FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: **781 762 4300** F: 781 762 9375 www.fmglobal.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

9004/ab-c-d-e, Safety Barrier.
NI /I /2 /ABCD; T4, Ta = 60°C
NI /I /2 /IIC; T4, Ta = 60°C
AIS /I,II,III /1 /ABCDEFG; — 90 046 11 31 1; Entity;
I /1 /AEx [ib] /IIC— 90 046 11 31 1; Entity;
a = 0 (Normal) or 5 (additional voltage limitation), or 6 (additional diode return).
b = Polarity 0 (Negative) or 1 (Positive).
c = Max voltage at I.S. output in V/10: Any Voc value from table below.
d = Max current in I.S. circuit in mA: Any Isc value from table below.
e = Variations which do not affect intrinsic safety.

Special Conditions of Use:

1 *Shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application including access only by the use of a tool.*
2 *The output of this device is Non Linear*

Max Entity Parameters					
Type	*Voc*	*Isc*	*Po*	*Ca*	*La*
	(V)	*(mA)*	*(mW)*	*(µF)*	*(mH)*
9004/0b-086-030-001	8.6	30	258	0.6	2.0
9004/0b-086-050-001	8.6	50	430	0.5	2.0
9004/0b-086-100-001	8.6	100	860	0.3	1.0
9004/0b-086-150-001	8.6	150	1290	0.3	0.5
9004/0b-168-030-001	16.8	30	504	0.12	2.0
9004/0b-168-050-001	16.8	50	840	0.09	2.0
9004/0b-200-030-001	20.0	30	600	0.07	2.0
9004/0b-200-050-001	20.0	50	1000	0.07	0.41
9004/0b-263-025-001	26.3	25	657.5	0.029	2.0
9004/0b-263-030-001	26.3	30	789	0.023	0.65
9004/0b-280-025-001	28.0	25	700	0.019	0.9
9004/5b-206-030-001	20.6	30	618	0.065	2.0
9004/5b-206-050-001	20.6	50	1030	0.06	0.3
9004/5b-220-030-001	22.00	30	770	0.05	2
9004/61-220-035-001	22.0	35	770	0.05	0.5
9004/61-232-028-041	23.2	28	650	0.04	1

9004/ab-c-d-e, Safety Barrier.
NI /I /2 /ABCD; T4, Ta = 60°C
NI /I /2 /IIC; T4, Ta = 60°C
AIS /I,II,III /1 /CDEFG; — 90 046 11 31 1; Entity;
I /1 /AEx [ib] /IIB — 90 046 11 31 1; Entity;
a = Style: 0, 5
b = Polarity: 0 or 1
c = Max voltage at I.S. output in V/10.: Any Voc value from table below
d = Max current in I.S. circuit in mA: Any Isc value from table below
e = Variations which do not affect intrinsic safety.

Special Conditions of Use:

1. *Shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application including access only by the use of a tool.*
2. *The output of this device is Non Linear*

Max Entity Parameters					
Type	*Voc*	*Isc*	*Po*	*Ca*	*La*
	(V)	*(mA)*	*(mW)*	*(µF)*	*(mH)*
9004/0*-168-100-001	16.8	100	1680	0.3	2.5
9004/0*-172-140-001	17.2	140	2408	0.39	0.6
9004/0*-200-095-001	20.0	95	1900	0.31	0.77
9004/0*-263-050-001	26.3	50	1315	0.16	2.5
9004/0*-280-045-001	28.0	45	1260	0.133	2.5
9004/0*-315-022-001	31.5	22	693	0.1	5
9004/0*-315-025-001	31.5	25	787.5	0.1	5
9004/5*-206-085-001	20.6	85	1751	0.25	0.5

An FM Global Enterpris

Equipment Ratings:

Nonincendive for Class I, Division 2, Groups A, B, C, D, and Class I, Zone 2 Groups IIC with intrinsically safe outputs for connections to Class I, II, III, Division 1, Groups A, B, C, D, E, F, G and Class I, Zone 1, Group IIC Hazardous (Classified) Locations when installed per manufacture's control drawing 90 046 11 31 1.

Nonincendive for Class I, Division 2, Groups A, B, C, D, and Class I, Zone 2 Groups IIC with intrinsically safe outputs for connections to Class I, II, III, Division 1, Groups C, D, E, F, G and Class I, Zone 1, Group IIB Hazardous (Classified) Locations when installed per manufacture's control drawing 90 046 11 31 1.

Approved for:

R. STAHL Schaltgeraete GmbH
Am Bahnhof 30
D-74638 Waldenburg (Wurtt.) Germany

This certifies that the equipment described has been found to comply with the following FM Approval Standards and other documents:

Class 3600	1998
Class 3610	1999
Class 3611	1999
Class 3810	1989
Including Suppliment #1	1995

Original Project ID: 3T9A3.AX FM Approval Granted: September 4, 1992

Subsequent Revision Reports / Date FM Approval Amended

Report Number	Date	Report Number	Date
3017163	November 25, 2003		

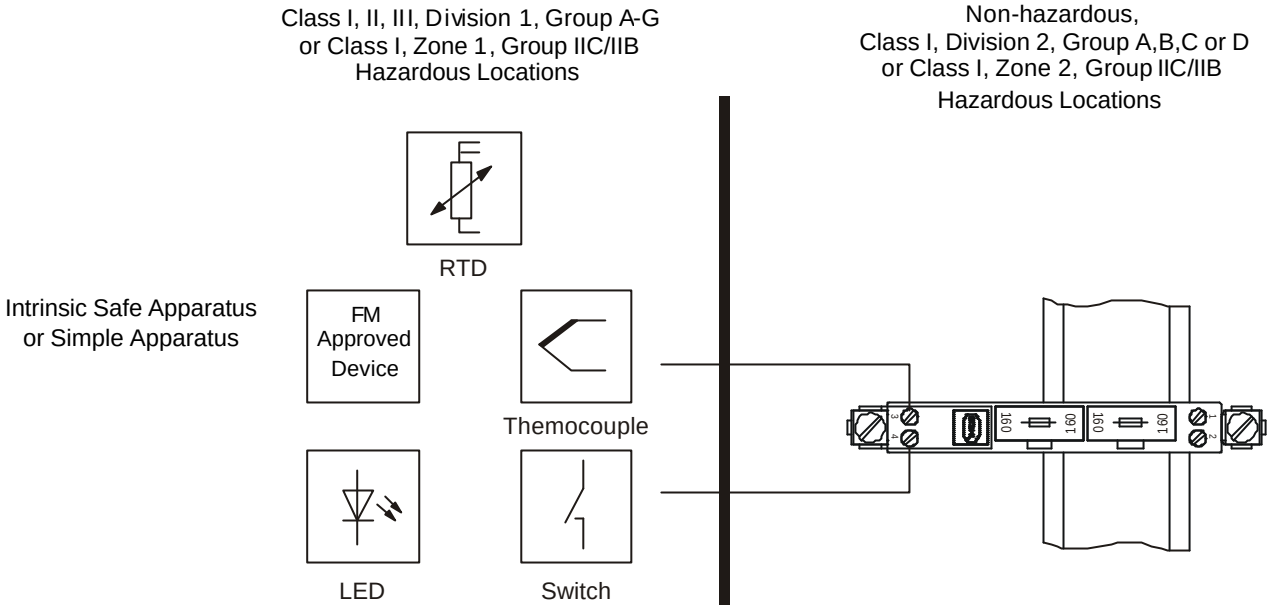
FM Global Technologies LLC

David W. Styrcula
Technical Team Manager

12/9/03
Date

An FM Global Enterpris

The copying, distribution and utilization of this document as well as the communication of its contents to others without expressed authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or ornamental design registration.



The Intrinsic Safety Barriers are associated apparatus located in a non-hazardous or Div. 2 or Zone 2 locations and provide intrinsically safe connections for device(s) located in Class I, Div. 1, Group A, B, C, D; Class II, Div. 1, Group E, F, G; Class III, Div. 1; or Class I, Zone 1, Group IIC/IIB Hazardous (Classified) Locations.

Notes:

1. The Intrinsic Safety Entity concept allows the interconnection of two FM Approved Intrinsically safe devices, with entity parameters, not specifically examined in combination as a system when:
   U_o or V_{oc} or $V_t \leq V_{max}$ I_o or I_{sc} or $It \leq I_{max}$,
   C_a or $C_o \geq C_i + C_{cable}$ L_a or $L_o \geq L_i + L_{cable}$ $P_o \leq P_i$
2. Dust-tight conduit seals must be used when installed in Class II and Class III environments.
3. Control equipment connected to the 9004 series must not use or generate more than 250 Vrms or Vdc.
4. Installation should be in accordance with ANSI/ISA RP12.06.01"Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
5. For Division 1 and Zone 1 connections, the configuration of Field Device must be FM Approved under Entity Concept for the associated location.
6. The Field Device manufacturer's installation drawing must be followed when installing this equipment.
7. The 9004 series are FM Approved for Class I, Zone 1, applications. If connecting AEx [ia] Associated Apparatus or AEx ia Field Device to the 9004 series, the I.S. circuit is only suitable for Class I, Zone 1, and is not suitable for Class I, Zone 0, Hazardous (Classified) Locations.
8. Simple Apparatus is defined as a device that does not generate more than 1.5 V, 0.1 A or 25 mW.
9. No revision to drawing without prior Approval by FM Approvals.
10. The barriers that do not contain a C_o and L_o value for Groups A, B, E, or IIC are subject to the following special investigation: If the barrier is installed within a Class I, Division 2 Group A or B or Class I, Zone 2, Group IIC location, the all wiring within the Class I, Division 2, Group A or B or Class I, Zone 2, Group IIC locations shall be installed using Division 2 wiring methods, for Division 2 installations, or Zone 2 wiring methods, for Zone 2 installations.
11. The maximum operating temperature for the barrier is 60°C

Weitergabe sowie Vervielfältigung dieses Dokuments, Verwertung und Mitteilung seines Inhalts sind verboten, soweit nicht ausdrücklich gestattet. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patent-, Gebrauchsmuster- oder Geschmacksmustereintragung vorbehalten.

			Certification drawing				
			2003	Date	Name	Title	Scale
			Drawn	25.11.	T. Stahl	INTRINSPAK Series 9004/..-…-…-..1 Intrinsic Safety Barriers	none
			Appr.		Kaiser		Sheet 1 of 2
					STAHL	Drawing No. 90 046 11 31 1	Agency FM
Index	Date	Drawn				Replaces:	Replaced by: A4

F 4830 510

Type	V_{OC}	I_{SC}	P_{max}	Grp. A, B, E		Grp. C, D, F, G	
	U_O	I_O	P_O	Grp. IIC		Grp. IIB	
	[V]	[mA]	[mW]	C_a (C_o) [µF]	L_a (L_o) [mH]	C_a (C_o) [µF]	L_a (L_o) [mH
9004/0a-086-030-001	8.6	30	258	0.6	2	2	5
9004/0a-086-050-001	8.6	50	430	0.5	2	2	5
9004/0a-086-100-001	8.6	100	860	0.3	1	1.6	2.5
9004/0a-086-150-001	8.6	150	1290	0.3	0.5	0.9	2.5
9004/0a-168-030-001	16.8	30	504	0.12	2	0.65	2.5
9004/0a-168-050-001	16.8	50	840	0.09	2	0.3	5
9004/0a-168-100-001	16.8	100	1680	-	-	0.3	2.5
9004/0a-172-140-001	17.2	140	2408	-	-	0.39	0.6
9004/0a-200-030-001	20	30	600	0.07	2	0.42	2.5
9004/0a-200-050-001	20	50	1000	0.07	0.41	0.36	2.5
9004/0a-200-095-001	20	95	1900	-	-	0.31	0.77
9004/0a-263-025-001	26.3	25	657.5	0.029	2	0.2	2.5
9004/0a-263-030-001	26.3	30	789	0.023	0.65	0.19	2.5
9004/0a-263-050-001	26.3	50	1315	-	-	0.16	2.5
9004/0a-280-025-001	28	25	700	0.019	0.9	0.17	2.5
9004/0a-280-045-001	28	45	1260	-	-	0.133	2.5
9004/0a-315-022-001	31.5	22	693	-	-	0.1	5
9004/0a-315-025-001	31.5	25	787.5	-	-	0.1	5
9004/5a-206-030-001	20.6	30	618	0.065	2	0.39	2.5
9004/5a-206-050-001	20.6	50	1030	0.060	0.3	0.33	2.5
9004/5a-206-085-001	20.6	85	1751	-	-	0.25	0.5
9004/5a-220-030-001	22	30	660	0.05	2	0.32	2.5
9004/61-220-035-001	22	35	770	0.05	0.5	0.32	2.5
9004/61-232-028-041	23.2	28	650	0.04	1	0.26	2.5

a = Polarity: 0 (negative)
1 (positive)

The copying, distribution and utilization of this document as well as the communication of its contents to others without expressed authorization is prohibited. Offenders will be held liable for the payment of damages. All rights reserved in the event of the grant of a patent, utility model or ornamental design registration.

Weitergabe sowie Vervielfältigung dieses Dokuments, Verwertung und Mitteilung seines Inhalts sind verboten, soweit nicht ausdrücklich gestattet. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patent-, Gebrauchsmuster- oder Geschmacksmustereintragung vorbehalten.

Certification drawing

	Date	Name
2003		
Drawn	25.11.	T. Stahl
Appr.		Kaiser

Title: INTRINSPAK
Series 9004/..-…-…-..1
Intrinsic Safety Barriers

Scale: none
Sheet: 2 of 2
Agency: FM

Drawing No.: 90 046 11 31 1

Replaces:
Replaced by:
A4

Index	Date	Drawn

F 4830 510