

# AXF Series Magnetic Flowmeter Installation Manual ATEX and IECEx Explosion Proof Type

IM 01E20A01-11EN

vigilantplant.®

## Contents

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Integral Flowmeter  
(AXF□□□C)



Remote Flowtube  
(AXF□□□C)



Remote Converter  
(AXFA14C)

Note: "□□□" means any of the following.  
002, 005, 010, 015, 025, 032, 040, 050, 065, 080, 100, 125, 150,  
200, 250, 300, 350, 400

This manual outlines the specification for ATEX and IECEx explosion proof type of the ADMAG AXF Series. For the items which are not covered in this manual, refer to IM 01E20A01-01JA or IM 01E20A01-01EN.

# 1. ATEX Documentation

This is only applicable to the countries in European Union.

- |   |  |
|---|--|
| <p><b>GB</b> All instruction manuals for ATEX Ex related products are available in English, German and French. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.</p> <p><b>DK</b> Alle brugervejledninger for produkter relateret til ATEX Ex er tilgængelige på engelsk, tysk og fransk. Skulle De ønske yderligere oplysninger om håndtering af Ex produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.</p> <p><b>I</b> Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese, tedesco e francese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.</p> <p><b>E</b> Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés, alemán y francés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.</p> <p><b>NL</b> Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels, Duits en Frans. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.</p> <p><b>SF</b> Kaikkien ATEX Ex -tyyppisten tuotteiden käyttöohjeet ovat saatavilla englannin-, saksan- ja ranskan kielisinä. Mikäli tarvitsette Ex -tyyppisten tuotteiden ohjeita omalla paikallisella kielellänne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.</p> <p><b>P</b> Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês, Alemão e Francês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.</p> <p><b>F</b> Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise, allemande et française. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.</p> <p><b>D</b> Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch, Deutsch und Französisch zur Verfügung. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichen Yokogawa-Vertreter in Verbindung.</p> <p><b>S</b> Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska, tyska och franska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.</p> <p><b>GR</b> Όλα τα εγχειρίδια λειτουργίας των προϊόντων με ATEX Ex διατίθενται στα Αγγλικά, Γερμανικά και Γαλλικά. Σε περίπτωση που χρειάζεστε οδηγίες σχετικά με Ex στην τοπική γλώσσα παρακαλούμε επικοινωνήστε με το πλησιέστερο γραφείο της Yokogawa ή αντιπρόσωπο της.</p> | <p><b>SK</b> Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom, nemeckom a francúzskom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.</p> <p><b>CZ</b> Všechny uživatelské příručky pro výrobky, na něž se vztahuje nevybušné schválení ATEX Ex, jsou dostupné v angličtině, němčině a francouzštině. Požadujete-li pokyny týkající se výrobků s nevybušným schválením ve vašem lokálním jazyku, kontaktujte prosím vaši nejbližší reprezentační kancelář Yokogawa.</p> <p><b>LT</b> Visos gaminio ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglų, vokiečių ir prancūzų kalbomis. Norėdami gauti prietaisų Ex dokumentaciją kitomis kalbomis susisiekite su artimiausiu bendrovės "Yokogawa" biuru arba atstovu.</p> <p><b>LV</b> Visas ATEX Ex kategorijas izstrādājumu Lietošanas instrukcijas tiek piegādātas angļu, vācu un franču valodās. Ja vēlaties saņemt Ex ierīšu dokumentāciju citā valodā, Jums ir jāsazinās ar firmas Jokogava (Yokogawa) tuvāko ofisu vai pārstāvi.</p> <p><b>EST</b> Kõik ATEX Ex toodete kasutamishendid on esitatud inglise, saksa ja prantsuse keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima lokagava (Yokogawa) kontori või esindaja poole.</p> <p><b>PL</b> Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim, niemieckim i francuskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym języku, prosimy o kontakt z najbliższym biurem Yokogawy.</p> <p><b>SLO</b> Vsi predpisi in navodila za ATEX Ex sorodni pridelki so pri roki v angleščini, nemščini ter francoščini. Če so Ex sorodna navodila potrebna v vašem tujejnem jeziku, kontaktirajte vaš najbliži Yokogawa office ili predstavnika.</p> <p><b>H</b> Az ATEX Ex műszerek gépkönyveit angol, német és francia nyelven adjuk ki. Amennyiben helyi nyelven kérik az Ex eszközök leírásait, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviselőt.</p> <p><b>BG</b> Всички упътвания за продукти от серията ATEX Ex се предлагат на английски, немски и френски език. Ако се нуждаете от упътвания за продукти от серията Ex на родния ви език, се свържете с най-близкия офис или представителство на фирма Yokogawa.</p> <p><b>RO</b> Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza, germana si franceza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.</p> <p><b>M</b> Il-manwali kollha ta' l-istruzzjonijiet għal prodotti marbuta ma' ATEX Ex huma disponibbli bi-Ingliż, bi-Germaniż u bi-Franċiż. Jekk tkun teħtieg struzzjonijiet marbuta ma' Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentant jew uffċju ta' Yokogawa.</p> |
|---|--|

## 2. Explosion Proof Type Instrument

In this chapter, further requirements and differences for explosion proof type instrument are described.



### NOTE

When describing the model name like AXF□□□C in this manual, "□□□" means any of the following.  
002, 005, 010, 015, 025, 032, 040, 050, 065, 080, 100, 125, 150, 200, 250, 300, 350, 400



### WARNING

Magnetic flowmeters with the model name AXF□□□C magnetic flowmeter and AXFA14C remote converter are products which have been certified as explosion proof type instruments. Strict limitations are applied to the structures, installation locations, external wiring work, maintenance and repairs, etc. of these instruments. Sufficient care must be taken, as any violation of the limitations may cause dangerous situations.

Be sure to read this chapter before handling the instruments.

For explosion proof type instrument, the description in this chapter is prior to other description in this user's manual.



### WARNING

The terminal box cover and display cover is locked by special screw. In case of opening the cover, use the hexagonal wrench attached.

The covers of explosion proof type products are locked. Use the attached hexagonal wrench to open and close the cover. Before opening the cover, be sure to check that the power of flowmeter has been turned off. Once the cover is closed, be sure to re-lock the product.

Be sure to lock the cover with the special screw using the hexagonal wrench attached after tightening the cover.

## 2.1 ATEX



### WARNING

Only trained persons use this instrument in industrial locations.

### (1) Technical Data

#### (AXF Integral Flowmeter), (AXF Remote Flowtube)

Applicable Standard:

EN 60079-0: 2012/A11: 2013,  
EN 60079-1: 2007, 2014,  
EN 60079-7: 2007,  
EN 60079-11: 2012,  
EN 60079-31: 2014

Certificate: DEKRA 15ATEX0029 X

#### (AXF Integral Flowmeter)

##### Type of Gas Atmosphere Protection

Group: II

Category: 2G

Type of Protection:

Ex db e ia IIC T6...T4 Gb

Specification of Protection:

Um: 250V

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

(a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T5	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)

(b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T5	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)

(c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T5	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T4	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)

**Type of Dust Atmosphere Protection**

Group: II

Category: 2D

Type of Protection:

Ex tb IIIC T75°C...T110°C Db

Specification of Protection:

Um: 250V

Power Supply: 100 to 240 Vac 47 to 63 Hz

100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max

off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

(a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T90°C	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)

(b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T90°C	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)

(c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T90°C	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T110°C	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)

**(AXF Remote Flowtube)**

**Type of Gas Atmosphere Protection**

Group: II

Category: 2G

Type of Protection:

Ex db e ia IIC T6...T3 Gb

Specification of Protection:

Um: 250V

Enclosure: IP66/IP67

(a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T5	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)
T3	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)

(b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T5	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)
T3	-40°C to +140°C (-40°F to +284°F)	-40°C to +60°C (-40°F to +140°F)

(c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T5	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T4	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)
T3	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)

**Type of Dust Atmosphere Protection**

Group: II

Category: 2D

Type of Protection:

Ex tb IIIC T75°C...T140°C Db

Specification of Protection:

Um: 250V

Enclosure: IP66/IP67

(a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T90°C	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)
T140°C	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)

(b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T90°C	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)
T140°C	-40°C to +140°C (-40°F to +284°F)	-40°C to +60°C (-40°F to +140°F)

(c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T90°C	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T110°C	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)
T140°C	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)



**WARNING**

For ATEX certified AXF remote flowtube, it is only approved to be combined with ATEX certified AXFA14C converter, or non ex-proof type AXFA14G converter. AXFA14G converter can be chosen when this conveter is installed in non-hazardous area.

**(AXFA14 Remote Converter)**

Applicable Standard:

- EN 60079-0: 2012/A11:2013,
- EN 60079-1: 2007, 2014,
- EN 60079-31: 2014

Certificate: DEKRA 15ATEX0029 X

**Type of Gas Atmosphere Protection**

Group: II

Category: 2G

Type of Protection:

Ex db IIC T6 Gb

Specification of Protection:

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

Ambient Temp.: -40°C to +60°C  
(-40°F to +140°F)

**Type of Dust Atmosphere Protection**

Group: II

Category: 2D

Type of Protection:

Ex tb IIIC T75°C Db

Specification of Protection:

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

Ambient Temp.: -40°C to +60°C  
(-40°F to +140°F)



**WARNING**

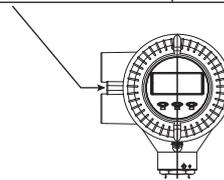
For ATEX certified AXFA14C converter, it is only approved to be combined with ATEX certified AXF remote flowtube, or non ex-proof type AXF remote flowtube, which can be chosen when this remote flowtube is installed in non-hazardous area.

**(2) Electrical Connection**

The type of electrical connection is stamped near the electrical connection port according to the following codes.

**(AXF Integral Flowmeter)**

Screw Size	Marking
ISO M20x1.5 female	M $\Delta$
ANSI 1/2NPT female	N $\Delta$



**(AXF Remote Flowtube)**

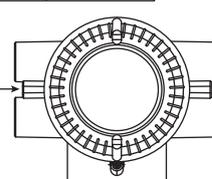
Screw Size	Marking
ISO M20x1.5 female	M $\Delta$
ANSI 1/2NPT female	N $\Delta$



F0201.ai

**(AXFA14 Remote Converter)**

Screw Size	Marking
ISO M20x1.5 female	M $\Delta$
ANSI 1/2NPT female	N $\Delta$



F0202.ai

**(3) Installation**

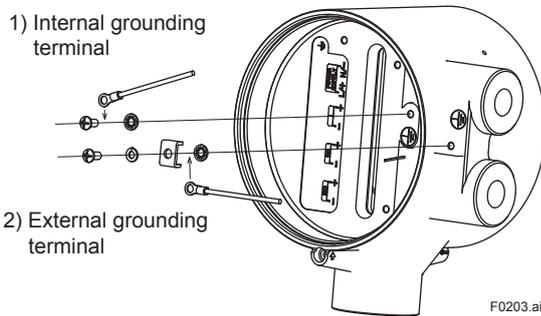


**WARNING**

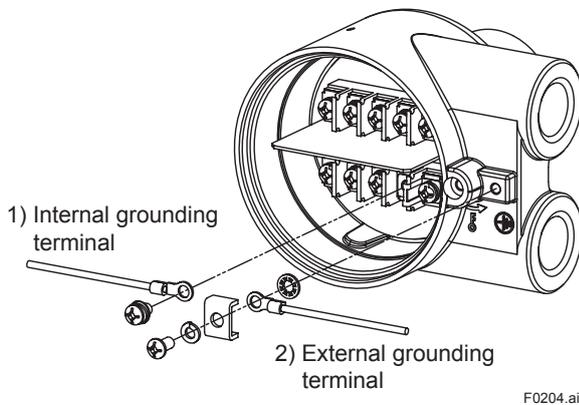
- All wiring shall comply with local installation requirements and local electrical code.
- In hazardous locations, the cable entry devices shall be of a certified ATEX flameproof type, suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable flameproof certified blanking elements. (The blanking plug is not provided with the flowmeter, and must be provided by the user.)
- The flowmeter sensor is not surrounded by pipe insulation material.
- Cable glands, adapters and/or blanking elements with a suitable IP rating shall be of Ex db IIC/Ex tb IIIC certified by ATEX and shall be installed so as to maintain the specific degree of protection (IP Code) of the equipment.

The grounding terminals are located on the inside and outside of the terminal area.  
Connect the cable to the grounding terminal in accordance with wiring procedure 1) or 2).

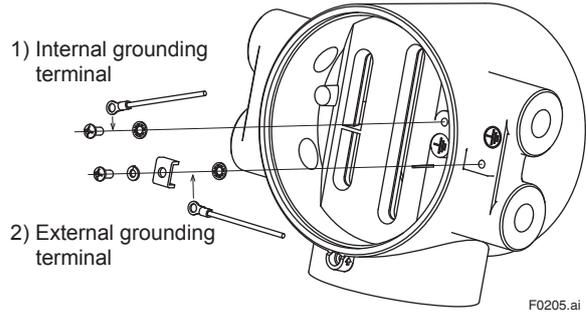
**(AXF Integral Flowmeter)**



**(AXF Remote Flowtube)**



**(AXFA14 Remote Converter)**



**(4) Operation**

**(AXF Integral Flowmeter),  
(AXFA14 Remote Converter)**



**WARNING**

- After de-energizing, delay 20 minutes before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

**(AXF Remote Flowtube)**



**WARNING**

- De-energize before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

**(5) Maintenance and Repair**

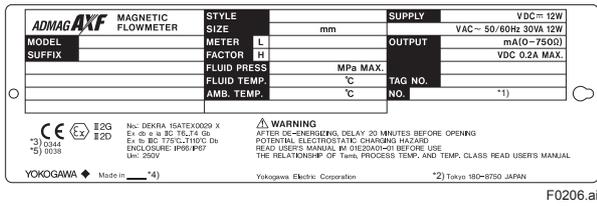


**WARNING**

The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void the certification.

(6) Name Plate

(AXF Integral Flowmeter)



- WARNING: Warning to apparatus
- YOKOGAWA ♦ Tokyo 180-8750 JAPAN :  
Name and address of manufacturer. \*2)

\*1)The first number in the second block of “NO.” column is the last one number of the production year. For example, the year of production of the product engraved as follows is year 2008.

No. S5EA05158 845

↑  
Produced in 2008

\*2)“180-8750” is a zip code which represents the following address:

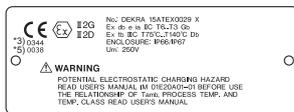
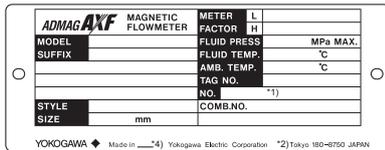
2-9-32 Nakacho, Musashino-shi, Tokyo Japan

\*3)The identification number of the notified body :  
0344 DEKRA Netherland

\*4)The product-producing country

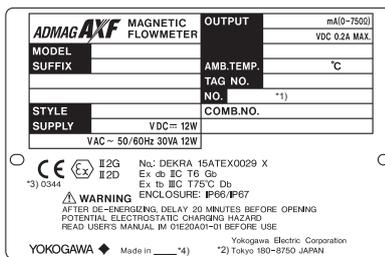
\*5)In case of the sizes of 2.5 to 25 mm (0.1 to 1.0 in.), “0038” is not described because it is outside the scope of CE Marking for PED.

(AXF Remote Flowtube)



F0207.ai

(AXFA14 Remote Converter)



F0208.ai

- MODEL: Specified model code
- SUFFIX: Suffix codes of the model code
- STYLE: Specified style code
- SIZE: Nominal size of apparatus
- METER FACTOR: Sensor constant number of apparatus
- SUPPLY: Power supply voltage of apparatus
- OUTPUT: Output signal of apparatus
- FLUID TEMP.: Fluid temperature of apparatus
- FLUID PRESS: Fluid pressure of apparatus
- AMB. TEMP.: Ambient temperature
- NO.: Manufacturing serial number \*1)
- CE: CE marking
- II 2G: Group II Category 2 Gas atmosphere
- II 2D: Group II Category 2 Dust atmosphere
- No.: DEKRA 15ATEX0029 X:  
EC Type Examination certificate number
- Ex db e ia IIC T6...T4 Gb or Ex db e ia IIC T6...T3 Gb or Ex db IIC T6 Gb:  
Protection type and temp. class for gas
- Ex tb IIIC T75°C...T110°C Db or Ex tb IIIC T75°C Db:  
Protection type and maximum surface temp. for dust
- Um: maximum r.m.s. a.c or d.c voltage
- ENCLOSURE: Enclosure protection code

(7) Special Conditions for Safe Use



- If the AXF is mounted in an area where the use of EPL Db equipment is required, it shall be installed in such a way that the risk from electrostatic discharges and propagating brush discharges caused by rapid flow of dust is avoided.
- Electrostatic charge may cause an explosion hazard.  
Avoid any actions that cause the generation of electrostatic charge, such as rubbing with a dry cloth on coating face of product.
- In case the electrodes and/or grounding rings are made of titanium, the flowtube should be kept away from impacts and frictions in hazardous locations.

## 2.2 IECEx



### WARNING

Only trained persons use this instrument in industrial locations.

### (1) Technical Data

#### (AXF Integral Flowmeter), (AXF Remote Flowtube)

Applicable Standard:

IEC 60079-0: 2011, IEC 60079-1: 2007, 2014,  
IEC 60079-7: 2006, IEC 60079-11: 2011,  
IEC 60079-31: 2013

Certificate: IECEx DEK 15.0022 X

#### (AXF Integral Flowmeter)

##### Type of Gas Atmosphere Protection

Type of Protection:

Ex db e ia IIC T6...T4 Gb

Specification of Protection:

Um: 250V

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

#### (a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T5	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)

#### (b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T5	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)

#### (c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T5	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T4	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)

#### Type of Dust Atmosphere Protection

Type of Protection:

Ex tb IIIC T75°C...T110°C Db

Specification of Protection:

Um: 250V

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

#### (a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T90°C	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)

#### (b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T90°C	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)

#### (c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T90°C	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T110°C	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)

#### (AXF Remote Flowtube)

##### Type of Gas Atmosphere Protection

Type of Protection:

Ex db e ia IIC T6...T3 Gb

Specification of Protection:

Um: 250V

Enclosure: IP66/IP67

#### (a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T5	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)
T3	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)

(b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T5	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T4	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)
T3	-40°C to +140°C (-40°F to +284°F)	-40°C to +60°C (-40°F to +140°F)

(c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Temperature Class	Process Temperature	Ambient Temperature
T6	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T5	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T4	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)
T3	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)

**Type of Dust Atmosphere Protection**

Type of Protection:

Ex tb IIIC T75°C...T140°C Db

Specification of Protection:

Um: 250V

Enclosure: IP66/IP67

(a) 2.5 to 15 mm (0.1 to 0.5 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +75°C (-40°F to +167°F)	-40°C to +60°C (-40°F to +140°F)
T90°C	-40°C to +90°C (-40°F to +194°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)
T140°C	-40°C to +95°C (-40°F to +203°F)	-40°C to +60°C (-40°F to +140°F)

(b) 25 to 400 mm (1.0 to 16 in.) of PFA lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-40°C to +50°C (-40°F to +122°F)	-40°C to +45°C (-40°F to +113°F)
T90°C	-40°C to +65°C (-40°F to +149°F)	-40°C to +60°C (-40°F to +140°F)
T110°C	-40°C to +110°C (-40°F to +230°F)	-40°C to +60°C (-40°F to +140°F)
T140°C	-40°C to +140°C (-40°F to +284°F)	-40°C to +60°C (-40°F to +140°F)

(c) 2.5 to 200 mm (0.1 to 8.0 in.) of Ceramics lining

Maximum Surface Temperature	Process Temperature	Ambient Temperature
T75°C	-10°C to +75°C (+14°F to +167°F)	-10°C to +60°C (+14°F to +140°F)
T90°C	-10°C to +90°C (+14°F to +194°F)	-10°C to +60°C (+14°F to +140°F)
T110°C	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)
T140°C	-10°C to +95°C (+14°F to +203°F)	-10°C to +60°C (+14°F to +140°F)



For IECEx certified AXF remote flowtube, it is only approved to be combined with IECEx certified AXFA14C converter, or non ex-proof type AXFA14G converter. AXFA14G converter can be chosen when this conveter is installed in non-hazardous area.

**(AXFA14 Remote Converter)**

Applicable Standard:

IEC 60079-0: 2011,

IEC 60079-1: 2007, 2014,

IEC 60079-31: 2013

Certificate: IECEx DEK 15.0022 X

**Type of Gas Atmosphere Protection**

Type of Protection:

Ex db IIC T6 Gb

Specification of Protection:

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

Ambient Temp.: -40°C to +60°C  
(-40°F to +140°F)

**Type of Dust Atmosphere Protection**

Type of Protection:

Ex tb IIIC T75°C Db

Specification of Protection:

Power Supply: 100 to 240 Vac 47 to 63 Hz  
100 to 120 Vdc 24 Vac/dc

Current Output: 4 to 20 mA

Digital Output: on; 1.6 Vdc, 200 mA max  
off; 30 Vdc max, 0 mA

Digital communication: 9 to 32 Vdc 15 mA

Enclosure: IP66/IP67

Ambient Temp.: -40°C to +60°C  
(-40°F to +140°F)



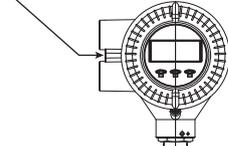
For IECEx certified AXFA14C converter, it is only approved to be combined with IECEx certified AXF remote flowtube, or non ex-proof type AXF remote flowtube, which can be chosen when this remote flowtube is installed in non-hazardous area.

**(2) Electrical Connection**

The type of electrical connection is stamped near the electrical connection port according to the following codes.

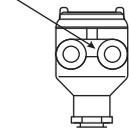
**(AXF Integral Flowmeter)**

Screw Size	Marking
ISO M20x1.5 female	M $\Delta$
ANSI 1/2NPT female	N $\Delta$



**(AXF Remote Flowtube)**

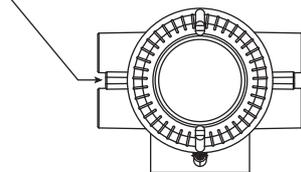
Screw Size	Marking
ISO M20x1.5 female	M $\Delta$
ANSI 1/2NPT female	N $\Delta$



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**(AXFA14 Remote Converter)**

Screw Size	Marking
ISO M20x1.5 female	M $\Delta$
ANSI 1/2NPT female	N $\Delta$



F0210.ai

**(3) Installation**



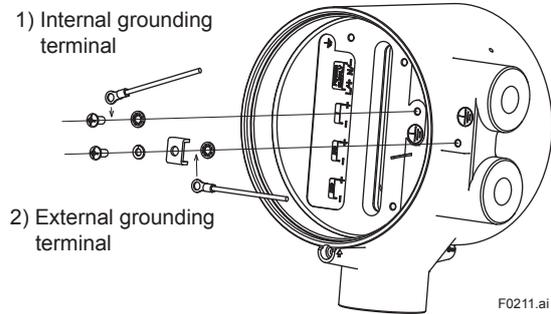
**WARNING**

- All wiring shall comply with local installation requirements and local electrical code.
- In hazardous locations, the cable entry devices shall be of a certified IECEx flameproof type, suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable flameproof certified blanking elements. (The blanking plug is not provided with the flowmeter, and must be provided by the user.)
- The flowmeter sensor is not surrounded by pipe insulation material.
- Cable glands, adapters and/or blanking elements with a suitable IP rating shall be of Ex db IIC/Ex tb IIIC certified by IECEx and shall be installed so as to maintain the specific degree of protection (IP Code) of the equipment.

The grounding terminals are located on the inside and outside of the terminal area.

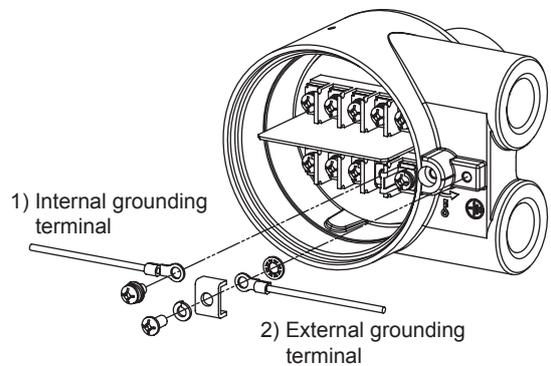
Connect the cable to the grounding terminal in accordance with wiring procedure 1) or 2).

**(AXF Integral Flowmeter)**



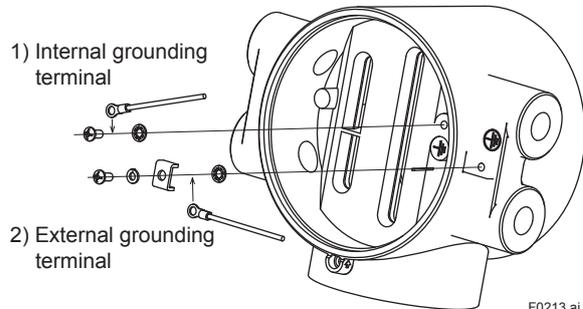
F0211.ai

**(AXF Remote Flowtube)**



F0212.ai

**(AXFA14 Remote Converter)**



F0213.ai

**(4) Operation**

**(AXF Integral Flowmeter),  
(AXFA14 Remote Converter)**



**WARNING**

- After de-energizing, delay 20 minutes before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(AXF Remote Flowtube)



**WARNING**

- De-energize before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(5) Maintenance and Repair



**WARNING**

The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void the certification.

(6) Name Plate

(AXF Integral Flowmeter)

ADMAGAXF MAGNETIC FLOWMETER		STYLE	SUPPLY	VDC=12W
MODEL	METER	SIZE	VAC - 50/60Hz 30VA 12W	OUTPUT
SUFFIX	FACTOR	mm		mA(0-7500)
	FLUID PRESS			VDC 0.2A MAX.
	FLUID TEMP.	MPa MAX.		
	AMB. TEMP.	°C	TAG NO.	
		°C	NO.	

No.: IECEx DEK 15.0022 X  
Ex db ia IIC T6...T4 Gb  
Ex tb IIC T75°C...T110°C Db  
ENCLOSURE: IP66/IP67  
Um: 250V

**WARNING**  
AFTER DE-ENERGIZING, DELAY 20 MINUTES BEFORE OPENING  
POTENTIAL ELECTROSTATIC CHARGING HAZARD  
SEE USER'S MANUAL IM 01E20A01-01 BEFORE USE  
THE RELATIONSHIP OF TAMB, PROCESS TEMP. AND TEMP. CLASS SEE USER'S MANUAL

YOKOGAWA ◆ Made in \_\_\_\_\_ \*1)

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(AXF Remote Flowtube)

ADMAGAXF MAGNETIC FLOWMETER		METER	L
MODEL	FACTOR	H	
SUFFIX	FLUID PRESS	MPa MAX.	
	FLUID TEMP.	°C	
	AMB. TEMP.	°C	
	NO.		
STYLE	COMB.NO.		
SIZE		mm	

YOKOGAWA ◆ Made in \_\_\_\_\_ \*1)

No.: IECEx DEK 15.0022 X  
Ex db ia IIC T6...T4 Gb  
Ex tb IIC T75°C...T110°C Db  
ENCLOSURE: IP66/IP67  
Um: 250V

**WARNING**  
POTENTIAL ELECTROSTATIC CHARGING HAZARD  
SEE USER'S MANUAL IM 01E20A01-01 BEFORE USE  
THE RELATIONSHIP OF TAMB, PROCESS TEMP. AND TEMP. CLASS SEE USER'S MANUAL

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(AXFA14 Remote Converter)

ADMAGAXF MAGNETIC FLOWMETER		OUTPUT	mA(0-7500)
MODEL	AMB. TEMP.	VDC 0.2A MAX.	
SUFFIX	TAG NO.		
	NO.		
STYLE	COMB.NO.		
SUPPLY	VDC=12W		
	VAC - 50/60Hz 30VA 12W		

No.: IECEx DEK 15.0022 X  
Ex db ia IIC T6...T4 Gb  
Ex tb IIC T75°C...T110°C Db  
ENCLOSURE: IP66/IP67

**WARNING**  
AFTER DE-ENERGIZING, DELAY 20 MINUTES BEFORE OPENING  
POTENTIAL ELECTROSTATIC CHARGING HAZARD  
SEE USER'S MANUAL IM 01E20A01-01 BEFORE USE

YOKOGAWA ◆ Made in \_\_\_\_\_ \*1)

F0216.ai

- MODEL: Specified model code
- SUFFIX: Suffix codes of the model code
- STYLE: Specified style code
- SIZE: Nominal size of apparatus

- METER FACTOR: Sensor constant number of apparatus
- SUPPLY: Power supply voltage of apparatus
- OUTPUT: Output signal of apparatus
- FLUID TEMP.: Fluid temperature of apparatus
- FLUID PRESS: Fluid pressure of apparatus
- AMB. TEMP.: Ambient temperature
- NO.: Manufacturing serial number
- No.: IECEx DEK 15.0022 X:  
IECEx Type Examination certificate number
- Ex db e ia IIC T6...T4 Gb or Ex db e ia T6...T3 Gb or Ex db IIC T6 Gb:  
Protection type and temp. class for gas
- Ex tb IIC T75°C...T110°C Db or Ex tb IIC T75°C Db:  
Protection type and maximum surface temp. for dust
- Um: maximum r.m.s. a.c or d.c voltage
- ENCLOSURE: Enclosure protection code
- WARNING: Warning to apparatus
- YOKOGAWA ◆ : Name of manufacture
- \*1)The product-producing country

(7) Special Conditions for Safe Use



**WARNING**

- If the AXF is mounted in an area where the use of EPL Db equipment is required, it shall be installed in such a way that the risk from electrostatic discharges and propagating brush discharges caused by rapid flow of dust is avoided.
- Electrostatic charge may cause an explosion hazard.  
Avoid any actions that cause the generation of electrostatic charge, such as rubbing with a dry cloth on coating face of product.
- In case the electrodes and/or grounding rings are made of titanium, the flowtube should be kept away from impacts and frictions in hazardous locations.

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# Revision Information

- Title : AXF Series Magnetic Flowmeter Installation Manual  
ATEX and IECEx Explosion Proof Type
- Manual No. : IM 01E20A01-11EN

Edition	Date	Page	Revised Item
1st	Mar. 2016	—	New publication



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## YOKOGAWA ELECTRIC CORPORATION

### Headquarters

2-9-32, Nakacho, Musashino-shi, Tokyo, 180-8750 JAPAN  
Phone : 81-422-52-5555

### Branch Sales Offices

Osaka, Nagoya, Hiroshima, Kurashiki, Fukuoka, Kitakyusyu

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## YOKOGAWA CORPORATION OF AMERICA

### Head Office

12530 West Airport Blvd, Sugar Land, Texas 77478, USA  
Phone : 1-281-340-3800 Fax : 1-281-340-3838

### Georgia Office

2 Dart Road, Newnan, Georgia 30265, USA  
Phone : 1-800-888-6400/ 1-770-253-7000 Fax : 1-770-254-0928

## YOKOGAWA AMERICA DO SUL LTDA.

Praca Acapulco, 31 - Santo Amaro, São Paulo/SP, BRAZIL, CEP-04675-190  
Phone : 55-11-5681-2400 Fax : 55-11-5681-4434

## YOKOGAWA EUROPE B. V.

Euroweg 2, 3825 HD Amersfoort, THE NETHERLANDS  
Phone : 31-88-4641000 Fax : 31-88-4641111

## YOKOGAWA ELECTRIC CIS LTD.

Grokholskiy per 13 Building 2, 4th Floor 129090, Moscow, RUSSIA  
Phone : 7-495-737-7868 Fax : 7-495-737-7869

## YOKOGAWA CHINA CO., LTD.

3F Tower D Cartelo Crocodile Building, No.568 West Tianshan Road,  
Shanghai 200335, CHINA  
Phone : 86-21-62396262 Fax : 86-21-62387866

## YOKOGAWA ELECTRIC KOREA CO., LTD.

(Yokogawa B/D, Yangpyeong-dong 4-Ga), 21, Seonyu-ro 45-gil, Yeongdeungpo-gu,  
Seoul, 150-866, KOREA  
Phone : 82-2-2628-6000 Fax : 82-2-2628-6400

## YOKOGAWA ENGINEERING ASIA PTE. LTD.

5 Bedok South Road, Singapore 469270, SINGAPORE  
Phone : 65-6241-9933 Fax : 65-6241-2606

## YOKOGAWA INDIA LTD.

Plot No.96, Electronic City Complex, Hosur Road, Bangalore - 560 100, INDIA  
Phone : 91-80-4158-6000 Fax : 91-80-2852-1442

## YOKOGAWA AUSTRALIA PTY. LTD.

Tower A, 112-118 Talavera Road, Macquarie Park NSW 2113, AUSTRALIA  
Phone : 61-2-8870-1100 Fax : 61-2-8870-1111

## YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(C)

P.O. Box 10070, Manama, Building 577, Road 2516, Busaiten 225, Muharraq,  
Kingdom of BAHRAIN  
Phone : 973-17358100 Fax : 973-17336100

Apr. '15