

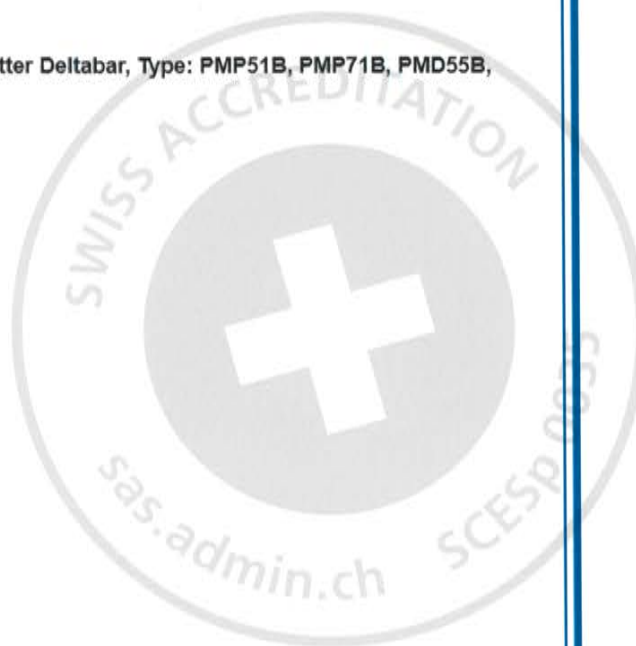


IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEX Scheme visit www.iecex.com

Certificate No.:	IECEX SEV 20.0009X	Page 1 of 4	<u>Certificate history:</u>
Status:	Current	Issue No: 3	Issue 2 (2022-06-14)
Date of Issue:	2023-09-15		Issue 1 (2020-08-03)
Applicant:	Endress+Hauser SE+Co. KG Hauptstraße 1 79689 Maulburg Germany		Issue 0 (2020-07-03)
Equipment:	Pressure transmitter Cerabar Differential pressure transmitter Deltabar, Type: PMP51B, PMP71B, PMD55B, PMD75B, PMD78B, PMC51B, PMC71B		
Optional accessory:			
Type of Protection:	ec, ia		
Marking:	Refer to marking at description of product		



Approved for issue on behalf of the IECEX
Certification Body:

Munira Gamma

Position:

Manager Product Certification

Signature:
(for printed version)

M. Gamma

Date:
(for printed version)

2023-09-15

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Switzerland



E&E



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Manufacturer: **Endress+Hauser SE+Co. KG**
Hauptstraße 1
79689 Maulburg
Germany

Manufacturing locations: **This equipment may be manufactured at any Endress + Hauser facility, listed on the current QAR DE/TUN/ QAR06.0003/09, that has been audited for the manufacture of the type of product and Ex protection listed on this certificate. Germany**

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2023 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:7.0

IEC 60079-26:2021 Explosive atmospheres - Part 26: Equipment with Separation Elements or combined Levels of Protection
Edition:4.0

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

IEC TS 60079-40:2015 Explosive atmospheres - Part 40: Requirements for process sealing between flammable process fluids
Edition:1.0

IEC TS 60079-47:2021 Explosive atmospheres – Part 47: Equipment protection by 2-wire intrinsically safe Ethernet concept (2-WISE)
Edition:1.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

CH/SEV/ExTR19.0044/05
NL/DEK/ExTR23.0022/00

CH/SEV/ExTR20.0002/01

CH/SEV/ExTR20.0012/02

Quality Assessment Report:

DE/TUN/QAR06.0003/10





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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Pressure transmitter Cerabar
Differential pressure transmitter Deltabar
Types: PMP51B, PMP71B, PMD55B, PMD75B, PMD78B, PMC51B, PMC71B

Rating:

Type of protection ia:

For MA10: 4..20 mA (HART):

$U_i \leq 30 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1 \text{ W}$, $C_i \leq 10 \text{ nF}$, $L_i = 0$

For MA11: Profibus PA, Foundation Fieldbus:

FISCO: $U_i \leq 17,5 \text{ V DC}$, $I_i \leq 380 \text{ mA}$, $P_i \leq 5,32 \text{ W}$, $C_i \leq 5 \text{ nF}$, $L_i = 0$

Entity: $U_i \leq 24 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1,2 \text{ W}$, $C_i \leq 5 \text{ nF}$, $L_i = 0$

For MA12: Ethernet APL:

2-WISE: $U_i \leq 17,5 \text{ V DC}$, $I_i \leq 380 \text{ mA}$, $P_i \leq 5,32 \text{ W}$, $C_i \leq 5 \text{ nF}$, $L_i = 0$

Entity: $U_i \leq 17,5 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1,2 \text{ W}$, $C_i \leq 5 \text{ nF}$, $L_i = 0$

For MA13: 4..20 mA HART + 4..20 mA:

Channel 1, 4..20 mA HART: $U_i \leq 30 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1 \text{ W}$, $C_i \leq 10 \text{ nF}$, $L_i = 0$

Channel 2, 4..20 mA: $U_i \leq 30 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1 \text{ W}$, $C_i \leq 10 \text{ nF}$, $L_i = 0$

For MA14: 4..20 mA HART + switch:

Channel 1, 4..20 mA HART: $U_i \leq 30 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1 \text{ W}$, $C_i \leq 10 \text{ nF}$, $L_i = 0$

Channel 2, switch output: $U_i \leq 30 \text{ V DC}$, $I_i \leq 300 \text{ mA}$, $P_i \leq 1 \text{ W}$, $C_i \leq 10 \text{ nF}$, $L_i = 0$

Type of protection ec:

For MA10: 4..20 mA (HART):

$U \leq 35 \text{ V DC}$, $P \leq 1 \text{ W}$

For MA11: Profibus PA, Foundation Fieldbus:

$U \leq 32 \text{ V DC}$, $P \leq 0.7 \text{ W}$

For MA12: Ethernet APL:

$U \leq 15 \text{ V DC}$, $P \leq 0.7 \text{ W}$

For MA13: 4..20 mA HART + 4..20 mA:

$U \leq 35 \text{ V DC}$, $P \leq 1 \text{ W}$

For MA14: 4..20 mA HART + switch output:

$U \leq 35 \text{ V DC}$, $P \leq 1 \text{ W}$

Classification of installation and use:

Fixed

Ingress protection:

IP 66 / IP67 / IP68

Rated ambient temperature range (°C):

Refer to Temperature classification at general product information for details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. For EPL Ga enclosures made of aluminium must be installed protected from impact and friction.
2. To avoid electrostatic charging: Do not rub surfaces with a dry cloth.





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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Addition of following:

- 2-channel electronic (4..20mA HART + 4..20 mA) MA13
- 2-channel electronic (4..20 mA HART + switch output) MA14
- two channel terminals
- standard updates IEC 60079-11: 2023, IEC 60079-26: 2021
- plastic enclosure HP07
- removal of gas/dust, dust/gas options
- reference IEC TS 60079-40: 2015, single seal test
- minor corrections

Annex:

[IECEX 20.0009X Annexe Issue3.pdf](#)



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Applicant Name: Endress+Hauser SE+Co. KG
Hauptstrasse 1, 79689 Maulburg, GERMANY
Electrical Apparatus: Pressure transmitter Cerabar
Differential pressure transmitter Deltabar
Temperature classification for intrinsic safety gas application:
Cerabar PMP51B, PMP71B (sensor SP11B)

Process connection type		Enclosure type and electronic insert		
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -50°C ¹⁾		Ambient Tamin: -20°C
	Process temperature ¹⁾ Tp max (°C)	MA12 ambient Tamin : -40°C Ambient temperature Ta max (°C)		
T6	80	45	40	Not suitable
	70	50	45	40
	60	50	45	45
T4	125	50	45	Not suitable
	100	55	50	45
	80	60	55	45
	70	65	55	50
Process connection type		Enclosure type and electronic insert		
High temperature		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -50°C ¹⁾		Ambient Tamin: -20°C
	Process temperature ¹⁾ Tp max (°C)	MA12 ambient Tamin : -40°C Ambient temperature Ta max (°C)		
T6	80	60	55	45
T4	130	70	60	55
T3	190	60	60	50
T2	290	60	55	45
T1	300	60	55	45
T1	400	55	50	Not suitable

Process connection type		Enclosure type and electronic insert		
Temperature decoupled, capillary remote		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -50°C ²⁾		Ambient Tamin: -20°C
	Process temperature ¹⁾ Tp max (°C)	MA12 ambient Tamin : -40°C Ambient temperature Ta max (°C)		
T6	80	60	55	60
T4	130	70	60	70
T3	190	70	60	70
T2	290	70	60	70
T1	400	70	60	70

¹⁾ T_{pmax}: process connection with temperature decoupling are suitable for higher process temperatures; Ta values must be fulfilled for device enclosure and sensor element

²⁾ T_{amin} : for metal housings: for versions with low temperature potting possible lower ambient temperature decreases to -52°C (order code option 580 = "JN"); functional limitations (e.g. by fill oil) are obvious and must be considered

 T_{pmin} : Minimum process temperature same as Ta min; process connection with temperature decoupling are suitable for lower temperatures; Ta values must be fulfilled for device enclosure and sensor element

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Cerabar PMC51B, PMC71B (sensor SP13B)

Process connection type		Enclosure type and electronic insert		
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾	Ambient Ta min: -40°C		Ambient Tamin: -20°C
	Tp max (°C)	Ambient temperature Ta max (°C)		
T6	80	45	40	Not suitable
	40	50	45	40
T4	125	50	40	Not suitable
	100	55	50	Not suitable
	80	60	50	40
	60	60	55	45

Process connection type		Enclosure type and electronic insert		
High temperature		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾	Ambient Ta min: -40°C		Ambient Tamin: -20°C
	Tp max (°C)	Ambient temperature Ta max		
T6	80	50	45	Not suitable
T6	60	50	45	40
T3...T1	150	50	40	Not suitable
T4	125	55	50	Not suitable
T4	100	60	50	40

¹⁾ Minimum process temperature T_{pmin} is limited to -40°C due to functional reasons

Deltabar PMD55B, PMD75B (sensor SP12B)

Process connection type		Enclosure type and electronic insert		
Compact		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -50°C ²⁾		Ambient Tamin: -20°C
	Tp max (°C)	MA12 ambient Tamin : -40°C		
T6	80	45	40	Not suitable
	70	45	45	Not suitable
	60	45	45	40
T4	60	65	55	55
	85	60	50	45
	100	60	50	45

¹⁾ process temperature at membrane

²⁾ Tamin : for metal housings: for versions with low temperature potting possible lower ambient temperature decreases to -52°C (order code option 580 = "JN"); functional limitations (e.g. by fill oil) are obvious and must be considered

Deltabar PMD78B (sensor SP12B)

Process connection type		Enclosure type and electronic insert		
High temperature, temperature decoupled, capillary remote		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14	c) plastic enclosure; MA10, MA11, MA12
Temperature class	Process temperature ¹⁾ Tp max (°C)	MA10, MA11 ambient Ta min: -50°C ¹⁾ MA12 ambient Tamin : -40°C		Ambient Tamin: -20°C
		Ambient temperature Ta max (°C)		
T6	80	50	55	40
T4	130	70	60	70
T3	190	70	60	70
T2	290	70	60	70
T1	400	70	60	70

¹⁾ Tpmax: process connection with temperature decoupling are suitable for higher process temperatures; Ta values must be fulfilled for device enclosure and sensor element

²⁾ Tamin : for metal housings: for versions with low temperature potting possible lower ambient temperature decreases to

-52°C (order code option 580 = "JN"); functional limitations (e.g. by fill oil) are obvious and must be considered

Tpmin : Minimum process temperature same as Ta min; process connection with temperature decoupling are suitable for lower temperatures; Ta values must be fulfilled for device enclosure and sensor element

Separated housing; valid for all sensor modules

Process connection type		Enclosure type and electronic insert	
All types		d) all enclosures; MA10, MA11, MA12	d) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾ Tp max (°C)	Ambient Tamin : -20°C	
		Ambient temperature Ta max (°C)	
T6	80	60	55
T4	100	60	55

¹⁾Tpmin : Minimum process temperature same as Ta min

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Temperature classification for intrinsic safety dust application:
Cerabar PMP51B, PMP71B (sensor SP11B)

Process connection type		Enclosure type and electronic insert	
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11 ambient Ta min: -50°C 2)	
		MA12 ambient Tamin : -40°C	
		Ambient temperature Ta max (°C)	
T125°C	125	50	45
	100	55	50
	80	60	55
	70	65	55

Process connection type		Enclosure type and electronic insert	
Temperature decoupled		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11 ambient Ta min: -50°C 2)	
		MA12 ambient Tamin : -40°C	
		Ambient temperature Ta max (°C)	
T125°C	130	70	60
	190	60	60
	290	60	55
	300	60	55
	400	55	50

Process connection type		Enclosure type and electronic insert	
Capillary remote		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11 ambient Ta min: -50°C 2)	
		MA12 ambient Tamin : -40°C	
		Ambient temperature Ta max (°C)	
T125°C	130	70	70
	190	70	70
	290	70	70
	300	70	70
	400	70	70

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Cerabar PMC51B, PMC71B:

Process connection type		Enclosure type and electronic insert	
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11, MA12 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T135°C	125	50	45
	100	55	50
	80	60	55
	60	60	55

Process connection type		Enclosure type and electronic insert	
Temperature decoupled		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11, MA12 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T150°C	150	50	45
	125	55	50
	100	60	50

1) the surface temperature only depends on the applied process temperature. The influence of self-heating to the process side is < 2K and negligible. Functional limitations depend on the process connection and are provided by the manufacturer documentation.

2) Minimum process temperature T_{pmin} is limited to -40°C due to functional reasons

Deltabar PMD55B, PMD75B (sensor SP12B)

Process connection type		Enclosure type and electronic insert	
Compact		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11, MA12 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T100°C	60	65	60
	85	60	55
	100	60	55

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Deltabar PMD78B (sensor SP12B)

Process connection type		Enclosure type and electronic insert	
Temperature decoupled, capillary remote		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Max. surface temperature 1) EPL Da and EPL Db part	Process temperature 2) Tp max (°C)	MA10, MA11, MA12 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T100°C	130	70	70
	190	70	70
	290	70	70
	400	70	70

- 1) the surface temperature only depends on the applied process temperature. The self-heating is < 2K and negligible. Functional limitations depend on the process connection and are provided by the manufacturer documentation. The marked surface temperature considers all direct heat influences from process heat and self-heating at the apparatus housing. Surface temperatures at process side, e.g. at high temperature process connections at FMD78B maybe higher and must be considered by the user. T marking is based on the process temperature of the compact designs.
- 2) the lower ambient and process temperature decreases to -50°C (order code option 580 = "JL"), when suitable sealing's relevant for the dust tightness of the enclosure as listed in IECExTR NL/KIWA/ExTR19.0026/xx are used. T_{pmin} : Minimum process temperature same as Ta min; process connection with temperature decoupling are suitable for lower temperatures; Ta values must be fulfilled for device enclosure and sensor element

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Temperature classification for increased safety
Cerabar PMP51B, PMP71B (sensor SP11B)

Process connection type		Enclosure type and electronic insert	
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -40°C	
	Tp max (°C)	Ambient temperature Ta max (°C)	
T6	80	55	50
	60	65	50
T4	125	50	45
	100	55	50
	80	65	55

Process connection type		Enclosure type and electronic insert	
High temperature		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -40°C	
	Tp max (°C)	Ambient temperature Ta max (°C)	
T6	80	65	60
T4	130	70	55
T3	190	60	55
T2	290	60	50
T1	300	60	50
T1	400	55	45

Process connection type		Enclosure type and electronic insert	
Temperature decoupled, capillary remote		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -40°C	
	Tp max (°C)	Ambient temperature Ta max (°C)	
T6	80	70	65
T4	130	70	65
T3	190	70	65
T2	290	70	65
T1	400	70	65

¹⁾ T_pmax: process connection with temperature decoupling are suitable for higher process temperatures; T_a values must be fulfilled for device enclosure and sensor element.

T_pmin : Minimum process temperature same as T_a min; process connection with temperature decoupling are suitable for lower temperatures; T_a values must be fulfilled for device enclosure and sensor element

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Cerabar PMC51B, PMC71B (sensor SP13B)

Process connection type		Enclosure type and electronic insert	
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾ Tp max (°C)	MA10, MA11 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T6	80	55	45
T4	125	50	40
	100	55	50
	80	60	50

Process connection type		Enclosure type and electronic insert	
High temperature		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾ Tp max (°C)	MA10, MA11 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T6	80	60	45
T4	125	55	50
T3	150	50	40

Deltabar PMD55B, PMD75B (sensor SP12B)

Process connection type		Enclosure type and electronic insert	
Compact, flanges		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾ Tp max (°C)	MA10, MA11 ambient Ta min: -40°C	
		Ambient temperature Ta max (°C)	
T6	80	55	50
T4	100	60	50
	85	60	55

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Deltabar PMD78B (sensor SP12B)

Process connection type		Enclosure type and electronic insert	
High temperature, capillary remote		a) Al and casted SS enclosure; MA10, MA11, MA12	b) 2-chamber Al and casted SS enclosure; MA13, MA14
Temperature class	Process temperature ¹⁾	MA10, MA11 ambient Ta min: -40°C	
	Tp max (°C)	Ambient temperature Ta max (°C)	
T6	80	70	65
T4	130	70	70
T3	190	70	70
T2	290	70	70
T1	300	70	70
T1	400	70	70

¹⁾ the lower ambient and process temperature decreases to -50°C (order code option 580 = "JL"), when suitable sealing's relevant for the tightness of the enclosure as listed in IECExTR NL/KIWA/ExTR19.0026/xx are used.

For PMD78B high process temperatures are possible. The suitability is depending on the temperature decoupling of the process connection and the used fill oil. Versions with temperature isolator reduces the temperature influence from process side, while the heat conduction at capillary connections is negligible (selection at model code option i=95; see dwg 961003899).

The lower temperature is limited to -40°C due to functional reasons.

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Marking:

The following marking strings are possible for all types and in combination with each other.

Ex ia IIC T6...T1 Ga

Ex ia IIC T6...T1 Gb

Ex ia IIC T6...T1 Ga/Gb

Ex ec IIC T6...T1 Gc

 Type:PMC51B, PMP51B, PMD55B, PMD75B, PMD78B, PMC71B, PMP71B
 Ex ia IIIC T₂₀₀ xxx °C Da/Db (for temperature see table below)

 Type:PMC51B, PMP51B, PMD55B, PMD75B, PMD78B, PMC71B, PMP71B
 Ex ia IIIC T_L xxx °C Db (for temperature see table below)

PMP51B, PMP71B	125 °C
PMC51B, PMC71B compact	135 °C
PMC51B, PMC71B high temp.	150 °C
PMD55B, PMD75B, PMD78B	100 °C

