



FireJet™ ONE



FireJet™ ONE Solid State UV LED Curing System

User Manual

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June, 2022

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For Technical Assistance Contact:

Phone +1 503 439 6446 • Fax +1 503 439 6408

Email: customerservice@phoseon.com

Website: www.phoseon.com

Contact Phoseon Sales for a Return Material Authorization (RMA)

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Overview and Safety

UV Curing System Components

The FireJet™ FJ ONE UV Curing System consists of the following components:

- FireJet ONE UV Light Source
- DC Power
- Supply Control

The product label on the FireJet ONE UV Light source identifies the production model and configuration. See the example (pictured right):

- **FireJet** is the product family
- **ONE 225x20** is the model number
 - **225** indicates the UV emitting length in mm
 - **20** indicates the UV emitting width in mm
- Configuration information follows the model number
 - **AC** defines the unit as air cooled with an internal fan
 - **395** defines wavelength in nm
- **20W** defines the peak irradiance in W/cm²

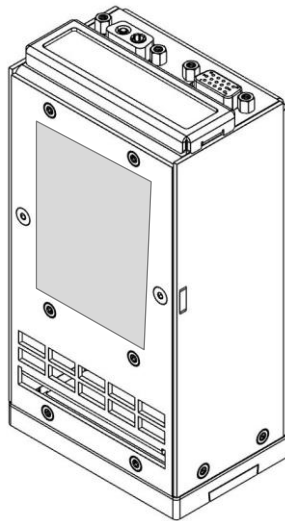


Figure 1.1: Safety Label Placement

Note: The current specification on the product label may vary based on product configuration.

CAUTION: The window frame may become a hot surface during UV operation.

Product Safety Information

UV LED Curing Sources



Intended Use

Phoseon light sources and optional power supplies are supplied as “open type” equipment. These system components must be mounted within an enclosure that is suitably designed for the specific environmental conditions present for the final product, and appropriately designed to prevent personal injury resulting from accessibility to live parts.

Protective Guards

Phoseon light sources include protective guards to fully enclose electrical mechanisms that may cause operator harm during normal use. These fixed guards adhere to the appropriate international safety standards.

CAUTION: Do not operate the light sources or the machine in which they are installed while any safety guards are open, loose, damaged, or missing.

Phoseon light sources are classified as Risk Group 3 under IEC 62471 at a distance of 200mm.

Risk groups defined in IEC 62471:

Exempt - There is no photo-biological hazard for the end points in this standard.

Risk Group 1 - Low Risk. Does not pose a hazard due to normal behavioral limitations on exposure.

Risk Group 2 - Moderate Risk. Does not pose a hazard due to aversion response to very bright light sources or due to thermal discomfort.

Risk Group 3 - High Risk. May pose a hazard even for momentary or brief exposure.

WARNING: DO NOT LOOK DIRECTLY AT THE UV LIGHT SOURCE WITHOUT WEARING UV SAFETY GOGGLES.

Note: A portion of the UV light will be visible and will be a strong visual stimulus.

Minimum requirement: UVEX SCT-orange lens which reduces eye fatigue by absorbing blue and green light and allows the operator to clearly view components during curing and inspection processes while absorbing 99.9% of UV radiation and visible light up to 532nm.

Note: Phoseon UV LED products emit 90% or more of the total UV light energy in a narrow wavelength band:

Wavelength	Band
365nm	345 to 385nm
385nm	370 to 410nm
395nm	380 to 420nm
405nm	390 to 430nm

Hazard and Safety Notices

The symbols and labels in the following table are used in Phoseon's light source product documentation and on the product labels. Please familiarize yourself with the symbols and their meaning in order to avoid misuse of the product.

Table 1.1: Safety Notices

Symbol	English Description	French Description	Italian Description	German Description	Spanish Description	Dutch Description	Polish Description
	Safety Notices	Consignes de Sécurité	Avvertenze sulla sicurezza	Sicherheits-hinweise	Notas de Seguridad	Veiligheids-aanduidingen	Ostrzeżenia dotyczące bezpieczeństwa
	Attention Read manual for safety instructions	Attention Lisez les instructions de sécurité dans le manuel	Attenzione Leggere il manuale per le avvertenze sulla sicurezza	Achtung Bitte Vorsichtsmaßnahmen in der Gebrauchsanleitung lesen	Atención Lea el manual de Instrucciones de seguridad	Opgelet Lees handleiding voor veiligheidsvoorschriften	Uwaga Zapoznaj się z zaleceniami bezpieczeństwa w instrukcji
	UV Light Read manual for safety instructions	Lumière UV Lisez les instructions de sécurité dans le manuel	Luce UV Leggere il manuale per le avvertenze sulla sicurezza	UV LICHT Bitte Vorsichtsmaßnahmen in der Gebrauchsanleitung lesen	Luz UV Lea el manual de Instrucciones de seguridad	UV-licht Lees handleiding voor veiligheidsvoorschriften	Promieniowa- nie UV Zapoznaj się z zaleceniami bezpieczeństwa w instrukcji
	Hot Surface	Surface Chaude	Superficie calda	Heiße Oberfläche	Superficie Caliente	Heet oppervlak	Gorąca powierzchnia
	Warning RISK GROUP 3 UV EMITTED FROM THIS PRODUCT Avoid eye and skin exposure to unshielded product.	Avertissement Rayonnement UV À Risque de Groupe 3 Eviter l'exposition des yeux et de la peau sans protection adéquat.	Attenzione DA QUESTO PRODOTTO EMISSIONI UV DELLA CLASSE DI RISCHIO 3 Evitare l'esposizione di occhi e pelle al prodotto non schermato.	Warnung Dieser Strahler emittiert UV-Strahlung der Risikogruppe 3. Setzen Sie Haut und Augen nicht der Strahlung des nicht abgeschirmten Strahlers aus.	Advertencia RADIACION UV DE RIESGO GRUPO 3 EMITIDA POR ESTE PRODUCTO Evite la exposición de ojos y piel por el producto sin protección adecuada.	Waarschuwing UV-STRALING RISICOGROEP 3 UITGEZONDEN VAN DIT PRODUCT Vermijd blootstelling van ogen en huid aan niet-afgeschermd product.	Ostrzeżenie GRUPA ZAGROŻENIA 3 PRODUKT EMITUJE PROMIENIOWANIE UV Unikać wystawiania skóry i oczu na działanie nieosłoniętego produktu.

Similar to the ANSI Z535.4 standard, the ISO 3864-2 standard defines the hazard severity panels as follows:

Yellow safety alert symbol Indicates possible human injury hazard exists.



DANGER signal word: used to indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING signal word: used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION signal word: used to indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



Restriction of Hazardous Substances (RoHS)

Phoseon Technology declares, to the best of our knowledge based on available information conducted to us, that our light sources do not contain any homogeneous materials that:

- Contains lead (Pb) in excess of 0.1 weight -% (1000 ppm)
- Contains mercury (Hg) in excess of 0.1 weight-% (1000 ppm)
- Contains hexavalent chromium (Cr VI) in excess of 0.1 weight-% (1000 ppm)
- Contains polybrominated biphenyls (PBB) or polybrominated dimethyl ethers (PBDE) in excess of 0.1 weight-% (1000 ppm)
- Contains cadmium (Cd) in excess of 0.01 weight-% (100 ppm)

Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Phoseon Technology has determined our products are not subject to EU REACH directive registration requirements.

With regards to the projected candidate list of substances of very high concern (SVHC) - issued 10 October 2008, Phoseon Technology further declares that, to the best of our knowledge, our products do not contain any currently listed SVHC above the level 0.1% by weight.

Product Recycling

This symbol is an internationally agreed indicator that the product bearing it should not be disposed of as general waste or garbage which might end up in landfill sites, but should instead be returned to Phoseon for reuse or be disposed of in accordance with local laws.

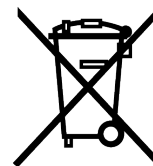


Figure 1.1: Do Not Dispose in Trash Symbol

Setup & Installation

Refer to the following documents for detailed information regarding integration into OEM equipment.

Table 2.1: FireJet ONE Documentation

FireJet ONE	75x20	150x20	225x20	300x20	375x20
Product Specification	39506				
Control Drawings	38855	38646	50222	50373	39287
Reducing Light Reflection	28658				
Window Cleaning Instructions	27182				
Declaration of Conformity	29321				

Optional Power Supply	75x20	150x20	225x20	300x20	375x20
FJ ONE 20W/cm ² 385, 395, 405nm	Mean Well www.meanwell.com 17512 RSP-1500-48		Mean Well www.meanwell.com 20011 RSP-3000-48		Mean Well www.meanwell.com 27254 RSP-5400-48

Table 2.2: DC Power Cable Part Numbers

DC Connector	Cable Length						
	2M	4M	5M	6M	10M	15M	20M
2W2	39339	N/A	39449	N/A	39450	N/A	39451
5W5	33167-xxM, where xxM is the length of the cable, in Meters (2, 4, 6, 10 & 15M)						N/A
8W8	50293-xxM, where xxM is the length of the cable, in Meters (2, 5, 10 & 15M)						N/A

Note: See 39506 Product Specifications to determine specific DC connector.

With the exception of the 3rd party power supplies, the above documents are included in this manual and also available as individual documents on the Phoseon Customer Resource Center (CRC) website at www.phoseon-support.com.

If using the optional power supply, or any 3rd party power supply, refer to the manufacturer's website for up to date dimensions and specifications. Particularly note any derating needed for operation in the target environment.

Electrical

The FireJet ONE requires a switching power supply with constant voltage output. The power supplies tested by Phoseon for use with the FireJet ONE systems are listed in the table above. The Mean Well specifications can be used as a guideline for selecting a switching power supply with the following critical specifications:

- 48Vdc +/- 4V delivered to the light source from constant voltage output source
- Maximum ripple should be less than 1V peak-to-peak
- See 39506 Product Specifications for minimum and maximum power delivered to the light source.

A power supply should be used that provides a Safety Extra Low Voltage (SELV) output and that is certified by a notified body and/or CE marked.

Requirements for FireJet ONE Modules Configured End-to-End

Power requirements are based on the individual modules when configured end-to-end. For example, three FireJet ONE 150x20 units can be used to create a 450x20 emitting window. Each module will have a dedicated DC power input based on the requirements defined above.

The control signals on the DB-15 connector may be daisy-chained for up to 5 light sources.

When scaling end-to-end, ensure the mounting bracket takes the tolerance stack into account.

PLC & RS485 Control

The light source can be controlled via a Programmable Logic Controller (PLC) using the DB-15 connection (see 39506 Product Specifications).

The light source can also be controlled via the RS485 interface on the DB-15 connector (see 29320 FireJet FJ100 & ONE RS485 Control Manual).

FireJet™ ONE

Product Specifications



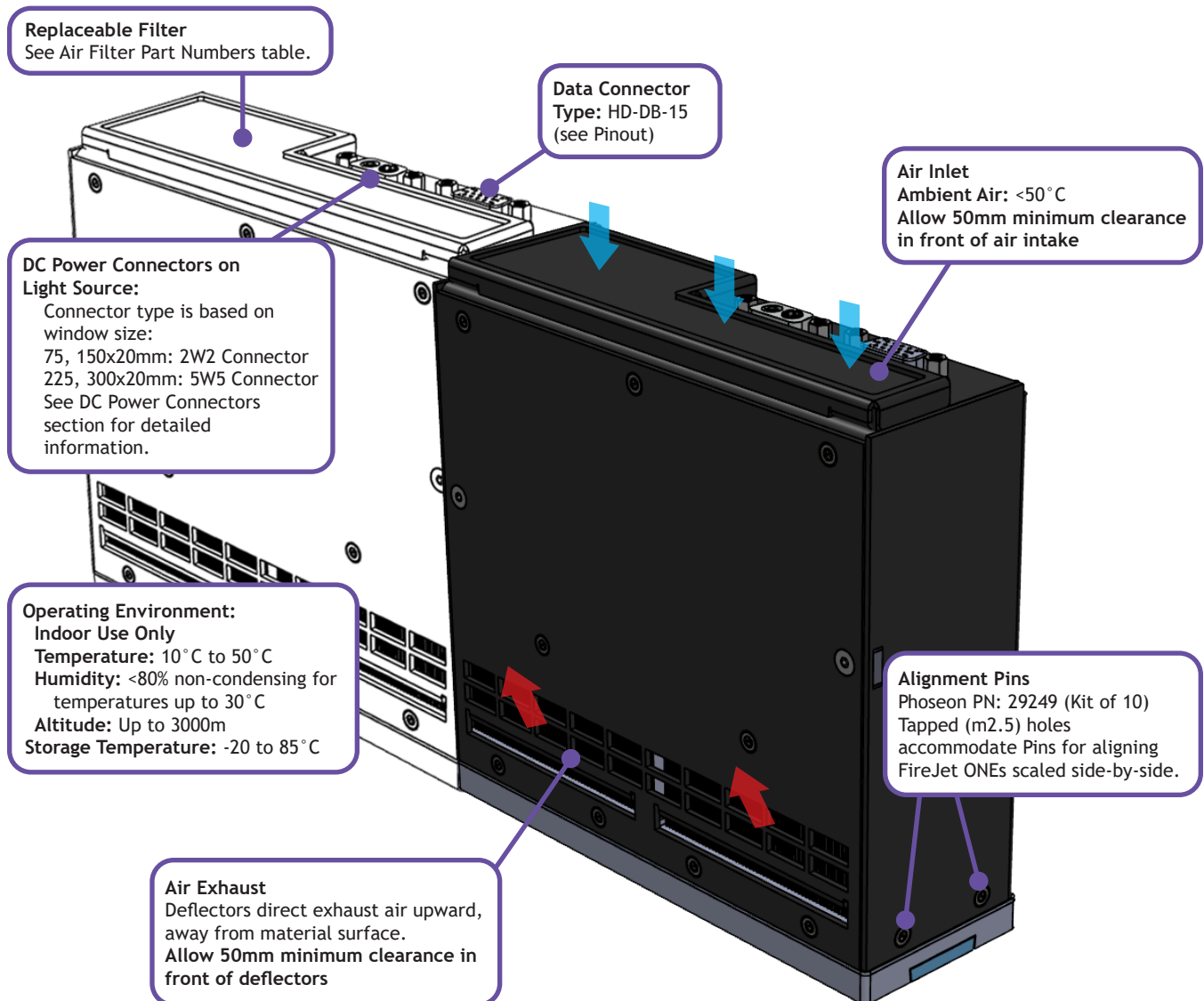
Phoseon UV LED SLM™ Technology

Phoseon Technology is the world leader in providing UV LED solutions for commercial and industrial applications. Phoseon's products deliver superior performance and real-world reliability for UV curing of adhesives, coatings and inks.

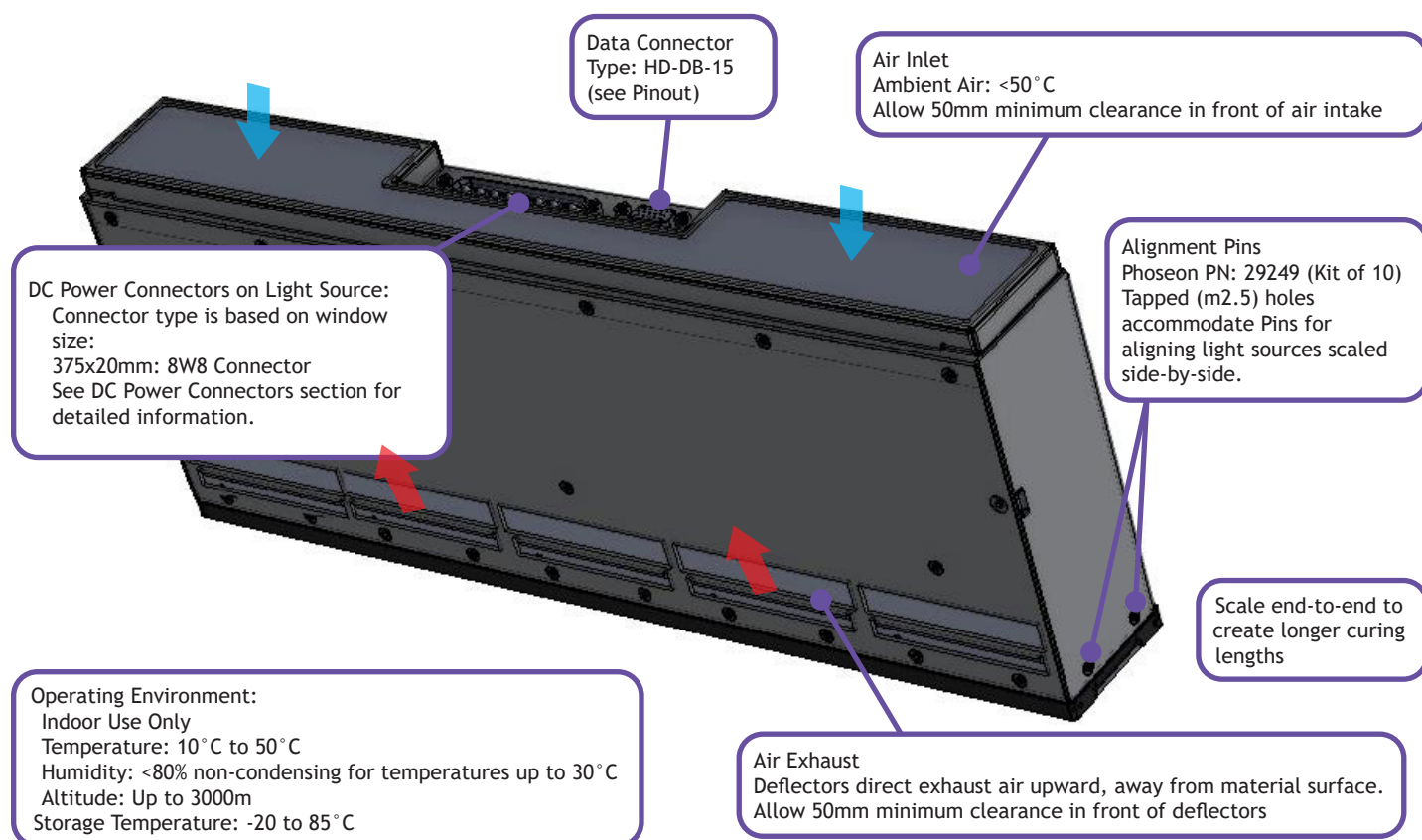
Phoseon's patented Semiconductor Light Matrix (SLM™) technology encapsulates LEDs, arrays, optics and cooling to maximize UV LED curing performance. The small footprint and end-to-end scalability of the FireJet™ ONE makes it an ideal solution for a variety of applications, including: wide format; and large single pass applications.



Light Source Setup (75, 150, 225, 300x20mm Windows)



Light Source Setup (375x20mm Window)



	Air Filter Part Numbers				
Window Size	75x20	150x20	225x20	300x20	375x20
Kit Part Number (6 filters/kit)	39680	39681	39682	39683	39684

Performance

	385, 395, 405nm				
Peak Irradiance	20W/cm ²				
Emitting Window (mm)	75x20	150x20	225x20	300x20	375x20
Maximum Fan Capacity	50 CFM	100 CFM	150 CFM	200 CFM	250 CFM
48V Power In (Max)	672W, 14A	1344W, 28A	2016W, 42A	2688W, 56A	3360W, 70A
Typical UV Emitting Power	205W	412W	620W	825W	1018W
DC Connector Type	2W2	2W2	5W5	5W5	8W8

	365nm				
Peak Irradiance	12W/cm ²				
Emitting Window (mm)	75x20	150x20	225x20	300x20	375x20
Maximum Fan Capacity	50 CFM	100 CFM	150 CFM	200 CFM	250 CFM
48V Power In (Max)	600W, 12.5 A	1200W, 25 A	1800W, 37.5 A	2400W, 50A	3000W, 62.5
Typical UV Emitting Power	125 W	250 W	375 W	500 W	625 W
DC Connector Type	2W2	2W2	5W5	5W5	8W8

Typical Dose*

	Typical Dose at 20W/cm ² (385, 395, 405nm)									
Process Speed (ft/min)	10	32.8	50	82	100	164	200	246	250	300
Process Speed (m/min)	3.05	10	15.24	25	30.48	50	60.96	75	76.2	91.44
Dose (mJ/cm ²)	5429.5	1656	1086.6	662.4	543.3	331.2	271.7	220.8	217.3	181.1

	Typical Dose at 12W/cm ² (365nm)									
Process Speed (ft/min)	10	32.8	50	82	100	164	200	246	250	300
Process Speed (m/min)	3.1	10	15.2	25	30.5	50	61.0	75	76.2	91.4
Dose (mJ/cm ²)	3257.7	993.6	652.0	397.4	326.0	198.7	163.0	132.5	130.4	108.7

*(+/-10%) at 100% Intensity and 5mm working distance

DC Power Connectors

The male Dsub connector is used to provide power to the light source.

2W2 Connector (75, 150x20mm windows)

Mating DC Connector Options

2W2 Female Dsub connector

FCT PN: F2W2SC-K121

Input Voltage: 48±4Vdc

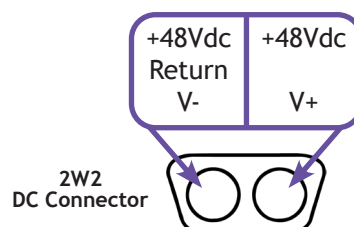
Mating Connector on Cable:

FCT PN: F2W2PC-K120 (Connector)

152-FMP007S103 (Socket)

152-FMP007P103 (Plug)

Phoseon Kit PN: 39598



5W5 Connector (225, 300x20mm windows)

Mating DC Connector Options

5W5 Female Dsub connector

Connector Housing: FCI PN DB5W5SA00LF

Female Contacts:

FCI PN 8638PSS4005LF (40A Max Solder

Contacts) or FCI PN 8638PSC4005LF

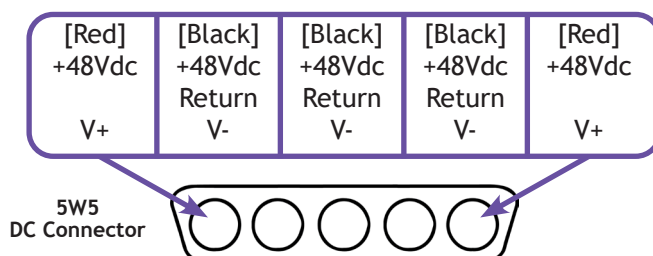
(40A Max Crimp Contacts)

Phoseon Custom Backshell Kit PN: 32968

Female 40A 5W5 with Solder Contacts:

Norcomp PN 680S5W5203L401

Custom Backshell Components plus hardware



8W8 Connector (375x20mm window)

Mating DC Connector Options

8W8 Female Dsub connector

MFR: Amphenol

MFR PN: DCO8W8P543H40LF

Input Voltage: 48±1Vdc

Mating Connector on Cable:

Connector

MFR: Amphenol

MFR PN: DC8W8SA00LF

Socket

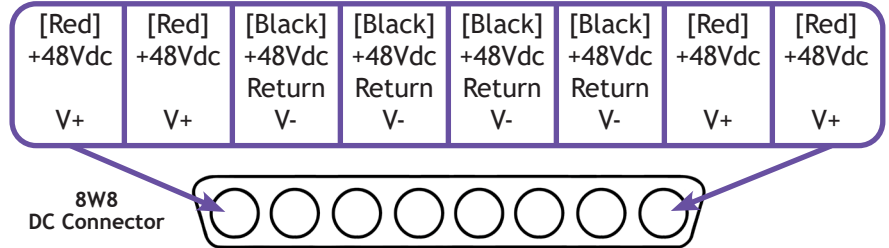
MFR: Conec

MFR PN: 132C11039X

Hood

MFR: ITT Cannon

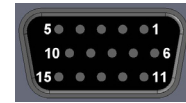
MFR PN: 980-2000-353



PLC Interface

The female HD-DB-15 connector is used to control the light source via PLC.

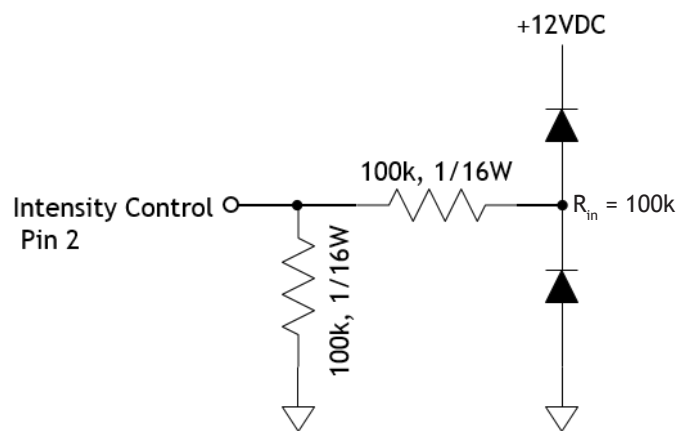
Data Connector



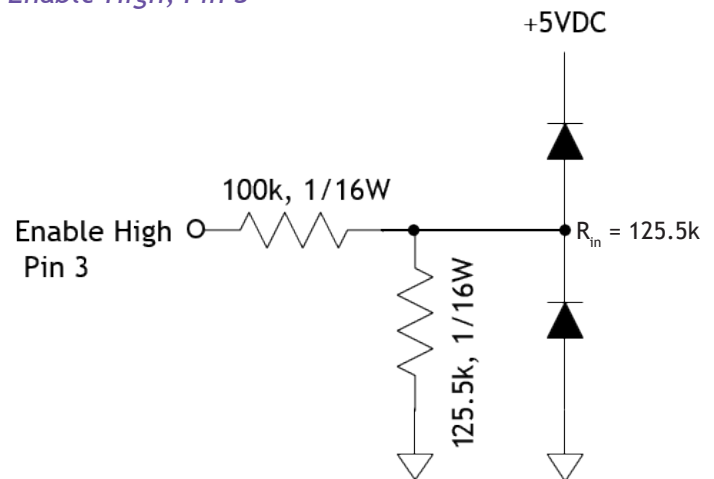
- | | | |
|---|--|--|
| 1 Do Not Connect | 5 Lamp Ready: (24V PLC Output)
0 to 6V = Not Ready or
16 to 24V = Ready
External resistive load on this
Pin must be $\geq 10k\Omega$ | 11 Do Not Connect |
| 2 Intensity Control: (Voltage Input)
0.5V = 5% of full power,
10V = 100% of full power
Internal resistive load on this Pin
is 100k Ω | 6 Do Not Connect | 12 RS485 Communication: Serial - |
| 3 Enable High: (24V PLC Input)
0 to 6V (ground/open input) = OFF
or 16 to 24V = ON
Internal resistive load on this
Pin is 125k Ω | 7 Do Not Connect | 13 RS485 Communication: Serial + |
| 4 Do Not Connect | 8 Ground | 14 Ground |
| | 9 Ground | 15 Temperature Monitor: (Voltage Output)
Voltage proportional to SLM heat sink
temperature 0.1V = 1°C
External resistive load on this Pin must
be $\geq 10k\Omega$ |
| | 10 Ground | |

The equivalent circuits inside the FireJet ONE UV curing source are shown below:

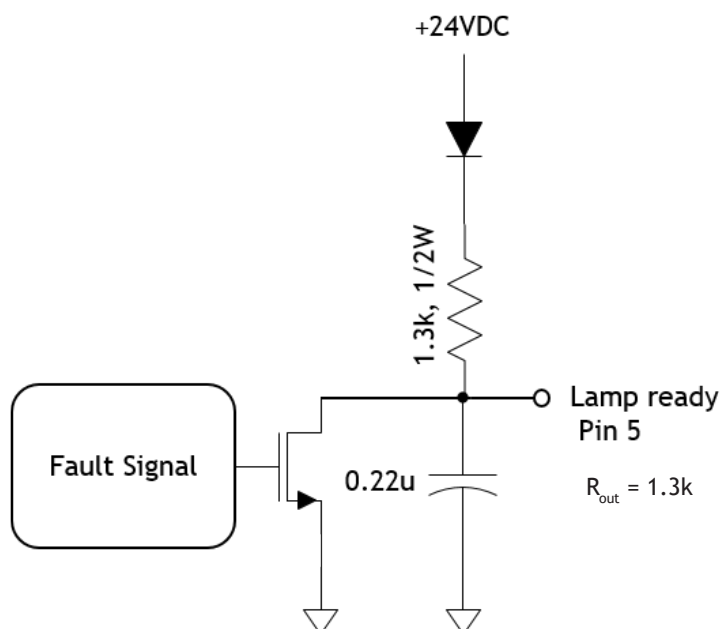
Intensity Control, Pin 2



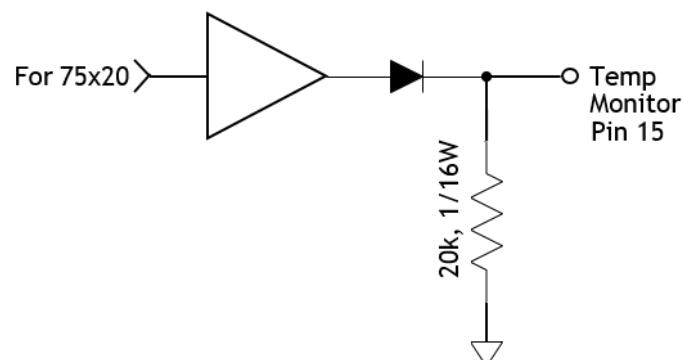
Enable High, Pin 3



Lamp Ready, Pin 5



Temperature Monitor, Pin 15



- For FireJet ONE 75x20mm, $R_{out} = 20k$
- For FireJet ONE 150x20mm, $R_{out} = 10k$ (two output modules parallel)
- For FireJet ONE 225x20mm, $R_{out} = 6.7k$ (three output modules parallel)
- For FireJet ONE 300x20mm, $R_{out} = 5k$ (four output modules parallel)
- For FireJet ONE 375x20mm, $R_{out} = 4k$ (five output modules parallel)

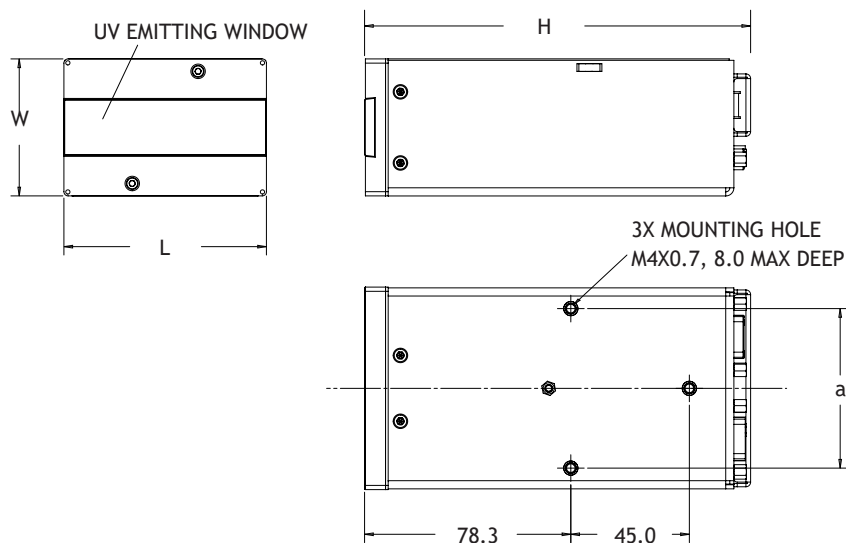
Dimensions

Units of measurement: mm

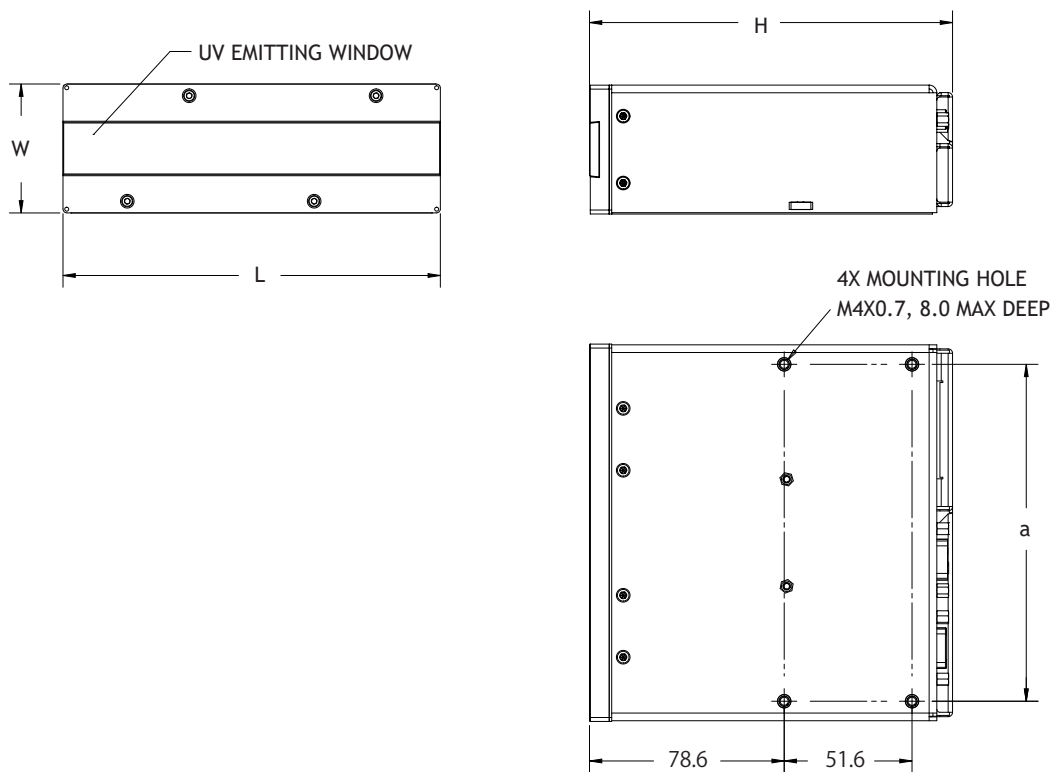
FireJet ONE					
UV Emitting Window (mm)	75x20	150x20	225x20	300x20	375x20
L	76.8	152.3	227.8	303.2	379
H	147.0	147.0	147.0	147.0	149
W	52.0	52.0	52.0	52.0	52
a	60.6	136.0	211.7	165.8	362
Weight (kg)	0.5	1.0	1.5	2.0	2.5

Note: Mounting holes differ between window sizes. See light source control drawing for specific mounting points and complete dimensions.

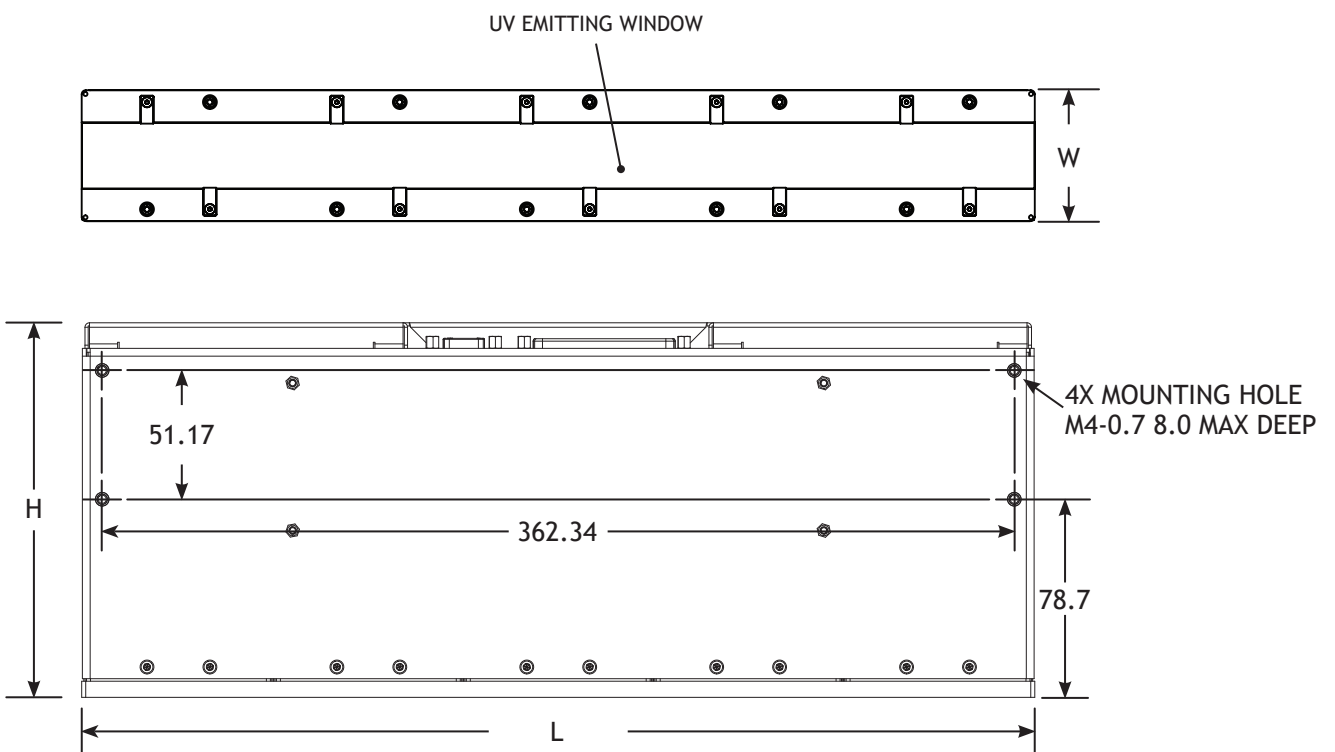
75x20mm Windows



150, 225, 300x20mm Windows



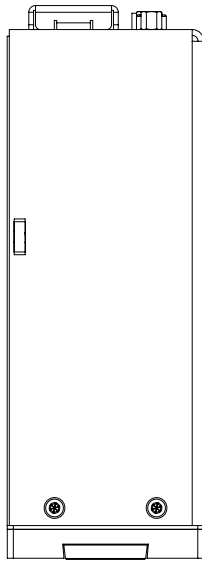
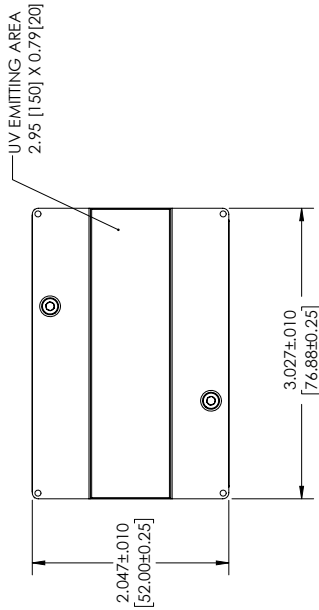
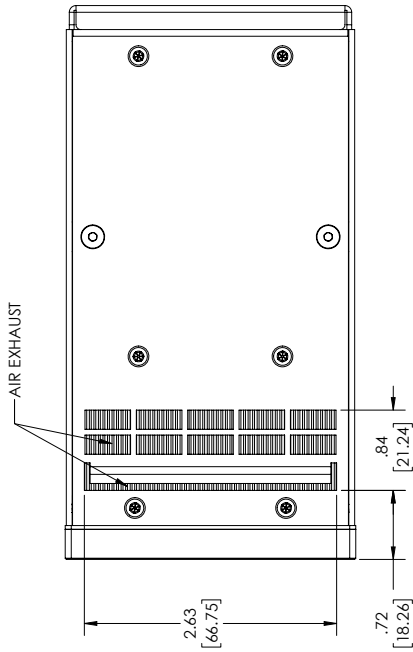
375x20mm Window



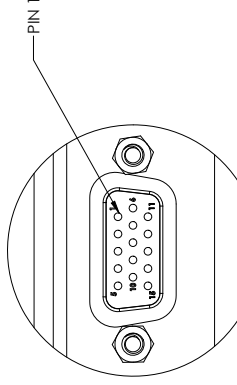
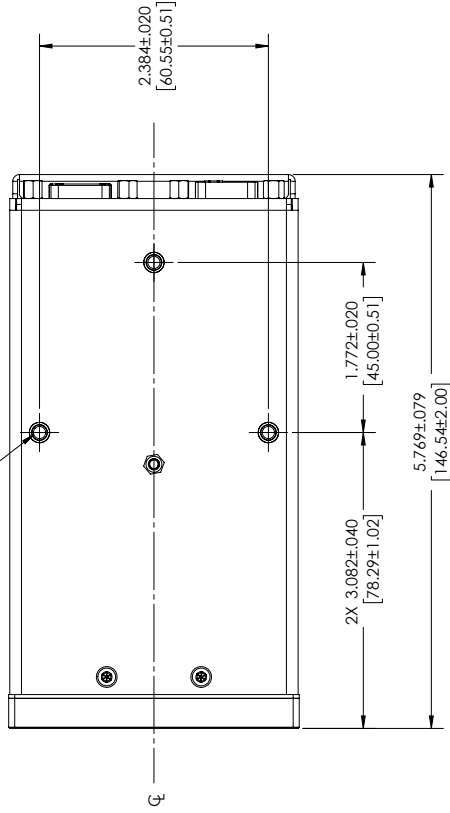
NOTES:

1. MOUNTING HARDWARE: M4X0.7 TAPPED HOLES; MAXIMUM SREW LENGTH IN INSERT IS 8MM WITH A MAXIMUM SCREW TIGHTENING TORQUE OF 3.5Nm [31 IN LB]
2. REFERENCE DOCUMENT: 29293 FIREJET FJ100 SPECIFICATION SHEET

REVISIONS				
REV.	DESCRIPTION	ENGR	DATE	APPROVED DATE
1	INITIAL RELEASE	AF	1/16/2020	1/16/2020

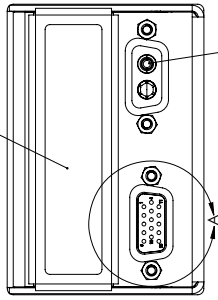


3X M4-0.7 X 8mm MAX DEPTH
MOUNTING POINTS



DETAIL A
SCALE 2:1

AIR INLET



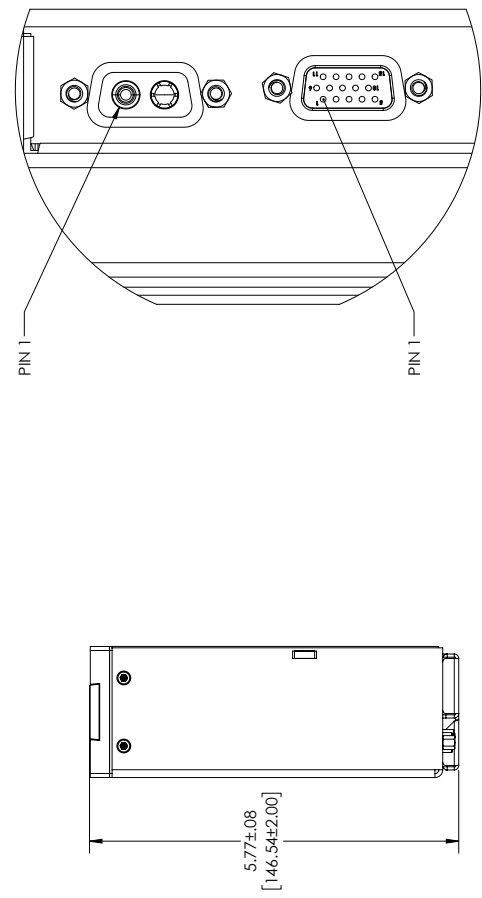
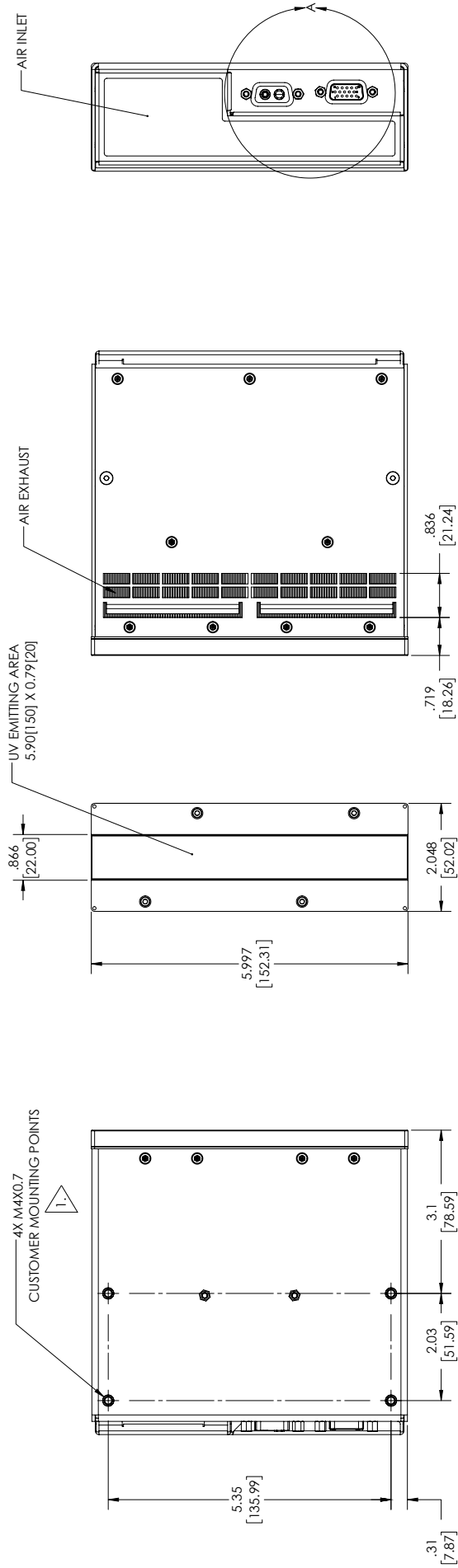
3RD ANGLE VIEW	ARTIFACT	INSET	TITLE
	NONE	NONE	CONTROL DRAWING, FJ100 75, GEN2

TOLERANCE LIMITS	PHASEON TECHNOLOGY
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL BE TO THE FOLLOWING TOLERANCES: FRACTIONS DECIMALS ANGLES X.XX ±.001 (0.001) X.XX ±.001 (0.001) X.XX ±.001 (0.001)	PHASEON TECHNOLOGY

REV.	DESCRIPTION	ENGR	DATE	APPROVED DATE
1	INITIAL RELEASE	AF	1/16/2020	1/16/2020

REV.	DESCRIPTION	ENGR	DATE	APPROVED DATE
1	INITIAL RELEASE	AF	1/16/2020	1/16/2020

REVIEWS					
REV.	DESCRIPTION	ENGR	DATE	ECO	APPROVED DATE
1	INITIAL RELEASE	AF	11/8/19	-	
2	REDUCE OVERALL HEIGHT BY .015	AF	03/10/2020	3561	03/10/2020

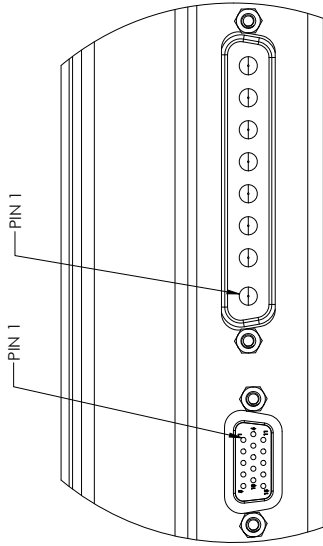
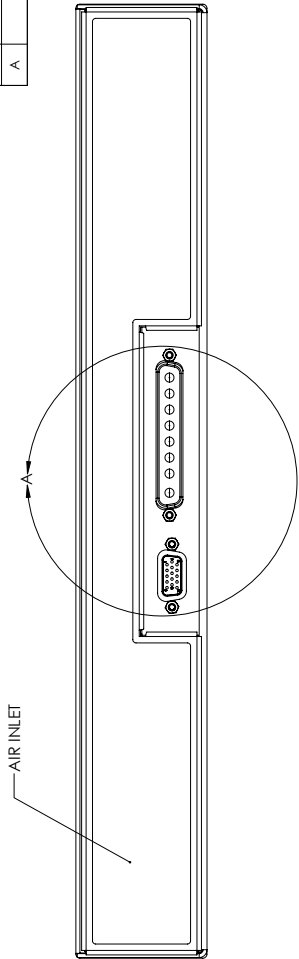


DETAIL A
SCALE 1.5:1

- NOTES:
1. MOUNTING HARDWARE: M4-0.7 STAINLESS STEEL, MAXIMUM SCREW LENGTH IN INSERT = 8mm WITH MAXIMUM SCREW TIGHTENING TORQUE = 31 in-lb [3.5 N-m]
 2. REFERENCE DOCUMENT: 29293 FIREJET FJ100 SPEC SHEET

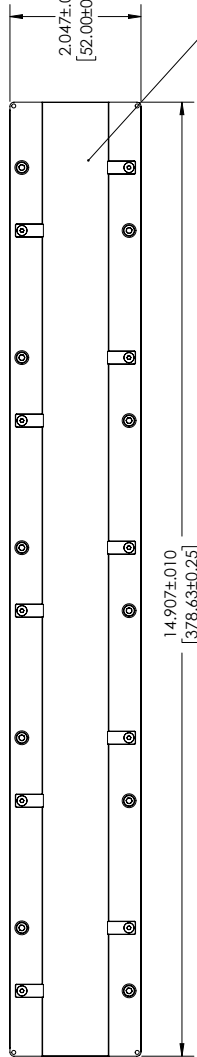
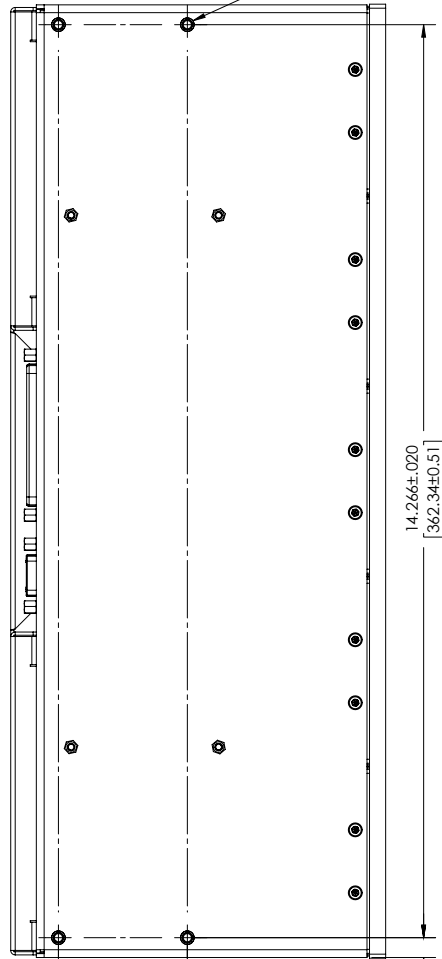
3RD ANGLE VIEW	MATERIAL	FINISH	TITLE
	N/A	N/A	CONTROL DRAWING, FJ100 150X20
Phoseon TECHNOLOGY			
PART NUMBER: 38646			
REV. 2			
ISSUED BY: A. KROD			
ISSUE DATE: 9/30/19			
3D DATABASE: N/A			
A06748E.TXT TGP-407501 SCALE: 1:1 SHEET 1 OF 1			

REVISONS				
REV.	DESCRIPTION	ENGR	DATE	APPROVED DATE
A	ENGINEERING RELEASE	AF	12/19/19	

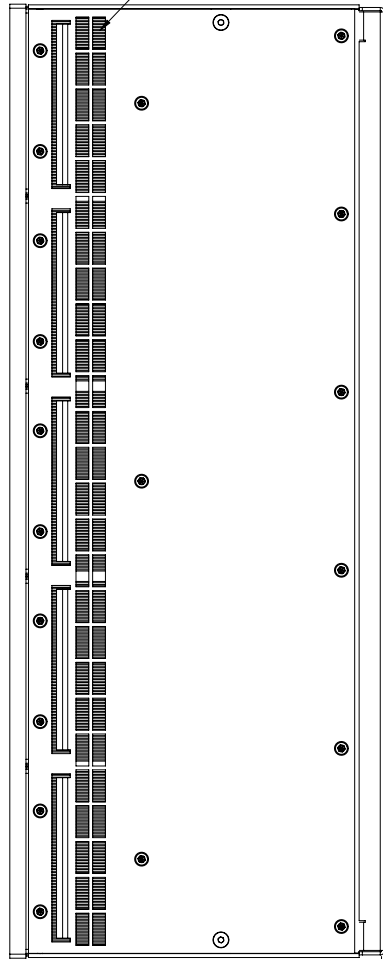


DETAIL A
SCALE 2:1.5

4X M4-0.7 X 8mm MAX DEPTH
CUSTOMER MOUNTING POINTS



UV EMITTING AREA
14.76 [375] X .79 [20]



NOTES:

1. MOUNTING HARDWARE:
M4-0.7 STAINLESS STEEL INSERTS: MAXIMUM SCREW LENGTH IN INSERT = 8mm
WITH MAXIMUM SCREW TIGHTENING TORQUE = 3.5 N·m (31 lb-in)

3RD ANGLE VIEW	ASSEMBLY	TEST	TITLE
	N/A	N/A	CONTROL DRAWING, FJ100 375X20

Phoseon TECHNOLOGY

PART NUMBER: 39287

ISSUED BY: A. KOSZ

REV. A

ISSUE DATE: 12/19/19

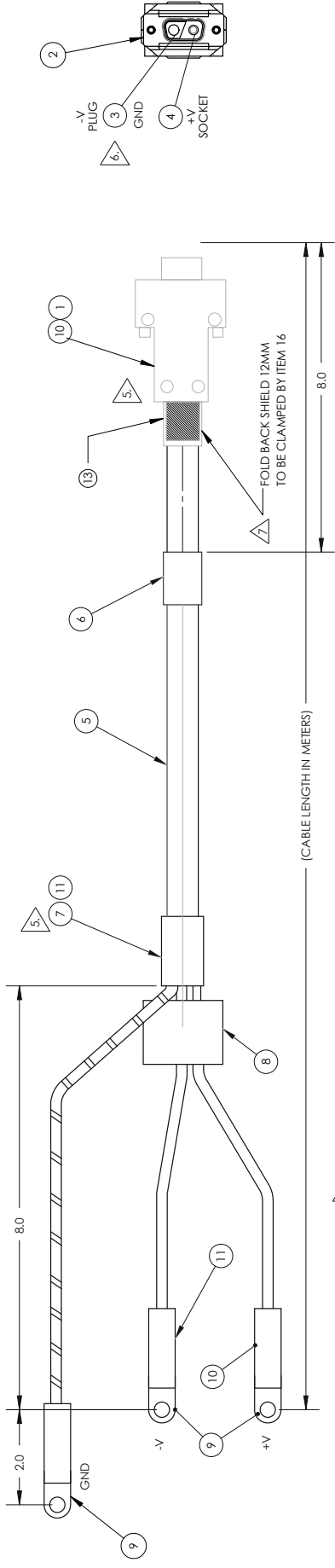
3D DATABASE: 9920 - REV: FJ100 375X20.31BP

ASSEMBLY: TTX (TGP 4407501) SCALE: 2:1.5 SHEET 1 OF 1

REVISIONS						
REV.	DESCRIPTION	ENGR	REV DATE	ECO	APPROVED	APPROVED DATE
3	UPDATE PANDUIT PN	DVF	2/07/2020	3514	AF	2/7/2020
4	UPDATE QTY ITEM NO.1	DVF	2/21/2020	3530	AF	2/21/2020
5	UPDATE BACKSHELL PART	DVF	3/09/2020	3558	AF	3/09/2020
6	ADD HEATSHRINK AND NOTE 8. SPECIFY WHITE LABEL	DVF	9/02/2020	3751	CS	9/02/2020
7	UPDATE BOM FOR INTERNAL MANUFACTURE	DVF	10/20/2020	3796	CS	10/21/2020
8	BOM ITEM 10 WAS P/N 20056, 3M EP-301-3/16" RD. HEATSHRINK 3/16" RED	AEH	02/25/2021	3909		

NOTE: UNLESS OTHERWISE SPECIFIED.

- CABLE ASSEMBLY SHALL BE ASSEMBLED PER COMPONENT MANUFACTURER'S RECOMMENDED PROCEDURES. ALL CRIMPED WIRE TERMINATIONS SHALL PASS MANUFACTURER'S CRIMP HEIGHT AND PULL TEST REQUIREMENTS.
- TEST CABLE ASSEMBLY CONTINUITY FROM PIN TO PIN.
- THE CLAMP-ON FERRITE MUST FIT FIRMLY AROUND THE CABLE ASSEMBLY. A TIE WRAP OR HEAT SHRINK TUBING OR A NYLON SPACER CAN BE USED ADJACENT TO THE CLAMP-ON FERRITE TO FIX IN PLACE.
- PART MARKING: LABEL WITH PHOSEON PART NUMBER AND REVISION WHERE SHOWN.
- ATTACH GROUND WIRE TO -V, ITEM 3 TERMINAL ON CONNECTOR.
- PERMISSIBLE TO SUBSTITUTE CRIMP CONTACTS FOR ITEMS 3 (FMP004P103) AND 4 (FMP004S103).
- USE PREFERRED COMPONENT MFR LISTED IN BOM OR PHOSEON ENGINEERING APPROVED EQUIVALENT.
- APPLY 1" HEATSHRINK ITEM 10 TO +V WIRE INSIDE CONNECTOR TO COVER EXPOSED CONTACT TO PREVENT BACKSHELL SHORTING. APPLY 1.5" HEATSHRINK ITEM 7 TO CABLE AT CONNECTOR END.



ITEM	PHOSEON P/N	REV	MFG.	MFG P/N	DESCRIPTION	QTY	CRIP COMP.
1	(50475)		TE CONNECTIVITY	1-2308340-1	BACKSHELL, HD D81.5, KIT	1	YES
2	(29256)		FCT	F2W2PC-K120	CONN, 2-PIN, PLUG, POWER, DB9	1	YES
3	(36267)		MOLEX	1727040153	Contact Pin, 40A Socket D-Sub, Crimp	1	YES
4	(50474)		MOLEX	1727040145	CONTACT, Male, 40A, Crimp	1	YES
5	(39313)		HELIKABEL	14428	CABLE, 3 CON, SHIELDED, 10 AWG, PVC	AR	
6	(10568)		HELLERMAN-ITTON	TAG91-105-WH	LABEL, SELF LAMINATING, 1 X 3/4,	1	
7	(27496)		3M	EP-300-1/2	Tubing, Heatshrink, 1/2", BLK w/Adhesive	AR	
8	(19709)		STEWART	28A2024-DA2	FERRITE, TUBE BOX CLAMPON, .500 BLK	1	
9	(39315)		PANDUIT	PN10-8R-D	CRIMP, RING TERM, 12-10 AWG, #8	3	
10	(36261)		3M	EP-300-3/8" RD	TUBING, HEATSHRINK, 3/8", RED	1	
11	(26859)		3M	EP-300-3/16"	TUBING, HEATSHRINK, 3/16", BLACK, ADHESIVE	1	
12	(39466)		MUELLER	1351003	(Alternate) Cable, 3 CON, Shielded, 10 AWG	AR	
13	(50476)		TE CONNECTIVITY	1-2308272-4	CABLE CLAMP, D-SUB, 4	1	

PART NUMBER	LENGTH IN METERS
39339	2M
39449	5M
39450	10M
39451	20M

CONNECTOR PIN	DESIGNATION	WIRE NUMBER
1	+V	1
2	-V	2
2	PE	GN-YE

3RD ANGLE VIEW

MATERIAL: SEE BOM

FINISH: N/A

TITLE: CABLE, DC POWER, 2, 5, 10, 20 METER, 2W2, 10AWG

Phoseon
TECHNOLOGY

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PHOSEON TECHNOLOGY IS PROHIBITED.

REV. 8

PART NUMBER: SEE TABLE

ISSUED BY: Don Farmer

ISSUE DATE: 2/19/2014

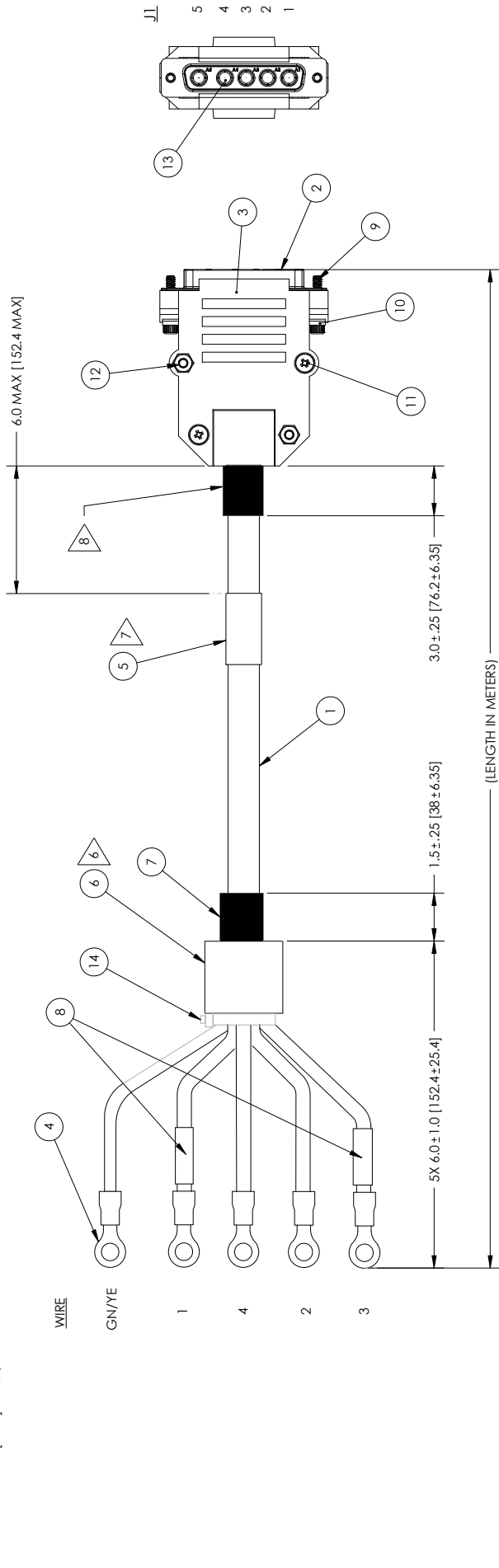
ASME/ANSI Y14.X, EGF-44274-01 | SCALE: 1:2 SIZE B | SHEET 1 OF 1

REVISONS					
REV.	DESCRIPTION	DATE	ENG	ECN	APPROVED DATE
8	COMBINED TABLE DRAWING PN 32649	12/30/19	DVF	3460	DW 12/30/19
9	UPDATE TO 5 WIRE CABLE. REMOVE BLK HEATSHRINK. ADD RING TERMINAL. UPDATE NETLIST	7/27/2020	DVF	3682	CS 7/27/2020
10	CHANGE PART NUMBER SCHEME. UPDATE CABLE LENGTH TOLERANCE. ADD NETLIST. UPDATE BOM.	03/16/2021	AF	PH3929	PH 04/09/2021

NOTES: UNLESS OTHERWISE SPECIFIED.

- DRAWING NOT TO SCALE.
- ASSEMBLE EACH COMPONENT PER COMPONENT MFR'S PROCEDURES.
- ASSEMBLE PER IPC/WHMA-A-620C STANDARD.
- TEST CONTINUITY OF EACH NET PIN TO PIN AND BETWEEN GROUND POINTS (SEE NETLIST TABLE).
- USE PREFERRED COMPONENT MFR LISTED IN BOM OR PHOSEON ENGINEER APPROVED EQUIVALENT.
- CLAMP-ON FERRITE (ITEM 6) MUST FIT FIRMLY AROUND THE CABLE ASSEMBLY.
- LABEL WITH PHOSEON PART NUMBER, CURRENT REV AND ASSIGNED VENDOR CODE APPROX. WHERE SHOWN.
- STRIP CABLE JACKET 2.25[57] ON CONNECTOR END. PLACE 4.0 [102] HEATSHRINK (ITEM 7) OVER JACKET AND WIRES.

9. RAW CABLE LENGTH TOLERANCE:
LENGTH ≤ 295[7500] = +2%/−0
LENGTH > 295[7500] = +5%/−0



ITEM	PHOSEON PN	MANUFACTURER	MFG PN	DESCRIPTION	QTY.
1	(50006)	HELUKABEL	62979	5 COND. TRAY CONTROL OIL RESISTANT, FLEXIBLE TRAY CABLE 600V	A/R
2	(39002)	AMPHENOL	L77TWB5WSS	CONN D-SUB HOUSING RCPT SPOS	1
3	34084	ANY PER SPEC	-	BACKSHELL, 5WS, CUSTOM, SLS	2
4	(26901)	MOLEX	19067-0025	CONN RING CIRC BAWG #5/16 CRIMP	5
5	(36263)	BRADY	PTL-33-427	LABEL 4PHX1.5" W WH/CLR	1
6	(34230)	LAIRD SIGNAL INTEGRITY PRODUCTS	28A5776-0A2	FERRITE CORE 210 OHM HINGED	1
7	(36319)	ALPHA WIRE	F2213/4 BK105	HEATSHRINK 3/4" BLACK	8IN
8	-	ALPHA WIRE	F221V1/2 RD105	HEATSHRINK 1/2" X 4 RED	2IN
9	(35755)	RAF	0823-SS	PANEL SCREW PAN SLOTTED #4-40	2
10	(34160)	TYCO	5204473-3	CONN SADDLE WASHER #4-40 ANPLMT	2
11	(33189)	MCMASTER CARR	92000A126	18-8 SS PAN HEAD SCREW, M3 X 1.6	4
12	(33190)	MCMASTER CARR	91828A211	18-8 SS HEX NUT, M3 X 0.5MM THREAD	4
13	(39119)	CONEC	132C11049X	CONN D-SUB SOCKET 8-10AWG CRIMP	5
14	(25022)	MCMASTER CARR	7130K52	CABLE TIE, 4" LONG, 7/8" BUNDLE DIAMETER	1

NETLIST	
J1	WIRE
1	3
2	2
3	GN-YE
4	4
5	1

PART NUMBER FORMAT

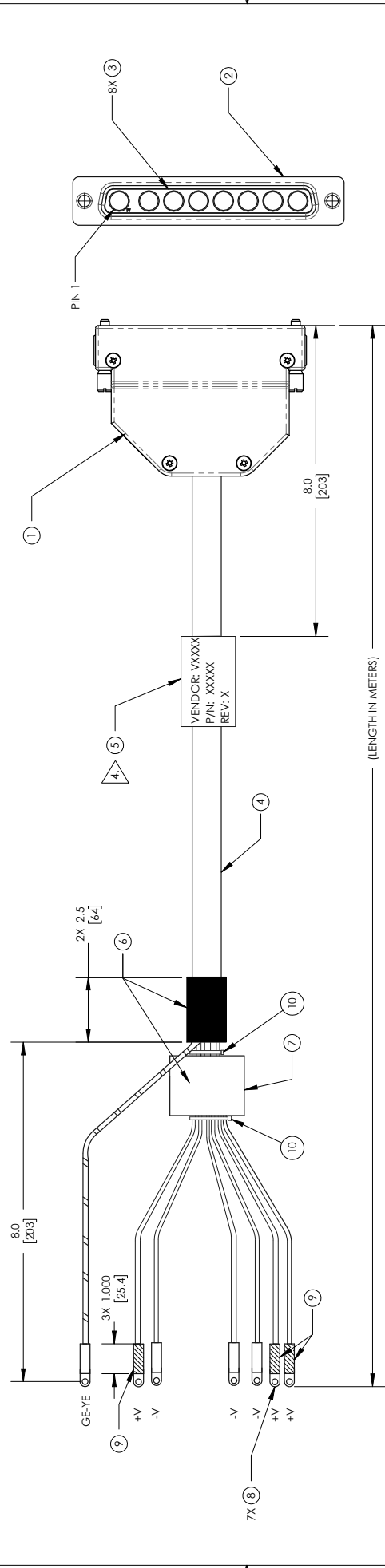
33167 - _ _ M

LENGTH, IN METERS

3RD ANGLE VIEW		MATERIAL:	FINISH:	TITLE:	CABLE, DC POWER, 5W5	
		N/A	N/A			
DIM UNITS: IN [mm]		PROPRIETARY AND CONFIDENTIAL		PART NUMBER: SEE PN FORMAT		REV. 10
TOLERANCES UNLESS OTHERWISE SPECIFIED		DO NOT REPRODUCE OR DISSEMINATE THIS INFORMATION WITHOUT THE WRITTEN PERMISSION OF PHOSEON TECHNOLOGY		ISSUED BY: G.TILL		ISSUE DATE: 12/2/16
X.X: ±0.020 [0.5]				3D DATABASE: N/A		ASME/ANSI Y14.5 (EFG-44273-01) SCALE: 1:1 SIZE C/SHEET 1 OF 1
X.XX: ±0.010 [0.25]						
X.XXX: ±0.005 [0.13]						
ANGLE: 31°						

REVISIONS						
REV.	DESCRIPTION	ENGR	REV DATE	ECO	APPROVED	APPROVED DATE
1	INITIAL RELEASE	DVF	9/8/2020	3759	CS	9/8/2020
2	UPDATE CONNECTOR, ADD CABLE CLAMP, REMOVE 3716' BLK SHRINK, UPDATE ITEM 6, 9	DVF	1/14/2021	3863	CS	1/14/2021
3	ITEM 1 WAS 51172, CONN BCKSHELL 37P; ITEM 3 QTY WAS 8; ITEM 4 WAS 50292, CABLE 12AWG; ITEM 7 WAS 19709, SEWARD FERRITE; ITEM 10 WAS 51173, CABLE CLAMP; ADD NOTE 7	AEH	06/29/2021	PH4055	CS	06/29/2021

- NOTE: UNLESS OTHERWISE SPECIFIED.
- CABLE ASSEMBLY SHALL BE ASSEMBLED PER COMPONENT MANUFACTURER'S RECOMMENDED PROCEDURES. ALL CRIMPED WIRE TERMINATIONS SHALL PASS MANUFACTURER'S CRIMP HEIGHT AND PULL TEST REQUIREMENTS.
 - TEST CABLE ASSEMBLY CONTINUITY FROM PIN TO PIN.
 - THE CLAMP-ON-FERRITE MUST FIT FIRMLY AROUND THE CABLE ASSEMBLY"
 - PART MARKING: LABEL WITH PHOSEON PART NUMBER AND REVISION WHERE SHOWN.
 - USE PREFERRED COMPONENT MFR LISTED IN BOM OR PHOSEON ENGINEERING APPROVED EQUIVALENT.
 - CUT ITEM 6 INTO TWO 2.5IN PIECES. PLACE HEATSHRINK AROUND BLK WIRES EXCLUDING GREEN WIRE WHERE FERRITE IS SHOWN IN DRAWING. OTHER 2.5IN PIECE COVERS ALL WIRES ON CABLE SIDE.
 - ASSEMBLE PER IPC/WHMAA-A-620C STANDARD.



ITEM	PHOSEON P/N	MFG.	MFG P/N	DESCRIPTION	QTY	CRIT. COMP.
1	(51666)	ITT CANNON	980-2000-348	D-SUB 37 METAL DIECAST BACKSHELL	1	YES
2	(50290)	AMPHENOL	DC8W85A00LF	CONN D-SUB HOUSING RCPT 8POS	1	YES
3	(50291)	CONEC	132C11039X	CONN D-SUB SOCKET 10-12AWG CRIMP	7	YES
4	(51667)	HELUKABEL	62974	CABLE, 7 COND. UNSHIELDED, 10 AWG, PVC	AR	YES
5	(10568)	BRADY	B-427 Clear/White	LABEL, SELF LAMINATING, 1 X 3/4"	1	-
6	(51174)	Quadrtek	Q5-4X 5/8-01-GB48IN-5	HEATSHRINK 5/8"-48" BLACK	5IN	-
7	(19716)	DIGI-KEY	240-2121-ND	CORE, FERRITE, HINGED, 210 OHM	1	-
8	(39315)	PANDUIT	PN10-8R-D	CRIMP, RING TERM, 12-10 AWG, #8	7	-
9	(28377)	Allied Electronics	FT-221-1/4RD 064	HEATSHRINK, 1/4", RED	6IN	-
10	(32568)	BELDEN	DT-07-50-0-C	ZIP TIES, NYLON, 8" X .17"	2	-

PART NUMBER	LENGTH IN METERS
50293-02M	2M
50293-05M	5M
50293-10M	10M
50293-15M	15M

CONNECTOR PIN	DESIGNATION	WIRE NUMBER
1	+V	1
2	+V	2
3	-V	3
4	-V	4
5	-V	5
6	-V	GN-YE
7	+V	N/C
8	+V	6

TITLE: CABLE, DC POWER, 2, 5, 10, 15 METER, 8W8

MATERIAL: SEE BOM

FINISH: N/A

3RD ANGLE VIEW

PHOSEON TECHNOLOGY

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DATE: 06/29/2021
DRAWN BY: J. L. LEE
CHECKED BY: J. L. LEE
APPROVED BY: J. L. LEE
P/N: 50293-02M
REV: 1
SCALE: 1:2
SHEET 1 OF 1

Reducing Light Reflection



Technical Note

Overview

One of the many benefits of UV LED technology is divergent light, meaning there is no focal point of the light output. This creates a longer exposure time for media traveling under the light source, and therefore typically higher dose for curing the adhesive, coating, ink or other UV curable material. When the light source is mounted adjacent to a print head, there may be a concern when using very sensitive inks that light could reflect off the media into the print head and begin curing prematurely. This document describes techniques to reduce reflected light.

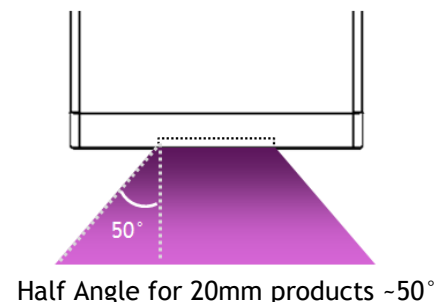
Note:

- The types of print media (surface roughness, reflectivity, color, etc.) will change the behavior and amount of any UV light reflection
- Increasing or decreasing the distance of the light source to the media changes the peak intensity of the UV and may affect cure speed
- Uses of recommendations in this document are done solely at the user's risk; Phoseon claims no responsibility for damage of any inkjet components

Light Output Angle

The typical half angle of light output from Phoseon UV LED light sources with a 20mm wide emitting window is approximately 50° from the edge of the glass.

For products with a 10mm wide emitting window, the half angle varies depending on the type of optic; please refer to the Optics Option Technical Note for more information regarding the shape of the light output.



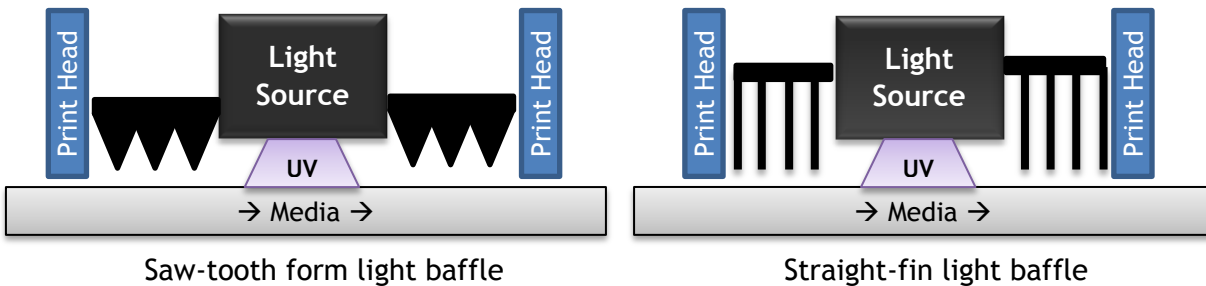
Reducing Light Reflection

To reduce the light reflection, the following techniques can be used:

- Use materials around the light source that absorb or do not reflect UV (examples below) and avoid materials that are good UV reflectors such as bare Aluminum
 - Black anodized or black painted materials
 - Optical absorption and anti-reflective coatings
 - Thorlabs blackout materials, e.g. black metal foil (<http://www.thorlabs.com>)
 - Steel
- Increase surface roughness of materials between the light source and print head
 - Avoid smooth surfaces, which are good reflectors
 - Bead blasting or other roughening techniques reduce reflection of flat surfaces
- Use light traps or baffles between the light source and print heads
 - Saw-tooth forms and straight-fins are good for capturing any reflected light
 - Increase number of grooves and increase depth of baffles
- Keep the light source close to the surface to reduce light spread

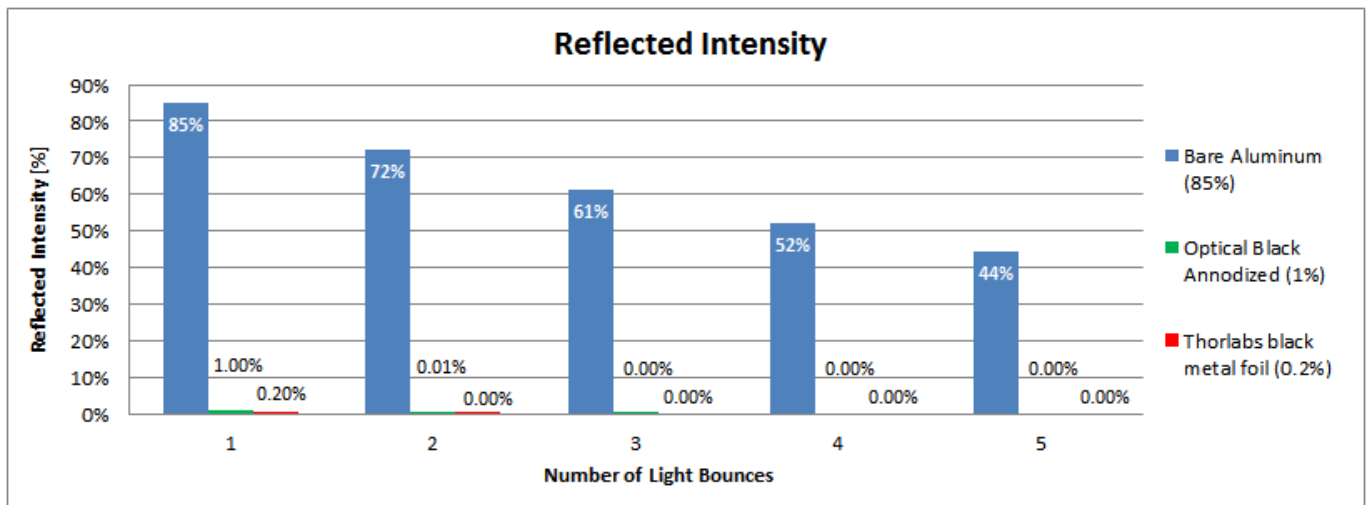
Light Baffle Examples (not to scale)

Adding a light baffle creates a surface to catch the reflected light beams and prevents them from reflecting (bouncing) off of other materials in the system and reduces the light spread.

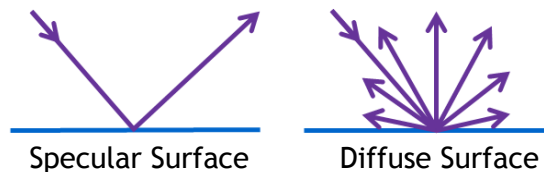


Materials

As stated above, avoid reflective materials such as bare Aluminum, as it has a UV reflectivity rating of 85%, whereas a surface that has been anodized optical black has a UV reflectivity rating of 1% and the Thorlabs black metal foil has a rating of 0.2% (see chart below). The intensity of the light will decrease every time it reflects (or 'bounces') off of a surface.



The surface finish of the material also affects how the light spreads. A specular surface is a smooth, mirror-like finish that allows a light beam to remain intact as it reflects off of the surface. A diffuse surface is a rough, textured finish that scatters the beam, causing the beam to reflect in many different directions. An example of a specular surface could be a mirror or polished metal. An example of a diffuse surface could be paper or textured paint.

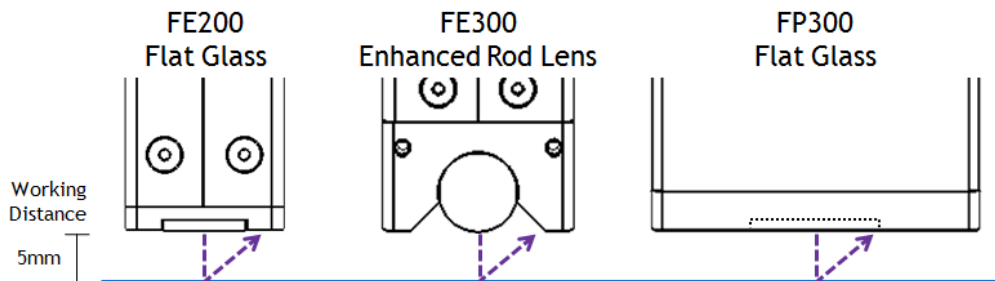


Light Reflection Examples

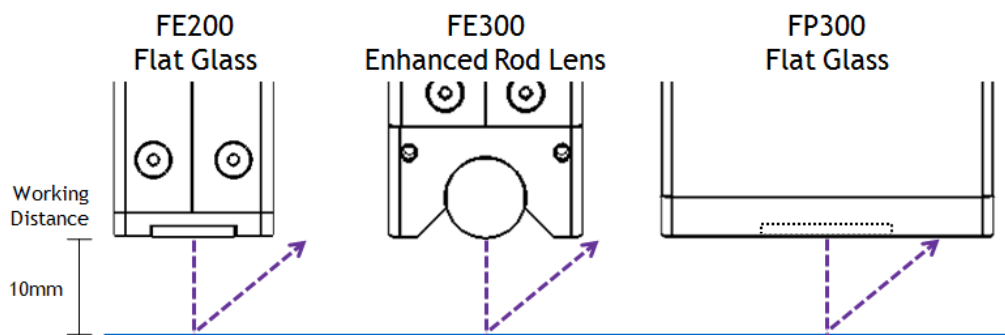
When curing with a reflective surface, like bare or polished aluminum, the size of the window frame and the working distance from the emitting window to the media, will affect how much light is allowed to reflect past the light source. Adding a light catch or shield that extends past the light source will catch some of this reflected light.

The amount of reflected light from a light source will vary based on the setup including:

- The peak intensity of the light source: directly correlates to the intensity of the reflected light, especially on a specular surface
- The type of window frame and optic: a focused light like the FE300 concentrates the light into a smaller area on the surface, where the FE200 Flat Glass and FP300 allows the light to spread due to the half-angle of the light output
- The working distance height between the light source and media: a larger working distance allows more room for the light to reflect past the emitting window frame
- The type of media surface: a highly reflective specular surface will reflect light more intensely than a non-reflective diffuse surface



Phoseon Product Examples at 5mm Working Distance

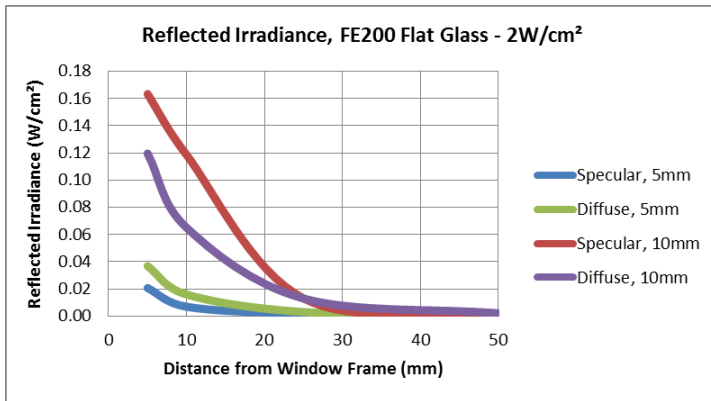


Phoseon Product Examples at 10mm Working Distance

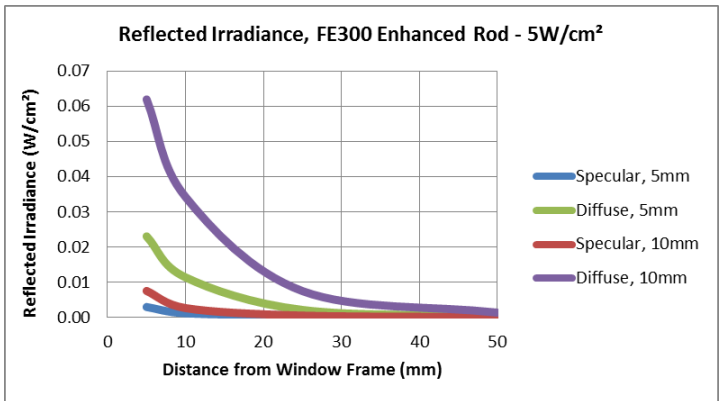
The charts below illustrate the irradiance values of reflected light with 3 different light sources; the FE200-2W/cm² with Flat Glass, the FE300-5W/cm² with Enhanced Rod Lens, and an FP300-20W/cm².

- The media is shown as a worst-case scenario with 100% reflectivity, meaning the media is not absorbing any of the UV energy, even if it is a specular or diffuse surface
 - For comparison, bare aluminum is 85% reflective as shown in the previous chart
 - In actual use, most surfaces will absorb some of the UV energy, which is either used to kick off a UV reaction (inks, coatings, or adhesives), or turns into heat
- The media is shown in two forms: a specular (smooth) surface and a diffuse (rough) surface

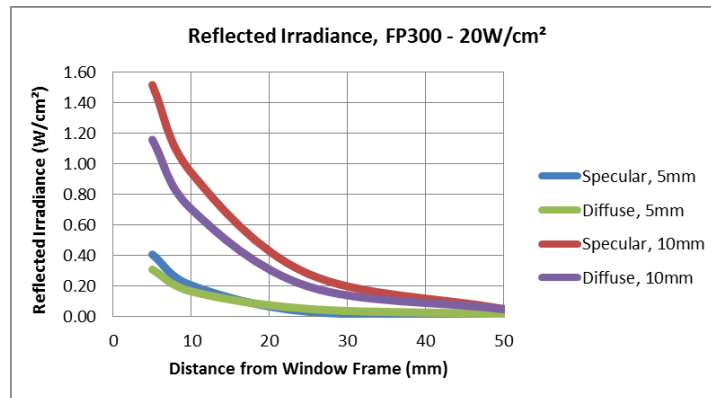
- Each media type is shown at two different working distances: 5mm and 10mm from the emitting window to the media
- The point of measurement for the reflected light is on the same plane as the emitting window at varying distances away from the edge of the light source (window frame, not the glass)



FireEdge FE200 Flat Glass, 2W/cm²



FireEdge FE300 Enhanced Rod, 5W/cm²



FirePower FP300, 20W/cm²

Observations from the charts above:

- The intensity of the light reflections from the FE200 are 10x less than the FP300, due to the difference in peak intensities (2W/cm² versus 20W/cm²)
- The FE300 has less intense light reflections and less specular reflection than the FE200 due to the Enhanced Rod Lens creating a narrower light output
- Other Phoseon products with 20mm emitting windows will have similar reflected irradiance patterns to the FP300, but the distance from the emitting window is different due to the width of the window frames

Connecting Multiple Light Sources

If multiple light sources are used and controlled together, the following Pins can be “AND” tied together so that one DB-15 interface can be used to control all the light sources in unison:

- Pin 2 (Intensity Control)
- Pin 3 (Enable)
- Pin 5 (Lamp Ready)
- Pins 8, 9, 10 & 14 (grounds)
- Pin 15 (Temperature Monitor)

CAUTION: DO NOT tie together the following signal Pins:

- Pin 4
- Pin 6

These Pins are used for factory functions. Light source operation may be affected if these Pins are tied together between multiple light sources.

Operation

On/Off Control

The UV source is controlled through a simple voltage and can be turned on and off electronically. The light source does not require shutters and is enabled only when needed.

CAUTION: Any material exposed to UV, when not in motion, can reach very high temperatures. Turn off the light source when not actively UV curing.

Intensity Control

The intensity of the UV output is controlled through an analog voltage (Pin 2 on the DB-15 data connector). The valid range of this voltage is 1 to 10Vdc. 10Vdc corresponds to 100% output irradiance and UV power, and 1Vdc corresponds to 10% output irradiance and UV power.

The output of the FJ ONE varies linearly from 10% to 100% for intensity control voltages of between 1Vdc and 10Vdc. Below 1Vdc the output irradiance is held at a constant minimum value below 10%. If zero UV output is desired, the Enable line (Pin 3) should be pulled low. Voltages above 10Vdc are internally clamped to 10Vdc.

Lamp Ready Output

The status of the FJ ONE is given by the state of the Lamp Ready line (Pin 5 on the DB-15 data connector). The line is high when the FJ ONE is in the Ready state, meaning the UV output may be enabled through the Enable line. If this line is low, the FJ ONE is in the Not Ready state, indicating the UV output will not enable.

The Not Ready state is caused by one or more of the following conditions:

- The FJ ONE has a blown fuse.
- The FJ ONE has detected false current when the lamp is disabled.
- The FJ ONE DC power supply is turned off.
- The FJ ONE DC power supply is providing a voltage too low for proper operation.
- The FJ ONE is in thermal shutoff due to excessive internal temperatures.
- A command has been issued via RS485 to force the light source into a fault condition (used for testing purposes).

Refer to the troubleshooting guide later in this manual for help identifying the cause of the Not Ready state.

Irradiance as a Function of Distance

The UV emission from the FJ ONE UV light source diverges with distance away from the window glass. However it is important to note that as the distance between the media and the emitting window increases, the total energy (dose) delivered by the light source remains constant. Peak irradiance decreases as the working distance increases, but it is offset by an increase in the exposure area (light footprint), keeping the dose constant.

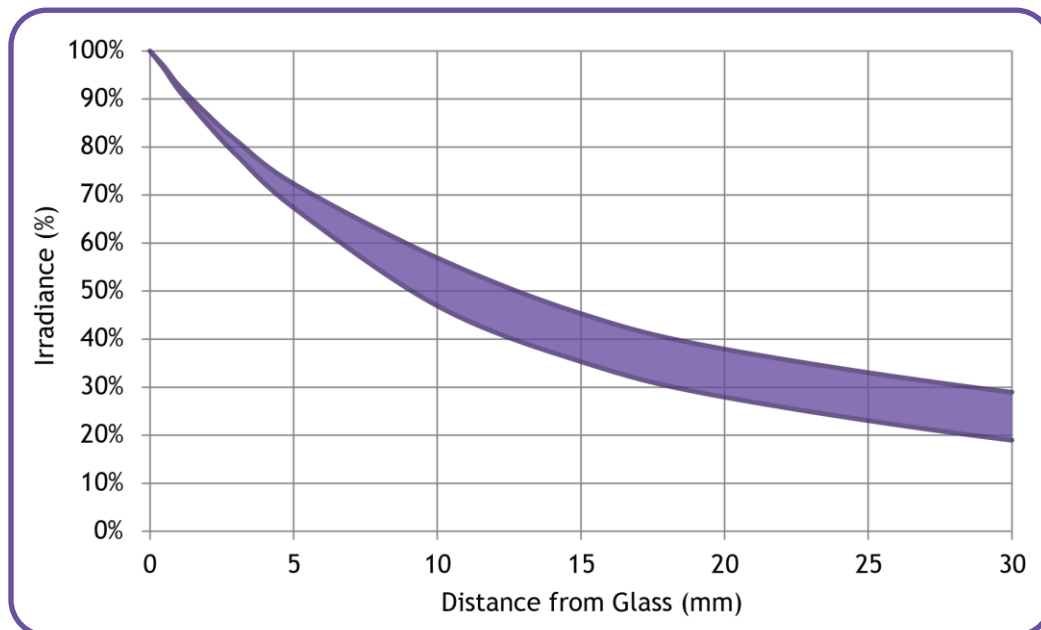


Figure 3.1: Irradiance as a Function of Distance

Monitoring Temperature

The performance of the FireJet, which is an air cooled system, will be directly impacted by the temperature of the ambient air, in the environment where the light source is being operated. Irradiance will increase slightly at cooler operating temperatures, for example at initial system start up, and decreases slightly with warmer operating temperatures.

Therefore, a temperature monitoring device has been integrated into the system to help monitor light source temperature during operation. The device inside the unit outputs a voltage signal of 0 to 10.5Vdc to Pin 15 which corresponds to 100mV per degree Celsius. For example, a reading of 2.55V equates to 25.5°C.

Phoseon recommends that the customer monitor the temperature through the HD DB-15 connector (Pin 15). If the reported temperature changes by more than 10 to 15 degrees from steady state operating conditions, this could indicate a problem and the environmental conditions should be inspected. See Troubleshooting Guide in Section 4 for more information.

In addition to monitoring the system temperature, a separate temperature switch has been integrated into the light source to shut down the emission of UV light when the light source has exceeded a safe operating temperature. The light source will shut off to prevent a thermal run away condition, and the Lamp Ready line (Pin 5) will be low.

Note: When a temperature fault occurs, the light source will shut off automatically. The light source will turn back on automatically when the operating temperature has returned to an acceptable value.

Service

For further details contact Phoseon Technology by phone at +1.503.439.6446 or email at customerservice@phoseon.com.

Troubleshooting Guide

Table 4.1: Troubleshooting Guide

Note: Green LED is located on the PCBA, visible when air intake filter is removed.

Symptom	Green LED	Pin 5: Lamp Ready	Pin 15: Temperature Output	Root Cause	Recommended Action	RS485 Logging
Lamp Ready, Not Enabled	On	Hi	<10.5V (<105°C)	No Fault	Apply +24V on Pin 3 to enable. If control signals are in question, isolate the lamp from the control system, and connect Pin 3 directly to Pin 6. If lamp operates, then it is not receiving the correct enable signal from the controller.	No FW log entry
Lamp Not Ready UV ON if Enabled	Off	Lo	<10.5V (<105°C)	Over Voltage, Input Voltage >53V	Adjust DC power input to lamp (48±1VDC) Note: Fault is not logged for first 10 seconds when DC power is applied, fault response is within 1 second of detection after the initial 10 seconds.	Event Code 5: Flt-inputV_hi
				Under Voltage, Input Voltage <43V	Adjust DC power input to lamp (48±1VDC) Note: Fault is not logged for first 10 seconds when DC power is applied, fault response is within 1 second of detection after the initial 10 seconds.	Event Code 6: Flt-inputV_lo

Symptom	Green LED	Pin 5: Lamp Ready	Pin 15: Temperature Output	Root Cause	Recommended Action	RS485 Logging
Lamp Not Ready UV OFF if Enabled	Off	Lo	>10.5V (>105°C)	LM35 Temperature Sensor, FW controlled: Over temperature >105°C	DO NOT SHUT-OFF DC Power Ensure air inlet and exhaust have at least 50mm clearance. Ensure ambient air temperature is $\leq 50^{\circ}\text{C}$, and filters are not clogged. Fault status will clear and UV will turn on (if enabled) when the light source has cooled down to $\leq 4.0\text{V}$ on Pin 15.	Event Code 3: Flt-FW_overtemp FW set limit at the factory
			>11.0V (>110°C)	Temperature sensor, HW switch: Over temperature >110°C	DO NOT SHUT-OFF DC Power Ensure air inlet and exhaust have at least 50mm clearance. Ensure ambient air temperature is $\leq 50^{\circ}\text{C}$, and filters are not clogged. Fault status will clear and UV will turn on (if enabled) when the light source has cooled down to $\leq 4.0\text{V}$ on Pin 15.	Event Code 2: Flt-temp_intrlck
Lamp Not Ready UV Off or Only Partially On if Enabled Part or all of the lamp remains off when enabled	Off	Lo	<10.5V (<105°C)	Blown Fuse	Shut off DC power Contact Phoseon	Event Code 1: Flt-blown_fuse
Lamp Not Ready UV On When Not Enabled DC Current Drawn When Not Enabled Part or all of the lamp remains on when not enabled	Lo	Lo	<10.5V (<105°C)	False Current Detected	Shut off DC power Contact Phoseon	Event Code 4: Flt-False_I

Window Cleaning Instructions



User Guide

Phoseon requires inspecting and cleaning the emitting window of the light source for any debris or UV material on a regular basis, up to daily if needed, to maintain the quality of UV light output.

Note: Do not submerge the light source or spray any liquid directly onto the light source.

The materials needed to properly clean the Phoseon light source, can be purchased from most home improvement supply stores, paint stores, or auto-body repair shops.

Materials Needed:

- Dry Paper Towels
- Razor Blade and Handle
- IPA Pre-moistened Wipe
- Gloves: Vinyl and Sharp Resistant (i.e. Kevlar)
- Sharps Disposal Container

Instructions:

1. Disconnect DC Power from the light source.

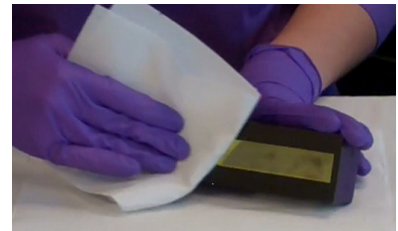
CAUTION: Wearing vinyl gloves is recommended to avoid getting any uncured UV material on the skin.

2. Wipe down the glass with a dry paper towel to remove any uncured UV material.
3. Carefully scrape large debris off the window using the sharp edge of the razor.

CAUTION: Wear sharp-resistant gloves.

Note: If the razor needs to be replaced, dispose of the razor blade in a properly marked sharps container.

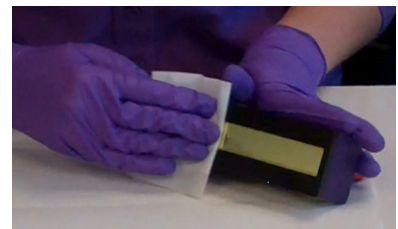
4. Use the pre-moistened IPA wipe to remove any remaining dust or debris left on the window during the cleaning process.
5. Repeat steps 2 through 5 until the window is clear of all contaminants.
6. If needed, use a dry paper towel to wipe down the light source.



Wipe Glass



Scrape with Razor



Wipe with IPA

Declaration of Conformity (CE)

Product Identification



Brand	Phoseon						
Product Family	Product Models						
FireEdge™	75x5 FE100 80x10 FE200 75x10 FE300 75x10 FE400 80x10 FE410 80x10	FE100 120x10 FE200 110x10 FE300 110x10 FE400 120x10 FE410 120x10	FE100 180x10	FE100 240x10 FE400 180x10 FE410 180x10	FE400 240x10 FE410 240x10		
FireFlex™	75x50	150x50	225x50				
FireFly	25x10 50x20 FF200 25x20	25x20 75x20 FF200 50x20	25x25 150x20				
FireJet™	225x20 ONE 75x20 FJ100 75x20 FJ100 G2 75x20 FJ240 75x40 FJ601 225x20 FJ605 300x20 FJ800 100x100 FJ801 100x100	ONE 150x20 FJ100 150x20 FJ100 G2 150x20 FJ200 150x20 FJ240 150x40 FJ601 300x20 FJ605 375x20	FJ50 225x20 ONE 225x20 FJ100 225x20 FJ100 G2 225x20 FJ200 225x20 FJ200SLD 225x20 FJ228 225x20 FJ240 225x40 FJ601 375x20 FJ605 450x20	ONE 300x20 FJ100 300x20 FJ100 G2 300x20 FJ200 300x20 FJ240 300x40 FJ601 450x20 FJ605 525x20	ONE 375x20 FJ100 375x20 FJ100 G2 375x20 FJ200 375x20 FJ240 375x40 FJ601 525x20 FJ605 600x20	FJ605 675x20	
FireLine™	125x20 350x20 FL200 75x10 FL400 125x20 FL400SLD 125x20 FL440 125x40	150x20 450x20 FL200 125x10 FL400 150x20 FL400SLD 150x20 FL440 150x40	225x20 550x20 FL400 225x20 FL400SLD 225x20 FL440 225x40	300x20 675x20 FL400 250x20 FL400SLD 250x20 FL440 250x40	FL400 300x20 FL400SLD 300x20 FL440 300x40		
FirePower™	FP200 150x20 FP300 150x20 FP501 300x20 FP601 300x20	FP200 225x20 FP300 225x20 FP501 350x20 FP601 350x20	FP200 300x20 FP300 300x20 FP501 450x20 FP601 375x20	FP200 350x20 FP300 350x20 FP501 525x20 FP601 450x20	FP200 450x20 FP300 450x20 FP501 600x20 FP601 525x20	FP300 900x20 FP501 700x20 FP601 600x20	FP601 675x20
KeyPro™ Explorer	25x10						
StarFire™	100x20	150x20					
StarFire MAX™	75x20	150x20	225x20	300x20			

Manufacturer

Name: Excelitas Technologies
Address: 7425 NE Evergreen Parkway, Hillsboro, Oregon 97124-5845
Country: United States of America

Means of Conformity

Excelitas Technologies declares that the product listed as a result of its design and construction is in conformity with the essential requirements and provisions of the following Council Directives and standards:

Applicable Directives:

- 2014/35/EU (Low Voltage Directive)
- 2014/30/EU (Electromagnetic Compatibility)
- 2011/65/EU (RoHS2)

Standards Used to Verify Compliance:

- EN 61010-1:2010/A1:2019/AC:2019-04/A1:2019
- EN 62471 (2008) IEC 62471 (2006)
- EN 61326-1 (2013)

Signature

Signature (electronic): Rob Gomeau

Name: Rob Gomeau, Director of Operations

Place : Hillsboro, OR