



European Technical Approval ETA-08/0209

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

Verdeckt liegende mehrachsige Türbänder DX 60/61/62 3-D;
DX 100/101/102 3-D; DX 101 3-D Safe; DXS 100/101/102 3-D Steel;
DX 120/180/200 3-D; DX 180 3-D IHA; DX 200 3-D Safe; DXA 200 3-D
Alu

Variable concealed multi-axis hinges
DX 60/61/62 3-D; DX 100/101/102 3-D; DX 101 3-D Safe;
DXS 100/101/102 3-D Steel; DX 120/180/200 3-D;
DX 180 3-D IHA; DX 200 3-D Safe; DXA 200 3-D Alu

Zulassungsinhaber
Holder of approval

Bartels Systembeschläge GmbH
Gewerbegebiet Echternhagen 2
32689 Kalletal
DEUTSCHLAND

**Zulassungsgegenstand
und Verwendungszweck**

Verdeckt liegende mehrachsige Türbänder
DX 60 3-D; DX 61 3-D; DX 62 3-D;
DX 100 3-D; DX 101 3-D; DX 101 3-D Safe; DX 102 3-D;
DXS 100 3-D Steel; DXS 101 3-D Steel; DXS 102 3-D Steel;
DX 120 3-D; DX 180 3-D; DX 180 3-D IHA;
DX 200 3-D; DX 200 3-D Safe; DXA 200 3-D Alu

*Generic type and use
of construction product*

Variable concealed multi-axis hinges
DX 60 3-D; DX 61 3-D; DX 62 3-D;
DX 100 3-D; DX 101 3-D; DX 101 3-D Safe; DX 102 3-D;
DXS 100 3-D Steel; DXS 101 3-D Steel; DXS 102 3-D Steel;
DX 120 3-D; DX 180 3-D; DX 180 3-D IHA;
DX 200 3-D; DX 200 3-D Safe; DXA 200 3-D Alu

Geltungsdauer:
Validity:

vom
from
bis
to

21 June 2013

21 June 2018

Herstellwerk
Manufacturing plant

Bartels Systembeschläge GmbH
Gewerbegebiet Echternhagen 2
32689 Kalletal
DEUTSCHLAND

Diese Zulassung umfasst
This Approval contains

24 Seiten einschließlich 16 Anhänge
24 pages including 16 annexes

Diese Zulassung ersetzt
This Approval replaces

ETA-08/0209 mit Geltungsdauer vom 09.04.2013 bis 28.08.2013
ETA-08/0209 with validity from 09.04.2013 to 28.08.2013

I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:
 - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998⁴, as amended by Article 2 of the law of 8 November 2011⁵;*
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
- 4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

¹ Official Journal of the European Communities L 40, 11 February 1989, p. 12
² Official Journal of the European Communities L 220, 30 August 1993, p. 1
³ Official Journal of the European Union L 284, 31 October 2003, p. 25
⁴ *Bundesgesetzblatt Teil I 1998*, p. 812
⁵ *Bundesgesetzblatt Teil I 2011*, p. 2178
⁶ Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of the products and intended use

1.1 Definition of the construction product

This European Technical Approval applies to the variable concealed three part hinges made of aluminium and steel with the designation "DX 60 3-D"; "DX 61 3-D"; "DX 62 3-D"; "DX 100 3-D"; "DX 101 3-D"; "DX 101 3-D Safe"; "DX 102 3-D"; "DXS 100 3-D Steel"; "DXS 101 3-D Steel"; "DXS 102 3-D Steel"; "DX 120 3-D"; "DX 180 3-D"; "DX 180 3-D IHA"; "DX 200 3-D"; "DX 200 3-D Safe" and "DXA 200 3-D Alu".

Each product consists of three parts, one part a mounting plate for the door frame, one part a mounting plate for the door leaf with segmented plates connected laterally in such a way as to allow the door to swing freely and to maintain the leaf in the same horizontal and vertical plane during the full operational cycle. Between the two mounting plates provide a variable geometry moving axis within a concealed unsprung hinge assembly.

The essential construction details including their joints are described in the supporting document in Annex. Annex is a formal part of the European technical approval.

1.2 Intended use

The hinges are intended for use on doors of timber and metal (aluminium and steel).

They are invisible (concealed) hinges to allow single and double swing door leaves to be mounted flush to its door leaf and frame, forming a flush panel surface when the door is closed, and allowing the door to open to 180°. The hinges are available for use on doors with door mass up to

- 80 kg "DX 60 3-D"; "DX 61 3-D"; "DX 62 3-D",
- 100 kg "DX 100 3-D"; "DX 101 3-D"; "DX 101 3-D Safe"; "DX 102 3-D"; "DXS 100 3-D Steel"; "DXS 101 3-D Steel"; "DXS 102 3-D Steel",
- 180 kg "DX 120 3-D"; "DXA 200 3-D Alu",
- 200 kg "DX 180 3-D"; "DX 180 3-D IHA "; "DX 200 3-D"; "DX 200 3-D Safe"

each door leaf.

The provisions made in this European technical approval are based on an assumed working life of the hinges of 10 years, provided that the conditions laid down in sections 4 and 5 for the manufacturing, installation, use, maintenance and repair are met. These provisions are based upon the current state of art and the available knowledge and experience.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

Categories of use are identified according to EN 1935⁷:

Door mass ≤ 80 kg	light up to heavy duty hinges
Door mass ≤ 100 kg	light up to heavy duty hinges
Door mass ≤ 180 kg	light up to severe duty hinges
Door mass ≤ 200 kg	light up to severe duty hinges.

2 Characteristics of product and methods of verification

2.1 Reaction to fire / Resistance to fire

The hinges "DX 100 3-D"; "DX 101 3-D"; "DX 101 3-D Safe"; "DX 102 3-D"; "DXS 100 3-D Steel"; "DXS 101 3-D Steel"; "DXS 102 3-D Steel"; "DX 180 3-D"; "DX 200 3-D"; "DX 200 3-D Safe" and "DXA 200 3-D Alu" are suitable for use on fire resisting and smoke control doors that have been favourably assessed relating to the contribution of the hinges to the fire resistance of the relevant fire resisting and smoke control doors. They have been tested on fire resisting doors according to EN 1634-1⁸ and were classified according to EN 13501-2⁹: EI₁30 for "DX 100 3-D" plus "DX 180 3-D" and EI₂30 for "DX 200 3 D" plus "DXA 200 3-D Alu".

The essential building materials which the hinges consist of are classified according to Commission Decision 96/603/EC¹⁰ in accordance with EN 13501-1¹¹: class A1.

2.2 Durability

The durability of the hinges is determined according to EN 1935⁷. The hinges were tested with 200,000 cycles.

2.3 Release of dangerous substances

The applicant shall submit a written declaration stating whether or not the product contains dangerous substances according to European and national regulations, when and where relevant in the Member States of destination, and shall list these substances.

In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e. g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

2.4 Test door mass

The mass of test doors were

- 80 kg "DX 60 3-D"; "DX 61 3-D"; "DX 62 3-D",
- 100 kg "DX 100 3-D"; "DX 101 3-D"; "DX 101 3-D Safe"; "DX 102 3-D"; "DXS 100 3-D Steel"; "DXS 101 3-D Steel"; "DXS 102 3-D Steel",
- 180 kg "DX 120 3-D"; "DXA 200 3-D Alu" or
- 200 kg "DX 180 3-D"; "DX 180 3-D IHA"; "DX 200 3-D"; "DX 200 3-D Safe"

according to EN 1935⁷.

2.5 Safety

The hinges satisfy the essential requirement of safety in use - according to EN 1935⁷.

⁸ EN 1634-1:2000-03 Fire resistance tests for door and shutter assemblies – Part 1: Fire doors and shutters

⁹ EN 13501-2:2003-12 Fire classification of construction products and building elements; Part 2: Classification using data from fire resisting tests, excluding ventilation services

¹⁰ Official Journal of the European Communities L 267, 19.10.1996, p.23

¹¹ EN 13501-1:2002-6 Fire classification of construction products and building elements; Part 1: Classification using test data from reaction to fire tests

2.6 Corrosion resistance

Corrosion resistance of hinges is identified according to EN 1670¹² and EN 1935⁷: grade 4 - very high resistance.

2.7 Hinge grade

Several hinge grades and their durability were identified

- grade 11a "DX 60 3-D"; "DX 61 3-D"; "DX 62 3-D"
- grade 12a "DX 100 3-D"; "DX 101 3-D"; "DX 101 3-D Safe"; "DX 102 3-D"; "DXS 100 3-D Steel"; "DXS 101 3-D Steel"; "DXS 102 3-D Steel"
- grade 14: "DX 120 3-D"; "DXA 200 3-D Alu"
- grade 15: "DX 180 3-D"; "DX 180 3-D IHA"; "DX 200 3-D"; "DX 200 3-D Safe".

2.8 Friction torque

The hinges were tested in accordance with EN 1935⁷. The maximum permissible frictional torque per hinge is

- 4 Nm "DX 60 3-D"; "DX 61 3-D"; "DX 62 3-D"; "DX 100 3-D"; "DX 101 3-D"; "DX 101 3-D Safe"; "DX 102 3-D"; "DXS 100 3-D Steel"; "DXS 101 3-D Steel"; "DXS 102 3-D Steel"; "DX 120 3-D"; "DXA 200 3-D Alu" and
- 7 Nm "DX 180 3-D"; "DX 180 3-D IHA"; "DX 200 3-D"; "DX 200 3-D Safe".

2.9 Deformation load and overload

The hinges were tested in accordance with EN 1935⁷ and resisted overload.

2.10 Identification

All components are clearly specified. Changes of materials, of composition or characteristics, should be immediately notified to the DIBt, which will decide whether a new assessment will be necessary.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the communication of the European Commission¹³ the system of attestation of conformity laid down in the decision 1999/93/EC of the European Commission¹⁴ for doors, windows, shutters, blinds, gates and related building hardware shall also be applied to invisible concealed hinges.

System 1:

Certification of the conformity of the product by an approved certification body on the basis of:

- a) Tasks of the manufacturer:
 - (1) factory production control
 - (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan
- b) Tasks of the approved body:
 - (3) initial type-testing of the product

¹² EN 1670:1998-12 Building hardware - Corrosion resistance - Requirements and test methods

¹³ Letter of the European Commission of 15/10/2004 to EOTA

¹⁴ Official Journal of the European Communities L 29/51 of 25 January 1999

- (4) initial inspection of factory and of factory production control
- (5) continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use constituent materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the control plan of 21 June 2013 relating to the European technical approval ETA 08/0209 issued on 21 June 2013 which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.¹⁵

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body/bodies which is/are approved for the tasks referred to in section 3.1 in the field of hinges in order to undertake the actions laid down in section 3.2.2 For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body/bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European technical approval ETA-08/0209 issued on 21 June 2013.

3.2.2 Tasks for the approved bodies

The approved bodies shall perform the

- initial type testing of the product,
- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control,

in accordance with the provisions laid down in the control plan.

The approved body/bodies shall retain the essential points of its/their actions referred to above and state the results obtained and conclusions drawn in a written report/written reports.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

¹⁵ The control plan is a confidential part of the European technical approval and only handed over to the approved body/bodies involved in the procedure of attestation of conformity. See section 3.2.2.

3.3 CE marking

The CE marking shall be affixed on the product itself - indicate where on the product, if necessary - or the label attached to it; packaging; accompanying commercial document, e. g. the EC declaration of conformity. The letters "CE" shall be followed by the identification number of the approved certification body, where relevant, and be accompanied by the following additional information:

- the name, address and identifying mark of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity,
- the number of the European technical approval,
- the classification summary (hinge designation),
- dangerous substances (if any).

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

It is assumed that the manufacturing of the Variable geometry concealed hinge fulfils the criteria for stable industrial production. The samples taken in connection with the evaluation of properties shall be representative of the whole production.

The European technical approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

4.2 Installation

The installation and commissioning of the variable geometry concealed hinge shall be in accordance with the manufacturer's technical literature.

5 Use, maintenance, repair

The assessment of the fitness for use is based on the assumption that no maintenance other than that stated in the installation instructions is required during the assumed intended working life.

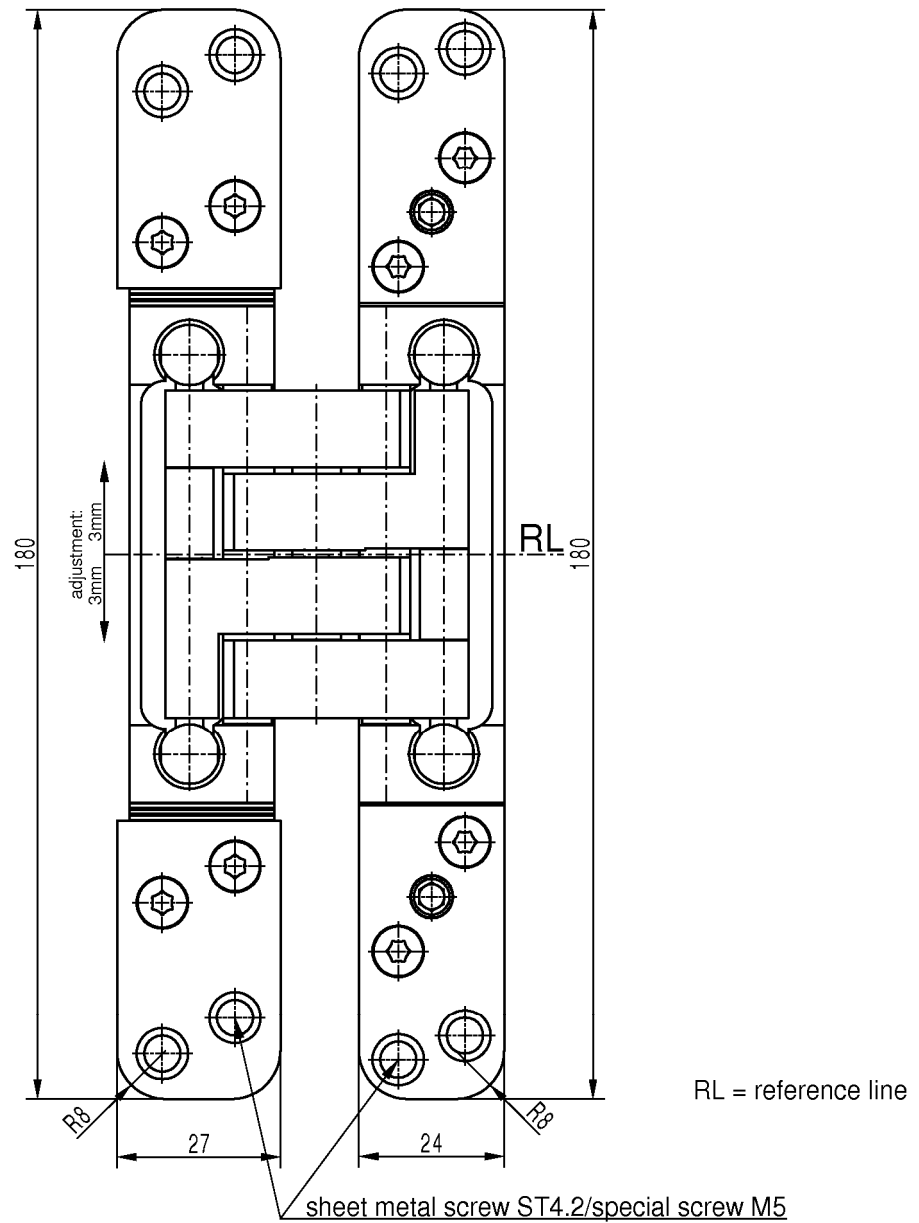
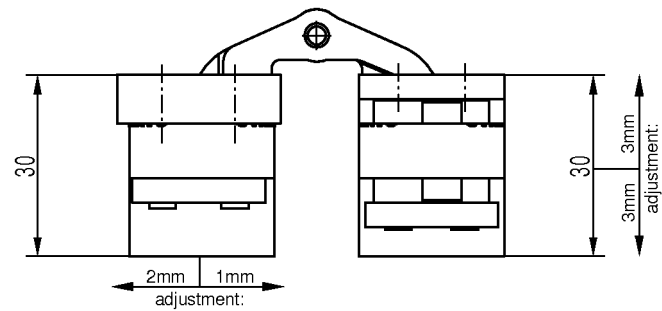
Should repair necessary this is normally achieved by replacement.

Prof. Hoppe
Head of Department

beglaubigt:
Pritzkow

ANNEX - DESCRIPTION OF PRODUCT

Annex 1	"DX 60 3-D"
Annex 2	"DX 61 3-D"
Annex 3	"DX 62 3-D"
Annex 4	"DX 100 3-D"
Annex 5	"DX 101 3-D"
Annex 6	"DX 101 3-D Safe"
Annex 7	"DX 102 3-D"
Annex 8	"DXS 100 3-D Steel"
Annex 9	"DXS 101 3-D Steel"
Annex 10	"DXS 102 3-D Steel"
Annex 11	"DX 120 3-D"
Annex 12	"DX 180 3-D"
Annex 13	"DX 180 3-D IHA"
Annex 14	"DX 200 3-D"
Annex 15	"DX 200 3-D Safe"
Annex 16	"DXA 200 3-D Alu"

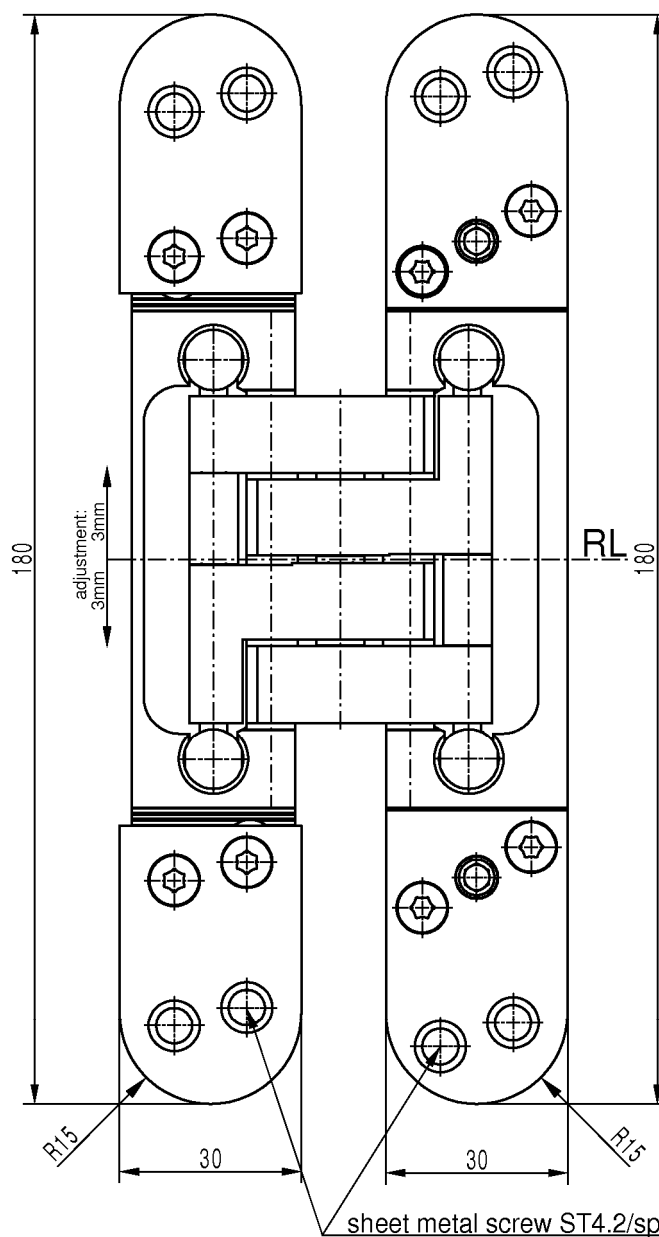
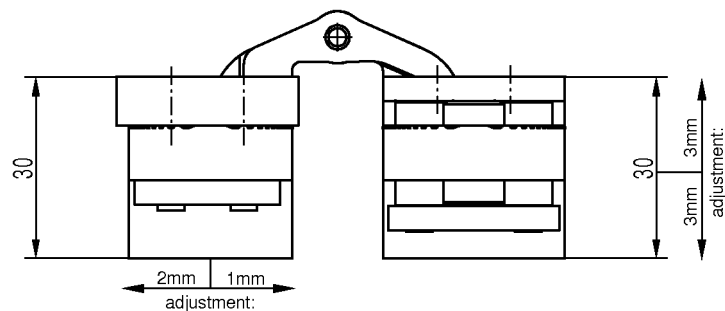


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Variable concealed multi-axis hinges DX 60 3-D

Construction

Annex 1



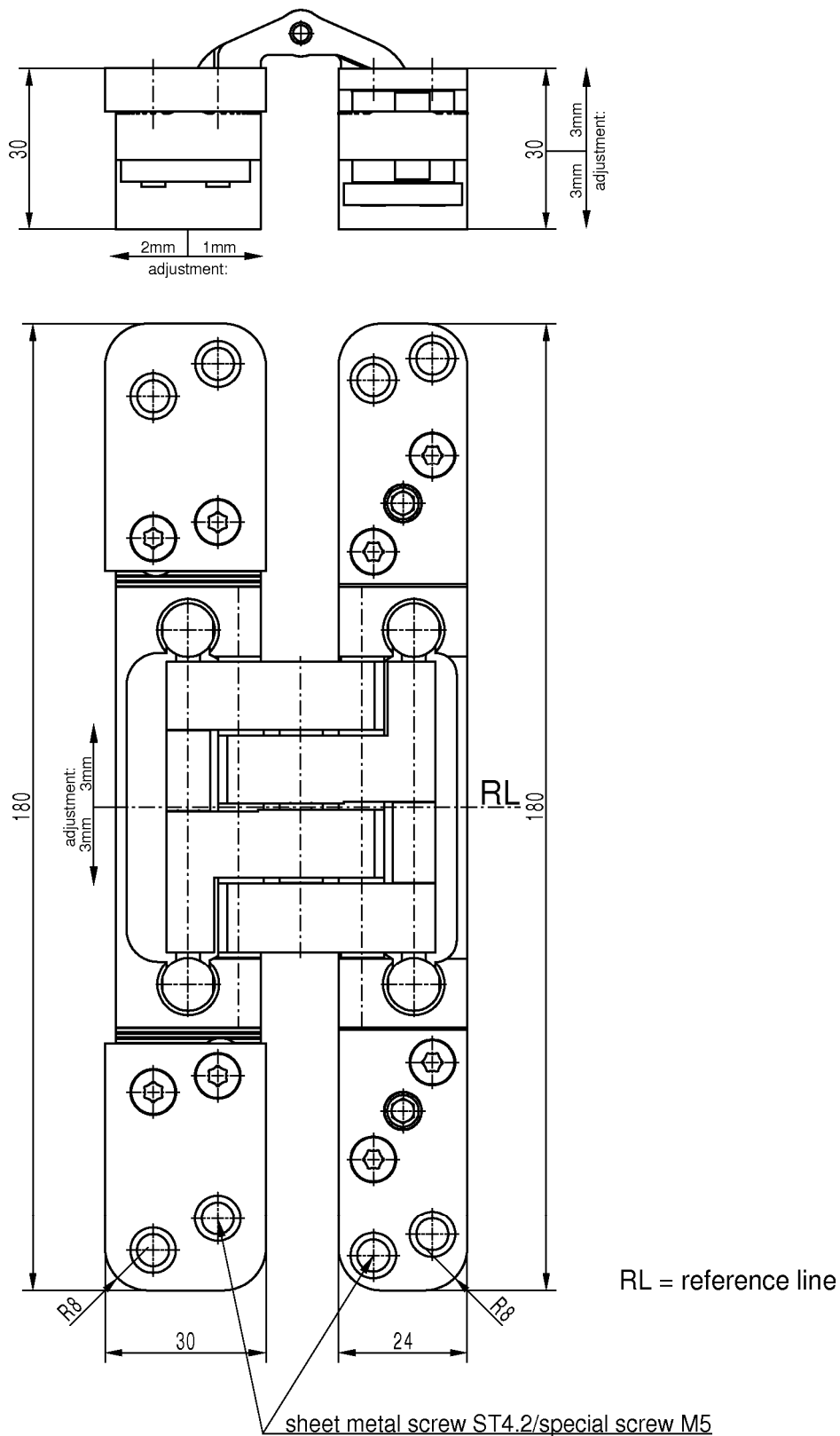
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Variable concealed multi-axis hinges DX 61 3-D

Construction

Annex 2



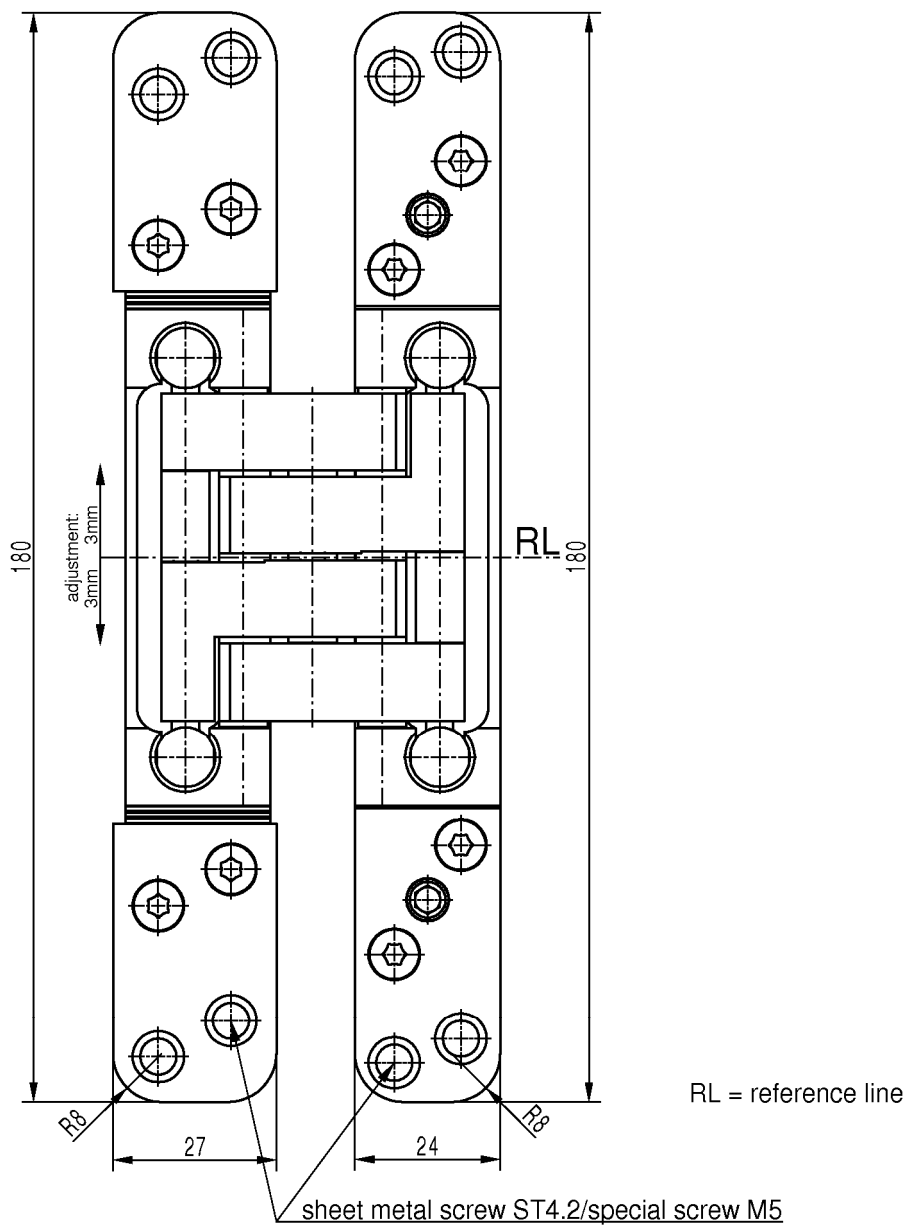
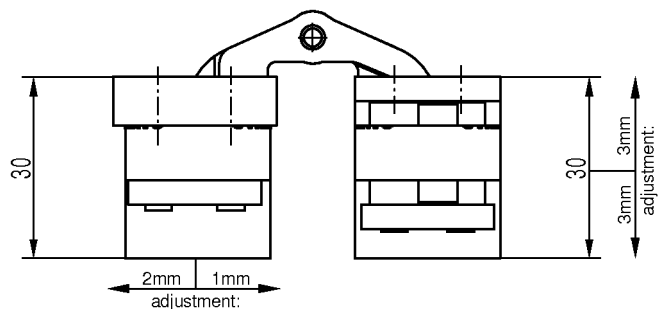
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sheet metal screw ST4.2/special screw M5

Variable concealed multi-axis hinges DX 62 3-D

Construction

Annex 3

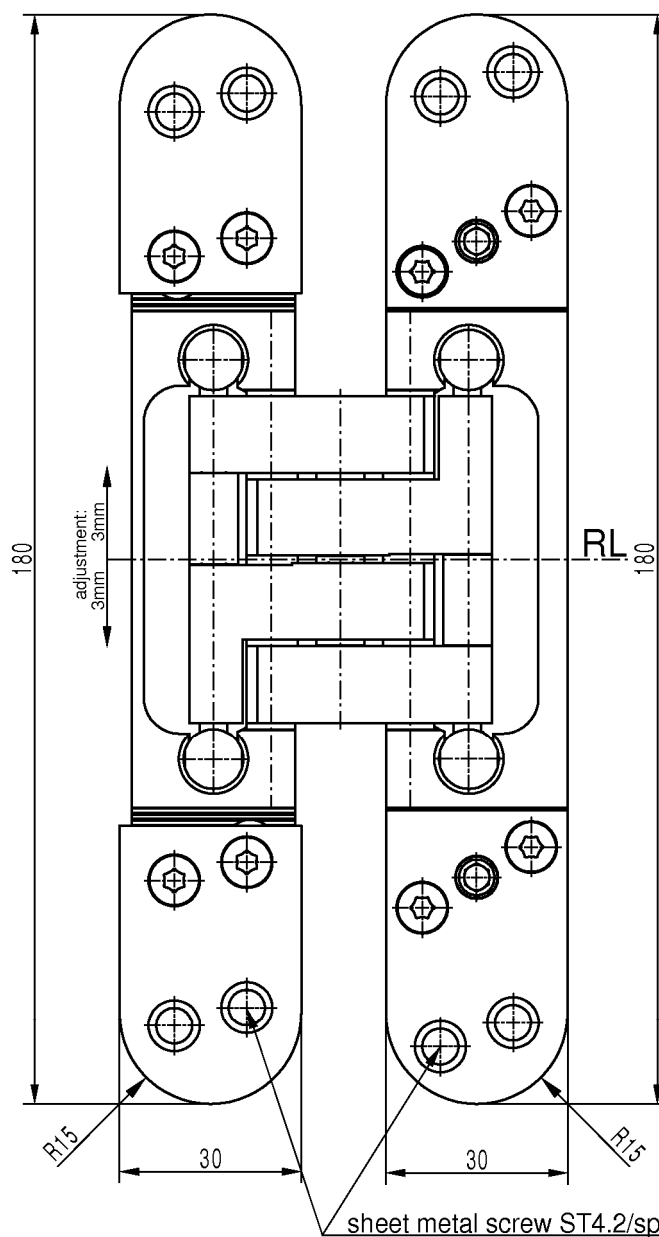
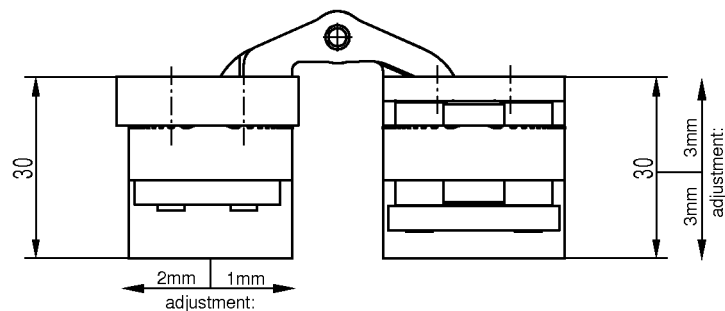


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Variable concealed multi-axis hinges DX 100 3-D

Construction

Annex 4



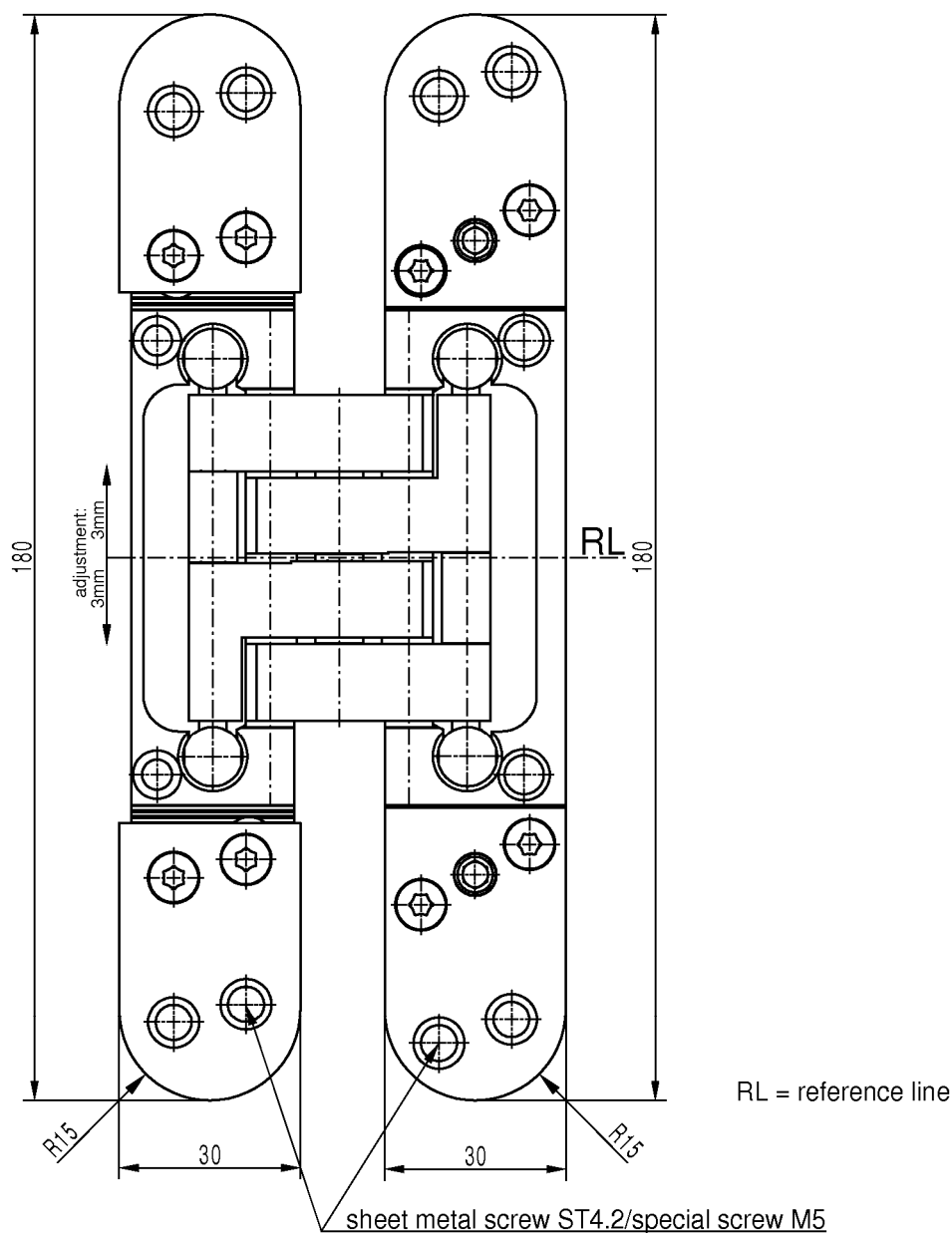
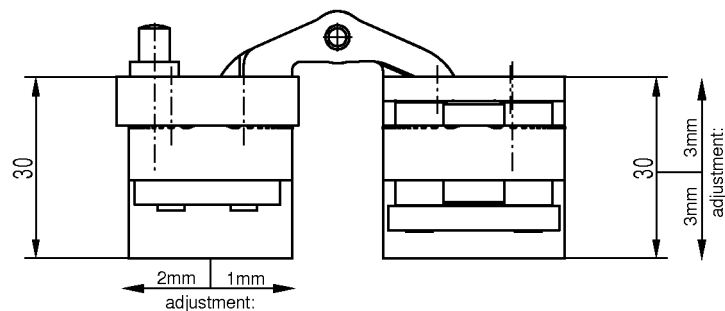
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Variable concealed multi-axis hinges DX 101 3-D

Construction

Annex 5

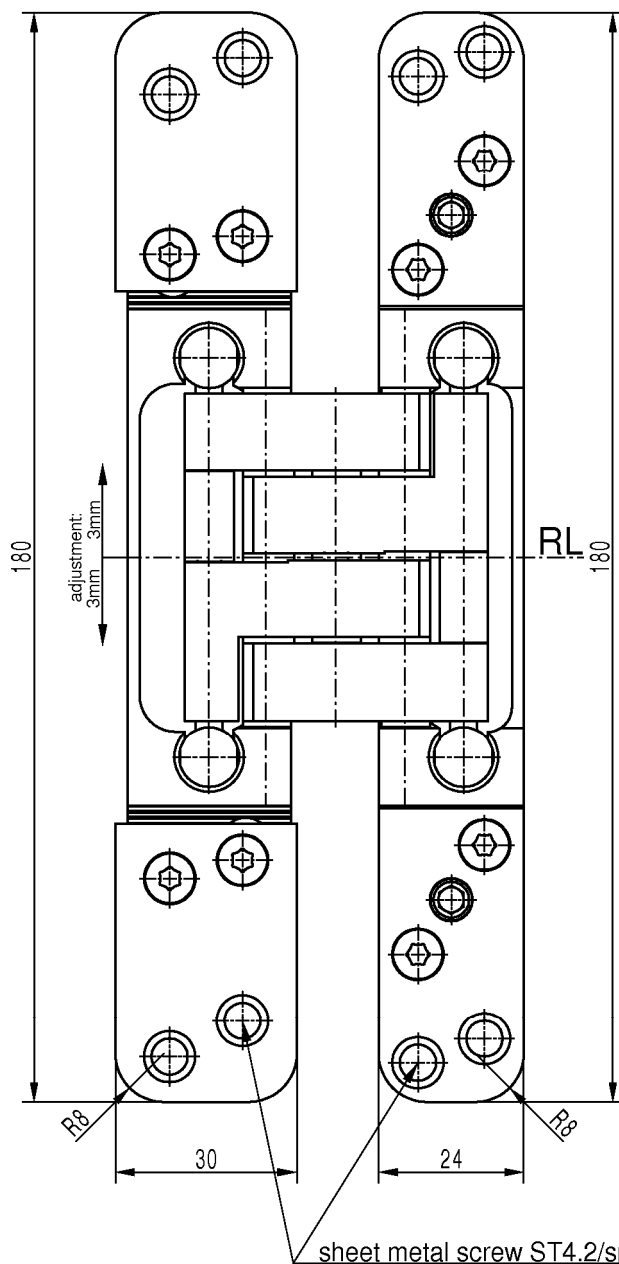
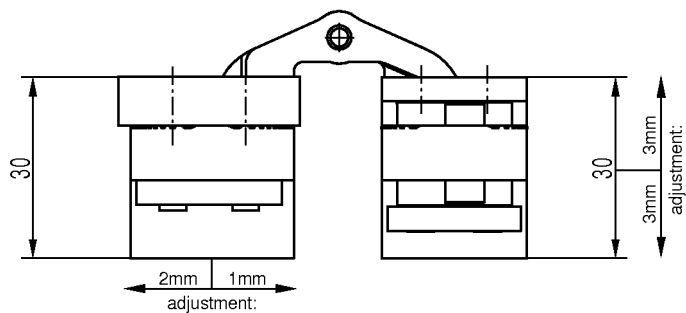


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Variable concealed multi-axis hinges DX 101 3-D Safe

Construction

Annex 6

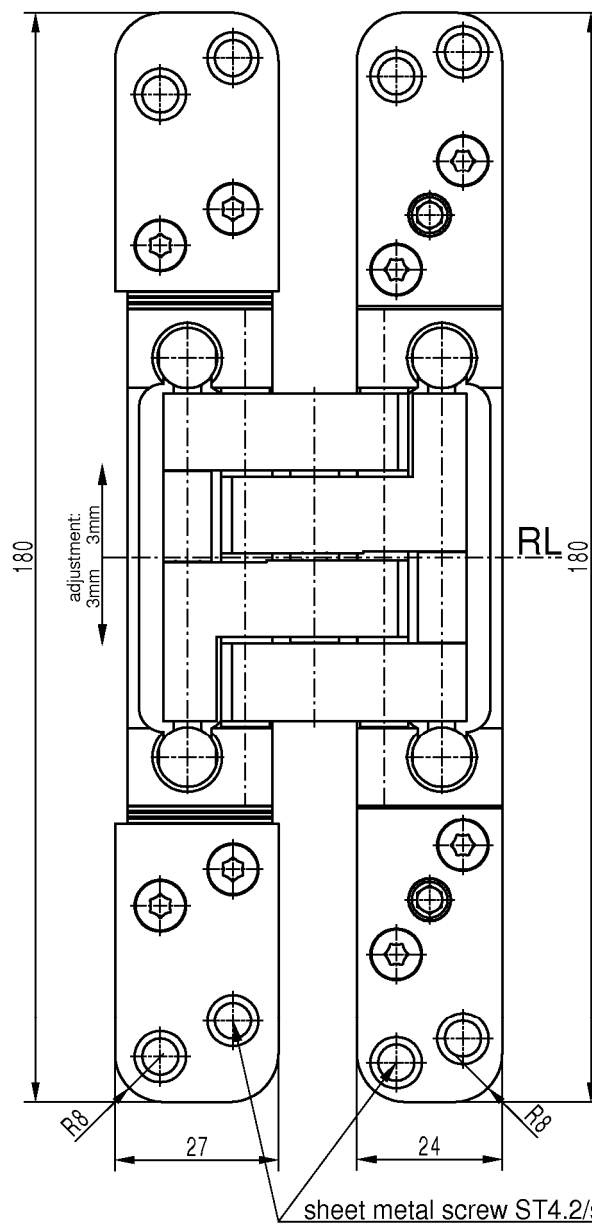
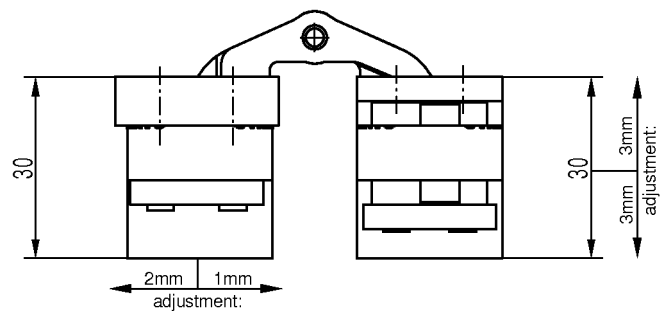


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Variable concealed multi-axis hinges DX 102 3-D

Construction

Annex 7



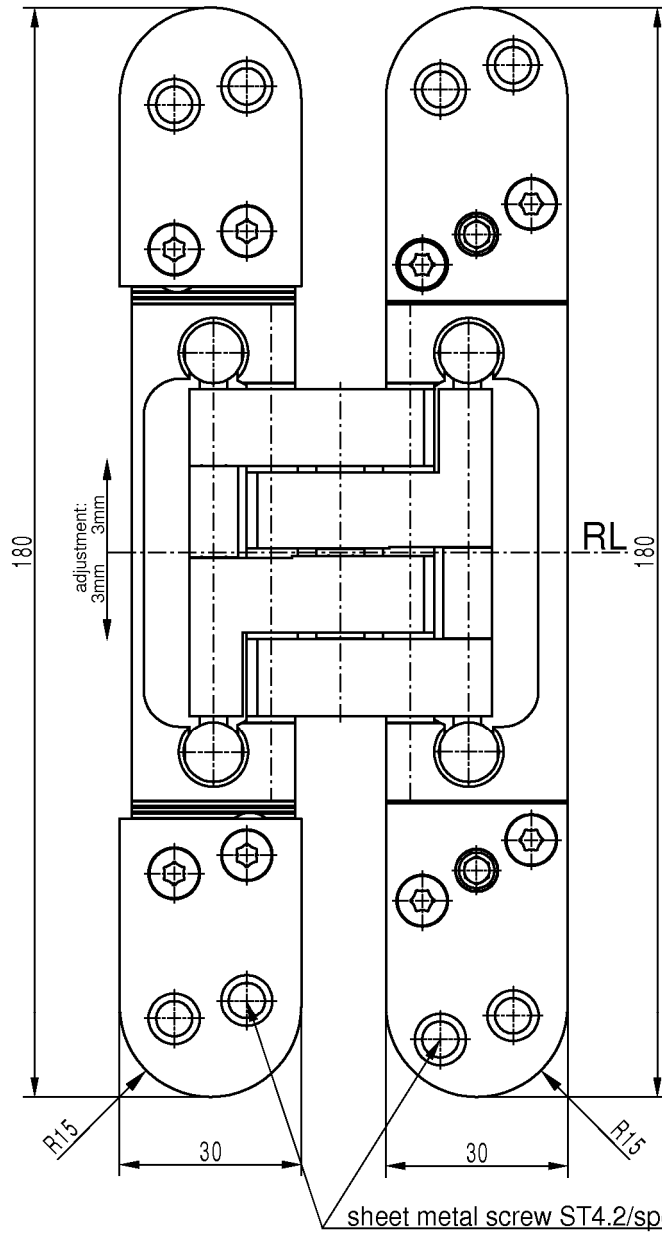
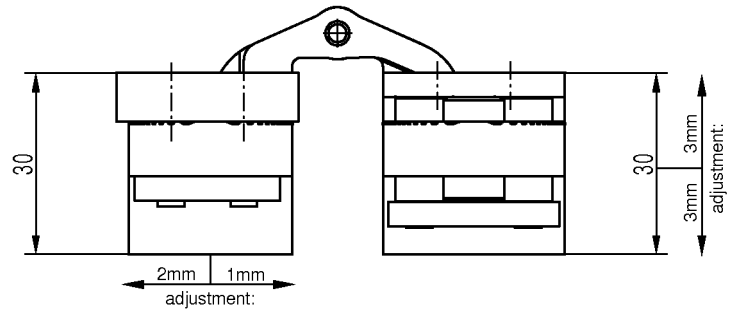
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Variable concealed multi-axis hinges DXS 100 3-D Steel

Construction

Annex 8



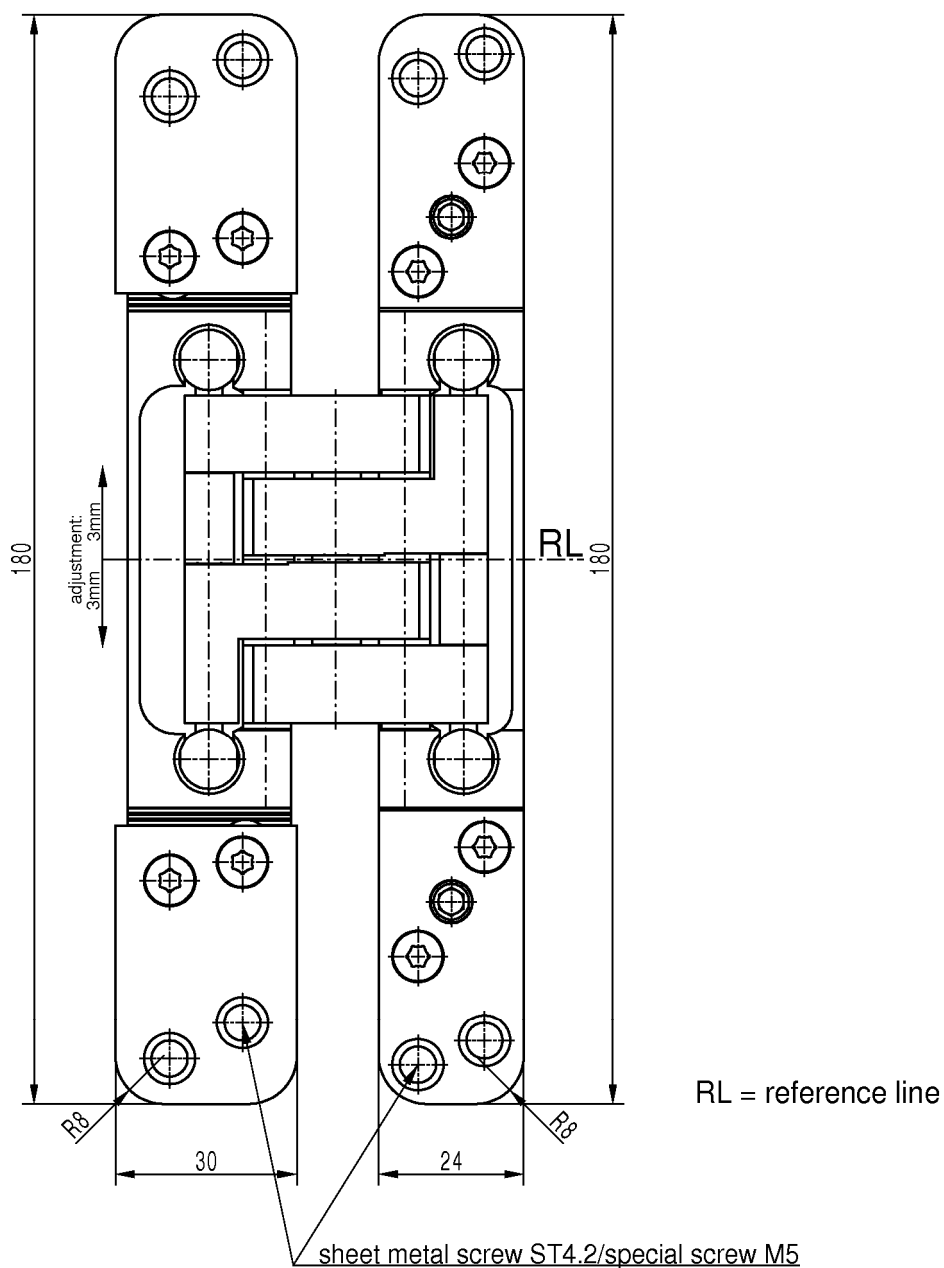
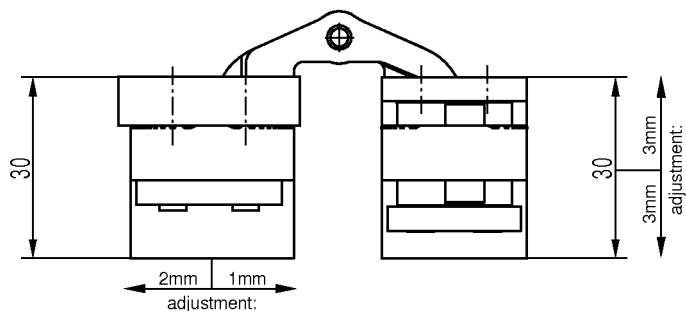
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Variable concealed multi-axis hinges DXS 101 3-D Steel

Construction

Annex 9

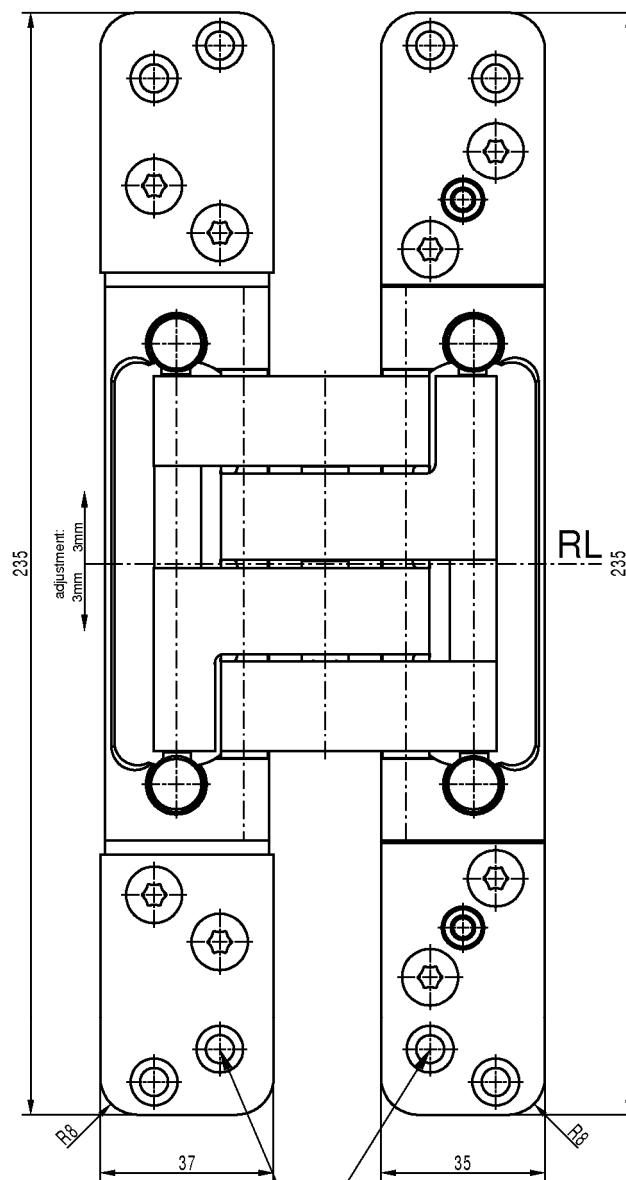
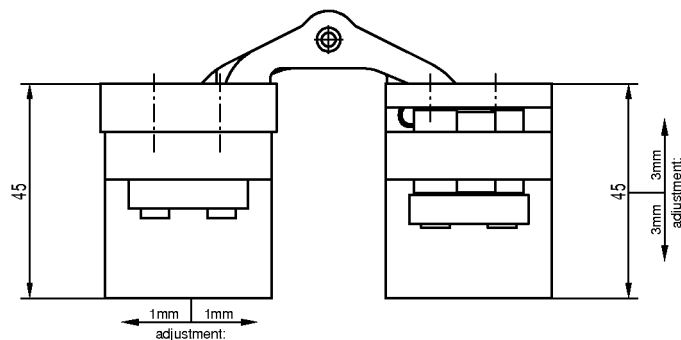


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Variable concealed multi-axis hinges DXS 102 3-D Steel

Construction

Annex 10



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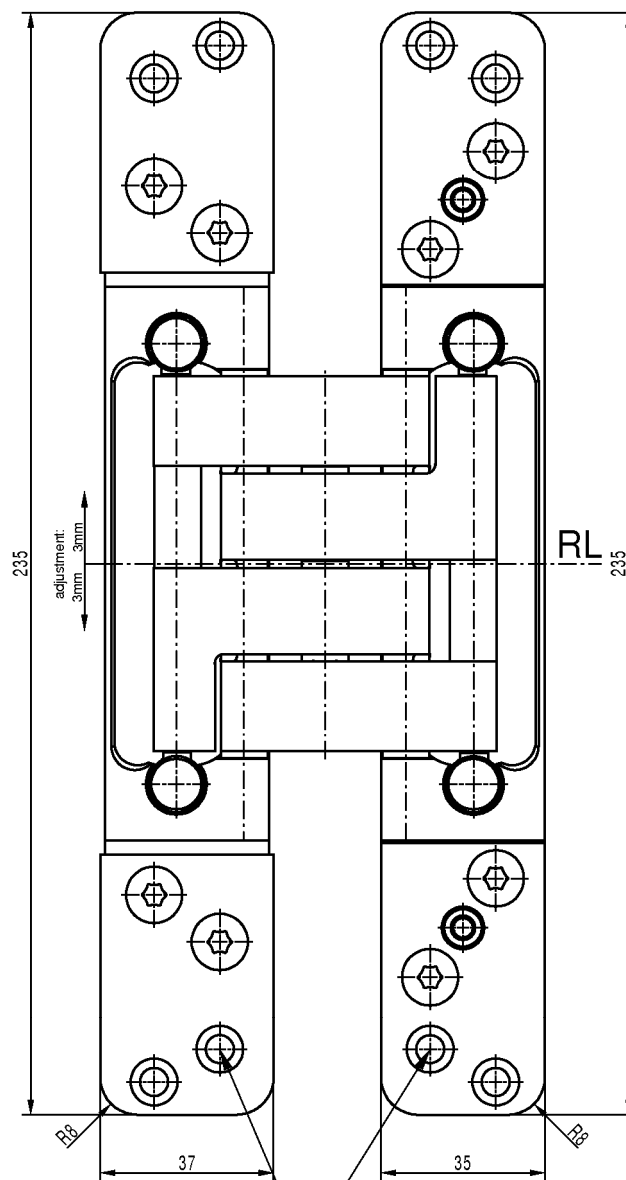
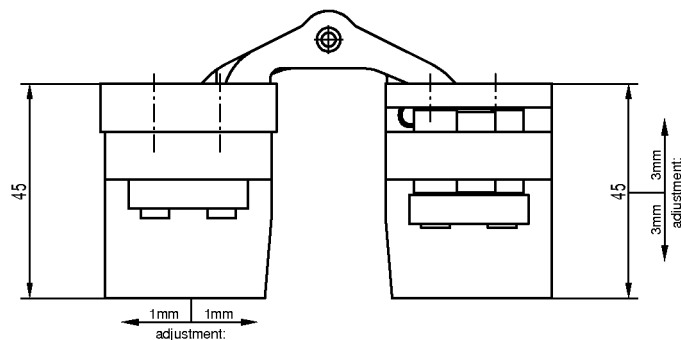
wood screw Spax 5/countersunk head screw M5

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Variable concealed multi-axis hinges DX 120 3-D

Construction

Annex 11



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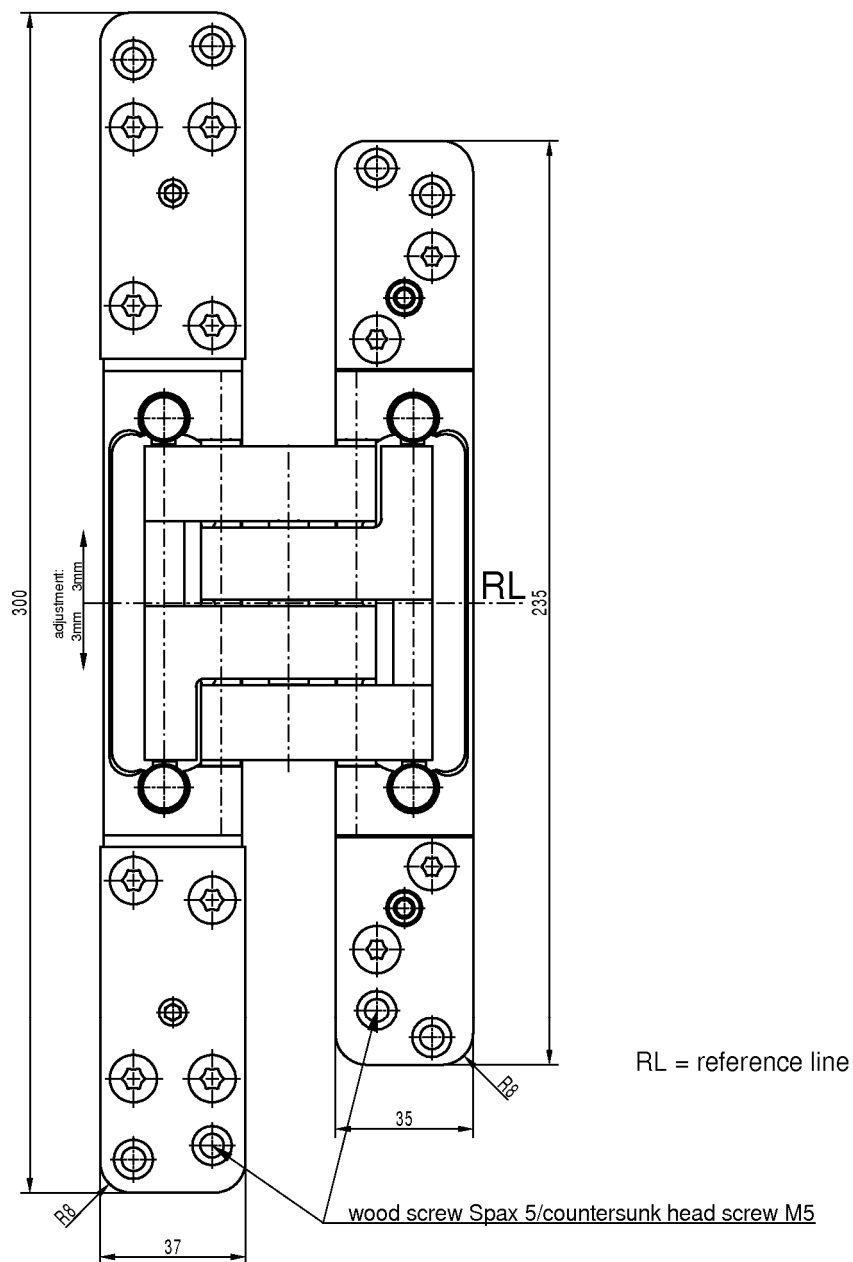
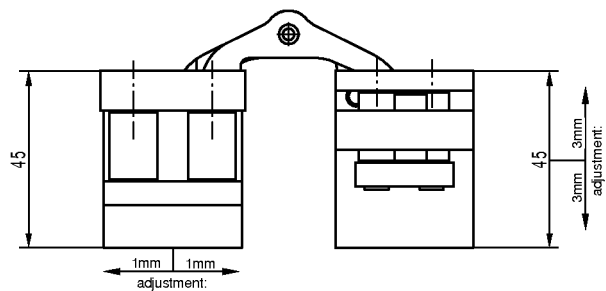
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Variable concealed multi-axis hinges DX 180 3-D

Construction

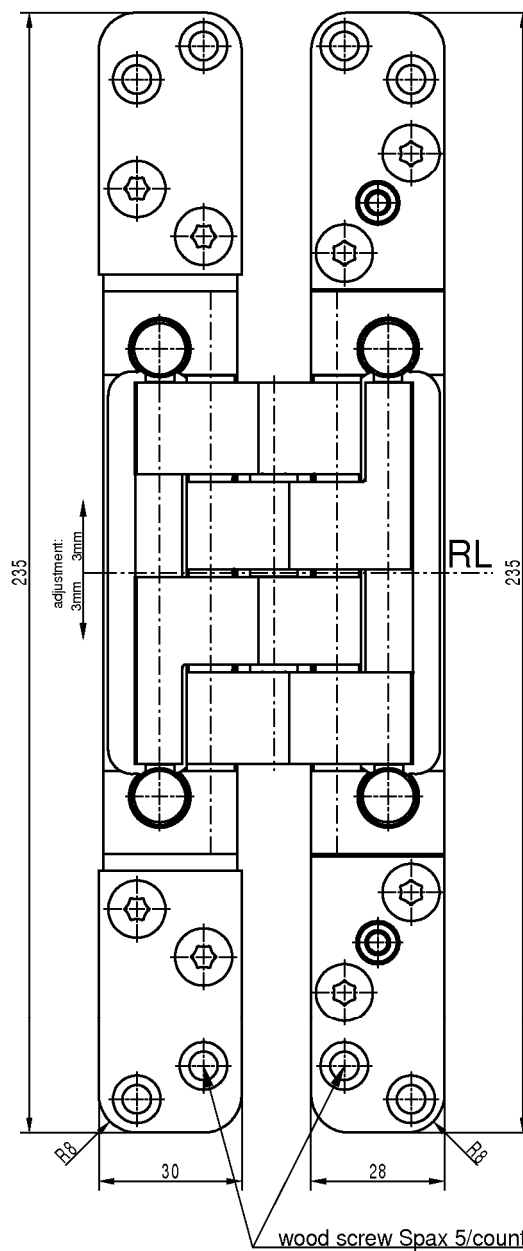
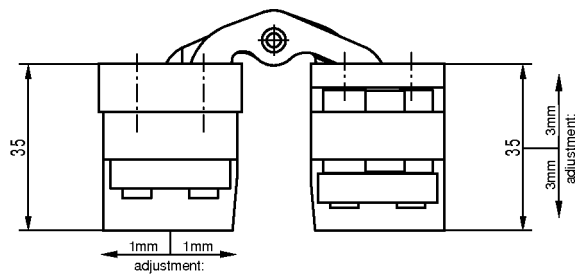
Annex 12



Variable concealed multi-axis hinges DX 180 3-D IHA

Construction

Annex 13



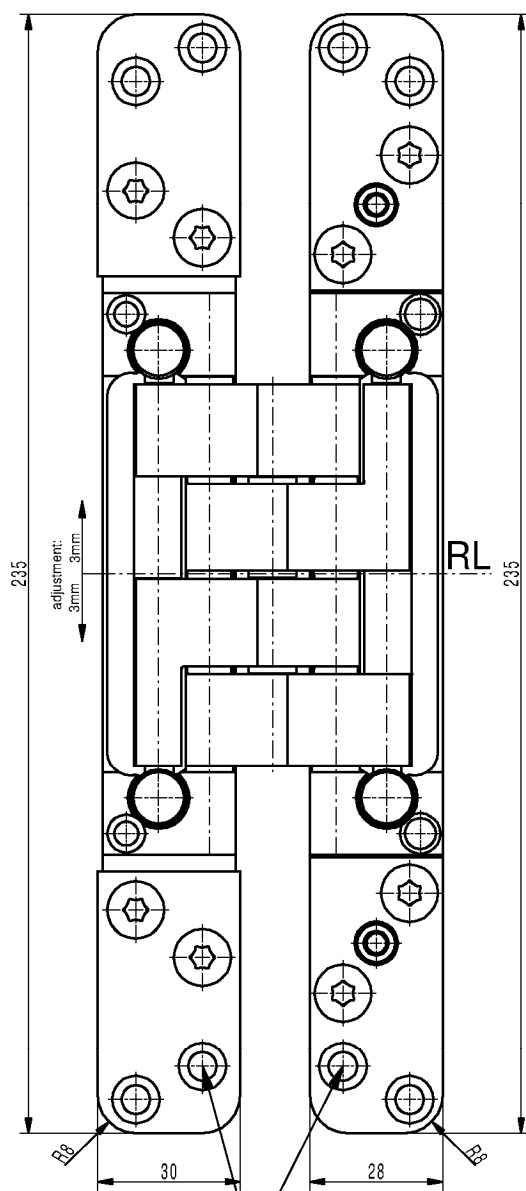
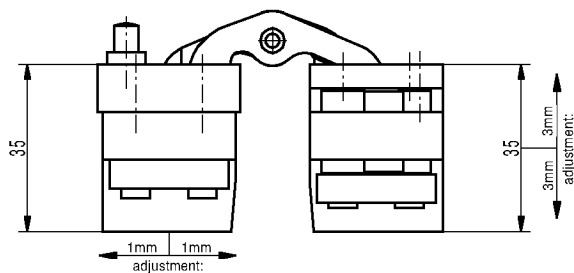
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Variable concealed multi-axis hinges DX 200 3-D

Construction

Annex 14



RL = reference line

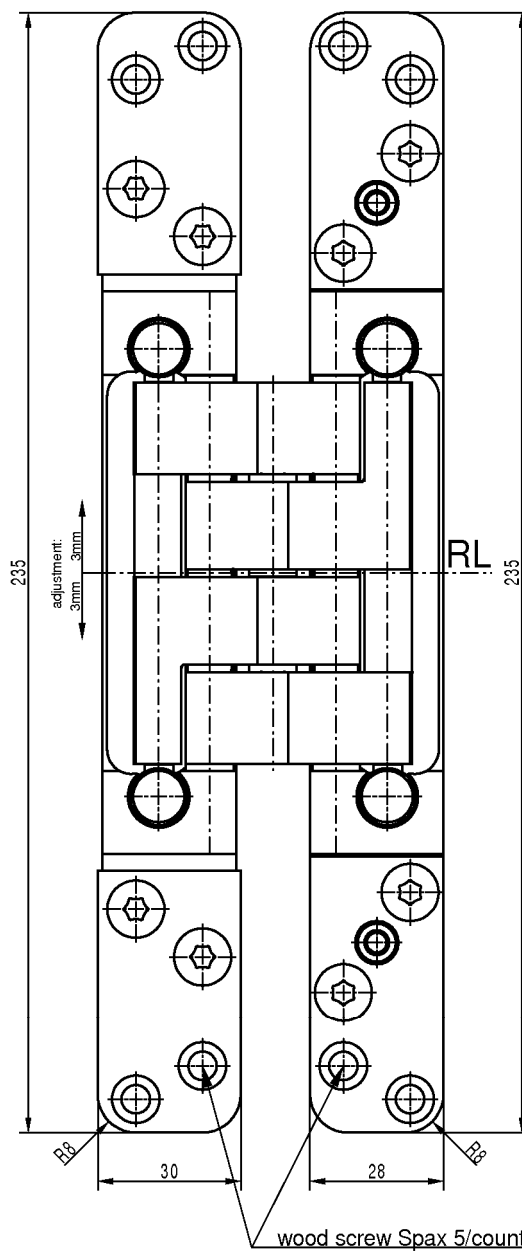
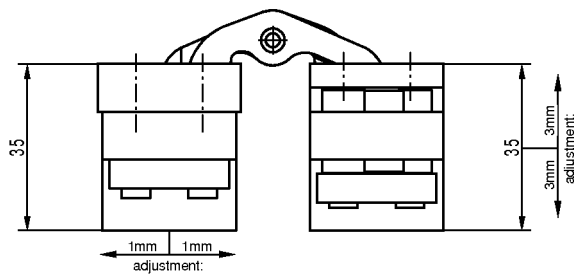
wood screw Spax 5/countersunk head screw M5

Electronic copy of the ETA by DIBt: ETA-08/0209

Variable concealed multi-axis hinges DX 200 3-D Safe

Construction

Annex 15



RL = reference line

Electronic copy of the ETA by DIBt: ETA-08/0209

Variable concealed multi-axis hinges DXA 200 3-D Alu

Construction

Annex 16