OVAL

Total-counter type Register

ULTRA OVAL with BATCH CONTROLLER

MODEL LW74E, LW76E

GENERAL SPECIFICATION

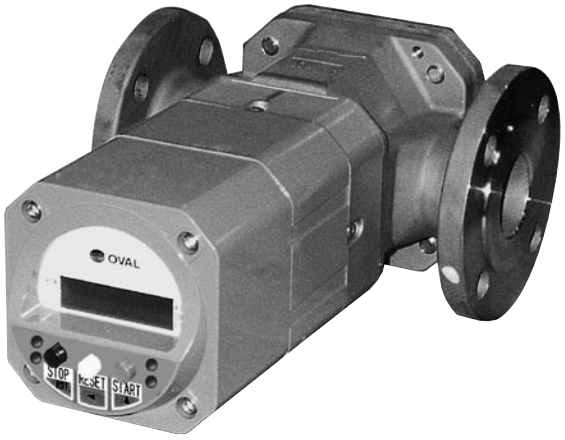
GS.No.GBC201E–4

■ GENERAL

This unit is designed specifically to mount integrally on the ULTRA OVAL, a high-precision flowmeter, to provide a user-friendly batch processing system that is controllable in the field.

Its battery-powered electronic register is programmable with front pushbuttons for batch processes (or quantities of the process material to be delivered). When used in combination with a pneumatic shutoff valve, you can build an automatic metering system which opens the shutoff valve upon depression of the start button and shuts it off when a preset quantity of the process material is reached.

The register comes in two models: the LW74E with onestep open, one-step close arrangement and the LW76E with two-step open, two-step close (or one-step open, two-step close) arrangement. Applications include batch processes in chemical plants, blending, or filling, processes in the food, pharmaceutical, paint, petroleum, and chemical industries to save time and effort, streamline processes, and achieve product uniformity.



■ FEATURES

1. An electronic arrangement offers reliability and long life.
2. Battery powered, it requires no external power sour (battery life 4 years approx.).
3. Improved performance from previously fered mechanical models LW74 and LW76. Improved safety features, too.
   a. Figures in the LCD display are 12.7mm hig
   b. The selectable add or subtract mode total counter with a switch for a target batch setpoint.
   c. an resume a metering cycle for the remainder of a batch that has been interrupted by an emergency stop.
   d. atch setpoint (6-digit) and cumulative total count (8-digit) are selectable with a switch for management of totals.
   e.Has safety features as
      i) Missing pulse detection and alarm
      ii) Overshoot (overmeasurement) detection and alarm
      iii) Low battery a
4. Waterproof construction (JIS C 0920 weathertight). Intrinsically safe explosionproof models conforming to the IEC standards also available.
5. Constructed of independent subassemblies to simpli maintenance.

■ REGISTER SPECIFICATIONS

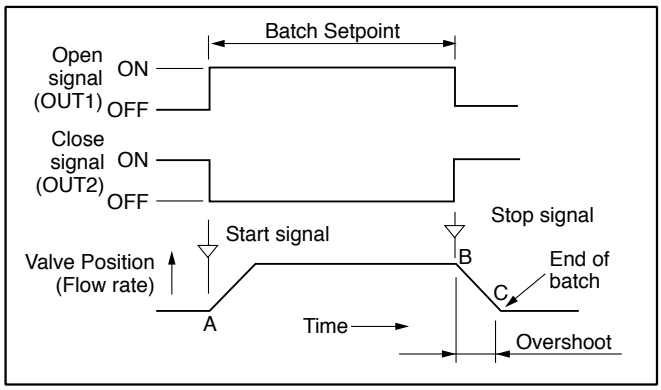
Item			Description	
			LW74E	LW76E
Pneumatic Circuit	Type of Control		Pneumatic one-step open, one-step close	Pneumatic two-step open, two-step close (Set the initial setting to 0 to change to one-step open mode.)
	Signal Air Pressure		0.20 to 0.69MPa (depends on the valve rating.) (Must be clean and dry air.)	
	Air Signal Line Connection		Rc 1/8 with a bite-type fitting for ø6×ø4 copper tubing provided	
	Distance to the Shutoff Valve		3 meters max.	
Display	Batch Setpoint Readout or Accumulated Total Readout (selectable with front pushbuttons)		Batch setpoint: 6-digit, 7-segment LCD except for the 1st and 8th Cumulative total: 8-digit, 7-segment LCD (characters 12.7mm high) Total counter units of measure: Meter size 39• • • ×0.1mL, ×1mL (standard), ×10mL Size 41, 45• • • ×1mL, ×10mL (standard), ×0.1L Size 50, 52, 53• • • ×10mL, ×0.1L (standard), ×1L Size 55, 56, 57• • • ×0.1L, ×1L (standard), ×10L	
	Operation Status Indicators		Shows in the 1st and 8th digit of the LCD only in the batch setpoint readout. RUN: Blinks while in operation OUT: Lights relative to valve operating signal output ALM: Lights to indicate missing pulses, or exceeding a preset overshoot, etc. COUNT: Lights while totalizer counts. END: Lights upon completion of a batch cycle.	
	Low Battery Alarm		Front-panel LCD “BATT” lights when the battery life has approached.	
Setup	Type of Operation		Select either add or subtract mode (subtract mode is standard).	
	Operation and Programming		STOP, RESET, START manually with three front-panel pushbuttons. Batch setpoint (6 digits)• • •Can be changed in the RUN mode. Cumulative total reading (8 digits)• • •Can be changed in the SET mode.	
	Initial Setting (oP) and Final Setting (cL)		Always set to 0	Set to any point from 0 to 999 counts in the SET mode.(A setpoint at 0 establishes the one-step open, one close mode.)
	Missing Pulse Setup (PL)		Set to any point from 0 to 15 sec. in the SET mode. (A setpoint at 0 disables the missing pulse setting.)	
	Overshoot Setup (oV)		Set to any point from 0 to 99 counts in the SET mode. (A setpoint at 0 disables the overshoot detection.)	
	Scaler Setup	Coefficient (F)	Set to any point from 0.0001 to 1.9999 in the SET mode.	
		Frequency Divide (d)	Selectable from one of 1/1, 1/10, and 1/100 in the SET mode.	
Repeat Feature			Provided	
Emergency Stop Feature			Front-panel pushbuttons (STOP or RESET). Can resume measurement for the remaining cycle.	
Backup Feature			Retains parameters, batch setpoint, total reading, cumulative total in an EEPROM.	
Power Supply			Dedicated battery (Good for 4 years approx. depending on operating conditions.)	
Water-proof Construction			JIS C 0920 weather-proof (IP65)	
Explosionproof Configuration			Select one of the following two: 1 Non-explosionproof 2 Intrinsically safe explosionproof: Exia IIB T3 (applied for) 3 TIIS explosionproof (Battery powered) 4 KOSHA explosionproof (Battery powered)	
Ambient Temperature Range			–10 to +60°C (Valve actuating fluid must not contain drain or mist at low temperatures.)	
External Finish			Munsell 2.5PB 5/8 (finished in baked melamine)	
Housing Material			Aluminum die casting	
Physical Orientation			Horizontal or vertical (view angle is adjustable)	
Option			Air set (one set) includes a mist separator, Install a reducing valve with filter (mesh size 5µm approx.), etc.	

Mounts on ULTRA OVAL models up to size 31. Consult factory for application assistance.

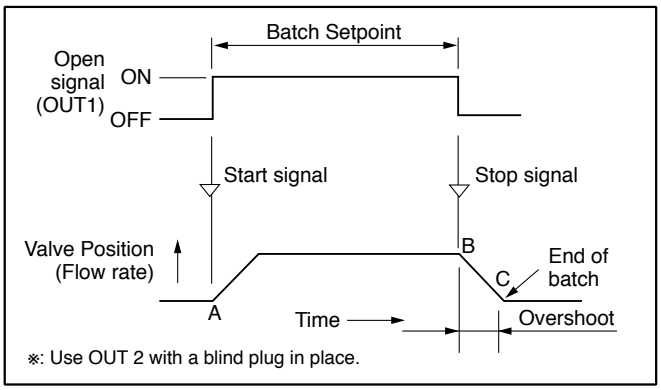
■ Operation Time Chart and Pneumatic Circuit

● LW74E (Pneumatic one-step open, one-step close)

(1) Combined with a double-acting torque cylinder ball valve

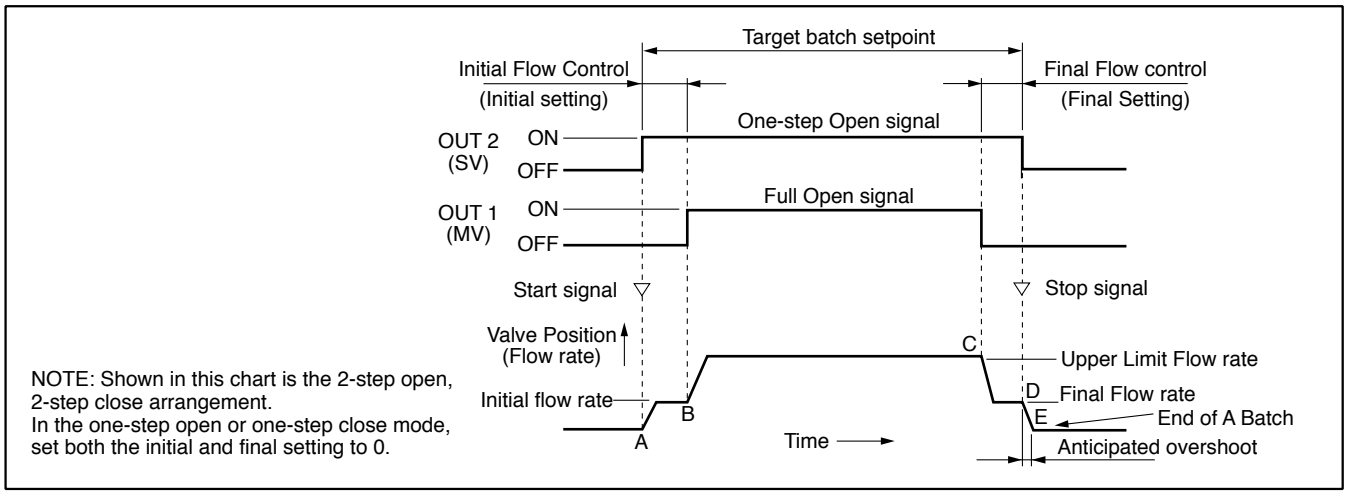


(2) Combined with a diaphragm valve or springloaded torque cylinder valve



※: Use OUT 2 with a blind plug in place.

● LW76E (Pneumatic two-step open, two-step close)



NOTE: Shown in this chart is the 2-step open, 2-step close arrangement.
In the one-step open or one-step close mode, set both the initial and final setting to 0.

■ OPERATION

Setup procedure for a batch:

To establish a new batch setpoint, while the LCD (6-digit) shows a batch setpoint, reset the current setpoint and depress STOP/ROT button for more than 3 seconds. The LCD (batch setpoint) then begins to blink, indicating that a new setpoint is acceptable.

START/▲ button adjusts the figure. RESET/◀ button carries the figure to the next column. At a desired figure, press STOP/ROT button. The batch setpoint is illuminated for approx. 2 sec. and goes to the RUN mode. (In the subtract counter, the display shows the new batch setpoint, and in the add counter, it shows "0,")

Start metering: Press RESET/◀ button to reset the batch setting. Making sure of the desired setpoint, press the START/▲ button. When the initial setting is at "0." the shutoff valve in the pipeline opens fully and both the upper and lower indicator OUT in the display light up. (The LW74E always behaves like this.) Except that the initial setting is at "0," only the lower indicator OUT lights (the LW76E only).

Metering: The process fluid begins to flow and the counter starts counting (the COUNT blinks on and off in sync with incoming counts).

Initial controlled flow: (LW76E only)

Except that the initial setting is at "0," a full open signal is generated when the fluid delivered has reached the initial setpoint and brings the shutoff valve to a full open. The upper OUT lights.

Final controlled flow: (LW76E only)

Except that the final setting is at "0," a full-open signal is discontinued when the remaining quantity of a batch has reached the final setting, bringing the shutoff valve to a partial open position to reduce the velocity of flow. The upper OUT goes out.

End of batch: When the target batch is reached, the signal to the shutoff valve is discontinued, bringing the valve to a total closure to complete a metering process. All OUT indicators go out and the END comes on.

Repeated metering: pressing RESET/◀ button and then START/▲ button allows repeated delivery of the same amount of process fluid. An attempt to start metering by pressing START/▲ button without pressing RESET/◀ button is prevented by an interlocked safety arrangement preventing inadvertent faulty operations sequence or tampering.

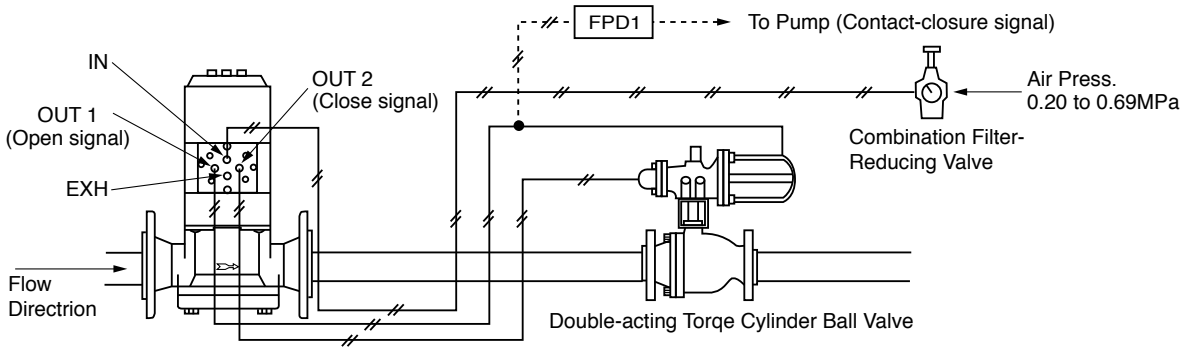
Emergency stops: Metering can be interrupted by pressing STOP/ROT or RESET/◀ button at any moment while a batch process is in progress. By pressing START button, the operation will resume for the remaining process.

Overshoot (overmeasurement): By determining the anticipated amount of overshoot (overmeasurement) due to inherent delay in valve actuation at valve closure and establishing a target setpoint with this anticipated overshoot taken into account, an accurate batch process can be achieved. An overshoot varies with such contributing factors as fluid velocity, piping conditions, and the type of shutoff valve.

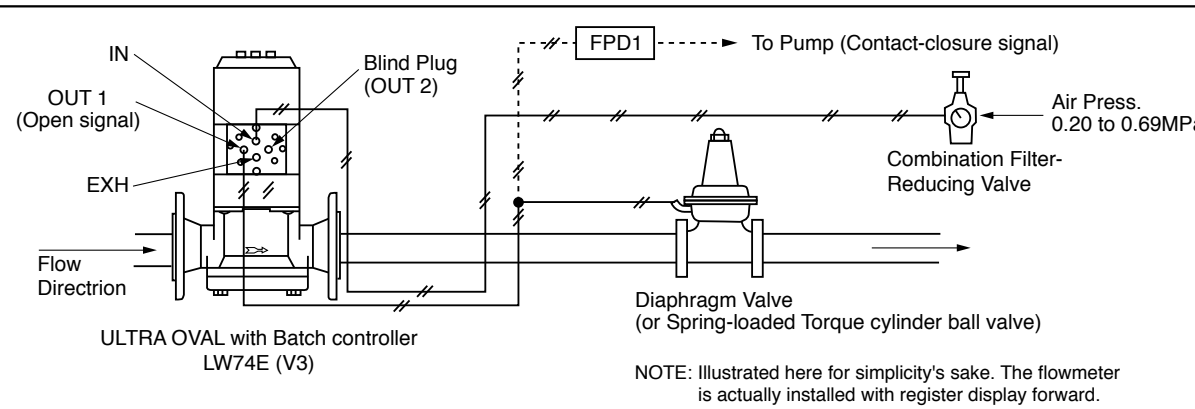
■ SYSTEM CONFIGURATIONS

● Meter with LW74E Register (one-step open, one-step close)

(1) Combined with a double-acting torque cylinder ball valve

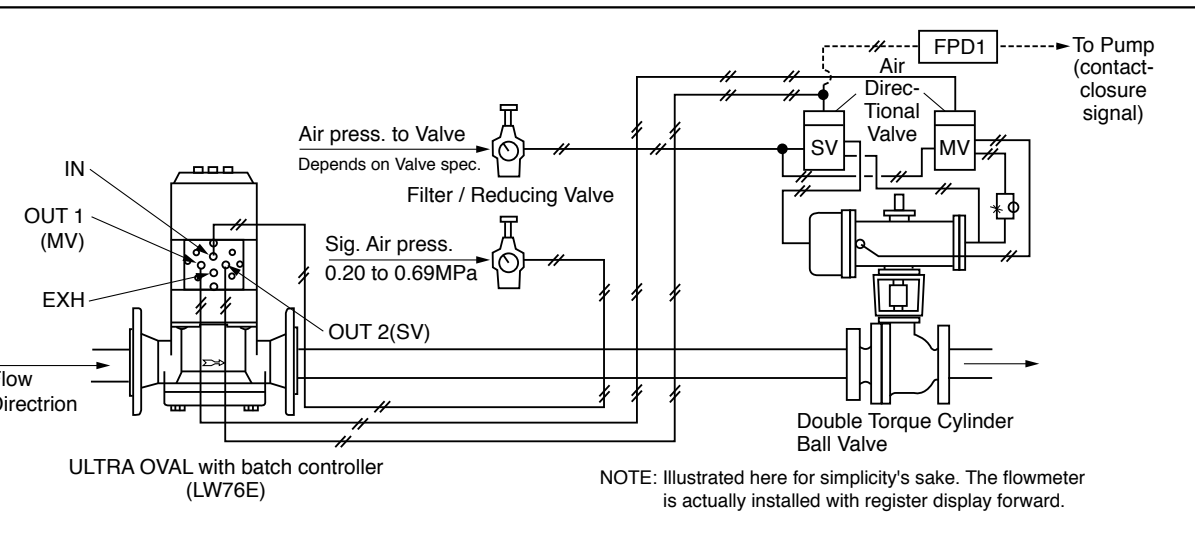


(2) Combined with a diaphragm valve (combined with a spring-loaded torque cylinder ball valve)



NOTES: 1. With a spring-loaded torque cylinder ball valve, the tubing runs same as that with a diaphragm valve.
2. In combining with a diaphragm valve or spring-loaded torque cylinder ball valve, stop up OUT 2 with a blind plug.
3. Specify LW74E (V3) when you order and we will ship with OUT 2 furnished with a blind plug.

● Meter Equipped with LW76E Register



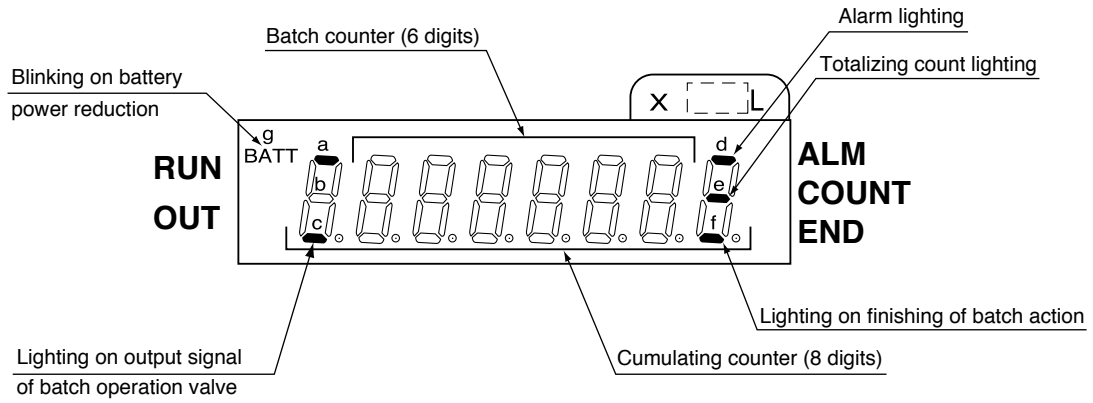
NOTE: When combined with OVAL pneumatic-electrical switch (Model FPD1), the pump can be interlocked.
For complete details, see the pneumatic-electrical switch instruction manual.

■ FUNCTION OF THE DISPLAY UNIT

Display	Contents	Lighting segment
RUN	Blinking on counting action	a
OUT	Switching on a light upon output of batching valve (MV, SV) operating signal	b, c
ALM	Alarm for emergency, i.e;pulse missing, overflow, battery power drop until reset of recovery	d
COUNT	Switching on a light synchronizing with total counting.	e
END	Switching on a light on finishing of a batch action continuing until reset operation is made.	f
BATT	Blinking on battery power reduction	g

∗See the marking fig in the fig. below.

[LCD]



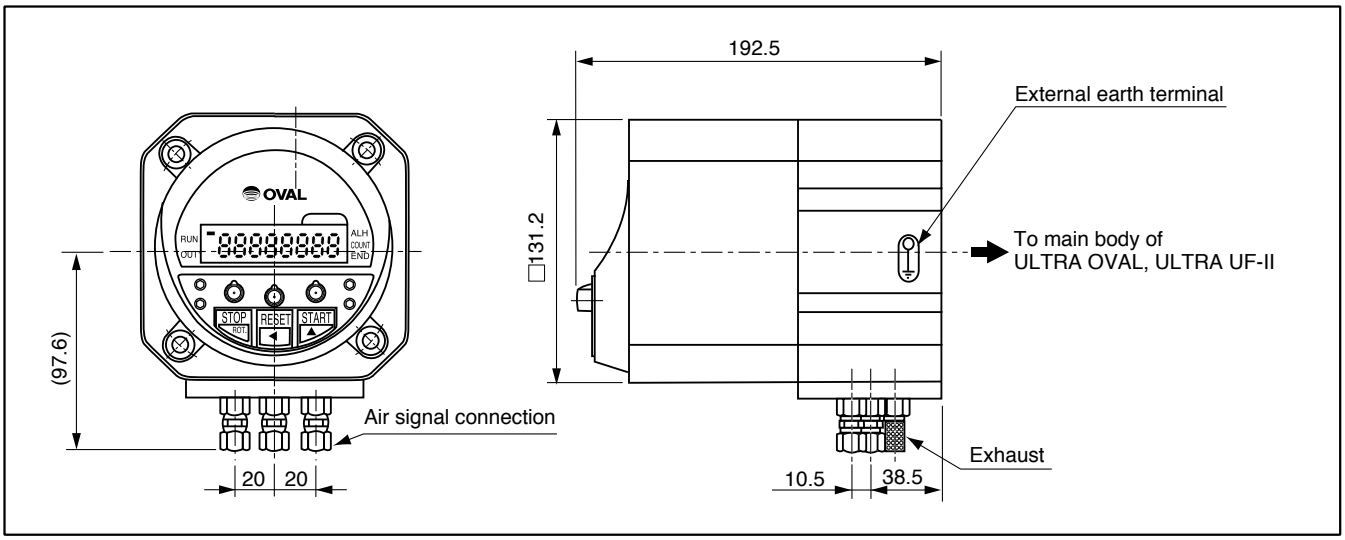
For LW74E, on output of operating signal, segments (b, c) are lighting at a time.
For LW76E (2-stage shutoff/open) : Single-stage open (small valve SV) Segment c lights in response to operating signal output → Partially open
Two-stage open (main valve MV) Segment c lights in response to operating signal output → Fully open

■ ABOUT SAFETY FEATURES

The register is provided with the following safeguards:

1. Detection of missing pulses
   Either condition 1 or 2 causes the indicator "ALM" in the display to light and the shutoff valve to close automatically for safety.
   1 The register fails to count any pulses within a preset missing pulse period (PL) from the moment a batch process started.
   2 Counting pulses is interrupted during a batch process and remains interrupted beyond a preset missing pulse period (PL).
   The system starts detection of missing pulses 5 seconds from the start of a batch process; this 5 second "delay" is required for this function to go into effect.
   Large totalizer units of measure (weights of the total count) by frequency reduction or other processes may require more time to update the count, but such conditions will not trigger a missing pulse detection alarm.
   If "0" is chosen for a missing pulse setpoint (PL), the capability to detect missing pulses will remain disabled.
   For manual batch processing, therefore, we recommend using a setpoint at "0"
2. Detection of an overshoot (overmeasurement)
   An overshoot of measurement at the end of a batch does occur due to some time lag in shutoff valve actuation (closure). An indicator"ALM" in the display lights when the register counts more than the anticipated overshoot count (oV).
   When"0" is chosen for the anticipated overshoot count (oV), the overshoot detection feature remains disabled.
3. Detection of a low battery
   When the built-in battery becomes weak, a blinking"BATT" alarm will appear in the display. As battery power nears zero, a steady "ALM" comes on, the shutoff valve closes automatically (if in an open position) and, at the same time, the variables (total count in a batch process and cumulative total count) are saved to memory.
   From this moment onward, valve operation will remain inoperative (the start button will not respond). Generally, it takes about 8 days from a blinking "BATT" alarm till a steady "ALM." It is suggested that the old battery be replaced with a new one during this period.

■ OUTLINE DIMENSIONS (Unit in mm)



■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE.

Item	Description
1. Companion flowmeter m	_____
2. Fluid	_____
3. Flow r	Min. Nor. Max. ☐ m^3/h, ☐ L/h
4. Companion register m	☐ LW74E ☐ LW76E
5. Units of total cou	_____ L
6. Initial setting	_____ L (with LW76E)
7. Final setting	_____ L (with LW76E)
8. Missing pulse setting	_____ sec
9. Overshoot setting	_____ L
10. Signal air press	_____ MPa
11. Distance from flowmeter Shutoff valve	_____ m (Max. 3m)
12. Shutoff valve t	☐ Spring-loaded torque cylinder ball valve — Fits LW74E (V3) ☐ Double-actuating single torque cylinder ball valve — Fits LW74E (V4) ☐ Diaphragm valve — Fits LW74E (V3) ☐ Double-actuating two torque cylinders ball valve — Fits LW76E ☐ Spring-loaded double torque cylinder ball valve — Fits LW76E
13. Air set (mist separator,combination filter/reducing valve)	☐ Req'd ☐ Not req'd