

HAZARDOUS (CLASSIFIED) LOCATION  
 Class I, Division 2, Groups C, D  
 Class I, Zone 2, Groups IIB, IIA

HAZARDOUS (CLASSIFIED) LOCATION  
 Class I, Division 1, Groups C, D  
 Class I, Zones 0 or 1, Groups IIB, IIA

**Safe Area Apparatus.**  
 Unspecified except that it must not be supplied from, nor contain, under normal or abnormal conditions, a source of potential with respect to earth in excess of 253V r.m.s. or 253V d.c.

**9491-PS 12VDC IS Power Supply Module**

**Hazardous Location Apparatus**

Entity parameters:

Terminals 13 and 14 or 8 pin connector		
Rated input voltage	30V d.c.	
$U_m$	253V	
Terminals 1 and 3 - 'ia' output (linear characteristic, resistive current limit, source)		
$U_o$ or $V_{oc}$	12.4V	
$I_o$ or $I_{oc}$	2.67A	
$P_o$	8.27W	
$C_o$ or $C_a$	Group IIB Class I, Group C	7.9 $\mu$ F
	Group IIA Class I, Group D	30 $\mu$ F
$L_a/R_a$ or $L_o/R_o$	Group IIB Class I, Group C	17.2 $\mu$ H/ $\Omega$
	Group IIA Class I, Group D	34.4 $\mu$ H/ $\Omega$
Terminals 5 and 6 - 'ib' output (non-linear, active current 'switch-off', source)		
$U_o$ or $V_{oc}$	12.4V	
$I_o$ or $I_{oc}$	505mA	
$P_o$	6.3W	
$C_o$ or $C_a$	500nF	
$L_o$ or $L_a$	100 $\mu$ H	

General notes:


- No revision to drawing without prior FM Approval.
- The supply output at terminals 5 and 6 of power supply is non-linear (active current 'switch-off').
- WARNING: Substitution of components may impair Intrinsic Safety.
- WARNING: To prevent ignition of flammable atmospheres, disconnect power before servicing.
- WARNING: Substitution of components may impair suitability for Division 2
- The maximum current drawn from Terminals 1, 3, 5 and 6 combined shall not exceed 480mA in normal operation.
- When optionally connecting the power supply module to an external backplane via connector X1 the following conditions apply:
  - The external backplane shall be fitted with two retention clips type MTL 012-533 (Honeywell part no. 51153961-100) that allow the power supply module to be 'clipped' to the backplane.
  - The power supply module being 'clipped' to the backplane forms part of the hazardous location protection and as such the retention clips shall always be in place when the power supply module is energised.
- Any backplane used does not form part of this equipment Approval and as such shall be separately assessed or Approved for use in Zone 2/Division 2.
- The 9491-PS 12VDC IS Power Supply Module has been assessed under the "Entity Concept". This requires:
  - $V_{max}$  or  $U_i$  (Hazardous Location Apparatus)  $\geq U_o$  (Power Supply)
  - $I_{max}$  or  $I_i$  (Hazardous Location Apparatus)  $\geq I_o$  (Power Supply)
  - $P_{max}$  or  $P_i$  (Hazardous Location Apparatus)  $\geq P_o$  (Power Supply)
  - $C_i$  (Hazardous Location Apparatus) + C (Cable)  $\leq C_a$  or  $C_o$  (Power Supply)
  - With respect to Power Supply Terminals 1 and 3:  
 $L/R$  (Cable)  $\leq L_a/R_a$  or  $L_o/R_o$  (Power Supply Terminals 1 and 3) and  $L_i$  (Hazardous Location Apparatus) = 0
  - With respect to Power Supply Terminals 5 and 6:  
 $L_i$  (Hazardous Location Apparatus) + L (Cable)  $\leq L_a$  or  $L_o$  (Power Supply Terminals 5 and 6)

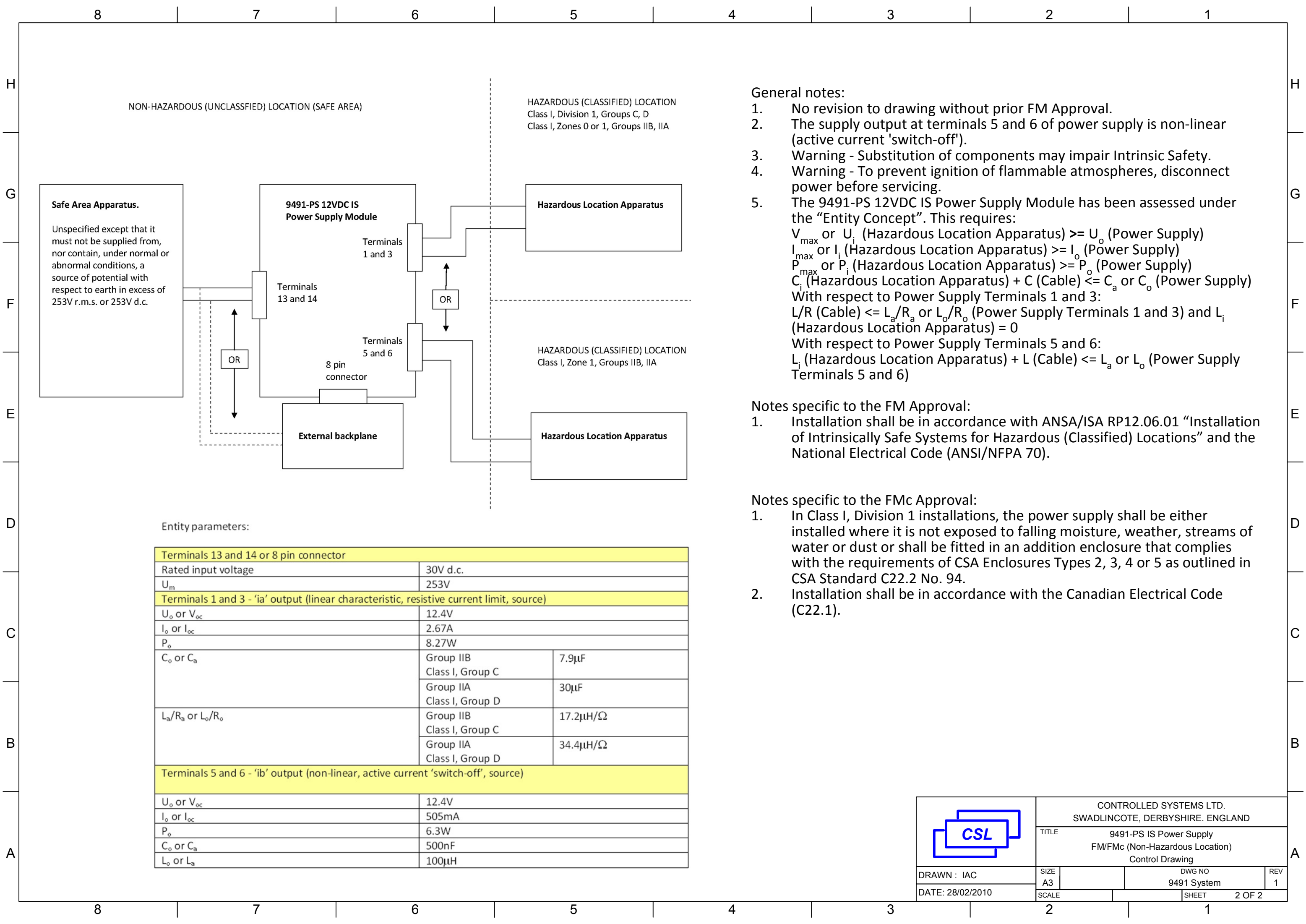
Notes specific to the FM Approval:

- Installation shall be in accordance with ANSA/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
- In Class I, Division 2 installations, the power supply shall be mounted within a tool-secured enclosure which is capable of accepting one or more of the Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70). This additional enclosure shall be capable of meeting the performance requirements of clause 5.0 of FM Class Number 3600 - November 1998.
- In Class I, Zone 2 installations, the power supply shall be mounted within a tool-secured enclosure which is capable of accepting one or more of the Class I, Zone 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70). This additional enclosure shall provide a minimum ingress protection rating of IP54 unless the apparatus is intended to be afforded an equivalent degree of protection by location. Any cable and conduit entries into this additional enclosure shall be in accordance with clause 7.1.3 and clause 7.1.4 of ANSI/ISA-12.12.02-2003 (IEC 60079-15-1987).

Notes specific to the FMc Approval:

- Installation shall be in accordance with the Canadian Electrical Code (C22.1).
- In Class I, Division 2 installations, the power supply shall be mounted within a tool-secured enclosure which is capable of accepting one or more of the Class I, Division 2 wiring methods specified in the Canadian Electrical Code (C22.1).
- In Class I, Zone 2 installations, the power supply shall be mounted within a tool-secured enclosure which is capable of accepting one or more of the Class I, Zone 2 wiring methods specified in the Canadian Electrical Code (C22.1). This additional enclosure shall provide a minimum ingress protection rating of IP54 unless the power supply is intended to be afforded an equivalent degree of protection by location.

		CONTROLLED SYSTEMS LTD. SWADLINCOTE, DERBYSHIRE, ENGLAND	
		TITLE 9491-PS IS Power Supply FM/FMc (Hazardous Location) Control Drawing	
DRAWN : IAC	SIZE A3	DWG NO 9491 System	REV 1
DATE: 28/02/2010	SCALE	SHEET	1 OF 2



NON-HAZARDOUS (UNCLASSIFIED) LOCATION (SAFE AREA)

HAZARDOUS (CLASSIFIED) LOCATION  
Class I, Division 1, Groups C, D  
Class I, Zones 0 or 1, Groups IIB, IIA

**Safe Area Apparatus.**  
Unspecified except that it must not be supplied from, nor contain, under normal or abnormal conditions, a source of potential with respect to earth in excess of 253V r.m.s. or 253V d.c.

**9491-PS 12VDC IS Power Supply Module**  
Terminals 1 and 3  
Terminals 13 and 14  
Terminals 5 and 6  
8 pin connector

**Hazardous Location Apparatus**

**External backplane**

**Hazardous Location Apparatus**

Entity parameters:

Terminals 13 and 14 or 8 pin connector		
Rated input voltage	30V d.c.	
$U_m$	253V	
Terminals 1 and 3 - 'ia' output (linear characteristic, resistive current limit, source)		
$U_o$ or $V_{oc}$	12.4V	
$I_o$ or $I_{oc}$	2.67A	
$P_o$	8.27W	
$C_o$ or $C_a$	Group IIB Class I, Group C	7.9 $\mu$ F
	Group IIA Class I, Group D	30 $\mu$ F
$L_a/R_a$ or $L_o/R_o$	Group IIB Class I, Group C	17.2 $\mu$ H/ $\Omega$
	Group IIA Class I, Group D	34.4 $\mu$ H/ $\Omega$
Terminals 5 and 6 - 'ib' output (non-linear, active current 'switch-off', source)		
$U_o$ or $V_{oc}$	12.4V	
$I_o$ or $I_{oc}$	505mA	
$P_o$	6.3W	
$C_o$ or $C_a$	500nF	
$L_o$ or $L_a$	100 $\mu$ H	

**General notes:**

- No revision to drawing without prior FM Approval.
- The supply output at terminals 5 and 6 of power supply is non-linear (active current 'switch-off').
- Warning - Substitution of components may impair Intrinsic Safety.
- Warning - To prevent ignition of flammable atmospheres, disconnect power before servicing.
- The 9491-PS 12VDC IS Power Supply Module has been assessed under the "Entity Concept". This requires:  
 $V_{max}$  or  $U_i$  (Hazardous Location Apparatus)  $\geq U_o$  (Power Supply)  
 $I_{max}$  or  $I_i$  (Hazardous Location Apparatus)  $\geq I_o$  (Power Supply)  
 $P_{max}$  or  $P_i$  (Hazardous Location Apparatus)  $\geq P_o$  (Power Supply)  
 $C_i$  (Hazardous Location Apparatus) + C (Cable)  $\leq C_a$  or  $C_o$  (Power Supply)  
With respect to Power Supply Terminals 1 and 3:  
 $L/R$  (Cable)  $\leq L_a/R_a$  or  $L_o/R_o$  (Power Supply Terminals 1 and 3) and  $L_i$  (Hazardous Location Apparatus) = 0  
With respect to Power Supply Terminals 5 and 6:  
 $L_i$  (Hazardous Location Apparatus) + L (Cable)  $\leq L_a$  or  $L_o$  (Power Supply Terminals 5 and 6)

**Notes specific to the FM Approval:**

- Installation shall be in accordance with ANSA/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).

**Notes specific to the FMc Approval:**

- In Class I, Division 1 installations, the power supply shall be either installed where it is not exposed to falling moisture, weather, streams of water or dust or shall be fitted in an addition enclosure that complies with the requirements of CSA Enclosures Types 2, 3, 4 or 5 as outlined in CSA Standard C22.2 No. 94.
- Installation shall be in accordance with the Canadian Electrical Code (C22.1).

	CONTROLLED SYSTEMS LTD. SWADLINCOTE, DERBYSHIRE. ENGLAND		
	TITLE 9491-PS IS Power Supply FM/FMc (Non-Hazardous Location) Control Drawing		
DRAWN : IAC	SIZE A3	DWG NO 9491 System	REV 1
DATE: 28/02/2010	SCALE	SHEET	2 OF 2