Operating Instructions

for

Level Switch for Liquids

Model: RFS

Order from: C A Briggs Company
622 Mary Street; Suite 101; Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118
Sales@cabriggs.com - www.cabriggs.com

1. Contents

Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.
The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:
- Level Switch model: RFS
- Operating Instructions

4. Regulation Use

Model RFS devices are used for when monitoring liquid levels. The device should only be used with liquids that are compatible with the unit's materials of construction.
Level control is often accomplished with at least two level switches - one acting to sense the minimum level and the other for maximum level detection.

Any use of the Level Switch, model: RFS, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

The Level Switch RFS is designed for economical control of liquids in vessels. The following three versions are available: A device with plug connection and two devices with aluminium housing connection of which one is an ATEX-version for the use in environment with gas explosion hazards. The switch is remarkable for its maintenance-free design and small dimensions. The switch is mounted on the side of the vessel. A hinged stainless steel float with a magnet floats up and down through the liquid level. In the end position a potential-free reed contact is operated by the magnet. The switching function (N/O contact / N/C contact) is determined by the mounting position. The switching function is reserved by simply rotating the switch through 180°.

6. Use in Hazardous Areas

With the approval the Level Switch, model RFS, can be used within hazardous areas. Thereby the aluminium housing is applicable outside the process in zone of category 2D. The float is appropriate for the use within the process in zone of category 2D and 1D.

The approvals are as follows:

II 1 GD Ex ia IIC T6 Ga
-20≤Ta≤+60 °C

An additional intrinsically safe relay is required in environment with gas explosion hazards (KFA…and respectively KFD).

For a correct and professional potential equalization, the ground terminal on the housing of the RFS must be connected in applications in hazardous areas.

7. Mechanical Connection

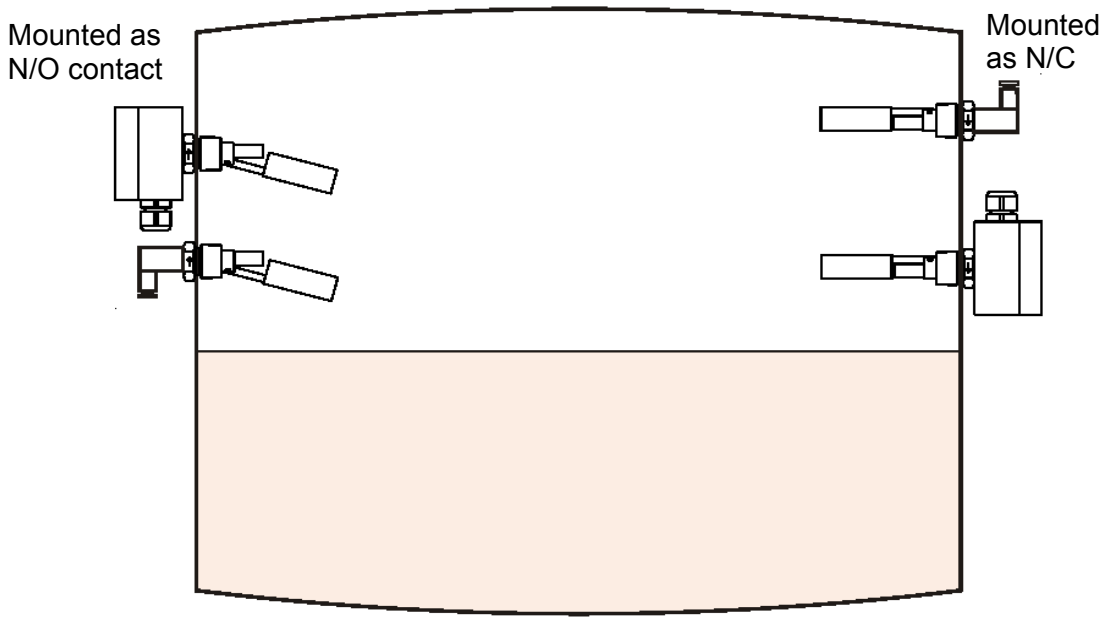
The Level Switch should be mounted so that the float can move freely over its entire path without hitting the walls, floor or roof of the container. Avoid fitting the switch where agitators or inlet valves could expose it to excessive turbulence.
Make sure that the medium does not contain solids or ferrite particles, as they could collect on the float magnet and interfere with the switching operation. If the liquid does contain sediment or suspended matter, you must be sure they do not come into contact with the float system.

Mount the switch in a way that it is easily accessible for installation and maintenance.

- Make sure that the allowed max. operational pressure and service temperature for the device is not exceeded.
- The installation position must be horizontal.
- If possible, examine all the connection joints for proper sealing, just after mechanical installation.
- The engraved arrow on the hexagon must point up or down depending on the desired contact function. In any case the marked hexagon surface must always be mounted vertically.

Mounting position

Depending on the mounting position of the device, the contact function (N/O or N/C contact) of the level switch will be defined.



8. Electrical Connection

Caution! Make sure that the voltage values of your system correspond with the voltage values of the level switch.

- Make sure that the supply wires are de-energised.
- Connect your connection cable to the terminal of the aluminium housing or the plug of the RFS level switch.
- The level switch has a protective insulation; a separate protection wiring for the standard version is not necessary.
- For the RFS version for ATEX applications, the connection of the potential terminal is mandatory.
- An additional intrinsically safe relay is required in environment with gas explosion hazards (KFA…and respectively KFD).

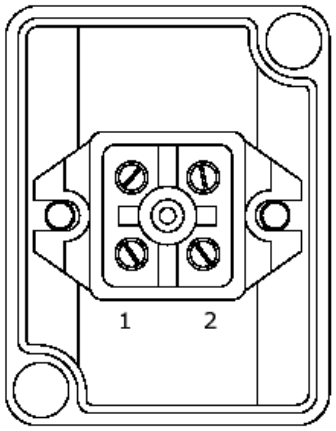
Pin assignment for RFS Level Switch

RFS-1200N4 and RFS-1201N4

There are only two connection terminals which can be connected by choice and which do not have any influence on the contact function (N/C / N/O). The contact function is defined by the mounting position of the instrument.

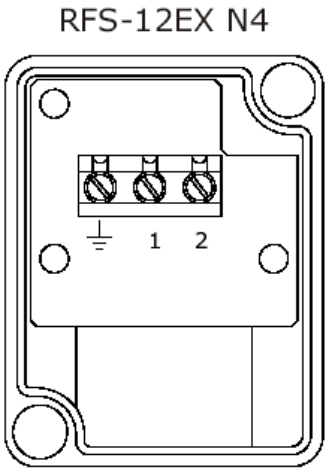
RFS-1200N4

RFS-1201 N4



RFS-12EXN4

There are three connection terminals of which one terminal is clearly marked as a ground terminal. The two other terminals are connected in the same way as the standard devices RFS-1200N4 and RFS-1201N4 respectively.



After the connection of any other from your designated external instruments to the limit contact, the device is ready for operation.

9. Technical Information

Medium temperature:	- 40...+120 °C
Ambient temperature:	-20...+80 °C (RFS-1200 N4 and RFS-1201 N4)
	-20...+ 60 °C (RFS-12Ex N4)
Operating pressure:	max. 5 bar
mounting position:	horizontal

Materials

• Housing / plug:	plastic with RFS-1200 N4 aluminium with RFS-1201 N4 and RFS-12Ex N4
• Float:	stainless steel 1.4301
• Connection:	stainless steel 1.4301
Process connection:	1/2 NPT
Electr. connection:	for RFS-1200 N4: DIN plug
	for RFS-1201 and RFS-12Ex: terminals in the aluminium connection
Contacts:	N/O or N/C contact, depending on the mounting position of the device
Switching voltage:	max. 240 V_{AC} / 300 V_{DC} with RFS-1200 and RFS-1201
	max. 40 V_{DC} with RFS-12Ex
Switching current:	max. 0.5 A
Switching capacity:	max. 15 VA with RFS-1200 and RFS-1201
	max. 4 VA with RFS-12Ex
Medium density:	>0.7 g/cm^3
Contact resistance:	max. 150 kΩ
Protection:	IP65
ATEX marking for RFS-12Ex:	 II 1 GD Exia IIC T6 Ga -20°C ≤ Ta ≤ +60 °C

10. Order Codes

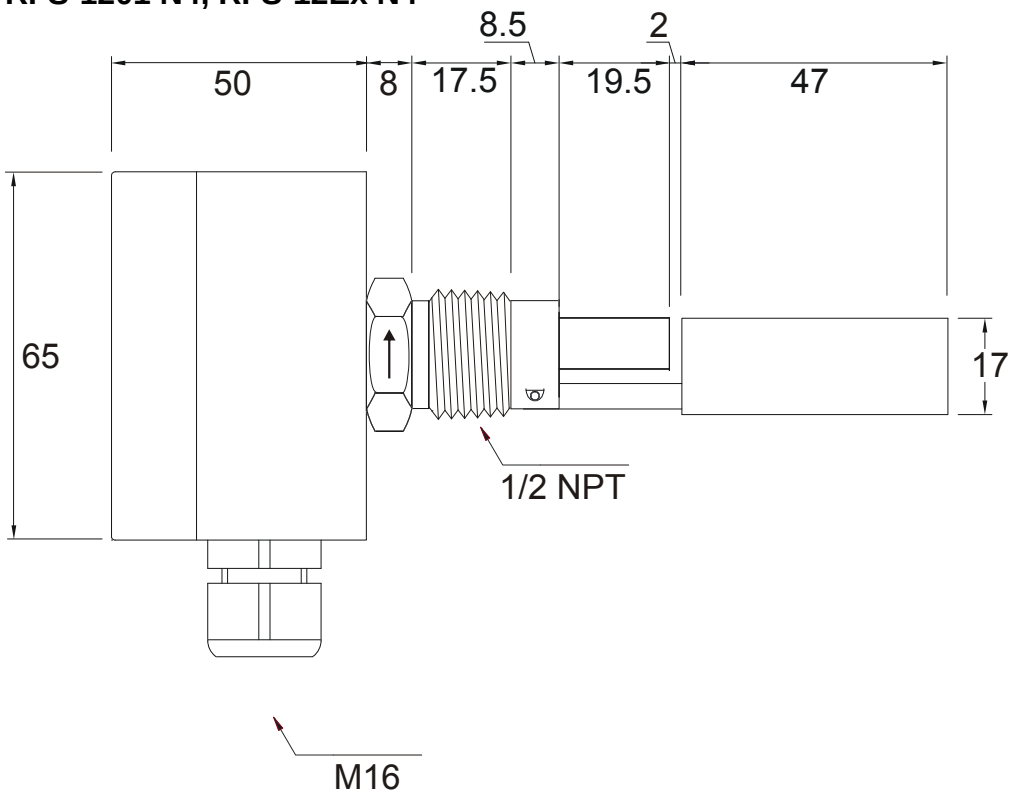
Example: RFS-1200 N4

Model	Description
RFS-1200 N4	Standard version with plug connection
RFS-1201 N4	Standard version with housing connection (aluminium)
RFS-12Ex N4*	ATEX version for use in environments with explosion hazards

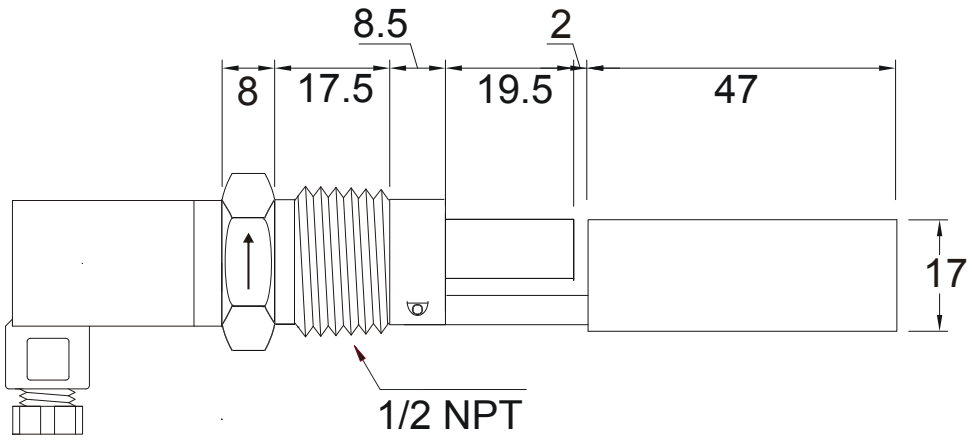
*an additional relay is required for the use in environment with gas explosion hazards

11. Dimensions

RFS-1201 N4, RFS-12Ex N4



RFS-1200 N4



12. EU Declaration of Conformance

DECLARACIÓN DE CONFORMIDAD EU

EU DECLARATION OF CONFORMITY
EU-KONFORMITÄTSERKLÄRUNG
DÉCLARATION DE CONFORMITÉ
DICHIARAZIONE DI CONFORMITÀ EU

KOBOLD MESURA SLU
Avda. Conflent 68 nave 15 08915 Badalona (España)

Declara, bajo la propia responsabilidad, que el producto
Declares under our sole responsibility, that the product
Erklärt in alleiniger Verantwortung, dass das Produkt
Déclare sous sa seule responsabilité, que le produit
Dichiara sotto la propia responsabilità, che il prodotto

Magnetic level switch
RFS-12Ex N4

A los cuales se refiere esta declaración, son conformes a las siguiente Directivas Europeas:
To which this declaration relates is in conformity with the following European Directives:
Mit folgenden Euroäischen Richtlinien Konform ist:
À auxquels se réfère cette déclaration, ils sont conformes aux Directives Européennes suivant :
A ai quali si riferisce questa dichiarazione, sono conformi alle direttive europee seguente:

EMC2014/30/EU LVD2014/35/EU ATEX2014/34/EU RoHS2011/65/EU

Normas armonizadas y documentos de la normativa aplicados:
Applied harmonised standards and normative documents:
Angewandte harmonisierte Normen und normative Dokumente:
Normes harmonisées et documents normatifs appliqués
Norme armonizzate e documenti normativi applicati:

EN61010-1 :2011 EN60079-0:2012 (acc. EN60079-0:2013)
EN61000-6-2 :2006 EN60079-11:2012 (acc. EN60079-11:2013)

Certificado de examen CE de tipo
EC-type examination certificate
EG-baumusterprüfbescheinigung
Attestation d´examen CE de type
Certificazione per esame di tipo CE
LOM06ATEX2054X

Marcado
Marking
Kennzeichnung
Inscription
Marcatura

II 1 GD Ex ia IIC T6 Ga
-20≤Ta≤+60ºC

Fabricado en: **KOBOLD MESURA SLU Avda. Conflent 68 nave 15 08915 BADALONA (Spain**)
Made in:
Hergestellt in:
Fabriqué dans:
Fabbricato in:

Organismo notificado : **LOM 0163**
Notified organism
Zertifizierungsstelle
Organization annoncée
Organismo informato

Número notificación : **LOM 05ATEX9070**
Notification number
Zertifikatsnummer
Nombre notification
Notifica di numero

Badalona april. 2016
DT0497

Gerente

13. ATEX-Certificate

LABORATORIO OFICIAL J. M. MADARIAGA

EC-TYPE EXAMINATION CERTIFICATE

(1)

(2) Equipment or protective system intended for use in potentially explosive atmospheres Directive 94/9/EC

(3) EC-Type Examination Certificate number: **LOM 06ATEX2054 X**

(4) Equipment or Protection System: Level detectors
Types MIL... EX y RFS...EX

(5) Applicant: CONTROL INSTRUMENTS MESURA S.L.

(6) Address: Guifré, 665 1º
08912 BADALONA(BARCELONA)
SPAIN

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) Laboratorio Oficial J.M. Madariaga (LOM), notified body number 0163 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in confidential report nr. **LOM 04.221 JP**

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
– Standards **EN 60079-0:2004** **EN 50020:2002**
prEN 61241-0:2005 **EN 61241-1:2004**

(10) If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:

Ex II 2/1 D Ex tD A21 IP65 T85 ºC Ta:-20 /+ 60 ºC

Ex II 1 GD Ex ia IIC T6 / Ex iaD 20 T85 Ta:-20 /+ 60 ºC

OFICIAL

LABORATORIO J.M. MADARIAGA LOM

Madrid, 16th June, 2006

Carlos Fernández Ramón
DIRECTOR OF THE LABORATORY

Angel Vega Remesal
Head of ATEX area

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ENSAYOS E INVESTIGACIONES DE MATERIALES Y EQUIPOS PARA ATMÓSFERAS EXPLOSIVAS Y MINERÍA
(Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29 -)
Alenza, 1 - 28003-MADRID • ☎ (34) 91 4421366/ 91 3367009 • Fax.(34) 91 4419933 • ✉ lom@lom.upm.es

LABORATORIO OFICIAL J. M. MADARIAGA

(A1) **SCHEDULE**

(A2) EC-Type Examination Certificate: : **LOM 06ATEX2054 X**

(A3) Description of equipment or protective system

Series of float switch magnetic level controllers which are mainly foreseen to be used in liquid tanks. The series is composed of the following types:

MIL.100.EX y MIL.200.EX	Float device in tube as guide and "reed" switch activated by magnet
MIL.300.EX	float device of bascule type and micro-switch
RFS.12.EX	float device of bascule type and "reed" switch

When they are used in explosive gas ambient and/or combustible dust thus must be connected to a intrinsically safe circuit, and having the marking:

Ex II 1 GD Ex ia IIC T6 / Ex iaD 20 T85 (simultaneous or alternative)

Alternatively, then can be used as category 2 apparatus when connected to conventional circuits. In this case the head of the apparatus is foreseen to be installed on the outside of tanks or silos; this head is a category 2 apparatus. The sensor that is foreseen to be installed inside tanks or silos have got a category ; this sensor is a simple mechanical device. The marking is:

Ex II 2/1 D Ex tD A21 IP65 T85 ºC

As category 1 devices, the intrinsically safe specific parameter is Ui: 40 V.

As equipment having a protection by enclosure type of protection of category 2D the characteristics are:
Maximum voltage: 250 V Maximum current: 500 mA Maximum power: 4 VA

In all the cases the external ambient temperature is Ta: -20 ºC /+60 ºC

The floats are foreseen for a maximum process temperature up to 130 ºC.

(A4) Test report nr: **04.221 JP**

(A5) Special conditions for safe use

The specific marking will determine the ambient type and zone of use.

(A6) Individual tests

None

OFICIAL LABORATORIO J. M. MADARIAGA LOM

LABORATORIO OFICIAL J. M. MADARIAGA

(A1) **SCHEDULE**

(A2) EC-Type Examination Certificate: : **LOM 06ATEX2054 X**

(A7) Essential Health and Safety Requirements

Explosion safe requirements are covered by application of the standards indicated in page 1/3 of this certificate.

(A8) Descriptive documents:

		Rev.	Date
- Description nr.	DT0126	0	2006-05-17
- Component lists nr.:	DT0078	0	2006-03-10
	DT0079	0	2006-03-10
	DT0125	0	2006-03-10
	DT0133	0	2006-03-21
- Drawings nº:	PM0347R0	0	1999-12-10
	PM0383R0	0	2004-11-15
	PM0385R0	0	2004-11-15
	PM0391R0	0	2004-11-15
	PM0425R0	0	2005-10-07
	PM0444R0	0	2006-03-10
	PM0447R0	0	2006-03-21

LABORATORIO OFICIAL J.M. MADARIAGA LOM

LABORATORIO OFICIAL J. M. MADARIGA

EC-TYPE EXAMINATION CERTIFICATE SUPPLEMENT

(1) EC-TYPE EXAMINATION CERTIFICATE SUPPLEMENT

(2) Equipment or protective system intended for use in potentially explosive atmospheres Directive 94/9/EC

(3) Supplement nr. 1 to EC-Type Examination Certificate number **LOM 06ATEX2054 X**

(4) Equipment or Protection System: Level detectors Type MIL... EX and RFS...EX

(5) Applicant: KOBOLD MESURA, S.L.U.

(6) Address: Guifré, 665 08918 BADALONA(BARCELONA) SPAIN

(7) Report nr.: **LOM 07.059 NP**

(8) Variations included in this certificate

- Change of the manufacturer name, before CONTROL INSTRUMENTS MESURA S.L.
- Update of applied standards to: EN 60079-0:2006, EN 60079-11:2007, EN 61241-0:2006, EN 61241-1:2004 and EN 61241-11:2006

(9) Marking variations

None

(10) Descriptive documents

		Rev.	Date
- Drawings nr.:	DT0132R2	2	2007-07-17

OFICIAL LABORATORIO LOM J.M. MADARIAGA

Madrid, 24th July, 2007

Carlos Fernández Ramón
DIRECTOR OF THE LABORATORY

Angel Vega Remesal
Head of ATEX area

This supplement must be an inseparable part together with the base certificate **LOM 06ATEX2054 X**

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LABORATORIO OFICIAL J. M. MADARIAGA

EC-TYPE EXAMINATION CERTIFICATE SUPPLEMENT

(1) EC-TYPE EXAMINATION CERTIFICATE SUPPLEMENT

(2) Equipment or protective system intended for use in potentially explosive atmospheres Directive 94/9/EC

(3) Supplement nr. **2** to EC-Type Examination Certificate **LOM 06ATEX2054 X**

(4) Equipment or protective system: Level detectors
Types MIL... EX, RFS...EX y M...E

(5) Manufacturer: KOBOLD MESURA, S.L.U.

(6) Address: Guifré, 665
08918 BADALONA(BARCELONA
SPAIN

(7) Test report nr.: **LOM 12.256 KP**

(8) Variations included in this certificate

- Update to the standards EN 60079-0:2009, EN 60079-11:2007 and EN 60079-31:2009
- To Include two new series named "M..E" and "MS..E" with intrinsically safe type of protection, with straight or angled tube respectively. May include junction box or direct cable connection
- To include new connection boxes and connectors for the variants MIL.100.EX, MIL.200.EX and RFS.12.EX
- Process temperature is not limited

(9) Changes in marking

All variants used in intrinsically safe circuits

Ex II 1GD Ex ia IIC T6 Ga
Ex ia IIIC T85 °C Da
-20 °C ≤ Ta ≤ +60 °C

Variant MIL.300.EX used as protection by enclosure type of protection

Ex II 2D Ex t IIIC T85 °C Db
-20 °C ≤ Ta ≤ +60 °C

(10) Changes in the special conditions for a safe use

It is added:

- The temperature class or surface temperature refers only to equipment operating at room temperature. In class facility shall be determined on the basis of actual temperature of the process.

(11) Descriptive documents

		Rev.	Date
- Descriptions nr.:	DT0494	-	2012-07
	DT0495	-	2012-07
- Drawings nr.:	DT0496	-	2012-07

Getafe, 2012-10-22

OFICIAL LABORATORIO J.M. MADARIAGA LOM

Carlos Fernández Ramón
DIRECTOR OF THE LABORATORY

Angel Vega Remesal
Head of the ATEX

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(Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29)
Eric Kandel, 1 – 28906 GETAFE (MADRID) • ☎ (34) 91 4421366 • 🖷 (34) 91 4419933 • 🖳 lom@lom.upm.es

LABORATORIO OFICIAL J. M. MADARIAGA

(1) EC-TYPE EXAMINATION CERTIFICATE SUPPLEMENT

(2) Equipment or protective system intended for use in potentially explosive atmospheres Directive 94/9/EC

(3) Supplement nr. **3** to EC-Type Examination Certificate number **LOM 06ATEX2054 X**

(4) Equipment or protection system: Level detectors
Types MIL... EX, RFS...EX, M…E0 y MM…E

(5) Manufacturer: Kobold Mesura S.L.U.

(6) Address: Avda. Conflent 68, nave 15
08915 Badalona (Barcelona)
SPAIN

(7) Test report nr.: **LOM 14.120 CP**

(8) Variations included in this certificate

1. To include a new series called MM…E

MM _ _ _ E
- Float material
- Process connection / head
- Output / transmitter

This new series is manufactured with intrinsically safe type of protection. It is based on a chain resistances and contact type "reed" driven by the magnetic field of the float, with potentiometric measurement.

The output signal can be direct, or using the loop signal converters for 4-20 mA, HART or PROFIBUS / FIELDBUS, intrinsically safe using certified transmitter modules.

Used transmitters

Type	Certificate	Manufacturer
5333D	KEMA 03ATEX1535	PR electronics A/S
5335D, 5337D	KEMA 03ATEX1537	
5350B	KEMA 02ATEX1318	

Also it cans include a display type CombiView DFON 5XX from Baumer A/S with certificate TUV 13ATEX113124 X.

The input parameters of the intrinsically safe type of protection will be the same as those indicated in the transmitter modules. For the version with direct connection the input parameter is *Pi*: 1.2 W

2. It is restricted to the use of group II for gases and marking is updated for all the variants MIL... EX, RFS...EX, M…E0 and MM…E.

3. Assessment update to the standards EN 60079-0:2012 and EN 60079-11;2012

(9) Changes in marking

II 1GD Ex ia IIC T6 Ga
-20 °C ≤ Ta ≤ +60 °C

This supplement must be an inseparable part together with the base certificate **LOM 06ATEX2054 X**
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LABORATORIO OFICIAL J. M. MADARIAGA

(3) Supplement nr. 3 to EC-Type Examination Certificate number **LOM 06ATEX2054 X**

(10) Changes in the special conditions for a safe use

- Attention should be paid to electrostatic risk of head and parts of the sensor / float made of plastic materials.
- The use in zone 0 of heads made of aluminium should be restricted to locations where the risk of ignition due to mechanical impact is not likely.

(11) Descriptive documents

		Rev.	Date
- Technical description nº:	DT0602	-	2014-05
- Drawings nr.:	DT0596	-	2013-12
	DT0598	-	2014-03
	PE0234	0	2014-02-11
	DT0615	-	2014-04-11

Getafe, 2014-06-23

Carlos Fernández Ramón
Responsible of the Certification Committee

RCPCER 07 4/2 Rev. 0