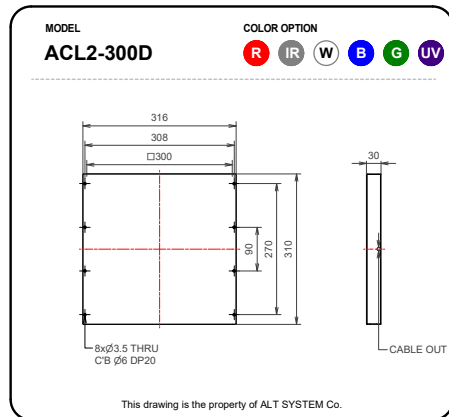
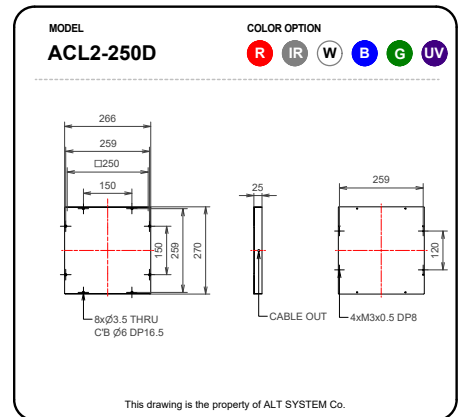
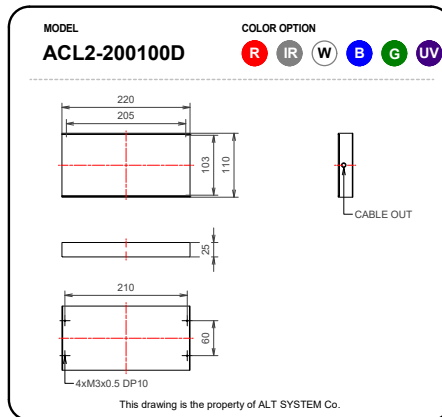
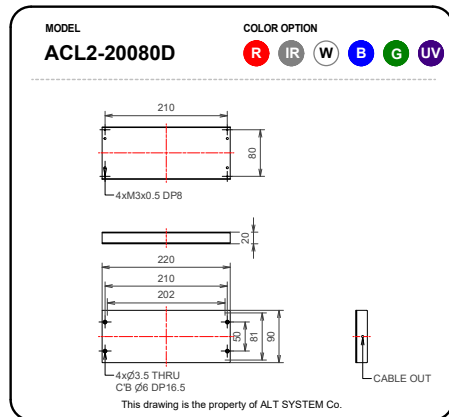
# ACL SERIES



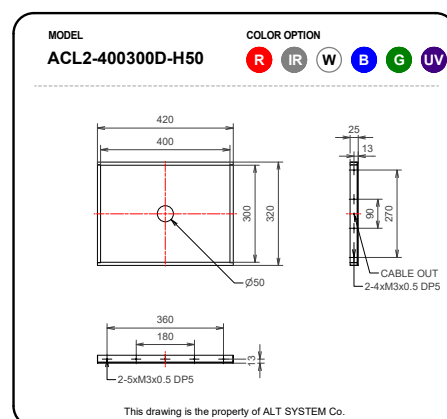
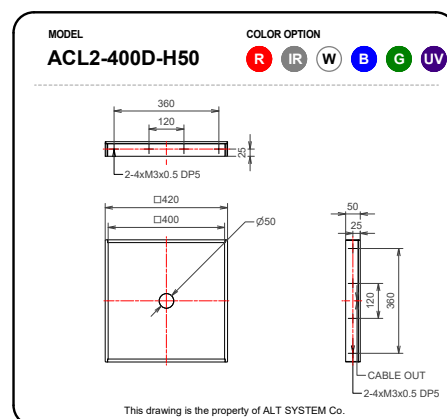
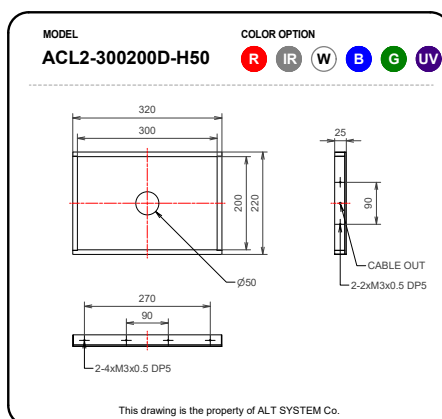
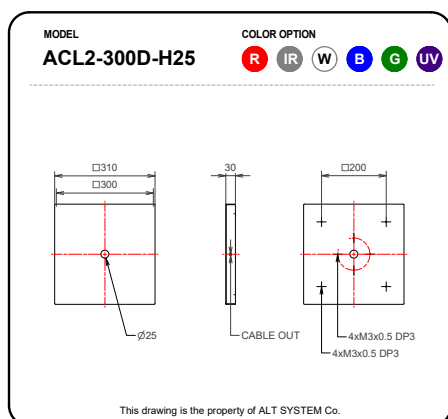
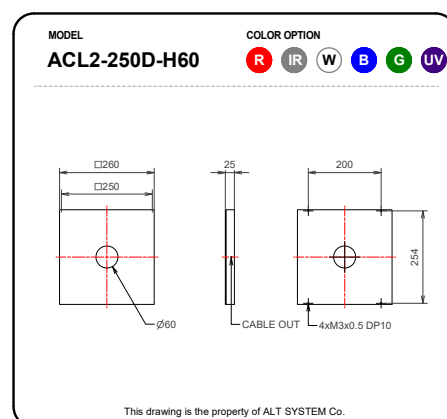
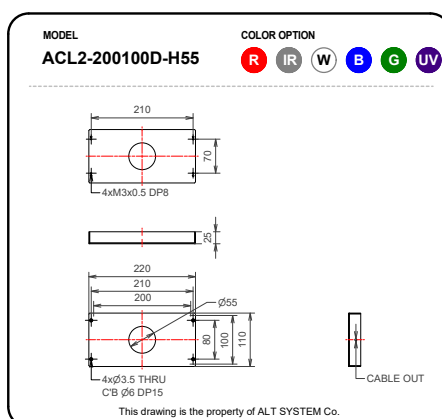
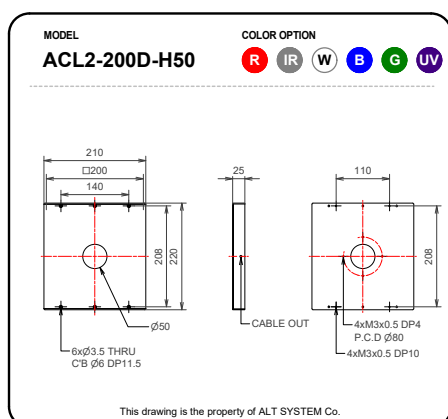
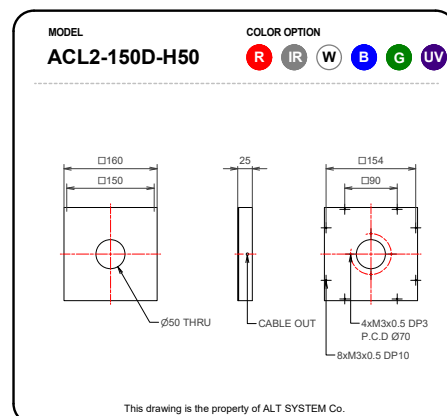
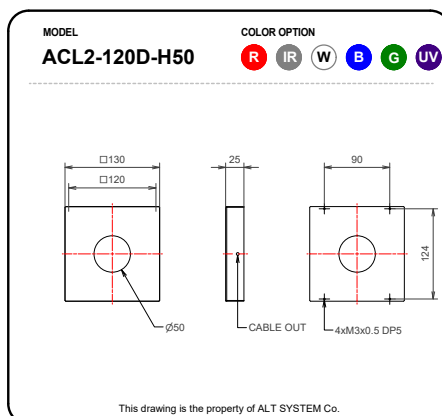
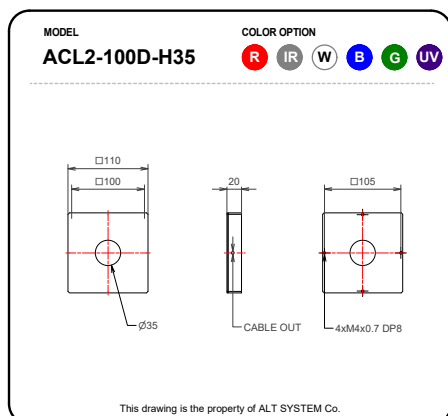
# ACL2 SERIES



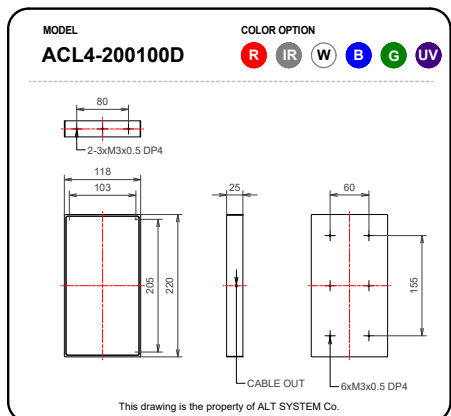
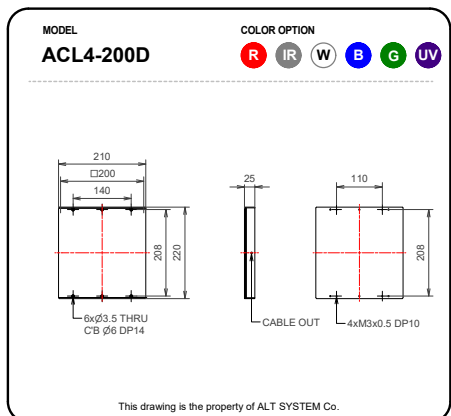
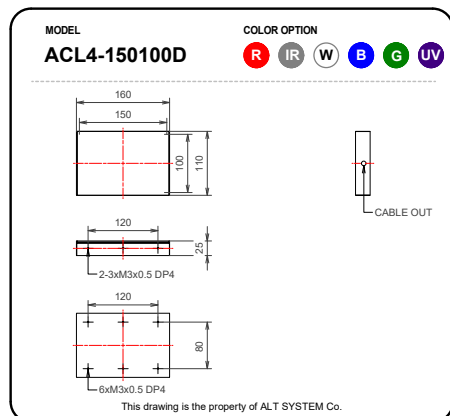
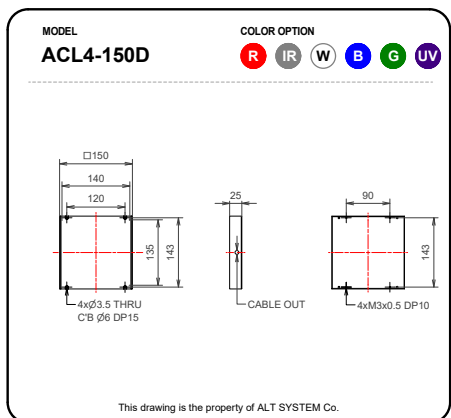
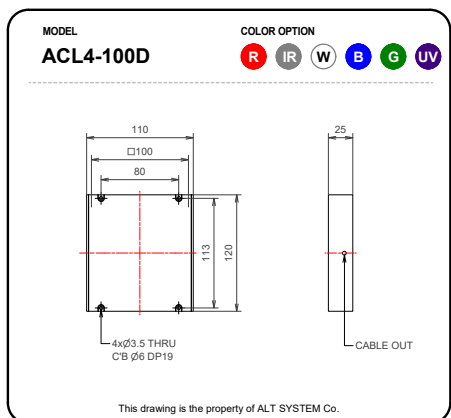
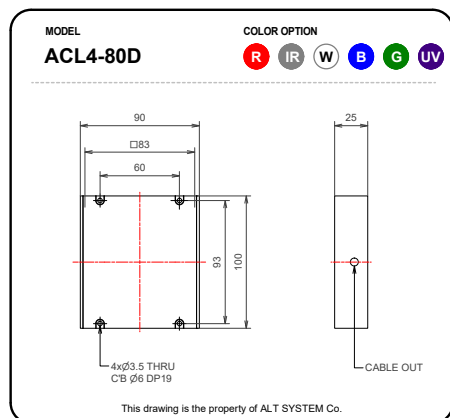
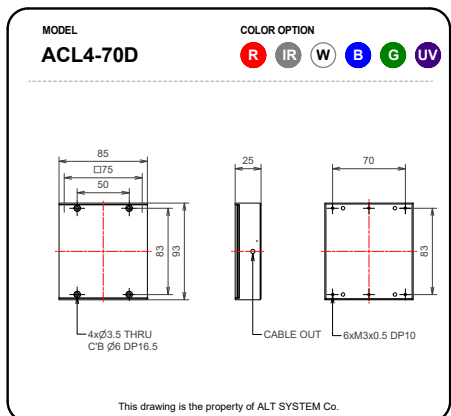
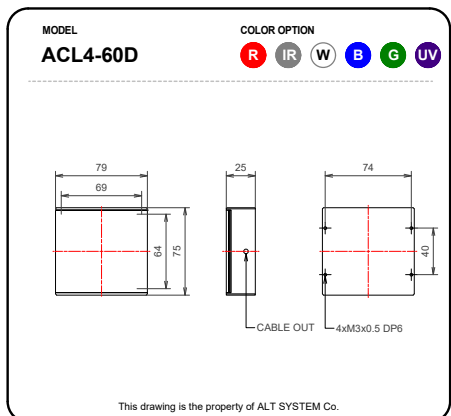
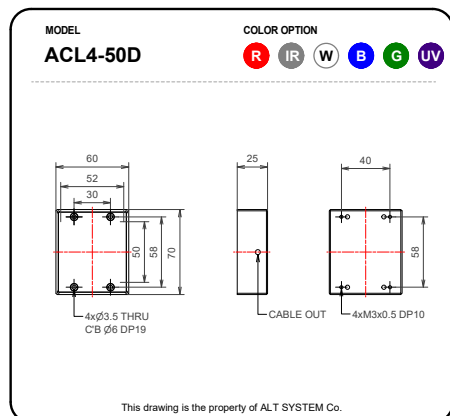
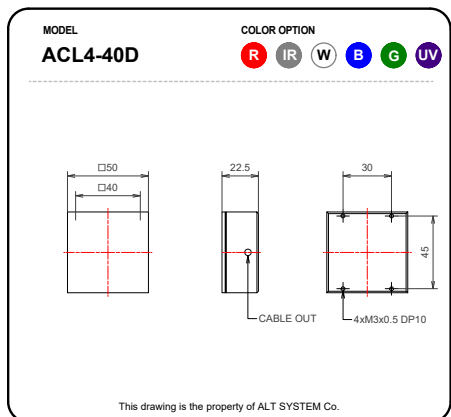
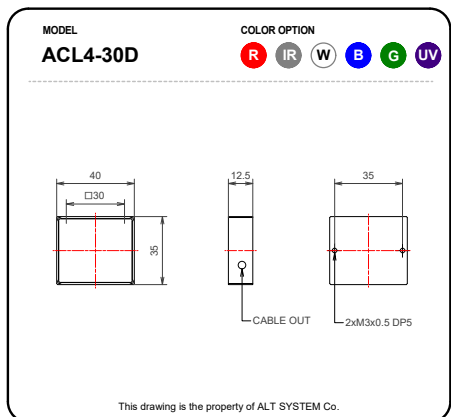
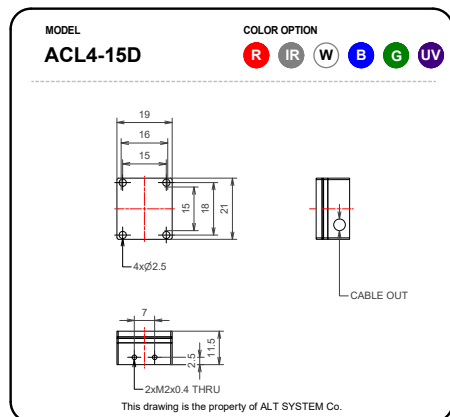
# ACL2 SERIES



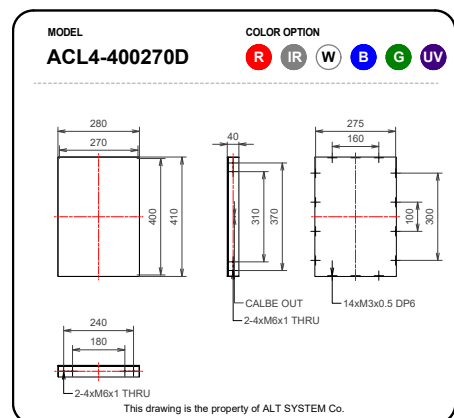
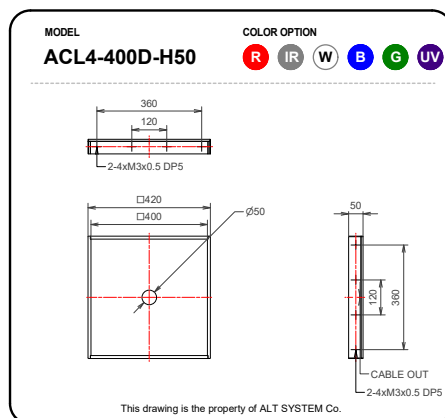
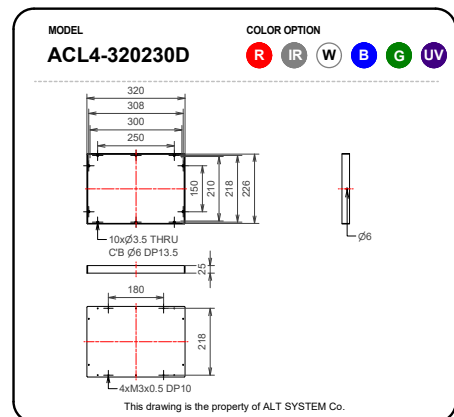
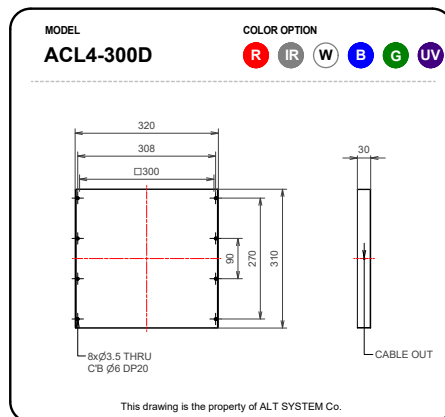
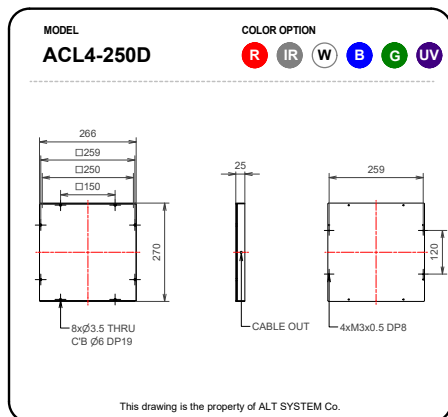
# ACL2-H SERIES



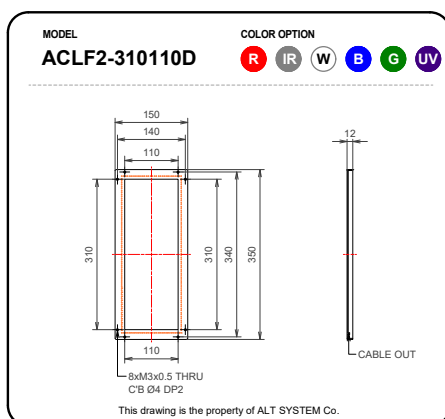
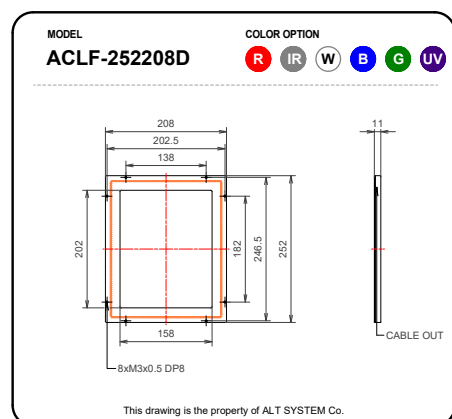
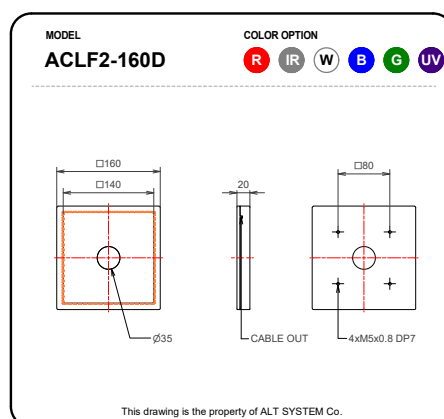
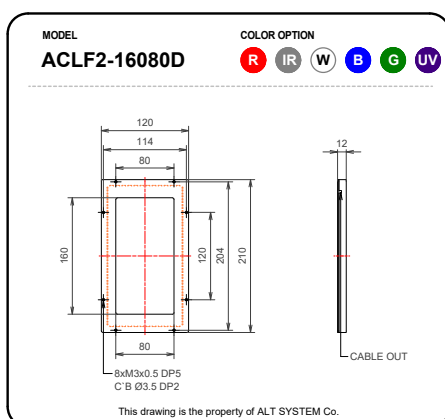
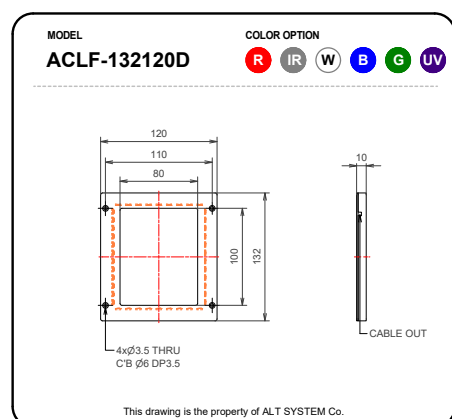
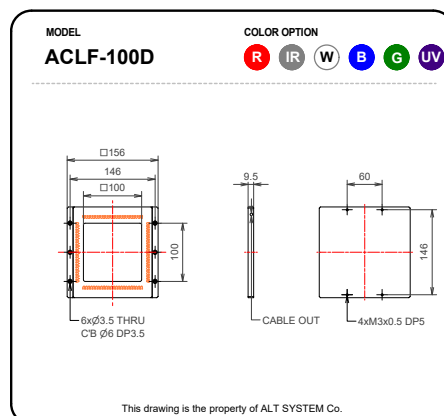
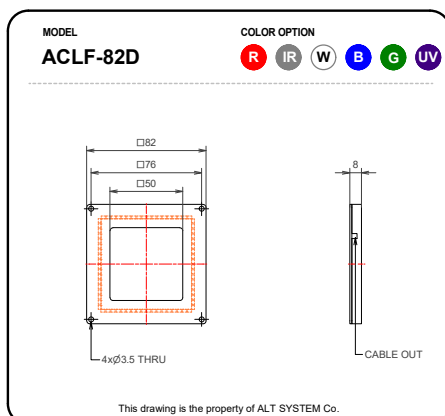
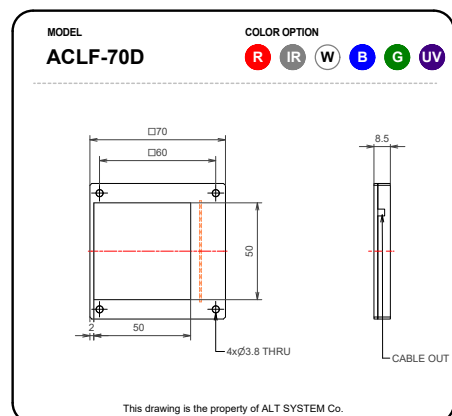
# ACL4 SERIES







# ACLF SERIES





## LINE SCAN LIGHTS



## APPLICATION

라인스캔카메라 사용 AOI 검사, GLASS 덴트 검사, 필름 원단 검사

## ALS/AHLS SERIES

내부에 균일하게 배열된 고휘도 POWER LED를 사용합니다.

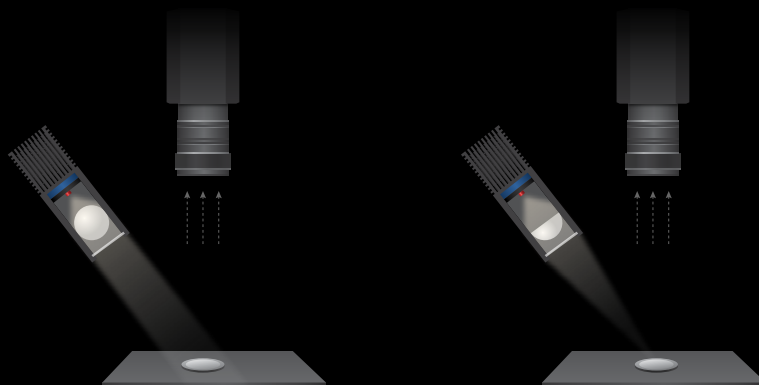
조명의 발광면에 고휘도 광을 균일하게 조사하여 라인스캔 카메라 용도로 사용할 수 있습니다.

### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES

**AHLS Series** 고휘도 라인스캔 조명

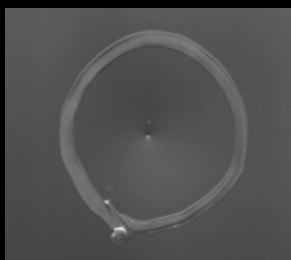
**ALS Series** 라인스캔 조명

특수 필터를 사용하여 LED광을 좌우로 고르게 분포 시킴으로써 균일도와 휘도를 극대화 하였습니다.

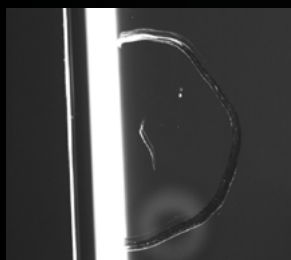


AHLS, ALS, ACLS

Dent region



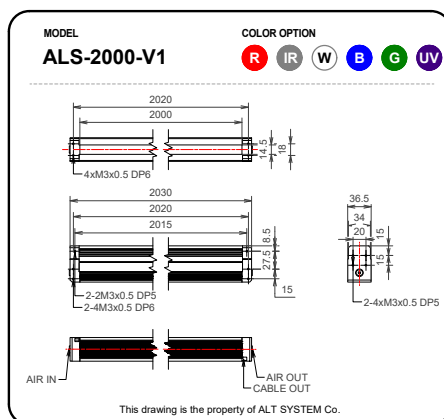
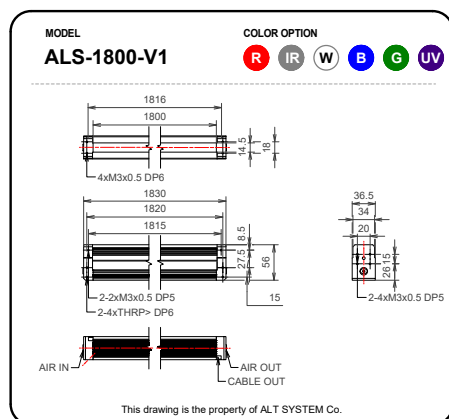
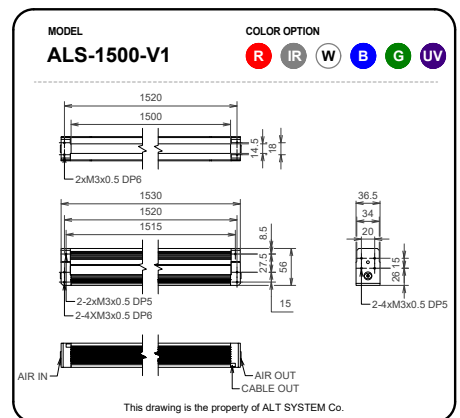
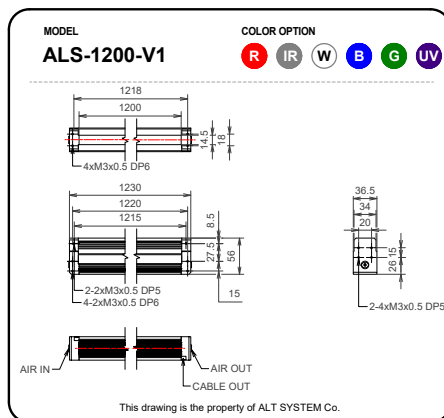
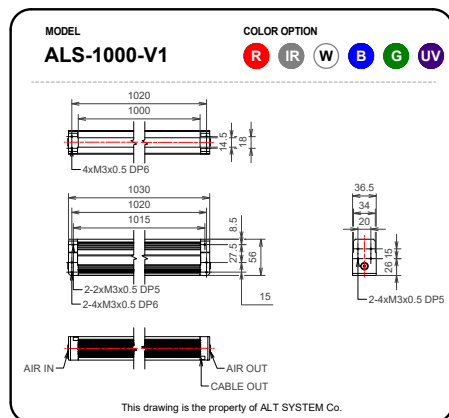
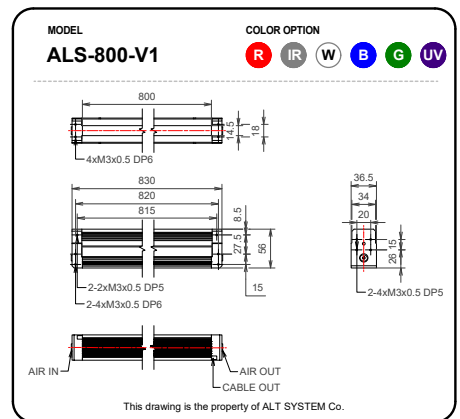
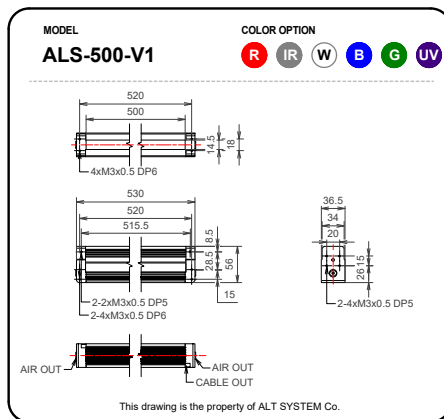
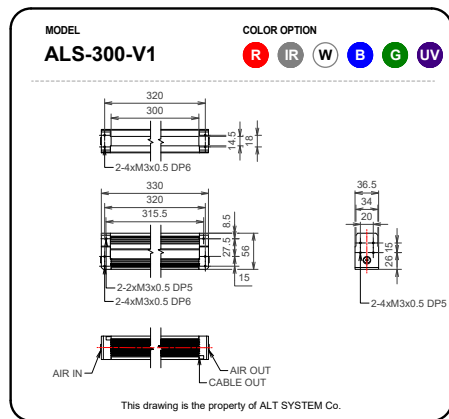
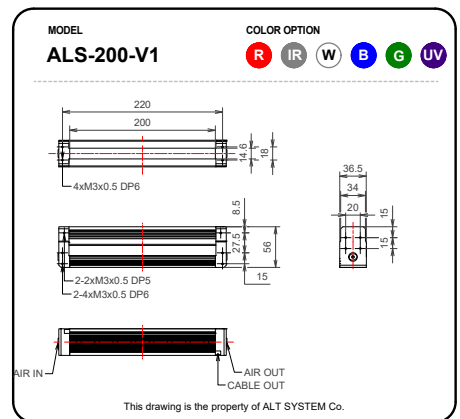
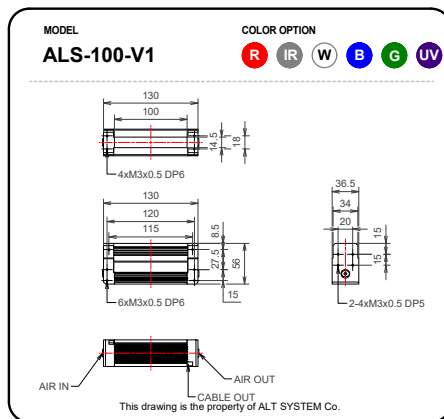
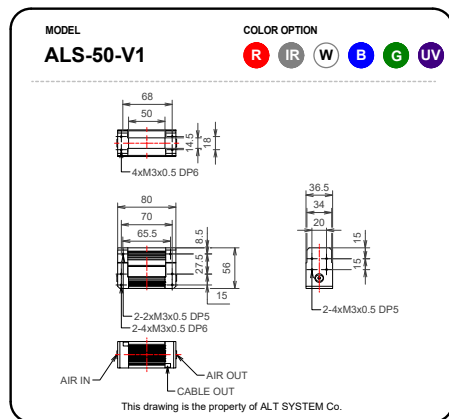
Scratch region



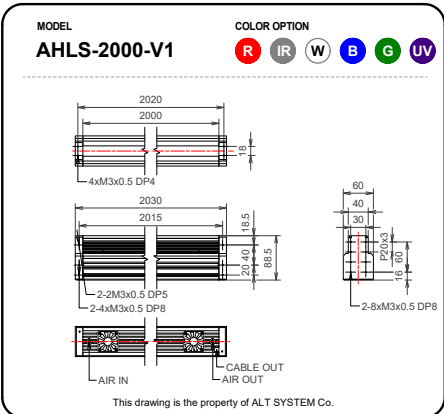
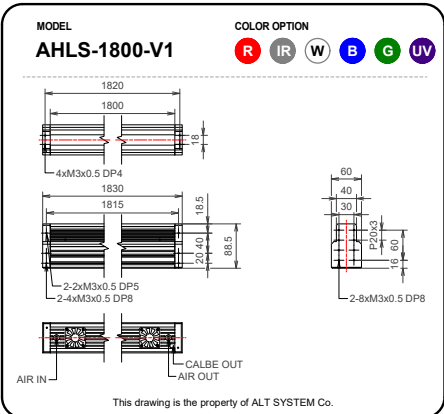
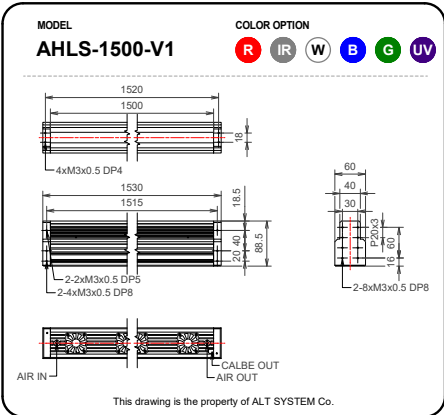
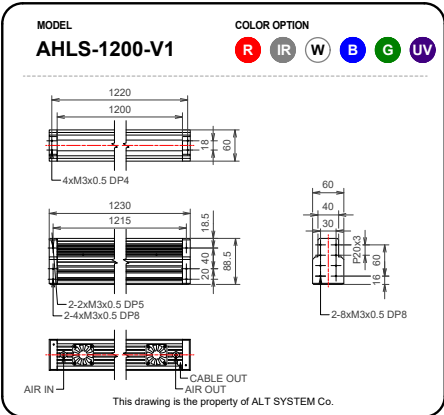
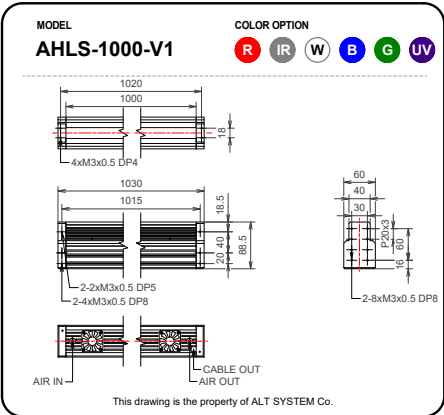
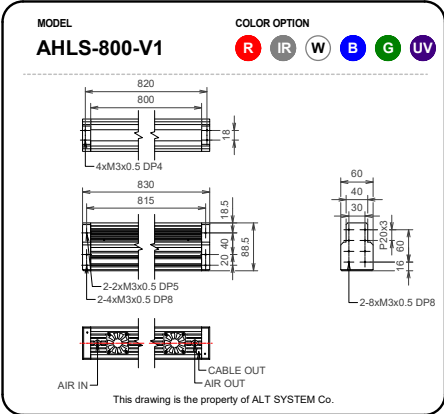
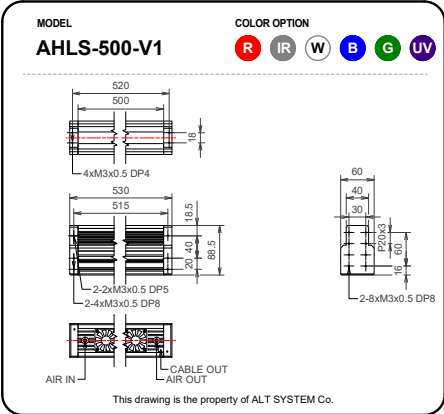
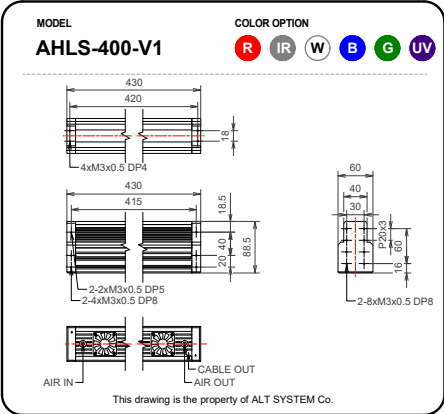
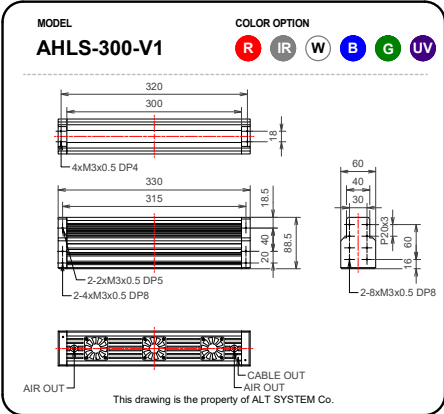
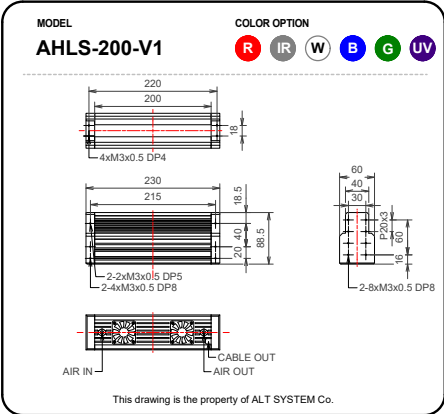
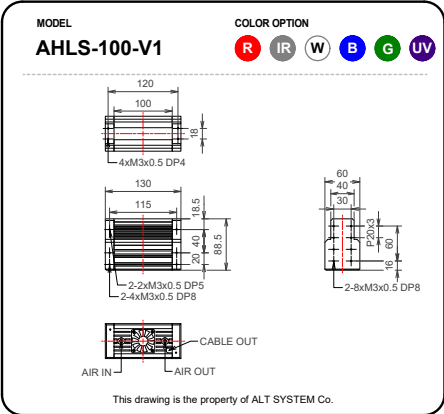
Chipping region



# ALS SERIES



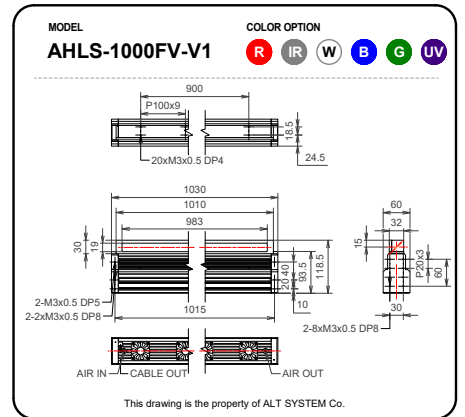
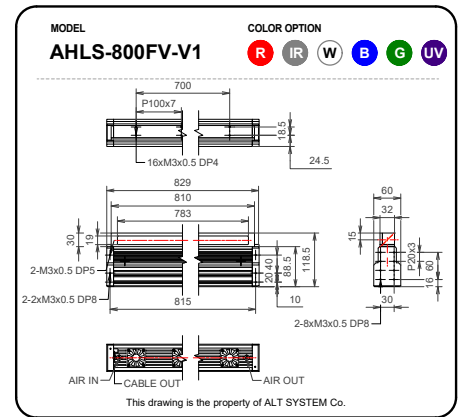
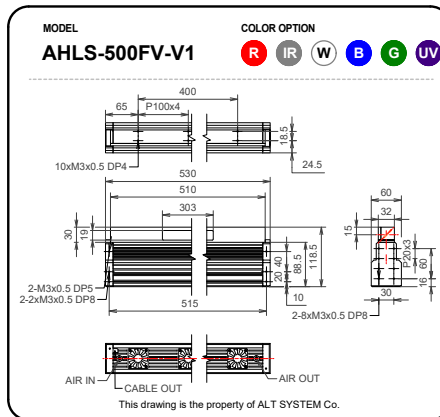
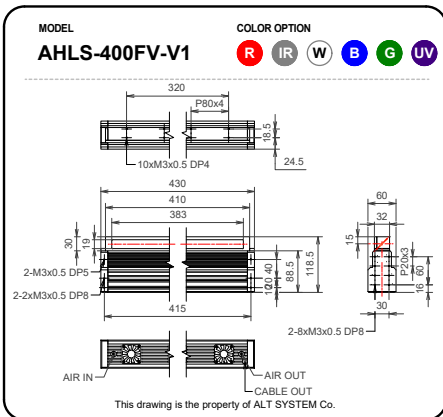
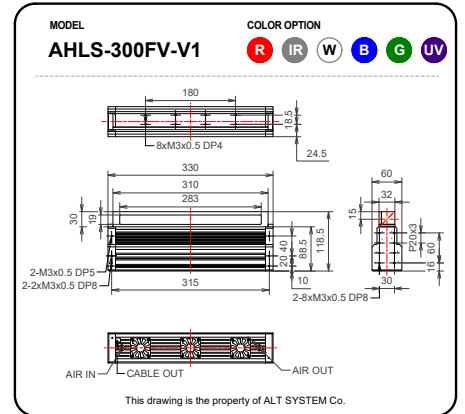
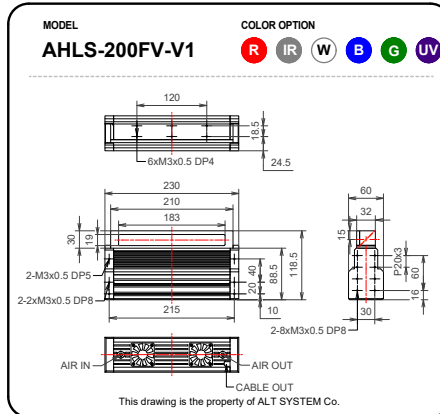
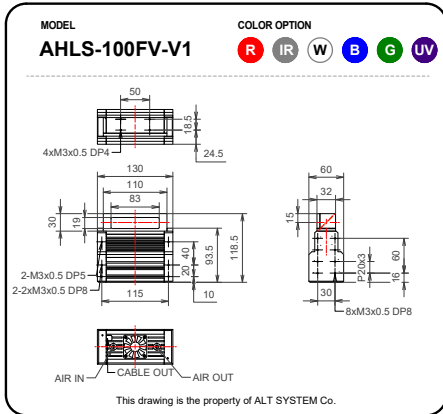
# AHLS SERIES



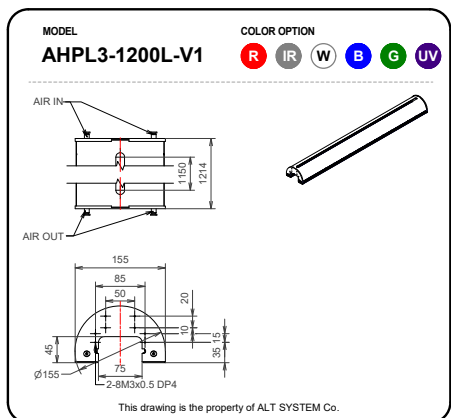
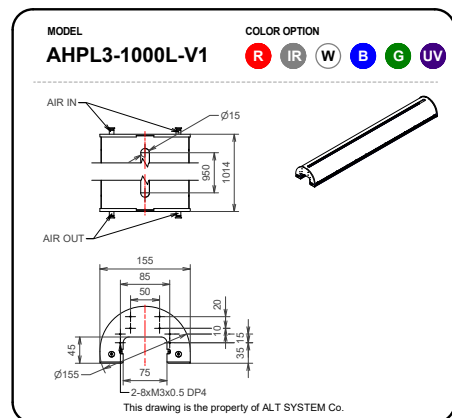
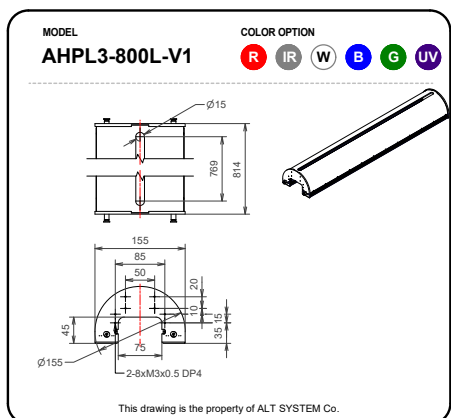
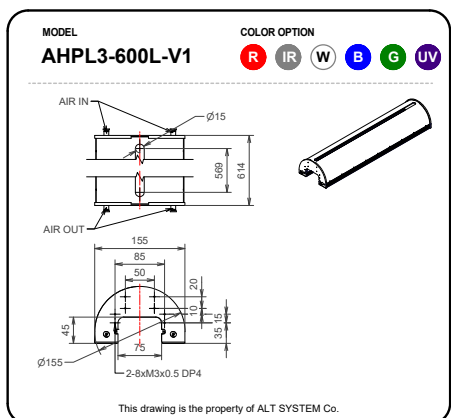
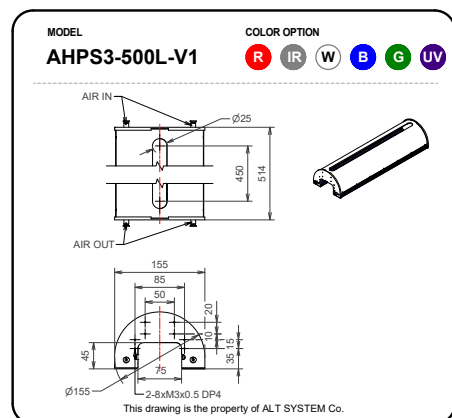
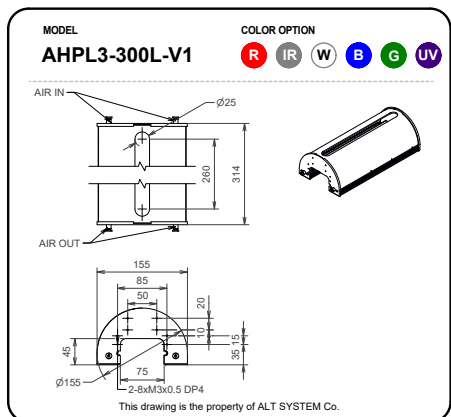
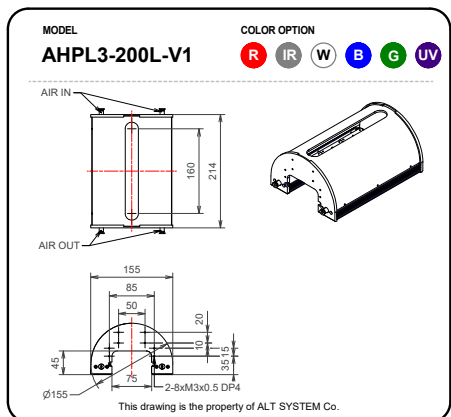
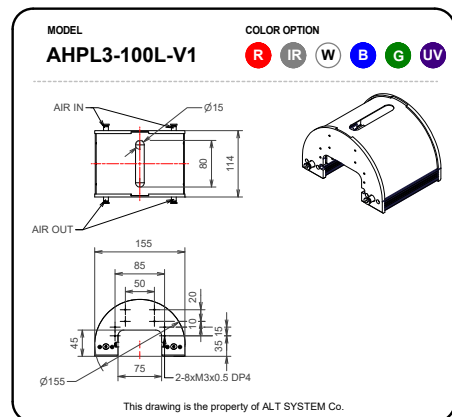




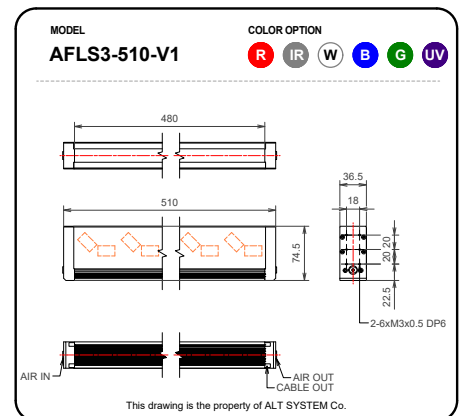
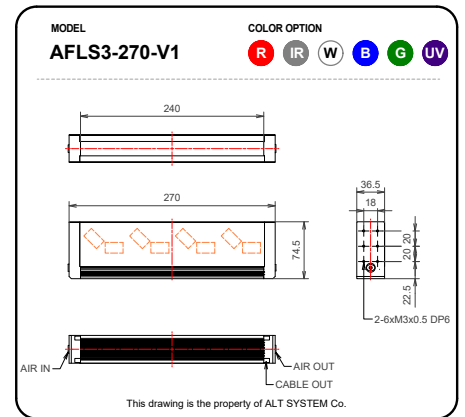
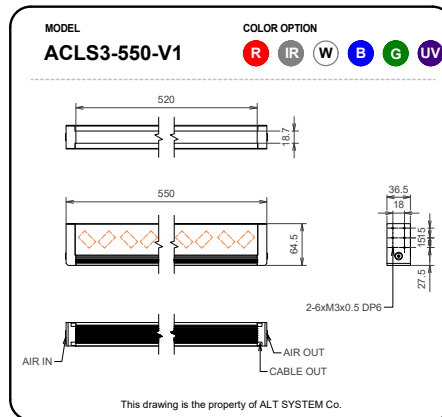
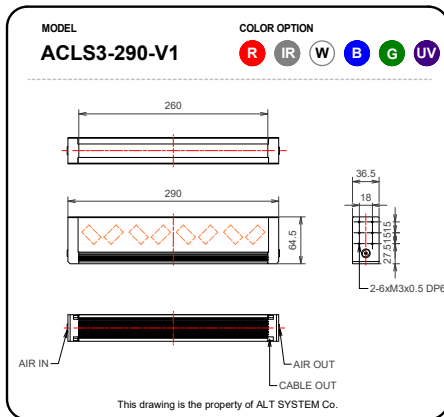
# AHLS-FV SERIES



# AHPL3 SERIES



# ACLS3/AFLS3 SERIES



**ALT**

advanced light technology

## COAXIAL SPOT LIGHT



## APPLICATION

라인스캔카메라, 필름검사, GLASS 검사

## ASP/ASL SERIES

경량의 컴팩트한 스폷 라이트는 자사만의 광학 디자인과 발열을 최소화한 설계를 통해 높은 출력의 광량을 조사할 수 있습니다.

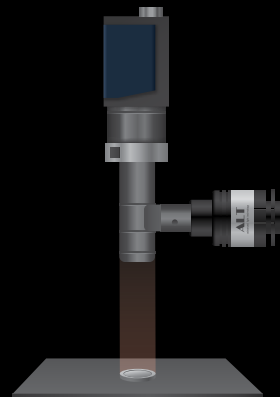
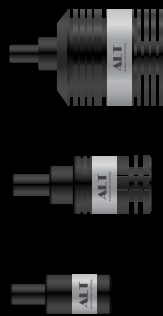
### 조사방식 및 적용사례 ILLUMINATION STRUCTURE & EXAMPLES

- ASP Series** 렌즈에 직접 체결하는 동축 조명으로 기존 할로겐 라이트가이드를 대체하는 고회도 Spot 조명입니다. 용도에 맞는 다양한 밝기와 색상의 조명을 선택할 수 있습니다.
- ASL Series** 집광렌즈가 장착된 Spot 조명으로 특정 부위를 집중하여 빛을 조사할 수 있는 조명입니다. 기존 동축 조명에 집광렌즈를 결합하여 사용하던 방식에서 일체형 ASL 조명으로 극부를 조명할 수 있습니다.

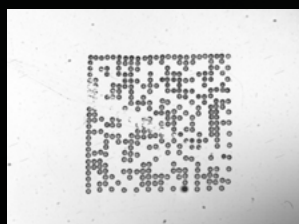
Ultra high intensity



Hight intensity

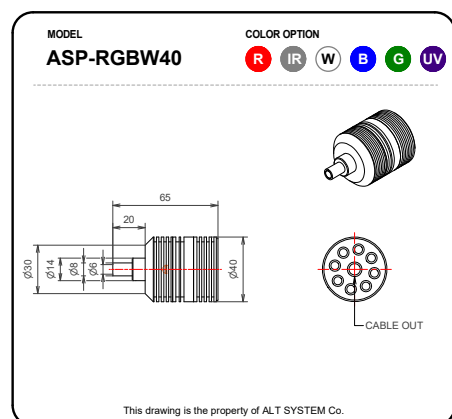


ASL Image



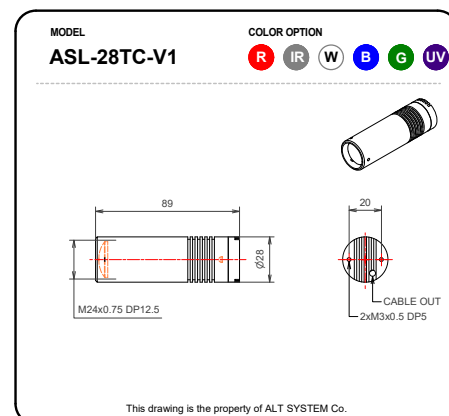
ASP Image







# ASL SERIES



# P W M   C O N T R O L L E R



## PWM CONTROLLER SERIES

- PWM 방식의 조명 밝기 제어 지원
- 1~8 채널 조명 출력 포트 지원
- 256 단계의 조명 미세 조정 가능
- RS-232C(Baudrate : 9600, 19200bps)
- IO 를 사용한 8bit ON-OFF 가능

### SPECIFICATION

MODEL NAME	MIP	1AND	2AND	2RSD	2RSDL	4RSDL	8RSDf
Intensity Method	PWM						
Intensity Step	256 Step[0~255]						
Number of Channels	1	1	2	2	2	4	8
Number of Input IO	None	1	2	2	2	4	8
Output Voltage	5V/12V/24V						
Connector	JST SM Connector						
Power	15W	15W	15W	60W	60W	60W	150W/350W
Maximum Current	1A/CH						3A/CH, 1A/CH
Communication	RS-232C	None	None	RS-232C			
Operating Environment	Temperature 0℃~30℃, Humidity 20~80% RH (with no condensation)						
Storage Environment	Temperature -15℃~60℃, Humidity 20~85% RH (with no condensation)						
Input Voltage	AC 100~240V, 50/60Hz						

# ETHERNET PWM CONTROLLER



## ALT-ERS SERIES

- PWM 방식의 조명 밝기 제어 지원
- 4~64 채널 조명 출력 포트 지원
- 256 단계의 조명 미세 조정 가능
- Ethernet(TCP/IP, UDP), RS-232C(Baudrate : 9600, 19200, 38400, 57600, 115200bps)
- IO 를 사용한 8bit ON-OFF 가능
- 256 Page 동작 지원
- MACRO 기능 지원 : IO, Timer 기능 연동형 사용자 프로그램 개발 가능
- DLL 라이브러리 제공

### SPECIFICATION

MODEL NAME	E4RS	E8RS	E16RS	E32RS	E64RS
Intensity Method	PWM				
Intensity Step	256 Step[0~255]				
Number of Channels	4	8	16	32	64
Number of Input IO	4	8	16	32	64
Output Voltage	12V/24V				
Connector	JST SM Connector				
Power	150W	200W	600W	600W	1000W
Maximum Current	3A/CH	3A/CH	3A/CH	1A/CH	1A/CH
Communication	RS-232C, Ethernet(10/100base-T)				
Operating Environment	Temperature 0°C~30°C, Humidity 20~80% RH (with no condensation)				
Storage Environment	Temperature -15°C~60°C, Humidity 20~85% RH (with no condensation)				
Input Voltage	AC 100~240V, 50/60Hz				



# LINE SCAN CONSTANT CURRENT CONTROLLER



## ALT-LSPE SERIES

- 정전류 방식의 조명 밝기 제어 지원
- 4~32 채널 조명 출력 포트 지원
- 미세 조정 가능
- Ethernet(TCP/IP, UDP), RS-232C(Baudrate : 9600, 19200, 38400, 57600, 115200bps)
- 256 Page 동작 지원
- MACRO 기능 지원 : IO, Timer 기능 연동형 사용자 프로그램 개발 기능
- DLL 라이브러리 제공

### SPECIFICATION

MODEL NAME	LSP150E	LSP300E	LSP1000E	LSP2000E
Intensity Method	Constant Current			
Intensity Step	0~255 Step			
Number of Channels	4	8	16	32
Number of Input IO	4	8	16	32
Output Voltage	12V/24V			
Connector	Circular Connector			
Power	150W	300W	1000W	2000W
Maximum Current	3A/CH	3A/CH	3A/CH	3A/CH
Communication	RS-232C, Ethernet(10/100base-T)			
Operating Environment	Temperature 0°C~30°C, Humidity 20~80% RH (with no condensation)			
Storage Environment	Temperature -15°C~60°C, Humidity 20~85% RH (with no condensation)			
Input Voltage	AC 100~240V, 50/60Hz			



## STROBE CONTROLLER



## ALT-ESTP SERIES

- 정전압 방식 스트로브 출력 지원
- 4~32 채널 조명 출력 포트 지원
- 미세 조정 가능
- Ethernet(TCP/IP, UDP), RS-232C  
(Baudrate : 9600, 19200, 38400, 57600, 115200bps)
- 256 Page 동작 지원
- MACRO 기능 지원 : IO, Timer 기능 연동형  
사용자 프로그램 개발 기능
- DLL 라이브러리 제공

## ALT-MSTP

- Strobe 방식의 조명 밝기 제어 지원
- 1 채널 조명 출력 포트 지원
- 1~4,096usec 단계의 On-Time 조정 가능
- 사용자 Pulse Width OnTime 기능

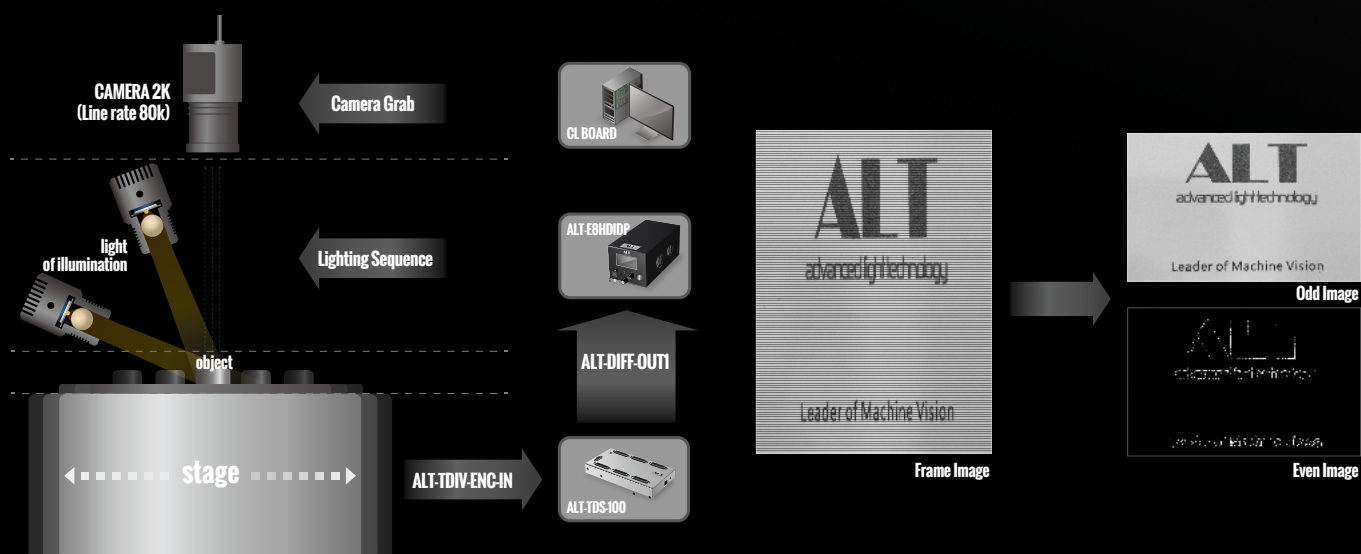
### SPECIFICATION

MODEL NAME	E4STP	E8STP	E16STP	E32STP	E64STP	MSTP
Intensity Method	Strobe					
Intensity Step	0~4,000 usec[1usec Step]					0~4,096 usec [1usec Step]
Number of Channels	4	8	16	32	64	1
Number of Input IO	4	8	16	32	64	1
Output Voltage	12V/24V					
Connector	JST SM Connector					
Power	150W	200W	600W	600W	1000W	
Maximum Current	3A/CH	3A/CH	3A/CH	1A/CH	1A/CH	3A/CH
Communication	RS-232C, Ethernet(10/100base-T)					
Operating Environment	Temperature 0°C~30°C, Humidity 20~80% RH [with no condensation]					
Storage Environment	Temperature -15°C~60°C, Humidity 20~85% RH [with no condensation]					

## T-DIVIDER



## APPLICATION CONFIGURATION



## ALT-TDS SERIES

- 트리거 분배기
- 엔코더 신호 및 센서등의 외부 신호 입력 받아 카메라 및 제어기의 동기 지령 수행
- 멀티 라인스캔 카메라 어플리케이션 및 멀티 필드 교차 솔루션 동기지령 수행
- Input 1MHz Diff-Encoder 1채널, Diff-Input 8채널, Photo-Input 8채널(TTL 옵션)
- Output Encoder 4채널, Diff-Output 16채널, Photo-Output 8채널(TTL 옵션), Delay/Active 구간 운영
- Remote RS-232(115200bps)/Ethernet(100Mbps, TCP/IP)
- Internal Timer 동작 가능

### SPECIFICATION

MODEL NAME	TDIVIDER
Encoder Input	1:1,2,4 디지털 채배/256 분주
Encoder Output	독립 4Ch, A/B, Pulse/Dir, CW/CCW 출력 방식, 윈도우 모드 Encoder/IO 연동 Output 기능
Diff/Photo Input	8Ch, Rising/Falling-Edge 선택
Diff/Photo Output (TTL Option)	Diff 16Ch, Photo 8Ch/Rising/Falling-Edge 선택/Delay 추가기능 Encoder/IO 연동 Output 기능/출력 개수 설정기능
Operating Environment	Temperature 0°C~30°C, Humidity 20~80% RH (with no condensation)
Storage Environment	Temperature -15°C~60°C, Humidity 20~85% RH (with no condensation)
Input Voltage	DC 24V

# PWM CONTROLLER SERIES

MODEL

ALT-1ND

Technical drawing of the ALT-1ND PWM controller showing front, top, and side views with dimensions: 72, 120, 100, 54, 63.5, 55.

This drawing is the property of ALT SYSTEM Co.

MODEL

ALT-2AND

Technical drawing of the ALT-2AND PWM controller showing front, top, and side views with dimensions: 72, 120, 100, 54, 63.5, 55.

This drawing is the property of ALT SYSTEM Co.

MODEL

ALT-2RSD

Technical drawing of the ALT-2RSD PWM controller showing front, top, and side views with dimensions: 70, 180, 148, 52, 103, 95.

This drawing is the property of ALT SYSTEM Co.

MODEL

ALT-4RSDL

Technical drawing of the ALT-4RSDL PWM controller showing front, top, and side views with dimensions: 97, 190, 170, 75, 100, 62.

This drawing is the property of ALT SYSTEM Co.

MODEL

ALT-8RSDL

Technical drawing of the ALT-8RSDL PWM controller showing front, top, and side views with dimensions: 95, 200, 150, 75, 103, 65.

This drawing is the property of ALT SYSTEM Co.

MODEL

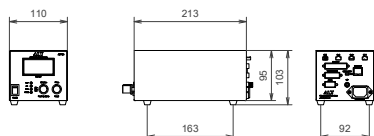
ALT-MIP

Technical drawing of the ALT-MIP PWM controller showing front, top, and side views with dimensions: 35, 40, 55, 19, 23.1, 45, 32. It also includes a 4xØ3.2 THRU hole specification.

This drawing is the property of ALT SYSTEM Co.

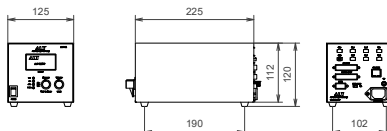
# ALT-ERS SERIES

MODEL  
**ALT-E4RS**



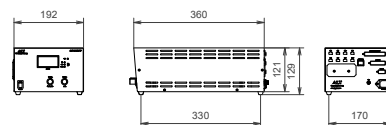
This drawing is the property of ALT SYSTEM Co.

MODEL  
**ALT-E8RS**



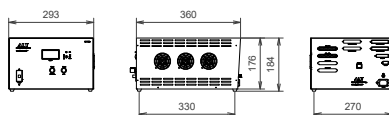
This drawing is the property of ALT SYSTEM Co.

MODEL  
**ALT-E16RS**



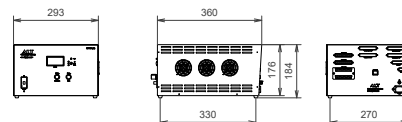
This drawing is the property of ALT SYSTEM Co.

MODEL  
**ALT-E32RS**



This drawing is the property of ALT SYSTEM Co.

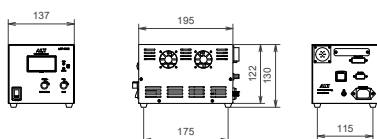
MODEL  
**ALT-E64RS**



This drawing is the property of ALT SYSTEM Co.

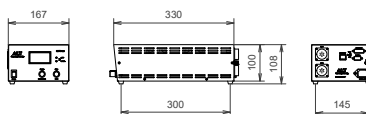
# ALT-LSPE SERIES

MODEL  
**ALT-LSP150E**



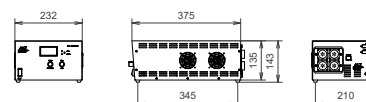
This drawing is the property of ALT SYSTEM Co.

MODEL  
**ALT-LSP300E**



This drawing is the property of ALT SYSTEM Co.

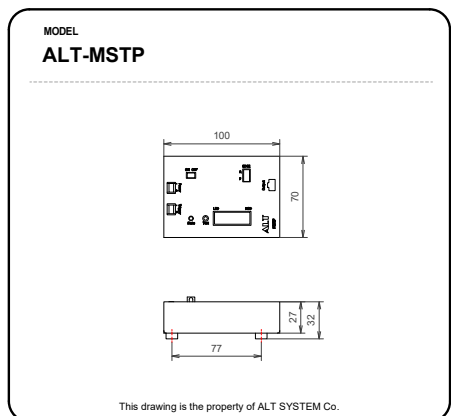
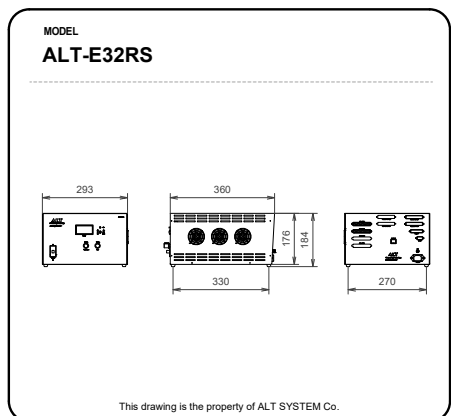
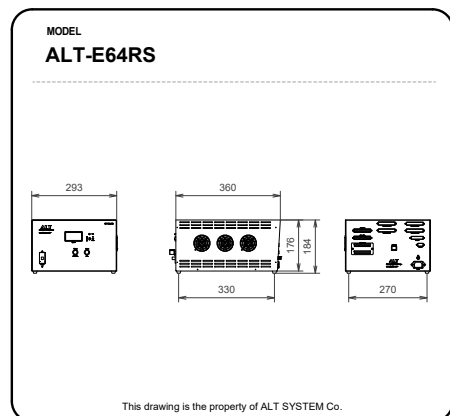
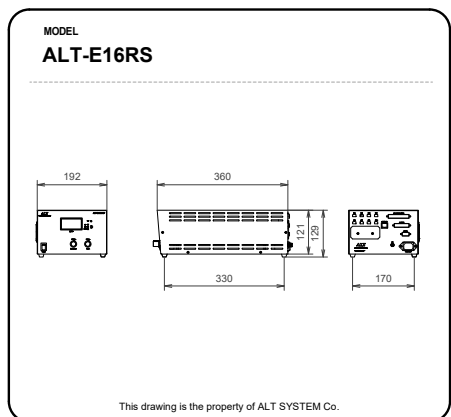
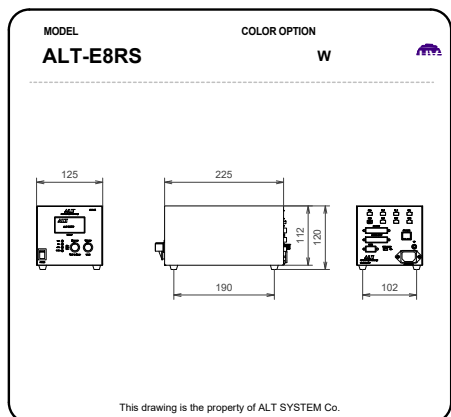
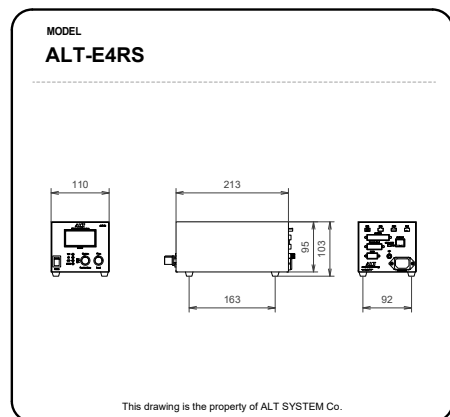
MODEL  
**ALT-LSP1000E**



This drawing is the property of ALT SYSTEM Co.

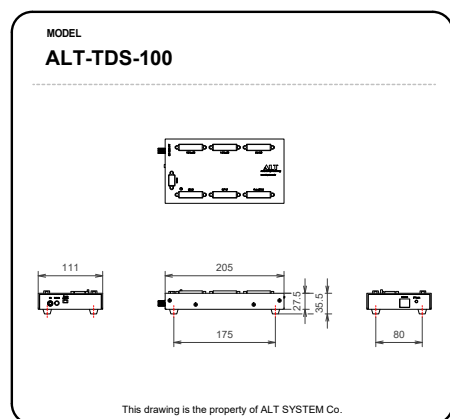
T-DIVIDER

# ALT-ESTP SERIES / ALT-MSTP



T-DIVIDER

# ALT-TDS SERIES







(주)알트시스템