OVAL

FLOW COMPUTER with MULTIFUNCTION TEMPERATURE COMPENSATOR

MODELS EL4501 and EL4511 (with comm. interface)

GENERAL SPECIFICATION

GS.No.GEJ341E-7

■GENERAL

Using the most advanced electronic technologies, this digital instrument has been developed specifically to meet the most demanding flow measurement applications in petroleum products receiving facilities where accuracy is the prime requirement.

In response to the liquid flowrate and temperature information arriving from the sensing terminal, such as a flowmeter, it totalizes the flow while implementing meter error and temperature corrections.

An analog output and instant flowrate (corrected for meter error and temperature) output are additional provisions. (EL4511 only)

IC CARD

■FEATURES

1. Incorporated capabilities to calibrate meter error f viscosity and flow velocity (viscosity correction), to correct by volumetric conversion factor (temperature correction), and to display the total flow readings readily permit the application engineer to build a petroleum products measurement system with this single instrument.
2. Changing the meter fact , ranges of temperature, or other parameters, of the companion flowmeter is simple by keystrokes on the front-panel keypad, or by inserting an IC card into the slot.
3. Built around a microprocess , the instrument carries out calculations entirely in digital signal processing circuits to achieve a high degree of accuracy and reliability.
4. ariables, such as temperature and totals, can be reviewed on command with the front panel keypad, whether or not calculation is in progress.
5. iscosity and density settings are continuously adjustable. Also, by switching the oil kind, the instrument is compatible with three different kinds of oils.
6. Remote viscosity and density read/write through t communication link is acceptable. (EL4511 only)
7. A nonvolatile memory 2PROM) retains all parameters and variables. Variables are resettable following a power cycle or reset if so configured.

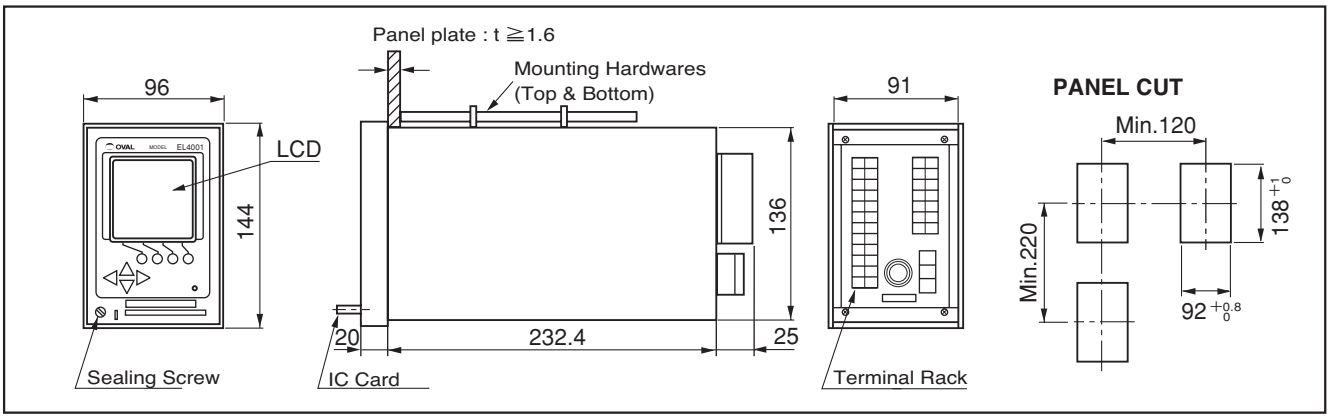
■GENERAL SPECIFICATIONS（EL4501, EL4511）

<table>
<tr><th colspan="3">Item</th><th colspan="5">Description</th></tr>
<tr><td rowspan="8">Input signal</td><td rowspan="8">Flowrate input</td><td></td><td>Type of Signal</td><td>Pulse Generator</td><td colspan="2">Power Supply</td><td>Response pulse</td></tr>
<tr><td></td><td>8VDC 2wires Current Pulse</td><td>OPTO 01, 02</td><td>8.5VDC</td><td rowspan="7">Allowable current 40mA app. Shortcircuit protection circuit provided</td><td>2kHz</td></tr>
<tr><td></td><td>Contact Pulse</td><td>PG20</td><td rowspan="2">13.5VDC</td><td>50Hz</td></tr>
<tr><td></td><td>2wire・12VDC 3wires Voltage Pulse</td><td>PG30 NPG60A(F)</td><td rowspan="3">2kHz</td></tr>
<tr><td></td><td>24VDC, 2wire Current Pulse（4/20mA）</td><td>PA14, 15, 25</td><td>24.0VDC</td></tr>
<tr><td></td><td>12VDC 2wires Current Pulse</td><td>PG30S</td><td rowspan="2">13.5VDC</td></tr>
<tr><td></td><td>Open Collector Pulse</td><td>FLOWPET-EG NPG60A(E3)</td></tr>
<tr><td>Temp. Input</td><td>Thermal resistance bulb</td><td colspan="5">Pt 100 at 0˚C, 3wires system, Rated Current: 2mA</td></tr>
<tr><td></td><td>Analog</td><td colspan="5">4 to 20mADC or 1 to 5VDC</td></tr>
<tr><td rowspan="5">Output signal</td><td rowspan="3">Pulse output</td><td>Totalized flow before correction</td><td colspan="5" rowspan="3">Open MOS-FET, Capacity：230VAC/340VDC 0.2A Pulse width：1ms/50ms</td></tr>
<tr><td>Total flow after compensated</td></tr>
<tr><td>Total flow compensated for visc. and temp.</td></tr>
<tr><td></td><td>Synchronous output to flowmeter input</td><td colspan="5">Open MOS-FET Capacity：30VAC, 20mA</td></tr>
<tr><td>Analog output</td><td>Output Temperature</td><td colspan="5">4 to 20mADC (max.Load：500Ω) or 1 to 5VDC (Output Impedance：250Ω)
Conversion accuracy：±0.1% of F.S.</td></tr>
<tr><td colspan="2">Display mode</td><td colspan="5">ST Display (128×128dot) w/Back Light （※1）（※2）
Items:Data, Unit, Error message are displayed at a time</td></tr>
<tr><td rowspan="11">Display items</td><td>Totalized flow before correction（Q）</td><td colspan="3" rowspan="3">Same as Output Pulse Unit （l etc.）</td><td colspan="2" rowspan="3">Display capacity : 8 digits</td></tr>
<tr><td>Total flow after compensated（Qμf）</td></tr>
<tr><td>Total flow compensated for visc. and temp. (Qμfρ)</td></tr>
<tr><td>Temperature</td><td colspan="5">2 digits under a decimal point（when ℃ is selected.）</td></tr>
<tr><td>Density setpoint（ρ）</td><td colspan="5">3 digits under a decimal point（when g/cm³ is selected.）</td></tr>
<tr><td>Viscosity setpoint（μ）</td><td colspan="5">1 digits under a decimal point（when mPa・s is selected.）</td></tr>
<tr><td>Overall meter error</td><td colspan="5">4 digits under a decimal point</td></tr>
<tr><td>Volume conversion factor</td><td colspan="5">4 digits under a decimal point (Field labeled measurement unit: Oil kind)</td></tr>
<tr><td>Correction factor E1</td><td colspan="5">4 digits under a decimal point</td></tr>
<tr><td>Correction factor E2</td><td colspan="5">4 digits under a decimal point</td></tr>
<tr><td>Frequency</td><td colspan="5">4 digits under a decimal point</td></tr>
<tr><td>Annunciation of abnormality</td><td colspan="5">No. of Errors + Error Messages</td></tr>
<tr><td rowspan="4">Compensation Range</td><td>Density range</td><td colspan="5">Crude oil：0.6105 to 1.0750 Fuel oil：0.6530 to 1.0750 Lubricating oil：0.8000 to 1.1640</td></tr>
<tr><td>Temperature range</td><td colspan="5">−10 to +118℃ NOTE: Except the range not covered in JIS K 2249-1995.</td></tr>
<tr><td>Reference Temp. range</td><td colspan="5">15℃</td></tr>
<tr><td>Viscosity range</td><td colspan="5">0.4 to 199.9 mPa・s</td></tr>
<tr><td rowspan="3">Computing accuracy</td><td>Total flow compensated for visc. and temp.</td><td colspan="5">±0.075% of R.D.</td></tr>
<tr><td rowspan="2">Temperature</td><td colspan="3">Pt100Ω at 0℃</td><td colspan="2">±0.3% of SPAN</td></tr>
<tr><td colspan="3">4 to 20mADC or 1 to 5VDC</td><td colspan="2">±0.1% of SPAN</td></tr>
<tr><td rowspan="3">IC Card</td><td>Kind</td><td colspan="5">Key card</td></tr>
<tr><td>Capacity</td><td colspan="5">SRAM32K</td></tr>
<tr><td>Backup battery</td><td colspan="5">Lithium Battery, Life:Approx. 5 years</td></tr>
<tr><td colspan="2">Backup battery for Clock IC</td><td colspan="5">Lithium Battery, Life:Approx. 10 years</td></tr>
<tr><td colspan="2">Communication（EL4511 only）</td><td colspan="5">Interface: RS485 Multipoint (Up to 16 units can be connected.)
Dedicated protocol Baud rate: 4800 bps standard 9600 bps max.</td></tr>
<tr><td colspan="2">Transmission cable</td><td colspan="5">Use 3-conductor shielded cable to the resistance thermometer bulb.
Loop resist. 5Ω max. Example: 300 meters max. with 3-conductor 1.25mm² cable;
500 meters with 2.0mm² cable</td></tr>
<tr><td colspan="2">Power supply</td><td colspan="5">85 to 264VAC, 50/60Hz, or 20 to 30VDC</td></tr>
<tr><td colspan="2">Power Consumption</td><td colspan="5">20W Max.</td></tr>
<tr><td colspan="2">Ambient Temperature</td><td colspan="5">−10 to +50˚C</td></tr>
<tr><td colspan="2">Installation</td><td colspan="5">Panel mount type</td></tr>
<tr><td colspan="2">Finish</td><td colspan="5">Munsell; NI.5</td></tr>
<tr><td colspan="2">Weight</td><td colspan="5">Approx. 2.5kg</td></tr>
</table>

※1： ST display stands for Super Twisted Nematic display.

※2：Backlight life (luminance declined to one half its original luminance): 2500h approx.

■OUTLINE DIMENSIONS (Units in mm)



■PRODUCT CODE EXPLANATION

Item	Code No. ① ② ③ ④ ⑤ ⑥	—	Supplementary Code ⑦	⑧	⑨	⑩	⑪	⑫	Description	
Model	E L 4 5 0 1	—							Flow computer with multifunction temp. compensator	
	E L 4 5 1 1	—							Flow computer with multifunction temp. compensator (w/comm. interface)	
Power			6						20 to 30VDC	Power Consumption：20W Max.
			7						85 to 264VAC 50/60Hz	
Temperature Input				0					None	
				1					Pt100Ω at 0˚C	
				2					4 to 20mADC/1 to 5VDC	
				9					Other than above	
Pulse Output					1				Pulse, uncompensed + Pulse, compensated for visc. + Pulse, compensated for visc. and temp.	
					9				Other than above	
Analog Output						1			Temperature	
						9			Other than above	
Communication Capability							0		No (EL4501)	
							1		Yes (EL4511)	
Finish								1	Munsell N1.5	

■TERMINAL CONNECTIONS

TB1					
1	SUP.	FLOW IN	12		
2	SIG.		13		
3	0V		14		
4	OUT1/1		15		
5	b	TEMP IN	16		
6	B		17		
7	A		18	+	COMM1 (※1)
8	+		19	−	
9	−		20	+	COMM2 (※1)
10	+	PULSE OUT3	21	−	
11	−				

※1：Provided with communication interface

TB2					
1			8	+	PULSE OUT2
2			9	−	
3			10		
4	+	ANALOG OUT	11		
5	−		12		
6	+	PULSE OUT1	13		
7	−				

TB3		
	H (+)	POWER
	N (−)	
	GND	

■TERMINAL IDENTIFICATION

TB1			
No	Display		Description
1	Flowrate Input	SUP.	3 wires Generator
2		SIG.	(+) 2 wires Generator
3		0V	(−) Synchronous Output
4		OUT1/1	(+) to Flowrate Input (O.C)
5	Temp. input	b	3 wires Pt100Ω
6		B	
7		A	
8		+	4 to 20mADC/1 to 5VDC
9		−	
10	Pulse Output 3	Non Polarity	Instant. flowrate, compensated for visc. and temp.
11			Open MOS-FET
12			
13			
14			

TB2			
No	Display		Description
1			
2			
3			
4	Analog Output	+	Temperature
5		−	4 to 20mADC/1 to 5VDC
6	Pulse Output 1	Non Polarity	Totalized flow before correction
7			Open MOS-FET
8	Pulse Output 2	Non Polarity	Total flow after compensated
9			Open MOS-FET
10			

TB3			
No	Display		Description
1	Power Supply	H (+)	85 to 264VAC or 20 to 30VDC
2		N (−)	
3	Earth		

Terminal connection screws：M3.5

■When you make inquiries please state the following: (fill in blanks or check ☐ with ✓mark)

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>1. Product Mod</td><td>EL45_____ Quantity_____</td></tr>
<tr><td>2. Flowrate Inp</td><td>Companion flowmeter model _____
Generator model _____
Meter factor _____ I/P(at 20˚C)</td></tr>
<tr><td>3. Temperature Inp</td><td>Resistance thermometer model _____
Temp. input ☐ 4 to 20mADC ☐ 1 to 5VDC
☐ Pt100Ω ☐ JPt100Ω (Old JIS)
※ Temp. range _____ to _____ ˚C</td></tr>
<tr><td>4. Process Fluid Na</td><td><table><tr><th></th><th>Fluid name</th><th>Temperature</th><th>Viscosity</th><th>Density</th><th>Flowrate</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>5. Fallback Valu</td><td>Upper temp._____ ˚C Lower temp. _____ ˚C</td></tr>
<tr><td>6. Flowrate Outp</td><td>Output pulse units Total flow, compensated _____ I/P
Compensated for visc. and temp. _____ I/P</td></tr>
<tr><td>7. Anal</td><td>Temp. full scale _____ ˚C to _____ ˚C</td></tr>
<tr><td>8. Test Point Setti</td><td>Specify test points combined with oil kind, viscosity, density, and flow velocity.
(Up to 5 points is acceptable as standard test points. Exceeding 5 points, additional cost applies to each point.)</td></tr>
<tr><td>9. Finish (instrument fram</td><td>☐ Standard ☐ Customer specified</td></tr>
<tr><td>10. Tag No., e</td><td></td></tr>
</table>

※ : Input range must be the same as computing range.