



# SMART PRESSURE TRANSMITTER

*for Differential/Gauge/Absolute Pressure Measurement*

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## Model 31

### Introduction

The 31 Smart Pressure Transmitter is a micro processor-based high performance transmitter, which has flexible pressure calibration and output, automatic compensation of ambient temperature and process variable, configuration of various parameters, communication with HART protocol. The application is very various, as measuring liquid, gas or steam flow as well as pressure and liquid level by application method. All data of sensor is to be input, modified and stored in EEPROM.



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### Feature

- Flexible Sensor Input : DP, GP, AP, HP
- Various Output : 4 ~20mA , Digital Signals
- Setting Various Parameters: Zero/Span, Trim, Unit, Fail-mode, etc.
- Self Diagnostic Function : Sensor, Memory A/D Converter, Power, etc
- Digital Communication with HART protocol
- Explosion-proof Approval & Intrinsic Safety Approval :  
ATEX, FM, FM Canada, GOST, KOSHA, KTL, etc.  
Marine Certificate: ABS, LR, BR, DNV

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### Application

- Air compressor
  - Various type of pumps
  - Hydraulic machine
  - Water treatment plant
  - Water works
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1 Pressure Sensor Range & URL

Range Code	DP/GP/HP/F					AP	
	Calibrated Span (KPa)	Upper Range (URL) (KPa)	Lower Range (LRL) (KPa)			Calibrated Span (KPa)	Range(KPa)
			D.P	G.P	H.P		
2	0.075 ~ 1.5	1.5	-1.5	-1.5	NA	NA	NA
3	0.15 ~ 7.5	7.5	-7.5	-7.5	NA	NA	NA
4	0.373 ~ 37.3	37.3	-37.3	-37.3	-37.3	2.5 ~ 250	0 ~ 250
5	1.865 ~ 186.5	186.5	-186.5	-100	-186.5	15 ~ 1500	0 ~ 1500
6	6.9 ~ 690	690	-690	-100	-690	25 ~ 2500	0 ~ 2500
7	20.68~2068	2068	-2068	-100	-2068	NA	NA
8	68.95~6895	6895	-6895	-100	NA	NA	NA
9	206.8~20680	20680	NA	-100	NA	NA	NA
0	413.7~41370	41370	NA	-100	NA	NA	NA

Range Code	Kpa	Kg/cm <sup>2</sup>	bar	psi	inH2O@4°C	mmH2O@4°C	inHg@0°C
2	1.5	0.015	0.015	0.217	6	152	0.442
3	7.5	0.076	0.075	1.087	30	765	2.215
4	37.3	0.38	0.373	5.41	149	3804	11.014
5	186.5	1.902	1.865	27.049	749	19018	55.072
6	690	7.036	6.9	100.073	2773	70361	203.75
7	2068	21.088	20.68	299.93	8310	210878	610.66
8	6895	70.309	68.95	1000.009	27708	703097	2036.025
9	20680	210.876	206.8	2999.303	83105	2108781	6106.597
0	41370	421.856	413.7	60000.211	166085	4218566	12216.55

2 Electrical Specification

Power Supply	12 to 45 Vdc	Output Signal	4 ~ 20 mA dc / HART
HART loop resistance	250 ~ 550 ohm	Isolation	500 Vrms (707 Vdc)

3 Performance Specification

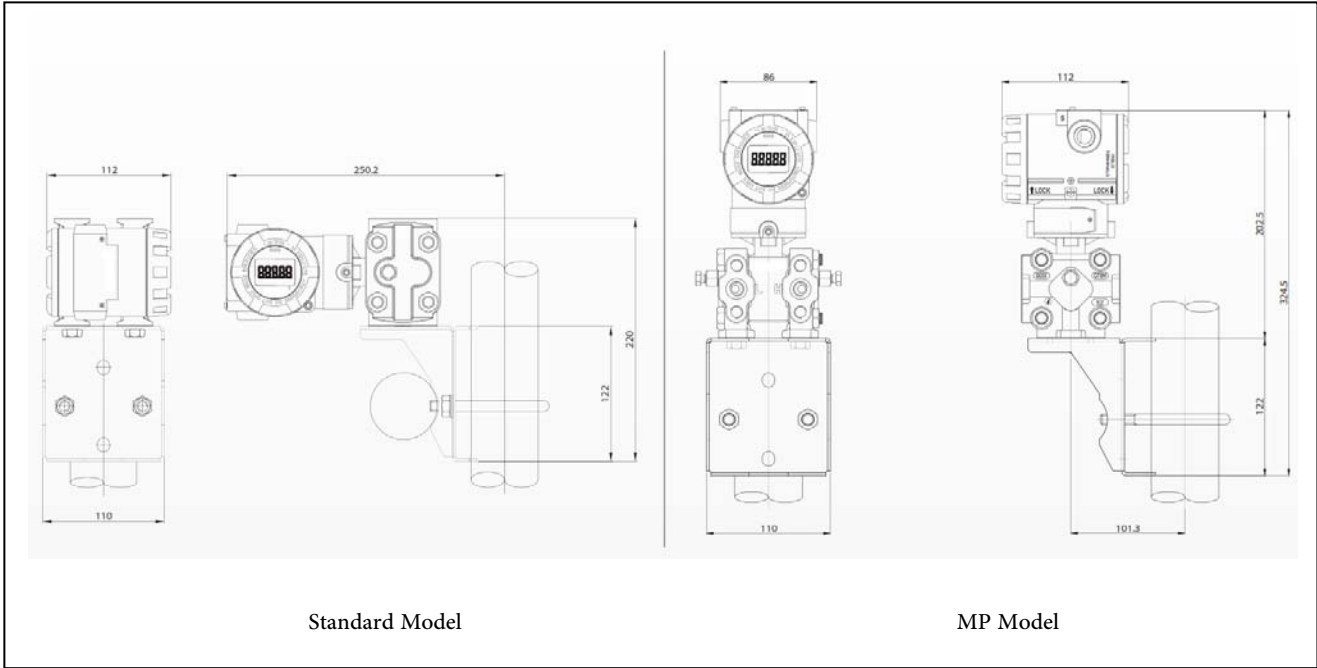
Reference Accuracy	± 0.075% of Span (0.1URL≤Span≤URL) ±[0.025+0.005x(URL/Span)]% of Span (0.01URL≤Span<0.1URL)	Ambient Temperature	-40 ~ +85°C
		LCD Meter Ambient Temp	-30 ~ +80°C
		Humidity Limits	5% ~ 100% RH
Ambient Temp. Effect	±[0.019%URL+0.125% Span] / 28 °C	Process Temperature Limits	-40°C ~ +120°C
Stability	±0.125% URL for 36 Months	Power Supply Effects	±0.005% of Span per Volt
Static Pressure Effects	±0.1% of URL per 7MPa (Zero Error) ±0.2% of Reading per 7Mpa(Span Error)	Mounting Position Effects	Zero Shift up to 350Pa No Span Effect

4 Physical Specification

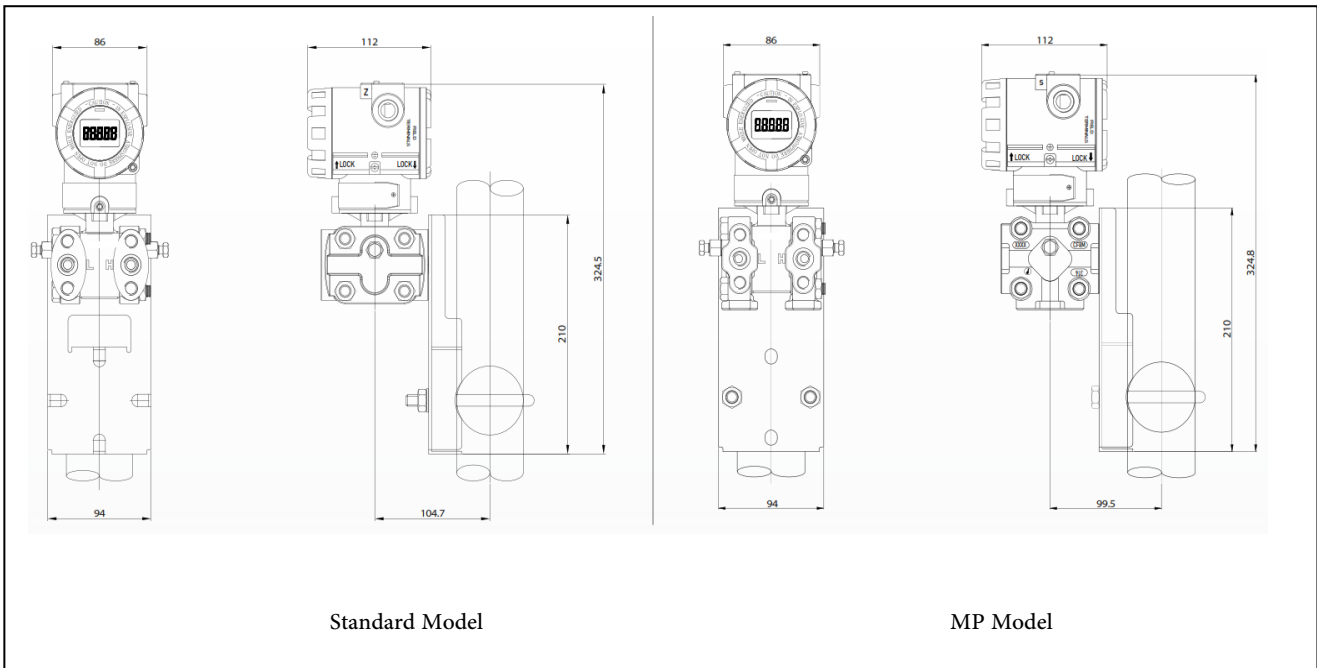
Isolating Diaphragm	316L SST	Process Connection Size	1/4 - 18 NPT
Drain & Vent Valve	316 SST	(Adapter - Option)	1/2 - 14 NPT
Flange & Adapter	316 SST	Electrical Connections	1/2 - 14 NPT with M4
O-ring	Viton, PTFE	Weight (excluding Option Items)	3.9 Kg (Standard) 5.35Kg(SST Housing)
Electronic Housing	Aluminum (Option:316L SST)	2" Pipe Stanchion Type bracket	Angle or Flat type
Bolts & Bolting Flange	304 SST	Housing Class	Waterproof (IP67), 4X

## Installation with Mounting Bracket

### 2" Pipe Mounting Bracket Model Angle Type

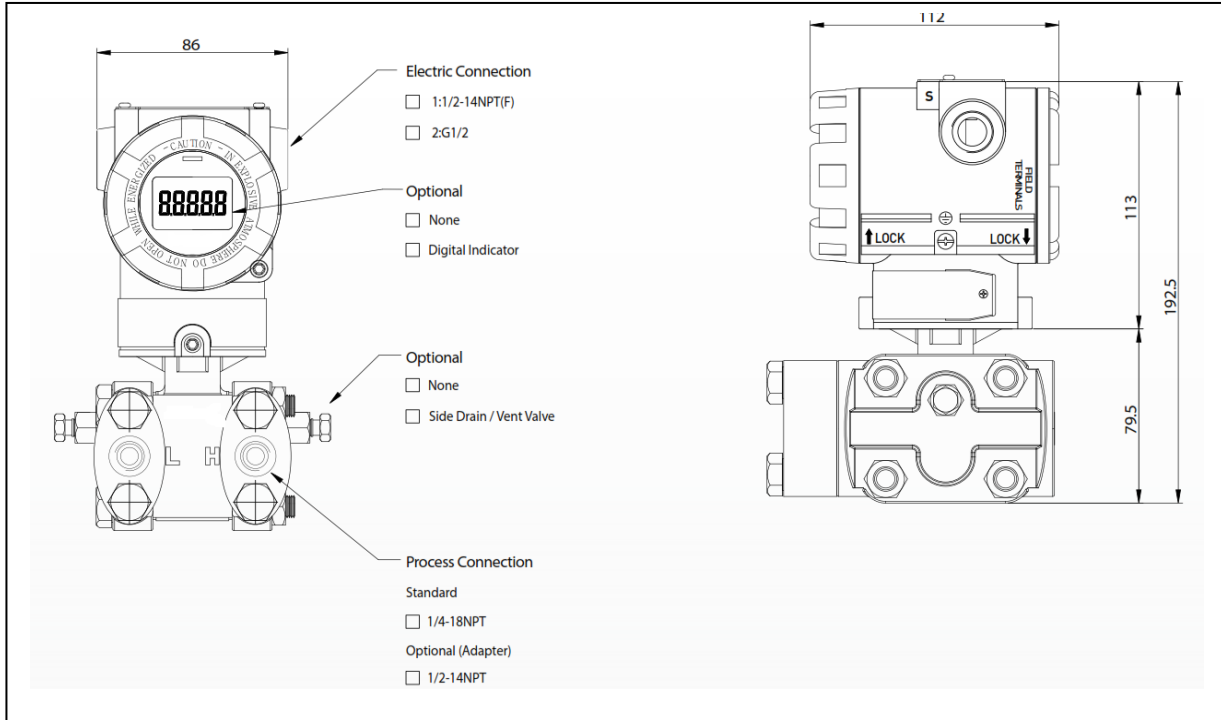


### 2" Pipe Mounting Bracket Model Flat Type

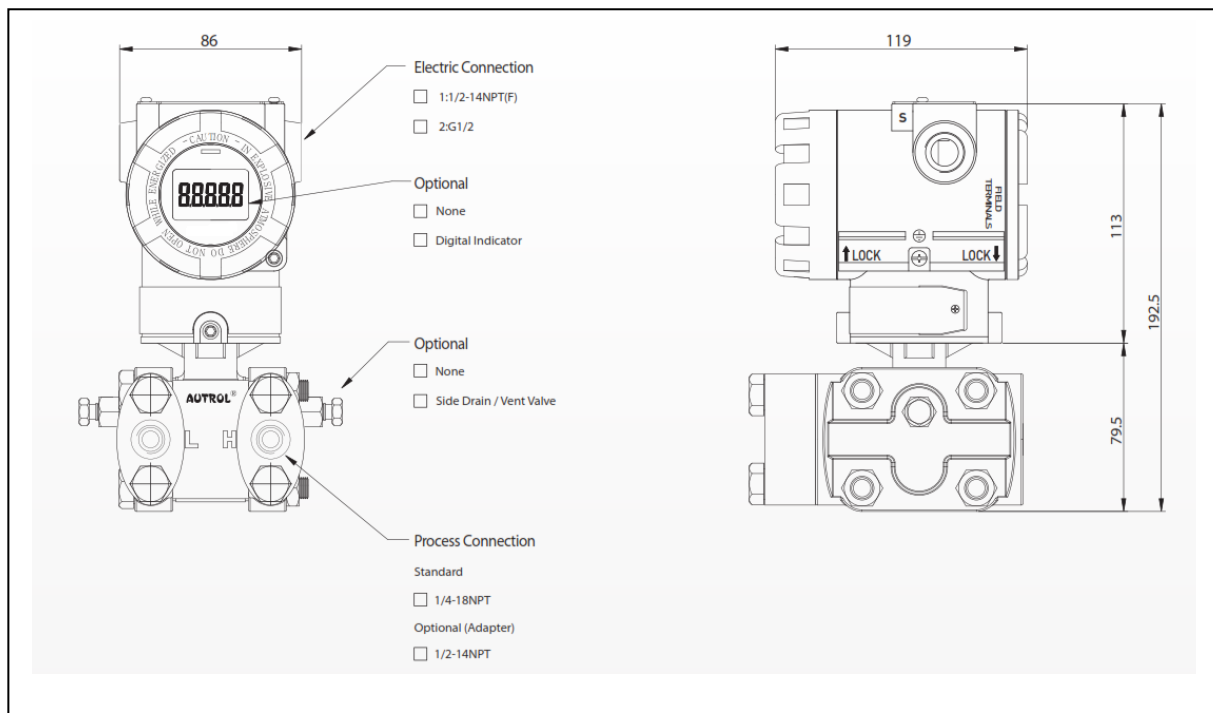


Dimension of Transmitter (mm)

Standard Model



Intrinsically Safe Model



Ordering Code

MODEL	Code	Description					
31	-D	Differential Pressure Transmitter (Static Pressure 13.79 MPa / 2000psi)					
	-F	Flow Transmitter (on the principle of Differential Pressure Use and only for Head)					
	-G	Gauge Pressure Transmitter					
	-H	Differential Pressure Transmitter for High Line Pressure (Static Pressure 31.02MPa / 4500psi )					
	-A	Absolute Pressure Transmitter					
RANGES		DP/GP/HP					*AP
		Calibrated Span Min. to Max	Lower Range Limit			Upper Range Limits	Range 31-A
			31-D	31-G	31-H		
	2	0.075 ~ 1.5 KPa	-1.5 KPa	-1.5 KPa	NA	1.5 KPa (6.022 inH2O)	NA
	3	0.15 ~ 7.5 KPa	-7.5 KPa	-7.5 KPa	NA	7.5 KPa (30 inH2O)	NA
	4	0.373 ~ 37.3 KPa	-37.3 KPa	-37.3 KPa	-37.3 KPa	37.3 KPa (150 inH2O)	0~250 KPa
	5	1.865 ~ 186.5 KPa	-186.5 KPa	-100KPa	-186.5 KPa	186.5 KPa (750 inH2O)	0~1500 KPa
	6	6.9 ~ 690 KPa	-690 KPa	-100KPa	-690 KPa	690 KPa (100 psi)	0~2500 KPa
	7	20.68 ~ 2068 KPa	-2068 KPa	-100KPa	-2068 KPa	2068 KPa (300 psi)	NA
	8	68.95 ~ 6895 KPa	-6895 KPa	-100KPa	NA	6895 KPa (1000 psi)	NA
	9	206.8 ~ 20680 KPa	NA	-100KPa	NA	20680 KPa (3000 psi)	NA
	0	413.7 ~ 41370 KPa	NA	-100KPa	NA	41370 KPa (6000 psi)	NA
	X	Special					
Mounting Flange/ Material		Body	Vent Plug		Diaphragm		
	M11	316 SST	316 SST		316L SST		
	M12	316 SST	316 SST		HAST - C		
	M13	316 SST	316 SST		Monel		
	M14	316 SST	316 SST		Tantalum		
	M21	HAST - C	HAST - C		HAST - C		
	M22	HAST - C	HAST - C		Monel		
M23	HAST - C	HAST - C		Tantalum			
Hazardous Location Certifications	K0	Maker Standard (Waterproof : IP67 )					
	K1	KOSHA Flameproof Approval			K2	KTL Intrinsic Safety Approval	
	E1	ATEX(KEMA) Flameproof			E2	ATEX(KEMA) Intrinsic Safety	
	F1	FM & FM Canada Explosion proof			F2	FM & FM Canada Intrinsic Safety	
Fill Fluid	1	Silicone (DC200)			2	Inert fill fluid (Halocarbon oil)	
Process Connection	S	1/4 - 18 NPT (Standard)			0	1/2 - 14 NPT Female (Adapter)	X Special
Electrical Connection	1	1/2-14NPT Epoxy-Polyester Painted Aluminum			2	G1/2 Epoxy- Polyester Painted Aluminum(Adapter)	X Special
Option	M1	LCD Indicator(5digit)					
	MP	Multi-Planar					
	LPI	Lightening Protector (Internal)			LPE	Lightening Protector (External)	
	K	Oil Free Finish					
	F1	Side Vent / Drain Top					
	F2	Side Vent / Drain Bottom					
	2W	2 Way Manifold (SST) : Remote type			2WF	Flange Type	
	3W	3 Way Manifold (SST) : Remote type			3WF	Flange Type	
	5W	5 Way Manifold (SST) : Remote type			6WF	Flange Type	
	BA	Stainless Steel Bracket (Angle type) with SST					
	BF	Stainless Steel Bracket (Flat type) with SST					
ST	Stainless Steel Housing						
T	Teflon O-Ring (Wetted Part)						



SMART  
PRESSURE TRANSMITTER  
With DIAPHRAGM SEAL

Bont of German Technologies

**BONT**<sup>®</sup>  
Bont Technologies



## Model 31L

### Introduction

The 31L Smart Pressure Transmitter is a micro processor-based high performance transmitter, which has flexible pressure calibration and output, automatic compensation of ambient temperature and process variable, configuration of various parameters, communication with HART protocol. All Data of Sensor (Tag No., Type, Range) is to be input, modified and stored in EEPROM.



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### Feature

- Superior performance
- High reference accuracy:  $\pm 0.075\%$  if calibrated Span (without seal)
- Long term stability
- High range ability ( 20 : 1 )
- Fail mode process function
- Continuous self diagnostics function
- Zero point adjustment

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### Function

- Flexible Sensor Input : measuring hydrostatic pressure head and transmitting liquid level
  - Various Output : 4 ~20mA(Analog) , Digital Signals
  - Setting Various Parameters : Zero/Span, Trim, Unit, Fail-mode, etc.
  - Self Diagnostic Function : Sensor, Memory A/D Converter, Power, etc
  - Digital Communication with HART protocol
  - Explosion-proof Approval & Intrinsic Safety Approval : KOSHA, KTL, CSA, FM, ATEX
-

## Specification

### 1 Diaphragm Sealed Sensor Range ( Range ability 20 : 1 )

Class	Code	mmH2O	Kpa
Low Level	4	0 ~ 194 to 0~ 3800	0 ~ 1.9 to 0 ~37.3
Medium Level	5	0 ~ 960 to 0 ~ 19000	0 ~ 9.4 to 0 ~ 186.5
High Level	6	0 ~ 3518 to 0 ~ 70000	0 ~ 34.5 to 0 ~ 690

### 2 Electrical Specification

Power Supply	12 to 45 Vdc	Output Signal	4 ~ 20 mA dc / HART
HART loop resistance	250 ~ 550 ohm	Isolation	500 Vrms (707 Vdc)
Update Time	0.25 sec	Turn on Time	5 sec

### 3 Performance Specification ( without seal )

Reference Accuracy	$\pm 0.075\%$ of Span ( $0.2URL \leq \text{Span} \leq URL$ ) $\pm [0.05 + 0.005 \times (URL/\text{Span})]\%$ of Span ( $0.05URL \leq \text{Span} < 0.2URL$ )	Ambient Temperature	-40 ~ +85°C
		LCD Meter Ambient Temp	-30 ~ +80°C
		Humidity Limits	5% ~ 98% RH
Ambient Temp. Effect	$\pm [0.025\%URL + 0.125\% \text{ Span}] / 28^\circ\text{C}$	Process Temperature Limits	-40°C ~ +120°C
Stability	$\pm 0.1\%$ URL for 12 Months	Power Supply Effects	$\pm 0.005\%$ of Span per Volt
Static Pressure Effects	$\pm 0.1\%$ of URL per 7MPa (Zero Error) $\pm 0.2\%$ of Reading per 7Mpa(Span Error)	Mounting Position Effects	Zero Shift up to 350Pa No Span Effect

### 4 Physical Specification

Isolating Diaphragm	316L SST	Process Connection Size	1/2" - 14 NPT
Drain & Vent Valve	316 SST	(Adapter - Option)	2" or 3" / 3" or 4"
Flange & Adapter	316 SST	Electrical Connections	1/2" - 14 NPT
O-ring	Viton, PTFE	Weight (only transmitter)	3.9 Kg
Electronic Housing	Aluminum	2" Pipe Stanchion Type bracket	Angle or Flat type
Bolts & Bolting Flange	316 SST	Housing Class	Waterproof (IP67,4X)

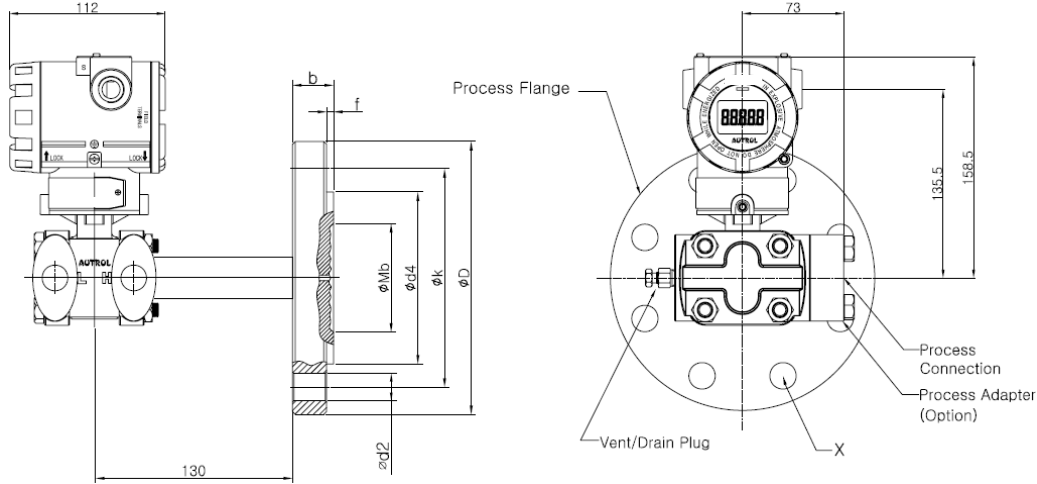
### 5 Hazardous Location Certificates - Option

Korea Standard Approval	Overseas Standards Approval
KC Flameproof Approval	FM & FMc Explosion proof/Intrinsic Safety Approval
KC Intrinsic Safety Approval	ATEX Flame proof /Intrinsic Safety Approval

## Model 31LFD

### Dimensional Drawing (mm)

For Flush Diaphragm Seal and Direct Mount Type Transmitter



#### Flange Size: 100mm (4 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	89	229	24	19	190	1.5	157	8
ANSI Class 300		254	32	22	200			
JIS 10K	89	210	18	19	175	2	157	8
JIS 20K		225	24	23	185			
DIN PN 10/16	89	220	20	18	180	3	157	8
DIN PN 25/40		235	24	22	190			

#### Flange Size: 80mm (3 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	89	190	24	19	152.5	1.5	127	4
ANSI Class 300		210	29	22	168.5			8
JIS 10K	89	185	18	19	150	2	127	8
JIS 20K		200	22	23	160			
DIN PN 10/16	89	200	20	18	160	3	138	8
DIN PN 25/40			24	22				

#### Flange Size: 50mm (2 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	61	152	19	19	120.5	1.5	92	4
ANSI Class 300		165	22		127			8
JIS 10K	61	155	16	19	120	2	96	4
JIS 20K			18					8
DIN PN 10/16	61	165	20	18	125	3	102	4
DIN PN 25/40								

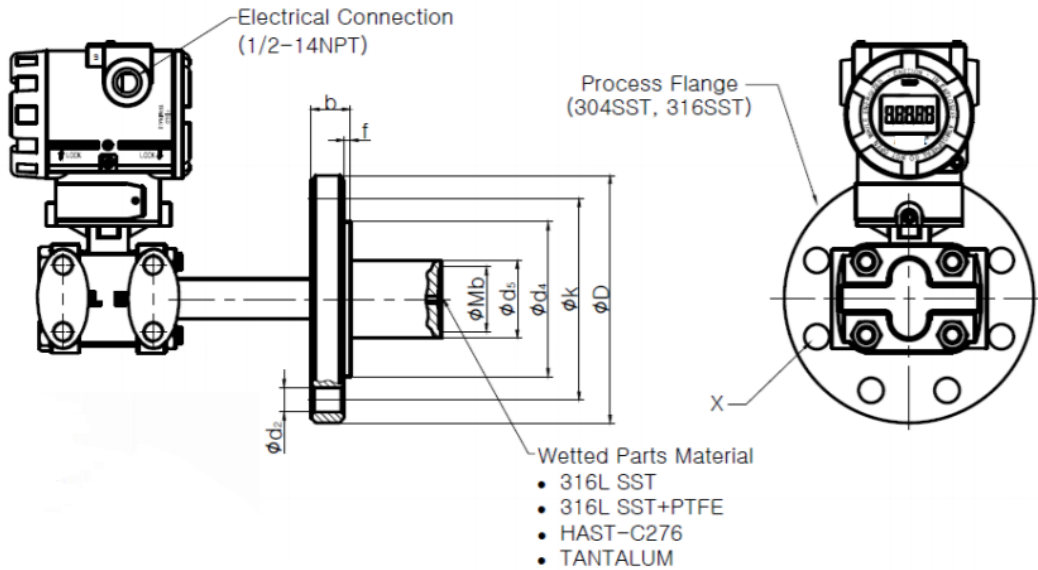
MODEL NO.	Code	Description	
31	LFD	Flush Diaphragm Seal and Direct Mount Type Transmitter	
Ranges	4	0-194 to 0-3800mmH2O (0-1.9 to 0-37.3 KPa)	
	5	0-960 to 0-19000mmH2O (0-9.4 to 0-186.5 KPa)	
	6	0-3518 to 0-70000mmH2O (0-34.5 to 0-690 KPa)	
	X	Special	
Mounting Flange Size/Material	C2	2-inch (50mm)	C. Steel
	S2	2-inch (50mm)	SST
	C3	3-inch (80mm)	C. Steel
	S3	3-inch (80mm)	SST
	XX	Special	
Mounting Flange Rating	A1	ANSI Class 150	
	A2	ANSI Class 300	
	J1	JIS 10K	
	J2	JIS 20K	
	D1	DIN PN 10/16	
	D2	DIN PN 25/40	
	XX	Special	
Wetted Parts Material Diaphragm/Others		<b>DIAPHRAGM</b>	<b>OTHERS</b>
	S	316L SST	316L SST
	PT	PTFE + 316L SST	316L SST
	H	Hastelloy C-276	316L SST
	T	Tantalum	316L SST
	X	Special	Special
Fill Fluid		<b>FILL FLUID</b>	<b>TEMPERATURE LIMITS</b>
	2	D.C Silicone 200	-40 to 205 °C (-40 to 400°F)
	7	D.C Silicone 704	0 to 315 °C (32 to 600°F)
	X	Special	
Materials of Construction		<b>FLANGE</b>	<b>VENT/DRAIN VALVE</b>
	SS	316 SST	316 SST
Low Side	W	without Process Adapter	
	N	with 1/2-14 NPT Process Adapter (316 SST)	
	C	Closed	
	X	Special	
Electrical Connection		<b>ELECTRICAL CONNECTION</b>	<b>MATERIAL</b>
	1	1/2-14NPT	Epoxy Coated-Aluminium
	2	G1/2	Epoxy Coated-Aluminium
	X	Special	
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67)	
	K1	KCs Flameproof	
	*K2	KCs Intrinsic Safety	
	E1	ATEX(KEMA) Flameproof	
	E2	ATEX(KEMA) Intrinsic Safety	
	F1	FM & FM Canada Explosion proof	
	*F2	FM & FM Canada Intrinsic Safety	
Option	M1	LCD Indicator (5-Digit)	LPI Lighting Protector
	K	Oil Free Finish	ST Stainless Steel Housing
	A	Vacuum Service	X Special Order

Note 1: Request to manufacturer for Draft Range, Absolute (small pressure and vacuum) and items marked “ \* ” before order.

## Model 31LED

### Dimensional Drawing (mm)

For Extended Diaphragm Seal and Direct Mount Type Transmitter



Flange Size: 100mm (4 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	89	229	24	19	190	1.5	157	89	8
ANSI Class 300		254	32	22	200				
JIS 10K	89	210	18	19	175	2	157	89	8
JIS 20K		225	24	23	185				
DIN PN 10/16	89	220	20	18	180	3	157	89	8
DIN PN 25/40		235	24	22	190				

Flange Size: 80mm (3 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	76	190	24	19	152.5	1.5	127	76	4
ANSI Class 300		210	29	22	168.5				8
JIS 10K	76	185	19	19	150	2	127	76	8
JIS 20K		200	22	23	160				
DIN PN 10/16	76	200	20	18	160	3	138	76	8
DIN PN 25/40			24	22					

Flange Size: 50mm (2 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	48	152	19	19	120.5	1.5	92	48	4
ANSI Class 300		165	22	19	127				8
JIS 10K	48	155	16	19	120	2	96	48	4
JIS 20K			18						8
DIN PN 10/16	48	165	20	18	125	3	102	48	4
DIN PN 25/40									

Ordering Code

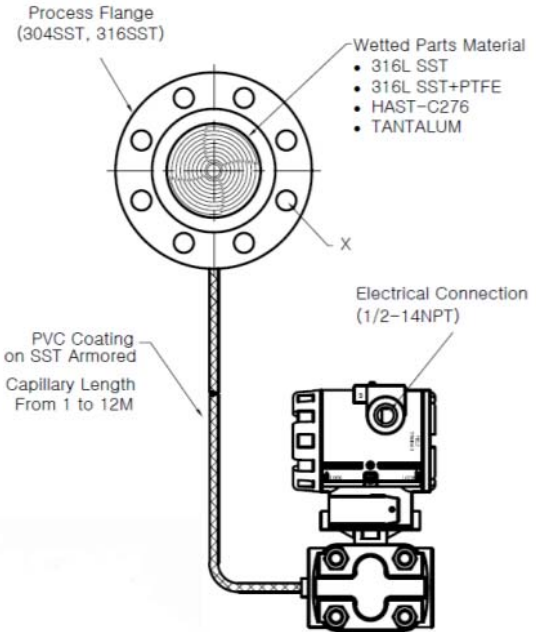
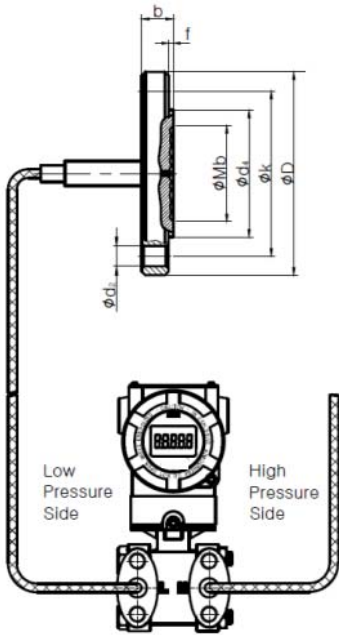
MODEL NO.	Code	Description		
31	-LED	Extended Diaphragm Seal and Direct Mount Type Transmitter		
Ranges	4	0-194 to 0-3800mmH2O (0-1.9 to 0-37.3 KPa)		
	5	0-960 to 0-19000mmH2O (0-9.4 to 0-186.5 KPa)		
	6	0-3518 to 0-70000mmH2O (0-34.5 to 0-690 KPa)		
	x	Special		
Mounting Flange Size/Material	C2	2-inch (50mm)	C. Steel	
	S2	2-inch (50mm)	SST	
	C3	3-inch (80mm)	C. Steel	
	S3	3-inch (80mm)	SST	
	XX	Special		
Mounting Flange Rating	A1	ANSI Class 150		
	A2	ANSI Class 300		
	J1	JIS 10K		
	J2	JIS 20K		
	D1	DIN PN 10/16		
	D2	DIN PN 25/40		
	XX	Special		
Extension Length	05	50mm (2in.)		
	10	100mm (4in.)		
	15	150mm (6in.)		
	XX	Special		
Wetted Parts Material Diaphragm/Others		<b>DIAPHRAGM</b>	<b>OTHERS</b>	
	S	316L SST	316L SST	
	P	Teflon + 316L SST	316L SST	
	H	Hastelloy C-276	316L SST	
	T	Tantalum	316L SST	
	X	Special	Special	
Fill Fluid		<b>FILL FLUID</b>	<b>TEMPERATURE LIMITS</b>	
	2	D.C Silicone 200	-40 to 205°C (-40 to 400 °F)	
	7	D.C Silicone 704	0 to 315 °C (32 to 600°F)	
Materials of Construction		<b>FLANGE</b>	<b>VENT/DRAIN VALVE</b>	
	SS	316 SST	316 SST	
Low Side	W	without Process Adapter (1/4-18 NPT on the cover flange)		
	N	with 1/2-14 NPT Process Adapter (316 SST)		
	C	Closed		
	X	Special		
Electrical Connection		<b>ELECTRICAL CONNECTION</b>	<b>MATERIAL</b>	
	1	1/2-14NPT	Epoxy Coated-Aluminium	
	2	G1/2	Epoxy Coated-Aluminium	
	X	Special		
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67/NEMA 4X)		
	K1	KCs Flameproof		
	*K2	KCs Intrinsic Safety		
	E1	ATEX Flameproof		
	E2	ATEX Intrinsic Safety		
	F1	FM & FM Canada Explosion proof		
	*F2	FM & FM Camada Intrinsic Safety		
Option	M1	LCD Indicator	LPI	Lighting Protector(Internal)
	K	Oil Free Finish	ST	Stainless Steel Housing
	A	Vacuum Service	X	Special Order

Noted: Request to manufacturer for Draft Range, Absolute ( Small Pressure and Vacuum ) and items marked " \* " before order

## Model 31LFC

### Dimensional Drawing (mm)

For Flush Diaphragm Seal and Capillary Type Transmitter



Flange Size: 100mm (4 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	89	229	24	19	190	1.5	157	8
ANSI Class 300		254	32	22	200			
JIS 10K	89	210	18	19	175	2	157	8
JIS 20K		225	24	23	185			
DIN PN 10/16	89	220	20	18	180	3	157	8
DIN PN 25/40		235	24	22	190			

Flange Size: 80mm (3 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	89	190	24	19	152.5	1.5	127	4
ANSI Class 300		210	29	22	168.5			8
JIS 10K	89	185	18	19	150	2	127	8
JIS 20K		200	22	23	160			
DIN PN 10/16	89	200	20	18	160	3	138	8
DIN PN 25/40			24	22				

Flange Size: 50mm (2 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	61	152	19	19	120.5	1.5	92	4
ANSI Class 300		165	22		127			8
JIS 10K	61	155	16	19	120	2	96	4
JIS 20K			18					8
DIN PN 10/16	61	165	20	18	125	3	102	4
DIN PN 25/40								

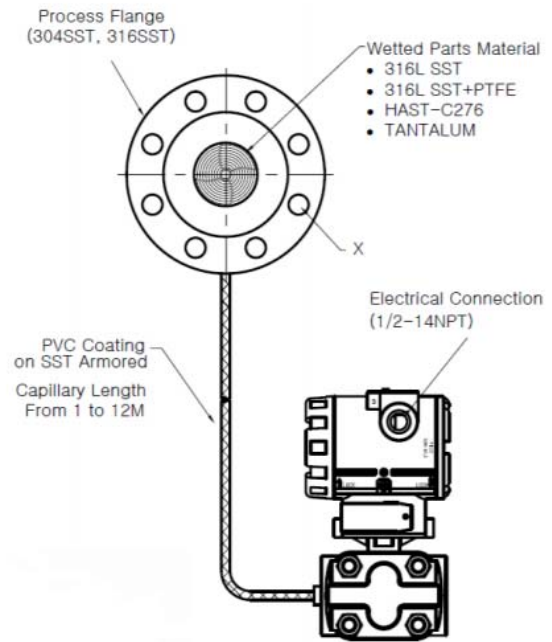
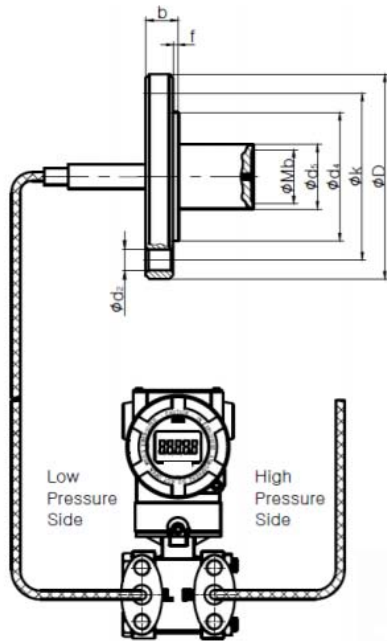
MODEL NO.	Code	Description	
31	-LFC	Flush Diaphragm Seal and Capillary Type Transmitter (Two remote Seal)	
Ranges	4	0-194 to 0-3800mmH <sub>2</sub> O (0-1.9 to 0-37.3 KPa)	
	5	0-960 to 0-19000mmH <sub>2</sub> O (0-9.4 to 0-186.5 KPa)	
	6	0-3518 to 0-70000mmH <sub>2</sub> O (0-34.5 to 0-690 KPa)	
	x	Special	
Mounting Flange Size/Material	C2	50mm (2-inch)	C. Steel
	S2	50mm (2-inch)	SST
	C3	80mm (3-inch)	C. Steel
	S3	80mm (3-inch)	SST
	XX	Special	
Mounting Flange Rating	A1	ANSI Class 150	
	A2	ANSI Class 300	
	J1	JIS 10K	
	J2	JIS 20K	
	D1	DIN PN 10/16	
	D2	DIN PN 25/40	
	XX	Special	
Wetted Parts Material Diaphragm/Others		<b>DIAPHRAGM</b>	<b>OTHERS</b>
	S	316L SST	316L SST
	P	Teflon + 316L SST	316L SST
	H	Hastelloy C-276	316L SST
	T	Tantalum	316L SST
	X	Special	Special
Fill Fluid		<b>FILL FLUID</b>	<b>TEMPERATURE LIMITS</b>
	2	D.C Silicone 200	-40 to 205 °C (-40 to 400 °F)
	7	D.C Silicone 704	0 to 315 °C (32 to 600 °F)
	X	Special	
Capillary Length (m)	<input type="text"/> <input type="text"/>	Capillary Length from 1 to 12mm (Example for 3m : 03)	
Materials of Construction		<b>FLANGE</b>	<b>VENT/DRAIN VALVE</b>
	SS	316 SST	316 SST
Electrical Connection		<b>ELECTRICAL CONNECTION</b>	<b>MATERIAL</b>
	1	1/2-14NPT	Epoxy Coated-Aluminium
	2	G1/2	Epoxy Coated-Aluminium
	X	Special	
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67/NEMA 4X)	
	K1	KCs Flameproof	
	K2	KCs Intrinsic Safety	
	E1	ATEX Flameproof	
	E2	ATEX Intrinsic Safety	
	F1	FM & FM Canada explosion proof	
	*F2	FM & FM Canada Intrinsic Safety	
Option	M1	LCD Indicator (5-Digit)	LP Lighting Protector
	BA	Stainless Steel Bracket (Angle type) with SST Bolts	K Oil Free Finish
	BF	Stainless Steel Bracket (Flat type) with SST Bolts	ST Stainless Steel Housing
	A	Vacuum Service	
	X	Special Order	



## Model 31LEC

### Dimensional Drawing (mm)

For Extended Diaphragm Seal and Capillary Type Transmitter



Flange Size: 100mm (4 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	89	229	24	19	190	1.5	157	89	8
ANSI Class 300		254	32	22	200				
JIS 10K	89	210	18	19	175	2	157	89	8
JIS 20K		225	24	23	185				
DIN PN 10/16	89	220	20	18	180	3	157	89	8
DIN PN 25/40		235	24	22	190				

Flange Size: 80mm (3 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	76	190	24	19	152.5	1.5	127	76	4
ANSI Class 300		210	29	22	168.5				8
JIS 10K	76	185	19	19	150	2	127	76	8
JIS 20K		200	22	23	160				8
DIN PN 10/16	76	200	20	18	160	3	138	76	8
DIN PN 25/40			24	22					

Flange Size: 50mm (2 inch)

Unit: mm

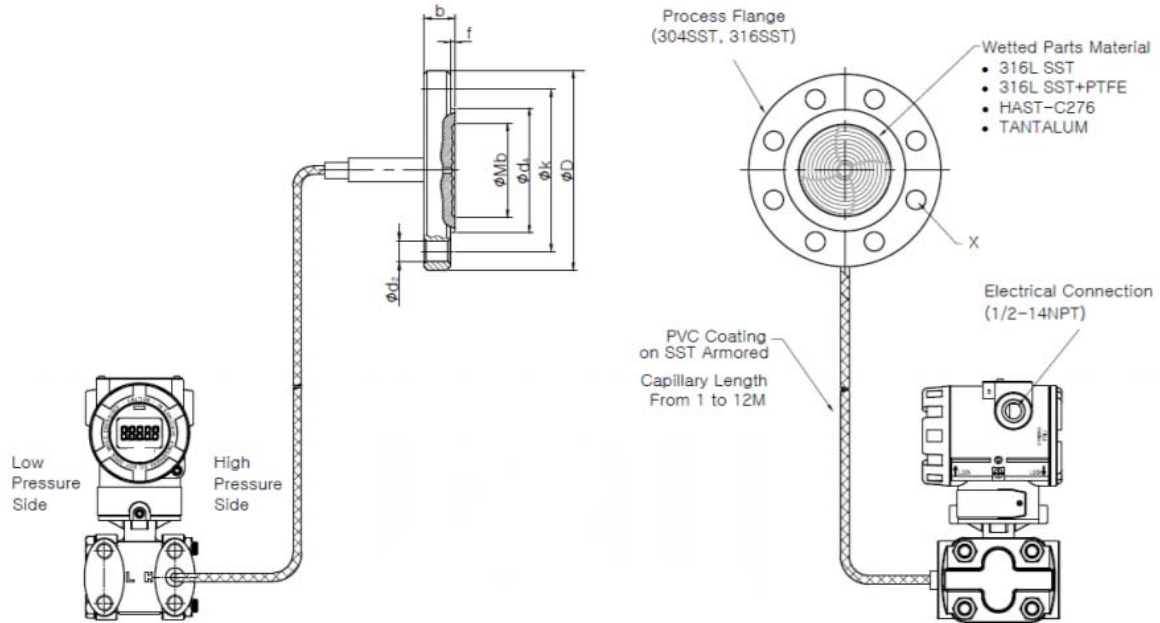
Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	48	152	19	19	120.5	1.5	92	48	4
ANSI Class 300		165	22		127				8
JIS 10K	48	155	16	19	120	2	96	48	4
JIS 20K			18						8
DIN PN 10/16	48	165	20	18	125	3	102	48	4
DIN PN 25/40									

MODEL NO.	Code	Description			
31	-LEC	Extended Diaphragm Seal and Capillary Type Transmitter (Two Remote Seal)			
Ranges	4	0-194 to 0-3800mmH2O (0-1.9 to 0-37.3 KPa)			
	5	0-960 to 0-19000mmH2O (0-9.4 to 0-186.5 KPa)			
	6	0-3518 to 0-70000mmH2O (0-34.5 to 0-690 KPa)			
	x	Special			
Mounting Flange Size/Material	C2	50mm (2-inch)	C. Steel		
	S2	50mm (2-inch)	SST		
	C3	50mm (2-inch)	C. Steel		
	S3	50mm (2-inch)	SST		
	XX	Special			
Mounting Flange Rating	A1	ANSI Class 150			
	A2	ANSI Class 300			
	J1	JIS 10K			
	J2	JIS 20K			
	D1	DIN PN 10/16			
	D2	DIN PN 25/40			
	XX	Special			
Extension Length	5	50mm (2in.)			
	10	100mm (4in.)			
	15	150mm (6in.)			
	XX	Special			
Wetted Parts Material Diaphragm/Others		<b>DIAPHRAGM</b>		<b>OTHERS</b>	
	S	316L SST		316L SST	
	P	Teflon + 316L SST		316L SST	
	H	Hastelloy C-276		316L SST	
	T	Tantalum		316L SST	
	X	Special		Special	
			<b>FILL FLUID</b>		<b>TEMPERATURE LIMITS</b>
Fill Fluid	2	D.C Silicone 200		-40 to 205°C (-40 to 400°F)	
	7	D.C Silicone 704		0 to 315°C (32 to 600°F)	
	X	Special			
		Capillary Length from 1 to 12mm (Example for 3m : 03)			
Materials of Construction		<b>FLANGE</b>		<b>VENT/DRAIN VALVE</b>	
	SS	316 SST		316 SST	
Electrical Connection		<b>ELECTRICAL CONNECTION</b>		<b>MATERIAL</b>	
	1	1/2-14NPT		Epoxy Coated-Aluminium	
	2	G1/2		Epoxy Coated-Aluminium	
	X	Special			
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67)			
	K1	KCs Flameproof			
	K2	KCs Intrinsic Safety			
	E1	ATEX Flameproof			
	E2	ATEX Intrinsic Safety			
	F1	FM & FM Canada Explosion proof			
	*F2	FM & FM Canada Intrinsic Safety			
Option	M1	LCD Indicator		LPI	Lighting Protector
	BA	Stainless Steel Bracket (Angle type) with SST Bolts		K	Oil Free Finish
	BF	Stainless Steel Bracket (Flat type) with SST Bolts		ST	Stainless Steel Housing
	X	Special Order			

## Model 31LFS

### Dimensional Drawing (mm)

For Flush Diaphragm Seal and Capillary Type Transmitter



Flange Size: 100mm (4 inch)

Unit: mm

=Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	89	229	24	19	190	1.5	157	8
ANSI Class 300		254	32	22	200			
JIS 10K	89	210	18	19	175	2	157	8
JIS 20K		225	24	23	185			
DIN PN 10/16	89	220	20	18	180	3	157	8
DIN PN 25/40		235	24	22	190			

Flange Size: 80mm (3 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	89	190	24	19	152.5	1.5	127	4
ANSI Class 300		210	29	22	168.5			8
JIS 10K	89	185	18	19	150	2	127	8
JIS 20K		200	22	23	160			
DIN PN 10/16	89	200	20	18	160	3	138	8
DIN PN 25/40			24	22				

Flange Size: 50mm (2 inch)

Unit: mm

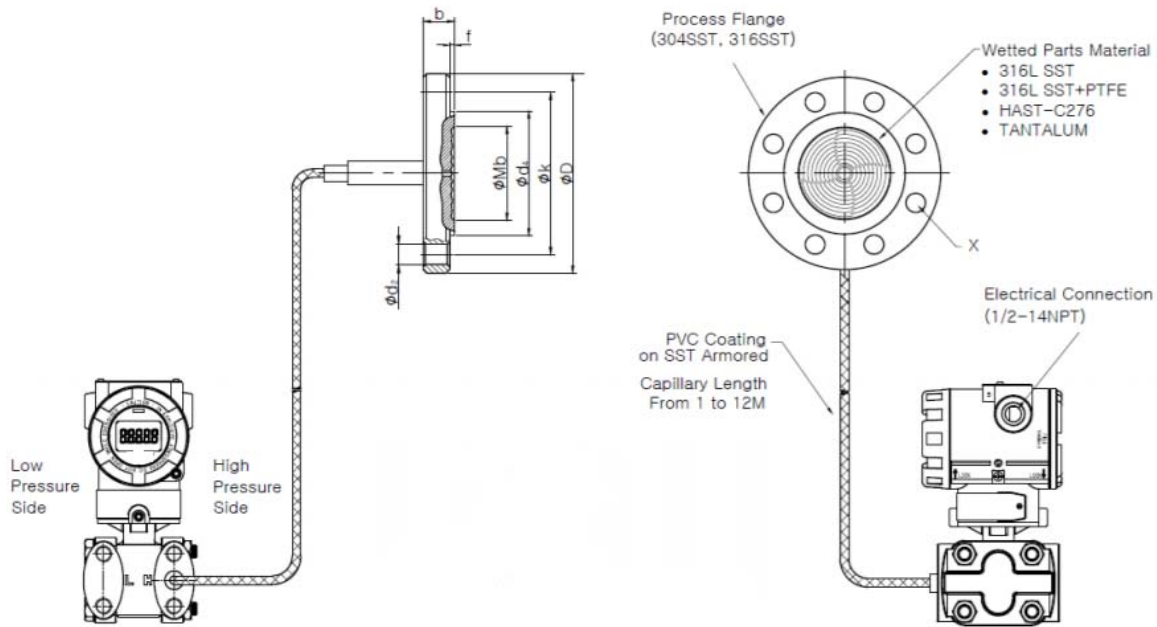
Flange Rating	Mb	D	b	d2	k	f	d4	X
ANSI Class 150	61	152	19	19	120.5	1.5	92	4
ANSI Class 300		165	22		127			8
JIS 10K	61	155	16	19	120	2	96	4
JIS 20K			18					8
DIN PN 10/16	61	165	20	18	125	3	102	4
DIN PN 25/40								

MODEL NO.	Code	Description	
31	-LFS	Flush Diaphragm Seal and Capillary Type Transmitter (One Remote Seal)	
Ranges	4	0-194 to 0- 3800mmH2O (0-1.9 to 0-37.3 KPa)	
	5	0-960 to 0-19000mmH2O (0-9.4 to 0-186.5 KPa)	
	6	0-3518 to 0-70000mmH2O (0-34.5 to 0-690 KPa)	
	x	Special	
Mounting Flange Size/Material	C2	50mm (2-inch)	C. Steel
	S2	50mm (2-inch)	SST
	C3	80mm (3-inch)	C. Steel
	S3	80mm (3-inch)	SST
	XX	Special	
Mounting Flange Rating	A1	ANSI Class 150	
	A2	ANSI Class 300	
	J1	JIS 10K	
	J2	JIS 20K	
	D1	DIN PN 10/16	
	D2	DIN PN 25/40	
	XX	Special	
Wetted Parts Material Diaphragm/Others		<b>DIAPHRAGM</b>	<b>OTHERS</b>
	S	316L SST	316L SST
	P	Teflon+ 316L SST	316L SST
	H	Hastelloy C-276	316L SST
	T	Tantalum	316L SST
	X	Special	Special
Fill Fluid		<b>FILL FLUID</b>	<b>TEMPERATURE LIMITS</b>
	2	D.C Silicone 200	-40 to 205°C (-40 to 400 °F )
	7	D.C Silicone 704	0 to 315 °C (32 to 600°F)
	X	Special	
Capillary Length (m)	<input type="text"/>	Capillary Length from 1 to 12mm (Example for 3m : 03)	
Materials of Construction		<b>FLANGE</b>	<b>VENT/DRAIN VALVE</b>
	SS	316 SST	316 SST
Electrical Connection		<b>ELECTRICAL CONNECTION</b>	<b>MATERIAL</b>
	1	1/2-14NPT	Epoxy Coated-Aluminium
	2	G1/2	Epoxy Coated-Aluminium
	X	Special	
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67/NEMA 4X)	
	K1	KCs Flameproof	
	K2	KCs Intrinsic Safety	
	E1	ATEX Flameproof	
	E2	ATEX Intrinsic Safety	
	F1	FM & FM Canada Explosion proof	
	*F2	FM & FM Canada Intrinsic Safety	
Option	M1	LCD Indicator (5-Digit)	LPI Lighting Protector
	BA	Stainless Steel Bracket (Angle type) with Bolts & Nuts	K Oil Free Finish
	BF	Stainless Steel Bracket (Flat type) with Bolts & Nuts	ST Stainless Steel Housing
	A	Vacuum Services	
	X	Special Order	

## Model 31LES

### Dimensional Drawing (mm)

For Extended Diaphragm Seal and Capillary Type Transmitter



Flange Size: 100mm (4 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	89	229	24	19	190	1.5	157	89	8
ANSI Class 300		254	32	22	200				
JIS 10K	89	210	18	19	175	2	157	89	8
JIS 20K		225	24	23	185				
DIN PN 10/16	89	220	20	18	180	3	157	89	8
DIN PN 25/40		235	24	22	190				

Flange Size: 80mm (3 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	76	190	24	19	152.5	1.5	127	76	4
ANSI Class 300		210	29	22	168.5				8
JIS 10K	76	185	19	19	150	2	127	76	8
JIS 20K		200	22	23	160				
DIN PN 10/16	76	200	20	18	160	3	138	76	8
DIN PN 25/40			24	22					

Flange Size: 50mm (2 inch)

Unit: mm

Flange Rating	Mb	D	b	d2	k	f	d4	d5	X
ANSI Class 150	48	152	19	19	120.5	1.5	92	48	4
ANSI Class 300		165	22	19	127				8
JIS 10K	48	155	16	19	120	2	96	48	4
JIS 20K			18						8
DIN PN 10/16	48	165	20	18	125	3	102	48	4
DIN PN 25/40									

MODEL NO.	Code	Description	
31	-LES	Extended Diaphragm Seal and Capillary Type Transmitter (One Remote Seal)	
Ranges	6	0-194 to 0-3800mmH2O (0-1.9 to 0-37.3 KPa)	
	7	0-960 to 0-19000mmH2O (0-9.4 to 0-186.5 KPa)	
	8	0-3518 to 0-70000mmH2O (0-34.5 to 0-690 KPa)	
	x	Special	
Mounting Flange Size/Material	C2	50mm (2-inch)	C. Steel
	S2	50mm (2-inch)	SST
	C3	50mm (2-inch)	C. Steel
	S3	50mm (2-inch)	SST
	XX	Special	
Mounting Flange Rating	A1	ANSI Class 150	
	A2	ANSI Class 300	
	J1	JIS 10K	
	J2	JIS 20K	
	D1	DIN PN 10/16	
	D2	DIN PN 25/40	
	XX	Special	
Extension Length	5	50mm (2in.)	
	10	100mm (4in.)	
	15	150mm (6in.)	
	XX	Special	
Wetted Parts Material Diaphragm/Others		<b>DIAPHRAGM</b>	<b>OTHERS</b>
	S	316L SST	316L SST
	P	Teflon+ 316L SST	316L SST
	H	Hastelloy C-276	316L SST
	T	Tantalum	316L SST
	X	Special	Special
Fill Fluid		FILL FLUID	TEMPERATURE LIMITS
	2	D.C Silicone 200	-40 to 205°C (-40 to 400 °F)
	7	D.C Silicone 704	0 to 315 °C (32 to 600 °F)
	X	Special	
Capillary Length (m)	<input type="text"/>	Capillary Length from 1 to 12mm (Example for 3m : 03)	
Materials of Construction		<b>FLANGE</b>	<b>VENT/DRAIN VALVE</b>
	CS	Plated C. Steel	316 SST
	SS	316 SST	316 SST
Electrical Connection		<b>ELECTRICAL CONNECTION</b>	<b>MATERIAL</b>
	1	1/2-14NPT	Epoxy Coated-Aluminium
	2	G1/2	Epoxy Coated-Aluminium
	X	Special	
Hazardous Locations Certifications	K0	Maker Standard (Waterproof : IP67/NEMA 4X)	
	K1	KCs Flameproof	
	K2	KCs Intrinsic Safety	
	E1	ATEX Flameproof	
	E2	ATEX Intrinsic Safety	
	F1	FM & FM Canada Explosion proof	
	*F2	FM & FM Canada Intrinsic Safety	
Option	M1	LCD Indicator (5-Digit)	LPI Lighting Protector
	BA	Stainless Steel Bracket (Angle type) with Bolts & Nuts	K Oil Free Finish
	BF	Stainless Steel Bracket (Flat type) with Bolts & Nuts	ST Stainless Steel Housing
	A	Vacuum Service	



# SMART PRESSURE TRANSMITTER

*for Gauge and Absolute Pressure Measurement*

## Model 32

### Introduction

The 32 Smart Pressure Transmitter is a micro processor-based high performance transmitter, which has flexible pressure calibration and output, automatic compensation of ambient temperature and process variable, configuration of various parameters, communication with HART protocol.

All Data of Sensor (Tag No., type, range etc.) is to be input, modified and stored in EEPROM.



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### Feature

- Superior performance
- Flexibility
- Reliability
- Continuous self diagnostics function
- Zero point adjustment

---

### Function

- Flexible Sensor Input : GP, AP, Flush Mount
  - Various Output : 4 ~20mA , Digital Signals
  - Setting Various Parameters: Zero/Span, Trim, Unit, Fail-mode, etc.
  - Self Diagnostic Function : Sensor, Memory A/D Converter, Power, etc
  - Digital Communication with HART protocol
  - Explosion-proof Approval & Intrinsic Safety Approval :  
ATEX, FM, FM Canada, GOST, KCs, etc.  
Marine Certificate: ABS, LR, BR, DNV
-



1 32- G/A Pressure Sensor Range (Range ability = 100 : 1)

	32 - G		32 - A	
	Range (KPa)	Calibrated Span (KPa)	Range (KPa)	Calibrated Span (KPa)
3	-100~150	1.5~150	NA	NA
4	-100 ~ 1,500	15 ~ 1,500	0 ~ 250	2.5 ~ 250
5	0 ~ 5,000	50 ~ 5,000	0 ~ 1,500	15 ~ 1,500
6	0 ~ 25,000	250 ~ 25,000	0 ~ 2,500	25 ~ 2,500
7	0 ~ 60,000	600 ~ 60,000	NA	NA

2 Electrical Specification

<b>Power Supply</b>	Voltage Range : 12 to 45 Vdc Voltage Rating : 24 Vdc ±30%	<b>Output Signal</b>	4 ~ 20 mA dc / HART
<b>HART Loop Resistance</b>	250 ~ 550 ohm	<b>Isolation</b>	500 Vrms (707 Vdc)

3 Performance Specification

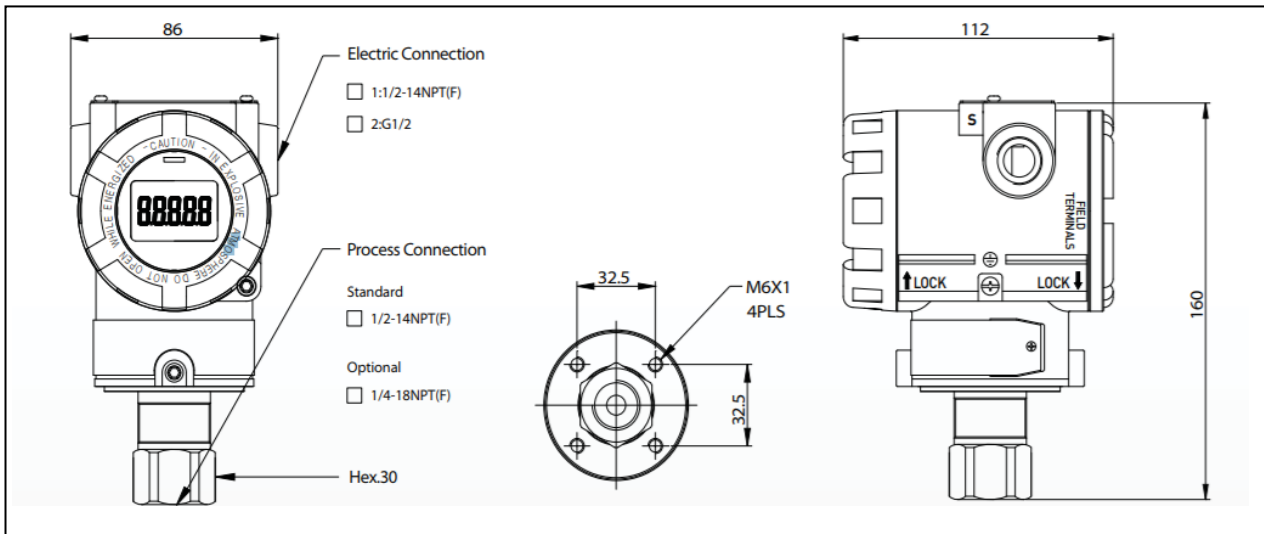
<b>Reference Accuracy</b>	± 0.075% of Span (0.1URL≤Span ≤URL) ± [0.025+0.005x(URL/Span)]% of Span (0.01URL≤Span<0.1URL)	<b>Ambient Temperature</b>	-40°C ~ +85°C
		<b>LCD Meter Ambient Temp</b>	-30°C ~ + 80°C
		<b>Humidity Limits</b>	5% ~ 100% RH
<b>Ambient Temp. Effect</b>	± [0.019%URL+0.125% Span] / 28°C	<b>Process Temp. Limit</b>	-40C ~ +120°C
		<b>Power Supply Effect</b>	± 0.005 % of Span per Volt
		<b>Stability</b>	± [0.125%URL for 36 months

4 Physical Specification

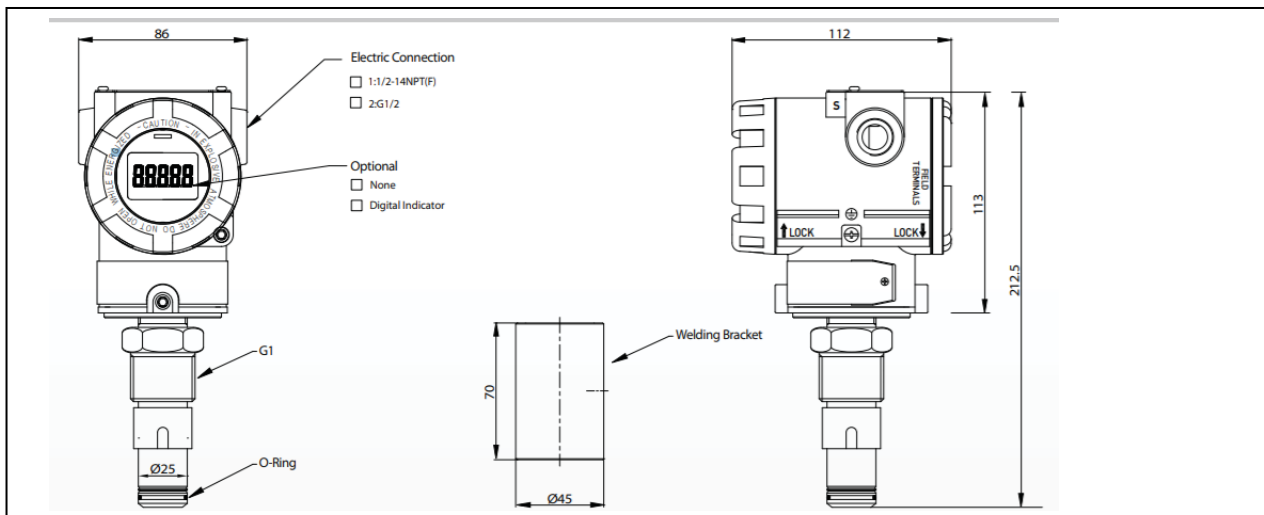
<b>Isolating Diaphragm</b>	316L SST	<b>Process Connection Size</b>	1/2 - 14 NPT Female
<b>Electronic Housing</b>	Aluminum	<b>Electrical Connections</b>	1/2 - 14 NPT with M4
<b>Housing Class</b>	Waterproof (IP67)	<b>2" Pipe Stanchion Type Bracket</b>	Angle or Flat type
		<b>Weight (excluding options)</b>	1.7 kg (standard) 2.83kg(SST Housing)

## Dimension of Transmitter (mm)

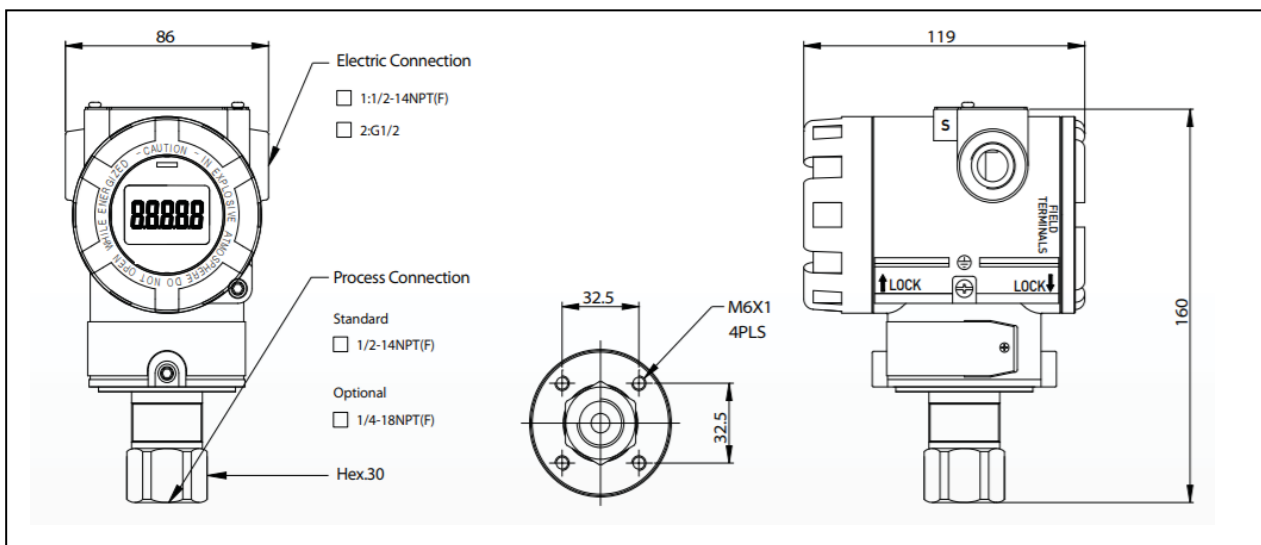
### Standard Model



### Flush Mount Model



### Intrinsically Safe Model



MODEL	Code	Description			
32	-G	Gauge Pressure Transmitter (reference accuracy : 0.075 % of span )			
	-F	Flush Mount Pressure Transmitter			
	-H	Absolute Pressure Transmitter (reference accuracy : 0.075 % of span)			
Range		G/F		A	
		Range (KPa)	Min. Span (KPa)	Range (KPa)	Min. Span (KPa)
	3	-100~150	1.5	NA	NA
	4	-100 ~ 1,500	15	0 ~ 250	2.5
	5	0 ~ 5,000	50	0 ~ 1500	15
	6	0 ~ 25,000	250	0 ~ 2500	25
	7	0 ~ 60,000	600	NA	NA
	X	Special			
Mounting Flange Material		DIAPHRAGM		OTHER	
	M11	316L SST		316 SST	
	*M12	HAST-C		316 SST	
	*M13	Tantalum		316 SST	
	*M21	HAST - C		HAST-C	
Hazardous Location Certifications	K0	Maker Standard (Waterproof : IP67 )			
	K1	KCs Flameproof Approval		K2	KCs Intrinsic Safety Approval
	E1	ATEX (KEMA) Explosion proof		E2	ATEX(KEMA) Intrinsic Safety
	F1	FM & FM Canada Explosion proof		F2	FM & FM Canada Intrinsic Safety
Fill Fluid	1	Silicone (DC 200)			
	*2	Inert fill (Halocarbon Oil)			
Process Connection	S	1/2 – 14 NPT Female (standard)			
	O	1/4 - 18 NPT Female (adapter)			
	X	Special			
Electrical Connection	1	1/2-14NPT	Epoxy-Polyester Painted Aluminium		
	2	G1/2	Epoxy-Polyester Painted Aluminium (Adapter)		
	X	Special			
Option	M1	LCD Indicator			
	LPI	Lightning Protector (Internal)		LPE	Lightning Protector (External)
	K	Oil Free Finish			
	2W	2 way manifold Remote type			
	BA	Stainless Steel Bracket (Angle type) with SST Bolts			
	BF	Stainless Steel Bracket (Flat type) with SST Bolts			
	ST	Stainless Steel Housing			
	X	Special			

Example: 32-G5-M11-K0-1-S-1-M1

Note 1: Request to manufacturer for Draft Range, Absolute (small pressure and vacuum) and Items marked “\*” before order.

Distributor:

LKS West Instruments Sdn Bhd<sup>(834286-T)</sup>  
 No. 50-2, Jalan Sunga Rasau D32/D,  
 Berjaya Park, Seksyen 32, Shah Alam  
 40460, Selangor, Malaysia  
 Tel: +603-5525 5038  
 Fax: +603-5525 5037  
 Email: [info.west@lkssb.com.my](mailto:info.west@lkssb.com.my)