



H250 M40 FM-IS Control Drawings for hazardous location

NON HAZARDOUS (UNCLASSIFIED) LOCATION

FM APPROVED ASSOCIATED INTRINSICALLY
SAFE WIRING APPARATUS
CURRENT LOOP ENTITY PARAMETERS:

$U_0 (V_{oc})$	$\leq 30V$
$I_0 (I_{sc})$	$\leq 130mA$
P_0	$\leq 1W$
$Co (Ca)$	$\geq C_{cable} + 0nF$
$Lo (La)$	$\geq L_{cable} + 0.01mH$

FM APPROVED APPROVED INTRINSICALLY
SAFE WIRING APPARATUS
BINARY OUTPUT 2 ENTITY PARAMETERS:

Uo (Voc) ≤ 16V	Io (Isc) ≤ 52mA
Po (Pmax) ≤ 169mW	
SLOT SENSOR TYPE SC3,5-N0-Y... or ITS23,5-N	
Co (Ca) ≥ Ccable + 150nF	
Lo (La) ≥ Lcable + 0.15mH	
SLOT SENSOR TYPE SJ3,5-SN or SJ3,5-S1N	
Co (Ca) ≥ Ccable + 30nF	
Lo (La) ≥ Lcable + 0.1mH	

FM APPROVED ASSOCIATED INTRINSICALLY
SAFE WIRING APPARATUS

BIARY OUTPUT 1 ENTITY PARAMETERS:

$U_o (V_{oc}) \leq 16V$	$I_o (I_{sc}) \leq 52mA$
$P_o (P_{max}) \leq 169mW$	
SLOT SENSOR TYPE SC3,5-N0-Y... or I7S23,5-N	
$Co (Ca) \geq C_{cable} + 150nF$	
$Lo (La) \geq L_{cable} + 0.15mH$	
SLOT SENSOR TYPE SJ3,5-SN or SJ3,5-S1N	
$Co (Ca) \geq C_{cable} + 30nF$	
$Lo (La) \geq L_{cable} + 0.1mH$	

1. THE ENTITY CONCEPT ALLOWS INTERCONNECTIONS OF INTRINSICALLY SAFE APPARATUS WITH ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS, USING ANY OF THE WIRING METHODS PERMITTED FOR NON HAZARDOUS (UNCLASSIFIED) LOCATIONS
2. USE FM APPROVED ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS WITH INTRINSICALLY SAFE FIELD WIRING PARAMETERS USED IN AN APPROVED CONFIGURATION SUCH THAT:
$$U_i (V_{max}) \geq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } U_o (V_{oc})$$
$$I_i (I_{max}) \geq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } I_o (I_{sc})$$
$$P_i (P_{max}) \geq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } P_o$$
$$C_i + C_{cable} \leq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } C_o (C_a)$$
$$L_i + L_{cable} \leq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } L_o (L_a)$$
3. INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ® NFPA 70, ARTICLE 500 TO 510 AND ANSI / ISA - RP 12.06.01
AND CANADIAN ELECTRICAL CODE FOR CANADA INSTALLATION
4. RUN SHIELDED INTERCONNECTION CABLE WITH SHIELD CONNECTED TO FM APPROVED ASSOCIATED APPARATUS GROUND
5. OBSERVE FLOW METER H250/M40/... AND ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION INSTRUCTIONS
6. NO REVISION TO DRAWING WITHOUT PRIOR FM APPROVAL

FUNCTIONAL RATINGS

THESE RATINGS DO NOT SUPERSEDE HAZARDOUS (CLASSIFIED) LOCATION VALUES:

CURRENT OUTPUT: NOMINAL CURRENT = 4...20mA NOMINAL VOLTAGE = 12...30V

BINARY OUTPUTS: NOMINAL CURRENT = 1...3mA
NOMINAL VOLTAGE = 8V

[illegible]

CONTROL DRAWING
H250/M40./ESK/K.

[illegible]

APPR GD 821070-01 d

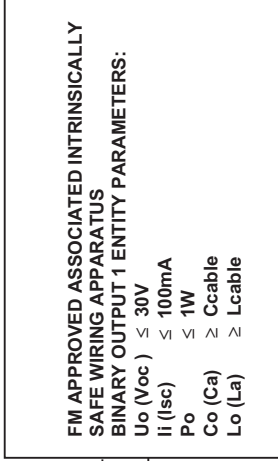
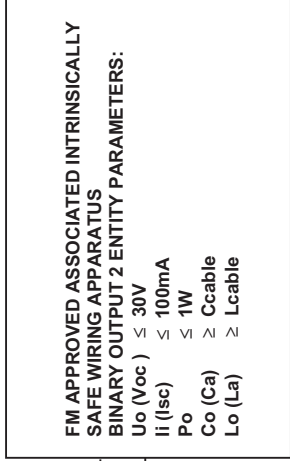
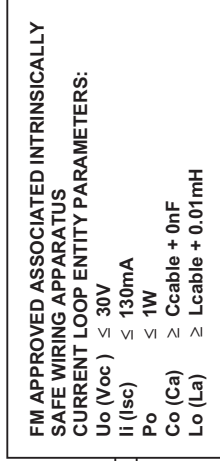
Ers. für	Ers. durch
----------	------------

MAX POWER OF ASSOCIATED APPARATUS	TYPE 1 U _o = 16V I _o = 25 mA P _o = 34 mW			TYPE 2 U _o = 16V I _o = 25 mA P _o = 64 mW			TYPE 3 U _o = 16V I _o = 52 mA P _o = 169 mW		
T-CLASS	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1
Model									
SC3,5-NO-Ya	55	67	95	48	60	88	23	35	63
SJ3,5-SNa	73	88	100	66	81	100	45	60	89
SJ3,5-S1Na	73	88	100	66	81	100	45	60	89
I7S23,5-N...	72	72	72	70	70	70	55	70	70

PERMITTED AMBIENT TEMPERATURES IN °C FOR SLOT SENSORS ACCORDING TO T-CLASS AND P_o OF ASSOCIATED INTRINSICALLY SAFE WIRING APPARATUS

						Datum	Name	Bezeichnung CONTROL DRAWING H250/M40./ESK/K. DIV1	
					Bearb.	16.10.14	We		
					Gepr.	16.10.14	Lk		
					Zul.	16.10.14	Lk		
					KROHNE			Zeichnungsnummer	
								APPR GD 821070-01 d	
d		16.04.15	We	We				Blatt 2	
Zust.	Änd.	Datum	Bearb.	Gepr.	Urspr.	Ers. für		Ers. d.	
								2	Bl.

NON HAZARDOUS (UNCLASSIFIED) LOCATION



1. THE ENTITY CONCEPT ALLOWS INTERCONNECTIONS OF INTRINSICALLY SAFE APPARATUS WITH ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS, USING ANY OF THE WIRING METHODS PERMITTED FOR NON HAZARDOUS (UNCLASSIFIED) LOCATIONS
2. USE FM APPROVED ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS WITH INTRINSICALLY SAFE FIELD WIRING PARAMETERS USED IN AN APPROVED CONFIGURATION SUCH THAT:
$$U_i (V_{max}) \geq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } U_o (V_{oc})$$
$$P_i (I_{max}) \geq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } I_o (I_{sc})$$
$$P_i (P_{max}) \geq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } P_o$$
$$C_i + C_{cable} \leq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } C_o (C_a)$$
$$L_i + L_{cable} \leq \text{ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS } L_o (L_a)$$
3. INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ® NFPA 70, ARTICLE 500 TO 510 AND ANSI / ISA - RP 12.06.01 AND CANADIAN ELECTRICAL CODE FOR CANADA INSTALLATION
4. RUN SHIELDED INTERCONNECTION CABLE WITH SHIELD CONNECTED TO FM APPROVED ASSOCIATED APPARATUS GROUND
5. OBSERVE FLOW METER H250/M40/... AND ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION INSTRUCTIONS
6. NO REVISION TO DRAWING WITHOUT PRIOR FM APPROVAL

FUNCTIONAL RATINGS

THESE RATINGS DO NOT SUPERSEDE HAZARDOUS (CLASSIFIED) LOCATION VALUES:
CURRENT OUTPUT: NOMINAL CURRENT = 4...20mA NOMINAL VOLTAGE = 12...30V
BINARY OUTPUTS: NOMINAL CURRENT < 100 mA NOMINAL VOLTAGE = 0...24V

[illegible]

HAZARDOUS (CLASSIFIED) LOCATION
CLASS I DIVISION 1 GROUPS A,B,C,D T6
CLASS I Zone 1 AEx/ Ex ia GROUP IIC T6 Gb

KROHNE INSTRUMENT H250/M40./ESK

TRANSMITTER ESK4

ENTITY PARAMETERS

U_i (V_{max}) = 30V

I_i (I_{max}) = 130 mA

P_i (P_{max}) = 1W

C_i = 0nF

L_i = 0.01mH

MODUL ESK4-T

ENTITY PARAMETERS

NAMUR Terminal 4, 5 or OC Terminal 4, 6

U_i (V_{max}) = 30V

I_i (I_{max}) = 130mA

P_i (P_{max}) = 1W

C_i = 10nF

L_i = 0mH

MODUL ESK4-T

ENTITY PARAMETERS

NAMUR Terminal 1, 2 or OC Terminal 1, 3

U_i (V_{max}) = 30V

I_i (I_{max}) = 130mA

P_i (P_{max}) = 1W

C_i = 10nF

L_i = 0mH

MODUL ESK4-T

ENTITY PARAMETERS

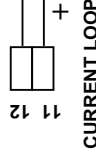
U_i (V_{max}) = 30V

I_i (I_{max}) = 130mA

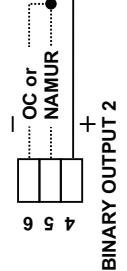
P_i (P_{max}) = 1W

C_i = 10nF

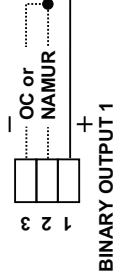
L_i = 0mH



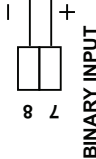
CURRENT LOOP



BINARY OUTPUT 2



BINARY OUTPUT 1



BINARY INPUT

FM APPROVED ASSOCIATED INTRINSICALLY
SAFE WIRING APPARATUS
CURRENT LOOP ENTITY PARAMETERS:

U_o (V_{oc}) ≤ 30V

I_i (I_{sc}) ≤ 130mA

P_o ≤ 1W

C_o (C_a) ≥ C_{cable} + 0nF

L_o (L_a) ≥ L_{cable} + 0.01mH

FM APPROVED ASSOCIATED INTRINSICALLY
SAFE WIRING APPARATUS
BINARY OUTPUT 2 ENTITY PARAMETERS:

U_o (V_{oc}) ≤ 30V

I_i (I_{sc}) ≤ 130mA

P_o ≤ 1W

C_o (C_a) ≥ C_{cable} + 10nF

L_o (L_a) ≥ L_{cable} + 0mH

FM APPROVED ASSOCIATED INTRINSICALLY
SAFE WIRING APPARATUS
BINARY OUTPUT 1 ENTITY PARAMETERS:

U_o (V_{oc}) ≤ 30V

I_i (I_{sc}) ≤ 130mA

P_o ≤ 1W

C_o (C_a) ≥ C_{cable} + 10nF

L_o (L_a) ≥ L_{cable} + 0mH

FM APPROVED ASSOCIATED INTRINSICALLY
SAFE WIRING APPARATUS
BINARY OUTPUT 1 ENTITY PARAMETERS:

U_o (V_{oc}) ≤ 30V

I_i (I_{sc}) ≤ 130mA

P_o ≤ 1W

C_o (C_a) ≥ C_{cable} + 10nF

L_o (L_a) ≥ L_{cable} + 0mH

NON HAZARDOUS (UNCLASSIFIED) LOCATION

NOTES: CLASS I DIVISION 1 INSTALLATION

- THE ENTITY CONCEPT ALLOWS INTERCONNECTIONS OF INTRINSICALLY SAFE APPARATUS WITH ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS, USING ANY OF THE WIRING METHODS PERMITTED FOR NON HAZARDOUS (UNCLASSIFIED) LOCATIONS
- USE FM APPROVED ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS WITH INTRINSICALLY SAFE FIELD WIRING PARAMETERS USED IN AN APPROVED CONFIGURATION SUCH THAT:
U_i (V_{max}) ≥ ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS U_o (V_{oc})
I_i (I_{max}) ≥ ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS I_o (I_{sc})
P_i (P_{max}) ≥ ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS P_o
C_i + C_{cable} ≤ ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS C_o (C_a)
L_i + L_{cable} ≤ ASSOCIATED INTRINSICALLY SAFE FIELD WIRING APPARATUS L_o (L_a)
- INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ® NFPA 70, ARTICLE 500 TO 510 AND ANSI / ISA - RP 12.06.01
- RUN SHIELDED INTERCONNECTION CABLE WITH SHIELD CONNECTED TO FM APPROVED AND CANADIAN ELECTRICAL CODE FOR CANADA INSTALLATION
- OBSERVE FLOW METER H250/M40./... AND ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION INSTRUCTIONS
- NO REVISION TO DRAWING WITHOUT PRIOR FM APPROVAL

7. CONTROL EQUIPMENT CONNECTED TO ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN THE SPECIFIED U_m OF ASSOCIATED APPARATUS

- THE ASSOCIATED APPARATUS MUST BE A RESISTIVELY LIMITED SINGLE OR MULTIPLE CHANNEL FM APPROVED BARRIER HAVING PARAMETERS LESS THAN THOSE QUOTED, AND FOR WHICH THE OUTPUT AND THE COMBINATIONS OF OUTPUTS IS NON-IGNITION CAPABLE FOR THE CLASS, DIVISION AND GROUP OF USE. FUNCTIONAL RATINGS

THESE RATINGS DO NOT SUPERSEDE HAZARDOUS (CLASSIFIED) LOCATION VALUES:

CURRENT OUTPUT: NOMINAL CURRENT = 4...20mA NOMINAL VOLTAGE = 12...30V

BINARY OUTPUTS: NOMINAL CURRENT = 1...3mA NOMINAL VOLTAGE = 8V NAMUR OR

NOMINAL CURRENT < 100 mA NOMINAL VOLTAGE = 8...30V OPEN COLLECTOR

BINARY INPUT: NOMINAL CURRENT < 2 mA NOMINAL VOLTAGE = 8...30V

	Datum	Name	Bezeichnung
	Bearb. 08.10.12	Werner	CONTROL DRAWING
	Gepr. 08.10.12	Lehmkuhl	H250/M40./ESK4-T
	Zul. 08.10.12	Lehmkuhl	DIV1
b	08.08.13	We	Zeichnungsnummer
a	17.04.13	We	APPR GD 821070-03 b
Zust. Änd.	Datum	Bearb.	Ers. für
		Gepr.	Ers. durch
			Blatt 1
			1 Bl.

