

# KM31 Pressure Transmitter

Fluids and gases measurement  
(Featuring stainless diaphragm)

## Overview

KM31 is improved in accuracy and noise performance. It can be used widely for various industrial applications. Pressure sensor is welded to the fitting for excellent durability.

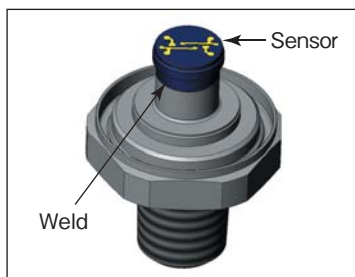
## Features

- Better Total Error Band Accuracy
- Broad Temperature Capability
- All-welded construction
- High EMI/RFI rating
- Ranges 0.2MPa through 140MPa
- IP65 Ingress rating



## Features of sensor

The sensor is welded to a stainless steel pressure fitting by electron beam, so that the assembly provides excellent capability for over pressure and durability in the presence of shock and vibration. Electronics is held within an internal metal cage and is protected in a durable reinforced Nylon enclosure.



## Introduction of KM series

	KM70	KM17
External appearance		
Condition	Lot production	Lot production
Total error band	±3.0%F.S. (-20 to 70°C)	±2.0%F.S. (-40 to 125°C)
Output	·0.5 to 4.5V DC Ratio metric ·1 to 5V DC	·0.5 to 4.5V DC Ratio metric ·0.5 to 4.5V DC ·0 to 5V DC ·1 to 5V DC ·4 to 20mA
Waterproof level	IP65	IP67

### Specifications

Measuring range	Pressure range (MPa) Gauge pressure	Proof pressure	Accuracy		
	-0.1 to 0.2	200% of pressure range	Linearity $\pm 0.25\%$ F.S. Total Error Band (-20 to 85°C) $\pm 1.0\%$ F.S. Total error band includes the following ①Linearity ②Hysteresis ③Repeatability  Error outside above temperature range 【Low temperature】 $\pm 1.5\%$ F.S. at -40 to -20°C 【High temperature】 $\pm 1.5\%$ F.S. at 85 to 125°C		
	-0.1 to 0.3				
	-0.1 to 0.5				
	-0.1 to 1				
	-0.1 to 2				
	0 to 0.2				
	0 to 0.3				
	0 to 0.5				
	0 to 1				
	0 to 2				
	0 to 3.5				
	0 to 5				
	0 to 10				
	0 to 20				
	0 to 35	150%	Linearity $\pm 0.25\%$ F.S. Total Error Band (-20 to 85°C) $\pm 1.0\%$ F.S. Total error band includes the following ①Linearity ②Hysteresis ③Repeatability  Error outside above temperature range 【Low temperature】 $\pm 1.5\%$ F.S. at -40 to -20°C 【High temperature】 $\pm 1.5\%$ F.S. at 85 to 125°C		
0 to 50					
0 to 70					
0 to 100					
0 to 140					
0 to 140					
0 to 140	120%	Linearity $\pm 0.25\%$ F.S. Total Error Band (-20 to 85°C) $\pm 1.0\%$ F.S. Total error band includes the following ①Linearity ②Hysteresis ③Repeatability  Error outside above temperature range 【Low temperature】 $\pm 1.5\%$ F.S. at -40 to -20°C 【High temperature】 $\pm 1.5\%$ F.S. at 85 to 125°C			
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
0 to 140					
Output signal	Output range	Supply voltage	Excess voltage	Transmission	
	0.5 to 4.5V DC Ratio metric	5.0 $\pm$ 0.5V DC	16V DC max.	3 wire	
	0 to 5V DC	9 to 36V DC	36V DC max.		
	1 to 5V DC				
	1 to 6V DC				
	0 to 10V DC	14 to 36V DC		2 wire	
4 to 20mA DC	9 to 36V DC ※				
Environmental performance	Withstand voltage	100V AC (1 minutes between connection and all terminals tied)			
	Insulation resistance	100M $\Omega$ or higher (100V DC between connection and all terminals tied)			
	Response time	1ms or lower			
	Circuit protection	Reverse polarity and mis-wire protected			
	Compensated temperature range	-40 to 125°C (Except connector 3 / DIN43650-A and cable are -30 to 105°C)			
	Operating temperature range				
	Storage temperature range				
	Shock resistance	981 m/s <sup>2</sup> (6ms or lower)			
	Vibration resistance	196.1 m/s <sup>2</sup> rms			
	Durability	50,000,000 times or higher (10 to 100%F.S.)			
Ingress protection	IP65				
Material	Diaphragm	SUS630 (17-4PH) Welded to a fitting			
	Fitting	SUS304			
	Case	Nylon 66			
Fitting	R1/8	Maximum allowable pressure 50MPa			
	R1/4				
	R3/8				
	G1/4A	Maximum allowable pressure 5MPa			
	G3/8A	Maximum allowable pressure 50MPa			
	G1/4B	Maximum allowable pressure 140MPa			
	7/16-20UNF	Maximum allowable pressure 20MPa			
Electrical termination	Connector 1	METRI-PACK 150 series			
	Connector 2	Mini-Hirschmann G series			
	Connector 3	DIN43650-A			
	Leads	Flying leads 1m (Standard)			
	Cable	Shielded cable 1m (Standard)			
Weight	Approx. 65g (METRI-PACK 150 series, R1/4, without mating connector)				

(Note) When the load resistance 500  $\Omega$  or more are needed, the supply voltage of 20V DC or more is necessary.

Sealed pressure type is available for 5MPa range or greater.

# KM31

## Pressure Transmitter

### Load resistance and accuracy

#### Loop Resistance at 2 wire system 4 to 20mA DC output

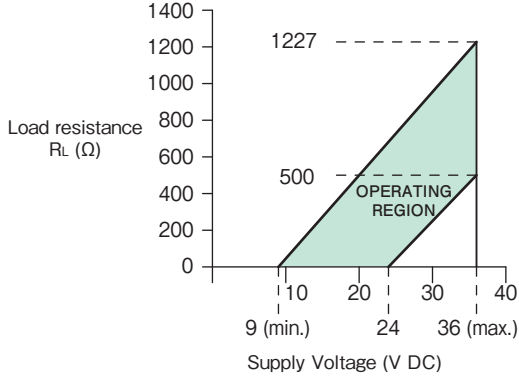
$$\text{Minimum power supply} = 9(V) + (0.022(A) \times R_L)$$

$$\text{Maximum power supply} = 24(V) + (0.024(A) \times R_L)$$

$$R_L = R_s + R_w$$

$R_s$  = Sensing resistance ( $\Omega$ )

$R_w$  = Resistance for cable ( $\Omega$ )



When the load resistance 500  $\Omega$  or more are needed, 24V DC supply voltage or more is necessary.

#### [About total error band]

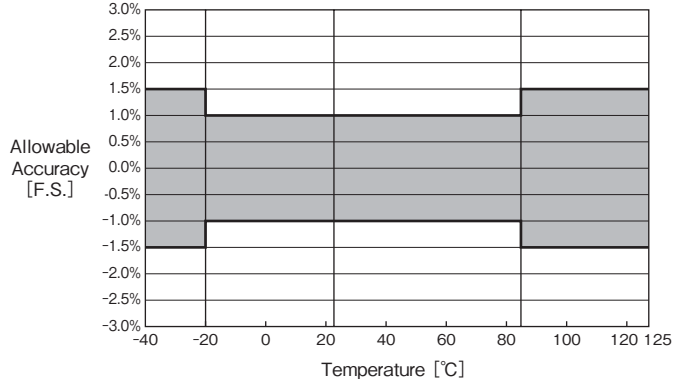
Total error band is defined for the use over wide temperature range as below.

The graph shows allowable error band in entire operating temperature range.

The output will be within indicated allowable error band even ambient temperature varies.

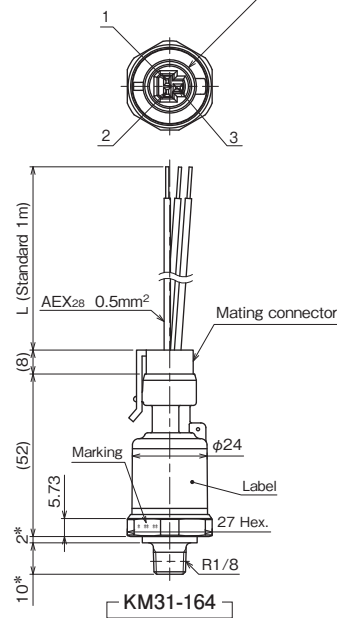
1 to 1.5% F.S. Total error band is accomplished by incorporating high performance ASIC to very stable poly-silicon thin film that is proven in the field.

#### Total Error Band Description

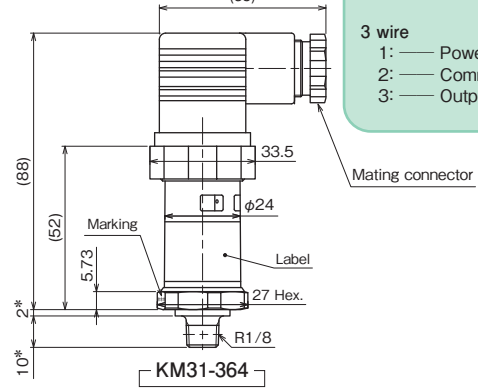
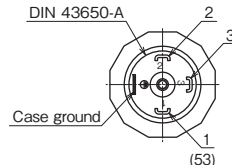
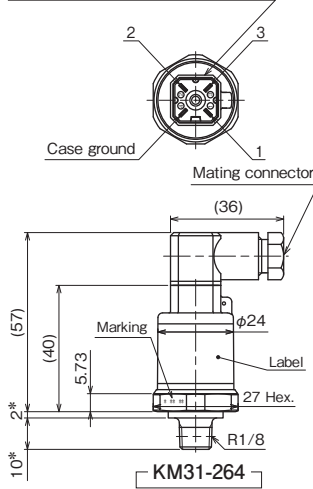


### Dimensions

Unit: mm



Mini-Hirschmann G Series compatible



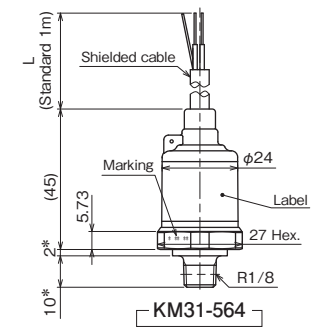
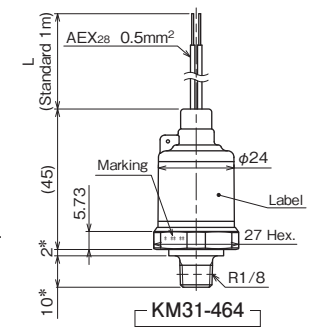
**Wiring for connector type**

**2 wire**

1: Power (+)  
2: Power (-)

**3 wire**

1: Power (+)  
2: Common  
3: Output (+)



**Wiring for cable**

**2 wire**

1: Red — Power (+)  
2: Black — Power (-)

**3 wire**

1: Red — Power (+)  
2: Black — Common  
3: White — Output (+)

※Shield is not attached to case

\* Dimension show is for R1/8 connection. Refer to following table for the other connections.

Process connection					
KM31-□74	KM31-□84	KM31-□B4	KM31-□C4	KM31-□24	KM31-□54
Maximum allowable pressure: 50MPa (Including R1/8)		Maximum allowable pressure: 5MPa	Maximum allowable pressure: 50MPa	Maximum allowable pressure: 140MPa	Maximum allowable pressure: 20MPa

### Model number configuration

Please specify the model number, each specs and the range for ordering.

Model

**K M 3 1** — **4** — **7 X** X X X X X X X X X X X X X

Pressure Transmitter

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮

Model number		Product specifications		Additional specifications (Optional)				
① Model	Gauge pressure type (Standard)							
	1	Connector 1 (METRI-PACK)						
	2	Connector 2 (Mini-Hirschmann)*1						
	3	Connector 3 (DIN43650-A)*1						
	4	Leads type (1m Standard)						
	5	Cable type (1m Standard)						
	Sealed pressure type (Pressure range: 5MPa or higher)							
	J	Connector 1 (METRI-PACK)						
	K	Connector 2 (Mini-Hirschmann)*1						
	L	Connector 3 (DIN43650-A)*1						
	M	Leads type (1m Standard)						
	N	Cable type (1m Standard)						
	② Process connection	Standard for fitting		Maximum allowable pressure				
		2	G1/4B	140MPa				
5		7/16-20UNF	20MPa					
6		R1/8	50MPa					
7		R1/4 (Standard)	50MPa					
8		R3/8	50MPa					
B		G1/4A	5MPa					
C		G3/8A (Standard)	50MPa					
Consult sales office for the other options.								
③ Wetted parts	4	Diaphragm: SUS630 (17-4PH) Fitting: SUS304						
④ Pressure range (MPa)	2	-0.1 to 0.2	B	0 to 0.2	K	0 to 3.5	S	0 to 50
	3	-0.1 to 0.3	C	0 to 0.3	L	0 to 5	T	0 to 70
	5	-0.1 to 0.5	E	0 to 0.5	N	0 to 10	U	0 to 100
	6	-0.1 to 1	G	0 to 1	Q	0 to 20	V	0 to 140
	7	-0.1 to 2	J	0 to 2	R	0 to 35		
⑤ Accuracy	7	Total Error Band $\pm 1.0\%$ F.S. (Includes Linearity, Hysteresis, Repeatability) (-20 to 85°C)						
⑦ Output signal (Supply voltage)	Y	0.5 to 4.5V DC Ratio metric 3 wire (5.0 $\pm$ 0.5V DC)						
	6	0 to 5V DC 3 wire (9 to 36V DC)						
	8	1 to 5V DC 3 wire (9 to 36V DC)						
	Z	1 to 6V DC 3 wire (9 to 36V DC)						
	7	0 to 10V DC 3 wire (14 to 36V DC)						
	1	4 to 20mA DC 2 wire (9 to 36V DC)						
⑧ Optional	0	Without cable						
	1	Cabel / Leads 1m (Standard)						
	9	Specify cable length						
⑨ Treatment	0	Not required						
	1	Use no oil						
	2	Use no water						
	3	Use no oil & water						
⑮ Documents	0	Not required						
	1	Required (Documents available upon request) Datasheet (Drawing / Specifications) Instruction manual Clibration test report (One-part one sheet) Inspection / Traceability certificate						

Please specify pressure range and unit of measure along with corresponding ordering code.

\*1 Cable with mating connector on the other side are not included.

\*Lead length can be specified from 0.5 to 5m.  
(Increase by 0.5m).

\*Cable length of shielded cable can be specified from 1 to 5m.  
(Increase by 0.5m).

\*Consult for nonstandard length.

Metri-Pack is a trademark of Delphi Packard Electronics System.

Mini-Hirschmann is a trademark of Richard Hirschmann of America, Inc..

### Treatment against wetted parts

#### ■ Use no oil

Oil used in manufacturing the gauges had been flushed out & no oil residue remained inside its wetted parts.

#### ■ Use no water

Water used in manufacturing the gauges had been flushed out & no water residue remained inside its wetted parts.

#### ■ Use no oil & water

Oil/Water used in manufacturing the gauges had been flushed out & no oil/water residue remained inside its wetted parts.

\* Specify code "X" to refer N/A