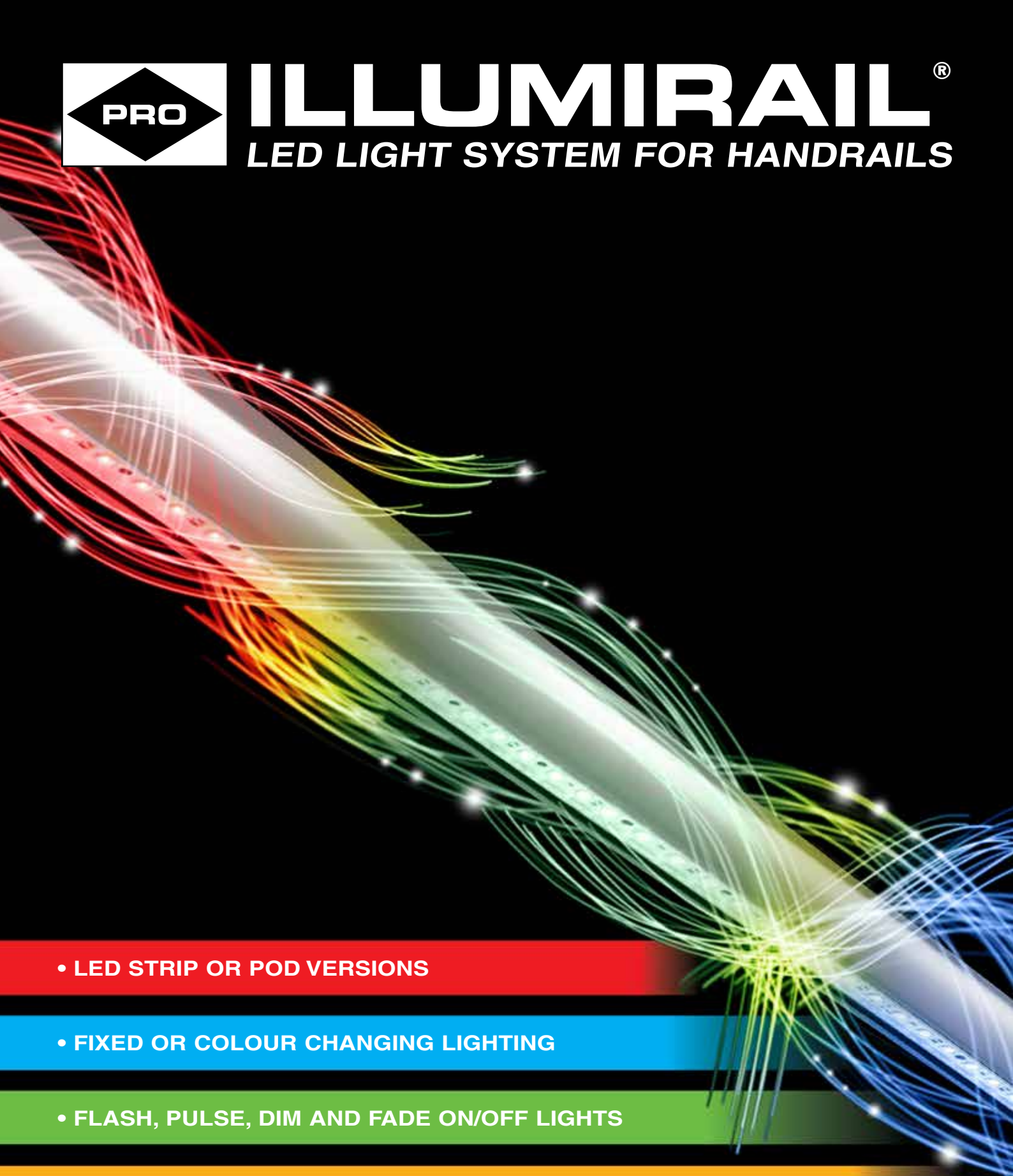
PRO ILLUMIRAIL®

LED LIGHT SYSTEM FOR HANDRAILS



- LED STRIP OR POD VERSIONS
- FIXED OR COLOUR CHANGING LIGHTING
- FLASH, PULSE, DIM AND FADE ON/OFF LIGHTS
- FOR SAFETY, SECURITY OR CREATING MOOD
- SUITABLE FOR WALL OR POST MOUNTED HANDRAILS SYSTEMS

www.fhbrundle.co.uk

ILLUMIRAIL®

LED HANDRAIL

Illumirail is a stylish and practical lighting application for incorporating into handrailing installations. With the choice of RGB, coloured and bright white LEDs, it doesn’t just aesthetically provide the finishing touch to any handrail project, it also offers a solution to safety and security issues surrounding dark stairwells and walkways. Illumirail can be fitted in wall mounted or post mounted handrailing.

THERE ARE 2 CHOICES FOR ILLUMINATING YOUR HANDRAIL:

- Bar System - fitted into our standard split tube handrail
- Pod System - can be fitted in any round Ø 42.4 - 48.3mm handrail system. Also retrofittable

Illumirail is ideal for specification in a wide range of applications including residential, restaurants, offices, night clubs, leisure and retail. In fact anywhere that requires illumination, inside or out, with Stainless Steel Type 316 as standard. Both systems are waterproof and fully rated to IP67. They can be used with PIR movement sensors, daylight sensors (dusk to dawn) and the solid colours can also be linked into emergency lighting back-up systems.

With thousands of colours to choose from, it’s easy to create the right mood or ambience in any enviroment.

The ColourTouch 4.3” controller is at the heart of the RGB bar system enabling it to change colour, flash, pulse, dim and fade on and off. The ColourTouch controller can be sited in any location up to 50m from the installation and requires a 24V DC supply. Where this is outdoor, the unit must be contained within a waterproof enclosure.

Both our Bar and POD systems can be used with a variety of infill options such as glass, wire rope or our crossbar systems. For more information please request our Pro-Railing catalogue or visit www.fhbrundle.co.uk.

Illumirail uses 24V DC for LED bar and 12V DC for POD, LED bar requires 100W and POD required 70W transformers connected to 230V AC 50Hz mains supply.

ILLUMIRAIL OPERATION CAN BE:

- On/Off via a mains supply switch. All variants should have isolation by this method
- All systems should be protected by an appropriate residual-current circuit breaker with overcurrent protection (RCBO)
- PIR and daylight sensor housing with engineer calibration trim pot. The trim pot will be factory set and should not require on site alteration except in areas which are particularly shaded or bright

COLOUR CHANGING SYSTEM (WITH COLOURTOUCH CONTROLLER):

- With a wall mounted ColourTouch controller (RGB rigid bar only) - one per system
- With an in-line pulse width modulation colour changing driver - one per transformer output for RGB system
- With an in-line relay (on/off) module - one per transformer output for PIR system

ILLUMIRAIL® BAR SYSTEM

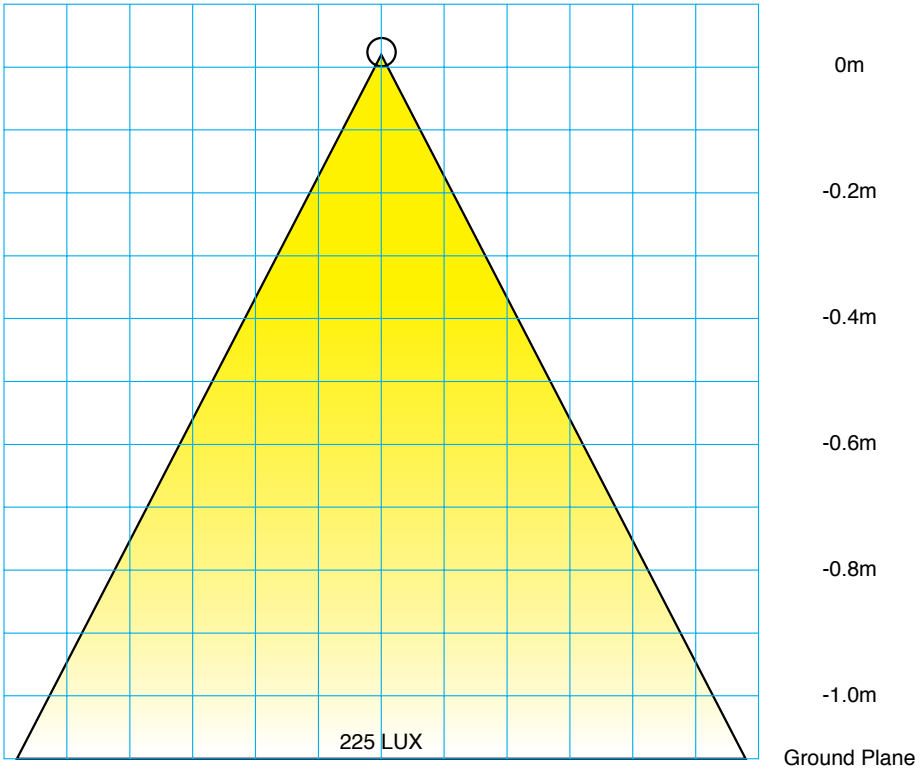
LED BAR & LIGHTING INFORMATION

LED BAR INSTALLATION

Exploded View

LIGHT DISTRIBUTION AT 1100mm HANDRAIL HEIGHT

850mm WARM WHITE LED RIGID BAR



Beam width 3.5m at ground plane

Our Illumirail LED bar fits discreetly and securely into our Ø 42.4mm split tube. It is supplied with an internal trunking that offers a tidy cable management system. Plus a full range of fittings to provide a handrailing solution that can work on post or wall mounted handrails.

Illumirail LED bar is available in both 425 and 850mm lengths. The standard length is 850mm and is designed to fit between our 1200mm Pro-Railing post centres.

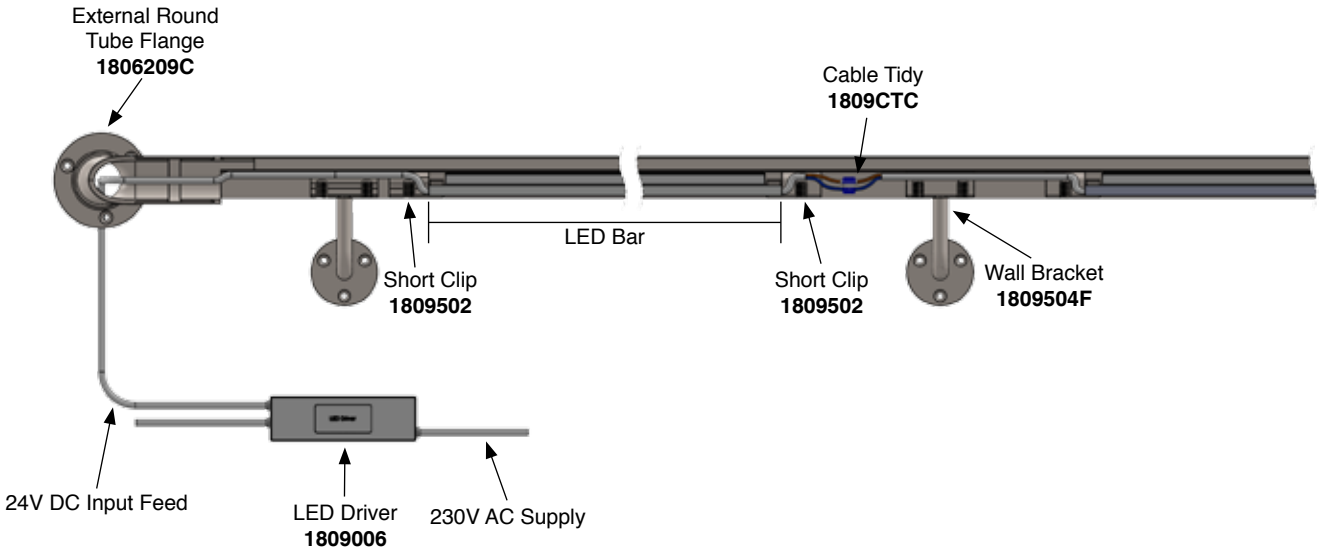
STANDARD COLOURS:

- Warm white (3000K), 1035 lumens per metre and 135 lumens per watt
- RGB (colour changing)

Single colour LED bars in red, green, blue and yellow are available to order. Please enquire.

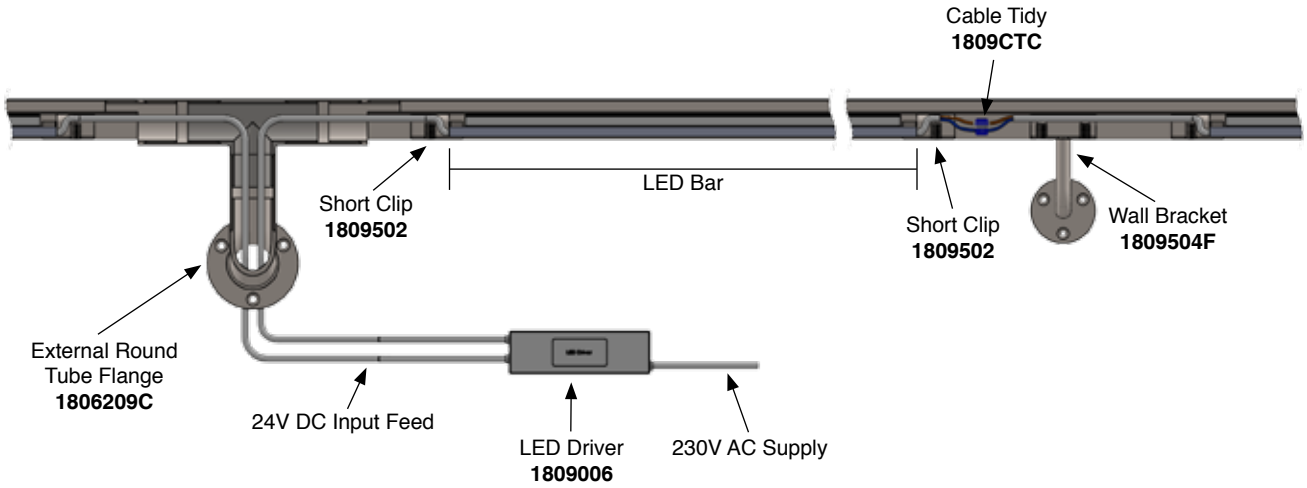
LED bar is a sealed one piece unit rated to IP67, with 54 LEDs totalling 12.24W. With a brightness of 3000K. They are supplied with a 200mm cable with waterproof connectors.

POWERING LEDS FROM END WALL CONNECTION



POWERING LEDS FROM MID RAIL POSITION

Recommended installation method

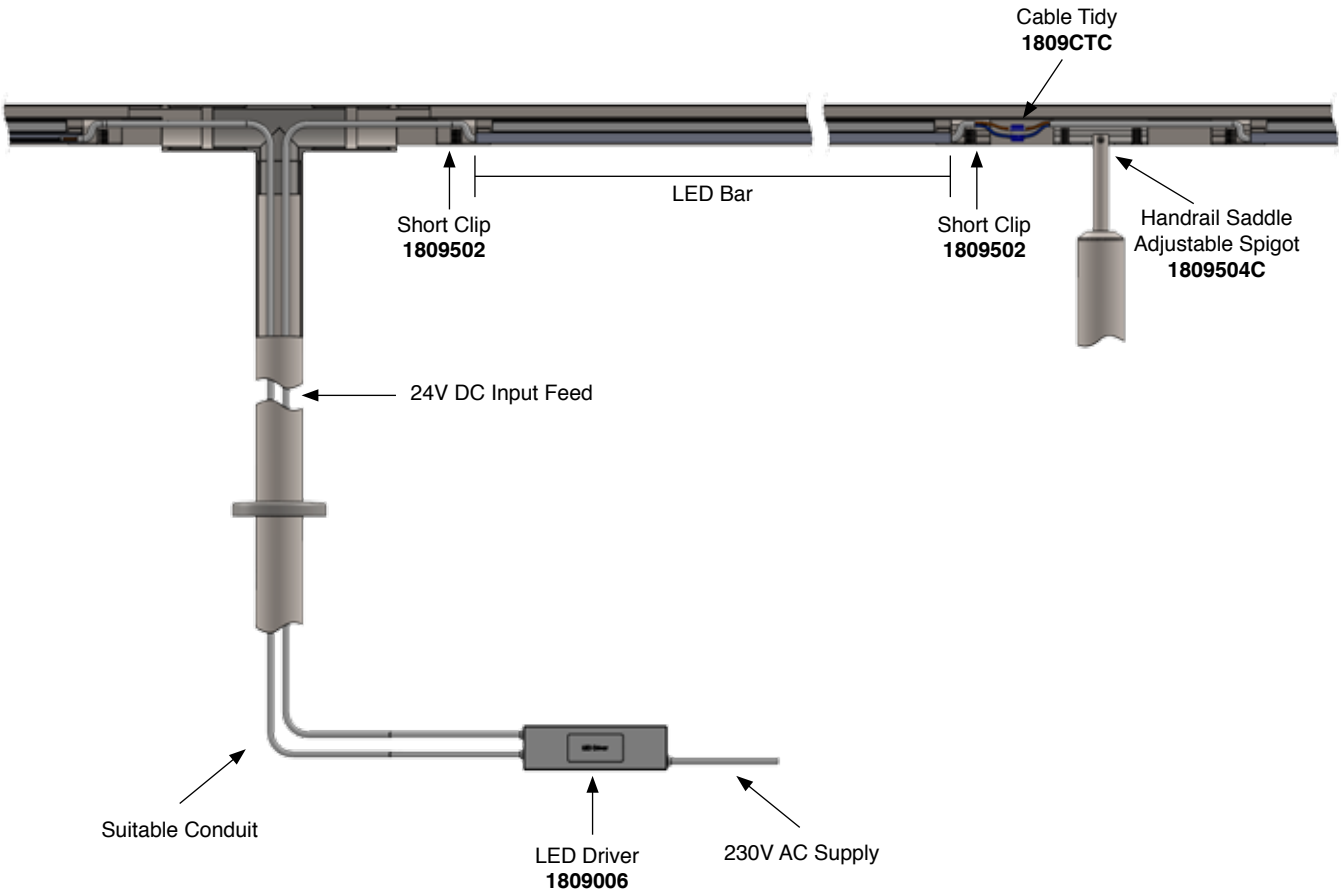


ILLUMIRAIL® BAR SYSTEM

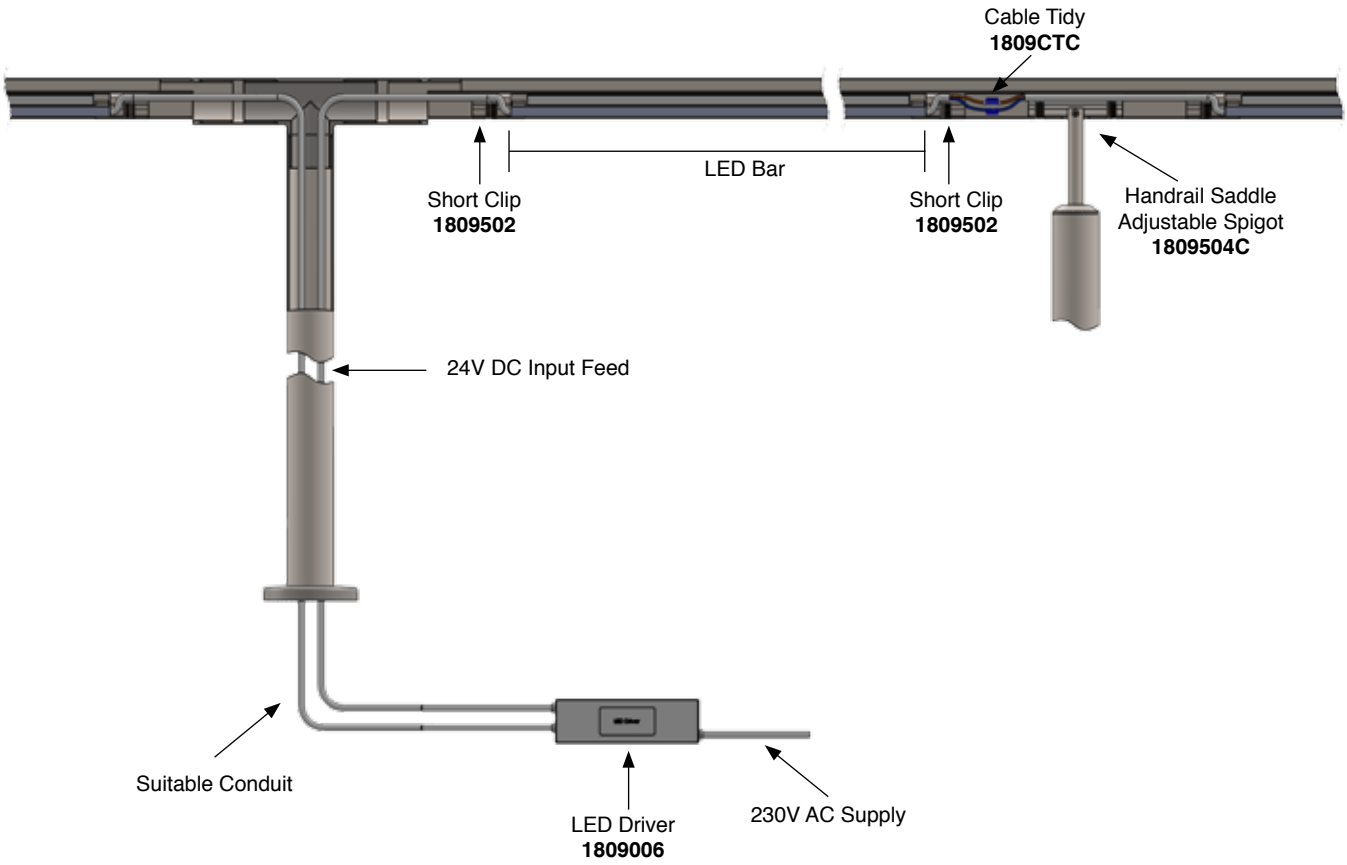
POST MOUNT WIRING

EXTENDED POST MOUNTED INTO POCKET

Core drilled post fitted into a hole in the ground



EXTENDED POST MOUNTED ONTO CONCRETE

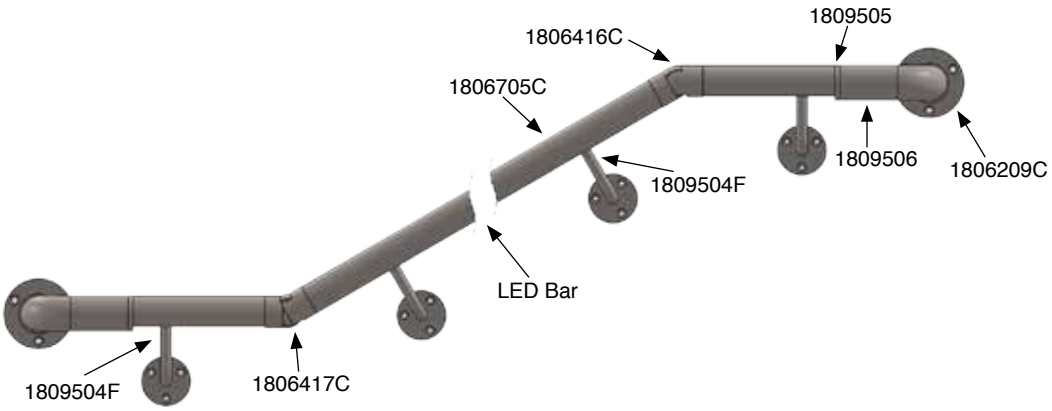


HANDRAIL WITH RETURN TO WALL ENDS FOR CABLE

Plan view

HANDRAIL WITH RETURN TO WALL ENDS FOR CABLE

Front view



HANDRAIL WITH END CAPS OR SCROLL ENDS

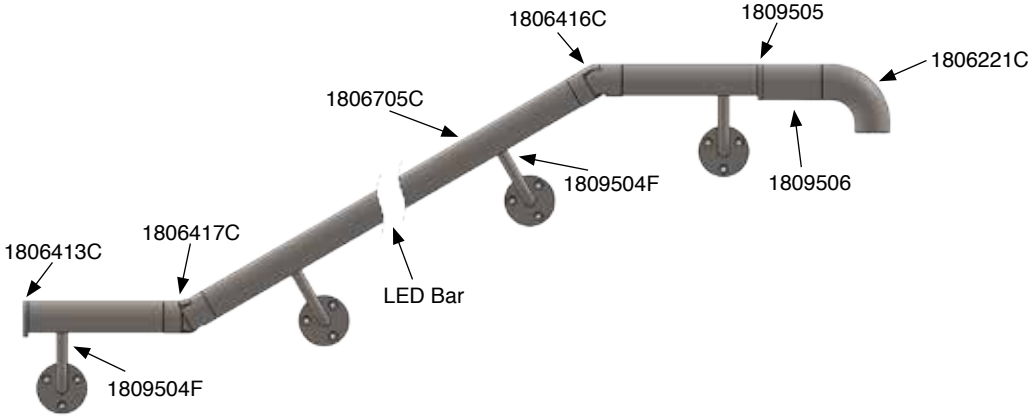
Cable runs through fixed wall bracket.

Plan view

HANDRAIL WITH END CAPS OR SCROLL ENDS

Cable runs through fixed wall bracket.

Front view

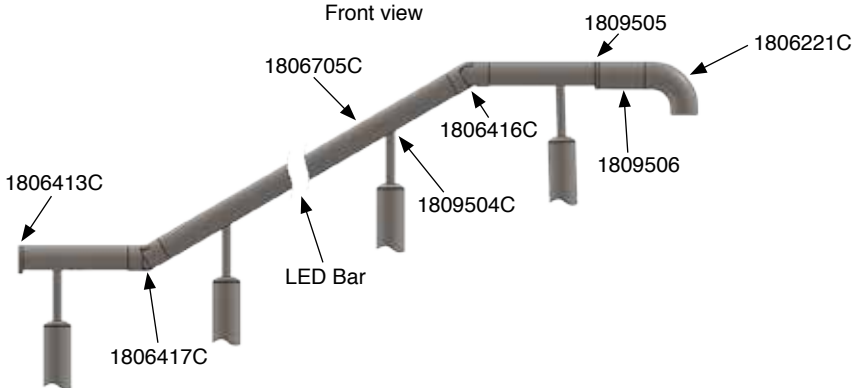


ILLUMIRAIL® BAR SYSTEM

POST MOUNTING GUIDE

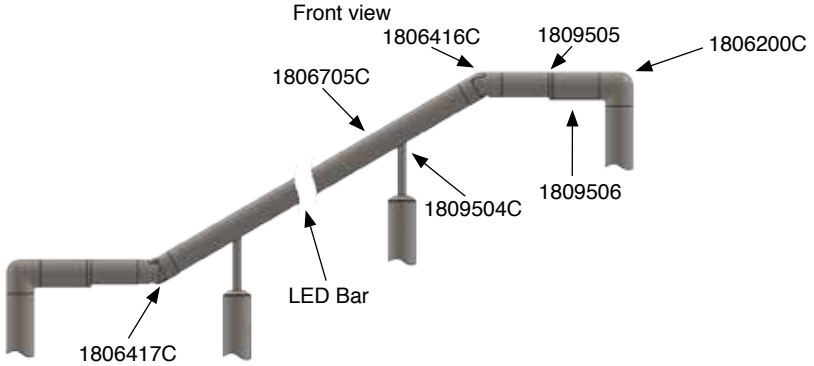
HANDRAIL WITH END CAPS OR SCROLL ENDS

Front view



HANDRAIL WITH RETURN TO FLOOR ENDS

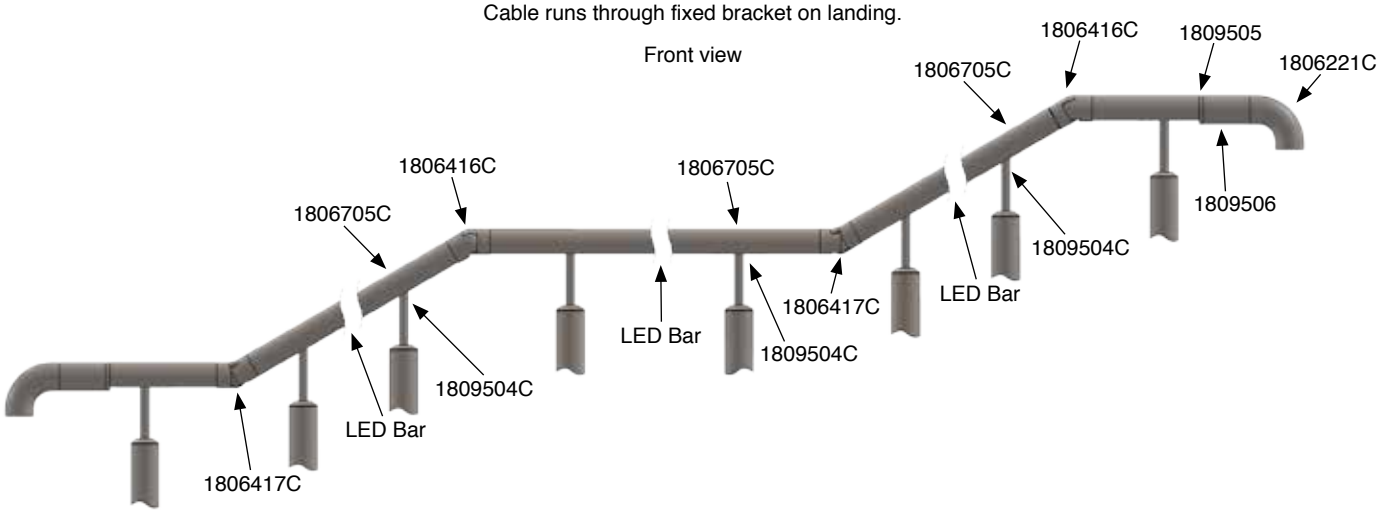
Front view



HANDRAIL WITH LANDING AND SCROLL ENDS

Cable runs through fixed bracket on landing.

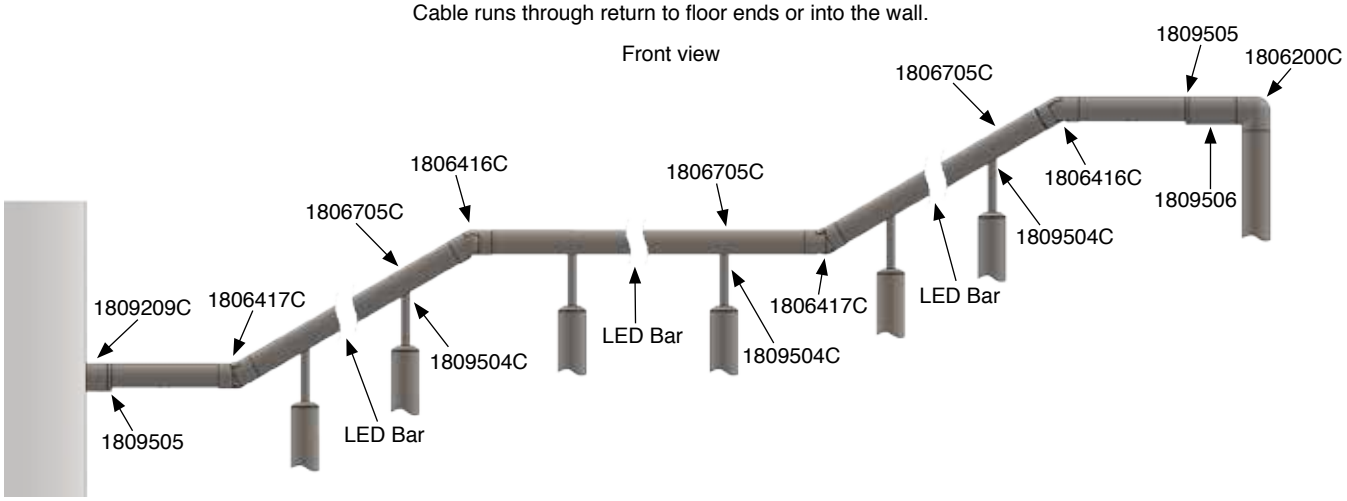
Front view



HANDRAIL WITH LANDING AND RETURN TO FLOOR ENDS OR WALL

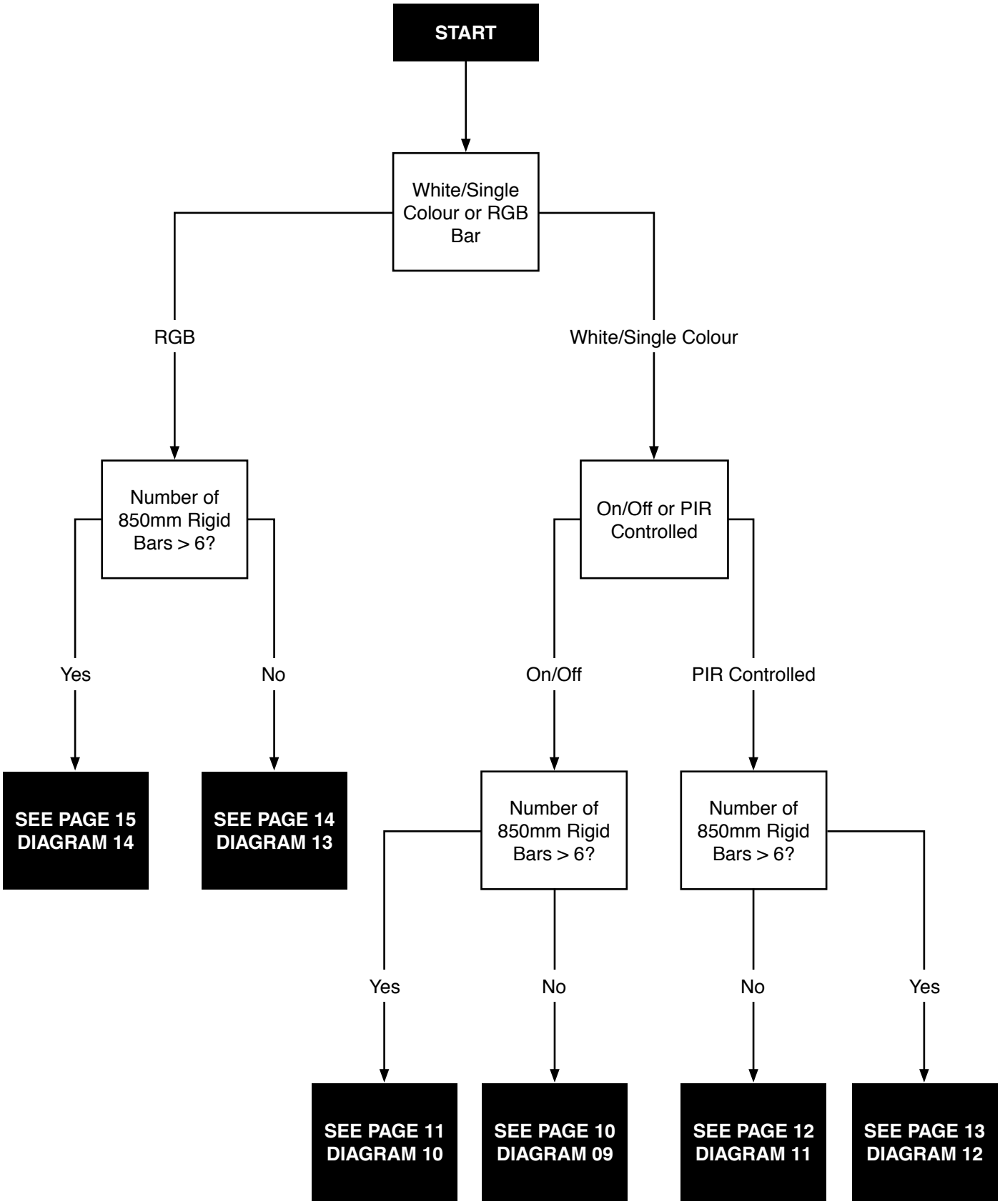
Cable runs through return to floor ends or into the wall.

Front view



ILLUMIRAIL® BAR SYSTEM

PRODUCT SELECTION FLOWCHART



ILLUMIRAIL® BAR SYSTEM

DIAGRAM 09

Up to 6 pieces of 850mm, or 12 pieces of 425mm, long white or single colour rigid LED bar. On/Off.

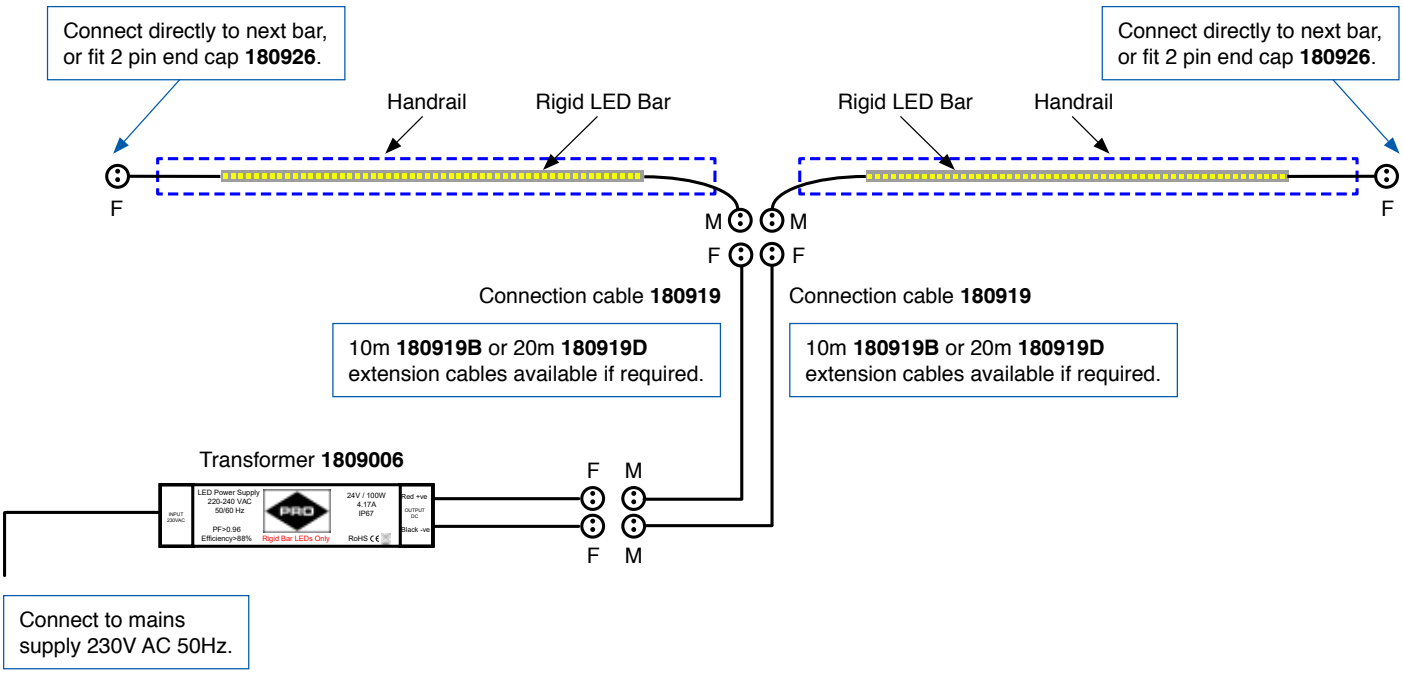
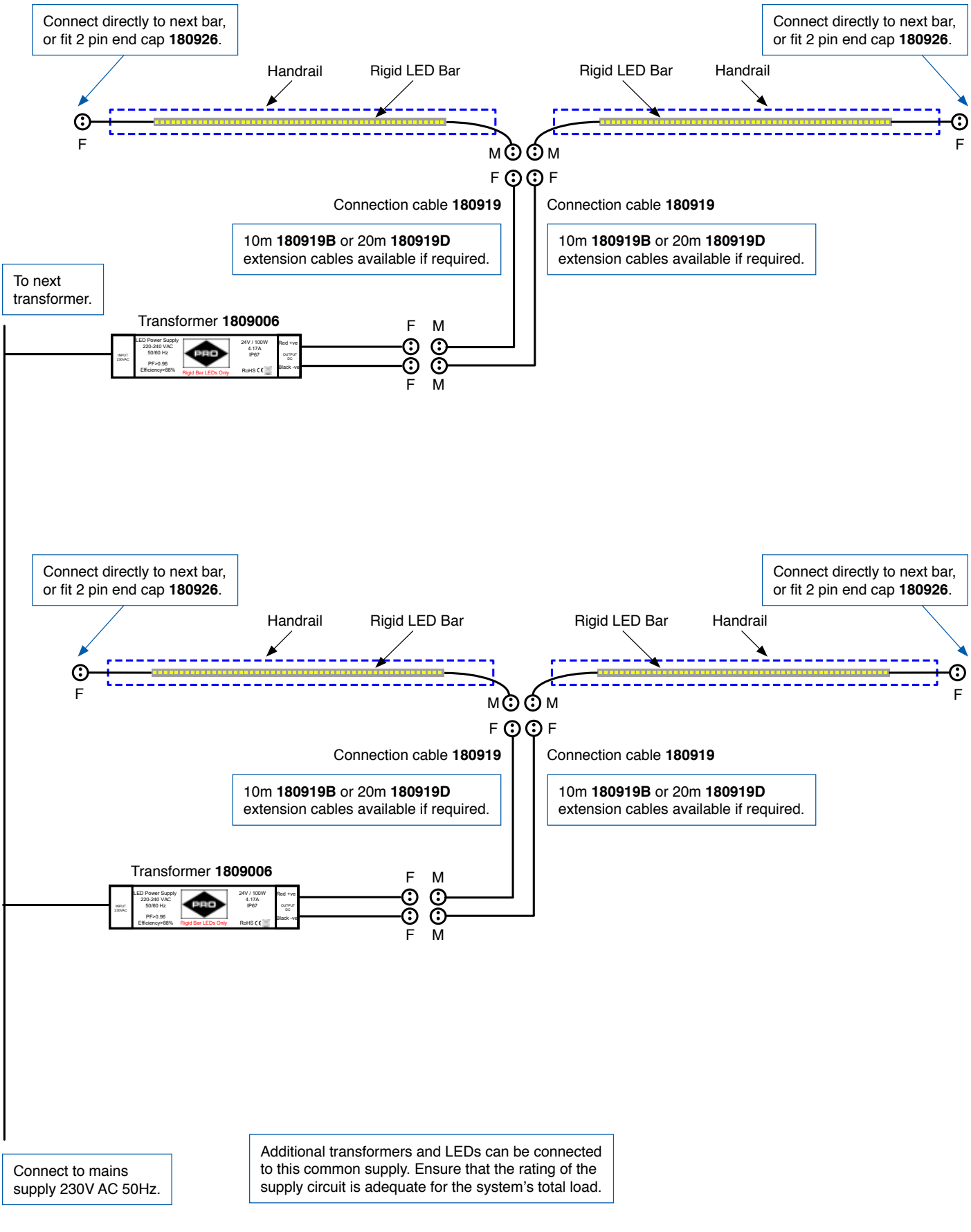


DIAGRAM 10

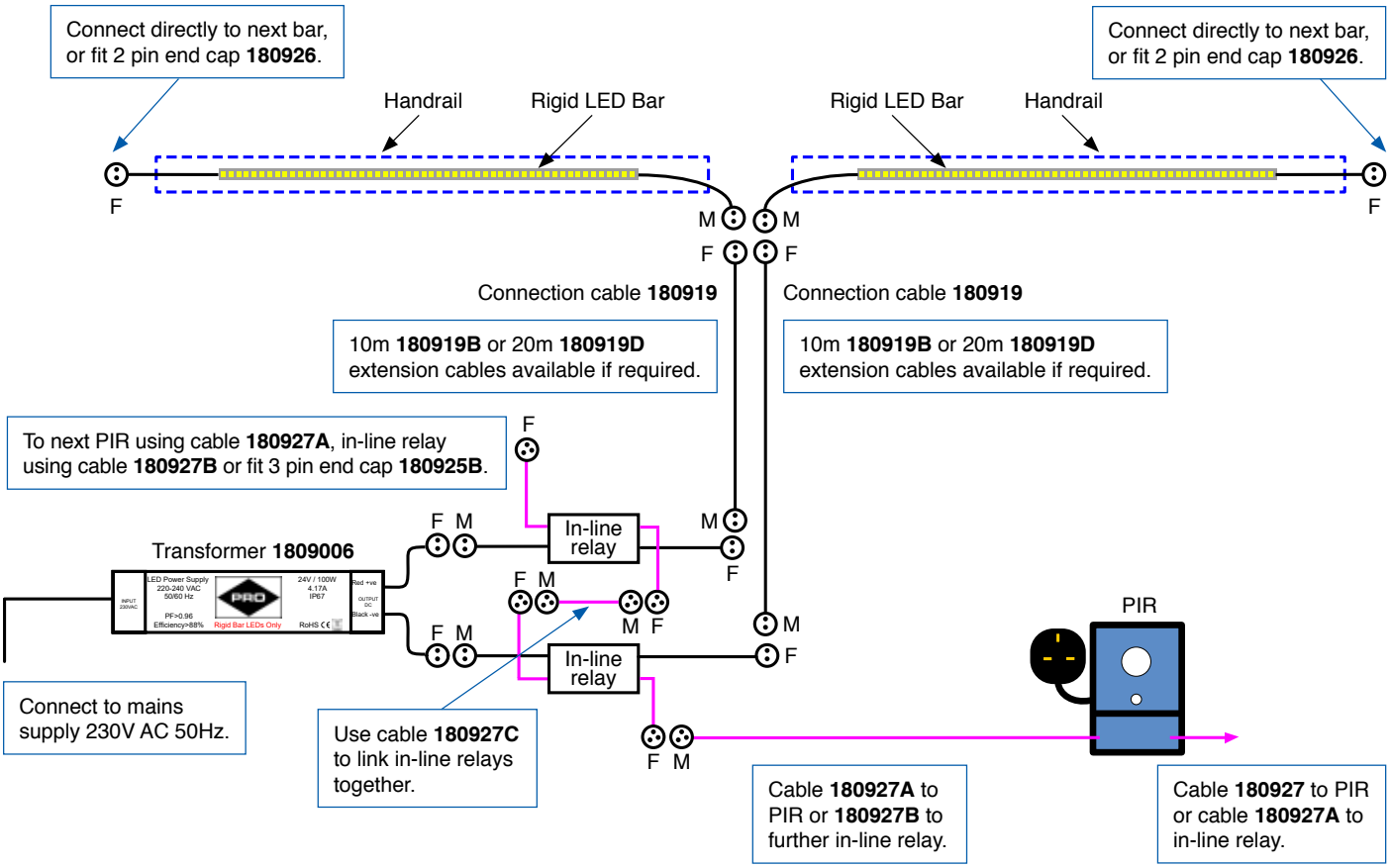
More than 6 pieces of 850mm, or 12 pieces of 425mm, long white or single colour rigid LED bar. On/Off.



ILLUMIRAIL® BAR SYSTEM

DIAGRAM 11

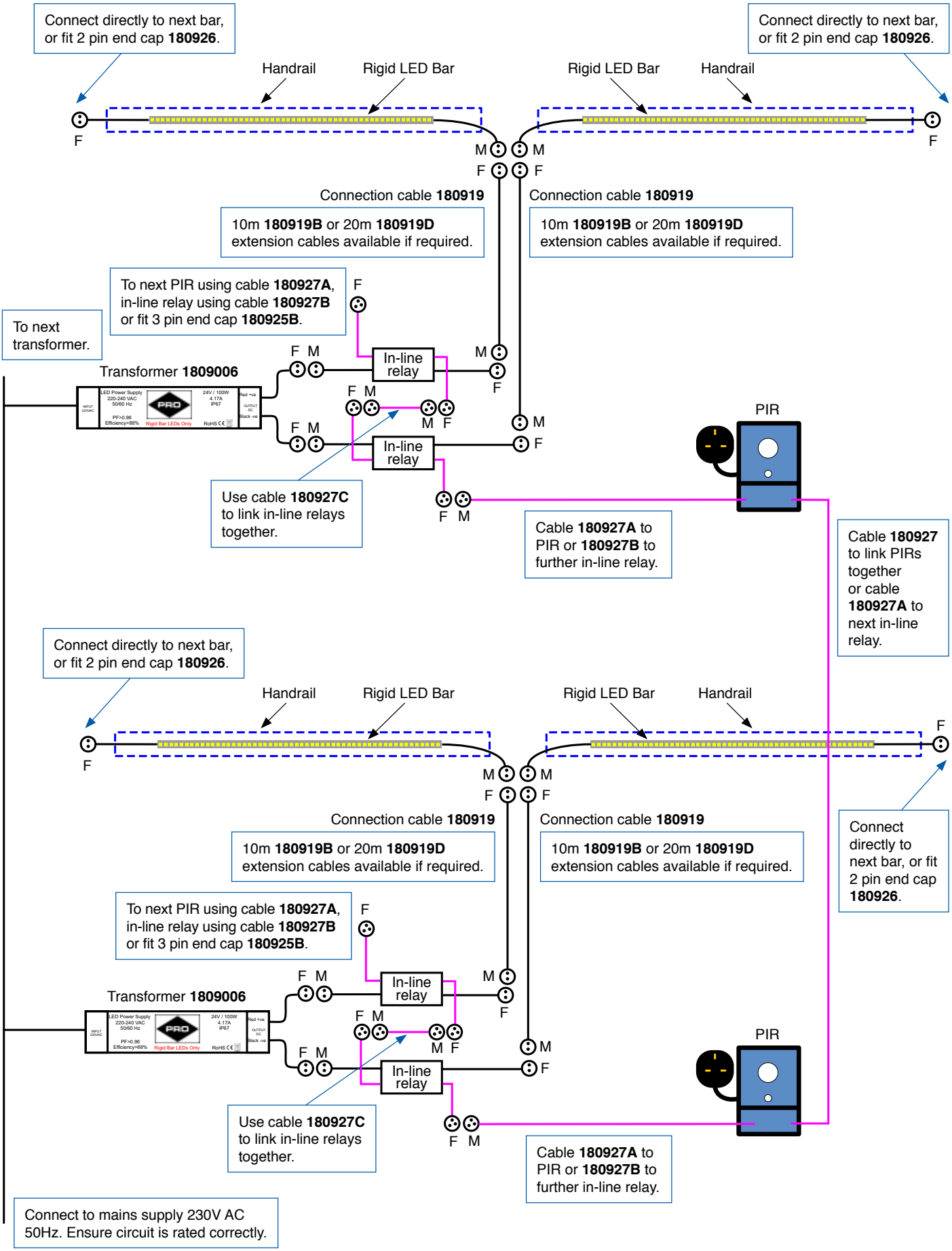
Up to 6 pieces of 850mm, or 12 pieces of 425mm, long white or single colour rigid LED bar. PIR controlled.



ILLUMIRAIL® BAR SYSTEM

DIAGRAM 12

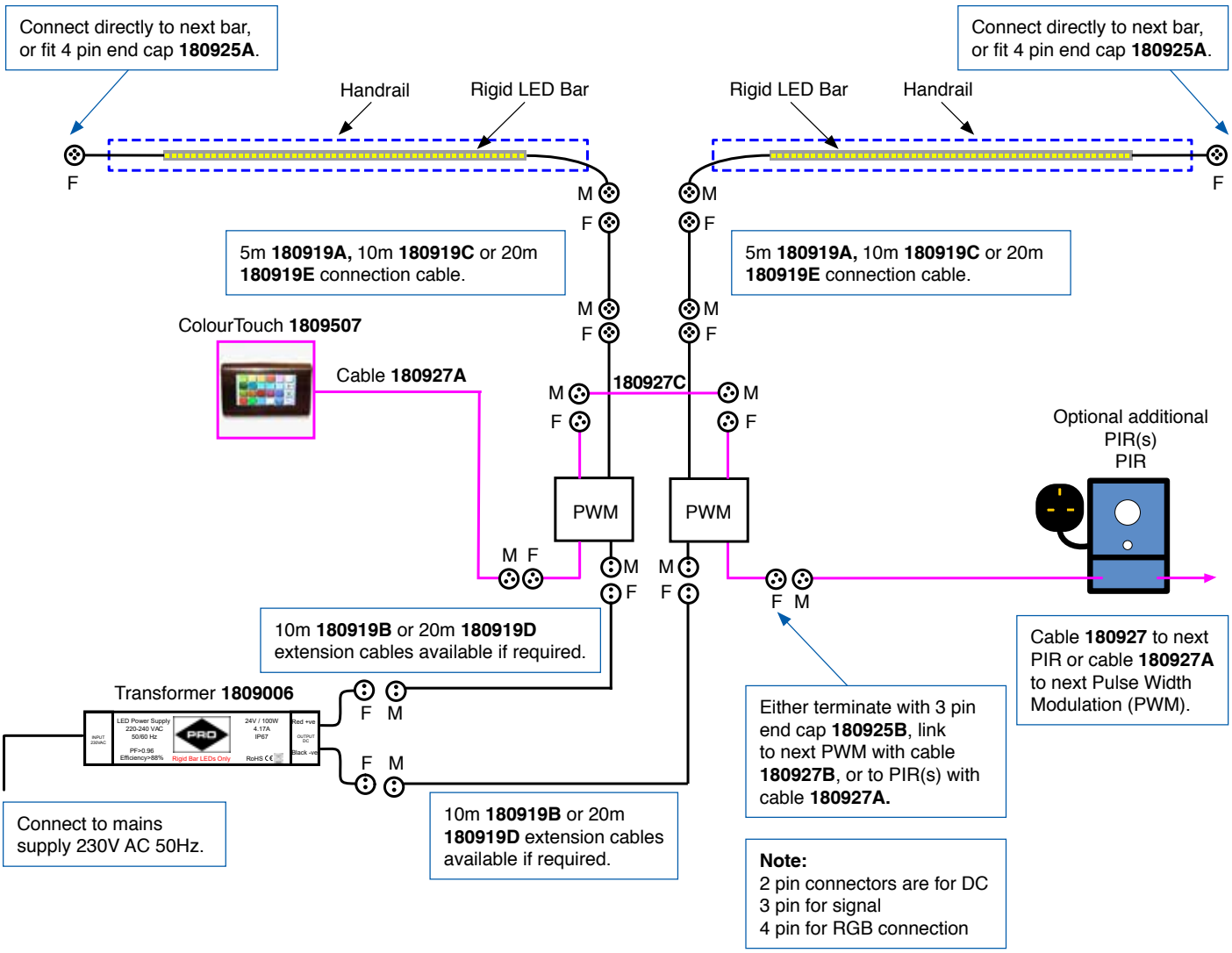
More than 6 pieces of 850mm, or 12 pieces of 425mm, long white, or single colour rigid LED bar. Single or multiple PIR controlled.



ILLUMIRAIL® BAR SYSTEM

DIAGRAM 13

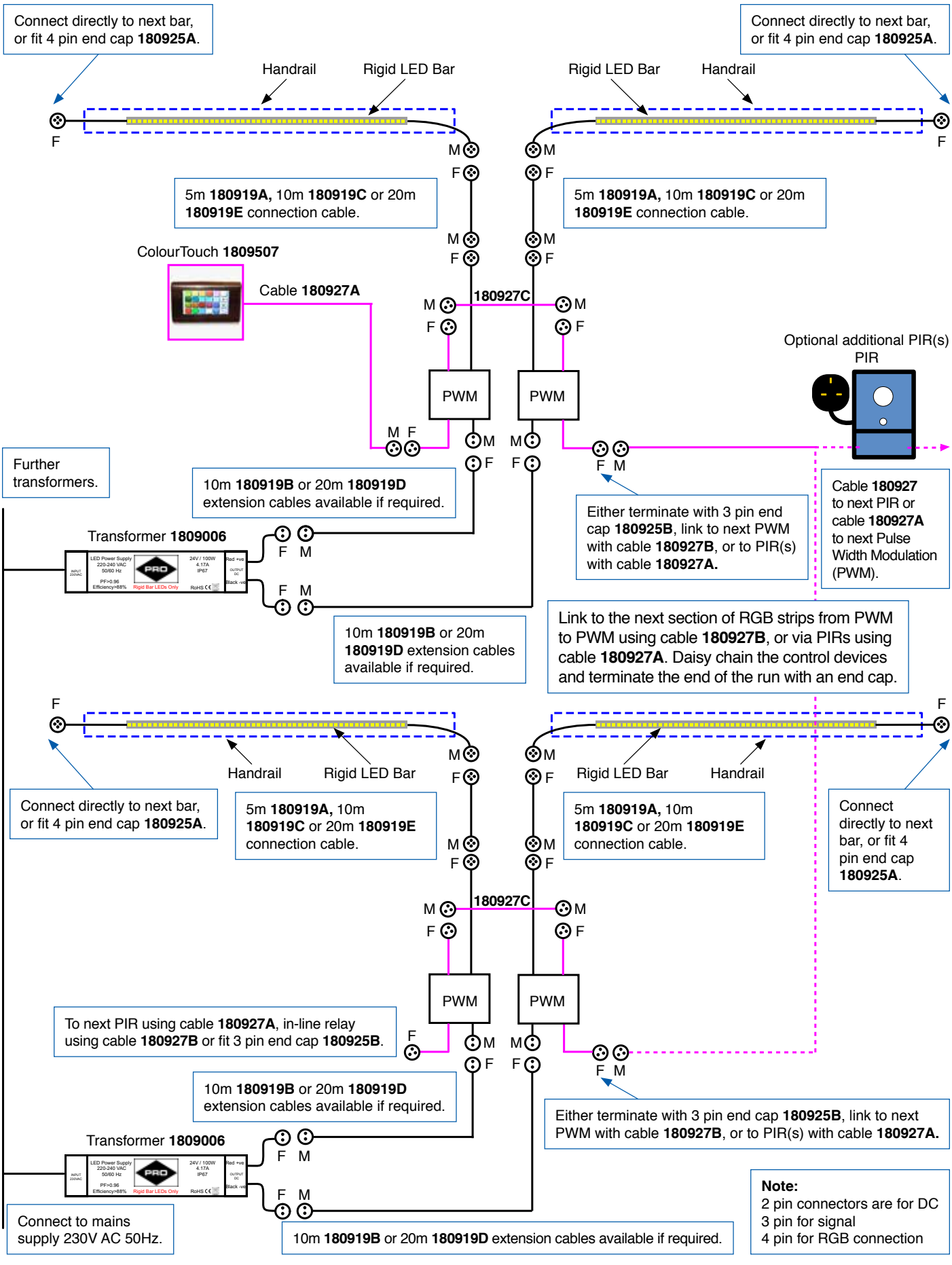
Up to 6 pieces of 850mm, or 12 pieces of 425mm, long RGB LED bar. ColourTouch with optional PIR ontrol.



ILLUMIRAIL® BAR SYSTEM

DIAGRAM 14

More than 6 pieces of 850mm, or 12 pieces of 425mm, long RGB LED bar. ColourTouch with optional PIR control.



ILLUMIRAIL® BAR SYSTEM

PHOTOMETRIC TEST REPORT

Test Method(s) Used	
POTS Standard Operating Procedure:	INTEGRATING SPHERE PROCEDURE POTS016
POTS Standard Operating Procedure:	NFMS OPERATION GUIDE
Standard:	LM79 08

Details of Product Tested	
Manufacturer: ADVANCED BMS	Source Type: LED
Model: HANDRAIL	Luminaire Type: ILLUMINATED HANDRAIL
Power Supply Used: Kikusui PCR1000M Voltage Stabiliser S/N SM01191	
Voltage(AC V) = 230.0	Current (mA)= 64
Power (Watts)= 5.382	Power factor= 0.364

Integrating Sphere Test	
Date of Test: 10/07/2015	Ambient Temperature:25°C
Measurement Filename: HANDRAIL	
Instrument Used: Labsphere model 2m integrating sphere spectroradiometer AS-02949-012	
Integrating Sphere Size: 2m	Measurement Geometry (2π / 4π): 4π
Sample Orientation: Horizontal	Auxiliary Correction Applied: YES
Comments:	
Date of Last Calibration (Operating Hours): 06-07-2015 (0:42)	Spectral Flux Standard Lamp Used: SCL-600
Standard Lamp Serial Number: L123	Traceable: to NIST standards
Calibration Certificate Number: SCL-600-L123	Calibration Certificate Date: 29/01/2014
Calibration Lamp Uncertainty: ± 0.67% (k=2)	
Results	
Flux (lumens): 240.7	
CIE 1931 Chromaticity Cx: 0.4500	CIE 1931 Chromaticity Cy: 0.4166
CRI (%):2888	CCT (K): 80.91

FIGURE 1: SPECTRAL IRRADIANCE

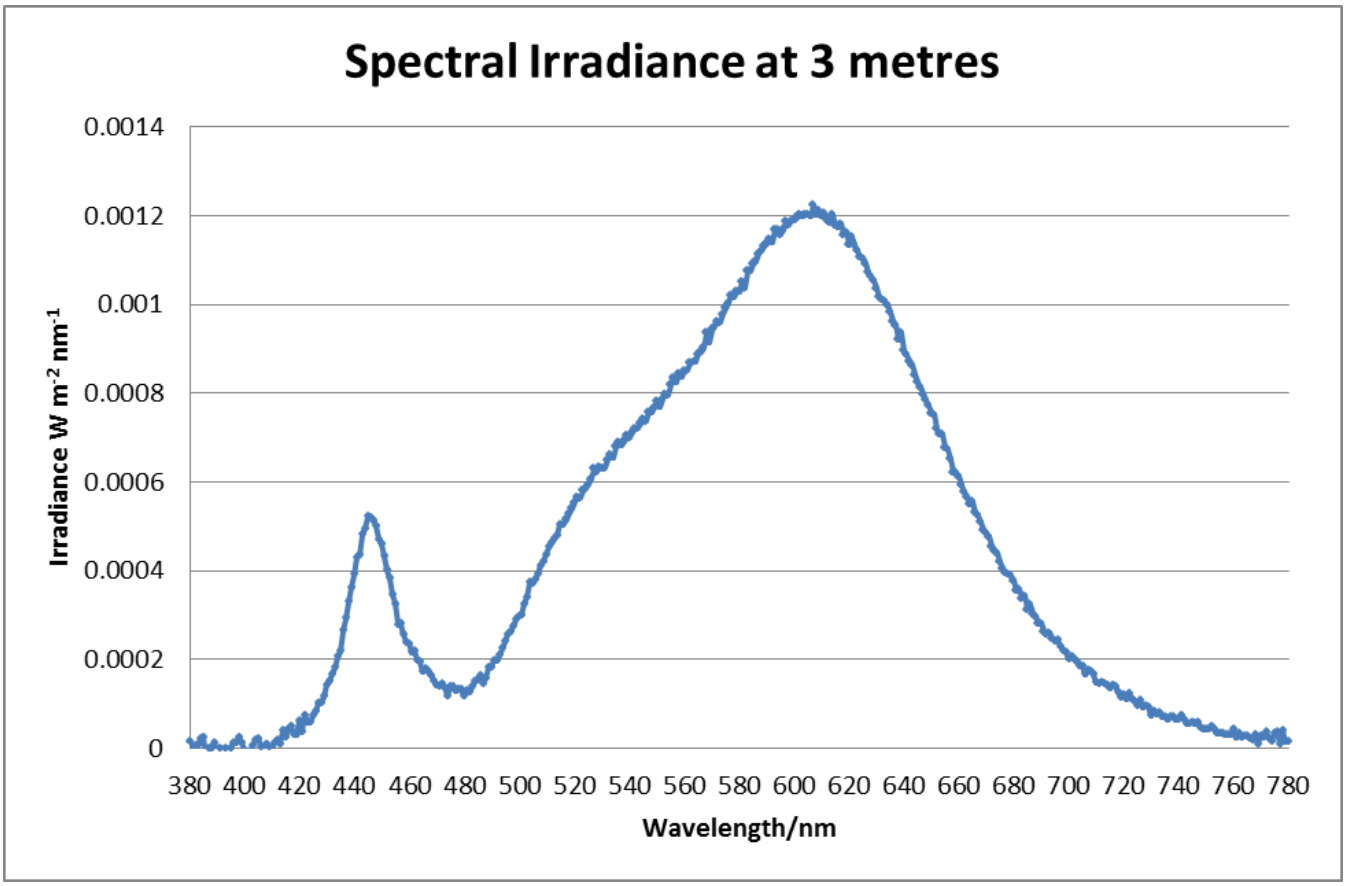


FIGURE 2: CIE 1931 DIAGRAM

ILLUMIRAIL® BAR SYSTEM

PHOTOMETRIC TEST REPORT

Goniophotometer Test		
Date of Test: 14/07/2015		Ambient Temperature: 25°C
Measurement Filename: HANDRAIL		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance: 3m		Measurement Geometry: Near-Field
Comments:		
Reference Photometer Used: Specbos1211		Reference Photometer Serial Number: 2014754
Traceable: to NIST standards		Calibration Certificate Number: 2129 WK-L 2014-02
Calibration Certificate Date: 13 February 2014		Sample Stabilisation Time (minutes): 60
Reference Photometer Calibration Uncertainty: ± 2.4% (k=2, 20-200 lux, CIE illuminant A source)		
Scan Set Up		
Direction	**Range**	**Increment**
Inclination Zone 1	0-90°	3°
Aziuth	0-360°	10°
Results		
Integrated Luminous Flux (lumens):240.7	Peak Intensity (3° Spot, candelas): 681.2	Efficacy (lumens/Watt): 44.7
Beam Angle (50% of max intensity C0-180, degrees): 31.1		
Photometric Filename (IES LM-63-2002): HANDRAIL		
IES File – Absolute or Relative Format? ABSOLUTE		
Photometric Filename (EULUMDAT): HANDRAIL		
EULUMDAT File – Absolute or Relative Format? ABSOLUTE		

FIGURE 3: ILLUMINANCE 1100mm BELOW DEVICE

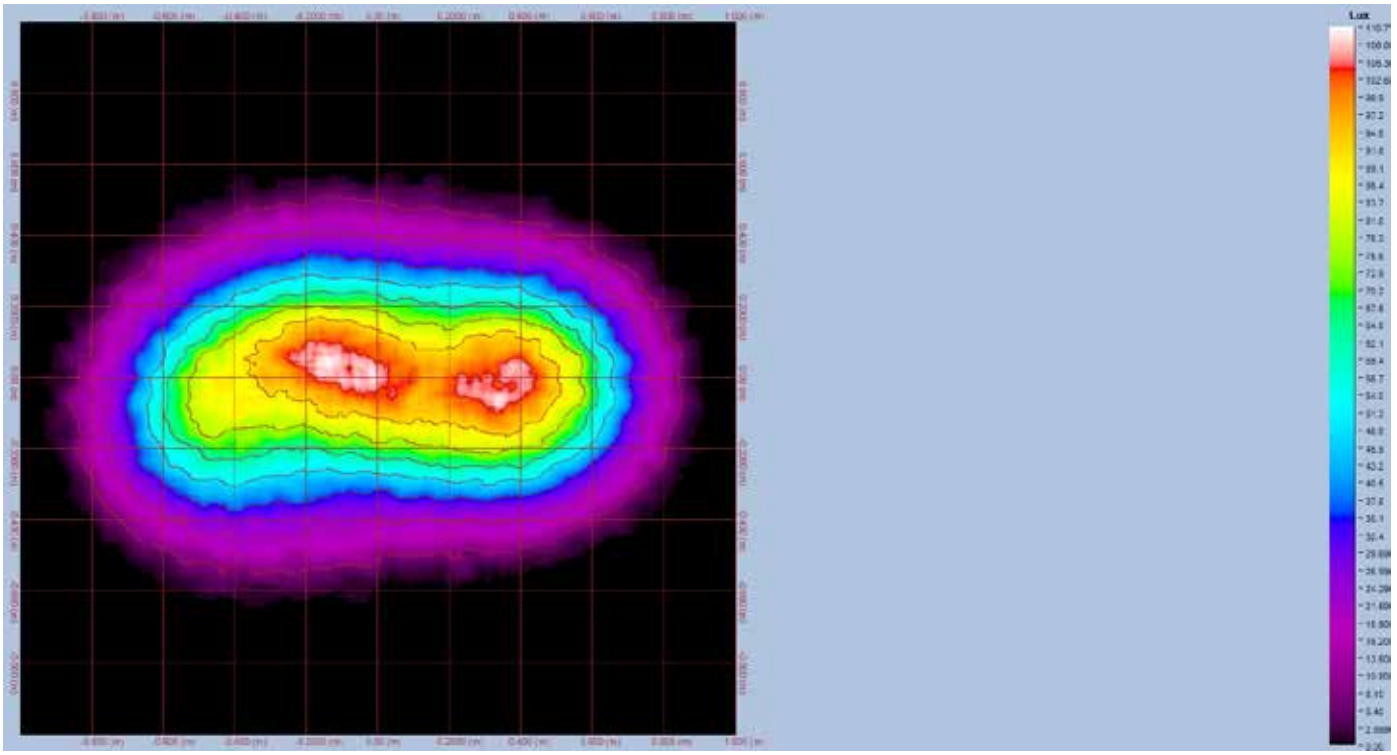


FIGURE 4: FAR-FIELD LUMINOUS INTENSITY (C0-180, CARTESIAN COORDINATES)

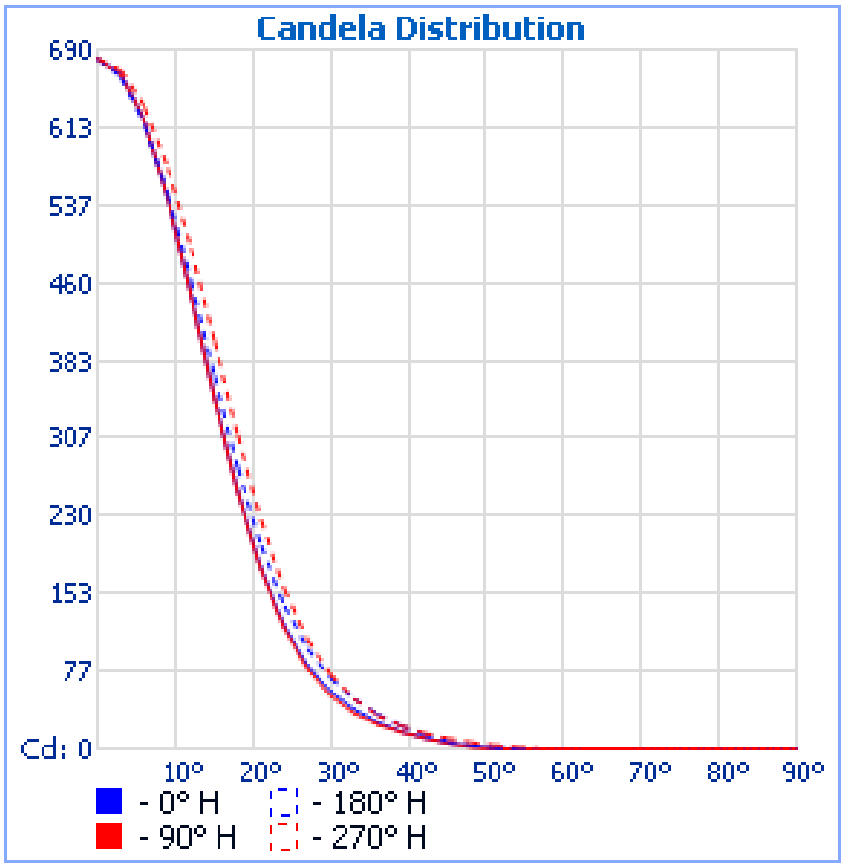
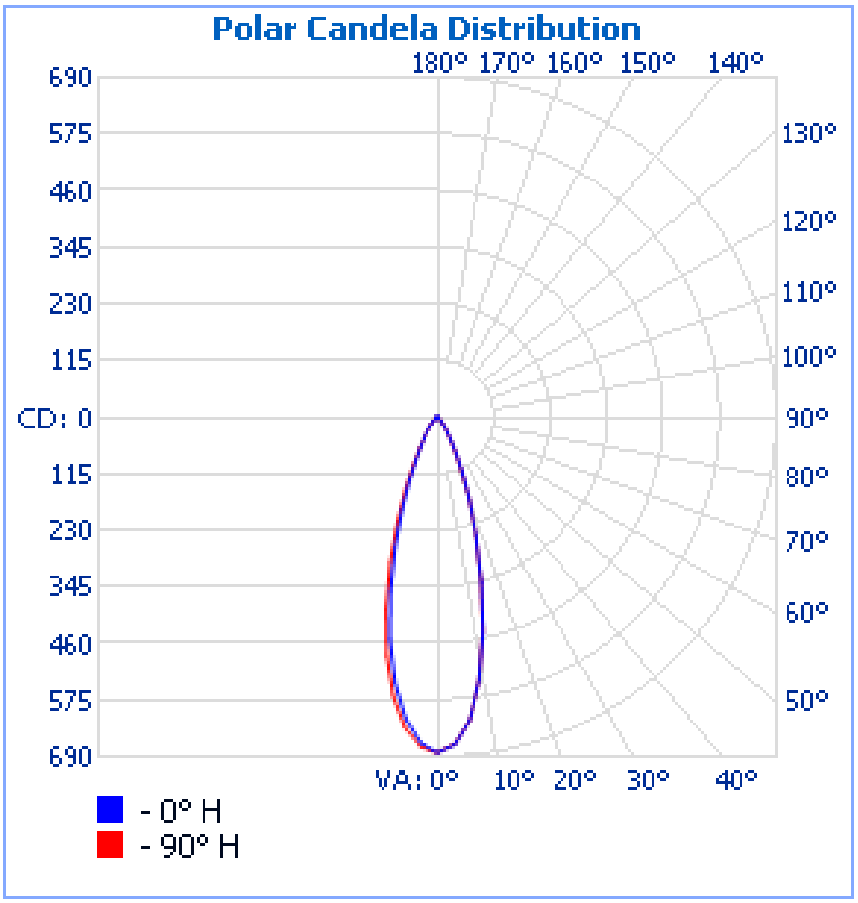


FIGURE 5: FAR-FIELD LUMINOUS INTENSITY (C0-180, C90-270, POLAR COORDINATES)



PHOTOMETRIC TEST REPORT

FIGURE 6. CONE DIAGRAM FOR MOUNTING HEIGHT OF 6 METRES

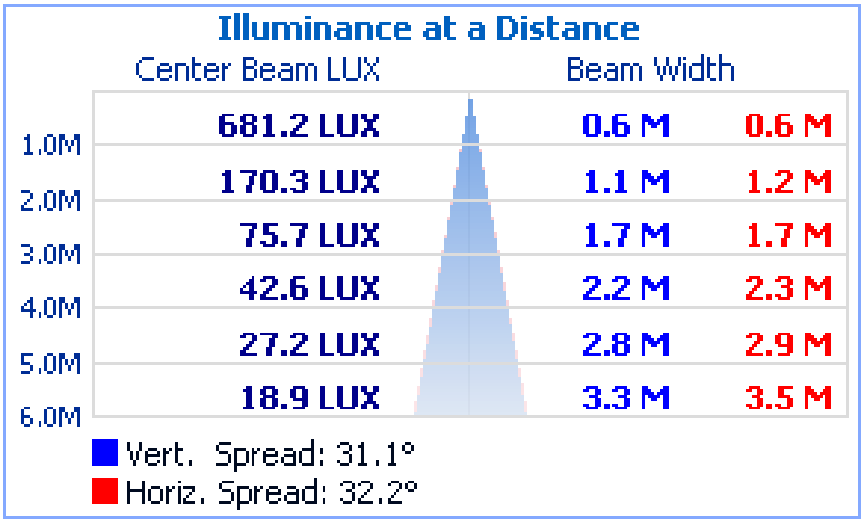


TABLE 1. UGR VALUES

Reflectance of											
Ceiling		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Floor Cavity		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room Dimension		View Endwise (C0)					View Crosswise (C90)				
x	y										
2H	2H	22.7	24.3	23.0	24.6	25.0	22.7	24.4	23.1	24.7	25.0
	3H	24.3	25.8	24.7	26.1	26.5	24.4	25.9	24.7	26.2	26.5
	4H	25.0	26.4	25.4	26.7	27.1	25.0	26.4	25.4	26.7	27.1
	6H	25.5	26.8	25.9	27.2	27.6	25.3	26.6	25.7	27.0	27.4
	8H	25.7	26.9	26.1	27.3	27.7	25.3	26.6	25.7	26.9	27.3
	12H	25.8	27.0	26.2	27.4	27.8	25.3	26.5	25.7	26.9	27.3
4H	2H	23.5	24.9	23.8	25.2	25.6	23.5	24.9	23.9	25.2	25.6
	3H	25.2	26.4	25.6	26.8	27.2	25.3	26.5	25.7	26.9	27.3
	4H	26.1	27.1	26.5	27.5	28.0	26.1	27.1	26.5	27.5	28.0
	6H	26.7	27.6	27.1	28.0	28.5	26.4	27.4	26.9	27.8	28.2
	8H	26.9	27.8	27.4	28.2	28.7	26.5	27.4	26.9	27.8	28.3
	12H	27.1	27.9	27.5	28.3	28.8	26.5	27.3	27.0	27.7	28.2
8H	4H	26.4	27.3	26.8	27.7	28.2	26.3	27.2	26.8	27.7	28.1
	6H	27.1	27.8	27.6	28.3	28.8	26.8	27.5	27.2	28.0	28.5
	8H	27.5	28.1	28.0	28.6	29.1	26.9	27.5	27.4	28.0	28.5
	12H	27.7	28.3	28.2	28.8	29.3	26.9	27.5	27.4	28.0	28.5
12H	4H	26.4	27.2	26.9	27.7	28.2	26.4	27.2	26.8	27.6	28.1
	6H	27.2	27.9	27.7	28.4	28.8	26.9	27.5	27.4	28.0	28.5
	8H	27.5	28.1	28.1	28.6	29.1	26.9	27.5	27.5	28.0	28.5

Distance between luminaires: 0.25
Due to missing symmetry characteristics the values apply only to the indicated line of sight.

TABLE 2A. LUMINOUS INTENSITY VALUES, AZIMUTH 0-180°

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681
3	667	666	665	667	666	666	666	666	666	665	664	664	663	662	661	663	660	662	663
6	619	617	623	624	622	621	622	621	620	619	618	617	616	613	615	617	617	614	617
9	542	539	544	539	542	543	543	544	544	542	542	540	538	537	537	537	544	542	548
12	447	444	443	446	455	452	450	446	446	446	446	445	449	451	456	451	453	457	463
15	347	342	349	348	348	351	347	348	344	346	344	349	350	355	355	359	363	361	369
18	254	258	253	258	252	255	253	254	256	253	257	256	257	261	261	270	268	278	278
21	178	181	181	183	180	178	179	181	179	177	180	183	183	184	190	195	195	199	201
24	121	122	123	119	121	123	119	122	120	119	121	124	124	127	130	129	136	139	142
27	82	83	81	81	82	81	80	79	79	79	80	82	85	87	90	90	91	97	99
30	57	56	55	56	54	53	53	53	53	53	54	56	58	58	61	62	63	67	70
33	40	38	37	39	37	36	36	35	35	36	37	38	40	41	43	44	44	46	50
36	27	27	25	26	25	25	25	24	24	25	26	27	28	29	30	31	31	32	35
39	18	17	18	18	17	17	17	17	17	17	18	19	20	20	20	20	22	21	23
42	11	11	11	11	11	11	11	11	11	11	12	13	13	13	13	13	13	13	15
45	6	5	6	7	6	7	7	6	6	6	7	8	8	8	7	7	6	7	8
48	3	3	3	3	3	3	3	3	3	2	3	4	4	3	3	3	3	3	4
51	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	2
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHOTOMETRIC TEST REPORT

TABLE 2B. LUMINOUS INTENSITY VALUES, AZIMUTH 190-350°

	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
0	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681	681
3	663	663	666	665	667	668	669	670	670	670	670	669	668	667	668	665	666
6	616	623	625	626	626	630	632	633	634	633	632	630	626	626	626	624	618
9	546	553	550	555	560	565	570	573	574	572	569	563	556	550	544	547	540
12	462	464	469	481	484	487	490	493	494	491	486	481	475	470	456	449	446
15	368	377	381	386	394	396	402	401	403	398	396	387	382	369	361	356	345
18	287	285	294	294	302	305	310	314	310	309	303	295	287	275	272	260	261
21	208	211	217	219	220	225	232	230	226	226	225	217	208	201	196	187	183
24	146	149	148	155	157	157	162	160	158	158	157	150	145	138	130	130	126
27	102	102	105	110	112	111	110	109	108	107	105	102	99	95	89	87	86
30	71	72	75	77	77	77	76	75	74	72	71	68	65	64	61	59	59
33	50	51	54	56	55	53	52	50	50	49	46	46	44	44	43	41	40
36	35	37	40	39	39	37	36	35	34	33	32	32	31	30	29	28	27
39	23	26	27	27	28	26	26	24	23	23	23	22	21	20	19	19	18
42	15	17	18	19	20	19	18	17	16	15	15	15	15	14	12	12	11
45	8	9	11	12	13	13	12	12	11	10	10	8	9	8	8	6	6
48	4	4	5	7	8	8	8	8	7	6	6	5	5	5	4	4	4
51	2	1	2	3	4	5	5	5	4	3	3	3	3	2	2	2	2
54	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	0
57	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

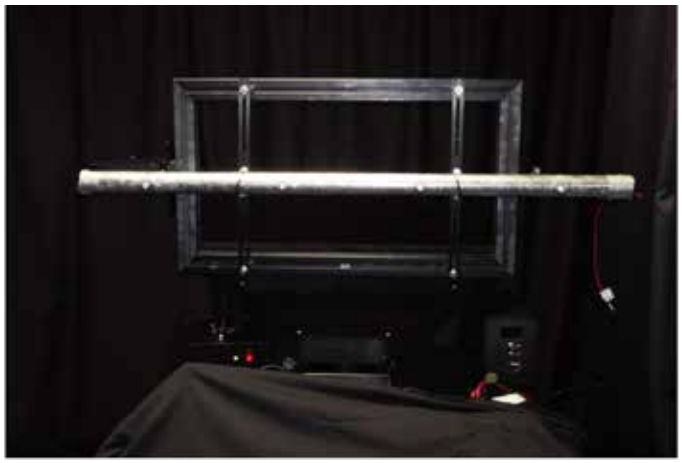
TABLE 3. ZONAL FLUX TABLE

Zone	Lumens	% Total
0-5	15.8	6.5%
5-10	41.3	16.9%
10-15	51.9	21.3%
15-20	48.0	19.7%
20-25	34.6	14.2%
25-30	22.2	9.1%
30-35	14.1	5.8%
35-40	8.5	3.5%
40-45	4.7	1.9%
45-50	2.1	0.9%
50-55	0.5	0.2%
55-60	0.1	0.0%
60-65	0.0	0.0%
65-70	0.0	0.0%
70-75	0.0	0.0%
75-80	0.0	0.0%
80-85	0.0	0.0%
85-90	0.0	0.0%

TABLE 4. UTILISATION FACTOR TABLE

Effective Floor Cavity Reflectance: 20%																		
RCC %:	**80**				**70**				**50**			**30**			**10**			**0**
RW %:	**70**	**50**	**30**	**0**	**70**	**50**	**30**	**0**	**50**	**30**	**20**	**50**	**30**	**20**	**50**	**30**	**20**	**0**
RCR: 0	1.19	1.19	1.19	1.19	1.16	1.16	1.16	1.00	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	1.00
1	1.14	1.12	1.10	1.08	1.12	1.10	1.08	0.96	1.06	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97	0.95
2	1.10	1.06	1.03	1.00	1.08	1.04	1.01	0.92	1.01	0.99	0.97	0.98	0.96	0.94	0.96	0.94	0.93	0.91
3	1.06	1.00	0.96	0.93	1.04	0.99	0.95	0.88	0.97	0.93	0.91	0.94	0.92	0.90	0.92	0.90	0.88	0.87
4	1.02	0.96	0.91	0.88	1.00	0.94	0.90	0.84	0.92	0.89	0.86	0.91	0.88	0.85	0.89	0.86	0.84	0.83
5	0.98	0.91	0.86	0.83	0.96	0.90	0.86	0.80	0.89	0.85	0.82	0.87	0.84	0.81	0.86	0.83	0.80	0.79
6	0.94	0.87	0.82	0.79	0.93	0.86	0.82	0.77	0.85	0.81	0.78	0.84	0.80	0.77	0.82	0.79	0.77	0.76
7	0.91	0.83	0.79	0.75	0.90	0.83	0.78	0.74	0.82	0.78	0.75	0.81	0.77	0.74	0.79	0.76	0.74	0.73
8	0.88	0.80	0.75	0.72	0.87	0.79	0.75	0.71	0.78	0.74	0.71	0.78	0.74	0.71	0.77	0.73	0.71	0.70
9	0.85	0.77	0.72	0.69	0.84	0.76	0.72	0.68	0.76	0.71	0.69	0.75	0.71	0.68	0.74	0.71	0.68	0.67
10	0.82	0.74	0.69	0.66	0.81	0.74	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.66	0.72	0.68	0.66	0.65

PHOTO 1: LUMINAIRE ON GONIOMETER MOUNT



Signature:

Print Name:

D CHAMBERS

Date:

16/07/2015

Test Engineer

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP

Checked By:

Signature:

Print Name:

G John

Date:

28/07/2015

Technical Director

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP

ILLUMIRAIL® BAR SYSTEM

WALL MOUNTING FITTINGS

SPLIT TUBE
1.5mm wall thickness

Finish	Ø mm	Length m	Code
316	42.4	3	18067053C
316	42.4	6	1806705C

WALL BRACKET
For split tube clamping

Finish	Clip Length mm	Code
316	60	1809504F

With cable hole

CABLE TIDY
Glue fit

Finish	Ø mm	Length mm	Depth mm	Code
316	42.4	300	20	1809CTC

Thickness 1.2mm

25° TO 55° DOWNWARDS ADJUSTABLE CONNECTOR

Finish	Ø mm	Code
316	42.4	1806416C

25° TO 55° UPWARDS ADJUSTABLE CONNECTOR

Finish	Ø mm	Code
316	42.4	1806417C

IN-LINE CONNECTOR

Finish	Ø mm	Code
316	42.4	1806412C

SEE PRO-RAILING CATALOGUE FOR OUR FULL RANGE OF SPLIT TUBE FITTINGS.

SPLIT TUBE TO PLAIN TUBE CONNECTOR

Finish	Ø mm	Code
316	42.4	1809505

TUBE SECTION

Finish	Ø mm	Length mm	Code
316	42.4	55	1809508
316	42.4	70	1809506

90° ELBOW RADIUSED CORNER

Finish	Ø mm	Code
316	42.4	1806200C

OTHER ELBOW OPTIONS AVAILABLE, SEE PRO-RAILING CATALOGUE.

SCROLL END

Finish	Ø mm	Code
316	42.4	1806221C

EXTERNAL ROUND TUBE FLANGE

Finish	Ø mm	Code
316	42.4	1806209C

END CAP

Finish	Ø mm	Code
316	42.4	1806413C

ILLUMIRAIL® BAR SYSTEM

POST MOUNTING FITTINGS

SPLIT TUBE
1.5mm wall thickness

Finish	Ø mm	Length m	Code
316	42.4	3	18067053C
316	42.4	6	1806705C

HANDRAIL SADDLE, ADJUSTABLE SPIGOT
For split tube clamping

Finish	Ø mm	Clip Length mm	Code
316	42.4	85	1809504C

With cable hole

HANDY TIP

For ease of application use pre-assembled posts, just replace the saddle for one with a cable hole.

CABLE TIDY
Glue fit

Finish	Ø mm	Length mm	Depth mm	Code
316	42.4	300	20	1809CTC

Thickness 1.2mm

IN-LINE CONNECTOR

Finish	Ø mm	Code
316	42.4	1806412C

FOR RETURN TO FLOOR ENDS USE HOLLOW TUBE, PLEASE VISIT www.fhbrundle.co.uk

25° - 55° DOWNWARDS ADJUSTABLE CONNECTOR

Finish	Ø mm	Code
316	42.4	1806416C

25° - 55° UPWARDS ADJUSTABLE CONNECTOR

Finish	Ø mm	Code
316	42.4	1806417C

SPLIT TUBE TO PLAIN TUBE CONNECTOR

Finish	Ø mm	Code
316	42.4	1809505

TUBE SECTION

Finish	Ø mm	Length mm	Code
316	42.4	70	1809506

90° ELBOW RADIUSED CORNER

Finish	Ø mm	Code
316	42.4	1806200C

SCROLL END

Finish	Ø mm	Code
316	42.4	1806221C

END CAP

Finish	Ø mm	Code
316	42.4	1806413C

WALL CONNECTOR

Finish	Ø mm	Code
316	42.4	1809209C

With cable hole

OTHER ELBOW OPTIONS AVAILABLE, SEE PRO-RAILING CATALOGUE.

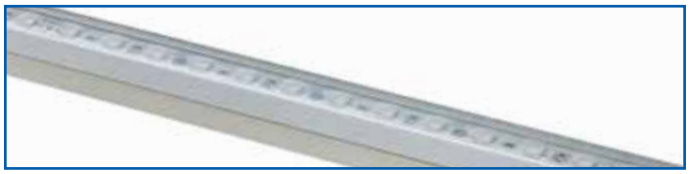
SEE PRO-RAILING CATALOGUE FOR OUR FULL RANGE OF SPLIT TUBE FITTINGS.

ILLUMIRAIL® BAR SYSTEM

FIXED COLOURS & RGB COLOUR CHANGING

Colour	425mm Length Code	850mm Length Code
White (3000K)	**18095015**	**1809501**
Blue	**18095015B**	**1809501B**
Green	**18095015G**	**1809501G**
Red	**18095015R**	**1809501R**
Yellow	**18095015Y**	**1809501Y**

Supplied with 2 gel crimps



Colour	425mm Length Code	850mm Length Code
RGB	**18095015RGB**	**1809501RGB**

Supplied with 4 gel crimps

CABLES

Description	Fixed Colour	RGB	Length	Code
2 pin M-F, over-moulded IP67 cable. 5 amp max. DC connection cable for LED bar	✓		5m	**180919**
2 pin M-F, over-moulded IP67 cable. 5 amp max. DC extension cable	✓		10m	**180919B**
2 pin M-F, over-moulded IP67 cable. 5 amp max. DC extension cable	✓		20m	**180919D**
2 pin small sealing cap M. Makes end of run of LED bar watertight. For DC power cables	✓			**180926**
4 pin M-F over-moulded IP67 cable. 5 amp max. DC connection cable		✓	5m	**180919A**
4 pin M-F, over-moulded IP67 cable. 5 amp max. DC connection cable		✓	10m	**180919C**
4 pin M-F, over-moulded IP67 cable. 5 amp max. DC connection cable		✓	20m	**180919E**
3 pin sealing cap M. Makes end of run of cables watertight. For signal cables	✓	✓		**180925B**
4 pin sealing cap M. Makes end of run of cables watertight. For RGB power cables		✓		**180925A**
STP signal cable, bare ends. Connects between PIR enclosures and ColourTouch controller		✓	Per metre	**180927**
STP signal cable, bare ends to M. Connects in-line relays and PWM's to PIR or ColourTouch enclosure	✓	✓	10m	**180927A**
STP signal connection cable M to M. Connects between PWMs and in-line relays	✓	✓	10m	**180927B**
STP signal connection patch cable M to M. Connects between PWMs and in-line relays	✓	✓	300mm	**180927C**
STP signal extension cable M to F. Extends cables	✓	✓	10m	**180927D**

CONTROLS

Description	Fixed Colour	RGB	Code
ColourTouch control enclosure with colour changing system and built in timer		✓	**1809507**
In-line PWM RGB driver module. Male 2 pole female 4 pole, one per transformer		✓	**180929A**
Power supply for ColourTouch control		✓	**1809507PS**
PIR enclosure, one or many per installation	✓	✓	**1809PIR**
In-line relay module, one per transformer	✓		**1809IR**

TRANSFORMER

SPECIFICATIONS:

- 100W
- 230V AC to 24V DC
- CE approved
- IP67, supplied with waterproof connector on the DC output
- PFC - 98%
- Efficiency >88%
- Supplied with one end cap

Description	Code
LED Driver - 24V DC/100W - IP67 Rated	**1809006**

SHORT CLIP

For securing LED bar

Finish	Code
316	**1809502**

Two clips required per LED

CRIMPING PLIERS

For gel crimps

Code
180959902

HIGH STRENGTH RETAINER

For use with tube fittings

ml	Code
50	**1899007638**

HIGH STRENGTH RETAINER

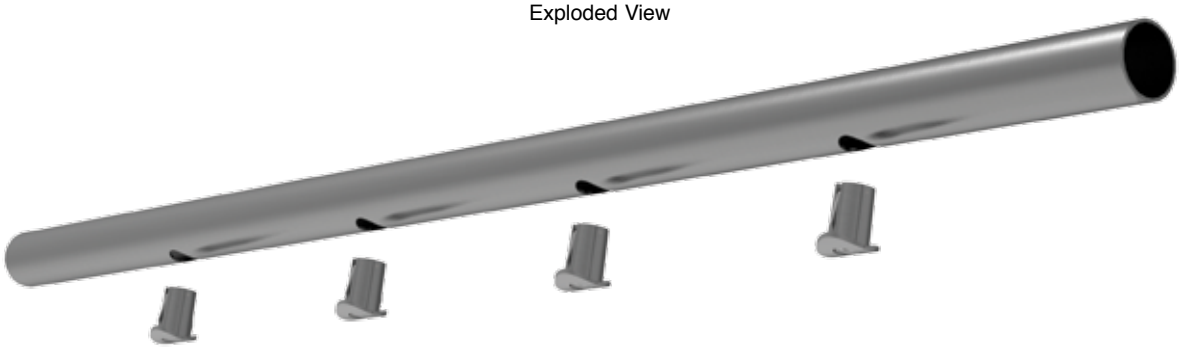
For use on assembled posts

ml	Code
10	**189900763810**

ILLUMIRAIL® POD SYSTEM

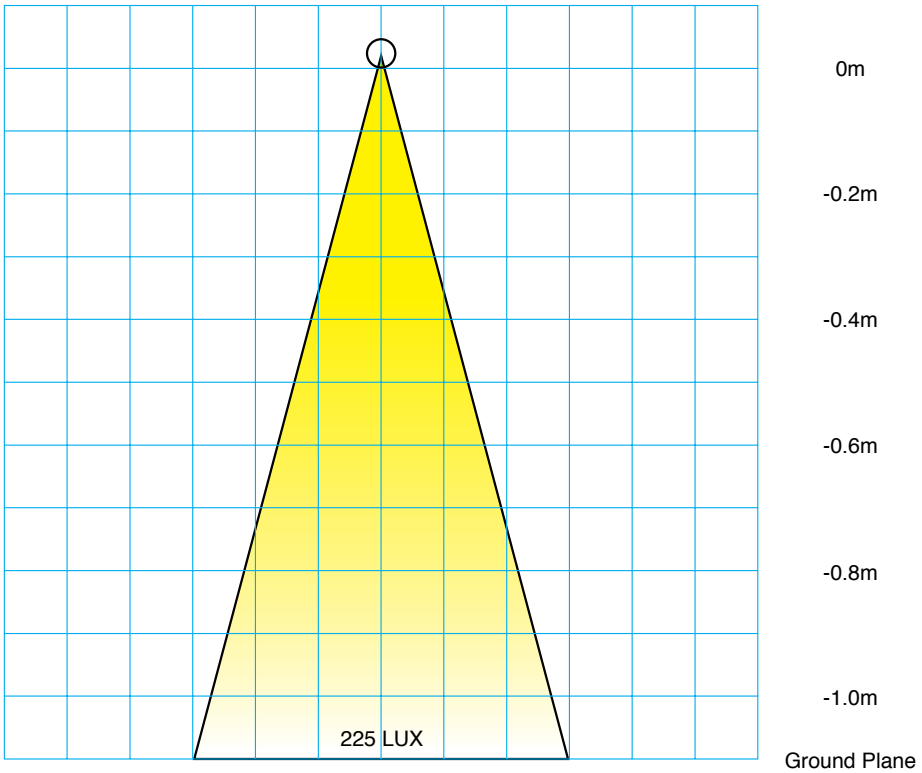
POD INSTALLATION

Exploded View



LIGHT DISTRIBUTION AT 1100mm HANDRAIL HEIGHT

4 x WARM WHITE SINGLE LENS LEDS MOUNTED AT 300mm CENTRES



Beam width 3.5m at ground plane

The Illumirail POD system is designed using top quality CREE LEDs. The single lens PODs are rated at 1.2W. They are directly connected to the bus power cable **Code: 180920** using gel crimps. PODs are fitted with a diode on the negative side of their circuit to prevent the POD LEDs from blowing if they are wired incorrectly.

POD SYSTEM AVAILABLE TO SUIT:

- 2.0 - 3.2mm wall thickness for Ø 42.4 and 48.3mm tube

There is a spring assembly incorporated into the lens body so it securely snaps into place and the lens can be removed if necessary. There is also the option to drill two holes in the flange of the lens which allows permanent fixing using a 2mm stainless steel rivet into pre-drilled holes in the tube.

We recommend the holes for the PODs are machined out in a workshop or they can be drilled on site using a 24mm step drill.

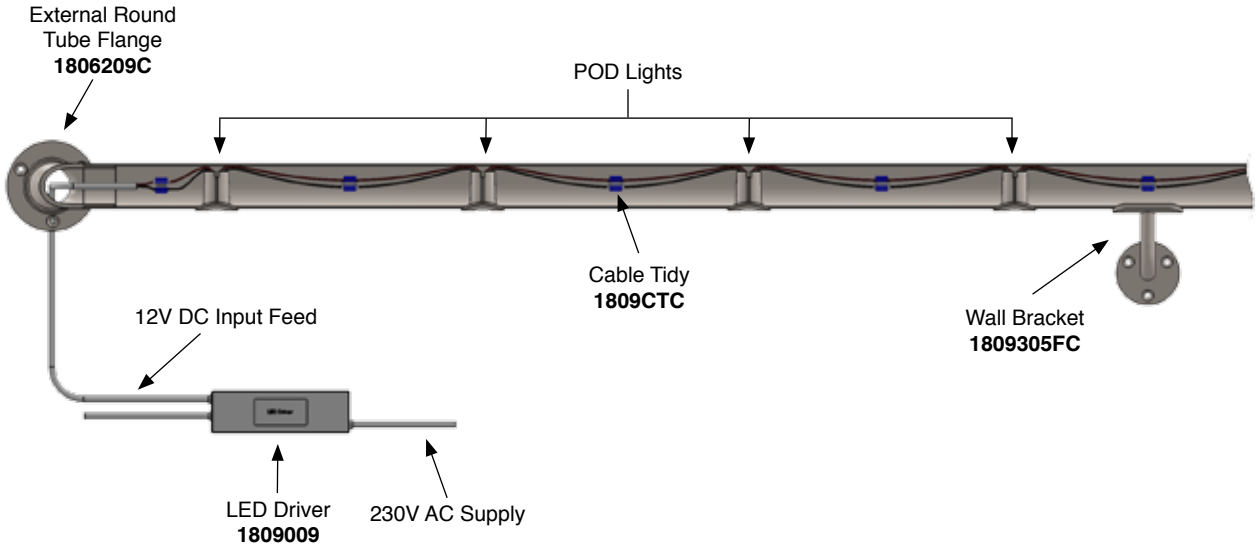
NB: Note polarity and ensure to connect the wires accordingly.

THE POD SYSTEM WORKS WITH ALL OF OUR GALVANISED, MILD STEEL & PRO-RAILING FITTINGS. SEE PAGES 44 - 45 FOR OUR RECOMMENDED TYPE 316 FITTINGS.

ILLUMIRAIL® POD SYSTEM

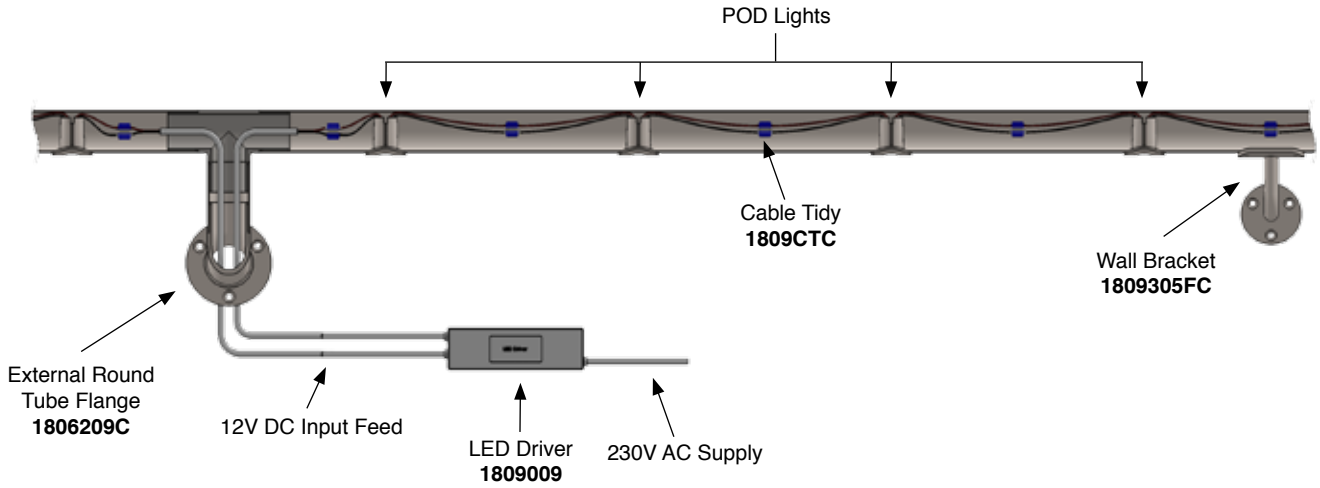
WALL MOUNT WIRING

POWERING PODS FROM END WALL CONNECTION

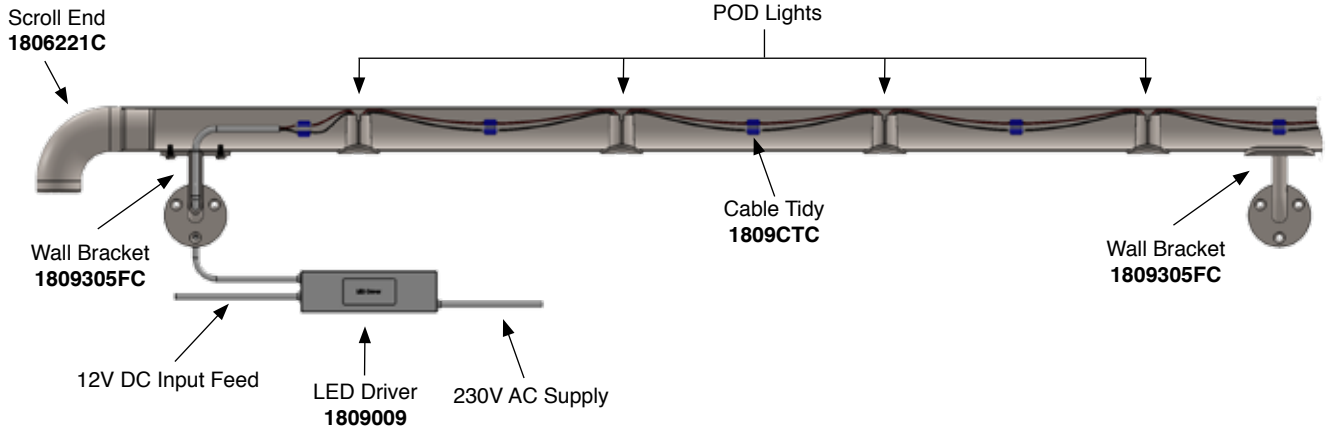


POWERING PODS FROM MID RAIL POSITION

Recommended installation method

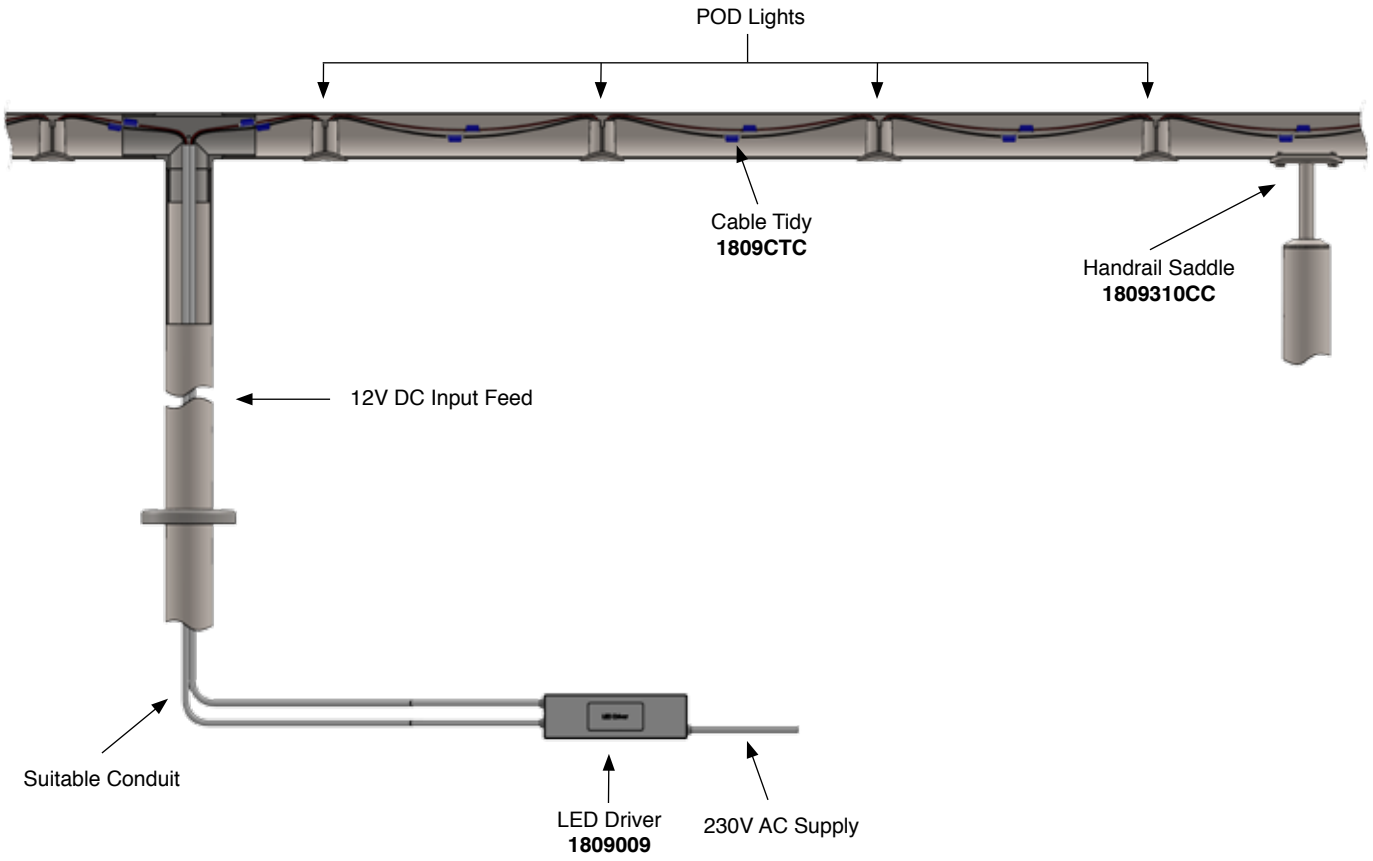


POWERING PODS THROUGH HANDRAIL BRACKET

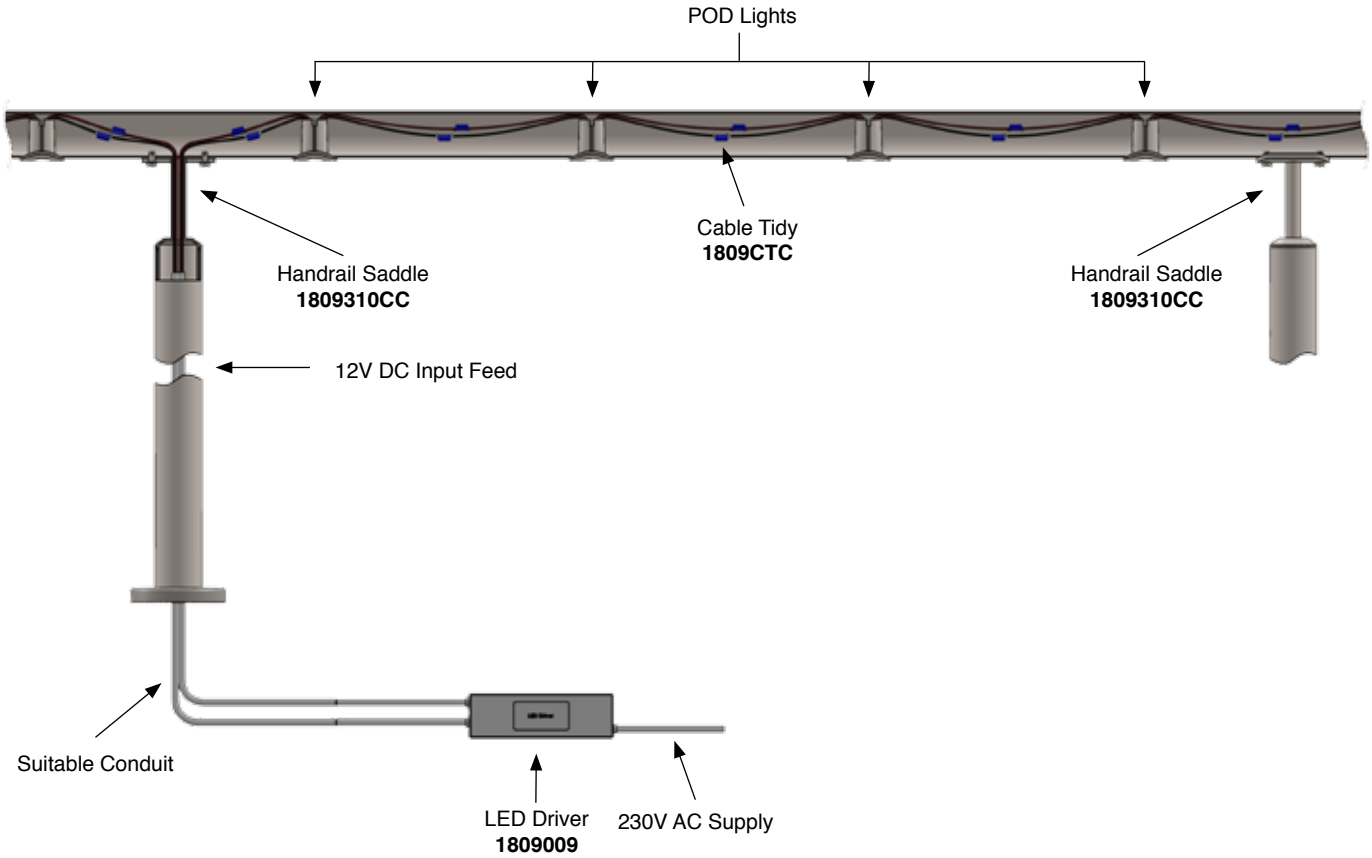


EXTENDED POST MOUNTED INTO POCKET

Core drilled post fitted into a hole in the ground



EXTENDED POST MOUNTED INTO POCKET

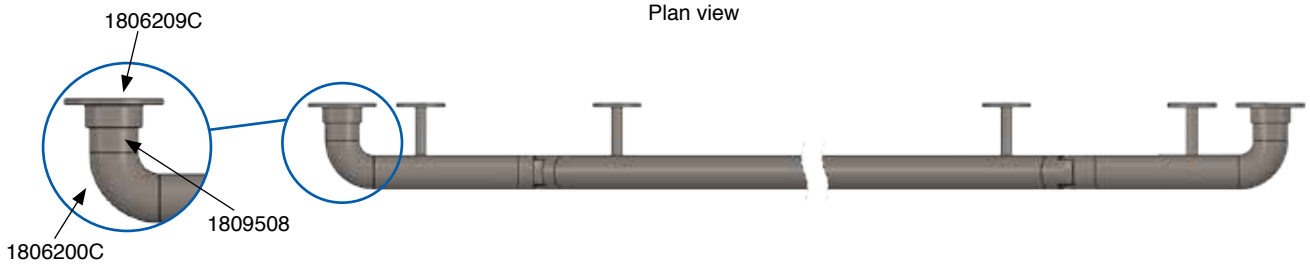


ILLUMIRAIL® POD SYSTEM

WALL MOUNTING GUIDE

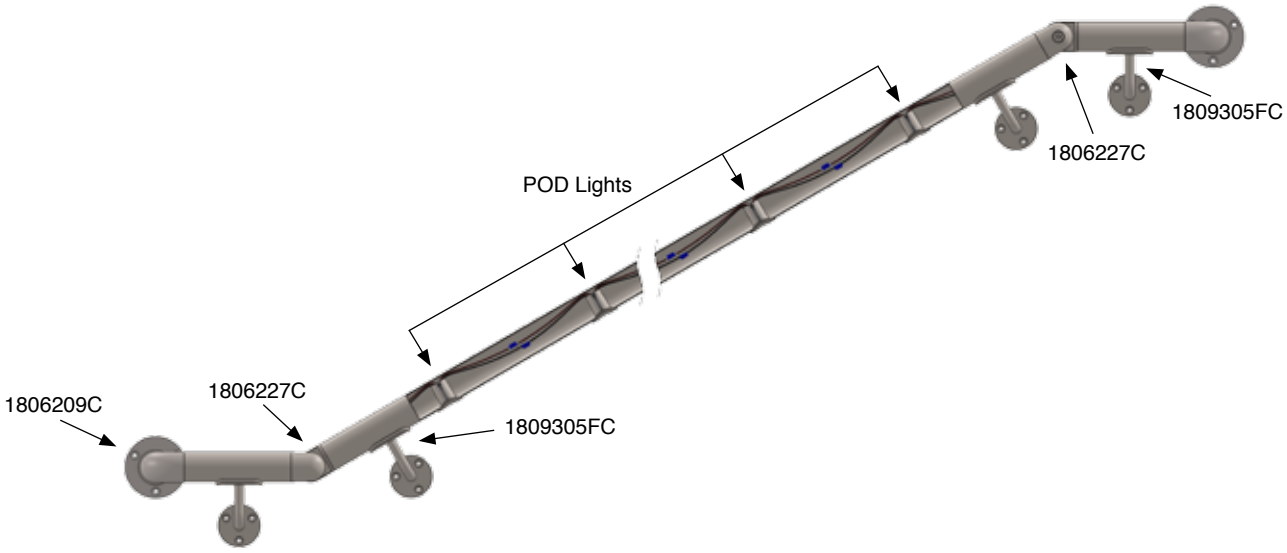
HANDRAIL WITH RETURN TO WALL ENDS FOR CABLE

Plan view



HANDRAIL WITH RETURN TO WALL ENDS FOR CABLE

Front view



HANDRAIL WITH END CAPS OR SCROLL ENDS

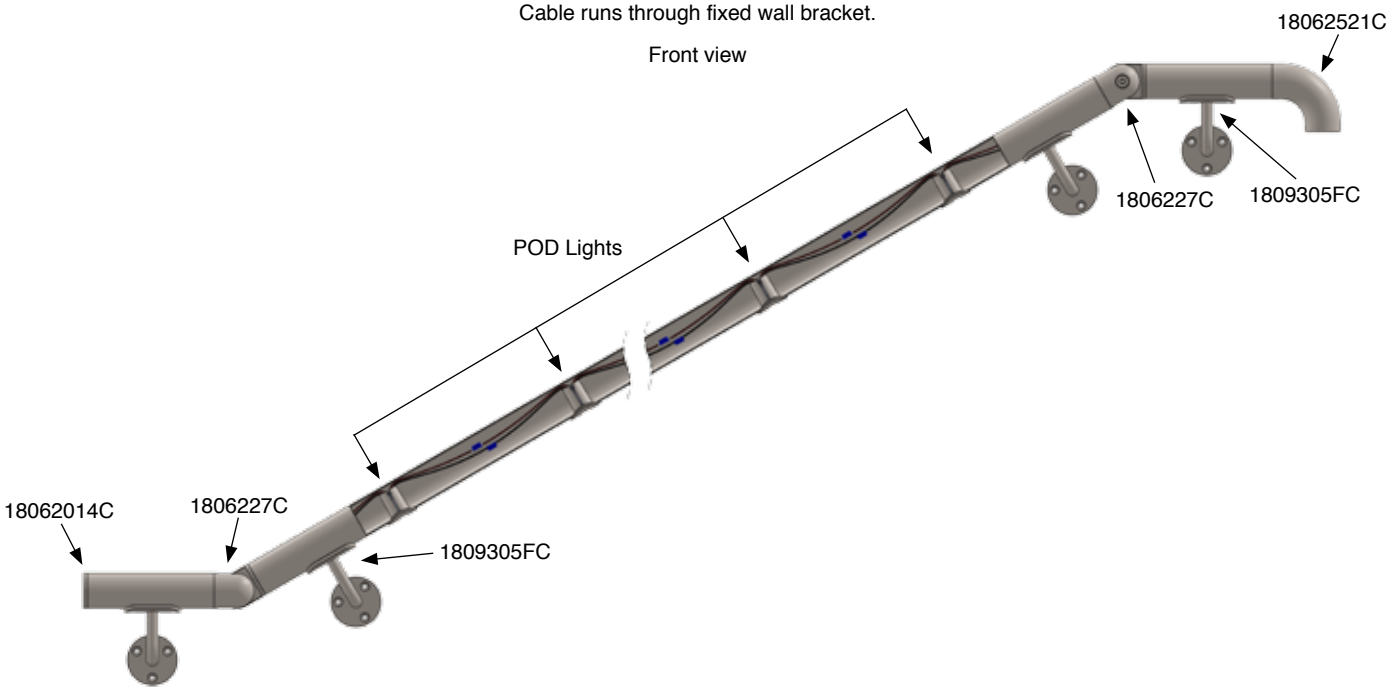
Cable runs through fixed wall bracket.

Plan view

HANDRAIL WITH END CAPS OR SCROLL ENDS

Cable runs through fixed wall bracket.

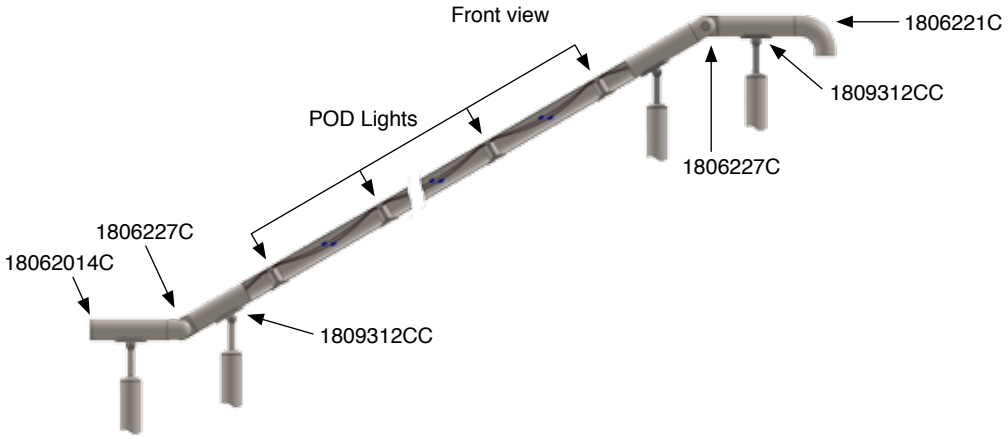
Front view



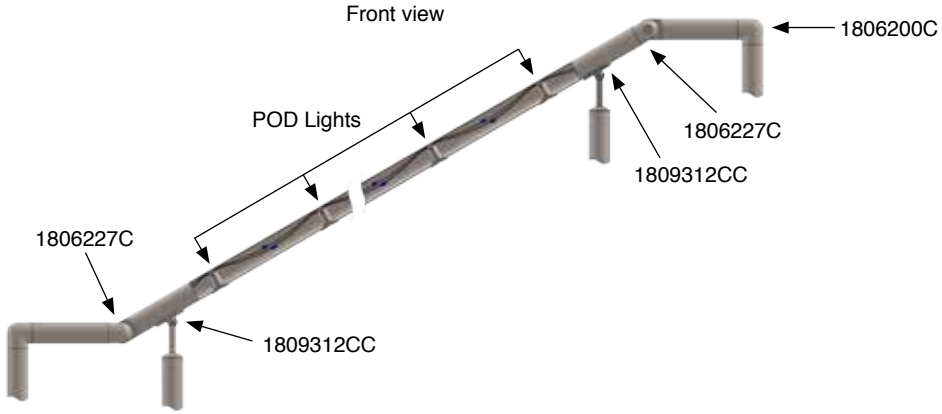
ILLUMIRAIL® POD SYSTEM

POST MOUNTING GUIDE

HANDRAIL WITH END CAPS OR SCROLL ENDS

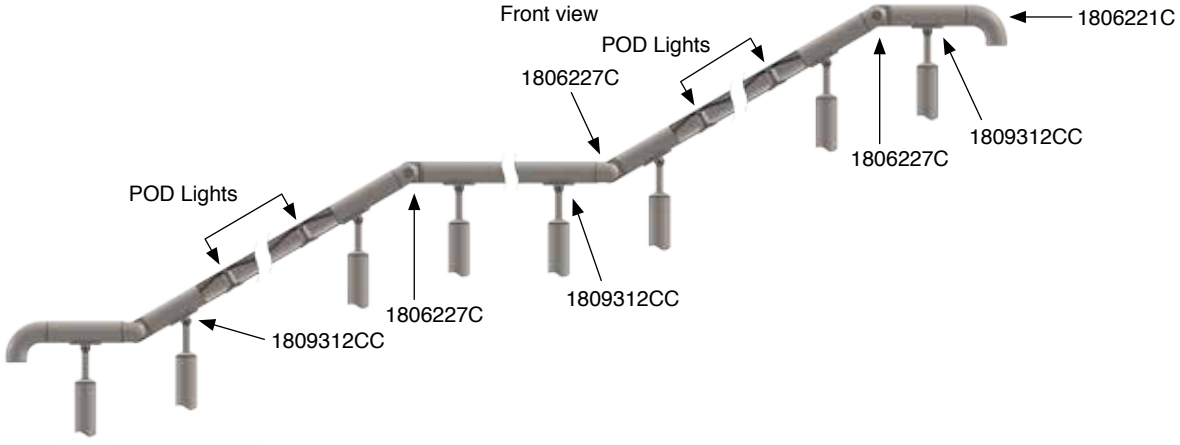


HANDRAIL WITH RETURN TO FLOOR ENDS



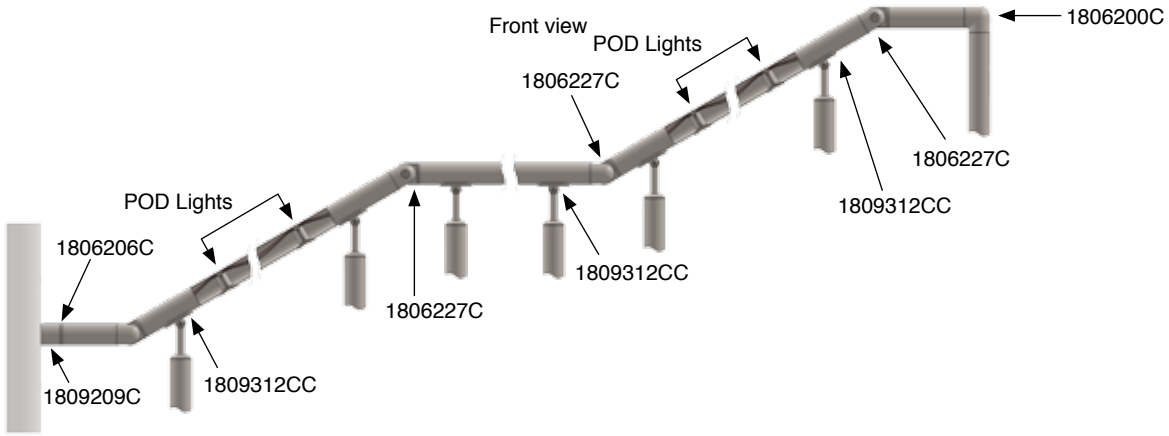
HANDRAIL WITH LANDING AND SCROLL ENDS

Cable runs through fixed bracket on landing.



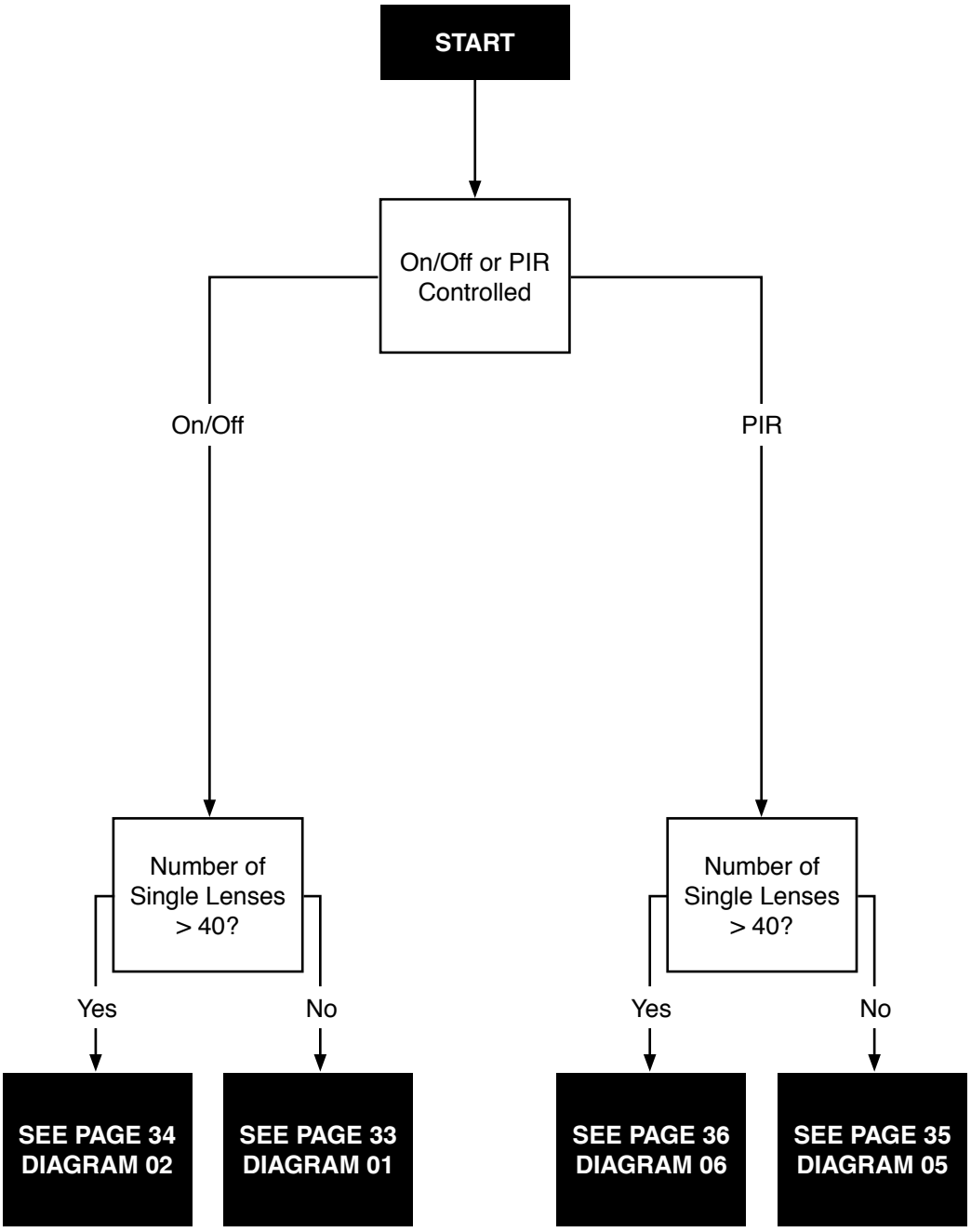
HANDRAIL WITH LANDING AND RETURN TO FLOOR ENDS OR WALL

Cable runs through return to floor ends or into the wall.



ILLUMIRAIL® POD SYSTEM

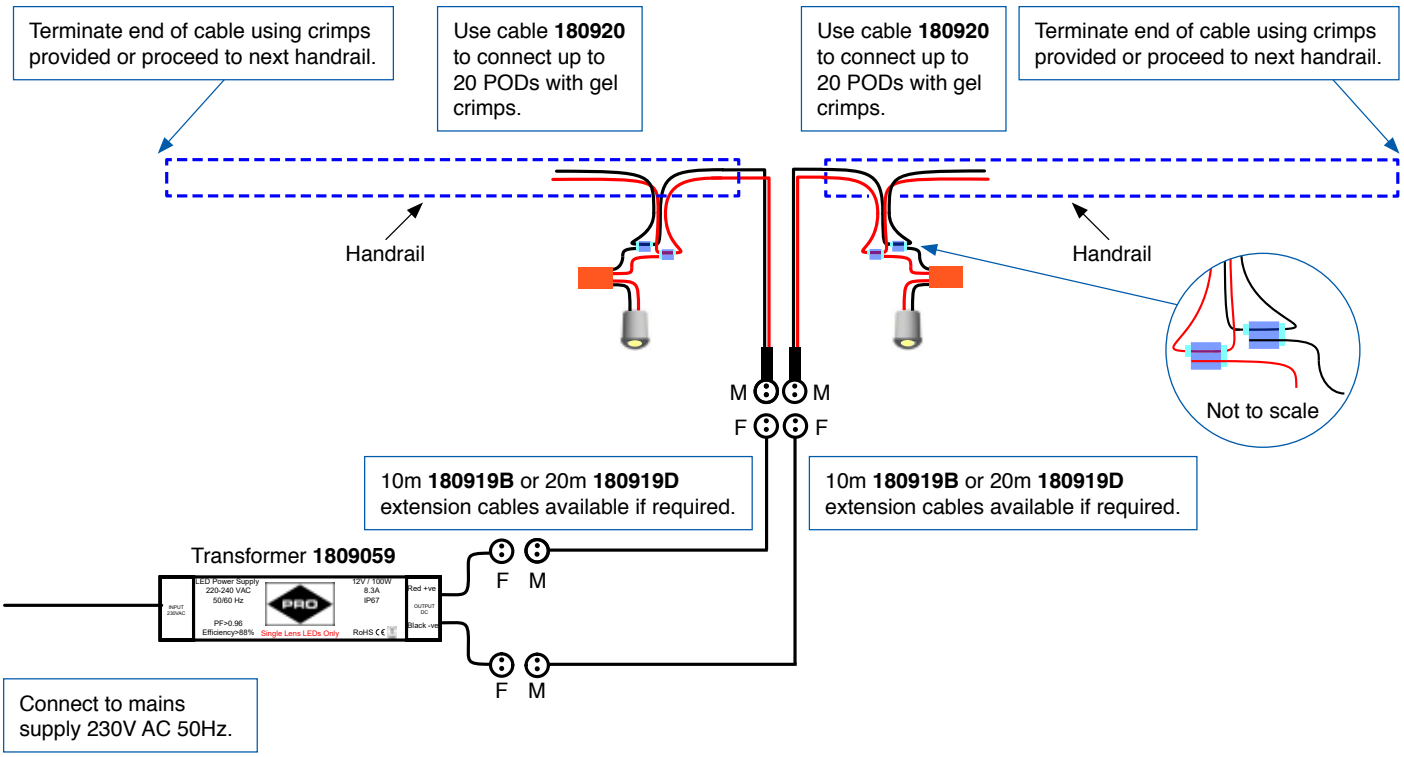
PRODUCT SELECTION FLOWCHART



ILLUMIRAIL® POD SYSTEM

DIAGRAM 01

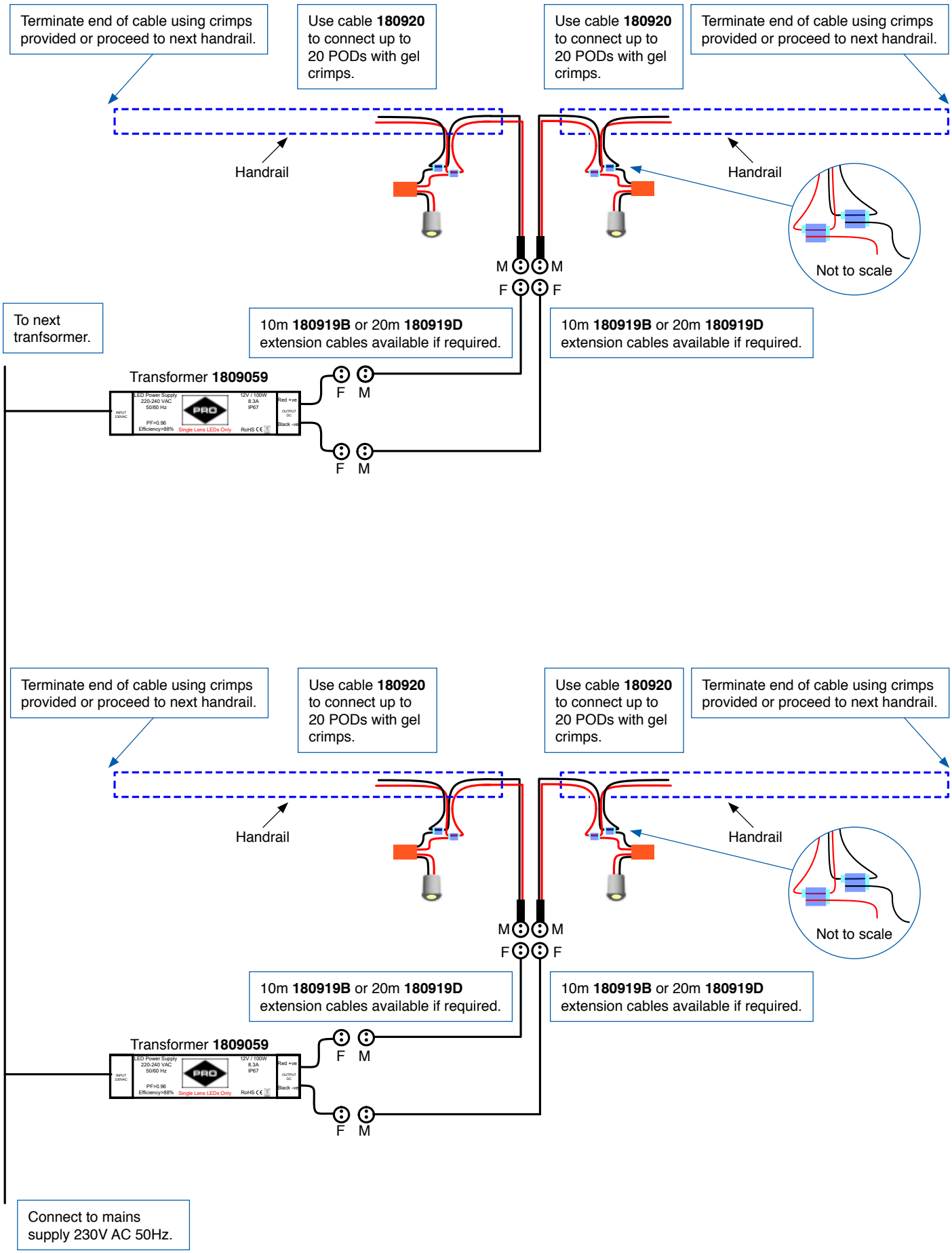
Single Lens System. On/Off operation. Up to 40 LEDs.



ILLUMIRAIL® POD SYSTEM

DIAGRAM 02

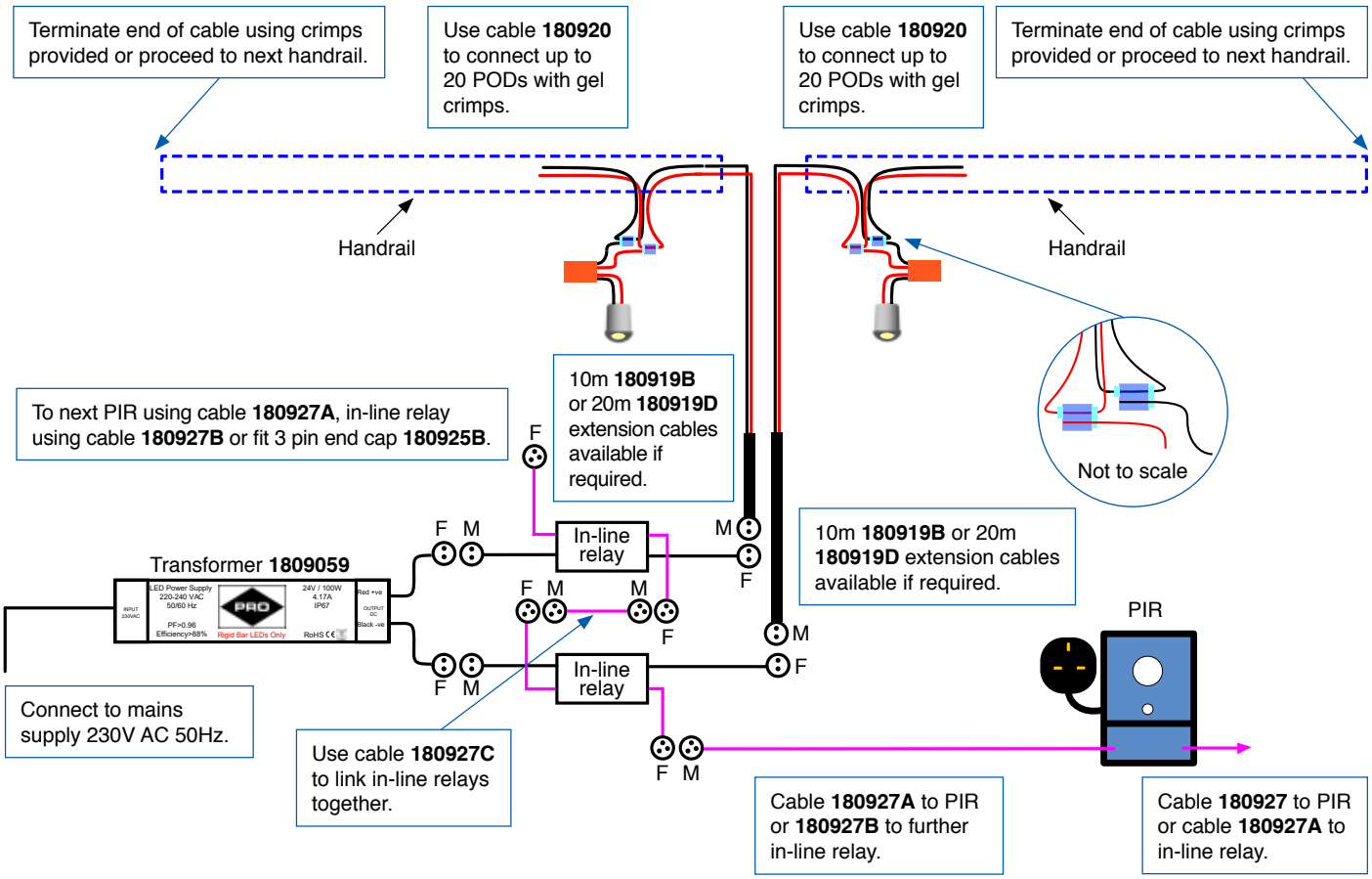
Single Lens System. On/Off operation. Over 40 LEDs.



ILLUMIRAIL® POD SYSTEM

DIAGRAM 05

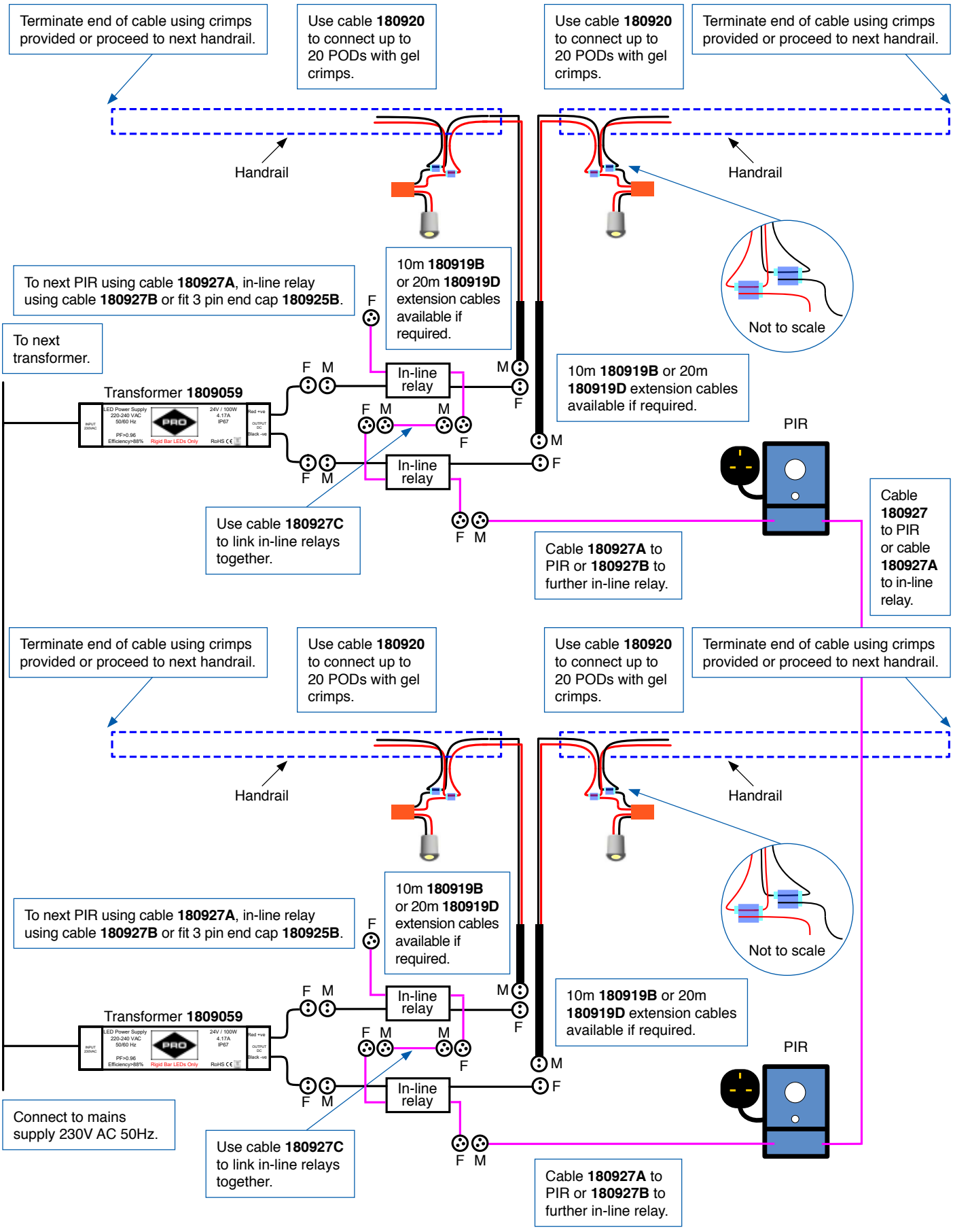
Single Lens System. PIR(s) operation. Up to 40 LEDs.



ILLUMIRAIL® POD SYSTEM

DIAGRAM 06

Single Lens System. Multiple PIR(s) operation. More than 40 LEDs.



ILLUMIRAIL® POD SYSTEM

PHOTOMETRIC TEST REPORT

Test Method(s) Used	
POTS Standard Operating Procedure:	INTEGRATING SPHERE PROCEDURE POTS016
POTS Standard Operating Procedure:	NFMS OPERATION GUIDE
Standard:	LM79 08

Details of Product Tested	
Manufacturer: ADVANCED BMS	Source Type: LED
Model: RIGID BAR	Luminaire Type: DOWNLIGHT
Power Supply Used: Kikusui PCR1000M Voltage Stabiliser S/N SM01191	
Voltage(AC V) = 230.0	Current (mA)= 180
Power (Watts)= 17.14	Power factor= 0.465

Integrating Sphere Test	
Date of Test: 10/07/2015	Ambient Temperature:25°C
Measurement Filename: RIGID BAR	
Instrument Used: Labsphere model 2m integrating sphere spectroradiometer AS-02949-012	
Integrating Sphere Size: 2m	Measurement Geometry (2π / 4π): 4π
Sample Orientation: Horizontal	Auxiliary Correction Applied: YES
Comments:	
Date of Last Calibration (Operating Hours): 06-07-2015 (0:42)	Spectral Flux Standard Lamp Used: SCL-600
Standard Lamp Serial Number: L123	Traceable: to NIST standards
Calibration Certificate Number: SCL-600-L123	Calibration Certificate Date: 29/01/2014
Calibration Lamp Uncertainty: ± 0.67% (k=2)	
Results	
Flux (lumens): 776.7	
CIE 1931 Chromaticity Cx: 0.4147	CIE 1931 Chromaticity Cy: 0.3823
CRI (%): 69.36	CCT (K): 3225

PHOTOMETRIC TEST REPORT

FIGURE 1: SPECTRAL IRRADIANCE

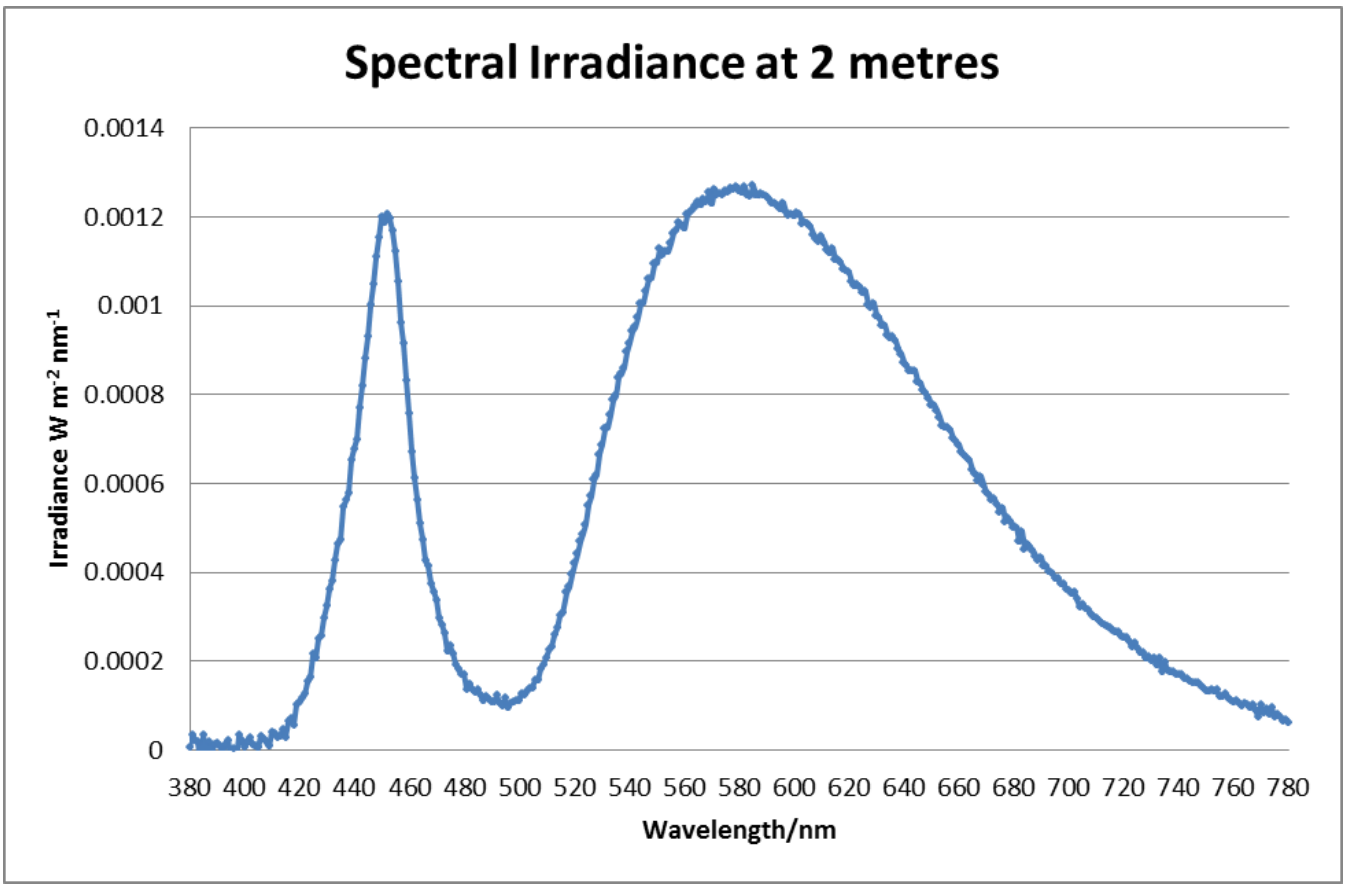
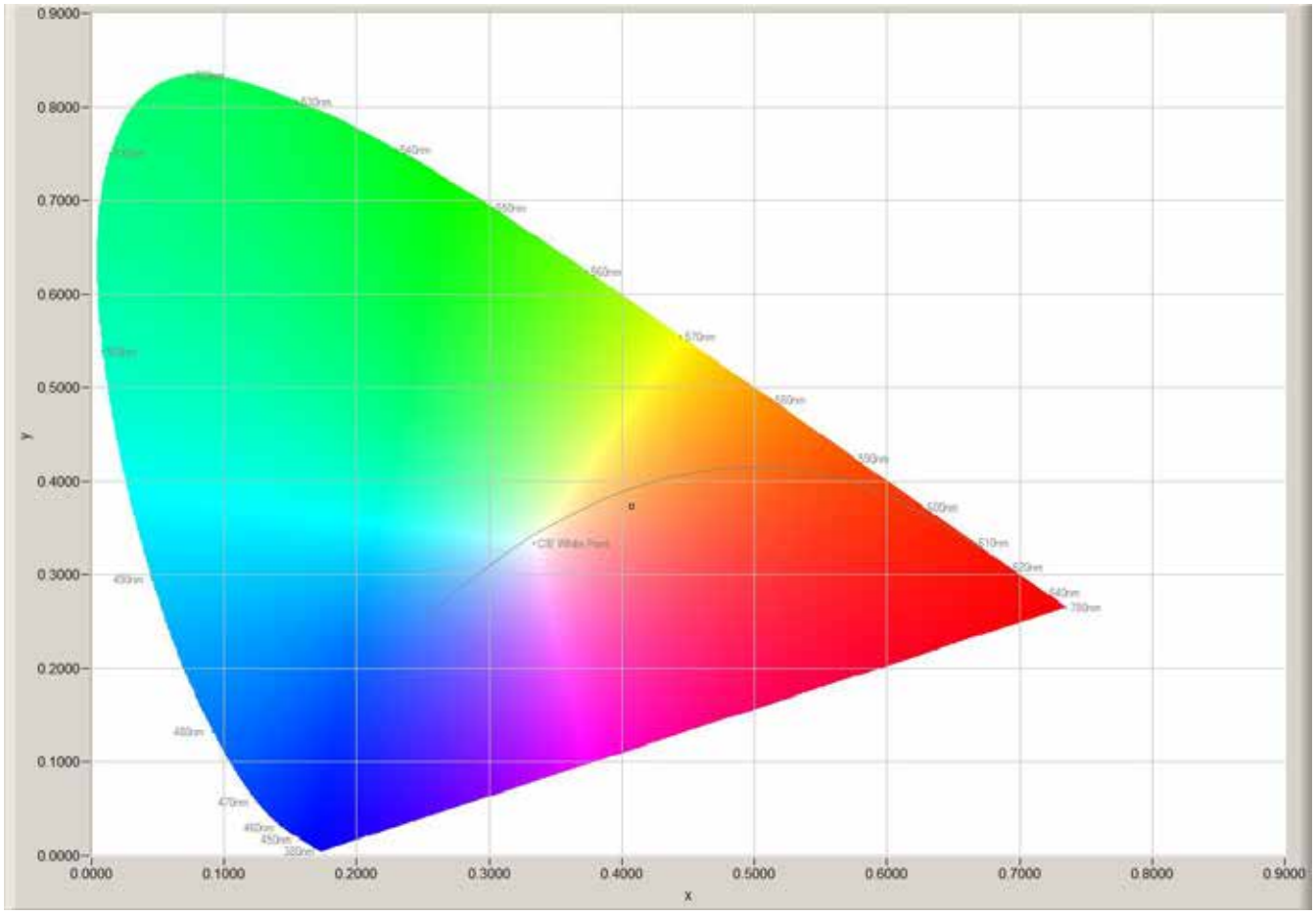


FIGURE 2: CIE 1931 DIAGRAM



ILLUMIRAIL® POD SYSTEM

PHOTOMETRIC TEST REPORT

Goniophotometer Test		
Date of Test: 16/07/2015		Ambient Temperature: 25°C
Measurement Filename: RIGID BAR		
Instrument Used: Radiant Imaging NFMS0800 Goniometer with ProMetric PM-1200N-1 Imaging Photometer		
Photometer Working Distance: 2m		Measurement Geometry: Near-Field
Comments:		
Reference Photometer Used: Specbos1211		Reference Photometer Serial Number: 2014754
Traceable: to NIST standards		Calibration Certificate Number: 2129 WK-L 2014-02
Calibration Certificate Date: 13 February 2014		Sample Stabilisation Time (minutes): 60
Reference Photometer Calibration Uncertainty: ± 2.4% (k=2, 20-200 lux, CIE illuminant A source)		
Scan Set Up		
Direction	**Range**	**Increment**
Inclination Zone 1	0-180°	3°
Azimuth	0-360°	10°
Results		
Integrated Luminous Flux (lumens):776.7	Peak Intensity (3° Spot, candelas): 269.4	Efficacy (lumens/Watt): 45.3
Beam Angle (50% of max intensity C0-180, degrees): 115.7		
Photometric Filename (IES LM-63-2002): RIGID BAR		
IES File – Absolute or Relative Format? ABSOLUTE		
Photometric Filename (EULUMDAT): RIGID BAR		
EULUMDAT File – Absolute or Relative Format? ABSOLUTE		

PHOTOMETRIC TEST REPORT

FIGURE 3: FAR-FIELD LUMINOUS INTENSITY (C0-180, CARTESIAN COORDINATES)

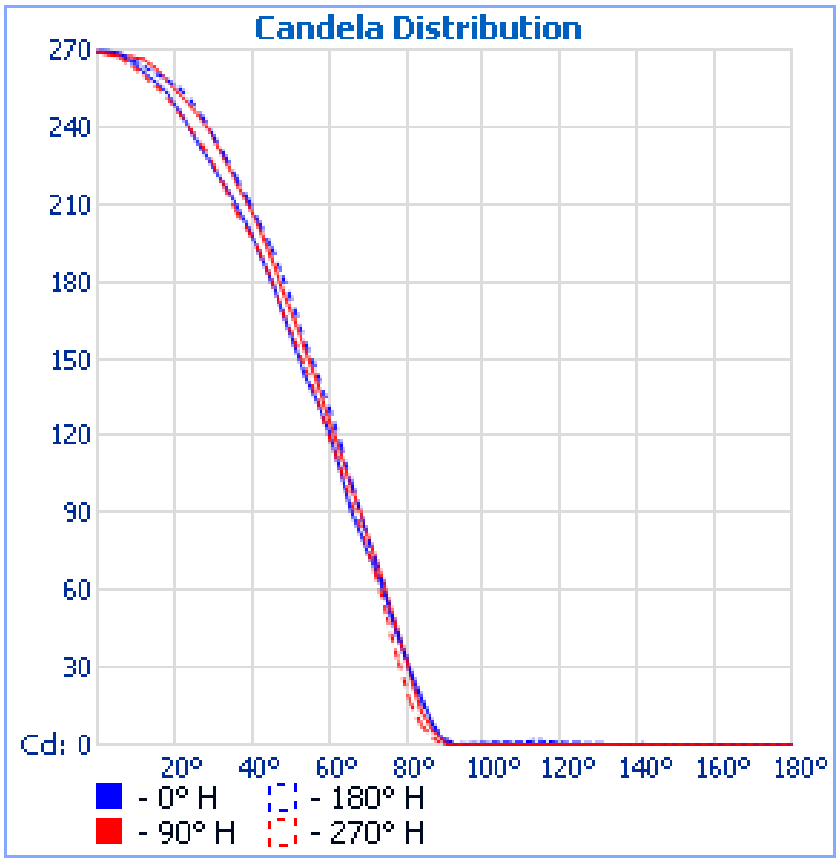


FIGURE 4: FAR-FIELD LUMINOUS INTENSITY (C0-180, C90-270, POLAR COORDINATES)

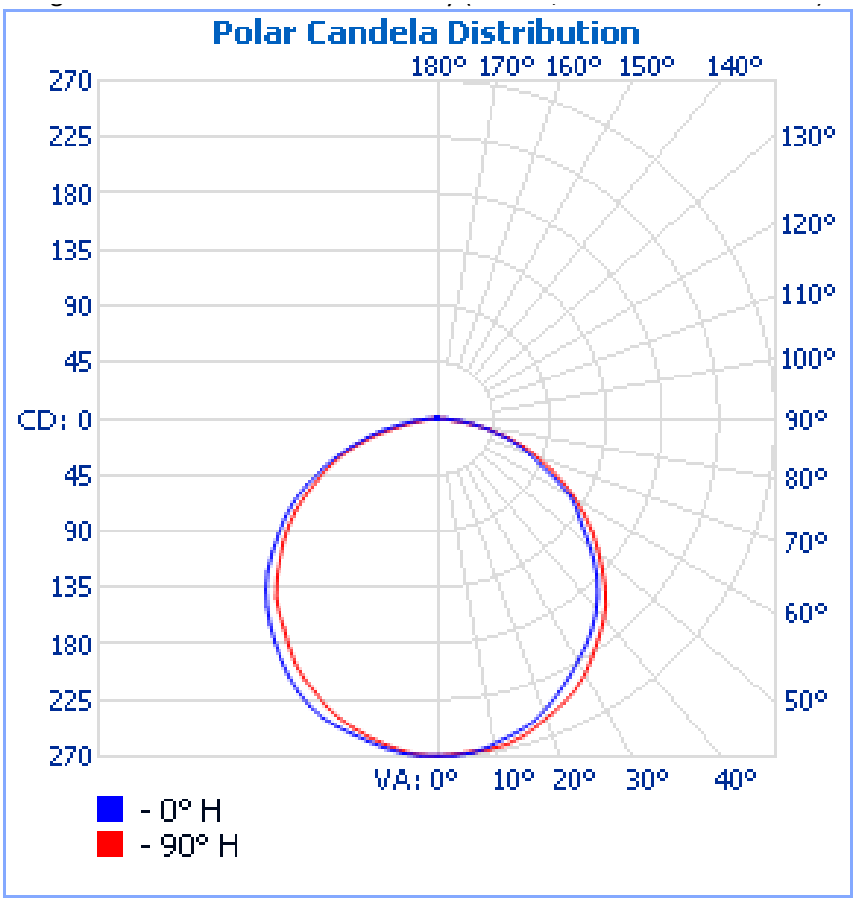


TABLE 2A. LUMINOUS INTENSITY VALUES, AZIMUTH 0-180°

	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269
3	269	269	269	269	269	269	269	269	268	268	268	268	269	269	269	269	269	269	269
6	268	269	269	269	268	268	268	268	267	267	267	267	267	268	268	268	268	268	269
9	265	266	266	266	266	266	266	267	267	267	267	266	266	265	265	265	266	266	266
12	261	262	263	263	264	264	264	265	266	266	266	265	263	263	263	262	262	263	264
15	258	258	259	260	260	260	260	261	262	263	263	262	261	260	260	260	260	261	261
18	253	254	254	256	256	256	256	256	257	258	259	259	257	256	255	256	257	259	259
21	247	247	248	251	252	252	252	252	253	253	254	254	252	250	250	250	251	254	255
24	239	240	242	243	245	246	247	248	248	248	248	248	246	246	245	243	243	247	251
27	232	234	234	236	238	239	240	241	243	243	242	241	241	241	242	239	236	239	245
30	224	227	227	229	230	231	231	232	235	236	235	234	234	235	237	235	231	231	237
33	217	219	220	222	223	222	222	222	226	227	227	226	226	226	228	229	226	221	229
36	210	210	212	215	214	212	213	214	216	218	219	218	217	217	217	220	219	210	220
39	201	201	204	205	205	203	204	206	207	210	208	209	208	209	207	207	211	199	212
42	192	191	193	193	194	194	195	196	197	201	197	199	199	200	200	196	200	190	203
45	181	179	181	182	182	183	184	185	187	189	186	189	188	187	191	187	187	181	193
48	168	167	171	172	171	171	171	174	176	177	176	178	176	175	179	180	173	173	182
51	155	157	161	161	160	161	160	163	165	165	166	166	165	165	168	170	158	165	169
54	143	147	150	146	146	150	148	153	152	153	155	153	152	154	157	156	147	154	156
57	133	133	135	133	134	138	137	141	140	140	143	140	140	142	146	140	134	141	144
60	122	121	121	121	123	125	126	127	127	127	129	127	129	130	132	125	122	127	131
63	106	108	110	109	111	112	114	112	113	113	115	115	116	117	116	111	108	113	117
66	90	92	96	97	98	99	100	97	99	100	100	101	102	103	101	99	96	100	101
69	79	78	82	83	84	85	84	86	86	86	86	87	88	89	86	83	82	86	86
72	69	67	69	70	69	70	71	73	73	73	73	74	75	75	72	68	68	70	72
75	56	55	54	55	55	57	58	60	58	59	57	59	60	62	58	55	54	56	57
78	41	41	41	42	42	43	43	44	42	43	40	42	44	46	45	43	42	42	43
81	30	29	32	31	32	30	29	29	27	28	25	27	28	31	31	31	30	28	28
84	18	19	19	19	17	15	14	13	13	13	13	12	15	16	16	19	18	18	17
87	8	9	9	7	6	5	5	4	5	5	6	6	7	6	6	6	8	10	8
90	1	2	2	1	1	1	0	1	1	1	2	2	2	1	1	1	1	2	2
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ILLUMIRAIL® POD SYSTEM

PHOTOMETRIC TEST REPORT

TABLE 2B. LUMINOUS INTENSITY VALUES, AZIMUTH 190-350°

	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350
0	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269
3	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269	269
6	269	269	268	268	268	268	267	267	267	266	266	266	266	266	266	267	268
9	267	267	267	266	266	265	264	264	264	264	263	263	262	262	262	263	264
12	264	265	265	264	263	262	261	260	260	260	261	260	259	259	259	260	260
15	261	261	261	260	259	258	258	257	256	256	257	257	256	255	256	257	257
18	257	255	255	254	253	253	254	253	252	252	252	252	251	251	252	253	254
21	254	250	248	247	246	246	248	248	246	246	247	246	245	246	248	248	248
24	249	244	241	242	241	239	240	240	240	241	241	240	240	240	240	240	240
27	240	235	235	237	238	235	233	232	233	234	234	234	233	234	234	233	232
30	230	226	230	231	232	230	228	226	226	226	226	226	224	226	226	226	224
33	220	219	225	221	222	220	222	219	216	218	218	216	215	216	217	218	217
36	210	211	217	210	211	210	211	212	207	210	209	207	206	207	208	208	207
39	199	201	205	200	203	202	201	201	200	200	201	198	197	198	198	199	198
42	187	190	193	193	195	194	193	190	192	189	191	189	188	189	187	190	188
45	179	179	181	184	183	182	183	179	181	179	180	179	177	178	176	179	178
48	171	169	171	171	169	169	173	169	169	170	168	168	166	168	167	169	166
51	162	154	162	159	158	157	161	158	157	159	157	158	156	157	156	157	157
54	151	142	148	149	148	144	148	146	146	146	145	145	145	144	141	145	146
57	140	130	133	138	136	133	134	134	134	133	132	133	133	132	130	131	134
60	128	118	119	124	124	121	122	121	121	121	120	121	120	120	117	117	122
63	114	108	106	108	110	108	109	107	107	108	109	109	106	106	104	104	107
66	100	94	93	95	95	95	95	93	94	95	96	96	94	93	91	90	91
69	85	80	78	80	80	82	81	80	81	81	82	82	81	77	76	78	77
72	70	66	63	66	66	68	67	67	67	68	68	68	68	64	63	66	67
75	54	50	50	52	53	52	51	51	50	51	52	52	54	51	50	51	54
78	40	38	37	38	37	35	34	34	32	33	35	36	38	37	37	37	40
81	26	26	23	22	20	17	17	16	17	17	19	19	22	24	26	28	28
84	16	14	12	8	8	7	8	8	8	8	8	8	9	11	14	16	18
87	7	5	2	2	2	2	3	3	3	2	2	3	3	3	3	6	8
90	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

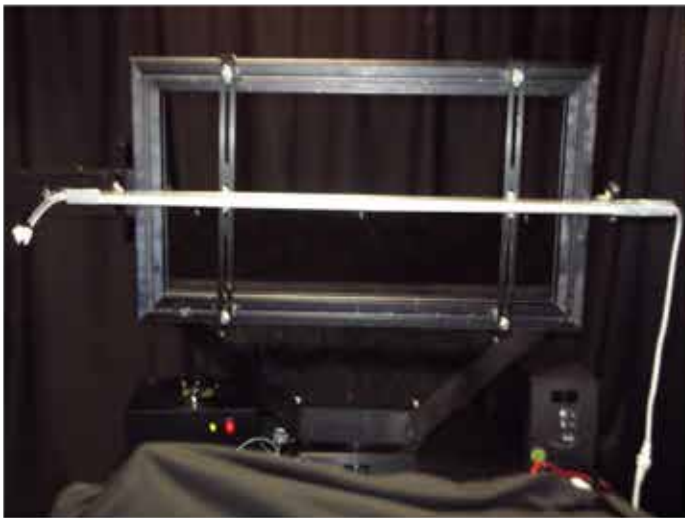
TABLE 3. ZONAL FLUX TABLE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	6.4	0.8%	90-95	0.1	0.0%
5-10	19.0	2.4%	95-100	0.0	0.0%
10-15	31.1	4.0%	100-105	0.0	0.0%
15-20	42.2	5.4%	105-110	0.0	0.0%
20-25	51.5	6.6%	110-115	0.0	0.0%
25-30	59.7	7.6%	115-120	0.0	0.0%
30-35	65.8	8.4%	120-125	0.0	0.0%
35-40	69.1	8.8%	125-130	0.0	0.0%
40-45	70.9	9.0%	130-135	0.0	0.0%
45-50	70.4	9.0%	135-140	0.0	0.0%
50-55	66.9	8.5%	140-145	0.0	0.0%
55-60	61.9	7.9%	145-150	0.0	0.0%
60-65	54.9	7.0%	150-155	0.0	0.0%
65-70	45.0	5.7%	155-160	0.0	0.0%
70-75	34.5	4.4%	160-165	0.0	0.0%
75-80	22.8	2.9%	165-170	0.0	0.0%
80-85	10.6	1.3%	170-175	0.0	0.0%
85-90	2.5	0.3%	175-180	0.0	0.0%

TABLE 4. UTILISATION FACTOR TABLE

Effective Floor Cavity Reflectance: 20%																		
RCC %:	**80**				**70**				**50**			**30**			**10**			**0**
RW %:	**70**	**50**	**30**	**0**	**70**	**50**	**30**	**0**	**50**	**30**	**20**	**50**	**30**	**20**	**50**	**30**	**20**	**0**
RCR: 0	1.19	1.19	1.19	1.19	1.16	1.16	1.16	1.00	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	1.00
1	1.09	1.04	1.00	0.96	1.06	1.02	0.98	0.84	0.97	0.94	0.91	0.93	0.91	0.88	0.90	0.88	0.86	0.84
2	0.99	0.90	0.83	0.78	0.96	0.88	0.82	0.71	0.85	0.79	0.75	0.81	0.77	0.73	0.78	0.75	0.71	0.69
3	0.90	0.79	0.71	0.64	0.87	0.77	0.70	0.60	0.74	0.68	0.62	0.72	0.66	0.61	0.69	0.64	0.60	0.58
4	0.82	0.70	0.61	0.54	0.80	0.69	0.60	0.51	0.66	0.59	0.53	0.64	0.57	0.52	0.62	0.56	0.52	0.49
5	0.75	0.62	0.53	0.47	0.73	0.61	0.53	0.45	0.59	0.52	0.46	0.57	0.50	0.45	0.55	0.49	0.45	0.43
6	0.70	0.56	0.47	0.41	0.68	0.55	0.47	0.39	0.53	0.46	0.40	0.52	0.45	0.40	0.50	0.44	0.39	0.37
7	0.64	0.51	0.42	0.36	0.63	0.50	0.42	0.35	0.48	0.41	0.35	0.47	0.40	0.35	0.46	0.39	0.35	0.33
8	0.60	0.46	0.38	0.32	0.58	0.46	0.37	0.31	0.44	0.37	0.32	0.43	0.36	0.31	0.42	0.36	0.31	0.29
9	0.56	0.43	0.34	0.29	0.55	0.42	0.34	0.28	0.41	0.33	0.28	0.40	0.33	0.28	0.39	0.33	0.28	0.26
10	0.53	0.39	0.31	0.26	0.51	0.39	0.31	0.25	0.38	0.31	0.26	0.37	0.30	0.26	0.36	0.30	0.25	0.24

PHOTO 1: LUMINAIRE ON GONIOMETER MOUNT



Signature:

Print Name:

D CHAMBERS

Date:

16/07/2015

Test Engineer

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP

Checked By:

Signature:

Print Name:

G John

Date:

28/07/2015

Technical Director

Duly authorised to sign on behalf of:
Photometric and Optical Testing Services LLP

ILLUMIRAIL® POD SYSTEM

WALL MOUNTING FITTINGS

HOLLOW TUBE

Finish	Ø mm	Length mm	Wall Thickness mm	Code
316	42.4	3000	2.0	**1806704C**
316	42.4	6000	2.0	**1806700C**

WALL BRACKET

Finish	Ø mm	Code
316	42.4	**1809305FC**

With cable hole

SMOOTH ADJUSTABLE ELBOW

Finish	Ø mm	Code
316	42.4	**1806227C**

IN-LINE CONNECTOR

Finish	Ø mm	Code
316	42.4	**1806206C**

90° ELBOW RADIUSED CORNER

Finish	Ø mm	Code
316	42.4	**1806200C**

FLAT TOP END CAP

Finish	Ø mm	Code
316	42.4	**1806214C**

OTHER ELBOW & END CAP OPTIONS AVAILABLE, SEE PRO-RAILING CATALOGUE.

EXTERNAL ROUND TUBE FLANGE

Finish	Ø mm	Code
316	42.4	**1806209C**

TUBE SECTION

Finish	Ø mm	Length mm	Code
316	42.4	55	**1809508**

SCROLL END

Finish	Ø mm	Code
316	42.4	**1806221C**

ILLUMIRAIL® POD SYSTEM

POST MOUNTING FITTINGS

HOLLOW TUBE

Finish	Ø mm	Length mm	Wall Thickness mm	Code
316	42.4	3000	2.0	**1806704C**
316	42.4	6000	2.0	**1806700C**

HANDY TIP

For ease of application use pre-assembled posts, just replace the saddle for one with a cable hole.

HANDRAIL SADDLE

Finish	Ø mm	Code
316	42.4	**1809310CC**

With cable hole.
To be used with double clip

HANDRAIL SADDLE ADJUSTABLE SPIGOT

Finish	Ø mm	Code
316	42.4	**1809312CC**

With cable hole

OTHER ELBOW & END CAP OPTIONS AVAILABLE, SEE PRO-RAILING CATALOGUE.

TUBE CONNECTOR

Finish	Ø mm	Code
316	42.4	**1809313CC**

With cable hole.
Use instead of saddles

ADJUSTABLE ELBOW

Finish	Ø mm	Code
316	42.4	**1806203C**

SMOOTH ADJUSTABLE ELBOW

Finish	Ø mm	Code
316	42.4	**1806227C**

IN-LINE CONNECTOR

Finish	Ø mm	Code
316	42.4	**1806206C**

90° ELBOW RADIUSED CORNER

Finish	Ø mm	Code
316	42.4	**1806200C**

WALL CONNECTOR

Finish	Ø mm	Code
316	42.4	**1809209C**

With cable hole

SCROLL END

Finish	Ø mm	Code
316	42.4	**1806221C**

FLAT TOP END CAP

Finish	Ø mm	Code
316	42.4	**1806214C**

ILLUMIRAIL® POD SYSTEM

WHITE LEDS

LED PODs

SPECIFICATIONS:
- CREE LED
- Spring assembly
- Includes driver
- Required DC supply
- Ø 24mm holes required in tube to fit POD lights
- Single lens POD, supplied with 2 gel crimps

Finish	Colour	To Suit Wall Thickness mm	Code
316	White (2700 - 3000K)	2.0 - 3.2	**1809550**

TRANSFORMER

SPECIFICATIONS:
- 70W
- 230V AC to 12V DC
- CE approved
- IP67, supplied with waterproof connector on the DC output
- PFC - 98%
- Efficiency >88%
- Supplied with one end cap

Description	Code
LED Driver - 12V DC/100W - IP67 Rated	**1809509**

CABLES

Description	Length m	Code
2 pin M-F, over-moulded IP67 cable. 5 amp max. DC extension cable	10m	**180919B**
2 pin M-F, over-moulded IP67 cable. 5 amp max. DC extension cable	20m	**180919D**
2 pin M, over-moulded IP67 cable. 5 amp max. DC to PODs, no outer sheath	10m	**180920**
3 pin sealing cap M. Makes end of run of cables watertight. For signal cables		**180925B**
STP signal cable, bare ends. Connects between PIR enclosures and ColourTouch controller	Per metre	**180927**
STP signal cable, bare ends to M. Connects in-line relays and PWM's to PIR or ColourTouch enclosure	10m	**180927A**
STP signal connection cable M to M. Connects between PWMs and in-line relays	10m	**180927B**
STP signal connection patch cable M to M. Connects between PWMs and in-line relays	300mm	**180927C**
STP signal extension cable M to F. Extends cables	10m	**180927D**

CONTROLS

Description	Code
PIR with enclosure, one or many per installation, wired to work directly from 230V AC supply	**1809PIR**
In-line relay module, one per transformer	**1809IR**

TOOLS

CRIMPING PLIERS
For gel crimps

Code
180959902

STEP DRILL

Drill Size Ø mm	Code
16 - 30	**180959901**

HIGH STRENGTH RETAINER
For use with tube fittings

ml	Code
50	**1899007638**

HIGH STRENGTH RETAINER
For use on assembled posts

ml	Code
10	**189900763810**

PIR ENCLOSURE

The PIR assembly also includes the daylight sensor on the front face of an IP67 ABS enclosure. In the enclosure is an engineer adjustment trim pot, which will be factory set and should not require on site alteration except in areas which are particularly shaded or bright.

A stainless steel enclosure is available. Please enquire.

The motion detection function can be provided by one, or many, PIRs. Requires 12V DC, plug top adaptor provided. Any PIR, once activated, will activate all LEDs and PODs in a system. The switching function is not performed within the PIR enclosure, but by an in-line relay at the transformer location.

A bus connection is made between all PIR enclosures and in-line relays. The bus uses three pin waterproof connectors and the bus cable is shielded as a twisted pair.

ALL PIRs USE 12V DC AND THIS CAN BE SUPPLIED IN TWO WAYS DEPENDING ON THE INSTALLATION:

- The PIR can have a waterproof power supply for connection to the mains within an enclosure. This requires a mains connection outside
- A plug in power supply is supplied as standard, which can be used in an indoor/waterproof location. This can be connected via twin 0.75mm cable to the PIR via a gland entry to the enclosure

PIRs can be added to the ColourTouch controller, to act as subordinate activators.

RGB - COLOURTOUCH INSTALLATIONS

The ColourTouch 4.3” controller allows for the selection of discrete colours or produces patterns of colour changing effects at various user defined rates.

A local DC power supply is required and is supplied to suit a standard UK electrical double back box.

The ColourTouch controller can be sited in any location up to 50m from the installation and requires a 24V DC supply. When sited outdoors, the unit must be contained within a waterproof enclosure.

PIRs can be added to the system in a bus configuration. The PIR provides an on/off and daylight sensor function.

Colour changing is achieved using in-line PWM (Pulse Width Modulation) devices at the transformer location, connected to a bus using the same cable and connectors as the PIR bus.

OTHER PRODUCT RANGES

TILT-LOC™

Spigots have been developed with our revolutionary tilt-lock adjustment technology to suit glass thicknesses from 12 - 25.25mm. Made from Duplex 2205, these spigots are stronger and require less cleaning than Type 316.

JULIET BALCONY KITS

Glass balconies are sought after architectural features in today's homes. Our single and double Juliet balcony kits are fabricated from Ø 48.3mm stainless steel Type 316.

PANELGRIP®

The PanelGrip® System utilises a unique locking mechanism of high-strength aluminium and PVC isolators combined with a specially designed aluminium Shoe Moulding.

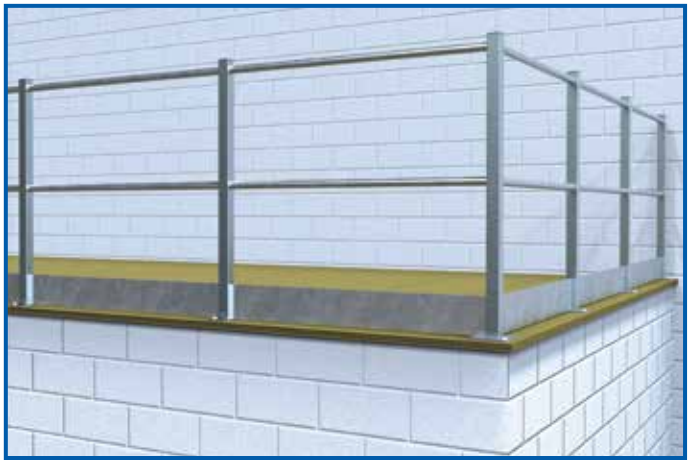
WIRE ROPE

A stainless steel 3mm strand wire rope system is simple and cost effective. It can be fixed to most surfaces including wood, metal and brick and is ideal for external applications in residential and commercial environments.

FLEXIRAIL®

The most flexible handrailing solution for stairs, gradients and around corners. Made with Ø 48.3 x 3.2mm galvanised tube.

MEZZIRAIL®



The system is supplied with BZP square RHS posts, tube and galvanised flat bar kick plate to conform to BS 4592-0:2006+A1:2012 requirements.

OTHER PRODUCT RANGES

PRE-ASSEMBLED POSTS

Satin polish pre-assembled glass clamp posts come in both Ø 42.4 and 48.3mm, Type 304 and 316 stainless steel. End, corner and mid posts cut installation time dramatically to create a stylish glass handrail.

CROSSBAR SYSTEM

Our crossbar system can provide a modern handrail and balustrade for many applications. Providing another practical alternative to a glazed balustrade. Flexible components allow for 7 rails to be fitted as standard.

GLASS STAND-OFF ADAPTORS

Adjustable glass stand-off adaptors suit glass up to 25.52mm. Available in stainless steel Type 316 these adaptors are a great solution for a stylish look and feel.

MINI TOP RAIL

This system has been designed to reduce visual impact on top rail. Available in either round or square, stainless steel Type 316, all products are satin finish. Mini top rail is designed to suit 10 - 12mm glass and requires no welding.

WEDGE-LOC™ - 3KN

A flexible system allowing installation of glass panels from 15 - 25mm thick to achieve up to 3kN/m loadings. Various fixing options result in a system suitable for almost every application you will come across.

GLASS CLAMPS

Quite possibly the largest selection of glass clamps on the market. With options available in mild steel, zamac, stainless steel Type 304 and 316 to suit various glass thicknesses and applications.

OTHER PRODUCT RANGES

POSIGLAZE

Innovative aluminium channel system that holds glass panels in place for use on balustrades and partitions. Posiglaze allows the installer to easily adjust the glass panels once in place. Fast and simple saving both time and money!

TOP RAIL

The latest range of split tube handrail to suit a variety of glass thicknesses. A stylish solution to the top of any glass balustrade.

WOODEN HANDRAIL

A wide range of Ø 45mm softwood and Ø 48.3mm hardwood handrails for internal and external use. With a range of fittings for the smooth transition between wood and stainless steel tube.

WEDGE-LOC™ SLIM CHANNEL

Satin anodised finish channels have pre-drilled fixing holes for quick installation and are available for 12 - 21.5mm glass thicknesses.

STIFFENERS

A slimmer frameless panel support system to suit 10-21.5mm glass. Available in Duplex 2205 (ultra marine stainless) and supplied with rubbers.

HANDRAIL STANDARDS

In a range of three tube sizes Ø 33.7, 42.4 and 48.3mm, mild steel and galvanised. Available in bolt-down, side-fix and concrete-in.

OTHER PRODUCT RANGES

MESH INFILL PANELS

Manufactured in a tough 50 x 50 x 3.0mm mesh with an 8mm frame. The panels are available in a choice of sizes to suit 1.2 and 1.5m post centres in handrailing applications.

INFINITY JULIET BALCONY

Zinc and UV powder coated in a stylish black sand RAL 9005, these balconies are available pre-assembled from stock in three widths; 1314, 1564 and 2077mm.

RSJ POSTS

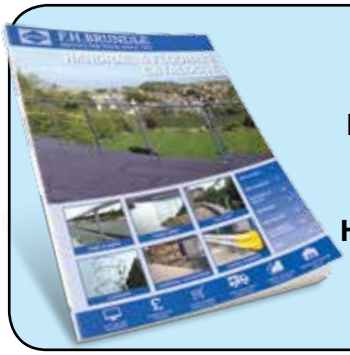
Galvanised RSJ posts are available in Ø 48.3mm two and three rail posts with a bolt-down plate.

TUBE CLAMPS

Manufactured with simplicity and ease of use in mind. No welding, no bending, no threading, just an Allen key to tighten the set screws and create bespoke handrails in a matter of seconds.

ALUMINIUM RAILING

Available in 1200mm high. This is our most cost efficient railing system in the range. Quick and easy to install.



WE STOCK A HUGE RANGE OF GREAT HANDRAIL PRODUCTS, PLEASE ASK FOR A COPY OF THE HANDRAIL & FLOORING CATALOGUE OR VISIT www.fhbrundle.co.uk

WROUGHT IRON COMPONENTS

PRO-RAILING

HANDRAIL & FLOORING

TUBE CLAMPS

GATE AUTOMATION

MESH

MESH FENCING

STEEL

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11/2016

IF YOU WOULD LIKE TO RECEIVE A COPY OF ANY OF OUR CATALOGUES, PLEASE CONTACT ONE OF THE BRANCHES FROM THE LIST BELOW.

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