

**I.S. POWER SUPPLY**

Uo	12.5V
Io	2.5A
Po	-
Co	20.2 uF
Lo	50.5 uH
L/R	-

IS Supply Cable Parameters

Cable Length	20 m	
Unit	m	
Totals		
Cc	0.425 pF	8.5 nF
Lc	0.67 uH	13.4 uH
Lc/Rc	-	

Cable Type SKK

Manufacturer	Westrac
Core CSA	-
Insulation Thickness	-
Insulation Rating	-
H.V. Test on Cable	-

Area Location	Zone 1
I.S. Apparatus	Power Supply
Manufacturer	Burn Brite
Type	ISPS110
Category	Ex e m [ib] Group I
Certification	IECEX TSA 07.0012X

Area Location	Zone 0 or 1
I.S. Apparatus	Managed Ethernet Switch
Manufacturer	MTL
Type	9466-ETA
Category	Ex ia Group I
Certification	IEC Ex TRA 17.0005X

**IS POWER SUPPLY**

OUTPUT PARAMETER CHECK - SYSTEM

Co > Cc + Ci	20.2 uF > 0.0367672 uF + 1.965 uF (2.001 uF)	✓
Lo > Lc + Li	50.5 uH > 13.444962 uH + 0 uH (13.445 uH)	✓
L/R >= Lc/Rc		

Maximum SKK Power Supply Cable - Worst Case  
67 Metres (if all Ethernet Cables were Unplugged)  
based on total inductance of system

**9466-ETA  
ETHERNET SWITCH  
PoEx, 5Ports**

Terminals: T1 - T4

Ui	15.4V	✓
Ii		
Pi		
Li	0 uH	
L/R		

PoEx OUTPUT A from IS Supply

Uo	12.5V	
Io	2.5A	
Po		
Co	P/Supply	
Lo	P/Supply	
Lo/Ro	P/Supply	
Ui	15.4V	✓
Ci	0.075uF	
Li	0 uH	

PoEx OUTPUT B from IS Supply

Uo	12.5V	
Io	2.5A	
Po		
Co	P/Supply	
Lo	P/Supply	
Lo/Ro	P/Supply	
Ui	15.4V	✓
Ci	0.075uF	
Li	0 uH	

PoEx OUTPUT C from IS Supply

Uo	12.5V	
Io	2.5A	
Po		
Co	P/Supply	
Lo	P/Supply	
Lo/Ro	P/Supply	
Ui	15.4V	✓
Ci	0.075uF	
Li	0 uH	

PoEx OUTPUT D from IS Supply

Uo	12.5V	
Io	2.5A	
Po		
Co	P/Supply	
Lo	P/Supply	
Lo/Ro	P/Supply	
Ui	15.4V	✓
Ci	0.075uF	
Li	0 uH	

PoEx OUTPUT E from IS Supply

Uo	12.5V	
Io	2.5A	
Po		
Co	P/Supply	
Lo	P/Supply	
Lo/Ro	P/Supply	
Ui	15.4V	✓
Ci	0.075uF	
Li	0 uH	

PoEx Ethernet Port CAT 7 Cable - 30m

IS PoE Cable Parameters

Cable Length	30m	
Unit	m	
Totals		
Cc	312 pF	9.36 nF
Lc	0.1145 uH	3.435 uH
Lc/Rc	4.58uH/Ω	

X5 LAN

Ui	12.8V	✓
Uo	5.88V	
Io	2.18A	
Ci	0.48uF	
Li	0mH	
Load Limits		
C	1000uF	
L	97.9mH	
L/R	145uH/Ω	

**9459-ETPLUST-SS  
ETHERNET  
CAMERA**

Area Location	Zone 0 or 1
I.S. Apparatus	Network Camera Unit
Manufacturer	MTL
Type	RugiCAM-IP
Category	Ex ia Group I
Certification	IEC Ex TRA 17.0001X

PoEx Ethernet Port CAT 7 Cable - 30m

IS PoE Cable Parameters

Cable Length	30m	
Unit	m	
Totals		
Cc	312 pF	9.63 nF
Lc	0.1145 uH	3.435 uH
Lc/Rc	4.58uH/Ω	

X5 LAN

Ui	12.8V	✓
Uo	5.88V	
Io	2.18A	
Ci	0.48uF	
Li	0mH	
Load Limits		
C	1000uF	
L	97.9mH	
L/R	145uH/Ω	

**9459-ETPLUS-SS  
ETHERNET  
CAMERA**

Area Location	Zone 0 or 1
I.S. Apparatus	Network Camera Unit
Manufacturer	MTL
Type	RugiCAM-IP
Category	Ex ia Group I
Certification	IEC Ex TRA 17.0001X

PoEx Ethernet Port CAT 7 Cable - 30m

IS PoE Cable Parameters

Cable Length	30m	
Unit	m	
Totals		
Cc	312 pF	9.36 nF
Lc	0.1145 uH	3.435 uH
Lc/Rc	4.58uH/Ω	

X5 LAN

Ui	12.8V	✓
Uo	5.88V	
Io	2.18A	
Ci	0.48uF	
Li	0mH	
Load Limits		
C	1000uF	
L	97.9mH	
L/R	145uH/Ω	

**9459-ETPLUS-SS  
ETHERNET  
CAMERA**

Area Location	Zone 0 or 1
I.S. Apparatus	Network Camera Unit
Manufacturer	MTL
Type	RugiCAM-IP
Category	Ex ia Group I
Certification	IEC Ex TRA 17.0001X

PoEx Ethernet Port CAT 7 Cable - 0.3m

IS PoE Cable Parameters

Cable Length	0.3m	
Unit	m	
Totals		
Cc	312 pF	93.6 pF
Lc	0.1145 uH	0.03435 uH
Lc/Rc	4.58uH/Ω	

LAN PORT

Ui	15.4V	✓
Ci	0.075uF	
Li	0uH	
Uo	0V	
Io	0A	
Po	0W	
L/R		

Po 5mW

**9465-ETA-S-SC  
MEDIA CONVERTER  
PoE CONNECTION**

Area Location	Zone 0 or 1
I.S. Apparatus	Ethernet Media Converter
Manufacturer	MTL
Type	9465-ETA-S-SC
Category	Ex ia op is Group I
Certification	IEC Ex TRA 17.0005X

5 Ethernet Cables in Parallel  
Cc = 28.2672 nF

5 Ethernet Cables in Parallel  
Lc = 0.044962242 uH

PoEx Ethernet Port CAT 7 Cable - 0.3m

IS PoE Cable Parameters

Cable Length	0.3m	
Unit	m	
Totals		
Cc	312 pF	93.6 pF
Lc	0.1145 uH	0.03435 uH
Lc/Rc	4.58uH/Ω	

LAN PORT

Ui	15.4V	✓
Ci	0.075uF	
Li	0uH	
Uo	0V	
Io	0A	
Po	0W	
L/R		

Po 5mW

**9465-ET-S-SC  
MEDIA CONVERTER  
PoE CONNECTION**

Area Location	Zone 0 or 1
I.S. Apparatus	Ethernet Media Converter
Manufacturer	MTL
Type	9465-ETA-S-SC
Category	Ex ia op is Group I
Certification	IEC Ex TRA 17.0005X

**Notes:**

- Capacitances are added in an I.S. Entity Concept System and Inductances in parallel are divided. For this audit, we have compiled total system inductance which is lowered by the amount of cables in parallel along with a worst case scenario where the longest length of cable has been taken into account for the highest system inductance. This is because there maybe times where the paralleled Ethernet cables are unplugged.
- Due to the nature of the paralleling of the Ethernet Cables, the length of Ethernet Cables is unlikely to cause a non compliance with I.S. Power Supply Parameters.
- The estimated worst case cable length scenario has been listed above which would require all Ethernet Cables to be unplugged with just the power supply cable left connected.
- Components 9466-ETA & 9465-ETA-S-SC are required to be housed in an enclosure IP54 or greater as well as complying to IEC 60079.0:2011 Clauses 7 & 8.  
Note: Clause 7 is only applicable to Non-Metallic Enclosures & Clause 8 refers to Metallic Enclosure and lists the aluminum, magnesium, etc content of the metal.
- The Burn Brite I.S. Power Supply is only certified as ib for the Intrinsically Safe supply output and therefore can only supply equipment located in a Zone 1, Zone 2 or Non Hazardous environment.

REVISIONS				REVISIONS			
NO	BY	DATE	DESCRIPTION	NO	BY	DATE	DESCRIPTION
0	DJK	07.05.19	For Review of System Installation				

- PRELIMINARY - NOT FOR CONSTRUCTION
- FOR REVIEW
- FOR CONSTRUCTION
- AS BUILT

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**automatedcontrol**

TITLE	I.S. AUDIT DIAGRAM MTL PoE CAMERAS
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SCALE	N.T.S	07.05.2019	PROJECT	LONGWALL CAMERAS
DRAWN	DJK		CUSTOMER	METROPOLITAN COLLIERY
CHECKED	PP		DRAWING NO.	A2 18109-IS-001_0
DESIGNED	Auto Control		SHEET	01 / 01
APPROVED			REV	0
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