



CLASSIFICATION REPORT no. 09 - A - 363

According to standards EN 15650: 2010 and EN 13501-3: 2007

Regarding A range of "CU-LT-1s"-type fire dampers
Operating vacuum pressure: - 500Pa

Sponsor RF TECHNOLOGIES
Lange Ambachtstraat, 40
B - 9860 OOSTERZELE

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1. INTRODUCTION

This classification report defines the classification assigned to a range of "CU-LT-1s"-type fire dampers in accordance with the procedures set out in the standard EN 13501-3: 2007 "Fire classification of construction products and building elements - Part 3: Classification using data from fire resistance tests, on products and elements used in building service installations: fire resisting ducts and fire dampers" and in the standard EN 15650: 2010 "Ventilation for buildings. Fire dampers".

2. BODY

EFFECTIS France
Voie Romaine
F - 57280 MAIZIERES-LES-METZ

3. SPONSOR

RF TECHNOLOGIES
Lange Ambachtstraat, 40
B - 9860 OOSTERZELE

4. REFERENCE AND ORIGIN OF THE TEST SPECIMENS

Reference: CU-LT-1s
Origin: RF TECHNOLOGIES
Lange Ambachtstraat, 40
B - 9860 OOSTERZELE

5. OVERALL PRINCIPLE

5.1. TYPE OF FUNCTION

The "CU-LT-1s"-type damper is defined as a "fire damper". Its function is to be fire-resistant as regards fire integrity, thermal insulation and leakage flow rates.

5.2. GENERAL POINTS

Each fire damper is composed of a tunnel, within which a horizontally-mounted mobile blade pivots using an external mechanism and a transmission.

Approved fire dampers have flow cross-section dimensions of between 200 x Ø 100mm and 800 x Ø 600mm (w x h).

5.3. DETAILED DESCRIPTION OF THE ELEMENTS

5.3.1. Fire damper casing

Each fire damper is composed of a galvanised steel duct with (W-6) x (H-6) mm (W x h), 0.8mm thick and 300mm long. At each end, the fire damper's tunnel is fitted with a steel flange. At each corner, the flanges are fixed together in pairs using a steel bracket attached to each flange by two steel rivets (\varnothing 4.8mm).

Level with the fire damper blade, the circumference of the casing is perforated with 20 x 3mm holes, at 3mm intervals over a width of 9mm.

On the inside, the perforations are completely covered by graphite, self-adhesive, intumescent tape with dimensions of 44 x 2mm (RECTORSEAL). A 60mm-wide strip of self-adhesive PP (TESA) tape is placed on the intumescent tape.

To guarantee its stiffness, the tunnel's sheet metal was bent over along the perforations described above at a height of 20mm. These bends act as reinforcement.

Inside the tunnel, EPDM-type gasket seals are placed on the semi-periphery above and below the damper blade.

Halfway up, the fire damper casing has two openings (\varnothing 12mm and \varnothing 18mm) on the mechanism side, which allow the hinge pin of the fire damper blade to pass through, and five openings (\varnothing 5mm), which are used to fix the transmission housing using aluminium rivets (\varnothing 4.8mm).

On the outside, the entire outer edge of the tunnel is fitted with a strip of plaster reinforced with Rinoflam-type fibre glass with dimensions of 140 x 30mm (w x th). A steel flange of dimensions 40 x 40 x 1.5mm (L x w x th) is fixed to this reinforcement using steel rivets (\varnothing 4.8 x 40mm).

The entire outer edge of the plaster reinforcement is also fitted with intumescent tape of dimensions 30 x 4mm (w x th). This intumescent tape is fixed to the plaster using clips.

5.3.2. Blade

The blade is made of a 25mm-thick Promatect H plate.

On the outer edge of the blade, a groove of dimensions 15 x 2mm (w x d) is machined, in which is clamped an graphite-based BLASESEAL-type intumescent seal with cross section dimensions of 15 x 1.5mm.

Two galvanized steel hinge pin brackets, with cross section dimensions of 80 x 40mm are fixed on the blade using two bolt (M5 x 30mm). The pin is fixed to the brackets using two bolts (M5 x 16mm).

The blade pivots on a steel hinge pin, with cross section dimensions of 10 x 10mm.

The pin rests on two brass bearings (\varnothing 12 x 14.5mm and \varnothing 18 x 9.5mm) on the mechanism side, fitted in the fire damper casing.

The clearance between the blade and the fire damper casing is approximately 4mm.

5.3.3. Mechanism

The control mechanism is fully installed on the outside of the fire damper and is composed of the following elements:

- A BLF (BELIMO) actuator
- A mounting section
- A transmission mechanism
- A thermal fuse

The actuator is connected to the protruding pin of the transmission housing and is fixed using two bolts (M6 x 70mm) to a 2mm-thick steel section.

The mounting section is fixed to the fire damper casing using two aluminium rivets (\varnothing 4.8mm). A transmission mechanism is installed between the mounting section and the fire damper casing using four aluminium rivets \varnothing 4.8mm). This mechanism is protected by a plastic sheathing.

A thermal seal is fixed to the fire damper casing using a plastic bracket fixed using a single blind rivet (\varnothing 4.8mm). The thermal seal is fixed to this bracket using two steel screws (\varnothing 3.5mm). The fuse connected to the thermal seal is located on the inside of the fire damper casing.

When switched on, the actuator puts the blade in the open position. An internal torsion spring is compressed at the same time.

If there is a power cut or the fuse is activated, the internal spring shuts the fire damper.

6. INSTALLATION OF THE TEST SPECIMENS

6.1. INSTALLATION IN A 100MM-THICK AERATED CONCRETE WALL

The fire damper is installed in feed-through in a 100mm-thick aerated concrete wall with a density of 550kg/m³.

The fire damper is positioned in an opening with dimensions (W + 80) x (h + 80) mm.

Each fire damper is fixed to the wall using the flange described in section 5.3.1. This flange is fixed to the wall using steel screws (25 x \varnothing 3mm) spaced at intervals of 200mm.

On both the fire side and the opposite to fire side, the clearance between the fire damper's tunnel and the opening is not plugged.

No seal is necessary.

The hinge pin of the blade may be horizontally- or vertically-mounted.

6.2. INSTALLATION IN A 150MM-THICK AERATED CONCRETE FLOOR

Fire dampers from the CU-LT-1s range can be fixed to an aerated concrete floor with a minimum thickness of 150mm and a minimum density of 650kg/m³ using bolts (M6 x 80mm).

The opening for a fire damper has dimensions (W + 80) x (H + 80) mm.

6.3. INSTALLATION IN A 70MM PLASTERBOARD PANEL PARTITION

For each fire damper, an opening with dimensions (W+80) H+80) mm is made in the partition by cutting out part of the plasterboard panels.

Each fire damper is fixed to the wall using the flange described in section 5.3.1. This flange is fixed to the wall using steel screws (50 x \varnothing 6mm) spaced at intervals of 150mm.

On both the fire side and the opposite to fire side, the clearance between the fire damper's tunnel and the opening is not plugged.

The hinge pin of the blade may be horizontally- or vertically-mounted.

6.4. INSTALLATION IN A PLASTERBOARD (GYPSUM) PARTITION

6.4.1. Partition

The fire dampers are installed in a "D 98/48"-type partition.

This partition is made using a metal framework fitted with twin-layer facings with standard type gypsum plasterboard; the partition has an overall thickness of 98mm, with an internal cavity of 48mm filled with stone wool.

6.4.2. Outer framework

The outer framework is made using 6/10mm-thick galvanised steel MSH 50 rails, fixed to the concrete support frame with steel screws (\varnothing 6mm) and anchors (\varnothing 6mm), spaced at intervals of 800mm.

6.4.3. Central framework

The framework of the partition is made using single, 6/10mm-thick galvanised steel MSV 50 studs, slotted into the upper and lower rails and screwed at the base with a centre-to-centre distance of 600mm. A thermal expansion gap of approximately 5mm is left at the top of each stud.

6.4.4. Header joist

A header joist designed to allow the fire damper to pass through is made using MSV 50 studs and MSH 50 rails.

The header joist is made of:

- A stud (A) added to the central framework of the partition spaced (L + 130) mm from the stud belonging to the central framework (B) and acting as a second support stud for the weight of the fire damper itself;
- An R 48 horizontal rail (C), sheared and bent, and installed perpendicular to the additional studs at the top and bottom and spaced (h + 65) mm apart from one another.
- For fire dampers with a length (L + 130) mm greater than 600mm, the stud belonging to the central framework is interrupted for the installation of the header joist.

The various elements are fixed together using screws (\varnothing 3.5mm).

6.4.5. Facings

The partition is made using 2 x 12.5mm- or 1 x 25mm-thick BPB GYPROC ABA-type plasterboard panels with a density of 750kg/m³. The facings can also be made using BA18 or BA25 plasterboard panels provided the reports (*procès-verbaux*) associated with the partitions made using these panels show that they meet the EI 120 fire resistance criterion.

For BA 13 panels, the plasterboard is installed with the vertical joints of one facing offset in relation to the other within the same facing and also between the inner surfaces of both facings.

The vertical joints of the plasterboards are perpendicular to the studs. The plasterboards are fixed to the framework with 212/25-type self-drilling screws spaced at intervals of 500mm for the first layer and 212/35-type screws at intervals of 300mm for the second layer.

The visible joints between the plasterboards and the screeds with concrete frame are treated using the JOINTFILLER filler + jointing tape technique. The screw heads are also concealed with the same filler.

The cavity between the plasterboards is filled with ROCKFIT 431-type stone wool with a density of 33kg/m³.

6.4.6. Sealing around the fire damper

The space between the tunnel of the fire damper and the wall is approximately 10mm. No specific sealing, other than the elements already present on the fire damper casing (intumescent seal), is applied.

All the joints between the plasterboard are covered with BPB GYPROC Jointfiller 45-type filler.

The screws are also covered with the same type of filler.

The fire damper is positioned in an opening with dimensions $(W + 80) \times (H + 80)$ mm.

Each fire damper is fixed to the partition using the flange described in section 5.3.1. This flange is fixed to the partition using steel screws (25 x Ø 3mm) spaced at intervals of 200mm. The hinge pin of the blade may be horizontally- or vertically-mounted.

For the offset installation of 100mm-thick aerated concrete wall with a duct made using GEOFLAM 45-type plates:

The CU-LT-1s fire damper is installed offset, inside or outside the furnace, on a GEOFLAM 45-type plate service duct.

The length of this duct is not specified. If the duct length is greater than 1m, a supporting system will be implemented as described above, at intervals of 1m, as well as additional support level with the fire damper.

- Protection of the duct and fire damper

The service duct is made with 45mm-thick staff plates, reference GEOFLAM F, fixed together using glue and packing. The fire damper casing is therefore also protected over a length of 120mm.

The GEOFLAM F staff plate protection is introduced between the fire damper and the wall. It stops 15mm from the wall. The free space between the wall and the staff plate protection is filled by packing (a mix of plaster and fibrous material).

- Seal

The opening, with dimensions $(W + 100) \times (H + 100)$ mm and made in the 100mm-thick aerated concrete wall, is filled with standard mortar (reference CEM II/B-V-32.5N manufactured by CBR-Heidelberg)

- Duct support system

The hangers are composed of 8mm diameter threaded rods and supporting rails with dimensions of 25 x 25 x 2mm and 1m long. A distance of approximately 25mm is kept between the threaded rods and the vertical sides of the duct. The threaded rods are protected by staff half-shells (Ø 90mm) and held together using adhesive and packing. The crossmember is protected with a "U"-shaped protective section in plaster (100 x 60mm), glued to the underside of the duct with PLACOL (PLACO SAINT-GOBAIN) or GEOCOL (GEOSTAFF) type adhesive plaster.

7. FIRE RESISTANCE CLASSIFICATIONS

7.1. CLASSIFICATION REFERENCE

This classification procedure was conducted in accordance with section 7.2.4 of the standard EN 13501-4.

7.2. CLASSIFICATIONS

The elements are classified according to the following combinations of performance parameters and classes for the following supporting constructions.

- 100mm-thick aerated concrete wall
- 150mm-thick aerated concrete floor slab
- 70mm-thick plasterboard panel partition
- Light partition made using 98/48 type gypsum plasterboard panels

The dimensional range* covered by the performances stated below is as follows:

W

	200	250	300	350	400	450	500	550	600	650	700	750	800
H	100												
	150												
	200												
	250												
	300												
	350												
	400												
	450												
	500												
	550												
	600												

* Interval of 50mm provided for information only.

- For fire dampers installed in partitions made using 98/48 type F (EN520) gypsum plasterboard panels:

No other classification is authorised.

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		90		ve	-		-	i	↔	o	-	S

- For fire dampers installed in partitions made using 98/48 type A (EN520) gypsum plasterboard panels:

No other classification is authorised.

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		60		ve	-		-	i	↔	o	-	S

- For fire dampers installed in an aerated concrete floor:

No other classification is authorised.

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		120			-	ho	-	i	↔	o	-	S

- For fire dampers installed in an aerated concrete wall:

No other classification is authorised.

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		120		ve	-		-	i	↔	o	-	S

- For fire dampers installed in a plasterboard panel wall:

No other classification is authorised.

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		120		ve	-		-	i	↔	o	-	S

- Offset fire dampers using a duct made of GEOFLAM F 45 plates:
The maximum approved operating vacuum pressure in this case is -500Pa.

E	I	-	t		ve	ho	i	<->	o	S
E	I		120		ve	ho	i	<->	o	S

The above performances of the elements are valid for heating as described in section 5.1.1 of the European standard EN 1363-1.

8. FIELD OF APPLICATION OF THE RESULTS

8.1. GENERAL POINTS

The requirements related to the field of application of all the fire dampers tested in accordance with EN 1366-2 apply, as well as the following items.

8.2. DIMENSIONS OF THE FIRE DAMPER

In accordance with section 13.1 of the standard EN 1366-2, the classifications indicated in section 7.2 of this classification report are valid for all fire dampers of the same type (including all the side reports), provided the maximum flow cross-section dimensions do not exceed 800 x 600mm and that the minimum flow cross-section dimensions are not less than 200 x 100mm.

8.3. SEPARATION BETWEEN FIRE DAMPERS AND BETWEEN FIRE DAMPERS AND CONSTRUCTION ELEMENTS

In accordance with section 13.5 of the standard EN 1366-2, the fire classifications indicated in section 7.2 of this classification report apply, in practice, with a minimum spacing:

- a) of 200mm between fire dampers installed in separate ducts;
- b) of 75mm between the fire damper and a construction element (wall or boards).

8.4. SUPPORTING CONSTRUCTIONS

In accordance with section 13.6.1 of the standard EN 1366-2, the classifications indicated in section 7.2 of this classification report apply only to fire dampers installed in feed-through in an aerated concrete wall with a minimum thickness of 100mm and a minimum density of 550kg/m^3 , built into a reinforced concrete wall with a minimum thickness of 150mm and a minimum density of 2200kg/m^3 or installed in feed-through or offset in a supporting construction of the same type as the standardized flexible supporting construction used in the test, with equal or greater fire resistance properties (greater thickness, higher density or more layers of plasterboard, as appropriate).

The test result may also apply to hollow masonry blocks or slabs possessing a fire resistance time that is equal to or greater than the one stated for the installation of the fire damper.

If a specific supporting construction, different to those mentioned above, is chosen - in this case, a 70mm-thick plasterboard panel wall with a density of 850kg/m^3 - the test results obtained are only applicable to this specific wall, partition or floor if it has a greater thickness or density than that of the test specimen.


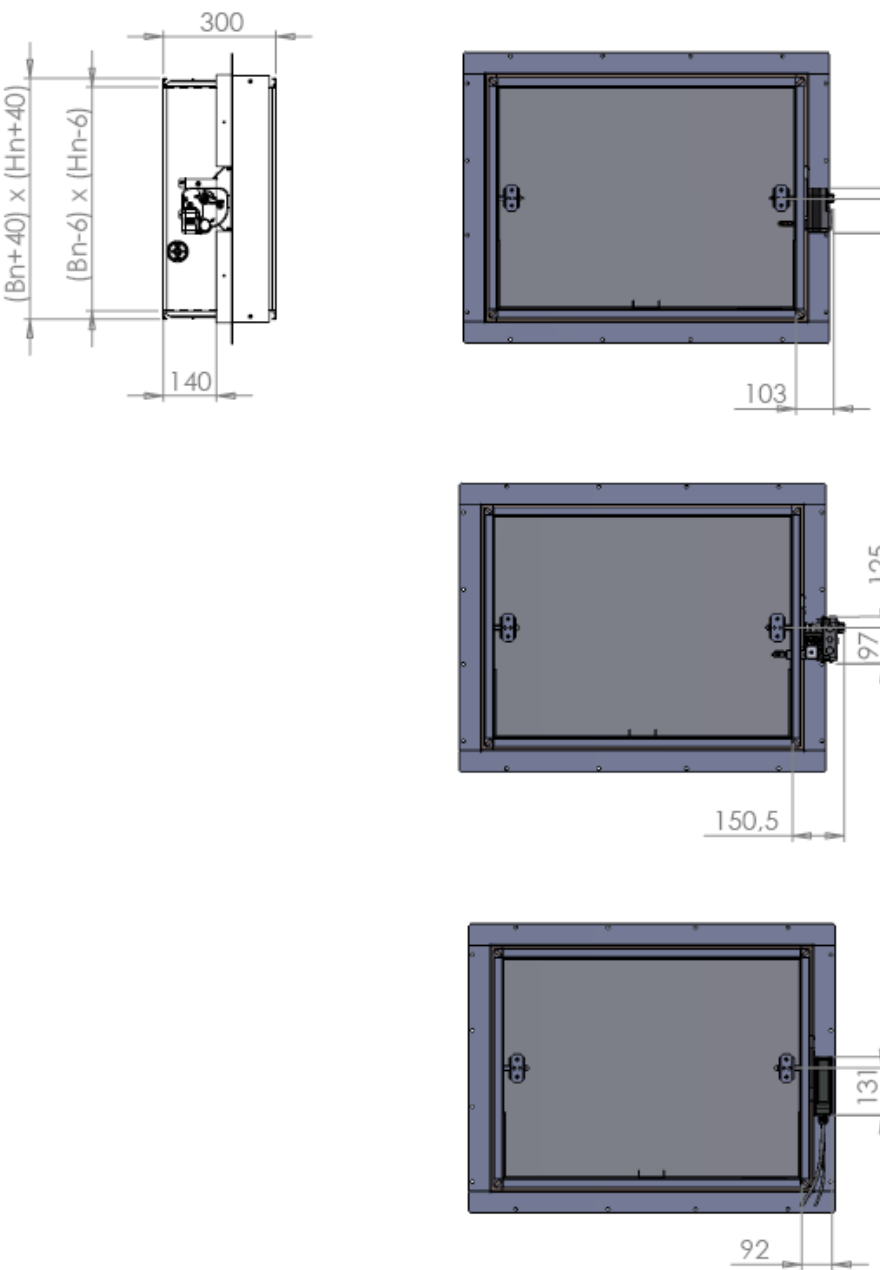
No modifications may be applied to the dimensions expressed above and no modifications may be made to the structure of the element without the prior issue of a classification extension by the laboratory.

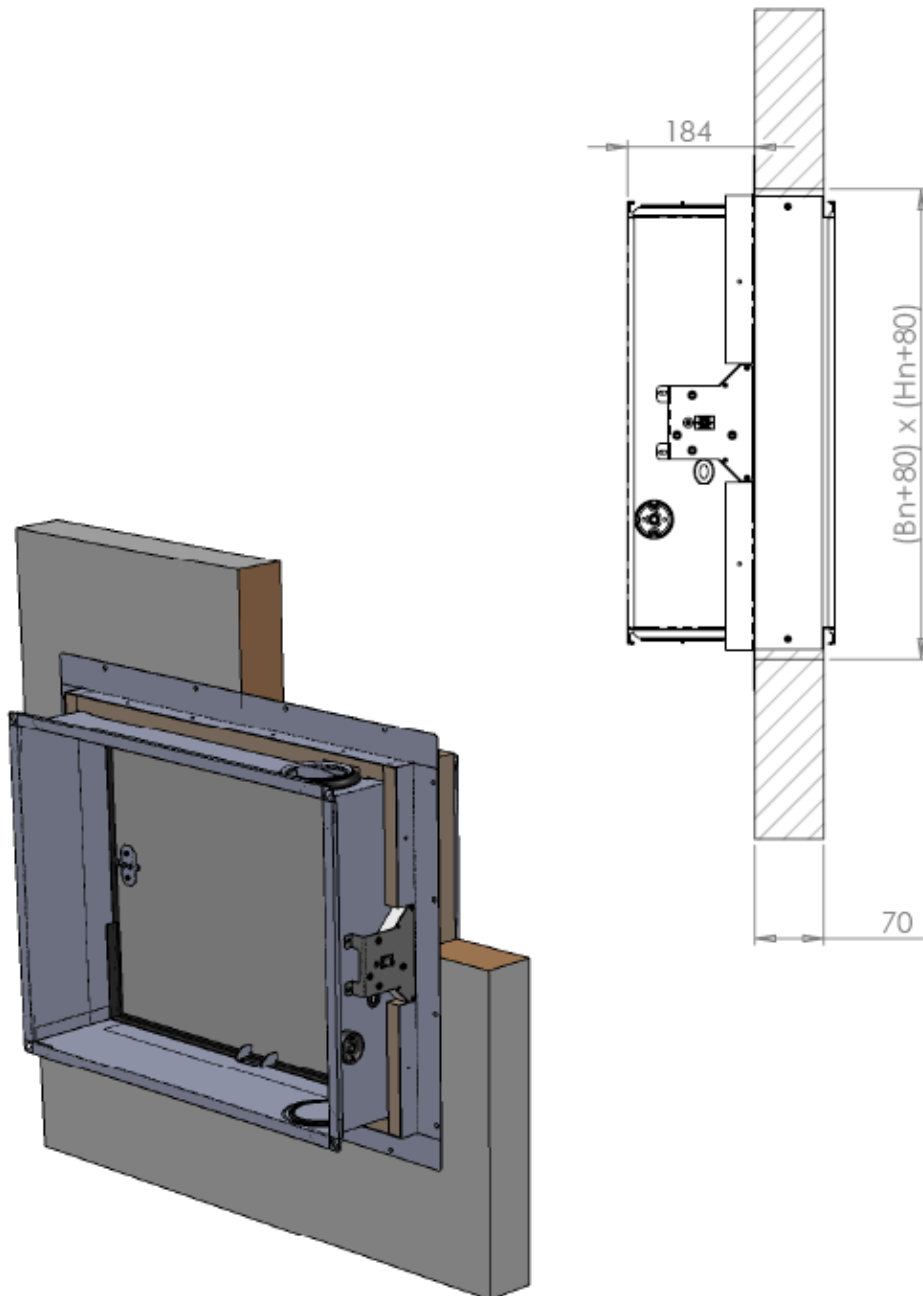
Issued in Maizières-lès-Metz, 14 June 2016

A handwritten signature in black ink, appearing to read "Fenucci", written over a horizontal line.

Mathieu Fenucci
Project Director

APPENDIX: FIGURES

	<u>Reference / Référence</u> CU-LT 120-A	<u>Subject / Sujet</u> Dimensions	<u>Plate / Plaque</u> 9
 <p>Technical drawings of a fire damper (CU-LT 120-A) showing side and front views with dimensions:</p> <ul style="list-style-type: none"> Side View (Top): Shows a rectangular profile with a total width of 300 and a depth of 140. The height is divided into two sections: $(Bn+40) \times (Hn+40)$ and $(Bn-6) \times (Hn-6)$. Front View (Middle): Shows a square face with a width of 103 and a height of 150.5. Front View (Bottom): Shows a square face with a width of 92 and a height of 131. 			
<u>Plan Title / Titre du plan</u> Fire Damper		<u>Date / Date:</u> 03/04/09	


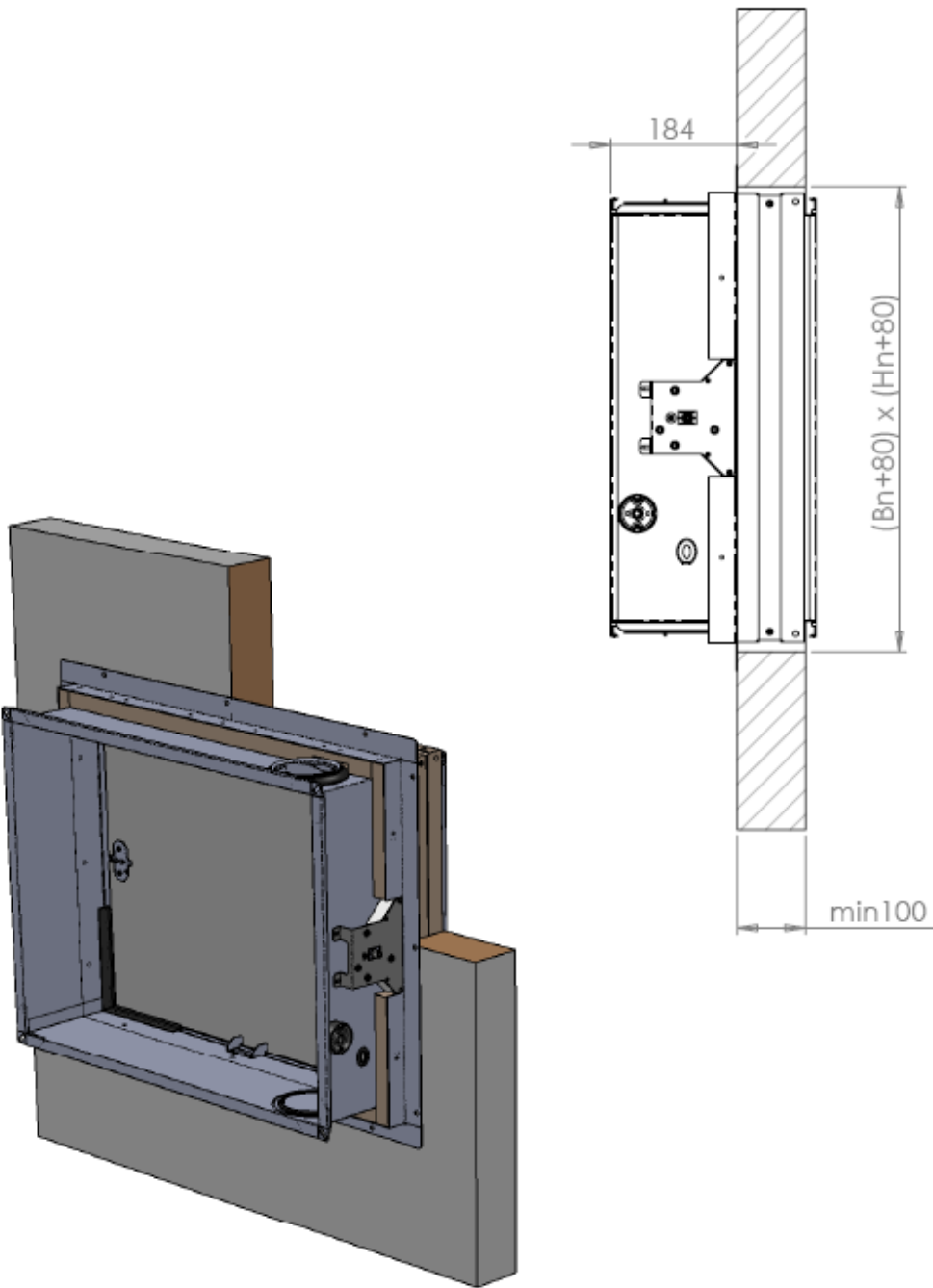


Plan Title / Titre du plan

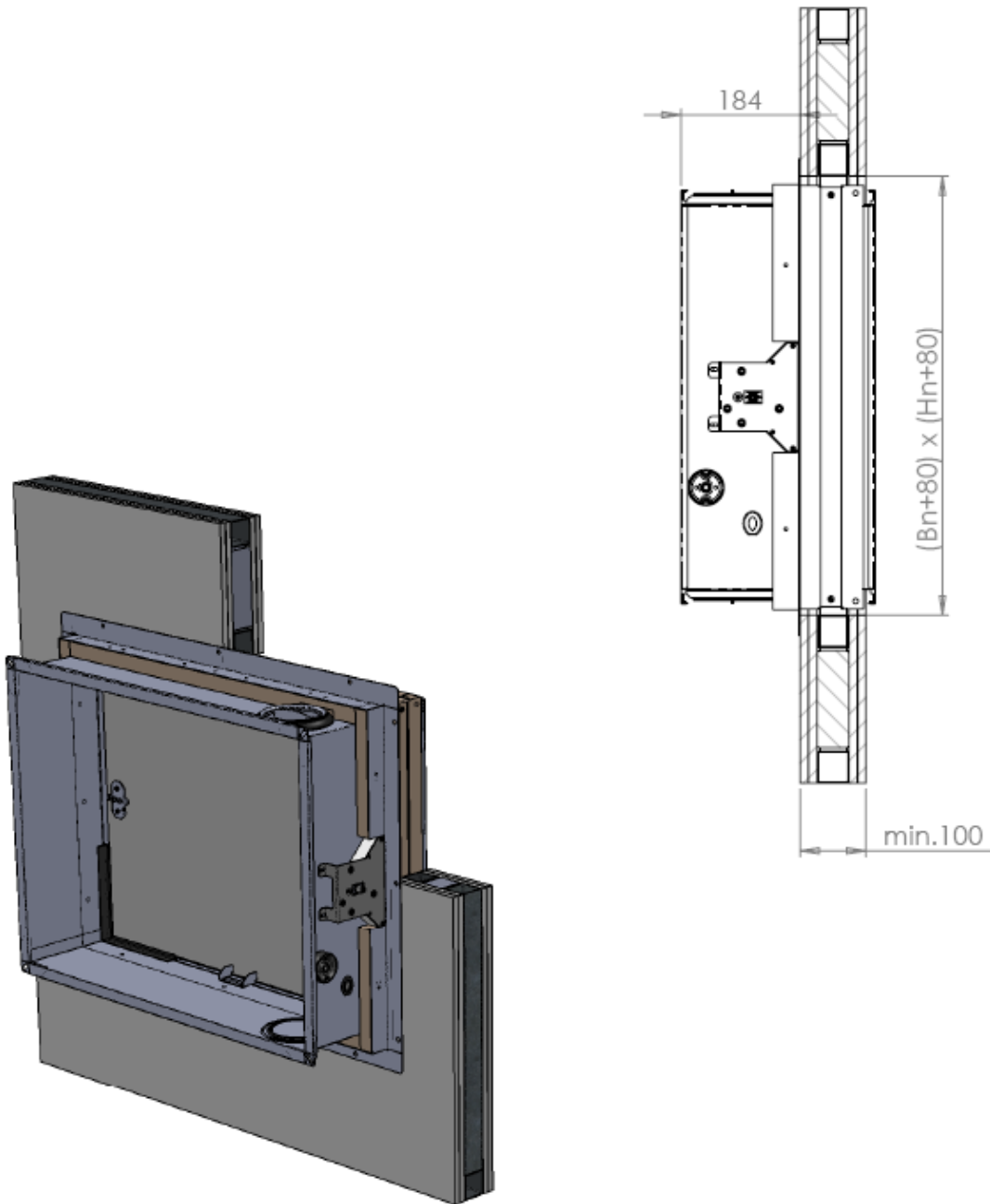
Fire Damper: Gypsum-block wall

Date / Date:

02/04/09


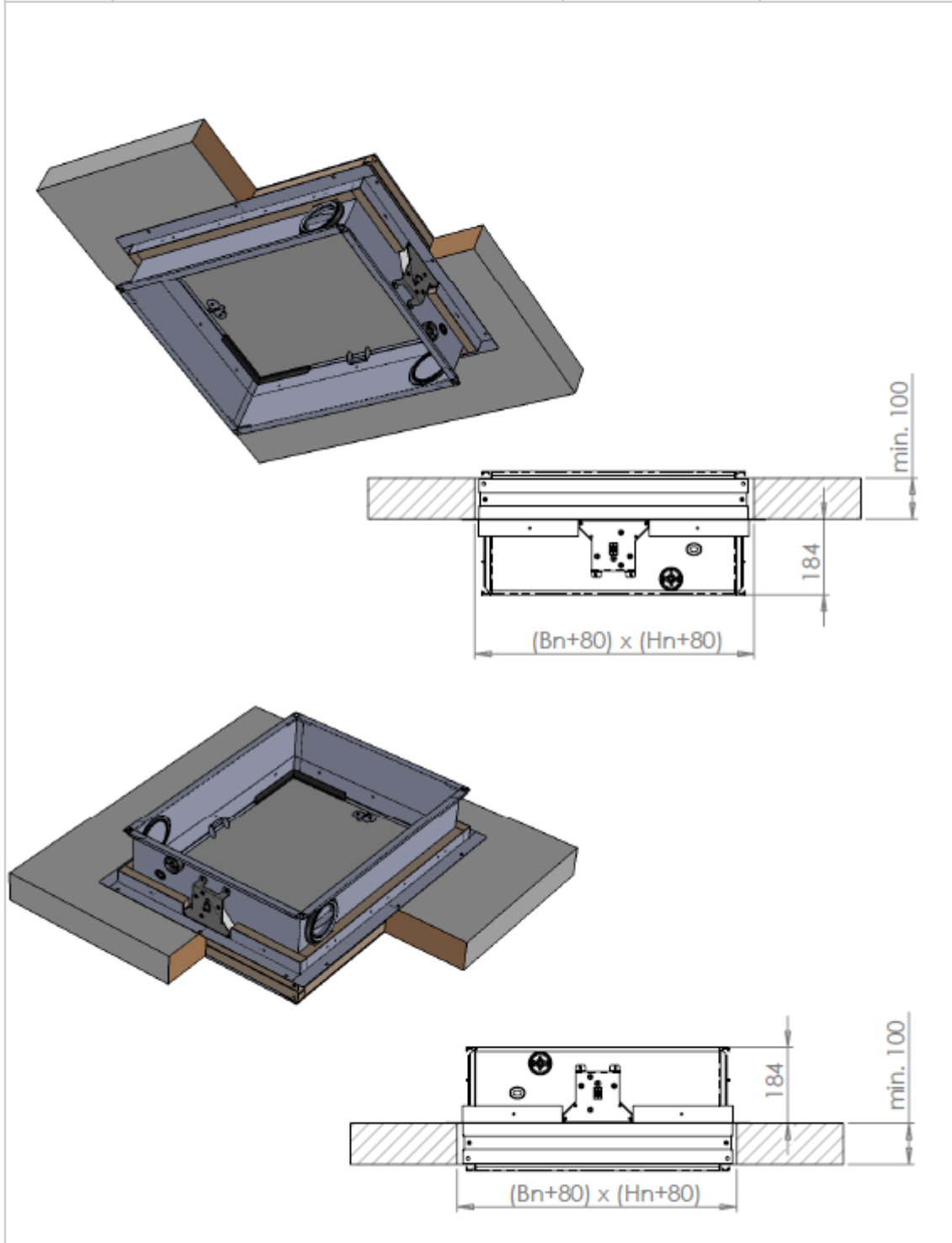
	<u>Reference / Référence</u> CU-LT 1S	<u>Subject / Sujet</u> Mounting	<u>Plate / Planche</u> 10
			
<u>Plan Title / Titre du plan</u> Fire Damper: Concrete wall		<u>Date / Date:</u> 22/06/09	

	<u>Reference / Référence</u> CU-LT 1S	<u>Subject / Sujet</u> Mounting	<u>Plate / Planche</u> 11
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Plan Title / Titre du plan
 Fire Damper : Flexible wall

Date / Date:
 22/06/09

	<u>Reference / Référence</u> CU-LT 1S	<u>Subject / Sujet</u> Mounting	<u>Plate / Planché</u> 12
			
<u>Plan Title / Titre du plan</u> Fire Damper: Concrete floor		<u>Date / Date:</u> 22/06/09	