VORTEX GAS FLOW SENSOR
REMOTE PROBE

INSTALLATION & OPERATING DATA

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GROUP I & II
INTRINSICALLY
SAFE

PETROCHEMICAL PROCESSING
•
MINING & TUNNELLING
•
VENTILATION SYSTEMS
•
COOLING SYSTEMS
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ENVIRONMENTAL MONITORING

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INSTALLATION & OPERATING DATA

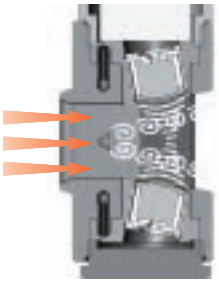
1 PRINCIPAL OPERATING FEATURES

The vortex flow velocity sensing system provides high accuracy, flow measurement free from drift and mechanical deterioration.

As the stream of gas passes through the sensing head, vortices are generated by a transverse strut or 'Bluff Body' intruding into the flow path. The vortex frequency is proportional to the flow velocity and this is detected by an ultrasound beam accurately positioned downstream of the strut.

The data is processed to provide an accurately calibrated output frequency signal that is proportional to the flow velocity and this is used to input directly into the TX6522/3 Enviro Multisensor.

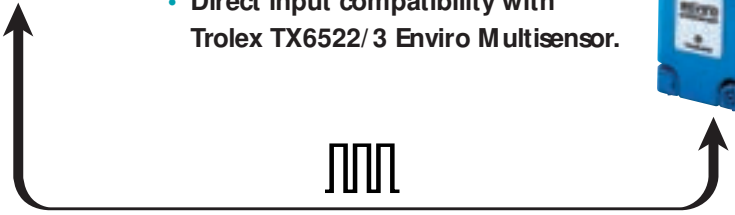
- 0...2KHz nominal output frequency.
- 0.5m...30m/sec measuring range.
- Stainless steel sensing probe.
- Intrinsically Safe version for use in hazardous areas.



2 APPLICATION

Portable, flow velocity measurement or volumetric measurement of air, gases and vapours in pipes, ducts and open areas.

- Ventilation systems.
- Cooling systems.
- Environmental control and monitoring.
- Roadway and tunnel ventilation.
- Process extraction plants.
- Direct input compatibility with Trolex TX6522/3 Enviro Multisensor.



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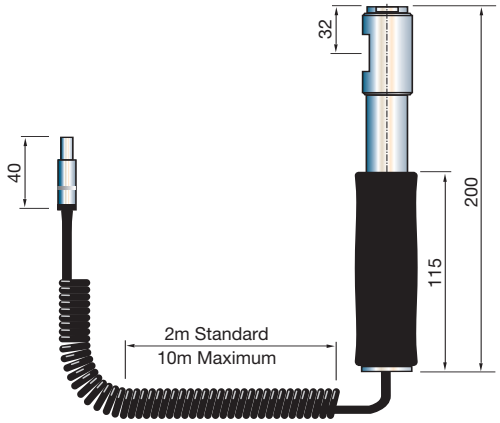
3 DIMENSIONS



ALL DIMENSIONS IN MM

4 TECHNICAL DETAILS

Flow Measuring Range:	0.5...30m/s.
Accuracy:	2%.
Ambient Temp. Limits:	–15...150°C.
Humidity:	0...95% non-condensing.
Protection Classification:	Dust and waterproof to IP66.
Sensing Probe Material:	Stainless steel.
Nett Weight:	1kg.
Connecting Cable:	2m, flexible, complete with connector.
Output Signal:	0...2KHz ±10% nominal for the 0...30m/s measuring range. (flow velocity/frequency relationship provided with each sensor).
Supply Voltage:	5V ± 0.2V.
Maximum Current:	10mA.

5 CONNECTIONS

5.1 Interconnection with Trolex TX6522/3 Enviro Multisensor.

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6 INSTALLATION

6.1 Conformity Check

0...2KHz (nominal)

(Refer to Test Certificate provided with the sensor).

- Does the output signal of the sensor concur with the input requirement of the monitoring equipment being used?

5V dc ± 0.2V

- Is the correct supply voltage available for the sensor?

0.5...30m/sec

- Is the velocity operating range of the system within the stated measuring range of the sensor?

GROUP I GROUP II

- Is the installation in a hazardous area?

  Ensure compliance with intrinsic safety regulations.

6.2 TX6522/3 Enviro Multisensor

- In order to ensure that the TX5924 Vortex Gas Flow Sensing Probe displays linearity accurately on the TX6522 Enviro Multisensor, a polynominal equation has been programmed into the TX6522/3. The TX5924 has been characterised to line up with this polynominal. The TX6522/3 can be lined up with the TX5924 by inputting 4 coefficients into the TX6522/3.

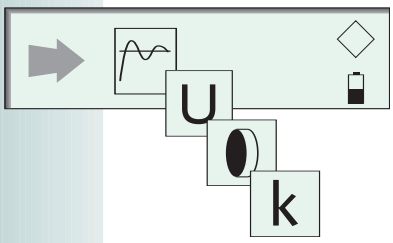
  The coefficients (A ,B, C and D) are etched onto the TX5924 head and also written on its calibration certificate.

6.2.1 Programming the TX5924 Coefficients on the TX6522/3

- Turn on the TX6522/3, and navigate to the Air Flow sensor parameters menu (refer to the TX6522/3 IOD for details).

Air Flow Sensor Parameters

This function will only appear when a remote air velocity sensor is connected to the auxiliary input of the TX6522/3.



The operating parameters of the sensor can be set up.

6 INSTALLATION continued

Scroll to ***North/South*** SELECT the sensor coefficients.

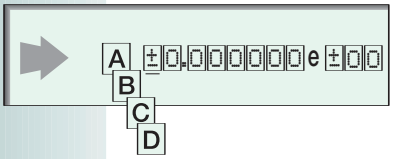
Step ***East.***

Step ***West*** to return to BASE.

CAUTION ALWAYS SWITCH OFF THE SUPPLY WHENEVER THE AIR VELOCITY SENSOR IS CONNECTED OR IS DISCONNECTED.
This ensures that the software is initialised to the new operating conditions.

k Sensor Coefficients

- Fixed coefficients relating to the output characteristics of the individual vortex flow sensor will have been entered into the TX6522/3 during manufacture and will not require further adjustment.
- If a new flow sensor is introduced, the TX6522/3 will need to be aligned to concur with the characteristics of the new sensor. Data is supplied with the new sensor in the form of four calibration codes or coefficients A, B, C, D for this purpose.



Scroll ***North/South*** to SELECT the co-efficient.

Step ***East*** to modify a coefficient.

Step ***East/West*** to TRAVERSE the cursor.

Scroll ***North/South*** to SET the digit with the cursor under.

- Repeat the same procedure for B, C and D.

Step ***East*** or return ***West.***

Step ***West*** to return to BASE.

6.3 Operation of the TX5924 with the TX6522 Enviro Multisensor

- For information on how to use the airflow option on the TX6522/3, refer to the TX6522/3 IOD.

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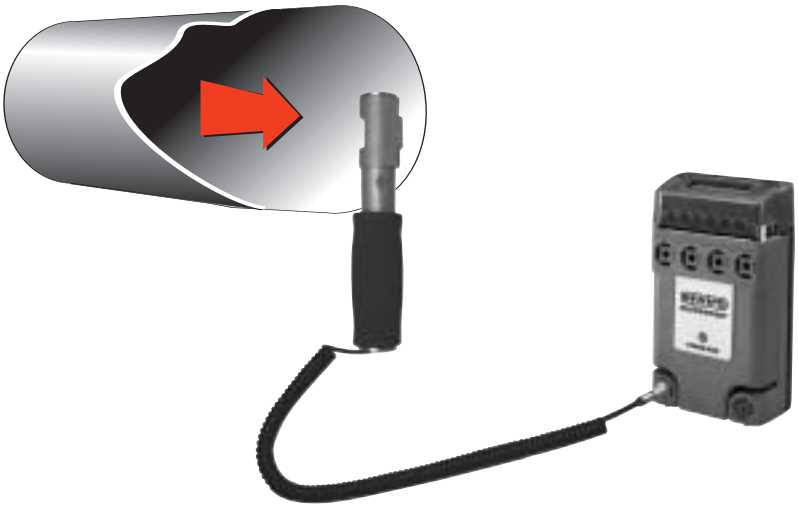
7 MAINTENANCE

There are no degradable components, but it is good safety practice to carry out regular preventative maintenance to confirm correct operation.

7.1 Sensing Probe

Under normal circumstances, the calibration of the actual sensing probe will not change by any significant degree. Check the accuracy at least once per year by comparing the output signal with an accurately measured value of flow velocity.



7.2 Cleaning the Sensing Probe

Remove the sensor at regular intervals to assess its condition. Clean the sensing head with a soft brush or cloth if necessary. Do not use sharp tools as this may cause damage to the ultrasound transducers and the transverse strut.

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8 APPROVALS AND CERTIFICATION

8.1 Intrinsically Safe

The instrument is certified Intrinsically Safe Group I and Group II apparatus for use in potentially explosive atmospheres to EURONORM standards when used with an approved power supply or safety barriers.

The sensor is designed to comply with the **ATEX directive (94/9/EEC).**

GROUP I: **I M1 EEx ia I**
(Ta = –20°C...+60°C)
SIRA99ATEX 2158

GROUP II: **II 2G EEx ia IIC T4**
(Ta = –20°C...+60°C)
SIRA99ATEX 2158

	Group I	Group II
U_i	16.5V	30V
I_i	390mA	390mA
P_i	1.61W	1.2W
C_i	0	0
L_i	15µH	15µH

8.2 Electro Magnetic Compatibility.

The instrument is designed to comply with the EC directive on EMC (89/336/EEC).

8.3 Compliance with ATEX Directives

GB

Instructions specific to hazardous area installations (reference European ATEX Directive 94/9/EC, Annex II, 1.0.6.)

The following applies to equipment covered by certificate number Sira 99ATEX 2158:

1. To comply with the requirements for intrinsic safety, the equipment must be supplied only from associated apparatus with an appropriate safety description matching the input parameters detailed in the certificate.
2. The equipment has not been assessed as a safety-related device (Directive 94/9/EC, Annex II, 1.5.1 to 1.5.8).
3. In Group I applications, the equipment is certified as Category M1.
4. In Group II applications, the equipment is certified as Category 1G and may be used with flammable gases and vapours with apparatus groups IIA, IIB & IIC and with temperature classes T1, T2, T3 and T4. The equipment has not been assessed for suitability with flammable dusts.
5. The equipment is only certified for use in ambient temperatures in the range –20°C to +60°C and should not be used outside this range.
6. The certicate number has an 'X' suffix which indicates that special conditions of installation and use applies. Those installing or inspecting this equipment must have access to the contents of this certificate.
7. Installation and repair shall be carried out in accordance with the applicable code of practice by suitably-trained personnel.
8. The equipment relies on the following materials used in its construction:
   Enclosure: polycarbonate
   Sensing Head: stainless steel
   Window: polycarbonate

   The equipment should not be exposed to substances, which could degrade these materials.

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11 APPROVALS AND CERTIFICATION continued

D

Bedingungen für die Installationen in explosionsgefährdeten Räumen (Europäische ATEX-Richtlinie 94/9/EC, Zusatz II, 1.0.6.)

Die folgende Bedingungen gelten für Geräte, die die Zertifikationsnummer. Sira 99ATEX 2158 tragen:

1. Zwecks Erfüllung der Andforderungen bezüglich derEigensicherheit, darf das Geräte nur an Versorgungen angeschlossen werden, deren sicherheitstechnische Auslegung mit den im Zertifikat aufgeführten Eingangsgrössen übereinstimmt.
2. Das Gerät ist nicht als sicherheitstechnisches Gerät eingestuft (Richtlinie 94/9/EC, Zusatz II 1.5.1 bis 1.5.8).
3. Die Zertifikationskategorie des Gerätes für Einsätze in Gruppe 1 ist M1.
4. Die Zertifikationskategorie des Gerätes für Einsätze in Gruppe II ist 1G, d.h. es darf mit entflammbaren Gasen und Dämpfen mit Geräten der Gruppen IIA, IIB und IIC und Temperaturklassen T1, T2 und T4 eingesetzt werden. Das Gerät wurde nicht in Hinblick auf seine Einsatzfähigkeit mit entflammbaren Stauben geprüft.
5. Das Gerät ist nur für den Einsatz bei Umgebungsteperaturen von –20°C bis 60°C zertifiziert und darf außerhalb dieses Bereiches nicht eingesetzt werden.
6. Die mit dem Suffix "X" behaftete Zertifikationsnummer weist darauf hin, daß die Installation und der Einsatz des Gerates an eine spezielle Bedingung gebunden sind. Personen, die die Installation bzw. Prüfung des Gerätes vornehmen, müssen Zugriff auf das Zertifikat und dessen Inhalt haben.
7. Installation und Reparaturen müssen nach den jeweils geltenden Betriebsvorschriften von qualifizierten Personen vorgenommen werden.
8. Für die Herstellung des Gerätes wurden folgende Werkstoffe eingesetzt:
   Gehäuse: Polycarbonat (PC)
   Meßkopf: Edelstahl
   Sichtglas: Polycarbonat (PC)

   Das Gerät darf nicht mit Substanzenin Kontakt kommen, die zu einer Zersetzung dieses Werkstoffes führen könnten.

NL

Instructies met specifieke betrekking op installaties voor gevaarlijke ruimten. (naar Europese ATEX Richtlijn 94/9/EC, Bijlage II, 1.0.6.)

De volgende instructies zijn van toepassing op onder Certificaat nummer Sira 099ATEX 2158:

1. Om aan de vereisten voor intrinsieke veiligheid te voldoen, mag de apparatuur uitsluitend gevoed worden via een verwant apparaat met een geschikte beschrijving voor veiligheid die overeenkomt met de invoerparameters zoals op het certificaat uiteengezet staan.
2. De apparatuur is niet gecontroleerd als een met veiligheid verwant toestel (Richtlijn 94/9/EC, Bijlage II, 1.5.1 t/m 1.5.8).
3. Bij toepassingen van Groep I is de apparatuur officieel verklaard onder Categorie M1 te vallen.
4. Bij toepassingen van Groep II is de apparatuur officieel verklaard onder Categorie 1G te vallen en kan deze gebruikt worden met vlambare gassen en dampen met apparaten van groep IIA, IIB en IIC en met temperatuurklasse T1, T2, T3 en T4. De apparatuur is niet gecontroleerd geschikt te zijn voor vlambare poeders.
5. De temperatuur is alleen officieel geschikt verklaard voor gebruik bij een omgevingstemperatuur tussen –20°C en +60°C en mag niet gebruikt worden buiten deze minimale en maximale temperaturen.
6. Het nummer van het certificaat eindigt op een 'X' wat aangeeft dat speciale installatie- en gebruiksvoorwaarden van toepassing zijn. De inhoud van dit certificaat moet beschikbaar zijn voor diegenen die deze apparatuur installeren of inspecteren.
7. Installatie- en reparatiewerkzaamheden dienen uitgevoerd te worden door geschikt opgeleid personeel in overeenstemming met de van toepassing zijnde praktijcode.
8. De apparatuur is afhankelijk van de volgende stoffen die in de constructie verwerkt zijn:
   Buitenkant: polycarbonaat
   Sensorkop: roestvrij staal
   Venster: polycarbonaat

   De apparatuur mag niet blootgesteld worden aan stoffen die de bovenstaande stoffen zouden kunnen aantasten.

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11 APPROVALS AND CERTIFICATION continued

N

Spesifikk informasjon om risiko på installasjoner i eksplosjonsfarlige soner (ref. Europeisk ATEX Direktiv 94/9/EC, Anneks II, 1.0.6.)

Følgende brukes til utstyr dekket av sertifikatnummer Sira 99ATEX 2158:

1. For å imøtekomme krav for egensikkerhett, må utstyret vaere forsynt kun fra tilknyttede apparater med passende inngangsparametrene beskrevet i sertifikatet.
2. Utstyret har ikke blitt vurdert som en sikkerhetsrelatert innretning. (Direktiv 94/9/EC, Anneks II, 1.5.1 til 1.5.8).
3. I Gruppe I versjonen, er utstyret sertifisert som Kategori M1.
4. I Gruppe II versjonen er utstyret sertifisert som Kategori 1G, og kan brukes i faresoner med brennende gasser og damp med apparatet fra grupper IIA, IIB og IIC med temperatur klasser T1, T2, T3 og T4. Utstyret er ikke vurdert som tilpasset omgivelse med antennelig støv.
5. Utstyret er kun sertifisert for bruk i omgivelsestemperaturer i område –20°C til +60°C og må ikke brukes utenfor dette området.
6. Nummeret i sertifikatet har en "X" suffiks som indikerer spesielle regler ved installasjon og bruk av utstyret. De som installerer eller inspiserer utstyret må ha adgang til innholdet i sertifikatet.
7. Installering og reparasjon skal bli utført av kompetent personale i samsvar med gjeldende regler.
8. Utstyret henspeiles til de følgelde materialer benyttet i konstruksjonen som:
   Hus: polycarbonate
   Sensorhode: rustfritt stål
   Vindu: polycarbonate

   Utstyret kan ikke bli utsatt for forhold som kan degradere materialet.

E

Instrucciones especificas para instalaciones de áreas peligrosas (con referencia a la Directiva Europea ATEX 94/9/EC, Anexo II, 1.0.6.)

Las siguientes instrucciones se aplican a equipos cubiertos por el certificado número Sira 99ATEX 2158:

1. Para cumplir con los requisitos de seguridad intrínseca, el equipo deberá ser suministrado solo por aparatos asociados, con una apropiada descripción de seguridad que igualen los parámetros de entrada detallados en el certificado.
2. El equipo no ha sido evaluado como una unidad relacionada con la seguridad (Directiva 94/9/CE, Anexo II, 1.5.1 to 1.5.8).
3. En aplicaciones del Grupo I, el quipo está certificado como Categoría M1.
4. En aplicaciones del Grupo II, el quipo está certificado como Categoría 1G y podrá ser usado con gases inflamables y vapores con aparatos del grupo IIA, IIB y IIC y con clases de temperatura de T1, T2, T3 y T4. El equipo no ha sido evaluado para ser usado con polvos inflamables.
5. El equip está certificado solo para usar en temperaturas ambientales dentro de un margen de –20°C a +60°C y no deberá ser usado fuera de este margen.
6. El número del certificado tiene un sufijo "X" el cual indica que se deben aplicar condiciones especiales de instalación y uso. Aquellas personas que realicen la instalación e inspección de este equippo deberán tener acceso al contenido del certificado.
7. La instalación y reparación deberá ser realizada de acuerdo con el código de practica indicado y por personal adecuadamente entrenado.
8. El equipo se basa en los siguientes materiales usados en su construcción:
   Recinto: polycarbonato
   Cabeza detectora: acero inoxidable
   Ventana: polycarbonato

   El equipo no deberá ser expuesto a sustancias que puedan degradar estos materiales.

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PROTECTING THE ENVIRONMENT

Many of our products are often used to monitor the quality of environmental conditions consequently Trolex is also particularly aware of the need to protect human health and the environment in which we live.

The Company has instituted a radical environment protection policy to ensure that all aspects of our manufacturing programme have the minimum possible detrimental impact on the environment. This covers all stages beginning with sustainable product design supported by careful selection of the materials used in their production, through to managed recovery and disposal at the end of the useful life of a product.

This policy also incorporates the principles of the Waste Electrical and Electronics Equipment (WEEE) directive, and the associated Restriction of Hazardous Substances (RoHS) directive, to be implemented in EU countries.

Progress is already well advanced on the introduction of a completely new range of products that maximise the central principle of sustainable design with the intention of reducing the end-of-life cost to the end user.

All Trolex products are manufactured to exacting standards in accordance with our stringent quality control ethos. Having chosen to use one of our products will, in itself, guarantee extended durability and a long operating life, endorsed by our commitment to recycling and recovery.

- All packaging materials are carefully selected to be bio-degradable or re-cycleable where possible.
- All plastic materials are identified for recycling purposes and re-cycled materials are used where it is possible to do so.
- Printing paper and material are sourced from suppliers that have a declared environmental management system.
- Product design centred around high quality and long term durability. Modular architecture both in construction and software design suitable for future upgrades and adaptability to alternative duty.
- Ease of product disassembly, minimisation of fixing devices, and clear separation of functional parts to benefit re-use and re-cycling.
- Control and monitoring of suppliers of components and sub-assemblies. Deal only with uppliers that have a defined commitment to environmental monitoring principles.
- Control the use of restricted substances within the design process. Deal only with suppliers that have a defined commitment to the control of restricted substances.
- Provide an efficient high speed service within Trolex for repair, refurbishing and conversion of products for alternative duty.
- Provision of an end-of-life product Take-back service for recovery, re-use, and recycling of electrical and electronic components. Retain the packaging of a new product and re-use it to return the device to us at the end of its working life. Trolex will guarantee to recover all materials and components, where practicable and arrange for them to be re-cycled in an appropriate and in a safe manner.

TROLEX LIMITED
NEWBY ROAD, HAZEL GROVE, STOCKPORT,
CHESHIRE SK7 5DY, UK
T: +44 (0)161 483 1435
E: sales@trolex.com
W: trolex.com