



Exploration & Production

GENERAL SPECIFICATION

HVAC

GS EP HVA 213

Fire Damper(s) Electrically Actuated

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1. Scope

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

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.

Documents order of precedence 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 must be quoted by the *BIDDER*. During the studies (Basic Engineering and/or Detailed Engineering) *CONTRACTOR(s)* shall raise the discrepancy noted to the *COMPANY's HVAC SPECIALIST*. This last shall review and shall cut short.
- The *HVAC VENDOR* or *CONTRACTOR* may propose proven improvements to the reference documents but must 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 must be included into *HVAC* scope.
- The latest revision of Standards, codes, regulations and the published errata if any must 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 15607	Specification and qualification of welding procedures for metallic materials - General rules
ISO 15614 (Parts 2; 8)	Specification and qualification of welding procedures for metallic materials - Welding procedure tests - (Parts 2; 8)

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

Statutory by law or recognised professional body approved by *COMPANY*.

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 General 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 must 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 must 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, 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, A60).

Whatever the fire damper classification (A0, A60, ...), a certificate, issued from the above notified body, must 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 must be transmitted by *CONTRACTOR* to the Fire damper(s) *MANUFACTURER*:

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

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

6. Construction

For stainless steel selection, refer to General Specification **GS EP HVA 010**.

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 must be chosen according to its location on the *HVAC* plant:

Location	Construction (<i>frames</i> , <i>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 must be continuous by Metal Inert Gas (MIG) process.

The fire damper must be supplied non-insulated (insulation must be carried out on site, in accordance with the requirements of *MANUFACTURER*). Detailed installation instructions, drawings and insulation specification must 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) must be designed for the peak extreme conditions of Project.

6.2 Frame

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

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

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

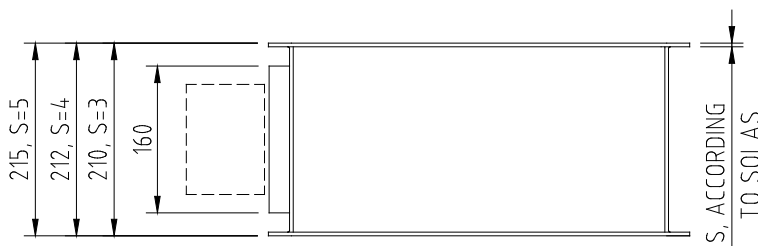
The *frame* must be formed from 3, 4 or 5 mm sheet according to [SOLAS 74](#) and [SOLAS Consolidated Edition, 2002](#) and according to the table here under (mandatory).

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 must 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

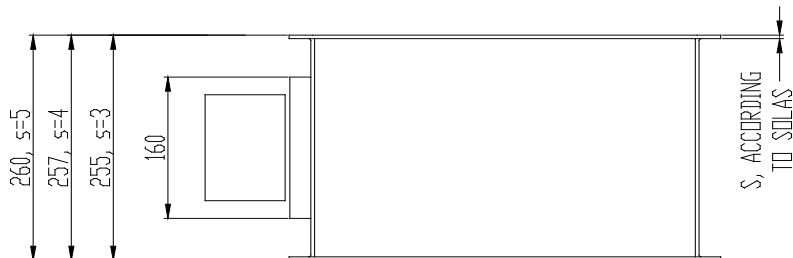
Depth of the *frame* must be in accordance with the drawing and table here under:

Fire damper with A class:



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

Fire damper with H-class:

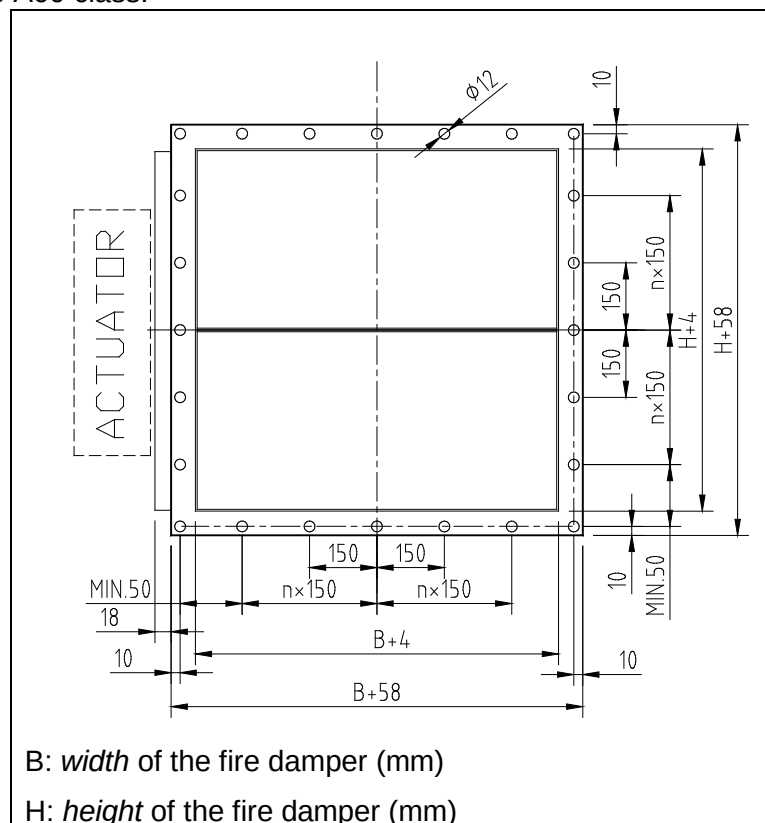


Depth (mm)	S (mm)
255	3
257	4
260	5

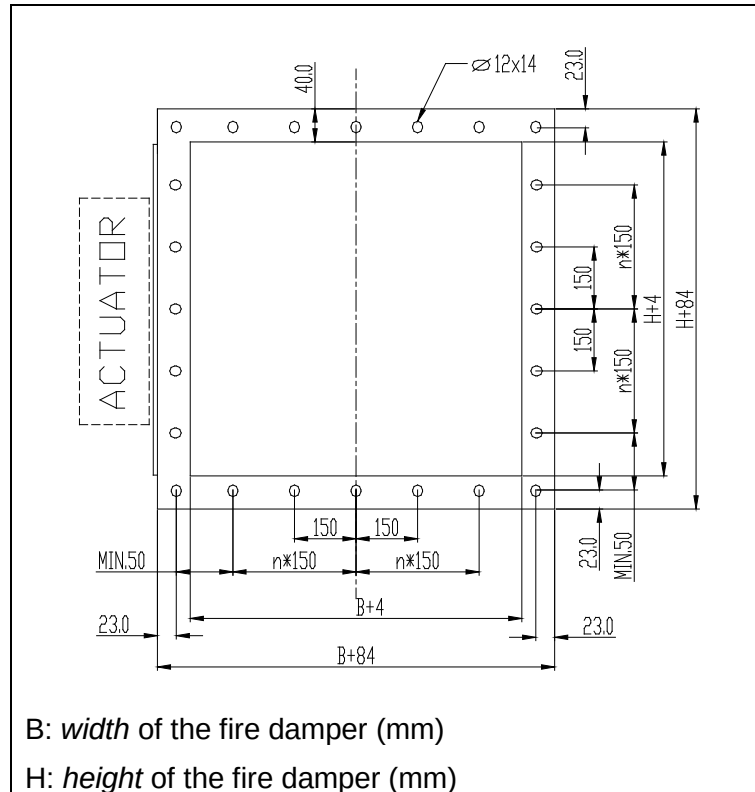
The flanges width of the fire damper must be 27 mm minimum in A-class and 40 mm minimum in H-class.

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

Fire damper A0 to A60 class:

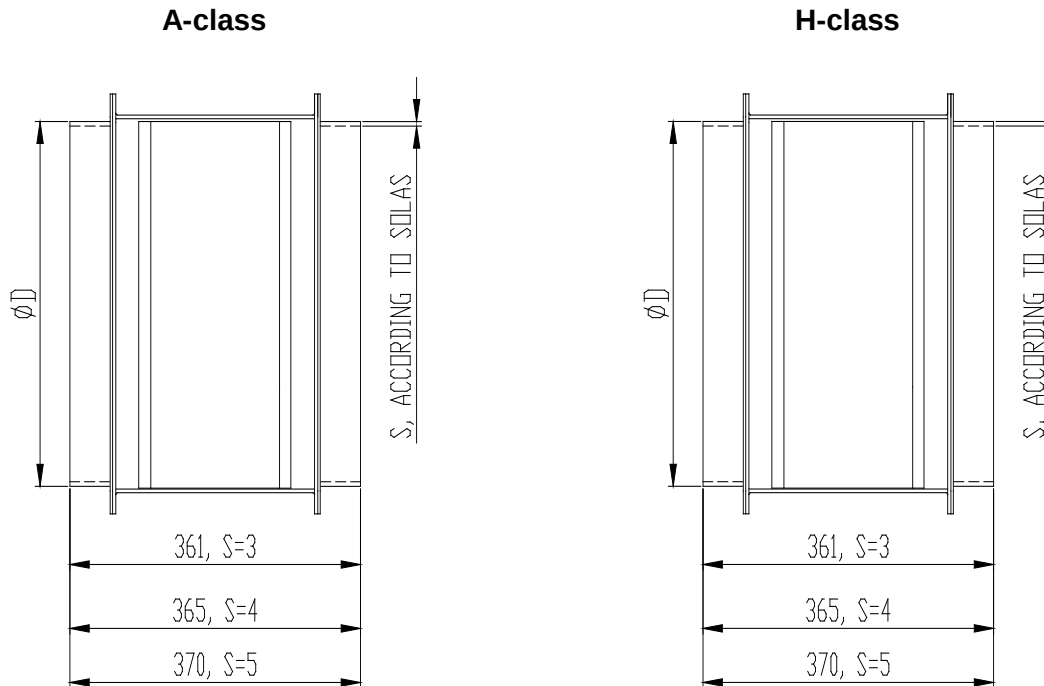


Fire damper H60 to H120 class:



Circular connection:

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



6.3 Blades/Shfts

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

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

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

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

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

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

The blades must be able to be dismantled.

A local mechanical device indicating blades position (open or closed) must be provided. Indicator must be readable outside of the fire damper. The indicator must be readable after insulation installation, without any dismantling and without removing the insulation.

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

6.4 Control housing

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

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

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

6.5 Actuator

Electrical actuator housing material must be selected according to their location:

- Onshore: aluminium
- Offshore: stainless steel.

All berthing, bearings, brackets shall be supported by the stationary part of the actuator housing (crankcase). The removable cover of the housing shall not support any components.

Housing must be antistatic and IP66. It must be provided with an external earthing connection of 4 mm².

ATEX actuator certification, when required, must be II2G EEx d[ia] IIC T6, zone 1 and 2.

The housing dimensions (width, length, height) must be identical for all actuators operating with a torque from 5 to 15 N.m.

The shaft connection must be provided with an universal clamp for square and round shafts, allowing a connection of 12 to 16 mm round or square shafts.

The open position of damper must be done by an electrical actuator. The closing of damper shall be fail safe and must be obtained by a return spring accommodated within the actuator housing. The minimum return spring torque must be 15 N.m. The maximum closing time must be 1 second after the power supply shortage.

The return spring must be fail safe function to guarantee that no jamming of movement from open to closed position may happen.

The operating direction must be selected by left / right mounting on fire damper shaft. It means that actuator housing must be of designed to allow a reverse mounting.

The actuator housing must include an automatic power adaptor allowing an external power supply from 24 to 230 VAC/VDC, without need to select the power supply voltage. The electrical part of actuator must be protected against overload. The maximum power consumption of actuator must be limited to 20 W when the damper is maintained in open position.

The open position must be maintained until tripping of power supply, except is case of operating failure (refer to hereafter table).

In case of power supply shortage, motion of damper from closed to open position of damper must be possible by manual action by mean of a tool. This manual operation shall be made possible without any cover or actuator removal.

A complete manual on/off cycle in less than 1 minute must be guaranteed by the **MANUFACTURER**.

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

An internal temperature sensor must shut-down operations when temperature inside actuator is above the maximum specified ambient temperature. In such a case, the fire damper must be moved or maintained in closed position (blades in closed position).

The actuator must be equipped with:

- Internal controlled heater
- Direct connection of temperature trigger
- Selectable operating time (from closed to open position of fire damper blades): 3, 15, 30, 60, 120 seconds for opening cycle
- **LED** for status indication: green for normal operating and red for fault. The following faults must be shown by **LED** lighting:

Status of actuator	Status of LED
No power supply	LED does not light
The actuator is operated above the maximum specified ambient temperature and the internal temperature sensor fail safe the actuator to the closed position.	
Power supply to actuator is lower than required. Actuator does not operate.	LED flashes randomly
Actuator is operated with a too high ambient temperature.	LED lights red
Actuator is not operating. Actuator is power supplied but the ambient temperature is too low and actuator cannot reach his internal operating temperature.	LED is red blinking
Actuator does not operate and required torque is greater than actuator torque.	LED lights green
Actuator is clocked with more than 20 pulses lower than 0.5 s and therefore must be therefore maintained in fail safe position.	
Control wires are not connected or wrongly connected.	

The adjustment of operating time (from closed to open position of fire damper blades) must be able even without power supply.

The initial current required when actuator power supply is switched-on must be limited to 2.0 A during 1 second, whatever the selected operating time.

The maximum absorbed current from the closed to the open position of fire damper must be as follow:

Operating time (s)	3	15	30	60	120
Maximum absorbed current (A)	5	1.5	0.6	0.5	0.5

The design of actuator must be done to operate with power supply cables dimensioned accordingly to the following formulae:

$$I = 90 \times S$$

With: S = section of cores (mm²)

I = length of cable, from power supply to actuator (m)

Cycles up/down, overheating, and heater operating data must be stored in internal EPROM readable by the actuator *MANUFACTURER*. This data must be used for analysis in case of fire damper malfunction.

Actuator must be supplied with a power supply cable length of 1 meter. Cable outer diameter must be lower than 10 mm.

Actuator must be maintenance free.

6.6 Control

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

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

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

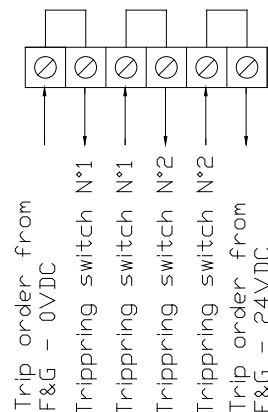
The fire damper must be provided by the *MANUFACTURER* with two changeover *position switches* (*proximity sensors*) on open position and two changeover *position switches* (*proximity sensors*) on closed position of the fire damper. One of the open *position switches* (*proximity sensor*) and one of the closed *position switch* (*proximity sensor*) must be used for HVAC automation. The two other *position switches* (*proximity sensors*) must be used by the Instruments Discipline for F&G system.

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

In case of use within hazardous area:

- Each fire damper must be provided with a stainless steel junction box EEx(e) explosion proof
- Fire damper (complete fire damper, including mechanical and electrical accessories) must 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 actuator, the cabling must be done to terminals in order to allow a serial wiring with the two tripping switches. Jumps between terminals must be wired by the **MANUFACTURER** as shown:



(Only terminals for tripping switches and connections to *F&G* system are indicated on the above drawing. Permanent power supply to the integral heater is not mentioned.)

Note: for "Tripping switch", refer to "Fire Damper(s) Installation - Remote control system" paragraph.

6.7 Fusible link

A fusible link will ensure fire detection. Maximum temperature release of the fuse (fusible link) must be 74°C.

When the temperature will rise above the release temperature, fusible link must ensure the closing of the fire damper.

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

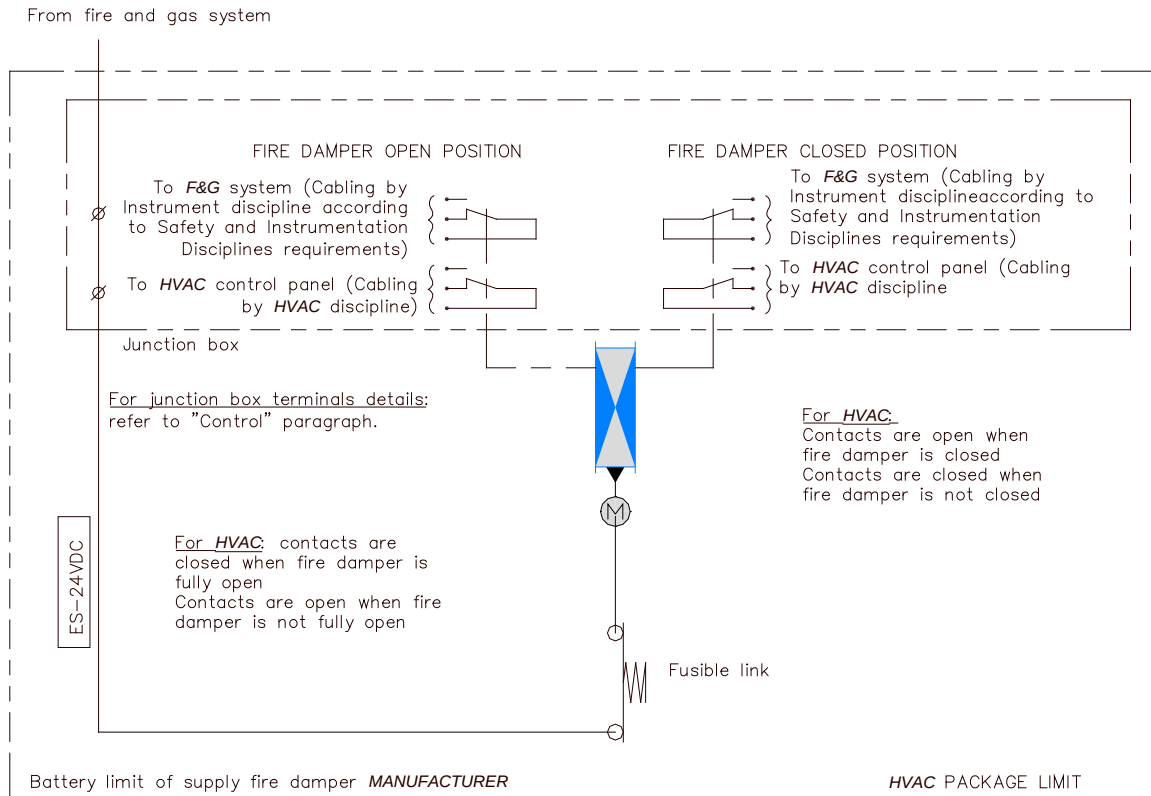
6.8 Junction box

To enable the connection of cables to the actuator and to the proximity sensors, terminals must be installed inside a stainless steel box located within control housing. The cabling between the accessories of the fire damper and the terminals must 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

6.9 Pipe and instrument diagram



6.10 Tagging

6.10.1 Fire damper tagging

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

1. Fire damper name plate

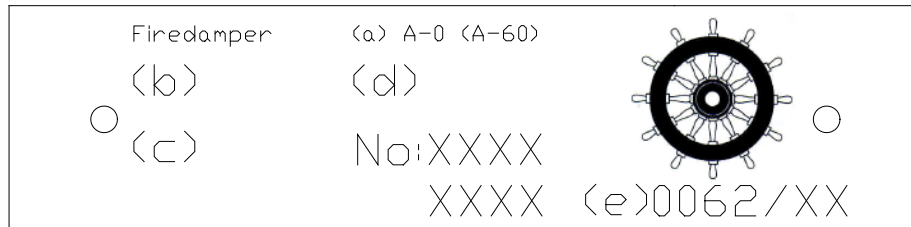
Each fire damper must be delivered with its tagging name plates made of stainless steel.

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

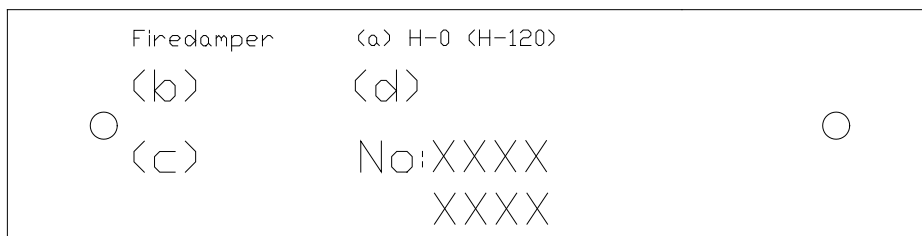
The non-installed tagging plate must be fixed on the mechanical protection of the insulation.

The nameplates must be in accordance with the example here under and the following information must 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 must be in accordance with tag numbering rules of the Project.

2. "On site" tagging

An equipment tagging label must be fixed on *WALL*, every time the fire damper is not visible without removing a raised floor, a suspended ceiling, a housing... Tagging plate must be made of stainless steel and must 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 must be in accordance with tag numbering rules of the Project.

6.10.2 Remote control system tagging

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

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

FIRE DAMPER XXXX

MANUAL CLOSURE

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

7. Fire damper performance

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 (until otherwise)	EEx II B T 4 + ATEX
	Battery room	EEx II C T 3 + ATEX (refer to GS EP ELE 079)
Power supply voltage to actuator:		24 VDC
Storage temperature range:		from -40°C to 70°C outside temperature
Operating temperature range:		- From -40°C to 40°C outside temperature (T6 classification) - From -40°C to 50°C outside temperature (T5 to T3 classifications),
Minimum insulation density:		150 kg/m ³ (for A60 classification)
Minimum insulation thickness:		Refer to "Installation" section
Damper closure time:		3 seconds maximum
Rupture temperature of fusible link:		74°C ± 5°C
Fire classification (A60, ...):		Refer to specific documents

Fire damper ("A" and "H" classes) must 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 of air / gas / smoke must 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

Dimensions		Test Pressure results							
Width	Height	250 Pa	500 Pa	750 Pa	1000 PA	1250 Pa	1500 Pa	1750 Pa	2000 Pa
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 must be $\leq 70 \text{ l/s/m}^2$ under a differential pressure of 500 Pa in accordance with the curve here under (tested in vertical position) (mandatory). The test must 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.

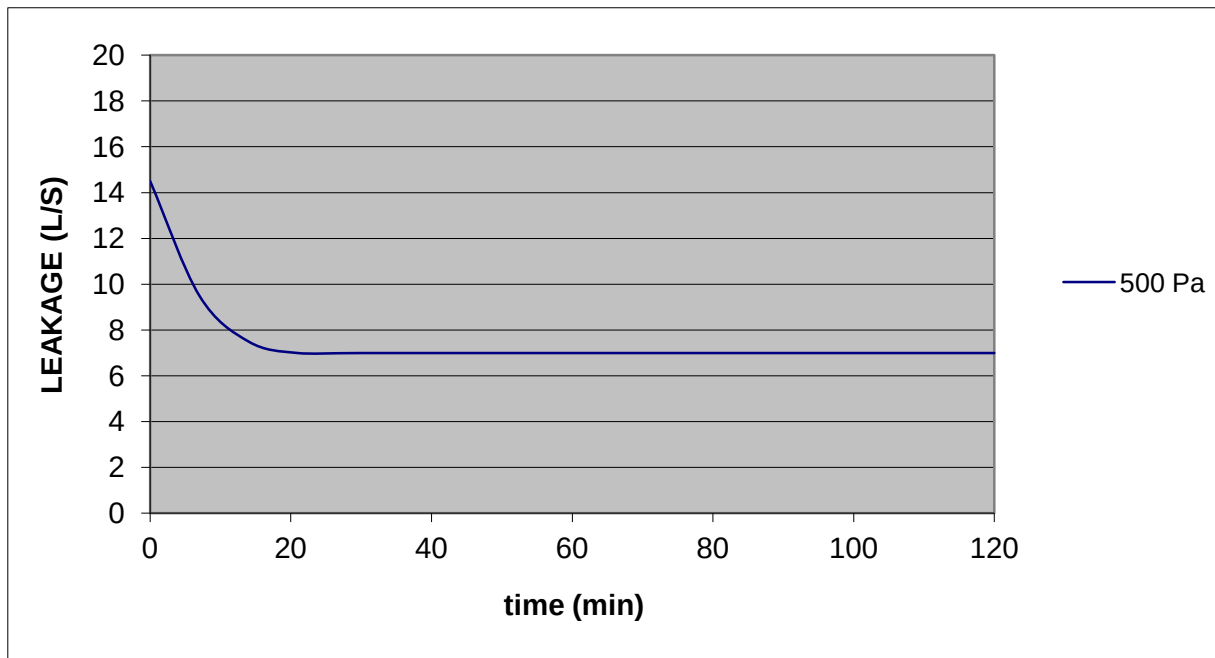
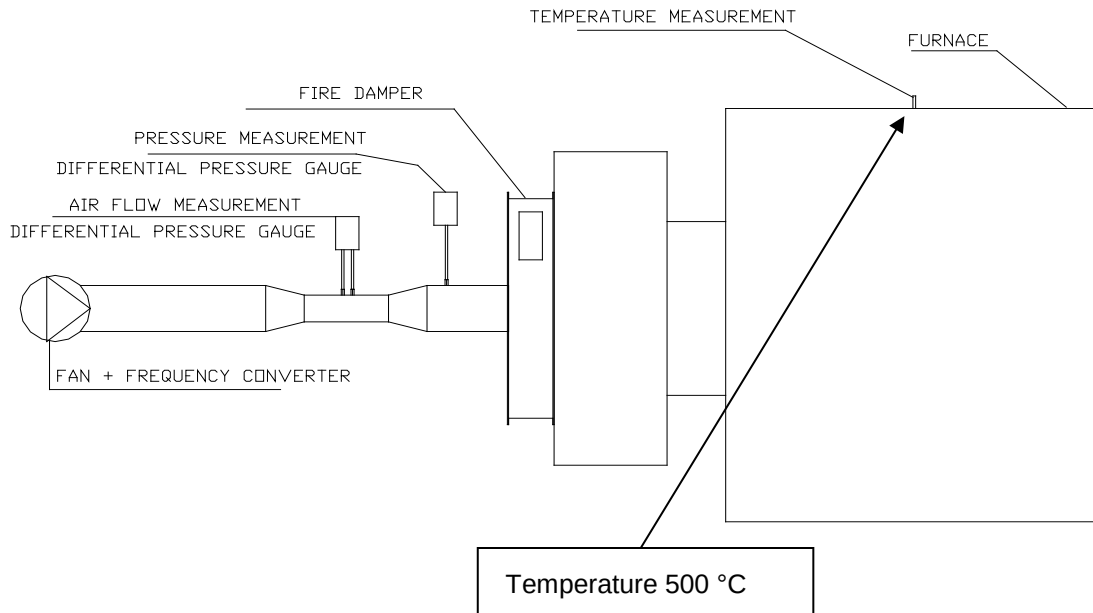


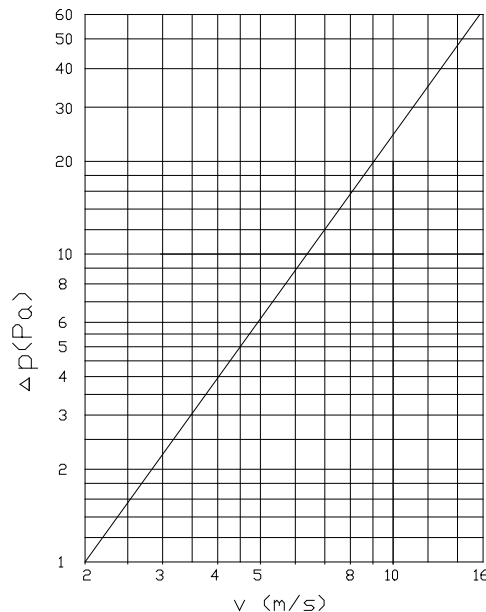
Figure 1 - Leakage air flow rate in “fire” conditions for fire damper 1000 x 1000 mm



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 must be less than the pressure drop curve here under, whatever the size of the damper, the classification (A0, A60, A60, H60 to H120,...) and the type of actuator:



8. Fire resistance certificate

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) must be provided with a fire resistance certificate issued from a Certifying Body agreed by *COMPANY*.

The fire resistance certificates must 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), must be applied.

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

Qualification of fire damper(s) for deck installation must be delivered when measurement criteria considered by [IMO resolution A.754 \(18\)](#) must 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 A.754 \(18\)](#) 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 to require further information.

9. Additional 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* must 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* must 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 have to be provided by the *VENDOR*:

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	
INT20	Weight / Centre of gravity drawings & data's	B	



Item	Document Title	Categ.	With Bid
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	
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	B	
ENG25	Cause & Effect Charts	B	
ENG26	Functional analysis	B	
ENG27	Insulation mounting drawings	B	



Item	Document Title	Categ.	With Bid
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			
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	
RRC17	Functional Test Report/certificates	B	
RRC22	Cable continuity and resistance test reports	B	
RRC26	Surface preparation & Coating reports	B	
RRC27	Certified Weight certificates	B	
INSTALLATION			
INS01	Weight	B	
INS02	Sub-assembly Documentation	C	

Item	Document Title	Categ.	With Bid
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, must be delivered with equipment.

A final certificate must 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 must 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).



9.4 Format of documents

9.4.1 Electronic copy

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

9.4.2 Hard Copy

All documents must 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 must 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 must be in the English language with dimensions and units in accordance with ISO.

A3 and A4 documents must 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 must be folded to A4 size with identification data visible at the bottom right.

Note I: The documents to provide represent an important part of the *VENDOR*'s supply. If one or several documents were not delivered, the Buyer would be able to suspend his payment.

Note II: The documents provided by the *VENDOR*, correspondence between the *VENDOR* and the Buyer or between the *VENDOR* and *ENGINEERING* must be typed. Hand-written correspondence will be rejected.

10. Equipment inspection

For the fire damper(s), the *COMPANY* can require 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</i> specialist (from Exploration & Production division, Technology department).
Level 2	[x ²]	- In-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</i> specialist (from Exploration & Production division, Technology department).
Level 3	[]	- Continuous monitoring by resident inspector. - Final inspection prior to shipment and <i>FAT</i> with <i>MANUFACTURER</i> and <i>COMPANY HVAC</i> specialist (from Exploration & Production division, Technology department).

11. Data sheet

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

12. Other references

Following documents are applicable:

- Standards: [EN 1751](#), [IEC 60335-1](#), [IEC 60529](#), [IEC 60947-5-1](#), [ISO 15607](#), [ISO 15614 \(Parts 2; 8\)](#)
- 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](#).

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



Appendix 1 Fire Damper(s) Electrically Actuated - Data Sheet



Exploration & Production

GENERAL SPECIFICATION

HVAC

DS EP HVA 213

Fire Damper(s) Electrically Actuated - Data Sheet

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



HVAC

Fire Damper(s) Electrically Actuated - Data Sheet

Data sheet presentation

This data sheet is composed of the following sheets:

- Fire damper(s) electrically actuated - ("Main" sheet - Pages 1 & 2)
This sheet mentions the main data concerning the fire damper(s) electrically actuated.
Page 1 sums the common for the fire damper(s) electrically actuated.
Page 2 mentionnes 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 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.
- 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.
- 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) ELECTRICALLY ACTUATED		Project Logo
			Page 2 /
1	Fire dampers components:		
2	Description:	Refer to data sheet:	
3	Actuator		
4	Position switch or proximity sensor		
5	Junction box		
6			
7			
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 TOTAL Exploration & Production		COMPANY PROJECT NAME DATA SHEET FIRE DAMPER(S) ELECTRICALLY ACTUATED										Page 3 /		
		MAIN DIMENSIONS												
		Tag number	Nominal						Maintenance					Weight (kg)
Aw	Ah		Al	Fw	Fh	Fl	Ht	Hb	Wl	Wr				
1														
2														
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 TOTAL Exploration & Production	COMPANY PROJECT NAME DATA SHEET FIRE DAMPER(S) ELECTRICALLY ACTUATED											
	PERFORMANCES											
											Page 4 /	
1	Fire damper (electrically actuated) tag number	Inside room	Outside	Area classif. (0,1,2)	ATEX classification (when required)	Closure time (s)	Leakage air flow rates (l/s) under differential pressure (Pa) of				Air flow rate through fire damper m³/h	
2							1000	2000	500	1000		
3							Normal	Fire				
4							conditions	conditions				
5												
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TOTAL
Exploration & Production

COMPANY
PROJECT NAME

FIRE DAMPER(S) ELECTRICALLY ACTUATED - DATA SHEET
ELECTRICAL ACTUATOR(S)

Doc. number:

Contractor document N°:

Page 5 /

Equipment location:

Tag No:

Refer to next page

Model:

System No:

Serial No:

Sub-system No:

Supplier:

Manufacturer:

Subject	Rev.	Stat.	Date	By:	Checked by:	Approved by:

1 Technical data

2 Minimum operating voltage:

3 Maximum operating voltage:

4 Voltage:

5 AC: DC:

6 Operating ambient temperature range:

7 from to °C

8 Compliance with ISO 5211:

9 Yes No

10 Possibility to invert pistons for inverse movement:

11 Yes No

12 Direct drive to:

13 Circular shaft

14 Square shaft

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16

17 Actuator ATEX certificat reference:

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19 ATEX Certifying Body (for ATEX certified fire dampers):

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21 Movement:

22 Rotating displacement

23 Linear displacement

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53 Materials

54 Housing:

55 Driver (rotating actuator):

56 Shaft (linear actuator):

57 Fixing:

58 Screws:

59 Nuts:

60 Name plate:

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73 Construction

74 Main dimensions (refer to the following page(s)):

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89 Maintenance

90 Main dimensions (refer to the following page(s))

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Appendix 1



TOTAL
Exploration & Production

COMPANY

PROJECT NAME

FIRE DAMPER(S) ELECTRICALLY ACTUATED - DATA SHEET

ACTUATORS PERFORMANCES AND SIZES

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Actuator tag number

Air Instrument connection size and type

Size

Type

Area classif. (0,1,2)

ATEX classification (when required)

Actuation

Return spring

Torques (N.m)

Dimensions (mm)

Nominal

Maintenance

Fw

Fh

Fl

Ht

Hb

Wl

Wr

	COMPANY PROJECT NAME FIRE DAMPER(S) ELECTRICALLY ACTUATED - DATA SHEET PROXIMITY SWITCHES		
Doc. number:	Contractor document N°:		Page 7 /
Equipment location:			
Tag No:	Refer to page 13	Model:	
System No:		Serial No:	
Sub-system No:			
Supplier:			
Manufacturer:			

Subject	Rev.	Stat.	Date	By:	Checked by:	Approved by:

1 Technical data

2 Switching element function:

3 Namur type: ☐

4 Other type: ☐

5 Switch position when plate not detected:

6 Closed: ☐ Open: ☐

7 Rated operating distance: mm

8 Maximum operating distance: mm

9 Reduction factor r_{cu} :

10 Reduction factor r_{AI} :

11 Reduction factor r_{V2A} :

12 Nominal voltage: V

13 Switching frequency range: from to Hz

14 Hysteresis range: from to %

15 Typical hysteresis: %

16 Protected against reverse polarity: Yes: ☐ No: ☐

17 Short circuit protection: Yes: ☐ No: ☐

18 Current consumption:

19 When plate is detected: mA

20 When plate is not detected: mA

21 LED indication of switching status: Yes: ☐ No: ☐

22 Standards conformity:

23

24

25 Operating ambient temperature:

26 from to °C

27 Storage ambient temperature:

28 from to °C

29 Cable type:

30 Halogen free cable: Yes: ☐ No: ☐

31 Cable length: m

32 Core-cross section: mm²

33 Protection degree (EN 60529): IP

34 Equipotential bonding: Yes: ☐ No: ☐

ATEX related characteristics (when classified):

36 Maximum cable length to avoid electrostatic charge on

37 fixed connections:

38 For group IIA: cm

39 For group IIB: cm

40 For group IIC: cm

41 ATEX Identification:

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43 Reference of ATEX certificat:

44

45 ATEX Certifying Body:

46

47 Actual internal capacitance: nF

48 for a cable length of: m

49 Actual internal inductance: nF

50 for a cable length of: m

53 Materials

54 Housing:

55 Sensing face:

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 TOTAL Exploration & Production	COMPANY _____ PROJECT NAME _____ FIRE DAMPER(S) ELECTRICALLY ACTUATED - DATA SHEET POSITION SWITCHES	
	Doc. number: _____	Contractor document N°: _____

Equipment location:		
Tag No:	Refer to page 13	Model:
System No:		Serial No:
Sub-system No:		
Supplier:		
Manufacturer:		

Subject	Rev.	Stat.	Date	By:	Checked by:	Approved by:

1 Technical data

Switching element function:

Change over: ☐ Normally closed: ☐ Normally open: ☐

Double break contact(s): Yes: ☐ No: ☐

Number of contacts:

Galvanic separation: Yes: ☐ No: ☐

Switching system:

Accordance with EN 60947 5-1: Yes: ☐ No: ☐

Slow action with overlapping: Yes: ☐ No: ☐

Snap action: Yes: ☐ No: ☐

Core-cross section: _____ mm²

Connections: screw terminals: ☐ Other: ☐

Cable entry size:

U_{imp}: _____ V

U_i: _____ V

I_{imp}: _____ A

I_E / U_E: _____ A / _____ VAC

_____ A / _____ VDC

Mechanical life span: _____ operations

Maximum switching frequency: _____ cycles/h

Bounce duration: _____ ms

Switchover time: _____ ms

Fuse rating: _____ A Type: _____

Repositionable actuator head: Yes: ☐ No: ☐

Number of positions: _____

Protection degree (EN 60529): _____ IP _____

Equipotential bonding: Yes: ☐ No: ☐

Maximum Impact energy: _____ J

Standards conformity: _____

Operating ambient temperature: _____ from _____ to _____ °C

Storage ambient temperature: _____ from _____ to _____ °C

ATEX related characteristics (when classified):

Reference of ATEX certificat: _____

ATEX Certifying Body: _____

53 Materials

Housing: _____

Sensing face: _____

Contact material: _____

[illegible]



Exploration & Production

General Specification

Date: 01/2012

GS EP HVA 213

Rev: 03

Appendix 1

 TOTAL Exploration & Production		COMPANY PROJECT NAME FIRE DAMPER(S) ELECTRICALLY ACTUATED - DATA SHEET TAG LISTS				
1						Page 10 /
2	Fire damper	Actuator tag	Proximity switch	Position switch tag	Junction box tag	
3	(electrically	number	tag number	number	number	
4	actuated) tag					
5	number					
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