Co-innovating tomorrow®

YOKOGAWA

ADMAG Total Insight

Magnetic Flowmeter

Bulletin 01E21A01-01EN

The philosophy of the ADMAG TI gives total insight throughout the entire life cycle

"ADMAG TI" is abbreviation for "ADMAG Total Insight"

History of Yokogawa
magnetic flowmeter

1955
FL280
AC excitation
First magnetic flowmeter of Yokogawa

1983
YEWMAG
Signal processing pulsed DC

1988
ADMAG AM
Dual frequency excitation, Alumina ceramics sensor tube

1994
ADMAG AE
Integral explosion proof type

1995
ADMAG CA
Capacitance electrode, 0.01μS/cm low conductivity measurement

2003
ADMAG AXF
Enhanced dual frequency excitation, Adhesion check function

2009
ADMAG AXR
Two-wire with dual frequency excitation

2012
ADMAG AXW
Large size sensor 500mm - 1800mm

2017
ADMAG TI
Two dedicated product lines with "Total Insight" concept

Always be your first choice in flow measurement

Yokogawa magnetic flowmeters are supported by a long history of more than half a century. We added innovative specifications in each era and have always been leading the industry. The consistent policy of Yokogawa magnetic flowmeter is to have high performance and high quality. The world's first dual frequency excitation method adopted in the ADMAG AM series announced in 1988 has pushed the stability of the measurement by the magnetic flowmeter to a higher standard. Capacitance type magnetic flowmeter ADMAG CA series has made it possible to measure low conductivity fluid to insulating adhesive fluid and semisolid highly concentrated slurry. ADMAG AXR series has realized overwhelming high performance with limited power supply voltage of two-wires.
And now, the birth of the ADMAG TI, adopting the "Total Insight" concept which totally supports the life cycle of the product.

What is required of a field device at the customer site based on high performance and high quality?

In case of field devices, customers require full support over the entire product life cycle such as easy selection of product specifications, instrument set up, operation, monitoring of process, simplified troubleshooting when product fails, flexibility for future upgrades and so on.

Yokogawa's flowmeter adopts the new "Total Insight" concept which provides total support to customers. For example, the AXG and AXW transmitters have a wizard function for easy parameter setting. Self-diagnostics check measurement result and automatically detect abnormalities. The built-in health check verification function can easily verify the device conditions in only 12 minutes and can output reports using the DTM tool. The flowmeters have in-built intelligence to detect process abnormalities such as flow noise (slurry, air bubbles) and changing fluid conductivity. These alarms can be logged for further analysis thereby maintaining the integrity of the process. These functions can be expected for detecting the timing of fluid changes, estimating liner abrasion etc.

These advanced new functionalities offered by the "Total Insight" concept enable more accurate and stable measurement of your process.

Total Insight

Simplified Selection 01

Two dedicated product lines

AXG®

Purpose
- Superior measurement accuracy for demanding process
  - Standard accuracy : ±0.3% of rate
  - High accuracy : ±0.15% of rate (25 to 200mm)
- Stable and reliable measurement for severe application

Demands
- High accuracy, application diagnostics
- High durability, wide selection of wetted parts material
- Intrinsically safe Output (To be released)
- Current input for process temperature (Calorie calculation, Density correction calculation for mass flow rate measurement)

AXW®

Purpose
- Accurate measurement for versatile application at lower cost of ownership
  - Standard accuracy: ±0.35% of rate
- Reliable measurement in versatile applications

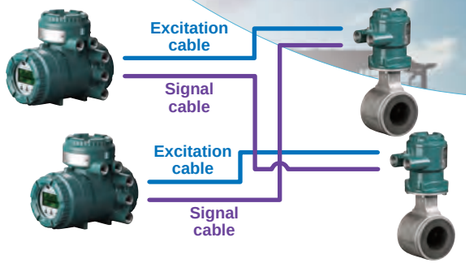
Demands
- Fast and reliable measurement with noise immunity

Selection tool *(To be released)*

Selecting the suitable flowmeter should be simple and, with the Yokogawa selection tool, it is. The tool allows you to select the best size, materials, and functionality for your process to ensure the optimal unit to be selected for your application. From selecting the best unit to choosing the functionality required, it is all done in a matter of a few clicks.

Cable connection check function

Reduce your installation and commissioning time by avoiding incorrect wiring and combination of the devices. The diagnostic function ensures that the connection between the sensor and transmitter is correct and functioning properly.



Wizard function

Eliminate the guesswork. The wizard function helps you set up the transmitter by step by step parameter setting.

02 Expert Guide

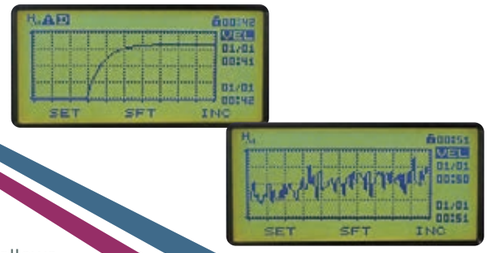
Multiple languages

As a global company, we know we need to speak a number of languages. That's why we have incorporated multiple languages, which are user selectable, into our latest flowmeter.

English
French
German
Italian
Spanish
Portuguese
Russian
Chinese
Japanese

Data logging function

By using the data logging function, a maximum of 4 different trends or events from 8 different measured variables can be stored on the microSD card at the same time. It is also possible to quickly troubleshoot by exporting recorded trend data and alarm information to PC.



Variety of verification

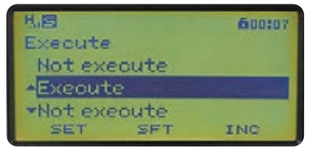
Ensuring the correct performance of critical plant instrumentation is costly, time consuming, and can result in lengthy plant downtime. The AXG and AXW verification function allows the health of the flowmeter to be confirmed easily. Verification results can be obtained as a report for maintenance records.

Verification via display or communication

Built-in verification

- Magnetic circuit check
- Excitation circuit check
- Calculation circuit check
- Device status check
- Connection status check
- Physical appearance check

Select the Verification



Execute the Built-in Verification

Verification with the ADMAG TI Verification Tool (FSA130)

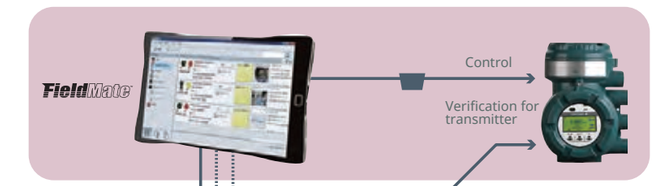
Standard verification

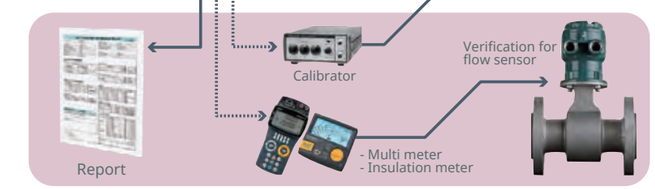
- Built-in verification and physical appearance check
- Checking for LCD display (with 4 display patterns)
- Verification result is output as a report

Enhanced verification

- Standard verification and additional external verification
- Verification result is output as a report

Standard verification





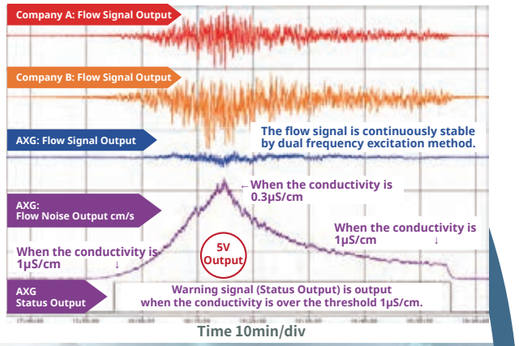
Enhanced verification

Application diagnostic

Application diagnostic can detect various process conditions of your site by actively utilizing flow noise signal.

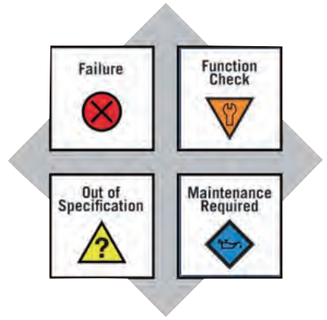
- **Detection of flow noise (air bubbles, slurry)**
- **Detection of coil insulation deterioration**
- **Detection of electrode insulation deterioration**
- **Detection of fluid conductivity decrease**
- **Detection of electrode adhesion (insulator)**

A stable flow measurement and accurate flow noise detection. (When changing the conductivity of fluid)



NAMUR mode

A total of 28 system and process alarms can be individually classified according to NAMUR NE 107. The user can adapt the action of each alarm individually to the process requirements and prevent unnecessary alarms from distracting plant operators. Alarms can be classified as Failure, Function Check, Out of Specification or Maintenance Required.



03 Process Guard

04 Maintenance Manager

Advanced Flexibility 06

Data Mobility 05

Available microSD card

(Realize easy data transfer)

The ADMAG TI supports microSD card for storing multiple information related to process measurements, device diagnostics, maintenance data and so on.

It can also be used to back up device parameter setting and factory settings which can be restored if required. A removable display also has storage functionality similar to the microSD card. The data mobility provided by the microSD card and removable display helps for easy cloning of parameters to similar devices drastically saving commissioning and start up man hours.

Recorded trend data and alarm information can be exported to PC for ease of troubleshooting.

Backward compatibility

The ADMAG TI ensures backward compatibility for retrofit. The ADMAG TI transmitters can be paired with earlier generation Yokogawa sensors or even third party flow tubes. This helps to optimize inventory and maximize useful life of existing equipment which results in considerable savings in capital expenditure.

Worldwide approvals

There are a number of approvals required in various regions throughout the world. The ADMAG TI offers explosion proof, SIL, EMC, NAMUR and multiple communication protocols to meet the needs of all markets and applications.

Various I/O combinations

Whether you have a DCS, PLC, or even just a local controller, the ADMAG TI offers multiple combination of I/O (including current input) and communication types. This gives you the flexibility in receiving the process information as the way you want to.

Type	Connection terminal assignment			
	Terminal 1	Terminal 2	Terminal 3	Terminal 4
Type A	Current out 1 (Active)	Pulse/ Status out 1 (Passive)	—	—
Type B			Pulse/ Status out 2 (Passive)	Current out 2 (Active)
Type C			Status in	Current out 2 (Active)
Type D			Status out (Passive)	Pulse/ Status out 2 (Passive)
Type E			Status in	Pulse/ Status out 2 (Passive)
Type F			Status in	Pulse/ Status out 2 (Active with Pull-up)
Type G			Status in	Pulse/ Status out 2 (Active without Pull-up)
Type H			Currentout 2 (Passive)	Current in (Active)
Type J			Pulse/ Status out 2 (Passive)	Current in (Active)
Type K			Status in	Current in (Active)

Intrinsically safe output to be released

Simplified Selection

Specification of
AXG and AXW transmitters

	AXG4A Transmitter	AXW4A Transmitter	AXFA11 Transmitter
Sensor combination	AXG 2.5 to 400mm	AXW 25 to 1000mm	AXG, AXW, AXF 2.5 to 1800mm
Dual frequency excitation	2.5 to 400mm	25 to 400mm	2.5 to 400mm
LCD	4 line display	4 line display	3 line display
microSD card data storage	Yes (Option)	Yes (Option)	N/A
Self-diagnostic (Adhesion, Empty pipe)	Yes	Yes	Yes
Built-in verification	Yes	Yes	N/A
Standard/Enhanced Verification with FieldMate	Yes	Yes	N/A
Application diagnostic	Yes Low conductivity, Bubble, Slurry etc	N/A	N/A
Explosion protection use	To be released	To be released	N/A

	AXG4A Transmitter	AXW4A Transmitter	AXFA11 Transmitter
Current, Pulse, Status Output (max. channel)	Current 2ch Pulse/Status 3ch	Current 1ch Pulse/Status 2ch	Current 1ch Pulse/Status 4ch
Status input	1ch (Selectable)	1ch (Selectable)	2ch (Independent)
Current input for process temperature (For calc. Calorie, Density correction)	1ch (Selectable)	N/A	N/A
Intrinsically safe output	To be released	N/A	N/A
Multiple languages	9 Languages	9 Languages	6 Languages
Communication protocols	HART 7, BRAIN (To be released : FF, Modbus, PROFIBUS PA)	HART 7, BRAIN (To be released : FF, Modbus, PROFIBUS PA)	HART 5, BRAIN
SIL certification	Yes	Yes	N/A
Combine with AXF flow sensor	Yes	Yes	Yes

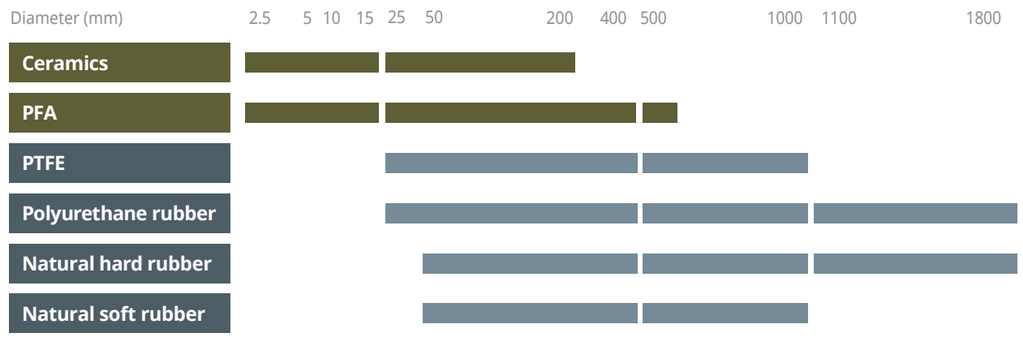
Note: Selectable maximum input/output number is 4.
The combinations of current input/output, pulse output and status input/output depend on selections of communication and input/output suffix code.

Specification of AXG and AXW Flow sensors

	AXG Flow sensor	AXW Flow sensor
Size	2.5 to 500mm	25 to 1800mm
Liner material	Ceramics, PFA	PTFE,Polyurethane rubber, Natural hard rubber, Natural soft rubber
General purpose use	Yes	Yes
Explosion protection use	To be released	To be released
Hygienic use	Yes	N/A
Submersible use	Yes	Yes
Standard accuracy *	± 0.3% of rate	± 0.35% of rate
High accuracy *	± 0.15% of rate 25 to 200mm	N/A
Wider flare area (Upgrade sealing reliability)	PFA	N/A
ASME Class 600 Flange (For high pressure application)	25 to 100mm	N/A
500mm PFA liner	Yes	N/A
Built-in grounding electrodes	150 to 400mm Platinum-Iridium, Tantalum	N/A

*Factory calibrated result

Definition of AXG and AXW Flow sensors



AXG

- The liner materials are ceramics and PFA with variety of electrode materials
- Size coverage is 2.5mm to 500mm

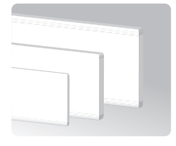
AXW

- The liner materials are PTFE, Polyurethane rubber, Natural soft rubber, Natural hard rubber with stainless steel and nickel alloy electrodes
- Size coverage is 25mm to 1800mm (Integral type is up to 1000mm)

Superior liner Materials for AXG

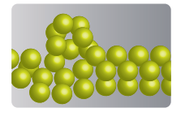
Alumina Ceramics

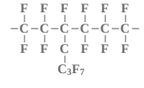
- Anti corrosive material
- Anti abrasive material
- For Chemical, Pulp&Paper and Mining
- Temp range:-10 to 180 ℃



Fluorocarbon PFA

- Anti corrosive material
- For chemical industry
- Temp range: -40 to 160 ℃

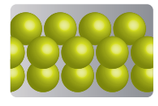




Cost effective liner Materials for AXW

Fluorocarbon PTFE

- Anti corrosive material
- For chemical industry
- Temp range: -10 to 130 ℃



Polyurethane rubber

- Anti-abrasive material
- For general use (water application)
- Temp range: -10 to 40 ℃

Natural hard rubber (Ebonite)

- Anti corrosive material
- For oily waste water
- Temp range:-5 to 80 ℃

Natural soft rubber

- Anti abrasive material
- For mining industry and so on
- Temp range: -10 to 70 ℃

YOKOGAWA ELECTRIC CORPORATION
World Headquarters
9-32, Nakacho 2-chome, Musashino-shi, Tokyo 180-8750, Japan
http://www.yokogawa.com/

YOKOGAWA CORPORATION OF AMERICA
12530 West Airport Blvd, Sugar Land, Texas 77478, USA
http://www.yokogawa.com/us/

YOKOGAWA EUROPE B.V.
Euroweg 2, 3825 HD Amersfoort, The Netherlands
http://www.yokogawa.com/eu/

YOKOGAWA ENGINEERING ASIA PTE. LTD.
5 Bedok South Road, Singapore 469270, Singapore
http://www.yokogawa.com/sg/

YOKOGAWA CHINA CO., LTD.
3F TowerD Cartelo Crocodile Building,
No.568 West Tianshan Road, Shanghai 200335, China
http://www.yokogawa.com/cn/

YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(c)
P.O. Box 10070, Manama,
Building 577, Road 2516, Busaiteen 225, Muharraq, Bahrain
http://www.yokogawa.com/bh/

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