



Exploration & Production

GENERAL SPECIFICATION

INSTRUMENTATION

GS INS 174

**Blow Down Valve
standard function
- BDV -**

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Rev.	Date	Notes



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1. Scope

The purpose of this document is to define the Standard Function for a Blow Down Valve (BDV).

In order to assist in understanding, this document should be read in conjunction with **GS INS 150**, Design Method for System Configuration Standard Functions.

This Standard Function is a fundamental building block, linked to the Safety Bar Standard Function, part of the SSS configuration.

This Standard Function proposes different functional facilities, which may be combined as per project requirements for BDV functions:

- Electrical local reset
- Solenoid valve test

achieved through additional devices mounted inside the control panel.

Another solution, based on smart devices with enhanced diagnostic capabilities, is not described here since depending on the selected devices; however test status and result will be transmitted to PCS for monitoring and recording.

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.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS INS 137	Design and Supply of ON/OFF Valve Control Panels
GS INS 150	Design Method for System Configuration Standard Functions

3. General description of functions

3.1 BDV operating description

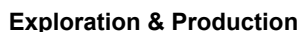
As per the project safety concept, emergency depressurisation will be provided upon automatic or manual initiation interlocked with "permissive to blowdown" signal, which means in both cases the BDV open command will be activated from internal SSS variable (safety trip). Individual open command is not available to the operator.

Reset function will also be provided and initiated either automatically upon reset of the corresponding safety bar, either manually from the control room or from the BDV control panel.

Likewise, emergency depressurisation interrupt may be implemented as per project safety concept. This interrupt may be achieved either automatically through the reset of the associated safety bar or manually by means of a push-button located in Control room.

3.2 List of main functions

- Handling of field inputs / outputs with status and discrepancy detection
- Interfacing with higher level Standard Function (e.g. Safety Bar)
- Operator's commands
 - Inhibit
 - Solenoid valve test (as per project requirements)



3.3.2 Specific description of field interfaces

Corresponding field interfaces are :

- BY (DO) : solenoid valve operating command: **1 = Close**
- BZH (DI) : open limit switch : **1 = Open**
- BZL (DI) : closed limit switch : **1 = Closed**

Options :

- BPSL (DI) : solenoid valve local bypass : **0 = Active**
- BHS2 (DI) : reset (from local panel or Control room) : **1 = Active (pulse)**
- BHS3 (DI) : interrupt push-button in Control Room : **1 = Active (pulse)**

This interrupt push-button will be line monitored and its status issued from the DI_LM Standard Function.

When project specifications require facility to remove the depressurisation interrupt, after its activation, switch will be used instead of push-button to prevent confusion.

4. Detailed description of functions

4.1 Operator's Commands and mode

4.1.1 Specific description

4.1.1.1 Maintenance inhibit

Available when in maintenance access level

When the maintenance inhibit is active:

- Limit switches are no longer considered with the internal Open/Closed status handling.
- Discrepancy is no longer active.
- Controlled part (valve body) is red steady if open and closed limit switches have the same status; else the open or closed or operating in progress status will be displayed as defined below.

Maintenance inhibit status is active when maintenance inhibit command is active.

4.1.1.2 Solenoid valve test

This test is designed to be used when the valve is in the open position. The local bypass of the solenoid valve will maintain the valve to its close position, no matter the status of the SSS solenoid command.

The safety function will always override the test function and trip the output to the open position when necessary.

Specific display will indicate the test has been stopped for safety reasons, and the local operator shall switch back the by-pass to its normal operating mode, in order to allow the valve to move to its safety position.

When the local bypass of the solenoid valve (BPSL) is detected then the test mode is activated. The Open command is available to the operator when the test mode is active and the safety trip is not active.

Upon activation of the Open command by the operator, an adjustable timer (a few seconds) is launched; when elapsed, the Closed command is restored and the test completed.

The local operator will then switch back the bypass to its normal position.

The Control Room operator will enter the completed test status for logging purpose as successful if the local operator has observed the solenoid valve being de-energised, else it will be logged as a failed test.

4.2 Status definition

4.2.1 Reset status :

This status will be set upon detection of the pulse from reset push-button and reset upon activation of the Open command when not in Test mode.

4.2.2 Interrupt status :

This status will be set upon pulse detection of the line monitored push-button, through DI_LM Standard Function, and reset upon de-activation of the safety trip.

4.2.3 Operating command status:

Operating command status is set to :

- Close when
 - interrupt status is active
 - or
 - de-activation of the safety trip and reset status (if applicable) are active
 - or
 - close test command and test mode are active
- Open upon activation of the safety trip or the open test command when in test mode

4.2.4 Solenoid valve Operating command (DO) :

Same as Operating command status

4.2.5 Open / Closed Status

4.2.5.1 Open status

HMI open status is active if Open limit switch is active and Closed limit switch is not active

Open status (internal data) is active if:

- (Operating command status = "Open") and (Open limit switch active and Closed limit switch not active)
- or
- (Operating command status = "Open") and maintenance inhibit status is active

4.2.5.2 Closed status:

HMI closed status is active if Open limit switch is not active and Closed limit switch is active

Closed status (internal) is active if :

- (Operating command status = "Close") and (Open limit switch not active and Closed limit switch active)
- or
- (Operating command status = "Close") and maintenance inhibit status is active

4.2.6 Discrepancy status:

It indicates a discrepancy between the command status and the limit switches status, after a time delay (operation in progress timer).

Discrepancy status is not active when :

- Internal Closed /Open status are active
- or
- Operating in progress status is active
- or
- Maintenance inhibit status is active

When in test mode and after an operator Open command, discrepancy will no longer be active.

4.2.7 Operation in progress status:

Active during "operation in progress" timer counts down

"Operation in progress timer" is activated upon change of the operating command status.

4.2.8 Fault status:

reports a hardware fault related to an associated I/O cards (field inputs/output).

4.2.9 Operation counter:

Reports the number of changes of the operating command status changes (from close to open) when not due to solenoid valve test.

The counter reset command will be issued manually by the operator from the HMI (a dedicated pop-up window at maintenance access level).

5. Tuning parameters and variables

PARAMETERS	ACCESS LEVEL
Test timer	Maintenance
"Operation in progress" timer pre-set value	Maintenance

6. Representation and animation description (HMI)

6.1 Events and values to be recorded

6.1.1 Events

- Maintenance inhibit command
- Test mode
- Completed test result
- Operating command Status
- Interrupt push-button switch
- Reset status
- Discrepancy Status
- Fault status

6.1.2 Values

- Operation counter

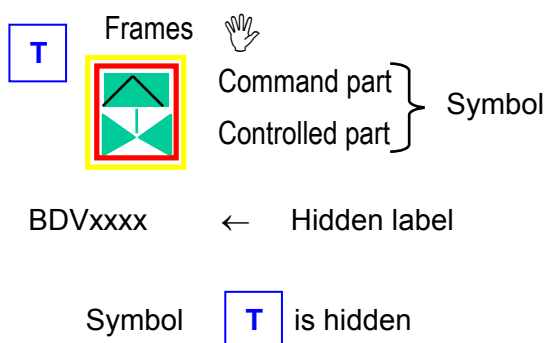
6.2 Alarm handling

Alarm Description	Priority
Discrepancy Status	Level 1
Fault Status	Level 3

6.3 Control display

The descriptions below give examples of valve representation animations. However, they may be amended dependant on the DCS features.

6.3.1 BDV (Blow Down Valve) representation:



6.3.2 Miscellaneous

BDVxxxx instrument label and Blue Symbol  appear on operator request (soft key)

BDVxxxx instrument label is used as target area for maintenance inhibit command.

A “hand” symbol (full yellow) appears near valve when Open or Close commands are available to the operator (commands as per project specifications)

Blue Symbol  is used as target area for Test command and test status entry

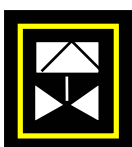
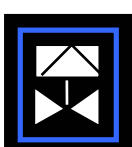
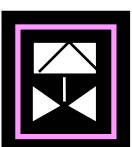
6.3.3 Animation of the symbol (command and controlled parts)

Display description	Display	Symbol	Tagname on safety logic display
Valve closed or Communication or system fault		White White	White
Open command but Valve closed		Fluid White	White
Valve opening in progress		Fluid Fluid flashing	White
Valve open		Fluid Fluid	Blue
Close command but Valve open		White Fluid	Blue
Valve closing in progress		White Fluid flashing	Blue
Valve discrepancy when closing before acknowledgement (*)		White Red flashing	Red flashing
Valve discrepancy when closing after acknowledgement Or open and closed limit switches have the same status and maintenance inhibit state active (*)		White Red	Red
Valve discrepancy when opening before acknowledgement (*)		Fluid Red flashing	Red flashing
Valve discrepancy when opening after acknowledgement Or (open and closed limit switches have the same status and maintenance inhibit state active) (*)		Fluid Red	Red



Valve in an undetermined position after a time delay.

6.3.4 Animation of the Frames

Display description	Display	Frames
Normal state		
Safety trip		External frame: White
Maintenance inhibit		External frame: Yellow
Solenoid valve test mode		External frame: Blue
fault (and maintenance inhibition)		Internal frame : Red flashing before acknowledgement Red steady after acknowledgement
Communication or system fault		External frame: Magenta

The events which drive these frame displays may not be mutually exclusive. Therefore, the precedence on the display, from most to least important, shall be: magenta, white, blue, and yellow