EN

Installation and Operation Instructions

Rotary Gas Meter Type FMR-HP

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 (-40°F to +150°F)
- 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 (see figure 1) the flow direction of the meter (standard: horizontal left- right). If the meter is installed in the wrong flow direction, the integrated bypass valve will not operate correctly. For the positions of the Pressure and Temperature connections see figure 2.
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) Level the meter within 5mm/m side-to-side and front-to-back
5) **Tighten the flange bolts crosswise and regularly**
6) **The meter is shipped with empty oil reservoir.** Fill the oil reservoir at the front side of the meter with oil (supplied with the meter) to the indicated level (see figure 3).
7) Pressurize the meter slowly and carefully to avoid overloading. The pressure change should never exceed 350 mbar/sec or 5 psi/sec.

8) 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.
9) 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 be 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 diagrams)
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 to overcome fraud and/or theft of gas.

BYPASS:

In case the meter is equipped with an integrated bypass (optional) the following information is applicable:

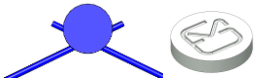
- The setting of the bypass is about 1,5 bar or 20 psi
- To check the status of the bypass, the differential pressure between Pm and P_{out} can be monitored

MAINTENANCE:

The meters are equipped with an automatic lubrication system. Under normal operating conditions - clean and dry natural gas – it is recommended to change the oil once every 3 years. Before changing the oil, depressurize the meter!.

METROLOGICAL SEALS (IF APPLICABLE):

The meters can be equipped with metrological seals or utility seals. Metrological (blue) seals may never be removed or broken. Utility Seals (orange) may be removed or broken without any consequences.



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

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

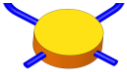
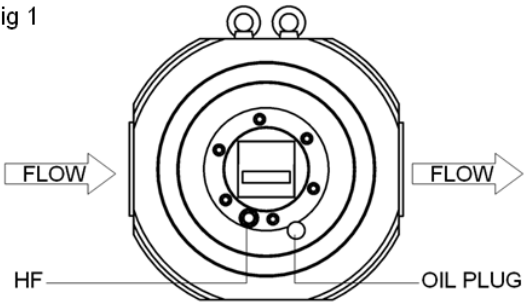
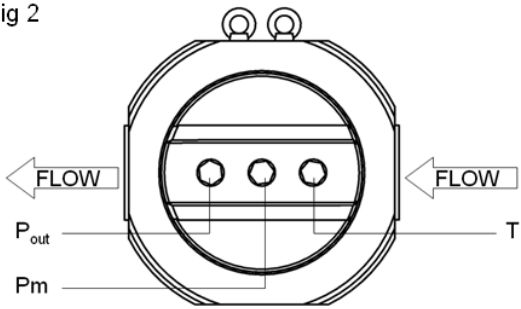


Fig 1



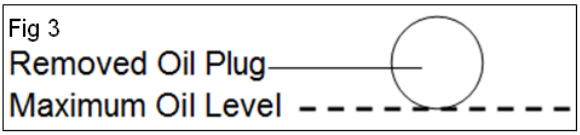
Front View

Fig 2



Rear View

Fig 3



SENSOR SECTION

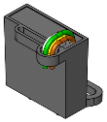
Installation Commissioning Service

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 FMG 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

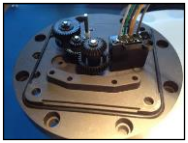
The 3710 MSR Assy can be used in FMG gas meters which are fitted with a mechanical index. The device will provide two electrical low frequency pulse outputs and one electrical magnetic tamper status output for use with auxiliary electronic equipment.

3710 in LC index

3710 in Std Index

Introduction to the 3720 Wiegand Assy

The 3720 Wiegand Assy can be used in FMG 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.

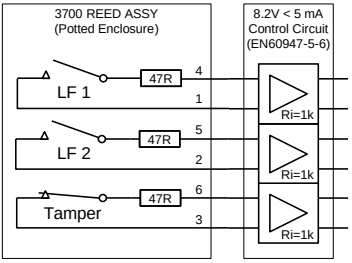


Intended use in explosive atmospheres

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).

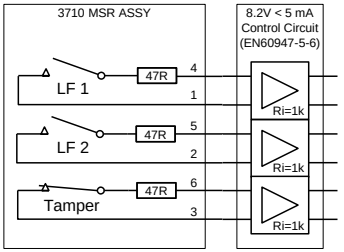
CAUTION	*Electrical equipment for use in explosive atmospheres*	*Electrical protection concept*	*EC Type Examination Certificate(s)*	*Ingress Protection*	*Ambient Temp. Range*
	Ⓔx II 2 G	**Ex ia IIC T4…T6 Gb**	**Baseefa11ATEX0280X**	**IP20 or IP67**	**-40°C ≤ Tamb ≤ +70°C**

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

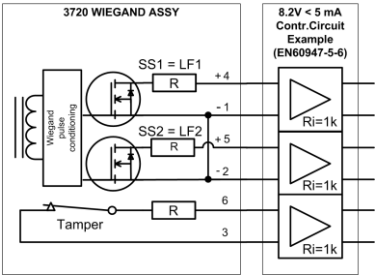


3700/3710 ASSY Intrinsically safe input parameters					
Baseefa11ATEX0280X Issue 1					
Temp. Class	**Ui (V)**	**Ii (mA)**	**Pi (mW)**	**Ci**	**Li**
T4	51	35	700	0	0
T5	51	35	400	0	0
T6	51	35	80	0	0

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 FMG 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 phase-shifted suitable for direction discrimination and/or use with auxiliary gas measurement equipment.

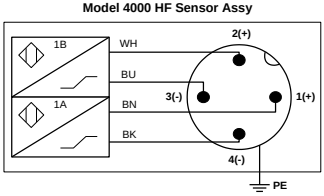
Intended use in explosive atmospheres

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*
	Ⓔx II 1 G or **Ⓔx 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.

Declaration of Conformity

This "Declaration of Conformity" complies with the European Standards

- *NEN-EN-ISO/IEC 17050-1:2010, Conformity assessment - Supplier's declaration of conformity – Part 1 "General Requirements" and where applicable,*
- *NEN-EN-ISO/IEC 17050-2:2004, Conformity assessment - Supplier's declaration of conformity – Part 2 "Supporting documentation".*

We: **Flow Meter Group B.V.**
Meniststraat 5c, 7091 ZZ Dinxperlo, The Netherlands

declare under our sole responsibility that the product(s)

Product: **Rotary Gas Meter**
Type: **FMR-HP**

to which this declaration relates are in conformity with the relevant sections of the following standard(s)

EN12480	**ASME B31.8**	**ASME VIII Div. 1**	**EN 1127-1**	**EN 13463-1**
EN 13463-5	**EN 60079-0**	**EN 60079-11**	**EN 60079-26**	

and where applicable following the provisions of EU Directive(s)

ATEX 95 (94/9/EC)

Conformity assessment body involved for Annex VIII (Module A+):

Lloyd's Register Verification Limited
71 Fenchurch Street, London EC3M 4BS, United Kingdom, NB number: 0038

Marking:

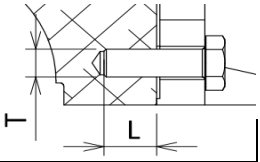
Ex **II 2 G T4**

Signature:

Name: **Paul Hoeks**
Position: **CEO Flow Meter Group B.V.**

Dinxperlo, **1 October 2013**

BOLTING CHART



FLANGE CONNECTIONS *(threading size + threading length in body)*

Installation Length L=273						
Inlet Size	**2”**	**2”**	**3”**	**3”**		
Flange conn.	**Class 300**	**Class 600**	**Class 300**	**Class 600**		
Thread (T)	**5/8"UNC**	**5/8"UNC**	**3/4"UNC**	**3/4"UNC**		
max. Length (L) mm	**23-25**	**23-25**	**23-25**	**23-25**		

Installation Length L=375						
Inlet Size	**3”**	**3”**	**4"**	**4"**		
Flange conn.	**Class 300**	**Class 600**	**Class 300**	**Class 600**		
Thread (T)	**3/4"UNC**	**3/4"UNC**	**3/4"UNC**	**7/8"UNC**		
max. Length (L) mm	**30-35**	**30-35**	**30-35**	**30-35**		

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