Hinges/by John Planck

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architectural hardware

Hinges

Hinges are a fundamental ingredient for making sure a door operates for as long as possible easily and safely. This means the correct selection of hinge type for the situation it's intended for is vital.

There are many different types of hinges including butt, security, flush, concealed, rising, piano and tee. There are more as you will see in this section and even within these categories there are variations of each type.

When deciding on the most suitable hinge for each application, you need to consider several things, such as: the adjusted door weight (which includes the additional weight as a result of a door closer being fitted); appearance to match both the environment and product; position of doors or windows within a building and their direction of opening; type of building use (e.g. hospital) and its location (e.g. coastal situation); frequency of use as well as security and fire resistance requirements. There is more information on these within the following pages.

Icons

Overall height

Overall length or width

Certifire approved products

CE marked

Load carrying capacity

CE Marking

CE Marking is the easiest and safest route to providing compliance with the latest UK Construction Products Directive for hardware used on fire, smoke and escape doors.

CE Marking indicates that the product has been 3rd party performance tested where applicable and is produced in a factory which has satisfactory production control systems. All of these have been assessed by an authorised certification body.

Finishes

ABUL	Antique Brass Unlacquered	**NP**	Nickel Plated	**SCS**	Self Coloured Steel
BLK	Black	**PBL**	Polished Brass Lacquered	**SCB**	Self Coloured Brass
BMA	Bronze Metal Antique	**PBP**	Polished Brass Plated	**SLV**	Silver Lacquered
BZP	Bright Zinc Plated	**PCP, CP**	Polished Chrome Plated	**SNP**	Satin Nickel Plated
EBP	Electro Brass Plated	**PNP**	Polished Nickel Plated	**SPB**	Simulated Polished Brass
EPC	Epoxy Powder Coated	**PSS**	Polished Stainless Steel	**SSS**	Satin Stainless Steel
FB	Florentine Bronze	**SB**	Satin Brass Plated	**SSSP**	Satin Stainless Steel Plated
GLV	Galvanised	**SBL**	Satin Brass Lacquered	**SZP**	Satin Zinc Plated
IBMA	Imitation Bronze Metal Antiqued	**SCP**	Satin Chrome Plated	**ZP**	Zinc Plated
SAA	Satin Anodised Aluminium	**SCA**	Self Coloured Aluminium		

The finish of the hinge is also very important, not only for aesthetics, but for more practical reasons. Please consider the door's location and weather resistance, then choose a hinge that will offer suitable protection against the corrosive elements.

Specification Notes

BS EN1935: 2002 – Building hardware Single Axis hinges
The standard provides details on product types, classification by use, test cycles, door mass, corrosion resistance, as well as definitions, product performance requirements, test apparatus, test methods and making of products. In addition, the published standards include annexes illustrating the various points made through diagrams and supplementary text.

This European Standard has replaced the previous national product performance standard BS 7352: 1990 Strength and durability performance of metal hinges for side hanging applications and dimensional requirements for template drilled hinges.

SCOPE:
The standard includes a wide range of hinges and includes single axis hinges and lift off hinges for use on windows and doors.

CATEGORY OF USE:
For all internal or external doors for use by the public or others, with little or no incentive to take care. i.e. where there is chance of misuse of the door.

Grade 1: Light duty. Example: Domestic or office situation, areas with no access to general public.

Grade 2: Medium duty. Example: Domestic and office situation where limited access is allowed to the general public.

Grade 3: Heavy duty. Example: Public and institutional buildings such as libraries, hospitals and schools.

Grade 4: Severe duty.

NUMBER OF TEST CYCLES:
When deciding on finish and the best hinge for each application take into account; appearance to match both the environment and product; position of doors or windows within building and direction of opening; type of building use e.g. hospital and its location, coastal situation; frequency of use; (see tables A&B) security and fire resistance requirements.

TESTING – refer to Table A
There are three categories identified for hinges manufactured to this standard.

Grade 3: 10,000 test cycles. **Grade 4:** 25,000 test cycles. **Grade 7:** 200,000 test cycles

TEST DOOR MASS:
Eight test door mass grades are identified according to table 1 of the BS EN1935: 2002 standard.

FIRE BEHAVIOUR:
Two grades of fire behaviour are identified for hinges manufactured to this standard.

Grade 0: Not Suitable for use on fire resistant and / or smoke control door assemblies

Grade 1: Suitable for use on fire / smoke resistant door assemblies subject to satisfactory assessment of the contribution of the hinges to the fire resistance of the specified fire / door assemblies.

Specification Notes

SAFETY:
All hinges are required to satisfy the essential requirement of safety in use. Therefore only **Grade 1** is identified.

CORROSION RESISTANCE:
Five grades of corrosion resistance are identified according to BS EN1670:
Grade 0: No defined corrosion resistance to **Grade 4:** Very high resistance.

SECURITY – BURGLAR-RESISTANCE:
Two grades of security are identified for hinges manufactured to this European Standard:

Grade 0: Not suitable for use on burglar –resistant door assemblies;

Grade 1: Suitable for use on burglar resistant door assemblies, subject to satisfactory further assessments

HINGE GRADE:
Fourteen grades of hinge are identified in this European Standard as detailed in Table A.

Table A

Grade	Max. mass of hinged door leaf kgs.	Max annual number of operations (cycles)
1	10	10,000
2	20	10,000
3	20	25,000
4	20	200,000
5	40	10,000
6	40	25,000
7	40	200,000
8	60	10,000
9	60	25,000
10	60	200,000
11	80	200,000
12	100	200,000
13	120	200,000
14	160	200,000

CE MARKING
The standard requires that single axis hinges manufactured in accordance with this standard for use on fire-resistant and or/smoke control doors or locked doors on escape routes, shall be marked as follows:

a) The manufacturers name or trademark or other means of identification

b) The hinge grade according to Table A

c) The number of the European Standard (BS EN 1935)

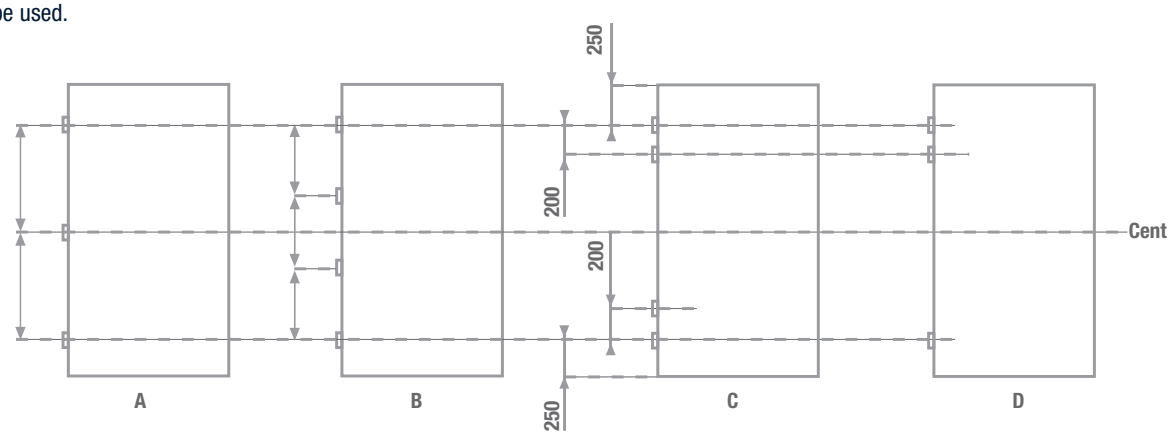
FIRE RATED HINGES
Hinges supplied for use on fire and escape door sets should be supplied and fitted complete with intumescent pads, which must be fitted behind each hinge flap, between the timber door and frame and the metal hinge leaves.

NUMBER OF HINGES:
Normally three hinges are fitted to each door leaf in accordance with BS 4787 part 1. For doors exceeding 2100mm in height a fourth hinge should be used.

HINGE INSTALLATION:
Hinges should be installed in accordance with the door manufacturer's recommendations and instructions. Where no such instructions are available care must be taken to ensure that the hinges are correctly aligned and fixed securely to door and frame. The screw holes should be piloted and screwheads must be flush with the hinge face to ensure that the door closes properly.

HINGE POSITIONING:
It is usually acceptable to line up the centre hinge with the door handle. Equally spaced hinges will minimise warping which may occur in environments with extremes of temperature or humidity on either side of the door, Fig.1, a and b.

Unequally spaced hinges Fig.1, c and d, improve load bearing. This is recommended where the hinges are operating near their load bearing maximum or where door closers, particularly back check door closers, are in operation and the door has a high frequency of use.



Specification Notes

LIFT-OFF AND RISING/FALLING HINGES:
Lift-off, rising and falling hinges are handed and must be specified to operate in either a clockwise closing or an anti-clockwise closing direction. The leaf with the pin in the upwards position must be fitted to the frame. Hinge operation is either clockwise closing or anti-clockwise closing and should be specified using the ISO 5 clockwise closing and ISO 6 anti-clockwise closing convention.

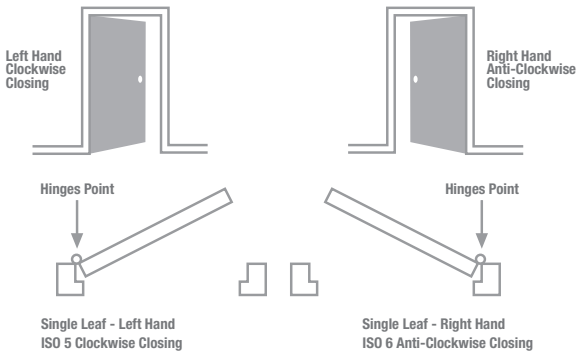


Table B - Door situation and estimated number of operations:

High frequency heavy duty situations:	**Daily**	**Anually**
Large departmental store entrances	5,000	1,500,000
Large office building entrance	4,000	920,000
Cinema or theatre entrance	1,300	455,000
School entrance	1,250	22,500
Entrance door to school toilets	1,250	22,500
City centre shop entrance	1,000	300,000
Large city bank entrance	1,000	250,000
School corridor fire door	600	108,000
Town bank entrance	500	125,000
City centre restaurant entrance	500	150,000
Large office corridor fire door	450	120,000
Large office or factory toilet entrance	400	92,000
Hospital ward door	350	128,000

Medium frequency medium duty situations:	**Daily**	**Anually**
School classroom door	80	15,000
Office door	75	18,000
Store toilet door	60	18,000
Dwelling rear or side entrance	15	5,400
Dwelling front entrance	12	4,400

Low frequency light duty situations:	**Daily**	**Anually**
Dwelling living room communications doors	30	10,800
Dwelling bathroom/ toilet door	20	7,200
Dwelling cupboard door	12	4,300
Dwelling bedroom door	9	3,200
Dwelling wardrobe/ closet door	6	2,200
Dwelling cabinet furniture door	5	1,800

Table C - Mass ranges of typical doors:

	Size (mm)	**Mass)kg)**	**Duty**
Cupboard, wardrobe, cabinet, louvered doors and shutters	2040 x 626 x 40	3 to 10	Light
Light internal large wardrobe and large louvered doors	2040 x 926 x 40	10 to 17.5	Light
Medium internal doors	2040 x 1012 x 40	17.5 to 25	Medium
Heavy internal doors	2040 x 1012 x 40	25 to 37.5	Medium
Half hour fire doors	2040 x 826 x 44	25 to 37.5	Heavy
Light external doors	2040 x 907 x 40	20 to 37.5	Heavy
Heavy external doors	2040 x 1002 x 44	37.5 to 55	Heavy
One hour fire doors	2040 x 826 x 54	37.5 x 72.5	Heavy
Oversize or special external doors	2040 x 1200	55 to 110	Heavy

Specification Notes

Table D - Side loading calculations:

Door Size		Factor	Normal increase of mass of door leaf %
Door Height mm	Door Width mm		
2000	1000	2	0
2000	1050	1.9	10
2000	1100	1.82	18
2000	1150	1.74	26
2000	1200	1.66	33
2000	1250	1.6	40

Table E - Side loading calculations:

	Doors of excess width, please refer to Side Loading Calculation table		
Actual Door Weight	Door Closer	+20%	**= Adjusted Door Weight**
	Door Closer (Backcheck)	+75%	
	Extra Heavy Use	+10%	
	Light Use	-10%	

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Concealed bearing maintenance free hinge

102mm 76mm
102mm 89mm
102mm 102mm

Thickness 3.0mm

BS EN1935:2002

CE certifire

D30

SSS PSS

160 Grade 14 internal or external use

D31
Radius Corner

32 year maintenance free

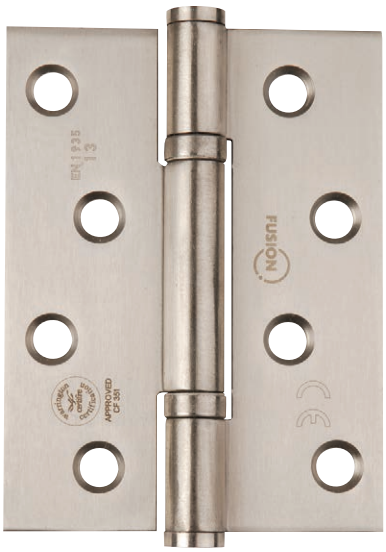
D20

SNP PNP SCP PCP SZP BZP BMA SPB SB EPC

120 Grade 13 internal use only

D21
Radius Corner

25 year maintenance free



Performance bearing maintenance free hinge

102mm 76mm
102mm 89mm

Thickness 2.5mm

BS EN1935:2002

CE certifire

D15

SSS PSS

120 Grade 13 internal or external use

D16
Radius Corner

25 year maintenance free

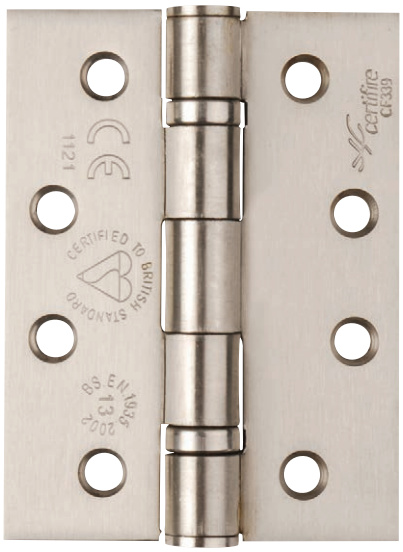
D10

SNP PNP SCP PCP SZP BZP BMA SPB SB EPC

100 Grade 12 internal use only

D11
Radius Corner

25 year maintenance free



BM2015
Ball bearing hinge

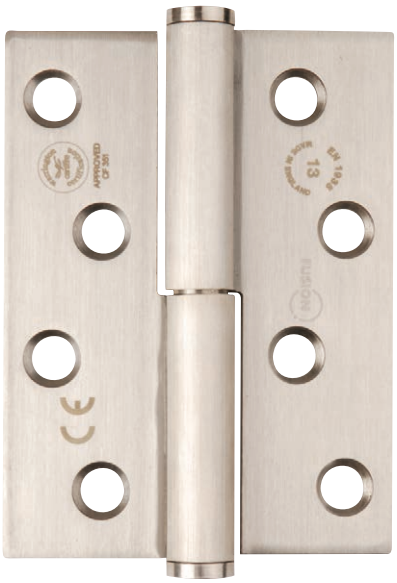
76mm	51mm	Grade 7	40
76mm	67mm	Grade 11	80
102mm	76mm	Grade 11-13	80 - 120
102mm	102mm	Grade 13	80 - 120

Thickness 2.5 or 3.0mm available

SSS PSS SPB

BS EN1935:2002

certifire CE



Concealed bearing
maintenance free lift off hinge

D44/
/ISO6 - anti clockwise closing

D45/
/ISO5 - clockwise closing

102mm	76mm
102mm	89mm
102mm	102mm

Thickness 2.5mm

32 year maintenance free
BS EN1935:2002

SNP PNP SCP PCP SZP BZP BMA SPB SB

120 Grade 13 internal use only

certifire CE

BM2401
Adjustable concealed high performance hinge

40	A	155mm	21mm
	APT	155mm	21mm
80	B	160mm	28mm
	BFR	160mm	28mm
	BPT	200mm	32mm
120	C	200mm	32mm
	CFR	200mm	32mm
	CPT	200mm	32mm
100	D	155mm	26mm
	E	155mm	26mm
200	F	240mm	32mm
	FFR	240mm	32mm
	FPT	240mm	32mm
300	G	280mm	36mm
	GFR	280mm	36mm

The fire rated versions are in accordance with BE EN1634 and a minimum of 3 hinges per leaf must be used.

The Power Transfer versions transfer energy through 16 wires at 0.8A per wire, maximum voltage 60.0V (24V or more with fuse secured power supply)

PBP SSS SSSP SNP PNP IBMA EPC SCP

BM2402
Adjustable concealed high performance hinge for up to 8mm cladding

100	A	200mm	32mm
	AFR	200mm	32mm
	APT	200mm	32mm
160	B	240mm	32mm
	BFR	240mm	32mm
	BPT	240mm	32mm

The fire rated versions are in accordance with BE EN1634 and a minimum of 3 hinges per leaf must be used.

The Power Transfer versions transfer energy through 16 wires at 0.8A per wire, maximum voltage 60.0V (24V or more with fuse secured power supply)

PBP SSS SSSP SNP PNP IBMA EPC SCP

BM2403
Adjustable concealed high performance hinge for doors with up to 14mm reveal

100	A	185mm	33mm

The fire rated versions are in accordance with BE EN1634 and a minimum of 3 hinges per leaf must be used.

BM2404
Routing jig for concealed high performance hinges

BM2405
Routing template kit for concealed high performance hinges (hinge reference to be specified)

D38/
/IS06 Rising hinge - anti clockwise closing

D39/
/IS05 Rising hinge - clockwise closing

50 100mm 77mm

13mm Rise over 180 deg standard
10mm Rise available as an option

SSS PSS

Minimum door thickness 29mm

D40/
/IS06 Falling hinge - anti clockwise closing

D41/
/IS05 Falling hinge - clockwise closing

50 100mm 77mm

SSS PSS

Minimum door thickness 29mm

BM2010
/IS06 - anti clockwise closing

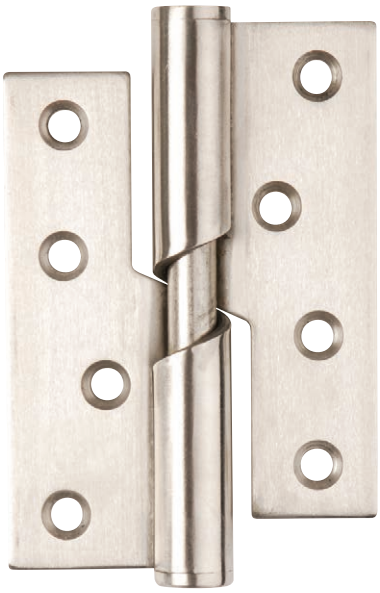
BM2010
/IS05 - clockwise closing

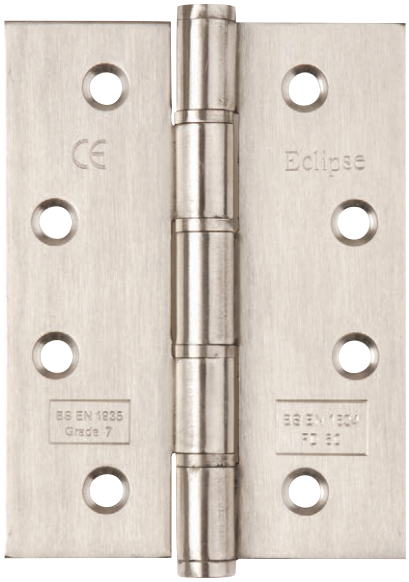
Rising hinge

75mm 70mm

102mm 81mm

SSS PSS BZP EBP PCP





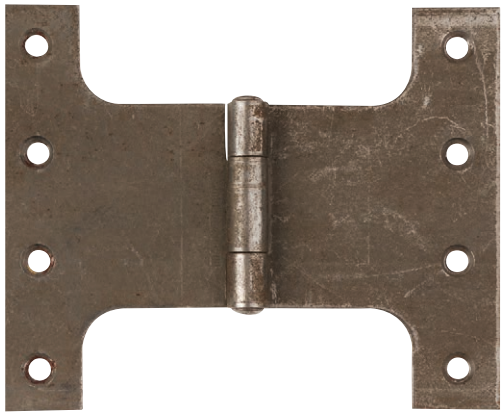
BM2411
Stainless steel washered hinge

76mm 51mm
Grade 7 102mm 76mm

SSS PSS

BS EN1935:2002

CE



BM2036
Parliament hinge

76mm 121mm
100mm 152mm

BZP EBP PCP

BM2001
Strong pattern steel hinge

76mm 61mm
Grade 7 100mm 74mm

SZP BZP SCP EBP PCP SCS

Fixed pin (loose pin also available)

BS EN1935:2002

CE (100mm only)

BM2000
Light pattern steel hinge

50mm	36mm
64mm	45mm
76mm	49mm
90mm	60mm
100mm	74mm
152mm	102mm

SCS BZP EBP PCP

BM2009
Cast iron hinge

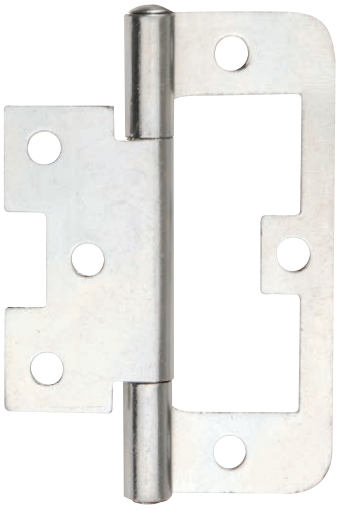
76mm	50mm
100mm	63mm

SCS EPC BLK BZP

BM2007
Flush steel hinge

40, 50, 60, 75mm

EBP BZP PCP



BM2031
Single action spring hinge

10	75mm	to suit 20-25mm thick doors
15	100mm	to suit 21-30mm thick doors
25	125mm	to suit 25-35mm thick doors
35	150mm	to suit 25-40mm thick doors
45	175mm	to suit 33-50mm thick doors
55	200mm	to suit 35-55mm thick doors

SLV PCP SSS PB

Also available: 100x75mm 30 Minute Fire Rated, for use on internal doors only.

BM2032
Double action spring hinge

10	75mm	to suit 20-25mm thick doors
15	100mm	to suit 21-30mm thick doors
25	125mm	to suit 25-35mm thick doors
35	150mm	to suit 25-40mm thick doors
45	175mm	to suit 33-50mm thick doors
55	200mm	to suit 35-55mm thick doors

SLV PCP SSS PB

BM2038
Tee hinge light pattern
150, 200, 230, 254mm

BM2039
Tee hinge medium pattern
150, 200, 254, 305, 356, 406mm

BM2040
Tee hinge heavy pattern
150, 200, 254, 305, 356, 406, 457, 600mm

BLK BZP

BM2041
Hook and band hinge
Available with flat plate fixing, bolt through post fixing and hooks to build into brickwork

BM2042
Cranked hook and band hinge

200, 250, 305, 356, 406, 457, 508, 600, 750, 900, 1054, 2000mm

SC GLV SCS

BM2405
Concealed bearing hinge

120	Grade 13	100mm	75mm
120	Grade 13	100mm	88mm
120	Grade 13	100mm	100mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BE EN1935:2002

CE certifire

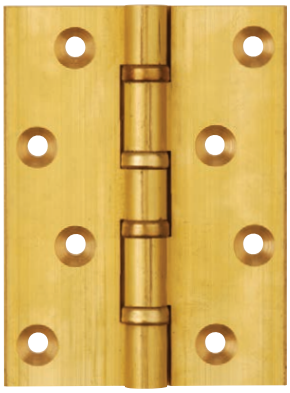
BM2022
Ball race brass butt hinge

	60	Grade 10	100mm	65mm	80	Grade 11	125mm	75mm
CE	60	Grade 10	100mm	65mm	CE 80	Grade 11	125mm	75mm
	80	Grade 11	100mm	75mm	80	Grade 11	150mm	75mm
CE	80	Grade 11	100mm	75mm	CE 80	Grade 11	150mm	75mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BE EN1935:2002

CE marked hinges are supplied with intumescent pads



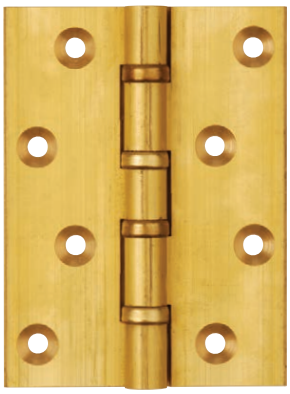
BM2022
Ball race brass projection hinge

	80	Grade 11	100mm	100mm	80	Grade 11	125mm	125mm
CE	80	Grade 11	100mm	100mm	CE 80	Grade 11	125mm	125mm
	80	Grade 11	150mm	100mm	80	Grade 11	150mm	125mm
CE	80	Grade 11	150mm	100mm	CE 80	Grade 11	150mm	125mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BE EN1935:2002

CE marked hinges are supplied with intumescent pads



All above are available with finials, the part numbers should be suffixed for the applicable type, i.e. Ball or Urn finial. Dog bolt versions also available, suffix DB.

BM2019
Double stainless steel washered brass butt hinge

20 Grade 4	75mm	50mm
40 Grade 7	100mm	65mm
40 Grade 7	100mm	75mm

BS EN1935:2002

BM2021
Double stainless steel washered brass projection hinge

20 Grade 4	75mm	75mm
40 Grade 7	100mm	100mm

BS EN1935:2002

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BM3001
Double phosphor bronze washered brass butt hinge

20 Grade 4	75mm	50mm	40 Grade 7	125mm	75mm
40 Grade 7	100mm	65mm	CE 40 Grade 7	125mm	75mm
40 Grade 7	100mm	75mm	40 Grade 7	150mm	75mm
CE 40 Grade 7	100mm	65mm	CE 40 Grade 7	150mm	75mm
CE 40 Grade 7	100mm	75mm			

BS EN1935:2002

CE marked hinges are supplied with intumescent pads

BM3002
Double phosphor bronze washered brass projection hinge

40 Grade 7	100mm	100mm	40 Grade 7	125mm	100mm
CE 40 Grade 11	100mm	100mm	40 Grade 7	150mm	100mm
80 Grade 7	100mm	125mm	CE 40 Grade 11	150mm	100mm
80 Grade 11	100mm	150mm	80 Grade 11	150mm	125mm
80 Grade 11	100mm	200mm	80 Grade 11	150mm	150mm

BS EN1935:2002

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BM2018
Unwashered brass butt hinge

	38mm	23mm	20 Grade 4	75mm	50mm
	51mm	28.5mm	20 Grade 4	75mm	60mm
	51mm	38mm	20 Grade 4	100mm	60mm
	63mm	28.5mm	20 Grade 4	100mm	65mm
	63mm	35mm	20 Grade 4	100mm	75mm
10 Grade 1	75mm	35mm	20 Grade 4	125mm	75mm
10 Grade 1	75mm	42mm	20 Grade 4	150mm	75mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BS EN1935:2002

All above are available with finials, the part numbers should be suffixed for the applicable type, i.e. Ball or Urn finial. Dog bolt versions also available, suffix DB.

BM2406
Unwashered brass projection hinge

20	Grade 4	75mm	75mm
20	Grade 4	100mm	100mm
20	Grade 4	125mm	100mm
20	Grade 4	150mm	100mm
40	Grade 4	125mm	125mm
40	Grade 4	150mm	125mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BS EN1935:2002

BM2012/
/IS05 Brass rising hinge, clockwise closing
/IS06 Brass rising hinge, anti-clockwise closing

40	Grade 7	75mm	65mm
45	Grade 7	100mm	65mm

BM2012/SPT/
/IS05 Support hinge for rising hinges, clockwise closing
/IS06 Support hinge for rising hinges, anti-clockwise closing
Increases load carying capacity

65	Grade 10	75mm	65mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BS EN1935:2002

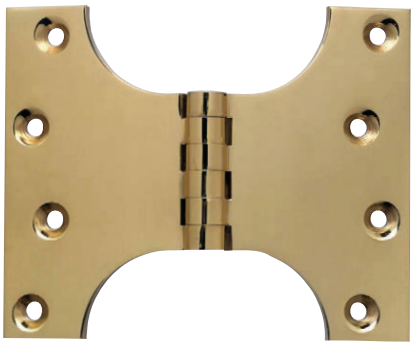
BM2013/
/IS05 Brass falling hinge, clockwise closing
/IS06 Brass falling hinge, anti-clockwise closing

40	Grade 7	75mm	65mm
45	Grade 7	100mm	65mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BS EN1935:2002

All above are available with finials, the part numbers should be suffixed for the applicable type, i.e. Ball or Urn finial. Dog bolt versions also available, suffix DB.

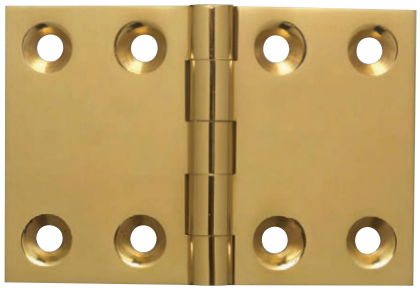


BM2035
Brass parliament hinge

25	Grade 4	102mm	64mm	102mm
30	Grade 4	102mm	76mm	127mm
35	Grade 4	102mm	102mm	152mm

SCB SBL PBL SCP PCP SNP PNP IBMA ABUL

BS EN1935:2002



BM2023
Brass backflap hinge

5		32mm	48mm
10	Grade 1	38mm	60mm
15	Grade 1	51mm	76mm
15	Grade 1	63mm	100mm
20	Grade 4	76mm	127mm

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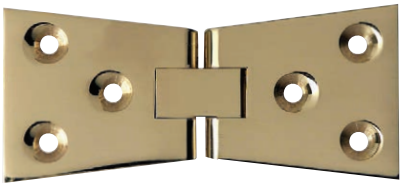

BM2407
Brass counterflap hinge

5		25mm	76mm
10	Grade 1	32mm	101mm
10	Grade 1	38mm	114mm

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All above are available with finials, the part numbers should be suffixed for the applicable type, i.e. Ball or Urn finial. Dog bolt versions also available, suffix DB.

BM2408/
Continuous hinge

1829mm

51, 76, 102, 182mm (open width)

/MD
Medium duty continuous hinge
Thicknesses: 1.2, 1.6, 2.0mm

/HD
Heavy duty continuous hinge
Thicknesses: 2.5, 3.0, 4.0, 5.0mm

Material and finishes:

Steel: SCS ZP
Stainless steel: SSS PSS
Aluminium: SCA SAA
Brass: SCB PCP SCP

BM2409
Light duty continuous piano hinge

1829mm

25, 32, 38, 51mm (open width)

Thicknesses: 0.6, 0.9, 1.2 & 1.6mm

Material and finishes:

Steel: SCS ZP FB EBP NP BMA PCP
Stainless steel: SSS PSS
Aluminium: SCA SAA
Brass: SCB PCP SCP

CM3227
Hinge bolt

48mm

13mm

ZP EBP WHITE BROWN

BM2410/
Pivot finger protection system c/w floor pivot

/2.1	2.1m Non fire rated	/2.4	2.4m Non fire rated
/2.1FR30	2.1m 30 minute fire rated doors	/2.4FR60	2.4m 30 minute fire rated doors
/2.1FR60	2.1m 60 minute fire rated doors	/2.4FR60	2.4m 60 minute fire rated doors

BM2410/
Pivot finger protection system c/w floor and frame pivot

/2.1	2.1m Non fire rated	/2.4	2.4m Non fire rated
/2.1FR30	2.1m 30 minute fire rated doors	/2.4FR60	2.4m 30 minute fire rated doors
/2.1FR60	2.1m 60 minute fire rated doors	/2.4FR60	2.4m 60 minute fire rated doors

SAA

Other finishes available on request.

Versions are available to work with floor springs and concealed closers - information available upon request.

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V1.1