



DOC024.52.93000

ORBISPHERE Model 366x ATEX

USER MANUAL

06/2024 Edition 18



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Section 1 General Information

1.1 Disclaimer

The information in this manual has been carefully checked and is believed to be accurate. However, Hach Lange assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Hach Lange be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. In the interest of continued product development, Hach Lange reserves the right to make improvements in this manual and the products it describes at any time, without notice or obligation.

1.2 Safety information

For safe operation, please read the entire manual before unpacking, setting up, or operating this instrument.

Pay particular attention to all warning and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To ensure the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that which is specified in this manual.

This user manual is based on safety requirement coming from the manual DOC024.98.93137.

1.2.1 Use of hazard information

DANGER

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially or imminently hazardous situation that may result in minor or moderate injury.

NOTICE

Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

1.2.2 Service and repairs

None of the instrument's components can be serviced by the user. Only personnel from Hach Lange Geneva are authorized to attempt repairs to the system and only components formally approved by the manufacturer should be used. Any attempt at repairing the instrument in contravention of these principles could cause damage to the instrument and corporal injury to the person carrying out the repair. It renders the warranty null and void and could compromise the correct working of the instrument and the electrical integrity or the CE compliance of the instrument.

If you have any problems with installation, starting, or using the instrument please contact the company that sold it to you. If this is not possible, or if the results of this approach are not satisfactory, please contact the manufacturer's Customer Service.

1.2.3 Safety precautions

⚠️ WARNING

The installation of the instrument should be performed exclusively by personnel specialized and authorized to work on electrical installations, in accordance with relevant local regulations.

⚠️ WARNING

In accordance with safety standards, it must be possible to disconnect the power supply of the instrument in its immediate vicinity.

1.2.4 Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed.

	This is the safety alert symbol. Obey all safety messages that follow this symbol to avoid potential injury. If on the instrument, refer to the instruction manual for operation or safety information.
	This symbol indicates that a risk of electrical shock and/or electrocution exists.
	This symbol, when noted on the product, indicates the presence of devices sensitive to electrostatic discharge and indicates that care must be taken to prevent damage to them.
	Electrical equipment marked with this symbol may not be disposed of in European public disposal systems. In conformity with European local and national regulations, European electrical equipment users must now return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.
	Products marked with this symbol indicates that the product contains toxic or hazardous substances or elements. The number inside the symbol indicates the environmental protection use period in years.
	Products marked with this symbol indicates that the product must only be used in the safe area and never in the explosive area.

1.3 Manufacturing standard

Orbisphere 3660EX and 3662EX instruments are manufactured in conformity with the following CE directives:

- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Equipment or Protective System Intended for Use in Potentially Explosive Atmosphere Directive 2014/34/EU

The 3660EX / 3662EX instrument complies with all the requirements of the electromagnetic compatibility standards EN 61326-1, Electrical Equipment for Measurement, Control and Laboratory Use (3662EX doesn't sustain EN6100-4-5 Tests with safety power supply 32956.C 24-48 VDC version).

1.4 Intrinsically safe conformity

Orbisphere series 3660EX and 3662EX analyzers for gas measurement have been certified as Intrinsically Safe by:

LCIE (Laboratoire Central des Industries Electriques),
33 av. Division Leclerc, Fontenay aux Roses 92260, France.

Note: LCIE is a notified body number 0081 in accordance the European ATEX Directive.

LCIE certifies that the electrical apparatus has been found to comply with the essential Health and Safety Requirements: EN IEC 60079-0, EN 60079-11.

These instruments are certified as follows:

-  II (1)/1 G EX [ia Ga] ia IIC T6 Ga under EU type Examination Certificate number LCIE 03 ATEX 6354 X for the 3660EX
-  II 1 G EX ia IIC T4 Ga under EU type Examination Certificate number LCIE 03 ATEX 6004 X for the 3662EX

See [3660EX certificates on page 15](#), [3662EX certificates on page 20](#) and also the following note.

Note: 3660EX: The instrument is in the safe area and the sensor is in the hazardous area.
3662EX: The instrument and the sensor are in the hazardous area.

Important Note: For 3662EX installation, the user must verify if a certificate of conformity is required for the entire system, including safety barrier, power supply cable, instrument.

Category	Explanation
 II (1)/1 G	ATEX marking: Surface apparatus with permanent explosive gas presence. Equipment (sensor) to be used in the explosive area, and safety device to be used in the safe area.
 II 1 G	ATEX marking: Surface apparatus with permanent explosive gas presence. Equipment (sensor) and safety device to be used in the explosive area.
EX	Explosion-proof apparatus built to the universal standards below:
ia	Type of protection: The highest category, based on a safety factor of 1.5 on two faults. No combination of two faults in the 3660EX/3662EX can produce a spark, or heating, causing ignition of an explosive atmosphere.
IIC	Gas group: Corresponds to the most flammable gases, including hydrogen.
T4	Temperature category: Maximum surface temperature of 135° C.
T6	Temperature category: Maximum surface temperature of 85° C.
Ga	Equipment protection level.

1.5 Product recycling information

	ENGLISH Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of-life equipment to the manufacturer for disposal at no charge to the user. Note: <i>For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment for proper disposal.</i>
	DEUTSCH Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben. Hinweis: <i>Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.</i>
	FRANCAIS A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur. Remarque: <i>Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.</i>
	ITALIANO Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore. Nota: <i>Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.</i>
	DANSK Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren. Bemærk: <i>I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.</i>

SVENSKA

Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller uttrangerad utrustning till tillverkaren för kassering utan kostnad för användaren.

Obs! Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.

ESPAÑOL

A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario.

Nota: *Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.*

NEDERLANDS

Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen.

Nota: *Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.*

POLSKI

Sprzęt elektryczny oznaczony takim symbolem nie może być likwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji.

Uwaga: *Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkownika.*

PORTUGUES

Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador.

Nota: *No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.*

1.6 Product disposal

Note: The following only applies to European customers.

Hach Lange is committed to ensuring that the risk of any environmental damage or pollution caused by any of its products is minimized as far as possible. The European Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) that came into force on August 13 2005 aims to reduce the waste arising from electrical and electronic equipment; and improve the environmental performance of all those involved in the life cycle of electrical and electronic equipment.



In conformity with European local and national regulations (EU Directive 2002/96/EC stated above), electrical equipment marked with the above symbol may not be disposed of in European public disposal systems after 12 August 2005.

Hach Lange will offer to take back (**free of charge to the customer**) any old, unserviceable or redundant analyzers and systems which carry the above symbol, and which were originally supplied by Hach Lange. Hach Lange will then be responsible for the disposal of this equipment.

In addition, Hach Lange will offer to take back (**at cost to the customer**) any old, unserviceable or redundant analyzers and systems which do not carry the above symbol, but which were originally supplied by Hach Lange. Hach Lange will then be responsible for the disposal of this equipment.

Should you wish to arrange for the disposal of any piece of equipment originally supplied by Hach Lange, please contact your supplier or our After Sales Service department in Geneva for instructions on how to return this equipment for proper disposal.

Section 2 Specifications and Certifications

2.1 General technical data

Intrinsic Safety Certification 3660EX	LCIE 03 ATEX 6354 X  II (1)/1 G EX [ia Ga] ia IIC T6 Ga
Intrinsic Safety Certification 3662EX	LCIE 03 ATEX 6004 X  II 1 G EX ia IIC T4 Ga
Power Requirements 3660EX	95 -130 VAC @ 50/60 Hz 207-253 VAC @ 50/60 Hz
Power Requirements 3662EX	6.5 - 13.5 VDC @ 50 mA maximum current (20 mA current output) via safety barrier
Power Consumption 3660EX	20 VA
Power Consumption 3662EX	0.8 W
Serial Output 3660EX (<i>safe area</i>)	RS-232 or RS-485: Baud rate: 9600; Stop Bit: 1; Start Bit: 0; Parity: None
Serial output 3662EX (<i>hazardous area</i>)	RS-485: Baud rate: 9600; Stop Bit: 1; Start Bit: 0; Parity: None
Current Output, <i>safe area</i> (3660EX only)	0–20 mA or 4–20 mA, isolated, R _{max} = 500 Ω
Current Output 3660EX (<i>hazardous area</i>)	0–20 mA or 4–20 mA, non-isolated, R _{max} = 350 Ω, short circuit current limited to 150 mA
Current Output 3662EX (<i>hazardous area</i>)	0–20 mA or 4–20 mA, non-isolated, R _{max} = 100 Ω, short circuit current limited to 212 mA
Voltage output (<i>hazardous area</i>) 3662EX only	0–2 V, non-isolated, R _{min} = 100 kΩ
Alarm relays (<i>safe area</i>) 3660EX only	High and Low relays, NO and NC contacts, rating: Current: 2A; Voltage: 125 V; Power: 50 W / 50 VA Hysteresis: ±1% of high or low limit
System relay	NO and NC contacts rating: Current: 2A; Voltage: 125 V; Power: 50 W / 50 VA
Operating Limits	0 to 45 °C
Dimensions (W x H x D)	200 mm x 200 mm x 90 mm
Weight	2.5 kg
Enclosure Rating	IP 65 / NEMA 4x, all stainless steel
EMC Requirements (3660EX & 3662EX)	EN 61326
Exproof Requirements (3660EX and 3662EX)	EN IEC 60079-0; EN 60079-11

2.2 Instrument configurations

Model	Gas	Phase	Concentration units
366x EX / 1xx	O ₂ *	Dissolved	ppb/ppm; ppm; mg/L
		Gaseous	Pa/kPa; mbar/bar; %; % sat; ppm/%
366x EX / 2xx	H ₂	Dissolved	ppb/ppm; cc/kg
		Gaseous	Pa/kPa; mbar/bar; %
366x EX / 3xx	O ₃	Dissolved	ppb/ppm; ppm

* = CO₂ and H₂S insensitive options available.

Note: Temperature units are available in Centigrade [°C] or Fahrenheit [°F] on all models.

2.3 Customer supplied cable requirements

"Safe" area analog output, alarm output, and RS-232 or RS-485 cables are "control" cables (that is, not power cables). They must be shielded cables that meet the specifications below:

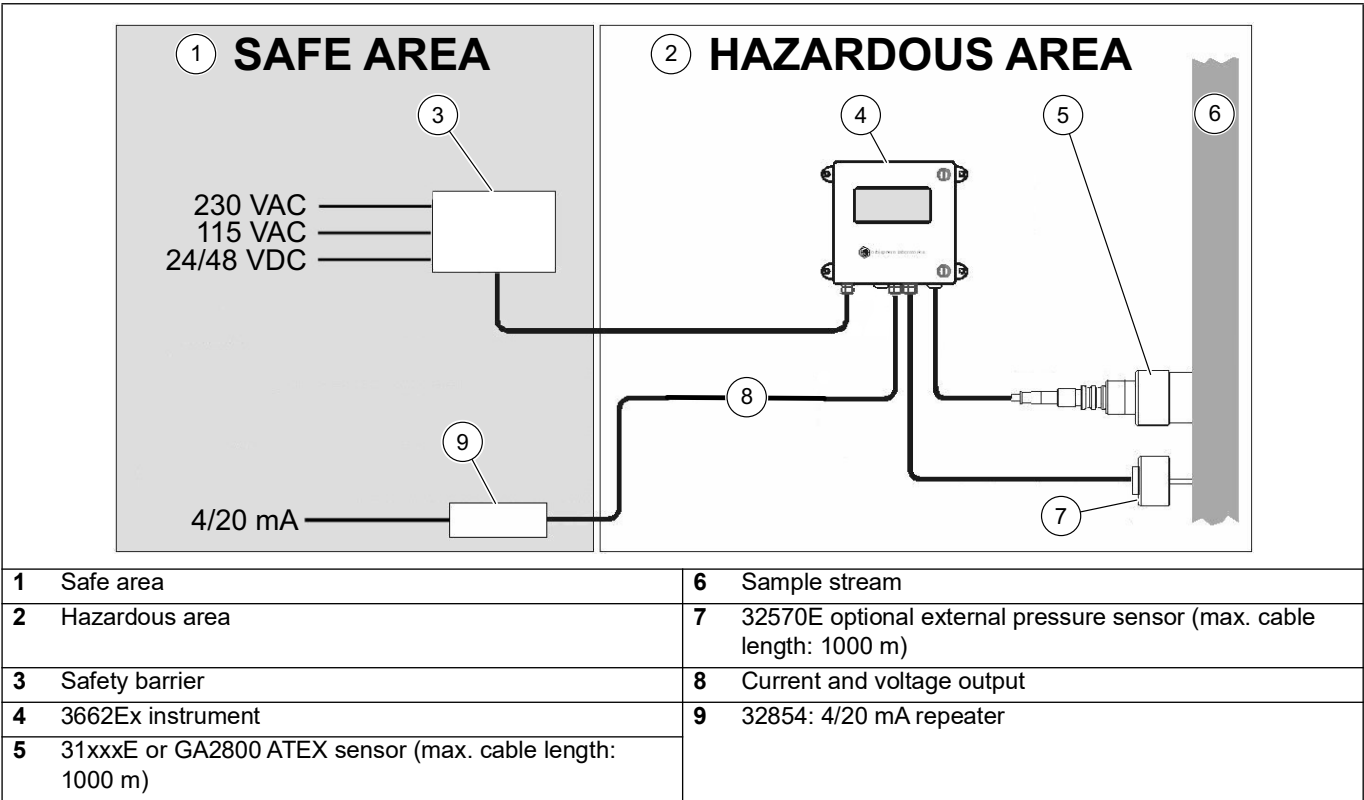
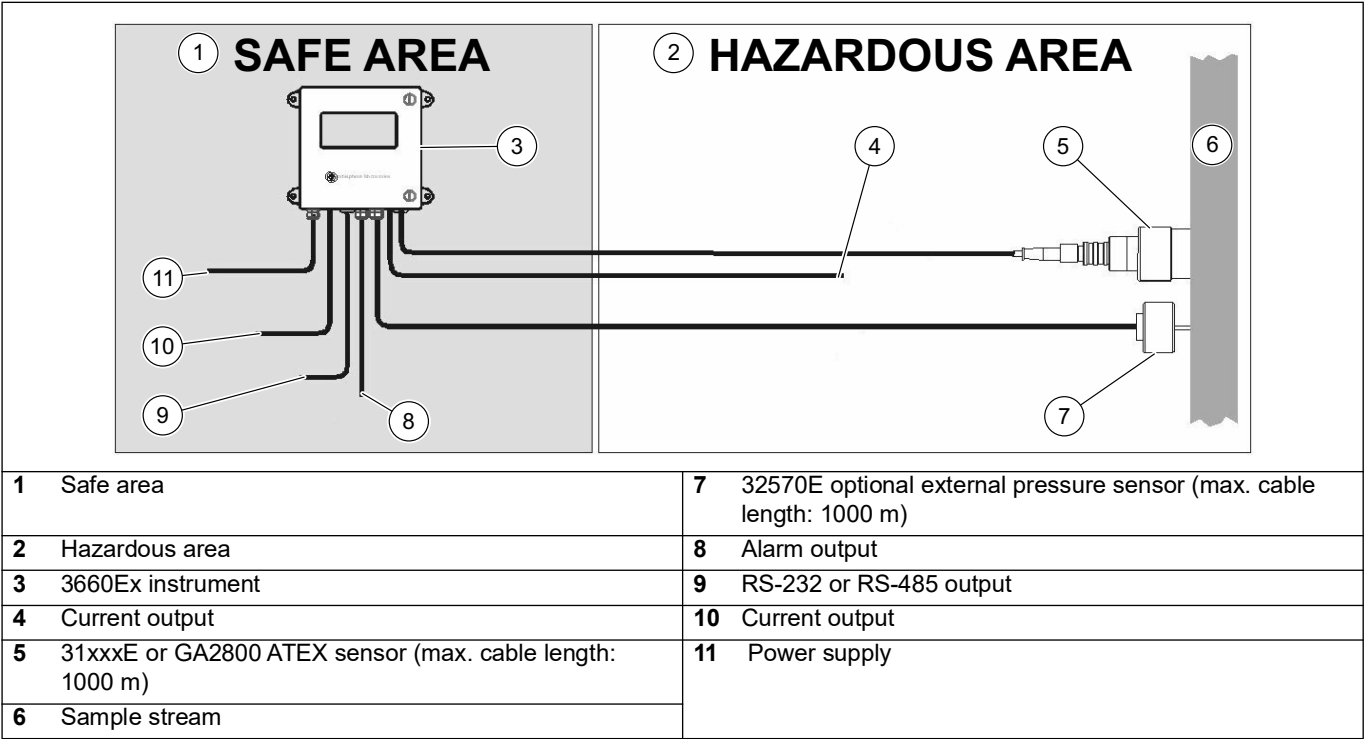
Table 1 Safe area analog and alarm output cable		
External diameter		$\geq 4 \text{ mm}; \leq 6 \text{ mm}$
Wire (core) area		$0.14\text{--}0.25 \text{ mm}^2$ (26–24 AWG)
Insulation		PVC
Nominal voltage		250 V
Absolute maximum voltage		1200 V
Absolute maximum current		1.5–2.5 A
Wire resistance		70–140 Ω/km
Capacitance @ 800 Hz	wire	100 pF/m
	screen	240 pF/m

Table 2 Hazardous area analog recorder output and RS-485 cable		
Maximum length		1000 m
Number of wires		2 (twisted cable for RS-485)
External diameter		6.5 mm max
Wire (core) area		0.5 mm^2 (20 AWG) or more
Insulation		PVC
Nominal voltage		250 V
Absolute maximum voltage		1200 V
Absolute maximum current		6 A
Wire resistance		39 Ω/km or less
Capacitance @ 800 Hz	wire	150 pF/m or less
	screen	290 pF/m or less

Table 3 Power cable	
Number of wires	3-wire (live, neutral and earth)
External diameter	$\geq 6 \text{ mm}; \leq 10.5 \text{ mm}$
Wire (core) area	$\geq 1 \text{ mm}^2$, AWG18; $\leq 2.5 \text{ mm}^2$, AWG14

Table 4 External pressure sensor cable	
External diameter	$\geq 4 \text{ mm}; \leq 6 \text{ mm}$

2.4 System layouts



2.5 Analog output signal

See also [Setting analog output limits on page 52](#), and [Jumper settings on page 37](#).

The analog output signal, representing the measured gas concentration, is available from the instrument in the ranges from 0 to 20 mA, or in the range from 4 to 20 mA.

In addition, the model 3662EX has a second analog output of 0 to 2 Volts. Depending on the instrument model, separate output connections are available for the "safe" area and for the "hazardous" area.

Scale these outputs between two custom concentration limits. If the lower of these limits is represented by AL, and the upper one by AH, the relation between the output current I (or voltage V) and the gas concentration C is as follows:

0 – 20 mA	$C = AL + (AH - AL) * I/20$
4 – 20 mA	$C = AL + (AH - AL) * (I - 4)/16$
0 – 2 Volts	$C = AL + (AH - AL) * V/2$

The analog output saturates at 20 mA (or 2 Volts), or is blocked at 0/4 mA (or 0 Volts) under various conditions, as summarized below:

Analog output	Explanation
0/4 mA (or 0 Volts)	Thermal cutoff or below analog output low limit (AL)
0/4 mA (or 0 Volts) < signal < 20 mA	Normal operating condition
20 mA (or 2 Volts)	Overrange, above analog output high limit (AH), or sensor disconnected

2.6 Alarm relay output (3660EX only)

There are three separate alarm relay connections on the instrument's output card (NO and NC), for each alarm limit relay (High and Low), and system (SYST) alarm. The following table lists the possible alarm conditions.

Conditions	Low alarm NC to Com*	High alarm NC to Com*	Low alarm NO to Com*	High alarm NO to Com*	Alarm syst NC to Com*	Alarm syst NO to Com*
Instrument power switch off	closed	closed	open	open	closed	open
No alarm: Low Limit < meas gas < High Limit	open	open	closed	closed	open	closed
Low alarm: measured gas < Low Limit	closed	open	open	closed	open	closed
High alarm: measured gas > High Limit	open	closed	closed	open	open	closed
System test					closed	open
Sensor not connected	closed	open	open	closed	closed	open
Thermal cut off					closed	open
* Low NC, High NC, Low NO, High NO, and Com identify the alarm relay connections on the instrument's output card.						

Note: The system alarm is turned on when following situations are met:
Instrument off - Alarm high - Alarm low - Sensor out - Thermal cut off

2.7 3660EX certificates

Refer to the IECEX Database web site for the IECEX Certificate of conformity:
<http://iecex.iec.ch>, with the Certificate reference: **LCI 09.0027X**



ATTESTATION D'EXAMEN UE DE TYPE EU TYPE EXAMINATION CERTIFICATE



1 Version : 06

LCIE 03 ATEX 6354 X

Issue : 06

Directive 2014/34/UE

- 2 Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles

Directive 2014/34/EU
Equipment or Protective System Intended for use in Potentially Explosive Atmospheres

- 3 Produit :
MicroLogger mural

Product :
Wall MicroLogger

Type: 3660EX

- 4 Fabricant :

Manufacturer :

- 5 Adresse :

Hach-Lange Sàrl
Address :
6, route de Compois
1222 Vézenaz
SUISSE

- 6 Ce produit et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.

This product and any acceptable variations thereto are specified in the schedule to this certificate and the documents therein referred to.

- 7 Le LCIE, Organisme Notifié sous la référence 0081 conformément à l'article 17 de la directive 2014/34/UE du Parlement européen et du Conseil du 26 février 2014, certifie que ce produit est conforme aux Exigences Essentielles de Sécurité et de Santé pour la conception et la construction de produits destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la Directive.

LCIE, Notified Body number 0081 in accordance with article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014 certifies that product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° :

The examination and test results are recorded in confidential report(s) N°:

60001647/3, 60022484/515730/03, 89388/580763/2, 112767-624064-3, 129682-660668, 147198-699769-02, 161254-736331

- 8 Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à :

Compliance with the Essential Health and Safety Requirements has been assured by compliance with :

EN 60079-0:2012+A11:2013
EN 60079-11:2012

- 9 Le signe « X » lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil est soumis aux conditions particulières d'utilisation, mentionnées dans l'annexe de cette attestation.

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

- 10 Cette Attestation d'Examen UE de Type concerne uniquement la conception et la construction du produit spécifié. Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture du produit. Ces dernières ne sont pas couvertes par la présente attestation.

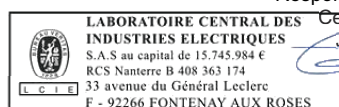
This EU Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

- 11 Le marquage du produit est mentionné dans l'annexe de cette attestation.

The marking of the product is specified in the schedule to this certificate.

Fontenay-aux-Roses, le 24 octobre 2019

Responsable de Certification



Certification Officer
Julien Gauthier

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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

LCIE 03 ATEX 6354 X

Issue : 06

12 DESCRIPTION DU PRODUIT

Le MicroLogger 3660EX est un analyseur de gaz mural fixé à demeure, conçu pour mesurer la concentration d'oxygène ou d'hydrogène d'un échantillon liquide ou gazeux, avec un capteur électrochimique externe.

L'appareil est installé en zone non dangereuse et possède des sorties de sécurité intrinsèque.

Il doit être équipé d'un capteur électrochimique de type 31xxxE, X1Y0E ou GA280E, avec ou sans câble de rallonge de 3m à 999m, et d'un capteur de pression (en option) référencé 32570E.wyz.

L'appareil se compose d'un boîtier en acier inoxydable (support de la sonde en aluminium), d'un écran LCD, d'un clavier couvert par un film plastique, deux cartes électroniques et une pile.

DESCRIPTION OF PRODUCT

The MicroLogger 3660EX is a fixed wall mounted gas analyzer, designed to measure oxygen or hydrogen gas concentration either from liquid or gaseous sample, with external electrochemical sensor.

The apparatus is located in non-hazardous location and has intrinsically safe outputs.

It shall be equipped with intrinsically safe sensors: an electrochemical sensor of type 31xxxE, X1Y0E or GA280E, with or without sensor extension cable of 3m to 999m length, and with a pressure sensor (in option) referenced 32570E.wyz.

The equipment consists of a stainless steel enclosure (sensor frame are made of aluminum), a LCD display, a plastic film panel keyboard, two electronic boards and a cell.

DETAIL DE LA GAMME

Modèle / Model	Gaz mesuré / Gas measured	Affichage des unités / Display units	Option / Option
3660EX/100-Y	Oxygène / Oxygen	ppm/ppb/°C (liquide/liquid)	---
3660EX/101-Y	Oxygène / Oxygen	ppm/ppb/°F (liquide/liquid)	---
3660EX/106-Y	Oxygène / Oxygen	%/ppm/°C (gazeux/gaseous)	---
3660EX/107-Y	Oxygène / Oxygen	%/ppm/°F (gazeux/gaseous)	---
3660EX/108-Y	Oxygène / Oxygen	%/°C (gazeux/gaseous)	---
3660EX/110-Y	Oxygène / Oxygen	%sat/°C (gazeux/gaseous)	---
3660EX/112-Y	Oxygène / Oxygen	kPa/Pa/°C (gazeux/gaseous)	---
3660EX/116-Y	Oxygène / Oxygen	%/ppm/°C (gazeux/gaseous)	Capteur de pression externe / External Pressure Sensor
3660EX/117-Y	Oxygène / Oxygen	%/ppm/°F (gazeux/gaseous)	Capteur de pression externe / External Pressure Sensor
3660EX/118-Y	Oxygène / Oxygen	%/ppm/°C (gazeux/gaseous)	Capteur de pression externe / External Pressure Sensor
3660EX/200-Y	Hydrogène / Hydrogen	ppm/ppb/°C (liquide/liquid)	---
3660EX/202-Y	Hydrogène / Hydrogen	cc/Kg/°C (liquide/liquid)	---
3660EX/218-Y	Hydrogène / Hydrogen	%/°C (liquide/liquid)	Capteur de pression externe / External Pressure Sensor
3660EX/300-Y	Ozone / Ozone	ppm/ppb/°C (liquide/liquid)	---

RANGE DETAILS

CARACTERISTIQUES

Paramètres électriques d'alimentation :

Le coffret 3660EX/xxx-Y peut être alimenté :

- Soit en 115V AC (référence 3660EX/xxx-A),
- Soit en 230 V AC (référence 3660EX/xxx-B).

Paramètres électriques de sécurité intrinsèque :

Connecteur / Terminal block	U	I	P	R	C	L
J20 Sortie signal 4...20mA/ Output signal 4...20mA	U ₀ : 12,6V	I ₀ : 131mA I ₀ : 94mA I ₀ : 56mA	P ₀ : 413mW P ₀ : 297mW P ₀ : 177mW	R55 = 0 R55 = 47 Ω R55 = 160 Ω	Co : 0,47µF Co : 0,92µF Co : 1,13µF	Lo : 1,98mH Lo : 3,98mH Lo : 9,98mH

RATINGS

Power supply parameters:

Equipment referenced 3660EX/xxx-Y could be supplied:

- Either by 115 V AC (reference 3660EX/xxx-A),
- Or by 230 V AC (reference 3660EX/xxx-B).

Intrinsic safety electrical parameters :

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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

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MARQUAGE

Le marquage du produit doit comprendre :

Marquage complet :

HACH LANGE

Adresse : ...

Type : 3660EX/xxx-Y

N° de fabrication : ...

Année de fabrication : ...

Ⓔ II (1)1 G

Ex [ia Ga] ia IIC T6 Ga

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$ U₀: ...V, I₀: ...A, P₀: ...W, Co: ..., Lo: ... (*)

(*) se reporter aux paramètres électriques de sécurité intrinsèque.

Marquage réduit sur le coffret :

HACH LANGE

Adresse : ...

Type : 3660EX/xxx-Y

N° de fabrication : ...

Année de fabrication : ...

Ⓔ II (1) G

[Ex ia Ga] IIC

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$ Marquage réduit sur les sondes EC :

HACH LANGE

Adresse : ...

Type : 31xxxE ou X1Y0E ou GA280E

N° de fabrication : ...

Année de fabrication : ...

Ⓔ II 1 G

Ex ia IIC T6 Ga

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$

AVERTISSEMENT : NE PAS SEPARER EN PRESENCE D'ATMOSPHERE EXPLOSIBLE.

Marquage réduit sur le capteur de pression :

HACH LANGE

Adresse : ...

Type : 32570E.wyz

N° de fabrication : ...

Année de fabrication : ...

Ⓔ II 1 G

Ex ia IIC T6 Ga

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$

L'appareil doit également comporter le marquage normalement prévu par les normes de construction qui le concernent sous la responsabilité du fabricant.

MARKING

The marking of the product shall include the following :

Complete marking:

HACH LANGE

Address: ...

Type : 3660EX/xxx-Y

Serial number: ...

Year of construction: ...

Ⓔ II (1)1 G

Ex [ia Ga] ia IIC T6 Ga

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$ U₀: ...V, I₀: ...A, P₀: ...W, Co: ..., Lo: ... (*)

(*) see intrinsic safety electrical parameters.

Reduced marking on electrical box:

HACH LANGE

Address: ...

Type : 3660EX/xxx-Y

Serial number: ...

Year of construction: ...

Ⓔ II (1) G

[Ex ia Ga] IIC

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$ Reduced marking on EC sensor:

HACH LANGE

Address: ...

Type : 31xxxE or X1Y0E or GA280E

Serial number: ...

Year of construction: ...

Ⓔ II 1 G

Ex ia IIC T6 Ga

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$

WARNING : DO NOT SEPARATE IN EXPLOSIVE ATMOSPHERE

Reduced marking on EC sensor:

HACH LANGE

Address: ...

Type : 32570E.wyz

Serial number: ...

Year of construction: ...

Ⓔ II 1 G

Ex ia IIC T6 Ga

LCIE 03 ATEX 6354 X

 $0^{\circ}\text{C} \leq T_{\text{amb}} \leq +45^{\circ}\text{C}$

The equipment shall also bear the usual marking required by the product standards applying to such equipment under the manufacturer responsibility.

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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

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Issue : 06

13 CONDITIONS PARTICULIERES D'UTILISATION

- Plage de température ambiante : 0°C à +45°C.
- Les matériels de sécurité intrinsèque ne doivent être raccordés qu'à des matériels associés de sécurité intrinsèque certifiés pour l'usage considéré. Cette association doit répondre aux exigences de la norme EN 60079-25.
- L'appareil doit être raccordé conformément au manuel d'instruction.
- Le connecteur J20 ne peut être raccordé qu'à des appareils de sécurité intrinsèque certifiés non générateurs d'énergie ou conforme au paragraphe 5.7 de la norme EN 60079-11.
- Les deux boucles de mesure (sonde et capteur) sont classées Ex ia IIC T6 Ga pour une température ambiante maximale de +45°C.
- L'anneau non métallique du capteur GA280E représente un risque potentiel de charge électrostatique. Nettoyer uniquement à l'aide d'un linge humide.

SPECIFIC CONDITIONS OF USE

Ambient operating temperature range: 0°C to +45°C.

The intrinsically safe apparatus shall only be connected to associated intrinsically safe apparatus certified for the intended use. This association shall comply with the requirements of the EN 60079-25 standard.

The apparatus must be connected according to instruction manual.

J20 can be only connected to a non-generator certified intrinsically safe apparatus or to equipment in compliance with requirement identified in clause 5.7 of EN 60079-11 standard.

Both measuring loops (head and sensor) are classified Ex ia IIC T6 Ga for a maximal operating ambient temperature of +45°C.

The non-metallic ring on the sensor GA280E represents a potential electrostatic charging hazard. Clean only with a wet cloth.

14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

15 DOCUMENTS DESCRIPTIFS

N°	Description	Reference	Rev.	Date	Page(s)
1.	Dossier technique / <i>Technical file</i>	3660EX.404	J	2019/08/19	64
2.	Manuel d'utilisation / <i>User Manual</i>	DOC024.98.93137	---	---	---
3.	Capteur de gaz électrochimique / <i>Electrochemical gas sensor</i>	GA280E.400	---	2019/06/24	4

DESCRIPTIVE DOCUMENTS

16 INFORMATIONS COMPLEMENTAIRES

Essais individuels

Néant

Conditions de certification

Les détenteurs d'attestations d'examen UE de type doivent également satisfaire les exigences de contrôle de production telles que définies à l'article 13 de la Directive 2014/34/UE.

En accord avec l'Article 41 de la Directive 2014/34/UE, les attestations d'examen CE de type mentionnant la Directive 94/9/CE émises avant la date d'application de la Directive 2014/34/UE (20 avril 2016) peuvent être considérées comme émises en accord avec la Directive 2014/34/UE. Les nouvelles versions de ces attestations peuvent conserver le numéro de l'attestation d'origine émise avant le 20 avril 2016.

ADDITIONAL INFORMATION

Routine tests

None

Conditions of certification

Holders of EU type examination certificates are also required to comply with the production control requirements defined in article 13 of Directive 2014/34/EU.

In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to Directive 94/9/EC that were in existence prior to the date of application of Directive 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. New issues of such certificates may continue to bear the original certificate number issued prior to 20 April 2016.

17 DETAILS DES MODIFICATIONS DE L'ATTESTATION

Version 00 : Version initiale.
2003/04/15 Certification selon les normes suivantes :
- EN 50014 (1997) + amendements 1 et 2,
- EN 50020 (2002),
- EN 13980 (1980).

DETAILS OF CERTIFICATE CHANGES

Issue 00: Initial issue.
2003/08/03 Certification according to following standards:
- EN 50014 (1997) + amendments 1 and 2,
- EN 50020 (2002),
- EN 13980 (1980).

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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE

EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

LCIE 03 ATEX 6354 X

Issue : 06

17 DETAILS DES MODIFICATIONS DE L'ATTESTATION (Suite)

- Version 01 : 2004/03/31 Changement de raison sociale : ORBISPHERE SA devient HACH ULTRA ANALYTICS.
- Version 02 : 2009/07/21 - Changement de raison sociale : HACH ULTRA ANALYTICS devient Hach-Lange Sàrl,
- Mise à jour normative selon les normes EN 60079-0 (2006) et EN 60079-11 (2007),
- Utilisation d'une sonde type X1Y0E,
- Modification de composants,
- Mise à jour de documents.
- Version 03 : 2013/02/20 Mise à jour normative selon les normes EN 60079:2009 et EN 60079-11:2007.
- Version 04 : 2014/11/05 - Mise à jour normative selon les normes EN 60079-0:2012,
- Modification des optocoupleurs U5, U6, U7, U9, U10 et U11,
- Modifications mineures des composants.
- Version 05 : 2018/02/13 - Mise à jour normative selon les normes EN 60079-0:2012,
- Emission d'une attestation UE de type selon les exigences de la Directive 2014/34/UE,
- Suppression des cartes 1200D et 1201F et remplacement par la carte 1335C,
- Mise à jour de la carte d'interface et d'alimentation AC/DC (carte et nomenclature des composants) 1204C en 1204D.
- Version 06: - Utilisation d'un nouveau capteur EC modèle GA280E.
- Mise à jour documentaire.

DETAILS OF CERTIFICATE CHANGES (continued)

- Issue 01: 2004/03/31 Manufacturer's name modification: ORBISPHERE SA becomes HACH ULTRA ANALYTICS.
- Issue 02: 2009/07/21 - Manufacturer's name modification: HACH ULTRA ANALYTICS becomes Hach-Lange Sàrl,
- Normative update according to EN 60079-0 (2006) and EN 60079-11 (2007) standards,
- Using a probe type X1Y0E,
- Modifications of components,
- Update of documents.
- Issue 03: 2013/02/20 Normative update according to EN 60079-0:2009 and EN 60079-11:2007 standards.
- Issue 04: 2014/11/05 - Normative update according to EN 60079-0:2012 and EN 60079-11:2012 standards,
- Modification of optocouplers U5, U6, U7, U9, U10, U11,
- Minor modifications of components.
- Issue 05: 2018/02/13 - Normative update according to EN 60079-0:2012 standard,
- Issuing of an EU Type examination certificate in compliance with requirements of Directive 2014/34/UE,
- Removal of cards 1200D and 1201F into a new card 1335C,
- Update of interface and supply card AC/DC (PCB and bill of material of components) 1204C en 1204D.
- Issue 06: - Usage of new EC Sensor model GA280E.
- Documents updating.

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2.8 3662EX certificates

Refer to the IECEX Database web site for the IECEX Certificate of conformity:
<http://iecex.iec.ch>, with the Certificate reference: **LCI 09.0026X**

	ATTESTATION D'EXAMEN UE DE TYPE EU TYPE EXAMINATION CERTIFICATE	
1 Version : 06	LCIE 03 ATEX 6004 X	Issue : 06
Directive 2014/34/UE 2 Appareil ou Système de Protection destiné à être utilisé en Atmosphères Explosibles 3 Produit : MicroLogger portable Directive 2014/34/EU Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Product : Portable MicroLogger		
Type: 3662EX		
4 Fabricant : 5 Adresse : Manufacturer : HACH LANGE Sàrl Address : 6, route de Compois 1222 Vézenaz Switzerland		
6 Ce produit et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence. 7 Le LCIE, Organisme Notifié sous la référence 0081 conformément à l'article 17 de la directive 2014/34/UE du Parlement européen et du Conseil du 26 février 2014, certifie que ce produit est conforme aux Exigences Essentielles de Sécurité et de Santé pour la conception et la construction de produits destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la Directive. Accréditation Cofrac Certification de Produits et Services, n°5-0014. Portée disponible sur www.cofrac.fr. Les résultats des vérifications et essais figurent dans le(s) rapport(s) confidentiel(s) N° : This product and any acceptable variations thereto are specified in the schedule to this certificate and the documents therein referred to. LCIE, Notified Body number 0081 in accordance with article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014 certifies that product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive. Cofrac Accreditation Product and Services Certification n°5-0014. Scope available on www.cofrac.fr. The examination and test results are recorded in confidential report(s) N° :		
169594-757493 rev A		
8 Le respect des Exigences Essentielles de Sécurité et de Santé est assuré par la conformité à : 9 Le signe « X » lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil est soumis aux conditions particulières d'utilisation, mentionnées dans l'annexe de cette attestation. 10 Cette Attestation d'Examen UE de Type concerne uniquement la conception et la construction du produit spécifié. Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture du produit. Ces dernières ne sont pas couvertes par la présente attestation. 11 Le marquage du produit est mentionné dans l'annexe de cette attestation. Compliance with the Essential Health and Safety Requirements has been assured by compliance with : If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate. This EU Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate. The marking of the product is specified in the schedule to this certificate.		
Fontenay-aux-Roses, le 5 avril 2022 Responsable de Certification Certification Officer Julien Gauthier		
 LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES S.A.S au capital de 15.745.984 € RCS Nanterre B 408 363 174 33 avenue du Général Leclerc F - 92266 FONTENAY AUX ROSES		
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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

LCIE 03 ATEX 6004 X

Issue : 06

12 DESCRIPTION DU PRODUIT

Le MicroLogger 3662EX est un analyseur de gaz mural fixé à demeure, conçu pour mesurer la concentration d'oxygène ou d'hydrogène d'un échantillon liquide ou gazeux, avec un capteur électrochimique externe.

L'appareil est alimenté par un appareil associé de sécurité intrinsèque et comporte une sortie analogique de sécurité intrinsèque 0-2V ou 0/4...20mA et un port de communication série (RS485) de sécurité intrinsèque.

L'appareil se compose d'un boîtier en acier inoxydable (support de la sonde en aluminium), d'un écran LCD, d'un clavier couvert par un film plastique, deux cartes électroniques et une pile.

Il doit être équipé d'un capteur électrochimique de type 31xxxE, X1Y0E ou GA280E, avec ou sans câble de rallonge de 3m à 999m, et d'un capteur de pression (en option) référencé 32570E.wyz.

DESCRIPTION OF PRODUCT

The MicroLogger 3662EX is a fixed wall mounted gas analyzer, designed to measure oxygen or hydrogen gas concentration either from liquid or gaseous sample, with external electrochemical sensor.

The apparatus is powered by an intrinsically safe associated apparatus and has an analog output 0-2V or 0/4...20mA as intrinsically safe output and an intrinsically safe serial communication (RS485) output.

The equipment consists of a stainless steel enclosure (sensor frame are made of aluminum), a LCD display, a plastic film panel keyboard, two electronic boards and a cell.

It shall be equipped with an electrochemical sensor of type 31xxxE, X1Y0E or GA280E, with or without sensor extension cable of 3m to 999m length, and with a pressure sensor (in option) referenced 32570E.wyz.

DETAIL DE LA GAMME**RANGE DETAILS**

Modèle / Model	Gaz mesuré / Gas measured	Affichage des unités / Display units	Option / Option
3662EX/100	Oxygène / Oxygen	ppm/ppb/C° (liquide/liquid)	-
3662EX/101	Oxygène / Oxygen	ppm/ppb/F° (liquide/liquid)	-
3662EX/106	Oxygène / Oxygen	%/ppm/°C (gazeux/gaseous)	-
3662EX/108	Oxygène / Oxygen	%/°C (gazeux/gaseous)	External Pressure Sensor
3662EX/110	Oxygène / Oxygen	%sat/°C (gazeux/gaseous)	-
3662EX/112	Oxygène / Oxygen	kPa/Pa/°C (gazeux/gaseous)	-
3662EX/116	Oxygène / Oxygen	%/ppm/°C (gazeux/gaseous)	-
3662EX/200	Hydrogène / Hydrogen	ppm/ppb/C° (liquide/liquid)	-
3662EX/218	Hydrogène / Hydrogen	%/°C (liquide/liquid)	External Pressure Sensor
3662EX/300	Ozone / Ozone	ppm/ppb/C° (liquide/liquid)	-

CARACTERISTIQUES**RATINGS**

Paramètres électriques de sécurité intrinsèque:

Intrinsic safety electrical parameters:

Connecteur Terminal block	U	I	P	R	C	L
J11 Borne d'alimentation Power supply	U_i : 28V	I_i : 120mA	P_i : 840mW	-	C_i : 2,64nF	L_i : 0
J12 Port communication RS485 / RS485 serial communication	U_i : 3,7V	I_i : 225mA	P_i : 206mW	-	C_i : 2,86µF	L_i : 14,3 µH

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1 Version : 06

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CARACTERISTIQUES (SUITE)			RATINGS (CONTINUED)			
Connecteur Terminal block	U	I	P	R	C	L
J12 Port communication RS485 / RS485 serial communication	$U_o : 5,88V$	$I_o : 53,9mA$	$P_o : 79,2mW$	-	$C_o : 21,5\mu F$ $C_o : 26,5\mu F$ $C_o : 33,1\mu F$ $C_o : 36,7\mu F$	$L_o : 1,78mH$ $L_o : 1,83mH$ $L_o : 2,08mH$ $L_o : 5,98mH$
J13 Sortie signal 4...20mA Output signal 4...20mA	$U_o : 5,88V$	$I_o : 152,3mA$ $I_o : 149,4mA$ $I_o : 128,8mA$ $I_o : 73,1mA$	$P_o : 206,6mW$ $P_o : 203,6mW$ $P_o : 176,6mW$ $P_o : 97,8mW$	$R_{12} = 0$ $R_{12} = 12 \Omega$ $R_{12} = 47 \Omega$ $R_{12} = 100 \Omega$		
J14 Sortie signal / 0-2V Output signal 0-2V	$U_o : 5,88V$	$I_o : 76,8mA$	$P_o : 103,3mW$	-		

MARQUAGE

Le marquage du produit doit comprendre :

Marquage complet :

HACH LANGE

Adresse : ...

Type : 3662EX/xxx

N° de fabrication : ...

Année de fabrication : ...

Ex II 1 G

Ex ia IIC T4...T6 Ga

LCIE 03 ATEX 6004 X

$0^{\circ}C \leq T_{amb} \leq +45^{\circ}C$

$U_i : ...V, I_i : ...A, P_i : ...W, C_i : ..., L_i : ... (*)$

$U_o : ...V, I_o : ...A, P_o : ...W, C_o : ..., L_o : ... (*)$

(*) voir paramètres électriques de sécurité intrinsèque.

Marquage réduit du boîtier principal :

HACH LANGE

Adresse : ...

Type : 3662EX/xxx

N° de fabrication : ...

Année de fabrication : ...

Ex II 1 G

Ex ia IIC T4 Ga

LCIE 03 ATEX 6004 X

$0^{\circ}C \leq T_{amb} \leq +45^{\circ}C$

Marquage réduit des sondes :

HACH LANGE

Adresse : ...

Type : 31xxxE ou X1Y0E ou 32570E.wyz ou GA280E

N° de fabrication : ...

Année de fabrication : ...

Ex II 1 G

Ex ia IIC T6 Ga

LCIE 03 ATEX 6004 X

$0^{\circ}C \leq T_{amb} \leq +45^{\circ}C$

L'appareil doit également comporter le marquage normalement prévu par les normes de construction qui le concernent sous la responsabilité du fabricant.

MARKING

The marking of the product shall include the following :

Complete marking :

HACH LANGE

Address: ...

Type : 3662EX/xxx

Serial number: ...

Year of construction: ...

Ex II 1 G

Ex ia IIC T4...T6 Ga

LCIE 03 ATEX 6004 X

$0^{\circ}C \leq T_{amb} \leq +45^{\circ}C$

$U_i : ...V, I_i : ...A, P_i : ...W, C_i : ..., L_i : ... (*)$

$U_o : ...V, I_o : ...A, P_o : ...W, C_o : ..., L_o : ... (*)$

(*) see intrinsic safety electrical parameters.

Reduced marking on main enclosure :

HACH LANGE

Address: ...

Type : 3662EX/xxx

Serial number: ...

Year of construction: ...

Ex II 1 G

Ex ia IIC T4 Ga

LCIE 03 ATEX 6004 X

$0^{\circ}C \leq T_{amb} \leq +45^{\circ}C$

Reduced marking on sensors :

HACH LANGE

Address: ...

Type : 31xxxE or X1Y0E or 32570E.wyz or GA280E

Serial number: ...

Year of construction: ...

Ex II 1 G

Ex ia IIC T6 Ga

LCIE 03 ATEX 6004 X

$0^{\circ}C \leq T_{amb} \leq +45^{\circ}C$

The equipment shall also bear the usual marking required by the product standards applying to such equipment under the manufacturer responsibility.

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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE

EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

LCIE 03 ATEX 6004 X

Issue : 06

13 CONDITIONS PARTICULIERES D'UTILISATION

- a) Les matériels de sécurité intrinsèque ne doivent être raccordés qu'à des matériels associés de sécurité intrinsèque certifiés pour l'usage considéré. Cette association doit répondre aux exigences de la norme EN 60079-25.
- b) L'appareil doit être raccordé conformément au manuel d'instruction.
- c) Les connecteurs J13 et J14 ne peuvent être raccordés qu'à des appareils de sécurité intrinsèque certifiés non générateurs d'énergie ou conforme au paragraphe 5.7 de la norme EN 60079-11.
- d) Les deux boucles de mesure (sonde et capteur) sont classées Ex ia IIC T6 Ga pour une température ambiante maximale de +45°C.
- e) L'anneau non métallique du capteur GA280E représente un risque potentiel de charge électrostatique. Nettoyer uniquement à l'aide d'un linge humide.

14 EXIGENCES ESSENTIELLES DE SANTE ET DE SECURITE

Couvertes par les normes listées au point 8.

15 DOCUMENTS DESCRIPTIFS**SPECIFIC CONDITIONS OF USE**

The intrinsically safe apparatus shall only be connected to associated intrinsically safe apparatus certified for the intended use. This association shall comply with the requirements of EN 60079-25 standard.

The apparatus must be connected according to instruction manual.

Terminals J13 and J14 can be only connected to a non-generator certified intrinsically safe apparatus or to equipment in compliance with requirement identified in clause 5.7 of EN 60079-11 standard.

Both measuring loops (head and sensor) are classified Ex ia IIC T6 Ga for a maximal operating ambient temperature of +45°C.

The non-metallic ring on the sensor GA280E represents a potential electrostatic charging hazard. Clean only with a wet cloth.

ESSENTIAL HEALTH AND SAFETY REQUIREMENTS

Covered by standards listed at 8.

DESCRIPTIVE DOCUMENTS

N°	Description	Reference	Rev.	Date	Page(s)
1.	Dossier technique / <i>Technical file</i>	3662EX.404	F	2021/05/18	55
2.	Manuel d'utilisation / <i>User Manual</i>	DOC024.98.93137			58
3.	Capteur de gaz électrochimique / <i>Electrochemical gas sensor</i>	GA280E.400	-	2019/06/24	4

16 INFORMATIONS COMPLEMENTAIRES**Essais individuels**

Néant

Composants intégrés**ADDITIONAL INFORMATION****Routine tests**

None

Integrated components

Désignation <i>Designation</i>	Fabricant <i>Manufacturer</i>	Type	Document de référence <i>Reference document</i>	Normes de référence <i>Reference standards</i>	
Fuse	LITTELFUSE	0259-125T	Baseefa 02 ATEX 0071U	EN 60079-0 : 2012 +A11 : 2013 EN 60079-11 : 2012	(2)

- (1) Pas de modifications techniques majeures applicables.
- (2) Modifications techniques majeures évaluées and considérées satisfaisantes.

- (1) No applicable Technical Differences.
- (2) Technical Differences evaluated and found satisfactory.

Conditions de certification

Les détenteurs d'attestations d'examen UE de type doivent également satisfaire les exigences de contrôle de production telles que définies à l'article 13 de la Directive 2014/34/UE.

Conditions of certification

Holders of EU type examination certificates are also required to comply with the production control requirements defined in article 13 of Directive 2014/34/EU.

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ATTESTATION D'EXAMEN UE DE TYPE - ANNEXE EU TYPE EXAMINATION CERTIFICATE - SCHEDULE

1 Version : 06

LCIE 03 ATEX 6004 X

Issue : 06

16 INFORMATIONS COMPLEMENTAIRES (SUITE)

En accord avec l'Article 41 de la Directive 2014/34/UE, les attestations d'examen CE de type mentionnant la Directive 94/9/CE émises avant la date d'application de la Directive 2014/34/UE (20 avril 2016) peuvent être considérées comme émises en accord avec la Directive 2014/34/UE. Les nouvelles versions de ces attestations peuvent conserver le numéro de l'attestation d'origine émise avant le 20 avril 2016.

17 DETAILS DES MODIFICATIONS DE L'ATTESTATION

Version 00 : Evaluation initiale suivant les normes EN 50014:1997 et EN 50020:2002.

Version 01 : Changement de raison sociale, Orbisphere SA devient HACH ULTRA ANALYTICS.

Version 02 :
2009/07/21

- Changement de raison sociale en HACH LANGE Sàrl.
- Mise à jour normative suivant les normes EN 60079-0:2006 et EN 60079-11:2007.
- Utilisation d'une sonde de type X1Y0E.
- Modification des paramètres électriques du connecteur J12.
- Modification de composants.
- Mise à jour de documents.

Version 03 : Mise à jour normative suivant les normes EN 60079-0:2009 et EN 60079-11:2012.

Version 04 :
2017/11/17

- Mise à jour normative selon la norme EN 60079-0:2012+A11:2013.
- Emission d'une attestation UE de type selon les exigences de la Directive 2014/34/UE.
- Suppression des cartes 1200D et 1201F et remplacement par la carte 1335C.
- Mise à jour de la carte d'interface et d'alimentation DC/DC TBTS (carte et nomenclature des composants) 1209B en 1209C.
- Modification du classement en température du boîtier principal d'alimentation : T6 devient T4, pour une température ambiante maximale de +45°C.
- Modification de la plage de température ambiante d'utilisation : de 0 à 45°C.

Version 05 :
2019/10/24

- Utilisation d'un nouveau capteur EC modèle GA280E
- Mise à jour documentaire.

Version 06 :
2022/03/22

- Mise à jour normative suivant la norme EN CEI 60079-0: 2018.
- Mise à jour documentaire.

Version 06
rev A:

- Corrections éditoriales du rapport.

ADDITIONAL INFORMATION (CONTINUED)

In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to Directive 94/9/EC that were in existence prior to the date of application of Directive 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. New issues of such certificates may continue to bear the original certificate number issued prior to 20 April 2016.

DETAILS OF CERTIFICATE CHANGES

Issue 00 : Initial assessment according to EN 50014:1997 and EN 50020:2002 standards.

Issue 01 : Change in name of the company, Orbisphere SA becomes HACH ULTRA ANALYTICS.

Issue 02 :
2009/07/21

- Change in name of the company to HACH LANGE Sàrl.
- Normative update according to EN 60079-0:2006 and EN 60079-11:2007 standards.
- Use of type X1Y0E probe.
- Modification of electrical parameters for the terminal J12.
- Modifications of components.
- Update of documents.

Issue 03 : Normative update according to EN 60079-0:2006 and EN 60079-11:2012.

Issue 04 :
2017/11/17

- Normative update according to EN 60079-0:2012+A11:2013 standard.
- Issuing of an EU Type examination certificate in compliance with requirements of Directive 2014/34/UE.
- Removal of cards 1200D and 1201F into a new card 1335C.
- Update of interface and supply card DC/DC SELV (PCB and bill of material of components) 1209B into 1209C.
- Modification of temperature classification of the main supply box: T6 becomes T4, at maximal ambient operating temperature of +45°C.
- Modification of operating ambient temperature range: from 0 to +45°C.

Issue 05 :
2019/10/24

- Usage of new EC sensor model GA280E
- Documents updating.

Issue 06 :
2022/03/22

- Normative update according to EN IEC 60079-0: 2018.
- Documents updating.

Issue 06
rev A:

- Editorial corrections of the report.

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Section 3 Installation

This section provides necessary information to install and connect the instrument. Do not hesitate to contact your Hach Lange representative regarding any of the installation procedures.

⚠ **WARNING**

In accordance with safety standard EN 61010-1, it must be possible to disconnect the power supply of the 3660 EX instrument in its immediate vicinity.

⚠ **WARNING**

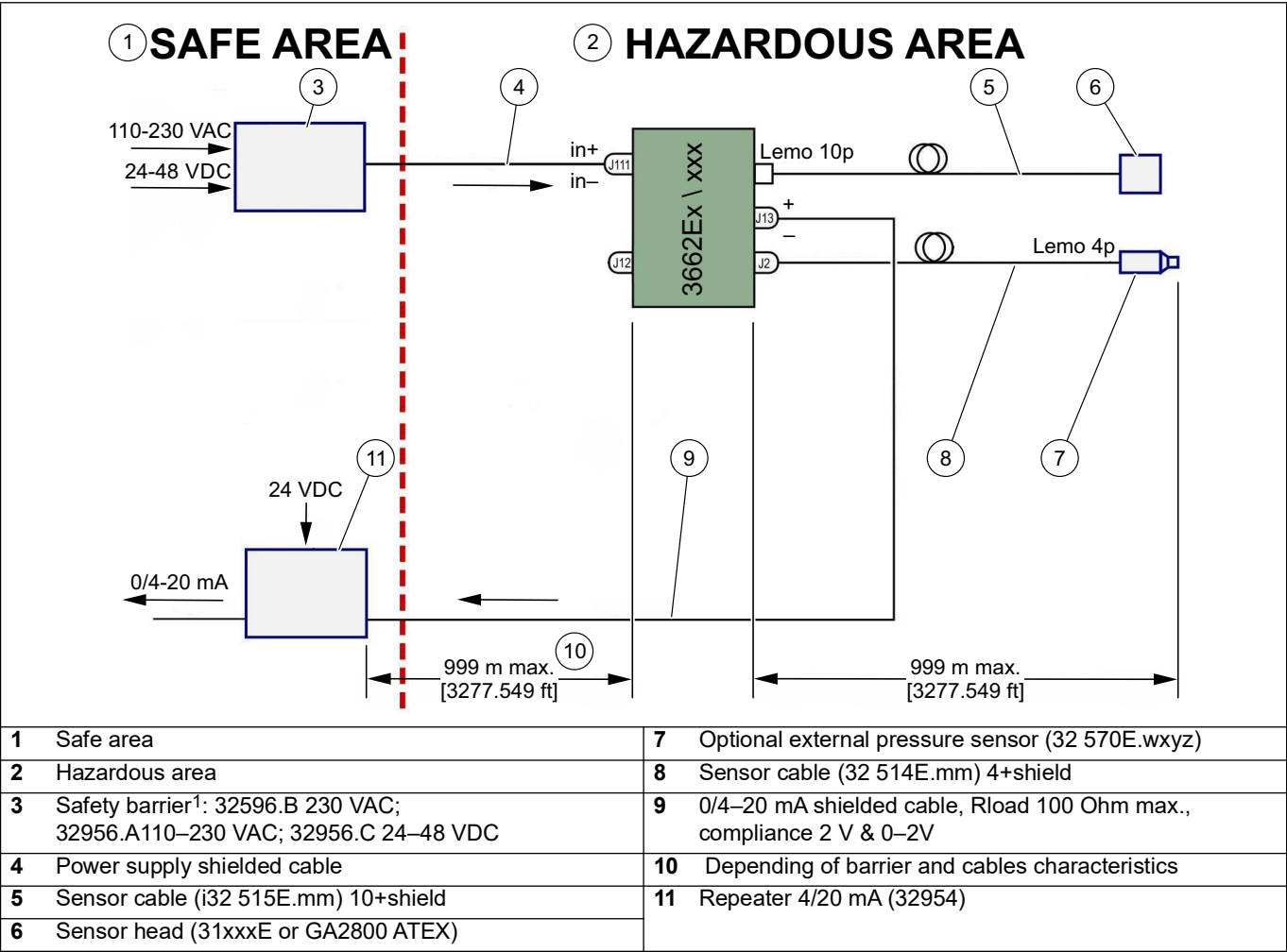
The installation of a 3660 EX or 3662 EX instrument should be performed exclusively by personnel specialized and authorized to work on electrical installations, in accordance with relevant local regulations.

3.1 Installation diagrams

3.1.1 3662EX installation

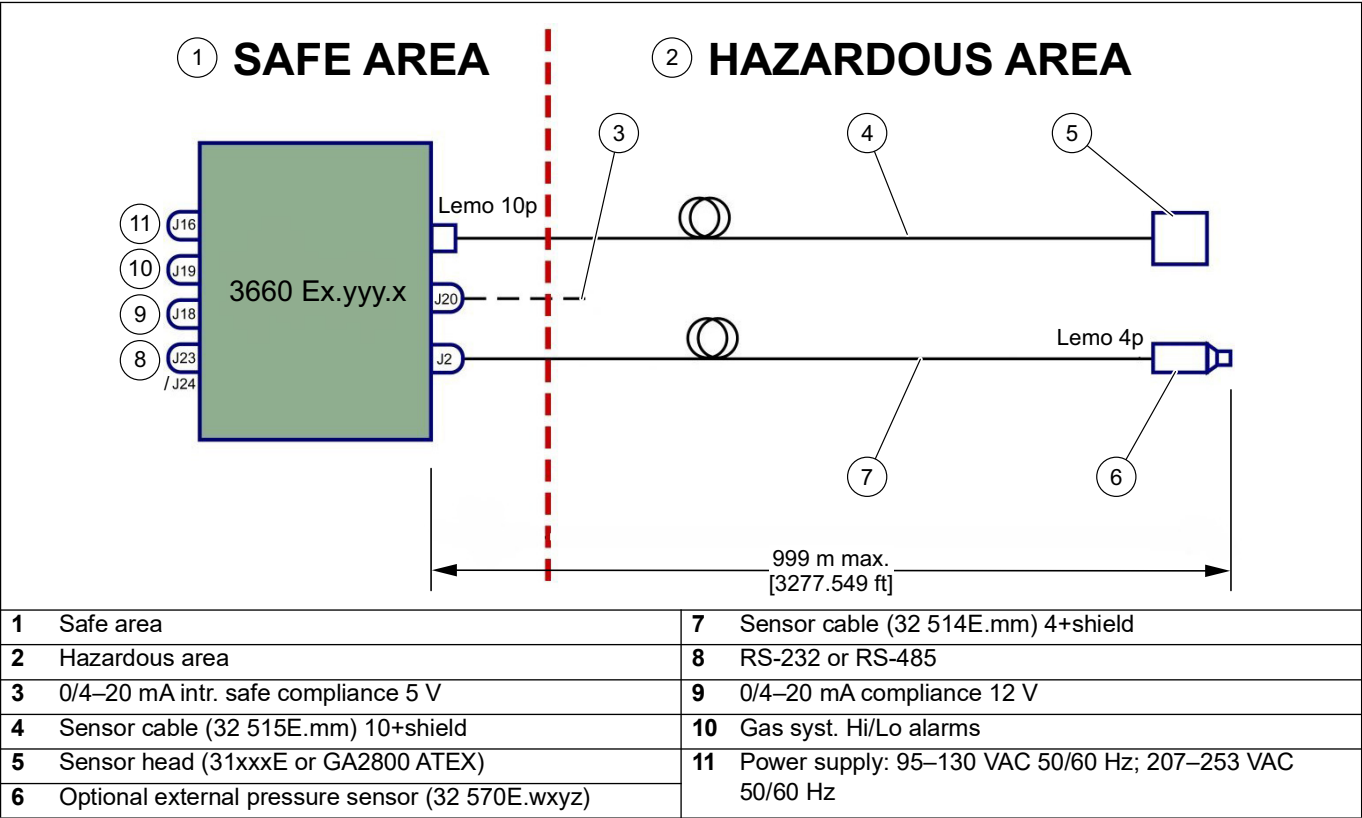
NOTICE

The ATEX certification for the 3662EX instrument covers only the hazardous area. The customer must verify if a certificate of conformity is required for the entire installed system, including safety barrier, power supply cable, and eventually the communication isolator, the 4/20 mA repeater and respective cables.



1 All the devices below are accessory equipments
Note: The 3662EX may be installed in different configuration and/or accessories.

3.1.2 3660EX installation



3.2 Connectors assembly instructions

⚠ WARNING	
	Potential Electrocution Hazard. In order to maintain the NEMA/IP environmental ratings of the enclosure, use only conduit fittings and cable glands rated for at least NEMA 4X/IP65 to route cables into the instrument.

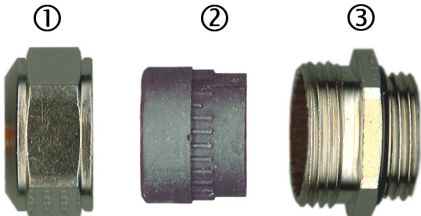
3.2.1 Cable glands

A waterproof cable gland is provided each time a cable must be connected inside the instrument. The nickel-plated cable glands are EMC-type, and are designed to ground the cable shield to the instrument metal case.

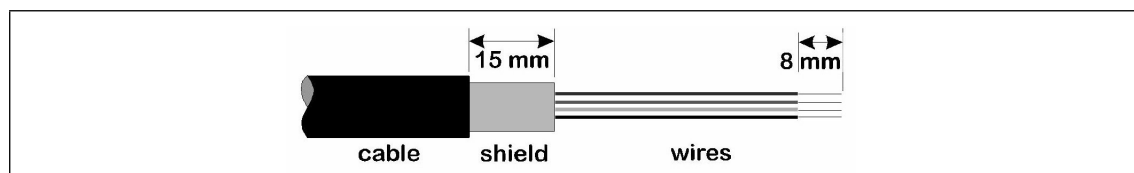
Determine which cable gland is in the instrument:

- Cable gland type 1 with washers. Refer to [section 3.2.2](#).
- Cable gland type 2 with springs. Refer to [section 3.2.3 on page 28](#).

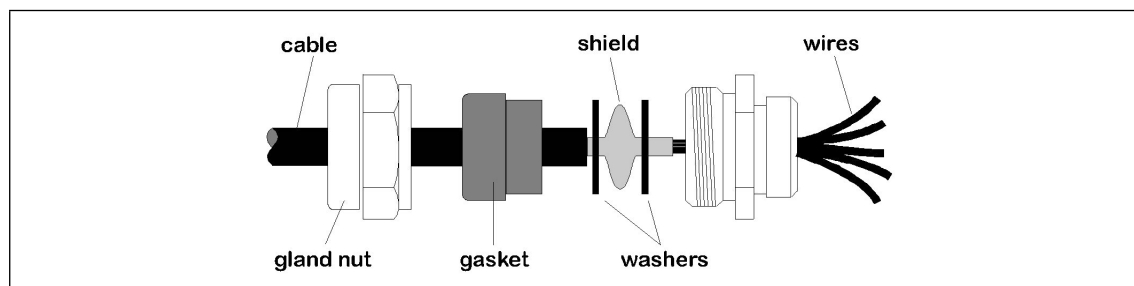
3.2.2 Cable gland type 1 wiring instructions

	Gland parts (washers not shown): 1. Nut 2. Rubber gasket (seal) 3. Gland fitting with O-ring (attached to instrument housing)
--	--

1. Unscrew the gland nut. Inside there is a rubber gasket, a metal washer with an 8.3 mm hole and another metal washer with a 7.5 mm hole.
2. Strip off external insulation as required, and 25 mm of shielding. Strip the wires about 8 mm from their ends (see illustration below).



3. Pass the cable through the nut, the gasket, the 8.3-mm hole washer and the 7.5-mm hole washer.
4. Pinch the shield so that its entire circumference is squeezed between the two washers and pass the cable into the housing, blocking the cable gland (see illustration below).



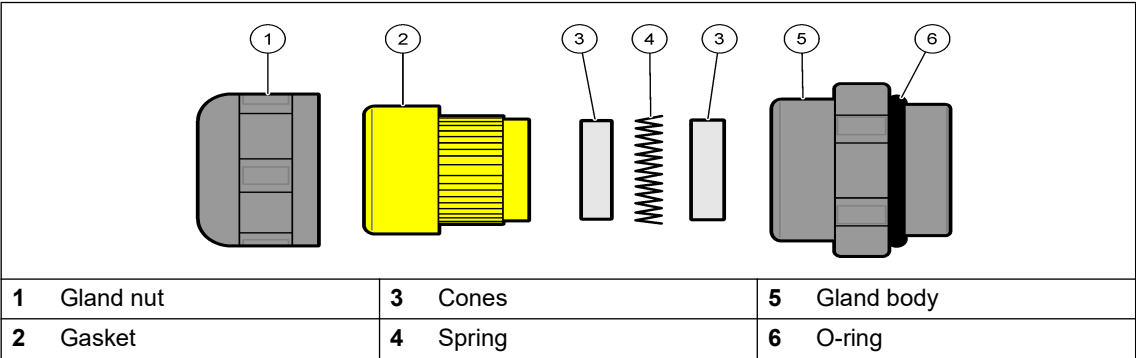
5. Reattach and tighten the cable gland nut.
6. * Solder a 1 mm² yellow/green cable on the cable shield end.
7. * Solder a 3 mm eyelet at the end of this cable.
8. * Attach it to the nearest ground screw.
9. Connect the wires in accordance with diagram in this section.

NOTICE

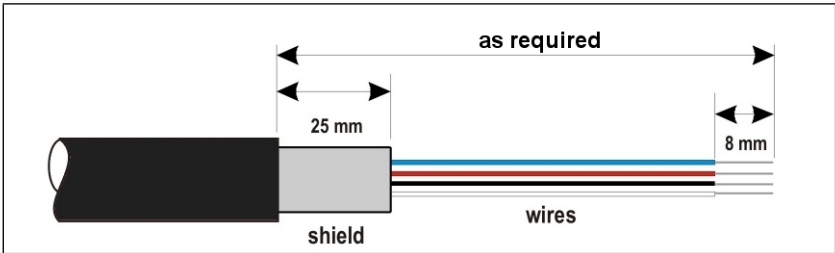
It is vitally important to ensure the shielding is pinched and secured between the two washers to ensure the shielding attaches directly to the instrument housing as a ground. Failure to do this could cause damage to the instrument, and for sensor cables give incorrect readings.

Note: * = only for 3662Ex installed inside hazardous area

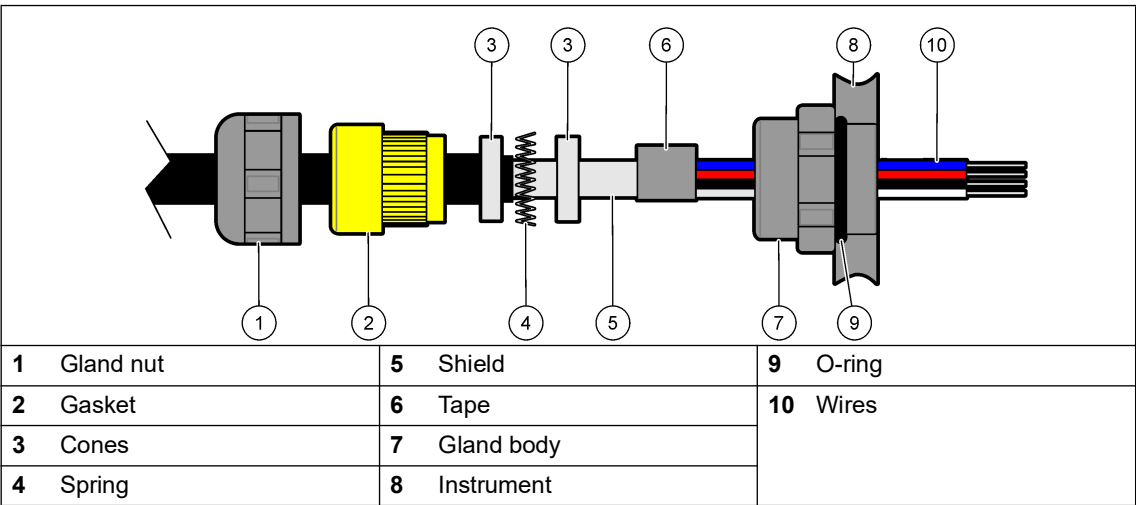
3.2.3 Cable gland type 2 wiring instructions



- 1. Unscrew the cable gland nut. Inside, the assembly is composed of a rubber gasket, two metal cones and a spring.
- 2. Strip off external insulation as required, and 25 mm of shielding. Strip the wires about 8 mm from the ends. (see illustration below).



- 3. Pass the cable through the nut, the rubber gasket, two metal cones and the spring and remove the plastic protection (tape) from the exposed shielding.
- 4. Position the spring on the shield, pass the cable into the housing and blocking the cable gland (see illustration below).



- 5. Reattach and tighten the cable gland nut.
- 6. * Solder a 1 mm² yellow/green cable on the cable shield end.

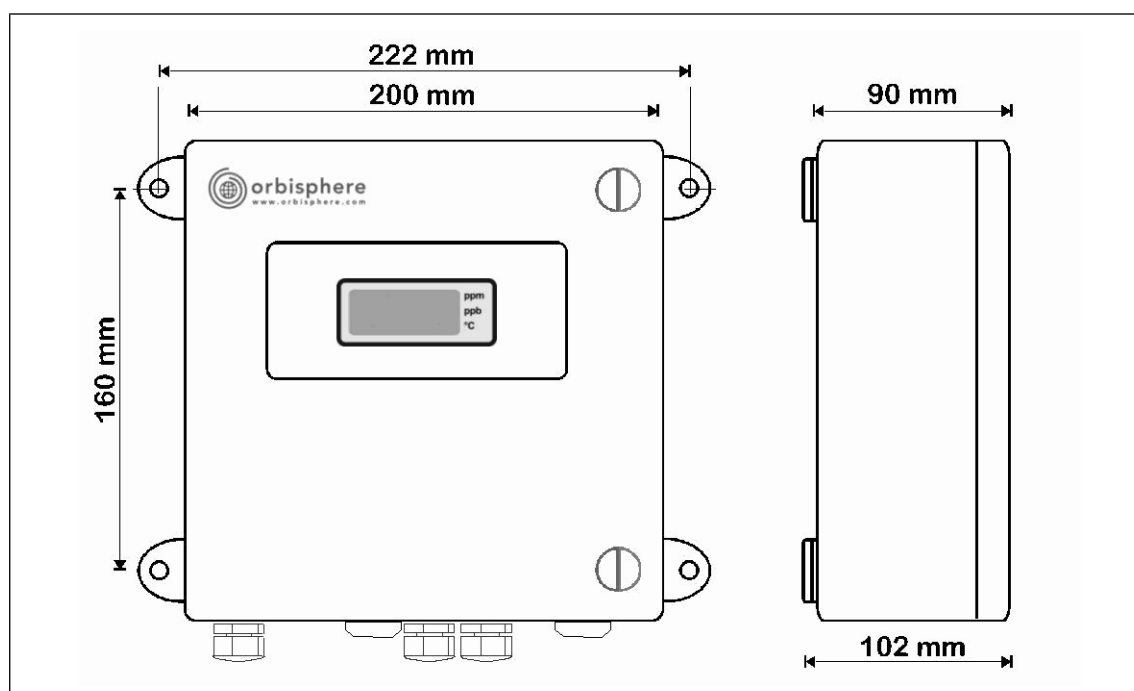
7. * Solder a 3 mm eyelet at the end of this cable.
8. * Attach it to the nearest ground screw.
9. Connect the wires in accordance with diagram in this section.

NOTICE

It is vitally important to ensure the shielding is in contact with the spring after tightening the cable gland to ensure the shielding attaches directly to the instrument housing as a ground. Failure to do this could cause damage to the instrument, and for sensor cables give incorrect readings.

Note: * = only for 3662Ex installed inside hazardous area

3.3 Instrument housing



The 3660EX or 3662EX instruments are designed for indoor as well as outdoor use. They are housed in a watertight, stainless-steel enclosure designed to be installed in the safe or the hazardous area, depending on model. The instrument case is surface mounted, either to a wall or a process control panel, by four attachment points. Both instruments case have the same size, same mounting dimensions and spacing needs (3660EX instrument illustrated).

Even if the instrument electronics are properly shielded, it is advisable to install the instrument as far as possible from a possible source of electromagnetic perturbation.

Instrument panel is hinged on the left side, to gain access to keypad, mechanical switches, and connections. A minimum of 200 mm front clearance is required to open it completely. The front panel is held close with two screws. It will be necessary to open this panel during operation and installation.

Connections are at the bottom of the instrument. Provide at least a 150 mm bottom clearance for cable installation.

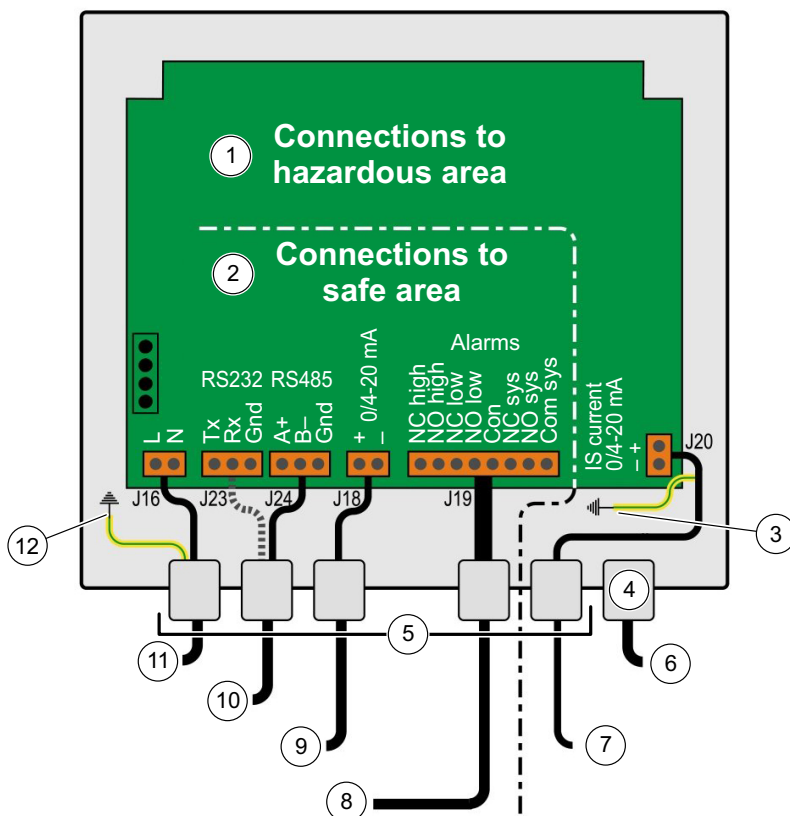
⚠ WARNING

Make sure that power supply is switched off before opening the front panel, changing any jumper settings or making any connections in the instrument. Before connecting cables inside the instrument, make sure that they are disconnected from any power supply.

To access instrument's terminal block connections, open the instrument front panel, and remove the protection cover by removing the four screws. Carefully set aside the keypad/display panel, paying attention not to pull on the cable that connects to the power supply and output card.

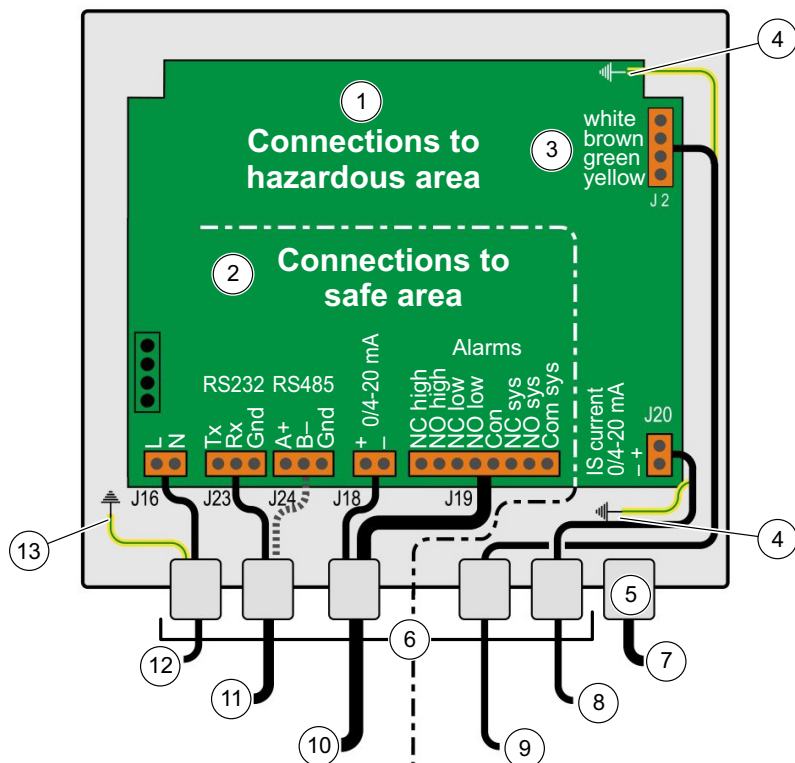
3.4 Connection diagrams

Figure 1 3660Ex instrument (Example is wired RS 485)



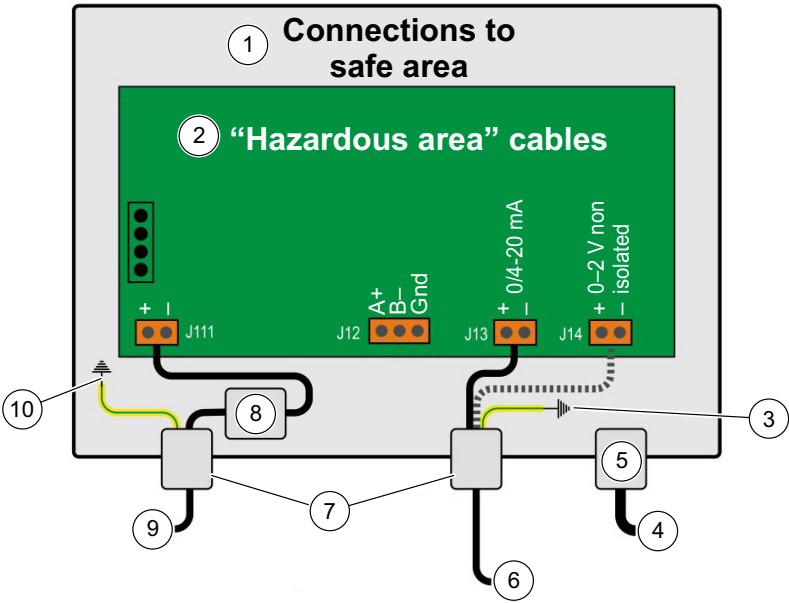
1 Connection to "hazardous area": Inside the instrument, cables to "hazardous area" must never overlap the "safe area".	7 Current output to hazardous area
2 Connections to "safe area": "Hazardous area" cables must be shielded up to the connector, then the shield must be connected to ground.	8 Alarm outputs
3 Shield wire ground	9 Current output to safe area
4 Lemo 10	10 RS-232 or RS-485
5 PG gland	11 115 or 230 VAC (L= Line, N=Neutral)
6 O2, O3 or H2 sensor (hazardous area)	12 PE-Earth

Figure 2 3660Ex instrument with external pressure sensor (Example is wired RS 232)



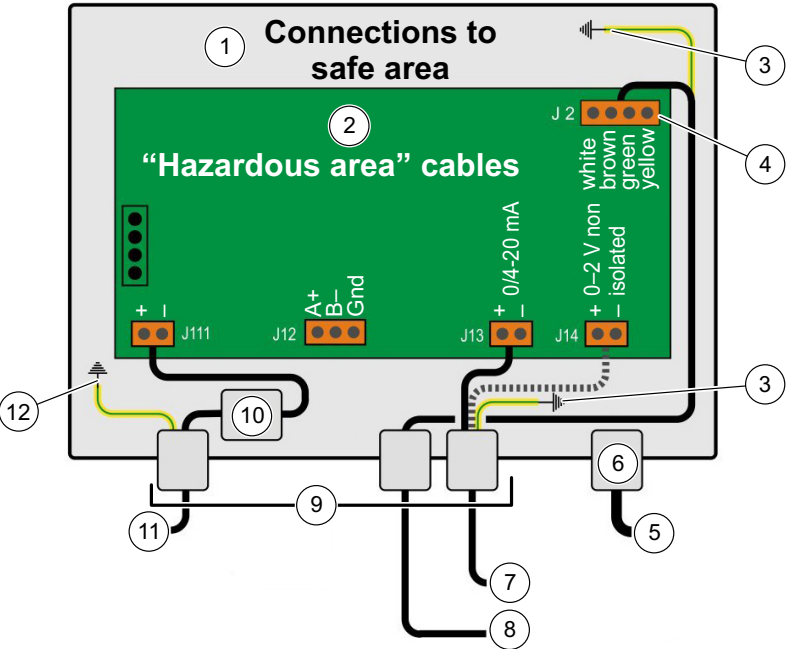
1	Connection to "hazardous area": Inside the instrument, cables to "hazardous area" must never overlap the "safe area".	8	Current output to hazardous area
2	Connections to "safe area": "Hazardous area" cables must be shielded up to the connector, then the shield must be connected to ground.	9	External pressure sensor
3	Color code for sensor cable item no. 32514E	10	Current output to safe area and alarm outputs
4	Shield ground	11	RS-232 or RS-485
5	Lemo 10	12	115 or 230 VAC (L= Line, N=Neutral)
6	PG gland	13	PE-Earth
7	O2, O3 or H2 sensor (hazardous area)		

Figure 3 3662Ex instrument



1	Connections to "safe area".	6	Current or voltage output
2	"Hazardous area" cables must be shielded up to the connector, then the shield must be connected to ground.	7	PG gland
3	Shield ground	8	Power from safety barrier
4	O2, O3 or H2 sensor	9	J11, Filter
5	Lemo 10	10	PE-Earth

Figure 4 3662Ex instrument



1	Connections to "safe area".	7	Current or voltage output
2	"Hazardous area" cables must be shielded up to the connector, then the shield must be connected to ground.	8	External pressure sensor
3	Shield ground	9	PG gland
4	Color codes for sensor cable item no. 32514E	10	Power from safety barrier
5	O2, O3 or H2 sensor	11	J11, Filter
6	Lemo 10	12	PE-Earth

3.5 Power input connections

⚠ CAUTION

Make sure that power supply meets the voltage requirement, as shown on the sticker located inside the instrument.

3.5.1 3660EX AC (in safe area)

AC power connections for the 3660EX instrument is through the left cable gland. Attach the power wires to the power terminal block J16.

L	Live (115/230 VAC, 50/60 Hz).
N	Neutral.
PE	Earth. This connection must be made to the ground screw on the left side of the instrument, using a 4 mm diameter eyelet.

Use a flexible cable of the type H05VV-F 3 X 0.75 mm². The length of the cable should be three meters maximum, and should have a separable plug (with three connectors, L+N+PE), without a locking device, to mate with a socket outlet in the building. The cable and plug must conform to local standard.

3.5.2 3662EX (in hazardous area)

⚠ WARNING

The power for the 3662EX instrument in the hazardous area must be provided through a safety barrier from the safe area with a shielded cable.

The power source comes from the customer's installation. Connect a safety barrier (model ref. 32956), to the power supply output in the safe area. Maximum cable length allowed from safety barrier to instrument is 999 m.

DC power connections for the 3662EX instrument are through the left cable gland. Attach the power wires to the power filter block J11, and the cable shield to a ground screw (see [Power input connections on page 33](#)).

+	+6.5 to +13.5 VDC (50 mA)
-	Ground.
PE	Earth. This connection must be made to the ground screw on the left side of the instrument, using a 4 mm diameter eyelet.

3.5.3 3662EX power supply cable requirements

The power supply cable from the safety barrier to the 3662EX instrument must meet the following criteria:

Cable loop maximum resistance, $R_c (\max) = \{(U_g - U_i (\min)) / I_{\max}\} - R_b$

where:

- U_g = external supply voltage, in safe area
- $U_i (\min)$ = minimum input voltage of 3662EX = 6.5V ($6.5V < U_i < 13.5V$)
- R_b = internal resistance of safety barrier
- $I_{\max}$ = average current of 3662EX ($I_{\max} = 0.050A$)

Maximum cable capacitance, $C_c = C_{ext} - C_{eq}$

where:

- C_{ext} = maximum permissible capacitance of safety barrier
- C_{eq} = input capacitance of 3662EX ($C_{eq} = 38nF$)

Maximum cable inductance, $L_c = L_{ext} - L_{eq}$

where:

- L_{ext} = maximum permissible inductance of safety barrier
- L_{eq} = input inductance of 3662EX ($L_{eq} = 1.92mH$)

For example, with the safety barrier (model ref. 32956) and a 24 VDC power supply, the cable requirement is as follows:

- $R_b = 226 \Omega$, $C_{ext} = 132 nF$, $L_{ext} = 4 mH$
- $R_c (\max) = \{(24 - 6.5) / 0.050\} - 226 = 124 \Omega$
- $C_c = 132 - 38 = 94 nF$
- $L_c = 4 - 1.92 = 2.08 mH$

Thus, for a 3662EX instrument installed 999 m. away (or closer) from a ref. 32956 safety barrier, the cable must have a maximum loop resistance of 124 Ω , maximum capacitance of 94 nF, and maximum inductance of 2.08 mH.

3.6 Analog and alarm output connections

3.6.1 Analog output and alarm cables in "Safe" area (3660EX)

3.6.1.1 Analog current output

Pass the cable through the cable gland. Attach the applicable output wires to the + and - terminals on terminal block J18.

3.6.1.2 Alarm contacts

Pass the cable through the cable gland. Attach the "hot" alarm wire to the applicable "NO" or "NC", data or system alarm terminal, and the return wire(s) to the "Common" terminal on the terminal block J19.

3.6.2 Analog output cables in "Hazardous" area

Use shielded wire for these connections. Pass the cable through the cable gland. Solder an insulated wire to the shield of about 12 cm long, with a 3-mm eyelet at the end. Attach the eyelet to the appropriate earth (ground) screw inside the box, near the terminal block. The wire inside the box must be as short as possible and never overlap the safe area (3660EX).

For current output, attach the applicable output wires to the + and - terminals of the "IS Current" terminal block J20 (3660EX) or J13 (3662EX).

For voltage output, attach the applicable output wires to the + and - terminals of the "IS Voltage" terminal block J14 (3662EX).

3.7 PC connections

Note: On the PC side, a 9-pin connector is needed. Some PC have a 25-pin connector, thus requiring a 25-to-9-pin adapter. Make sure the adapter is designed for this purpose and that all nine pins are accessible. Some 25 to 9 pin adapters are supplied for specific use, such as a mouse, and they may not have all the pins connected.

3.7.1 For 3660EX

PC serial connections uses a custom cable passing through the appropriate gland.

For instrument to PC connections up to 12 meters, a RS-232 cable is adequate. If the distance is greater, use an RS-485 connection, which can run as long as 1 kilometer without a signal loss.

When using the RS-485 output, the PC requires a separate communications port. Hach Lange can supply a card (ref. 32907) that can be mounted in a standard 16-bit PCI expansion slot.

3.7.2 For 3662EX

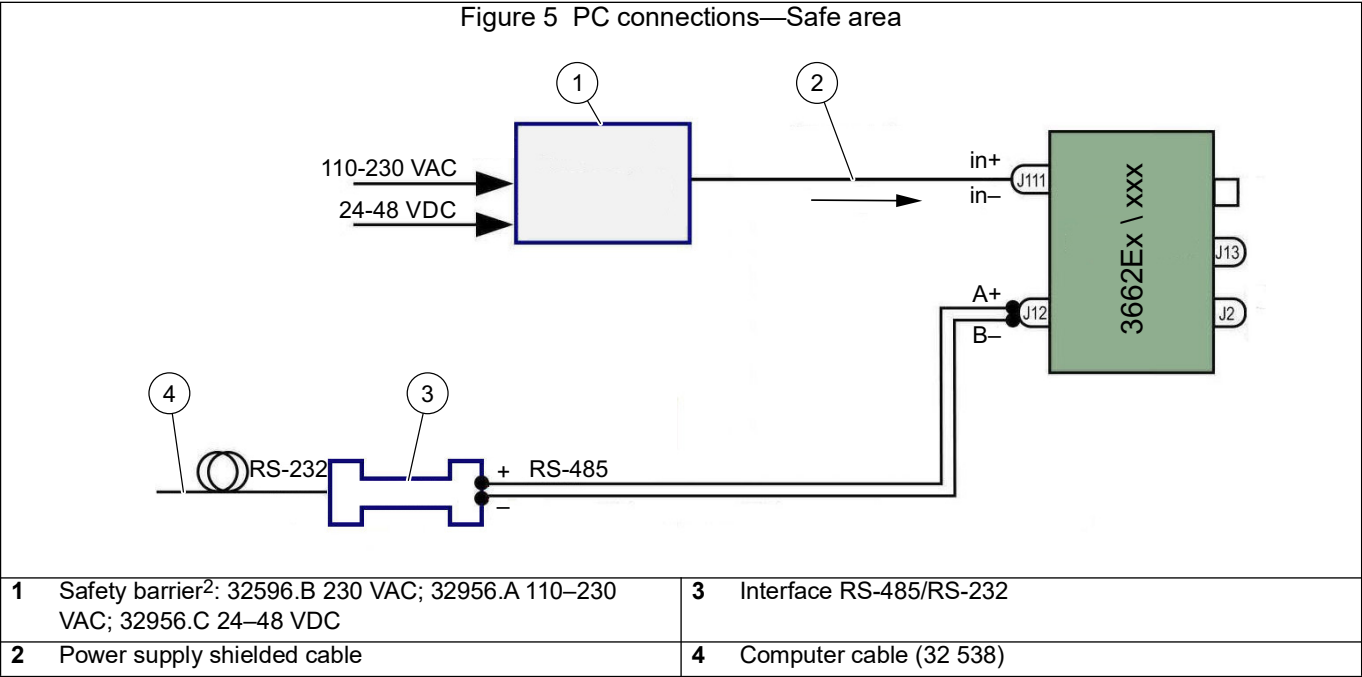
WARNING

A connection from a 3662EX instrument to a PC must **only** be made when the instrument is located in the safe area. **Never** connect the instrument to a PC when the instrument is located in the hazardous area.

A connection from a 3662EX instrument to a PC is required for configuration purposes and should be done **before** the physical installation of the instrument in the hazardous area.

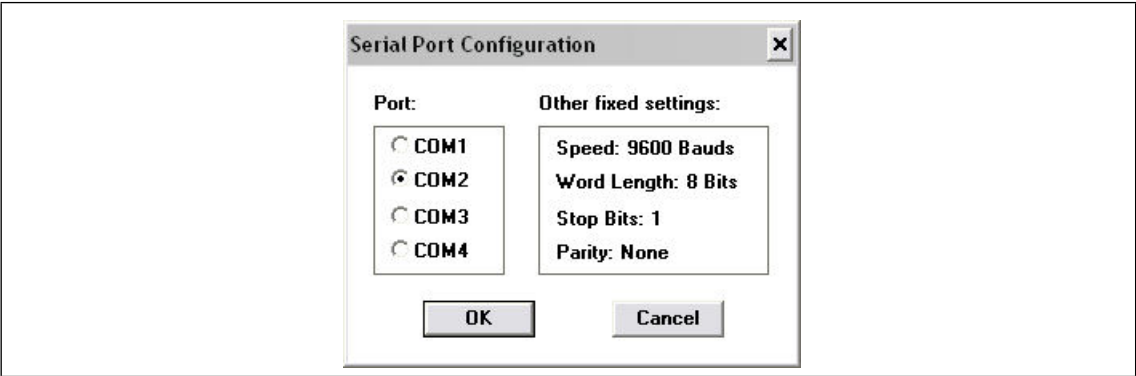
If a connection from the instrument to a PC is required after the instrument has been installed in the hazardous area, disconnect all sensors and any other peripherals from the instrument and then physically remove the instrument from the hazardous area and place it in the safe area.

When the instrument is in the safe area, connect a PC according to the following diagram:



2 All the devices below are accessory equipments

Select the serial port command from the Configuration menu to select the communication port connected to the instrument. The instrument must be connected to the PC port and turned on to get a port communication. The Serial port configuration dialog box is displayed. Select the applicable COM port.



Note: On most PC's, the COM1 port is used to connect a mouse, so try COM2 first.

Click OK to initialize the COM port. If the selected port in this dialog box is available, the ATEX 3660 software returns to the main menu. Otherwise, an "RS-232 ERROR" message advises to select another port.

3.8 Gas sensor

Before making any measurements, for GA2x00 sensors perform the preparation procedure in the **GA2X00 Sensor Manual** and for other sensors perform the sensor service procedure as described in the **EC Sensor Manual**.

Gas sensors are supplied pre-wired with a LEMO-10 connector that fits in the respective instrument socket.

3.9 External pressure sensor (optional)

The optional pressure sensor (ref. 32570E.Bxxx) is located in the hazardous area and connects to the instrument, using the sensor cable ref. 32514E.

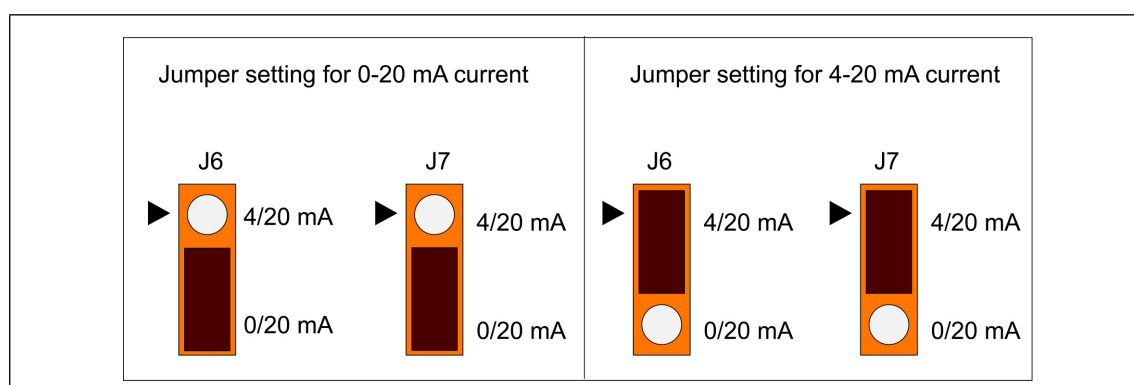
Pass the cable through the cable gland. Solder a 6 cm insulated wire to the shield with a 4 mm eyelet at its end. Attach it to earth (ground) screw close to the terminal block J2.

3.10 Jumper settings

Access to this setting requires that the front panel is opened and display/keypad set aside to gain access to the power supply and output card. Install the jumpers in the indicated position for the required selection.

3.10.1 3660EX current output to safe area

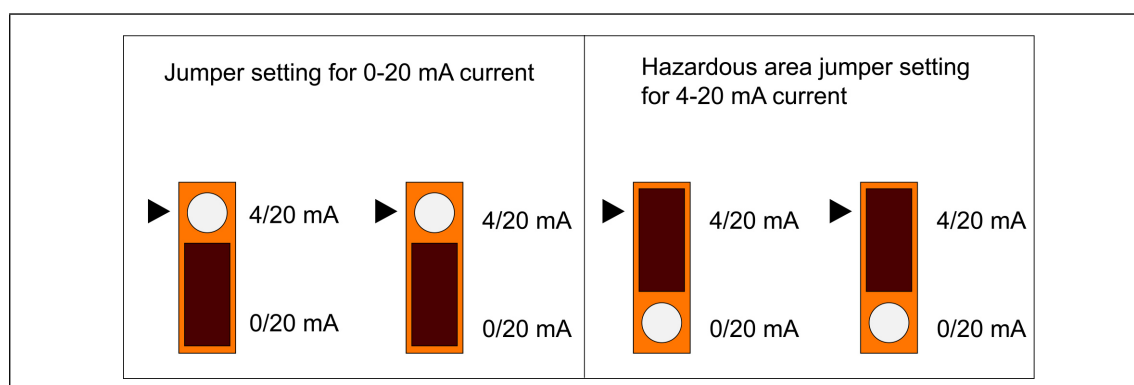
To select the analog current output in the "safe" area for a recorder from a 0-20 mA signal to a 4-20 mA signal, set the jumpers at position J6 and J7 as follows:



3.10.2 3660EX current output to hazardous area

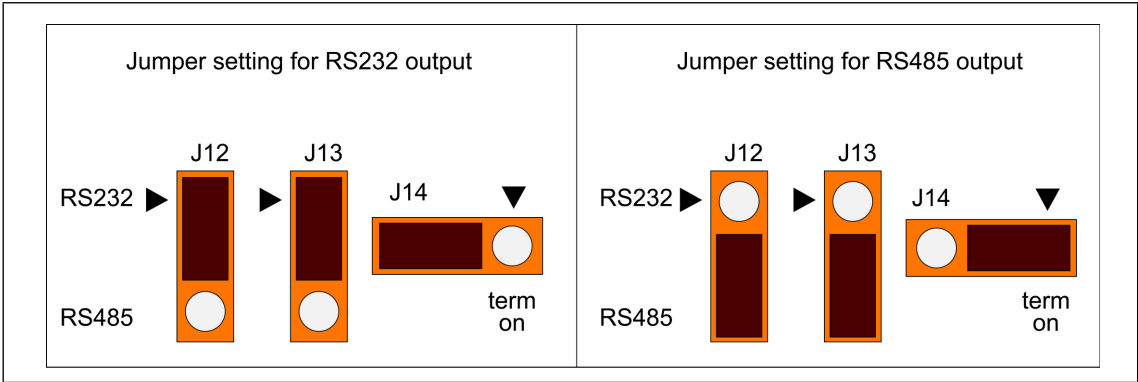
3662EX current output in hazardous area

For an analog output to the "hazardous" area, set the jumpers at positions J9 and J10 (3660EX), or at J5 and J6 (3662EX), as follows:



3.10.3 3660EX RS232 / RS485 communication selection

To switch from RS-232 to RS-485 (or vice versa) in the "safe" area, set the jumpers at positions J12, J13, and J14 as follows:



Section 4 Operating Instructions

The 3660EX/3662EX instrument can be operated with or without a PC connected to it, making measurements as a gas analyzer. Data can be stored in the analyzer, and downloaded later on the PC for analysis, using the ATEX 3660 software.

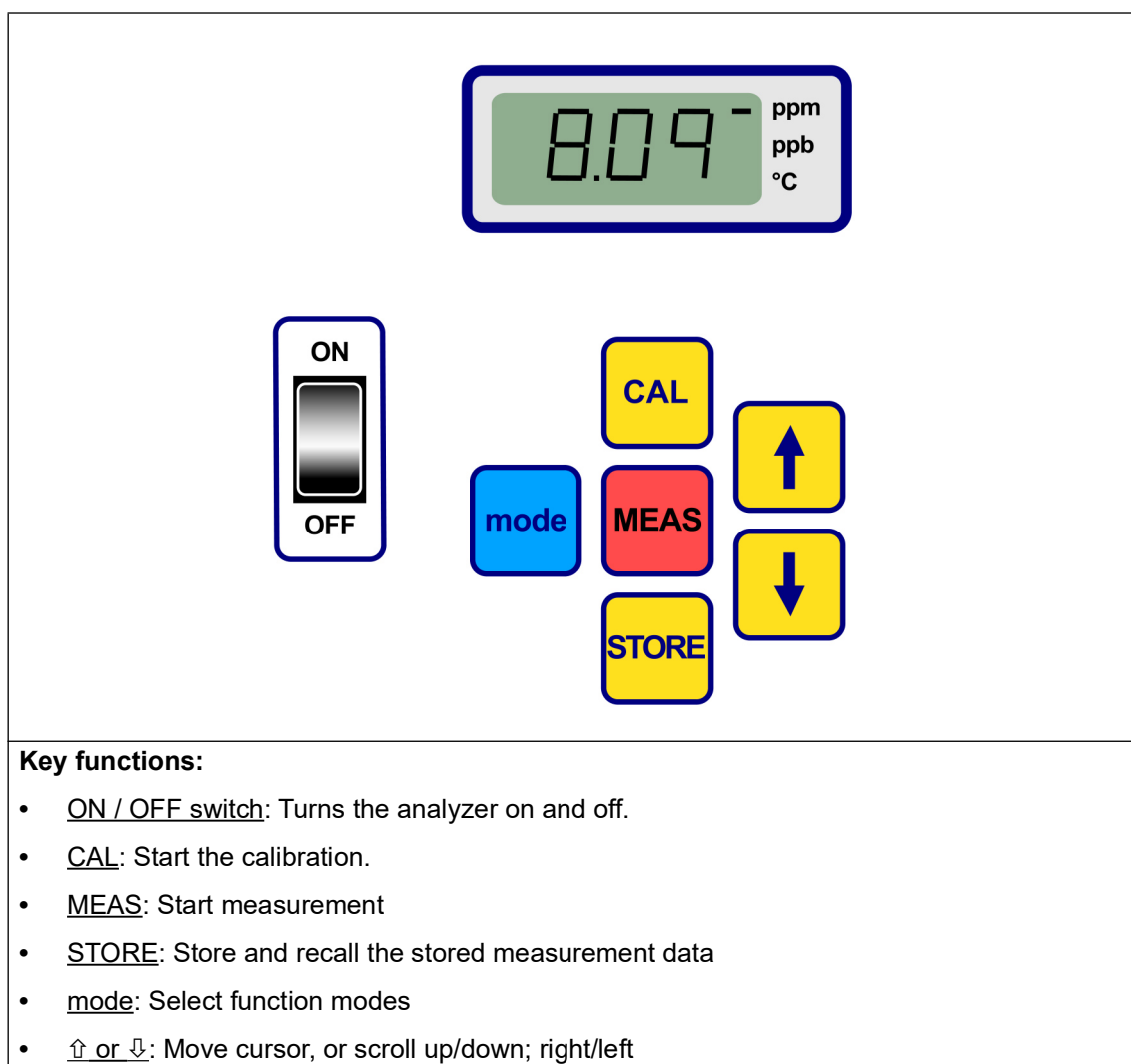
4.1 Before using the analyzer

Note: Before making measurements for the first time, check again all the connections. Make sure that power supply meets the voltage requirement, as shown on the sticker located inside the instrument. Verify that instrument calibration has been performed.

If the instrument is connected to a PC, check date and time setting on the instrument's internal clock (see [Clock settings on page 59](#)).

4.2 Instrument display and keyboard

When the analyzer is closed, only the display can be seen through the window provided in the front panel. To access the keyboard, open the front panel by removing the two screws on the right side of the panel.



4.3 Making measurements

When switching on the instrument, the displayed gas concentration value will typically start from a maximum and rapidly decrease to the actual concentration levels. It is normal for the right digit to vary in reaction to slight variations in gas content. However, if bigger variations are present, measurement readings will lag while the sensor adjusts itself to the new concentration.

The instrument LCD includes a marker on the right, to identify gas concentration measurements and temperature. This marker also indicates which concentration units is used (when configured for multiple gas concentration units).



To switch from gas concentration measurement to temperature measurement, press either the $\uparrow$ or $\downarrow$ key. After a short period (about 10 seconds), the display reverts to gas concentration.

Note: If the sensor is not connected to the instrument, an "out" message is shown in place of the measurement display on the LCD.

Some models are provided with two measurement units. When the measurement value drops below the minimum for the higher units, the lower unit is selected for the display.

- concentrations below 1.00 ppm are displayed in ppb (1 ppm = 1000 ppb)
- concentrations below 0.10% are displayed in ppm (0.1% = 1000 ppm)

4.4 Storing measurements

The instrument stores up to 500 lines of measurement data, including measurement date, time, and event, referred as sample 0 through 499. These data can be saved manually or automatically.

Note: Do not switch off the instrument while it is in the process of storing data, or data will be lost.

4.4.1 Manual storage mode

To store the first measurement, press "STORE" to bring up the first sample reference number available. The default sample number is "000." If needed, select another reference number by pressing the $\uparrow$ or $\downarrow$ key (within five seconds).

The first value can be stored as sample 001. The next value to be stored will be automatically advanced and labeled as sample 002. Pay attention though, as a measurement stored under a reference will over write previous measurement under this particular reference.

Should you decide not to store a measurement value, wait five seconds, or press "MEAS". The display returns to measurement mode.

Press "STORE" a second time, within five seconds of the first, and the following sequence will be displayed:

1. A brief clearing "- -" message,
2. A measurement display, for three seconds,
3. A "- -" message, as measurement data are being stored.

4.4.2 Automatic storage mode

The instrument can store gas concentration measurements automatically, as samples 0 to 499. To enter automatic data acquisition mode, hold down the "MODE" key while pressing the "STORE" key. The letters "Sto" will appear on the LCD for about two seconds.

To end automatic data acquisition mode, hold down the "MODE" key while pressing the "STORE" key. The letters "End" on the LCD will appear.

Automatic storage can be set to "Timer" mode where the sampling interval is a pre-set value from 30 seconds to 1 hour, or "Events" mode where samples are stored when a specific events occurs (such as an Alarm or a Thermal cut-off). See [Automatic or manual storage mode on page 50](#) and [Sampling rate for the automatic storage mode on page 51](#) to set the sampling interval.

Note: When 500 samples are stored, the instrument recycles the memory, meaning the next measurement replaces the oldest one. Thus, the memory contain a continuously updated set of 500 measurements, while the old ones are lost.

4.4.3 Memory recall

Use the instrument to view the stored measurements. To activate "Memory Recall", hold down the "MODE" key while pressing the $\uparrow$ key. "Rcl" will be displayed on the LCD.

- Scroll through the stored data using the $\uparrow$ and $\downarrow$ keys.
- Push the "STORE" key to see a measurement.
- Press "STORE" again brings next stored measurement.

To return to measurement mode, hold down the "MODE" key while pressing the $\uparrow$ key. The letters "End" will be displayed on the LCD.

4.5 Shutting down the system

During a short shutdown period (such as weekends) the sensor can be left in its flow chamber or sensor socket. If this inactive period is likely to last a long time, remove the sensor and store properly with storage cap installed (put one drop of water in the cap).

See the **Sensor Manual** for details.

4.6 Software and instrument identification

These informations are useful when contacting Hach Lange.

To identify the instrument software:

1. Switch off the instrument.
2. Hold down the "MEAS" key and switch on the instrument.

An identifying software version number will appear in the LCD for two seconds.

To identify the instrument model number:

1. Switch off the instrument.
2. Switch on the instrument normally.

Factory configured model number is briefly displayed.

Note: If instrument configuration has been modified, the model number will not be displayed.

Section 5 ATEX 3660 Operating Software

The ATEX 3660 software is an integral part of the 3660EX and 3662EX analyzer. Running under Microsoft Windows®, this software provides:

- On-line monitoring of the measurements
- Downloading stored measurement from the instrument to PC
- Reviewing and setting up instrument configuration
- System troubleshooting

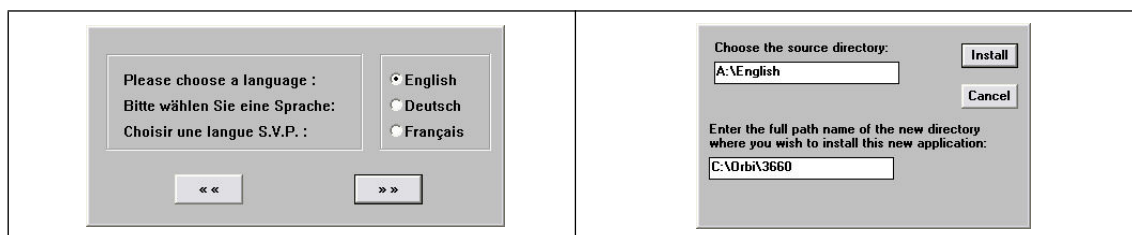
After installation, a program group labeled "Orbisphere" is available. Select the ATEX 3660 icon to start the ATEX 3660 software.

Note: The Help icon brings the Help in the language selected during the installation. The english, french, and german help files can be found on the installation diskette.

5.1 Software installation

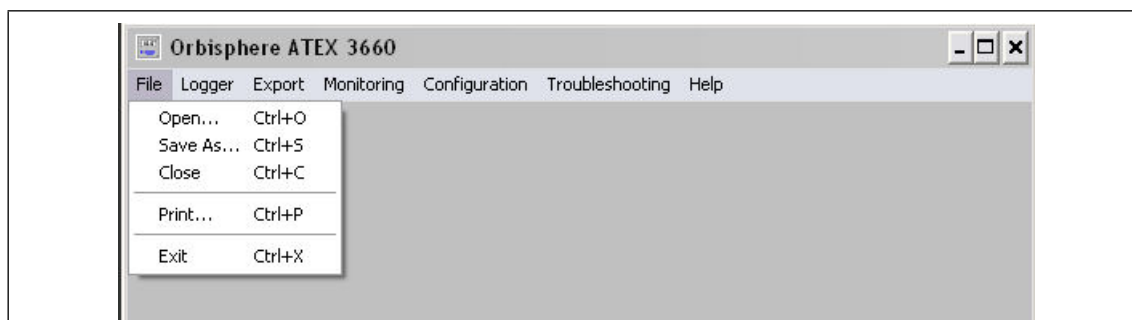
To start the installation, insert the supplied software disc into the A:/ drive (or equivalent).

1. Select Run from the Start menu.
2. Enter A:\SETUP.EXE in the Run dialog box (A:/ or applicable disc drive).
3. Click OK to start the installation.
4. Follow instructions on screen.



5.2 File menu

The File menu serves typical Windows file management needs, like open, save, close, or print data files.



5.2.1 Saving data files

Data file saved as text files (".txt") can be recalled by the ATEX 3660 software, or imported as into other Windows software. When saving a file, a dialog box appears asking for an 8 digit file name (the ".txt" suffix is automatically attached). If previous files are present, they appear as greyed out in the list.

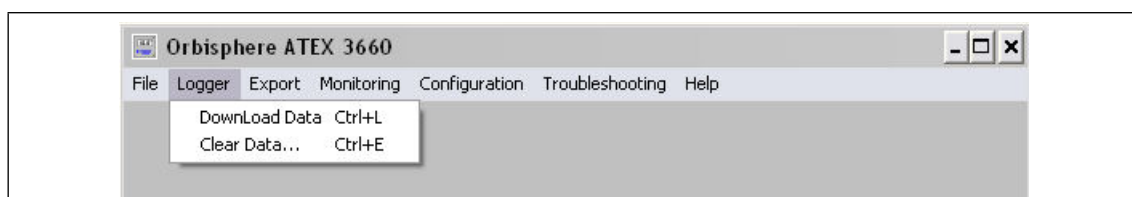
5.2.2 Printing

The software asks for Title and Author information. The printout will include this information on each page.

Note: The date shown is the one set by the Windows operating system.

5.3 Logger menus

If measurements are stored in the instrument, it is possible to download them into the ATEX 3660 software for display, storage, and print out. The Logger menu allows to download or/and clear the instrument's stored data.



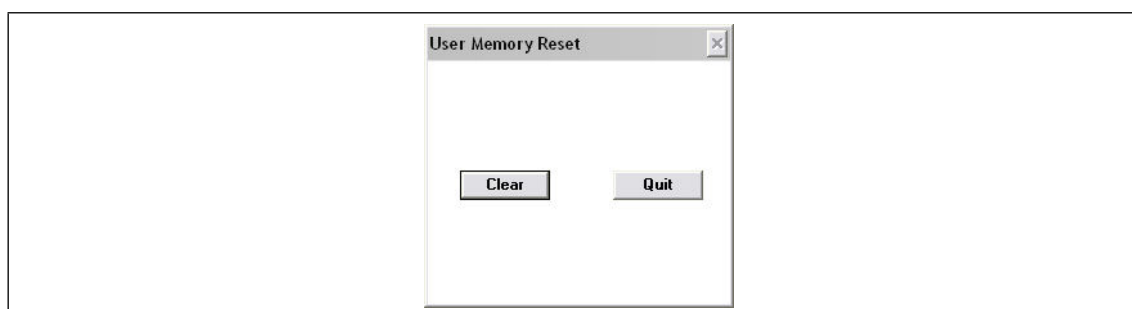
5.3.1 Data download

To download the stored results from the instrument to the PC, choose the DownLoad Data command. The software displays a message "Downloading in Progress..." while the data is being transferred to the PC. The download window displays the stored measurements as five columns of data:

1. Sample (reference number of the sample).
2. Gas (measured gas concentration).
3. Date (date of the measurement).
4. Time (time of the measurement).
5. Line status (the event that triggered this record, applicable only when Automatic Storage is set to Event mode).

5.3.2 Clearing stored data

To clear all the values stored in the instrument, choose Logger, Clear data. Since this action will clear the storage memory of the instrument, a warning message appears first. Choose OK to confirm.

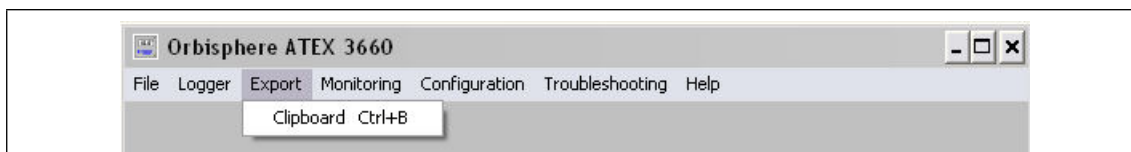


A message is displayed "Reset in Progress... This takes about 35s." A message "Reset should be completed" appears at the bottom of this box when the reset is finished. Choose Quit to return to the ATEX 3660 menus.

Note: Saved data are also erased when overwritten by new ones.

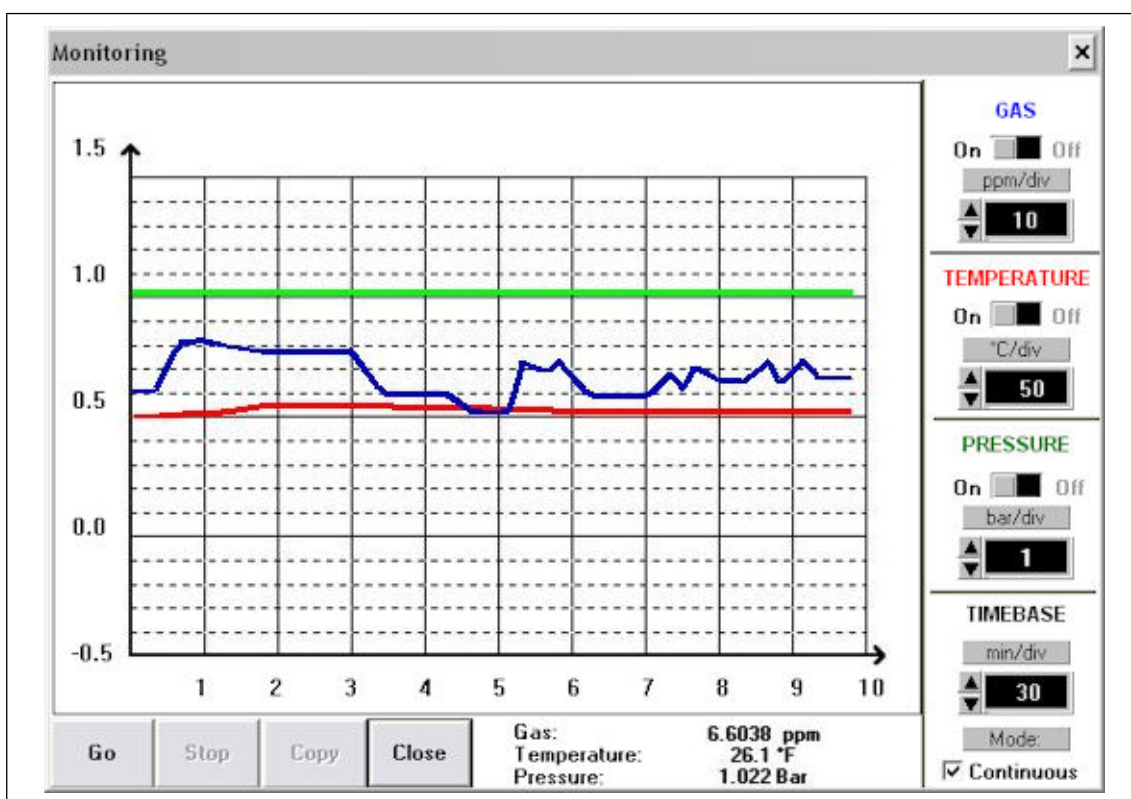
5.4 Data export

The Export function copies data into the Windows Clipboard, to paste it into other software. This is useful when working with spreadsheets, or with a word processing software.



5.5 Real-time monitoring

The Monitoring command displays a running chart of real-time measurements, similar to a chart recorder. A running display of latest gas, temperature, and pressure is also shown in the bottom-right corner of the chart. The chart shows the gas concentration (in blue), temperature (in red), and pressure (in green) as the sample is being measured by the instrument.



Use the buttons at the bottom of the chart to control the real-time monitoring:

- Choose **Go** to clear the chart and start the real-time monitoring display.
- Choose **Stop** to stop the real-time monitoring.
- Choose **Copy** to copy the data on the chart as a text file to the clipboard.
- Choose **Close** to exit the real time monitoring window.

Click on the **Continuous** box, in the lower right corner, to enable or disable continuous charting. When box is checked, the chart scrolls continuously after reaching the 10th division, and the measurement points exiting on left side of the chart are lost. When box is not checked, the chart stops when reaching the 10th division, and all subsequent measurements are not saved.

The chart is updated at the rate set in the TIMEBASE box, located at the lower right corner of the window. Click the TIMEBASE up/down pointers to set the time scale. Each division mark, along the baseline from 1 to 10, can represent from 30 seconds to 2½ hours. This provides from 5 minutes to 25 hours of continuously displayed measurements.

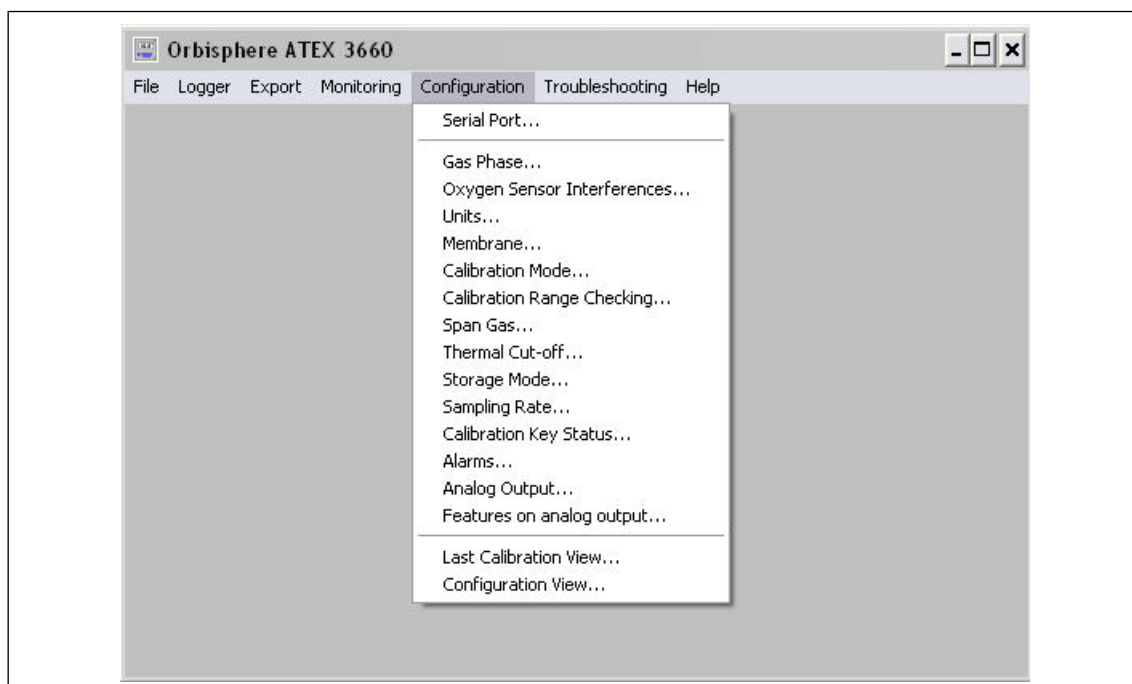
Note: This chart "updating rate" is independent from the rate set via Sampling Rate command.

Time Base (Time Per Division)	Display Updating Rate	Measurements Points Seen on the 10 Division Display
0.5 min.	5 sec.	60
1 min.	5 sec.	120
10 min.	5 sec.	1200
30 min.	9 sec.	2000
60 min.	18 sec.	2000
150 min.	45 sec.	2000

Click the up/down pointers for each measurement variable (GAS, TEMPERATURE, and PRESSURE) in the right column to change its displayed range. If the display is not satisfactory, curb display can be improved by playing with this adjustment, in relation to the set time base. Also, variable curb can be turned on or off, using the On / Off switches.

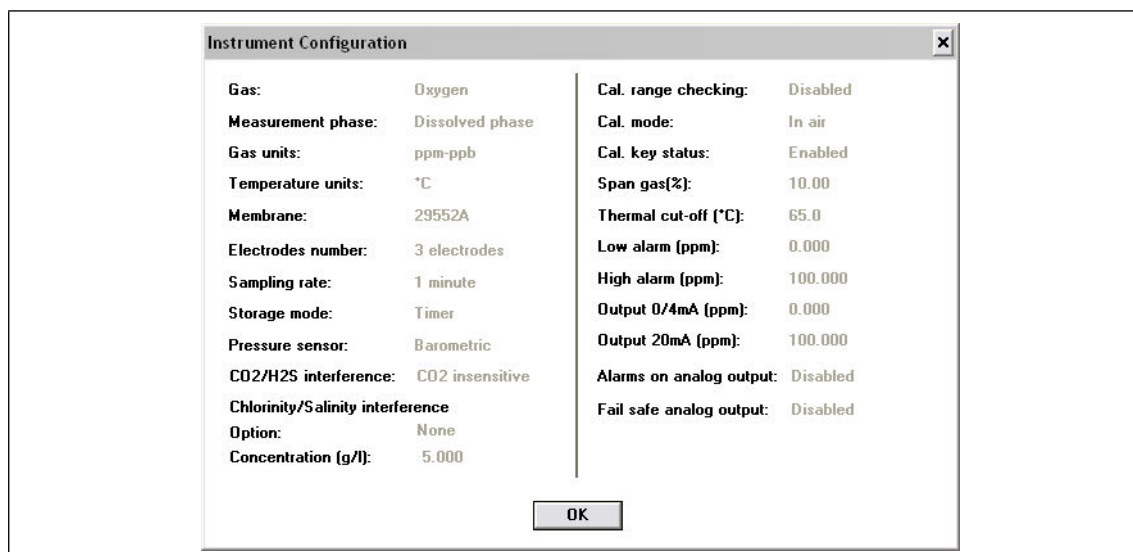
5.6 Configuring the instrument

The Configuration menu is used to set up the instrument.



5.6.1 Configuration view

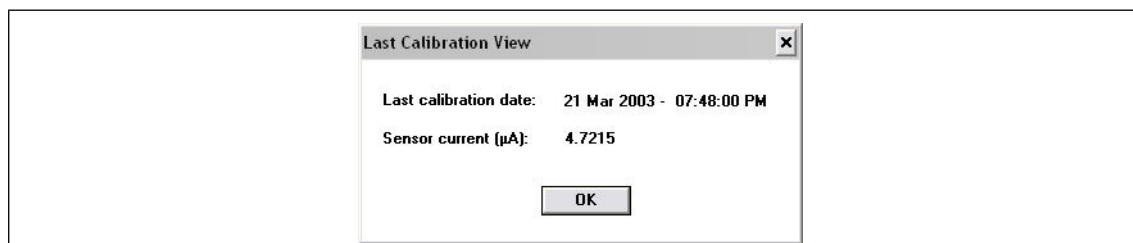
Choose Configuration, Configuration View to verify if the analyzer has been set up as expected. A window opens showing the current instrument set up.



The user can change some of these setups. The type of gas being measured (Oxygen, Hydrogen or Ozone) and the number of electrodes in the sensor (3 or 4 electrodes) cannot be changed using the ATEX 3660 software. Should any unexpected items be listed on this display window, contact your Hach Lange representative.

5.6.2 Last calibration view

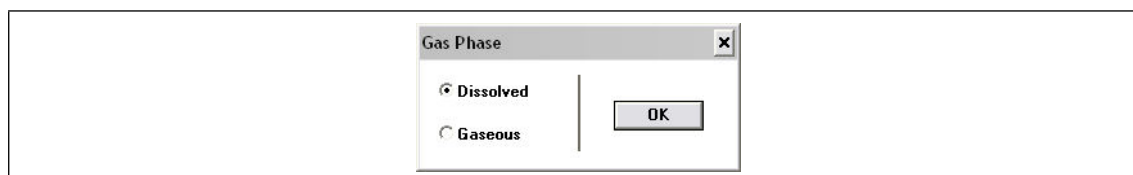
Use the Configuration, Last Calibration View to display the date and time of the last calibration, as well as the sensor current measured then. The system updates these values after each successful calibration.



5.6.3 Liquid or gaseous sample selection

Use the Configuration, Gas Phase to set the measurement phase (dissolved or gaseous) according to application. Choose OK to confirm.

Note: Ozone measurement can only be made in dissolved phase.



5.6.4 Specifying oxygen sensor interferences

Use the Configuration, Oxygen Sensor Interferences to eliminate the sensitivity of the oxygen sensor to CO₂ or H₂S in the sample measured. Select Insensitive to CO₂, Insensitive to H₂S, or None as appropriate.

This screen is also used to correct oxygen measurements taken in high salinity or chlorinity conditions. If required, select Chlorinity or Salinity and enter the chlorine or salt concentration in the box provided, otherwise select None.

Note: Operating the oxygen sensor in insensitive to H₂S mode requires a different sensor and electrolyte to be used in place of the standard oxygen sensor and electrolyte. Please contact your Hach Lange representative for details.

5.6.5 Setting measurement units

Choose Configuration, Units to specify the measurement units for gas concentration and temperature. The selected units are used for the instrument LCD display and appear in all ATEX 3660 displays, print outs, and data tables.

The following choice is available, according to the gas phase selected earlier:

- Gas measurements in dissolved phase: ppm/ppb, ppm, %sat or cc/kg
- Gas measurements in gaseous phase: %/ppm, %, kPa/Pa, kPa, or bar/mbar
- Temperature measurements: °C or °F

Note: The %sat gas measurement in the dissolved phase is equivalent to % air saturation.

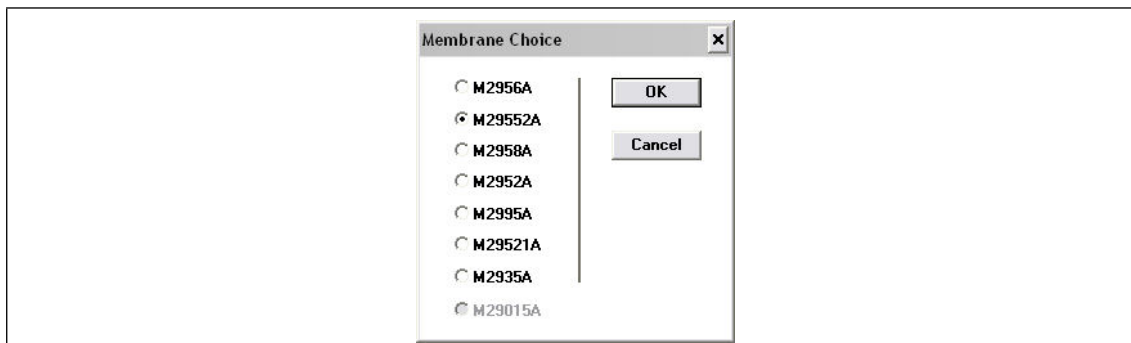
When "composite" units are selected, such as ppm/ppb or %/ppm, the instrument display will automatically switch between the units (auto ranging) when the measurement drops below the minimum value of the higher units.

Note: Ozone measurement units are limited to ppm/ppb, or ppm

5.6.6 Membrane selection

Using a different type of membrane in the sensor may be necessary to suit conditions. Selecting another membrane from the software returns the instrument calibration to factory settings. A warning message asks to continue.

Choose the Configuration, Membrane choice to review or select the membrane which is used in the sensor.

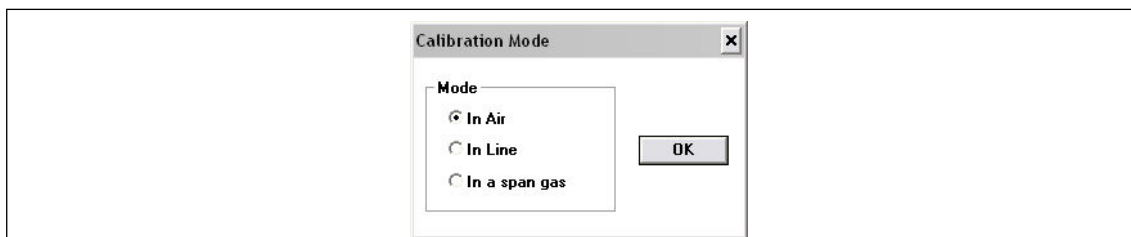


Note: A calibration of the instrument is always required after selecting a new membrane type.

5.6.7 Selecting calibration mode

Note: The calibration mode can be selected either from the instrument or from the software.

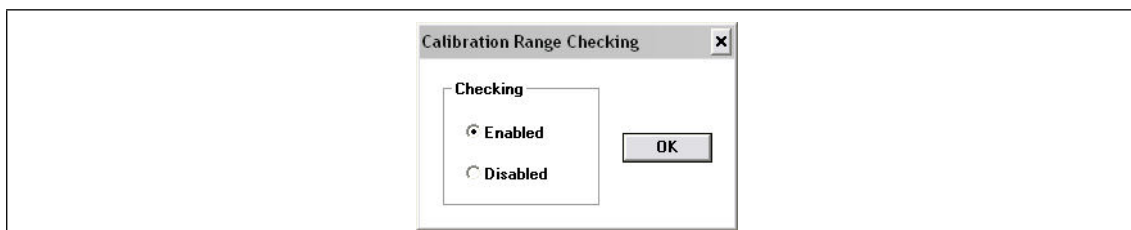
Use the Configuration, Calibration Mode to select whether the sensor is to be calibrated in air, in-line, or in a calibration (span) gas. See [Calibrations on page 53](#) for details.



5.6.8 Calibration range check

When performing calibration, the instrument compares the sensor current to an ideal value, to determine if the calibration makes sense. Enable or disable this calibration range checking for "In Air" and "In a calibration Gas" calibration modes.

See [Calibrations on page 53](#) for details.



Note: It is recommended to leave this checking feature enabled. In specific measurement situations, it may be necessary to disable range checking. However, contact your Hach Lange representative before disabling this feature.

5.6.9 Calibration gas concentration

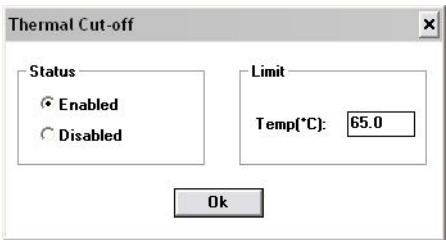
When calibrating the sensor in a calibration gas, use the Calibration (span) gas to enter the concentration of the calibration gas used. Enter the percentage of gas concentration in the calibration gas (for example, 10.00%), and then select OK.

A dialog box titled "Span Gas" with a close button (X) in the top right corner. It contains a label "Span gas:" followed by a text input field containing "10.00" and a percentage symbol "%". To the right of the input field is an "OK" button.

5.6.10 Setting thermal cut-off

To protect the sensor, the thermal cut-off function allows for setting a sample high temperature limit. If exceeded, the electrical signal to the sensor is cut off, and the system warns the user on the display, and send an analog and digital signal. The temperature is factory set at 65° C, but can be modified to suit conditions.

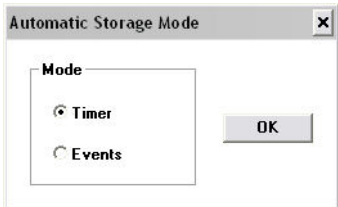
After a thermal cut-off, the instrument restores the current supply to the sensor when the sample temperature drops 2.5°C below the specified cut-off temperature. This feature increases sensor's life, should the sample temperature go beyond the temperature range of the sensor.

A dialog box titled "Thermal Cut-off" with a close button (X) in the top right corner. It has two sections: "Status" and "Limit". The "Status" section has two radio buttons: "Enabled" (selected) and "Disabled". The "Limit" section has a label "Temp(*C):" followed by a text input field containing "65.0". Below these sections is an "Ok" button.

Use this window to enable or disable the thermal cut-off feature and to set the temperature limit. If Enabled, when the sample temperature exceeds this limit, the instrument switches off the sensor. If Disabled is selected, there is no current cut-off.

5.6.11 Automatic or manual storage mode

The instrument will store up to 500 gas concentration measurement values, labeled as sample numbers 0 through 499, with the date and time of the measurement. This information can be saved manually or automatically. Choose the Configuration, Automatic Storage Mode command to select an automatic storage mode.

A dialog box titled "Automatic Storage Mode" with a close button (X) in the top right corner. It contains a section labeled "Mode" with two radio buttons: "Timer" (selected) and "Events". To the right of the radio buttons is an "OK" button.

If Timer mode is selected, measurements are stored at intervals defined by the Sampling Rate command (see [Sampling rate for the automatic storage mode on page 51](#)).

If Events mode is selected, one measurement is stored when an event occurs, for each of the following events:

- Power On
- Sensor Out
- Thermal Cut-off

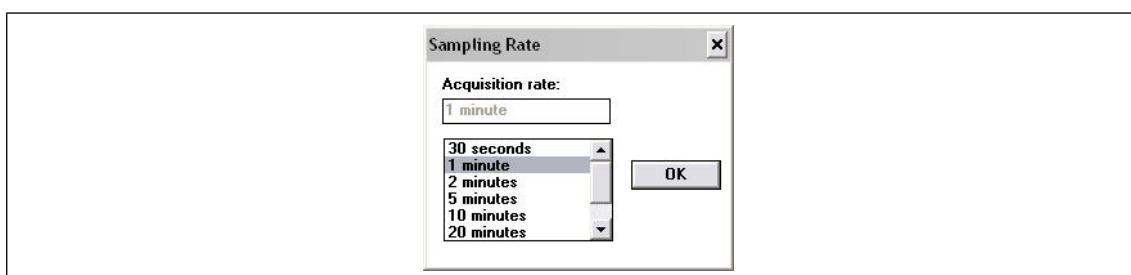
- Alarm High
- Alarm Low
- Normal measurement (event ends, see below)

The event and measurement is saved in the Line Status column on the data table. When the event ends, such as a gone alarm condition, the event "Normal Measurement" occurs and a measurement is stored as well.

5.6.12 Sampling rate for the automatic storage mode

Choose the Configuration, Sampling Rate command to select the time interval (Acquisition rate) for the automatic storage. This rate is used only when automatic storage mode is set to Timer (see [Automatic or manual storage mode on page 50](#)).

Use the scale to view and select a sampling rate, from 30 seconds to 1 hour. The selected rate is shown in the "Acquisition rate" window.



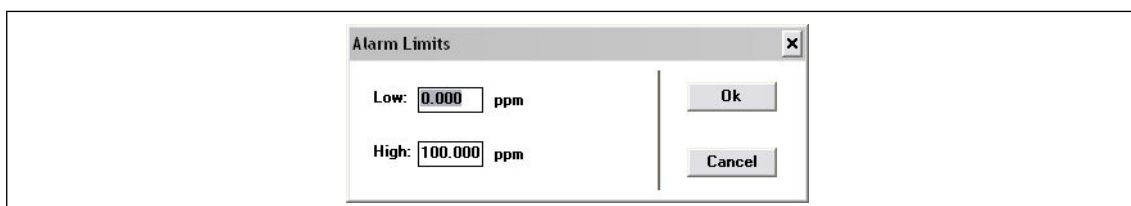
Note: The Acquisition rate set via this menu is independent from the Monitoring chart updating rate. The Sampling rate menu applies only to automatic storage mode, while the chart updating rate is used only for displaying real-time results on the monitoring chart.

5.6.13 Locking the "CAL" key

Use the Configuration, Calibration Key Status command to prevent an accidental sensor calibration via the instrument front panel. Choosing Disabled will lock out the "CAL" key on the instrument front panel. To unlock, choose Enabled.

5.6.14 Setting alarm limits

It may be necessary to modify the alarm low and high limits for gas concentration. To set the alarm limits choose Configuration, Alarms, Enter the Low and High gas concentration limits and click OK to save the new limits.

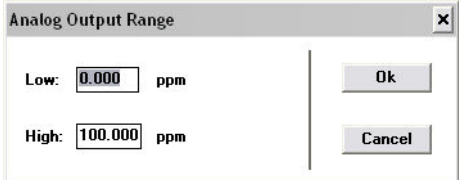


When the measured gas concentration exceeds the high limit or falls below the low limit, the instrument sends a signal at the alarm output connections.

The instrument clears the High alarm when the gas concentration drops to 1% below the high limit, or clears the Low alarm when the concentration rises to 1% above the low limit.

5.6.15 Setting analog output limits

Use this command to specify the analog output range from the instrument. Choose Configuration, Analog output. Set limits to rescale the instrument analog output to peripheral equipment, such as recorders or plotters.



Enter a Low and High gas concentration value to specify the limits for the analog output, corresponding to:

- 0 (Low) - 20 (High) mA
- 4 (Low) - 20 (High) mA
- 0 (Low) - 2 (High) Volts

5.6.16 Setting “Alarm on” analog output

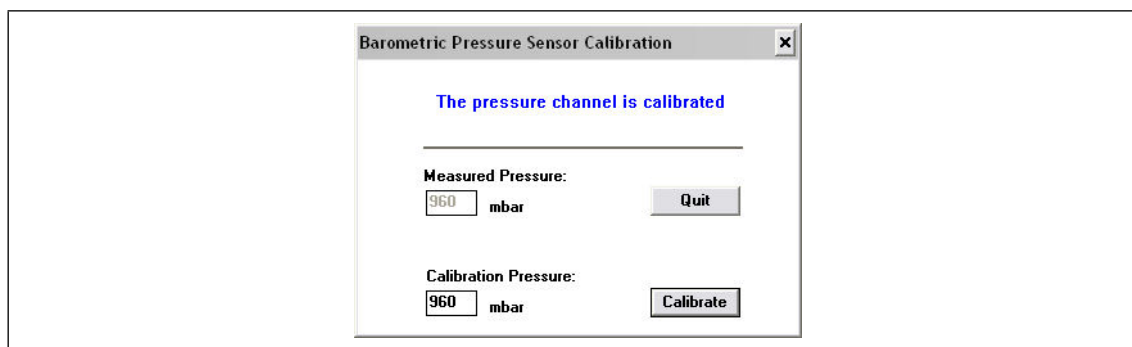
Turn on this feature when the hardware of the instrument is configured for analog output from 0 to 20 mA. When this feature is enabled, the alarm information will use the range within 0 to 4 mA.

Analog output	Explanation
1 mA	On for 5 sec. at instrument start up
2 mA	Sensor out, or unplugged
3 mA	Thermal cut off function activated

Section 6 Calibrations

6.1 Barometric pressure sensor calibration

Calibrate the internal barometric pressure sensor using a certified barometer and the ATEX 3660 software. Select "Troubleshooting / Pressure Calibration" to start the calibration procedure. A warning message is displayed first. Choose OK to continue.



The calibration procedure displays a barometric pressure calibration window showing the actual instrument pressure reading. Enter the current atmospheric pressure, in mbar, in the Calibration Pressure box. Choose Calibrate to store the calibration value.

6.2 External pressure sensor calibration

If the optional external pressure sensor is used, instrument should be calibrated using the ATEX 3660 software, and an in-line certified pressure gauge. The calibration procedure first displays the External sensor calibration dialog box.

Calibration procedure uses two pressure points. The currently measured barometric pressure, labeled "First point", is displayed in the field "Measured value". In the First point entry box, enter the actual pressure (in mbar) and click on Cal1 to store the first calibration point.

Increase the pressure to the pressure sensor and follow the same procedure for the Second point. Click on Cal2 to store the second point.

- The pressure values for calibration points 1 and 2 must be above 500 mbar.
- "Measured value" at point 2 must be at least 20% above the "Measured value" at point 1.
- "Calibration value" at point 2 must be at least 20% above the "Calibration value" at point 1.

The last field should now display the "Measured value" for the last calibration point. Choose Quit to close the dialog box and to end this procedure.

6.3 Gas sensor calibration

6.3.1 Selecting the calibration mode

The sensor can be calibrated either in air, in line in the liquid sample, or using a calibration gas. Select the applicable calibration mode from the instrument keyboard:

Note: The calibration mode can be selected either from the instrument or from the software.

1. Push "MODE" and "CAL" at the same time. The instrument display should show either "Air" for in air calibration, "Li" for in line calibration, or "SPA" when using a calibration (span) gas.
2. Press either the $\uparrow$ or $\downarrow$ key to select mode.
3. Press "STORE" key to confirm. The instrument displays "Sto" for a few seconds, then returns to measurement mode.

Selected calibration mode is stored and is valid until next modification.

6.3.2 Gas sensor calibration range check

When a calibration is performed, the sensor current is compared to the ideal current for the membrane selected. The variation in sensitivity of the sensor is displayed as a percentage of the expected value.

Calibration out of bounds

- If the current is not within 60% to 140% of the ideal current, the instrument displays "Er0". This is a warning message telling that a sensor service is probably needed. The instrument will still calibrate correctly.
- If the current is below 25% or over 175% of the ideal current, the instrument displays "Er1" and the system will not calibrate. Sensor may require servicing (see the Sensor Manual for details).

Note: This calibration range check can be disabled from the ATEX 3660 software. It is recommended to leave this check feature enabled. However in specific situations it may be necessary to disable range checking. Contact your Hach Lange representative before disabling this feature.

6.3.3 "Hold" feature: Avoiding false alarms during calibration

Press the "CAL" key twice, before taking the sensor out of sample to run the "Hold" feature. This avoids triggering false alarm outputs when the sensor is in the air. The LCD and PC will still display the actual readings.

Perform the gas sensor calibration as indicated in following paragraphs.

During calibration, the instrument holds the alarm outputs, and flashes a "hld" message alternately with the measurement. When calibration is done, and sensor is back into sample, press "MEAS" to quit the "Hold" feature, resuming normal measurements operations.

6.3.4 Calibration in air (not for hydrogen sensor)

The sensor can be accurately calibrated in air. Calibration is best achieved using the storage cap that protected the sensor during shipment.

1. Remove the sensor from its mounting or flow chamber, and wipe dry the sensor protection grille (if applicable).
2. Put several drops of tap water in the storage cap, shake out the excess, and then attach it to the sensor by means of its collar.
3. It is best to leave the cap slightly loose, to avoid compressing the air inside. The cap and sensor should be about the same temperature.
4. Switch on the instrument.
5. Press the "CAL" key
6. A brief clearing (" - - ") message appears.
7. Press "CAL" again within 3 second.
8. The displays shows the measured current to ideal current percentage.
9. When the reading is stable, press "CAL" again.
10. Install the sensor back in place.

Calibration is stored and valid until next membrane replacement.

6.3.5 Calibration in line

An "In line" calibration routine is used when calibrating the sensor in place, against a liquid sample with a known dissolved oxygen or ozone concentration.

This is done by exposing the sensor and adjusting the expected values with the instrument keyboard. To perform this calibration, the instrument must be set for calibration "In line".

1. Switch on the instrument.
2. Expose the sensor to a liquid sample with a known gas concentration, and wait for the displayed measurement to settle.
3. Press the "CAL" key.
4. A brief clearing ("- -") message appears.
5. Press "CAL" again within a 3-second period.
6. The instrument should display a measurement showing the gas concentration of the calibration sample.
7. Knowing the gas content to be a certain value, adjust the displayed value with the $\uparrow$ or $\downarrow$ key.
8. When the reading is adjusted, press "CAL" again. The instrument displays "CAL" and returns to the measurement mode.

Calibration is stored and valid until next membrane replacement.

6.3.6 Calibration in gas mode (not for ozone sensor)

The calibration gas procedure may be used when calibrating an oxygen or an hydrogen sensor. When calibrating in a calibration gas, it is recommended to use the flow chamber type 32001 to introduce the calibration gas to the sensor (see the Sensor Manual for details).

To perform this type of calibration, the instrument must be set for calibration "In a calibration Gas". The Windows ATEX 3660 software is used in this procedure.

1. First remove the sensor from its socket or mounting, then insert the sensor into the flow chamber type 32001. Connect a calibration gas sample of a known oxygen or hydrogen content to the flow chamber's central port.
2. Switch on the instrument.
3. Expose the sensor to the calibration gas sample.
4. Enter the percentage of oxygen or an hydrogen in the calibration gas using the ATEX 3660 software "calibration Gas" menu.
5. Press the "CAL" key.
6. A brief clearing ("- -") message appears.
7. Press "CAL" again within a 3-second period.
8. The displays shows the measured current to ideal current percentage.
9. When the reading is stable, press "CAL" again.
10. Install sensor back in place.

Calibration is stored and valid until next membrane replacement.

6.3.7 Calibration procedure for hydrogen sensor

Hach Lange recommends the following calibration gas / inert gas combinations for calibrating with the following membranes:

Membrane	Recommended calibration gas
2956A	1% H ₂ / 99% N ₂
2952A	5% H ₂ / 95% N ₂
2995A	10% H ₂ / 90% N ₂
29015A	100% H ₂

The Windows ATEX 3660 software must be used for this procedure. To calibrate:

1. Switch on the instrument, if necessary, and wait approximately one minute for the displayed measurement to settle.
2. Expose the sensor to a calibration gas sample with a known hydrogen concentration.

Note: Once you start introducing calibration gas via the flow chamber, some time is required for measurements to stabilize. About 20 minutes is normal for membranes 2956A and 2995A; closer to an hour is usually required for membrane 29015A. It depends on the cleanliness of the sensor and the variation in H₂ content from sample to calibration gas.

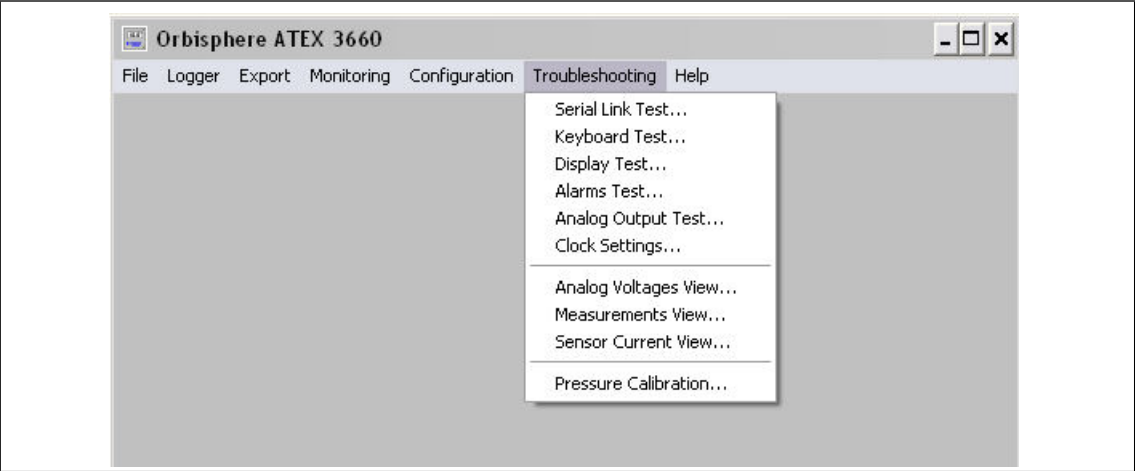
3. Enter the percentage of hydrogen in the calibration gas, using the ATEX 3660 software "calibration Gas" menu.
4. Press the "CAL" key.
5. A brief clearing (" - - ") message appears.
6. Press "CAL" again within a 3 second period.
7. The percentage of the measured current to the ideal one is displayed.
8. When the reading is stable, press "CAL" again.

Calibration is stored and valid until next membrane replacement.

Section 7 Troubleshooting

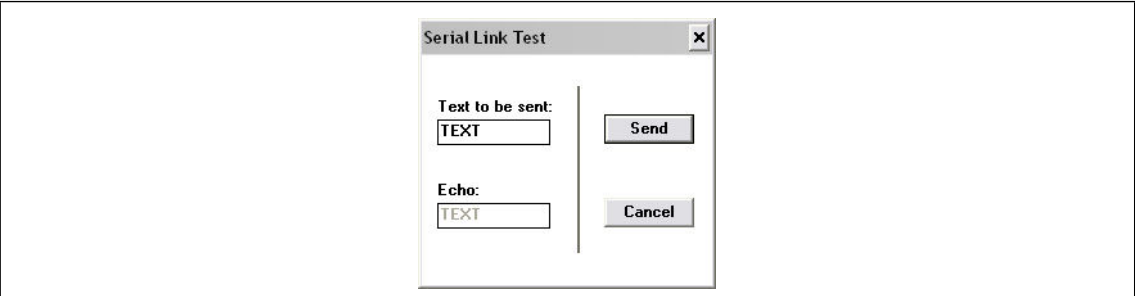
The Troubleshooting menu includes a series of instrument operating tests, and enables the barometric sensor and external pressure sensor (when applicable) calibrations.

If analyzer is behaving improperly, failing to calibrate, giving inappropriate measurement values, use the Troubleshooting menu to verify that the instrument is configured correctly for the application, and that is in good operating conditions. The instrument must be connected to PC and in measurement mode to perform the tests.



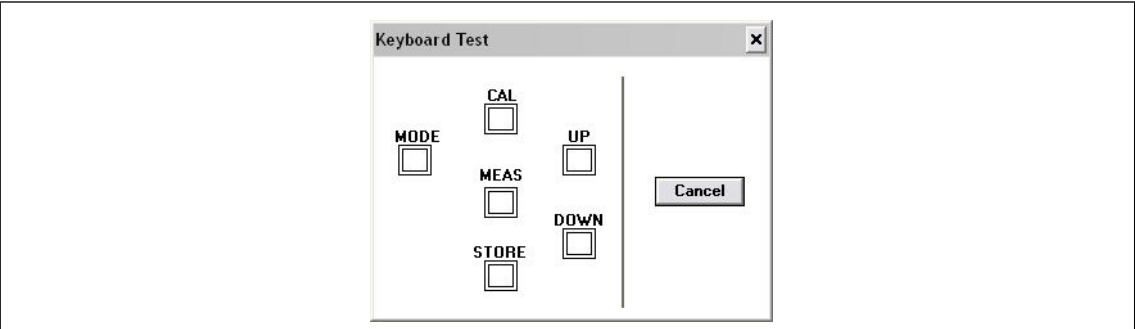
7.1 Serial link test

Normally, the instrument will warn the operator of a disconnected RS-232 or RS-485 (serial) link. Confirmation of a good connection can be done with the Serial Link Test by "echoing" a test message via the instrument. Enter text characters in the Text to be sent box, then click Send. If the serial link is operating correctly, the instrument will display back the same text in the Echo box.



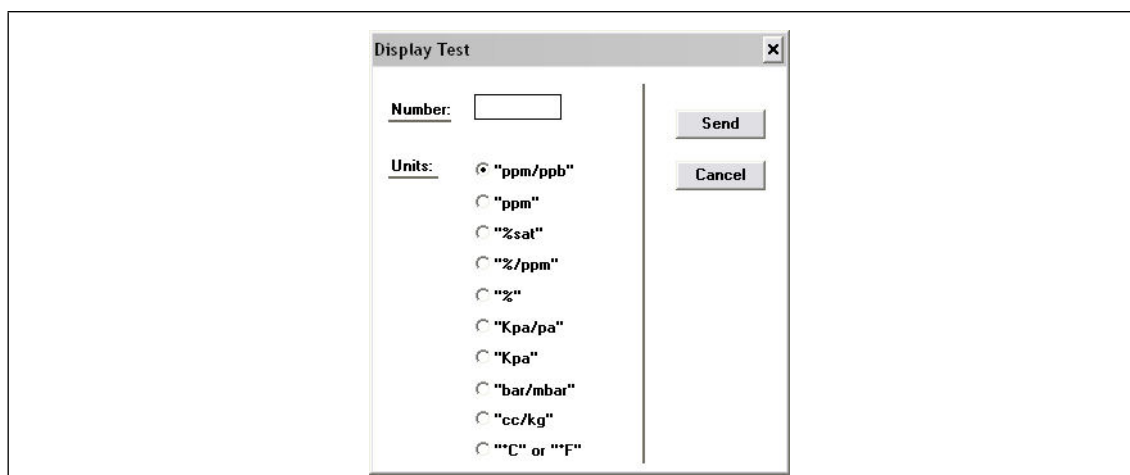
7.2 Keyboard test

Choose Keyboard Test from the Troubleshooting menu to check instrument keys. The following dialog box is displayed to test the instrument keyboard. Press any keys on the instrument for a second; the associated square on the dialog box should darken (as illustrated here for the "CAL" key).



7.3 Display test

Choose the Display test command to verify the LCD display on the instrument. The following dialog box is displayed to test the instrument LCD.



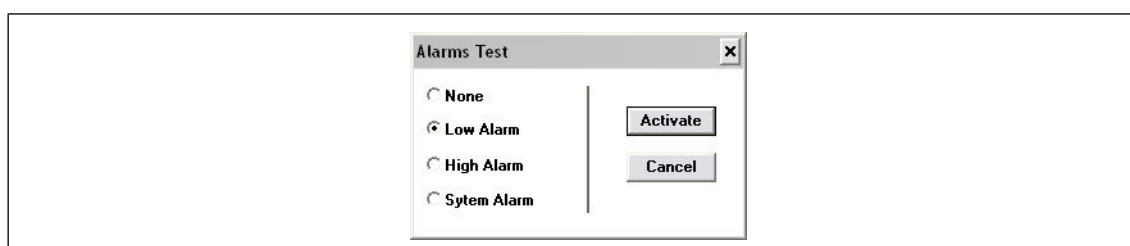
Type a number, with or without decimal point, in the number box, and select the measurement units to be displayed. Click on Send to transmit this test to the instrument. The number entered, and indicator bar placement, should appear on the instrument LCD display.

7.4 Alarms test

When connecting the alarm outputs to user-supplied equipment, it may be helpful to verify the connections with a test signal.

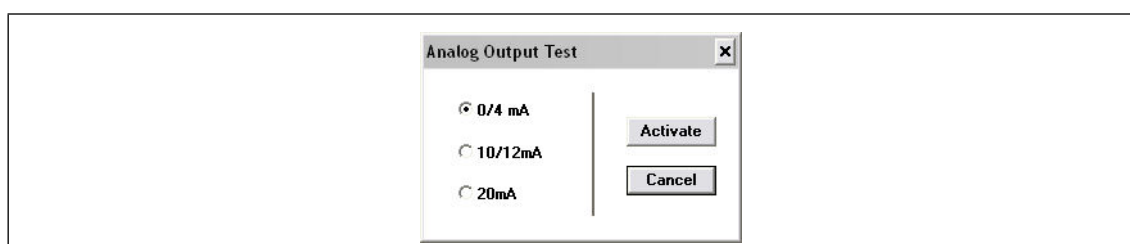
Choose Low Alarm, High Alarm, or system alarm to test the relays, then click Activate. The selected relay is activated and the associated contacts provide a test output.

Choose None, then click on Activate to verify that the alarm contacts are set for "No alarm" condition. Click Cancel to reset any relay activated and exit from this test box.



7.5 Analog output test

Choose the Analog Output Test to test the analog output of the instrument. When this command is selected, an output test may be performed at the instrument analog output connections. Choose 0/4 mA, 10/12 mA, or 20 mA to select the analog level for the output test. Then click on Activate to apply the selected current to the analog output connection.

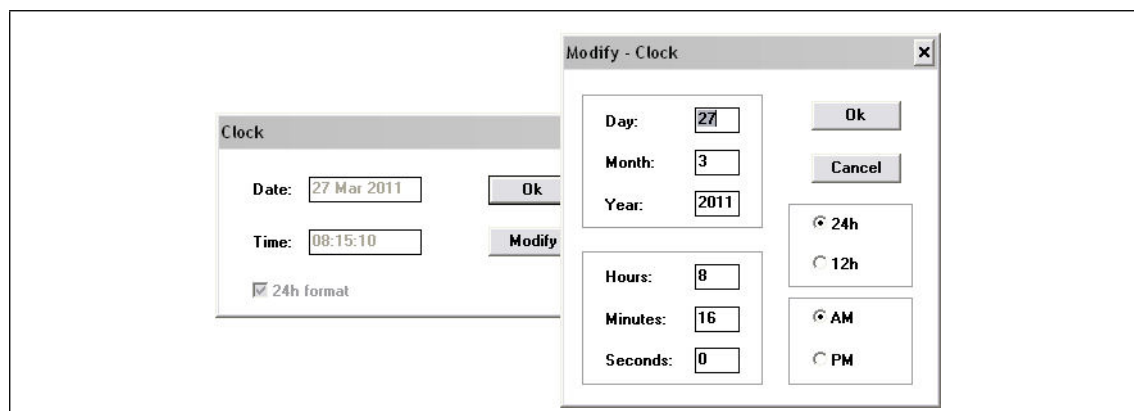


Note: When the alarms are transmitted on the analog output, the calibration has to be done at 0 mA as alarms are set between 0 to 4 mA. (See [Analog output signal on page 14](#))

7.6 Clock settings

Choose the Clock Settings to set the instrument's date and time. The first screen displays the current date and time. If this is correct, choose OK; if either date or time must be changed, choose Modify.

Enter the current date and time, and click OK to store the new data. All measurements will be saved with this date and time when they are downloaded in the ATEX 3660 software.



7.7 Analog input test

The signal received from the gas sensor, corresponding to the measured gas concentration, is amplified by the instrument. The system automatically selects the best amplification range according to conditions (Auto range function).

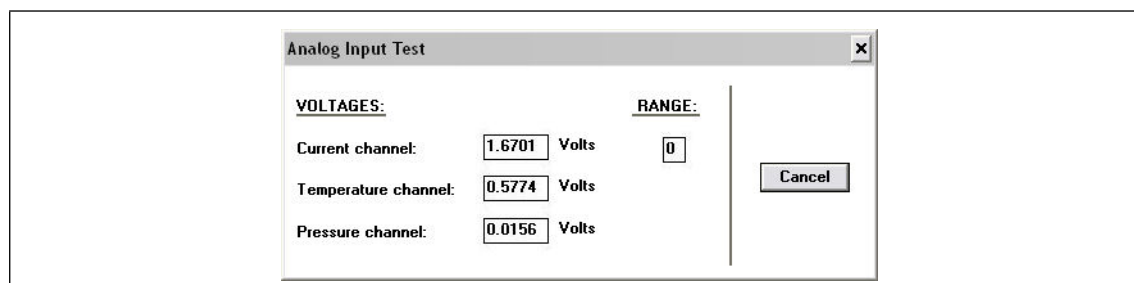
Amplification ranges from 0 (low amplification for high gas concentration) to 3 (high amplification for low gas concentration).

Note: The Range box shows the signal amplification that is currently applied to the gas concentration signal.

This test shows the amplified signals received from the sensors in Volts. This test is used when trying to define an instrument or a sensor problem.

Amplified signals on display are:

- Current (gas concentration).
- Temperature.
- Pressure.

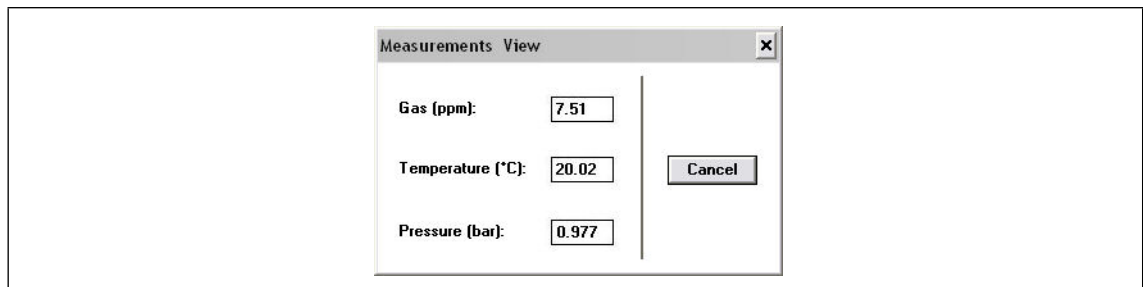


When performing this test, the system will send a warning message when current, temperature, or pressure limits are exceeded. The limits of the voltages for normal operation are:

- Current channel: 0 V to + 1.5 V
- Temperature channel: + 10 mV to + 4 V
- Pressure channel: 0 mV to + 100 mV

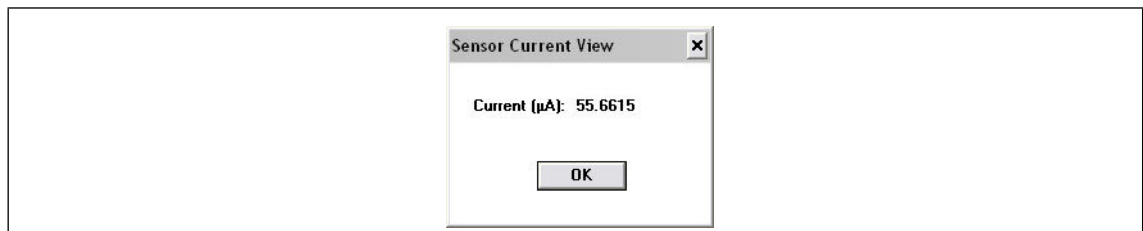
7.8 Measurements view

Choose the Measurements View command to confirm what the instrument is displaying on the LCD display.



7.9 Sensor current view

Choose the Sensor Current View command to monitor the sensor current, in real time.



7.10 Pressure sensor calibration

See [Barometric pressure sensor calibration on page 53](#) and [External pressure sensor calibration on page 53](#).

Section 8 Spare Parts

8.1 Spare parts

Part No.	Description
32514E.03	3 meter cable for external pressure sensor, 32570E.Bxxx. Supplied with one LEMO 4 connector.
32515E.03	3 meter sensor cable for 366xEX, 5 wires. Supplied with 2 connectors, 2 sleeves with 32515E label.
32538.02	2 meter RS232 cable, to connect the interface box to a computer for the 3650EX or 3662EX. Supplied with 2 female 9D connectors.
32570E.B110	External pressure sensor in stainless steel for use with 366xEX (300 psia). Supplied with Viton O-rings and 6mm fittings.
32570E.B111	External pressure sensor in stainless steel for use with 366xEX. (300 psia). Supplied with Viton O-rings and ¼" fittings.
32570E.B210	External pressure sensor in stainless steel for use with 366xEX. (300 psia). Supplied with Kalrez O-rings and 6mm fittings.
32570E.B211	External pressure sensor in stainless steel for use with 366xEX. (300 psia). Supplied with Kalrez O-rings and ¼" fittings.
32570E.B411	External pressure sensor in stainless steel for use with 366xEX. (300 psia). Supplied with Nitril O-rings and ¼" fittings.
32696	ATEX3660 Windows software
32878	Kit of LCD labels, with °Centigrade
32879	Kit of LCD labels, with °Fahrenheit
32907	PC COM port board for RS-485
32954	0-4 / 20mA repeater for 3662EX
32956.x	Safety barrier for 3662EX with power supply x = A: 115 VAC, C: 24 - 48 VDC
32959A	RS-485 / RS-232 converter for 3662EX (PC side)

8.2 Sensors

Part No.	Description
31120E.01	EC Sensor, Substance measured: Oxygen, Sensing head material: Stainless Steel, Guard ring: Silver, Maximum pressure: 50 bar, O-Ring: EPDM, Intrinsically safe
31230E.11	EC Sensor, Substance measured: Hydrogen, Sensing head material: Stainless Steel, Guard ring: Platinum, Maximum pressure: 100 bar, O-Ring: Viton, Intrinsically safe
31330E.15	EC Sensor, Substance measured: Ozone, Sensing head material: Titanium, Guard ring: Platinum, Maximum pressure: 100 bar, O-Ring: Viton, Special: Titanium protection cap, Intrinsically safe.
GA280E-SVS	GA2800 oxygen sensor, ATEX, stainless steel, viton o-rings, cap with grille
GA280E-SKS	GA2800 oxygen sensor, ATEX, stainless steel, kalrez o-rings, cap with grille
GA280E-HVS	GA2800 oxygen sensor, ATEX, hastelloy, viton o-rings, cap without grille
GA280E-HKS	GA2800 oxygen sensor, ATEX, hastelloy, kalrez o-rings, cap without grille

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