

*Danfoss*

# MBT 9110 - 084Z7443



ATEX



2-tråds programmerbar transmitter

Side 1 - DK

2-wire programmable transmitter

Page 15 - UK

Transm. 2-fils universel (Pt100/TC)

Page 29 - FR

2-Leiter Universalmessumformer

Seite 43 - DE



# 2-TRÅDS PROGRAMMERBAR TRANSMITTER

**MBT 9110, 084Z7443**

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## EC DECLARATION OF CONFORMITY

As manufacturer

**Danfoss A/S  
Danfoss Industrial Automation  
DK-6430 Nordborg**

hereby declares that the following products:

**Type MBT 9110 084Z7441 and  
MBT 9110 084Z7443**

is in conformity with the following directives and standards:

The EMC Directive 2004/108/EC and later amendments  
**EN 61326-1 : 2006**

For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The ATEX Directive 94/9/EC and later amendments

**EN 60079-0 : 2006, EN 60079-11 : 2007  
EN 60079-15 : 2005 and EN 60079-26 : 2007  
EN 61241-0 : 2006 and EN 61241-11 : 2006  
ATEX certificate: KEMA 04ATEX1339 (MBT 9110 084Z7441  
and MBT 9110 084Z7443)**

Notified body

**KEMA Quality B.V. (0344)  
Utrechtsweg 310, 6812 AR Arnhem  
P.O. Box 5185, 6802 ED Arnhem  
The Netherlands**

Date: 2010-06-15

  
.....  
Quality Manager: Thomas Matzen

## **2-TRÅDS PROGRAMMERBAR TRANSMITTER MBT 9110, 084Z7443**

- *Indgang for RTD, TC, Ohm eller mV*
- *Ekstrem målenøjagtighed*
- *1,5 kVAC galvanisk isolation*
- *Kan monteres i DIN form B følerhoved*

### **Anvendelse:**

- Temperaturlineariseret måling med Pt100...Pt1000, Ni100...Ni1000 eller termoelementføler.
- Omsætning af lineær modstandsændring til standard analogt strømsignal, f.eks. fra ventiler eller ohmske niveaustave.
- Forstærkning af bipolært mV-signal til et standard 4...20 mA strømsignal.

### **Teknisk karakteristik:**

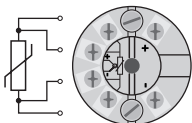
- RTD og modstandsindgangen har kabelkompensering for 2-, 3- og 4-leder tilslutning.
- Der er løbende sikkerhedscheck af gemte data.

### **Montage / installation:**

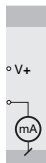
- Kan monteres i DIN form B følerhoved. I ikke-eksplosionsfarlige områder kan MBT 9110, 084Z7443 monteres på en DIN-skinne med et specielt beslag.

## APPLIKATIONER

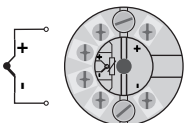
RTD til 4...20 mA



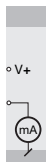
2-Trådsinstallation  
i kontrolrum



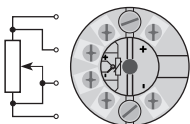
TC til 4...20 mA



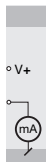
2-Trådsinstallation  
i kontrolrum



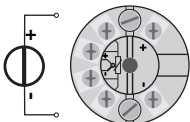
Modstand til 4...20 mA



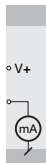
2-Trådsinstallation  
i kontrolrum



mV til 4...20 mA



2-Trådsinstallation  
i kontrolrum



Type	Version	
MBT 9110	Galvanisk isolation Galvanisk isolation, EEx	084Z7442 084Z7443

## Elektriske specifikationer:

### Specifikationsområde:

-40°C til +85°C

### Fælles specifikationer:

Forsyningsspænding DC

Galvanisk isolation, MBT 9110, 084Z7442 7,2...35 V

Galvanisk isolation, EEx, MBT 9110, 084Z7443 7,2...30 VDC

Egetforbrug ..... 25 mW...0,8 W

Spændingsdrop ..... 7,2 VDC

Isolationsspænding, test / drift ..... 1,5 kVAC / 50 VAC

Opvarmningstid ..... 5 min.

Kommunikationsinterface ..... Loop Link

Signal- / støjforhold ..... Min. 60 dB

Reaktionstid (programmerbar) ..... 1...60 s

EEPROM fejlcheck ..... < 3,5 s

Signaldynamik, indgang ..... 20 bit

Signaldynamik, udgang ..... 16 bit

Kalibreringstemperatur ..... 20...28°C

Nøjagtighed, størst af generelle og basisværdier:

Generelle værdier		
Indgangstype	Absolut nøjagtighed	Temperaturkoefficient
Alle	≤ ±0,05% af span	≤ ±0,01% af span / °C

Basisværdier		
Indgangstype	Basis nøjagtighed	Temperatur- koefficient
RTD	$\leq \pm 0,2^{\circ}\text{C}$	$\leq \pm 0,01^{\circ}\text{C}/^{\circ}\text{C}$
Lin.R	$\leq \pm 0,1 \Omega$	$\leq \pm 10 \text{ m}\Omega/^{\circ}\text{C}$
Volt	$\leq \pm 10 \mu\text{V}$	$\leq \pm 1 \mu\text{V}/^{\circ}\text{C}$
TC-type: E, J, K, L, N, T, U	$\leq \pm 1^{\circ}\text{C}$	$\leq \pm 0,05^{\circ}\text{C}/^{\circ}\text{C}$
TC-type: B, R, S, W3, W5, LR	$\leq \pm 2^{\circ}\text{C}$	$\leq \pm 0,2^{\circ}\text{C}/^{\circ}\text{C}$

EMC-immunitetspåvirkning .....	$< \pm 0,5\%$ af span
Udvidet EMC-immunitet:	
NAMUR NE 21, A kriterium, gniststøj.....	$< \pm 1\%$ af span

Virkning af forsyningsspændings- ændring .....	$< 0,005\%$ af span / VDC
Vibration .....	IEC 60068-2-6 Test FC
Lloyd's specifikation nr. 1 .....	4 g / 2...100 Hz
Max. ledningskvadrat .....	1 x 1,5 mm <sup>2</sup> flerkeret ledning
Luftfugtighed.....	$< 95\%$ RH (ikke kond.)
Mål .....	$\varnothing 44 \times 20,2 \text{ mm}$
Tæthedsgrad (hus / klemme).....	IP68 / IP00
Vægt.....	50 g

#### Elektriske specifikationer indgang:

#### RTD- og lineær modstandsindgang:

Type	Min. værdi	Max. værdi	Min. span	Standard
Pt100	-200°C	+850°C	25°C	IEC 60751
Ni100	-60°C	+250°C	25°C	DIN 43760
Lin. R	0 $\Omega$	5000 $\Omega$	30 $\Omega$	-----

Max. nulpunktsforskydning (offset) .....	50% af valgt max. værdi
Kabelmodstand pr. leder (max.).....	5 $\Omega$
Følerstrøm.....	Nom. 0,2 mA
Virkning af følerkabelmodstand (3- / 4-leder).....	$< 0,002 \Omega/\Omega$
Følerfejlsdetektering.....	Ja



**TC-indgang:**

Type	Min. temperatur	Max. temperatur	Min. span	Standard
B	+400°C	+1820°C	200°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	100°C	IEC584
R	-50°C	+1760°C	200°C	IEC584
S	-50°C	+1760°C	200°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	75°C	DIN 43710
W3	0°C	+2300°C	200°C	ASTM E988-90
W5	0°C	+2300°C	200°C	ASTM E988-90
LR	-200°C	+800°C	50°C	GOST 3044-84

Max. nulpunktsforskydning (offset) ..... 50% af valgt max. værdi

Koldt loddestedskomp. (CJC)..... < ±1,0°C

Følerfejlsdetektering ..... Ja

Følerfejlsstrøm:

under detektering ..... Nom. 33 mA

ellers ..... 0 mA

**Spændingsindgang:**

Måleområde ..... -12...800 mV

Min. måleområde (span)..... 5 mV

Max. nulpunktsforskydning (offset) ..... 50% af valgt max. værdi

Indgangsmodstand..... 10 MΩ

**Udgang:****Strømodgang:**

Signalområde..... 4...20 mA

Min. signalområde ..... 16 mA

Opdateringstid ..... 440 ms

Udgangssignal ved EEpromfejl ..... ≤ 3,5 mA

Belastningsmodstand..... ≤ (V<sub>forsyn.</sub> - 7,2) / 0,023 [Ω]

Belastningsstabilitet ..... < ±0,01% af span / 100 Ω

**Følerfejlsdetektering:**

Programmerbar..... 3,5...23 mA

NAMUR NE43 Upscale..... 23 mA

NAMUR NE43 Downscale..... 3,5 mA

Af span = Af det aktuelt valgte område

**EEx-godkendelse: MBT 9110, 084Z7443:**

KEMA 04ATEX1339 .....  II 1 G Ex ia IIC T4 eller T6  
II 1 D Ex iaD

Max. omgivelsestemp. for T4 ..... 85°C

Max. omgivelsestemp. for T6 ..... 60°C

ATEX, må anvendes i zone ..... 0, 1, 2, 20, 21 eller 22

ATEX Installation Drawing No..... MBT 9110 - 084Z7443

**Overholdte myndighedskrav:**

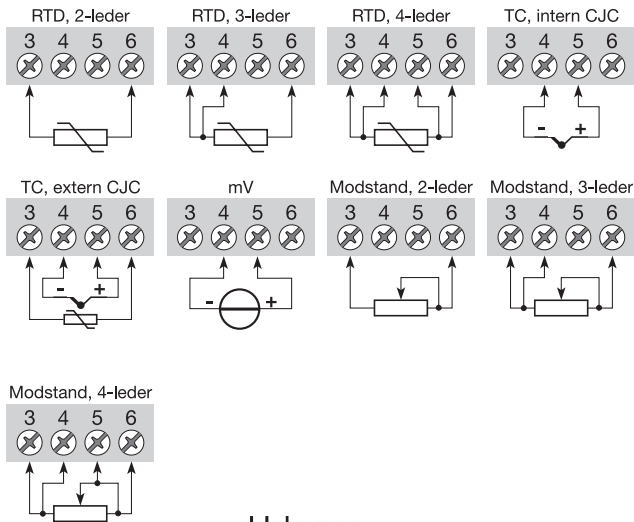
EMC 2004/108/EF ..... Emission og immunitet ..... EN 61326-1

ATEX 94/9/EF ..... EN 60079-0, EN 60079-11,  
EN 60079-15, EN 60079-26,  
EN 61241-0, EN 61241-11

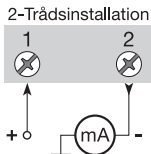
**Standard:**

# Tilslutninger:

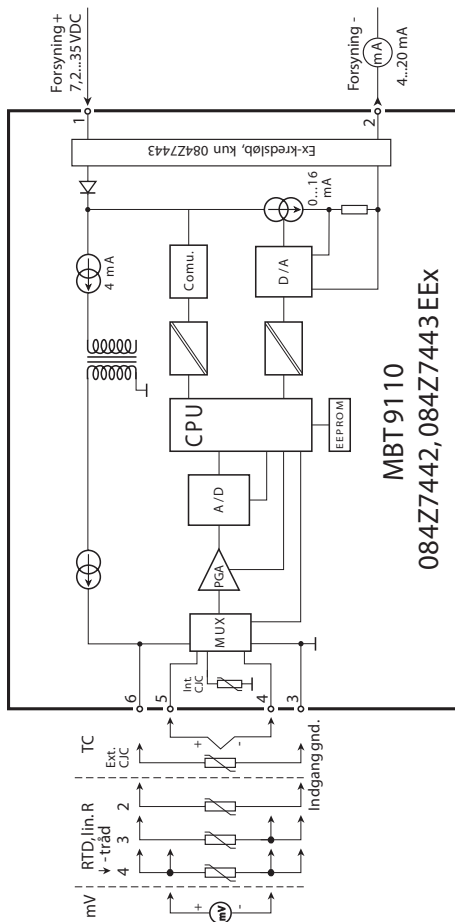
## Indgang:



## Udgang:



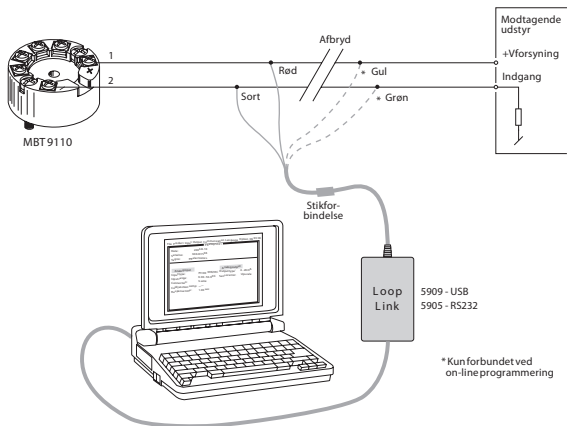
# BLOKDIAGRAM:



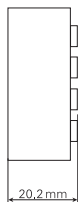
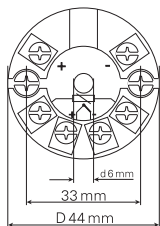
## Programmering:

- Loop Link er et batteridrevet kommunikationsinterface, der er nødvendigt for programmering af MBT 9110.
- Ved programmering henvises til tegningen nedenfor og hjælpefunktionen i PRreset programmet.
- Loop Link må ikke benyttes til kommunikation med moduler installeret i Ex-område

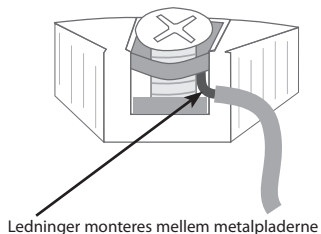
### Bestilling: Loop Link



### Mekaniske specifikationer:



### Montering af følerledninger:



# APPENDIX

## ATEX Installation drawing MBT 9110 - 084Z7443

ATEX Certificate      KEMA 04ATEX 1339

Marking



II 1 G Ex ia IIC T6..T4  
II 1 D Ex iaD

Standards

EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-26 : 2007,  
EN 61241-0 : 2006, EN 61241-11 : 2006

Hazardous area

Zone 0, 1, 2, 20, 21, 22

T4:  $-40 \leq T_a \leq 85^{\circ}\text{C}$

T6:  $-40 \leq T_a \leq 60^{\circ}\text{C}$

**Terminal: 3,4,5,6**

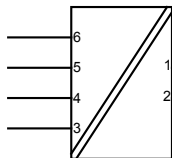
Uo: 9.6 VDC

Io: 25 mA

Po: 60 mW

Lo: 33 mH

Co: 2.4  $\mu\text{F}$



**Terminal: 1,2**

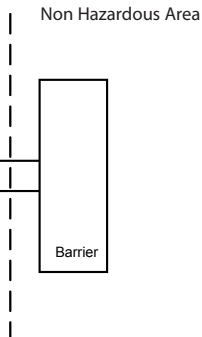
Ui: 30 VDC

Ii: 120 mA

Pi: 0.84 W

Li: 10  $\mu\text{H}$

Ci: 1.0nF



# Sikkerhedsinstruktion

## Bemærkninger til installering

For at gennemføre en sikker installering af MBT 9110 084Z7443 skal følgende overholdes. Modulet må kun installeres af kvalificeret personale, der er bekendt med gældende nationale og internationale love, direktiver og standarder inden for dette område.

Produktionsåret fremgår af de første to cifre i serienummeret.

Følerkredsløbet er ikke ufejlbarligt galvanisk isoleret fra indgangskredsløbet. Den galvaniske isolation mellem kredsløbene er dog i stand til at modstå en prøvespænding på 500 VAC i løbet af ét minut.

I en potentielt eksplosiv gasatmosfære skal transmitteren monteres i en kapsling, så man opnår en beskyttelsesgrad på min. IP20 i henhold til EN 60529.

Installeres transmitteren i en eksplosiv atmosfære, der kræver udstyr i kategori 1G, og hvis kapslingen er lavet af aluminium, skal den installeres således, at gnister fra antændelseskilder ved slag og friktion selv under usædvanlige omstændigheder holdes ude. Er kapslingen lavet af ikke-metalliske materialer, skal elektrostatisk opladning undgås.

Ved installering i en atmosfære med potentielt eksplosivt støv følges disse anvisninger:

Transmitteren skal monteres i en metalkapsling form B i henhold til DIN 43729, der yder en beskyttelsesgrad på min. IP6X i henhold til EN 60529. Kapslingen skal være egnet til applikationen og installeret korrekt.

Der må kun anvendes kabelindgange og blindstik, der er egnet til applikationen og installeret korrekt.

Ved en omgivende temperatur på  $\geq 60^{\circ}\text{C}$  skal der anvendes varmebestandige kabler med en klassificering på mindst 20 K over den omgivende temperatur.

Kapslingens overfladetemperatur er lig med den omgivende temperatur plus 20 K ved et støvlag med en tykkelse på op til 5 mm.

Danfoss A/S  
Danfoss Industrial Automation  
DK 6430 Nordborg Denmark  
Phone +45 7488 2222





# 2-WIRE PROGRAMMABLE TRANSMITTER

**MBT 9110, 084Z7443**

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Notified body

**KEMA Quality B.V. (0344)  
Utrechtsweg 310, 6812 AR Arnhem  
P.O. Box 5185, 6802 ED Arnhem  
The Netherlands**

Date: 2010-06-15

  
.....  
Quality Manager: Thomas Matzen

## **2-WIRE PROGRAMMABLE TRANSMITTER**

### **MBT 9110, 084Z7443**

- *RTD, TC, Ohm, or mV input*
- *Extremely high measurement accuracy*
- *1.5 kVAC galvanic isolation*
- *For DIN form B sensor head mounting*

#### **Application:**

- Linearised temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analogue current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

#### **Technical characteristics:**

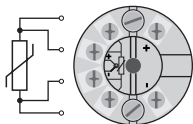
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.

#### **Mounting / installation:**

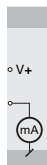
- For DIN form B sensor head mounting. In non-hazardous areas the MBT 9110, 084Z7443 can be mounted on a DIN rail with a special fitting.

## APPLICATIONS

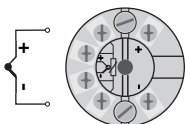
RTD to 4...20 mA



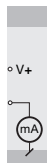
2-wire installation  
in control room



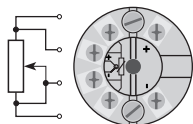
TC to 4...20 mA



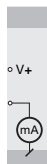
2-wire installation  
in control room



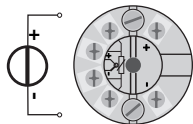
Resistance to 4...20 mA



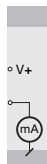
2-wire installation  
in control room



mV to 4...20 mA



2-wire installation  
in control room



Type	Version	
MBT 9110	Galvanic isolation	084Z7442
	Galvanic isolation, EEx	084Z7443

### Electrical specifications:

#### Specifications range:

-40°C to +85°C

#### Common specifications:

Supply voltage, DC

Galvanic isolation, MBT 9110, 084Z7442.. 7,2...35 V

Galvanic isolation, EEx, MBT 9110, 084Z7443.. 7,2...30 VDC

Internal consumption..... 25 mW...0.8 W

Voltage drop ..... 7.2 VDC

Isolation voltage, test / operation..... 1.5 kVAC / 50 VAC

Warm-up time ..... 5 min.

Communications interface ..... Loop Link

Signal / noise ratio ..... Min. 60 dB

Response time (programmable)..... 1...60 s

EEPROM error check..... < 3.5 s

Signal dynamics, input..... 20 bit

Signal dynamics, output..... 16 bit

Calibration temperature..... 20...28°C

Accuracy, the greater of general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	$\leq \pm 0.05\%$ of span	$\leq \pm 0.01\%$ of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
RTD	$\leq \pm 0.2^{\circ}\text{C}$	$\leq \pm 0.01^{\circ}\text{C}/^{\circ}\text{C}$
Lin. R	$\leq \pm 0.1 \Omega$	$\leq \pm 10 \text{ m}\Omega/^{\circ}\text{C}$
Volt	$\leq \pm 10 \mu\text{V}$	$\leq \pm 1 \mu\text{V}/^{\circ}\text{C}$
TC type: E, J, K, L, N, T, U	$\leq \pm 1^{\circ}\text{C}$	$\leq \pm 0.05^{\circ}\text{C}/^{\circ}\text{C}$
TC type: B, R, S, W3, W5, LR	$\leq \pm 2^{\circ}\text{C}$	$\leq \pm 0.2^{\circ}\text{C}/^{\circ}\text{C}$

EMC immunity influence.....	< $\pm 0.5\%$ of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< $\pm 1\%$ of span

Effect of supply voltage variation .....	< 0.005% of span / VDC
Vibration .....	IEC 60068-2-6 Test FC
Lloyd's specification no. 1 .....	4 g / 2...100 Hz
Max. wire size.....	1 x 1.5 mm <sup>2</sup> stranded wire
Humidity.....	< 95% RH (non-cond.)
Dimensions.....	$\varnothing 44 \times 20.2 \text{ mm}$
Tightness (enclosure / terminal).....	IP68 / IP00
Weight .....	50 g

### Electrical specifications, input:

#### RTD and linear resistance input:

Type	Min. value	Max. value	Min. span	Standard
Pt100	-200°C	+850°C	25°C	IEC 60751
Ni100	-60°C	+250°C	25°C	DIN 43760
Lin. R	0 $\Omega$	5000 $\Omega$	30 $\Omega$	-----

Max. offset.....	50% of selec. max. value
Cable resistance per wire (max.).....	5 $\Omega$
Sensor current .....	Nom. 0.2 mA
Effect of sensor cable resistance (3- / 4-wire) .....	< 0.002 $\Omega/\Omega$
Sensor error detection .....	Yes

**TC input:**

Type	Min. temperature	Max. temperature	Min. span	Standard
B	+400°C	+1820°C	200°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	100°C	IEC584
R	-50°C	+1760°C	200°C	IEC584
S	-50°C	+1760°C	200°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	75°C	DIN 43710
W3	0°C	+2300°C	200°C	ASTM E988-90
W5	0°C	+2300°C	200°C	ASTM E988-90
LR	-200°C	+800°C	50°C	GOST 3044-84

Max. offset..... 50% of selec. max. value

Cold junction compensation ..... < ±1.0°C

Sensor error detection ..... Yes

Sensor error current:

    When detecting ..... Nom. 33 mA

    Else..... 0 mA

**Voltage input:**

Measurement range..... -12...800 mV

Min. span..... 5 mV

Max. offset..... 50% of selec. max. value

Input resistance ..... 10 MΩ

**Output:****Current output:**

Signal range ..... 4...20 mA

Min. signal range ..... 16 mA

Updating time ..... 440 ms

Output signal at EEprom error ..... ≤ 3.5 mA

Load resistance ..... ≤ (V<sub>supply</sub> - 7.2) / 0.023 [Ω]

Load stability..... < ±0.01% of span / 100 Ω

**Sensor error detection:**


Programmable..... 3.5...23 mA

Namur NE43 Upscale ..... 23 mA

Namur NE43 Downscale..... 3.5 mA

Of span = Of the presently selected range

**EEx-approval: MBT 9110, 084Z7443:**

KEMA 04ATEX1339 .....		II 1 G Ex ia IIC T4 or T6 II 1 D Ex iaD
Max. amb. temperature for T4.....	85°C	
Max. amb. temperature for T6 .....	60°C	
ATEX, applicable in zone.....	0, 1, 2, 20, 21 or 22	
.. ATEX Installation Drawing No. ....	MBT 9110 - 084Z7443	

**Observed authority requirements:**

EMC 2004/108/EC

Emission and immunity.....

ATEX 94/9/EC .....

..

..

**Standard:**

EN 61326-1

EN 60079-0, EN 60079-11,

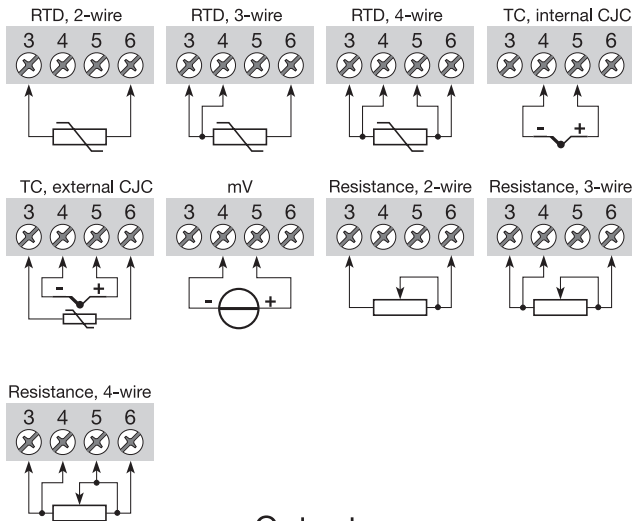
EN 60079-15, EN 60079-26,

EN 61241-0, EN 61241-11

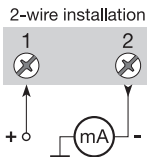


# Connections:

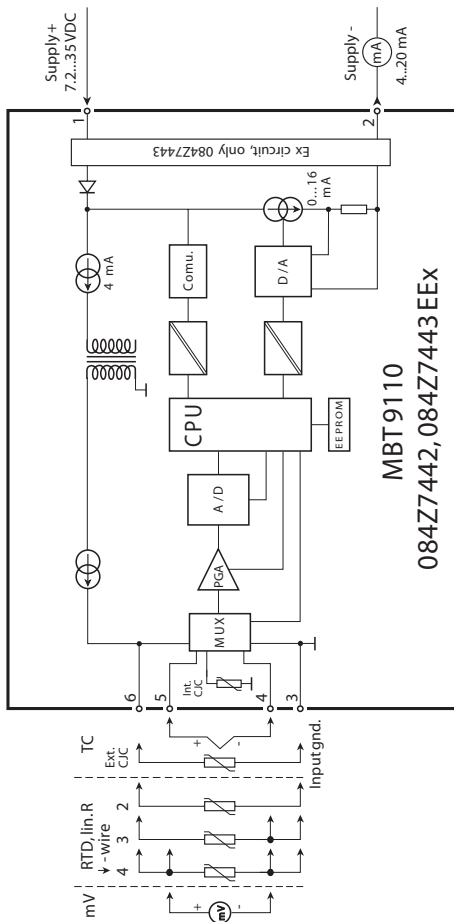
## Input:



## Output:



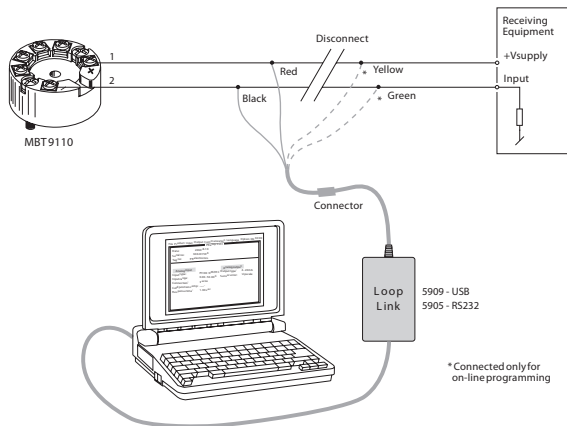
# BLOCK DIAGRAM:



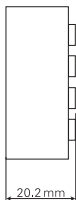
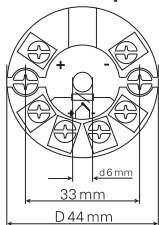
## Programming:

- Loop Link is a communications interface that is needed for programming MBT 9110.
- For programming please refer to the drawing below and the help functions in PReset.
- Loop link is not approved for communication with modules installed in hazardous (Ex) areas

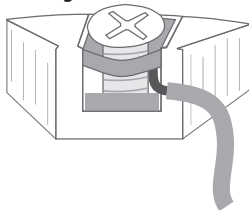
### Order: Loop Link



### Mechanical specifications:



### Mounting of sensor wires



Wires must be mounted between the metal plates.

# APPENDIX

## ATEX Installation drawing MBT 9110 - 084Z7443

ATEX Certificate      KEMA 04ATEX 1339

Marking



II 1 G Ex ia IIC T6..T4  
II 1 D Ex iaD

Standards

EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-26 : 2007,  
EN 61241-0 : 2006, EN 61241-11 : 2006

Hazardous area

Zone 0, 1, 2, 20, 21, 22

T4:  $-40 \leq T_a \leq 85^\circ\text{C}$

T6:  $-40 \leq T_a \leq 60^\circ\text{C}$

**Terminal: 3,4,5,6**

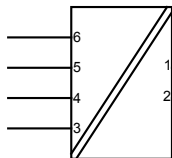
Uo: 9.6 VDC

Io: 25 mA

Po: 60 mW

Lo: 33 mH

Co: 2.4  $\mu\text{F}$



**Terminal: 1,2**

Ui: 30 VDC

Ii: 120 mA

Pi: 0.84 W

Li: 10  $\mu\text{H}$

Ci: 1.0nF

# Safety instructions

Installation notes.

For safe installation of MBT 9110 084Z 7443 the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

The sensor circuit is not infallibly galvanic isolated from the input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500Vac during 1 minute.

In a potentially explosive gas atmosphere, the transmitter shall be mounted in an enclosure in order to provide a degree of protection of at least IP20 according to EN60529.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment of category 1G and if the enclosure is made of aluminium, it must be installed such, that even in the event of rare incidents, ignition sources due to impact and friction, sparks are excluded; if the enclosure is made of non-metallic materials, electrostatic charging shall be avoided.

For installation in a potentially explosive dust atmosphere, the following instructions apply:

The transmitter shall be mounted in a metal enclosure form B according to DIN43729 that is providing a degree of protection of at least IP6X according to EN60529, that is suitable for the application and correctly installed.

Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For an ambient temperature  $\geq 60^{\circ}\text{C}$ , heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

The surface temperature of the enclosure is equal to the ambient temperature plus 20 K, for a dust layer with a thickness up to 5 mm.

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# TRANSMETTEUR 2-FILS UNIVERSEL (Pt100/TC)

**MBT 9110, 084Z7443**

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## EC DECLARATION OF CONFORMITY

As manufacturer

**Danfoss A/S  
Danfoss Industrial Automation  
DK-6430 Nordborg**

hereby declares that the following products:

**Type MBT 9110 084Z7441 and  
MBT 9110 084Z7443**

is in conformity with the following directives and standards:

The EMC Directive 2004/108/EC and later amendments  
**EN 61326-1 : 2006**

For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The ATEX Directive 94/9/EC and later amendments

**EN 60079-0 : 2006, EN 60079-11 : 2007  
EN 60079-15 : 2005 and EN 60079-26 : 2007  
EN 61241-0 : 2006 and EN 61241-11 : 2006  
ATEX certificate: KEMA 04ATEX1339 (MBT 9110 084Z7441  
and MBT 9110 084Z7443)**

Notified body

**KEMA Quality B.V. (0344)  
Utrechtsweg 310, 6812 AR Arnhem  
P.O. Box 5185, 6802 ED Arnhem  
The Netherlands**

Date: 2010-06-15

  
.....  
Quality Manager: Thomas Matzen



# TRANSMETTEUR 2-FILS UNIVERSEL (Pt100/TC) MBT 9110, 084Z7443

- *Entrée RTD, TC, Ohm ou mV*
- *Très grande précision de mesure*
- *Isolation galvanique de 1,5 kVAC*
- *Pour tête de sonde DIN B*

## **Application :**

- Mesure linéarisée de la température avec un capteur Pt100...Pt1000, Ni100...Ni1000 ou de thermocouples.
- Conversion d'une résistance linéaire en un signal courant standard analogique pour mesurer par exemple le niveau ou la position d'une vanne.
- Amplification d'un signal mV bipolaire en un signal courant standard de 4...20 mA.

## **Caractéristiques techniques :**

- Compensation de ligne pour des entrées RTD et résistance avec un raccordement à 2, 3 et 4 fils.
- Vérification continue des données sauvegardées.

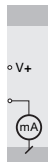
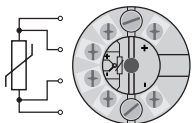
## **Montage / installation :**

- Pour tête de sonde DIN B. En zone non-dangereuse le MBT 9110, 084Z7443 peut être monté sur rail DIN avec un raccord spécial.

## APPLICATIONS

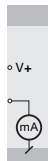
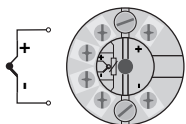
RTD en 4...20 mA

Installation 2-fils  
en salle de contrôle



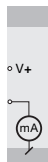
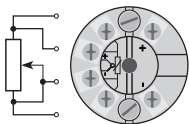
TC en 4...20 mA

Installation 2-fils  
en salle de contrôle



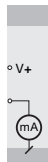
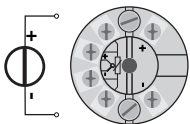
Résistance en 4...20 mA

Installation 2-fils  
en salle de contrôle



mV en 4...20 mA

Installation 2-fils  
en salle de contrôle



Type	Version	
MBT 9110	Isolation galvanique Isolation galvanique, EEx	084Z7442 084Z7443

## Spécifications électriques :

### Plage des spécifications :

-40°C à +85°C

### Spécifications communes :

Tension d'alimentation, cc

Isolation galvanique, MBT 9110, 084Z7442 7,2...35 V

Isolation galvanique, EEx, MBT 9110, 084Z7443 7,2...30 Vcc

Consommation interne..... 25 mW...0,8 W

Chute de tension..... 7,2 Vcc

Tension d'isolation, test / opération..... 1,5 kVca / 50 Vca

Temps de chauffe..... 5 min.

Kit de programmation..... Loop Link

Rapport signal / bruit..... Min. 60 dB

Temps de réponse (programmable)..... 1...60 s

Vérification de l'EEPROM..... < 3,5 s

Dynamique du signal d'entrée..... 20 bit

Dynamique du signal de sortie..... 16 bit

Température d'étalonnage..... 20...28°C

Précision, la plus grande des valeurs générales et de base :

Valeurs générales		
Type d'entrée	Précision absolue	Coefficient de température
Tous	$\leq \pm 0,05\%$ de l'EC	$\leq \pm 0,01\%$ de l'EC / °C

### Valeurs de base

Type d'entrée	Précision de base	Coefficient de température
RTD	$\leq \pm 0,2^{\circ}\text{C}$	$\leq \pm 0,01^{\circ}\text{C}/^{\circ}\text{C}$
R. lin.	$\leq \pm 0,1 \Omega$	$\leq \pm 10 \text{ m}\Omega/^{\circ}\text{C}$
Volt	$\leq \pm 10 \mu\text{V}$	$\leq \pm 1 \mu\text{V}/^{\circ}\text{C}$
Type TC : E, J, K, L, N, T, U	$\leq \pm 1^{\circ}\text{C}$	$\leq \pm 0,05^{\circ}\text{C}/^{\circ}\text{C}$
Type TC : B, R, S, W3, W5, LR	$\leq \pm 2^{\circ}\text{C}$	$\leq \pm 0,2^{\circ}\text{C}/^{\circ}\text{C}$

Immunité CEM.....  $< \pm 0,5\%$  de l'EC

Immunité CEM améliorée :

NAMUR NE 21, critère A, burst .....  $< \pm 1\%$  de l'EC

Effet d'une variation de

la tension d'alimentation .....  $< 0,005\%$  de l'EC / Vcc

Vibration ..... IEC 60068-2-6 Test FC

Lloyd, spécification no 1 ..... 4 g / 2...100 Hz

Taille max. des fils..... 1 x 1,5 mm<sup>2</sup> fil multibrins

Humidité.....  $< 95\%$  HR (sans cond.)

Dimensions.....  $\varnothing 44 \times 20,2 \text{ mm}$

Étanchéité (boîtier / bornier) ..... IP68 / IP00

Poids..... 50 g

#### Spécifications électriques, entrée :

##### Entrée RTD et entrée résistance linéaire :

Type	Valeur min.	Valeur max.	Plage min.	Standard
Pt100	-200°C	+850°C	25°C	IEC 60751
Ni100	-60°C	+250°C	25°C	DIN 43760
R lin.	0 $\Omega$	5000 $\Omega$	30 $\Omega$	-----

Décalage max. .... 50% de la valeur max. sélec.

Résistance de ligne max. par fils..... 5  $\Omega$

Courant de sonde..... Nom. 0,2 mA

Effet de la résistance de ligne (3 / 4 fils) .....  $< 0,002 \Omega/\Omega$

Détection de rupture sonde..... Oui

**Entrée TC :**

Type	Température min.	Température max.	Plage min.	Standard
B	+400°C	+1820°C	200°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	100°C	IEC584
R	-50°C	+1760°C	200°C	IEC584
S	-50°C	+1760°C	200°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	75°C	DIN 43710
W3	0°C	+2300°C	200°C	ASTM E988-90
W5	0°C	+2300°C	200°C	ASTM E988-90
LR	-200°C	+800°C	50°C	GOST 3044-84

Décalage max. .... 50% de la valeur max. sélec.

Compensation de soudure froide ..... < ±1,0°C

Détection de rupture de sonde ..... Oui

Courant de sonde :

Pendant la détection ..... Nom. 33 mA

Si non ..... 0 mA

**Entrée tension :**

Gamme de mesure ..... -12...800 mV

Plage de mesure min. .... 5 mV

Décalage max. .... 50% de la valeur max. sélec.

Résistance d'entrée ..... 10 MΩ

**Sortie :****Sortie courant :**

Gamme de mesure ..... 4...20 mA

Plage de mesure min. .... 16 mA

Temps de scrutation ..... 440 ms

Sortie en cas de corruption de l'EEPROM ..... ≤ 3,5 mA

Résistance de charge ..... ≤ (V<sub>alim.</sub> - 7,2) / 0,023 [Ω]

Stabilité de charge ..... < ±0,01% de l'EC / 100 Ω

**Détection de rupture de sonde :**


Programmable ..... 3,5...23 mA

NAMUR NE43 Haut d'échelle ..... 23 mA

NAMUR NE43 Bas d'échelle ..... 3,5 mA

**EC** = Echelle configurée

**Approbation EEx: MBT 9110, 084Z7443 :**

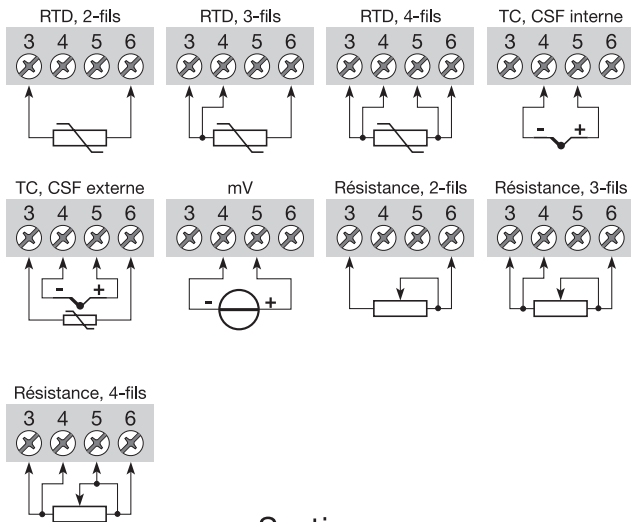
KEMA 04ATEX1339 .....		II 1 G Ex ia IIC T4 or T6 II 1 D Ex iaD
Température amb. max. (T4) .....	85°C	
Température amb. max. (T6) .....	60°C	
ATEX, applicable en zone .....	0, 1, 2, 20, 21 ou 22	
.. ATEX Installation Drawing No. ....	MBT 9110 - 084Z7443	

**Agréments et homologations :..... Standard:**

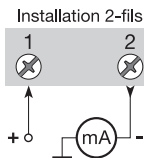
CEM (EMC) 2004/108/CE		
Emission et immunité.....	EN 61326-1	
ATEX 94/9/CE .....	EN 60079-0, EN 60079-11,	
..	EN 60079-15, EN 60079-26,	
..	EN 61241-0, EN 61241-11	

# Connexions :

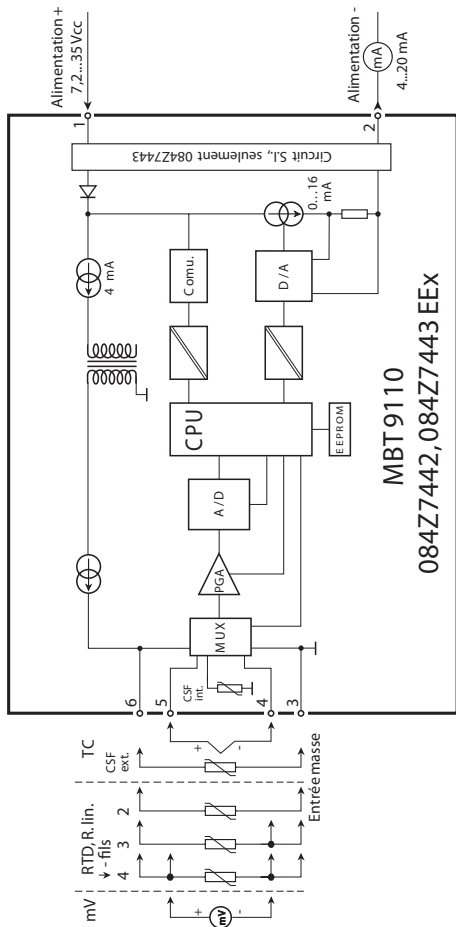
## Entrée :



## Sortie :



## SCHEMA DE PRINCIPE :

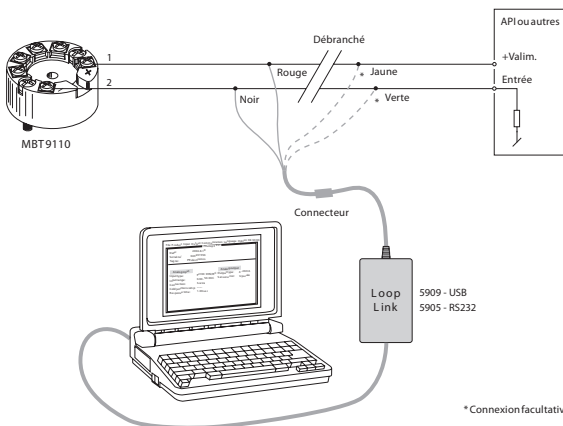




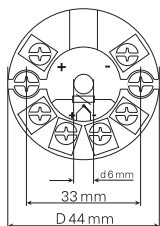
## Programmation :

- Loop Link est un kit de programmation permettant de programmer le MBT 9110.
- Pour le raccordement du Loop Link, veuillez vous reporter au schéma ci-dessous et à l'aide en ligne du logiciel PReset.
- Loop Link ne doit pas être utilisé pour communication avec des modules installés en zone dangereuse.

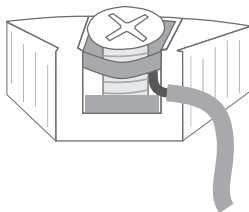
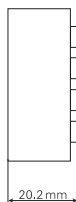
### Numéro de référence : Loop Link



### Dimensions mécaniques :



### Montage des fils du capteur



Les fils doivent être montés entre les plaques métalliques.

# APPENDIX

## ATEX Installation drawing MBT 9110 - 084Z7443

ATEX Certificate      KEMA 04ATEX 1339

Marking



II 1 G Ex ia IIC T6..T4  
II 1 D Ex iaD

Standards

EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-26 : 2007,  
EN 61241-0 : 2006, EN 61241-11 : 2006

Hazardous area

Zone 0, 1, 2, 20, 21, 22

T4:  $-40 \leq T_a \leq 85^{\circ}\text{C}$

T6:  $-40 \leq T_a \leq 60^{\circ}\text{C}$

**Terminal: 3,4,5,6**

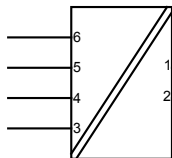
Uo: 9.6 VDC

Io: 25 mA

Po: 60 mW

Lo: 33 mH

Co: 2.4  $\mu\text{F}$



**Terminal: 1,2**

Ui: 30 VDC

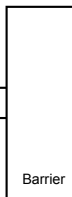
Ii: 120 mA

Pi: 0.84 W

Li: 10  $\mu\text{H}$

Ci: 1.0nF

Non Hazardous Area



# Consigne de sécurité

Notes concernant l'installation :

Pour l'installation sûre du MBT 9110 084Z 7443, il convient de suivre les instructions suivantes. Le module ne doit être installé que par du personnel qualifié connaissant la législation nationale et internationale ainsi que les directives et normes régissant ce domaine.

L'année de production est indiquée par les deux premiers chiffres du numéro de série.

L'isolation galvanique entre le circuit du capteur et le circuit d'entrée n'est pas infaillible. Cependant, l'isolation galvanique entre les circuits est capable de résister à une tension de test de 500 V CA pendant 1 minute.

Dans les atmosphères gazeuses potentiellement explosives, le transmetteur doit être monté dans un boîtier afin de garantir un degré de protection d'au moins IP20 conformément à la norme EN 60529.

Si le transmetteur est installé dans une atmosphère explosive nécessitant l'usage d'un équipement de catégorie 1G et si le boîtier est en aluminium, il doit être monté d'une telle manière que, même dans le cas d'incidents rares, les sources d'inflammation dues aux impacts et à la friction, et les étincelles ne puissent se produire. Si le boîtier est construit dans des matériaux non métalliques, la charge électrostatique doit être évitée.

Pour l'installation dans des atmosphères poussiéreuses potentiellement explosives, les instructions suivantes s'appliquent :

Le transmetteur doit être monté dans un boîtier métallique de forme B conformément à DIN 43729 assurant un degré de protection d'au moins IP6X conformément à la norme EN 60529. Ce boîtier doit convenir à l'application et il doit être correctement installé.

Seuls des entrées de câble et des bouchons convenant à l'application et correctement installés doivent être utilisés.

Pour une température ambiante  $\geq 60$  °C, il faut utiliser des câbles résistant aux températures élevées avec une capacité nominale d'au moins 20 K au-dessus de la température ambiante.

La température de surface du boîtier est égale à la température ambiante plus 20 K, pour une couche de poussière d'une épaisseur de 5 mm.

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# 2-DRAHT UNIVERSALMESSUMFORMER

**MBT 9110, 084Z7443**

## **Inhaltsverzeichnis**

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## EC DECLARATION OF CONFORMITY

As manufacturer

**Danfoss A/S  
Danfoss Industrial Automation  
DK-6430 Nordborg**

hereby declares that the following products:

**Type MBT 9110 084Z7441 and  
MBT 9110 084Z7443**

is in conformity with the following directives and standards:

The EMC Directive 2004/108/EC and later amendments  
**EN 61326-1 : 2006**

For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The ATEX Directive 94/9/EC and later amendments

**EN 60079-0 : 2006, EN 60079-11 : 2007  
EN 60079-15 : 2005 and EN 60079-26 : 2007  
EN 61241-0 : 2006 and EN 61241-11 : 2006  
ATEX certificate: KEMA 04ATEX1339 (MBT 9110 084Z7441  
and MBT 9110 084Z7443)**

Notified body

**KEMA Quality B.V. (0344)  
Utrechtsweg 310, 6812 AR Arnhem  
P.O. Box 5185, 6802 ED Arnhem  
The Netherlands**

Date: 2010-06-15

  
.....  
Quality Manager: Thomas Matzen

## **2-DRAHT UNIVERSALMESSUMFORMER MBT 9110, 084Z7443**

- *Eingang für WTH, TE,  $\Omega$  oder mV*
- *Extreme Messgenauigkeit*
- *1,5 kVAC mit galvanische Trennung*
- *Für Einbau in Anschlusskopf DIN Form B*

### **Verwendung:**

- Linearisierte Temperaturmessung mit Pt100...Pt1000, Ni100...Ni1000 oder Thermoelementsensoren.
- Umwandlung von linearer Widerstandsänderung in ein analoges Standard-Stromsignal, z.B. von Ventilen oder Niveau-Messwertgeber.
- Verstärkung von bipolaren mV-Signalen zu einem Standard 4...20 mA Stromsignal.

### **Technische Merkmale:**

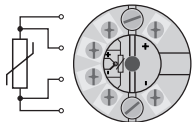
- Der WTH- und Widerstandseingang haben Leitungskompensation bei 2-, 3- oder 4-Leiter-Anschluss.
- Die gespeicherten Daten werden laufend kontrolliert.

### **Montage / Installation:**

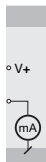
- Für DIN Form B Sensorkopf Montage. Im sicheren Bereich kann der MBT 9110, 084Z7443 auf einer DIN-Schiene mittels eines speziellen Beschlages.

## ANWENDUNGEN

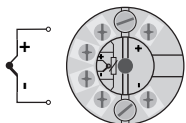
WTH in 4...20 mA



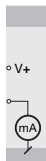
2-Draht-Installation  
im Kontrollraum



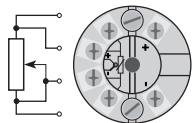
TE in 4...20 mA



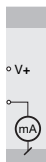
2-Draht-Installation  
im Kontrollraum



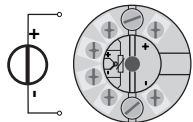
Widerstand in 4...20 mA



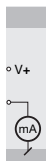
2-Draht-Installation  
im Kontrollraum



mV in 4...20 mA



2-Draht-Installation  
im Kontrollraum





Type	Version	
MBT 9110	Galvanische Isolation Galvanische Isolation, EEx	084Z7442 084Z7443

## Elektrische Daten:

### Spezifikationsbereich:

-40°C bis +85°C

### Allgemeine Daten:

Versorgungsspannung, DC

Galvanische Isolation MBT 9110, 084Z7442 7,2...35 V

Galvanische Isolation, EEx, MBT 9110, 084Z7443 7,2...30 VDC

Eigenverbrauch..... 25 mW...0,8 W

Spannungsabfall..... 7,2 VDC

Isolationsspannung, Test / Betrieb..... 1,5 kVAC / 50 VAC

Aufwärmzeit..... 5 Min.

Kommunikationsschnittstelle..... Loop Link

Signal- / Rauschverhältnis..... Min. 60 dB

Ansprechzeit (programmierbar)..... 1...60 s

EEPROM Fehlerkontrolle ..... < 3,5 s

Signaldynamik, Eingang..... 20 bit

Signaldynamik, Ausgang..... 16 bit

Kalibrierungstemperatur..... 20...28 °C

Genauigkeit, höherer Wert von allgemeinen und Grundwerten:

Allgemeine Werte		
Eingangsart	Absolute Genauigkeit	Temperaturkoeffizient
Alle	≤ ±0,05% d. Messsp.	≤ ±0,01% d. Messsp./°C

Grundwerte		
Eingangsart	Grund-Genauigkeit	Temperaturkoeffizient
WTH	$\leq \pm 0,2^\circ\text{C}$	$\leq \pm 0,01^\circ\text{C}/^\circ\text{C}$
Lin. R	$\leq \pm 0,1 \Omega$	$\leq \pm 10 \text{ m}\Omega/^\circ\text{C}$
Volt	$\leq \pm 10 \mu\text{V}$	$\leq \pm 1 \mu\text{V}/^\circ\text{C}$
TE-Typ: E, J, K, L, N, T, U	$\leq \pm 1^\circ\text{C}$	$\leq \pm 0,05^\circ\text{C}/^\circ\text{C}$
TE-Typ: B, R, S, W3, W5, LR	$\leq \pm 2^\circ\text{C}$	$\leq \pm 0,2^\circ\text{C}/^\circ\text{C}$

EMV-Immunitätswirkung .....	$< \pm 0,5\%$ d. Messsp.
Erweiterte EMV-Immunität:	
NAMUR NE 21, A Kriterium, Burst .....	$< \pm 1\%$ d. Messsp.

Einfluss von Änderung der Versorgungsspannung.....	$< 0,005\%$ d. Messsp. / VDC
Vibration .....	IEC 60068-2-6 Test FC
Lloyd's Spezifikation Nr. 1 .....	4 g / 2...100 Hz
Max. Leitungsquerschnitt .....	1 x 1,5 mm <sup>2</sup> Litzendraht
Luftfeuchtigkeit.....	$< 95\%$ RF (nicht kond.)
Maß .....	$\varnothing 44 \times 20,2 \text{ mm}$
Schutzart (Gehäuse / Anschluss).....	IP68 / IP00
Gewicht.....	50 g

### Elektrische Daten, Eingang:

#### WTH- und Linearer Widerstandseingang:

WTH-Typ	Min. Wert	Max. Wert	Min. Spanne	Norm
Pt100	-200°C	+850°C	25°C	IEC 60751
Ni100	-60°C	+250°C	25°C	DIN 43760
Lin. R	0 $\Omega$	5000 $\Omega$	30 $\Omega$	-----

Max. Nullpunktverschiebung (Offset).....	50% des gewählten Maximalwertes
Leitungswiderstand pro Leiter (max.).....	5 $\Omega$
Sensorstrom .....	Nom. 0,2 mA
Wirkung des Fühlerkabelwiderstandes (3- / 4-Leiter).....	
	$< 0,002 \Omega / \Omega$
Fühlerfehlererkennung .....	Ja

**TE-Eingang:**

Typ	Min. Temperatur	Max. Temperatur	Min. Spanne	Norm
B	+400°C	+1820°C	200°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	100°C	IEC584
R	-50°C	+1760°C	200°C	IEC584
S	-50°C	+1760°C	200°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	75°C	DIN 43710
W3	0°C	+2300°C	200°C	ASTM E988-90
W5	0°C	+2300°C	200°C	ASTM E988-90
LR	-200°C	+800°C	50°C	GOST 3044-84

Max. Nullpunktverschiebung (Offset)..... 50% des gewählten Maximalwertes

Vergleichstellenkompensation (CJC) ..... < ±1,0°C

Fühlerfehlererkennung ..... Ja

Fühlerfehlerstrom:

Bei Erkennung ..... Nom. 33 mA

Sonst ..... 0 mA

**Spannungseingang:**

Messbereich ..... -12...800 mV

Min. Messbereich (Spanne) ..... 5 mV

Max. Nullpunktverschiebung (Offset)..... 50% des gewählten Maximalwertes

Eingangswiderstand ..... 10 MΩ

**Ausgang:****Stromausgang:**

Signalbereich ..... 4...20 mA

Min. Signalbereich ..... 16 mA

Aktualisierungszeit ..... 440 ms

Ausgangssignal bei EEPROMfehler ..... ≤ 3,5 mA

Belastungswiderstand ..... ≤ (U<sub>Versorg.</sub> - 7,2) / 0,023 [Ω]

Belastungsstabilität ..... < ±0,01% d. Messsp. / 100 Ω

**Sensorfehlanzeige:**


Programmierbar ..... 3,5...23 mA

NAMUR NE43 aufsteuernd ..... 23 mA

NAMUR NE43 zusteuernd ..... 3,5 mA

**d. Messspanne** = der gewählten Messspanne

**EEx-Zulassungen: MBT 9110, 084Z7443:**

KEMA 04ATEX1339 .....		II 1 G Ex ia IIC T4 or T6 II 1 D Ex iaD
Max. Umgebungstemp. für T4.....		85°C
Max. Umgebungstemp. für T6.....		60°C
ATEX, für Anwendung in Zone .....		0, 1, 2, 20, 21 oder 22
.. ATEX Installation Drawing No. ....		MBT 9110 - 084Z7443

**Eingehaltene Richtlinien:**

EMV 2004/108/EG

Emission und Immunität.....

ATEX 94/9/EC .....

..

..

**Norm:**

EN 61326-1

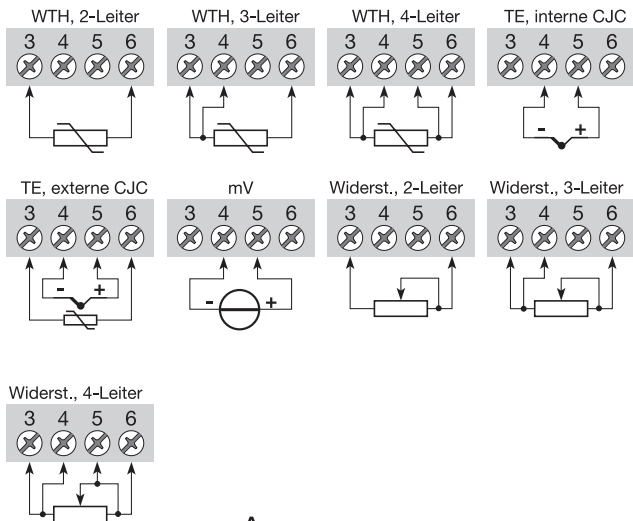
EN 60079-0, EN 60079-11,

EN 60079-15, EN 60079-26,

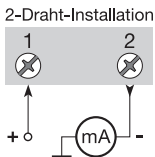
EN 61241-0, EN 61241-11

# Anschlüsse:

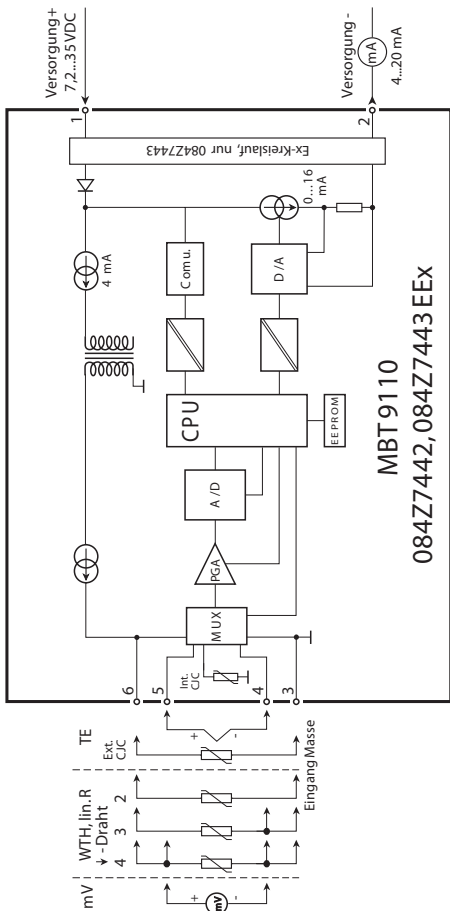
## Eingang:



## Ausgang:



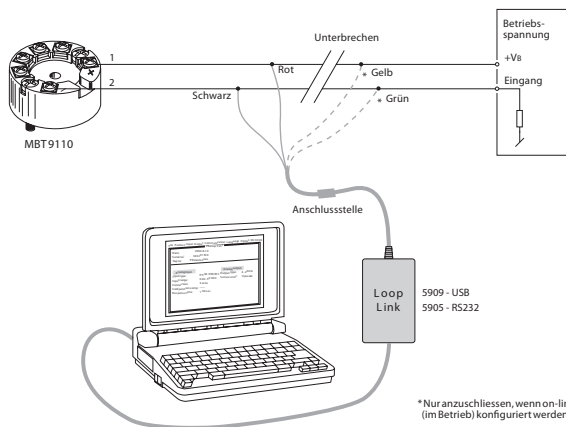
# BLOCKDIAGRAMM:



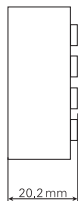
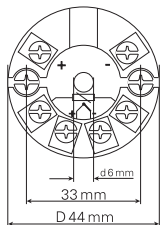
## Programmierung:

- Loop Link ist eine batteriegespeiste Schnittstelle zur Programmierung des MBT 9110
- Bezüglich Programmierung verweisen wir auf die nachfolgende Zeichnung und die "Hilfe"-Funktion im PReset-Programm.
- Loop Link darf nicht zur Kommunikation mit Modulen, die in Ex-gefährdeten Bereichen installiert sind, benutzt werden.

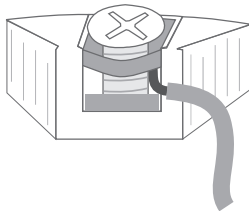
### Bestellangabe: Loop Link



### Abmessungen:



### Montage von Fühlerleitungen:



Die Leitungen müssen zwischen den Metallplatten montiert werden.

# APPENDIX

## ATEX Installation drawing MBT 9110 - 084Z7443

ATEX Certificate      KEMA 04ATEX 1339

Marking



II 1 G Ex ia IIC T6..T4  
II 1 D Ex iaD

Standards

EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-26 : 2007,  
EN 61241-0 : 2006, EN 61241-11 : 2006

Hazardous area

Zone 0, 1, 2, 20, 21, 22

T4:  $-40 \leq T_a \leq 85^\circ\text{C}$

T6:  $-40 \leq T_a \leq 60^\circ\text{C}$

**Terminal: 3,4,5,6**

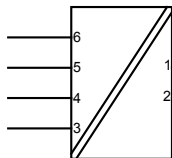
Uo: 9.6 VDC

Io: 25 mA

Po: 60 mW

Lo: 33 mH

Co: 2.4  $\mu\text{F}$



**Terminal: 1,2**

Ui: 30 VDC

Ii: 120 mA

Pi: 0.84 W

Li: 10  $\mu\text{H}$

Ci: 1.0nF



# Sicherheitsinstruktion

Installationshinweise.

Um den MBT 9110 084Z 7443 sicher zu installieren, sind die folgenden Hinweise zu beachten. Das Modul ist von qualifizierten Technikern mit Kenntnissen über einschlägigen nationalen und internationalen Gesetzen, Richtlinien und Standards zu installieren.

Das Baujahr entnehmen Sie den ersten beiden Ziffern der Seriennummer.

Der Sensorkreis ist vom Eingangskreis nicht unfehlbar galvanisch getrennt. Die galvanische Trennung zwischen den beiden Kreisen kann jedoch eine Minute lang einer Prüfspannung von 500 V AC standhalten.

In explosionsfähigen Gasatmosphären ist der Messumformer in ein Gehäuse einzubauen, um mindestens die Schutzart IP20 gemäß EN 60529 zu gewährleisten.

Bei Installation des Messumformers in einer explosionsfähigen Atmosphäre, in der Geräte der Kategorie 1G erforderlich sind, und wenn das Gehäuse aus Aluminium hergestellt ist, muss der Messumformer so installiert werden, dass selbst bei seltenen Ereignissen – Zündquellen durch Schlägen oder Reibung – keine Funken auftreten können. Bei einem Gehäuse aus einem nichtmetallischen Material sind elektrostatische Aufladungen zu vermeiden.

Bei Installation in einer explosionsfähigen Staubatmosphäre sind folgende Anweisungen zu beachten:

Der Messumformer ist in ein Metallgehäuse nach DIN 43729 Form B einzubauen, wobei mindestens die Schutzart IP6X gemäß EN 60529 gewährleistet werden soll. Das Gehäuse muss für die Anwendung geeignet sein und ordnungsgemäß installiert werden.

Es sind Kabeleinführungen und Blindstopfen zu verwenden und ordnungsgemäß zu installieren, die für die Anwendung geeignet sind.

Bei Umgebungstemperaturen von  $\geq 60^{\circ}\text{C}$  sind hitzebeständige Kabel mit einem Rating von mindestens 20 K über der Umgebungstemperatur zu verlegen.

Die Oberflächentemperatur des Gehäuses entspricht bei einer Staubschicht von 5 mm der Umgebungstemperatur plus 20K.

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Danfoss Industrial Automation  
DK 6430 Nordborg Denmark  
Phone +45 7488 2222





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