



Installation and Operation Instructions

Rotary Gas Meter Type EMR 171/241/260

WARNING



If there remain any questions or remarks after reading these instructions, please contact the supplier of this product. Before installing the gas meter the international, national, as well as local and company regulations related to this product should be known.

A more extensive manual of this gas meter is available on request.

ENVIRONMENTAL CONDITIONS OF THE METER:

- Mechanical class M2 & Electromagnetic class E1
- Max. Operating temperature range from -40°C to +70°C.
- Meter can be installed in open air.
- Avoid direct sunshine on the meter.
- Minimal IP-classification of Index: IP54 (splash proof)



II 2 G T4

INSTRUCTIONS:

- 1) Check the meter for damage due to transportation and handling. The rotors should rotate freely.
- 2) Check the flow direction, as indicated with an arrow on the Pm-indication label on the meter. In case the flow direction is incorrect, this can be changed to a reversed flow (horizontal, right to left) by turning the index plate. For the positions of the Pressure and Temperature connections see figure 4.
- 3) **The piping on the inlet side of the meter must be clean (free of dirt, welding beads and pipe scale).** It is recommended to install a 100 micron filter upstream of the meter. For new installations it is recommended to install a wire mesh screen (250 micron) for the first weeks of operation.
- 4) The meter must be installed free of piping stress.
- 5) Level the meter within 5mm/m side-to-side and front-to-back
- 6) **TIGHTEN THE FLANGE BOLTS CROSSWISE AND REGULARLY** (for the dimensions of the flange bolts and the applied tightening torque on the different sizes see figure 3).
- 7) **The meter is shipped with empty oil reservoir.** Fill the oil reservoir at the front side of the meter with the supplied oil to the indicated level (see figure 1). For a correct reading

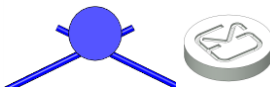


of the oil level it should stabilize for a few minutes. To remove or place the oil plug you need an Allen key.

- 8) Pressurize the meter with care to avoid overloading. The pressure change should never exceed 350 mbar/sec.
- 9) Connect the electrical pulsers in accordance with the connection diagram (see figure 2). The connector is in conformance with IP67 as long as the companion plug or the protection cap is connected.
- 10) An indication of the meter condition can be obtained by monitoring the pressure drop over the meter (Pm- vs. P-point). It is recommended that the pressure drop over a new meter is measured. This value can be compared to future measurements.

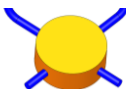
PRECAUTIONS:

- 1) Never use the meter as a spool piece during welding.
- 2) The meter must be depressurised before filling or adding oil.
- 3) Before removing the meter, the oil should be drained.
- 4) The meter should be transported and stored with the rotor axis horizontal.
- 5) Use only devices with electrical characteristics as recommended (see connection diagram figure 2)
- 6) The maximum tightening torque on the Pressure and Temperature tapping connections is: 18 Nm. To tighten the swivel nuts; use 2 wrenches to avoid over tighten and damage the meter body.
- 7) Avoid mechanical shock during handling and transportation of the meter.
- 8) Avoid strong magnet fields close to the meter (particular the index), since they can affect the metrological performance and/or interrupt the pulse generators.
- 9) Seal all plugs and sight glasses to overcome fraud and/or theft of gas.
- 10) Lock (two bolts M5) and seal the index after adjusting it in the right position.



all **BLUE** or **TABLET** seals are 'Metrological Seals'; do NOT remove them

all **ORANGE** seals are 'Service Seals'; they can/may be removed and replaced





Installatie en bedieningshandleiding Rotor Gas Meter Type EMR 171/241/260

WAARSCHUWING



Bij vragen of onduidelijkheden na het lezen van de handleiding wordt verzocht contact op te nemen met de leverancier van het product. Voor het installeren en in gebruik nemen dienen de van toepassing zijnde nationale / internationale en bedrijfsregels bekend te zijn. Een meer uitgebreide handleiding (Engelse taal) is op verzoek verkrijgbaar.

OMGEVINGSCONDITIES VAN DE METER:

- Mechanisch klasse M2 en Elektromagnetisch klasse E1
- Bedrijfstemperatuur -40°C tot +70°C.
- Meter kan in de open lucht worden opgesteld.
- Voorkom directe instraling van zonlicht
- Minimale IP Klasse van telwerk: IP54, mits aangesloten volgens voorschrift.



II 2 G T4

INBOUWINSTRUCTIES:

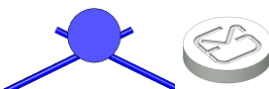
- 1) Controleer de meter op beschadigingen veroorzaakt door het transport. De rotoren moeten vrij draaien. In geval van beschadigingen meld dit bij de leverancier van dit product.
- 2) Controleer de stromingsrichting zoals aangegeven op de meter (Pm label met pijl) en sluit de druk- en temperatuursensors aan op de daarvoor bestemde aansluitingen. Het maximale aanhaalkoppel voor de druk- en temperatuuraansluitingen is 18 Nm.
- 3) **De in en uitlaat pijpstukken van de meter dienen vrij te zijn van vuil, roest, lasslakken, etc.** Het wordt aanbevolen, om in de eerste weken van gebruik een 250 micron filter te installeren.
- 4) De meter moet vrij van installatiespanningen geïnstalleerd worden.
- 5) De meter moet in alle richtingen horizontaal vlak geïnstalleerd worden met een maximale afwijking van 5mm per meter.
- 6) **HAAL DE FLENSBOUTEN KRUISLINGS EN EVENREDIG** aan met een maximaal aanhaalmoment zoals weergegeven in onderstaande tabel.
- 7) **De meters dienen altijd getransporteerd te worden zonder olie in het carter.** Vul het carter met de meegeleverde olie tot het niveau als weergegeven in onderstaande figuur. Wacht een minuut om het olieniveau te laten stabiliseren.
- 8) Breng de meter langzaam (maximaal 350mbar/sec) op druk en voorkom daarmee overbelasting.



- 9) Sluit de elektrische contacten aan volgens onderstaand figuur. De connector en het telwerk hebben een classificatie IP67 zolang het contradeel of de beschermingskap van de connector zijn aangesloten.

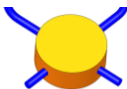
VOORZORGSMAATREGELEN:

- 1) Gebruik de meter niet als vulstuk bij laswerkzaamheden.
- 2) Voordat een van de pluggen (olie vulplug, olie aftapplug, HF plug, etc.) van het voordeksel losgedraaid wordt, dient de druk in de meter afgelaten te worden.
- 3) Voordat de meter uit de leiding wordt gehaald dient de olie uit het carter af getapt te worden. Voer de afgetapte olie af volgens geldende milieu wetgeving/richtlijnen.
- 4) De meter moet met de rotorassen horizontaal getransporteerd en opgeslagen worden.
- 5) Sluit alleen elektrische apparaten aan met de juiste elektrische eigenschappen (zie aansluitschema).
- 6) Voorkom mechanische schokken gedurende het transport en het inbouwen.
- 7) Voorkom magnetische velden dicht bij de meter. Sterke magnetische velden kunnen de metrologische eigenschappen van de meter beïnvloeden.
- 8) Voorkom dat de pluggen en kijkglazen ongeoorloofd geopend kunnen worden in verband met beïnvloeding van de metrologische eigenschappen en diefstal van gas.
- 9) Fixeer het telwerk middels de twee M5 bouten aan het voordeksel en verzegel de afdekplaten.
- 10) De conditie van de meter kan worden gecontroleerd door regelmatig het drukverschil te meten over de drukmeetpunten (PM - vs. P punt). Het wordt daarom aanbevolen het drukverschil over een nieuwe meter te meten. Deze waarde kan worden vergeleken met toekomstige metingen.



alle **BLAUWE** of **TABLET** zegels zijn 'Metrologische Zegels';
verwijder deze **NIET**!

alle **ORANJE** zegels zijn 'Service Zegels'; deze kunnen/mogen
worden verwijderd/vervangen.





Installation und Inbetriebungsanleitungen Drehkolbengaszähler Typ EMR 171/241/260



Sollten sich nach dem Durchlesen dieser Anleitung Fragen oder Hinweise ergeben, wenden Sie sich bitte an den Hersteller.

Bei Installation und Anwendung dieser Anleitung sollten nationale- und internationale Vorschriften bekannt sein.

Ein Handbuch in Englisch steht auf Anfrage zur Verfügung.

UMGEBUNGSBEDINGUNGEN DES ZÄHLERS:

- Mechanische Klasse M2 und elektromagnetische Klasse E1.
- Max. Betriebstemperatur -40° C bis +70 ° C.
- Das Messgerät kann im Freien installiert werden.
- Direkte Sonneneinstrahlung vermeiden.
- Minimaler IP Klasse Zählerwerk: IP54 sofern nach Vorgaben angeschlossen.



INSTALLATIONSANLEITUNG:

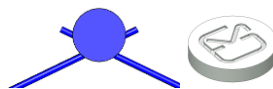
- 1) **Das Rohrleitungs-System, in das der Zähler montiert wird, muss sauber und frei von Schweissrückständen u.ä. sein.**
- 2) Zählerkontrolle auf Transportschäden und freie Drehbewegung der Rotoren.
- 3) Transportschäden sind unmittelbar an den Zählerhersteller zu melden.
- 4) Es wird empfohlen, ein 250 Mikro-Filter (Sieb) zu installieren.
- 5) Überprüfen Sie die Durchflussrichtung - wie angegeben auf dem Zähler (Pm Andeutung mit Pfeil) - und schließen Sie Druck- und Temperatur-Sensoren an die entsprechenden Buchsen (Anschlusspositionen) an. Das maximale Anzugsdrehmoment für Druck- und Temperaturverbindungen beträgt 18 Nm. Es wird empfohlen zwei Schlüssel zu verwenden.
- 6) Bei Zählermontage Strömungsrichtung beachten. Vor Drehung des Zählwerks sollten zwei verplombte M5-Schrauben auf der linken Seite des Zählwerks entfernt werden. Drehen Sie das Zählwerk in die richtige Position (Durchflussrichtung). Nach der Positionierung des Zählwerks müssen die zwei M5-Schrauben wieder verplombt werden.
- 7) Der Zähler muss spannungsfrei und waagrecht installiert werden (maximale Abweichung von 5 mm/m).



- 8) **ZIEHEN SIE DIE FLANSCHSCHRAUBEN KREUZWEISE UND REGELMÄSSIG.** Das maximale Drehmoment der Flanschverschraubung ist in einer der folgenden Tabelle dargestellt.
- 9) **Der Zähler wird mit leeren Ölreservoir geliefert.** Füllen Sie das Öl-Reservoir an der Vorderseite des Zählers mit dem mitgelieferten Öl zu dem angegebenen Ebene (siehe Abbildung 1). Für die richtige Lesung des Ölstands sollte es für ein paar Minuten stabilisieren. Zum Entfernen oder legen den Öl-Stopfen benötigen Sie einen Inbusschlüssel.
- 10) Den Zähler langsam mit Gas befüllen (bis max. 350mbar/s).
- 11) Verbinden Sie die elektrischen Kontakte gemäß der Abbildung: elektrische Anschlüsse. Ein Gegenstecker ist dem Gerät beigelegt. Die komplette Steckerverbindung entspricht der Schutzart IP67.
- 12) Ein Hinweis auf die Zähler-Bedingung kann durch Überwachung des Druckabfalls über der Zähler (Pm - vs. P-Punkt) abgerufen werden. Es wird empfohlen, dass der Druckabfall über einem neuen Meter gemessen wird. Dieser Wert kann mit zukünftigen Messungen verglichen werden.

MONTAGEHINWEISE / VORSICHTSMASSNAHMEN:

- 1) Verwenden Sie das Messgerät nicht als Passtück bei Schweißarbeiten.
- 2) Der Zähler muss vor dem Befüllen oder Hinzufügen von Öl drucklos sein.
- 3) Bevor der Zähler aus dem Netz genommen wird (drucklos), muss das Öl abgelassen werden. Bei Entsorgung des Öls müssen die landesspezifischen Umweltrichtlinien beachtet werden.
- 4) Der Zähler sollte in waagerechter Position transportiert werden.
- 5) Schließen Sie elektrische Geräte nach den entsprechend Vorschriften und der Werksempfehlung an (siehe elektrische Anschlüsse).
- 6) Vermeiden Sie mechanische Erschütterungen und starke Magnetfelder (Magnetfelder beeinflussen die messtechnischen Eigenschaften).
- 7) Verplomben Sie alle Schrauben (Diebstahlsicherung von Gas).



Jede **BLAUE** Plombe/Schlagsiegel ist ein **eichamtliche Versiegelung** und darf **NIEMALS** entfernt werden!

Jede **ORANGE** Plombe ist eine Werksversiegelung und darf durch Ihre eigenen Werksplombe ersetzt werden!

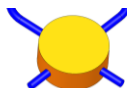


Fig. 1

OIL VOLUMES (INDICATIVE)
OLIE VOLUMES (INDICATIEF)
ÖLSTANDANZEIGE (INDIKATIV)

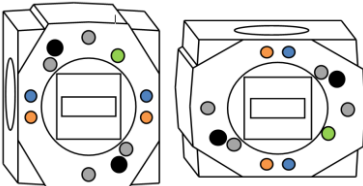
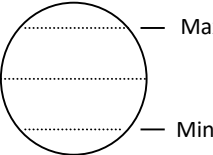
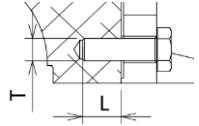
Length	Front view	Horizontal position	Vertical position	
171		37 cc	99 cc	= pressure tapping = Temperature tapping = fill-/drain plug = oil sight glass = Optical HF (non-standard feature) 
241		37 cc	99 cc	
241/260		119 cc	266 cc	
	3mm 3mm  Level – Oil Sight Glass			

Fig. 2

Calculation HF value for optical testing (only for UNI-directional version)	$HF [imp/m^3] = 1000 / (Volume [dm^3] * 2)$ the value of the volume (V) is mentioned on the nameplate of the meter. (in testbench setup: n cycle = 2)
Berekenen impuls waarde Optische HF Sensor (alleen bij UNI-directionele versie)	$HF [imp/m^3] = 1000 / (Slagvolume [dm^3] * 2)$ De waarde van het slagvolume (V) staat op de typeplaat van de meter. (in testbank setup: n cycle = 2)
Berechnung Impulswertigkeit Optischer HF Sensor (nur bei Universal Ausführung)	Für Prüfzwecke ist eine optische Schnittstelle vorgesehen. Die zu verwenden Impulswertigkeit wie folgt berechnen: $Impuls (imp/m^3) = 1000 / Kammervolumen * 2$ Das Kammervolumen steht auf den Typschild. Um maximale Messsicherheit bei Zeitmessung zu gewährleisten, muss jeder zweite Impuls bei Start / Stopp registriert werden.

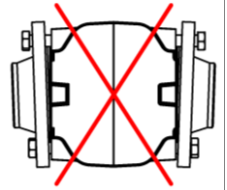
Fig. 3 **FLANGE CONNECTIONS** (threading size + threading length in body)
FLENS AANSLUITINGEN (schroefdraad grootte / lengte in huis)
FLANSCH ANSCHLÜSSE (Gewinde / Gewindelänge im Gehäuse)



Inlet Size	1½"	DN040	2"	DN050	3"	DN080
Flange conn.	ANSI	DIN	ANSI	DIN	ANSI	DIN
Thread (T)	1/2"UNC	M16	5/8"UNC	M16	5/8"UNC	M16
max. Length (L) mm	16-24	16-24	16-24	16-24	16-24	16-24

Inlet Size	4"	DN100	6"	DN150		
Flange conn.	ANSI	DIN	ANSI	DIN		
Thread (T)	5/8"UNC	M16	3/4"UNC	M20		
max. Length (L) mm	16-24	16-24	20-30	20-30		

Fig. 4 **TIGHTENING TORQUES OF FLANGE BOLTS** (in opposite pairs)
AANDRAAIMOMENTEN FLENS BOUTEN (kruislings aandraaien)
DREHMOMENTEN FLANSCH BOLTZEN (über Kreuz anzuziehen)



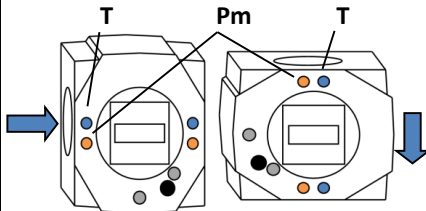
Inlet Size	1½"	DN040	2"	DN050	3"	DN080
Flange conn.	ANSI	DIN	ANSI	DIN	ANSI	DIN
nominal Torque	40 Nm	40 Nm	50 Nm	50 Nm	40 Nm	40 Nm
max. Torque	50 Nm	50 Nm	60 Nm	60 Nm	50 Nm	50 Nm

Inlet Size	4"	DN100	6"	DN150		
Flange conn.	ANSI	DIN	ANSI	DIN		
nominal Torque	55 Nm	55 Nm	70 Nm	70 Nm		
max. Torque	65 Nm	65 Nm	80 Nm	80 Nm		

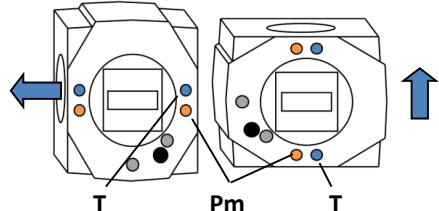
Fig.5 (EN) POSITION OF PRESSURE AND TEMPERATURE CONNECTIONS
(NL) POSITIE VAN DRUK EN TEMPERATUUR AANSLUITINGEN
(DU) POSITIONEN VON DRUCK UND TEMPERATUR ANSCHLUSSE

The pressure reference connection (Pm) is always located on the **INLET** of the rotary meter.
De referentiedrukaansluiting (Pm) zit altijd aan de **INLAAT** zijde van de rotormeter.
Den Referenzdruckanschluss (Pm) ist immer am **EINGANG** der Drehkolbengaszähler.

P + T connections: on front cover / op deksel (voorzijde) / am vorderseite der Zähler

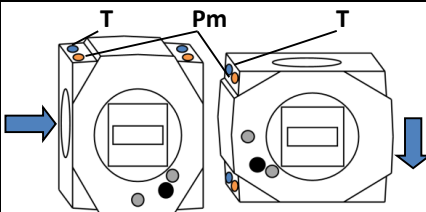


left-right / top-bottom
links-rechts / boven-onder
links-rechts / oben-unten

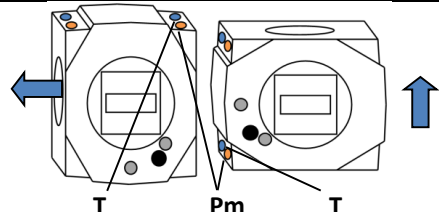


right-left / bottom-top (not recommended)
rechts-links / onder-boven (niet aanbevolen)
rechts-links / unten-oben (nicht bevorzugt)

P + T connections: on body / op het huis / auf Gehäuse der Zähler

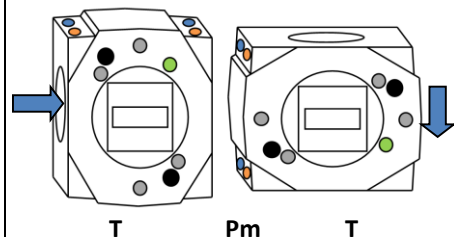
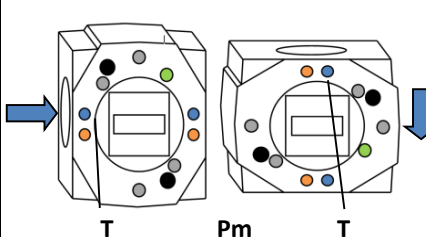


left-right / top-bottom
links-rechts / boven-onder
links-rechts / oben-unten



right-left / bottom-top (not recommended)
rechts-links / onder-boven (niet aanbevolen)
rechts-links / unten-oben (nicht bevorzugt)

P + T connections: UNI-directional versions / UNI-directionele versies / Universal Ausführung



Index: Universal – Basic – Instrument drive

Introduction to the universal index

This is the standard version and it has two 8-digit mechanical roller indexes. Depending on the flow direction, one index will be covered. The index can be rotated in any position, so that the meter can be used in any position. Two separate LF pulse signals can be monitored by a integrated male binder connection in the index.



Introduction to the basic index

Optional is the basic index. This is a simplified version of the universal index. It is suitable for only one flow direction. It is equipped with a male binder to monitor the LF pulses.



Introduction to the instrument drive

This is a standalone unit to provide a mechanical input into for example a volume corrector. To rotate the instrument drive, see instructions below.



Rotating the index



To rotate the Universal index or the instrument drive it is required to remove the two M5 screws. Therefore the service sealing will have to be removed. After the index has been rotated in the correct position, the two M5 screws should be mounted and the service sealing will have to be applied again. (Note: The position of the M5 screws may vary due to customer standards.)

The basic index can always be rotated in the desired position.

Sensor section

Installation Commissioning Service

WARNING



A sensor Assy may only be connected and operated by trained and qualified staff, which must have knowledge of and have verified the protection classes, directives and regulations concerning electrical equipment designed for use in explosive atmospheres.

The approval expires if the device is repaired or modified by a person other than the manufacturer.

Do not install the device in a dust flow and avoid build-up of dust deposits. Avoid static charging. Please only clean the device with a damp cloth.

If connection cables could be subject to mechanical damage, they must be protected accordingly.

Connection cables must be shielded against strong electro-magnetic fields. Disconnect power before proceeding with any work on this equipment. Hazardous voltage can cause electrical shock and burns. Electrical plugs and sockets shall be:

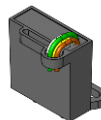
a) interlocked mechanically, so that they cannot be separated when the contacts are energized and the contacts cannot be energized when the plug and socket are separated, or

b) fixed together by means of special fasteners and the device marked with the separation marking as required "WARNING – DO NOT SEPERATE WHEN ENERGIZED"

Sensor: 3700 REED - 3710 MSR - 3720 Wiegand

Introduction to the 3700 Reed Assy

The 3700 Reed Assy can be used in ELGAS gas meters which are fitted with a mechanical index. The device will provide two electrical low frequency pulse outputs and one electrical magnetic tamper status output for use with auxiliary electronic equipment.



Introduction to the 3710 MSR Assy

The 3710 MSR Assy can be used in ELGAS gas meters which are fitted with a mechanical index. The device will provide two electrical low frequency pulse outputs and one electrical magnetic tamper status output for use with auxiliary electronic equipment.



3710 in LC index 3710 in Std Index

Introduction to the 3720 Wiegand Assy

The 3720 Wiegand Assy can be used in ELGAS gas meters which are fitted with a mechanical index. The device provides two low frequency solid state pulse outputs and one magnetic tamper status output for use with auxiliary electronic equipment.



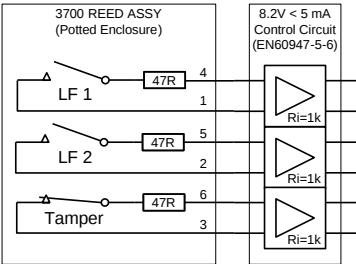
Intended use in explosive atmospheres

The Assy fulfills the requirements of the **ATEX directive 94/9/EC** and can be used in explosive atmospheres according the European normative documents EN60079-0 and EN60079-11 (Ex i).

CAUTION 	<i>Electrical equipment for use in explosive atmospheres</i>  II 2 G	<i>Electrical protection concept</i> Ex ia IIC T4...T6 Gb	<i>EC Type Examination Certificate(s)</i> Baseefa11ATEX0280X	<i>Ingress Protection</i> IP20 or IP67	<i>Ambient Temp. Range</i> -40°C ≤ Tamb ≤ +70°C
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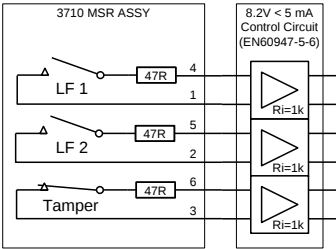
Please observe the max. admissible electrical ratings for the applicable temperature classes.

3700/3710 ASSY					
Intrinsically safe input parameters					
Baseefa11ATEX0280X Issue 1					
Temp. Class	Ui (V)	Ii (mA)	Pi (mW)	Ci	Li
T4	51	35	700	0	0
T5	51	35	400	0	0
T6	51	35	80	0	0

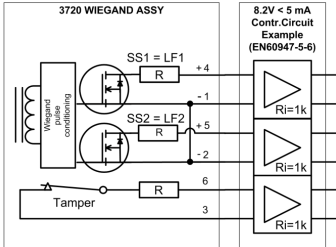


Each circuit 1&4, 2&5, 3&6 may be connected to linked (multi-channel single IS source) or separate intrinsically safe sources which are certified [Ex ia IIC] such that the series or parallel combinations of all 3 channels do not exceed 51V, 35mA and 700mW(T4), 400mW(T5) and 80mW(T6).

Please observe the max. admissible electrical ratings for the applicable temperature classes.



3720 WIEGAND ASSY					
Intrinsically safe input parameters					
Baseefa11ATEX0280X Issue 1					
Temp. Class	Ui (V)	Ii (mA)	Pi (mW)	Ci	Li
T4	51	35	700	0	0
T5	51	35	300	0	0
T6	51	35	80	0	0



Each output circuit 1&4, 2&5, 3&6 may be connected to linked (multi-channel single IS source) or separate intrinsically safe sources which are certified [Ex ia IIC] such that the series or parallel combinations of all 3 channels do not exceed 51V, 35mA and 700mW(T4), 300mW(T5) and 80mW(T6). Be aware that the two Wiegand Sensor outputs share a common ground!

Sensor: 4000 HF Sensor Assy

Introduction to the 4000 HF Sensor Assy



The 4000 HF Sensor Assy can be (optionally) used with ELGAS gas meters. The device provides a dual high frequency (HF) pulse output (Acc. NAMUR, EN60947-5-6) suitable for gas volume measurement. The dual pulse output is fase-shifted suitable for direction discrimination and/or use with auxiliary gas measurement equipment.

Intended use in explosive atmospheres

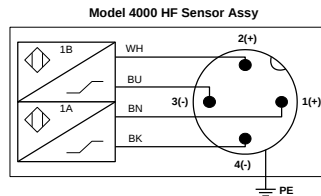
The 4000 HF Sensor Assy fulfills the requirements of the **ATEX directive 94/9/EC** and the **EMC directive 2004/108/EC** and can be used in explosive atmospheres according the European normative documents EN60079-0, EN60079-11 and EN60079-26.

CAUTION	Electrical equipment for use in explosive atmospheres	Electrical protection concept	EC Type Examination Certificate(s) for embedded sensor: Manufacturer: TURCK Type: BIM-EH6,5-2AY1/S1236 0,5m	Ingress Protection	Ambient Temp. Range
	Ex II 1 G or Ex II 2 G	Ex ia IIC T4...T6 Ga or Ex ia IIC T4...T6 Gb	KEMA 04 ATEX 1152X	IP67	See table Temp. Classes & Intrinsically Safe Circuit Parameters

4000 HF Sensor - Temperature Classes and Intrinsically Safe Circuit Parameters								
Min. Amb. Temp.	Max. Amb. Temp.	Category	Temp. Class	Pi *1 (mW)	Ui *2 (VDC)	Ii *2 (mA)	Li *2 (μH)	Ci *2 (nF)
-40°C	+100 °C	II 2 G	T4	200	20	60	350	180
	+80 °C	II 1 G, II 2 G	T4	200				
	+85 °C	II 2 G	T5	80				
	+80 °C	II 1 G, II 2 G	T5	80				
	+70 °C	II 1 G, II 2 G	T5	200				
	+70 °C	II 1 G, II 2 G	T6	80				
	+60 °C	II 1 G, II 2 G	T6	150				
Note 1	Parameter Pi is applicable for the combined sensor circuits (1A and 1B)							
Note 2	Parameters Ui, Ii, Ci and Li apply per sensor circuit (1A or 1B)							

Please observe the max. admissible electrical ratings for the applicable temperature classes.

An industrial IP67, M12 4-pin male socket (A-type coded acc. EN 61076-2-101) is provided for external signal connections. The M12 metal shell of the output socket is electrically connected to the gas meter body which should in gas installations be connected to (skid) earth potential. The M12 connector nut should be tightened with a preset torque of 0.4 Nm to guarantee IP67 ingress protection.



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ELGAS, s.r.o.

Semtinská 211, 533 53 Pardubice, Czech republic
Tel +420 466 414 511 Fax +420 466 411 190
sales@elgas.cz www.elgas.cz

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