EFECTIS France
ZI les Nappes
149 route du Marc
F-38630 LES AVENIÈRES VEYRINS-THUELLIN
Tél : +33 (0)4 37 06 38 11

CLASSIFICATION REPORT

Laboratoire agréé Efectis par le Ministère de l'Intérieur

CLASSIFICATION REPORT n° EFR-20-004121 A - Revision 3

According to standard EN 13501-3+A1:2012

Delivered the	25 March 2022
Laboratory assessment	EFR-20-004121 A - Revision 3
Regarding	A range of circular fire dampers.

- Reference: ISONE 2.1 Circular
- Internal section: from Ø 100 mm to Ø 500 mm
- Fire direction: mechanism inside or outside fire area
- Nominal pressure: - 500 Pa

Sponsor

ALDES AERAULIQUE
20 Boulevard Joliot Curie
69694 Vénissieux Cedex
FRANCE

This classification report cancels and replaces the classification report EFR-20-004121 A - Revision 2.

LIST OF REVISIONS

Revision index	Date	Modification	Author
0	22/01/2021	Document creation	ABR
1	17/03/2021	- Addition of electrical devices on the mechanism - Validation of different supporting constructions	ABR
2	05/05/2021	- Validation of BELIMO mechanisms - Validation of remote damper configuration (ducts)	RST
3	25/03/2022	- Commercial reference change (from ISONE 2 to ISONE 2.1) - New actuator validation - Validation BSIA module - Validation 98/62 flexible wall - Validation separation distance between product and between product and supporting construction	RST

1. SUBJECT OF THE CLASSIFICATION REPORT

This classification report defines the classification assigned to a range of « ISONE 2.1 » fire dampers in accordance with the procedures set out in the standard EN 13501: 2012 "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".

2. TEST LABORATORY

EFECTIS France
149, route du Marc
F - 38630 LES AVENIERES VEYRINS-THUELLIN

Notified body : 1812

3. REFERENCE AND ORIGIN OF THE STUDIED SPECIMENS

Reference:	ISONE 2.1 Circular
Origin:	ALDES AERAULIQUE 20 Boulevard Joliot Curie 69694 Vénissieux Cedex FRANCE

4. REFERENCE DOCUMENTS

The document is based on the following reference documents:

- EFR-20-004121 A - Revision 3 APL
- EFR-19-J-000182 A
- EFR-19-J-000182 F
- EFR-19-J-005163 A
- EFR-19-J-005163 B
- EFR-19-J-005163 C
- EFR-19-J-005163 D
- EFR-20-J-001592 A
- EFR-19-T2-000182 G
- EFR 21-T2-004913
- EFR-22-J-000211
- EFR-22-L-003414

5. DESCRIPTION OF THE STUDIED SPECIMENS

5.1. TYPE OF FUNCTION

The « ISONE 2.1 » fire damper is defined as a "fire damper". Its function is to resist fire as regards fire integrity, thermal insulation and leakage flow rates.

5.2. GENERAL

The subject of this document is a range of circular fire dampers with reference « ISONE 2.1 » and internal section from Ø 100 mm to Ø 500 mm. The dampers are mounted (sealed) into supporting constructions with different orientations (wall and floor).

The damper has the following characteristics:

- Internal section: from Ø 100 mm to Ø 500 mm
- Fire direction: mechanism inside or outside fire area
- Nominal pressure: - 500 Pa

The damper is constituted as follows:

- A casing
- A mobile blade
- A mechanism

5.3. DETAILED DESCRIPTION OF THE SPECIMENS

5.3.1. Casing

The damper casing is a single cylindrical sleeve in galvanized steel with length of 419 mm ± 5 mm. The sleeve is rolled and welded.

Damper's section	Sleeve's thickness
Ø 100 mm to Ø 315 mm	0.8 mm
Ø 355 mm to Ø 500 mm	1.0 mm

A groove with a maximum depth of 3 mm is present at each end of the casing for the installation of a rubber seal for connection to the ducts.

In order to dissipate heat, three rows of holes are created, used as thermal dissipators (punching). The axis of the thermal dissipators from the end of the casing on the mechanism side are placed at:

- 254 mm ± 5 mm: before the blade
- 289 mm ± 5 mm: at the level of the blade
- 324 mm ± 5 mm: after the blade

The rows on each side of the blade position are constituted by four lines of holes with dimensions 35 x 3 mm, a space of 5 mm is respected between consecutive holes (except in specific areas like fixations). The holes are staggered, a space of 3 mm is respected between consecutive lines.
The middle row is constituted by two lines of the same rectangular holes.

Adhesive tape is placed on the thermal dissipators.

Two M5 shoulder screws and two flange bearings are used to create the axis of rotation.
An end stop is fixed with a Ø 4.8 steel rivet on the casing (inside). This end stop is plastic or galvanized steel parts and is used to stop the blade's rotation.

A galvanized steel fixing bracket is fixed with a Ø 4.8 steel rivet on the casing (outside).

5.3.2. Blade

The damper's blade is created by a calcium silicate board. The clearance between the blade and the casing is 5 ± 1 mm.

Damper's section	Blade's thickness
Ø 100 mm to Ø 315 mm	25 mm
Ø 355 mm to Ø 500 mm	29.8 mm

The axis of the blade is placed at 289 mm ± 5 mm from the end of the casing on the mechanism side.

On two opposite ends of the blade, two blade rotation supports are crimped with two steel rivets Ø 4.8 mm, in order to ensure the rotation inside the casing.

The rotational shafts are two M5 sockets crimped on these rotation supports. The blade is inserted in the casing and assembled with the two M5 shoulder screws and the flange bearings, screwed on the guiding part sockets.

A graphite basis intumescent seal with section of 22 x 2 mm (according to supplier tolerance) is fixed to the edge of the blade with staples with dimensions 5 x 15 mm, placed every 50/120 mm. The seal is centered in the thickness of the blade.

A double lip seal is used to ensure the sealing between the casing and the blade. The seal is U-shaped and is fixed under the intumescent seal. The type and dimensions of the seal is mentioned below.

Material	Width (mm)	Lip's thickness (mm)
EPDM	0.6 ± 0.3	25 ± 0.4
Silicone	0.65 ± 0.3	26.65 ± 1

5.3.3. Mechanism ISONE 2.1 PM

5.3.3.1. Mechanism plate

For the dampers Ø 100 mm to Ø 250 mm: A polyamide mechanism plate with thickness 3 mm and dimensions 220 x 160 x 57 mm is fixed by two Ø 6 screws into the crimped sockets onto the casing.

For the dampers Ø 315 mm to Ø 500 mm: A polyamide mechanism plate with thickness 3 mm and dimensions 220 x 160 x 57 mm is fixed by two Ø 6 screws into the crimped sockets onto the support plate. The support plate is made of galvanized steel with thickness 1.5 mm and dimensions 151 x 131 mm, over a width of 161 mm. This support is fixed on the casing using four Ø 4.8 mm steel rivets.

A polyethylene foam (ALDES) with dimensions 120 x 80 mm and thickness 12 mm is placed between the plate mechanism and the casing.

5.3.3.2. Mechanism's shaft

A polyamide shaft of dimensions Ø 24 mm crosses the mechanism plate and the casing. A stainless-steel spring coil around the mechanism's shaft located within the mechanism is used to force the blade to its safety position (close).

For the dampers Ø 100 mm to Ø 250 mm: A polyamide clevis is fixed to the blade. A polyamide connecting rod with a rotation axis is assembled with the clevis.
A polyamide arm is fixed to the mechanism's shaft. This arm is assembled to the rotation axis of the connecting rod.

For the dampers Ø 315 mm to Ø 500 mm: A galvanized steel L-shaped plate with thickness 2 mm is fixed to the blade. This part have an oblong hole of dimensions Ø 10.5 x 67.5 mm.
A polyamide arm is fixed to the mechanism's shaft. A roller with dimensions Ø 10 mm is fixed to the previous arm and inserted inside the oblong hole of L-shaped plate.

5.3.3.3. Locking device

The locking device consists of a spring and a locking arm. In the opening position, the mechanism's shaft is locked by the locking arm.

The blade could be closed using a thermal triggering device. This fuse is an alloy with a melting point of 70 (-5/+30) °C. It is fixed to one side on the axis of the steel thermal triggering device and on the other side to a spring.
The thermal triggering device is positioned in plastic support of ABS and fixed by a screw on the mechanism cover.

5.3.3.4. Mechanism's cover

The mechanism's cover in ABS with overall dimensions 155 x 160 x 40 mm is fixed by clip to the mechanism plate. The manual reset handle in ABS is positioned in the mechanism's shaft and through the mechanism cover.

An electrical cover is added near the mechanism's cover with two cable grommets.

5.3.3.5. Electrical devices

The mechanism could be equipped:
- A remote electromagnetic trigger device fixed by 2 steel screws and consisting of an electromagnetic suction pad fitted around a pendulum and a polyamide release support.
- An EHOP MINI reference remote reset actuator fixed by 2 steel screws.
- Open/closed position indicators fixed by 1 steel screw.
- Connecting devices for electrical connection to fire safety

These electrical devices are fixed with screws inside the mechanism box.

5.3.4. Mechanisms BELIMO

The ISONE 2.1 PM mechanism can be replaced by an actuator below:
- BFL24-T or BFL230-T or BFN24-T or BFN230-T
- BFL24 or BFL230 or BFN24 or BFN230

BFL24-T, BFL230-T, BFN24-T and BFN230-T actuators are equipped with a BAT72°C thermal probe.
BFL24, BFL230, BFN24 and BFN230 actuators are equipped with a BAE165 US thermal probe.

The actuators are equipped with a spring return for the blade closing.
The actuators can be equipped with open/closed indicators and connectors for connection to fire safety systems.

Plastic mechanism plate:
For the dampers Ø 100 mm to Ø 250 mm:
A plastic mechanism plate with thickness 3 mm and dimensions 147 x 100 x 59 mm is fixed by two Ø 6 screws into the crimped sockets onto the casing. The actuator is fixed to the plastic plate by two Ø 5 screws and Ø 5 nuts crimp in the plate.

For the dampers Ø 315 mm to Ø 500 mm:
A plastic mechanism plate with thickness 3 mm and dimensions 147 x 100 x 59 mm is fixed by two Ø 6 screws into the crimped sockets onto the support plate. The support plate is made of galvanized steel with thickness 1.5 mm and dimensions 151 x 131 mm, over a width of 161 mm. This support is fixed on the casing using four Ø 4.8 mm steel rivets. The actuator is fixed to the plastic plate by two Ø 5 screws and Ø 5 nuts crimp in the plate.

A polyethylene foam:
For the dampers Ø 100 mm to Ø 250 mm:
A polyethylene foam (ALDES) with dimensions 120 x 80 mm and thickness 12 mm is placed between the plastic mechanism plate and the casing.

For the dampers Ø 315 mm to Ø 500 mm:
A polyethylene foam (ALDES) with dimensions 120 x 80 mm and thickness 12 mm is placed between the support plate and the casing.

BSIA (or BSIA-R) option:
BSIA or BSIA-R modules can be added to the actuator.

6. INSTALLATION OF THE TEST SPECIMENS

According to EXAP EN15882-2:2015, rules X.45 and 46, the gap between the damper and the supporting construction can be:
- Increased in size : Increase in area up to 50% permitted
- Decreased in size : Decrease permitted where there is sufficient room for installation of the seal

The classification obtained for a standard installation in the different supporting constructions and their respective sealing remains valid for a minimal spacing:
- of 200 mm between fire dampers installed in separate ducts;
- of 75 mm between the fire damper and a construction element (wall or floor).

6.1. INSTALLATION IN AERATED CONCRETE OR CONCRETE FLOOR

The dampers could be installed in a concrete floor (solid or aerated blocks) with the characteristics below:
- Thickness ≥ 150 mm
- Density ≥ 600 kg/m^3

The damper is positioned in an opening of dimensions (Ø + 50) mm. And it is sealed with aerated concrete adhesive mortar or standard mortar plaster.

6.2. INSTALLATION IN AERATED CONCRETE OR CONCRETE WALL

The dampers could be installed in a concrete wall (solid or aerated blocks) with the characteristics below:
- Thickness ≥ 100 mm
- Density ≥ 450 kg/m^3

The damper is positioned in an opening of dimensions (Ø + 50) mm. And it is sealed with aerated concrete adhesive mortar or standard mortar plaster.

6.3. INSTALLATION IN GYPSUM BLOCKS WALL

The dampers can be installed in a gypsum blocks wall with the characteristics below:
- Thickness ≥ 70 mm
- Density ≥ 900 kg/m^3

The damper is positioned in an opening of dimensions (Ø + 50) mm.

6.3.1. Solution n°1

The damper is sealed with aerated concrete adhesive mortar or standard mortar plaster.

6.3.2. Solution n°2

The damper is sealed with aerated concrete adhesive mortar or standard mortar plaster.

Two extra boards (or one board with a circular opening) is added on each side of the wall. Around the dampers, two U-shaped BA13 type F plasterboards is fixed by screws Ø 3.5 mm with a maximal spacing of 150 mm. The extra boards represent a square of external dimensions (Ø + 135) x (Ø + 135) mm with a circular opening of dimensions (Ø + 5) mm.

The extra boards can be also replaced by 15.5 mm thick calcium silicate boards.

6.4. INSTALLATION IN PLASTERBOARDS PARTITION

The dampers can be installed in a plasterboards partition wall constituted by:

- A frame realized by steel studs and rails 98/48 or 98/62;
- A cavity isolated by mineral wool of thickness 45 mm and minimal density 35 kg/m^3;
- Two facings of plasterboards BA13 Type A or F or one facing of plasterboards BA25 Type A or F on each side.

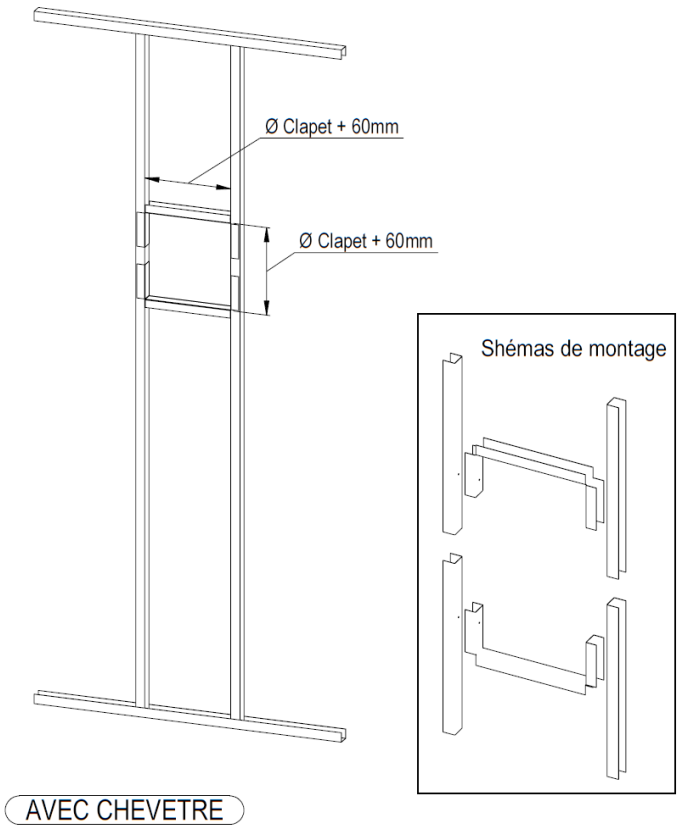
The first layer of boards is fixed to the steel frame by screws Ø 3.5 x 25 mm with a maximal spacing of 300 mm. The second layer of boards is fixed to the header joist by screws Ø 3.5 x 35 mm with a maximal spacing of 150 mm.
If plasterboards BA25 are used, then only screws Ø 3.5 x 35 mm with a maximal spacing of 150 mm must be used.
Every board junctions and screw heads are treated by a joint filler reference bonded to a joint tape.

The mineral wool inside the partition can be removed.

A header joist for passage of the fire damper is made using M48 or M62 rails and M48 or M62 studs. The header joist (see drawing below) is made of with:

- A vertical stud placed on each side of the fire damper at (Ø + 60) mm;
- A horizontal rail cut, bent, slide and install perpendicular to the studs at the top and bottom and separated by (Ø + 60) mm.

These elements are fixed together using screws Ø 3.5 mm.

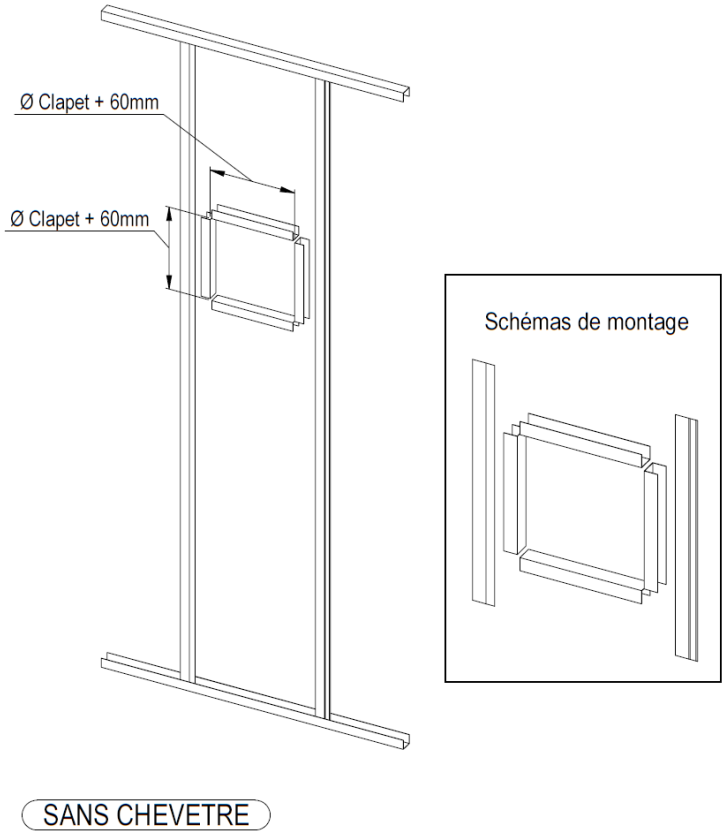


6.4.1. Solution n°1

The damper is positioned in a circular opening of dimensions (Ø + 5) mm, made in the plasterboards in front the header joist.

The header joist described in § 4.4 can be replaced with only four rails of (Ø + 60) mm long placed inside the partition to form a square of dimensions (Ø + 60) x (Ø + 60) mm (see drawing below).
In this case, the four rails are placed inside the partition through the circular opening with dimensions of (Ø + 5) mm made in the plasterboards. These rails are fixed by screws Ø 3.5 mm through the plasterboards facing.

The gap inside the header joist (between the damper and the plasterboards) is filled with mineral wool.



6.4.2. Solution n°2

The damper is positioned in a square opening of dimensions (Ø + 60) x (Ø + 60) mm, made in the plasterboards in front the header joist.

Two extra boards (or one board with a circular opening) is added on each side of the wall. Around the dampers, two U-shaped plasterboards is fixed by screws Ø 3.5 mm with a maximal spacing of 150 mm. The extra boards represent a square of external dimensions (Ø + 135) x (Ø + 135) mm with a circular opening of dimensions (Ø + 5) mm.
The boards used for the extra boards are the same as those used for the partition wall. Or it can be replaced by a 15.5 mm thick calcium silicate boards.

The gap between the damper and the header joist is filled with standard plaster or aerated concrete mortar.

6.5. INSTALLATION REMOTE FROM A WALL

The dampers can be installed remote from a wall with a duct.

6.5.1. Promatect L500 boards

The duct is made of calcium silicate boards Promatect L500 (PROMAT) with thickness 50 mm. The internal section of the duct is Ø x Ø mm (dimensions of the damper). The duct is manufactured according to the PROMAT French national classification document named “Procès-verbal de classement” number 06-A-315.

The duct crosses through the supporting construction. The gap between the duct and the supporting construction is filled with mineral wool of thickness 30 mm and minimum density 30 kg/m³. Fire side, Promatect L500 boards cover the mineral wool. These boards of 100 mm wide are fixed on the supporting construction by screws Ø 5 mm with a gap of 150 mm.

At each end of the duct, two frames made of Promatect L500 boards with external dimensions (Ø+100) x (Ø+100) mm, are fixed to the duct by glue PROMACOL-S (PROMAT) and VBA scews Ø 5 mm with a gap of 50 mm. The frame with an opening of (Ø+5) mm is used to seal the fire damper. The gap between the damper and the frame is filled with glue PROMACOL-S (PROMAT).

The supporting of the duct is made with cradles manufactured as follows:
- One galvanized steel corner of section 41 x 41 x 1.5 mm (w x h x t) and length (Ø+300) mm;
- Two threaded rods Ø 12 mm placed on the duct sides;
- One nut with washer Ø 12 mm placed on each threaded rod.

The supporting of the duct (galvanized steel corner and threaded rods) can be insulated with Promatect L500 boards with thickness 50 mm. The boards are fixed on the duct and together with glue PROMACOL-S (PROMAT) and VBA screws with a gap of 300 mm.

6.5.2. GEOFLAM boards

The duct is made of staff boards GEOFLAM 45 or GEOFLAM LIGHT 35 (GEOSTAFF). The internal section of the duct is Ø x Ø mm (dimensions of the damper). The duct is manufactured according to the GEOSTAFF French national classification documents named “Procès-verbal de classement” number 12-A-344 and 13-A-894.

The duct crosses through the supporting construction. The gap between the duct and the supporting construction is filled with mineral wool of thickness 30 mm and minimum density 30 kg/m³. Fire side, staff boards (GEOFLAM 45 or GEOFLAM LIGHT 35) cover the mineral wool. These boards of 100 mm wide are fixed on the supporting construction by screws Ø 5 mm with a gap of 150 mm.

At each end of the duct, two frames made of GEOFLAM 45 boards with external dimensions (Ø+2xT) x (Ø+2xT) mm, are fixed to the duct by adding fiber caulking and plaster. The frame with an opening of (Ø+5) mm is used to seal the fire damper. The gap between the damper and the frame is filled with fiber caulking and plaster or GEOCOL (GEOSTAFF) or PLACOL (PLACO SAINT GOBAIN).
T = duct boards thickness

The supporting of the duct is made with cradles manufactured as follows:
- One galvanized steel profile of section 25 x 25 x 2 mm (w x h x t) and length (Ø + 300) mm ;
- Two threaded rods Ø 8 mm placed on the duct sides ;
- One nut Ø 8 mm placed on each threaded rod. »

The supporting of the duct can be insulated as follows:
- The threaded rods with staff half-shells (Ø 90 mm);
- The galvanized steel corner with a U-shaped protective section in plaster (100 x 60 mm).

Adhesive plaster GEOCOL (GEOSTAFF) or PLACOL (PLACO SAINT GOBAIN) is added to fixed staff half-shells and U-shaped on the duct and half-shells together.

6.5.3. DESENFIRE boards

The duct is made of staff boards DESENFIRE HD 25 or DESENFIRE HD 35 or DESENFIRE HD 45 DESENFIRE THD 25 or DESENFIRE STR 25 (MF INDUSTRIES). The internal section of the duct is Ø x Ø mm (dimensions of the damper). The duct is manufactured according to the MF INDUSTRIES French national classification documents named “Procès-verbal de classement” number:
- EFR-14-003263
- EFR-14-003264
- EFR-15-000722
- EFR-15-000723
- EFR-16-002563
- EFR-16-002582

The duct crosses through the supporting construction. The gap between the duct and the supporting construction is filled with mineral wool of thickness 30 mm and minimum density 30 kg/m³. Fire side, staff boards (DESENFIRE HD 25 or DESENFIRE HD 35 or DESENFIRE HD 45 DESENFIRE THD 25 or DESENFIRE STR 25) cover the mineral wool. These boards of 100 mm wide are fixed on the supporting construction by screws Ø 5 mm with a gap of 150 mm.

At each end of the duct, two frames made of DESENFIRE boards with external dimensions (Ø+2xT) x (Ø+2xT) mm, are fixed to the duct by adding fiber caulking and plaster. The frame with an opening of (Ø+5) mm is used to seal the fire damper. The gap between the damper and the frame is filled with fiber caulking and plaster or MFI COL (MF INDUSTRIES).
T = duct boards thickness

The supporting of the duct is made with cradles manufactured as follows:
- One galvanized steel corner of section 41 x 41 x 1.5 mm (w x h x t) and length (Ø+300) mm;
- Two threaded rods Ø 12 mm placed on the duct sides;
- One nut with washer Ø 12 mm placed on each threaded rod.

The supporting of the duct can be insulated as follows:
- The threaded rods with staff half-shells (Ø 90 mm);
- The galvanized steel corner with a U-shaped protective section in plaster (100 x 60 mm).

Adhesive plaster MFI COL (MF INDUSTRIES) is added to fixed staff half-shells and U-shaped on the duct and half-shells together.

7. COMPLIANCE WITH THE STANDARD EN 15650

7.1. OPERATIONAL RELIABILITY

In accordance with paragraph 4.3.1 a) of standard EN 15650: 2010, the results are given in the reference reports.

Operational reliability: 50 cycles – compliant.

7.2. DURABILITY OF OPERATIONAL RELIABILITY

In accordance with paragraph 4.3.3.2 and appendix C of standard EN 15650: 2010, the results are given in the SA 21 00 02 RevA (CNPP) reference report:
- 300 cycles with ISONE 2.1 PM mechanism: **compliant**
- 10200 cycles with BELIMO mechanism: **compliant**

7.3. RESPONSE TIME AND LOAD CAPACITY OF THE THERMAL TRIGGER

In accordance with paragraphs C.2.2 / C.2.3 / C2.5.2.1 / C.2.5.2.2 of appendix C of standard ISO 21925-1: 2018, the results are given in the ST 13 00 20 C (CNPP) reference report:
- Load capacity of the thermal trigger: **compliant**
- Response time of the thermal trigger: **compliant**

8. FIRE RESISTANCE CLASSIFICATIONS

8.1. CLASSIFICATION REFERENCE

This classification procedure is conducted in accordance with section 7.2.3 of the standard EN 13501- 3.

8.2. CLASSIFICATIONS

The elements are classified in accordance with the following combinations of performance parameters and classes.

The dimensional range covered by the performances stated below is from Ø 100 mm to Ø 500 mm for a nominal pressure of - 500 Pa.

Fire direction: mechanism inside or outside fire area.

The orientation of the damper is indifferent (every angle validated).

No other classification is authorized.

8.2.1. Dampers into aerated concrete or concrete floor with thickness ≥ 150 mm and density ≥ 600 kg/m³

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

8.2.2. Dampers into aerated concrete or concrete wall with thickness ≥ 100 mm and density ≥ 450 kg/m³

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

8.2.3. Dampers into gypsum blocks wall with thickness ≥ 70 mm and density ≥ 900 kg/m³

8.2.3.1. Solution n°1:

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

8.2.3.2. Solution n°2 – Extraboards:

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

8.2.4. Dampers into gypsum blocks wall with thickness ≥ 100 mm and density ≥ 900 kg/m³

8.2.4.1. Solution n°1:

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

8.2.4.2. Solution n°2 – Extraboards:

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

8.2.5. Dampers into plasterboards partition

8.2.5.1. Solution n°1 – Type A plasterboards:

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

8.2.5.2. Solution n°2 – Type A plasterboards:

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

8.2.5.3. Solution n°2 – Type F plasterboards:

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

8.2.6. Dampers remote from a wall (PROMATECT L500 without protected supporting systems) :

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

8.2.7. Dampers remote from a wall (with protected supporting systems :PROMATECT L500; With or without protected supporting systems :GEOFLAM 45, GEOFLAM LIGHT 35, DESENFIRE HD 25 or DESENFIRE HD 35 or DESENFIRE HD 45 DESENFIRE THD 25 or DESENFIRE STR 25 ducts)

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

9. CONDITIONS OF VALIDITY OF FIRE RESISTANCE CLASSIFICATIONS

9.1. TO THE MANUFACTURE AND IMPLENTATION

The specimen must conform to the detailed description in the reference laboratory assessment, which may be requested from its owner, without obligation to transfer the document in the event of a dispute over the item covered by this classification report.

The assembly of the specimen must comply with the paragraph 6. of this classification report.

9.2. FIRE DIRECTION

See classifications above.

9.3. FIELD OF VALIDITY

No dimensional modification may be applied to the dimensions expressed above and no modification to the constitution of the element may be made without the prior issue of a classification extension by the Laboratory.

10. FIELD OF DIRECT APPLICATION OF THE TEST RESULTS

10.1. GENERAL POINTS

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

10.2. DIMENSIONS OF THE FIRE DAMPER

In accordance with section 13.1 of the standard EN 1366-2, the classifications indicated in section 8.2 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 Ø 500 mm and that the minimum flow cross-section dimensions are not less than Ø 100 mm.

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

In accordance with section 13.6 of the standard EN 1366-2 and regarding the specific fire tests done, the fire classifications indicated in section 8.2 of this classification report apply, in practice, with a minimum spacing:

For 60 minutes, there was no influence between products or between products and supporting construction. The minimum spacing allowed is so:
a) 20 mm between fire dampers installed in separate ducts;
b) 20 mm between the fire damper and a construction element (wall or floor).

For 90 minutes, there was influence between products but no influence between products and supporting construction. The minimum spacing allowed is so:
a) **200** mm between fire dampers installed in separate ducts;
b) 20 mm between the fire damper and a construction element (wall or floor).

For 120 minutes, there was influence between products and between products and supporting construction. The minimum spacing allowed is so:
a) **200** mm between fire dampers installed in separate ducts;
b) 75 mm between the fire damper and a construction element (wall or floor).

10.4. SUPPORTING CONSTRUCTIONS

In accordance with paragraph 13.7 of the standard EN 1366-2, a test obtained for a fire damper mounted in or on the face of a standard supporting is applicable to a supporting construction of the same type with a fire resistance equal to or greater than that of the standard supporting construction used in the tests (thicker, denser, more layers of board, as appropriate).

The classifications indicated in section 8.2 of this classification report apply to fire dampers installed:

- Into an aerated concrete or concrete floor with the characteristics: thickness ≥ 150 mm and density ≥ 600 kg/m^3
- Into an aerated concrete or concrete wall with the characteristics: thickness ≥ 100 mm and density ≥ 450 kg/m^3
- Into a gypsum blocks wall with the characteristics: thickness ≥ 70 mm and density ≥ 900 kg/m^3
- Into a plasterboards partition as described in § 6.4 and thickness ≥ 98 mm

Test results obtained with dampers installed in aerated concrete are applicable to rigid constructions made from hollow blocks, provided that the holes are filled/closed before the addition of the final penetration seal.

Test results obtained with dampers installed in insulated flexible vertical supporting constructions may be applied to applications where the same vertical supporting construction is uninsulated – aperture framing shall be used using the same materials as used in the test partition construction, using the same number of boards as was tested.

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.

11. LIMITATION

This classification document does not represent type approval or certification of the product.

These conclusions only relate to the fire resistance performances of the elements covered by this document. They are without prejudice, in any case, to other performances related to their use in a structure.

Les Avenières Veyrins-Thuellin, 25 March 2022

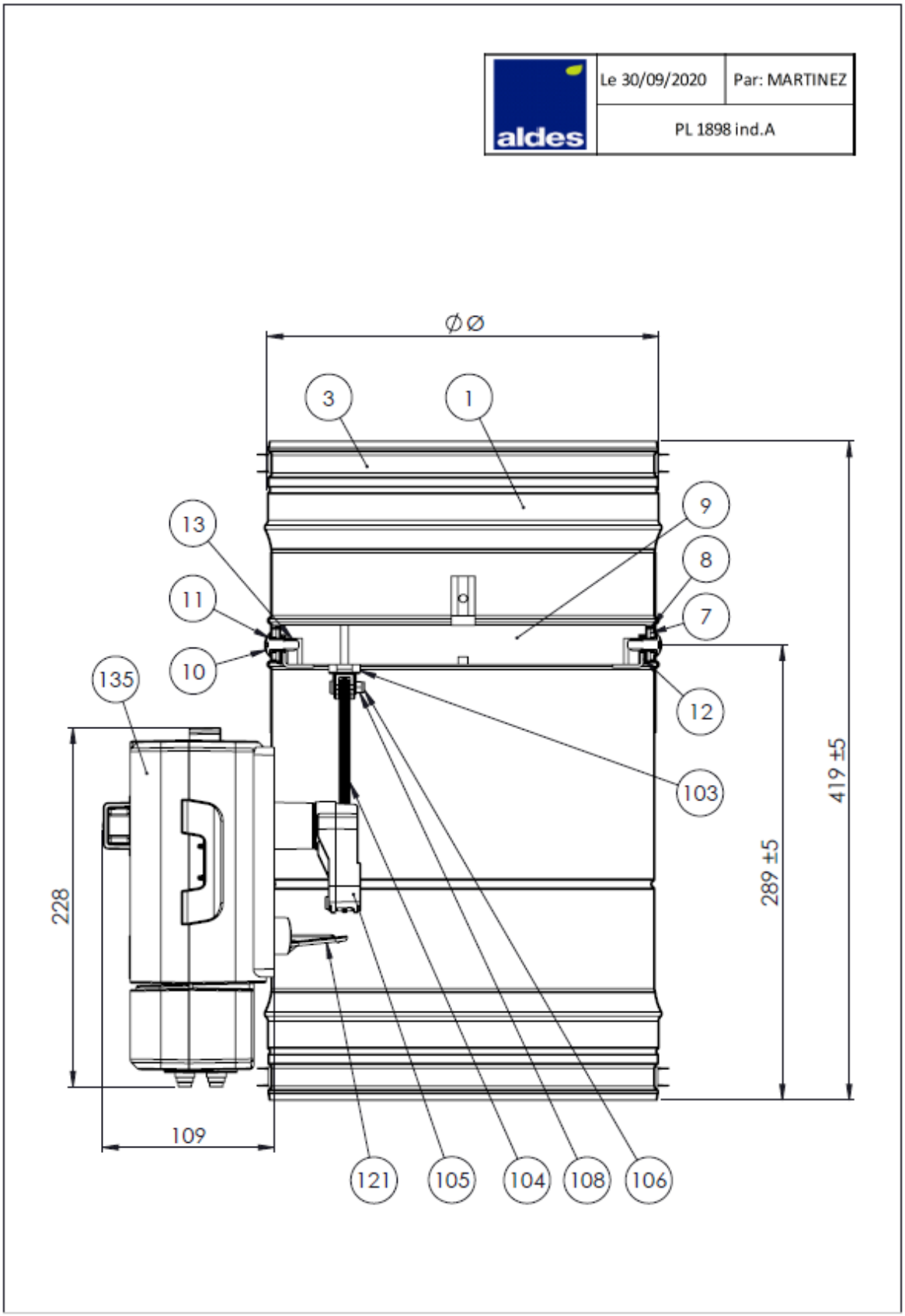
X Charlotte SCHNELLER

Project leader
Signé par : Charlotte SCHNELLER

X Romain STOUVENOT

Supervisor
Signé par : Romain STOUVENOT

APPENDIX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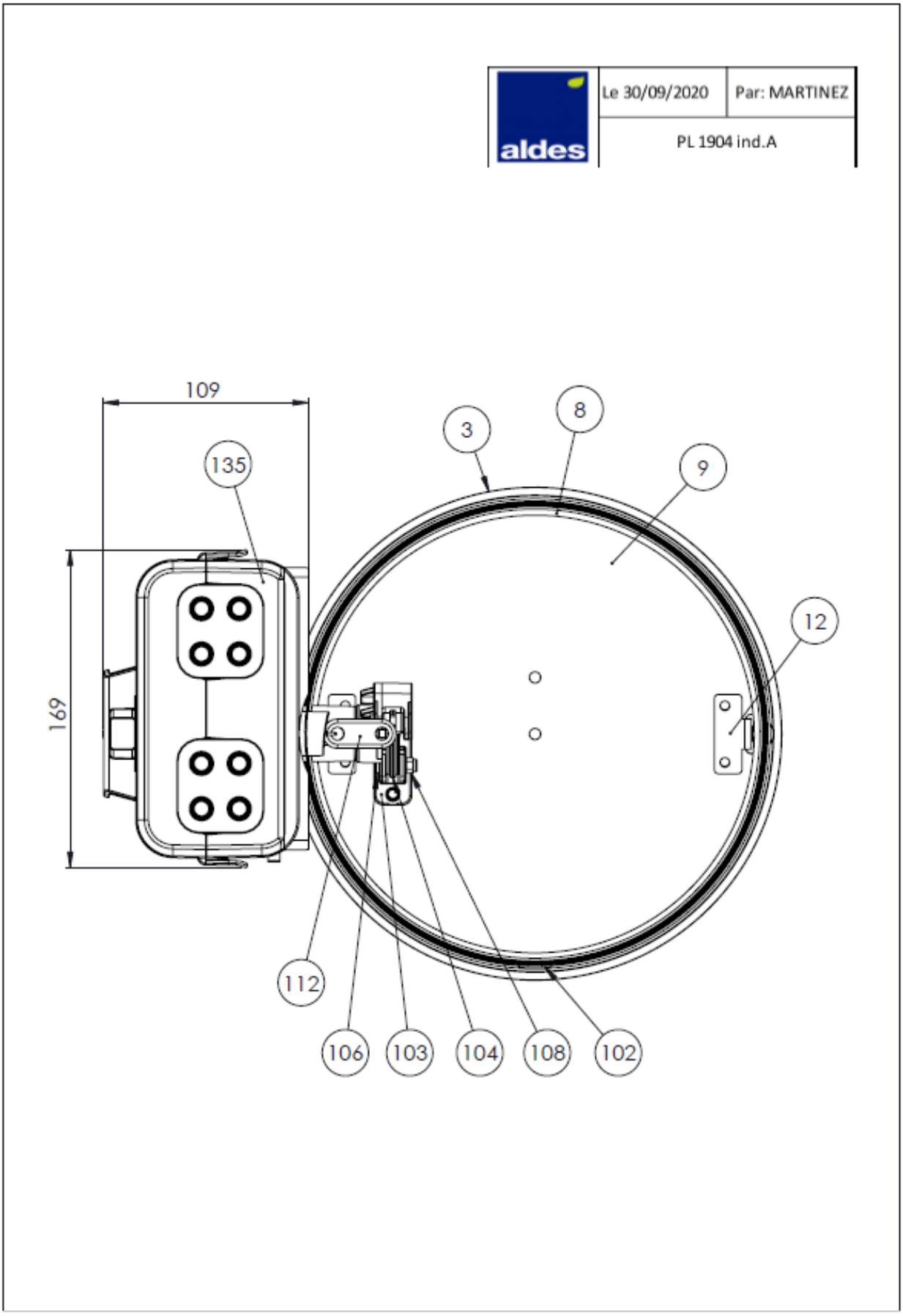

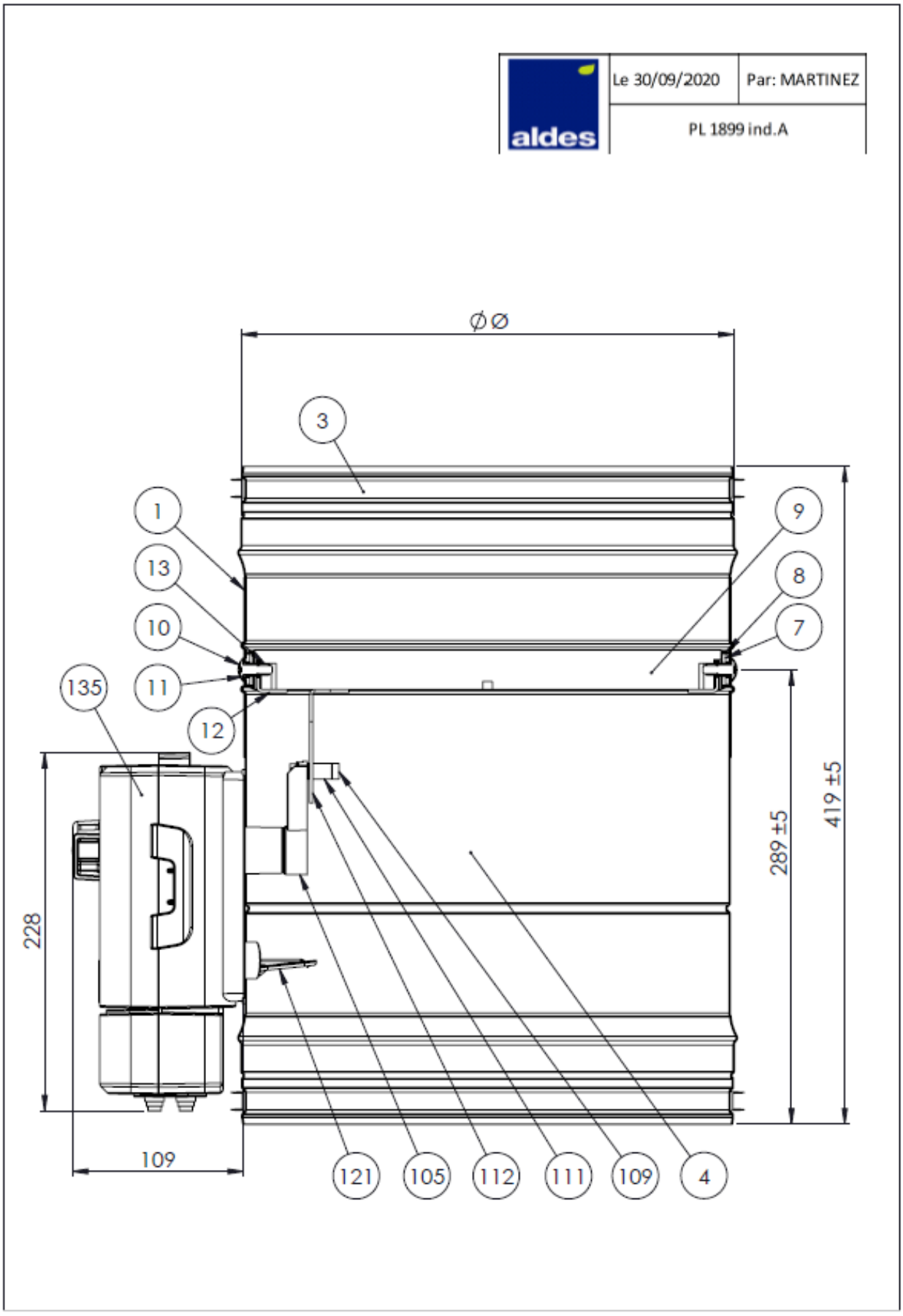
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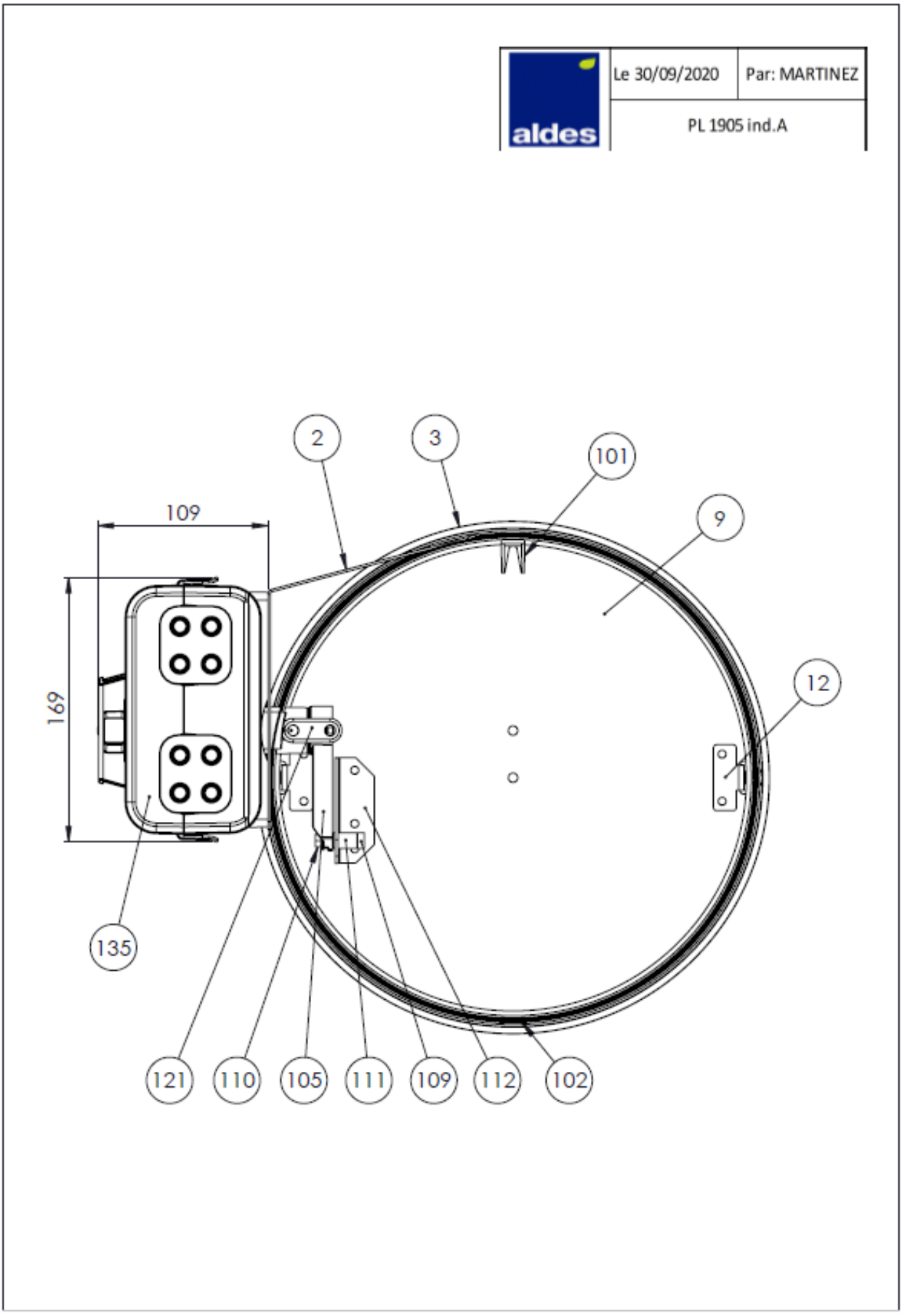
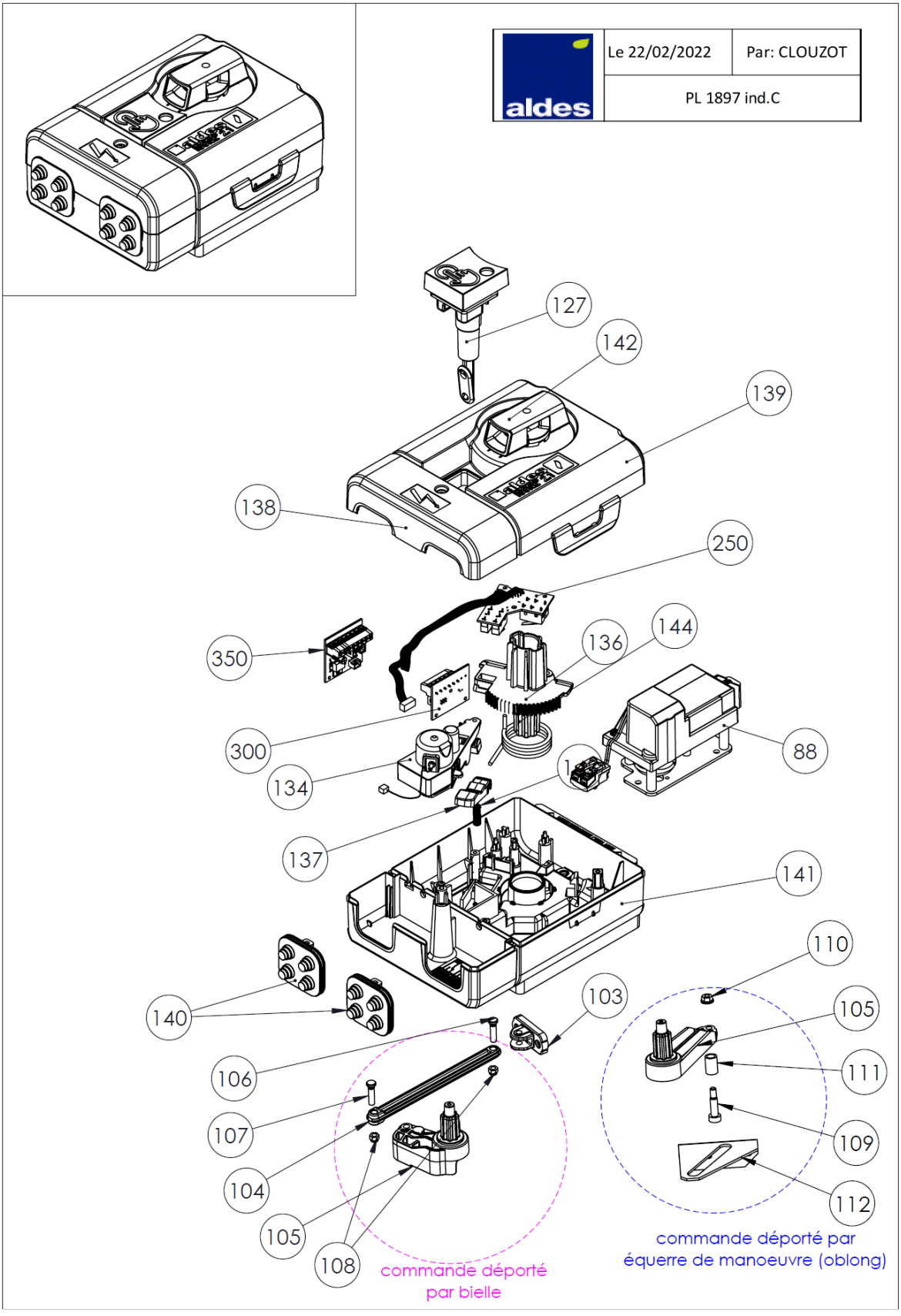
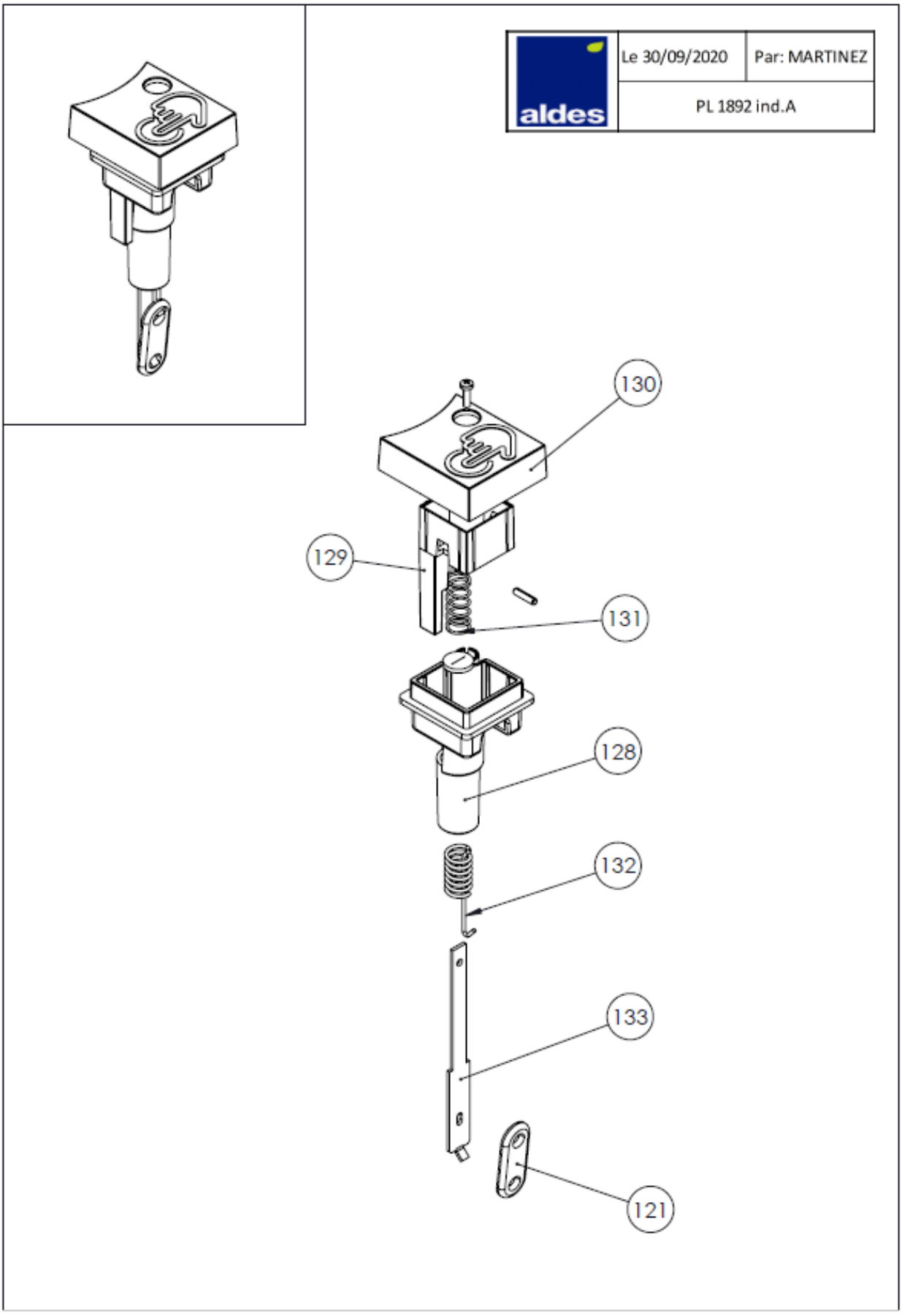
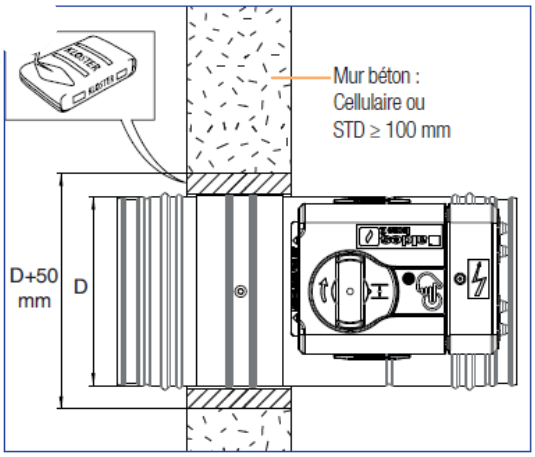


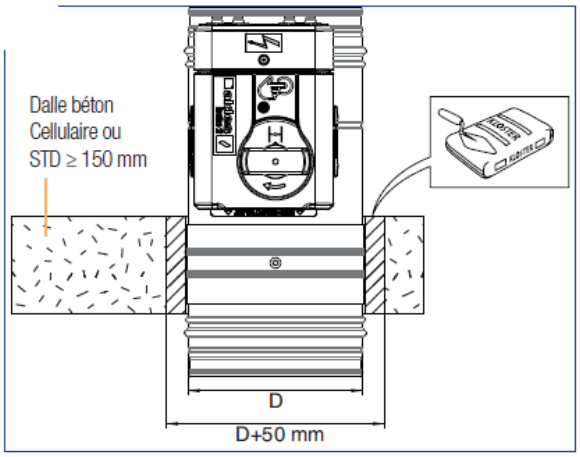




APPENDIX: Supporting constructions

MISE EN OEUVRE : MUR ET DALLE BÉTON / BÉTON CELLULAIRE





MISE EN ŒUVRE : PAROI EN CARREAUX DE PLÂTRE

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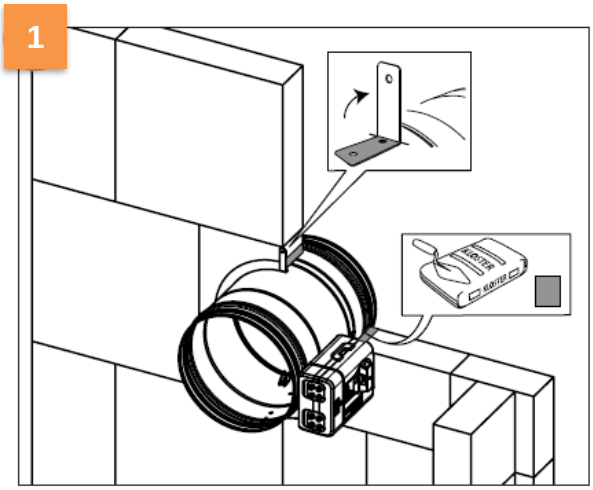

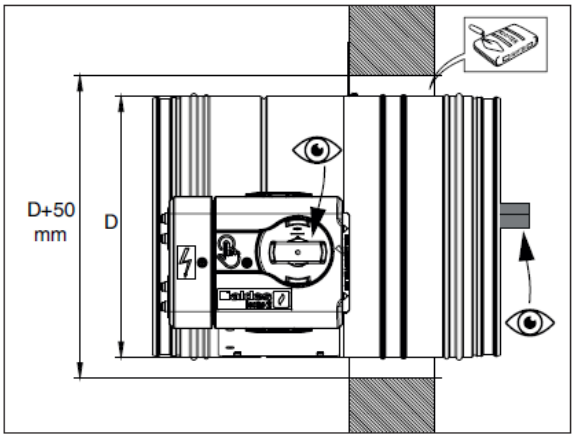

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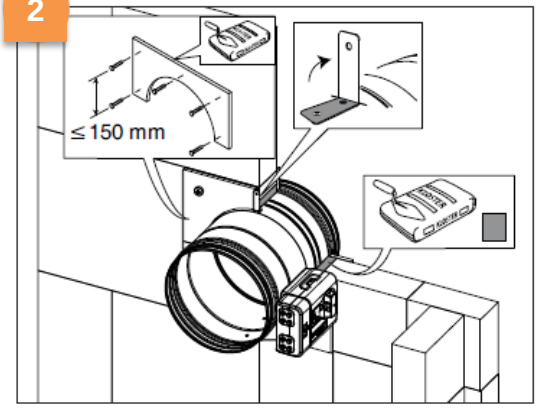
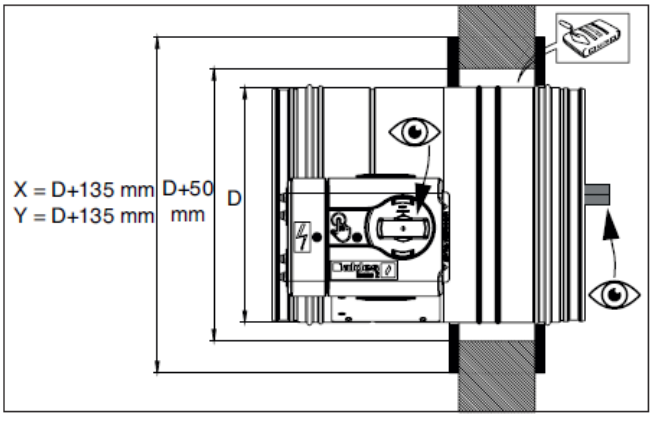
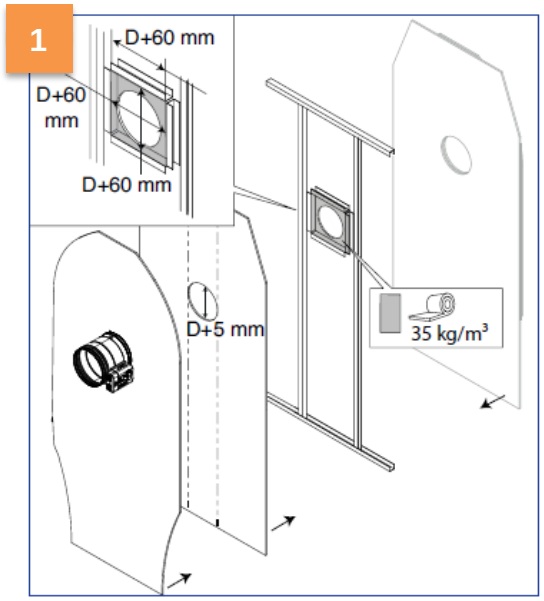
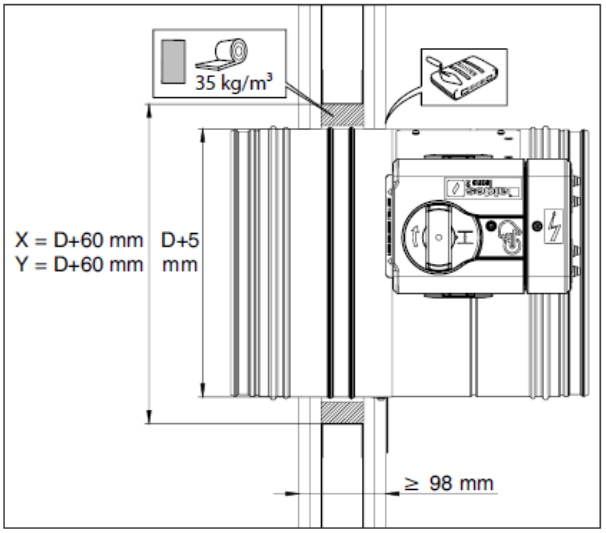
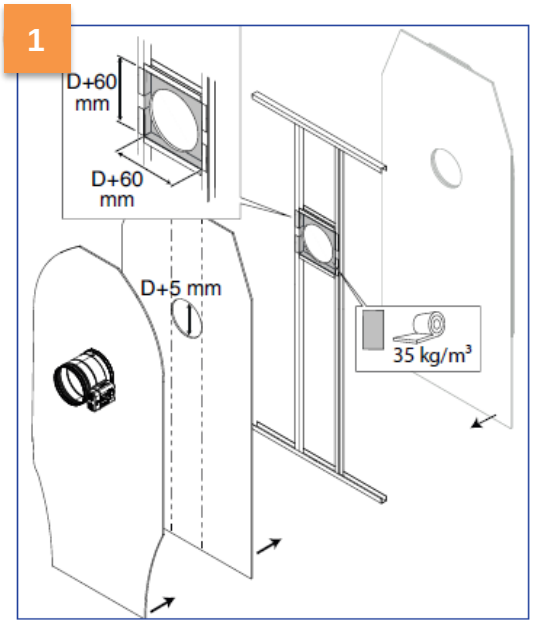


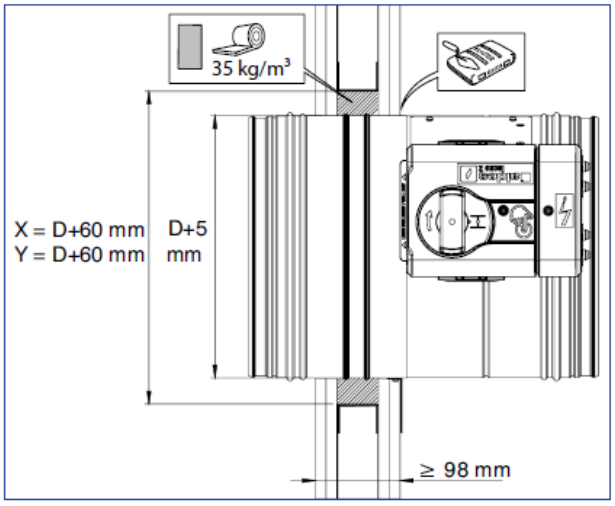


MISE EN ŒUVRE : PAROI EN PLAQUES DE PLÂTRE









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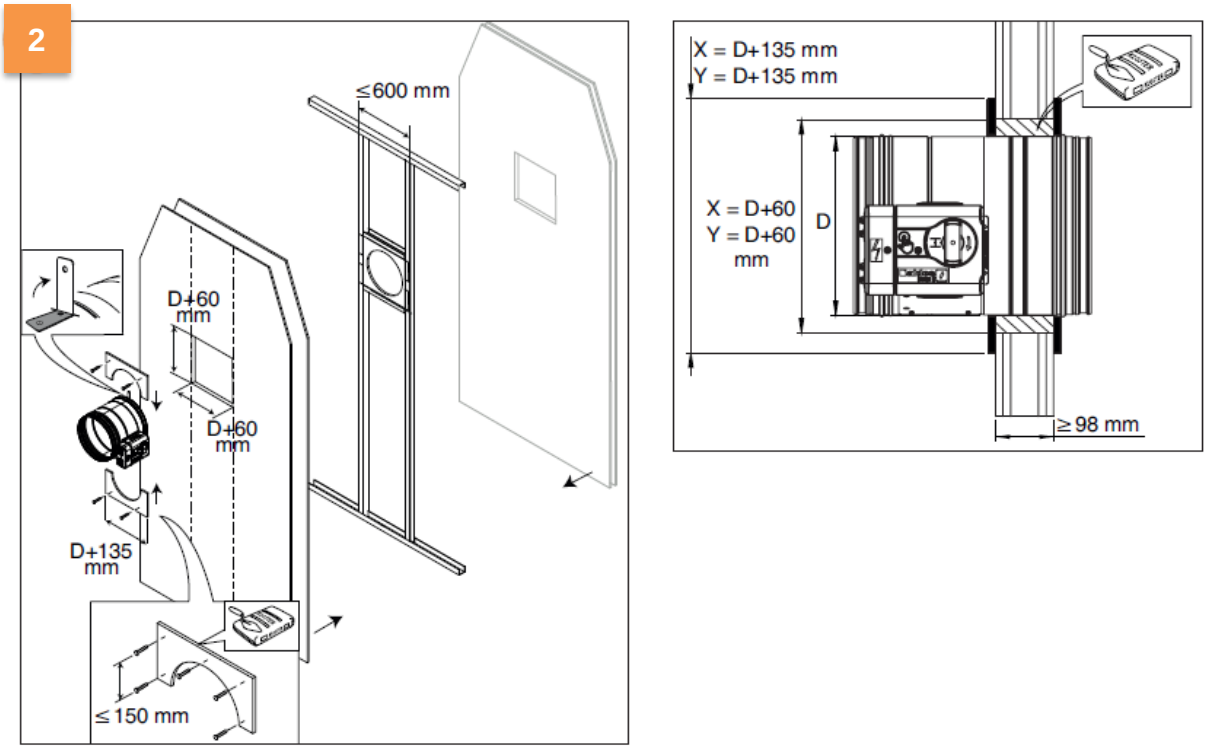
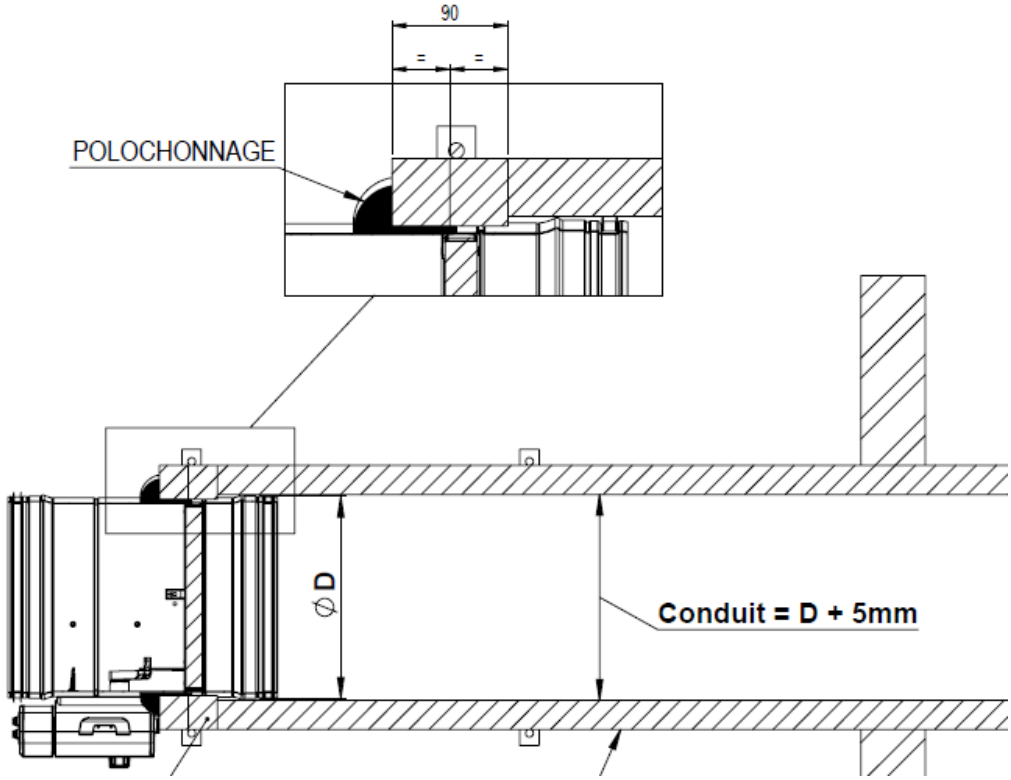


REMOTE FROM A WALL WITH A GEOSTAFF OR MF INDUSTRIES DUCT



REMOTE FROM A WALL WITH A PROMAT DUCT