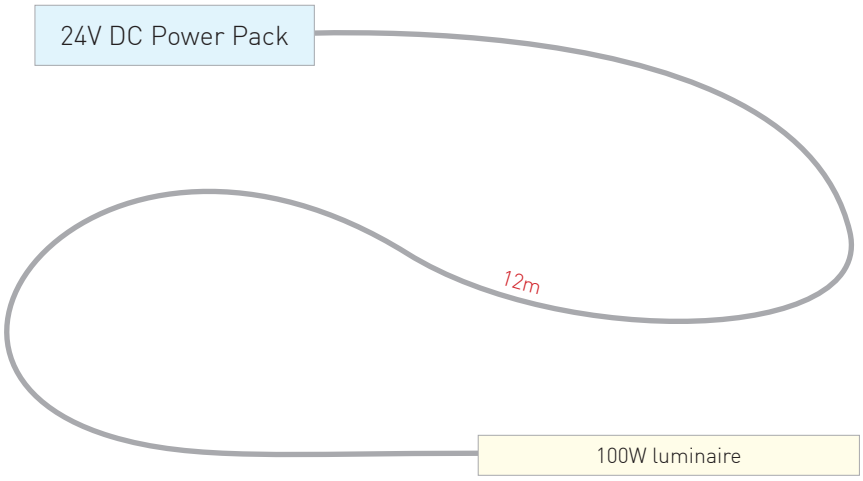
wire size calculation

INSTRUCTION SHEET

To calculate the wire size required for remote mounting of DC Power packs

EXAMPLE 1: Single Luminaire connected to Power Pack



1 Add up total wattage of luminaire
100W luminaire

2 Look up 24V wire size table and find
120W table
(always use closest wattage above)

3 Find appropriate length of cable in 120W table
14m then scroll left

4 Determine appropriate mm² cable
1.5mm²

Watts 24V	metres for 2V D
25	686
25	1098

Watts 24V	metres for 2V D
90	18
90	30
90	44
90	74
90	122
90	190
90	304

Watts 24V	metres for 2V D

mm²	AWG	Watts 24V	metres for 2V D
16mm	5	45	380
25mm	3	45	610

2

120W

mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	120	14
2.5mm	13	120	22
4mm	11	120	34
6mm	9	120	54
10mm	7	120	90
16mm	5	120	142
25mm	3	120	228

12m is less than 14m

3

280W

mm²	AWG	Watts 24V	metres for 2V D

4

WIRE SIZE = 1.5mm²

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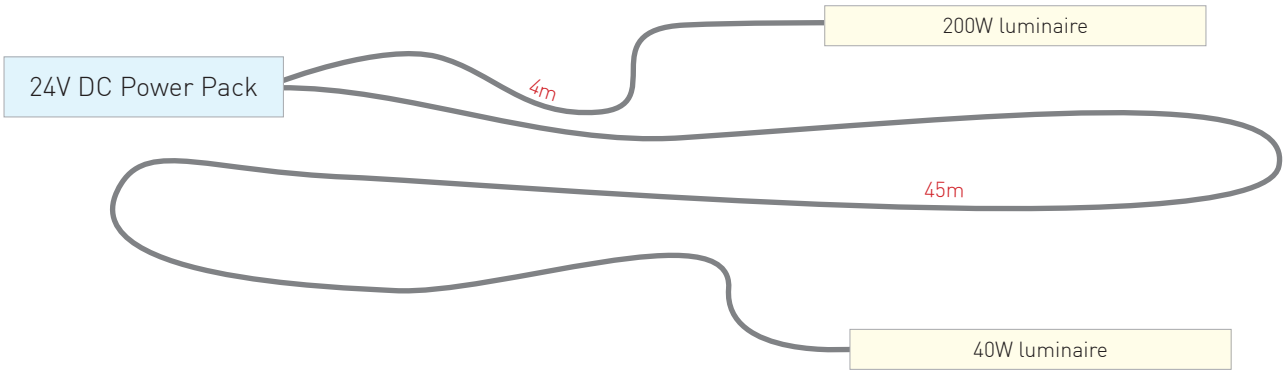
EXAMPLE 2: Multiple Luminaires all directly connected to Power Pack



1 Divide calculations into 2 luminaires
200W luminaire calculation 1
40W luminaire calculation 2

2 Look up 24V wire size table and find
220W table and 45W table
(always use closest wattage above)

3 Find appropriate length of cable in each table = **4m and 45m**

4 Determine appropriate mm² cable
1.5mm² and 2.5mm²

2 **220W**

metres for 2V D	mm²	AWG	Watts 24V	metres for 2V D	mm²
10	1.5mm	15	220	8	1.5mm
16	2.5mm	13	220	12	2.5mm
28	4mm	11	220	20	4mm
42	6mm	9	220	30	6mm
68	10mm	7	220	50	10mm
108	16mm	5	220	78	16mm
172	25mm	3	220	124	25mm

3 4m is less than 8m

2 **45W**

25W Watts 24V	25W metres for 2V D	mm²	AWG	45W Watts 24V	45W metres for 2V D
25	66	1.5mm	15	45	36
25	106	2.5mm	13	45	60
25	174	4mm	11	45	96
25	242	6mm	9	45	146
25	342	10mm	7	45	242
25	686	16mm	5	45	380
25	1098	25mm	3	45	610

3 45m is less than 60m and more than 36m

4 **4**

WIRE SIZE
45m cable = 2.5mm²
4m cable = 1.5mm²

wire size calculation

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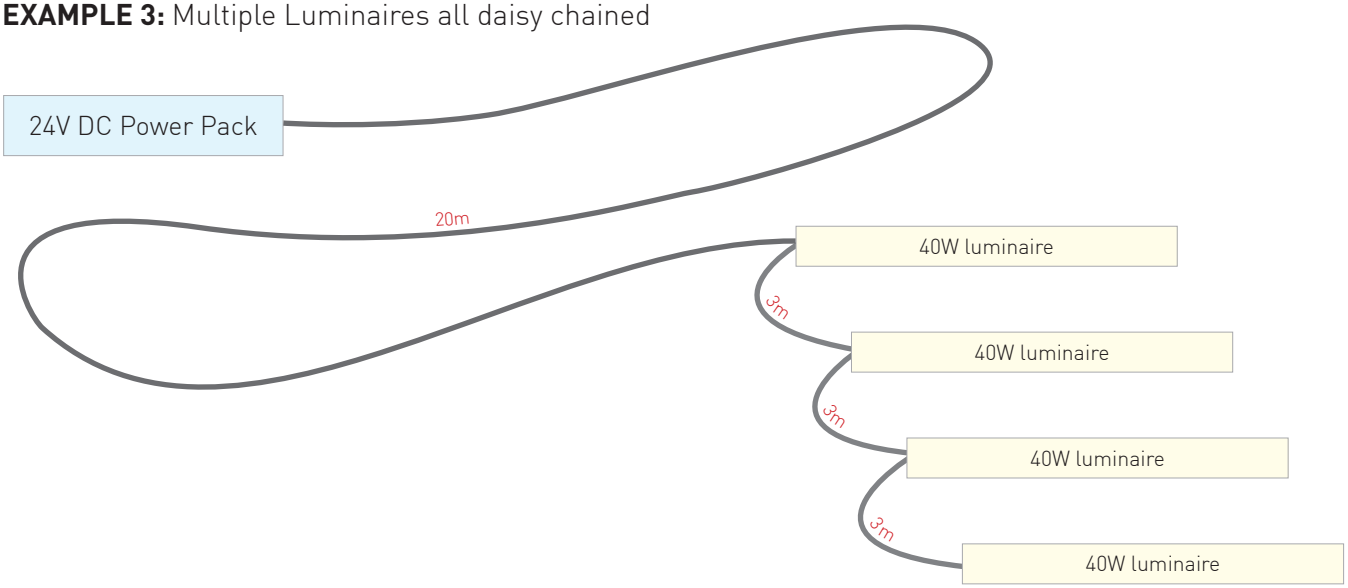
To calculate the wire size required for remote mounting of DC Power packs

EXAMPLE 3: Multiple Luminaires all daisy chained



1 Add up total wattage of luminaires
40 + 40 + 40 + 40
160W luminaire

2 Look up 24V wire size table and find
160W table

3 Add up length of cable 20m + 3m + 3m + 3m **= 29m**
Find appropriate length of cable in 160W table
34m then scroll left

4 Determine appropriate mm² cable
6mm²

mm²	AWG	Watts 24V	metres for 2V D
10mm	7	60	182
16mm	5	60	286
25mm	3	60	458

2 **160W**

mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	160	10
2.5mm	13	160	16
4mm	11	160	28
6mm	9	160	42
10mm	7	160	68
16mm	5	160	108
25mm	3	160	172

3

29m is less than 42m and more than 28m

mm²	AWG	Watt 24V
10mm	7	90
16mm	5	90
25mm	3	90

220W

mm²	AWG	Watt 24V
1.5mm	15	220
2.5mm	13	220
4mm	11	220
6mm	9	220
10mm	7	220
16mm	5	220
25mm	3	220

4

600W

Watts	metres

960W

Watt

WIRE SIZE = 6mm²

wire size calculation

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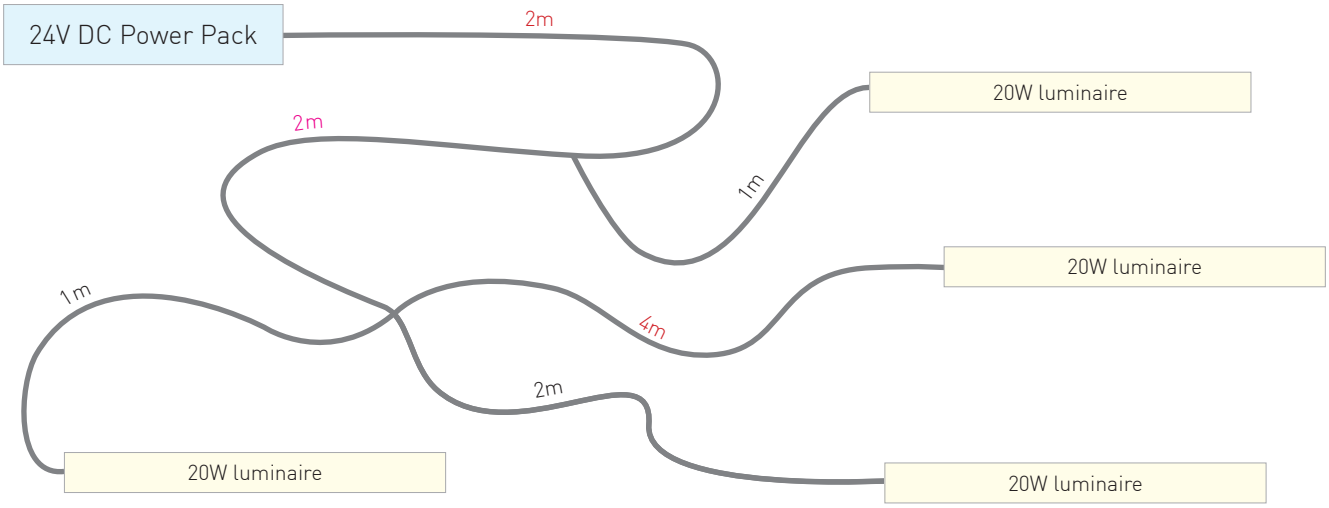
To calculate the wire size required for remote mounting of DC Power packs

EXAMPLE 4: Multiple Luminaires with multiple branches



1 Add up total wattage of luminaires
20W + 20W + 20W + 20W
= **80W luminaire calculation**

2 Look up 24V wire size table and find
90W table

3 Find longest run of cable 2m + 2m+ 4m **= 8m**
then appropriate length of cable in 90W table
18m then scroll left

4 Determine appropriate mm² cable
1.5mm²

Watts 24V	metres for 2V D	mm²	AWG	Watts 24V	metres for 2V D
15	1142	16mm	5	25	686
15	1828	25mm	3	25	1098

2

90W

Watts 24V	metres for 2V D	mm²	AWG	Watts 24V	metres for 2V D
60	28	1.5mm	15	90	18
60	44	2.5mm	13	90	28
60	72	4mm	11	90	44
60	110	6mm	9	90	74
60	182	10mm	7	90	122
60	286	16mm	5	90	190
60	458	25mm	3	90	304

3

8m is less than 18m

220W

Watts 24V	metres for 2V D	mm²	AWG	Watts 24V	metres for 2V D
160	10	1.5mm	15	220	8

4

WIRE SIZE = 1.5mm²
will be appropriate with a high safety margin

24V WIRE SIZE TABLE

15W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	15	110
2.5mm	13	15	188
4mm	11	15	290
6mm	9	15	438
10mm	7	15	728
16mm	5	15	1142
25mm	3	15	1828

25W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	25	66
2.5mm	13	25	106
4mm	11	25	174
6mm	9	25	262
10mm	7	25	438
16mm	5	25	686
25mm	3	25	1098

45W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	45	36
2.5mm	13	45	60
4mm	11	45	96
6mm	9	45	146
10mm	7	45	242
16mm	5	45	380
25mm	3	45	610

60W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	60	28
2.5mm	13	60	44
4mm	11	60	72
6mm	9	60	110
10mm	7	60	182
16mm	5	60	286
25mm	3	60	458

90W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	90	18
2.5mm	13	90	30
4mm	11	90	44
6mm	9	90	74
10mm	7	90	122
16mm	5	90	190
25mm	3	90	304

120W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	120	14
2.5mm	13	120	22
4mm	11	120	36
6mm	9	120	54
10mm	7	120	90
16mm	5	120	142
25mm	3	120	228

160W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	160	10
2.5mm	13	160	16
4mm	11	160	28
6mm	9	160	42
10mm	7	160	68
16mm	5	160	108
25mm	3	160	172

220W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	220	8
2.5mm	13	220	12
4mm	11	220	20
6mm	9	220	30
10mm	7	220	50
16mm	5	220	78
25mm	3	220	124

280W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15	280	6
2.5mm	13	280	10
4mm	11	280	16
6mm	9	280	24
10mm	7	280	38
16mm	5	280	62
25mm	3	280	98

600W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15		
2.5mm	13		
4mm	11	600	8
6mm	9	600	10
10mm	7	600	18
16mm	5	600	28
25mm	3	600	46

960W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15		
2.5mm	13		
4mm	11		
6mm	9		
10mm	7	960	12
16mm	5	960	18
25mm	3	960	28

1200W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15		
2.5mm	13		
4mm	11		
6mm	9		
10mm	7		
16mm	5	1200	14
25mm	3	1200	22

1440W			
mm²	AWG	Watts 24V	metres for 2V D
1.5mm	15		
2.5mm	13		
4mm	11		
6mm	9		
10mm	7		
16mm	5	1440	12
25mm	3	1440	20

Disclaimer: This advice is published as a guide only. Correct installation and operation of the lighting system is the sole responsibility of the installer.