HINGES FOR OUTWARD OPENING APPLICATIONS

Friction Hinges

Parts Brochure

Friction Hinges
Index

Friction Hinges
Product Liability Guidelines

Turn-Only Hardware for windows and balcony doors

According to the defined manufacturer's liability described in paragraph 4 of the "product liability law", the following information regarding Turn-Only Hardware for window and balcony door sashes should be observed. Non-compliance exempts the manufacturer of his liability.

1. Product information and specified application.

Turn-Only Hardware as covered by this definition is one-hand-operation Turn-Only Hardware for windows and balcony doors in building construction. This is used to enable windows and balcony-door sashes into a turning position by operating a 'hand lever' (handle).

Turn-Only Hardware is used on vertically installed windows and balcony- doors made of timber, PVC, aluminium or steel and their corresponding material combinations. Conventional Turn-Only Hardware as covered by this definition, lock window and balcony-door sashes and enable various ventilating positions. When closing, the gasket counter force must be overcome as a rule.

Differing applications do not correspond to its specified application. Burglar-resistant window and balcony doors, window and balcony doors for damp rooms and those for use in environments with aggressive, corrosive air content, require hardware adapted for the respective application and individually agreed upon performance features.

Opened windows and balcony-door sashes achieve only a shielding function and do not meet any demands on joint impermeability, water tightness, sound reduction, heat insulation and burglary resistance.

In the case of wind and draught, the window and balcony-door sashes must be closed and locked. Wind and draught as covered by this definition is present, if a window or balcony door sash while in one of it's opening positions, can open or close on it's own, in an uncontrolled manner by means of either air pressure or air suction. A static opening position of windows and balcony door sashes can only be achieved with additional hardware. The resistance against wind loads in a closed and locked state is dependent on the respective designs of windows & balcony doors. Should wind loading in accordance with DIN EN 12210 occur (in particular pressure test p3), suitable hardware compilations are to be matched in relation to the respective window design and frame material, and each case individually agreed upon.

Generally speaking, Turn-Only Hardware can fulfil the demands made for barrier-free dwellings according to DIN 18025. However corresponding hardware compilations and installations for windows and balcony doors are necessary, which must be coordinated and each case individually agreed upon.

2. Misuse

Misuse - therefore not the specified product utilisation - of Turn Only hardware for windows and balcony doors occurs in particular:

- if obstacles are inserted in the opening vicinity between frame and sash, thus preventing its proper specified use.
- when window and balcony door sashes are pressed advertently or uncontrolled (for example by the wind) up against the window reveals, so that the hardware, the frame material or other individual window or balcony-door sash components are damaged or destroyed and/or if consequential damage can arise.
- if additional loads are put on windows or balcony-door sashes (for example if children swing on the window or balcony door sash),
- if while closing the windows and balcony door sashes, someone reaches into the rebate between the sash and frame (injury hazard).

3. Liability

The respective entire hardware set may only consist of hardware components from Roto's outward opening range. In the case of inappropriately assembled hardware, and/or in case of non original accessory components and/or non factory-approved accessory components, no liability is accepted.

4. Product performance

4.1 Maximum sash weights

The following listed maximum sash weights for the individual hardware versions may not be exceeded. The building component with the least permissible load-carrying capacity determines the max. sash weight. Application diagrams and component allocation are to be observed.

4.2 Sash sizes

The presentation of the application diagrams shows the relationships between the permissible sash rebate widths and sash rebate heights, depending on various glass weights and/or thickness'. The resulting sash rebate dimensions or sash formats (portrait and/or landscape format) - as well as the maximum sash weight - must not be exceeded under any circumstances.

4.3 Hardware-combination

The manufacturer's regulations that deal with the combination of hardware are obligatory. (for example: the application of additional stay arms, the hardware design for burglar-resistant window and balcony-door sashes).

5. Product maintenance

Security relevant hardware components are to be examined at least once a year for stability and wear and tear. Depending on the requirements, the fixing-screws are to be tightened and/or parts exchanged. In addition to this, the following maintenance work is to be carried out annually:

- All movable parts and all locking points of the Turn-Only and Tilt & Turn Hardware are to be greased and tested.
- Only cleaning and maintenance agents which do not damage the corrosion protection of the hardware components are to be used.

The hardware adjustments - particularly in the vicinity of the corner pivot rest and the scissors - as well as replacing parts and the unhinging & hinging of the active sash are to be carried out by a specialist company.

When surface treating - for example when painting or varnishing - the windows' and balcony doors hardware is excluded from this process and is also to be protected against any impurities (paint/varnish splashes).

5.1 Retention of the surface quality

Electrolytically applied zinc coatings are not attacked in a normal room climate, when no condensation can form on the hardware or occasionally formed condensation can dry rapidly.

In order to permanently preserve the hardware's surface quality and to avoid deterioration by corrosion, it is imperative to observe the following points:

- The hardware and/or the rebate areas are to be ventilated sufficiently in particular during the building phase so that they are not exposed either to direct wetness or condensation.
- The hardware is to be kept free from deposits and soiling from building materials (building dust, plaster, cement etc.).
- Aggressive vapours in the rebate area (for example: through formic acid or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, tannic acid etc.) in connection with small formations of condensation can lead to fast corrosion of the hardware. In the case of such aggressive vapours occurring, a general adequate ventilation of the rebate areas of windows and balcony doors is to be ensured. This is particularly valid for windows and balcony doors made of oak or other types of timber with a high concentration of (tannic-) acid.
- Furthermore no acetic-acid or cross-linked acidic sealing compounds or those with the above mentioned contents may be used, since both the direct contact with the sealing compound and it's vaporisation can attack the surface.
- The hardware may only be cleaned with mild, pH-neutral cleaning agent in diluted form. Under no circumstances may aggressive, acidiferous cleaners or abrasive cleaning agents whose contents are listed in the above paragraph be used.

6. Obligation to issue information and instructions

To fulfil the information and instruction obligations as well as the maintenance operations according to the "product liability law", the following is available:

- for planning engineers "planning documents" for authorised dealers "catalogues"
- for fabricators "installation instructions" and "factory drawings"
- for builders and end users: "service & maintenance instructions" as well as "Operating manuals".

In order to safeguard the function of Turn-Only hardware for windows and balcony doors:

- Planning engineers are obliged to request and comply with the manufacturers or authorised dealers product information.
- The authorised dealers are obliged to observe and request product information from the manufacturer and to pass this on to the fabricators, in particular installation instructions, factory drawings, service & maintenance instructions as well as operating manuals.
- Fabricators are obliged to observe the product information and in particular to request service & maintenance instructions as well as operating manuals from the manufacturer or authorised dealer, and to pass these on to the builders and end users.

7. Applicability for related hardware

The variations possible within the individual hardware system - for example Tilt-only and Top-hung hardware - are to be treated according to the corresponding valid features of product performance, product maintenance, information and instruction obligations, product information, specified use/application and misuse.

General Design Description

The general design description lists characteristics of the friction hinges.

Accurate closure

Designed for use on PVC-u, aluminium and timber windows. All hinges feature a unique asymmetric location design, which utilises the full width of the sash arm to achieve early collection of the end point and ensure a secure, weather tight seal for the window. A low friction end cap automatically directs the end point smoothly and firmly towards the closed position.

Corrosion resistance

Two grades of high quality Stainless Steel are available: **Ferritic** hinges can be specified for low exposure areas. **Austenitic** hinges give maximum anti-corrosion durability, making them ideal for exposed coastal locations and many industrialised inland areas. Austenitic hinges survive a 500 hour neutral salt spray test to BS7479, five times the level achieved by ferritic hinges.

Easy to install

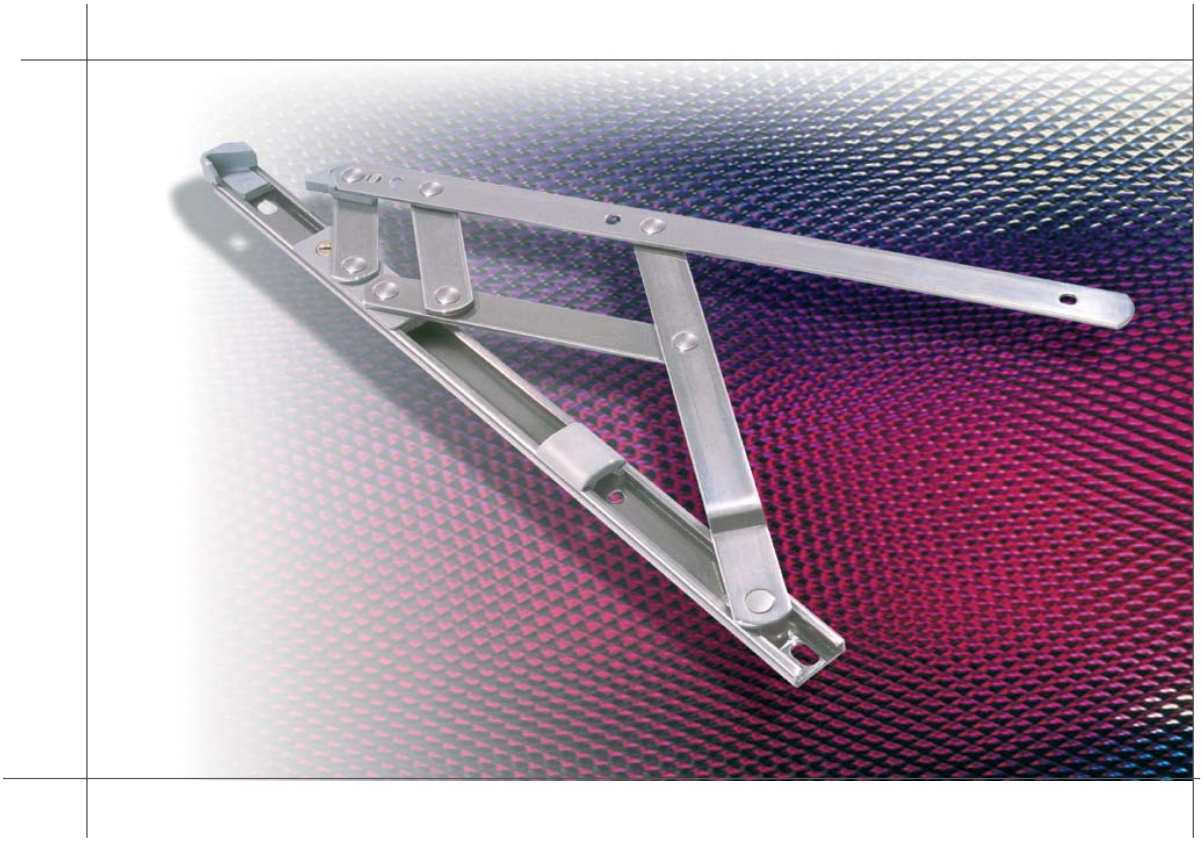
All hinges are designed to give the maximum accommodation to window manufacturing tolerances. With flexible fixing locations these hinges are simple and quick to fit correctly.

Long life

High performance components are used throughout the hinge range. This investment provides reliability in operation which is unequalled in the industry.

Friction Hinges
Defender
Order Details

Defender, standard purpose friction hinges



Part & product specification

Ferritic (403) Part No.	Austenitic (304) Part No.	Description	Stack height
318 423	**318 439**	8″ top hung friction hinge	13 mm
318 424	**318 440**	10″ top hung friction hinge	13 mm
318 425	**318 441**	12″ top hung friction hinge	13 mm
318 426	**318 442**	16″ top hung friction hinge	13 mm
318 427	**318 443**	20″ top hung friction hinge	13 mm
318 428	**318 444**	24″ top hung friction hinge	13 mm
318 429	**318 445**	12″ side hung friction hinge	13 mm
318 430	**318 446**	16″ side hung friction hinge	13 mm
318 431	**318 447**	8″ top hung friction hinge	16 mm
318 432	**318 448**	10″ top hung friction hinge	16 mm
318 433	**318 449**	12″ top hung friction hinge	16 mm
318 434	**318 450**	16″ top hung friction hinge	16 mm
318 435	**318 451**	20″ top hung friction hinge	16 mm
318 436	**318 452**	24″ top hung friction hinge	16 mm
318 437	**318 453**	12″ side hung friction hinge	16 mm
318 438	**318 454**	16″ side hung friction hinge	16 mm

- Long & reliable working life, tested to 30,000 cycles
- Asymmetric location system for reliable weather sealing to BS6375 Part 1
- Lipped slider for enhanced, smooth operation
- Easy friction adjustment
- Unique patented, robust cam friction device eliminates any risk of friction screw misuse
- Available in ferritic (430) as standard or austenitic (304) stainless steel for enhanced corrosion resistance
- Available with built in restrictors

Sash sizes, weights and operating angles

Hinge description	Maximum sash weight	Minimum sash height	Maximum sash height	Maximum sash width	Opening angle (± 2.5°)
8″ top hung	12 Kg	200 mm	350 mm	-	50°
10″ top hung	16 Kg	275 mm	400 mm	-	80°
12″ top hung	20 Kg	350 mm	550 mm	-	80°
16″ top hung	21 Kg	500 mm	750 mm	-	80°
20″ top hung	24 Kg	700 mm	1000 mm	-	50°
24″ top hung	35 Kg	850 mm	1200 mm	-	37.5°
		Minimum sash width			
12″ side hung	22 Kg	300 mm	-	600 mm	60°
16″ side hung	24 Kg	400 mm	-	700 mm	60°

Positions and clearances

This hinge is designed to be fitted between two flat and parallel rigid surfaces that conform to the measurements in diagrams 1.1 for 13 mm stack height or 1.2 for 16 mm stack height.

The sash and outer frame hinge location recess or upstand, if any, must be as shown.

The end cap of the hinge must be located in the internal corner of the outer frame. All fixing holes and slots must be used to ensure optimum performance and weather sealing.

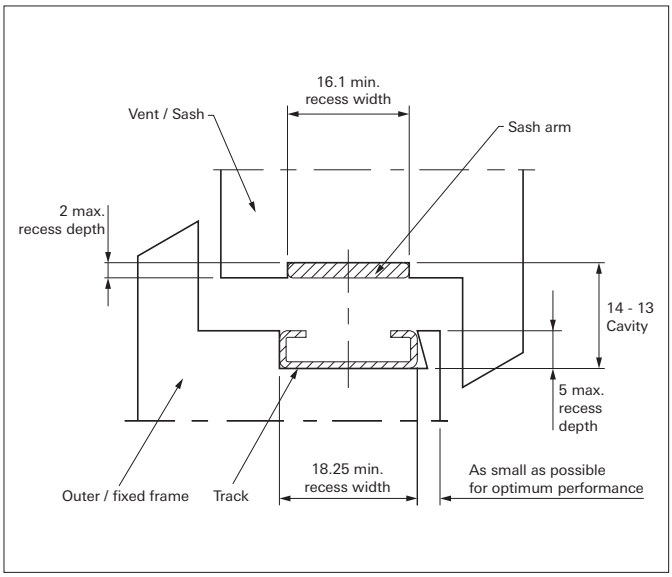


Diagram 1.1

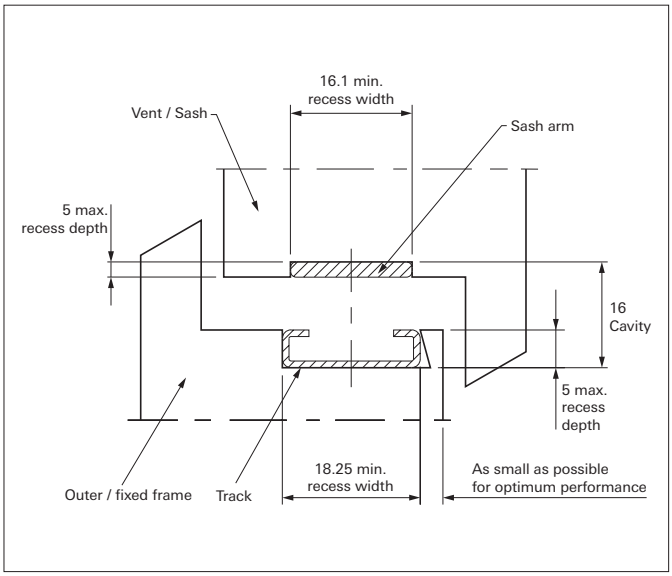
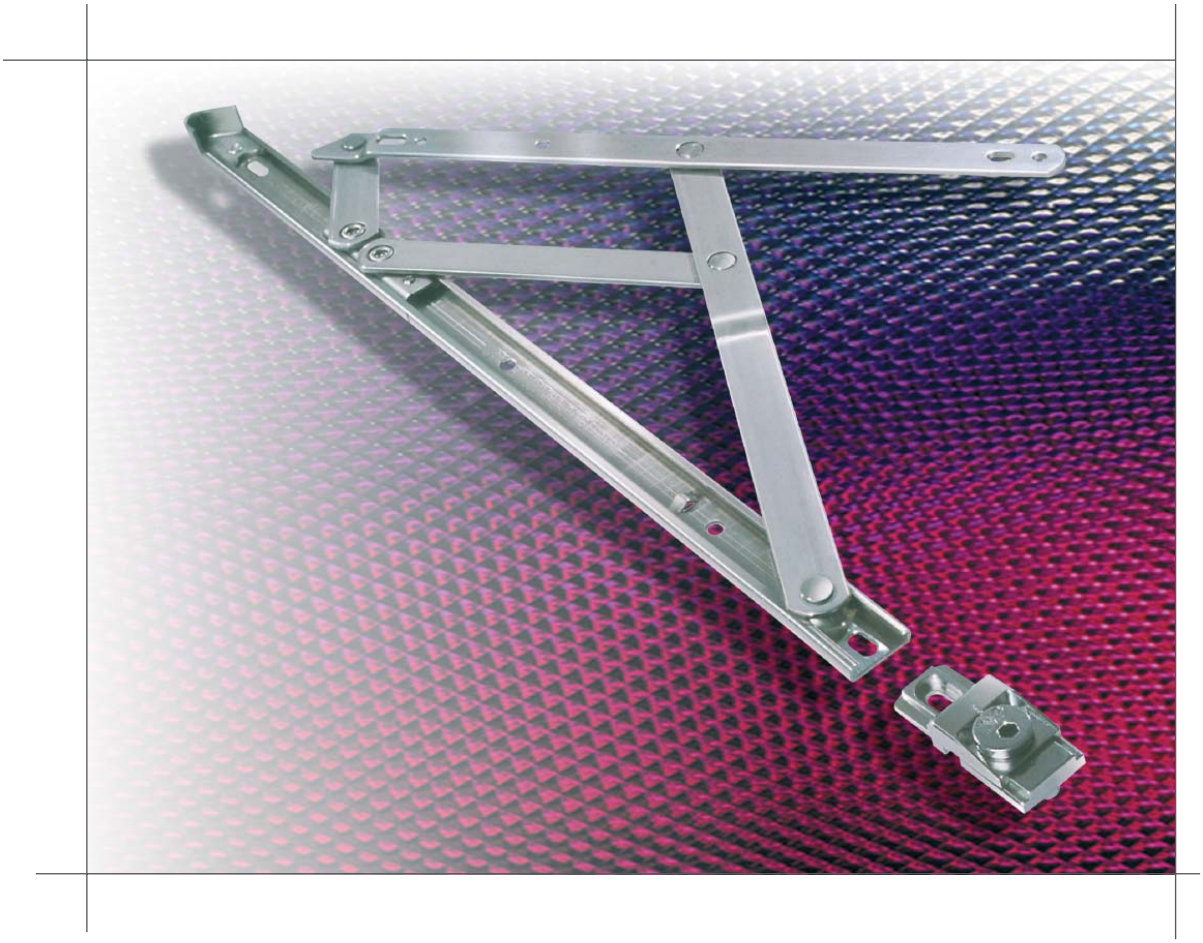


Diagram 1.2

Friction Hinges
Storm
Order Details

Storm, heavy duty friction hinges



Part & product specification

The Storm hinge range has been designed to exceed the requirements of AAMA 101/I.S.2 - 97, specifically gust loading to AW90 rating. In addition to exceeding this high performance standard, Storm also benefits from excellent weather sealing due to its unique asymmetrical metal point and cap, which also provides a smooth, reliable operation.

Austenitic (304) **Part No.**	**Description**	**Stack height**
318 455	10" top / side hung friction hinge	16 mm
318 456	16" top / side hung friction hinge	16 mm
318 457	22" top / side hung friction hinge	16 mm
318 458	26" top / side hung friction hinge	16 mm

- Asymmetric closure design for unrivalled weather sealing
- Capable of achieving AAMA 101/I.S. 2 - 97 section 4.1 AW90 rating (135 lb/ft² 6,470 Pa)
- Minimises inventory (four sizes suit all casement and projected requirements)
- Easy to fit, with friction adjustment mechanism
- Austenitic (304) stainless steel throughout
- Superior carrying capacity
- Large top hung sashes need additional, permanent restriction to 30° / 45° opening
- 10,000 cycles, life expectancy

Sash sizes, weights and operating angles

Hinge description	Maximum sash weight	Minimum sash height	Maximum sash height	Maximum sash width	Opening angle (± 2.5°)
10″ top hung	50 Kg	280 mm	762 mm	-	75°
16″ top hung	63 Kg	457 mm	1120 mm	-	87°
22″ top hung	75 Kg	610 mm	1321 mm	-	90°
26″ top hung	120 Kg	1270 mm	2200 mm	-	20°
		Minimum sash width			
10″ side hung	34.5 Kg	280 mm	-	660 mm	75°
16″ side hung	47 Kg	450 mm	-	838 mm	87°

Positions and clearances

This hinge is designed to be fitted between two flat and parallel rigid surfaces that conform to the measurements in diagram 1.1

The sash and outer frame hinge location recess or upstand, if any, must be as shown.

The end cap of the hinge must be located in the internal corner of the outer frame. All fixing holes and slots must be used to ensure optimum performance and weather sealing.

All dimensions are in millimetres.

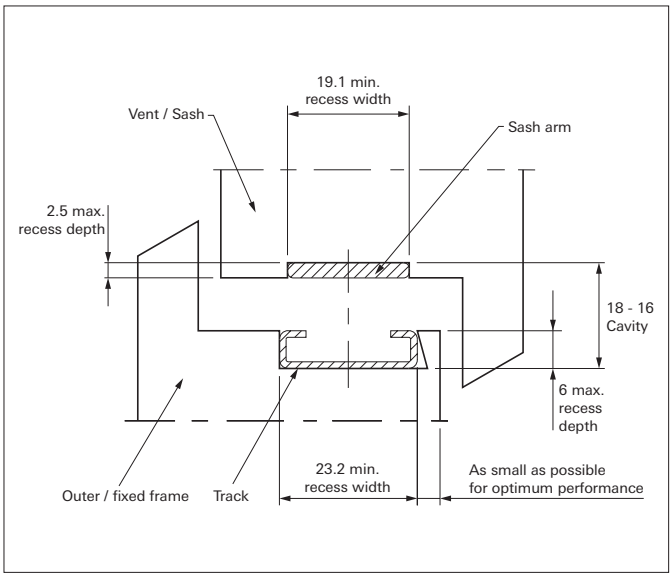


Diagram 1.1

Note additional link form on the Storm 26″ hinge only.

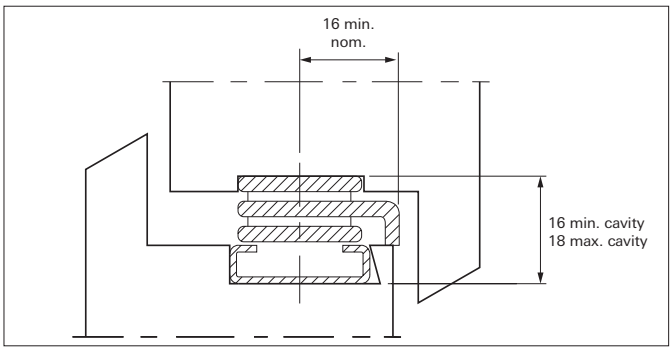


Diagram 1.2

Friction Hinges
Sterling
Order Details

Sterling, heavy duty friction hinges

Part & product specification

Austenitic (304) **Part No.**	Description	Stack height
318 459	10″ top hung friction hinge	16 mm
318 460	12″ top hung friction hinge	16 mm
318 461	16″ top hung friction hinge	16 mm
318 462	22″ top hung friction hinge	16 mm
318 463	26″ top hung friction hinge	16 mm
318 464	10″ side hung friction hinge	16 mm
318 465	16″ side hung friction hinge	16 mm

- Self balancing hinge
- Capable of achieving all leading international standards, including the UK BS6375, the North American AAMA 904.1, the French NFP-20-501 & NFP-20-302 and the Singapore Standard 212:1988
- Unrivalled weather sealing
- Austenitic (304) stainless steel throughout
- Superior carrying capacity

Sash sizes, weights and operating angles

Hinge description	Maximum sash weight	Minimum sash height	Maximum sash height	Maximum sash width	Opening angle (± 2.5°)
10″ top hung	37 Kg	267 mm	635 mm	-	50°
12″ top hung	45 Kg	635 mm	787 mm	-	50°
16″ top hung	55 Kg	787 mm	1090 mm	-	50°
22″ top hung	75 Kg	1090 mm	1500 mm	-	45°
26″ top hung 26″ top hung	100 Kg 150 Kg	1270 mm 1270 mm	2000 mm 2000 mm	-	20° restricted to 15°
		Minimum sash width			
10″ side hung	38 Kg	300 mm	-	660 mm	85°
16″ side hung	47 Kg	450 mm	-	838 mm	90°

Positions and clearances

This hinge is designed to be fitted between two flat and parallel rigid surfaces that conform to the measurements in diagram 1.1

The sash and outer frame hinge location recess or upstand, if any, must be as shown.

The end cap of the hinge must be located in the internal corner of the outer frame. All fixing holes and slots must be used to ensure optimum performance and weather sealing.

All dimensions are in millimetres.

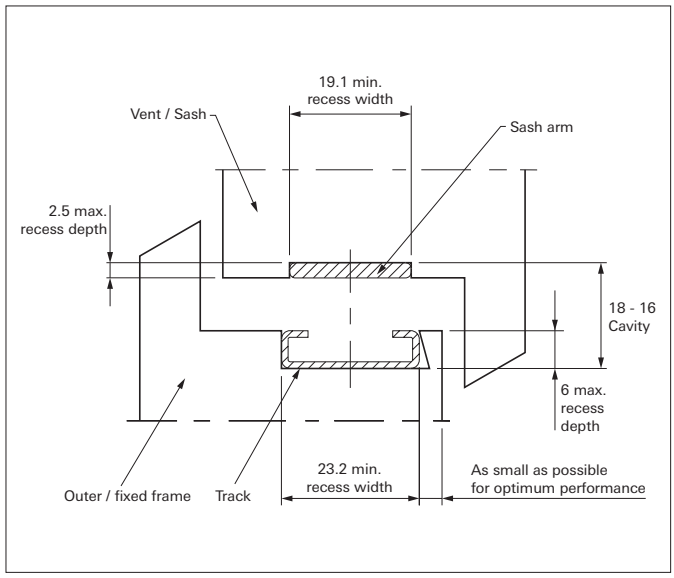


Diagram 1.1

Note additional link form on the Sterling 22″ & 26″ hinges.

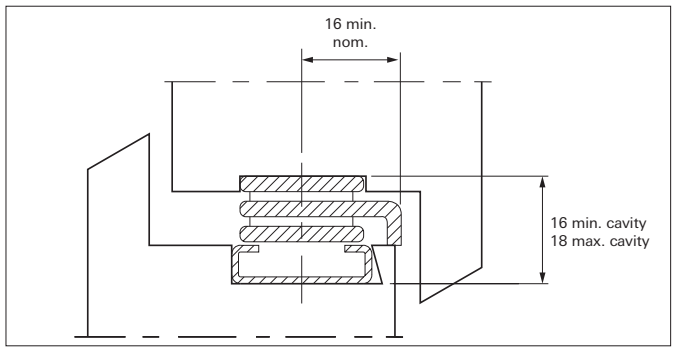
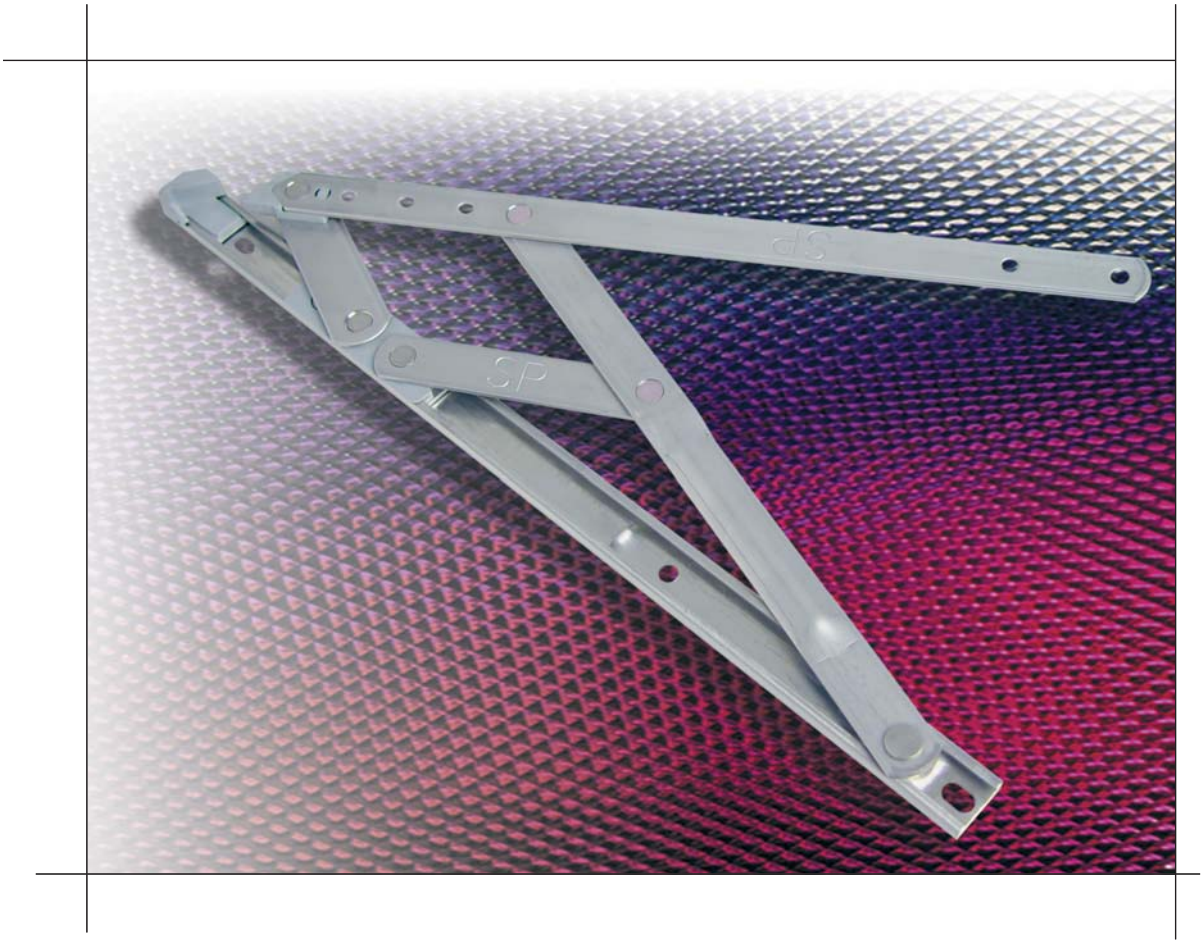


Diagram 1.2

Friction Hinges
90°
Order Details

90° - Side hung friction hinges



Part & product specification

Austenitic (304) **Part No.**	Description	Stack height
318 470	12" 90 ° side hung friction hinge	13.5 mm
318 471	16" 90 ° side hung friction hinge	13.5 mm
318 472	12" 90 ° side hung friction hinge	15.5 mm
318 473	16" 90 ° side hung friction hinge	15.5 mm

- Asymmetric location system for reliable, accurate closure
- Easy to fit
- Effective weather sealing & draught proofing
- Long and reliable working life, tested to operate for up to 25,000 cycles to UK use and up to 50,000 to SISIR
- Adjustable friction cam in slider
- Available in high grade Austenitic stainless steel only

Sash sizes, weights and operating angles

Hinge description	Maximum sash weight	Maximum sash width	Maximum sash height	Minimum sash width	Test Standard
12" side hung, 13.5 / 15.5 mm stack height	20 kg	550 mm	see profile manufacturers recommendations	350 mm	
16" side hung, 13.5 / 15.5 mm stack height	24 kg	900 mm	see profile manufacturers recommendations	400 mm	SISIR 212: 1988
16" side hung, 13.5 / 15.5 mm stack height	30 kg	900 mm	see profile manufacturers recommendations	400 mm	AAMA 904.1: 1987 & BS 6375 Pt. 2

Positions and clearances - 13.5 mm stack height

This hinge is designed to be fitted between two flat and parallel rigid surfaces that conform to the measurements in diagram 1.1. If the cavity height is greater than 14.5 mm, use the 16 mm stack height variant.

The sash and outer frame hinge location recess or upstand, if any, must be as shown.

The end cap of the hinge must be located in the internal corner of the outer frame. All fixing holes and slots must be used to ensure optimum performance and weather sealing.

All dimensions are in millimetres.

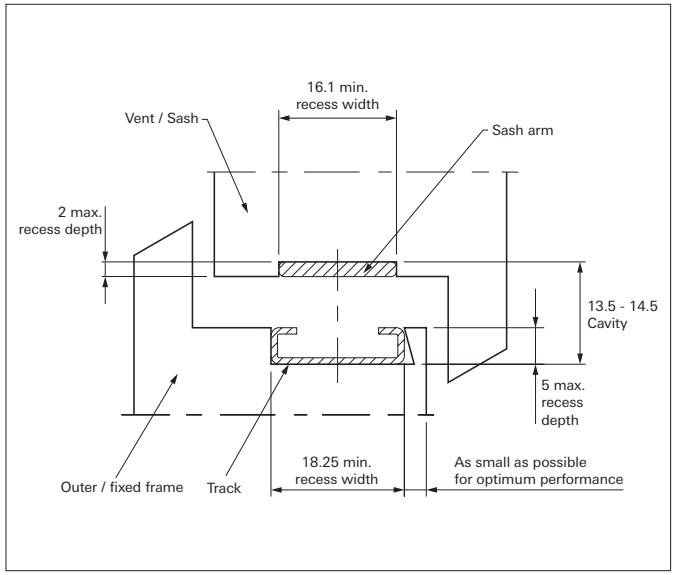


Diagram 1.1

Positions and clearances - 15.5 mm stack height

This hinge is designed to be fitted between two flat and parallel rigid surfaces that conform to the measurements in diagram 1.2. If the cavity height is less than 16.5 mm, use the 13.5 mm stack height variant.

The sash and outer frame hinge location recess or upstand, if any, must be as shown.

The end cap of the hinge must be located in the internal corner of the outer frame. All fixing holes and slots must be used to ensure optimum performance and weather sealing.

All dimensions are in millimetres.

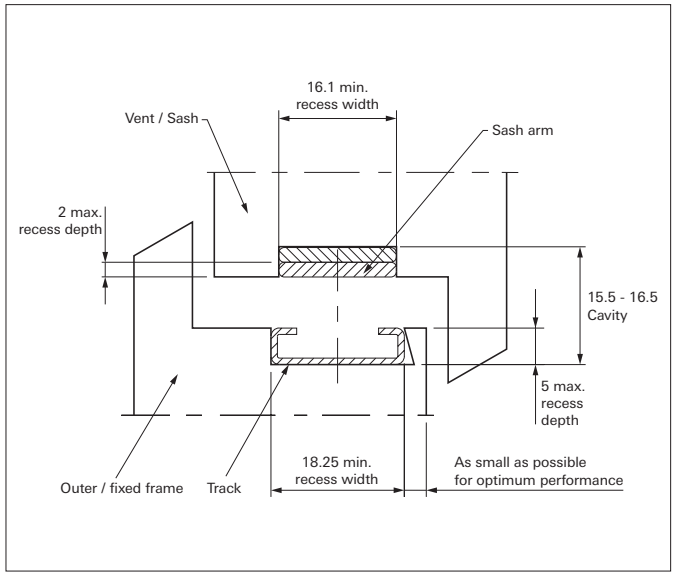
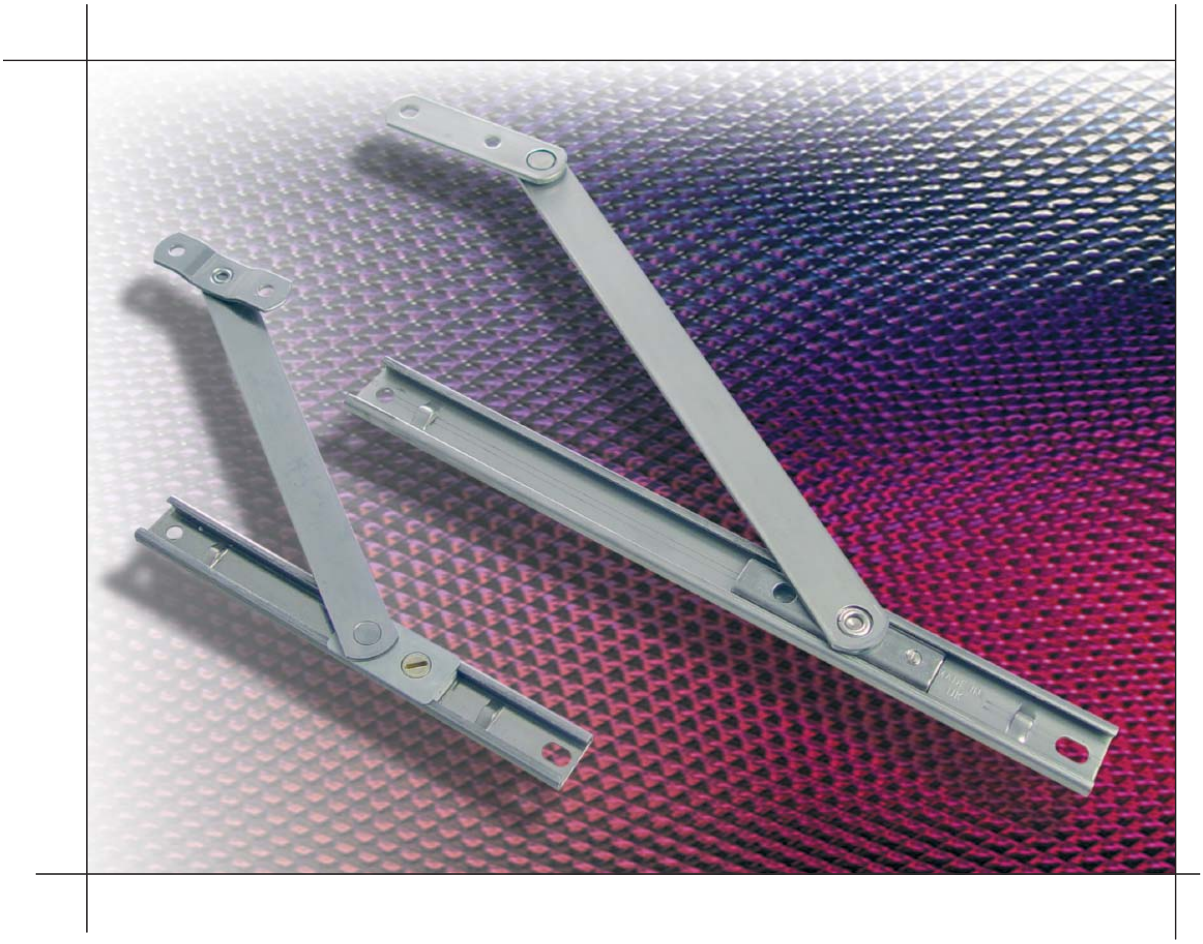


Diagram 1.2

Friction Hinges
Separate Restrictor Stays
Order Details

6" standard purpose & 8" heavy duty restrictor stays



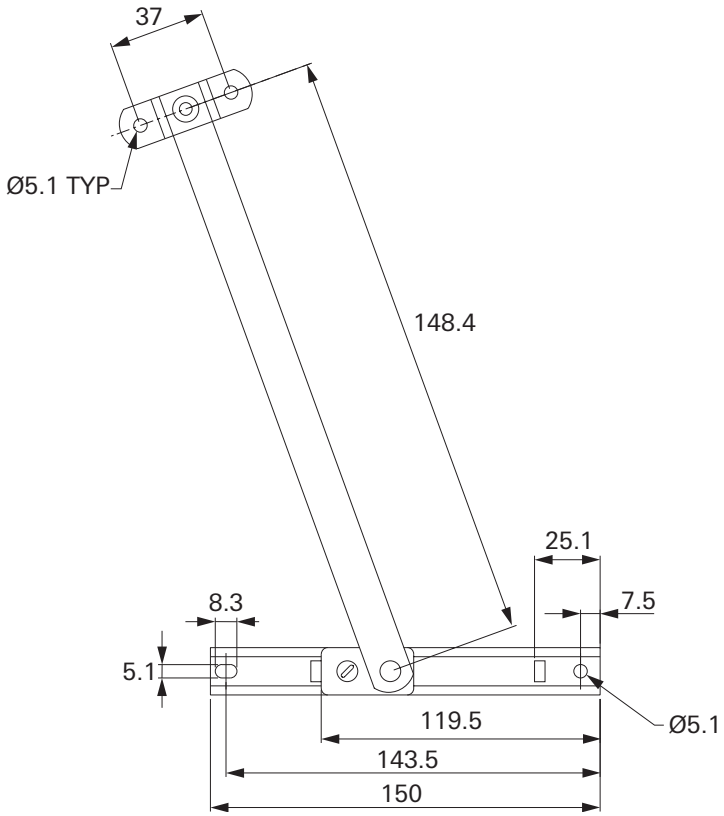
Part & product specification

Ferritic (403) **Part No.**	Description	Stack height
318 474	6" standard purpose restrictor stay	13 / 18 mm

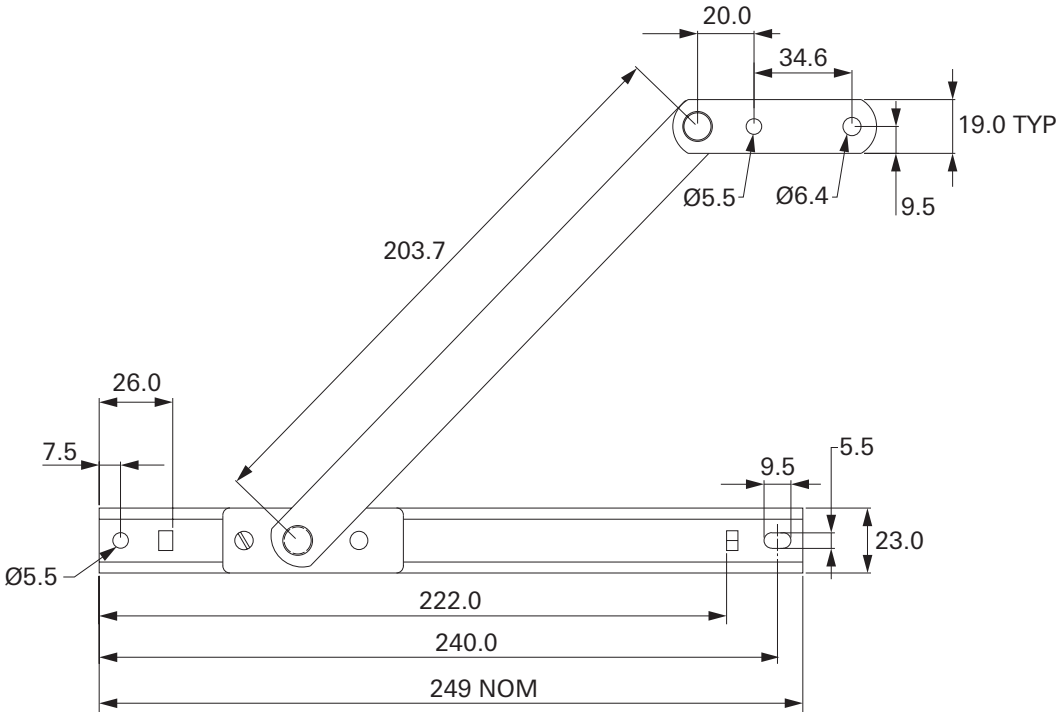
Austenitic (304) **Part No.**	Description	Stack height
318 475	8" heavy duty restrictor stay	16 / 21 mm

- Separate restrictors available in ferritic or austenitic stainless steel, dependant on size
- Easy to fit
- Smooth operation
- Adjustable friction cam / screw in slider

6" standard purpose restrictor stay



8" heavy duty restrictor stay



Roto Frank Ltd
Swift Point • Rugby • Warwickshire • CV21 1QH
Telephone: 01788 558600 • Facsimilie: 01788 558605
E-Mail: uk_sales@roto-frank.com • Internet: www.roto-frank.co.uk

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