Yamatake-Honeywell

Specification

MagneW 3000
Electromagnetic Flowmeter Detectors (Remote Type)
Model KID15B (JIS Explosion-Proof)

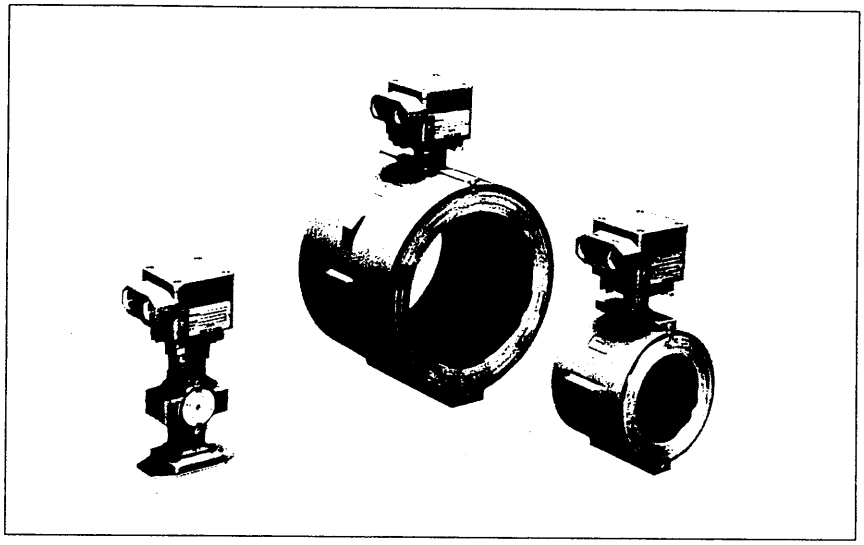
Introduction

The MagneW3000 Electromagnetic Flowmeters are extremely compact and light, and can lay claim to being a new generation instrument. They render high measuring accuracy and stability. Model KID15B explosion-proof-type detector, a key component of the flowmeter, offers an isd2G4 explosion-proof structure that permits use in hazardous environments up to Explosion Class 2 and heat conditions up to Ignition Group G4.

Features of Electromagnetic Flowmeters

The features of electromagnetic flowmeters in general (quoted from JIS Z8764) are as follows:

1) Volumetric measurement of a liquid flow can be done without being influenced by changes in temperature, pressure, density, or viscosity of the liquid being measured.
2) Measurement is not affected by conductivity change, provided that conductivity is above a minimum level. Therefore, irrespective of the type of liquid measured, calibration can be done with the actual flow of water at normal temperature.
3) Liquids which contain solid suspensions can also be measured.
4) Pressure loss caused by measurement is practically zero.
5) The output signal is linearly proportional to the actual flow, starting from zero flow.
6) Only a short length of straight pipe is required at the upstream side of the detector as compared with those required by other types of flowmeters.
7) Structure without moving parts assures fast response.



Features of the MagneW3000 Explosion-proof Detectors

The outstanding features of the MagneW3000 explosion-proof detectors are as follows:

1) The MagneW3000 employs a square-wave excitation system, thereby providing excellent zero-point stability and eliminating zero-point shift that could be caused by stain of electrodes.
2) The practical measuring range accuracy is ±0.5% of rate.
3) The detectors are extremely compact and light, and provide a very high magnetizing efficiency—all products of their design which employs a Finite Element Method magnetic field analysis (concentrated magnetic field system).
4) Usable in hazardous environments up to Explosion Class 2 and in heat conditions up to Ignition Group G4.
5) While featuring superminiature, super-light-weight structure, face-to-face dimensions are identical with those of Model KID10 general-type detectors.
6) The flange-pincered installation-type detectors can be installed regardless of the flange types.
7) Electrodes are an external insertion type that permits mounting/demounting while keeping the detector installed on the pipe. Sealing effects are also excellent.
8) The lining is made of Teflon PFA and embedded with an integral punched plate structure (patent No. 129514), making the MagneW3000 highly resistant to sharp changes in heat, steam, and vacuum pressures.

Measureable Liquids

Any liquids, provided that their electrical conductivity is 3μS/cm or higher, can be measured irrespective of their properties or states (viscosity, temperature, pressure, or slurry).

Water:	Potable, sewage, industrial, irrigation, sea, or drain water
Chemical:	Acidic, alkaline, or corrosive liquids
Slurries:	Cement, lime, alumina, latex, and other slurries
Suspensions:	Pulp, drain, mud, or filthy liquids

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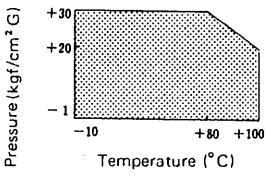
Instrument Specifications

Item		Specifications
Detector	Size (Diameter)	2.5, 5, 10, 15, 25, 40, 50, 80, 100, 150, 200 (mm)
	Materials	Case: Aluminium alloy (40mm and over), cast steel (25mm or less) Pipe: SUS304 (40mm and over), SCS14 (25mm or less) Lining: Teflon PFA Electrodes: SUS316L, hastelloy B, hastelloy C, titanium, tantalum, platinum/iridium Ground rings: SUS316, hastelloy B, hastelloy C, titanium, tantalum, platinum
	Electrode	External insertion type (Detachable electrodes)
	Case structure	Equivalent to JIS C0920 water-tight type
	Finish	Acryl finish
	Finish color	Dark beige (Munsell 10YR4.7/0.5)
	Structure*	Explosion-proof: JIS C0903 isd2G4 Detector body: Special explosion-proof Terminal box: Flame-proof type explosion-proof Electrode: Intrinsic-safety explosion-proof (Zener barrier type) "*" mark: Equivalent to following specification. FM; Special protection for Class I, Division 1, Group B.C.D (except hydrogen) Electrode: Intrinsic-safety circuit Detector: Special protection Terminal box: Explosion-proof PTB; Increased safety and intrincic-safety EEX eibIIBT6 Detector and terminal box: Increased safety Electrode: Intrinsic-safety circuit
Zener barrier	Type No.	8907/22-05/110
	Open-circuit voltage	10V, Intrinsic-safety side maximum voltage of barrier including operating trouble time
	Short-circuit current	110mA, Intrinsic-safety side maximum current of barrier including operating trouble time
	Safety retention rating	500V AC, 35A, 50/60Hz

Installation Specifications

Detector	Installation place	Division 1 and 2 hazardous area of explosive atmosphere under Explosion Class 2, Ignition Group G4.
	Ambient temperature	–10 to +60°C
	Pipe connection	Flange-pincering type
	Flange ratings	JIS 10K, JIS 20K, JIS 30K, ANSI 150, ANSI 300, DIN ND 10, DIN ND 40
	Electrical conduit connection	G1/2 internal thread
	Cables (Between detector and converter)	Signal cable: 2-core individually-double-shielded cable (Yamatake-Honeywell standard KIW, 0.75mm^2, outside dia. 11.4mm), or equivalent cable (CVVS, CEEV, etc.) Cable for excitation current: Chloroprene cabtire cable 2RNCT. JIS C3327 (2mm^2, outside dia. 11.4mm), or equivalent cable (vinyl-sheathed cable CVV JIS C3401, etc.)
	Cable length	Up to 300 meters (Cable length is limited by detector size and electrical conductivity of measured liquid. For details, refer to the specification sheet for the dedicated cables for MagneW SS2-5662-0100.)
	Mounting angle	The two electrodes to be in mutually horizontal position
	Ground	JIS Class 3 ground (Ground resistance not greater than 100 ohms)
Zener barrier	Ground	JIS Class 1 ground (Ground resistance not greater than 10 ohms)
	Ambient temperature	0 to 50°C
	Ambient humidity	0 to 90% RH

Fluid Specifications

Flow velocity ranges	0 – 0.1m/s to 0 – 10.0m/s
Electrical conductivity of liquid	3μS/cm or over
Fluid pressure and temperature ranges	Fluid pressure: –1 to +30kgf/cm^{2}G Fluid temperature: –10 to +100°C 

Performance Specification

Accuracy	±0.5% of rate (For more information, please refer to the spec. sheets of the converter)

Semi-standard Specification

Corrosion-resistant finish (Y138 A, B)	Corrosion-resistant finish (Y138 A): Baked acryl finish Corrosion-proof finish (Y138 B): Baked epoxy finish

Flow Conversion Table

$V = K \times Q$

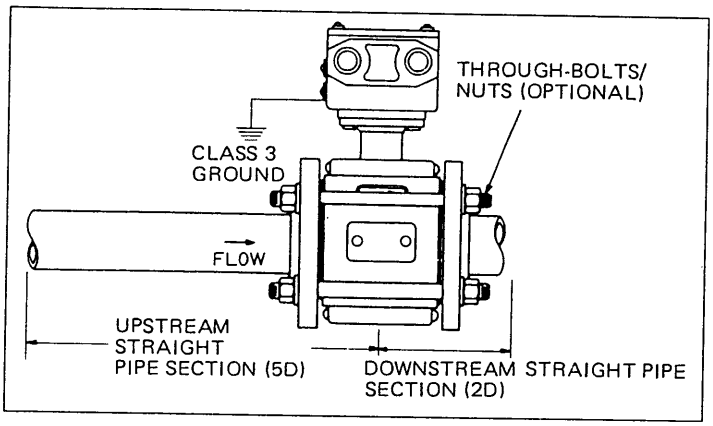
[V: Flow velocity (m/s); Q: Flow rate (m^3/h); K: Flow conversion factor $\frac{1}{3600} \times \frac{4}{\pi D^2}$]

Example: When size is 50 (mm) and flow rate is 20 (m^3/h.)

$V = 0.1415 \times 20 = 2.830$ (m/s)

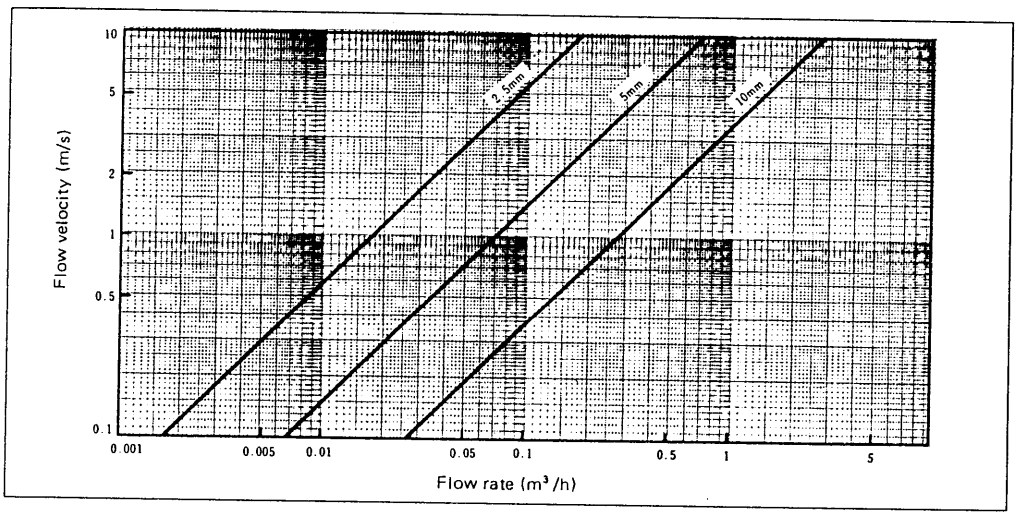
Size (D) mm	Flow convertion factor K	Flow span Q (m^3/h)	Flow velocity V (m/s)
2.5	56.59	0.00177 to 0.177	0.1 to 10
5	14.15	0.00707 to 0.707	
10	3.537	0.0283 to 2.83	
15	1.572	0.0636 to 6.36	
25	0.5659	0.177 to 17.7	
40	0.2210	0.452 to 45.2	
50	0.1415	0.707 to 70.7	
80	0.05526	1.81 to 181.0	
100	0.03537	2.83 to 283.0	
150	0.01572	6.36 to 636.0	
200	0.008842	11.31 to 1131.0	

Example of Detector Installation



Maximum Flow Velocity Conversion Chart

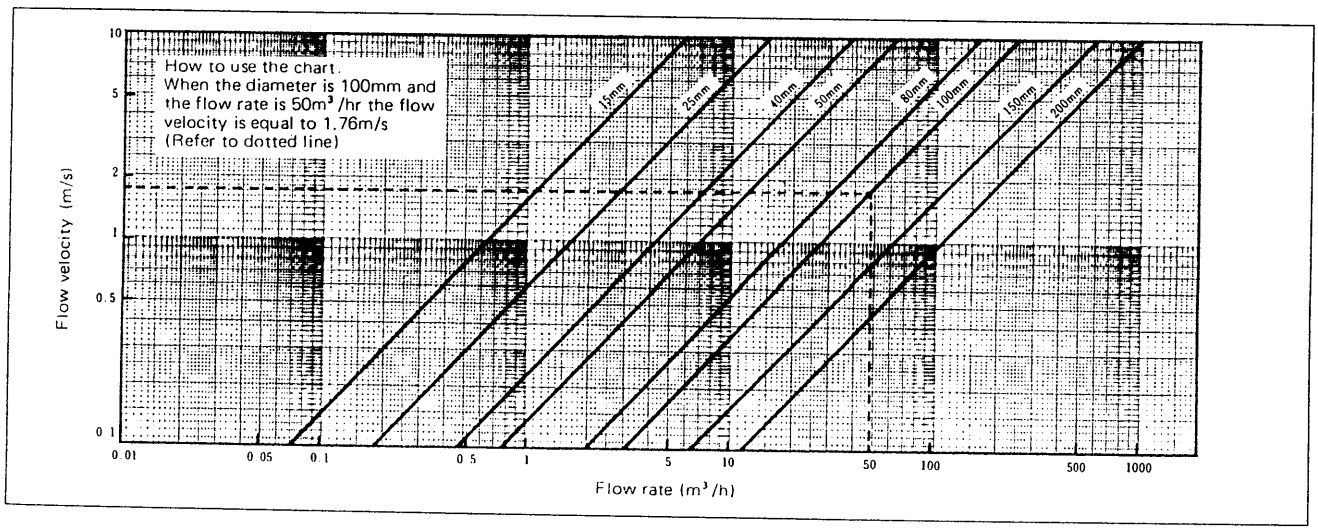
(1) Sizes 2.5 to 10mm



Type Approval for Pressure-tight Intrinsic-safety Explosion-proof, by TIIS

Model	Approved No.
KID15B-0002	No. 38926
KID15B-0005	No. 38933
KID15B-0010	No. 38927
KID15B-0015	No. 38928
KID15B-0025	No. 38929
KID15B-0040	No. 36993
KID15B-0050	No. 36994
KID15B-0080	No. 36995
KID15B-0100	No. 36996
KID15B-0150	No. 36997
KID15B-0200	No. 36998

(2) Sizes 15 to 200mm



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Model Number Table

Ex: KID15B-0050PL11SV-3X

Basic model No.	Selections: Size	Lining	Electrodes	Mating pipe	Ground ring	Conduit conection	Options I	Options II	Applicable sizes: 2.5mm	5 mm	10 mm	15 mm	25 mm	40 mm	50 mm	80 mm	100 mm	150 mm	200 mm	Description
	I	II	III	IV	V	VI	VII	VIII												
KID 15B									○	○	○	○	○	○	○	○	○	○	○	Explosion-proof type detector (JIS C0903 isd2G4)
	−0002								○											2.5mm
	−0005									○										5 mm
	−0010										○									10 mm
	−0015											○								15 mm
	−0025												○							25 mm
	−0040													○						40 mm
	−0050														○					50 mm
	−0080															○				80 mm
	−0100																○			100 mm
	−0150																	○		150 mm
	−0200																		○	200 mm
		P							○	○	○	○	○	○	○	○	○	○	○	Teflon PFA
			L						○	○	○	○	○	○	○	○	○	○	○	SUS316L
			B						○	○	○	○	○	○	○	○	○	○	○	Hastelloy B
			C						○	○	○	○	○	○	○	○	○	○	○	Hastelloy C
			K						○	○	○	○	○	○	○	○	○	○	○	Titanium
			T						○	○	○	○	○	○	○	○	○	○	○	Tantalum
			P						○	○	○	○	○	○	○	○	○	○	○	Platinum/Iridium
				11					●	●	●	○	○	○	○	○	○	○	○	JIS 10K
				12					●	●	●	○	○	○	○	○	○	○	○	JIS 20K
				13					●	●	●	○	○	○	○	○	○	○	○	JIS 30K
				14					○	○	○									JIS 10/20K,10mm flange
				15					○	○	○									JIS 30K,10mm flange
				21					●	●	●	○	○	○	○	○	○	○	○	ANSI 150
				22					●	●	●	○	○	○	○	○	○	○	○	ANSI 300
				41					●	●	●	○	○	○	○	○	○	○	○	DIN ND10
				43					●	●	●	○	○	○	○	○	○	○	○	DIN ND40
				44					○	○	○									DIN ND10/40,10mm flange
					S				○	○	○	○	○	○	○	○	○	○	○	SUS316
					B				○	○	○	○	○	○	○	○	○	○	○	Hastelloy B
					C				○	○	○	○	○	○	○	○	○	○	○	Hastelloy C
					K				○	○	○	○	○	○	○	○	○	○	○	Titanium
					T				○	○	○	○	○	○	○	○	○	○	○	Tantalum
					P				○	○	○	○	○	○	○	○				Platinum
						V			○	○	○	○	○	○	○	○	○	○	○	G½ internal thread
							-X		○	○	○	○	○	○	○	○	○	○	○	None
							-3		○	○	○	○	○	○	○	○	○	○	○	Two flame-proof packing cable adaptors are provided (refer note 2)
								X	○	○	○	○	○	○	○	○	○	○	○	None
								A	○	○	○	○	○	○	○	○	○	○	○	SUS304 through bolts and nuts
								B	○	○	○	○	○	○	○	○	○	○	○	Carbon steel through bolts and nuts

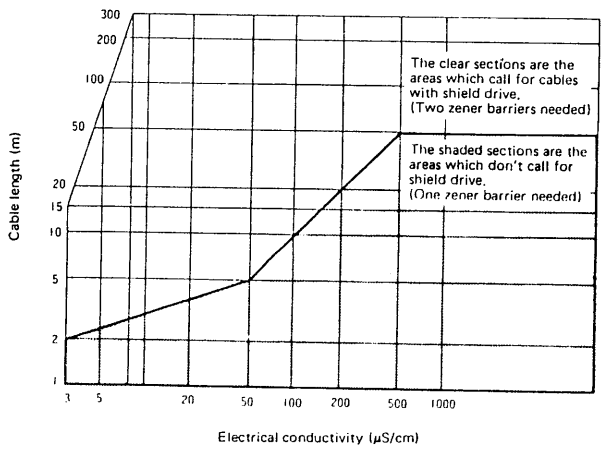
Note: 1) ○ . . . . . Applicable
● . . . . . Applicable when mating flanges are 15mm.

2) For pressure-tight explosion-proof wiring, use Yamatake-Honeywell's flame-proof packing cable adaptor.

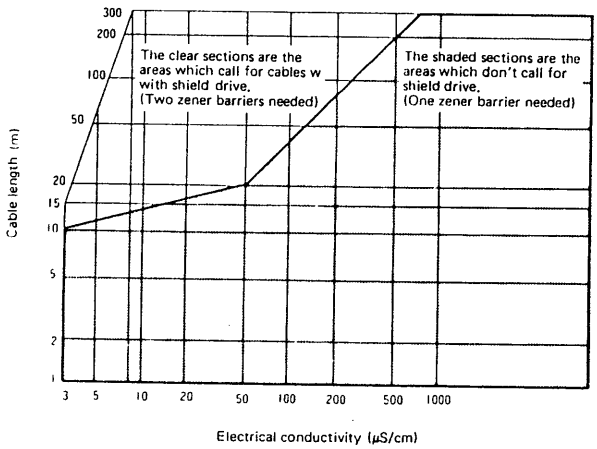
Zener Barriers

The number of zener barriers needed per loop depends on detector size, electrical conductivity of measured liquid and cable length. See the below charts.

(1) Sizes 2.5 and 5mm



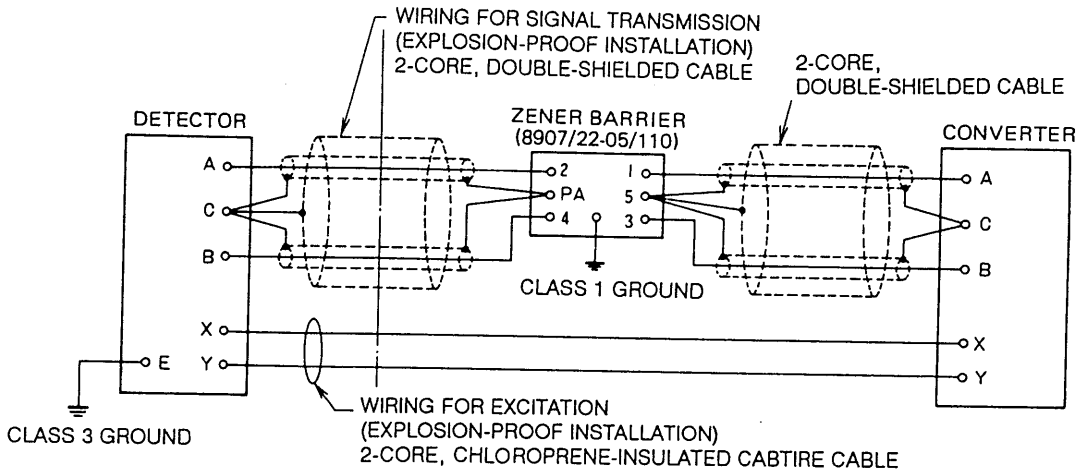
(2) Sizes 10mm and over



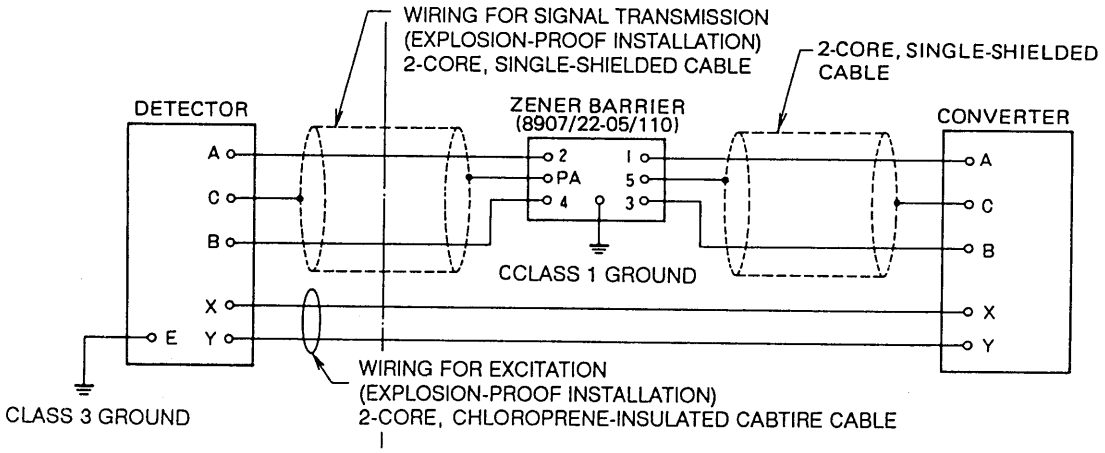
Terminal Connection Diagram

(1) Without shield drive

Signal cable: 2-core, double-shielded cable

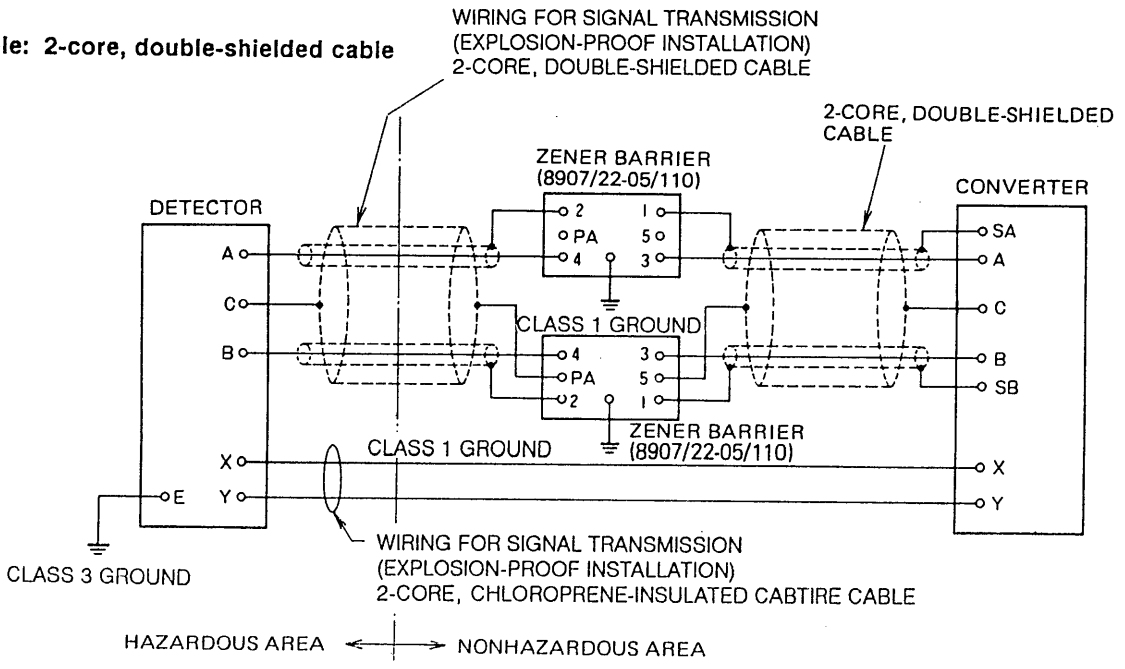


Signal cable: 2-core, single-shielded cable



(2) With shield drive

Signal cable: 2-core, double-shielded cable



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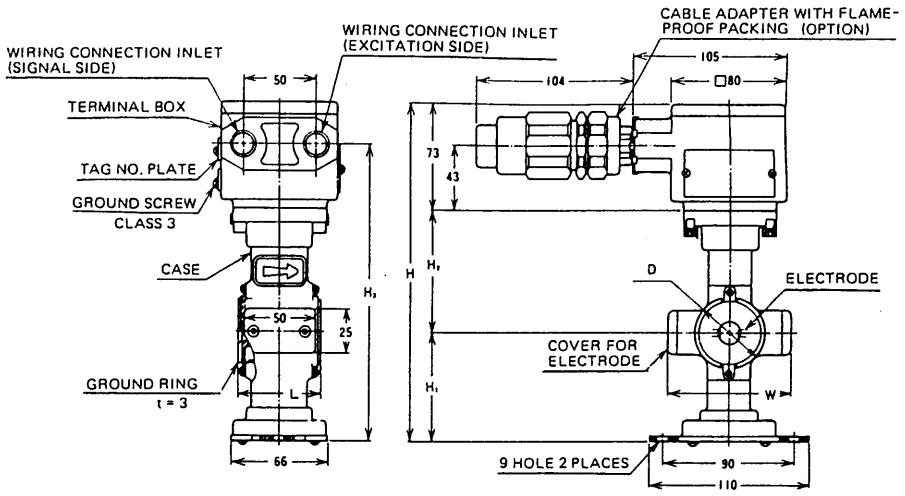
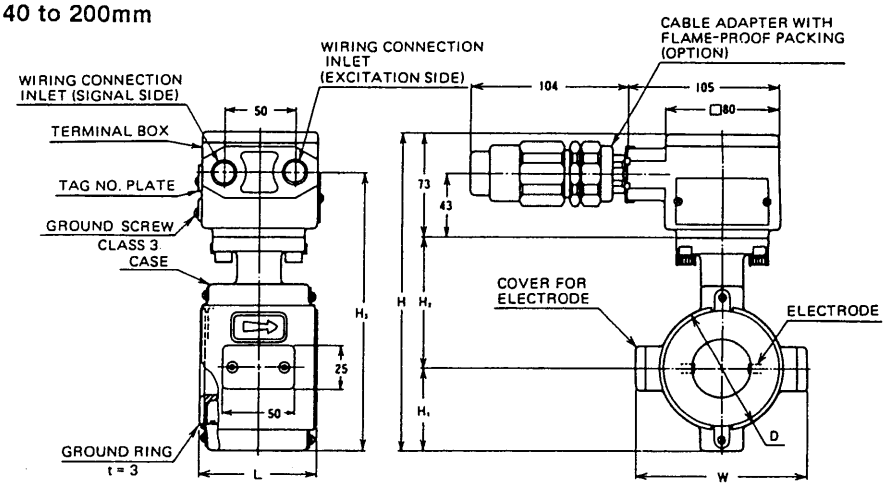
Dimension Drawing

(Unit: mm)

(1) Detector Sizes 2.5 to 25mm



(2) Detector Sizes 40 to 200mm



Size (Diameter)		2.5	5	10	15	25	40	50	80	100	150	200
Face-to-face	L	56	56	56	56	56	80	86	106	120	160	200
Height	H	228	228	228	228	242	216	232	260	284	339	394.5
	H_1	73	73	73	73	80	55	64	78	90	120	149.5
	H_2	82	82	82	82	89	88	95	109	121	146	172
	H_3	198	198	198	198	212	186	202	230	254	309	364.5
Case width	W	84	84	84	84	94	116	126	156	180	230	286
Case OD	D	49.5	49.5	49.5	49.5	66.5	86	102	132	156	216	267
Weight* (kg)		3.4	3.4	3.4	3.1	4.3	3.9	4.5	6.3	8.0	15.0	24.0

* Add 1.2 kg when cable adaptors with flame-proof packing is used.

Ordering Information

When ordering, please specify:

1) Model number
2) Additional specifications
3) Condition fluid being measured
   - Name of fluid
   - Temperature range
   - Range of flow rate
   - Pressure range
   - Conductivity

Specifications are subject to change without notice.