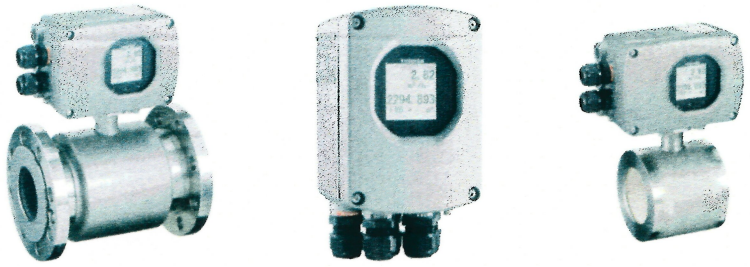
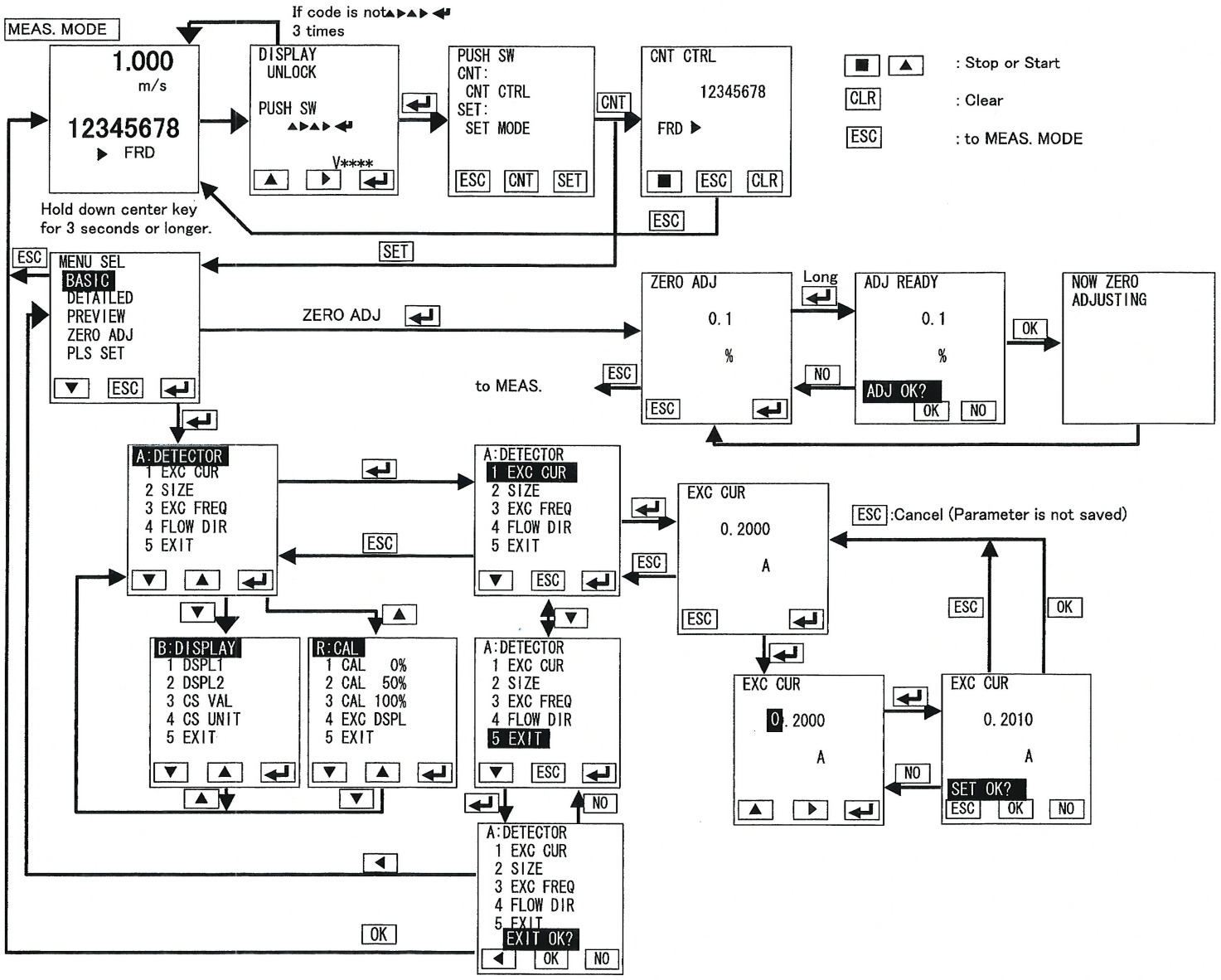
TOSHIBA

Leading Innovation

Electromagnetic Flowmeter LF620 Series Operation Guide



Setting Parameters Flow



Setting Menu

		Items	Screen Display	Setting or selecting value	
A	A		DETECTOR		
	1	Excitation Current	EXC CUR	0.0000A ~ 0.2500A (0.0001A each)	*1
	2	Meter size	SIZE	0.1 ~ 36 inch , 2.5mm ~ 900mm	*1
	3	Excitation Frequency	EXC FREQ	6, 12, 24 Hz	
	4	Flow Direction	FLOW DIR	NORMAL , SWITCH	
	5	Measurement Mode	EXIT		
B	B		DISPLAY		
	1	Display 1	DSPL1	• First Unit : Volume, Others %, m^3, L, mL, bbl, gal, Mgl, ft3, m/s, ft/s, COUNT, RANGE, pt, qt, CUSTOM, GRAPH (*3) • Second Unit : Time unit /s, /min, /h, /d • Third unit : Flow direction code B (Automatic selection bidirectional flow) F (Fixed forward flow), R (Fixed reverse flow) D (Difference) C (Totalized cyclic display)	*2 *3
	2	Display 2	DSPL2		
	3	Custom Coefficient	CS VAL	0.000001 ~ 99999999	
	4	Custom Unit	CS UNIT	7 Characters	
	5	Measurement Mode	EXIT		
C	C		RANGE		
	1	Range Type	R TYPE	SINGLE, 4F-0R, 2F-2R, EXT 2F-0R, EXT 2F-2R	*4
	2	Range 1	R1	• Volume unit m^3, L, mL, bbl, gal, pt, qt, Mgl, ft3 • Time unit /s, /min, /h, /d • Velocity unit m/s, ft/s • Other CUSTOM	
	3	Range 2	R2		
	4	Range 3	R3		
	5	Range 4	R4		
	6	Range Hysteresis	R HYS	0.0 ~ 25.0 % (0.1% each)	
	7	Measurement Mode	EXIT		
D	D		FILTER		
	1	Damping Constant	DAMPING	0.0, 0.5, 1.0 ~ 60.0 s	
	2	Rate-of-change Limit	LIM RATE	0.0 ~ 30.0 % (0.1% each)	
	3	Control Limit Time	LIM TIME	00 ~ 20 s (1s each)	
	4	Measurement Mode	EXIT		
E	E		LOW CUT		
	1	Low Cutoff	CUT VAL	0.0 ~ 10.0 % (0.1% each)	
	2	Display Low Cutoff	DSPL SET	LINEAR, LOW CUT	
	3	Measurement Mode	EXIT		
F	F		ZERO		
	1	Zero Adjustment	ZERO ADJ	Hold down the [↵] key	
	2	Manual Zero	MANUAL	±10% of 10m/s-maximum range (0.1% each)	*5
	3	Measurement Mode	EXIT		
G	G		4-20mA		
	1	4-20mA Alarm Output	ALM 4-20	UNDER 3mA, 4mA, HOLD , OVER 24mA	
	2	Output Low Limit	LOW LIM	4.0mA, 3.2mA, 2.4mA	*6
	3	Measurement Mode	EXIT		
H	H		DO		
	1	Digital Output 1	DO1 FUNC	NO USE, H ALM, HH ALM, L ALM, LL ALM, EMPTY ALM, RNG SIG1, RNG SIG2, PRESET C, CONV ALM, PLS OUT, PLS FRD, PLS REV, MRH ALM, MRL ALM	*7
	2	Digital Output 2	DO2 FUNC		
	3	Digital Output 1 Active Status	DO1 STAT	NormOPEN, NormCLOSE	*8
	4	Digital Output 2 Active Status	DO2 STAT		
	5	Measurement Mode	EXIT		
I	I		DI		
	1	Digital Input	DI FUNC	NO USE, CNT ST/SP, CNT RS/ST, RNG SW, ZERO ADJ, FIX OUT	
	2	Digital Input Detective Level	DET LVL	H LEVEL, L LEVEL	*9
	3	Measurement Mode	EXIT		
J	J		CNT/PLS		
	1	Counting Rate	CNT RATE	Units : m^3, L, mL, bbl, gal, pt, qt, Mgl, ft3 Value : within the range 3.6 ~ 36000000 pulse/h (0.001 ~ 10,000 pps)	
	2	Pulse Mode	PLS MODE	AUTO, MANUAL	
	3	Pulse Width	PLS WID	0.3 ~ 500.0ms (0.1ms each) or Less than 40% of the pulse rate for 100% flow rate output	
	4	Measurement Mode	EXIT		
K	K		PRESET C		
	1	Preset Count	PRST VAL	0 ~ 99999999 count (1 count each)	
	2	Preset Function	OUT MODE	HOLD, 50ms PLS, 500ms PLS	*10
	3	Measurement Mode	EXIT		
L	L		H/L ALM1		
	1	High Alarm Set	H SET	ON, OFF	
	2	High Alarm Value	H VAL	-10 ~ 110 % (0.1% each)	
	3	Low Alarm Set	L SET	ON, OFF	
	4	Low Alarm Value	L VAL	-10 ~ 110 % (0.1% each)	
	5	Measurement Mode	EXIT		
M	M		H/L ALM2		
	1	High High Alarm Set	HH SET	ON, OFF	
	2	High High Alarm Value	HH VAL	-10 ~ 110 % (0.1% each)	
	3	Low Low Alarm Set	LL SET	ON, OFF	
	4	Low Low Alarm Value	LL VAL	-10 ~ 110 % (0.1% each)	
	5	Measurement Mode	EXIT		
N	N		SELF CHK		
	1	Empty Pipe Alarm	EMPTY	OFF, NORMAL, SENS, SENS-H	*11
	2	Self-diagnosis function	SELF CHK	ON, OFF	
	3	Alarm Output Preset	CONV ALM	CONV ONLY, WITH EMP	
	4	Measurement Mode	EXIT		
O	O		FIX OUT		
	1	Fixed-value Output	FIX SET	ON, OFF	*12
	2	Fixed-current Output	CUR VAL	2.4 ~ 24.0 mA (0.1mA each)	
	3	Fixed-pulse Output	PLS VAL	0 ~ 10000 pps (1pps each)	
	4	Measurement Mode	EXIT		
P	P		OTHERS		
	1	Password	PASSWORD	000 ~ 999 (1 each)	
	2	LCD Density Adjustment	LCD ADJ	1(Light) ~ 5 (Dark)	
	3	Switch Position	SW POSN	TOP, BOTTOM, LEFT, RIGHT	
	4	Measurement Mode	EXIT		
Q	Q		COMM		
	1	PROFIBUS Communication	PROFIBUS		*13
	2	MODBUS Communication	MODBUS		*13
	3	Measurement Mode	EXIT		
R	R		CAL		
	1	0% Flow Rate Calibration	CAL 0%		
	2	50% Flow Rate Calibration	CAL 50%		
	3	100% Flow Rate Calibration	CAL 100%		
	4	Checking the Excitation Current Value	EXC DSPL		
	5	Measurement Mode	EXIT		

*1 This value is factory adjusted when shipped.

*2 In case of choosing COUNT or RANGE
COUNT : displays totalized flow counts (8 digits) without a unit.
RANGE : displays the range number (1 to 4)

*3 Only display2

*4

Range type	Description
1 : SINGLE	Single range
2 : 4F-0R	Unidirectional flow , automatic selection of multiple ranges
3 : 2F-2R	Bidirectional flows , automatic selection of multiple ranges
4 : EXT 2F-0R	Unidirectional flows , multiple ranges selected by exterminal single
5 : EXT 2F-2R	Bidirectional flows , multiple ranges selected by exterminal single

*5 (1) In case of the zero adjustment (Menu No.F1),Zero offset is automatically cleared to Zero.
(2) Calculate the zero offset value with the following equation:
Zero offset value (%) = {(Actual flow rate) - (LF620 measured value)}
(Sample)

Measured condition	Flow rate	% in measured span
Actual flow rate obtained from other instrument	10.0 m^3/min	50%
LF620 measured value	10.5 m^3/min	52.5%
Zero offset	—	-2.5%

If zero offset is set to -2.5% , LF620 will output 50.0% flow rate instead of 52.5%

*6

4-20mA Alarm Output	Output Status
0 : UNDER 3mA	Under 3mA output
1 : 4mA	4mA output
2 : HOLD	Measured data hold
3 : OVER 24mA	Over 24mA output

*7

DO1,DO2 items	Digital output function
0 : NO USE	Not used
1 : H ALM	High limit alarm output
2 : HH ALM	High high limit alarm output
3 : L ALM	Low limit alarm output
4 : LL ALM	Low low limit alarm output
5 : RNG SIG1	Multi - range output No.1
6 : RNG SIG2	Multi - range output No.2
7 : PRESET C	Preset point output
8 : CONV ALM	Converter failure alarm output
9 : EMPTY ALM	Empty pipe alarm output
10 : PLS OUT	Pulse output (bidirectional flow)
11 : PLS FRD	Pulse output (fixed forward flow)
12 : PLS REV	Pulse output (fixed reverse flow)

*8

DO1/DO2 Active Status	Alarm - output Status
0 : NormCLOSE	Normal close
1 : NormOPEN	Normal open

*9

DI Detective Level	Detective Level
0 : L LEVEL	L level
1 : H LEVEL	H level

*10

Preset Function	Output Status
0 : HOLD	Output Status Level Hold
1 : 50ms PLS	Pulse out (pulse width 50ms)
2 : 500ms PLS	Pulse out (pulse width 500ms)

*11

Empty Pipe Alarm	Digital output function
0 : OFF	Not used
1 : NORMAL	Used and Low-sensitive
2 : SENS	Used and Middle-sensitive
2 : SENS-H	Used and High-sensitive

*12 When this function is set to ON , the conditions are following.

Items	Conditions
Current output	User - set current output
Pulse output	Pulse output with a user - set counting rate
Digital outputs	Previous status is retained (excluding pulse output).
Data indicating	Instaneous flow rates and flow velocity (no totalization).

*13 These functions are option.

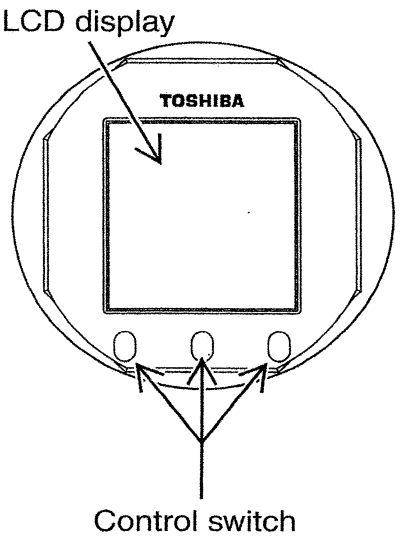
●Factory default standard value table

Code	Item	Default value		Changed value
		English unit	SI unit	
A3	Excitation Frequency	Value	Value	
A4	Flow Direction	NORMAL	NORMAL	
B1	Display 1	gal/min	m^3/h	
B2	Display 2	COUNT B	m^3	
	Display digit setting (For Display 1 and Display 2)	1/1000	1/1000	
B3	Custom Coefficient	1.0	1.0	
B4	Custom Unit	CUSTOM	CUSTOM	
C1	Range Type	SINGLE	SINGLE	
C2	Range 1	Value	Value	
C6	Hysteresis	3.0%	3.0%	
D1	Damping Constant	5 sec	1 sec	
D2	Rate-of-change Limit	0.0%	0.0%	
D3	Control Limit Time	0.0s	0.0s	
E1	Low Cutoff	1.0%	1.0%	
E2	Display Low Cutoff	LINEAR	LINEAR	
F2	Manual Zero	0.0%	0.0%	
G1	4-20mADC Alarm Output	4mA	4mA	
G2	Output Low Limit	4mA	4mA	
H1	DO1 Function	PLS OUT	PLS OUT	
H2	DO2 Function	EMPTY ALM	NO USE	
H3	DO1 Active Status	NormOPEN	NormOPEN	
H4	DO2 Active Status	NormOPEN	NormOPEN	
I1	Digital input	NO USE	NO USE	
I2	DI Detective Level	H LEVEL	H LEVEL	
J1	Counting Rate	Value	Value	
J2	Pulse width setting mode	AUTO	AUTO	
J3	Preset width	5ms	100ms	
K1	Preset count	00000000	00000000	
K2	Preset Function	HOLD	HOLD	
L1,L2	High Alarm Set / Value	OFF 0.0%	OFF 0.0%	
L3,L4	Low Alarm Set / Value	OFF 0.0%	OFF 0.0%	
M1,M2	High High Alarm Set / Value	OFF 0.0%	OFF 0.0%	
M3,M4	Low Low Alarm Set / Value	OFF 0.0%	OFF 0.0%	
N1	Empty Pipe Alarm	NORMAL	NORMAL	
N2	Self-diagnosis function	ON	ON	
N3	Alarm Output Preset	CONV ONLY	CONV ONLY	
P1	Password	000	000	
P2	LCD display adjustment	3	3	
P3	Switch position setting	BOTTOM	BOTTOM	

Value : See the setting values for each meter size in the right table.

Meter Size		Ex.Freq	Range 1		
inch	mm	(Hz)	gal/min	ft/s	m^3/h
1/10"	2.5	24	0.5	21.084	0.05
1/6"	4	24	1.5	24.707	0.1
1/4"	6	24	4	29.283	0.2
1/2"	15	24	25	29.283	2
1"	25	24	75	31.625	6
1 1/4"	32	24	125	32.171	10
1 1/2"	40	24	175	28.826	15
2"	50	24	300	31.625	25
2 1/2"	65	24	475	29.629	40
3"	80	24	650	26.766	60
4"	100	24	1,000	26.354	100
5"	125	24	1,750	31.625	150
6"	150	24	2,500	29.283	200
8"	200	24	4,500	29.649	300
10"	250	12	7,000	29.517	600
12"	300	12	10,000	28.283	900
14"	350	12	12,000	25.817	1,200
16"	400	12	16,000	26.354	1,600
18"	450	12	20,000	26.029	2,500
20"	500	6	25,000	26.354	3,000
24"	600	6	40,000	29.283	4,000
28"	700	6	50,000	26.892	5,000
30"	750	6	60,000	28.112	6,000
32"	800	6	70,000	28.825	7,000
36"	900	6	80,000	26.029	8,000

●LCD



ETBK15031B
2010-8(TDOC)

●Meter Size vs. Velocity/Rate

unit : gal/min

Size (inch)	Flow rate 0.98ft/s	3ft/s	10ft/s	32.8ft/s
1/10"	0.02334	0.07115	0.2372	0.7781
1/6"	0.05975	0.1821	0.6071	1.992
1/4"	0.1344	0.4098	1.366	4.482
1/2"	0.8403	2.561	8.532	28.01
1"	2.334	7.115	23.72	77.81
1 1/4"	3.824	11.66	38.86	127.5
1 1/2"	5.975	18.21	60.71	199.2
2"	9.337	28.46	94.86	311.2
2 1/2"	15.78	48.09	160.3	526.0
3"	23.90	72.85	242.8	796.7
4"	37.35	113.8	379.4	1,245
5"	58.35	177.9	592.9	1,945
6"	84.03	256.1	853.8	2,801
8"	149.4	455.3	1,518	4,980
10"	233.4	711.5	2,372	7,781
12"	336.1	1,025	3,415	11,200
14"	457.5	1,394	4,648	15,250
16"	597.5	1,821	6,071	19,920
18"	756.3	2,305	7,684	25,210
20"	933.7	2,846	9,486	31,120
24"	1,344	4,098	13,660	44,820
28"	1,830	5,578	18,590	61,000
30"	2,101	6,403	21,340	70,020
32"	2,390	7,285	24,280	79,670
36"	3,025	9,221	30,740	100,800

unit : m^3/h

Size (mm)	Flow rate 0.3m/s	1m/s	3m/s	10m/s
2.5	0.005301	0.01767	0.05304	0.1767
4	0.01357	0.04524	0.13572	0.4524
6	0.03053	0.1018	0.3054	1.018
15	0.1908	0.6361	1.908	6.361
25	0.5301	1.767	5.301	17.67
32	0.8686	2.895	8.686	28.95
40	1.357	4.523	13.57	45.23
50	2.120	7.067	21.20	70.67
65	3.583	11.95	35.83	119.5
80	5.428	18.09	54.28	180.9
100	8.482	28.27	84.82	282.7
125	13.25	44.17	132.5	441.7
150	19.08	63.61	190.8	636.1
200	33.93	113.1	229.3	1,131
250	53.01	176.7	530.1	1,767
300	76.34	254.5	763.4	2,545
350	103.9	346.4	1,039	3,464
400	135.7	452.3	1,357	4,523
450	171.7	572.5	1,717	5,725
500	212.1	706.9	2,121	7,069
600	305.4	1,018	3,054	10,180
700	415.6	1,385	4,156	13,850
750	477.1	1,590	4,771	15,900
800	542.9	1,810	5,429	18,100
900	687.1	2,290	6,871	22,900

●ERROR/ALARM

Error/Alarm type	Indicating message	Error contents
Self-diagnosis error	ROM ERROR	ROM error
	RAM ERROR	RAM error
	PARAMETER FAILURE	System parameter error
	EXC CUR OPEN	Excitation circuit error
	EXC CUR ERROR	Excitation current error
	ADC ERROR	ADC error
	INVALID TOTAL	Invalid totalizer counts
Setting error	HIGH OVER SPEC	Setting value exceeds the allowable high limit.
	LOW OVER SPEC	Setting value exceeds the allowable low limit.
	HIGH OVER CNT RATE	Counting rate exceeds the allowable high limit.
	LOW OVER CNT RATE	Counting rate exceeds the allowable low limit.
	MULTI RNG ERROR	Span is not appropriate for multi-range configuration.
Limit alarms	HIGH ALARM	Flow rate reading exceeds the high limit.
	HIGH HIGH ALARM	Flow rate reading exceeds the high high limit.
	LOW ALARM	Flow rate reading goes below the low limit.
	LOW LOW ALARM	Flow rate reading goes below the low low limit.
	OVER 125%	Measurement value exceeds the 125%
	UNDER -125%	Measurement value goes below the 125%
Empty pipe alarm	EMPTY ALARM	Detector pipe is not filled with fluid.