

# General Specifications

YEW MAG

## Model YMA 11 MAGNETIC FLOW CONVERTER

These YEW MAG magnetic flow converters are field-mounting, contain indicators (both bar graph and digital displays) and microprocessor "intelligence": they support a variety of outputs and display formats as well as providing self-diagnostic functions. They are compatible with YEW MAG series magnetic flow transducers as well as with almost any magnetic flow transducer which uses AC line frequency or low frequency excitation.

### FEATURES

- Versatile: many functions – "options supplied as standard".
- Two user-selectable excitation modes.
- Output signal clamped at zero when "no-liquid" detected.
- AC or DC power source may be used – no change to instrument.
- Low power consumption.
- Built-in calibrator.

### STANDARD SPECIFICATIONS

#### Input Signals

Flow Signal: Proportional flow signal from transducer.

#### Contact or

Voltage Signals: Manual range switching signal, "output zero" clamp signal (contact, semiconductor switch, or voltage level signal).

Input	Input status – ON	Input status – OFF
Contact	Contact closed – source up to 200 $\Omega$	Contact open – source at least 100 k $\Omega$
Voltage	Low: -1 to +1 V DC	High: 4.5 to 25 V DC

#### Output Signals

Current Output: 4 to 20 mA DC (load resistance 0 to 600 ohm).

Voltage Output: 1 to 5 V DC.

Contact Outputs: Open-collector transistor switch – of rating 30 V DC, 200 mA – for pulse, alarm contact and status contact outputs (see below).

Pulse Output: Output rate 0.0004 to 1000 pps.

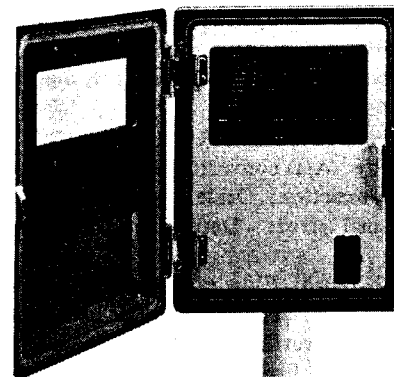
Alarm Contact Outputs: High/low limit alarms, "fail" alarm.

Status Contact Outputs: Forward or reverse flow measurement, range (two-range auto-ranging case).

#### Converter Functions and Special Features

##### Span Setting Functions:

Volumetric flow totalization of the measured flow value



can be performed by setting volume units, time units, flow span and transducer diameter.

Volume units: m<sup>3</sup>, l, cm<sup>3</sup>, gallon, bbl.

Time units: hour, min, sec.

Flow rate display: 5 digits, maximum indication 30000.

Decimal point may be set for between 4 and 0 decimal places (i.e. corresponding display formats X.XXXX and XXXXX).

Transducer diameter: 1.0 to 3000 mm or 0.1 to 300 inch (five digits).

For converting the total volumetric flow of a liquid to a weight, the reciprocal of liquid density (five digits) can be entered.

#### Multiple Ranges:

Max. four ranges when external range-switching contact input is used.

Max. two ranges when automatic range switching is used.

#### Damping

Damping time range: 1 to 100 sec. (63% response).

#### Forward and Reverse Flow Measurement Functions:

In forward and reverse flow measurement mode, reverse flow measurement is possible.

In reverse flow mode, a minus sign is added to displayed flow value, and status contact output changes from open to closed.

#### Instantaneous Flow Display Function:

Ten-segment bar graph display.

Actual flow display.

Percentage flow display (display format XXX.X).

#### Totalizer Value Display Functions:

For volumetric flow totalization, volume units are set as described above. Can display totalizer value for forward or reverse flow directions, or display difference between forward and reverse flows.

#### Pulse Output Functions:

Flow pulses after scaling are output by setting the number of pulses per unit volume.

Pulse duration: Freely selectable the following:

Duty 50%; 0.5, 1, 20, 33, 50 and 100 ms

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**Power Backup Functions:**

Totalizer function: Totalizer value held during power failure.

Data backup: Internal battery.

Contact outputs: All contact outputs are OFF (open) during power failure.

Battery life: At least 10 years (in normal operation)  
At least 6 years (in backup mode)  
(temperature up to 40 °C).

**Self-Diagnostic Functions:**

Alarm code is displayed, alarm lamp lights and alarm contact opens.

Microprocessor failure: RAM data volatilization.

A/D failure: A/D converter failure.

Coil disconnection: Cable or coil disconnected.

Input signal error: Detection of empty flowmeter tube.

High limit alarm: Flow rate over high limit setting.

Low limit alarm: Flow rate under low limit setting.

Output pulse overflow: Output pulse memory over.

Invalid setting: Erroneous parameter setting.

Battery failure: Battery is not mounted or voltage drop.

**Zero-Adjust Function (Automatic):**

Automatic zero adjustment is initiated by pressing the RESET switch when liquid flow is zero.

**Calibration Function (Automatic span adjustment):**

Span can be adjusted by connecting reference flow signal obtained from the TEST terminal to the input terminal and by pressing RESET switch.

**Signal Lock Function (at 0% signal):**

Output can be locked at 0% by external contact signal (e.g. during cleaning).

**Rate Limit Function:**

Rate limit function removes abruptly changing noises superimposed to a flow signal.

**Two User-Selectable Excitation Modes:**

The usual three-state excitation mode offers low drift, low power consumption. Two-state excitation mode provides good rejection of slurry noise, for slurry flow measurement.

**Surge Arrestors:**

Built-in surge arrestors – connected to power supply, excitation, analog output, pulse output and contact input/output terminals.

**Mounting and Construction:**

Mounting: 50 mm (2-inch) pipe mounting, panel or surface mounting.

Electrical connection: JIS PF1/2 female or ANSI 1/2NPT female.

Wiring terminals: ISO M4 screws (4 mm).

Case material: Aluminum alloy

Finish: Light grayish green (Munsell 2.5GY5.0/1.0), backed polyurethane resin paint.

Enclosure classification: Conforming to JIC C 0920 deck water-tight and NEMA type 4 water-tight and dust-tight.

Weight: Approx. 9.5 kg (21 lb).

**STANDARD PERFORMANCE****Accuracy (when used with transducer):**

Nominal size	Span (m/s)	Accuracy	
2.5 to 15 mm (1/10 to 1/2 inches)	0.3 or more and less than 0.5	1.5% of span	
	0.5 or more and less than 1.0	1.0% of span	
	1 to 10 (both including)	1.0% of flow rate (at indication 50% of span or more)	0.5% of span (at indication below 50% of span)
0.3 or more and less than 0.5		1.0% of span	
25 to 400 mm (1 to 16 inches)	0.5 or more and less than 1.0	0.5% of span	
	1 to 10 (both including)	0.5% of flow rate (at indication 50% of span or more)	0.25% of span (at indication below 50% of span)
		0.3 or more and less than 0.5	1.5% of span
500 mm or more (20 inches or more)	0.5 or more and less than 1.0	1.0% of span	
	1 to 10 (both including)	1.0% of flow rate (at indication 50% of span or more)	0.5% of span (at indication below 50% of span)
		0.3 or more and less than 0.5	1.5% of span

**Power Consumption:** 18 VA or 11 W (converter only)

**Insulation Resistance:** 100 M ohm with 500 V DC applied between power terminal and ground terminal.

100 M ohm with 500 V DC between power terminal and each of excitation, analog output, pulse output and contact input/output terminals.

**Dielectric Strength:** 1000 V AC between power terminal and ground terminal for 1 min.

**Normal Operating Conditions:**

Ambient temperature: -10 to 60 °C.

Ambient humidity: 5 to 95% RH (dew free).

Power supply voltage: DC or AC (no change to instrument).

DC supply: 20 to 130 V (of either polarity).

AC supply: 80 to 138 V, 47 to 63 Hz (100 VAC).  
or 138 to 264 V, 47 to 63 Hz (200 V AC).

**MODEL AND SUFFIX CODES**

Model	Suffix codes	Description
YMA11		Magnetic flow converter
Power supply	-A1	100 V AC and 24 V DC
	-A2	200 V AC
Electrical connection	J	JIS PF 1/2 female
	A	ANSI 1/2 NPT female
Style code	*A	Style A
Options	/APC . . .	Air purge connector (Note 1)
	/ECG . . .	Waterproof gland
	/ECU . . .	Waterproof gland with union
	/SCT . . .	Stainless steel tag plate

(Note 1) The air purge connector dimensions are the same as electrical connection dimensions.

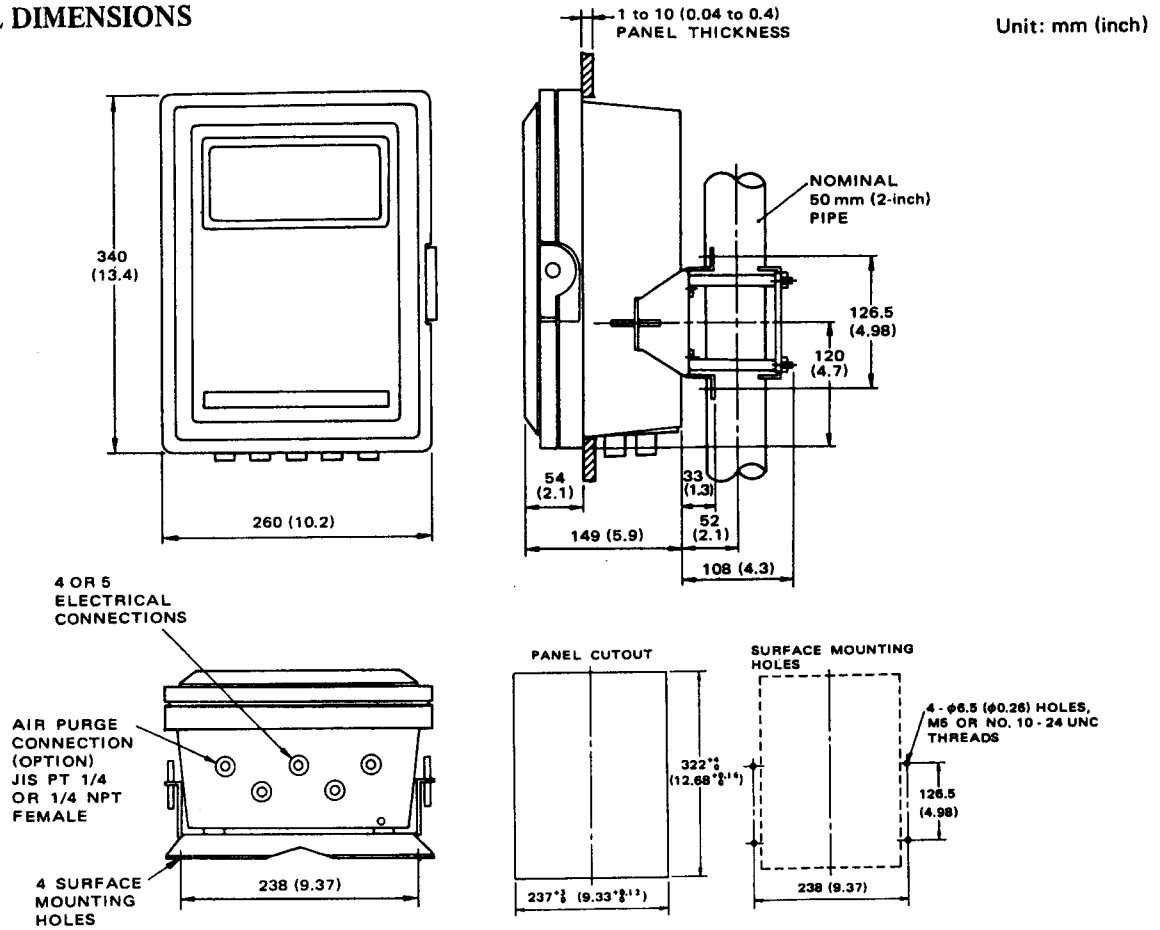
**OPTIONS**

- Air Purge Connector:** Applied pressure is max. 1.4 kg/cm<sup>2</sup>, JIS PT $\frac{1}{4}$  female or  $\frac{1}{4}$  NPT female (specified). Option code: APC.
- Waterproof Gland:** Waterproof gland contains power supply and signal wiring inlets (not available for  $\frac{1}{2}$  NPT inlet). Option code: ECG.
- Waterproof Gland with Union:** Waterproof glands with union are provided for power supply inlet and signal wiring inlet (not available for  $\frac{1}{2}$  NPT inlet). Option code: ECU.
- Stainless Steel Tag Plate:** Tag plate (SUS 304) screwed to front of case. Option code: SCT.

**ACCESSORIES**

Fuse (3A) . . . . . 1 pc, Unit seal . . . . . 1 set.

**EXTERNAL DIMENSIONS**



**TERMINAL WIRING**

Terminal designation	Remarks	
TEST -CH	Standard flow signal output	
SIGNAL	Flow signal input	
		SA
		A
		B
CUR/VOLT OUT	1 to 5 V DC voltage output 4 to 20 mA DC current output	
		4-20mA+
		1-5V+
EXCITER	Exciting current output	
		EX1
SUPPLY	Power supply	
		L1
		L2
	Ground	

Terminal designation	Remarks
ALM OUT	Alarm contact output
PULSE OUT	Pulse output
STAT IN	Selector switch input for ranges 1, 2
STAT OUT	Forward/reverse status contact output or Automatic dual-range status contact output
AUX	Selector switch input for ranges 3, 4 or 0% signal lock contact input

===== **ORDERING INSTRUCTIONS** =====

Specify the following when ordering.  
 1. Model, Suffix code and Options.

===== **RELATED EQUIPMENT** =====

**Related Equipment**

- Magnetic Flow Transducer
  - (YM 100 to 300 series) . . . . . GS 1E4C2-E
  - (YM 400 series) . . . . . GS 1E4C4-E
  - (YM 100C to 300C series) . . . . . GS 1E4D2-E
  - (YM 200H series) . . . . . GS 1E4F2-01E
- Magnetic Flowmeter Special Cable (YM011)
- Consumable Spare Parts**
- Data Backup Battery . . . . . Part No. E9711DH