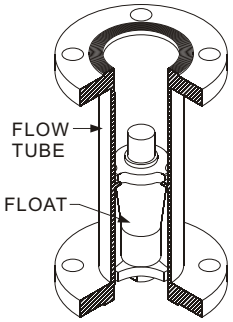
ARMORED FLOWMETERS 616 SERIES

Metallic Meter Tube / Variable Area Type

DOERS

FEATURES

- SUITABLE FOR LIQUIDS、STEAM OR GASES
- RIGID AND DURABLE BODY
- HIGH SAFETY AND RELIABILITY
- EASILY READABLE LARGE INDICATING SCALE
- AIR DAMPER OPTIONAL
- VARIOUS CONNECTIONS & FLOW DIRECTIONS OF YOUR CHOICES



GENERAL SPECIFICATIONS

■ **INDICATOR PORTION**

Scale length : 120 mm (arch)
Flowrate unit : M^3/H or specified
Metering range : 1 : 10
Accuracy : ±1.5% F.S.
Material :
Follower / 304SS
Housing / 304SS Frame & ABS cover
Sight window / Safety glass
Housing gasket / Buna-N
Damper : Discal / gas damper
Enclosure : IP65
Ambient temperature : -20 to +60°C

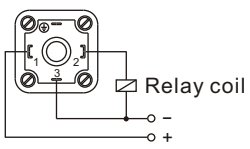
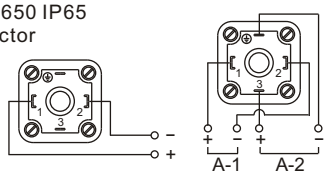
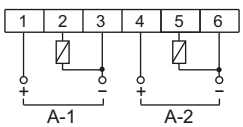
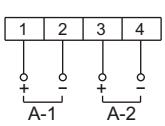
■ **METER TUBE PORTION**

Pressure rating :
≦10 kg/cm^2G (Standard)
≦100 kg/cm^2G (Options)
Operating temp. :
-20 to +120°C (Standard)
≦400°C (Options)
Material : 304SS , 316SS , 316LSS or PTFE lining

ALARM DEVICE

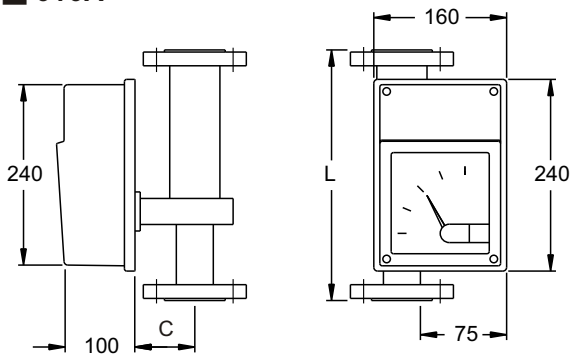
ITEMS	SPECIFICATIONS	
FUNCTION CODE	1	2
DETECTING MODE	Inductive Proximity Switch	
CONTACT FORM	Transistor PNP - NO	NAMUR (Monostable Proximity Switch)
POWER SUPPLY	10～30V DC	8V DC
OPERATING CURRENT	100mA max.	≦1mA at detecting ≧3mA at No-detecting
SWITCH FREQUENCY	2 KHz max.	3 KHz max.
ELECTRIC PROTECTION	With short-circuit & reverse-polarity protection.	PTB NO. Ex-83/ 2023X Eex ia ⅡC T6
EMC DESIGN & TESTING	According to EN 60947-5-2	According to EN 60947-5-2 & DIN EN 60947-5-6 (NAMUR)
ENCLOSURE CLASS	IP67	
SETTING RANGE	10～100% adjustable and 15% gap for H/L alarm	
ALARM SETTING	The switch with a screw can be set on the slot of scale	
AMBIENT TEMP.	-25～+70°C	
ACCESSORIES (OPTIONAL)	Relay unit	Safety Barrier KF DC/AC Power supply or MTL5011B / 5018 DC system (Prox input / Relay output)

WIRING CONNECTION FOR ALARM DEVICE

FUNCTION CODE		1	2
WIRING CONNECTION	**A-MODE** Note : This connector should be assembled at the back of meter housing	DIN43650 IP65 connector 	DIN43650 IP65 connector 
	B-MODE Note : This mode with a cable entry 1/2"NPT (F) placed at the back of meter houisng	Terminal Block , 6.3mm^W Barrier 	Terminal Block , 6.3mm^W Barrier 

DIMENSIONS

■ 616A

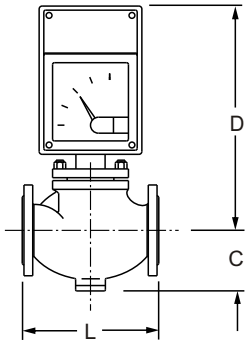


Options : Extended Follower (code item 6)

■ 616A

METER SIZE		WATER MAX.		Air @1 atm 0°C		⑤INSTALLATION
mm	inch	M^3/H	△P mmH_2O	NM^3/H	△P mmH_2O	L mm
15	1/2	2.0	650	30	1000	350
20	3/4	2.5	650	50	1000	350
25	1	4.0	700	100	1000	350
40	1-1/2	8.0	900	200	1000	350
50	2	15.0	600	400	1000	375
65	2-1/2	25.0	700	500	1000	375
80	3	40.0	900	800	1500	375
100	4	60.0	1100	1200	2000	375

■ 616B

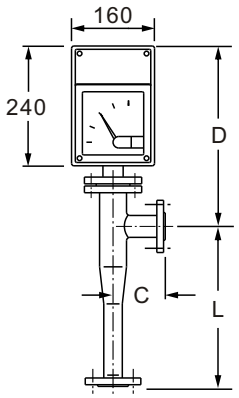


Options :
Extended follower
Cooling Fin (code item 6)

■ 616B

METER SIZE		WATER MAX.		Air @1 atm 0°C		⑤ INSTALLATION		
mm	inch	M^3/H	△P mmH_2O	NM^3/H	△P mmH_2O	L mm	C mm	D mm
15	1/2	1.5	800	18	1000	148	55	380
20	3/4	2.0	800	50	1000	148	55	380
25	1	4.0	900	100	1100	158	62	390
40	1-1/2	7.0	900	200	1200	198	75	400
50	2	15.0	1000	400	1400	228	85	420
65	2-1/2	25.0	1000	500	1500	288	118	430
80	3	35.0	1200	800	1700	320	135	450
100	4	60.0	1400	1200	2000	360	155	470

■ 616C

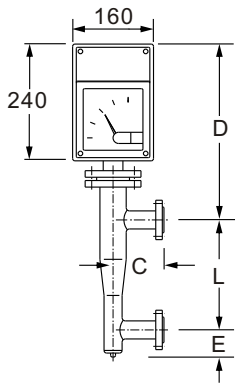


Options :
Extended Follower
Cooling Fin (code item 6)

■ 616C

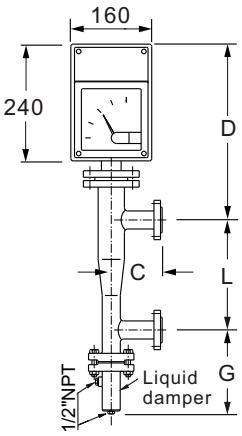
METER SIZE		WATER MAX.		Air @1 atm 0°C		⑤ INSTALLATION		
mm	inch	M^3/H	△P mmH_2O	NM^3/H	△P mmH_2O	L mm	C mm	D mm
15	1/2	2.0	600	30	400	250	100	350
20	3/4	2.5	600	50	400	250	100	350
25	1	4.0	700	80	400	250	100	380
40	1-1/2	8.0	700	130	400	250	130	400
50	2	15.0	800	300	400	250	130	400
65	2-1/2	25.0	800	600	500	350	150	400
80	3	40.0	1000	1000	500	350	180	420
100	4	70.0	1200	1800	600	350	180	420

■ 616D



Options : Extended follower
Cooling Fin
(code item 6)

■ 616E



Options : Extended follower
Cooling Fin
(code item 6)

■ 616D / E

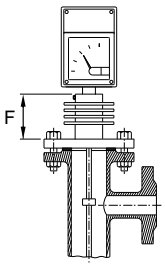
METER SIZE		STEAM @ 9Kg/cm^2G		Air @1 atm 0°C		⑤ INSTALLATION				
mm	inch	M^3/H	△P mmH_2O	NM^3/H	△P mmH_2O	L mm	C mm	D mm	E mm	G mm
15	1/2	30	800	30	600	250	100	350	45	190
20	3/4	40	900	50	600	250	100	350	45	190
25	1	60	1200	80	600	250	100	380	45	200
40	1-1/2	130	1300	130	600	250	130	400	55	210
50	2	250	1500	300	600	250	130	400	65	250
65	2-1/2	400	1700	600	700	350	150	400	75	250
80	3	600	1800	1000	700	350	180	420	90	260
100	4	1100	1800	1800	900	350	180	420	100	270

MODEL SELECTION

ITEMS	CODE	SPECIFICATIONS
① MODEL	616A	Bottom to top flow direction
	616B	Horizontal flow direction
	616C	Bottom to top side flow direction
	616D	Sideways flow direction
	616E	Sideways flow direction with liquid damper
	616F	OEM Versions
② ALARM DEVICE	—0	Not required (Indicator only)
	—1	Transistor PNP-NO output
	—2	NAMUR without safety barrier
	—3	NAMUR with DC safety barrier
	—4	NAMUR with AC safety barrier
	—5	To be specified
③ ALARM POINTS	0	Indicator without alarm device
	1	With 1 point alarm device
	2	With 2 points alarm device
	3	To be specified
④ CONNECTION	0	ANSI 150^{lb} Flange
	1	JIS 10K Flange
	2	DIN 2632 / 2633 Flange (PN10/16)
	3	To be specified
⑤ MATERIAL OF WETTED PARTS	0	304SS (1.4301)
	1	316SS (1.4571)
	2	316LSS
	3	PTFE Lining
	4	To be specified
⑥ INSTALLATION LENGTH	—A	Standard design
	—B	To be specified
⑦ OPTIONAL COOLING PARTS	A	Not required (-20 to +120℃)
	B	Extended follower (≦300℃)
	C	Cooling fin (≦400℃)
	D	To be specified
⑧ OPTIONAL JACKET PARTS	A	Not required
	B	Semi-Jacket
	C	Full Jacket
	D	To be specified
⑨ OPTIONAL ACCESSORIES	A	Not required
	B	Flow adjusting valve
	C	Magnetic filter
	D	To be specified
⑩ METER SIZE	—015	15mm ($1/_2$")
	≀	≀
	—100	100mm (4")
	—xxx	To be specified

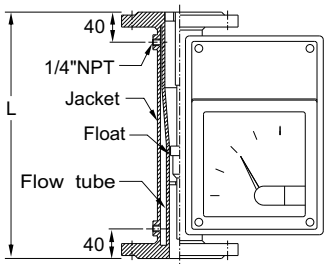
OPTIONAL

■ COOLING FIN

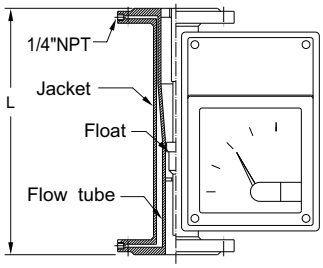


METER SIZE	F (mm)	
	≦250℃	≦400℃
15~25	50	70
40~65	80	100
80	90	110
100	100	120

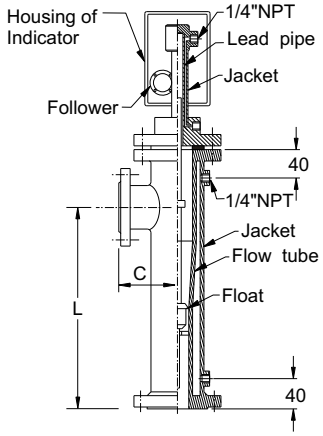
■ SEMI-JACKET



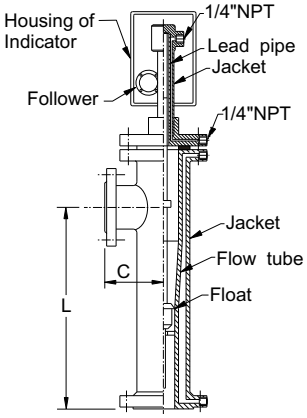
■ FULL JACKET



■ SEMI-JACKET (Back view)

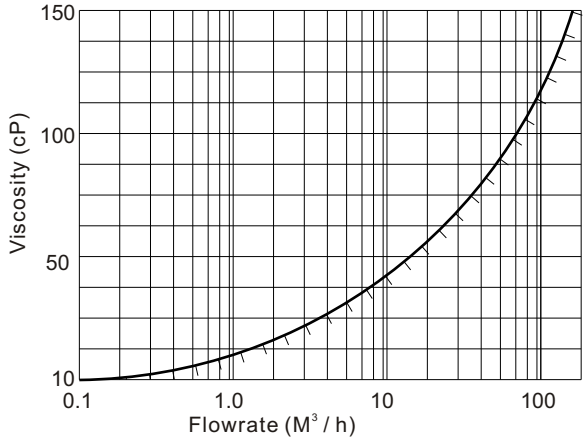


■ FULL JACKET (Back view)

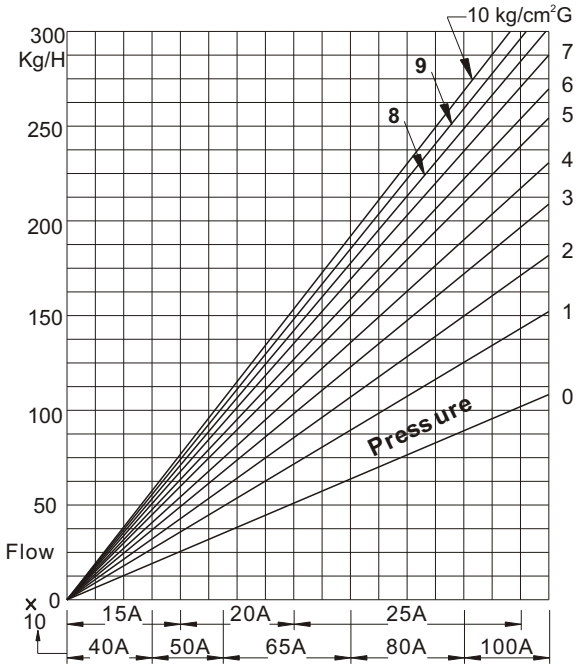


INSTRUCTIONS

■ SUITABLE RANGE FOR THE LIQUID VISCOSITY



■ PIPE SIZE OF STEAM FLOWS



■ GAS FLOW CALCULATION

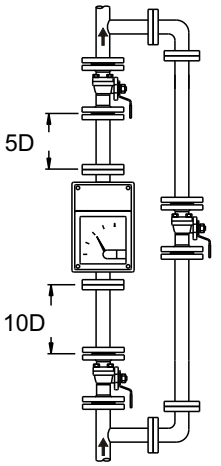
When the gas flowmeter is different from the ordered specifications , errors in measurement may occur. In this case , further calculation is necessary. The formula is as follows :

$$Qa = Qg \times \sqrt{\frac{\gamma}{1.293}} \times \sqrt{\frac{1.033}{(1.033+P)}} \times \sqrt{\frac{(273+t)}{273}}$$

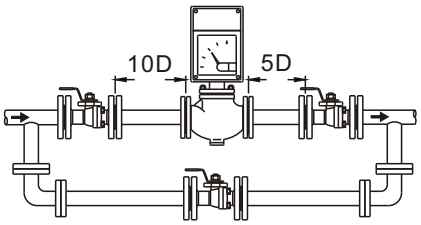
Qa : Air flowrate for converted result (M^3/H)
Qg : Flowrate of the gas to be metered (M^3/H)
γ : Density of the gas to be metered (kg/NM^3)
P : Operating pressure (kg/cm^2G)
t : Operating temperature (°C)

PIPELINE PLANNING

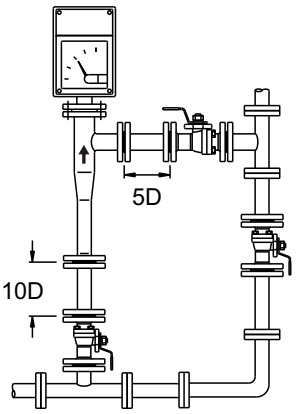
■ 616A



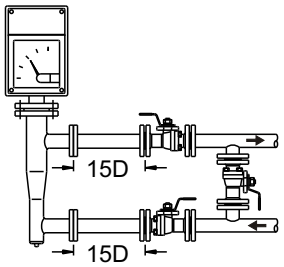
■ 616B



■ 616C



■ 616D



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