OVAL

Explosionproof Batch Counter

MODEL: EL7320

GENERAL SPECIFICATION

GS.No.GEB404E-3

■ GENERAL

Combined with a flowmeter and valve, the batch counter measures a predetermined amount of process fluid in batching operations. As a piece of explosionproof equipment, the batch counter is suitable for outdoor applications. It saves time and effort in various processes, such as blending materials, dosing with additives, transferring fluid from one tank to another, or shipping process, mainly in chemical, food, and paint industries.

■ FEATURES

1. Flameproof rat

The batch counter is flameproof rated (Ex d IIB T4) and can be implemented in hazardous locations Zone 1 and Zone 2.

2. Easy to opera

(1) Parameter settings, start, stop, and reset can be done by pressing large pushbuttons on the front panel.

(2) Improved visibility for outdoor and/or remote applications with large LED display (7-segment, 25.4mm).

(3) With each operation function (start, stop, and reset) and parameter setting function assigned separately to different buttons, erroneous setting will be prevented.

3. Erroneous setting protecti

Accidental erroneous settings can be prevented by selecting predefined batch settings with the cam switch. Up to five batch settings are available.

4. Accurate batching control

(1) The valve can be programmed to open and close in two stages for precise batch control.

(2) Setting anticipated overshoot enables the batch counter to correct the overshoot caused by response lag from the valve.

5. Feasible system constructi

With the ability to operate by remote commands (start, stop, and reset) and batch-end output function, interlocking with other process control systems can be easily done.

6. Increased process safe

(1) The batch counter controls a valve in two stages (two-stage open, two-stage close). This prevents static inside pipes or tank at the start of operation, and hydraulic shock at valve closure.

(2) An alarm signal can be generated when there is no pulse input or the batch counter receives a pulse exceeding the batch setting for any reason.

7. Reliable and easy to mainta

(1) This equipment is highly reliable and easily serviced since internal electronics are assembled as units.

(2) Every input/output system is isolated by photocouplers and/or relays.

(3) FeRAM storage retains the total count and other parameters when the power is turned off.

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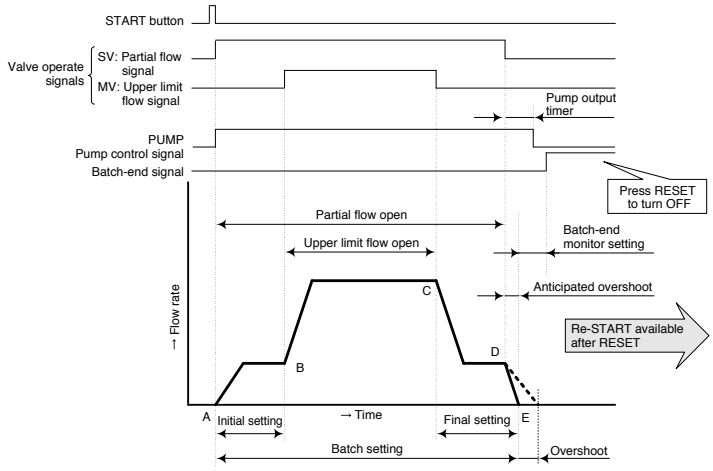
■ GENERAL SPECIFICATIONS

Item			Description				
Type of operation			Pulse addition				
Display	**Display**		Total count: 6-digit, 7-segment, 25.4mm, Red LED				
			Batch setting: 6-digit, 7-segment, 14mm, Red LED (displays grand total in 9-digit by ▼ button operation)				
			Channel number: 2-digit, 7-segment, 14mm, Red LED (displays error code when alarm is set off.)				
	Operation status indicator		LEDs: RUN (YEL)/ END (GRN)/ ALARM (RED)/ InterLock(BLU)/ ×10 (ORG)/ ×100 (ORG)/ MV (RED)/ SV (RED)/ PUMP (RED)				
Buttons	**Channel select**		Explosionproof cam switch with 6 notches				
	Pushbutton		ϕ30 explosionproof pushbuttons: SET(BLK)/ ▼ (BLK)/ ▲ (BLK)/ STOP (RED)/ RESET (YEL)/ START (GRN)				
Buzzer			ϕ30 explosionproof buzzer for alarm				
Input Signal	**Pulse Input**	**Pulse type**	Example Transmitters	Power to Transmitter		Signal Level	Freq. Response
		2-wire/12V DC 3-wire contact-closure pulse	PG20	13.5VDC	Current capacity: 55mA (with short-circuit protection)	12VDC ON/OFF (Input load resistance: 10kΩ)	Max 50Hz
		2-wire/12V DC 3-wire open collector pulse	Coriolis flowmeter/NPG60A (E3) FLOWPET-EG	13.5VDC			Max 3kHz (※1)
		2-wire/12V DC 3-wire voltage pulse	PG30 NPG60A (F)	13.5VDC		"1": more than 5VDC "0": less than 1.5VDC	
		12V DC 2-wire current pulse	PG30S	13.5VDC		"1": 20mADC "0": 4mADC Input load resistance: 510Ω	
		24V DC 2-wire current pulse	PA14/15/25 ULTRA OVAL NPG60A (E)	24VDC		"1": 20mADC "0": 4mADC Input load resistance: 250Ω	
	Remote Input	**Start**	Form "a" contact		Contact signal/Open collector signal Contact current: 24V DC Max. 20mA Instant signal "ON" width: 200msec Instant signal "OFF" width: 200msec		
		Reset	Form "a" contact				
		Stop	Form "b" contact				
		Channel select	BCD combination of 1 /2 /4				
		Set	Form "a" contact				
		InterLock	Form "a" contact normally short-circuited				
Parameter Setting	**Meter factor setting**		0.00010 to 1.99999 (Default: 1.00000)				
	Input pulse freq.		Software-defined frequency: 1/1, 1/10, 1/100 (Default: 1/1)				
	Output pulse freq.		Software-defined frequency: 1/1, 1/10, 1/100 (Default: 1/1)				
	Batch	**Batch setting**	6 channels: 0 to 999999 counts (Only Ch.1 can be changed on the front panel.)				
		Initial setting	0 to 9999 counts (Default: 80)				
		Final setting	0 to 9999 counts (Default: 80)				
		Anticipated overshoot	0 to 99 counts (Default: 2)				
		Batch-end monitor setting	0 to 99 sec (Default: 5)				
	Pump output timer		0 to 9999 sec (Default: 30)				
	Alarm	**Missing pulse interval**	0 to 999 sec (Default: 5)				
		Overshoot	0 to 99 counts (Default: 2)				
		Leak	0 to 99 counts (Default: 10)				
Output Signal	**Upper limit flow signal**		Full-open signal MV		Same as power-supply voltage (max. 0.5A) or relay contact (250V AC 0.5A) Refer to the operation chart for ON/OFF of form "a" contact.		
	Partial flow signal		1-stage open signal SV				
	Pump control signal		Relay contact (250V AC 0.5A) form "c" contact				
	Batch-end signal		Static relay (250V AC 0.1A) form "a" contact				
	Alarm signal		Relay contact (250V AC 0.5A) form "a" contact				
	Pulse signal		Open collector NPN transistor output (35V DC 100mA) Pulse width: 150μsec/ 1msec/ 50msec max. 3kHz (※2)				
Power failure backup			Saves data to FeRAM at power-off				
Power source			100/110VAC or 200/220VAC 50/60Hz (Allowable voltage: within ±10% of rated voltage)				
Power consumption			30VA (Power consumed by the batch counter only, excluding power supply for MV/SV.)				
Ambient temperature			–20 to +50°C				
Configuration			Explosionproof rating: Flameproof Ex d IIB T4 (※3)				
Installation			Wall-mount or Stanchion				
Finish			Munsell 2.5PB 5/8, glossy (standard)				
Housing material			Aluminum casting (Stanchion: steel)				
Outline dimensions			300 (W) ×360 (H) ×247 (D) (batch counter body only)				
Weight			Approx. 20kg (batch counter body only)				
Noise resistance			EMC EN55011 EN61000-6-2				

※1: Varies depending on transmission distance and specification of the cable.
(e.g. 100m when open collector pulse with CVVS 1.25sq cable)
※2: When 150μsec output is selected, transmission distance will be limited depending on cable specification and receiving circuit.
(e.g. with CVVS 1.25sq cable and collector current 20mA, the transmission distance will be limited to 500m.)
※3: Specific pressure-tight packing cable glands are required if the batch counter is to be used for explosionproof purpose.
Five explosionproof plugs are provided with the batch counter.

■ OPERATION CHART



As you press the START button, the valve opens to a predefined position. The valve fully opens when flow of the fluid reaches a certain amount (where Initial setting = Point A to Point B). As it reaches Point C, the valve automatically closes to a predefined position. At Point D, a signal will be generated for shutting the valve, but because of valve operation delay, the valve fully closes at Point E.

The amount processed from Point D to Point E is anticipated overshoot. Batch setting (Point D) can be configured with the corrected value.

Even if the valve shuts off at constant time periods, the actual point for valve to be shut off may fluctuate from Point E as line pressure varies.

If overshoot exceeds Point E, an alarm will be set off.
Note that the positions of valve (for Point A → B and C → D) need to be determined beforehand.

■ PRODUCT CODE EXPLANATION

● Batch Counter Body

Item	Product Code Explanation																Description
	①	②	③	④	⑤	⑥	–	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	
Model	E	L	7	3	2	0	–											Explosionproof batch counter
Power								1										100VAC 50/60Hz
								2										200VAC 50/60Hz
								3										110VAC 50/60Hz
								4										220VAC 50/60Hz
								9										Other
Flow Input									2									2-wire, 12VDC 3-wire contact-closure pulse
									3									2-wire, 12VDC 3-wire voltage pulse
									4									24VDC 2-wire current pulse (4/20mA DC)
									5									12VDC 2-wire current pulse
									6									2-wire, 12VDC 3-wire open collector pulse
									9									Other
Additional Function										1								Standard
										9								Other
Valve Operation Signal											1							Same as supply voltage
											2							Contant-closure output
											9							Other
Installation												1						Wall-mount
												2						Stanchion
												9						Other
Sunshade													0					Not furnished
													1					Furnished
Hood														0				Not furnished
														1				Furnished
Rubber Button Cover															0			Not furnished
															1			Furnished
Finish																1		Munsell 2.5PB5/8, glossy
																9		Other
Version																	A	

● Code Explanation for Pressure-tight Packing Cable Gland

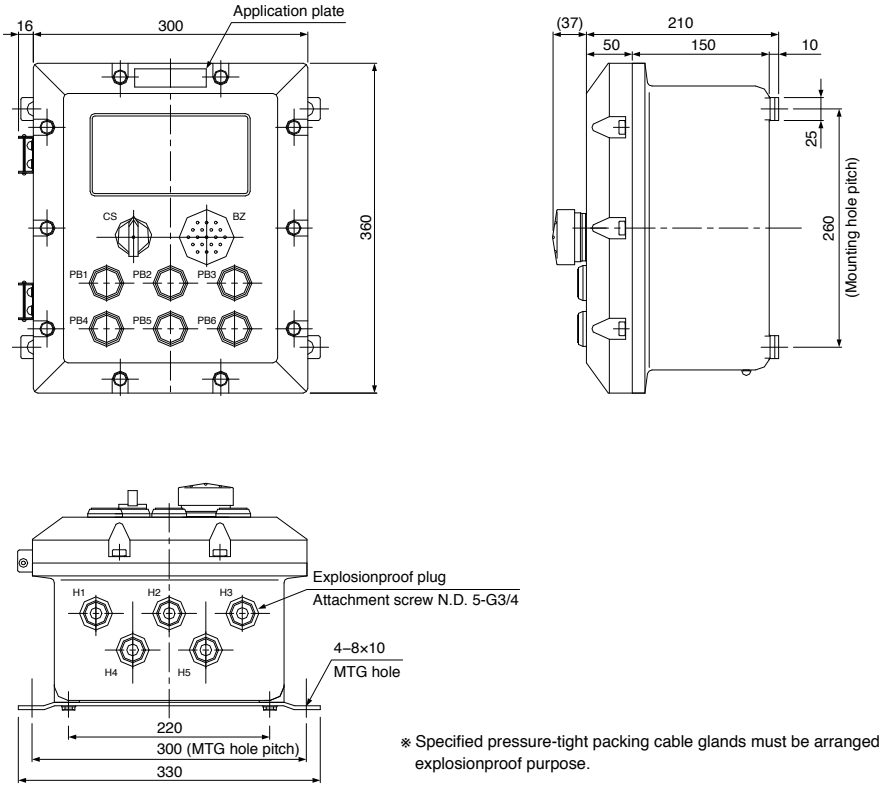
(This apparatus must be arranged for explosionproof purpose.)

Item	Code Explanation											Description
	①	②	③	④	⑤	—	⑦	⑧	⑨	⑩	⑪	
Model	H	P	N	2	1	–						Cable gland
Applicable Cable O.D.							R	0	8	–	C	More than 6mm up to 8mm
							R	1	0	–	C	More than 8mm up to 10mm
							R	1	2	–	C	More than 10mm up to 12mm

Item	Code Explanation											Description
	①	②	③	④	⑤	–	⑦	⑧	⑨	⑩	⑪	
Model	H	P	N	2	2	–						Cable gland
Applicable Cable O.D.							R	1	4	–	C	More than 12mm up to 14mm
							R	1	6	–	C	More than 14mm up to 16mm

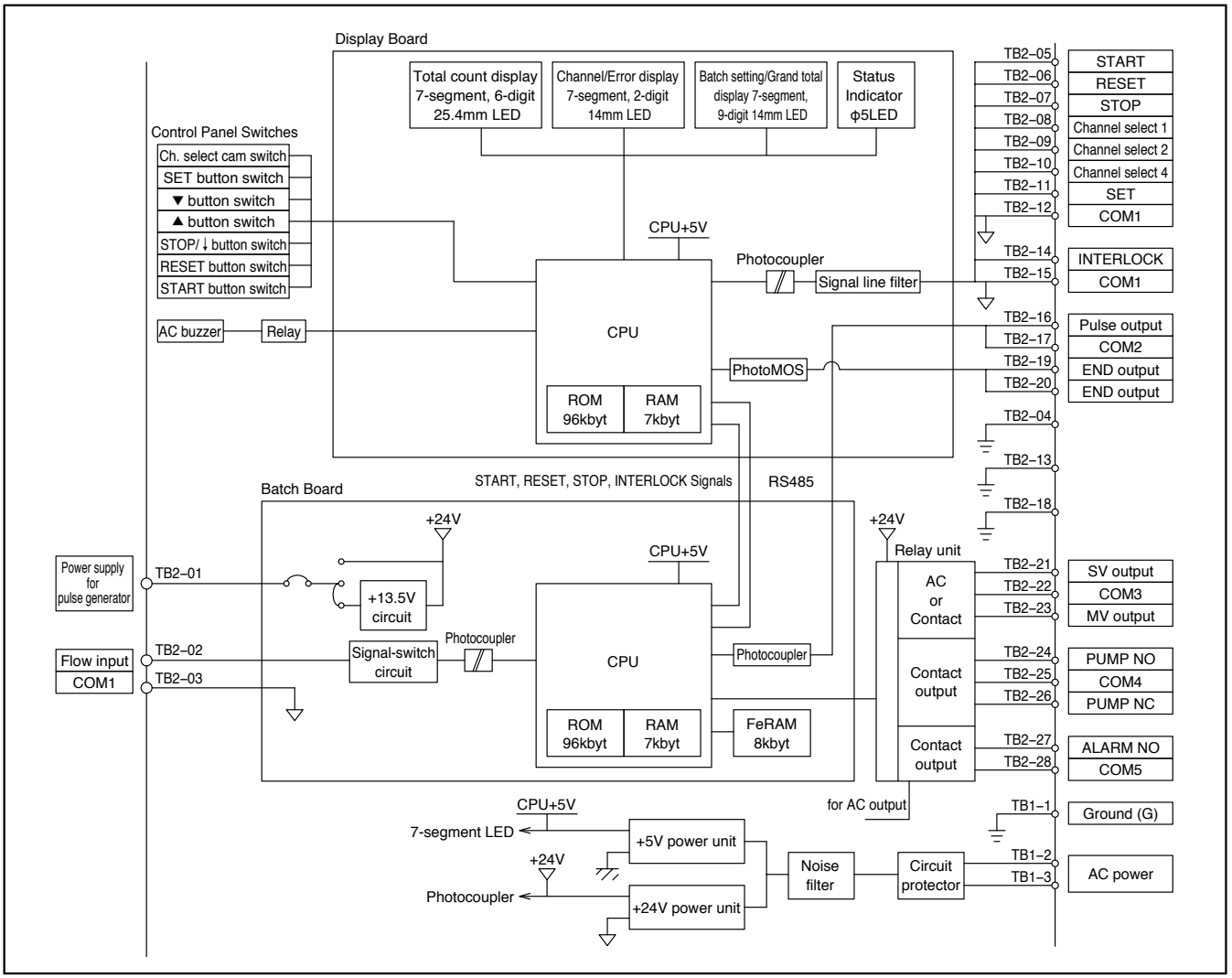
■ OUTLINE DIMENSIONS

Unit: mm



※ Specified pressure-tight packing cable glands must be arranged for explosionproof purpose.

■ BLOCK DIAGRAM



■ EXTERNAL CONNECTION TERMINALS

● Terminal Block

TB02 (M3.5 touchdown structure)

1	3	5	7	9	11	13	15	17	19	21	23	25	27	
2	4	6	8	10	12	14	16	18	20	22	24	26	28	

TB01 (M4)

1	2	3

● Connection Terminals

TB01

Signal	No.	Description	
Power	1	G	Ground Terminal (※1)
	2	AC (L)	100/110V AC 200/220V AC
	3	AC (N)	

※1: To prevent electric shock, fire, and interference from exogenous noise, make sure to ground the terminal.

TB02

Signal		No.	Description
Flow Signal Input	SUP.	1	2-wire current pulse (4/20mA) 3-wire voltage pulse (PG30) 2-wire current pulse (PG30S)
	SIG.	2	contact-closure pulse/open collector
	COM.1	3	
	G	4	Shield Earth Ground
Remote Control Input	START	5	
	RESET	6	
	STOP	7	
	SELECT 1	8	
	SELECT 2	9	
	SELECT 4	10	
	SET	11	
	COM.1	12	
	G	13	Shield Earth Ground
	INTERLOCK	14	Short-circuit INTERLOCK when not in use
	COM.1	15	
Pulse Output	SIG.	16	Open collector
	COM.2	17	
	G	18	Shield Earth Ground
Batch-end Output	END	19	Static relay "a" contact
	END	20	
Valve Operation Signal	SV	21	Partial flow signal: one-stage open
	COM.3	22	Same voltage as power source or relay contact, form "a" contact
	MV	23	Upper limit flow signal: Fully open
Pump Output	PUMP	24	Pump Control Output: Relay contact, Form "c" contact
	COM.4	25	
	PUMP	26	
Alarm Output	ALARM	27	Relay contact, Form "a" contact
	COM.5	28	

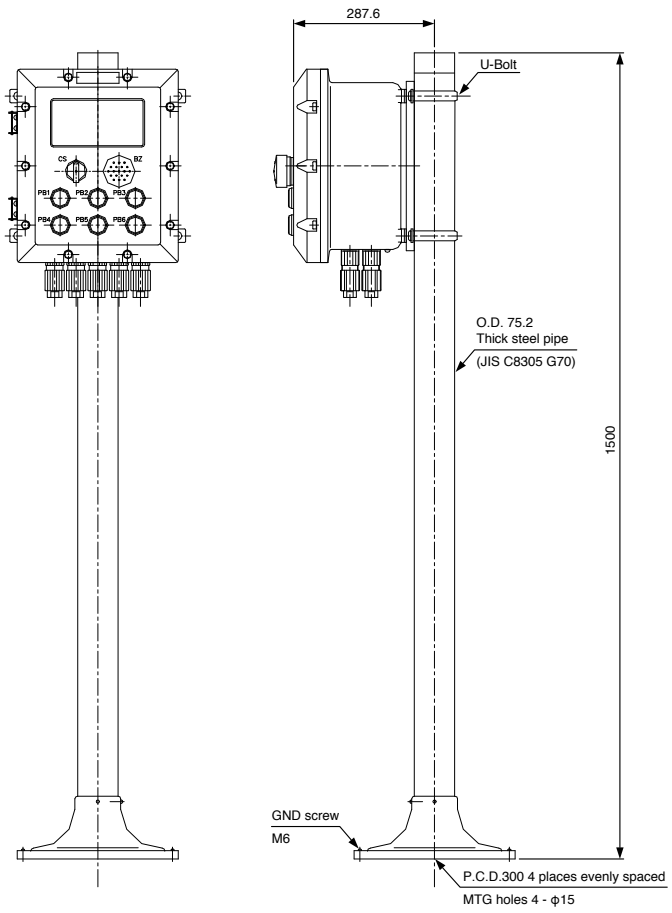
Combinations of SELECT and CH

	CH.1	CH.2	CH.3	CH.4	CH.5	CH.6
SELECT 1	ON	OFF	ON	OFF	ON	OFF
SELECT 2	OFF	ON	ON	OFF	OFF	ON
SELECT 4	OFF	OFF	OFF	ON	ON	ON

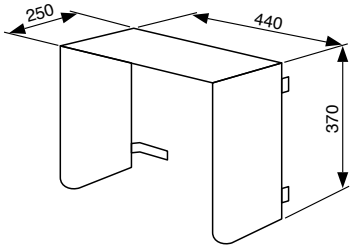
※ Every COM.1 terminal and G terminal is electrically continuous.

■ OPTIONS

◆ Stanchion

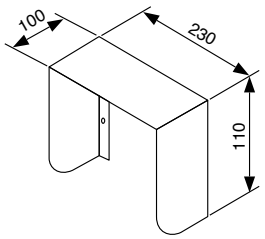


◆ Sunshade



Protects the bacth counter from direct sunlight and rain.
Material: SUS unfinished

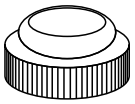
◆ Hood



Covers over the display for better visibility.

Material: SUS
Finish : N1.5 matte

◆ Rubber Cover for Pushbuttons

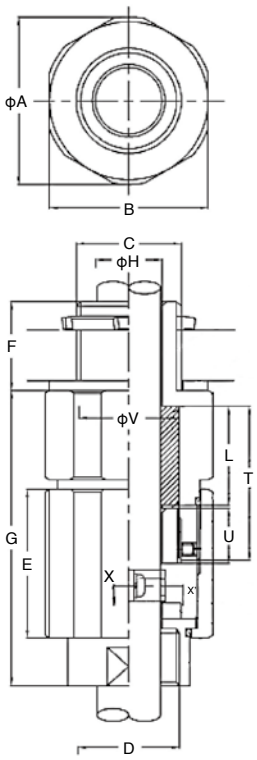


Ensures better waterproof performance by covering the pushbuttons.

◆ Pressure-tight packing cable gland

A wiring apparatus used for leading cables (rubber/plastic) into the counter

Model			HPN21–			HPN22–	
			R8 - C	R10 - C	R12 - C	R14 - C	R16 - C
Applicable cable O.D.			6 - 8	8 - 10	10 - 12	12 - 14	14 - 16
Packing	O.D.		21			25	
	I.D.		8	10	12	14	16
	Thickness		6.5	5.5	4.5	5.5	4.5
	Length before compression (L)		34			34	
	Length after compression (L)		Min. 25.5			Min. 25.5	
	Effective compressibility		10% approx.			10% approx.	
	Box	I.D. (V)	21.5			25.5	
		I.D. (T)	44			44	
	Depth (U)		17.5			17.5	
A			38			42	
B			36			40	
C	N.D.		G 3/4			G 3/4	
	Pitch		1.8143			1.8143	
	Grade		B			B	
D			G 1/2			G 3/4	
E			41.5			41.5	
F			25			25	
G			(78)			(78)	
H			13			17	
J			R14			R12	
K			9	11	13	15	17
M			21			25	
N			13			17	
O			5			5	
P (min.)			4.5	5.5	6.5	11	12
Q			8			8	
R			28			32	
S			21			25	



■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE:

Item		Specification
1.	**Product model**	EL7320 - _____
2.	**Quantity**	_____ units
3.	**Finish**	☐ Munsell 2.5PB 5/8, glossy (standard) ☐ _____
4.	**Application label**	Material: Clear acrylic Engraving: Black-on-white Location: Front top Placement: Adhesive Size: 12.5mm × 80mm × 2t Font: Round Gothic Font size: 24Q Letters: _____
5.	**Power supply**	_____VAC
6.	**Input pulse**	Pulse type: _____ Meter factor: _____ Pulse width: _____ Pulse unit: _____ Max. frequency: _____ Hz Combined flowmeter: _____
7.	**Output pulse**	Pulse unit: same as input pulse Pulse width: ☐ 150µsec ☐ 1msec ☐ 50msec
8.	**Valve output**	☐ Same as power supply voltage ☐ Relay contact
9.	**Batch control**	☐ 2-stage open, 2-stage close ☐ 2-stage open, 1-stage close ☐ 1-stage open, 2-stage close ☐ 1-stage open, 1-stage close
10.	**Options**	☐ Stanchion Height ☐ 1500mm (standard) ☐ _____ ☐ Sunshade ☐ Hood ☐ Pushbutton covers (6pcs) ☐ Pressure-tight packing cable glands (Up to 5pcs)
		Applicable cable diameter: ☐ 6 - 8mm _____ (pcs) ☐ 8 - 10mm _____ (pcs) ☐ 10 - 12mm _____ (pcs) ☐ 12 - 14mm _____ (pcs) ☐ 14 - 16mm _____ (pcs)
11.	**Special notes**	

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