



# FLOW METERS

## POSITIVE DISPLACEMENT TYPE

# 624

## SERIES

### FEATURES

- HIGH ACCURACY & RELIABILITY
- EASY INSTALLATION & MAINTENANCE
- SUITABLE FOR HIGH VISCOSITY FLUIDS
- LARGE REGISTER CAN BE READ EASILY
- REMOTE SIGNAL TRANSMITTER CAN BE ADDED
- RIGID CONSTRUCTION TO PROVIDE DURABILITY

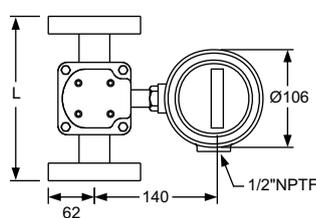


### SPECIFICATIONS

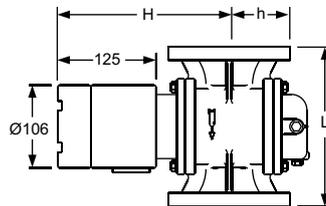
ITEM \ MODEL		624A	624B	624C
METER SIZE		15A ~40A ( 1/2"~1-1/2" )	25A ~100A( 1"~4" )	15A ~50A( 1/2"~2" )
ELEMENT SHAPE		Over gear	Roots	Turbine
REGISTER	FLOW RATE	5 digits LCD display , 8.9mm <sup>H</sup> ( 0.35" )		
	TOTALIZER	8 digits LCD display , 5.0mm <sup>H</sup> ( 0.2" )		
RESET DEVICE		By key of front panel ( standard ) or reset bar from housing side		
POWER OF DISPLAY		With 2 pairs lithium battery ( 3.6V ) , able to continuously operate for 5 years. Battery should be replaced within 15 days after the occurrence of low battery warning		
ACCURACY		±0.5% for standard , ±0.2% is available if special specified		
FLUID TEMPERATURE		-10 to 80°C for standard , -30 to 300°C for special version		
FLUID PRESSURE		10 kg/cm <sup>2</sup> for standard , 20 kg/cm <sup>2</sup> max. for special version		
FLUID VISCOSITY		0.2~30,000 cPs		Less than 10 cPs
ELECTRIC HOUSING ( Optional version )		Material : Low copper aluminum alloy with polyester epoxy painted Cable entry : 1/2"NPT ( F ) Enclosure class : IP66 or Explosion-proof Exd II B T4 IP68 ( Option )		

### DIMENSIONS ( mm )

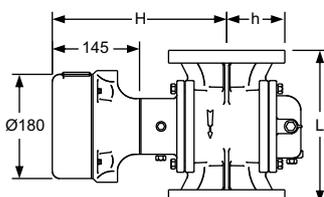
#### 624A



#### 624B



#### 624C

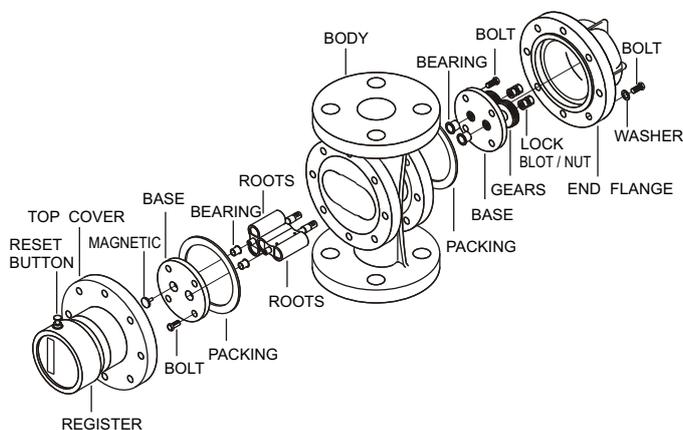


CODE	CONN. SIZE	L-LENGTH OF 624A			624B / C		
		Thread	ANSI FF	JIS FF	L	H	h
015	15A	114	140	170			
L15	15A	165	203	170			
020	20A	165	203	170	175	220	72
L20	20A	165	203	170	200	237	78
025	25A	198	254	200	200	210	78
L25	25A		280	200	200	210	78
040	40A		280	200	200	210	78
L40	40A				250	235	105
050	50A				250	235	105
L50	50A				320	275	144
080	80A				320	275	144
L80	80A				320	275	144
100	100A				320	275	144
L100	100A				430	350	260
150	150A				450	395	260

## MODEL SELECTIONS

ITEM	CODE	SPECIFICATIONS				
① MODEL	624A	OVER GEAR TYPE FLOWMETER				
	624B	ROOTS TYPE FLOWMETER				
	624C	TURBINE TYPE FLOWMETER				
	624D	OEM VERSION				
② RESET DEVICE	-0	Standard				
	-1	With reset bar				
	-2	Specially specified				
③ MATERIAL	CODE	BODY	ELEMENT	INNER HOUSING		
	0	FC200 (A126)	Bronze (BC)	Bronze (BC)		
	1	SCS13 (A351 CF8)	PPS resin	SCS13 (A351 CF8)		
	2	SCS14 (A351 CF8M)	SCS14 (A351 CF8M)	SCS14 (A351 CF8M)		
	3	Specially specified				
④ CONNECTION	0	ANSI 150# Flange				
	1	JIS 10K Flange				
	2	Specially specified				
⑤ FLUID TEMPERATURE	-A	80°C Max.	-C	200°C Max.		
	-B	120°C Max.	-D	Specially specified		
⑥ TRACING JACKET	A	Not required				
	B	Required				
⑦ OUTPUT SIGNAL	A	Not required	D	Pulse output & 4~20mA DC, 2-wire system		
	B	Pulse output	E	4~20mA + HART Protocol		
	C	4~20mA DC, 2-wire system	F	Specially specified		
⑧ ELECTRICAL PROTECTION / ENCLOSURE CLASS	A	General purpose / IP66				
	B	Eex ia IIC T6 / IP66				
	C	Specially specified				
⑨ METER SIZE / FLOW RANGE	CODE	SIZE	MAX. FLOW RANGE	CODE	SIZE	MAX. FLOW RANGE
	-015	15A (1/2")	0.7 M <sup>3</sup> /H	-L50 -080	80A (3")	24 M <sup>3</sup> /H
	-L15 -020	20A (3/4")	1.3 M <sup>3</sup> /H	-L80	80A (3")	50 M <sup>3</sup> /H
	-L20 -025	25A (1")	3.5 M <sup>3</sup> /H	-100	100A (4")	50 M <sup>3</sup> /H
	-L25 -040	40A (1-1/2")	5.5 M <sup>3</sup> /H	-L100 -150	100A (4")	120 M <sup>3</sup> /H
	-L40 -050	50A (2")	15 M <sup>3</sup> /H	-XXX	Specially specified	

## STRUCTURE / COMPONENT PARTS



## COUNTING UNIT

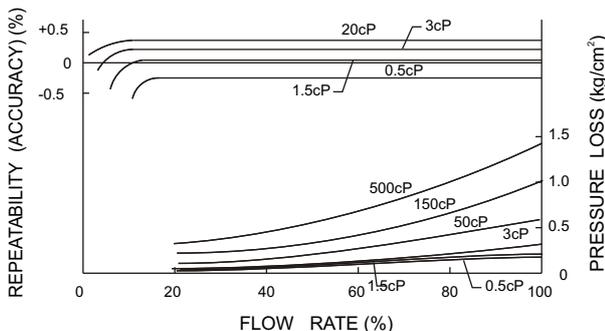
MODEL	CONN. SIZE	RESETTING COUNTER DEVICE		PULSE OUTPUT
		Minimum Unit	Maximum Unit	
624A	15A / 20A	0.1 l	999999.9 l	0.1 l / Pulse
624B	20A / 25A	0.1 l	999999.9 l	0.1 l / Pulse
624C	20A / 25A	0.1 l	9999.9 l x 10 l	0.1 l / Pulse
624B	40 ~ 150A	1 l	9999999 l	1 l / Pulse
624C	40 ~ 150A	1 l	99999 l x 10 l	1 l / Pulse

MODEL	CONN. SIZE	TOTALIZING COUNTER		OPTIONAL
		Minimum Unit	Maximum capacity	
624A	15A / 20A	0.1 l	999999.9 l	0.01 l
624B	20A / 25A	0.1 l	999999.9 l	0.01 l
624C	20A / 25A	0.1 l	999999.9 l x 10 l	0.01 l
624B	40 ~ 150A	1 l	9999999 l	0.1 l
624C	40 ~ 150A	1 l	9999999 l x 10 l	0.1 l

## METER SIZE / FLOW RANGE SELECTIONS (m<sup>3</sup>/H)

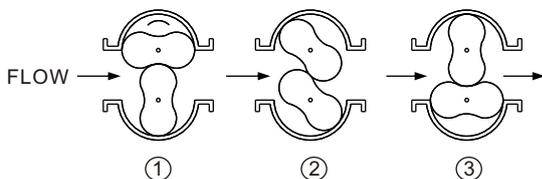
CODE	CONN. SIZE	OPERATING CONDITION	WATER		OTHER LIQUIDS					
			80°C max.	80~120°C	0.5 cP~	2 cP~	5 cP~	50cP~	500cP~	~2000cP
015	15A	Continuous	0.01~0.7	0.01~0.6	0.01~0.7	0.01~0.7	0.01~0.7	0.01~0.7	0.01~0.7	0.01~0.7
		Intermittent	0.01~0.8	0.01~0.7	0.01~0.8	0.01~0.8	0.01~0.8	0.01~0.8	0.01~0.8	0.01~0.8
		Maximum	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8
L15 020	15A 20A	Continuous	0.02~1.3	0.02~1.2	0.02~1.3	0.02~1.3	0.02~1.3	0.02~1.3	0.02~1.3	0.02~1.3
		Intermittent	0.02~1.4	0.02~1.3	0.02~1.4	0.02~1.4	0.02~1.4	0.02~1.4	0.02~1.4	0.02~1.4
		Maximum	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.4
L20 025	20A 25A	Continuous	0.05~3.5	0.05~3.0	0.05~4.0	0.05~4.0	0.05~4.0	0.05~4.0	0.05~4.0	0.05~3.5
		Intermittent	0.05~4.0	0.05~3.5	0.05~4.5	0.05~4.5	0.05~4.0	0.05~4.0	0.05~4.0	0.05~4.0
		Maximum	4.0	3.5	4.5	4.5	4.2	4.2	4.2	4.0
L25 040	25A 40A	Continuous	0.1~5.5	0.1~5.0	0.1~5.5	0.1~5.5	0.1~5.5	0.1~5.5	0.1~5.5	0.1~5.5
		Intermittent	0.1~6.5	0.1~5.5	0.1~6.5	0.1~6.5	0.1~6.5	0.1~6.5	0.1~6.0	0.1~6.0
		Maximum	7.0	6.5	7.0	7.0	7.0	6.5	6.0	6.0
L40 050	40A 50A	Continuous	1.5~7.5	2.0~6.0	2.0~10	1.5~16.5	0.8~16.5	0.3~16.5	0.025~16.0	0.02~15.0
		Intermittent	1.5~9.0	2.0~7.5	2.0~13	1.5~18	0.8~18	0.3~18	0.025~18.0	0.02~17.0
		Maximum	10.0	9.0	15	18	18	18	18	17
L50 080	50A 80A	Continuous	3.5~15	5.0~10	5.0~20	3.5~25	1.8~25	0.3~25	0.05~25	0.05~24
		Intermittent	3.5~20	5.0~17	5.0~25	3.5~30	1.8~30	0.3~30	0.05~30	0.05~28
		Maximum	20.0	20.0	28	30	30	30	30	28
L80 100	80A 100A	Continuous	5~28	8~22	8~40	5~55	2.5~55	0.5~52	0.15~52	0.15~50
		Intermittent	5~35	8~28	8~50	5~57	2.5~57	0.5~57	0.15~57	0.15~55
		Maximum	40.0	35	55	57	57	57	57	55
L100 150	150A	Continuous	12~120	16~100	15~120	12~120	8~120	2~120	0.5~120	0.5~120
		Intermittent	12~125	16~110	15~125	12~130	8~130	2~128	0.5~125	0.5~125
		Maximum	125	110	125	130	130	130	130	125

## PRESSURE LOSS



## OPERATING PRINCIPLE

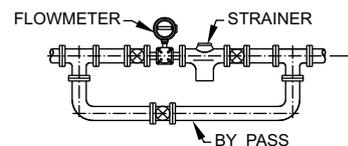
The fluid that runs into the meter pushes the upper rotor to rotate clockwise. The lower rotor in ①, is simultaneously driven counterclockwise, as the changes in ② and ③.



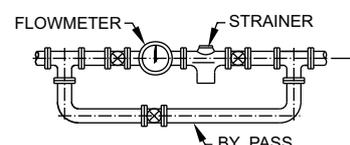
## PIPING AND INSTALLATION

1. Make sure to prevent foreign particles from entering the flowmeter while installing in case of flowmeter breakdown.
2. Newly installed pipes need to be washed out thoroughly by letting same liquid pass through before fitting the flowmeter.
3. While installing, any factors which may distort the body has to be avoided. Carefully fit the flowmeter in the correct direction.
4. Install the strainer directly to the upstream of the flowmeter as picture illustrated at right hand side.
5. Be sure to operate flowmeter within the range of flow, pressure and temperature indicated on the plate.
6. When installing the flowmeter on horizontal pipe, the display register should be on the top of the flowmeter's body for type 624A. For type 624B / C, the display window should be on the side of the flowmeter's body.

### ● FOR 624A / C



### ● FOR 624B



## UNIVERSAL TRANSMITTER

### LCD DISPLAY

<b>Rate display</b>	5 Digits (99999), 9mm <sup>H</sup> (0.35")
<b>Totalizer display</b>	8 Digits (99999999), 5mm <sup>H</sup> (0.2")
<b>Display updated</b>	2 sec/cycle for rate 1 count/cycle for totalizer
<b>Decimal setting</b>	selectable from keys
<b>Measure unit</b>	/sec, /min, /HR for rate GAL, LIT, Ft3, M3 for totalizer
<b>Accuracy</b>	0.01%±1 digit
<b>Temp. drift</b>	≤50 ppm/°C
<b>Power source</b>	Lithium battery
<b>Warning</b>	BAT displayed while low battery

### PULSE OUTPUT FOR FLOW ACCUMULATION

<b>Signal form</b>	Opto-isolated open collector
<b>Off state</b>	30VDC max.
<b>On state</b>	0.1mA @1.0V drop. 5mA @1.4V drop.
<b>Pulse duration</b>	32msec
<b>Output rate</b>	8 CPS max.
<b>Output divided</b>	0, 1, 0.1, 0.01 selectable from keys
<b>Field display</b>	When the output divided is "0", the converter is only for display
<b>K-factor</b>	0.001 ~ 999.999 selectable from keys

### CURRENT OUTPUT FOR RATE TRANSMISSION

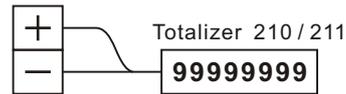
<b>Signal form</b>	4 ~ 20mADC, 2 wire system
<b>Resistance load</b>	700Ω st 24VDC
<b>Power supply</b>	8.5V ~ 30VDC (External loop powered)
<b>Accuracy</b>	±0.15% F.S.
<b>Temp. drift</b>	50 ~ 200ppm/°C
<b>Error prevent</b>	Reverse polarity protected

## SMART TRANSMITTER (WITH HART PROTOCOL)

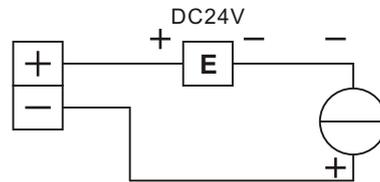
<b>Display / Programmer.....</b>	8 × 1 Character LCD indicator for programming and display of input/output parameters and status (K-option).
<b>Digital Resolution.....</b>	>17 dits
<b>Outputs.....</b>	4 ~ 20mA isolated current loop, standard. With HART Protocol communication
<b>Maximum Load.....</b>	$R_{max} = (V_{supply} - 12) / 20mA$
<b>Analog Output Resolution...</b>	0.025% of span ( $\pm 4 \mu A$ )
<b>Analog Output Linearity.....</b>	±0.025% of span (for D/A)
<b>Supply.....</b>	12 - 40 VDC (@ no load) Reverse polarity protected
<b>Supply Voltage Effect.....</b>	< ±0.001% per Volt
<b>Trigger Sensitivity.....</b>	30 mV
<b>Over Voltage Protection.....</b>	300 VDC
<b>Isolation.....</b>	Input/Output: 800 VDC or peak AC Terminals to case: 500 VDC or peak AC
<b>RFI/EMI Immunity.....</b>	Tested per SAMA PMC 33.1C from 20 to 1000 Mhz and for field strength up to 30 V/m (CE Marked)
<b>Long Term Stability.....</b>	Btter than ±0.01% of span for 6 months

## WIRING CONNECTIONS

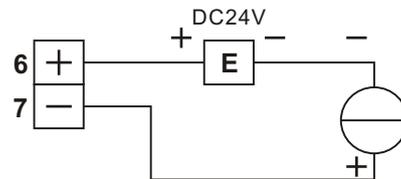
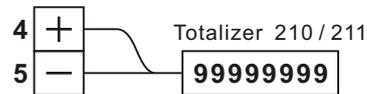
### PULSE OUTPUT (CODE : B)



### CURRENT OUTPUT (CODE : C)

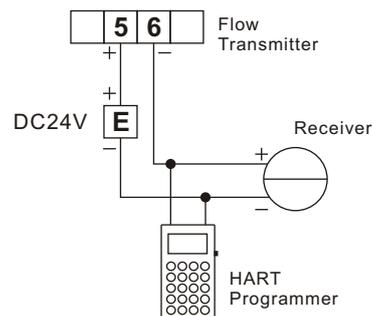


### PULSE OUTPUT & CURRENT OUTPUT (CODE : D)



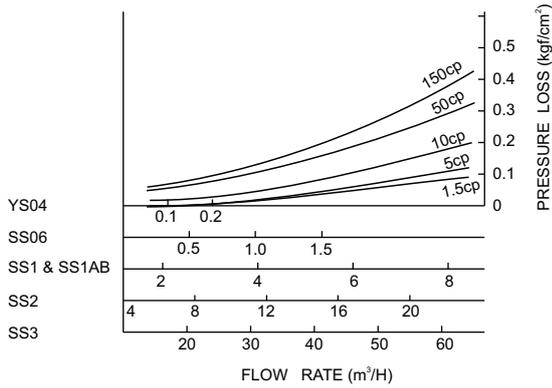
<b>Filter.....</b>	Damping : Programmable 0.0 tp 60.0 seconds Band : 0 to 99% (% range where damping is applied)
<b>Response Time.....</b>	Linear input : 0.5 second to 99% of reading (2 updates / second) Linearized input : <1 second to 99% of reading (>1 updates second)
<b>Turn-on Time.....</b>	Within 4 seconds to rated esponse
<b>Operating Conditions....</b>	-4°F to 150°F (-20°C to 70°C) 0 - 95% RH, non-condensing
<b>Storage Temperature.....</b>	-67°F to 257°F (-55°C to 125°C)

### WIRING CONNECTION (CODE : E)



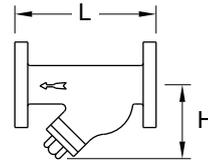
# STRAINER

## ■ PRESSURE DROP

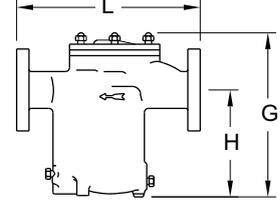


## ■ DIMENSIONS

### ● 060A



### ● 060B

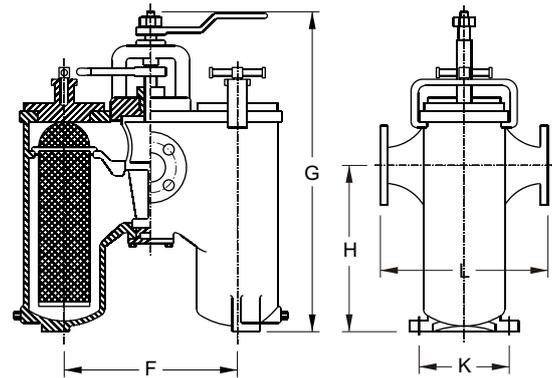


CODE	CONN. SIZE	060A		060B		
		L	H	L	H	G
015	15A	125	70			
020	20A			160	103	146
025	25A			212	130	180
040	40A			233	144	210
050	50A			260	178	260
065	65A			330	190	287
080	80A			350	250	350
100	100A			400	300	420
125	125A					

## ■ MODEL SELECTIONS

ITEMS	CODE	SPECIFICATIONS
① MODEL	060A	Y-TYPE STRAINER
	060B	BUCKET TYPE STRAINER
	060C	DUPLEX STRAINER
	060D	O.E.M. VERSION
② MATERIAL OF BODY	-0	A126 (FC200)
	-1	A216 WCB (SCPH2)
	-2	A351 CF8 (SCS-13)
	-3	A351 CF8M (SCS-14)
	-4	Specially specified
③ MATERIAL OF SCREEN	0	304SS
	1	316SS
	2	Specially specified
④ CONNECTION	0	ANSI 150# Flange
	1	JIS 10K Flange
	2	Specially specified
⑤ MESH OF SCREEN	-A	40 mesh (greater than 10cP)
	-B	80 mesh (Less than 10cP)
	-C	Specially specified
⑥ TRACING JACKET	A	Not required
	B	Required
⑦ PAINTED	A	Standard
	B	Specially specified
⑧ CONNECTION SIZE	-015	15A
	-150	150A

### ● 060C



CODE	CONN. SIZE	060C				
		L	H	G	F	K
015	15A					
020	20A	205	115	285	190	120
025	25A	205	115	285	190	120
040	40A	240	150	465	260	140
050	50A	272	280	550	305	155
065	65A	277	294	580	320	160
080	80A	315	255	640	345	170
100	100A	400	370	880	430	200
125	125A	460	410	1000	475	275

## DOERS TECHNOLOGY CORPORATION

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