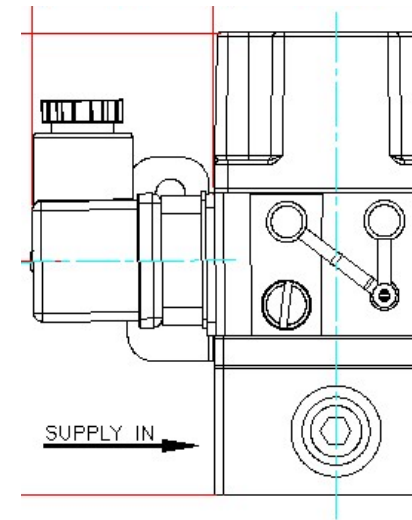




# Instrument Manual

## Type 100X/101X



Norgren Limited  
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Leeds, LS6 2RT, United Kingdom

Tel: +44 (0)113 245 7587  
Fax: +44 (0)113 246 5735

Email: [enquiries@norgren.com](mailto:enquiries@norgren.com)  
Website: <http://www.norgren.com/ws>

Ref: YM10000 07/06

If installation instructions required in alternative European language please contact Norgren Ltd either by e-mail on [enquiries@norgren.com](mailto:enquiries@norgren.com), or by telephone on +44 113 245 7587, or fax on +44 113 246 5735.

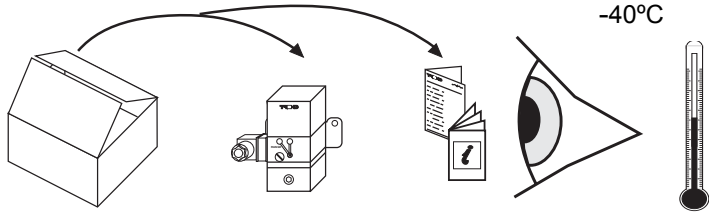
Pour obtenir cette documentation en d'autres langues, priere de contacter Norgren Ltd par e-mail a [enquiries@norgren.com](mailto:enquiries@norgren.com), par telephone au +44 113 245 7587 ou par fax au +44 113 246 5735.

Sollten Sie dieses Handbuch in anderen Sprachen benötigen, wenden Sie sich bitte an Norgren Ltd unter der email-Adresse: [enquiries@norgren.com](mailto:enquiries@norgren.com), oder rufen Sie unter der Nummer +44 113 245 7587 an oder faxen Sie unter der Nummer +44 113 246 5735.

Se vi occorre questo prontuario in una lingua diversa, siete pregati di contattare Norgren Ltd all 'indirizzo e-mail: [enquiries@norgren.com](mailto:enquiries@norgren.com), oppure telefonare al n. +44 113 245 7587, o inviare un fax al n. +44 113 246 5735

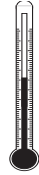
# 100X/101X: Installation Instructions

## IMPORTANT



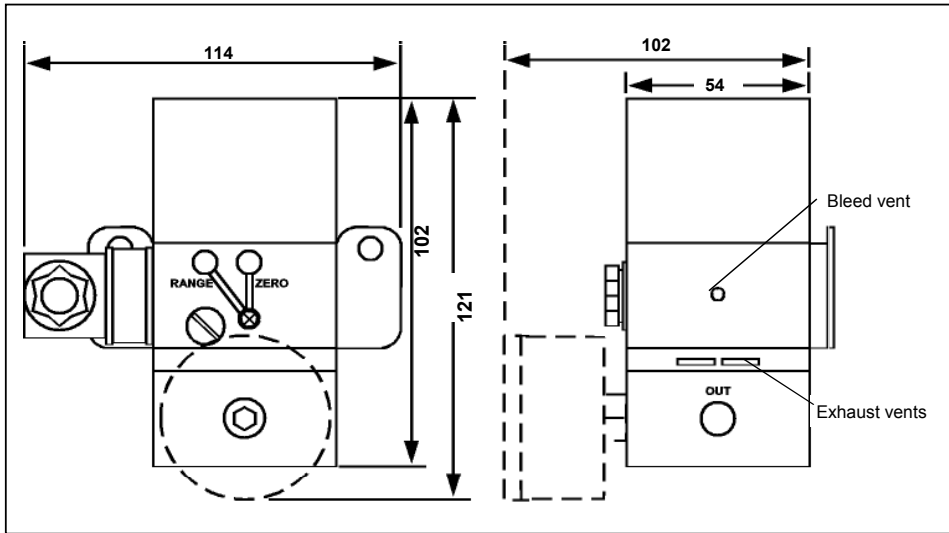
## STORING

-40°C +80°C



## INSTALLATION

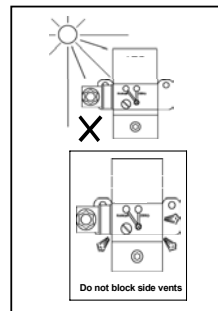
### 1. Dimensions in mm *Note: Pictures shown as block diagram and not to scale*



## 2. Requirements

IP65 in operating conditions

For different orientations recalibration may be required



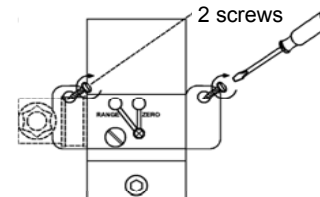
To conform with the **Health and Safety at Work Act 1974** our product should be installed, used and maintained in accordance with:

- 1 Normal Safety Procedures
- 2 The installation and operating instructions provide for each instrument.
- 3 BS 6379 for general applications or ANSI/ASA-57.3 1975
- 4 BS 5345 for hazardous area applications

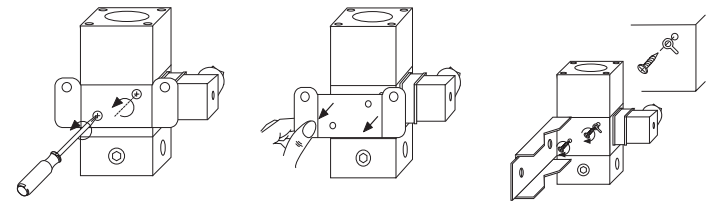
If for any reason local conditions dictate non-compliance with the above, Noraren Ltd. should be consulted.

## 3. Fixing

### a Mounting Bracket



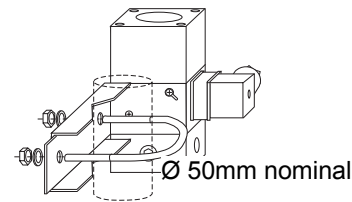
### b Pipe Mounting Kit (option)



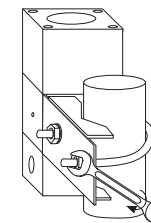
(i) Remove Screws

(ii) Remove Brackets

(iii) Screw in new bracket

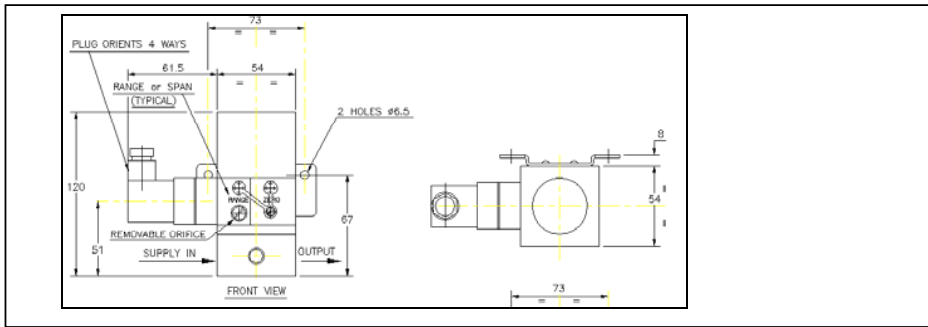


(iv) Clamp to pipe

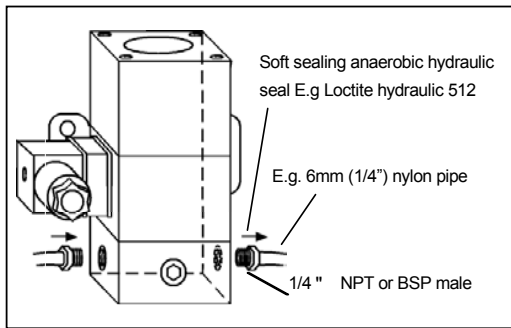


(v) Tighten nuts

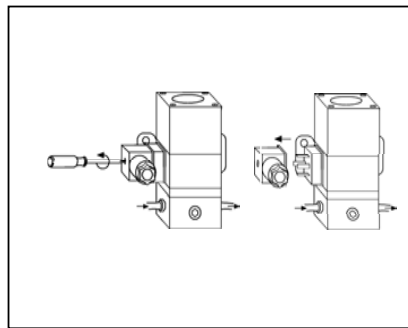
#### 4. Mounting Dimensions



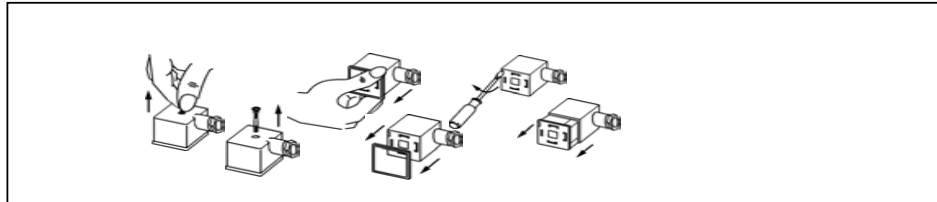
#### 5. Make Pneumatic Connections



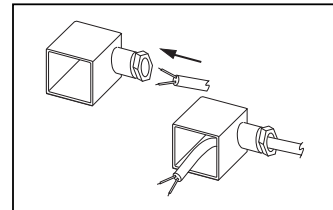
#### 6. Remove Connector



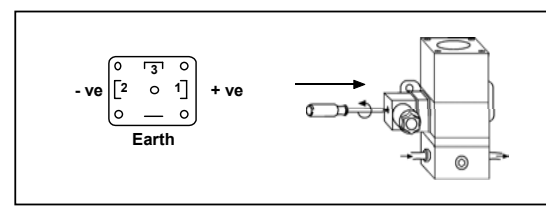
#### 7. Expose Terminals



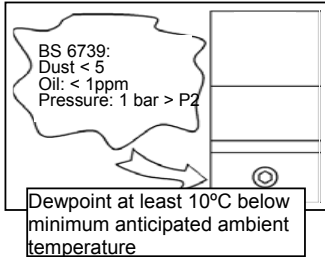
#### 8. Insert Cable



#### 9. Assemble and Fit Connector



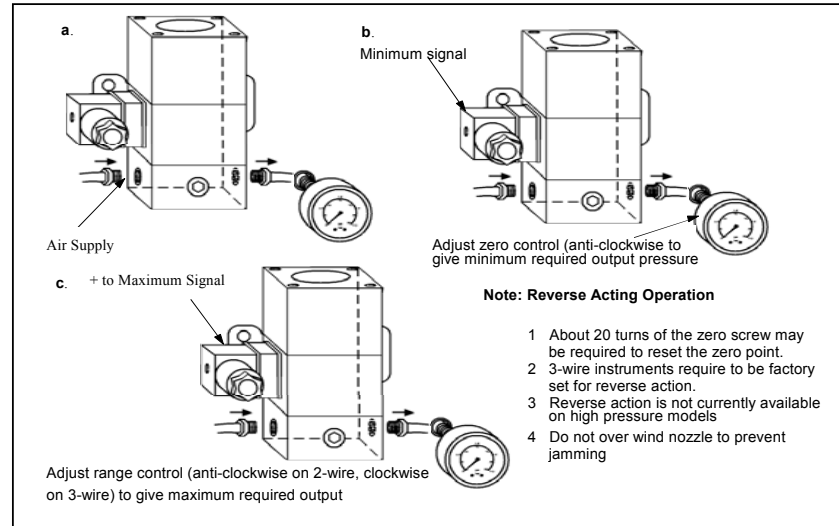
#### 10. Air Supply



	SUITABLE I/P CONVERTER	UP TO 6 I/P CONVERTERS
Particle/Water Removal Filter	Type F72G with 5 micron Element	Type F74G with 5 micron Element
Oil/Particle/Water Removal Water	Type F72C	F74C
Regulator	Type R72	Type R74
Combination Filter/Regulator	Type B72 with 5 micron Element (=F72+R72)	Type B74 with 5 micron Element

#### 11. Calibration

When the instrument is first installed, or after a long period of downtime, a moderate zero shift is normal. This is due to the rubber diaphragms which are stretched by the internal springs. After a few operations, the instrument will settle into its normal operating condition. It is recommended that, under these circumstances, instruments should be exercised by alternately applying zero and full scale signals several times. Zero calibration should then be carried out.



#### Note: Hazardous Area Versions

The 100X is available in versions suitable for use in hazardous areas. The hazardous area versions carry information on their certification on a special label. This gives an indication to the correct areas of use.

Installation of any hazardous areas equipment should be made in accordance with the relevant specifications and to the operating instructions. Norgren cannot be held responsible for incorrect installation, or any modifications to or repair of a certified instrument as this may invalidate the certified design. If a certified instrument should fail, no attempt should be made by the user to repair it. The unit should be returned to the

## 12. After Sales Service

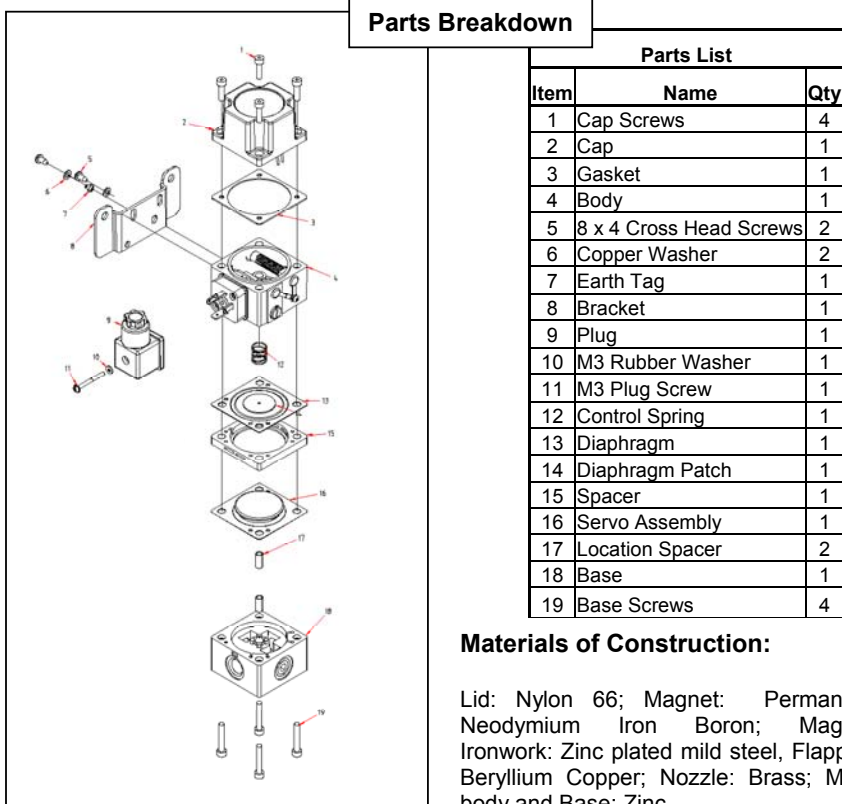
Product No.	Model	Contents
400096R	100X (2 wire)	Restrictor screw and 'O' rings, control spring, diaphragm, servo assembly
500096R	101X (3 wire)	Restrictor screw and 'O' rings, control spring, diaphragm, servo assembly

For alternative Repair Services, please contact Norgren Ltd

## 13. Maintenance

Care must also be taken to re-align transfer passages correctly during reassembly of the instrument.

Routine maintenance consists of replacing the restrictor screw if the internal orifice becomes blocked.

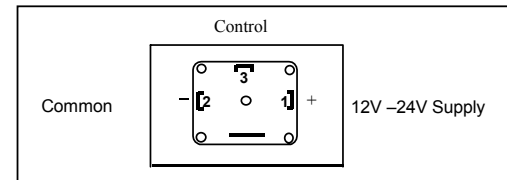


## 14. Production Variations

### 3 Wire Versions

These are products designed for electrical control signals which differ from the normal 4-20. 0-60mA signals. An internal amplifier is fitted to translate the control signal into the required current through the coil. An external 12V-24V DC signal is required to power the amplifier, which should be capable of providing 25mA (low pressure) or 65mA. (high pressure)

It is essential that wiring be carried out correctly as incorrect wiring may destroy the amplifier completely.



### E-P Versions (Voltage Controlled converters)

These are available in the 2 and 3 wire versions. The two wire versions are recalibrated I/P converters with a suitable buffer resistor in series with the coil to adjust the sensitivity

**Captured Exhaust Versions:** Designed for use with certain gases. This part must be connected to a suitable exhaust arrangement e.g. stack pipe. N.B. Check with Watson Smith Technical Department before installation.

**Warning:** Not for use where no escape of gas is permitted to escape to the environment due to the constant bleed of the unit

### Note: Reverse Acting Operation

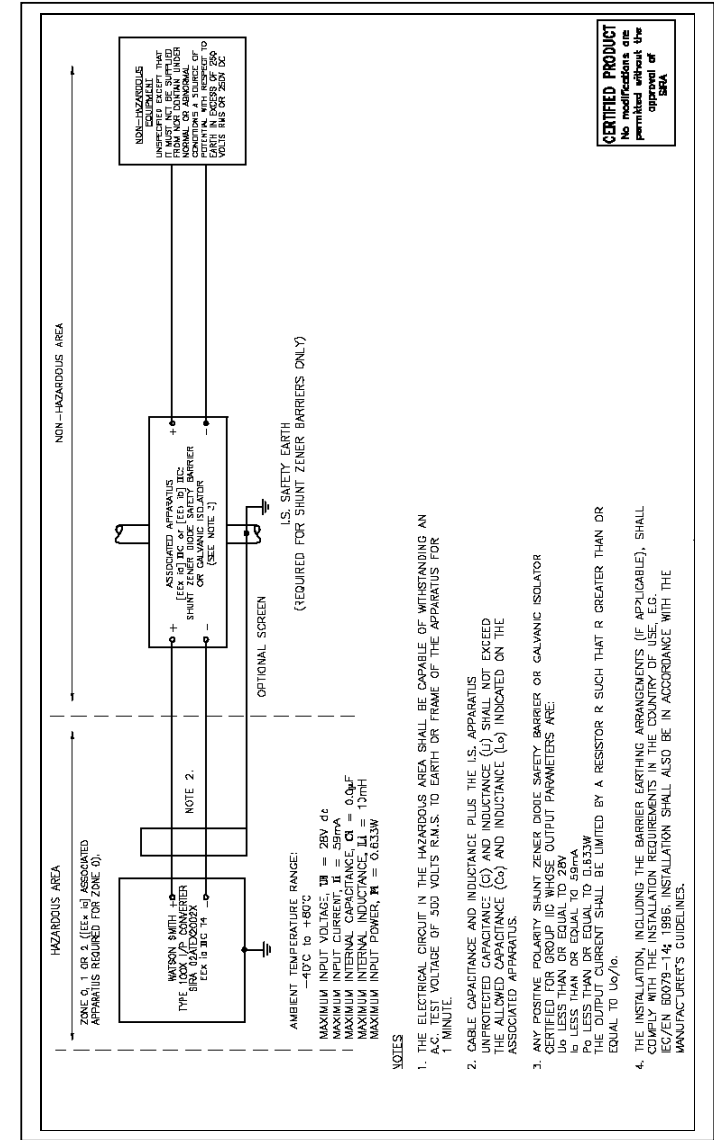
- 1 About 20 turns of the zero screw may be required to reset the zero point.
- 2 3-wire instruments require to be factory set for reverse action.
- 3 Reverse action is not currently available on high pressure models
- 4 Do not over wind nozzle to prevent jamming

## 15. Troubleshooting Guide

PROBLEM	POSSIBLE CAUSES	SUGGESTED ACTION
No Output Pressure	Reversed Current Polarity	Check wiring and signal, continuity with milliammeter
	Broken Internal wiring	Check instrument resistance with ohmmeter. Repair if faulty
	No air supply	Correct
Maximum output not available	Insufficient supply pressure	Adjust
	Damaged coil or nozzle	Return to Factory for repair
	Oil contamination	Replace instrument
	Clogged restrictor	Replace
Zero will not adjust	Pinion disengaged from nozzle (after excessive adjustment)	Re-engage components
Zero calibration error on initial turn-on	A small error is normal	Exercise instrument several times and re-test

For requirements not listed, please contact Technical Sales

## Intrinsically Safe Control Drawing



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

The following instructions apply to equipment covered by certificate number Sira 02ATEX2002X:

1.



2. The Model 100X may be installed in zones containing potentially flammable gas atmospheres:
  - For flammable gas atmospheres, the equipment may be used in zones 0, 1 and 2 with gases and vapours assigned to IIA, IIB and IIC apparatus groups, with temperature classes T1, T2, T3 and T4;
3. The equipment should not be used outside the stated ambient temperature range of  $-40^{\circ}\text{C}$  to  $80^{\circ}\text{C}$
4. The certificate number has an 'X' suffix, which indicates that the certificate contains one or more special conditions for safe use. Those installing or inspecting the equipment should have access to this section of the certificate.
5. The equipment has not been assessed as a safety-related device (as referred to by Directive 94/9/EC Annex II, clause 1.5)
6. Installation and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with the applicable codes of practice
7. Repair of this equipment shall be carried out by the manufacturer or in accordance with the applicable code of practice
8. The certification of this equipment relies on the following materials used in its construction:
 

Enclosure base and body:	zinc alloy
Enclosure cap:	nylon
Gasket material:	Neoprene

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

- Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials
- Suitable precautions: e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals

**Instructions relatives aux installations en zone dangereuse  
(référence Directive européenne ATEX 94/9/EC, Annexe II, 1.0.6)**

Les instructions suivantes sont d'application pour tout matériel couvert par le numéro de certificat Sira 02ATEX2002X :

1.



2. Le modèle 100X peut être installé dans des zones contenant des atmosphères gazeuses potentiellement inflammables :
  - En ce qui concerne les atmosphères gazeuses inflammables, le matériel peut être utilisé dans les zones 0, 1 et 2 comportant des gaz et vapeurs convenant aux groupes d'appareils IIA, IIB et IIC, avec des classes de température T1, T2, T3 et T4 ;
3. Le matériel ne peut pas être utilisé en dehors de la plage de température ambiante prévue, qui peut aller de  $-40^{\circ}\text{C}$  à  $80^{\circ}\text{C}$
4. Le numéro de certificat a un suffixe « X ». Ceci indique que le certificat contient une ou plusieurs conditions spéciales pour permettre une utilisation en toute sécurité. Les personnes chargées de l'installation ou de l'inspection du matériel doivent avoir accès à cette partie du certificat.
5. Le matériel n'a pas été jugé comme étant important pour la sécurité (ainsi que mentionné par la Directive 94/9/EC, Annexe II, clause 1.5)
6. Un personnel bien formé effectuera l'installation et l'entretien de ce matériel selon les codes de bonne pratique en application.
7. Les réparations de ce matériel seront réalisées par le fabricant ou selon le code de bonne pratique en application.
8. L'homologation de ce matériel repose sur l'utilisation des matériaux suivants dans sa fabrication :
 

socle et corps de l'enceinte :	alliage de zinc
couvercle de l'enceinte :	nylon
produit d'étanchéité :	néoprène

Si le matériel risque d'entrer en contact avec des substances agressives, il est de la responsabilité de l'utilisateur de prendre les précautions nécessaires pour empêcher qu'il ne soit abîmé et de veiller ainsi à sauvegarder son type de protection.

- Substances agressives : par ex. les liquides et gaz acidifiants qui peuvent attaquer les métaux ; ou les solvants qui peuvent agir sur les matériaux polymérisés
- Précautions adéquates : par ex. les contrôles réguliers faisant partie d'inspections de routine ; ou la vérification, d'après la feuille de données du matériel, qu'il résiste à des produits chimiques spécifiques.

### Sondervorschriften für Anlagen in explosionsgefährdeten Bereichen (Quelle: Europäische ATEX-Richtlinie 94/9/EC, Zusatz II, 1.0.6)

Die im Folgenden genannten Vorschriften gelten für Geräte mit der Zertifikatsnummer Sira 02ATEX2002X:



- 1.
2. Das Modell 100X kann in Bereichen installiert werden, die explosionsgefährdete Atmosphären enthalten:
  - Bei explosionsgefährdeten Atmosphären können die Geräte in den Kategorien 0, 1 und 2 eingesetzt werden; diese Kategorien umfassen Gase und Dämpfe, die den Explosionsgruppen IIA, IIB und IIC zugewiesen sind, und Temperaturen, die zu den Temperaturklassen T1, T2, T3 und T4 gehören.
3. Die Geräte sollten nicht bei Temperaturen eingesetzt werden, die außerhalb des ausgewiesenen Umgebungstemperaturbereichs von -40 °C bis 80 °C liegen.
4. Die Zertifikatsnummer besitzt die Endung 'X', was bedeutet, dass das Zertifikat eine oder mehrere Sonderbedingungen für den normal zulässigen Gebrauch beinhaltet. Die Geräteinstallation bzw. Geräteinspektion sollte daher im entsprechenden Zertifikatsabschnitt berücksichtigt werden.
5. Die Geräte sind nicht als sicherheitsbezogene Apparatur beurteilt worden (siehe Richtlinie 94/9/EC Zusatz II, Klausel 1.5).
6. Die Geräteinstallation und -wartung sind von ausreichend ausgebildetem Personal gemäß den entsprechenden Normen für den praktischen Gebrauch durchzuführen.
7. Die Gerätereparatur ist vom Gerätehersteller oder gemäß den entsprechenden Normen für den praktischen Gebrauch durchzuführen.
8. Die Geräte Zertifizierung ist von folgenden bei der Konstruktion verwendeten Materialien abhängig:
  - Gehäusefundament und -körper: Zinklegierung
  - Gehäusedeckel: Nylon
  - Dichtungsmaterial: Neopren

Wenn die Geräte leicht in Kontakt mit aggressiven Stoffen kommen können, liegt es in der Verantwortung des Benutzers, die erforderlichen Maßnahmen gegen nachteilige Auswirkungen zu treffen und somit zu gewährleisten, dass der Schutztyp nicht beschädigt wird.

- Aggressive Stoffe: z.B. flüssige Säuren bzw. Gase, die Metalle angreifen können, oder Lösungen, die Polymermaterialien beeinflussen können.
- Entsprechende Maßnahmen: z.B. regelmäßige Überprüfungen als Bestandteil von Routineinspektionen oder aus dem Datenblatt des Materials hervorgehender Nachweis darüber, dass das Material gegen spezielle Chemikalien resistent ist.

### Istruzioni specifiche per installazioni in aree a rischio (con riferimento alla Norma Europea ATEX 94/9/EC, Allegato II, 1.0.6)

Le seguenti istruzioni si riferiscono ad impianti dotati del numero di certificazione Sira 02ATEX2002X:



- 1.
2. È possibile installare il Modello 100X anche in aree contenenti atmosfere gassose potenzialmente infiammabili:
  - Per atmosfere gassose potenzialmente infiammabili, è necessario utilizzare l'impianto nelle aree 0, 1 e 2 assegnando i gas e i vapori ai gruppi di apparecchi IIA, IIB e IIC, con classi di temperatura T1, T2, T3 e T4.
3. L'impianto deve essere utilizzato esclusivamente in ambienti con un intervallo di temperatura compreso tra -40°C e 80°C.
4. Il numero di certificazione ha un suffisso "X", ad indicare che il certificato contiene una o più condizioni speciali per la sicurezza d'uso. Il personale addetto all'installazione o alle ispezioni dell'impianto dovrebbe consultare questa sezione del certificato.
5. L'impianto non è stato considerato come dispositivo soggetto alle direttive sulla sicurezza previste dalla Norma 94/9/EC Allegato II, clausola 1.5
6. L'installazione e la manutenzione di questo impianto devono essere eseguite da personale specializzato in osservanza delle normative vigenti.
7. La riparazione dell'impianto deve essere effettuata dal produttore o nel rispetto delle normative vigenti.
8. La certificazione di questo impianto si basa sui seguenti materiali utilizzati nella costruzione:
  - Base e corpo della chiusura: lega di zinco
  - Coperchio di chiusura: nylon
  - Materiale di guarnizione: neoprene

Se si prevede che l'impianto possa entrare in contatto con sostanze corrosive, è responsabilità dell'utente adottare le precauzioni necessarie per evitare di danneggiare l'impianto e garantire che il tipo di protezione non venga compromesso.

- Sostanze corrosive: ad esempio, liquidi o gas acidi che possono corrodere i metalli o solventi che possono danneggiare i materiali polimerici.
- Precauzioni adeguate: ad esempio, controlli regolari eseguiti durante le ispezioni periodiche di routine o consultazione della scheda tecnica del materiale per accertarsi che sia resistente a specifiche sostanze chimiche.

## EC DIRECTIVE 94/9/EC (ATEX)

### DECLARATION OF CONFORMITY

Watson Smith declares under our sole responsibility that the product listed below complies with the relevant provisions of Directive 94/9/EC of 23 March 1994.

**Product:** Type 100X I/P Converter  
**Manufactured by:** Watson Smith Instrumentation  
Norgren Ltd.  
Cross Chancellor Street  
Leeds, LS6 2RT  
England  
**Notified Body:** Sira Certification Service (0518)  
Rake Lane  
Ecclestone  
Chester, CH4 9JN  
England

Conformity has been demonstrated with reference to the following documentation:

EC Type Examination Certificate: Sira 02ATEX2002X dated 25<sup>th</sup> Feb 2002  
Quality Assurance Notification: Sira 02ATEX M189 dated 9<sup>th</sup> Aug 2002

Compliance with the Essential Health & Safety Requirements has been assessed by reference to the following standards:

EN 50014: 1997 (plus amendments A1&A2)  
EN 50020: 2002  
EN 50284: 1999

Signed:  Date: 11/05/05

Name: P. Hartley

Position: Managing Director

Document No. 2005-041A  
Date 07 Nov 02  
Re-issued 04 May 05

Watson Smith Instrumentation

## EC DIRECTIVE 89/336/EEC (EMC)

### DECLARATION OF CONFORMITY

Watson Smith declares under our sole responsibility that the product listed below (and its derivatives listed in the report EMC 10001)

**Product:** Type 100X and Type 101X I/P Converter  
**Manufactured by:** Watson Smith Instrumentation  
Norgren Ltd.  
Cross Chancellor Street.  
Leeds, LS6 2RT  
England

Conforms with the protection requirements of Council Directive 89/336/EEC (amendments 92/31/EEC and 93/68/EEC) on the approximation of the laws of the Member State relating to electromagnetic compatibility SI 2372 : 1992 (amendment SI 3080 : 1994).

Representative samples of the Type 100X and Type 101X I/P Converter have been tested and evaluated (Report EMC 10001) in accordance with:

BS EN 50081-2 : 1994 Electromagnetic Compatibility  
Generic Emission Standard  
Part 2: Industrial Environment

BS EN 50082-2 : 1995 Electromagnetic Compatibility  
Generic Immunity Standard  
Part 2: Industrial Environment

to demonstrate compliance with Council Directive 89/336/EEC (amendments 92/31/EEC and 93/68/EEC).

Signed:  Date: 11/05/05

Name: P. Hartley

Position: Managing Director

Document No. 2005-042A  
Date 25 Nov 96  
Re-issued: 04 May 05

Watson Smith Instrumentation