



Exploration & Production

GENERAL SPECIFICATION

PIPING VALVES VESSELS

GS EP PVV 102

Piping Hook-up Standards

00	01/2011	First issue
Rev.	Date	Notes

Owner: EP/TDO/TEC

Managing entity: EP/TDO/TEC/PVV



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1. Scope

This document sets rules for the design of piping standards (process and utilities) of onshore and offshore petroleum installations.

This specification gives the minimum requirements, at basic engineering level, for the design of the piping standards of process/test drain or vent and connections of instrument to the process equipment/piping.

This specification is intended to be used both onshore and offshore for oil and/or gas installations.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Any divergence between any of the Contractual Reference Documents, or between this specification and any other Contractual Reference Document, shall be reported to the Company for decision. In such a case, and unless otherwise agreed or decided by the Company, it is understood that the more stringent requirement shall apply.

Exceptions to, or deviations from this specification are not permitted unless previously accepted in writing by the Company. For this purpose, requests for substitutions or changes of any kind shall be complete with all pertinent information required for the Company assessment.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

If the country of installation has its own regulation, it must be applied wherever more stringent than the Basic Code.

Any Construction Code or Government Regulations, which may be listed in the Project Specifications or in the contract, shall have precedence except where this Specification is more stringent.

Reference	Title
Not applicable	



Codes

Process and utilities piping shall comply with the requirements of **ASME B31.3**.

Reference	Title
ASME B31.3	Code for Pressure Piping. Chemical Plant and Petroleum Refinery Piping

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP ECP 103	Process sizing criteria
GS EP INS 900	Instrument hook-up diagrams
GS EP PVV 111	Piping design specification
GS EP PVV 112	Piping material classes
GS EP PVV 142	Valves
GS EP PVV 211	Design and fabrication of pressure vessels according to ASME VIII
GS EP PVV 212	Design and fabrication of pressure vessels according to BSI PD 5500

3. List of piping standards

The list of piping standards is indicated in the table with the reference of corresponding standard drawings.

Std drawings	Type
SD 01XX	Process Drain / Vent
SD 02XX	Test Drain / Vent
SD 03XX	Temperature gauge in line
SD 04XX	Temperature gauge on vessel
SD 05XX	Orifice Plate
SD 06XX	Pressure gauge / Transmitter in line
SD 07XX	Pressure gauge / Transmitter on vessel
SD 08XX	Level gauge on vessel
SD 09XX	Level transmitter with remote diaphragm seals
SD 10XX	Pressure transmitter & Level transmitter
SD 11XX	Capacity level transmitter external

4. Piping standards vs. piping class

The piping standards described in this general specification may be modified by the operation philosophy after consultation between process and field operations departments.

In this document, the use of a simple or double block and bleed is defined as follow:

- Piping classes 150# and 300# => Simple block and bleed
- Piping classes 600# and above => Double block and bleed.

However for the piping classes 150# and 300#, the use of Simple block and bleed can be in contradiction to the requirements of the **GS EP ECP 103** (e.g. corrosive fluid, LNG service, etc.). In such case, the requirements from **GS EP ECP 103** are mandatory.



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Series	Class	Process/Vent Drain 3/4"	Process/Vent Drain 1"	Process/Vent Drain 2"	Test/Vent Drain	Temperature gauge in line	Temperature gauge on vessel	Orifice flange	P° gauge/transmitter in line	P° gauge/transmitter on vessel	Level gauge on vessel	level transmitter with remote diaphragm seal	Pressure transmitter and level transmitter	Capacity level transmitter external
150 lbs	B01 / B01N / B01R / B03 / B03N / B03S / B05 / B05S / B06 / B06S / B21 / B21S / B23 / B23N / B23S / B26 / B48 / B49 / B50 - Note 2 B12 / B42 (Steam fluids) - note 1 B31 / B45 / B46 / B47 (Cryogenic fluids)	SD 0100 SD 0101 SD 0102		SD 0120 SD 0121 SD 0122	SD 0201 SD 0202 SD 0203	SD 0301 SD 0302 SD 0303	SD 0401	SD 0501	SD 0601	SD 0701	SD 0801	SD 0901	SD 1001	SD 1101
150 lbs	B03D	Specific design to be defined. Company approval is mandatory.												
150 lbs	B10 / B13	SD 0103 SD 0104 SD 0105			SD 0204 SD 0205 SD 0206 SD 0207	SD 0301 SD 0304								
150 lbs	B86		SD 0106 SD 0107	SD 0123 SD 0124	SD 0208 SD 0209									
150 lbs	B90 / B91 / B93 / B94 / B95		SD 0108 SD 0109 SD 0110	SD 0125 SD 0126	SD 0210 SD 0211	SD 0301 SD 0305								
150 lbs	B92	SD 0111 SD 0112 SD 0113		SD 0128 SD 0129 SD 0130	SD 0212 SD 0213 SD 0214 SD 0215 SD 0216	SD 0301 SD 0302 SD 0303								
300 lbs	D01 / D01S / D03 / D03N / D03S / D05 / D05S / D06 / D21 / D23 / D23N / D23S / D48 / D49 / D70 D42 (Steam fluids) - Note 1 D50 - Note 2 D31 / D46 / D47 (Cryogenic fluids)	SD 0100 SD 0101 SD 0102		SD 0120 SD 0121 SD 0122	SD 0201 SD 0202 SD 0203	SD 0301 SD 0302 SD 0303	SD 0401	SD 0501	SD 0601	SD 0701	SD 0801	SD 0901	SD 1001	SD 1101
600 lbs	F01 / F01N / F03 / F03N / F03S / F05 / F05S / F06 / F21 / F23 / F23S / F26S / F48 / F49 / F70 F12 / F42 (Steam fluid) - Note 1 F50 - Note 2 F31 / F46 / F47 (cryogenic fluids)	SD 0114 SD 0115 SD 0116		SD 0131 SD 0132 SD 0133	SD 0217 SD 0218 SD 0219	SD 0301 SD 0302 SD 0303	SD 0401	SD 0502	SD 0602	SD 0702	SD 0802	SD 0902	SD 1002	SD 1102



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Series	Class	Process/Vent Drain 3/4"	Process/Vent Drain 1"	Process/Vent Drain 2"	Test/Vent Drain	Temperature gauge in line	Temperature gauge on vessel	Orifice flange	P° gauge/transmitter in line	P° gauge/transmitter on vessel	Level gauge on vessel	level transmitter with remote diaphragm seal	Pressure transmitter and level transmitter	Capacity level transmitter external
900 lbs	G01 / G01S / G03 / G03N / G03S / G05 / G06 / G21 / G23 / G23N / G23S / G25 / G48 / G49 / G70 G50 - Note 2 G31 / G47 (cryogenic fluids)	SD 0114 SD 0115 SD 0116		SD 0131 SD 0132 SD 0133	SD 0217 SD 0218 SD 0219	SD 0301 SD 0302 SD 0303	SD 0401	SD 0502	SD 0602	SD 0702	SD 0802	SD 0902	SD 1002	SD 1102
1500 lbs	H01 / H01S / H03 / H03N / H03S / H05 / H05S / H06 / H06S / H21 / H21S / H23 / H23N / H25 / H26 / H26S / H48 / H49 / H70 / H73 H50 - Note 2 H31 / H47 (cryogenic fluids)	SD 0114 SD 0115 SD 0116		SD 0131 SD 0132 SD 0133	SD 0217 SD 0218 SD 0219	SD 0301 SD 0302 SD 0303	SD 0401	SD 0502	SD 0602	SD 0702	SD 0802	SD 0902	SD 1002	SD 1102
2500 lbs	J01 / J01S / J03 / J03S / J06 / J06S / J23 / J26 / J26S / J48 / J49 / J70 / J73 J50 - Note 2	SD 0114 SD 0115 SD 0116		SD 0131 SD 0132 SD 0133	SD 0217 SD 0218 SD 0219	SD 0301 SD 0302 SD 0303	SD 0401	SD 0502	SD 0602	SD 0702	SD 0802	SD 0902	SD 1002	SD 1102
5000 lbs	K01 / K01S / K03	SD 0114 SD 0115 SD 0116		SD 0131 SD 0132 SD 0133	SD 0217 SD 0218 SD 0219	SD 0301 SD 0302 SD 0303	SD 0401	SD 0502	SD 0602	SD 0702	SD 0802	SD 0902	SD 1002	SD 1102
10000 lbs	L01 / L03 / L03N / L23N / L70 / L73	SD 0114 SD 0115 SD 0116		SD 0131 SD 0132 SD 0133	SD 0217 SD 0218 SD 0219	SD 0301 SD 0302 SD 0303	SD 0401	SD 0502	SD 0602	SD 0702	SD 0802	SD 0902	SD 1002	SD 1102

Note 1: For steam fluids: Ball valve shall be replaced by gate valve except for double block and bleed

Note 2: For B50/D50/F50/G50/H50/J50:
Temperature gauge in line and all the hook up standards on vessel are not applicable.
Process drain in 2" is only applicable for B50.

Note 3: For piping class L70 minimum diameter is 2"



Appendix 1 Standard drawings

The piping standards described in this general specification may be modified by the operation philosophy after consultation between process and field operations departments.

	END ACCORDING TO PIPING CLASS (GS EP PVV 112)					
Diameter	1/2"	...	1"1/2"		2"	...
Piping class						
B (150#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange SW				Flange WN	
D (300#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange SW				Flange WN	
F (600#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange SW				Flange WN	
G (900#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange SW				Flange WN	
H (1500#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange SW				Flange WN	
J (2500#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange WN				Flange WN	
K (5000#)	Fittings SW				Fittings BW (weldolet allowed)	
	Flange WN				Flange WN	
L (10000#)	Fittings BW				Fittings BW (weldolet prohibited)	
	Flange WN				Flange WN	

**GLOSSARY**

Piping Class	B	Piping class 150#
	D	Piping class 300#
	F	Piping class 600#
	G	Piping class 900#
	H	Piping class 1500#
	J	Piping class 2500#
	K	Piping class 5000#
	L	Piping class 10000#
Pipe end type	SW	Socket Weld
	BW	Butt Weld
	WN	Welding Neck
	FLG	Flanged
	NPT-F	National Pipe Thread - Female
	NPT-M	National Pipe Thread - Male
<u>Nipple End type</u>	PE	Plain Ends
	PBE	Plain Both Ends
	TE	Threaded End
	TBE	Threaded Both End
	POE/TOE	Plain One End / Threaded One End
<u>Swage Nipple End type</u>	PBE	Plain Both Ends
	PLE	Plain Large End
	PSE	Plain Small End
	BBE	Bevelled Both Ends
	BLE	Bevelled Large End
	BSE	Bevelled Small End
	PBE	Threaded Both Ends
	TLE	Threaded Large End
	TSE	Threaded Small End



Summary of standards

Description	Standard N°	Page
Process drain = 3/4 " (invert for vent)	STD 0100 – 0101 - 0102	12
Process drain = 3/4 " (invert for vent)	STD 0103 – 0104 - 0105	13
Process drain = 1 " (invert for vent)	STD 0106 – 0107	14
Process drain = 1 " (invert for vent)	STD 0108 – 0109 - 0110	15
Process drain = 3/4 " (invert for vent)	STD 0111 – 0112 - 0113	16
Process drain = 3/4 " (invert for vent)	STD 0114 – 0115 - 0116	17
Process drain = 2 " (invert for vent)	STD 0120 – 0121 - 0122	18
Process drain = 2 " (invert for vent)	STD 0123 – 0124	19
Process drain = 2 " (invert for vent)	STD 0125 – 0126	20
Process drain = 2 " (invert for vent)	STD 0127 – 0128 - 0129	21
Process drain = 2 " (invert for vent)	STD 0130 – 0131 - 0132	22
Test drain = 3/4 " (invert for vent)	STD 0201 – 0202 - 0203	23
Test drain = 1 & 3/4 " (invert for vent)	STD 0204 – 0205 – 0206 - 0207	24
Test drain = 1 " (invert for vent)	STD 0208 – 0209	25
Test drain = 1 " (invert for vent)	STD 0210 – 0211	26
Test drain = 2 & 3/4 " (invert for vent)	STD 0212 – 0213 – 0214 – 0215 - 0216	27
Test drain = 3/4 " (invert for vent)	STD 0217 – 0218 - 0219	28
Temperature gauge in line 2" < diameter < 4"	STD 0301	29
Temperature gauge in line diameter > 4"	STD 0302	30
Temperature gauge in line diameter > 4"	STD 0303	31
Temperature gauge in line diameter > 4"	STD 0304	32
Temperature gauge in line diameter > 4"	STD 0305	33
Temperature instrument on vessel	STD 0401	34
Orifice plate	STD 0501	35
Orifice flange	STD 0502	36
Pressure gauge / transmitter in line	STD 0601	37
Pressure gauge / transmitter in line	STD 0602	38
Pressure gauge & transmitter on vessel	STD 0701	39
Pressure gauge & transmitter on vessel	STD 0702	40
Level gauge on vessel	STD 0801	41
Level gauge on vessel	STD 0802	42
Level transmitter with remote diaphragm seals	STD 0901	43



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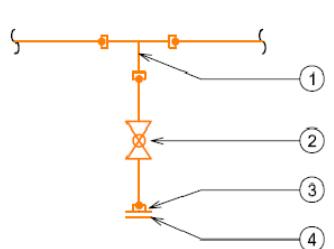
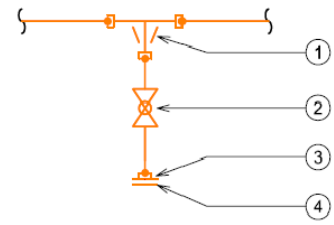
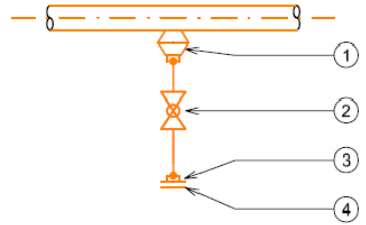
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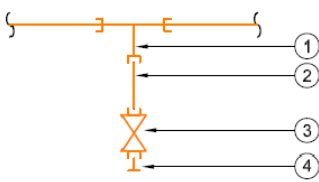
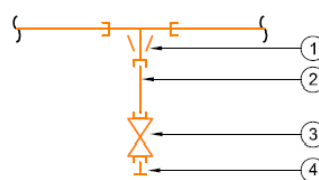
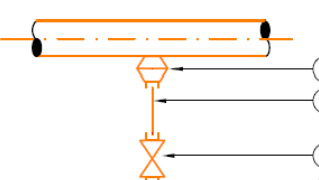
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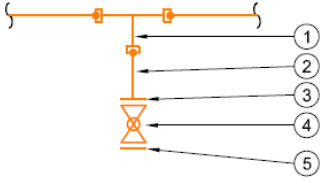
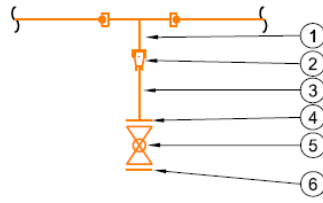
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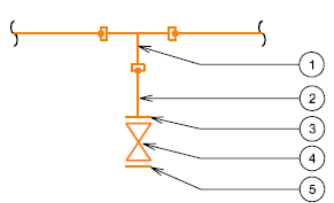
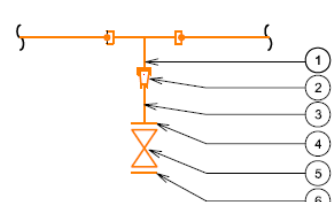
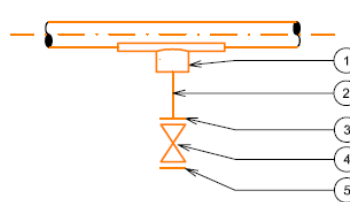
Appendix 1

Description	Standard N°	Page
Level transmitter with remote diaphragm seals on vessel	STD 0902	44
Pressure transmitter & level transmitter	STD 1001	45
Pressure transmitter & level transmitter	STD 1002	46
Capacity level transmitter external	STD 1101	47
Capacity level transmitter external	STD 1102	48

PROCESS DRAIN = 3/4" (INVERT FOR VENT)					
TYPICAL ARRANGEMENT	TYP.	DESCRIPTION ⁽¹⁾	DIA.	QTY	CLASSES
<u>HEADER 3/4"</u> SD 0100 		1- SW EQUAL TEE 2- BALL VALVE WITH 2 NIPPLES PE100 mm ⁽²⁾ 3- SW FLANGE 4- BLIND FLANGE GASKET SET OF BOLTING	3/4" 3/4" 3/4" 3/4" 3/4"	1 1 1 1 1 1	B D
<u>HEADER 1" TO 1" 1/2</u> SD 0101 		1- SW REDUCING TEE 2- BALL VALVE WITH 2 NIPPLES PE 100mm ⁽²⁾ 3- SW FLANGE 4- BLIND FLANGE GASKET SET OF BOLTING	DIA x 3/4" 3/4" 3/4" 3/4" 3/4"	1 1 1 1 1 1	
<u>HEADER >= 2"</u> SD 0102 		1- SOCKOLET 2- BALL VALVE WITH 2 NIPPLES PE 100mm ⁽²⁾ 3- SW FLANGE 4- BLIND FLANGE GASKET SET OF BOLTING	DIA x 3/4" 3/4" 3/4" 3/4" 3/4"	1 1 1 1 1 1	
STANDARDS NOT APPLICABLE FOR: B10/B13 = SPECIFIC STANDARDS B03D B86 = SPECIFIC STANDARDS B92 = SPECIFIC STANDARDS B90/91/93/94/95 = SPECIFIC STANDARDS.					
NOTES : (1) - MATERIAL ACCORDING TO PIPING CLASS . (2) - FOR PIPING CLASSES B12/B42/D42 : GATE VALVES + 2 PIPES (100mm) INSTEAD OF BALL VALVE, WITH NIPPLES (100mm)					

PROCESS DRAIN = 3/4" (INVERT FOR VENT)						
TYPICAL ARRANGEMENT	TYP.	DESCRIPTION ⁽¹⁾	DIA.	QTY	CLASSES	
<u>HEADER 3/4"</u> SD 0103 		1- EQUAL TEE NPT-F 2- NIPPLE TBE 80mm 3- GATE VALVE NPT-F 4- PLUG NPT-M	3/4" 3/4" 3/4" 3/4"	1 1 1 1	B10 B13	
<u>HEADER 1" TO 1 1/2"</u> SD 0104 		1- REDUCING TEE NPT-F 2- NIPPLE TBE 80mm 3- GATE VALVE NPT-F 4- PLUG NPT-M	DIAx3/4" 3/4" 3/4" 3/4"	1 1 1 1		
<u>HEADER >= 2"</u> SD 0105 		1- THREADOLET 2- NIPPLE TBE 80mm 3- GATE VALVE NPT-F 4- PLUG NPT-M	DIAx3/4" 3/4" 3/4" 3/4"	1 1 1 1		
NOTES : (1) - MATERIAL ACCORDING TO PIPING CLASS.						

PROCESS DRAIN = 1" (INVERT FOR VENT)					
TYPICAL ARRANGEMENT	TYP.	DESCRIPTION ⁽¹⁾	DIA.	QTY	CLASSES
<u>HEADER 1"</u> SD 0106 		1- SW EQUAL TEE 2- NIPPLE PE 3- FLANGE 4- BALL VALVE 5- BLIND FLANGE GASKET SET OF BOLTING	1" 1" 1" 1" 1" 1"	1 1 1 1 1 1 1	B86
<u>HEADER >= 1 1/2"</u> SD 0107 		1-SW EQUAL TEE 2- SW REDUCER BUSHINGS (AS REQUIRED) 3- NIPPLE PE 4- FLANGE 5- BALL VALVE 6- BLIND FLANGE GASKET SET OF BOLTING	DIA DIAx1" 1" 1" 1" 1" 1"	1 1 1 1 1 1 1 1	
NOTES : (1)- MATERIAL ACCORDING TO PIPING CLASS.					

PROCESS DRAIN = 1" (INVERT FOR VENT)					
TYPICAL ARRANGEMENT	TYP.	DESCRIPTION ⁽¹⁾	DIA.	QTY	CLASSES
<u>HEADER 1"</u> SD 0108 		1- EQUAL TEE 2- NIPPLE PE 3- FLANGE 4- GATE VALVE 5- BLIND FLANGE GASKET SET OF BOLTING	1" 1" 1" 1" 1" 1" 1"	1 1 1 1 1 1 1	A91 B90 B91 B93 B94 B95
<u>HEADER 1 1/2"</u> SD 0109 		1- EQUAL TEE 2- REDUCER INSERT SW 3- NIPPLE PE 4- FLANGE 5- GATE VALVE 6- BLIND FLANGE GASKET SET OF BOLTING	1 1/2" 1 1/2"x1" 1" 1" 1" 1" 1"	1 1 1 1 1 1 1	
<u>HEADER >= 2"</u> SD 0110 		1- SADDLE WITH INSERT IN CuNi or SS TP 321 2- NIPPLE PE 3- FLANGE 4- GATE VALVE 5- BLIND FLANGE GASKET SET OF BOLTING	1" 1" 1" 1" 1" 1"	1 1 1 1 1 1 1	
NOTES : (1) - MATERIAL ACCORDING TO PIPING CLASS. GRP (Ø ≥ 1")					