CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1040964 (LR 82598-26) **Master Contract:** 160686 (LR 82598)

Project: 1387929 **Date Issued:** December 5, 2002

Issued to: **ENDRESS + HAUSER FLOWTEC AG**
Kaegenstrasse 7
CH-4153 Reinach
SWITZERLAND
Attention: Mr. Frank Bonschab

The products listed below are eligible to bear the CSA Mark shown

Issued by: G. Lewis, CET

Authorized by: Nick Affano
Operations Manager

PRODUCTS

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations

Class I, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Type 4X Enclosure:

- PROWIRL 77F/W/H a-bcdefgFij and Honeywell SVM 3000 BASIC V7F a-bcdefgFij and Honeywell SVM 3000 BASIC V7W a-bcdefgFij Flowmeters (Compact Versions), supply rated 4-20 mA or "pulsed 4-20mA" (30 Vdc max). Intrinsically Safe with Entity Parameters, Temperature Codes and Maximum Ambient Temperatures per Drawing No. SK 8192 and Honeywell Drawing No. 8324. Entity Parameters: Vmax = 30 V, Imax = 150 mA, Ci = 11 nF, Li = 1.23 mH.

Note: a,b,c,d,e,f,g,i and j in the Model No. may be any character or numeral representing specific options.

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Certificate: 1040964 **Master Contract:** 160686 (LR 82598)
Project: 1387929 **Date:** December 5, 2002

CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations

Class I, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Type 4X Enclosure:

- PROWIRL 77F/W/H a-bcdefg**F**ij and Honeywell SVM 3000 BASIC V7F a-bcdefg**F**ij and Honeywell SVM 3000 BASIC V7W a-bcdefg**F**ij Flowmeters (Compact Versions), supply rated 4-20 mA or "pulsed 4-20mA" (30 Vdc max). Intrinsically Safe with Temperature Codes and Maximum Ambient Temperatures per Drawing No. SK 8192 and Honeywell Drawing No. 8324.

Note: a,b,c,d,e,f,g,i and j in the Model No. may be any character or numeral representing specific options.

- PROWIRL 77F/W/H a-bcdefg**G**ij Flowmeter (Compact Version), supply rated 4-20 mA or "pulsed 4-20mA" (30 Vdc max). Explosion-Proof with Intrinsically Safe electronics and sensor. Temperature Code T6 (-40°C ≤ Ta ≤ +40°C) or T5 (-40°C ≤ Ta ≤ +60°C).

Notes: 1. a,b,c,d,e,f,g,i and j in the Model No. may be any character or numeral representing specific options.
2. The equipment to which the device is connected may not use or generate more than 125V.

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

Class I, Div. 2, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Type 4X Enclosure:

- PROWIRL 77F/W/H a-bcdefg**F**ij and Honeywell SVM 3000 BASIC V7F a-bcdefg**F**ij and Honeywell SVM 3000 BASIC V7W a-bcdefg**F**ij Flowmeters (Compact Versions), supply rated 4-20 mA or "pulsed 4-20mA" (30 Vdc max). Suitable for Div. 2 and Dust-Tight with Temperature Codes and Maximum Ambient Temperatures per Drawing No. SK 8192 and Honeywell Drawing No 8324.

Note: a,b,c,d,e,f,g,i and j in the Model No. may be any character or numeral representing specific options.

APPLICABLE STANDARDS

CSA Std C22.2 No.	25-1966 -	Enclosures for Use in Class II, Groups E, F and G Hazardous Locations
CSA Std C22.2 No.	30-M1986 -	Explosion-Proof Enclosures for Use in Class I Hazardous Locations
CAN/CSA-C22.2 No.	94-M91 -	Special Purpose Enclosures
CSA Std C22.2 No.	142-M1987 -	Process Control Equipment
CAN/CSA-C22.2 No.	157-92 -	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
CSA Std C22.2 No.	213-M1987 -	Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations

CSA INTERNATIONAL

Supplement to Certificate of Compliance

Certificate: 1040964 (LR82598-26) **Master Contract:** 160686 (LR 82598)

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
1387929	Dec. 5, 2002	1. New connection board version. 2. Revised / alternative construction of main board. 3. Minor changes to model coding. 4. Revised drawings.
1194874	May 2, 2001	1. Addition of the enhanced climatic version. 2. Model coding change for new Climatic version. 3. Revised drawings.
1040964	Feb. 15, 2000	***ORIGINALLY ISSUED AS 2500006590.*** 1. Addition of PROWIRL 77H sensor. 2. Revised construction of PROWIRL 77F/W.3. New model coding.
LR82598-58	June 14, 1999	1. Revised Main Board. 2. Changes to Model Coding. 3. Revised Drawings.
LR82598-50	Sept. 18, 1998	1. Addition of PROFIBUS Version of I.S. / Div. 2 PROWIRL 77. 2. Revised Construction of barrier for Explosion-proof PROWIRL 77.
LR82598-53	Aug. 6, 1998	Alternative construction to cover private label agreement with Honeywell.
LR82598-38	April 6, 1998	Revised construction of I.S./Div.2 version and new Explosion-Proof version.
LR82598-26	May 14, 1997	Original Certification.

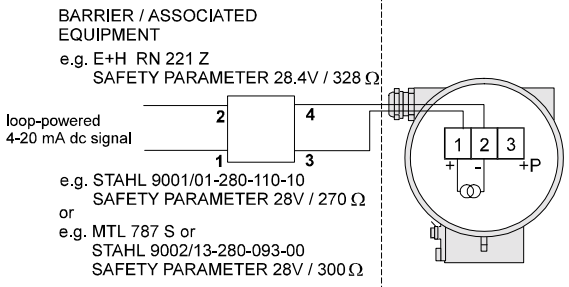
NON HAZARDOUS LOCATION

HAZARDOUS LOCATION

CLASS I, II AND III DIVISION 1, GROUPS A, B, C, D, E, F AND G

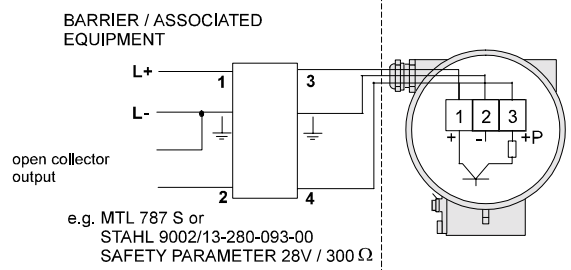
two-wire version

4-20 mA with HART or PFM



three-wire version

open collector output



Sensor Prowirl 77 F **-***F0*; Prowirl 77W **-*****F0*; Prowirl 77 F **-*****F3* and Prowirl 77W **-*****F3*:**

	Temperature class				
	T6	**T5**	**T4**	**T3**	**T2**
T_{medium}	80 °C	95 °C	130 °C	190 °C	280 °C
$T_{ambient}$	40 °C	60 °C	60 °C	60 °C	60 °C

Sensor Prowirl 77 F **-***F1*; Prowirl 77W **-*****F1* and Prowirl 77H **-*****F1*:**

	Temperature class					
	T6	**T5**	**T4**	**T3**	**T2**	**T1**
T_{medium}	80 °C	95 °C	130 °C	190 °C	290 °C	440°C
$T_{ambient}$	40 °C	60 °C	60 °C	60 °C	60 °C	60 °C

Notes:

This page applies to model code: **Prowirl 77 * **-*****F*0, Prowirl 77 * **-*****F*3, Prowirl 77 * **-*****F*4, Prowirl 77 * **-*****F*5,**

Instrinsically safe installation

1) Control room equipment may not use or generate over 250 Vrms.
2) Wire all circuits for power supply per ISA RP 12.6.
3) Use entity approved safety barrier or other associated equipment that satisfy the following conditions:
   $V_{oc} \le V_{max}$, $I_{sc} \le I_{max}$, $C_a \ge C_i + C_{cable}$, $L_a \ge L_i + L_{cable}$ transmitter entity parameters are as follows:

V_{max}	I_{max}	P_i	C_i	L_i
30 V	150 mA	1 W	11 nF	1.23 mH

4) **WARNING**: SUBSTITUTION OF COMPONENTS MAY IMPAIR INSTRINSIC SAFETY.

Division 2 installation (without barrier)

5) Installation of transmitter circuit wiring according to Canadian Electrical Code using threaded conduit.
6) **WARNING**: EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
7) Terminal 1 and 2
   Supply voltage: HART 12 ... 30 V
   Signal current: 4 ... 20 mA (max. 25 mA)
8) Terminal 1 and 3
   Pulse Output: max. 30 V, max. 10 mA

Class II installation (without barrier)

9) Transmitter circuit wiring in conduit in accordance with the Canadian Electrical Code.

Aenderungen:						Ersetzt durch:
	A	29.04.97 / Bn	F			
	B	23.09.97 / Bn	G			Ersatz für:
	C	11.09.98 / Bn	H			Ersteller: FES/Bn
	D	24.11.99 / Bn	J			File: M:\ZEICHNG\...\980911C.DOC **ID 853**
	E	04.12.02 / Bn	K			

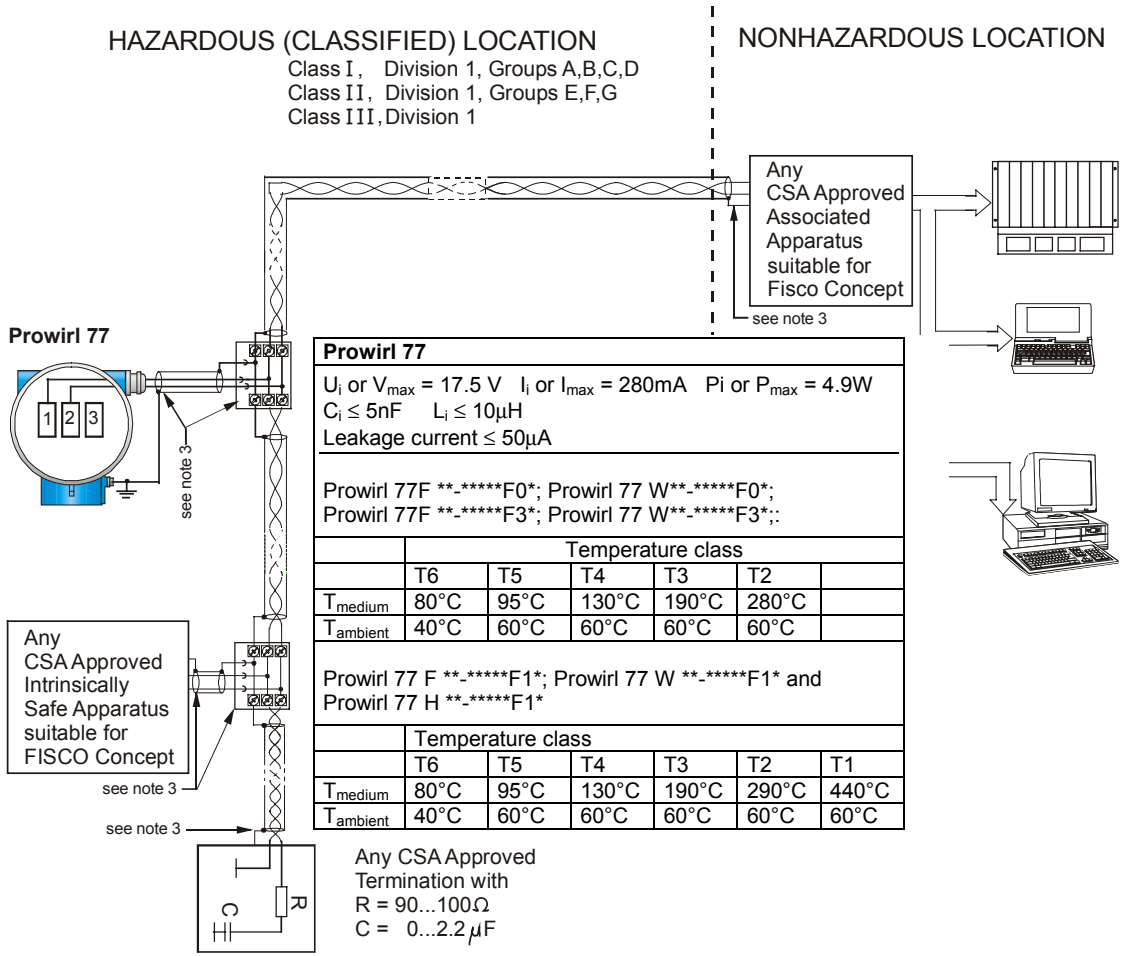
CSA CONTROL DRAWING PROWIRL 77 2 and 3-WIRE VERSION ENTITY INSTALLATION

Massstab			
Gezeichnet	29.04.97	Bn
Geprüft		
Ex-geprüft	04.12.02	Bn
Gesehen		

Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

SK 8192-0000C0E

This page applies to model code: **Prowirl 77 * **-*****F*6**



FISCO-Concept

The FISCO Concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for interconnection is that the voltage (Ui or Vmax), the current (Ii or Imax) and the power (Pi) which intriniscally safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo or Voc), the current (Io or Isc) and the power (Po) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 µH respectively.

In each segment only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system. The voltage Uo of the associated apparatus has to be limited to the range of 14V to 24V d.c. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 µA for each connected device. Separately powered equipment needs a galvanic isolation to assure that the intrinsically safe fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameters in the following range:

loop resistance R' : 15 .... 150 Ω/km
inducance per unit length L' : 0.4 .... 1 mH/km
capacitance per unit length C' : 80 .... 200 nF/km
C' = C' line/line + 0.5 C' line/screen, if both lines are floating or
C' = C' line/line + C' line/screen, if the screen is connected to one line
length of spur cable : ≤ 30 m
length of trunk cable : ≤ 1 km
length of splice : ≤ 1 m

At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:

R = 90 .... 100 Ω
C = 0 .... 2.2 µF

One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

Notes:

Intrinsically safe installation

1) Control room equipment may not use or generate over 250 Vrms.
2) Wire all circuits for power supply per Canadian Electrical Code Part I.
3) Be aware of multiple earthing of the screen. The screen must be connected in accordance with ISA RP 12.6.
4) WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Division 2 installation

5) Transmitter circuit wiring in conduit in accordance with the Canadian Electrical Code Part I
6) WARNING: EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Class II installation

7) Transmitter circuit wiring in conduit in accordance with the Canadian Electrical Code Part I

Aenderungen:						Ersetzt durch:
	A	29.4.97 / Bn	F			
	B	23.9.97 / Bn	G			Ersatz für:
	C	11.09.98 / Bn	H			Ersteller: FES/Bn
	D	24.11.99 / Bn	J			File: M:\ZEICHNG\...\980911C.DOC **ID 853**
	E	04.12.02 / Bn	K			

CSA CONTROL DRAWING
PROWIRL 77
Profibus PA
FISCO - Concept

Massstab

Gezeichnet	29.04.97	Bn
Geprüft		
Ex-geprüft	04.12.02	Bn
Gesehen		

Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

SK 8192-0000C0E