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GHMGROUP

Specialists by Competence.

ATEX.

Measuring technology
for applications in Ex areas.

Members of GHM GROUP: GREISINGER | HONSBERG | Martens | IMTRON | DeltaOHM | VAL.CO

Utilising synergies

With the merger of companies, we have expanded our competence considerably and therefore also offer optimal assistance and consultation in all matters relating to measuring, control, and closed-loop control technologies.

We are capable of offering a complete product portfolio for requirements of the broadest range of segments:

- Process measurement technology
- Laboratory measurement technology
- Industrial electronics / closed-loop control technology
- Industrial measurement technology
- Test stand measurement technology
- Customer-specific developments

Quality from Germany

All products from GHM Messtechnik are developed and produced in Germany. Through the consolidation of companies, the product range has expanded significantly. Renowned companies value the "Quality from Germany".

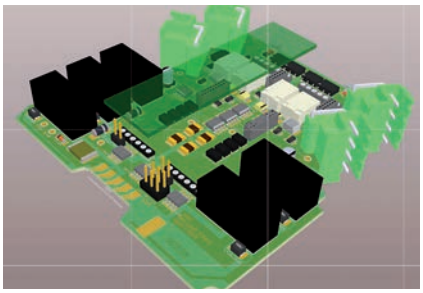
Our claim – Your benefit

As a specialist and complete measurement technology provider, we develop solutions tailored to our customers and markets which meet the highest demands in the industry.

Our locations

Flexibility and Innovation

These two terms are an inseparable part of the success of GHM Messtechnik.
In addition to the extensive standard programme, tailored solutions are developed according to customer needs.



Altium 3D circuit board layout

Pressure testing up to 1000 bar

EMC cabins

GHM stands for ☑ Competence

☑ Quality

☑ Service

Our competences in the Ex area

Our products fullfil the special requirements of the
ATEX Directive 2014/34/EU in the fields of:

- Industrial Sensors and Instrumentation
- Industrial Electronics
- Laboratory Instrumentation

and are therefore recommended for use in the Ex area.

Legal Basis of Explosion Protection

Explosion protection is legally regulated throughout the world by the governments of individual states. Country-specific differences in technical requirements and requisite approvals for explosion-protected equipment place high demands on globally-operative companies, in particular, and necessitate high expenditures on development and approvals.

Consequently, there has been an interest among the leading industrial nations to eliminate barriers to trade through harmonisation of the applicable technical standards and at the same time to implement uniform safety standards.

Within the European Union, the harmonisation process in the area of explosion protection is largely completed. At the international level the IEC has the goal of coming closer to a „one test and one certificate worldwide" accepted by the IECEx Scheme, which currently has only gained very limited acceptance (www.iecex.com).

EU Directives / CE Symbol

Explosion protection is regulated in the European Union by Directives and Laws. Electrical equipment must satisfy the relevant EU regulations. If these requirements are fulfilled, a manufacturer can provide the relevant equipment with the CE symbol. Any misuse in this respect is subject to prosecution.

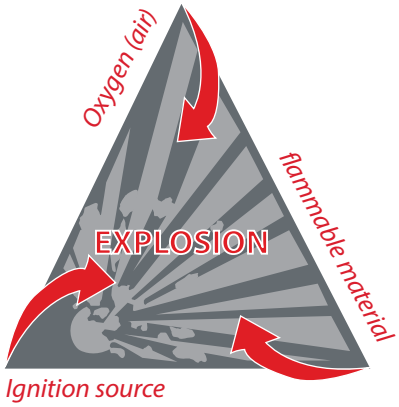
According to Directive 2014/34/EU (ATEX Directive), this symbol for explosion protection with specific equipment classification – when required – is accompanied by the registered number of the Notified Body (NB) responsible for the recognition of the quality assurance system.

Unlike non-European laws, the ATEX Directives also apply for non-electrical equipment, such as pneumatic drives. Corresponding plants and apparatuses are classified as plants requiring supervision, and only equipment approved for this purpose may be used. In addition, commissioning, modifications and periodic safety inspections must be accepted and/or performed by officially approved institutions or organisations. The EU Directives serve as the legal framework that is bindingly legislated for all EU Member States.

Explosion

Thus explosions can occur in atmospheric air, three factors may need to come together usually:

- Flammable material
- Oxygen (air)
- Ignition source



Ignition sources (according to EN 1127-1)

A multitude of ignition sources is possible in connection with technical apparatuses. Potential ignition sources according to EN 1127-1 include:

- Hot surfaces
- Flames, hot gases and particles
- Mechanically generated sparks
- Electrical Plants
- Electrical compensating currents, cathodic corroison protection
- Static electricity
- Lightning strikes
- Electromagnetic radiation – RF radiation
- Electromagnetic radiation – IR radiation
- Ionising radiation – UV radiation
- Ultrasound
- Adiabatic compression and shock waves

The most frequent ignition sources are self-ignition, hot surfaces and mechanically generated sparks.

Equipment Groups / Categories (according to EN 60079-0)

Equipment is divided into three equipment groups. Each equipment group contains apparatuses which are, in turn, assigned to different categories. The category states the zone in which the apparatuses may be used.

Apparatuses of **equipment group I** are used for mining which is at risk of fire damp.

An additional subdivision into explosion groups applies for the electrical apparatuses of **equipment group II**. Electrical apparatuses with the approval for explosion group IIC (gases) may also be used in explosion groups IIA and IIB.

Electrical apparatuses of **equipment group III** (dusts) are also subdivided into additional explosion groups.

Zones

Areas at risk of explosion are divided into zones. The zone classification depends on the temporal and local probability of the presence of a dangerous, potentially explosive atmosphere. Information and specifications for the zone classification are described in EN 60079-0.

Equipment in areas constantly at risk of explosion (Zone 0/20) are subject to higher requirements, whereas equipment in lower risk areas (Zone 1/21, Zone 2/22) are subject to lower requirements.

Zoning

Zone 0	Area in which a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mists is continuously, present over long periods or frequently present.
Zone 1	Area in which a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mists can occasionally form during normal operation.
Zone 2	Area in which a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mists normally does not arise or only arises for a short time.
Zone 20	Area in which a potentially explosive atmosphere in the form of a cloud of flammable dust contained in the air is continuously present, present for long periods or is frequently present.
Zone 21	Area in which a potentially explosive atmosphere in the form of a cloud of flammable dust contained in the air can form occasionally during normal operation.
Zone 22	Area in which a potentially explosive atmosphere in the form of a cloud of flammable dust contained in the air normally does not arise or only arises for a short time.

Ignition Protection Category

The ignition protection categories are design and electrical measures on the equipment to achieve explosion protection in hazardous areas. Protection types are secondary explosion protection measures. The scope of the secondary explosion protection measures depends on the probability for the occurrence of a hazardous explosive atmosphere. Electrical apparatus for potentially explosive areas must be conform to the general requirements of the EN 60079-0 and the special requirements for relevant type of protection which they are designed. For GHM products according to EN 60079-0 the below illustrated types of protection are of importance.

Intrinsic safety „i“ (according to EN 60079-11)
The basis for the „intrinsic safety“ ignition protection class is that a specific minimum ignition energy is required for the ignition of a potentially explosive atmosphere. In intrinsically safe power circuits, no sparks and no heating can occur in the event of an error due to the limitation of current and voltage.

Flameproof enclosures „d“ (according to EN 60079-1)
Parts that can ignite a potentially explosive atmosphere are arranged in a housing which, in the event of an explosion of a potentially explosive mixture in the interior, withstands the pressure of the explosion and prevents its transfer to the potentially explosive atmosphere surrounding the housing.

Increased safety „e“ (according to EN 60079-7)
For this ignition protection type a higher degree of safety is provided by measures which reliably prevent the occurrence of impermissibly high temperatures and the occurrence of sparks or electric arc in the interior and on exterior parts of electrical apparatuses on which they do not occur normal operation.

Equipment Protection Category (EPL)

An alternative method for classification of the Ex equipment into areas at risk of explosion is the system of the Equipment Protection Level (EPL) according to IEC 60079-0.

Equipment Group I (for equipment in subterranean operations of mining as well as their underground plants which can be at risk from mine gas and/or flammable dusts)		
Equipment Protection Level EPL	Ma	Mb
Requirement Protection Level	very high	high
Sufficient safety	in the event of a gas outbreak (if the equipment remains in operation)	in the time span between the gas outbreak and the shut-down of the equipment

Equipment Group II (for equipment in the remaining areas at risk of explosion)						
Equipment Protection Level EPL	Ga	Da	Gb	Db	Gc	Dc
Requirement Protection Level	very high		high		elevated	
Use in	Zone 0	Zone 20	Zone 1	Zone 21	Zone 2	Zone 22

Sufficient Security

Zone 0 / 20	for specified operation, for expected errors and for rarely occurring
Zone 1 / 21	for specified operation, for expected errors which are not necessarily the normal case
Zone 2 / 22	for specified operation, the ignition occurs at any regulary expected events

Ignition temperatures and temperature classes for gases

The ignition temperature of a flammable gas or a flammable liquid is the lowest temperature of a heated surface on which the ignition of the gas/air or vapour/air mixture occurs. Therefore the highest surface temperature of an apparatus must always be lower than the ignition temperature of the surrounding atmosphere.

The temperature classes T1 to T6 are established for electrical equipment of Explosion Group II. Each temperature class is assigned equipment based on their maximum surface temperature.

Temperature classes	Ignition temperature of mixtures	Permissible surface temperature of equipment
T1	> 450 °C	450 °C
T2	> 300 ... ≤ 450 °C	300 °C
T3	> 200 ... ≤ 300 °C	200 °C
T4	> 135 ... ≤ 200 °C	135 °C
T5	> 100 ... ≤ 135 °C	100 °C
T6	> 85 ... ≤ 100 °C	85 °C

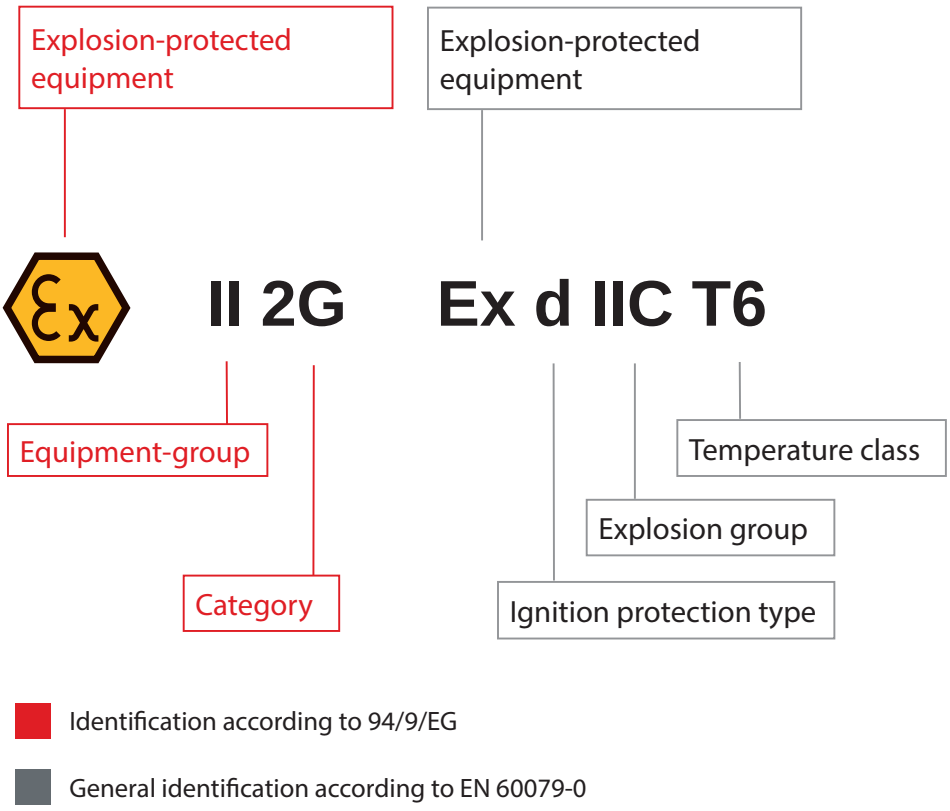
Ignition temperatures for dusts

For dusts the method of determining the ignition temperature has likewise become uniform and is specified in the document IEC 61241-2-1. It must be noted that dust in the deposited form – as a layer – and in the dispersed form – as a cloud – have different ignition temperatures.

Ignition temperature / dusts	
Permissible temperature from a layer $T_{zul.S} = T_{min.S} - 75\ K$	Permissible temperature from a layer $T_{zul.W} = 2/3T_{min}$
Max. permissible surface temperature of the equipment $T_{zul.S} \geq T_{zul} \leq T_{zul.W}$	

Marking

Example of a marking for electrical explosion-protected quipment with explosion protection according to Directive 94/9/EC and EN 60079-0:



B Industrial Sensors and Measurement

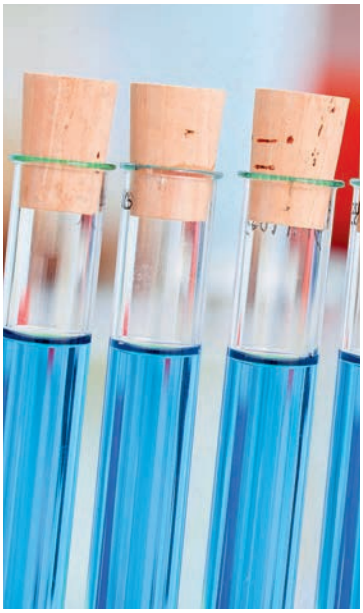
B1. Temperature

B2. Flow

B3. Level

B6. Pressure

B7. Weighing



E Industrial Electronics

E1. Displays

E2. Transmitters

E3. Isolation Amplifiers

E4. Security and Monitoring Equipment

D Laboratory Measurement

Handshelds Instruments and Pressure Sensors

B Industrial Sensors and Instrumentation
B1 Temperature

II 1G Ex ia IIC T6 Ga
II 1D Ex ia IIIC T80 °C Da IP65
II 2G Ex ia IIC T6 Gb
II 2D Ex ia IIIC T80 °C Db IP65
II 2G Ex e m IIC T6 Gb
II 2D Ex mb IIIC T80 °C Db IP65

NEW

II 1G Ex ia IIC T6 Ga
II 1D Ex ia IIIC T80 °C Da IP65
II 1/2G Ex ia IIC T6 Ga/Gb
II 1/2D Ex ia IIIC T80 °C Da/Db IP65
II 2G Ex ia IIC T6 Ga
II 2D Ex ia IIIC T80 °C Da IP65
II 2G Ex e m IIC T6 Gb
II 2D Ex mb IIIC T80 °C Db IP65

NEW

Device type	GTF 101-Ex / GTF 111-Ex	GTF 102-Ex / GTF 112-Ex
Brief description	***Ex temperature sensor without process connection GTF111-EX: with M12-round plug connector*** **Measuring element:** Pt100/Pt1000, jacket thermal element, 4-wire Typ K (NiCr-Ni) **Measurement range with extension tube:** -200 °C...+600 °C (for Pt100 / Pt1000) -200 °C...+900 °C (for NiCrNi) ***Sensor length:*** up to 1 m (longer on request) **Sensor diameter:** 3, 4, 5, 6 or 8 mm **Process connection:** without thread * **Ambient temperature:** -20...+60 °C (+80 °C) optional: -20...+80 °C (Ignition protection type „i“)	***Ex temperature sensor with process connection GTF112-EX: wit M12-round plug connector*** **Measuring element:** Pt100/Pt1000, jacket thermal element, 4-wire Typ K (NiCr-Ni) **Measurement range with extension tube:** -200 °C...+600 °C (for Pt100 / Pt1000) -200 °C...+900 °C (for NiCrNi) ***Sensor length:*** up to 1 m (longer on request) **Sensor diameter:** 3, 4, 5, 6 or 8 mm **Process connection:** with thread: • G 1/2“ (standard) • optional: G 1/8“, G 1/4“, G 3/8“, G 3/4“, M10x1, M12x1,5, M14x1,5, M16x1,5, M18x1,5, other on request **Ambient temperature:** -20...+60 °C (+80 °C) optional: -20...+80 °C (Ignition protection type „i“)
Ignition protection type	Intrinsic safety „i“ Elevated safety „e“	Intrinsic safety „i“ Elevated safety „e“
Protection class	IP 65	IP 65
Equipment group	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II
Potentially explosive area	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1/2, Zone 1, Zone 2, Zone 20, Zone 20/21, Zone 21, Zone 22

* We recommend using a compression fitting

II 1G Ex ia IIC T6 Ga
II 1D Ex ia IIIC T80 °C Da IP65
II 1/2G Ex ia IIC T6 Ga/Gb
II 1/2D Ex ia IIIC T80 °C Da/Db IP65
II 2G Ex ia IIC T6 Ga
II 2D Ex ia IIIC T80 °C Da IP65
II 2G Ex e m IIC T6 Gb
II 2D Ex mb IIIC T80 °C Db IP65

Ex II 1G Ex ia IIC T1...T6
Ex II 1D / Ex tD A 1D IP6X T80°C

Ex II 1G Ex ia IIC T1...T6
Ex II 1D / Ex tD A 1D IP6X T80°C

GTF 103-Ex	TC293-Ex	TR293-Ex
Ex temperature sensor with process connection and sensor head	***Safety thermocouple for gaseous media***	***Safety temperature sensor for gaseous media***
Measuring element: Pt100/Pt1000, jacket thermal element, **4-wire** Typ K (NiCr-Ni) **Measurement range with extension tube:** -200 °C...+600 °C (for Pt100 / Pt1000) -200 °C...+900 °C (for NiCrNi) **Sensor length:** up to 1 m (longer on request) **Sensor diameter:** 3 mm , 4, 5, 6 or 8 mm **Process Connection:** a) without thread * b) with thread: • G 1/2" (standard) • optional: G 1/8", G 1/4", G 3/8", G 3/4", M10x1, M12x1,5, M14x1,5, M16x1,5, M18x1,5, other on request **Ambient temperature** -20...+60 °C (+80 °C) optional: -20...+80 °C (Ignition protection type „i")	**Measuring element:** Typ J (Fe-CuNi) Typ K (NiCr-Ni) Typ N (NiCrSi-NiSi) **Protective tube diameter:** 9 auf 3 mm tapered **Nominal length:** 100, 160, 250, 400, 600 mm **Process Connection:** compression fitting G1/2B **Working temperature** ***Typ J (Fe-CuNi)*** -100...+600 °C ***Typ K (NiCr-Ni)*** -100...+900 °C ***Typ N (NiCrSi-NiSi)*** -100...+1000 °C **Ambient temperature:** -40...+100°C (Gas) -20...+80°C (Dust) approved to be used as transducers to DIN EN 14597 for exhaust gas and air	**Measuring element:** Pt100 **Protective tube diameter:** 9 auf 3 mm tapered **Nominal length:** 100, 160, 250, 400, 600 mm **Process Connection:** compression fitting G1/2B **Working temperature:** -100... +600°C **Ambient temperature:** -40...+100°C (Gas) -20...+80°C (Dust) approved to be used as transducers to DIN EN 14597 for exhaust gas and air
Intrinsic safety „i" Elevated safety „e"	Intrinsic safety „i"	Intrinsic safety „i"
IP 65	IP 65	IP 65
Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II
Zone 0, Zone 1/2, Zone 1, Zone 2, Zone 20, Zone 20/21, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2	Zone 0, Zone 1, Zone 2

More information can be found in the product information **Temperature** online on www.ghm-messtechnik.de

* We recommend using a compression fitting

B Industrial Sensors and Instrumentation
B1 Temperature

NEW

	Ex II 1G Ex ia IIC T1...T6 Ex II 1D / Ex tD A 1D IP6X T80°C	Ex II 1G Ex ia IIC T1...T6 Ex II 1D / Ex tD A 1D IP6X T80°C	EX II 2G Ex ia IIB T3/T4/T5 EX II 2G Ex ib IIB T3/T4/T5
Device type	**TC296-Ex**	**TR296-Ex**	**GTL720**
Brief description	***Safety thermocouple for liquid media and air*** **Measuring element:** Typ J (Fe-CuNi) Typ K (NiCr-Ni) Typ N (NiCrSi-NiSi) **Protective tube diameter:** 9 auf 6 mm tapered **Nominal length:** 100, 160, 250, 400, 600 mm **Process Connection:** Thread G1/2B **Working temperature:** ***Typ J (Fe-CuNi)*** -100...+600 °C ***Typ K (NiCr-Ni)*** -100...+900 °C ***Typ N (NiCrSi-NiSi)*** -100...+1000 °C **Ambient temperature:** -40...+100 °C (Gas) -20...+80 °C (Dust) approved to be used as transducers to DIN EN 14597 for water, oil and air	***Safety temperature sensor for liquid media and air*** **Measuring element:** Pt100 **Protective tube diameter:** 9 auf 6 mm tapered **Nominal length:** 100, 160, 250, 400, 600 mm **Process Connection:** Thread G1/2B **Working temperature:** -100...+600 °C **Ambient temperature:** -40...+100 °C (Gas) -20...+80 °C (Dust) approved to be used as transducers to DIN EN 14597 for water, oil and air	***Clamp-on temperature sensor*** ***Measuring element:*** Pt100, Klasse A ***Pipe diameter:*** DN10...DN80 ***Electrical connection:*** 4 pole M12x1 ***Measuring range:*** -20...+160 °C ***Ambient temperature*** -20...+85°C
Ignition protection type	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“
Protection class	IP 65	IP 65	IP 67
Equipment group	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas mixtures of Equipment group II
Potentially explosive area	Zone 0, Zone 1, Zone 2	Zone 0, Zone 1, Zone 2	Zone 1, Zone 2

Ex II (1) G [Ex ia] IIC
Ex II (1) D [Ex iaD]

MU500-Ex

Transducer

Measurement input:
Pt100, switchable
to 13 measurement ranges
Pt1000, switchable
to 16 measurement ranges
Auxiliary voltage:
85..253 V AC/110..125 V DC
10..30 V AC/DC
Working temperature:
-10...+60 °C

Intrinsic safety „i"

Housing IP 30, optionally IP 20

Gas or dust mixtures of
Equipment group II

for connection of sensors from
Zones 0, 1, 2, 20, 21, 22

PROFIBUS

Ex II (1) G [Ex ia] IIC/IIB
Ex II (1) D [Ex iaD]

PMT50-Ex-2/-3

Transducer

PMT50Ex-2
Measurement input:
Resistance
measurement 0..20 kΩ,
Potentiometer measurement
1..100 kΩ
PMT50Ex-3
Measurement input:
Pt100, Pt1000 and
thermocouples J, K, N and S
Pt100, 3-wire, -100,0..+600,0 °C
Pt1000, 3-wire, -100,0..+300,0 °C
Typ J (Fe-CuNi) -100,0..+800,0 °C
Typ K (NiCr-Ni) -150..+1200 °C
Typ N (NiCrSi-NiSi) -150..+1200 °C
Typ S (Pt10Rh-Pt) -50..+1600 °C
Output:
0/4 ..20 mA, 0/2 ..10 V DC
galvanically isolated,
max. 2 alarm outputs
Modbus, Profibus DP

Intrinsic safety „i"

Housing IP 30, optionally IP 20

Gas or dust mixtures of
Equipment group II

for connection of sensors from
Zones 0, 1, 2, 20, 21, 22

Ex II (1) G [Ex ia] IIC/IIB
Ex II (1) D [Ex iaD]

TG50-Ex

Temperature monitor

Measurement input:
Pt100, Pt1000 and
thermocouples J, K, N and S
Pt100, 3-wire, -100,0..+600,0 °C
Pt1000, 3-wire, -100,0..+300,0 °C
Typ J (Fe-CuNi) -100,0..+800,0 °C
Typ K (NiCr-Ni) -150..+1200 °C
Typ N (NiCrSi-NiSi) -150..+1200 °C
Typ S (Pt10Rh-Pt) -50..+1600 °C
Output:
0/4 ..20 mA, 0/2 ..10 V DC
galvanically isolated
2 alarm outputs

Intrinsic safety „i"

Housing IP 30, optionally IP 20

Gas or dust mixtures of
Equipment group II

for connection of sensors from
Zones 0, 1, 2, 20, 21, 22

Ex II (1) G [Ex ia] IIC/IIB
Ex II (1) D [Ex iaD]

STL50-Ex

Safety temperature limiter according to DIN EN 14597

Measurement input:
PT100, 3-wire, -100 .. +600 °C
Typ J (Fe-CuNi) -100 .. +800 °C
Typ K (NiCr-Ni) -150 .. +1200 °C
Typ N (NiCrSi-NiSi) -150 .. +1200 °C
Typ S (Pt10Rh-Pt) 0 .. 1600 °C
Auxiliary voltage:
230 V AC +/-10 %
115 V AC +/-10 %
24 V DC +/-15 %
Working temperature:
-10 .. 55 °C

Intrinsic safety „i"

IP 20

Gas or dust mixtures of
Equipment group II

for connection of sensors from
Zones 0, 1, 2, 20, 21, 22

More information can be found in the product information **Temperature** or online on www.ghm-messtechnik.de

B Industrial Sensors and Instrumentation
B2 Flow

	 I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga II 1D Ex ia IIIC T135°C Da	 I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga II 1D Ex ia IIIC T135°C Da	 II 2G Ex d IIC T6
Device type	**A-V1**	**A-V2**	**A-V3**
Brief description	***ATEX switching head with reedswitch*** **Use in combination with Flow Switch in Valve Design** Type VD- **Switch:** ***reedswitch*** **Switching voltage:** max. 30 V (without signal diode) max. 15, 28 or 36 V (with signal diode) **Switching current:** max. 1,5 A **Ambient temperature:** -20..+50 °C	***ATEX switching head with microswitch*** **Use in combination with Flow Switch in Valve Design-** Type VM- **Switch:** microswitch **Switching voltage:** max. 30 V (without signal diode) max. 15, 28 oder 36 V (with signal diode) **Switching current:** max. 1,5 A **Ambient temperature:** -20..+50 °C	***ATEX switching head with microswitch*** **Use in combination with Flow Switch in Valve Design-** Type VM- **Switch:** microswitch **Switching voltage:** max. 250 V AC **Switching current:** max. 5 A **Ambient temperature:** -20..+50 °C
Ignition protection type	DIN EN 60079-11 Intrinsic safety „i“	DIN EN 60079-11 Intrinsic safety „i“	DIN EN 60079-1 flameproof enclosure „d“
Protection class	IP 65	IP 65	IP 65
Equipment group	Gas or dust mixtures of Equipment group I, II and III	Gas or dust mixtures of Equipment group I, II and III	Gas or dust mixtures of Equipment group II
Potentially explosive area	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 1, Zone 2

			
I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga II 1D Ex ia IIIC T135°C Da	I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga II 1D Ex ia IIIC T135°C Da	I M1 Ex ia I Ma II 1G Ex ia IIC T4 Ga II 1D Ex ia IIIB T135°C Da	I M1 Ex ia I Ma
A-H1.1	**A-H1.2**	**A-H2.1**	**A-H3.1**
ATEX switching head with reed switch **Use in combination with Flow Switch in Inline Design** Type (n) HD1K- , HD2K-, HD1KO-, HD2KO- **Switch:** reed switch **Switching voltage:** max. 30 V (without signal diode) max. 15, 28, 36 V (with signal diode) **Switching current:** max. 1,5 A **Ambient temperature:** -20..+50 °C	***ATEX switching head with reed switch*** **Use in combination with Flow Switch in Inline Design** Type (n) HR1MV-, HR1MVO **Switch:** reed switch **Switching voltage:** max. 30 V (without signal diode) max. 15, 28, 36 V (with signal diode) **Switching current:** max. 1,5 A **Ambient temperature:** -20..+50 °C	***ATEX switching head with reed switch*** **Use in combination with Flow Switch in Inline Design:** Type (n) HD1K-, HD2K-, HD1KO-, HD2KO- **Switch:** reed switch **Switching voltage:** max. 30 V **Switching current:** max. 1,5 A **Ambient temperature:** -20..+50 °C	***ATEX switching head with reed switch*** **Use in combination with Flow Switch in Inline Design:** Type (n) HD1K- , HD2K-, HD1KO-, HD2KO- **Switch:** reed switch **Switching voltage:** max. 24 V **Switching current:** max. 1,5 A **Ambient temperature:** -20..+50 °C
DIN EN 60079-11 Intrinsic safety „i“	DIN EN 60079-11 Intrinsic safety „i“	DIN EN 60079-11 Intrinsic safety „i“	DIN EN 60079-11 Intrinsic safety „i“
IP 65	IP 65	IP 65	IP 65
Gas or dust mixtures of Equipment group I, II and III	Gas or dust mixtures of Equipment group I, II and III	Gas or dust mixtures of Equipment group I, II and III	Gas or dust mixtures of Equipment group I
Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Only mines susceptible to firedamp

More information can be found in the product information **Piston Valve Design, Piston Inline Design and Paddle** or online on www.ghm-messtechnik.de

B Industrial Sensors and Instrumentation
B2 Flow | **B3** Level

I M1 Ex ia I Ma
II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC T135°C Da

A-H4.1

ATEX switch head made of conductive plastic material with reed switch

Use in combination with Flow Switch in Inline Design:
Type (n) HD1K-, HD2K-, HR2-, HD1KO-, HD2KO-, HR2O-

Switch:
Reed switch
Switching voltage:
max. 30 V
Switching current:
max. 1,5 A
Ambient temperature:
-20..+50 °C

DIN EN 60079-11
Intrinsic safety „i“

IP 65

Gas or dust mixtures of
Equipment group I, II and III

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

I M1 Ex ia I Ma
II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC T135°C Da

A-H4.2

ATEX switch head made of conductive plastic material with reed switch

Use in combination with Flow Switch in Inline Design:
Type (n) HD1K-, HD2K-, HR2-, HD1KO-, HD2KO-, HR2O-

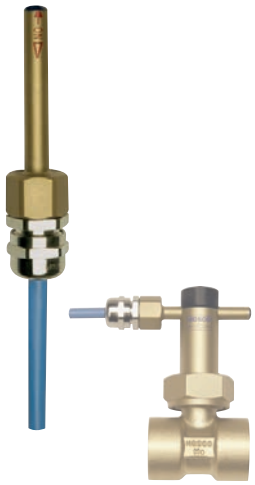
Switch:
Reed switch
Switching voltage:
max. 30 V
Switching current:
max. 1,5 A
Ambient temperature:
-20..+50 °C

DIN EN 60079-11
Intrinsic safety „i“

IP 65

Gas or dust mixtures of
Equipment group I, II and III

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



I M1 Ex ia I Ma
II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC T135°C Da

A-U1-1

ATEX Switching head with reed switch

Use in combination with Flow Switch in Paddle Design:
Type UR1-

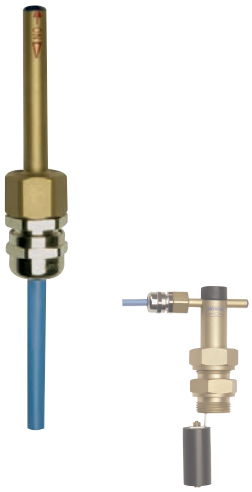
Switch:
Reed switch
Switching voltage:
max. 30 V
Switching current:
max. 1 A
Ambient temperature:
-20..+50 °C

DIN EN 60079-11
Intrinsic safety „i“

IP 65

Gas or dust mixtures of
Equipment group I, II and III

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



I M1 Ex ia I Ma
II 1G Ex ia IIC T4 Ga
II 1D Exia IIIC T135°C Da

A-U1-2

ATEX Switching head with reed switch

Use in combination with Level Switches:
Type NW1-

Switch:
Reed switch
Switching voltage:
max. 30 V
Switching current:
max. 1 A
Ambient temperature:
-20..+50 °C

DIN EN 60079-11
Intrinsic safety „i“

IP 65

Gas or dust mixtures of
Equipment group I, II and III

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

Ex II 1 G Ex ia IIA/IIC T4/T5/T6
Ex II 1 D Ex iaD T80°C

NEW

II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb

Device type	IL10	IS-3
Brief description	***Fill level sensor (submersible probe)*** **Measurement range:** 0,1..25 bar **Ambient temperature:** -10..+60 °C **max. immersion depth:** 300 m	***Screw-in sensor*** **Process connection:** Thread G1/2B **Measurement range:** -1..0; 0..1000 bar **Medium temperature:** -20..+80 °C (-20..150°C option) **Material;** stainless steel **Ambient temperature:** -20..+80 °C
Ignition protection type	Intrinsic safety „i“	Intrinsic safety „i“
Protection class	IP 68	IP 65
Equipment group	Gas or dust mixtures of Equipment group II	Gas mixtures of Equipment group II
Potentially explosive area	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2

B Industrial Sensors and Instrumentation
B7 Weighing

			 **PROFIBUS**
Ex II 1 G EEx ia IIC T6...T4 T130 °C / T150 °C Ex II 1 D EEx ia IIC T6...T4 T130 °C / T150 °C	Ex II 1 G EEx ia IIC T6... T4 T130 °C / T150 °C Ex II 1 D EEx ia IIC T6... T4 T130 °C / T150 °C	Ex II 1 G EEx ia IIC T6... T4 T130 °C / T150 °C Ex II 1 D EEx ia IIC T6... T4 T130 °C / T150 °C	Ex II (1) G [Ex ia] IIC/IIB Ex II (1) D [Ex iaD]
PC22	**SB8**	**RC3**	**DMS50Ex**
DMS-load-cell	***DMS-load-cell***	***DMS-load-cell***	***Transducer***
Design: Pressure force **Measurement range:** 5..40 kg **Output:** 2 mV/V 400 Ω bridge resistance	**Design:** Pressure force **Measurement range:** 10..500 kg **Output:** 2 mV/V 375 Ω bridge resistance	**Design:** Pressure force **Measurement range:** 7,5..100 t **Output:** 2 mV/V 1150 Ω bridge resistance	**Measurement Input:** DMS-load-cell Sensitivity: 0,500..5,000 mV/V Bridge Excitation: 2,5V / 5V max. 40 mA **Output:** Analogue output 0/4..20 mA, 0/2..10 V max. 2 alarm outputs Modbus, Profibus DP
Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“
IP 67	IP 68	IP 68	Housing IP 30, optionally IP 20
Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II
Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22	for connection of sensors from Zones 0, 1, 2, 20, 21, 22

More information can be found in the product information or online on www.ghm-messtechnik.de

II 2G Ex ia/ib IIC/IIB T4

II 2G Ex ia/ib IIC/IIB T4

PROFIBUS

Ex II (1) G [Ex ia] IIC/IIB
Ex II (1) D [Ex iaD]

Device type	**GIA 0420 N - ex** **GIA 010 N - ex**	**GIA 0420 VO.. - ex,** **GIA 0420 WK.. - ex**	**PMT50Ex-1**
Brief description	***Self-sustaining display or display*** **Input signal** **(GIA 0420 N - ex):** 4..20 mA, 2-wirer **Input signal (GIA 010 N - ex):** 0..10 V, 3-wire **Switching output:** galv. isolated open collector switching output **Working temperature:** -20..+50 °C **Display:** 10 mm high LCD display **Display area:** -1999 up to +9999	***Self-sustaining display for 4 – 20 mA transducer or display*** **Input signal** **(GIA 0420 VO.. - ex, GIA 0420 WK.. - ex):** 4..20 mA (2-wire) **Input signal** **(GIA 010 VO.. - ex, GIA 010 WK.. - ex):** 0..10 V (3-wire) **Switching output optional:** galv. isolated open collector switching output **Working temperature:** -20..+50 °C **Display:** 10 mm high LCD display **Display area:** -1999 up to +9999	***Standard signal transducer*** **Measurement input:** Standard signals 0/4..20 mA; 0/2..10 V **Output:** 0/4..20 mA, 0/2..10 V DC galvanically isolated max. 2 alarm outputs Modbus, Profibus DP
Ignition protection type	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“
Protection class	IP 54 (optional IP 65) for installation of the housing flush at the front IP 20 for device incl. terminals	IP65 (with properly mounted angle plug) IP65 (IP00 for open cable ends of the termination cable)	Housing IP 30, optionally IP 20
Equipment group	Gas mixtures of Equipment group II	Gas mixtures of Equipment group II	Gas mixtures of Equipment group II
Potentially explosive area	Zone 1, Zone 2	Zone 1, Zone 2	for connection of sensors from Zones 0, 1, 2, 20, 21, 22

E Industrial Electronics
E3 Isolation Amplifiers | **E4** Security and Monitoring Equipment

Ex II (1) G [Ex ia] IIC
Ex II (1) D [Ex iaD]

Ex II (1) G [Ex ia] IIC
Ex II (1) D [Ex iaD]

NEW

SIL

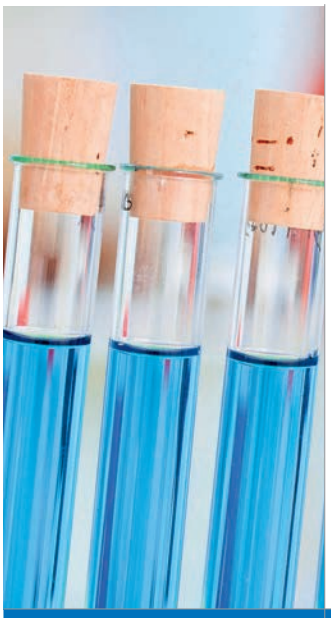
EX II (1) G [Ex ia Ga] IIC/IIB
EX II (1) D [Ex ia Da] IIIC
EX II 3 G nA nC [ic] IIB T4 Gc
EX II 3 G nA nC IIB T4 Gc X

Device type	**TV500Ex, ST500Ex**	**TV501Ex**	**TV125M-Ex, ST125M-EX**
Brief description	***Isolating Signal Converter*** **Signal input:** 0/4..20 mA; 0/2..10 V (intrinsically safe) **Output:** 0/4..20 mA, 0/2..10 V	***Isolating Signal Converter*** **Signal input:** 0/4..20 mA; 0/2..10 V **Output:** 0/4..20 mA, 0/2..10 V (intrinsically safe)	***Universal Isolating Amplifier TV125M / ST125M*** **Signal input:** 0/4..20 mA; 0/2..10 V (intrinsically safe) **Output:** 0/4..20 mA, 0/2..10 V ***Auxiliary voltage:*** 24V- or wide range power supply
Ignition protection type	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“ Non-sparking end equipment „nA nC“ (when installed in suitable cabinet)
Protection class	Housing IP 30, optionally IP 20	Housing IP 30, optionally IP 20	IP20
Equipment group	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II
Potentially explosive area	for connection of sensors from Zones 0, 1, 2, 20, 21, 22	for connection of sensors from Zones0, 1, 2, 20, 21, 22	for connection of sensors from Zones 0, 1, 2, 20, 21, 22

More information can be found in the product information or online on www.ghm-messtechnik.de

 Ex II (1) G [Ex ia Ga] IIC / IIB Ex II (1) D [Ex ia Da] IIIC Ex II 3G Ex nA nC IIB T4 Gc Ex II 3G Ex nA nC [ic Gc] IIB T4 Gc	 Ex II (1) G [Ex ia] IIC/IIB Ex II (1) D [Ex iaD]	 Ex II (1) G [Ex ia] IIC/IIB Ex II (1) D [Ex iaD]	 Ex II (1) G [Ex ia] IIC/IIB Ex II (1) D [Ex iaD]
TS125L-Ex, TS125M-Ex, TS225M-Ex	**TS500-EX**	**MR50Ex**	**STL50Ex**
Isolating switching amplifier 1- or 2-channel functional safety to SIL2 mounting in Zone 2 possible 2,5 mm or 22,5 mm case width **Measurement input:** (intrinsically safe) Switching contacts, Namur initiators, optocouplers **Outputs:** Relay contact (transformer or transmitter) **Auxiliary voltage:** 24V- or wide range power supply	***Isolating switching amplifier*** 1 or 2-channel **Signal inputs:** (intrinsically safe) Switching contacts, Namur initiators, optocouplers **Outputs:** Relay contact (transformer) or electronics (transistor)	***Limit value switch*** **Measurement input:** Standard signals 0/4..20 mA; 0/2..10 V **Output:** 0/4 – 20 mA, 0/2 – 10 V DC galvanically isolated 2 alarm outputs	***Safety temperature limiter according to DIN EN 14597*** **Measurement input** PT100, 3-wire, -100 .. +600 °C ***Type J (Fe-CuNi)*** -100 .. +800 °C ***Type K (NiCr-Ni)*** -150 .. +1200 °C ***Type N (NiCrSi-NiSi)*** -150 .. +1200 °C ***Type S (Pt10Rh-Pt)*** 0 .. 1600 °C **Auxiliary voltage:** 230 V AC +/-10 % 115 V AC +/-10 % 24 V DC +/-15 % **Working temperature:** -10 .. 55 °C
Intrinsic safety „i“ Non-sparking end equipment „nA nC“ (when installed in suitable cabinet)	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“
IP20	Housing IP 30, optionally IP 20	Housing IP 30, optionally IP 20	IP 20
Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II	Gas or dust mixtures of Equipment group II
for connection of sensors from Zones 0, 1, 2, 20, 21, 22	for connection of sensors from Zones 0, 1, 2, 20, 21, 22	for connection of sensors from Zones 0, 1, 2, 20, 21, 22	for connection of sensors from Zones 0, 1, 2, 20, 21, 22

D Laboratory Instrumentation
Handheld Instruments



			
	II 2 G Ex ib IIC T4 Gb	II 2 G Ex ib IIC T4 Gb	II 2 G Ex ib IIC T4 Gb
Device type	**GMH 3111 - ex**	**GMH 3151 - ex**	**GMH 3156 - ex**
Brief description	***Handheld pressure measuring device*** **Number of connectible sensors:** 1 **Measurement range:** depending on the sensor used (see page 25) **Output:** Interface **Display:** 2 x 4 1/2 digit LCD	***Handheld pressure measuring device with logger*** **Number of connectible sensors:** 1 **Measurement range:** depending on the sensor used (see page 25) **Output:** Interface or analogue output (0-1 V) **Display:** 2 x 4 1/2 digit LCD	***Handheld pressure measuring device with logger*** **Number of connectible sensors:** 2 **Measurement range:** depending on the sensors used (see page 25) **Output:** Interface or analogue output (0-1 V) **Display:** 2 x 4 1/2 digit LCD
Ignition protection type	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“
Protection class	IP 65 for the device front	IP 65 for the device front	IP 65 for the device front
Equipment group	Gas mixtures of Equipment group II	Gas mixtures of Equipment group II	Gas mixtures of Equipment group II
Potentially explosive area	Zone 1, Zone 2	Zone 1, Zone 2	Zone 1, Zone 2

			
II 2 G Ex ib IIC T4 Gb	II 2 G Ex ib IIC T4	II 2 G Ex ib IIC T4 Gb	II 2 G Ex ib IIC T4 Gb
GMSD ... - ex	**MSD ... - ex**	**GMH 3161 - ... - ex**	**GMH 3181 - ... - ex**
Piezo-resistive pressure sensor	***Stainless steel pressure sensor***	***Handheld pressure measuring device***	***Handheld pressure measuring device with logger***
Sensor for: GMH 3111, GMH 3151, GMH 3156 **Measurement range (depending on sensor type):** -1.999..+2.500 mbar rel. to -1.00..+10.00 bar rel. or 0..1300 mbar abs. to 0.00..7.00 bar abs. **Pressure connection (process connection):** 2 nylon connecting ports for hoses 6 x 1 mm (6 mm outside Ø and 4 mm inside Ø) **Working temperature:** 0..50 °C	**Sensor for:** GMH 3111, GMH 3151, GMH 3156 **Measurement range (depending on sensor type):** 0.0..100.0 mbar rel. to 0..1000 bar rel. or 0..1000 mbar abs to 0.00..25.00 bar abs. **Pressure connection (process connection):** connection thread G 1/2B **Working temperature:** -20..+80 °C	**Number of connectible sensors:** Integrated pressure sensor with 1 or 2 connections (absolute =1; relative =2) **Number of connectible sensors:** -1..+25 mbar to -1000..+2000 mbar rel. and 0..1300 mbar abs. **Output:** Interface **Display:** 2 x 4 1/2-digit LCD	**Number of connectible sensors:** Integrated pressure sensor with 1 or 2 connections (absolute =1; relative =2) **Measurement range (depending on device type):**- 1..+25 mbar to - 1000..+2000 mbar rel. and 0..1300 mbar abs. **Output:** Interface or analog output (0-1 V) **Display:** 2 x 4 1/2-digit LCD
Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“	Intrinsic safety „i“
-	IP 67 for the sensor	IP 65 for the device front	IP 65 for the device front
Gas mixtures of Equipment group II	Gas mixtures of Equipment group II	Gas mixtures of Equipment group II	Gas mixtures of Equipment group II
Zone 1, Zone 2	Zone 1, Zone 2	Zone 1, Zone 2	Zone 1, Zone 2

More information about **Handheld Instruments** can be found in the Greisinger Product catalog or online on www.greisinger.de

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