



# FLOW SENSOR 601

## HALL-EFFECT / INSERTED ROTOR TYPE

### FEATURES

- FREE FLOW DIRECTION
- ANTICORROSIVE MATERIALS
- EASY INSTALLATION & MAINTENANCE
- LINEAR OUTPUT & NO PRESSURE DROP
- SAFE , RIGID CONSTRUCTION
- HIGH ACCURACY & RELIABILITY



### GENERAL SPECIFICATIONS

<b>Output Frequency</b>	19Hz / M / Sec (0.3~6m/sec) 49Hz / M / Sec (0.1~6m/sen)	<b>Fluid Temperature</b>	105°C max.
<b>Output Signal</b>	Open collector , Sinking	<b>Ambient Temperature</b>	0~60°C , 90%RH max.
<b>Measuring Range</b>	0.3 to 6m/Sec~0.1 to 6m/Sec	<b>Enclosure</b>	IP67 Encapsulation
<b>Exciting Power</b>	3.5 to 24V DC	<b>Electric Protection</b>	Ex ia IIC T6
<b>Supply Current</b>	1 ~ 6mA (3.5~24V)	<b>Standard Materials</b>	Sensor Body / PP
<b>Output Current</b>	25mA max.		Rotor / PP
<b>Repeatability</b>	±0.5% FS (0.3 to 6m/Sec)		Shaft / 316SS
<b>Linearity</b>	±0.5% (0.3 to 6m/Sec)		Bearing / Ceramic
			O-Ring / EPDM

### MODEL & DIFFERENTIATION

Table 1

MODEL	SPECIFICATIONS	MODEL	SPECIFICATIONS
<p><b>601A</b></p>	Fitting Conn. : White grey Coupling, 1-1/2"PS Operating Pressure : 1.0MPa max. Lead Cable : 24AWG , 8 metres or specified Conduit Connection : ●M12 with Cable Gland & Strain relief ●M20 or ½" NPT(F) for optional Materials : Sensor Head / POM Sensor Coupler / Polypropylene or options Lead Cable / CVVS Enclosure : IP67	<p><b>601D</b></p>	Fitting Conn. : White grey Coupling, 1-1/2"PS Operating Pressure : 1.0MPa max. Cable Entry : ½" NPT(F) or specified Materials : Electric Housing / ADC-12 with anticorrosive painted Sensor Head / 304SS (1.4301) Sensor Coupler / Polypropylene or options Enclosure : Exd IIB T4 , IP67
<p><b>601B</b></p>	Fitting Conn. : White grey Coupling, 1-1/2"PS Operating Pressure : 1.0MPa max. Cable Entry : Connector, DIN 43650 , A / ISO 4400 PG9 or ½" NPT(F) for optional Materials : Sensor Head / POM Sensor Coupler / Polypropylene or options Lead Cable / CVVS Enclosure : IP67	<p><b>601E</b></p>	Fitting Connection : 50mm Square Flange, M8 Screws Operating Pressure : 1.6MPa max. Cable Entry : ½" NPT(F) or specified Materials : Electric Housing / ADC-12 with anticorrosive painted Flange And Head / 304SS (1.4301) or specified Enclosure : IP67
<p><b>601C</b></p>	Fitting Conn. : White grey Coupling, 1-1/2"PS Operating Pressure : 1.0MPa max. Cable Entry : ½" NPT(F) or specified Materials : Electric Housing / ADC-12 with anticorrosive painted Sensor Head / 304SS (1.4301) Sensor Coupler / Polypropylene or options Enclosure : IP67	<p><b>601F</b></p>	Fitting Connection : 50mm Square Flange, M8 Screws Operating Pressure : 1.6MPa max. Cable Entry : ½" NPT(F) or specified Materials : Electric Housing / ADC-12 with anticorrosive painted Flange And Head / 304SS (1.4301) or specified Enclosure : Exd IIB T4 , IP67

## MODEL SELECTION FOR SENSORS

Table 2

ITEMS	CODE	SPECIFICATIONS
① MODEL	601A 601F	See Table 1
	601G	OEM Versions
② SUITABLE PIPELINE	-0	15A~150A(1/2"~6")
	-1	125A~300A(5"~12")
	-2	250A~600A(10"~24")
	-3	To be specified
③ FLOW VELOCITY DESIGNED	0	0.3 to 6 m/Sec ( Standard )
	1	0.1 to 6 m/Sec
	2	0.2 to 6 m/Sec
	3	To be specified
④ SENSOR COUPLER	0	Not required
	1	1 1/2" PS / 50 Flange / ( St'd )
	2	1 1/4" NPSM / 6153 Flange
	3	Special specified
⑤ MATERIAL OF SENSOR BODY	-A	Polypropylene ( Standard )
	-B	PVDF
	-C	316SS (1.4571)
	-D	To be specified
⑥ ROTOR MATERIAL	A	Polypropylene ( Standard )
	B	PVDF
	C	To be specified
⑦ SHAFT MATERIAL	A	316SS (1.4571) ( Standard )
	B	Ceramic
	C	PVDF
	D	Titanium
	E	Hastelloy-C
	F	To be specified
⑧ O-RING MATERIAL	A	EPDM ( Standard )
	B	Viton
	C	To be specified

## SENSOR DIMENSIONS

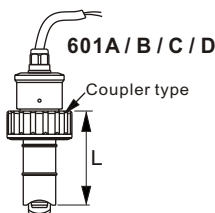


Table 3

CODE	SUITABLE PIPELINE	L-LENGTH
0	15A~150A(1/2"~6")	80 mm
1	125A~300A(5"~12")	110 mm
2	250A~600A(10"~24")	190 mm

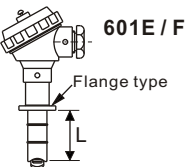
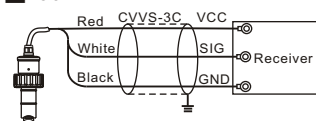


Table 4

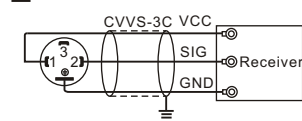
CODE	SUITABLE PIPELINE	L-LENGTH
0	15A~150A(1/2"~6")	70 mm
1	125A~300A(5"~12")	100 mm
2	250A~600A(10"~24")	180 mm

## WIRING CONNECTIONS

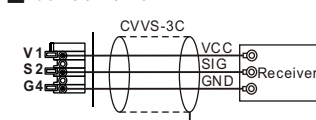
### 601A



### 601B



### 601C/D/E/F



P/N:CG1-1-1809 of 601 series

## MODEL SELECTION FOR FITTINGS

Table 5

ITEMS	CODE	SPECIFICATIONS		
① MODEL (See table 6)	090A }	WELDOLETS HOLDER }		
	093C	SADDLE OF STRAP-ON TYPE		
② COUPLER OF SENSOR	-0	1 1/2" PS Thread		
	-1	1 1/4" NPSM		
	-2	Square flange ( 50mm )		
	-3	Oblong flange ( 61mm x 53mm )		
	-4	To be specified		
③ MATERIAL	CODE	090A ; 093A 091A / B / C / D	090B/C/D ; 093B/C 092A / B / C / D	
	0	UPVC ( 5°C ~ 50°C )	304SS ( -20°C ~ +120°C )	
	1	CPVC ( 0°C ~ 90°C )	316SS ( -20°C ~ +120°C )	
	2	PP ( 0°C ~ 80°C )	304SS / UPVC ( For 090C )	
	3	PVDF ( -20°C ~ +120°C )	FC200 / PP ( For 094C )	
4	To be specified			
④ OPERATING PRESSURE	0	≤0.6M Pa ( 6barG / 6kg/cm <sup>2</sup> G / 85PSIG )		
	1	≤1.0M Pa ( 10barG / 10kg/cm <sup>2</sup> G / 140PSIG )		
	2	To be specified		
⑤ PROCESS CONNECTION	CODE	090A / B / C / D 091A / B ; 092A 093A / B / C	091C 092B	091D 092C/D
	-A	SCH20	NPT	ANSI 150# Flange
	-B	SCH40	PT(Rc)	JIS 10K Flange
	-C	SCH80	PS(G)	Sanitary for 093C
	-D	To be specified		
⑥ INSTALLATION LENGTH	A	Standard		
	B	To be specified		
⑦ EXTRA TREATMENT	A	Not required ( For General purpose )		
	B	High purity cleaning ( HPC )		
	C	Electro-polishing ( EP ) ( For metallic )		
	D	Special finished ( Painting or coating )		
	S	To be specified		
⑧ PIPE SIZE ( See page 3 )	-015 }	15A ( 1/2" ) }		
	-300	300A ( 12" ) ( As dimensions table )		
	-XXX	To be specified		

## MAIN SPECIFICATIONS ( Quick View )

Table 6

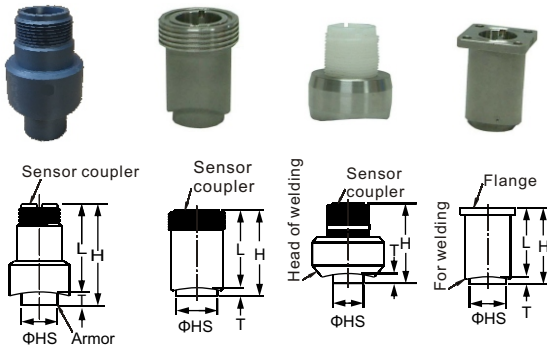
MODEL	MAIN TYPE (CONNECTION)	COUPLER	MATERIAL	PIPE SIZE	
090	A	1 1/2" PS	UPVC / CPVC / PP / PVDF	80A ( 1 1/2" )	
	B		304 SS / 316 SS	}	
	C	1 1/4" NPS	Metallic w/ PVC / PVDF		600A ( 24" )
	D		Square / Oblong flange	304 SS / 316 SS	
091	A	Pipe socket	UPVC / CPVC PP / PVDF	15A ( 1/2" )	
	B	Socket union		}	
	C	Thread union			100A ( 4" )
	D	Flange			
092	A	Socket	304 SS / 316 SS or Special Specified	15A ( 1/2" ) ~	
	B	Thread		40A ( 1 1/2" )	
	C	Sanitary		15A ( 1/2" ) ~	
	D	Flange		300A ( 12" )	
093	A	Clip-on	UPVC w/ holder	80A ( 1 1/2" ) ~	
	B	Glue-on	Fiber glass	300A ( 12" )	
	C	Strap-on	FC200 w/ holder		

# FITTINGS OF SENSOR

(mm)

## 090 SERIES (Holder for weldolets / thread olets)

090A (PVC/PVDF)    090B (304SS / 316 SS)    090C (Hybrid)    090D (304SS / 316 SS)



## DIMENSIONS OF 090 SERIES

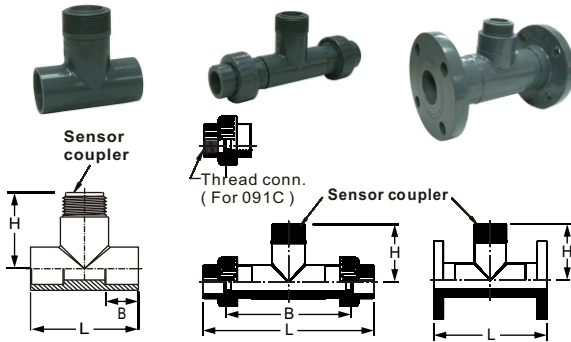
Table 7

CODE OF SENSOR	SUITABLE	090A	090B	090C	090D	
0	15A (1/2")	2"~2.5"	38	34	38	
	150A (6")	3"~24"	38	38	34	
		H	68	69	69	69
1	125A (5")	T	Depending on pipe size and schedule			
		H	102	102	102	102
	300A (12")	T	Depending on pipe size and schedule			
2	250A (10")	ØHS	38	38	38	38
		H	178	178	178	178
	600A (24")	T	Depending on pipe size and schedule			

Note: ① We accept customized orders that match any particular requirements.  
② ØHS = Hole-saw dimensions

## 091 SERIES (Nonmetallic Fitting)

091A    091B / C    091D



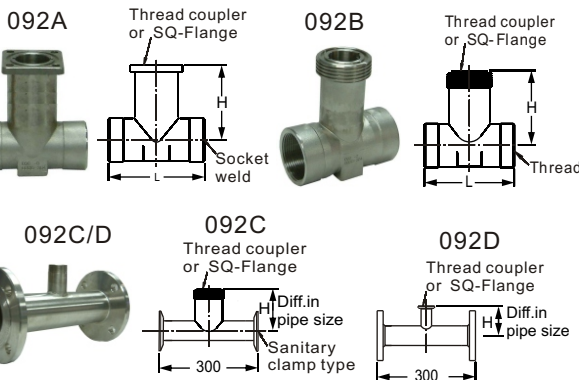
## DIMENSIONS OF 091 SERIES (UPVC/CPVC)

Table 8

CODE	SIZE	091A			091B/C			091D		
		L	B	H	L	B	H	L		H
015	15A(1/2")	120	23	76	230	186	76	ANSI 150#	JIS 10K	H
020	20A(3/4")	120	27	77	250	200	77	175	195	76
025	25A(1")	103	30	80	245	189	80	182	205	77
032	32A(1 1/4")	115	34	82	290	227	82	172	200	80
040	40A(1 1/2")	128	37	85	330	261	85	190	220	82
050	50A(2")	146	41	88	340	264	88	210	255	85
065	65A(2 1/2")	171	47	96	400	312	96	235	290	88
080	80A(3")	197	50	100	450	355	100	270	315	96
100	100A(4")	237	60	120	560	446	120	305	350	100
								365	430	120

Note : Tolerance ± 2mm

## 092 SERIES (metallic Fitting / Flow Tube)



## DIMENSIONS OF 092A/B

Table 9    Table 10

CODE	015	020	025	032	040	CODE	015 ~ 300
PIPE SIZE	15A (1/2")	20A (3/4")	25A (1")	32A (1 1/4")	40A (1 1/2")	PIPE SIZE	15A 300A (1/2") ~ (12")
L	92	92	92	104	104	L	300
H	74	78	80	84	88	H	Diff. in pipe size

Note: ① The material of standards are 304SS / 316SS.  
② We accept orders that match your request for special installation length and material.

## 093 SERIES ( Saddles version )

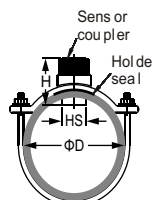
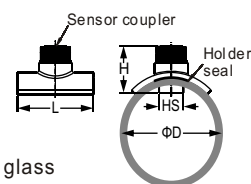
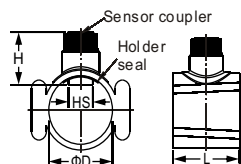
093A (Clip-on type)



093B (Glue-on type)



093C (Strap-on type)



## DIMENSIONS OF 093 SERIES

Table 11

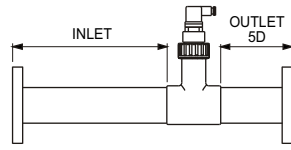
CODE	PIPE SIZE	093A(PN10)			093B(SCH80)			093C (SCH40)	
		ØD	L	HS	ØD	L	HS	ØD	HS
080	80A (3")	90	105	38	88.9	150	38	89.1	38
100	100A (4")	110	105	38	114.3	200	38	114.3	38
150	150A (6")	160	120	38	168.3	200	38	165.2	38
200	200A (8")	200	120	38	219.1	250	38	216.3	38
225	225A (9")	225	120	38	—	—	—	—	—
250	250A (10")				273.1	300	38	267.4	38
300	300A (12")				323.9	300	38	318.5	38

Legend : ØD = Pipe O.D.  
HS = Size of hole saw

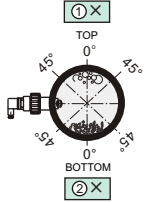
## PIPING / INSTALLATION

### HOW TO LOCATE THE SENSOR

OBSTACLE OF INLET	INLET LENGTH OF STRAIGHT PIPE
FLANGE / SOCKET	10D
REDUCER	15D
BUTTERFLY / BALL VALVE	15D
ELBOW / TEE	20D
PUMP / GLOBE / GATE VALE	50D



### THE COUNTERPLOT FOR HORIZONTAL PIPING

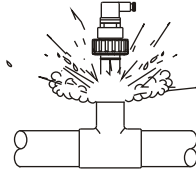


The sensor is unsuitable to installed vertically (0°) When ① bubbles occur at the top of horizontal piping, or ② presence of sediments at the bottom of the pipe, Therefore, it must be installed at  $\pm 45^\circ \angle$ .

## TROUBLESHOOTING

### PULL OUT THE FLOW SENSOR

When the flow sensor is pulled out for cleaning or replacement the line pressure and service conditions must be carefully checked beforehand. In order to protect the operator and to ensure industrial safety, it is strongly recommended to stop the machines operation while doing cleaning and replacement.



### TO INSERT THE FLOW SENSOR

The flow sensor has a convexity which connects the concave side of fitting. The convexity has to be inserted or pulled out straight without swaying. Also the convexity must meet the fitting closely to join the sensor coupling tightly.

## PLUG OF SENSOR FITTINGS

ITEMS	CODE	SPECIFICATIONS
① MAIN TYPE	CM5-1LA	Plug without pull ring
	CM5-1LB	Plug with pull ring
	CM5-1LC	To be specified
② COUPLING	-0	1-1/2" PS
	-1	1-1/4" PS
	-2	To be specified
③ MATERIAL OF BODY	A	PP
	B	PVDF
	C	316SS
	D	To be specified
④ O-RING	A	NBR / EPDM
	B	Viton
	C	To be specified
⑤ OPTIONAL	A	Not required
	B	To be specified

#### CM5-1LA



#### CM5-1LB (With pull ring)



## K-FACTOR vs. FLOW RANGE

### STAINLESS STEEL PIPE SCH 20

PIPE SIZE	Pipeline (mm)		K-Factor For Liter	Optimum flow rate (L/min)		
	INCH	O.D. Thick		min.	Nor. (1 ~ 3m/sec)	Max. (Span)
1/2"	21.7	2.5	86.742066	6.5	10 ~ 40	50
3/4"	27.7	2.5	46.947340	12	20 ~ 75	100
1"	34	3	30.856498	15	30 ~ 110	150
1-1/4"	42.7	3	17.961003	30	60 ~ 190	250
1-1/2"	48.6	3	13.330410	40	80 ~ 250	340
2"	60.5	3.5	8.451915	60	130 ~ 400	540
2-1/2"	76.3	3.5	5.037282	100	200 ~ 700	900
3"	89.1	4	3.678079	150	300 ~ 900	1200
4"	114.3	4	2.140899	260	530 ~ 1600	2100
5"	139.8	5	1.435864	390	700 ~ 2400	3200
6"	165.2	5	1.004337	560	1100 ~ 3400	4500
8"	216.3	6.5	0.585313	970	1900 ~ 5800	7800

### PVC PIPE SCH40

PIPE SIZE	Pipeline (mm)		K-Factor For Liter	Optimum flow rate (L/min)		
	INCH	O.D. Thick		min.	Nor. (1 ~ 3m/sec)	Max. (Span)
1/2"	21.3	2.77	97.398054	6.0	11 ~ 35	50
3/4"	26.7	2.87	55.065571	10	20 ~ 65	80
1"	33.4	3.38	34.087430	16	33 ~ 100	130
1-1/4"	42.2	3.56	19.658190	28	55 ~ 175	230
1-1/2"	48.3	3.68	14.433346	39	78 ~ 240	320
2"	60.3	3.91	8.783651	60	120 ~ 390	520
2-1/2"	73	5.16	6.157504	90	180 ~ 550	740
3"	88.9	5.49	3.984471	140	280 ~ 860	1150
4"	114.3	6.02	2.313402	240	490 ~ 1500	1970
6"	168.3	7.11	1.018991	550	1100 ~ 3400	4500
8"	219.1	8.18	0.588551	960	1900 ~ 5800	7800

### PVC PIPE SCH80

PIPE SIZE	Pipeline (mm)		K-Factor For Liter	Optimum flow rate (L/min)		
	INCH	O.D. Thick		min.	Nor. (1 ~ 3m/sec)	Max. (Span)
1/2"	21.3	3.73	126.296270	4.5	9 ~ 27	36
3/4"	26.7	3.91	67.867011	8.0	16 ~ 50	70
1"	33.4	4.55	40.968509	13	27 ~ 85	110
1-1/4"	42.2	4.85	22.903190	24	49 ~ 150	200
1-1/2"	48.3	5.08	16.630348	34	68 ~ 210	280
2"	60.3	5.54	9.985722	57	110 ~ 340	460
2-1/2"	73	7.01	6.954296	80	160 ~ 500	660
3"	88.9	7.62	4.458608	125	250 ~ 800	1050
4"	114.3	8.56	2.561586	220	440 ~ 1350	1780
6"	168.3	10.97	1.129322	500	1000 ~ 3000	4000
8"	219.1	12.7	0.644768	880	1700 ~ 5300	7100

### PVDF-HP PIPE

PIPE SIZE	Pipeline (mm)		K-Factor For Liter	Optimum flow rate (L/min)		
	INCH	O.D. Thick		min.	Nor. (1 ~ 3m/sec)	Max. (Span)
1/2"	20	1.9	92.179145	6.0	12 ~ 37	50
3/4"	25	1.9	53.825861	10	20 ~ 65	85
1"	32	2.4	32.689279	17	34 ~ 105	140
1-1/4"	40	2.4	19.524386	29	58 ~ 175	240
1-1/2"	50	3	12.495607	45	90 ~ 280	370
2"	63	3	7.445828	75	150 ~ 460	620
2-1/2"	75	3.6	5.262636	105	210 ~ 650	900
3"	90	4.3	3.651017	155	310 ~ 940	1250
4"	110	5.3	2.448443	230	460 ~ 1400	1900

## DOERS TECHNOLOGY CORPORATION

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The specifications are subject to change without prior notice.



ISO 9001:2008

Registration No: QA080308

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