Yamatake-Honeywell **SPECIFICATION**

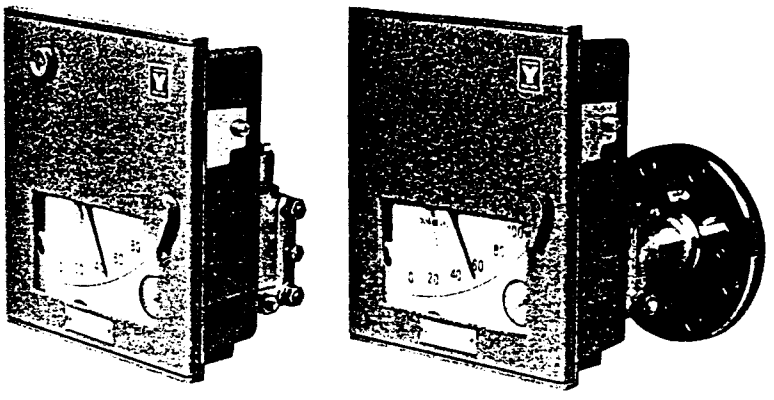
KF SERIES (FIELD TYPE) DIFFERENTIAL PRESSURE INDICATING CONTROLLER

MODEL:KFD

General

Each of KF Series instruments consists of two major items: one is the measuring element which detects the process variable and the other is the indicating controller section which is common for all models of instruments. Simply by changing measuring elements, the same instrument can be used to measure and control such basic process variables as temperature, pressure, flow rate, and liquid level, with a standardized pneumatic signal of 0.2 to 1.0 kg/cm^2.

The KFD type differential pressure indicating controller can entirely use the measuring section of the ND type transmitter series, which has many variations (remote seal and button diaphragm or wafer). This indication controller is available in two models; the flow rate control model that has a differential pressure detecting section provided with a variable dumping device and the model for the control of the liquid level subject to a large measuring span or the liquid level or viscous fluids.



Standard Type Flange Type

Figure 1

Features

- **Various models and functions:**
Simply by changing measuring elements, the instrument can also measure process variables (temperature, pressure, and flow) other than liquid level, and can perform receiving and controlling functions on the detected pneumatic signal. Various control actions are available, such as P, PI, PID, PD, and PI batch actions. Also, various provisions are incorporated for such operations as ON-OFF, differential gap, manual reset, and external reset operations.

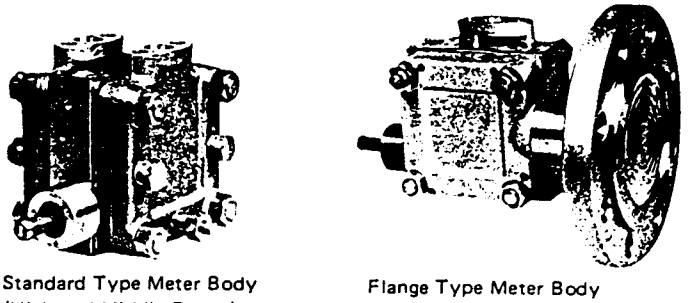
- **High reliability:**
The KF Series instruments employ a pneumatic circuit block system, as the first of its kind for field type instruments. This system eliminates the use of air tubing which could often cause air leakage, thereby greatly enhancing instrument reliability. The case is made of non-flammable metal, providing sufficient sturdiness, heat resistance, and weather resistance. The instrument provides water resistant and dust resistant features equivalent to NEMA3, IP54, and JIS F8001, Class 3 water spray test.

- **Convenient expandability of functions and high flexibility of use:**
Various control functions are selectable and a number of optional features are available. These can be conveniently selected and coupled as the pneumatic circuit block system is employed, thereby making this field instrument as flexible in use as panel instruments.

- **High maintainability, interchangeability, and economy:**
Measuring elements are interchangeable with those of other existing models of pneumatic instruments supplied by Yamatake-Honeywell. Components except the measuring elements are interchangeable, thereby greatly reducing the number of replacement spares to be kept in stock. Various expandable features and optional features are available, enhancing operability, maintainability, reduction in replacement spares, and economy.

- **Prevention of troubles:**
Screws are identified between those for clamping (Philips screws) and those for adjustments (plain screws). Provisions are made to prevent troubles caused by simple errors, such as prevention of erroneous assembling of parts.

- **Pulsation Preventing Mechanism:**
The differential pressure detecting section, provided with a variable dumping device, eliminates the effects of flow rate noise, liquid lever noise, etc.



Standard Type Meter Body (High and Middle Range) Flange Type Meter Body

Figure 2

Issue 1 Oct., 1978
Issue 3 Oct., 1982

Standard Specifications

Item				Specifications		
	Model No.	Type of meter body	Measuring range (Continuously adjustable)	Process connection	Pressure limit	Overload protection
Sensing element	11	Standard type	0~5,000 to 0~50,000 mmH_2O	PT ½ (ISO R7 ½") female for cover materials of carbon steel, 316 SS and titanium.	−0.5~+100 kg/cm²G	To 100 kg/cm²G in either direction.
	22		0~500 to 0~6,500 mmH_2O	PF ½-A (ISO R228 ½") female for cover material of monel lining and tantalum lining.		
	33		0~100 to 0~600 mmH_2O	PT½ (ISO R7 ½") or ½" NPT tap thread.	−0.1~+50 kg/cm²G	To 50 kg/cm²G in either direction.
	44		0~20 to 0~120 mmH_2O		−150mmH_2O ~+5 kg/cm²G	To 5 kg/cm² in either direction.
	61	Flange type	0~5,000 to 0~50,000 mmH_2O	HP side; Flange connection Flush diaphragm type 80mm-JIS 10K, 30K (RF) equiv. flange 3"-ANSI 150, 300 (RF) equiv. flange Extended diaphragm type 100mm-JIS 10K, 30K (RF) equiv. flange 4"-ANSI 150, 300 (RF) equiv. flange Length of extended part; 100 or 150 mm LP side; PT½ (ISO R7 ½") or ½" NPT tap thread..... Carbon steel, 316 SS, Titanium and PVC cover material PF½-A (ISO R228 ½") tap thread..... Monel lining and Tantalum lining cover materials	−0.5 kg/cm² G maximum flange rated pressure.	To maximum flange rated pressure.
	62		0~500 to 0~6,500 mmH_2O			
	71	Remote seal diaphragm type	0~5,000 to 0~50,000 mmH_2O	Flange connection (Both HP & LP side) Flush diaphragm type: 80mm-JIS 10K, 30K (RF) equiv. flange 3"-ANSI 150, 300 (RF) equiv. flange Extended diaphragm type; 100mm-JIS 10K, 30K (RF) equiv. flange 4"-ANSI 150, 300 (RF) equiv. flange Length extended part; 100 or 150mm	−0.5 kg/cm² G to maximum flange rated pressure.	To maximum flange rated pressure.
	72		0~500 to 0~6,500 mmH_2O			
	81	High static pressure type	0~5,000 to 0~50,000 mmH_2O	13.6 x 5 [mm dia.] nipple for butt welding (Pitch dimension of HP and LP taps; 85 mm) With manifold ..... ½" socket welding (Pitch dimension of HP and LP taps; 110 mm)	−0.5~+500 kg/cm²G	To 500 kg/cm²G in either direction.
	82		0~500 to 0~5,500 mmH_2O			
	91	Absolute pressure type	0~5,000 to 0~50,000 mmH_2O abs.	PT ½ (ISO R7 ½") or ½" NPT tap thread for cover materials of Carbon steel (SF 45) and 316 SS. PF½ -A (ISO R228 ½") tap thread for cover materials of Monel lining and Tantalum lining.	−1~+5 kg/cm²G	Up to 35 kg/cm²G
	92		0~1,360 to 0~6,500 mmH_2O abs.			

Function	Accuracy	±1% FS (Indicating), ±0.5% FS (Transmission)
	Repeatability	Within 0.3% FS
	Dead band	Within 0.2% FS
Indication	Angle	44 degrees
	Scale length	150 mm
	Pointer	Process variable ... Red, Setpoint value ... Green
	Output indicator	Scale range; 0 ~ 2 kg/cm² Indicator accuracy; ±3% FS
Set-point section	Local setting	Internal or external setting by setting knob.
	Remote setting	Pneumatic pressure setting of 0.2 ~ 1.0 kg/cm².
	Setting range	0 ~ 100% FS
Controller	Control action	P + Manual reset, PI, PID, PD + Manual reset, PI + Batch, On-Off, Differential gap, P + External reset, PID + External reset
	Proportional band (P)	5 ~ 500% (Direct or reverse action)
	Integral (I)	0.05 ~ 30 min.
	Derivative (D)	0.05 ~ 30 min.
	Differential gap	1 ~ 100% FS, adjustable
	Batch setting pressure	0.6 ~ 1.1 kg/cm², adjustable
	External reset pressure	0.2 ~ 1.0 kg/cm²
	Manual reset	0 ~ 100% FS, adjustable (By pneumatic pressure setting)
	Output	0.2 ~ 1.0 kg/cm²
	Minimum load	I.D. 4mm x 3 m + 20 cm³
	Supply air pressure	1.4 ± 0.14 kg/cm²
	Air consumption (50% output balanced)	Indicating and transmission ; 4 Nℓ/min. Indicating and control ; 8 Nℓ/min. Indicating and control and air pressure transmission ; 8 Nℓ/min.

Note) For element materials, refer to the selection in the model number table.

	Item	Specifications
General specifications	**Saturated air supply capacity**	Pneumatic transmission ; 40 Nℓ/min. Output ; 40 Nℓ/min. Manual pneumatic pressure ; 30 Nℓ/min.
	Air connection	PT ¼ (ISO R7 ¼") or ¼" NPT tap thread
	Ambient temperature limit	At meter body (process fluid); −40 ~ +120°C At transmitter (ambient); −30 ~ +80°C
	Relative humidity limit	10 ~ 90% RH
	Case , Door	Enclosure : Rain-tight and dust-tight, meets JIS F 8001 class III splash-proof, NEMA 3, IEC IP 54 Materials : Case . . . . . Aluminium die-cast Door . . . . . Polyester with fiberglass Door-glass . . . Reinforced glass (3 mm thick, JIS R3206 equivalent) Case finish : Acryl baking finish (For corrosion-resistant and silver finish, refer to the optional specification.) Color of finish : Dark beige (Munsell 10YR 4.7/0.5)
	Mounting	Panel, 2-inch pipe or flange mounting.
	Net weight	14.2 ~ 30.0 kg (Pipe mounting type, local mode PI controller using type 22 or 82 meterbody.)

Options (Accessories)

Item	Specifications
(1) External SP setting knob (For local setting)	A setting knob is mounted on the door. SP can be adjusted from outside.
(2) Built-in manual controller (With auto/manual transfer switch)	Consists of a manual control regulator, two position transfer switch and balance check button.
(3) With manifold valve (Excluding type 6□/7□/9□ meter body)	It is used mainly for flow rate measurement. (Four types are available, refer SS2-519-020.)
(4) Elevation, Suppression	It is applied when head pressure is imposed on the sensor of a transmitter at liquid level zero. Elevation; The lower limit of input range is above zero. Suppression; The lower limit of input range is below zero. (Excluding type 9□ meter body.)
(5) Air set	Adjustable combination regulator with 50 mm gauge mounted and piped to controller, not available with panel mounted controller.
(6) Integral orifice (Applicable to type 22/33 meter body).	It is used for measuring extremely low flow rate. Range of flow rate measurement. Liquid: 1.3 ~ 2000 ℓ/h (15°C, I atm.), in water equivalent. Gas : 0.04 ~ 50 Nm^3/h (15°C, I atm.) in air equivalent.

Semi-Standard Options

Item	Specifications	Applicable models
(1) Half range (Y20)	Measurement of half range of each measurement range. Accuracy; ±1.25% FS (Indicating), ±0.75% FS (Transmission)	KFD□□□-11/22/33/44 6□/7□/8□/9□
(2) Oil free (Y21)	Wet-part material; 316 SS Sealing liquid; Daifloil	KFD□□□-11/22/33/44
(3) Vacuum use (Y23)	Static pressure range; −1 ~ +35 kg/cm^2G	KFD□□□-11/22/6□/7□
(4) Steam jacket (Y29)	Maximum working pressure; 50 kg/cm^2 10 kg/cm^2 Maximum working temperature; 300°C (Below 120°C at meter body.) 250°C (") 200°C (")	KFD□□□-11/22/6□^{LP}/7□ KFD□□□-33/6□^{LP}/8□ KFD□□□-11/22/6□^{LP}/7□ KFD□□□-33/8□ KFD□□□-6□^{HP}
(5) High temperature use (Y62)	Fluid temperature; −10 ~ +200°C Ambient temperature; −10 ~ +80°C Sealing liquid; Special silicon oil	KFD□□□-6□/7□
(6) Low temperature use (Y63)	Fluid temperature; −80 ~ +60°C Ambient temperature; −30 ~ +60°C	KFD□□□-7□
(7) Wafer type (High pressure use) (Y65)	Remoted seal diaphragm type was remodeled for measurement under high pressure (100 kg/cm^2).	KFD□□□-7□
(8) Stainless steel bolt (Y66)	304 Stainless steel is used for meter body fixing bolts.	All the KFD models
(9) Corrosion-resistant and silver finish (Y 138)	Corrosion-resistant (Acryl baking) finish (Y 138A); Resistance for corrosive gases. Corrosion-proof (Epoxy baking) finish (Y 138B); Resistance for corrosive liquids. Silver-normal (Acryl baking) finish (Y 138C); Protection for temperature rise of device caused by direct sun light, radiation heat, etc. Silver-corrosion-resistant (Acryl baking) finish (Y 138D) Protection for above-mentioned temperature rise and resistance for corrosive gases. (Note: Silver finish is not applicable for alkaline gases)	All the KFD models

Model Number Table

Ex. KFD 102-11222AT-M, K, 6, 7

Basic model No.				Selections							Options	Description
Type	Function	Control action	Type of meter body	Cover or flange*1 material		Seal diaphragm material		Flange rating	Air connection	Mounting method		
				HP*2	LP*3	HP*4	LP*5					
KFD												Differential pressure indicating controller
	0											Indicating transmitter
	1											Indicating controller
	2											Indicating transmitting controller (Local type)
	3											Indicating controller (Cascade type)
	4											Indicating transmitting controller (Cascade type)
		00										No selection
		01										P + Manual reset
		02										PI
		03										PID
		04										PD + Manual reset
		52										PI + Batch
		65										On-Off
		66										Differential gap
		71										P + External reset
		74										PD + External reset
			–11									Standard type (High range) 0~5,000 to 0~50,000mmH$_2$O
			–22									" (Middle range) 0~ 500 to 0~ 6,500mmH$_2$O
			–33									" (Low range) 0~ 100 to 0~ 600mmH$_2$O
			–44									" (Lowest range) 0~ 20 to 0~ 120mmH$_2$O
			–61									Flange type (High range) 0~5,000 to 0~50,000mmH$_2$O
			–62									" (Middle range) 0~ 500 to 0~ 6,500mmH$_2$O
			–71									Remote seal diaphrogm type(High range) 0~5,000 to 0~50,000mmH$_2$O
			–72									" (Middle range) 0~ 500 to 0~ 6,500mmH$_2$O
			–81									High static pressure type (High range) 0~5,000 to 0~50,000mmH$_2$O
			–82									" (Middle range) 0~ 500 to 0~ 5,500mmH$_2$O
			–91									Absolute pressure type (High range) 0~5,000 to 0~50,000mmH$_2$O abs.
			–92									" (Middle range) 0~1,360 to 0~ 6,500mmH$_2$O abs.
				1								Carbon steel (SF45)
				2								316SS
				3								Monel llning (Base 316SS) (Applicable for type 11/22/91/92 meter bodies.)
				4								Tantalum lining (Base 316SS) (")
				5								Rigid PVC (Applicable for type 11/22/33 meter boidies.)
				6								Titanium (Applicablef for type 11/22 meter boidies.)
					1							Carbon steel (SF 45) (Not applicable for type 91/92 meter bodies.)
					2							316SS
					3							Monel lining (Base 316SS) (Applicable for type 11/22/61/62 meter bodies.)
					4							Tantalum lining (Base 316SS) (")
					5							Rigid PVC (Applicable for type 11/22/33/61/62 meter bodies.)
					6							Titanium (Applicable for type 11/22/61/62 meter bodies.)
						2						316SS
						3						Monel (Not applicable for type 44 meter body.)
						4						Tantalum (")
						6						Titanium (Applicable for type 11/22/61/62/71/72 meter bodies.)
							2					316SS
							3					Monel (Not applicable for type 44/91/92 meter bodies.)
							4					Tantalum (")
							6					Titanium (Applicable for type 11/22/61/62/71/72 meter bodies.)
												Blank (Not applicable for type 61/62/71/72 meter bodies.)
								1				80mmJ IS 10K (RF) equiv. flange — Flush diaphragm type — Applicable for type 61/62/71/72 meter bodies.
								2				80mmJ IS 30K (RF) equiv. flange — Flush diaphragm type
								3				3"-ANSI 150 (RF) equiv. flange — Flush diaphragm type
								4				3"-ANSI 300 (RF) equiv. flange — Flush diaphragm type
								5				100mmJ IS 10K (RF) equiv. flange — Extended diaphragm type
								6				100mmJ IS 30K (RF) equiv. flange — Extended diaphragm type
								7				4"-ANSI 150 (RF) equiv. flange — Extended diaphragm type
								8				4"-ANSI 300 (RF) equiv. flange — Extended diaphragm type
									A			PT¼ (ISO R7 ¼") tap thread
									B			¼" NPT tap thread
										P		Panel mounting
										T		2-inch pipe mounting
										F		Flange mounting (Applicable for type 61/62 meter bodies.)
											–X	No selection
											–M	Built-in manual controller (With auto/manual transfer switch)
											–K	With external SP setting knob
											–V	With manifold valve (Not applicable for type 61/62/71/72/91/92 meter bodies.)
											–5	Elevation
											–6	Suppression (Not applicable for type 91/92 meter bodies.)
											–7	Air-set
											–12	Integral orifice ass'y (Applicable for type 22/33 meter bodies.)

[Note]

1) For materials of cover, flange and seal diaphragm.

*1. Cover materials denote for meter body type 11/22/33/44/61LP*3/62LP*3/81/82/91/92. Flange materials denote for meter body type 61HP*2/62HP*2/71/72.

*2. For meter body type 61/62;
Flange material
For meter body type 91/92;
Input chamber cover material

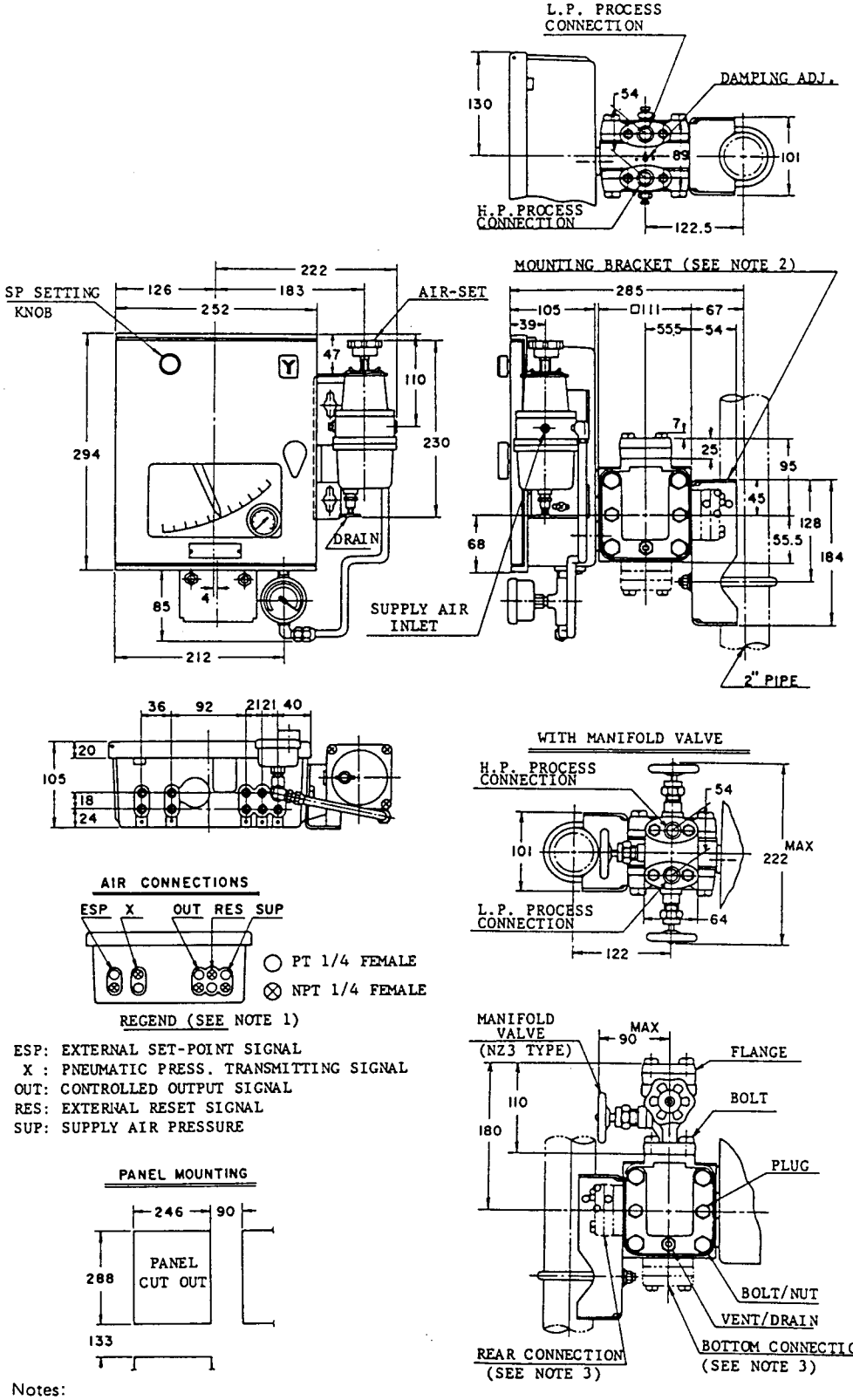
*3. For meter body type 61/62;
Chamber cover material
For meter body type 91/92;
Vacuum chamber cover material

*4. For meter body type 91/92;
Input chamber seal diaphragm materail

*5. For meter body type 91/92;
Vacuum chamber seal diaphragm materail

2) When specifying semi-standard option (Y□) not listed in model no table, please write as; KFD102Y-112222AT-M,K, 6, 7 (Y20, Y138) (Please consult with factory in case of a multiple of "Y" spec. are required.)

Overall Dimensions



ESP: EXTERNAL SET-POINT SIGNAL
X : PNEUMATIC PRESS. TRANSMITTING SIGNAL
OUT: CONTROLLED OUTPUT SIGNAL
RES: EXTERNAL RESET SIGNAL
SUP: SUPPLY AIR PRESSURE

Notes:

1. The holes not to be used for air connection are plugged.
2. These holes in the bracket enable the controller to be mounted in various position.
3. Process connection can be selected freely in any of three positions of top, bottom or rear. Cover, flange and vent / drain plug must be replaced according to the newly selected position.
4. Manifold valve; In the case of meter body type 11/22 . . . . . Separate type (Model NZ4)
   " 33/44 . . . . . Direct mounting type (Model NZ3)
   " 81/82 . . . . . High pressure type (Model NZ6)
5. This dimensions are of standard type meter body. (Meter body model nos. 11 and 12.) Caution must be taken to dimensions which depend on the shape of meter body. (Refer to the reference spec. sheets at the rear of this sheet.)

Figure 3

Ordering Information

When ordering, please specify;

1) Model No.
2) Diff. pressure range
3) Options

Reference Specification Sheets

Standard type meter body	No. SS2-512-110/220/330/440
Flange type meter body	No. SS2-512-610/620
Remote seal diaphragm type meter body	No. SS2-512-710/720
High static pressure type meter body	No. SS2-512-810/820
Absolute pressure type meter body	No. SS2-512-910/920

Reference Instruction manuals

Instrument	No. OM2-613-000
Meter body (type 11/22/33/44/81/82)	No. OM2-614-110
Meter body (type 61/62/71/72)	No. OM2-614-610

* Specifications are subject to change without notice.

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