



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS EP HVA 212

Fire Damper(s) Pneumatically Actuated
--

07	01/2012	Integration of Data Sheet
06	01/2011	Number of position switches - Pictures
05	10/2009	Updating of "Reference documents", certification
04	10/2008	General update
00	10/2004	First issue
Rev.	Date	Notes

Owner: DEV/TEC	Managing entity: DEV/TEC/MTH
----------------	------------------------------



Contents

1. Scope	4
2. Reference documents.....	4
3. Definitions.....	6
4. Operation	7
5. General remark.....	7
6. Construction.....	8
6.1 Particular case of "Arctic conditions"	8
6.2 Frame	8
6.3 Blades/Shafts.....	13
6.4 Control housing	15
6.5 Actuator	15
6.6 Tubing.....	15
6.7 Control	16
6.8 Fusible link.....	17
6.9 Pressure regulator	17
6.10 Junction box.....	17
6.11 Pipe and instrument diagram	19
6.12 Tagging.....	20
7. Performances	22
8. Fire resistance certificates	25
9. Documents to provide	26
9.1 Submission of documents	26
9.2 Documents to provide	27
9.3 Quantities of documents	30
9.4 Format of documents	31
10. Equipment inspection.....	32
11. Data sheet.....	32



12. Spare parts list	32
13. Other references	34
Appendix 1 Fire Damper(s) Pneumatically Actuated – Data Sheet.....	35



1. Scope

The purpose of this document is to define the minimum requirements for design, construction and supply of fire damper(s) pneumatically actuated.

The words and expressions in CAPITAL CHARACTERS AND *ITALIC* are defined inside the general specification **GS EP HVA 801**.

When other words require a definition only to be used in the present document, then the definition is given in a dedicated paragraph of the present document and the defined word, when used, is marked in small and *italic* letters.

All pictures and figures within this specification are indicated for illustration and example purpose only.

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.

Order of precedence of documents is defined in **GS EP HVA 100**.

Notes:

- In case of discrepancy between documents (whatever the documents and / or whatever origins), the most expensive solution shall be quoted by the *BIDDER*. During the studies (Basic Engineering and / or Detailed Engineering) *CONTRACTOR(s)* shall raise the discrepancy in question to the *COMPANY's HVAC* specialist who will then review and advise which document(s) is (are) to be specified for the project.
- The *HVAC VENDOR* or *CONTRACTOR* may propose proven improvements to the reference documents but shall obtain written approval of the *COMPANY* prior to implementation.
- An International Standard is a good "engineering practice" which shall be recognised and taken into consideration by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and/or *CONTRACTOR*. If required, the translation of the standards shall be included into *HVAC* scope.

The latest revision of Standards, codes, regulations and the published errata if any shall be used and applied by *VENDOR*, *SUPPLIER*, *MANUFACTURER* and *CONTRACTOR*.

Standards

Reference	Title
EN 1751	Ventilation for buildings. Air terminal devices. Aerodynamic testing of dampers and valves
EN 10204	Metallic materials - Types of inspection documents
IEC 60335-1	Household and similar electrical appliances - Safety - Part 1: General requirements
IEC 60529	Degrees of protection provided by enclosures (API code)



Reference	Title
IEC 60947-5-1	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices
ISO 5211	Industrial valves - Part-turn actuator attachments
ISO 15607	Specification and qualification of welding procedures for metallic materials - General rules
ISO 15614-2	Specification and qualification of welding procedures for metallic materials - Welding procedure tests - Part 2: Arc welding of aluminium and its alloys
ISO 15614-8	Specification and qualification of welding procedures for metallic materials - Welding procedure tests - Part 8: Welding of tubes to tube-plate joints

Professional Documents

Reference	Title
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association (All documents concerning duct)

Regulations

Reference	Title
Directive 94/9/EC, referred to a ATEX 100a / 95	Directive of the European parliament and the council on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosives atmospheres
Directive 1999/92/EC referred to a ATEX 118 / 137	Directive of the European parliament and the council on minimum requirements for improving the safety and health protection of workers potentially at risk from explosives atmospheres

Codes

Reference	Title
IMO Resolution A.754 (18)	IMO resolution for testing
MED directive	Compliance with Marine Equipment Directive (MED) 96/98/EC as modified by Commission Directives 98/85/EC, 2001/53/EC and 2002/75/EC
NORSOK Standard H-001	Gas Dampers
SOLAS	International convention for Safety Of Life At Sea 1974 and amendments of November 1981, June 1983. Consolidated Edition 2004

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP ELE 079	Electrical apparatus for potentially explosive gas atmospheres
GS EP HVA 000	List of HVAC Specifications
GS EP HVA 010	Selection of Stainless Steel Grade for HVAC Equipment
GS EP HVA 100	HVAC Basis of design
GS EP HVA 402	Fire Damper(s) Installation
GS EP HVA 801	Terminology, definitions, abbreviations

3. Definitions

Frame: part of the damper which is used as a duct to drive air from the upstream ducting to the downstream ducting.

Height: vertical dimension (horizontal duct) or more important dimension (vertical ducting) measured inside the section of the damper, where air is passing.

Fire condition: means that the blade(s) of the fire damper is (are) in contact one side with a fire (average temperature minimum 500°C).

Normal condition: means that the blade(s) of the fire damper is (are) in contact with ambient temperature (e.g. 14°C and 25°C).



Position switch: device equipped with a mechanical switch to monitor the position of one component of a piece of equipment. A change in a component position drives a shaft displacement which induces a modification of switch status.

Proximity sensor: device monitoring the position of one component of a piece of equipment. The device status is modified when a component of the piece of equipment to monitor is at lower distance of *proximity sensor*. A physical contact between *proximity switch* and equipment is not required.

Width: horizontal dimension (horizontal duct) or smaller dimension (vertical ducting) measured inside the section of the damper, where air is passing.

4. Operation

The fire damper shall be designed and used for ductwork / bulkhead / deck installation to prevent the spread of fire and smoke from an *AREA* to another *AREA*.

The fire damper shall be certified by notified body for use in fire resisting divisions as defined in *IMO Resolution A.754 (18)* and to the classification (A0, A60, H60, H120) according to the location of the fire damper.

The Fire damper shall have a certification acceptable by notified body and be tested according to a recognised standard such as *IMO Resolution A.754 (18)*.

The acceptable notified body are the followings:

- BV
- Lloyd's Register
- DNV
- ABS
- *MED* (A0, A60).

The fire damper (A0, A60,...), has to be in accordance with Marine Equipment Directive (*MED*) 96/98/EC as modified by Commission Directives 98/85/EC, 2001/53/EC and 2002/75/EC. Supplier has to affix a *MED* mark with the Year of Manufacturing and Number of the Notified Body on the fire damper (A0, A60).

Whatever the fire damper classification (A0, A60,...), a certificate, issued from the above notified body, shall be supplied for each fire damper or for several fire dampers if they are all covered by that Certificate.

5. General remark

In order to avoid any difficulty with Certifying Authority, the following documents shall be transmitted by *CONTRACTOR* to the Fire damper(s) *MANUFACTURER*:

- The present General Specification
- *GS EP HVA 402*.

In case of comment(s) (concerning technical, law..., point of view), the fire Damper *MANUFACTURER* shall inform *COMPANY* and *CONTRACTOR*, and shall propose solution(s) to solve it (them).

6. Construction

General note: when equipment has to be in accordance with **ATEX directives**, only certification by Notified Body is accepted by *COMPANY* (auto-certification is not allowed, even when this auto-certification is recorded by Notified Body).

The fire damper material shall be chosen according to its location on the *HVAC* plant:

Location	Construction (<i>frames, blades</i>)
Fire damper outside of building	Stainless steel
Fire damper on the outside wall of building (whatever the side of location (inside or outside))	Stainless steel
Fire damper inside the building (on fresh air duct)	Stainless steel
Fire damper inside the building on chemical hood, chemical fume cupboard, battery room, photocopy room	Stainless steel
Fire damper inside the building, on other rooms that the above	Stainless steel

The welding shall be continuous by Metal Inert Gas (MIG) process.

The fire damper shall be supplied non-insulated (insulation shall be carried out on site, in accordance with the requirements of *MANUFACTURER*). Detailed installation instructions, drawings and insulation specification shall be provided by the *MANUFACTURER* to respect the requirements from certifying authority's requirements and to obtain agreement from the Insurance *COMPANY*.

The position of the actuator, blades mechanism and associated position indicator shall be either on left hand side or right hand side, as per request.

6.1 Particular case of "Arctic conditions"

In case of fire damper(s) installed on Project exposed to the "arctic conditions" (minimum operating temperature of -40°C) (fire dampers installed inside building, on peripheral *WALLS*, inside and outside, outside) shall be designed for the peak extreme conditions of Project.

Moreover, the following special components shall be used:

- Pressure regulator: Nordgren Ref R38 for -40°C
- Solenoid valve: Nordgren Ref 240115.4672.024.00
- Limit switches: Bartec Ref 07-2511-3330/63 "cold resistant"
- Quick exhaust valve: Pressmair Ref VSR 1/8 "cold resistant"
- Spring actuator AT100 Ref AT100 LT "Low temperature".

6.2 Frame

Material of the *frame* shall be in accordance with the above table. Material certificate type 3.1 according to **EN 10204** shall be supplied by the *MANUFACTURER* (mandatory).

The fire damper casing shall be continuously welded by metal inert gas (MIG). The assembly of the metal sheets to be welded, shall be realised by a robot, in order to ensure an air / smoke tightness in accordance with the tested equipment (mandatory).

All the welding shall be cleaned by sinking welded parts to a passivation or acid liquid.

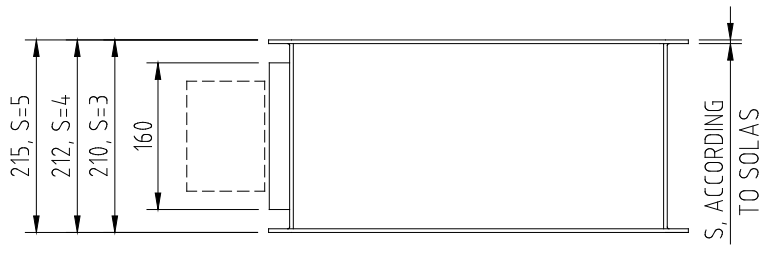
The *frame* shall be formed from 3, 4 or 5 mm sheet according to SOLAS 74 and SOLAS Consolidated Edition, 2002 and according to the table here under (mandatory).

Whatever the classification of the fire damper (classification A0 to A60, classification H60 to H120), the *frame* material thickness, depending on the *width* and from the *height* of the fire damper shall be in accordance with the following table:

Width (mm) Height (mm)	≤ 100	≤ 150	≤ 200	≤ 250	≤ 300	≤ 350	≤ 400	≤ 450	≤ 500	≤ 550	≤ 600	≤ 650	≤ 700	≤ 750	≤ 800	≤ 900	≤ 1000	≤ 1100	≤ 1200	≤ 1300
≤ 100	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 150	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 200	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 250	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 300	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 350	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 400	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	3 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 450	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 500	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 550	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 600	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	4 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 650	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 700	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 750	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 800	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 900	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 1000	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 1100	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
≤ 1200	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm

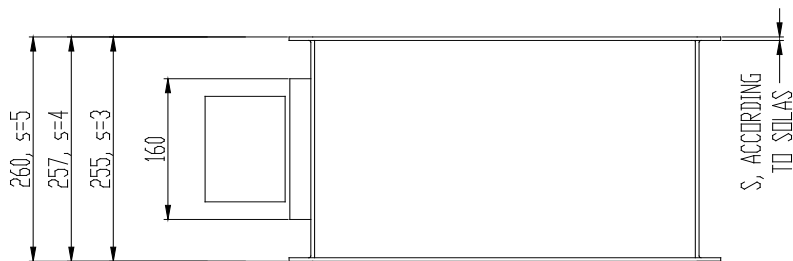
Depth of the *frame* shall be in accordance with the drawing and table here under:

Fire damper with A class:



Depth (mm)	S (mm)
210	3
212	4
215	5

Fire damper with H-class:

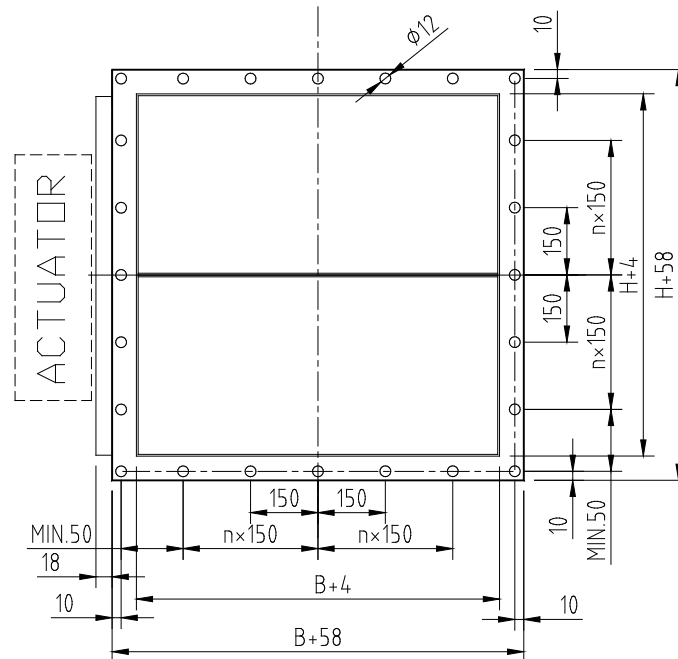


Depth (mm)	S (mm)
255	3
257	4
260	5

The flanges width of the fire damper shall be 27 mm minimum in A-class and 40 mm minimum in H-class.

The fire damper shall be drilled in accordance with the following drawing:

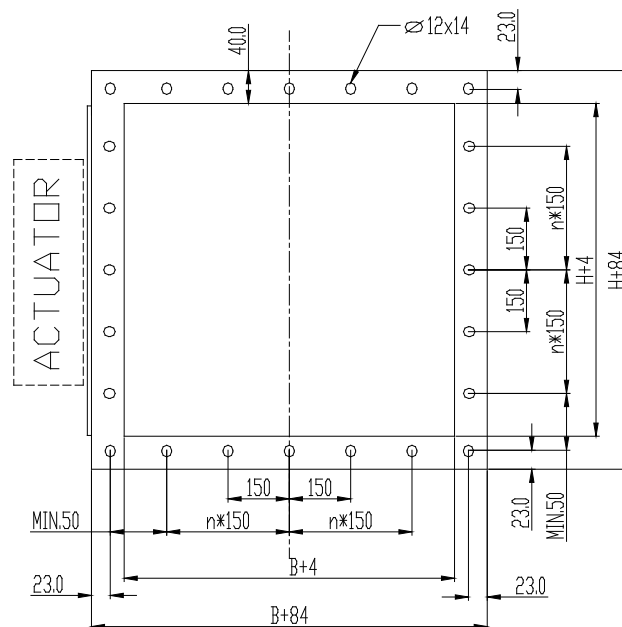
Fire damper A0 to A60 class:



B: *width* of the fire damper (mm)

H: *height* of the fire damper (mm)

Fire damper H60 to H120 class:

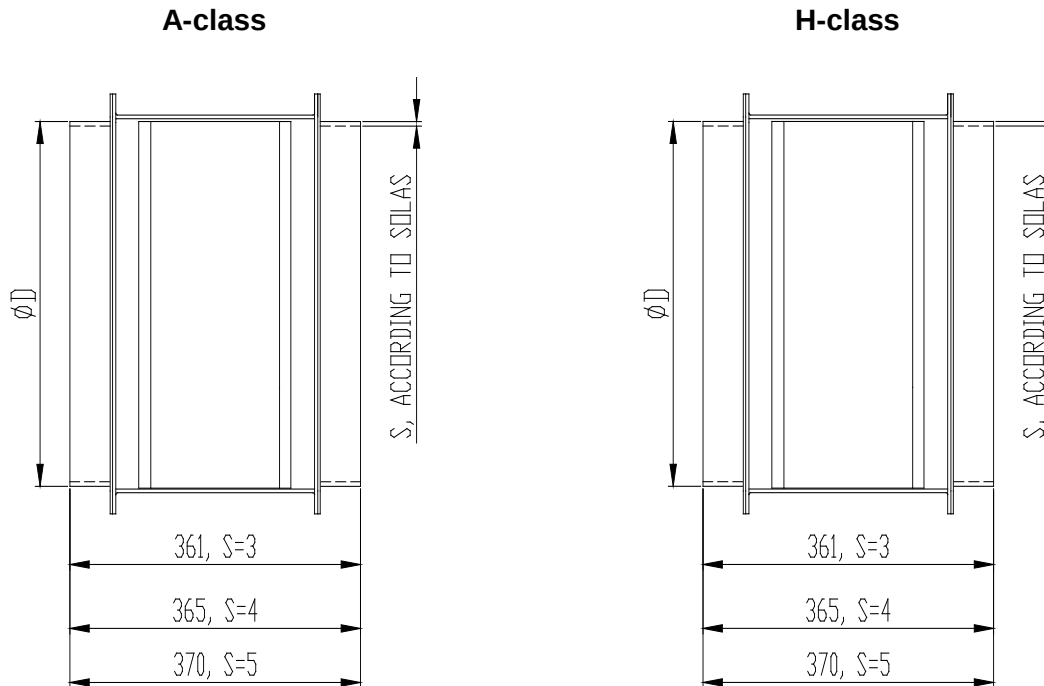


B: *width* of the fire damper (mm)

H: *height* of the fire damper (mm)

Circular connection:

When circular connection is required, additional spigot adaptors in Stainless steel AISI 316L of 3, 4 or 5 mm shall be used in accordance with **SOLAS**. However in this case the overall flange dimension shall be in accordance with the drawing here under:



6.3 Blades/Shfts

Material of the blades shall be stainless steel AISI 316L, Material Certificate type 3.1 according to **EN 10204** shall be supplied by the **MANUFACTURER** (mandatory).

The blades shall be double sheet aerofoil-section construction to obtain a blade with minimum thickness 2 mm (mandatory). The blade movement shall be opposed type.

The shaft of each blade shall be made of a 15 mm diameter plain stud stainless steel. Material Certificate type 3.1 according to **EN 10204** shall supplied by the **MANUFACTURER** (mandatory).

The blades for A0 to A60 shall contain silicon gasket (withstanding 300°C) and thermal expansion graphite seal gasket (expansion process starting at 150°C). The same technology shall be used concerning the air tightness between the *frame* and the blades.

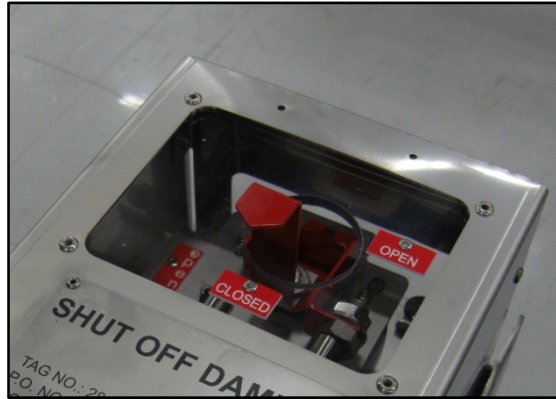
The blades for H60 (H120) shall contain thermal expansion graphite seal gasket (efficient from 150°C).

Stainless steel bearings shall be located inside the *frame* to support the shafts.

The blades shall be able to be dismantled.

A local mechanical device indicating blades position (open or closed) shall be provided by **MANUFACTURER**. Indicator shall be readable outside of the fire damper, without actuator

housing removing. The indicator shall be readable after insulation installation, without any dismantling and without removing the insulation.

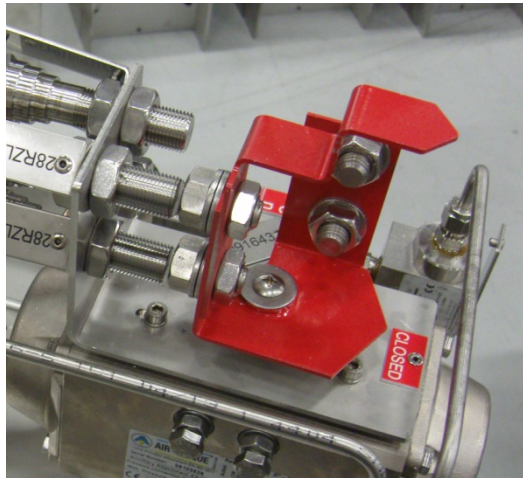


Picture 1 - Example of internal position indicator (inside housing)

The blades position indicator shall be located outside of housing, every time an internal position indicator cannot be read by an operator located on a floor (reading position: 1,6 m from the floor). In case of blades position indicator is inside housing (indicator readable from floor), housing opening, with synthetic glass, shall be provided to allow the indicator reading. Whatever the type of indicator provided (internal or external location), opening in synthetic glass, allowing passage of indicator, shall be provided. The position of indicator shall be changeable on site by manual turnover of indicator.



Picture 2 - Example of external position indicator (outside housing)



Picture 3 - Example of external position indicator (outside housing – housing is removed)

Extremity of shaft for connection to the actuator shall be 12 mm square.

6.4 Control housing

All control equipment shall be housed in stainless steel. Material Certificate type 3.1 according to [EN 10204](#) shall be supplied by the *MANUFACTURER* (mandatory). The thickness of housing shall be 1.5 mm minimum. The enclosure shall be fitted with a removable access cover.

The location of the control housing shall be as indicated on the fire damper data sheet (right side, left side, topside, bottom side) informed by the *HVAC CONTACTOR*.

The location of the control housing shall allow the installation of the damper insulation and a free access for maintenance without removing the said insulation.

The control housing shall be delivered with cable glands to ensure a safe installation of the cables and piping.

6.5 Actuator

The fire damper shall be pneumatically operated by single action spring return rotating actuator arranged to fail in a closed predefined position upon loss of air supply pressure.

Actuator shall be directly coupled to a stainless steel bodied quick exhaust valve to reduce the damper closure time to 2 seconds maximum.

The actuator shall be sized 40% above the required damper closing torque.

6.6 Tubing

All instrument tubing and fitting on damper package shall be made of Stainless steel 316L (outdoor location) or Stainless steel 304 (indoor location).

For the both above construction, outside diameter of the tubing used for the connection of the components in the enclosure shall be 6 mm.

6.7 Control

Remote indication of blades fully open and fully closed status shall be monitored by *position switches* or *proximity sensors* (as indicated hereafter) installed on the drive shaft which shall be positively connected to the damper blades.

Location of the fire damper	Type of status detection
Non hazardous area	Position switch
Hazardous area	For zone 2: position switch or proximity sensor Proximity sensor for zone 1 (Sensors shall be designed to operate on intrinsically safe circuits (IS)) Whatever the hazardous area classification, ATEX requirements shall be applied.

The *position switches* (or *proximity sensors*) shall be mounted in order to be activated when the blade(s) of the fire damper is (are) fully open (first *position switch*) and when the blade(s) of the fire damper is (are) fully closed (second *position switch*).

The fire damper shall be provided by the *MANUFACTURER* with:

- One changeover position switches (*proximity sensors*) monitoring the open position of the fire damper
- One changeover position switches (*proximity sensors*) monitoring the closed position of the fire damper.

The two *position switches* (*proximity sensors*) shall be used by the Instruments Discipline for *F&G* system.

The *proximity sensors* shall be provided with a minimum of 1.0 m length of cable.

The fire damper shall be delivered with a solenoid valve operating with 24 VDC.

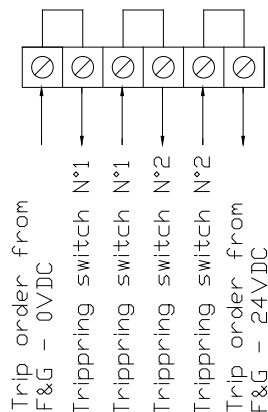
The electrical classification of the solenoid valve coil shall be in accordance with the location of the fire damper.

The fire damper shall be operated by compressed air (from 4 to 10 barg).

In case of use within hazardous area:

- Each fire damper shall be provided with an AISI 316 junction box EEx(e) explosion proof
- Fire damper (complete fire damper, including mechanical and electrical accessories) shall be certified by a notified body, in accordance with ATEX requirements (auto certifying of the complete fire damper and/or auto certifying of the electrical components only will be rejected).

Regarding the solenoid valve, the cabling shall be done to terminals in order to allow a serial wiring with the two tripping switches. Jumps between terminals shall be wired by the *MANUFACTURER* as shown:



(Only terminals for tripping switches and connections to *F&G* system are indicated on the above drawing).

Note: For "Tripping switch", refer to General Specification [GS EP HVA 402](#), paragraph "Remote control system".

6.8 Fusible link

A fusible link will ensure fire detection. Maximum temperature release of the fuse (fusible link) shall be within the range 72 to 74°C.

When the temperature will rise above the release temperature, fusible link shall cut the air supply to the actuator in order to ensure the closing of the fire damper.

The fusible link shall be removable for checking or for replacement; an easy access shall then be provided.

6.9 Pressure regulator

A pressure regulator shall be provided in the installation in order to ensure a pressure range between 4 to 10 barg at each fire/gas damper connecting point.

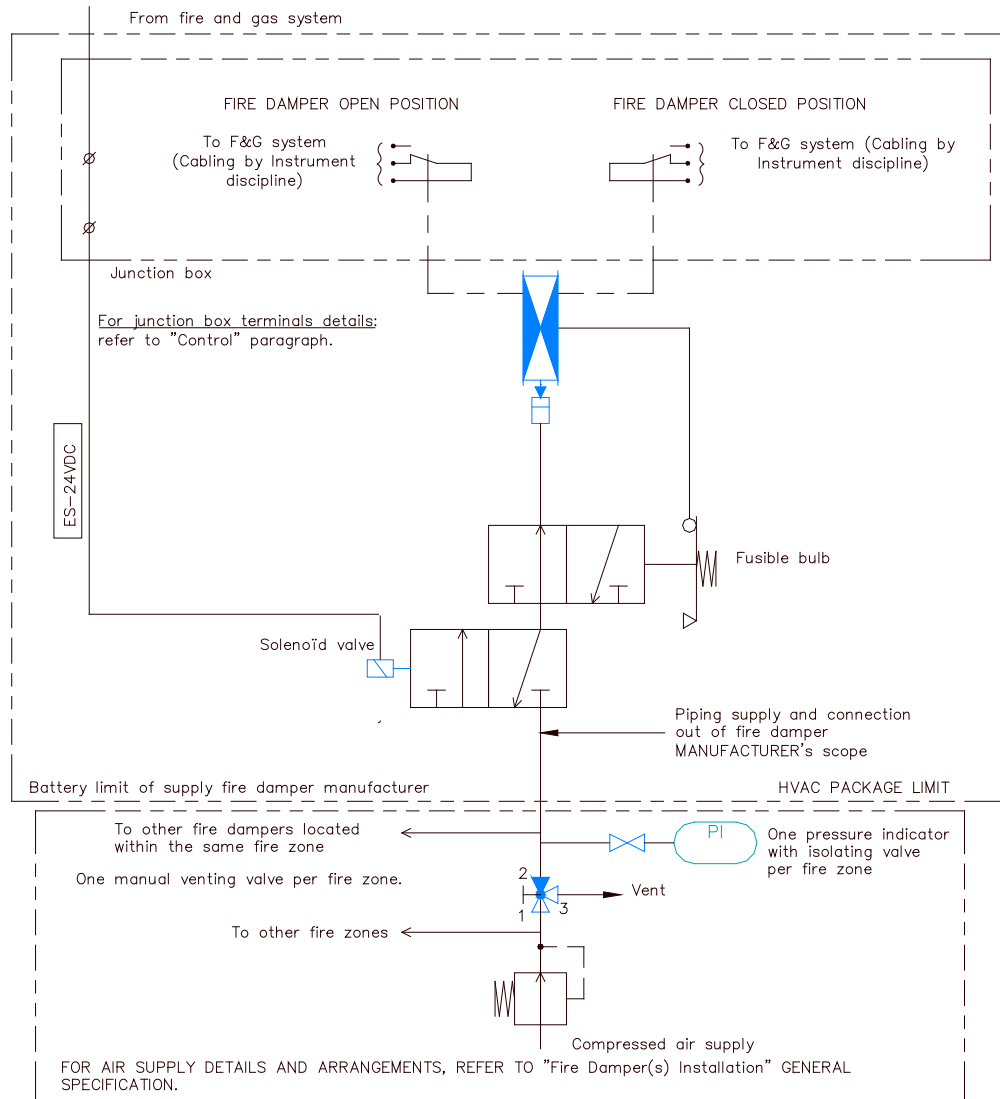
6.10 Junction box

To enable the connection of cables to the solenoid valve and to the proximity sensors, terminals shall be installed inside a stainless steel box located within control housing. The cabling between the accessories of the fire dampers and the terminals shall be realised by the fire damper *MANUFACTURER*.

According to the location of the fire damper, the junction box and the cable glands can be made of different materials (for building type, refer to [GS EP HVA 100](#)):

"Building type"	Location of fire damper	AREA	Material
RU	Inside closed AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass Polyamide
	Open AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass
IN	Inside closed AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass Polyamide
	Open AREA	Hazardous AREA	Stainless steel
		Non hazardous AREA	Brass
INT	Inside closed AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass Polyamide
	Open AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass
MA	Inside closed AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass Polyamide
	Open AREA	Hazardous AREA	Stainless steel
		Non hazardous AREA	Stainless steel
MAT	Inside closed AREA	Hazardous AREA	Brass
		Non hazardous AREA	Brass Polyamide
	Open AREA	Hazardous AREA	Stainless steel
		Non hazardous AREA	Brass

6.11 Pipe and instrument diagram



Status of fire damper components:

Situation	Action on	Status			
		Solenoid valve	Fusible link distributor	Manual three-way valve	Fire damper blades
Normal	No action	On	On	1-2 open	Open
Emergency	Manual venting valve (fire zone)	On (atmospheric pressure)	On (atmospheric pressure)	1-2 closed 2-3 open	Closed
	Solenoid valve (by F&G)	Off (venting)	On (atmospheric pressure)	1-2 open	Closed
	Fusible link	On	Off (atmospheric pressure)	1-2 open	Closed
	Remote control	Off (venting)	On (atmospheric pressure)	1-2 open	Closed
Test	Remote control	Off (venting)	On (atmospheric pressure)	1-2 open	Closed
Absence of compressed air	No action	On	On	1-2 open	Closed

6.12 Tagging

6.12.1 Fire damper tagging

For each fire damper, two tagging plates shall be provided:

1. Fire damper name plate

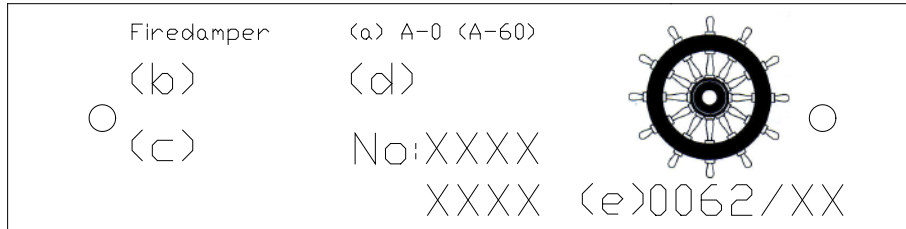
Each fire damper shall be delivered with its tagging name plates made of Stainless Steel 316L.

For each damper, two nameplates shall be supplied (one shall be fixed on the fire damper, the other shall be delivered but non-installed).

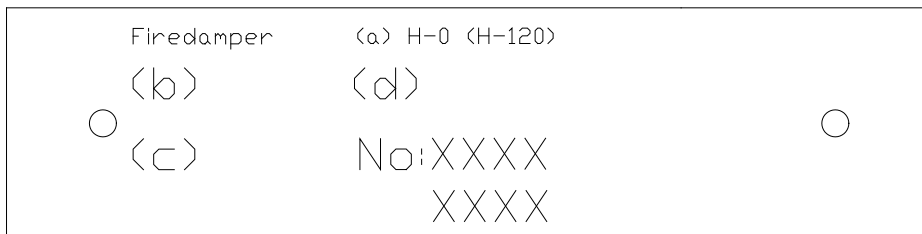
The non-installed tagging plate shall be fixed on the mechanical protection of the insulation.

The nameplates shall be in accordance with the example here under and the following information shall be indicated as a minimum:

A-class tagging:



H-class tagging:



Common legend to the A / H class:

- Classification of the fire damper A 0 to A 60 / H60 to H120 (a)
- Fire damper name (b)
- MANUFACTURER name (c)
- Tag number (d)
- MED number (not for H-class) (e)

The tag number shall be in accordance with tag numbering rules of the Project.

2. "On site" tagging

An equipment tagging label shall be fixed on *WALL*, every time the fire damper is not visible without removing a raised floor, a suspended ceiling, a housing... Tagging plate shall be made of Stainless Steel 316 L and shall be mechanically fixed on a wall, at a vertical position from the fire damper and shall be visible without raised floor, a suspended ceiling,... removing.

The tag number shall be in accordance with tag numbering rules of the Project.

6.12.2 Venting valve tagging

For each venting valve, it shall be installed a descriptive plate near the venting valve, indicating the following data:

- Venting valve tag number (as per Project tag numbering rules)

- List of room(s) (room(s) name(s)) with room(s) tag number(s) associated to the venting valve
- A drawing of venting valve where handle position is shown for fire damper(s) closure. The following legend shall be engraved near the drawing: "Handle position for fire damper(s) closure".

6.12.3 Remote control system tagging

(For "remote control system" definition, refer to "Installation" paragraph)

Each "remote control system" shall be tagged as follow:

FIRE DAMPER XXXX

MANUAL CLOSURE

where XXXX corresponds to the tag number of the fire damper.

7. Performances

Subject	Area classification	Performance
Explosion proof classification: (for electrical components) Refer also to Project specifications which prevail on the explosion proof classification indicated in this specification.	Non hazardous area	Non classified equipment
	Hazardous area	EEx II B T 4 + ATEX
	Battery room	EEx II C T 3 + ATEX (refer to GS EP ELE 079)
Safety solenoid valve air supply		From 4 to 10 barg
Electrical solenoid valve voltage		24 VDC
Minimum insulation density		150 kg/m ³ (for A60 classification)
Minimum insulation thickness		Refer to "Installation" section
Damper closure time		2 seconds maximum
Rupture temperature of fusible link		72 to 74°C ± 5°C
Fire classification (A60,...)		See specific documents

Fire damper (“A” and “H” classes) shall fulfil both *normal condition* and *fire condition* leakage limits, whatever the size of the damper, the classifications and type of actuators (mandatory):

- In *normal condition* (18 to 25°C), leakage flow rate (m³/h) of air / gas / smoke shall be in accordance with the following table:

Dimensions		Test Pressure results							
Width	Height	250 Pa	500 Pa	750 Pa	1000 Pa	1250 Pa	1500 Pa	1750 Pa	2000 Pa
100	100	0	0	0	0	0	78	78	78
200	200	0	0	0	0	0	78	78	78
300	300	0	0	0	0	78	94	104	118
400	400	0	0	0	94	112	118	129	136
500	500	90	112	125	135	145	155	161	165
600	600	123	123	123	135	135	149	156	156
700	700	94	112	129	140	153	169	178	189
800	800	0	94	123	140	153	162	175	186
900	900	104	129	144	158	169	183	200	215
1000	1000	197	176	200	210	223	236	244	259
1100	1100	123	155	175	192	206	222	233	243
1200	1200	118	149	169	185	200	218	231	258
1200	1300	140	175	203	233	265	301	332	356
1200	1400	123	153	171	186	206	231	254	273
1200	1500	155	180	207	228	243	256	265	274
1200	1600	147	183	209	231	253	277	293	338

- In fire condition 500°C (see Figure 1): leakage of air / gas / smoke shall be ≤ 7 l/s/m² under a differential pressure of 500 Pa in accordance with the curve here under (tested in vertical position) (mandatory). The test shall be realised during a period in accordance with the fire rating classification (for example A60: test during 60 min, H120: test during 120 min).

The above acceptable values have to be measured for each fire damper whatever the fire damper class and sizes. In case of several fire dampers with the same dimensions (*width and height*), only one leakage test is acceptable. If one leakage test fails *COMPANY* may require testing of all dampers.

Regarding the leakage values, for *fire conditions*, the following approaches are forbidden:

- Mathematical approach shall be rejected
- Mathematical adaptation of the leakage rate from “normal” conditions (18°C to 25°C) to “fire” conditions (500°C as minimum) shall be rejected.

The above tests regarding the leakage air flow rate have to be certified by a Certifying Authority.

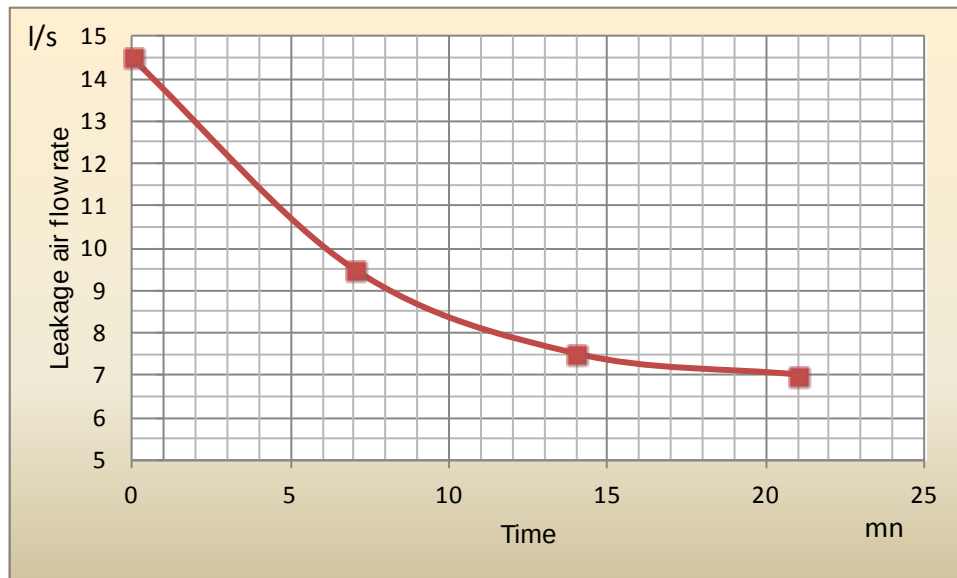
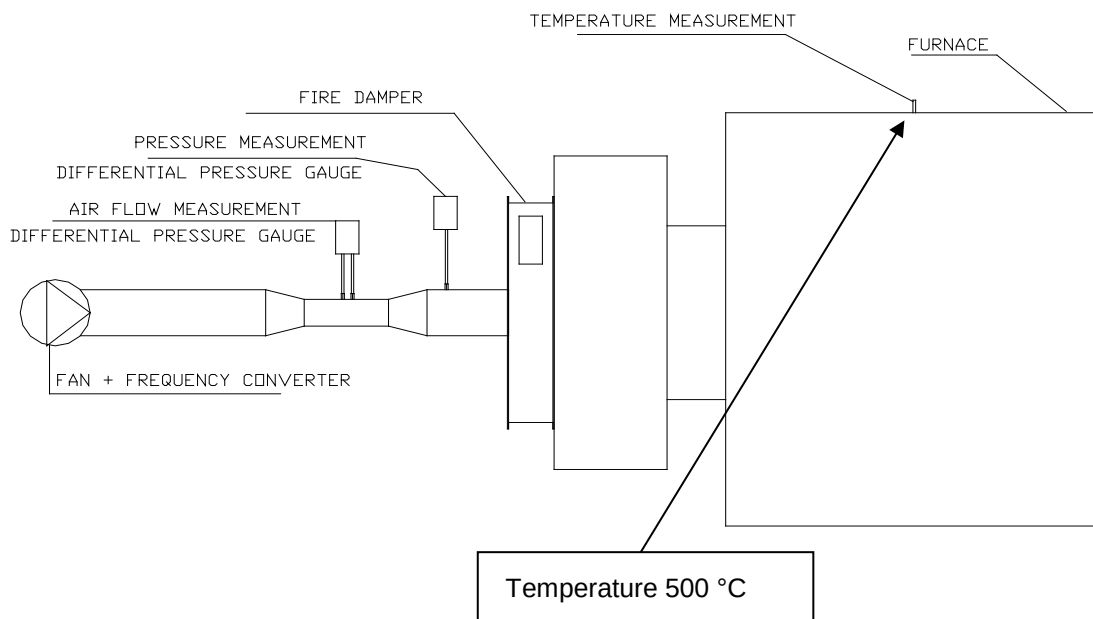


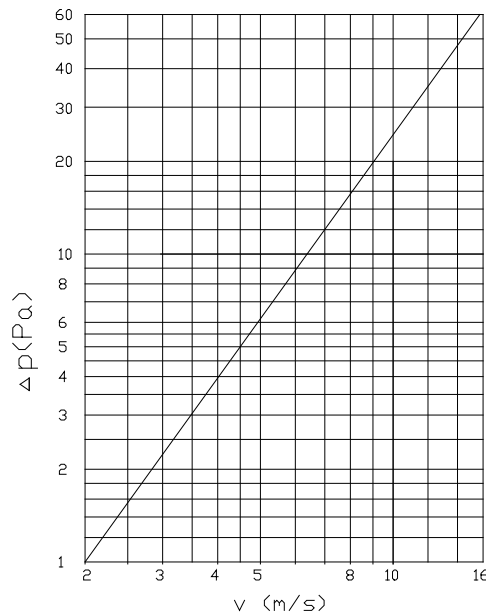
Figure 1 - Leakage air flow rate in “fire” conditions for fire damper 1000 x 1000 mm



Remark concerning air leakages in *normal condition* and in *fire condition*: the values demanded above are the maximum acceptable air leakages. Any deviation shall be granted by *COMPANY*.

Operating Pressure Drop:

In open position, the fire damper pressure loss shall be less than the pressure drop curve here under, whatever the size of the damper, the classification (A0, A60, H60 to H120,...) and the type of actuator:



8. Fire resistance certificates

Important note: deviation request regarding the requirements of this paragraph shall be rejected by *COMPANY*.

The goal of fire resistance tests is to demonstrate the fire integrity of duct penetration. Implementation of these tests is the only accepted way to demonstrate the fire integrity of duct penetration (calculation notes, calculation codes, extrapolations, ... to demonstrate fire integrity is rejected).

The fire damper(s) shall be provided with fire resistance certificates issued from a Certifying Body agreed by *COMPANY*. The fire resistance certificates shall be provided for both following test conditions:

- Fire is coming from room where the fire damper is installed (as per SOLAS / IMO resolution A.754 (18)), (installation on deck and bulkhead)
- Fire is coming from the adjacent room where the fire damper is installed (installation on deck and bulkhead). For this second test conditions, the criteria indicated in paragraphs "Instrumentation", "Method of test", "Performance criteria" of SOLAS / IMO resolution A.754 (18), shall be applied.

Qualification of fire damper(s) for bulkhead installation shall be delivered when measurement criteria considered by IMO resolution A.754 (18) shall be obtained for the two above tests, when the fire damper is installed on bulkhead.

Qualification of fire damper(s) for deck installation shall be delivered when measurement criteria considered by [IMO resolution A.754 \(18\)](#) shall be obtained for the two above tests, when the fire damper is installed on deck.

A "Type approval Certificates", even issued from an agreed Certifying Body shall be rejected.

The following information has to be mentioned within the certificate(s):

- The identification number of certificate(s)
- The *MANUFACTURER* reference(s) of the fire damper
- The reference Regulation(s) and Standard(s) taken into account for fire resistance testing ([IMO resolution A754 \(18\)](#) is a minimum)
- The date of certification and the certificate validity limit date
- The product description, including the frame and blades thickness, the sizes range of fire dampers for which the certificate is valid
- The fire damper detailed drawing(s) number(s) issued from *MANUFACTURER*
- The test reports indicating that the results are in accordance with the reference documents above mentioned
- The limitation(s) of application, if applicable
- The fire test arrangement drawing(s) indicating:
 - The coaming / spigot length and thickness
 - The insulation characteristics (density, thickness, material, number of layers, nature of adhesive, ...)
 - The position of measured temperatures by thermocouples during the fire test.

Note: The sized arrangement drawing has to be sufficiently detailed to allow the construction on site without interpretation and without requiring further information.

9. Documents to provide

9.1 Submission of documents

The documents are submitted for Approval, Comment or Information. The following table lists the category of each document. Definitions of the submission class of documents are indicated below:

- Category A: document required for approval; *VENDOR* shall not proceed on until receipt of the Purchaser's approval or first working day after the end of the review cycle, first coming.
- Category B: document required for comment; *VENDOR* shall be allowed to proceed on before the end of the review cycle, but shall take into account at no cost/schedule impact any Purchaser's comment(s) issued within the review cycle.
- Category C: document required for information.



9.2 Documents to provide

The following documents shall be provided by the *VENDOR*. These documents are a part of *FINAL DOCUMENTATION* that *HVAC CONTRACTOR* shall provide to *COMPANY*:

Item	Document Title	Categ.	With Bid
MANAGEMENT			
MGT01	<i>VENDOR</i> Document Schedule - VDS	A	Mandatory
MGT02	Organisation Brief	B	Mandatory
MGT04	Planning showing Engineering, Procurement, Fabrication, Testing, Delivery	B	Mandatory
QUALITY			
QAC01	Project Quality Plan	B	
QAC02	Quality Manual	B	Mandatory
QAC03	QC Inspection Plan	A	
QAC04	QC Procedures	A	
HEALTH, SAFETY, ENVIRONMENT			
HSE02	Material Safety and product Data sheets	B	
INTERFACE			
INT02	Electrical & Instrumentation wiring drawings	B	
INT03	Equipment Data Sheets	B	Mandatory
INT04	Reliability Availability Maintainability calculations / reports	B	Estimate
INT05	Performance curves	B	Mandatory
INT07	Functional description	B	Mandatory
INT08	General arrangements drawings	B	Mandatory
INT09	Mechanical Equipment List	B	
INT10	Electrical Equipment List	B	
INT11	Control & Instrument List	B	
INT12	Interface Block diagrams	B	
INT13	Junction box termination drawings	B	
INT14	Functional logic diagram	A	
INT15	P&ID's	A	
INT16	Utility Consumption List	B	Mandatory
INT17	Power supply requirements	A	Mandatory
INT19	Earthing details	B	



Item	Document Title	Categ.	With Bid
INT20	Weight / Centre of gravity drawings & data's	B	
INT21	External Static and Dynamic Forces & Moments (present during start-up, normal/maximum operation, shutdown, and other conditions of service)	B	
INT22	Anchor bolt details drawings (incl. size, type, locations relative to the equipment centre-lines in three planes)	B	
ENGINEERING			
ENG01	Detailed Functional Design Specification	B	
ENG02	Detailed Overall Description	C	
ENG03	Mechanical Detailed Specifications (one per component)	B	
ENG04	Detailed design/fabrication drawings	B	
ENG06	Assembly drawings	B	
ENG07	Design calculation notes	B	
ENG09	Piping Detailed Specifications (one per component)	B	
ENG10	Piping routing	B	
ENG11	Valves & Instruments location drawings (incl. provisions for operational and maintenance access)	B	
ENG12	Electrical Detailed Specifications (one per component)	B	
ENG13	Electrical cables routing (including junction boxes)	B	
ENG14	Electrical equipment location drawings (incl. provisions for operational and maintenance access)	B	
ENG16	Electrical control schematics	B	
ENG17	Instrument & Control Detailed Specifications (one per component)	B	
ENG18	Instrument cables routing (incl. cable trays & junction boxes)	B	
ENG19	Instrument equipment location drawings (incl. provisions for operational and maintenance access)	B	
ENG21	Wiring Loops diagrams	B	
ENG22	Instrument control schematics	B	
ENG23	Instrument mounting & housing instructions	C	
ENG24	Power distribution & consumption (air supply)	B	

Item	Document Title	Categ.	With Bid
ENG25	Cause & Effect Charts	B	
ENG26	Functional analysis	B	
ENG27	Insulation mounting drawings	B	
PROCUREMENT			
PRO01	Procurement procedure (covering Purchase, Expediting, QC)	A	Mandatory
PRO02	List of sub-suppliers (table giving: part of equipment, tag no, sub-supplier reference)	A	Mandatory
PRO03	Unpriced copy of sub-orders	C	
MANUFACTURING			
MAN01	Weighting procedure	B	
MAN02	Surface preparation and painting procedures	B	
MAN04	Welding procedure specification (including repair procedures)	B	
MAN05	Welder qualification procedure	B	
TESTING			
TES01	Pneumatic Testing Procedure (Tightness test)	B	
TES02	Performances & Functional Test Procedure	B	Mandatory
RECORDS, REPORTS & CERTIFICATES			
RRC01	Material Inspection Certificate (EN 10204 , DIN 50049)	C	
RRC02	Testing Authority Approval Certificate	C	
RRC03	Hazardous Area Certificates	C	
RRC05	Conformity Certificates and Temporary Certificates	C	
RRC07	Welding procedure qualification record	B	
RRC08	Welder qualification records	B	
RRC09	NDT Operator Qualifications	B	
RRC10	Detailed NDT reports	B	
RRC11	Weld/ NDT Identification Diagram	B	
RRC12	Dimensional Control Reports	B	
RRC16	Pressure Test Reports/Certificates	B	
RRC17	Functional Test Report/certificates	B	
RRC22	Cable continuity and resistance test reports	B	



Item	Document Title	Categ.	With Bid
RRC26	Surface preparation & Coating reports	B	
RRC27	Certified Weight certificates	B	
INSTALLATION			
INS01	Weight	B	
INS02	Sub-assembly Documentation	C	
INS03	Sub-assembly Drawings	C	
INS04	Erection/Installation & Tie-in Documentation	B	
INS05	Erection/Installation & Tie-in Drawings	B	
INS06	Lifting Procedure (Onshore/Offshore)	B	
INS07	Name Plate Documents	C	
INS08	Handling, Transportation & Storage Instructions	C	
INS09	Unpacking & Inspection Instructions	C	
INS10	Packing List	C	
OPERATION & MAINTENANCE			
OPM01	Operating Instructions	C	
OPM02	Maintenance Instructions	C	
OPM03	Commissioning & Start-up Manual	C	
OPM04	List of Spare Parts Commissioning & Start-up	C	Mandatory
OPM05	List of Spare Parts 2 Years Operation	C	Mandatory
OPM06	List of Special Tools	C	Mandatory
OPM07	Lube Oil Schedule	C	

A temporary certificate, which will prove that equipment is in accordance with fire rate requirements, shall be delivered with equipment.

A final certificate shall be delivered when insulation is properly carried out on site (by classification society).

9.3 Quantities of documents

The hereafter indicated values are minimum. In case of more important quantity of copies required by the Contract, the values indicated hereafter shall be increased as per requirement.

For Review:

- Drawings: 3 hard-copy + 1 electronic
- Documents: 3 hard-copy + 1 electronic
- *VENDOR's* Book: 2 sets + 1 electronic.



Final Submission (Certified Finals)

- Drawings: 6 hard-copy + 2 electronic (CD-Rom)
- Documents: 12 hard-copy + 2 electronic (CD-Rom)
- Data Books: 3 Original + 3 copies + 2 electronic (CD-Rom).

In addition, a complete final documentation (1 CD-Rom, with native files for drawings), including spare parts lists, shall be provided by *MANUFACTURER* to the *HVAC SPECIALIST*.

9.4 Format of documents

9.4.1 Electronic copy

An electronic copy of all project specific documents shall be submitted in Native File Format (.doc, .xls & .dwg preferred). Standard documentation may be .pdf or .tif format. Data shall be provided on CD.

9.4.2 Hard Copy

All documents shall be full size based on 'A' series sizes, A0 size is not acceptable.

All documents shall be checked before submission, unchecked documents may be returned un-reviewed.

All documents submitted shall be clearly marked with the Purchase Order No., Item No, *VENDOR* Job No., Equipment/Tag No. (if applicable), *VENDOR* Document No., Purchasers Document No.

All documents and technical data shall be in the English language (unless otherwise stated) with dimensions and units in accordance with ISO.

A3 and A4 documents shall be submitted with a project document front sheet, which will carry the Purchaser's review status on return to the *VENDOR*.

All document prints larger than A4 shall be folded to A4 size with identification data visible at the bottom right.

The documents provided by the *VENDOR* shall be typed. Hand-written correspondence will be rejected.



10. Equipment inspection

For the fire damper(s), the *COMPANY* requires an equipment inspection according to the following table:

Level 0	[]	No inspection required
Level 1	[X ¹]	Final inspection prior to shipment and <i>FAT</i> with <i>MANUFACTURER</i> and <i>COMPANY HVAC SPECIALIST</i> (from Exploration & Production division, Technology department).
Level 2	[X ²]	Progress surveillance, meetings, all witness and hold points. Final inspection prior to shipment and <i>FAT</i> with <i>MANUFACTURER</i> and <i>COMPANY HVAC SPECIALIST</i> (from Exploration & Production division, Technology department) - Cost for <i>COMPANY</i> , regarding this equipment inspection level is at <i>CONTRACTOR</i> charge.
Level 3	[]	Continuous monitoring by resident inspector. Final inspection prior to shipment and <i>FAT</i> with <i>MANUFACTURER</i> and <i>COMPANY HVAC SPECIALIST</i> (from Exploration & Production division, Technology department).

11. Data sheet

A data sheet (provided in General Specification CDrom) shall be filled and transmitted to *COMPANY*.

12. Spare parts list

A spare part list for start-up and two years maintenance shall be provided by the *MANUFACTURER*.

Except when otherwise stated in General Specifications or in Project documents, the spare parts list shall be filled on a form according to the present model (refer to next page).

By its acceptance of purchase order, the equipment *MANUFACTURER* contracts to provide exhaustive spare parts lists including the designation and reference of each component, as mentioned in catalogue of the originator *MANUFACTURER* of this component.

Equipment spare parts list can be required by *COMPANY*'s *HVAC SPECIALIST* as soon as equipment is provided by the *MANUFACTURER*. In this case the *COMPANY*'s *HVAC SPECIALIST* requirement prevails on other specification, delay or request mentioned in the other Projects documents.

¹ Applicable to *MANUFACTURER* which is in the *COMPANY*'s *HVAC VENDORS* List

² Applicable to *MANUFACTURER* which is not in the *COMPANY*'s *HVAC VENDORS* List

[illegible]



13. Other references

Following documents are applicable:

- Standards: [EN 1751](#), [IEC 60335-1](#), [IEC 60529](#), [IEC 60947-5-1](#), [ISO 5211](#), [ISO 15607](#), [ISO 15614-2](#), [ISO 15614-8](#)
- Professional Documents: [SMACNA](#)
- Regulations: [Directive 94/9/EC referred to a ATEX 100a/95](#), [Directive 1999/92/EC referred to a ATEX 118/137](#)
- Code: [NORSOK Standard H-001](#)
- Total General Specifications: [GS EP COR 350](#), [GS EP HVA 000](#), [GS EP HVA 010](#).



Appendix 1 Fire Damper(s) Pneumatically Actuated – Data Sheet



Exploration & Production

GENERAL SPECIFICATION

HVAC

DS EP HVA 212

Fire Damper(s) Pneumatically Actuated - Data Sheet

01	10/08	General updating
00	10/07	First issue
Revision	Date	Notes



Exploration & Production

HVAC

Fire Damper(s) Pneumatically Actuated - Data Sheet

Data sheet presentation

This data sheet is composed of the following sheets:

- Fire damper(s) pneumatically actuated - ("Main" sheet - Pages 1 & 2)
This sheet mentions the main data concerning the fire damper(s) pneumatically actuated.
Page 1 sums up the common for the fire damper(s) pneumatically actuated.
Page 2 mentions the main components of fire dampers and references of their data sheets.
- Main dimensions of fire dampers - ("Dimensions" sheet - Page 3)
Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.
- Performances ("Performances" sheet) which indicates the performances of each fire damper.
Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.
- Actuator ("Actuator" sheet) which indicates the characteristics of each pneumatic actuator.
Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.
- Actuator performances ("Actu Performances" sheet) which indicates the performances of each actuator. Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.
- Solenoid valve ("Solenoid Valve" sheet) which indicates the characteristics of solenoid valves.
Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.
- Solenoid valve performances ("Sol. valve perf." sheet) which indicates the performances of solenoid valves. Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.
- Quick exhaust valve ("Quick Exh valve" sheet) which indicates the performances of quick exhaust valves.
- Proximity switch ("Prox. Switch" sheet) which indicates the performances of proximity switches valves.
- Position switch ("Pos. Switch" sheet) which indicates the characteristics of position switches.
- Junction boxes ("Junc. Box" sheet) which indicates the characteristics of junction boxes.



Appendix 1

- Tag list ("Tag list" sheet) indicates the tag numbers for each quick exhaust valve, proximity switch, position switch and junction box associated to each pneumatic fire damper. Depending on number of fire dampers on Project, this page can be copied to create the number of requested folios. In this case, page numbering has to be updated.

Instruction for use of sheets:

Only fields to be filled-in by the *CONTRACTOR* are accessible.

For major part of these fields, contextual help is accessible when roll-over with the mouse.

The contextual help includes a definition of field to avoid misunderstanding.

The "Cover" and "Data sheet presentation" have not to be attached to the data sheet submitted to *COMPANY* for approval.

A "Highlighting" button allows to identify the fields to modify or to fill in for each sheet.

Before printing a sheet, press "Without highlighting" button.

Data sheets approval:

The data sheets have to be fully filled in by *CONTRACTOR*.

The filled data sheet (including all sheets) has to be approved by the *COMPANY*'s Specialist before purchasing the equipment.

Within *HVAC* documents, expression in capital characters and *ITALIC* are defined within the "Terminology, definitions and abbreviations" General Specification.

Within *HVAC* documents, expression in small characters and *italic* are defined within the "Definition" paragraph of the associated specification.

[illegible]



 TOTAL Exploration & Production	COMPANY PROJECT NAME DATA SHEET FIRE DAMPER(S) PNEUMATICALLY ACTUATED		Project Logo
			Page 2 /
1	Fire dampers components:		
2	Description:	Refer to data sheet:	
3	Actuator		
4	Solenoid valve (3 ways-valve)		
5	Quick exhaust valve		
6	Position switch or proximity sensor		
7	Junction box		
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			

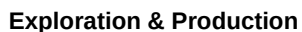


 TOTAL Exploration & Production		COMPANY PROJECT NAME DATA SHEET FIRE DAMPER(S) PNEUMATICALLY ACTUATED										Page 3 /	
		MAIN DIMENSIONS											
		Tag number	Dimensions (mm)						Weight (kg)	Frame metal thickness (mm)	Actuator location (as per "Observation point" on drawing page 1)		
Nominal						Maintenance							
	Dw	Dh	DI	Aw	Ah	AI	Mt	Mb	MI	Mr			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													
61													



 TOTAL Exploration & Production		COMPANY PROJECT NAME DATA SHEET FIRE DAMPER(S) PNEUMATICALLY ACTUATED									
		PERFORMANCES									
Pneumatic fire damper tag number		Inside room	Outdoor	Area classif. (0,1,2)	ATEX classification (when required)	Closing time (s)	Leakage air flow rates (l/s) under differential pressure (Pa) of				Air flow rate through fire damper m³/h
							1000	2000	500	1000	
							Normal conditions		Fire conditions		
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											

[illegible]



General Specification

Date: 01/2012

GS EP HVA 212

Rev: 07

Appendix 1

This document is the property of Total. It must not be stored, reproduced or disclosed to others without written authorisation from the Company.



Exploration & Production

General Specification

Date: 01/2012

GS EP HVA 212

Rev: 07

Appendix 1

		COMPANY			
		PROJECT NAME			
FIRE DAMPER(S) PNEUMATICALLY ACTUATED - DATA SHEET SOLENOID VALVES					
Doc. number:		Contractor document N°:		Page 7 /	
Equipment location:		Tag No: Refer to page 8		Model:	
		System No:		Serial No:	
		Sub-system No:			
		Supplier:			
		Manufacturer:			
Reason for issue	Rev.	Stat.	Date	By:	Checked by:
1 Technical data				53	
2	Nominal air flow rate through valve:		l/mn	54	
3	Operating design pressure:		barg	55	
4	Operating temperature range (instrument air):			56	
5	from to °C			57	
6	Ambient temperature range:			58	
7	from to °C			59	
8	Solenoid valve voltage:		V	60	
9	Solenoid valve voltage frequency:		Hz	61	
10	Solenoid valve current*:		A	62	
11	Power consumption (actuation)*:		VA	63	
12	Power consumption (maintain)*:		VA	64	
13	Degree of protection:	IP		65	
14	Terminals sizes (cables capacity)*:		mm ²	66	
15	Connection sizes (piping)*:			67	
16	Connection type (piping)*:			68	
17	NPT: ☐ Gas: ☐ Other: ☐			69	
18	Solenoid valve ATEX certificat reference:			70	
19				71	
20	ATEX Certifying Body (for ATEX certified fire dampers):			72	
21				73	
22				74	
23				75	
24				76	
25	Materials			77	
26	Body:			78	
27	Seal seat:			79	
28	Inner part:			80	
29	Bolts:			81	
30	Nuts:			82	
31	Name plates:			83	
32				84	
33				85	
34				86	
35				87	
36				88	
37				89	
38				90	
39				91	
40				92	
41				93	
42				94	
43				95	
44				96	
45				97	
46				98	
47				99	
48				100	
49				101	
50				102	
51	*: in case of several models, data to indicate in			103	
52	"Solenoid valves performances" sheet.			104	



TOTAL Exploration & Production		COMPANY PROJECT NAME FIRE DAMPER(S) PNEUMATICALLY ACTUATED - DATA SHEET SOLENOID VALVES PERFORMANCES									
1		Page 8 /									
2		Air Instrument connection size and type		Area classif. (0,1,2)	ATEX classification (when required)	Absorbed current (A)	Power consumption during			Maximum terminals sizes (mm ²)	
3		Size (mm)	Type				Actuat.	Maintain	Unit W or VA		
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											



Exploration & Production

General Specification

Date: 01/2012

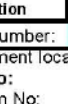
GS EP HVA 212

Rev: 07

Appendix 1

TOTAL Exploration & Production		COMPANY PROJECT NAME FIRE DAMPER(S) PNEUMATICALLY ACTUATED - DATA SHEET QUICK EXHAUST VALVE			
Doc. number:		Contractor document N°:		Page 9 /	
Equipment location:		Tag No: Refer to page 13		Model:	
System No:		Sub-system No:		Serial No:	
Supplier:		Manufacturer:			
Reason for issue	Rev.	Stat.	Date	By:	Checked by:
1 Technical data				53	
2	Nominal air flow rate through valve:		l/mn	54	
3	Operating design pressure:		barg	55	
4	Operating temperature range (instrument air):			56	
5	from	to	°C	57	
6	Ambient temperature range:			58	
7	from	to	°C	59	
8	Degree of protection:	IP		60	
9				61	
10	Connection sizes (piping):			62	
11	Connection type (piping):			63	
12	NPT: ☐ Gas: ☐ Other: ☐			64	
13	Quick exhaust valve ATEX certificate reference:			65	
14				66	
15	ATEX Certifying Body (for ATEX certified fire dampers):			67	
16				68	
17				69	
18				70	
19				71	
20				72	
21				73	
22				74	
23				75	
24				76	
25	Materials			77	
26	Body:			78	
27	Seal seat:			79	
28	Inner part:			80	
29	Bolts:			81	
30	Nuts:			82	
31	Name plates:			83	
32				84	
33				85	
34				86	
35				87	
36				88	
37				89	
38				90	
39				91	
40				92	
41				93	
42				94	
43				95	
44				96	
45				97	
46				98	
47				99	
48				100	
49				101	
50				102	
51				103	
52				104	

Appendix 1

 TOTAL Exploration & Production	COMPANY																																											
	PROJECT NAME FIRE DAMPER(S) PNEUMATICALLY ACTUATED - DATA SHEET PROXIMITY SWITCHES																																											
Doc. number:		Contractor document N°:																																										
Equipment location: Tag No: System No: Sub-system No: Supplier: Manufacturer:		Model: Serial No:																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 35%;">Reason for issue</th> <th style="width: 10%;">Rev.</th> <th style="width: 10%;">Stat.</th> <th style="width: 10%;">Date</th> <th style="width: 10%;">By:</th> <th style="width: 10%;">Checked by:</th> <th style="width: 15%;">Approved by:</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Reason for issue	Rev.	Stat.	Date	By:	Checked by:	Approved by:																																			
Reason for issue	Rev.	Stat.	Date	By:	Checked by:	Approved by:																																						
1 Technical data Switching element type: Namur type: ☐ Other type: ☐ Switch position when plate not detected: Closed: ☐ Open: ☐ Rated operating distance: mm Maximum operating distance: mm Reduction factor r_{CU}: mm Reduction factor r_{AJ}: mm Reduction factor r_{V2A}: mm Nominal voltage: V Switching frequency range: from to Hz Hysteresis range: from to % Typical hysteresis: % Protected against reverse polarity: Yes: ☐ No: ☐ Short circuit protection: Yes: ☐ No: ☐ Current consumption: When plate is detected: mA When plate is not detected: mA LED indication of switching status: Yes: ☐ No: ☐ Standards conformity: Operating ambient temperature: from to °C Storage ambient temperature: from to °C Cable type: Halogen free cable: Yes: ☐ No: ☐ Cable length: m Core-cross section: mm² Degree of protection (EN 60529): IP Equipotential bonding: Yes: ☐ No: ☐ ATEX related characteristics (when classified): Maximum cable length to avoid electrostatic charge on fixed connections: For group IIA: cm For group IIB: cm For group IIC: cm ATEX Identification: Reference of ATEX certificat: ATEX Certifying Body: Actual internal capacitance: nF for a cable length of: m Actual internal inductance: nF for a cable length of: m	53 Materials Housing: ☐ Sensing face: ☐																																											

[illegible]

[illegible]



Exploration & Production

General Specification

Date: 01/2012

GS EP HVA 212

Rev: 07

Appendix 1

 TOTAL Exploration & Production		COMPANY PROJECT NAME FIRE DAMPER(S) PNEUMATICALLY ACTUATED - DATA SHEET TAG LISTS					
							Page 13 /
	Pneumatic fire damper tag number	Actuator tag number	Solenoid valve tag number	Pneumatic quick exhaust valve tag number	Proximity / Position switch tag number	Junction box tag number	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
61							