

General Specifications

Model AM11 Magnetic Flow Converter

ADMAG

GS 01E06C01-00E

The AM11, ADMAG series magnetic flow converter has multi-functions and high performance. It supports various outputs, display formats, self-diagnostics function, batch control function etc. The optimum converter can be selected among 4 types on demand to realize excellent flow measurement.

■ FEATURES

- Dual frequency excitation. High stability and good performance even for slurry fluid
- Microprocessor-based multifunction
Bi-direction flow, Multi-range, Batch control, etc.
- Fast response, 0.1 sec.
Excellent for batch control
- BRAIN or HART communication available
- Five configurations
Standard type, High performance with BRAIN, High performance with HART and Batch control function type and for Ultra large size flow tube.

Note : HART is a registered trademark of the HART Communication Foundation.

■ STANDARD SPECIFICATIONS

Excitation method :

Size up to 400mm (16 inch) : Dual frequency excitation
Size 500mm (20 inch) and larger : Pulsed DC excitation

Input Signal :

Status Input : Dry contact
Load resistance : 200Ω or less (ON)
100kΩ or more (OFF)

Output Signal :

Current Output : 4 to 20mA DC (Load resistance : 1000Ω maximum)
Pulse Output : Transistor contact
Rating : 30V DC(OFF), 200mA(ON)
Output rate : 0.0001 to 1000 pps
Alarm Output : Transistor contact
Rating : 30V DC(OFF), 200mA(ON)
Status Output : Transistor contact, 2 points
Rating : 30V DC(OFF), 200mA(ON)

Communication (except AM11-AS) :

BRAIN or HART (Superimposed on 4 to 20mA DC signal)
Load Resistance (including cable resistance):
BRAIN : 250 to 600Ω
HART : 230 to 600Ω, depending on q'ty of field devices connected to the loop (multidrop mode)
Load Capacitance : 0.22μF maximum
Load Inductance : 3.3 mH maximum
Distance from Power Line : 15cm (0.6ft) or more
(Parallel wiring should be avoided.)
Input Impedance of Receiver Connected to Receiving Resistance : 10 kΩ or more (at 2.4 kHz).



Maximum Cable Length:

approx. 2km (6500ft) (when polyethylene-insulated PVC-sheathed control cables (CEV cables) are used.)

Data Security during Power Failure :

Data storage in EEPROM---back-up battery is not required.

Surge Arrestors :

Surge arrestors are built in each terminal for excitation, power supply, analog output, pulse output, status inputs and status outputs.

Mounting : 2-inch pipe, panel or surface mounting

Electrical Connection :

ANSI 1/2NPT female, DIN Pg13.5 female, ISO M20×1.5 female, JIS G1/2 female

Wiring Terminals : ISO M4 screw terminal

Case Material : Aluminum alloy

Coating :

Polyurethane corrosion-resistance coating
Door : Deep sea moss green (Munsell 0.6GY3.1/2.0)
Case : Frosty white (Munsell 2.5Y8.4/1.2)

Protection : NEMA 4

Grounding : 100Ω or less

*10Ω or less for functioning surge arrestor

■ FUNCTIONS

Instantaneous Flow Rate Display Function:

Flow rate can be displayed either in engineering units or in percent of span.

Totalization Display Function:

Totalized volume in any engineering unit can be displayed by setting a totalizing factor.

Damping Time Constant:

0.1 to 100 sec. (63% response)

Span Setting Function:

Volumetric flow setting is available by setting volume unit, time unit, flow rate and flow tube size.

- Volume Unit : gallon(US), m³, L, cm³, barrel (=158.987L)
- Velocity Unit : ft, m
- Time Unit : sec., min., hour, day
- Flow Tube Size : inch, mm
- Mass flow or user-defined volume units are programmable.

Pulse Output Function:

Scaled pulse can be output by setting a pulse factor. Pulse Width : Duty 50% or fixed pulse width (0.5, 1, 20, 33, 50 or 100ms)-user selectable

Bi-direction and Multiple Range Function:

4-range maximum for each flow direction (forward/reverse) can be switched with external status input or automatically.

Totalization Switch Function :

When the internal totalized value exceeds the set value, the switch status changes OFF to ON.

Totalization Presetting Function:

Totalized value can be preset or reset with a front panel key or an external status input.

Process Alarm Function :

High limit alarm and low limit alarm are provided. (Normal Close Fixed)

Self-diagnostics Function:

Converter failure, flow tube failure, setting error, etc. can be diagnosed and displayed.

Zero % Signal Lock Function :

Flow rate display and output can be locked on zero and the totalization can be stopped with an external status input.

Batch Control Function :

Simple batch station is built in. It is operated with front panel keys or external status inputs. Batch function mode ; 4-mode maximum

Functions List A : Available N : Not available

No.	Function	-AS	-DH	-DE	-DB	-DL
1	4 to 20mA DC Output	A	A	A	A	A
2	4 to 20mA DC Output Low Limit	A	A	A	A	A
3	Forward Totalization	A	A	A	A	A
4	Totalizing Presetting	A	A	A	A	A
5	Pulse Output (selectable pulse width)	A	A	A	A	A
6	User-defined Unit for Flow Rate	A	A	A	A	A
7	Automatic Zero Adjustment	A	A	A	A	A
8	Analog Output Selection when Alarming	A	A	A	A	A
9	Normal Flow Direction Setting	A	A	A	A	A
10	Test Mode (for loop test)	A	A	A	A	A
11	Self-diagnostics	A	A	A	A	A
12	High/Low Limit Alarms	A	A	A	A	A
13	Alarm Output	A	A	A	A	A
14	Damping	A	A	A	A	A
15	Tag No. Setting	A	A	A	A	A
16	Compatible with Other Flow Tubes	A	A	A	A	N
17	User-defined Unit for Totalization	A	A	A	A	A
18	Totalization, Pulse Output Low Cut	A	A	A	A	A
19	LED Display	A	A	A	A	A
20	LCD Display	A	A	A	A	A
21	Flow Span Setting	A	A	A	A	A
22	Flow Rate Display	A	A	A	A	A
23	Parameter Display Limitation	A	A	A	A	A
24	Empty Pipe Detection	A	A	A	A	N
25	Fast Response 0.1 sec. minimum	A	A	A	A	A
26	Totalization of Reverse and Difference	N	A	A	N	A
27	Totalization Switch	N	A	A	N	A
28	4-range Switching with External Input	N	A	A	N	A
29	Automatic 4-range Switching	N	A	A	N	A
30	Bi-direction Flow Measurement	N	A	A	N	A
31	Zero Adjustment with External Input	N	A	A	A	A
32	Totalization Preset with External Input	N	A	A	A	A
33	Zero % Signal Lock	N	A	A	A	A
34	BRAIN Communication	N	A	N	A	A
35	HART Communication	N	N	A	N	N
36	Batch Control	N	N	N	A	N
37	For Ultra Large Size Flow tube	N	N	N	N	A

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STANDARD PERFORMANCE

Accuracy (combined with ADMAG flow tube)

PFA and Ceramics Lining Vs: Span Setting Value (m/s)

Size in mm (inch)	Span in m/s (ft/s)	Accuracy
2.5 to 15 (0.1 to 0.5)	0.1 to 0.3 (0.3 to 1)	0.15/Vs % of span
	0.3 to 1 (1 to 3)	0.5% of span
	1 to 10 (3 to 33)	0.25% of span (at indication below 50% of span) 0.5% of rate (at indication 50% of span or more)
25 to 400 (1 to 16)	0.1 to 0.3 (0.3 to 1)	0.075/Vs % of span
	0.3 to 1 (1 to 3)	0.25% of span (at indication below 50% of span) 0.5% of rate (at indication 50% of span or more)
	1 to 10 (3 to 33)	0.1% of span (at indication below 20% of span) 0.5% of rate (at indication 20% of span or more)

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Polyurethane Lining

Vs: Span Setting Value (m/s)

Size in mm (inch)	Span in m/s (ft/s)	Accuracy
25 to 400 (1 to 16)	0.1 to 0.3 (0.3 to 1)	0.15/Vs % of span
	0.3 to 1 (1 to 3)	0.5% of span
	1 to 10 (3 to 33)	0.25% of span (at indications below 50% of span) 0.5% of flowrate indication (at indications 50% of span or more)
500 to 1000 (20 to 40)	0.1 to 0.3 (0.3 to 1)	0.225/Vs % of span
	0.3 to 1 (1 to 3)	0.75 % of span
	1 to 10 (3 to 33)	0.5% of span
1100 to 2000 (44 to 80)	0.3 to 1 (1 to 3)	0.75 % of span
	1 to 10 (3 to 33)	0.5% of span
2200 to 2600 (88 to 104)	0.3 to 1 (1 to 3)	1/Vs % of span
	1 to 10 (3 to 33)	1% of span

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Repeatability :

0.1% of flowrate (1mm/s minimum)

Maximum Power Consumption (for combination with flow tube) : 28W**Insulation Resistance :**

- 100MΩ between power terminals and ground terminal at 500V DC*
- 100MΩ between power terminals and each output and status input terminal at 500V DC

Withstand Voltage :

1500V AC between power terminals and ground terminal for 1 minute.*

* Surge arrestor ground terminal should be disconnected beforehand.

**CAUTION**

When performing the Voltage Breakdown Test, Insulation Resistance Test or any unpowered electrical test, wait 10 seconds after the power supply is turned off before removing the housing cover. In case of size 500 to 1000mm, be sure to remove the Short Bar at terminal "G". After testing, return the Short Bar to its correct position. Screw tightening torque should be 1.18N-m (12kg-cm)(0.88ft-lb) or more, because the G-terminal is thought as a protective grounding and should conform to the Safety requirements.

NORMAL OPERATING CONDITIONS

Ambient Temperature : -10 to 60°C (14 to 140°F)*

*Air purge(Code /APC) is required only for AM11-DL at ambient temperature 50°C(122°F) or above.

Ambient Humidity :

5 to 95%RH (Dew formation should be avoided.)

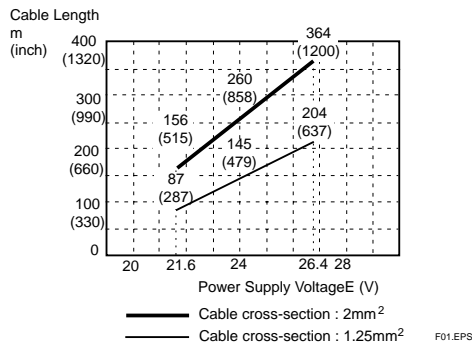
Power Supply Voltage :

Range 80 to 264V AC/Range100 to 130VDC,

Range 21.6 to 26.4V DC

Power Supply Frequency : 47 to 63 Hz

Supplied Power and Max. Cable Length for 24VDC version:



MODEL AND SUFFIX CODE

Magnetic Flow Converter :

Model	Suffix code	Description
AM11	Magnetic Flow Converter
Function	-AS	Standard type
	-DH	High performance type with BRAIN
	-DE	High performance type with HART
	-DB	Batch function type
	-DL	For ultra large size (1100mm or larger) flow tube
Power supply	A1	80 to 264V AC /100 to 130VDC
	D1	21.6 to 26.4 VDC(except AM11-DE)
Electrical connection	J	JIS G 1/2 female
	A	ANSI 1/2 NPT female
	D	DIN Pg13.5 female
	M	ISO M20 X 1.5 female
---	-000 ...	Always -000
Style code	*A	Style A
Optional code	/□	Refer to "Optional Specifications"

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Signal Cable:

Model	Suffix code	Description
AM011	Dedicated signal cable between converter and flow tube
Termination	-0	No termination
	-2	Terminated for 1000mm(40in.) or smaller flow tube
	-3	Terminated for 1100mm(44in.) or larger flow tube
Cable length	-L□□□	Designate the length in m. (200 m maximum)
Style code	*A	Style A
Optional specification		/C□ Q'ty of termination parts set

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Note 1: A user provided two-conductor cable is required for coil excitation.

Note 2: Submersible style flow tubes are provided with 30meters (98feet) of excitation and signal cable. No additional cable is required.

Note 3: The maximum temperature for the signal cable is 80°C(176°F).

Optional Specifications

Item	Specification	Code
Stainless Steel Tag Plate	Stainless Steel (SUS304) Tag Plate is fixed with screws.	/SCT
Waterproof Gland	Waterproof glands are attached to all wiring ports. For JIS G1/2 only.	/ECG
Waterproof Gland with Union Joint	Waterproof gland (union Joint) are attached to all wiring ports. For JIS G1/2 only.	/ECU
DC Noise Suppression	Eliminating DC Noise For size 15mm or larger, conductivity 50μS/cm or more, cable length within 200m. *Empty pipe detection is not available.	/ELC
Epoxy Resin Coating	Epoxy resin coating for door and case. The color is same as standard one.	/EPF
High Anti-corrosion Coating	Coating is changed to three-layer coating (Urethane coating on two-layer Epoxy coating)	/X2
Air Purge Connection	Purge pressure 0.14MPa or less, connection Rc1/4(PT1/4) female for electrical connection code J, 1/4NPT female for the code A or B, Air consumption 1.5L/min.	/APC
Parameter Setting	Flow span, totalizing pulse unit, transmission pulse unit are set at factory.	/PRS
Calibration Certificate	Level 2: Declaration and Calibration Equipment List	/ L2
	Level 3: Declaration and Primary Standard List	/ L3
	Level 4: Declaration and YOKOGAWA Measuring Instruments Control System	/ L4
GOST Certification	Calibration Certificate for GOST (only for products produced at YFT)	/GOS
C-Tick mark	AS/NZS2064 compliance Only for Australia or New Zealand	/CTK

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ACCESSORIES

Fuse (2A for -A1, 2.5A for -D1) 1 pc.

Data sheet 1 pc.

Unit label 1 set

Mounting bracket 1 set

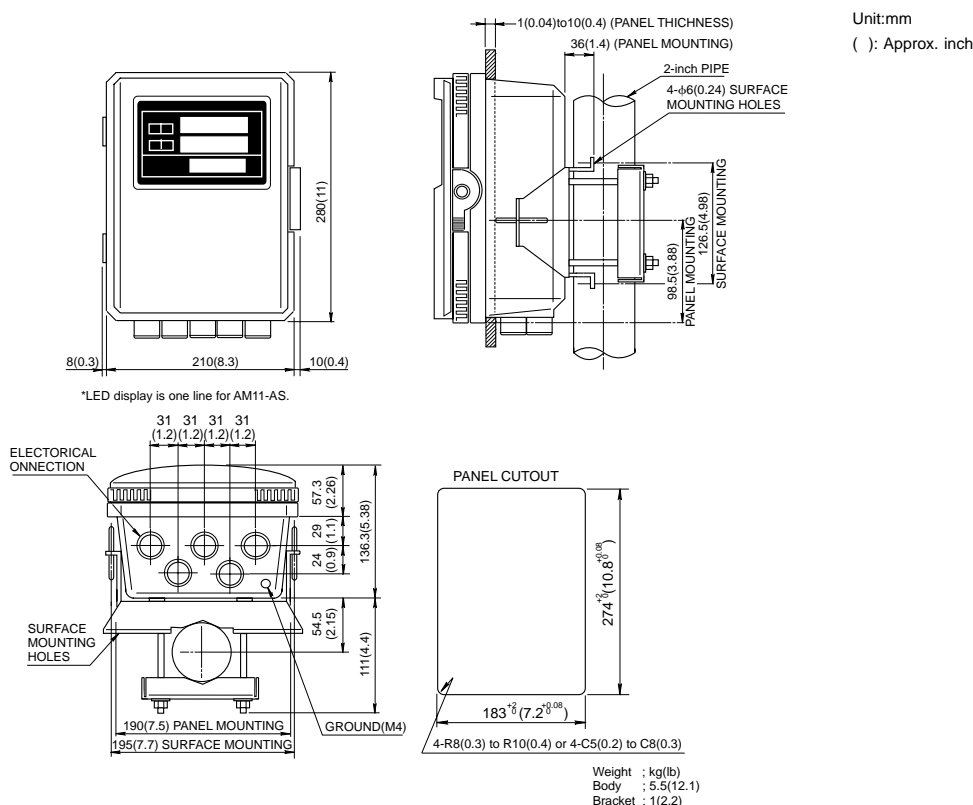
■ TERMINAL CONNECTIONS

TERMINAL SYMBOLS	DESCRIPTION	TERMINAL SYMBOLS	DESCRIPTION
SIGNAL	SA A B SB C	STATUS OUT (END)	S1+ S1-
CUR OUT	I+ I-	STATUS OUT (PRE)	S2+ S2-
EXCITER	EX1 EX2	STATUS IN (AUX)	S3+ S3-
SUPPLY	L N ⊥	(START)	(Batch cycle start)
PLS OUT	P+ P-	(RESET)	(Batch cycle reset)
ALM OUT	AL+ AL-	S4- (COM)	
			Protective grounding (Outside and bottom of case)

() : for AM11-DB

There are no status input/output terminals for AM11-AS

■ EXTERNAL DIMENSIONS



=== ORDERING INFORMATION ===

- Model, suffix and optional codes.
- Parameter setting.(when /PRS is selected)
 - Flow rate span (at 100% output)
Example: Volume/time unit
 - Totalizing pulse units
Example: Volume/pulse, pulse/time unit
 - Transmission pulse units
Example: Volume/pulse, pulse/time unit
- Tag number.(Only when necessary)
8 characters maximum for parameter
16 characters maximum for tag plate and certificate

=== RELATED INSTRUMENTS ===

Calibrator for magnetic flowmeter
AM012GS 01E06K02-00E
Magnetic Flow Tube
AM100D/200D/300D/400D/500D series
.....GS 01E06D00-00E
BT200 BRAIN Terminal GS 1C0A11E