

Rosemount 9901

Safety Instructions



Safety Instructions

These safety instructions are to be read and used in conjunction with the manual of the measuring instrument.

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing or maintaining this product.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.
Process leaks could result in death or serious injury.

A. DEFINITIONS

NOTES:

- Ps = Maximum allowable chamber pressure (in psi or bar) at stated temperature
Pt = Chamber test pressure (in psi or bar)
Ts_{max} = Maximum allowable chamber temperature (in °F or °C)
Ts_{min} = Minimum allowable chamber temperature (in °F or °C)

B. PRESSURE EQUIPMENT DIRECTIVE (PED)

The *PED-approved 9901* (model codes 9901*1 and 9901*5) is designed and manufactured to comply with modules “B1+D” of the Pressure Equipment Directive 97/23/EC. It carries a “CE” mark and has a Declaration of Conformity to show compliance with the Directive. Under the Pressure Equipment Directive, the *PED-approved 9901* is classified as **Category III Piping**. The *PED-approved 9901* is designed for use with **unstable gases and liquids within Groups 1 and 2**.

C. INSTRUCTIONS

It is the responsibility of the installer/user of this equipment to ensure:

1. The product is installed and used by suitably trained personnel in accordance with all relevant Local and National regulations and codes.
2. Safe working practices for the media and process concerned are followed during installation and maintenance.
3. The materials of construction are suitable for the application. See Table 1-1 on page 1-2.
4. The pressure and temperature limits for this equipment are not exceeded, if necessary by the use of suitable safety accessories. See Table 1-5 on page 1-4.
5. All Rosemount supplied installation fixing bolts are used where applicable, and are only replaced by exact equivalents. On all other flanges, the correct quantity, size, and strength of bolts (clamp type) are used. All fasteners are evenly tightened to the correct torque. See Table 1-2 on page 1-2.
6. Correct gaskets/seals are fitted and are compatible with the media and process.
7. The product is protected from fire.
8. The product is protected from impact.
9. This product is not used as a support for other equipment or personnel.
10. Regular inspection for corrosion and wear are carried out, both internal and external.
11. This product is adequately supported.

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D. MATERIALS

Table 1-1. Chamber Pressure Materials

Component	Carbon Steel	Stainless Steel
Instrument Mounting Flange	ASTM A105	ASTM A182 F316/F316L
Chamber Body Tube	ASTM A106 Grade B	ASTM A312 TP316/TP316L
Chamber End Cap	ASTM A105	ASTM A182 F316/F316L
Process Flange / Fitting	ASTM A105	ASTM A182 F316/F316L
T-Pieces and Reducers	ASTM A234 WPB	ASTM A403 WP316/WP316L-S
Standard Alloy Steel Studbolts	ASTM A193 B7	ASTM A320 L7
Standard Alloy Steel Nuts	ASTM A194 2H	ASTM A194 Grade 7 + S3
Stainless Studbolts	ASTM A193 B8M Cl2	ASTM A193 B8M Cl2
Stainless Nuts	ASTM A194 Grade 8M	ASTM A194 Grade 8M

E. BOLTING AND TIGHTENING TORQUE

Table 1-2. Bolt Torques (Instrument Mounting Flange)

Flange Rating	Bolt Size	Bolt Torque (in Nm) ⁽¹⁾		
		Fibre Gasket	Ring Type Joint ⁽²⁾	Spiral Wound
ASME B16.5 Flanges				
Class 150 (3 in.)	5/8-in. UNC	135	124	122
Class 150 (4 in.)	5/8-in. UNC	135	112	122
Class 300 (3 in.)	3/4-in. UNC	235	174	203
Class 300 (4 in.)	3/4-in. UNC	235	196	203
Class 600 (3 in.)	3/4-in. UNC	(3)	218	203
Class 600 (4 in.)	7/8-in. UNC	(3)	313	325
Class 900 (3 in.)	7/8-in. UNC	(3)	348	325
Class 900 (4 in.)	1 1/8-in. UNC	(3)	677	722
Class 1500 (3 in.)	1 1/8-in. UNC	(3)	752	722
Class 1500 (4 in.)	1 1/4-in. UNC	(3)	1040	1016
EN 1092-1 Flanges				
PN16 DN80	M16	125	Not Applicable	120
PN16 DN100	M16	125		120
PN25 DN80	M16	125		120
PN25 DN100	M20	250		235
PN40 DN80	M16	125		120
PN40 DN100	M20	250		235
PN63 DN80	M20	(3)		235
PN63 DN100	M24	(3)		404
PN100 DN80	M24	(3)		404
PN100 DN100	M27	(3)		587
PN160 DN80	M24	(3)		404
PN160 DN100	M27	(3)		587
PN250 DN80	M27	(3)		587
PN250 DN100	M30	(3)		830

(1) Tightening torques listed above are suitable for ASME B16.5 and EN 1092-1 standard instrument flanges when assembled with the alloy steel B7 and L7 bolting, stainless steel B8 class 2 bolting, and gaskets, that are supplied with the 9901 chamber and are for lubricated studs and nuts.

(2) The torque values are applicable to both soft iron and stainless steel rings.

(3) Fibre gaskets are not normally recommended for flange ratings CL600 / PN63 and higher, unless permitted by the instrument supplier. Refer to the manual supplied with the measuring instrument.

IMPORTANT!

Always refer to the manual supplied with the instrument. If that manual contains recommended tightening torques for the bolting and gaskets supplied with the 9901 chamber, use those values and not Table 1-2. For any other bolting or gasket, contact the instrument supplier for recommended tightening torques.

F. NAMEPLATE STAMPING EXPLANATION

Table 1-3. Nameplate Stamping Explanation (Imperial)

Ps max @ 68 °F	Ts _{min}		284	14
Ps max @ Ts _{max}	Ts _{max}		94	752
Pt			435	

Table 1-4. Nameplate Stamping Explanation (Metric)

Ps max @ 20 °C	Ts _{min}		19.6	-10
Ps max @ Ts _{max}	Ts _{max}		6.5	400
Pt			30	

NOTE:

- Ts_{min} for carbon steel chambers is always:
 “14 °F” (fourteen degrees Fahrenheit) / “-10 °C” (minus ten degrees Celsius)
- Ts_{min} for 316/316L stainless steel chambers is always:
 “-148 °F” (minus one hundred and forty eight degrees Fahrenheit) / “-100 °C” (minus 100 degrees Celsius)
- Ts_{max} for carbon and stainless steel chambers with standard alloy steel bolting is always:
 “752 °F” (seven hundred and fifty two degrees Fahrenheit) / “400 °C” (four hundred degrees Celsius)
- Ts_{max} for carbon and stainless steel chambers with stainless steel bolting is always:
 “752 °F” (seven hundred and fifty two degrees Fahrenheit) / “400 °C” (four hundred degrees Celsius)

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Table 1-5. Chamber Pressure and Temperature Ratings (Standard Alloy Steel Bolting and Stainless Steel 316 Bolting)

Class / Rating		Working Pressure (Psi and Bar) For The 9901 Chambers			
		Carbon Steel ⁽¹⁾		Stainless Steel ⁽²⁾	
		Psi	Bar	Psi	Bar
ASME B16.5 Class 150	Ps max (RT) ⁽³⁾	285	19.6	275	19.0
	Ps max (752 °F) / (400 °C)	95	6.5	95	6.5
	Pt	428	30	413	29
ASME B16.5 Class 300	Ps max (RT)	740	51.1	720	49.6
	Ps max (752 °F) / (400 °C)	505	34.7	425	29.4
	Pt	1110	78	1080	75
ASME B16.5 Class 600	Ps max (RT)	1480	102.1	1440	99.3
	Ps max (752 °F) / (400 °C)	1015	69.4	855	58.9
	Pt	2220	154	2160	149
ASME B16.5 Class 900	Ps max (RT)	2220	153.2	2160	148.9
	Ps max (752 °F) / (400 °C)	1520	104.2	1280	88.3
	Pt	3330	230	3240	224
ASME B16.5 Class 1500	Ps max (RT)	3705	255.3	3600	248.2
	Ps max (752 °F) / (400 °C)	2535	173.6	2135	147.2
	Pt	5558	383	5400	373
EN 1092 PN16	Ps max (RT)	232	16	227	15.7
	Ps max (752 °F) / (400 °C)	137	9.5	134	9.3
	Pt	348	24	348	24
EN 1092 PN25	Ps max (RT)	362	25	356	24.6
	Ps max (752 °F) / (400 °C)	214	14.8	211	14.6
	Pt	543	37.5	536	37
EN 1092 PN40	Ps max (RT)	580	40	569	39.3
	Ps max (752 °F) / (400 °C)	345	23.8	339	23.4
	Pt	870	60	855	59
EN 1092 PN63	Ps max (RT)	913	63	899	62
	Ps max (752 °F) / (400 °C)	543	37.5	536	37
	Pt	1377	95	1348	93
EN 1092 PN100	Ps max (RT)	1450	100	1427	98.4
	Ps max (752 °F) / (400 °C)	862	59.5	851	58.7
	Pt	2175	150	2146	148
EN 1092 PN160	Ps max (RT)	2320	160	2291	158
	Ps max (752 °F) / (400 °C)	1380	95.2	1361	93.9
	Pt	3480	240	3437	237
EN 1092 PN250	Ps max (RT)	3625	250	3567	246
	Ps max (752 °F) / (400 °C)	2158	148.8	2132	147
	Pt	5438	375	5351	369

(1) Ts min is 14 °F (-10 °C)

(2) Ts min is -148 °F (-100 °C)

(3) RT is Room Temperature of 68 °F (20 °C)

G. MANUFACTURER

Mobrey Limited, 158 Edinburgh Avenue, Slough, Berkshire, SL1 4UE, United Kingdom

H. PRODUCT RECYCLING/DISPOSAL

Recycling of equipment and packaging should be taken into consideration. The product and packaging should be disposed of in accordance with local and national legislation.

Rosemount Level Solutions

Emerson provides a complete range of Rosemount products for level measurement applications.

Vibrating Fork Switches – Point Level Detection

For high and low alarms, overflow protection, pump control, including wide pressure and temperature requirements, and hygienic applications. Flexible mounting. Immune to changing process conditions and suitable for most liquids.

The product line consists of:

- Rosemount 2160 Wireless
- Rosemount 2130 Enhanced
- Rosemount 2120 Full-featured
- Rosemount 2110 Compact

Differential Pressure – Level or Interface Measurement

Flexible mounting for liquid tank levels, including those with wide temperature and pressure requirements. Can be isolated by valves. Unaffected by: vapor space changes, surface conditions, foam, corrosive fluids, internal tank equipment. Optimize performance with direct mount, Tuned-System Assemblies:

- Rosemount DP Level Transmitters and Remote Seals
- Rosemount 3051S_L, 3051L, and 2051L Liquid Level Transmitters

Ultrasonic – Level Measurement

Top mounted, non-contacting for simple tank and open air level measurements. Unaffected by fluid properties such as: density, viscosity, dirty coating, and corrosiveness. Appropriate for routine applications outside of explosion proof areas.

The product line consists of:

- Rosemount 3100 Series Ultrasonic Process Level Transmitters

Guided Wave Radar – Level and Interface Measurement

Top mounted, direct level and interface measurement of liquids or solids, including those with wide temperature and pressure requirements. Unaffected by changing process conditions. Good fit for small spaces and easy swap for older technologies.

The product line consists of:

- Rosemount 5300 Series – Accurate, superior performance transmitter in most applications including process vessels and control
- Rosemount 3300 Series – Versatile and easy-to-use transmitter in most liquid storage and monitoring applications

Non-contacting Radar – Level Measurement

Top mounted, direct level measurement for liquids or solids, including those with wide temperature and pressure requirements. Can be isolated by valves. Unaffected by changing process conditions. Good for dirty, coating, and corrosive applications.

The product line consists of:

- Rosemount 5400 Series – Accurate, superior performance 2-wire transmitters for most liquid level applications and process conditions
- Rosemount 5600 Series – 4-wire transmitters with maximum sensitivity and performance for solids, challenging reactors, rapid level changes, and excessive process conditions

Chambers for Process Level Instrumentation

- Rosemount 9901 – High quality chambers for external mounting of level measurement and control instrumentation on process vessels

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**Emerson Process Management
Rosemount Inc.**
8200 Market Boulevard
Chanassen, MN 55317 USA
T (U.S.) 1-800-999-9307
T (International) (952) 906-8888
F (952) 949-7001
www.rosemount.com

Emerson Process Management
Blegistrasse 23
P.O. Box 1046
CH 6341 Baar
Switzerland
T +41 (0) 41 768 6111
F +41 (0) 41 768 6300

Emerson FZE
P.O. Box 17033
Jebel Ali Free Zone
Dubai UAE
T +971 4 883 5235
F +971 4 883 5312

**Emerson Process Management
Asia Pacific Pte Ltd**
1 Pandan Crescent
Singapore 128461
T +65 6777 8211
F +65 6777 0947
Service Support Hotline: +65 6770 8711
Email: Enquiries@AP.EmersonProcess.com



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