JW WINCO®
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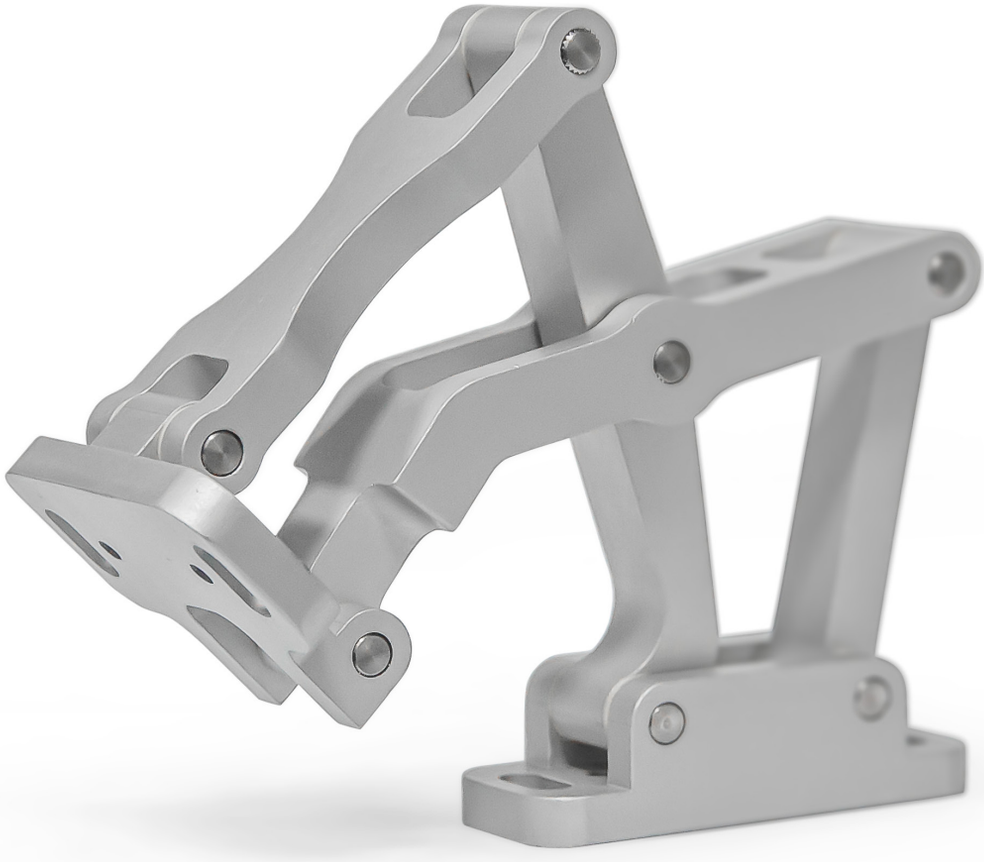
Highlights

Multiple-Joint Hinges



Standard Parts. Winco.

Contents

J.W.Winco, Inc., April 2022

Multiple-joint hinges are a new type of hinge for the construction sector. Mounted inside the housing to save space and protect against vandalism, they allow opening angles of up to 180° on flaps, hatches, and doors. This ensures optimum accessibility to the inside of the housing. In general, the outside of the housing remains free of attachments that do not match the design or must be avoided entirely due to special requirements, such as ease of cleaning.

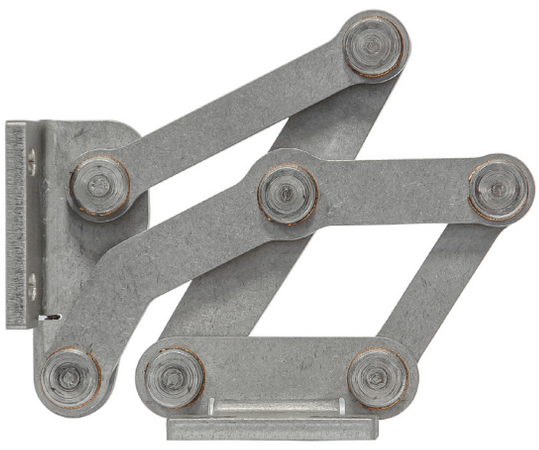
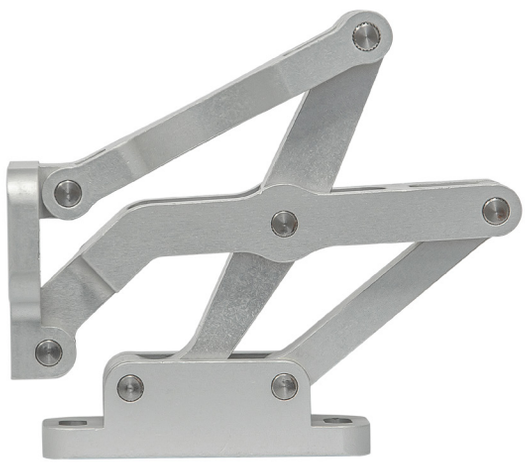
Multiple-joint hinges replace existing conventional hinge solutions while opening up entirely new motion sequences since they can do more than pivot flaps and doors. The zero-play, self-lubricated multiple-joint mechanism was designed with simulation software and allows a flap to be lifted first on opening and only then pivoted by 180°.

Jointed hinges or cup hinges have been used in the furniture sector for quite some time. These allow similar motion sequences, but the challenges to mount them in technical environments often make them difficult to use. In addition, they are usually only designed for lower load capacities.

The assembly angle brackets or mounting flanges of the multiple-joint hinges, which are mounted on the housing or door, feature slotted holes. Together with the spacer plates available as accessories, the hinges can be adjusted in three planes. This allows them to be used universally in any design. Spacer plates with tapped holes or mounting plates with threaded studs are also available for quick and easy mounting.

Since the development process was focused on creating a design with the most uniform possible gradations of achievable door geometry and load capacity, the hinges are ideal for applications in logistics and vehicle manufacturing in addition to a wide range of industrial applications. The use of high-quality materials and the attractive design open up an even greater range of applications. This means that these hinges are also suitable for use in building services engineering as well as in furniture making and display cases.

To support more complex applications with specific motion sequences, special versions are available that go beyond the typical applications on flaps, hatches and doors. Examples include 4x, 7x or 10x joint mechanisms for corresponding lifting, scissor or extension systems.

Stainless steel multiple-joint hinge	Aluminum multiple-joint hinge
	

Multiple-Joint Hinges

Overview of Types

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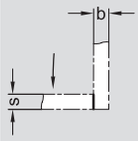
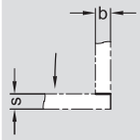
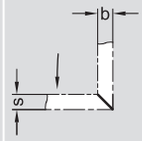
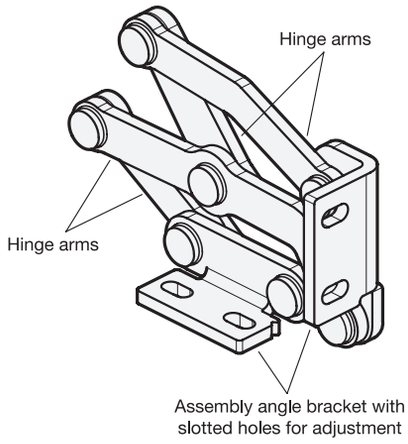
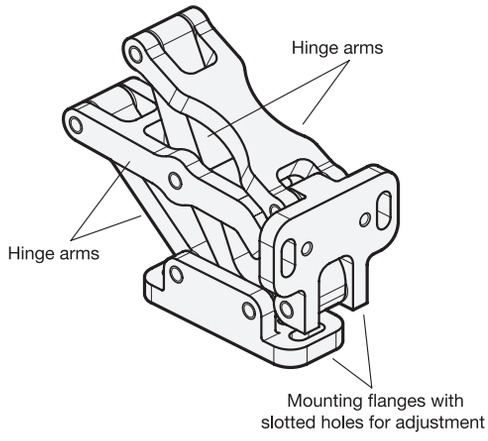
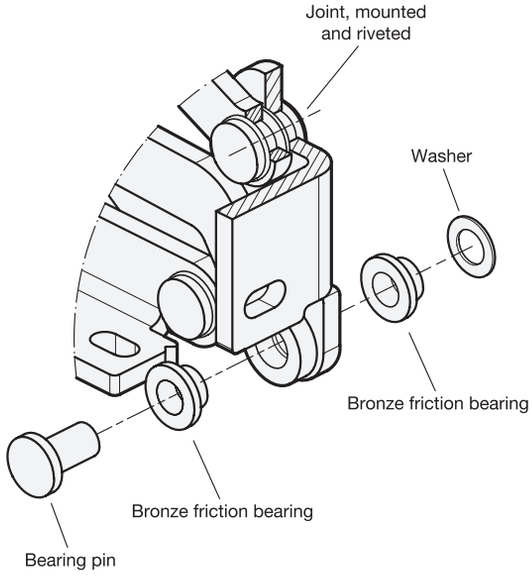
Series		Opening angle	Load capacity per pair	Max. door / housing thickness in millimeters (s / b) for design version			Material
				Inset 	Surface-mounted 	Mitered 	
GN 7231 Page 6		90°	F_A = 39 lbf (175 N) F_R = 169 lbf (750 N)	$s_{max.}$ = 60 $b_{max.}$ = ∞	$s_{max.}$ = ∞ $b_{max.}$ = 60	$s_{max.}$ = 50 $b_{max.}$ = 50	Stainless steel
GN 7241 Page 26		90°	F_A = 146 lbf (650 N) F_R = 169 lbf (750 N)	$s_{max.}$ = 30 $b_{max.}$ = ∞	$s_{max.}$ = ∞ $b_{max.}$ = 30	$s_{max.}$ = 30 $b_{max.}$ = 30	Aluminum
GN 7233 Page 10		120°	F_A = 39 lbf (175 N) F_R = 169 lbf (750 N)	$s_{max.}$ = 50 $b_{max.}$ = ∞	$s_{max.}$ = ∞ $b_{max.}$ = 50	$s_{max.}$ = 40 $b_{max.}$ = 40	Stainless steel
GN 7243 Page 30		120°	F_A = 146 lbf (650 N) F_R = 169 lbf (750 N)	$s_{max.}$ = 24 $b_{max.}$ = ∞	$s_{max.}$ = ∞ $b_{max.}$ = 24	$s_{max.}$ = 20 $b_{max.}$ = 20	Aluminum
GN 7237 Page 14		180°	F_A = 39 lbf (175 N) F_R = 169 lbf (750 N)	$s_{max.}$ = 25 $b_{max.}$ = ∞	$s_{max.}$ = ∞ $b_{max.}$ = 25	$s_{max.}$ = 21 $b_{max.}$ = 21	Stainless steel
GN 7247 Page 34		180°	F_A = 146 lbf (650 N) F_R = 169 lbf (750 N)	$s_{max.}$ = 15 $b_{max.}$ = ∞	$s_{max.}$ = ∞ $b_{max.}$ = 15	$s_{max.}$ = 11 $b_{max.}$ = 11	Aluminum

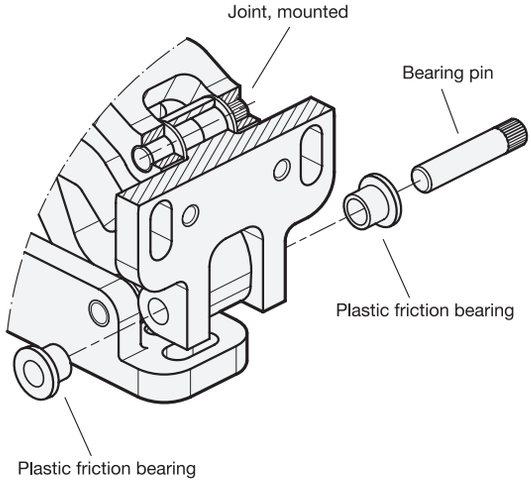
Design

Stainless steel multiple-joint hinges	Aluminum multiple-joint hinges









Applications

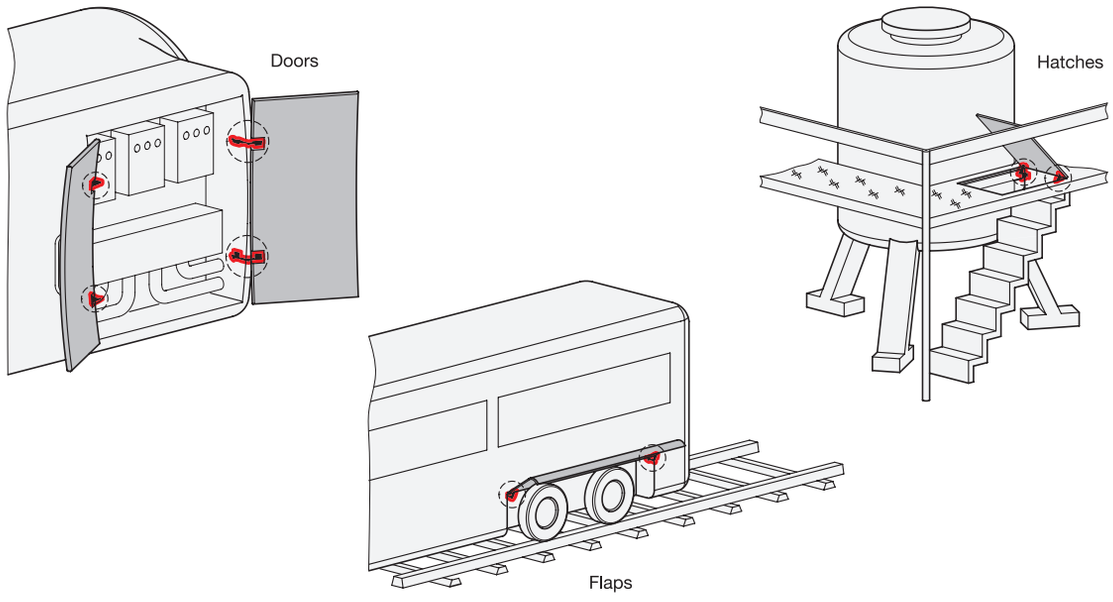
For stainless steel multiple-joint hinges, the bearing points of the joints are arranged in two levels that are very close to each other. This makes them particularly suitable for applications with flaps and hatches.

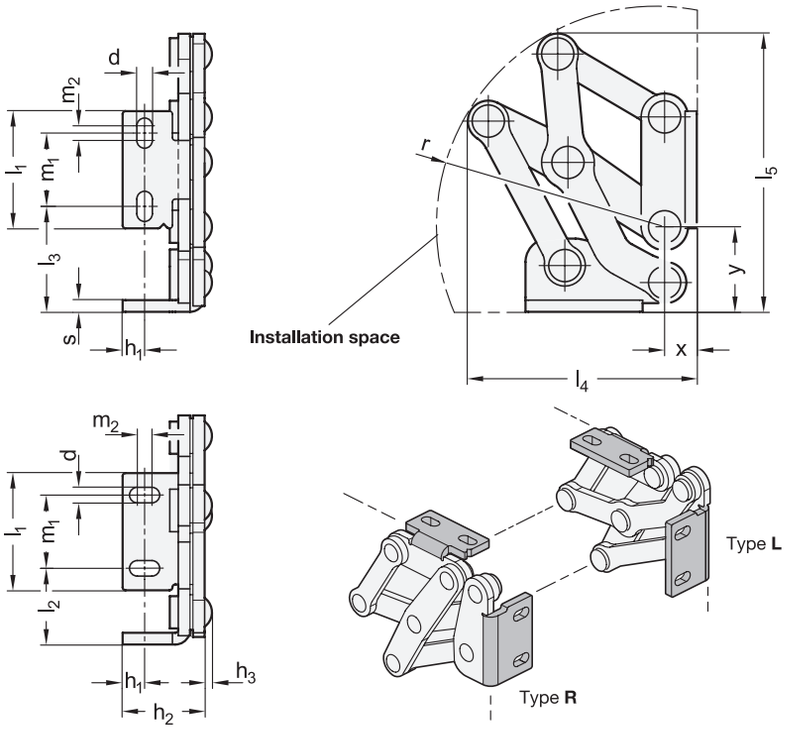
For aluminum multiple-joint hinges, the bearing point levels of the joints are spaced more widely, making them suitable for use with doors, even heavy ones.

Areas of application and requirements

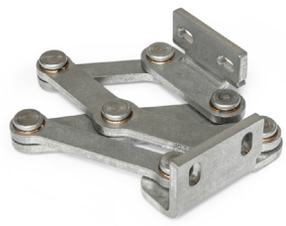
	Industries	Examples of use	Examples of requirements
Manufacturing	Machine and plant engineering	Machine doors, cleaning flaps	**Kinematics** - Large opening angle - Concealed, space-saving, zero-play, self-lubricating, reliable, adjustable - Motion sequence as per specification - Lifting with subsequent pivoting - With additional indexing or spring elements
	Medical and pharmaceutical industry	Repair and maintenance hatches	
	Chemical and electrical industry	Pivot mechanisms, shelves	
	Logistics and conveyor systems	Safety devices, conveyor hatches, adjustment units and control systems	
Transport	Bus and rail industry	Luggage hatches, storage compartments, rear and skirt hatches	**Design** - Surface finish - Refined appearance - Round, convex, concave housing shapes - Inset, surface-mounted or mitered installation - Vandalism-proof, concealed, gap-free
	Agricultural and construction machinery	Cabin construction, auxiliary units, engine hoods, front hatches, repair and maintenance openings	
	Ship and yacht building	Exterior hatches, floor hatches, door and maintenance systems	
Architecture	Furniture and display case construction	Interior fittings and glass enclosures	**Safety** - Stability and resilience - Reliability - Compliance with safety requirements - Avoidance of collisions - High load capacity - Long lifespan - Corrosion resistance
	Building services engineering	Door systems, glass facades, skylights, maintenance and repair shafts, emergency openings, access hatches, stair and floor hatches, fire protection systems	

Application examples





Metric



SS Stainless Steel

3 Type

L Left-hand assembly angle bracket
R Right-hand assembly angle bracket

Metric table

Dimensions in: millimeters - *inches*

2																	
l_1	d	h_1	h_2	h_3	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	m_1	m_2	r	s	x	y
40 *1.57*	5.3 *0.21*	7.5 *0.30*	28 *1.10*	2.5 *0.10*	26 *1.02*	36 *1.42*	78 *3.07*	95 *3.74*	23.9 *0.94*	75.8 *2.98*	23.9 *0.94*	85.8 *3.38*	25 *0.98*	5 *0.20*	77.5 *3.05*	4 *0.16*	11 *0.43*	29 *1.14*
50 *1.97*	6.5 *0.26*	10 *0.39*	35 *1.38*	2.5 *0.10*	35 *1.38*	46 *1.81*	101 *3.98*	126 *4.96*	37.2 *1.46*	97.9 *3.85*	37.2 *1.46*	108.6 *4.28*	30 *1.18*	6 *0.24*	97.5 *3.84*	5 *0.20*	19 *0.75*	37 *1.46*
60 *2.36*	8.5 *0.33*	12.5 *0.49*	40 *1.57*	2.5 *0.10*	40 *1.57*	61 *2.40*	126 *4.96*	163 *6.42*	63.9 *2.52*	117.8 *4.64*	63.9 *2.52*	138.6 *5.46*	36 *1.42*	8 *0.31*	127 *5.00*	5 *0.20*	22 *0.87*	47 *1.85*

Specification

	1	4
• Body Stainless steel AISI 304	NI	
Matte, tumbled finish		MT
• Friction bearing Bronze, self-lubricated		
• *Stainless Steel Characteristics* → *Standard Parts Handbook page 2143*		
• RoHS compliant		

On request

- Other materials
- Other finishes
- Other assembly angle brackets
- Other opening angles
- Other max. wall thicknesses
- Other lifting motion

Information

GN 7231 multiple-joint hinges are installed on the inside of flaps, hatches and doors to save space and ensure protection against vandalism. The hinges have a maximum opening angle of 90°, making them perfect for use with thick door leaves.

Use of this hinge type leaves housing exteriors free of attachments that do not match the design or that should be avoided entirely in the interests of fast and easy cleaning.

Multiple-joint hinges are typically used in pairs, meaning that one L type and one R type is used per opening. For higher loads, e.g. from large hatches, these can be supplemented with additional hinges of any type.

see also...

- *Spacer Plates GN 2370* → *page 22*
- *Spacer Plates with Tapped Holes GN 2372* → *page 23*
- *Mounting Plates with Threaded Studs GN 2376* → *page 24*

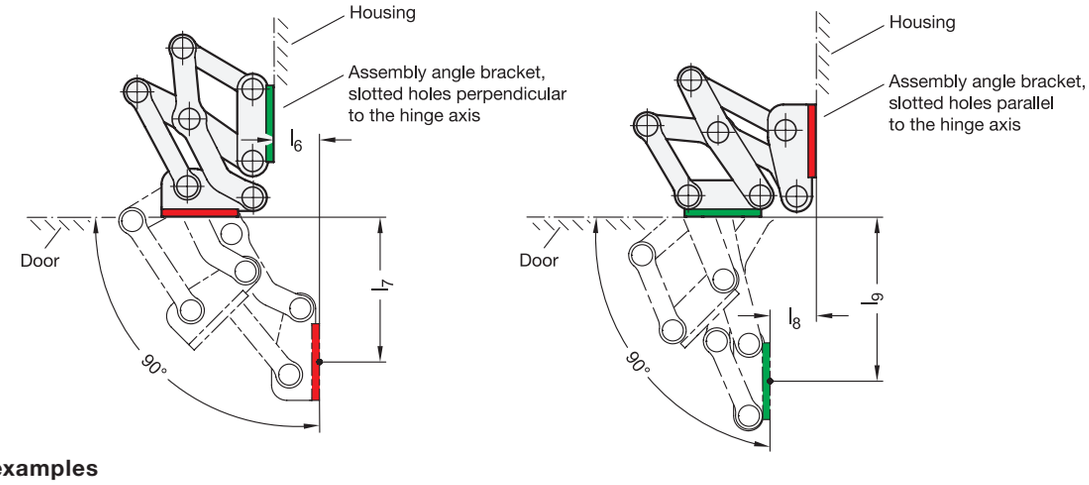
How to order

1 2 3 4
GN 7231-NI-50-R-MT

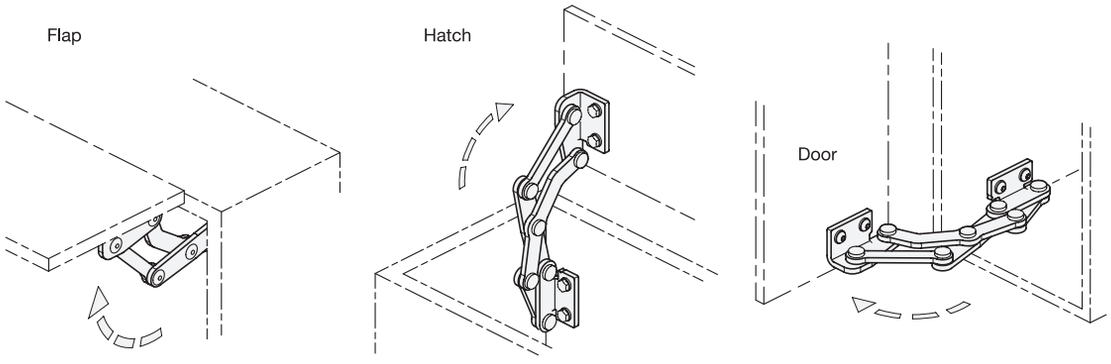
1	Material
2	Length l_1
3	Type
4	Finish

Installation position – pivot characteristics

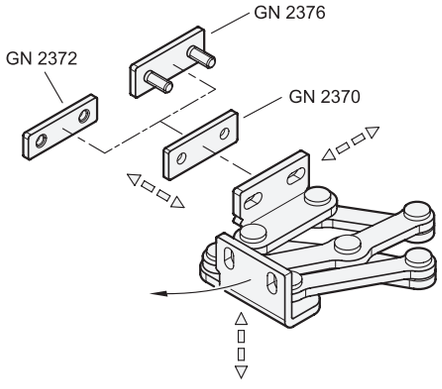
Multiple-joint hinges can be installed on the housing with the slotted holes of the assembly angle brackets that are either perpendicular or parallel to the hinge axis. This results in the two pivot characteristics depicted.



Application examples



Adjustment and mounting options



Multiple-joint hinges can be adjusted in three planes during installation. For example, this allows compensation for tolerances or establishing of required compressive forces for seals.

Two planes can be adjusted via parallel or perpendicular slotted holes in the assembly angle brackets. In the third plane, position corrections can be made using GN 2370 spacer plates.

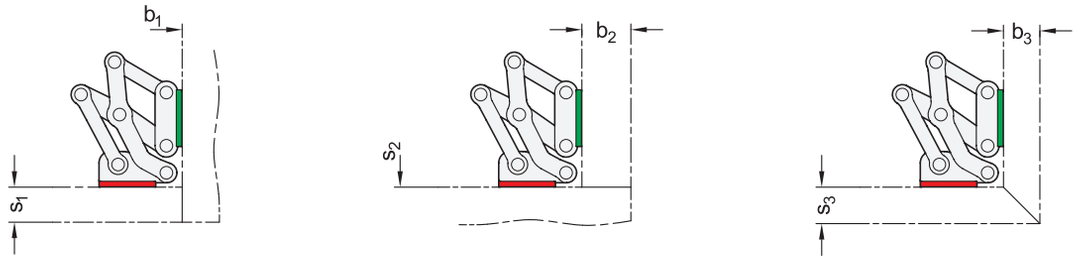
GN 2372 spacer plates with tapped holes as well as GN 2376 mounting plates with threaded studs are also available for mounting the hinges. The latter can be welded on or inserted through the wall from the outside and fastened in place.

All accessory items are designed for use with both assembly angle brackets.

Design variants

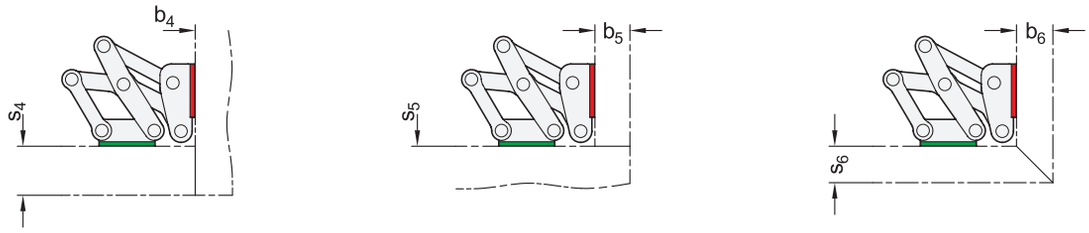
Flaps, hatches and doors can be inset, surface-mounted or mitered. The maximum wall thicknesses and bend sizes for planned sheet metal constructions arise from the respective installation type.

1. Assembly angle brackets mounted to the housing with slotted holes perpendicular to the hinge axis:



l_1	$s_{1\ max.}$	b_1	$s_{2\ max.}$	$b_{2\ max.}$	$s_{3\ max.}$	$b_{3\ max.}$
40 *1.57*	25 *0.98*	1 ... ∞	1 ... ∞	35 *1.38*	26 *1.02*	26 *1.02*
50 *1.97*	30 *1.18*	1 ... ∞	1 ... ∞	45 *1.77*	36 *1.42*	36 *1.42*
60 *2.36*	35 *1.38*	1 ... ∞	1 ... ∞	60 *2.36*	50 *1.97*	50 *1.97*

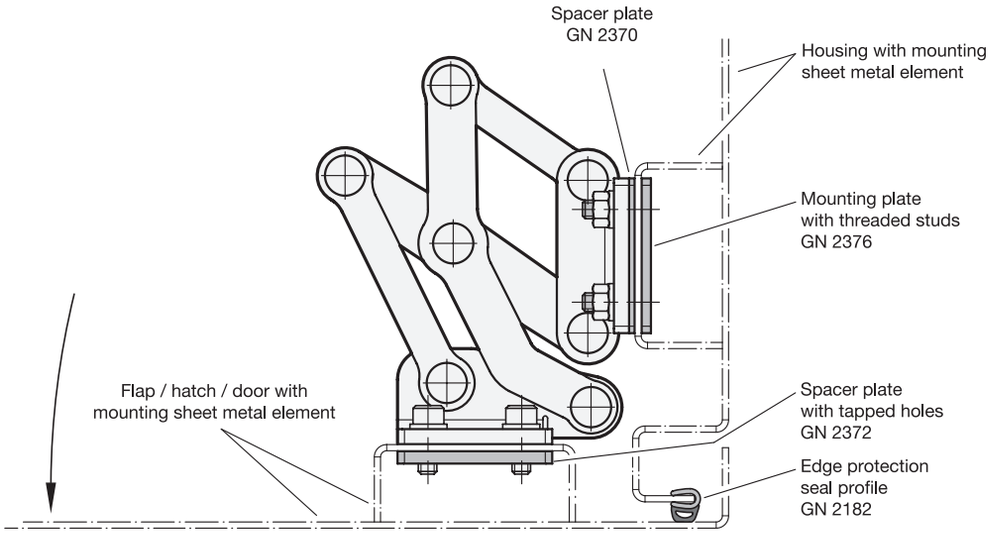
2. Assembly angle brackets mounted to the housing with slotted holes parallel to the hinge axis:



l_1	$s_{4\ max.}$	$b_{4\ max.}$	s_5	$b_{5\ max.}$	$s_{6\ max.}$	$b_{6\ max.}$
40 *1.57*	35 *1.38*	1 ... ∞	1 ... ∞	25 *0.98*	26 *1.02*	26 *1.02*
50 *1.97*	45 *1.77*	1 ... ∞	1 ... ∞	30 *1.18*	36 *1.42*	36 *1.42*
60 *2.36*	60 *2.36*	1 ... ∞	1 ... ∞	35 *1.38*	50 *1.97*	50 *1.97*

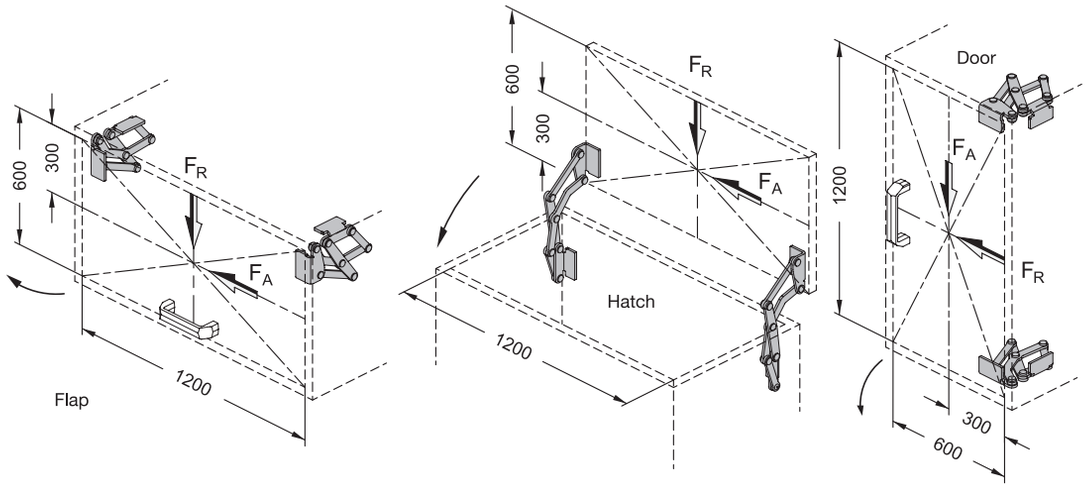
The design variants shown represent standard installation conditions. If the installation position of the hinge is changed or one of the two wall thickness dimensions s or b are lower, the maximum achievable dimensions change independently of each other. This makes it possible in some cases to work with larger wall thickness dimensions than those specified with the same hinge size. A simple design check via CAD or a test setup is therefore recommended.

Construction example



Load capacity

The maximum load of the multiple-joint hinges specified below applies to the standard use cases and serves for orientation in the case of deviating applications. The resulting forces lead to slight elastic deformation, which can be compensated for by means of the adjustment options, if necessary.

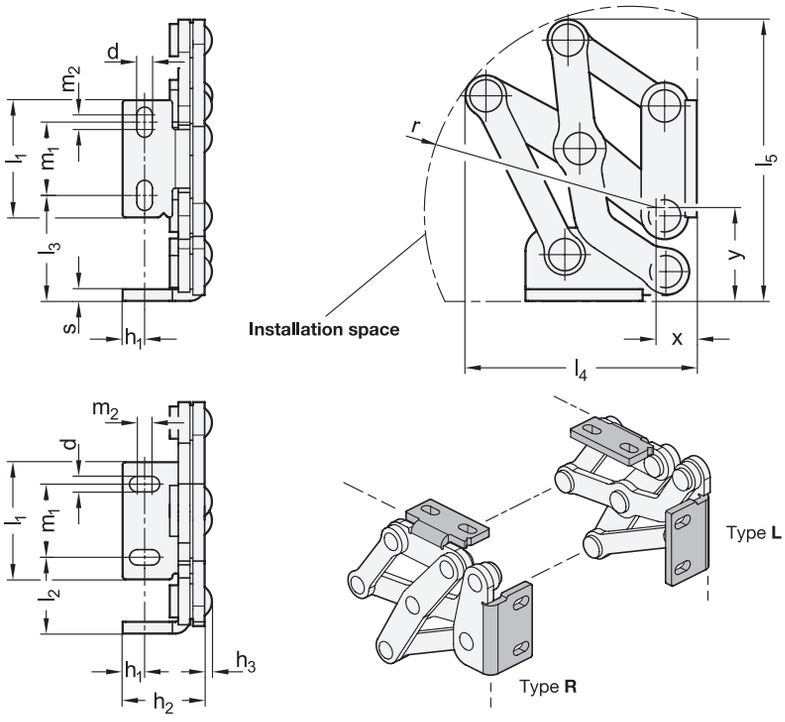


Max. load capacity per hinge pair		
l_1	**F_A (axial)**	**F_R (radial)**
40 *1.57*	175 N *39.34 lbf*	650 N *146.13 lbf*
50 *1.97*	175 N *39.34 lbf*	750 N *168.61 lbf*
60 *2.36*	150 N *33.72 lbf*	550 N *123.65 lbf*

GN 7233 | Multiple-Joint Hinges

Stainless Steel, Concealed, with Opening Angle of 120°

JW WINCO® A Ganter Company



Metric

SS Stainless Steel

3 Type

L Left-hand assembly angle bracket
R Right-hand assembly angle bracket

Metric table

Dimensions in: millimeters - *inches*

2																	
l_1	d	h_1	h_2	h_3	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	m_1	m_2	r	s	x	y
40 *1.57*	5.3 *0.21*	7.5 *0.30*	28 *1.10*	2.5 *0.10*	26 *1.02*	36 *1.42*	79 *3.11*	96 *3.78*	33.8 *1.33*	65.9 *2.59*	27.9 *1.10*	77.4 *3.05*	25 *0.98*	5 *0.20*	70 *2.76*	4 *0.16*	23 *0.91*	30.5 *1.20*
50 *1.97*	6.5 *0.26*	10 *0.39*	35 *1.38*	2.5 *0.10*	35 *1.38*	46 *1.81*	105 *4.13*	135 *5.31*	79.3 *3.12*	82 *3.23*	2.8 *0.11*	113.3 *4.46*	30 *1.18*	6 *0.24*	105 *4.13*	5 *0.20*	20 *0.79*	37 *1.46*
60 *2.36*	8.5 *0.33*	12.5 *0.49*	40 *1.57*	2.5 *0.10*	40 *1.57*	61 *2.40*	130 *5.12*	169 *6.65*	87.5 *3.44*	107.5 *4.23*	17.4 *0.69*	147.1 *5.79*	36 *1.42*	8 *0.31*	125 *4.92*	5 *0.20*	34 *1.34*	50 *1.97*

Specification

	1	4
• Body		
Stainless steel AISI 304	NI	
Matte, tumbled finish		MT
• Friction bearing		
Bronze, self-lubricated		
• *Stainless Steel Characteristics*		
→ *Standard Parts Handbook page 2143*		
• RoHS compliant		

On request

- Other materials
- Other finishes
- Other assembly angle brackets
- Other opening angles
- Other max. wall thicknesses
- Other lifting motion

Information

GN 7233 multiple-joint hinges are installed on the inside of flaps, hatches and doors to save space and ensure protection against vandalism. The hinges have a maximum opening angle of 120°, allowing for easy accessibility and making them suitable for use with medium-thick door leaves.

Use of this hinge type leaves housing exteriors free of attachments that do not match the design or that should be avoided entirely in the interests of fast and easy cleaning.

Multiple-joint hinges are typically used in pairs, meaning that one L type and one R type is used per opening. For higher loads, e.g. from large hatches, these can be supplemented with additional hinges of any type.

see also...

- *Spacer Plates GN 2370 → page 22*
- *Spacer Plates with Tapped Holes GN 2372 → page 23*
- *Mounting Plates with Threaded Studs GN 2376 → page 24*

How to order

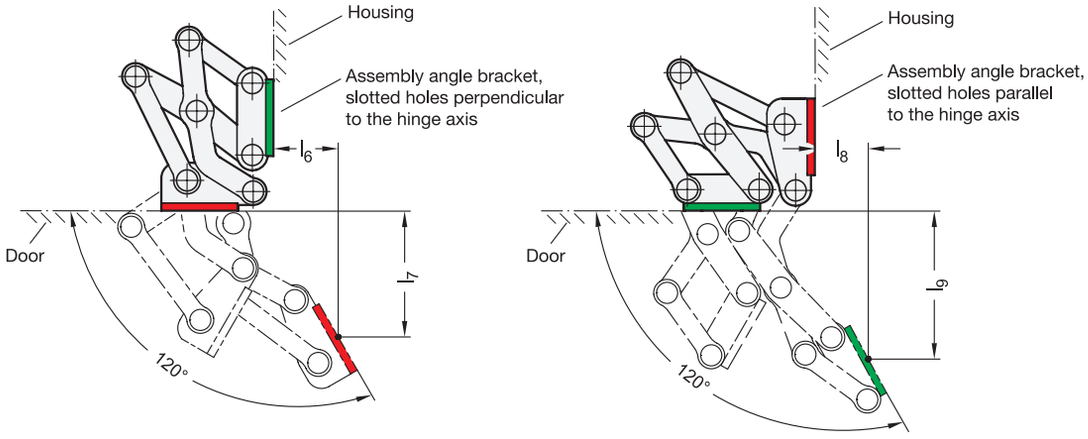
1 2 3 4

GN 7233-NI-60-L-MT

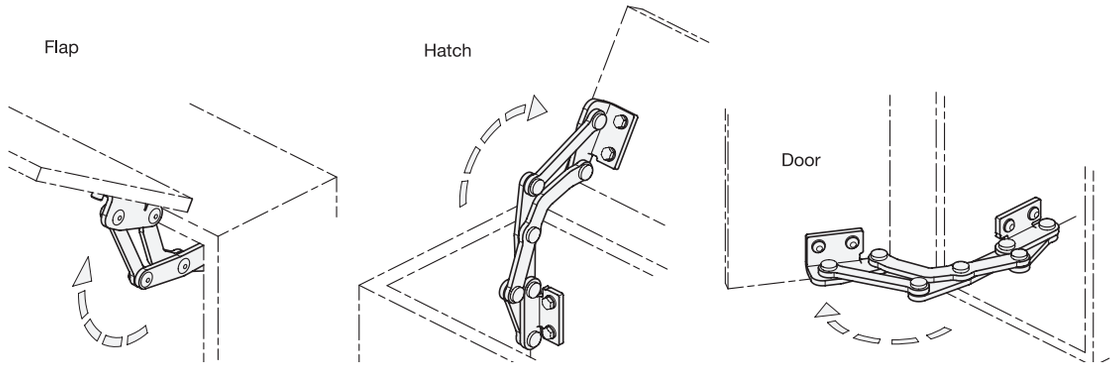
1	Material
2	Length l_1
3	Type
4	Finish

Installation position – pivot characteristics

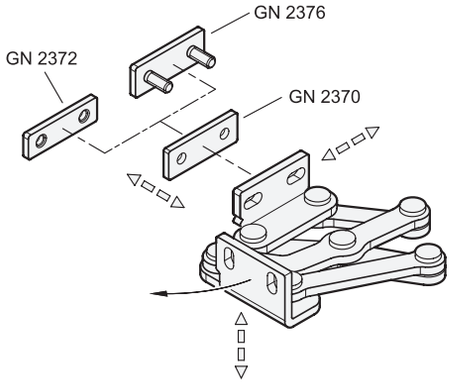
Multiple-joint hinges can be installed on the housing with the slotted holes of the assembly angle brackets that are either perpendicular or parallel to the hinge axis. This results in the two pivot characteristics depicted.



Application examples



Adjustment and mounting options



Multiple-joint hinges can be adjusted in three planes during installation. For example, this allows compensation for tolerances or establishing of required compressive forces for seals.

Two planes can be adjusted via parallel or perpendicular slotted holes in the assembly angle brackets. In the third plane, position corrections can be made using GN 2370 spacer plates.

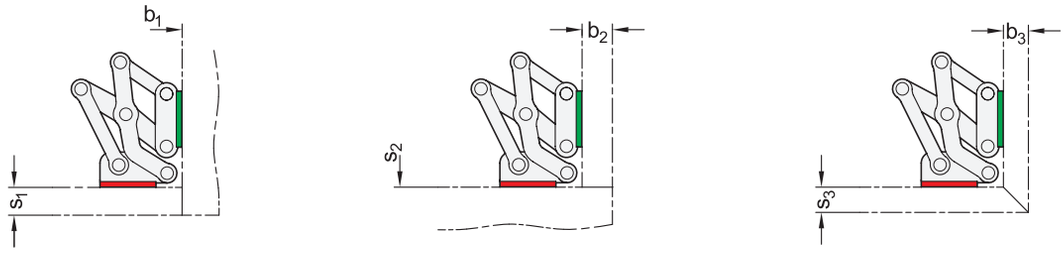
GN 2372 spacer plates with tapped holes as well as GN 2376 mounting plates with threaded studs are also available for mounting the hinges. The latter can be welded on or inserted through the wall from the outside and fastened in place.

All accessory items are designed for use with both assembly angle brackets.

Design variants

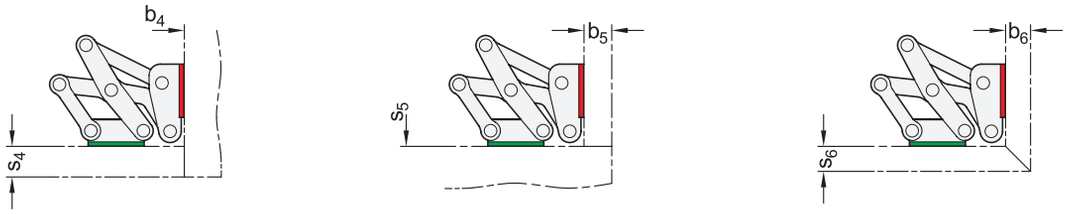
Flaps, hatches and doors can be inset, surface-mounted or mitered. The maximum wall thicknesses and bend sizes for planned sheet metal constructions arise from the respective installation type.

1. Assembly angle brackets mounted to the housing with slotted holes perpendicular to the hinge axis:



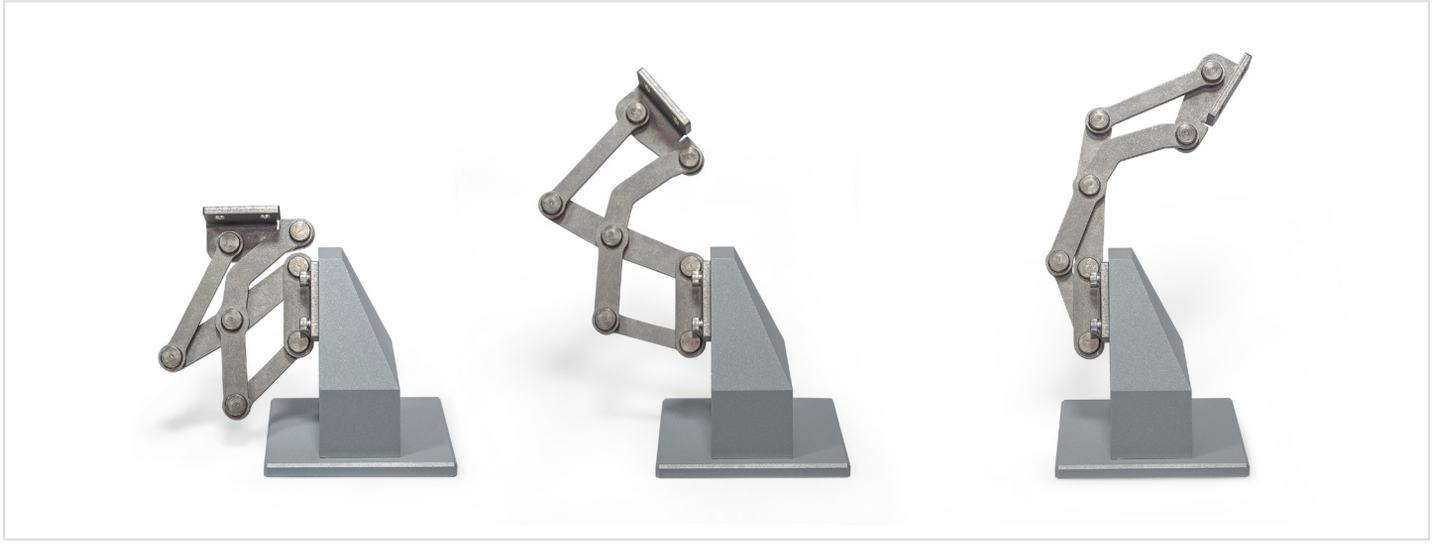
l_1	$s_{1\ max.}$	b_1	$s_{2\ max.}$	$b_{2\ max.}$	$s_{3\ max.}$	$b_{3\ max.}$
40 *1.57*	20 *0.79*	1 ... ∞	1 ... ∞	22 *0.87*	18 *0.71*	18 *0.71*
50 *1.97*	25 *0.98*	1 ... ∞	1 ... ∞	38 *1.50*	30 *1.18*	30 *1.18*
60 *2.36*	32 *1.26*	1 ... ∞	1 ... ∞	50 *1.97*	40 *1.57*	40 *1.57*

2. Assembly angle brackets mounted to the housing with slotted holes parallel to the hinge axis:

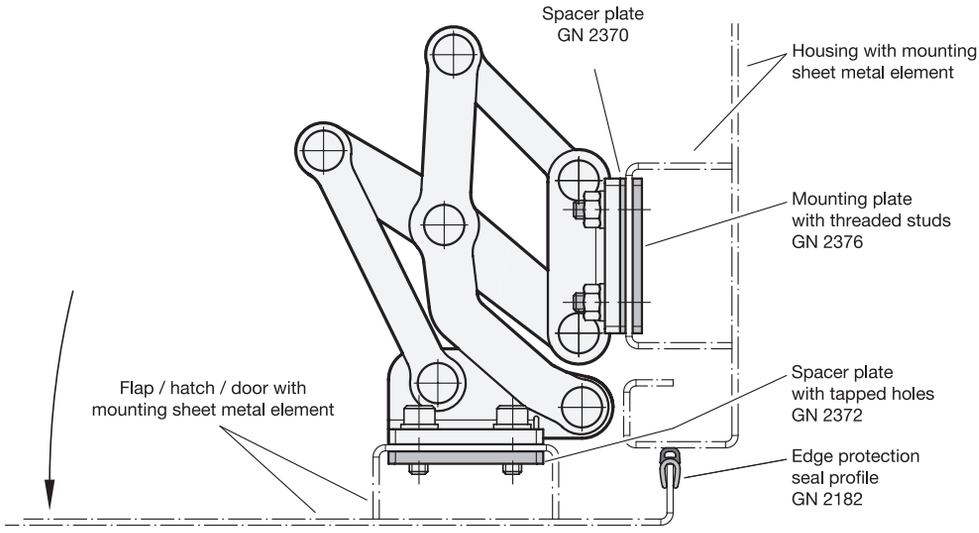


l_1	$s_{4\ max.}$	$b_{4\ max.}$	s_5	$b_{5\ max.}$	$s_{6\ max.}$	$b_{6\ max.}$
40 *1.57*	22 *0.87*	1 ... ∞	1 ... ∞	20 *0.79*	18 *0.71*	18 *0.71*
50 *1.97*	38 *1.50*	1 ... ∞	1 ... ∞	25 *0.98*	30 *1.18*	30 *1.18*
60 *2.36*	50 *1.97*	1 ... ∞	1 ... ∞	32 *1.26*	40 *1.57*	40 *1.57*

The design variants shown represent standard installation conditions. If the installation position of the hinge is changed or one of the two wall thickness dimensions s or b are lower, the maximum achievable dimensions change independently of each other. This makes it possible in some cases to work with larger wall thickness dimensions than those specified with the same hinge size. A simple design check via CAD or a test setup is therefore recommended.

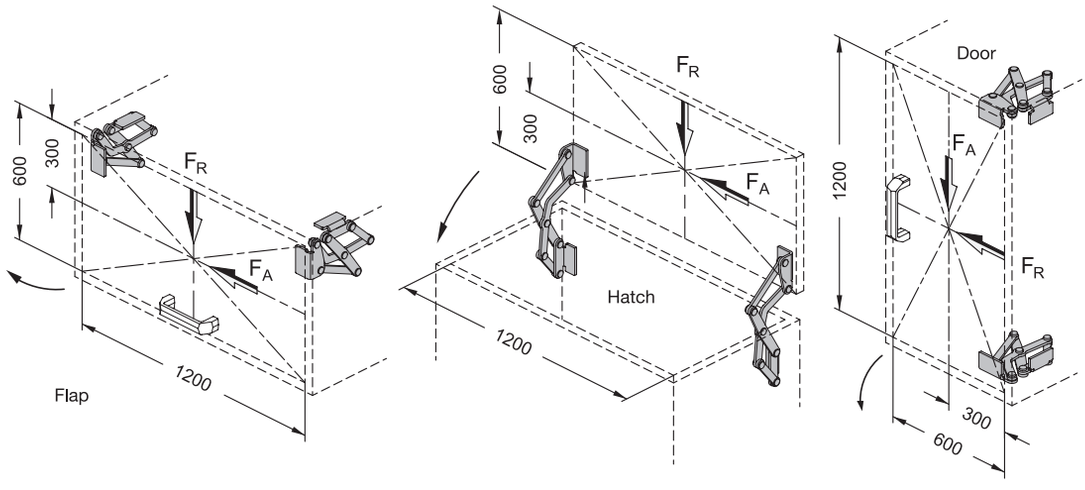


Construction example

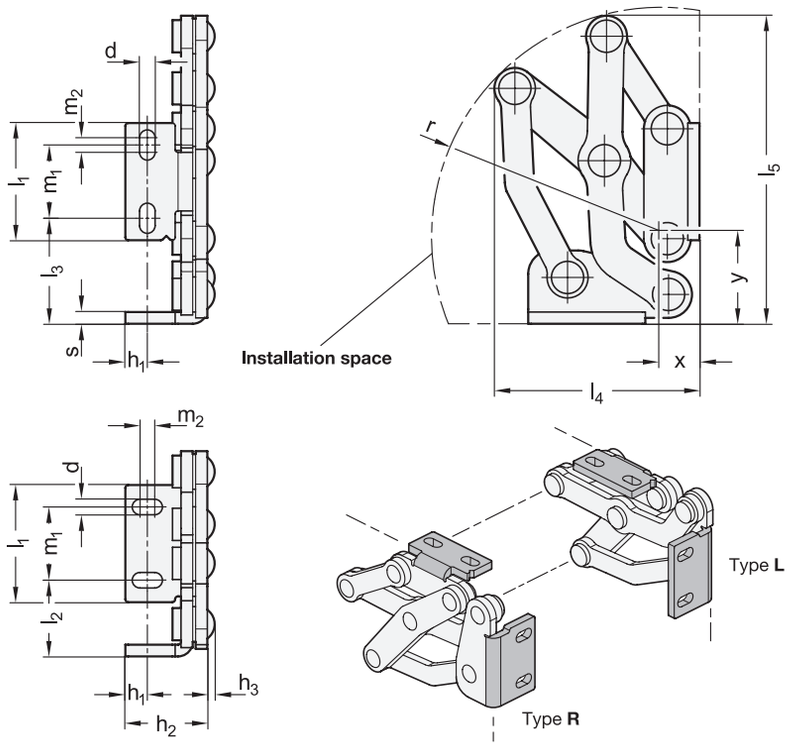


Load capacity

The maximum load of the multiple-joint hinges specified below applies to the standard use cases and serves for orientation in the case of deviating applications. The resulting forces lead to slight elastic deformation, which can be compensated for by means of the adjustment options, if necessary.



Max. load capacity per hinge pair		
l_1	**F_A (axial)**	**F_R (radial)**
40 *1.57*	175 N *39.34 lbf*	650 N *146.13 lbf*
50 *1.97*	175 N *39.34 lbf*	750 N *168.61 lbf*
60 *2.36*	150 N *33.72 lbf*	550 N *123.65 lbf*



Metric

SS Stainless Steel

3 Type

L Left-hand assembly angle bracket
R Right-hand assembly angle bracket

Metric table

Dimensions in: millimeters - *inches*

l_1	d	h_1	h_2	h_3	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	m_1	m_2	r	s	x	y
40 *1.57*	5.3 *0.21*	7.5 *0.30*	28 *1.10*	2.5 *0.10*	26 *1.02*	36 *1.42*	70.1 *2.76*	105.2 *4.14*	74.5 *2.93*	27.4 *1.08*	101.9 *4.01*	16 *0.63*	25 *0.98*	5 *0.20*	78.5 *3.09*	4 *0.16*	13 *0.51*	29.5 *1.16*
50 *1.97*	6.5 *0.26*	10 *0.39*	35 *1.38*	2.5 *0.10*	35 *1.38*	46 *1.81*	92.3 *3.63*	140 *5.51*	102.8 *4.05*	39.3 *1.55*	134.7 *5.30*	27.8 *1.09*	30 *1.18*	6 *0.24*	105 *4.13*	5 *0.20*	18 *0.71*	38 *1.50*
60 *2.36*	8.5 *0.33*	12.5 *0.49*	40 *1.57*	2.5 *0.10*	40 *1.57*	61 *2.40*	116.5 *4.59*	179.5 *7.07*	125.2 *4.93*	51.3 *2.02*	172.2 *6.78*	37.2 *1.46*	36 *1.42*	8 *0.31*	137.5 *5.41*	5 *0.20*	19 *0.75*	47 *1.85*

Specification

	1	4
• Body Stainless steel AISI 304	NI	
Matte, tumbled finish		MT
• Friction bearing Bronze, self-lubricated		
• *Stainless Steel Characteristics* → *Standard Parts Handbook page 2143*		
• RoHS compliant		

On request

- Other materials
- Other finishes
- Other assembly angle brackets
- Other opening angles
- Other max. wall thicknesses
- Other lifting motion

Information

GN 7237 multiple-joint hinges are installed on the inside of flaps, hatches and doors to save space and ensure protection against vandalism. The hinges have a maximum opening angle of 180°, which provides optimal accessibility and avoids the blocking of escape routes by open doors, for example.

Use of this hinge type leaves housing exteriors free of attachments that do not match the design or that should be avoided entirely in the interests of fast and easy cleaning.

Multiple-joint hinges are typically used in pairs, meaning that one L type and one R type is used per opening. For higher loads, e.g. from large hatches, these can be supplemented with additional hinges of either type.

see also...
- *Spacer Plates GN 2370 (Stainless Steel)* → *page 22*
- *Spacer Plates with Tapped Holes GN 2372 (Stainless Steel)* → *page 23*
- *Mounting Plates GN 2376 (Stainless Steel, with Threaded Studs)* → *page 24*

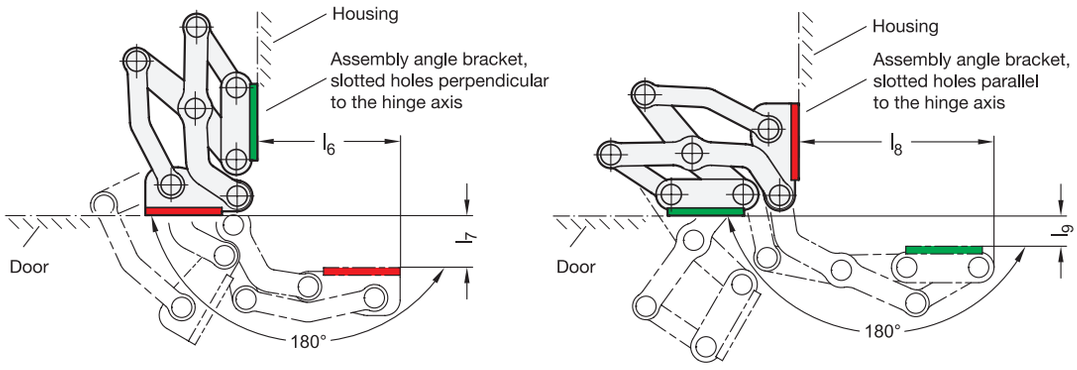
How to order

1 2 3 4
GN 7237-NI-40-L-MT

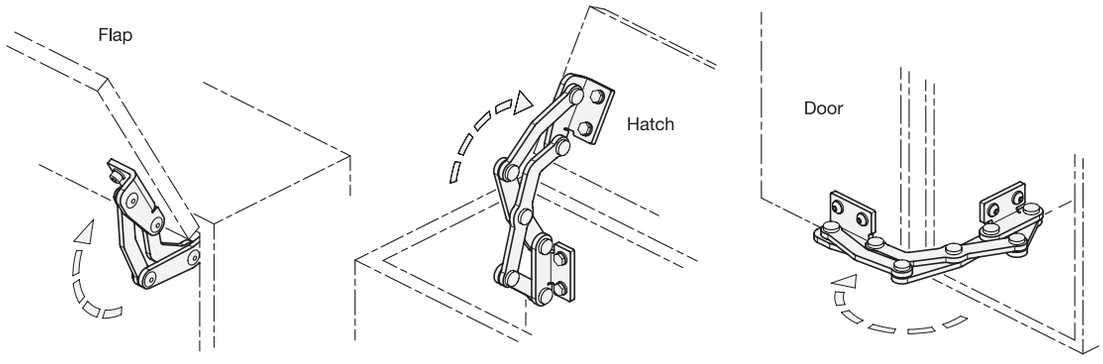
1	Material
2	Length l_1
3	Type
4	Finish

Installation position – pivot characteristics

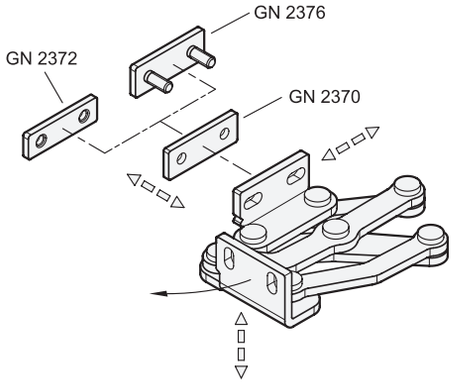
Multiple-joint hinges can be installed on the housing with the slotted holes of the assembly angle brackets that are either perpendicular or parallel to the hinge axis. This results in the two pivot characteristics depicted.



Application examples



Adjustment and mounting options



Multiple-joint hinges can be adjusted in three planes during installation. For example, this allows compensation for tolerances or establishing of required compressive forces for seals.

Two planes can be adjusted via parallel or perpendicular slotted holes in the assembly angle brackets. In the third plane, position corrections can be made using GN 2370 spacer plates.

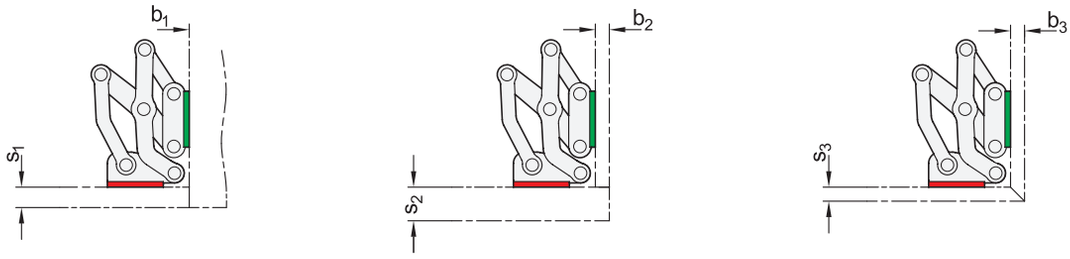
GN 2372 spacer plates with tapped holes as well as GN 2376 mounting plates with threaded studs are also available for mounting the hinges. The latter can be welded on or inserted through the wall from the outside and fastened in place.

All accessory items are designed for use with both assembly angle brackets.

Design variants

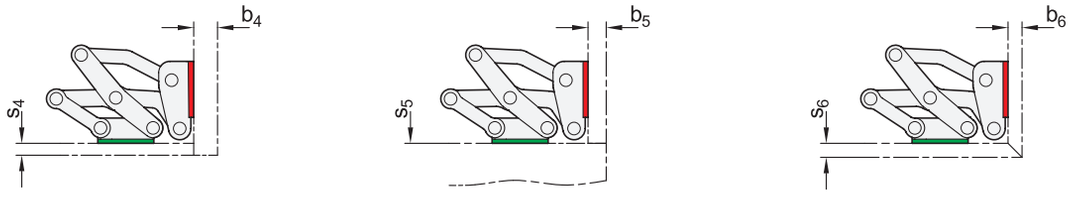
Flaps, hatches and doors can be inset, surface-mounted or mitered. The maximum wall thicknesses and bend sizes for planned sheet metal constructions arise from the respective installation type.

1. Assembly angle brackets mounted to the housing with slotted holes perpendicular to the hinge axis:



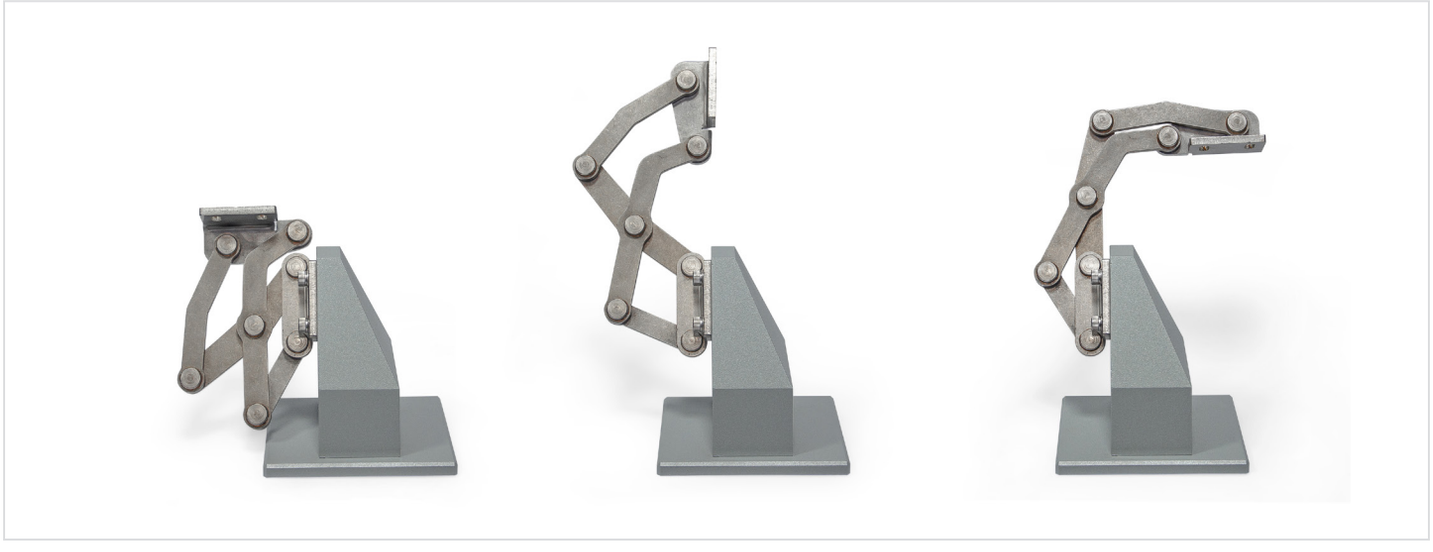
l_1	$s_{1\ max.}$	b_1	$s_{2\ max.}$	$b_{2\ max.}$	$s_{3\ max.}$	$b_{3\ max.}$
40 *1.57*	13 *0.51*	1 ... ∞	24 *0.94*	10 *0.39*	10 *0.39*	10 *0.39*
50 *1.97*	19 *0.75*	1 ... ∞	34 *1.34*	17 *0.67*	16 *0.63*	16 *0.63*
60 *2.36*	25 *0.98*	1 ... ∞	44 *1.73*	24 *0.94*	21 *0.83*	21 *0.83*

2. Assembly angle brackets mounted to the housing with slotted holes parallel to the hinge axis:

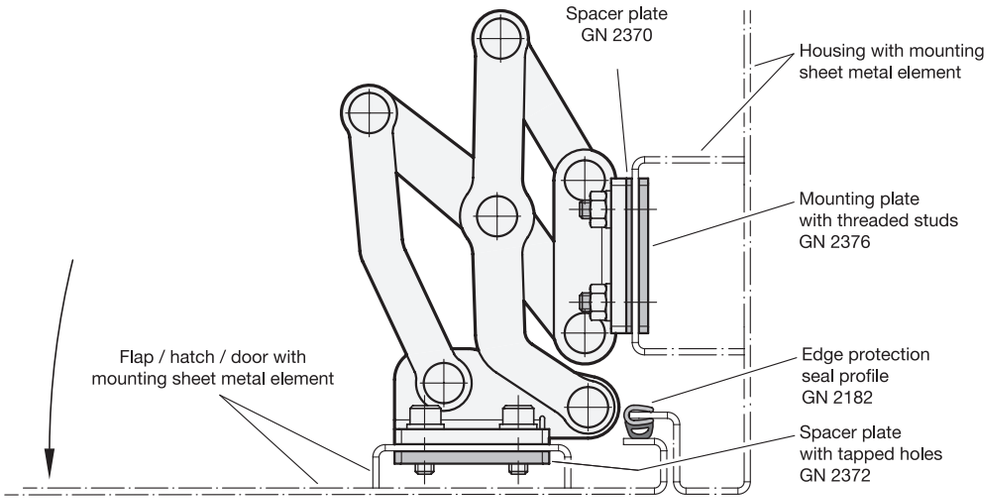


l_1	$s_{4\ max.}$	$b_{4\ max.}$	s_5	$b_{5\ max.}$	$s_{6\ max.}$	$b_{6\ max.}$
40 *1.57*	9 *0.35*	27 *1.06*	1 ... ∞	13 *0.51*	10 *0.39*	10 *0.39*
50 *1.97*	17 *0.67*	35 *1.38*	1 ... ∞	19 *0.75*	16 *0.63*	16 *0.63*
60 *2.36*	23 *0.91*	45 *1.77*	1 ... ∞	25 *0.98*	21 *0.83*	21 *0.83*

The design variants shown represent standard installation conditions. If the installation position of the hinge is changed or one of the two wall thickness dimensions s or b are lower, the maximum achievable dimensions change independently of each other. This makes it possible in some cases to work with larger wall thickness dimensions than those specified with the same hinge size. A simple design check via CAD or a test setup is therefore recommended.

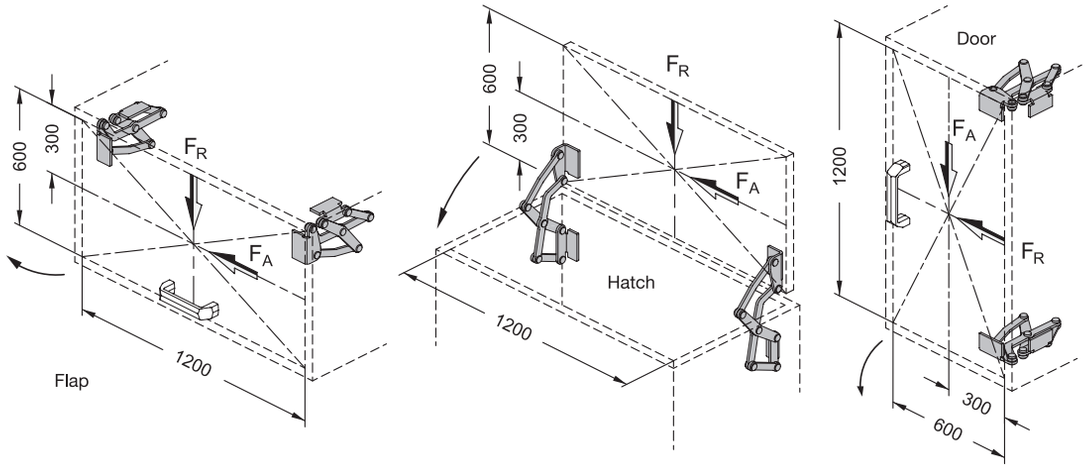


Construction example



Load capacity

The maximum load of the multiple-joint hinges specified below applies to the standard use cases and serves for orientation in the case of deviating applications. The resulting forces lead to slight elastic deformation, which can be compensated for by means of the adjustment options, if necessary.



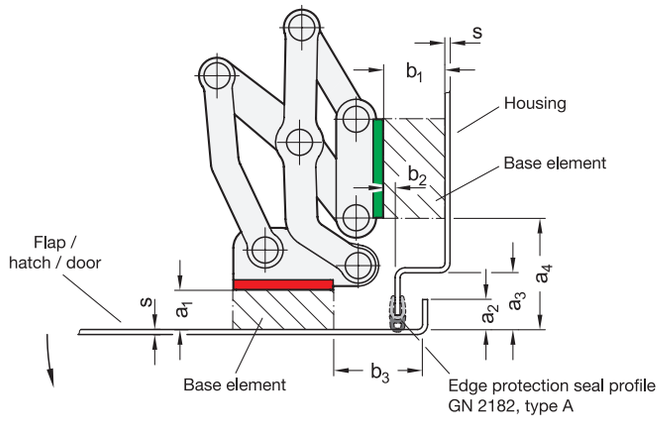
Max. load capacity per hinge pair		
l_1	**F_A (axial)**	**F_R (radial)**
40 *1.57*	175 N *39.34 lbf*	650 N *146.13 lbf*
50 *1.97*	175 N *39.34 lbf*	750 N *168.61 lbf*
60 *2.36*	150 N *33.72 lbf*	550 N *123.65 lbf*

Four common sheet metal designs are shown below as examples of many possibilities. They show the installation of a type L hinge, which is also valid for type R. Multiple-joint hinges can be mounted to the housing by means of the assembly angle bracket with slotted holes that are either perpendicular or parallel to the hinge axis. This results in different pivoting characteristics. Recesses within the movement range of the hinge arms as well as enlarged base elements open up additional design possibilities.

The final functional test must be done by the user either with a CAD program or a test setup because various factors, such as the compression of the edge protection seal profiles, adjustment options, or part tolerances cannot be entirely taken into account.

Example 1 - Externally attached door with edge protection seal on the housing

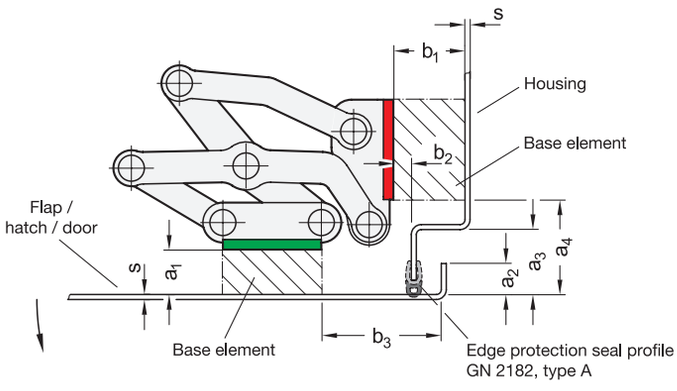
Assembly angle bracket with slotted holes perpendicular to the hinge axis on the housing



Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	a_4	b_1	b_2	b_3	s
40 *1.57*	14.5 *0.57*	10 *0.39*	16 - 35 *0.63 - 1.38*	43 *1.69*	14 - ∞ *0.55 - ∞*	0 *0*	28.5 *1.12*	1.5 *0.06*
50 *1.97*	19 *0.75*	12 *0.47*	16 - 48 *0.63 - 1.89*	55 *2.17*	14 - ∞ *0.55 - ∞*	0 *0*	38 *1.50*	2 *0.08*
60 *2.36*	28 *1.10*	20 *0.79*	22 - 70 *0.87 - 2.76*	77 *3.03*	17 - ∞ *0.67 - ∞*	2 *0.08*	45 *1.77*	2 *0.08*

Assembly angle bracket with slotted holes parallel to the hinge axis on the housing

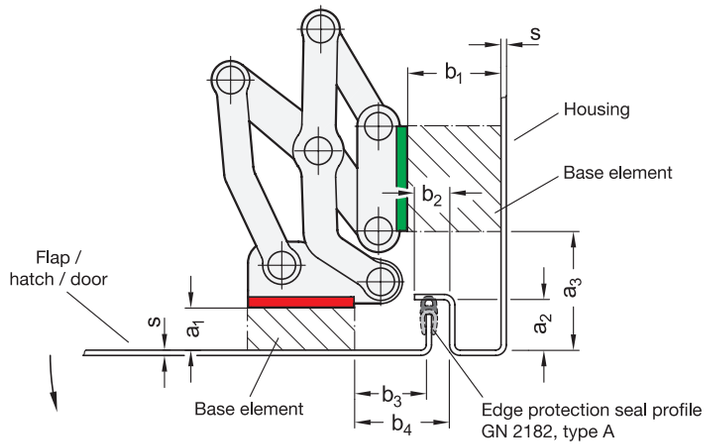


Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	a_4	b_1	b_2	b_3	s
40 *1.57*	-	-	-	-	-	-	-	-
50 *1.97*	17 *0.67*	10 *0.39*	17 - 35 *0.67 - 1.38*	42 *1.65*	14 - ∞ *0.55 - ∞*	0 *0*	50 *1.97*	2 *0.08*
60 *2.36*	25 *0.98*	14 *0.55*	25 - 46 *0.98 - 1.81*	53 *2.09*	19 - ∞ *0.75 - ∞*	2 *0.08*	68 *2.68*	2 *0.08*

Example 2 - Embedded door with edge protection seal on the flap / hatch / door

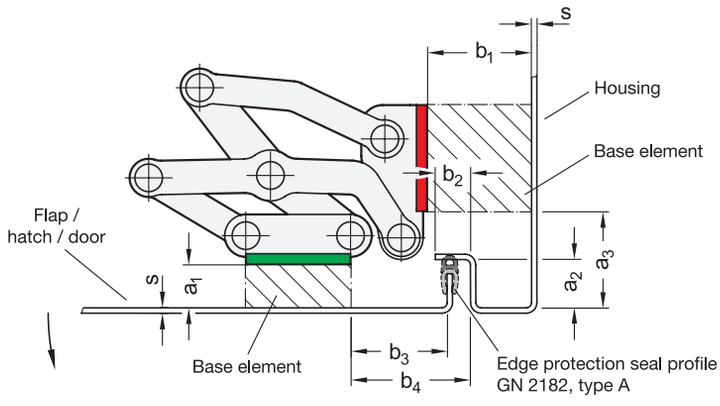
Assembly angle bracket with slotted holes perpendicular to the hinge axis on the housing



Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	b_1	b_2	b_3	b_4	s
40 *1.57*	-	-	-	-	-	-	-	-
50 *1.97*	16 *0.63*	19 *0.75*	52 *2.05*	34 - ∞ *1.34 - ∞*	12 *0.47*	27 *1.06*	35 *1.38*	2 *0.08*
60 *2.36*	22 *0.87*	27 *1.06*	71 *2.80*	42 - ∞ *1.65 - ∞*	14 *0.55*	30 *1.18*	38 *1.50*	2 *0.08*

Assembly angle bracket with slotted holes parallel to the hinge axis on the housing

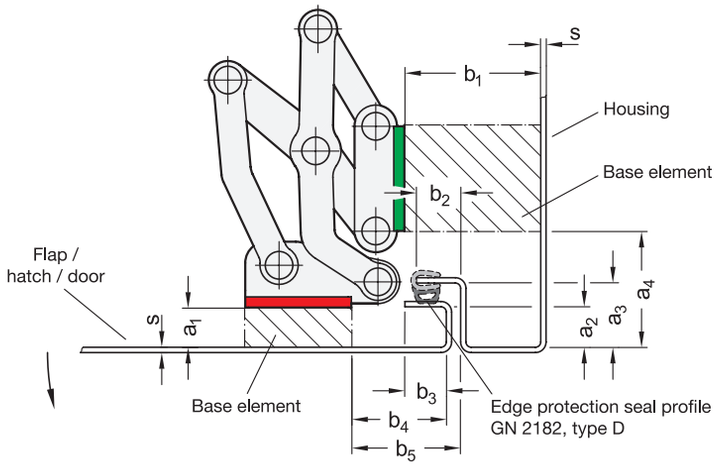


Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	b_1	b_2	b_3	b_4	s
40 *1.57*	-	-	-	-	-	-	-	-
50 *1.97*	11 *0.43*	16 *0.63*	36 *1.42*	32 - ∞ *1.26 - ∞*	12 *0.47*	40 *1.57*	47 *1.85*	2 *0.08*
60 *2.36*	16 *0.63*	21 *0.83*	44 *1.73*	38 - ∞ *1.50 - ∞*	14 *0.55*	52 *2.05*	60 *2.36*	2 *0.08*

Example 3 - Embedded door with edge protection seal on the housing

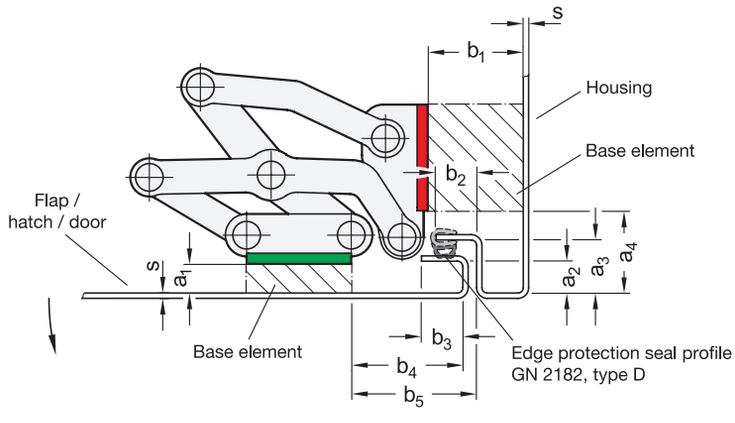
Assembly angle bracket with slotted holes perpendicular to the hinge axis on the housing



Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	a_4	b_1	b_2	b_3	b_4	b_5	s
40 *1.57*	-	-	-	-	-	-	-	-	-	-
50 *1.97*	14 *0.55*	14 *0.55*	22 *0.87*	50 *1.97*	43 - ∞ *1.69 - ∞*	15 *0.59*	14 *0.55*	38 *1.50*	42 *1.65*	2 *0.08*
60 *2.36*	21 *0.83*	24 *0.94*	32 *1.26*	70 *2.76*	52 - ∞ *2.05 - ∞*	16 *0.63*	16 *0.63*	40 *1.57*	44 *1.73*	2 *0.08*

Assembly angle bracket with slotted holes parallel to the hinge axis on the housing

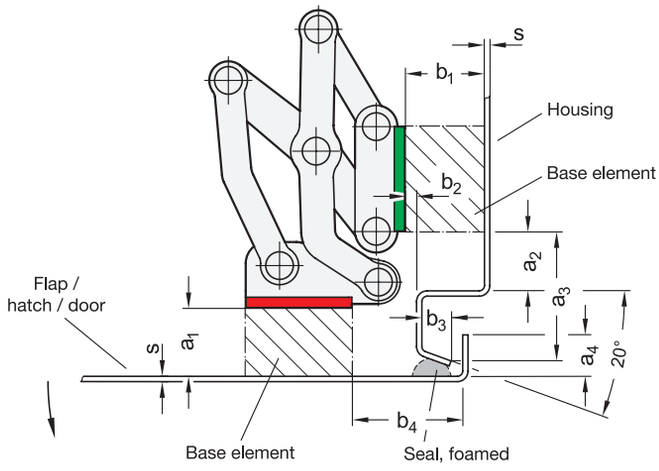


Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	a_4	b_1	b_2	b_3	b_4	b_5	s
40 *1.57*	-	-	-	-	-	-	-	-	-	-
50 *1.97*	11 *0.43*	12 *0.47*	20 *0.79*	36 *1.42*	40 - ∞ *1.57 - ∞*	14 *0.55*	12 *0.47*	47 *1.85*	51 *2.01*	2 *0.08*
60 *2.36*	16 *0.63*	20 *0.79*	28 *1.10*	44 *1.73*	50 - ∞ *1.97 - ∞*	16 *0.63*	16 *0.63*	63 *2.48*	67 *2.64*	2 *0.08*

Example 4 - Embedded door with foamed seal on the flap / hatch / door

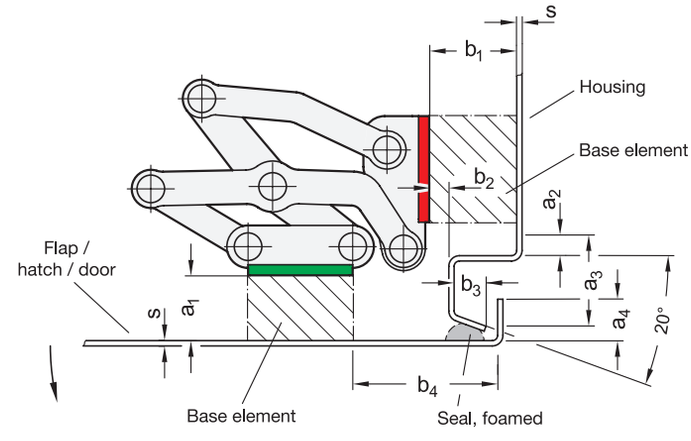
Assembly angle bracket with slotted holes perpendicular to the hinge axis on the housing



Dimensions in: millimeters - *inches*

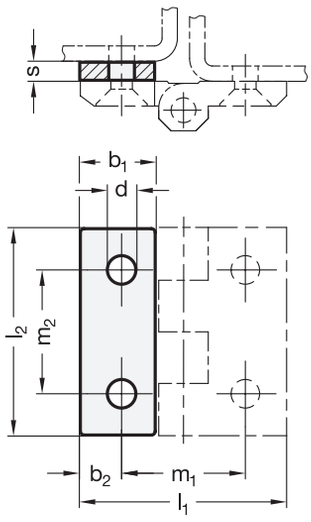
l_1	a_1	a_2	a_3	a_4	b_1	b_2	b_3	b_4	s
40 *1.57*	22 *0.87*	5 - 25 *0.20 - 0.98*	46.9 *1.85*	10 *0.39*	14 - ∞ *0.55 - ∞*	0 *0*	8 *0.31*	30 *1.18*	1.5 *0.06*
50 *1.97*	31 *1.22*	5 - 33 *0.20 - 1.30*	63.3 *2.49*	14 *0.55*	18 - ∞ *0.71 - ∞*	2 *0.08*	12 *0.47*	43 *1.69*	2 *0.08*
60 *2.36*	40 *1.57*	5 - 47 *0.20 - 1.85*	85.1 *3.35*	22 *0.87*	19 - ∞ *0.75 - ∞*	2 *0.08*	14 *0.55*	48 *1.89*	2 *0.08*

Assembly angle bracket with slotted holes parallel to the hinge axis on the housing



Dimensions in: millimeters - *inches*

l_1	a_1	a_2	a_3	a_4	b_1	b_2	b_3	b_4	s
40 *1.57*	-	-	-	-	-	-	-	-	-
50 *1.97*	26 *1.02*	5 - 21 *0.20 - 0.83*	47 *1.85*	12 *0.47*	20 - ∞ *0.79 - ∞*	4 *0.16*	11 *0.43*	56 *2.20*	2 *0.08*
60 *2.36*	35 *1.38*	5 - 24 *0.20 - 0.94*	59 *2.32*	20 *0.79*	24 - ∞ *0.94 - ∞*	5 *0.20*	14 *0.55*	73 *2.87*	2 *0.08*



Metric

SS Stainless Steel

Metric table

Dimensions in: millimeters - *inches*

2 l_2	3 s				b_1	b_2	d	l_1	m_1	m_2	Suitable for hinges with hole spacing m_2			
											GN 235 GN 337 EN 337.1 GN 437 GN 7231 GN 7233 GN 7237	GN 237 EN 237.1	GN 237.3 (Type A)	GN 437.1 GN 437.2 GN 437.3 GN 437.4
30 *1.18*	1 *0.04*	1.5 *0.06*	3 *0.12*	5 *0.20*	10.8 *0.43*	6 *0.24*	4 *0.16*	30 *1.18*	18 *0.71*	18 *0.71*	-	x	-	-
40 *1.57*	1 *0.04*	1.5 *0.06*	3 *0.12*	5 *0.20*	14.5 *0.57*	7.5 *0.30*	5 *0.20*	40 *1.57*	25 *0.98*	25 *0.98*	x	x	-	-
50 *1.97*	1 *0.04*	1.5 *0.06*	3 *0.12*	5 *0.20*	18 *0.71*	10 *0.39*	6 *0.24*	50 *1.97*	30 *1.18*	30 *1.18*	x	x	x	-
60 *2.36*	1 *0.04*	1.5 *0.06*	3 *0.12*	5 *0.20*	21.5 *0.85*	12.5 *0.49*	8 *0.31*	60 *2.36*	36 *1.42*	36 *1.42*	x	x	x	x

Specification

	1	4
• Stainless steel AISI 304	NI	
Matte, tumbled finish		MT

- *Stainless Steel Characteristics*
  → *Standard Parts Handbook page 2143*
- RoHS compliant

Information

Tolerances of chamfers, different sheet metal thicknesses, or the use of seals could mean that the mounting surfaces of hinges on the frame and door are not at the desired distance to each other.

GN 2370 spacer plates are designed as accessories for several hinge variations, ensuring the appropriate position or height compensation during mounting by shimming, either individually or in combination.

The table includes a number of potential compensation heights, which can be accomplished by shimming with one or two spacer plates.

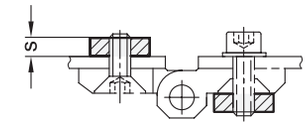
Dimensions in: millimeters - *inches*

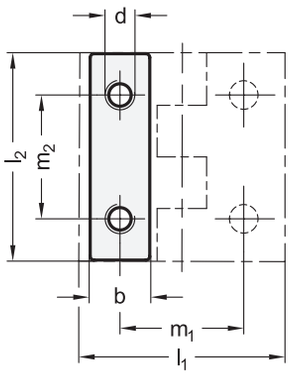
Height compensation	Plate height **s**	Height compensation	Plate height **s**
1 *0.04*	1 *0.04*	4.5 *0.18*	3 + 1.5 *0.12 + 0.06*
1.5 *0.06*	1.5 *0.06*	5 *0.20*	5 *0.20*
2 *0.08*	1 + 1 *0.04 + 0.04*	6 *0.24*	3 + 3 *0.12 + 0.12*
2.5 *0.10*	1 + 1.5 *0.04 + 0.06*	6.5 *0.26*	5 + 1.5 *0.20 + 0.06*
3 *0.12*	3 *0.12*	8 *0.31*	5 + 3 *0.20 + 0.12*
4 *0.16*	3 + 1 *0.12 + 0.04*	10 *0.39*	5 + 5 *0.20 + 0.20*

How to order

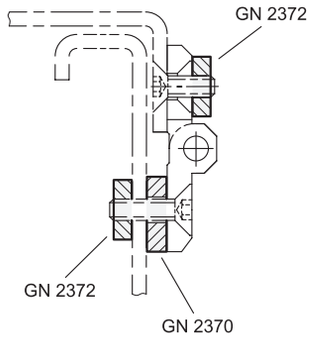
1 2 3 4
GN 2370-NI-40-5-MT

1	**Material**
2	**Length l_2**
3	**Height s**
4	**Finish**





Application example



Metric

SS Stainless Steel

Metric table

Dimensions in: millimeters - *inches*

l_2	b	d Thread	l_1	m_1	m_2	s	Suitable for hinges with hole spacing m_2			
							GN 235 GN 337 EN 337.1 GN 437 GN 7231 GN 7233 GN 7237	GN 237 EN 237.1	GN 237.3	GN 437.1 GN 437.2 GN 437.3 GN 437.4
30 *1.18*	9 *0.35*	M 4	30 *1.18*	18 *0.71*	18 *0.71*	3 *0.12*	-	x	-	-
40 *1.57*	12 *0.47*	M 5	40 *1.57*	25 *0.98*	25 *0.98*	3 *0.12*	x	x	-	-
50 *1.97*	15 *0.59*	M 6	50 *1.97*	30 *1.18*	30 *1.18*	4 *0.16*	x	x	x	-
60 *2.36*	18 *0.71*	M 8	60 *2.36*	36 *1.42*	36 *1.42*	4 *0.16*	x	x	x	x

Specification

	1	3
• Stainless steel AISI 304	NI	
Matte, tumbled finish		MT

• *Stainless Steel Characteristics → Standard Parts Handbook page 2143*

• RoHS compliant

Information

GN 2372 spacer plates are designed as accessories for several hinge variations, eliminating the need for additional threads, nuts, and washers for mounting.

There is no need for the time-consuming pre-assembly of the above components or for counterholding during tightening or loosening. Mounted to the top side of the hinge, the plate offers entirely new design options.

see also...

- *Mounting Plates with Threaded Studs GN 2376 → page 24*
- *Limit Stops GN 2374 → Standard Parts Handbook page 1336*
- *Spacer Plates GN 7247.2 → page 38*
- *Spacer Plates with Tapped Holes GN 7247.4 → page 39*
- *Mounting Plates with Threaded Studs GN 7247.6 → page 40*

How to order

1 2 3

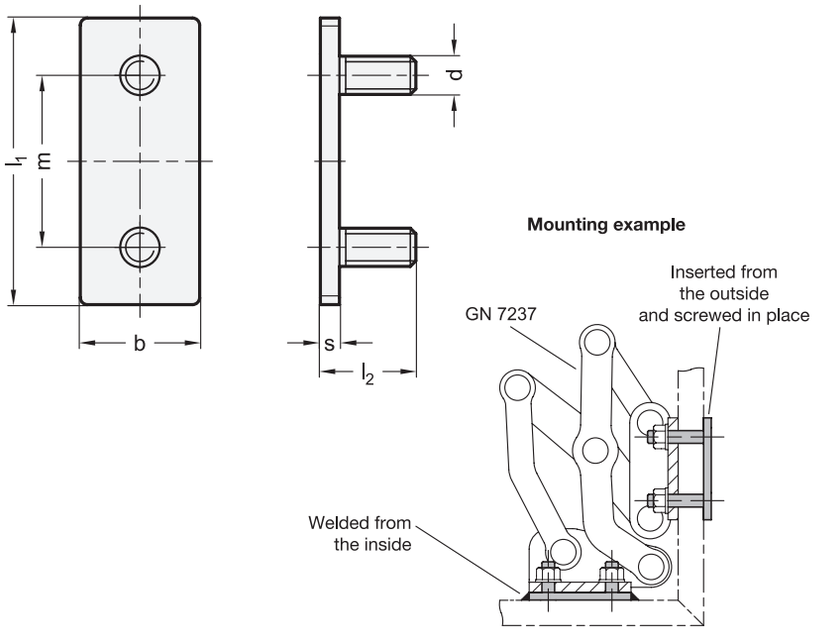
GN 2372-NI-40-MT

1	**Material**
2	**Length l_2**
3	**Finish**

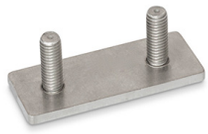
GN 2376 | Mounting Plates with Threaded Studs

Stainless Steel, for Hinges

JW WINCO® A Ganter Company



Metric



SS Stainless Steel

Metric table

Dimensions in: millimeters - *inches*

2 l_1	3 l_2		b	d Thread	m	s	Suitable for hinges with hole spacing m	
							GN 235	GN 7231 GN 7233 GN 7237
40 *1.57*	15 *0.59*	25 *0.98*	15 *0.59*	M 5	25 *0.98*	3 *0.12*	x	x
50 *1.97*	20 *0.79*	30 *1.18*	20 *0.79*	M 6	30 *1.18*	3 *0.12*	x	x
60 *2.36*	20 *0.79*	30 *1.18*	25 *0.98*	M 8	36 *1.42*	4 *0.16*	x	x

Specification

	1	4
• Body Stainless steel AISI 304	NI	
Matte, tumbled finish		MT
• Threaded studs Stainless steel AISI 304 Pressed-in		
• *Stainless Steel Characteristics* → *Standard Parts Handbook page 2143*		
• RoHS compliant		

On request

- Other threaded stud lengths
- Other plate sizes
- Other plate geometries

Information

GN 2376 mounting plates with threaded studs are designed as accessories for several hinge variations. They eliminate the need for additional threads, screws, nuts, and washers for mounting. There is no need for the time-consuming pre-assembly of the above components or for counterholding during tightening or loosening.

The mounting plates are mounted from the outside via through-holes in the housing wall or alternatively by welding to the inside of the wall. This results in effective protection against vandalism, and the housing exteriors remain free of attachments that do not match the design or that should be avoided entirely in the interests of easy cleaning.

see also...

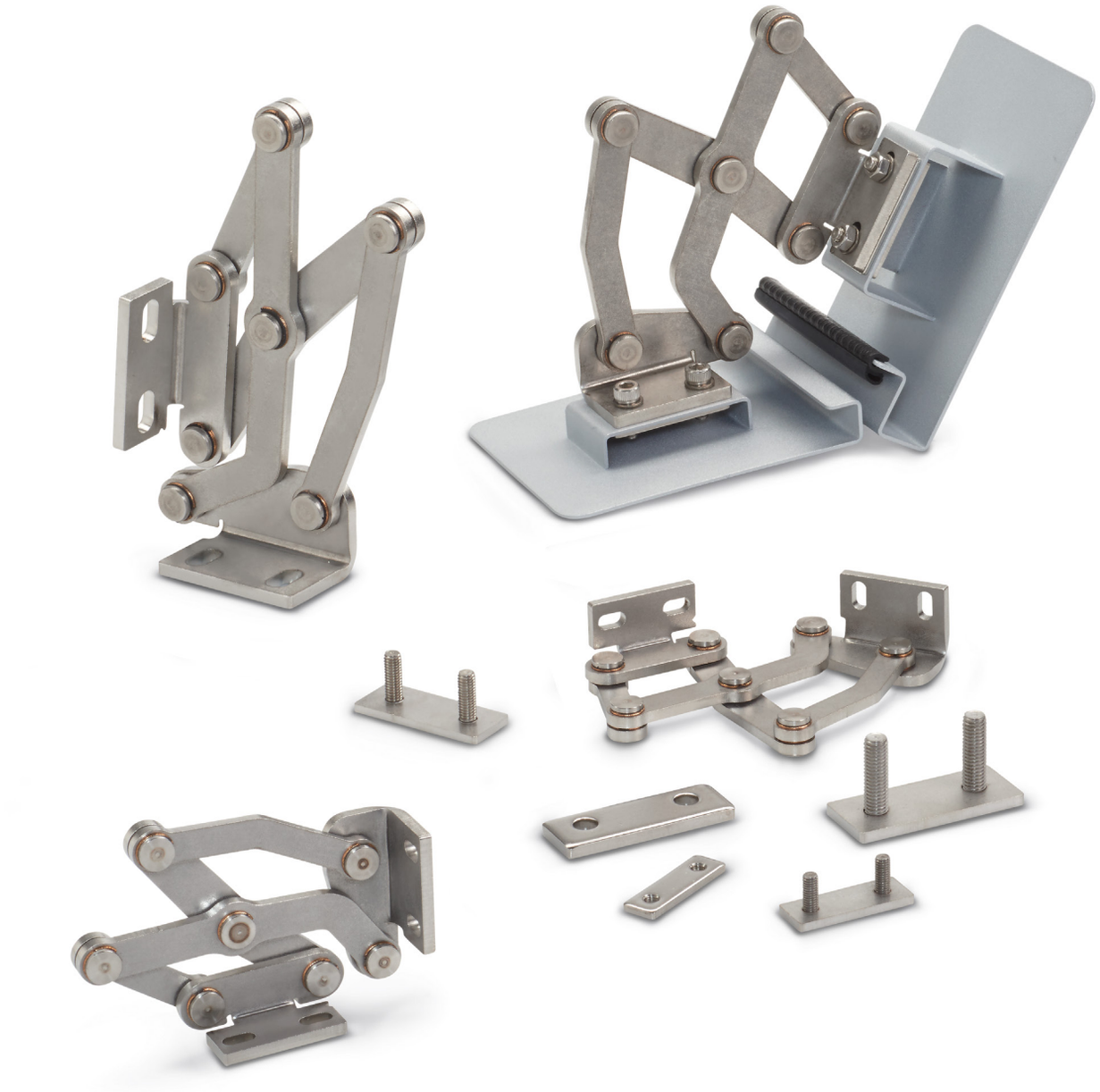
- *Spacer Plates with Tapped Holes GN 2372 → page 23*
- *Spacer Plates GN 2370 → page 22*
- *Limit Stops GN 2374 → Standard Parts Handbook page 1336*

How to order

1 2 3 4

GN 2376-NI-40-15-MT

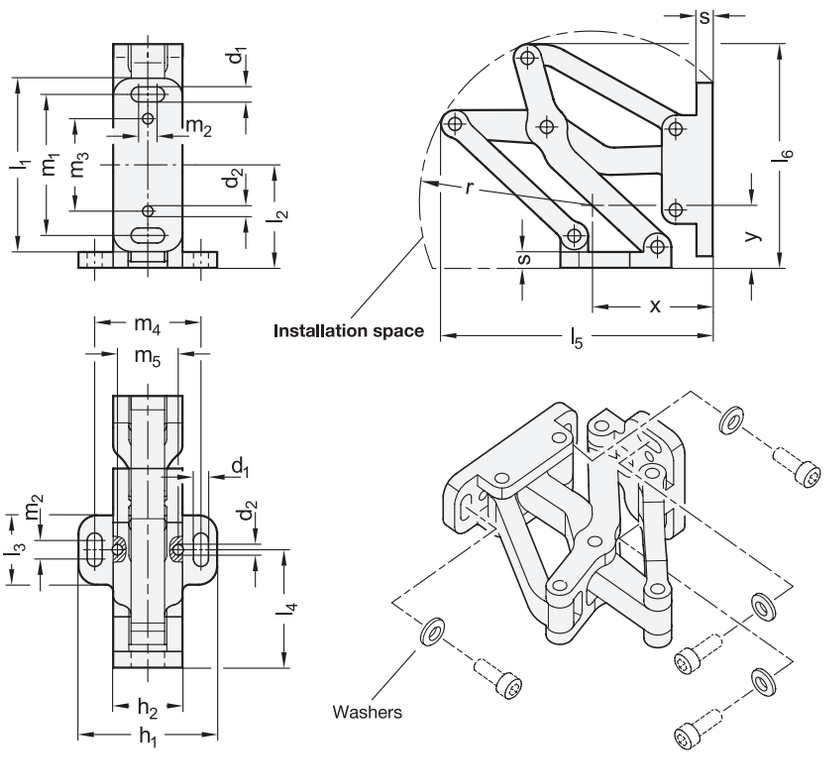
1	Material
2	Length l_1
3	Thread length l_2
4	Finish



GN 7241 | Multiple-Joint Hinge

Aluminum, Concealed, with Opening Angle of 90°

JW WINCO® A Ganter Company



Metric

Metric table

Dimensions in: millimeters - *inches*

2																				
l_1	d_1	d_2	h_1	h_2	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	m_1	m_2	m_3	m_4	m_5	r	s	x	y
75	6.5	4	60	30	44.5	30	51	117.5	96.7	13.5	108	101.7	61	8	40	46	28	75	7	52	29
2.95	*0.26*	*0.16*	*2.36*	*1.18*	*1.75*	*1.18*	*2.01*	*4.63*	*3.81*	*0.53*	*4.25*	*4.00*	*2.40*	*0.31*	*1.57*	*1.81*	*1.10*	*2.95*	*0.28*	*2.05*	*1.14*

Specification

1	3

- Body
  Aluminum — **AL**
  Anodized finish, natural color — **EL**
- Hinge pins / washers
  Stainless steel AISI 304
- Friction bearing
  Plastic
  - Self-lubricated
  - Temperature resistant from -40 °F to +194 °F (-40 °C to +90 °C)
- *Stainless Steel Characteristics*
  → *Standard Parts Handbook page 2143*
- RoHS compliant

On request

- Other finishes / colors
- Other mounting flanges
- Other opening angles
- Other max. wall thicknesses
- Other lifting motion

Information

The GN 7241 multiple-joint hinge is installed on the inside of flaps, hatches and doors to save space and ensure protection against vandalism. The hinge has a maximum opening angle of 90°, making them perfect for use with thick door leaves.

Use of this hinge type leaves housing exteriors free of attachments that do not match the design or that should be avoided entirely in the interests of fast and easy cleaning.

Multiple-joint hinges are typically used in pairs. For higher loads, e.g. from large doors, these can be supplemented with additional hinges. Four reinforced washers are supplied for assembly, which can be used with mounting screws of thread size M6.

see also...
- *Spacer Plates GN 7247.2* → *page 38*
- *Spacer Plates with Tapped Holes GN 7247.4* → *page 39*
- *Mounting Plates with Threaded Studs GN 7247.6* → *page 40*

How to order

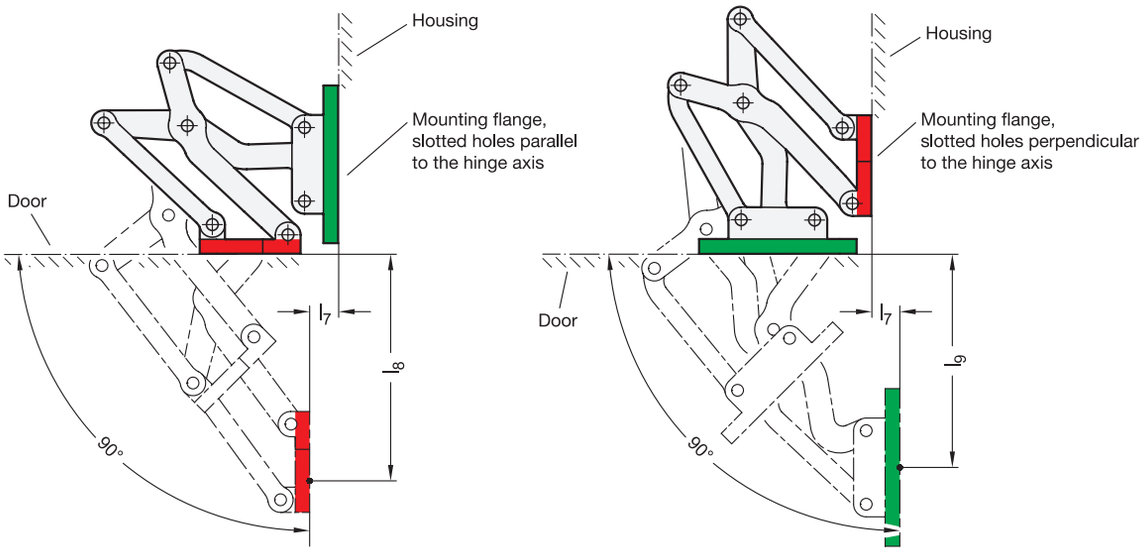
1 2 3

GN 7241-AL-75-EL

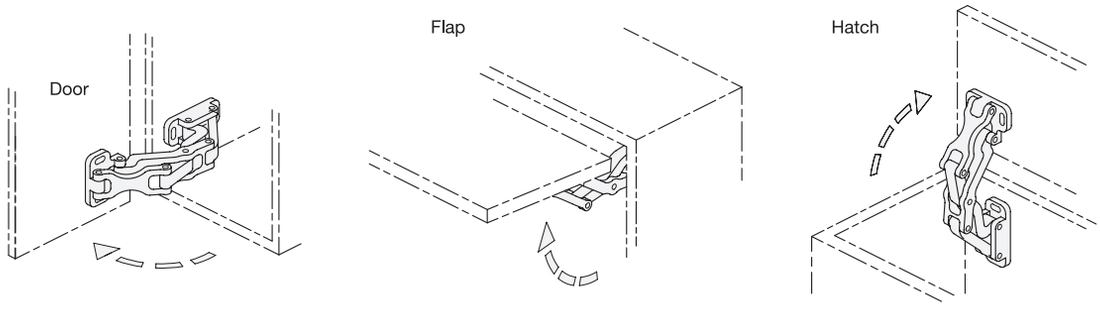
1	**Material**
2	**Length l_1**
3	**Finish / Color**

Installation position – pivot characteristics

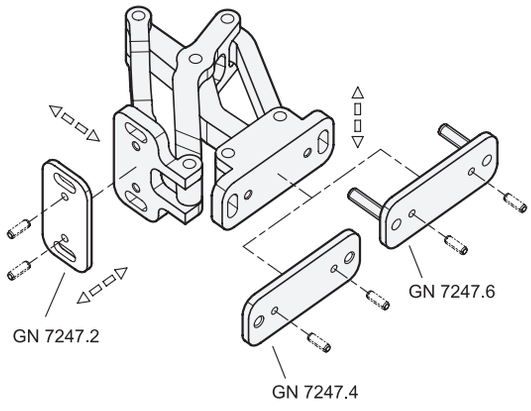
Multiple-joint hinges can be installed on the housing with the slotted holes of the mounting flanges that are either perpendicular or parallel to the hinge axis. This results in the two pivot characteristics depicted.



Application examples



Adjustment and mounting options



Multiple-joint hinges can be adjusted in three planes during installation. For example, this allows compensation for tolerances or establishing of required compressive forces for seals.

Two planes can be adjusted via parallel or perpendicular slotted holes in the mounting flanges. In the third plane, position corrections can be made using GN 7247.2 spacer plates.

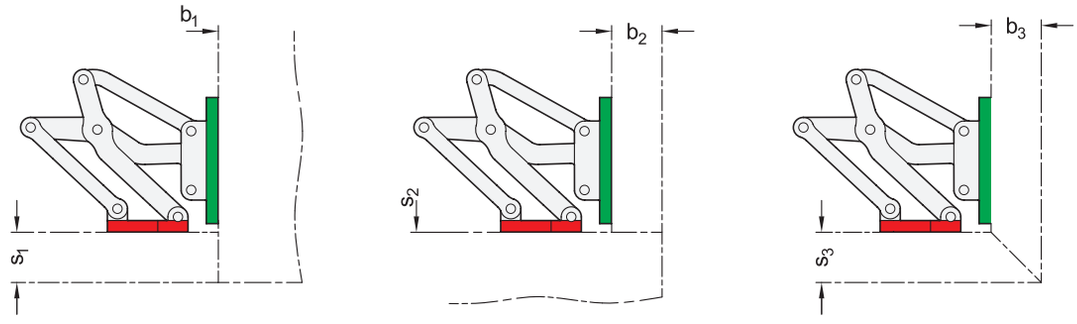
GN 7247.4 spacer plates with tapped holes as well as GN 7247.6 mounting plates with threaded studs are also available for mounting the hinges. The latter can be welded on or inserted through the wall from the outside and fastened in place.

The holes d_2 are used to accomodate clamping or positioning pins, making it easy to position the hinge. This also prevents unintended turning or slipping under load. The pins cannot be removed for subsequent adjustment.

Design variants

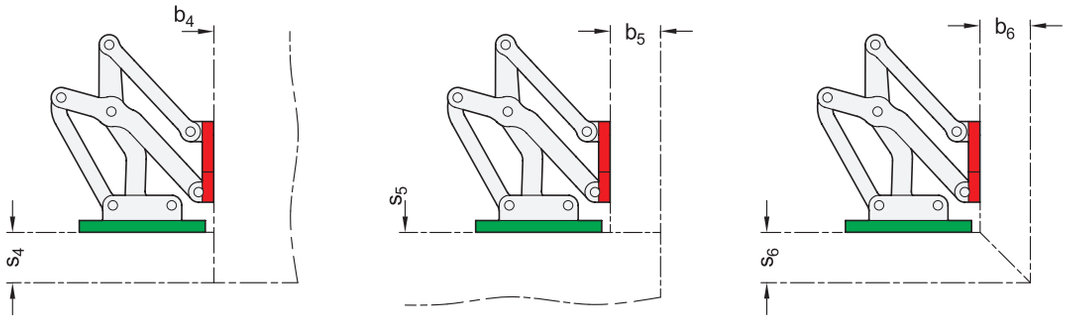
Flaps, hatches and doors can be inset, surface-mounted or mitered. The maximum wall thicknesses and bend sizes for planned sheet metal constructions arise from the respective installation type.

1. Mounting flange mounted to the housing with slotted holes parallel to the hinge axis:



l_1	$s_{1\ max.}$	b_1	s_2	$b_{2\ max.}$	$s_{3\ max.}$	$b_{3\ max.}$
75 *2.95*	30 *1.18*	1 ... ∞	1 ... ∞	30 *1.18*	30 *1.18*	30 *1.18*

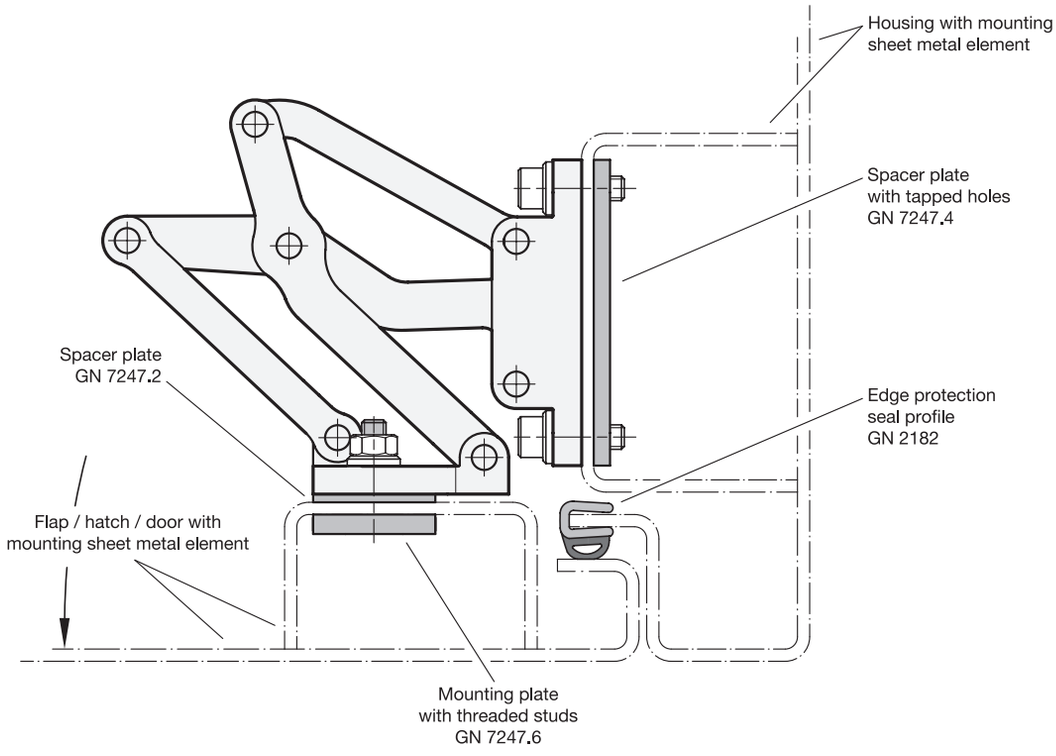
2. Mounting flange mounted to the housing with slotted holes perpendicular to the hinge axis:



l_1	$s_{4\ max.}$	b_4	s_5	$b_{5\ max.}$	$s_{6\ max.}$	$b_{6\ max.}$
75 *2.95*	30 *1.18*	1 ... ∞	1 ... ∞	30 *1.18*	30 *1.18*	30 *1.18*

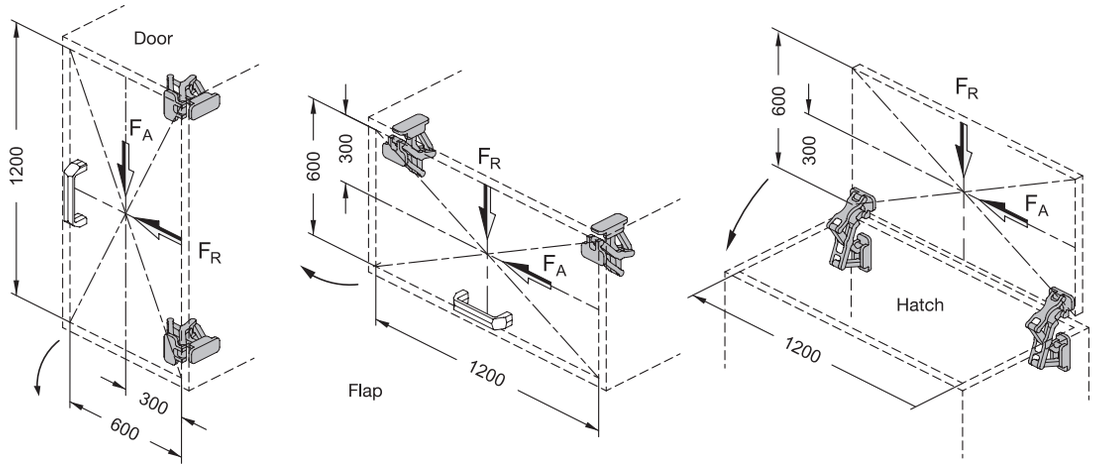
The design variants shown represent standard installation conditions. If the installation position of the hinge is changed or one of the two wall thickness dimensions s or b are lower, the maximum achievable dimensions change independently of each other. This makes it possible in some cases to work with larger wall thickness dimensions than those specified with the same hinge size. A simple design check via CAD or a test setup is therefore recommended.

Construction example



Load capacity

The maximum load of the multiple-joint hinges specified below applies to the standard use cases and serves for orientation in the case of deviating applications. The resulting forces lead to slight elastic deformation, which can be compensated for by means of the adjustment options, if necessary.

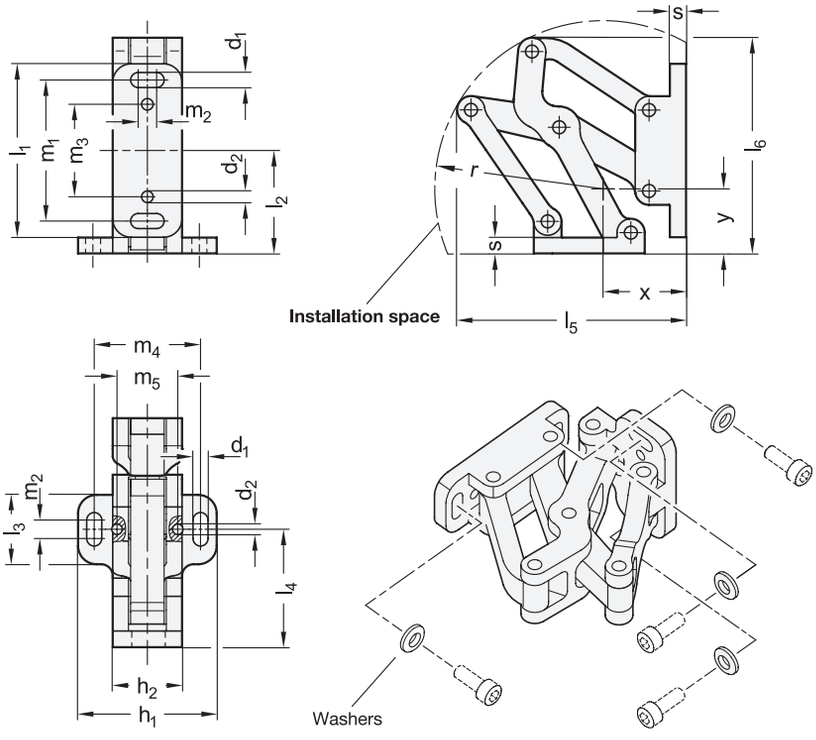


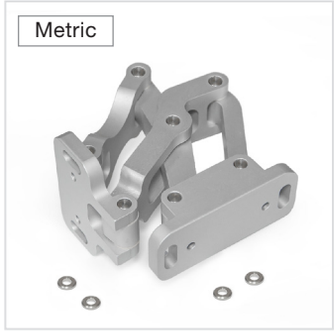
Max. load capacity per hinge pair		
l_1	**F_A (axial)**	**F_R (radial)**
75 *2.95*	650 N *146.13 lbf*	750 N *168.61 lbf*

GN 7243 | Multiple-Joint Hinge

Aluminum, Concealed, with Opening Angle of 120°

JW WINCO® A Ganter Company





Metric table

Dimensions in: millimeters - *inches*

2																						
l_1	d_1	d_2	h_1	h_2	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	m_1	m_2	m_3	m_4	m_5	r	s	x	z
75	6.5	4	60	30	44.5	30	51	99	93.3	24	80.4	41.7	69.3	61	8	40	46	28	73	7	36	28
2.95	*0.26*	*0.16*	*2.36*	*1.18*	*1.75*	*1.18*	*2.01*	*3.90*	*3.67*	*0.94*	*3.17*	*1.64*	*2.73*	*2.40*	*0.31*	*1.57*	*1.81*	*1.10*	*2.87*	*0.28*	*1.42*	*1.10*

Specification

	1	3
• Body		
Aluminum	AL	
Anodized finish, natural color		EL
• Hinge pins / washers		
Stainless steel AISI 304		
• Friction bearing		
Plastic		
- Self-lubricated		
- Temperature resistant from -40 °F to +194 °F (-40 °C to +90 °C)		
• *Stainless Steel Characteristics* → *Standard Parts Handbook page 2143*		
• RoHS compliant		

On request

- Other finishes / colors
- Other mounting flanges
- Other opening angles
- Other max. wall thicknesses
- Other lifting motion

Information

The GN 7243 multiple-joint hinge is installed on the inside of flaps, hatches and doors to save space and ensure protection against vandalism. The hinge has a maximum opening angle of 120°, allowing for easy accessibility and making them suitable for use with medium-thick door leaves.

Use of this hinge type leaves housing exteriors free of attachments that do not match the design or that should be avoided entirely in the interests of fast and easy cleaning.

Multiple-joint hinges are typically used in pairs. For higher loads, e.g. from large doors, these can be supplemented with additional hinges. Four reinforced washers are supplied for assembly, which can be used with mounting screws of thread size M6.

see also...
- *Spacer Plates GN 7247.2* → *page 38*
- *Spacer Plates with Tapped Holes GN 7247.4* → *page 39*
- *Mounting Plates with Threaded Studs GN 7247.6* → *page 40*

How to order

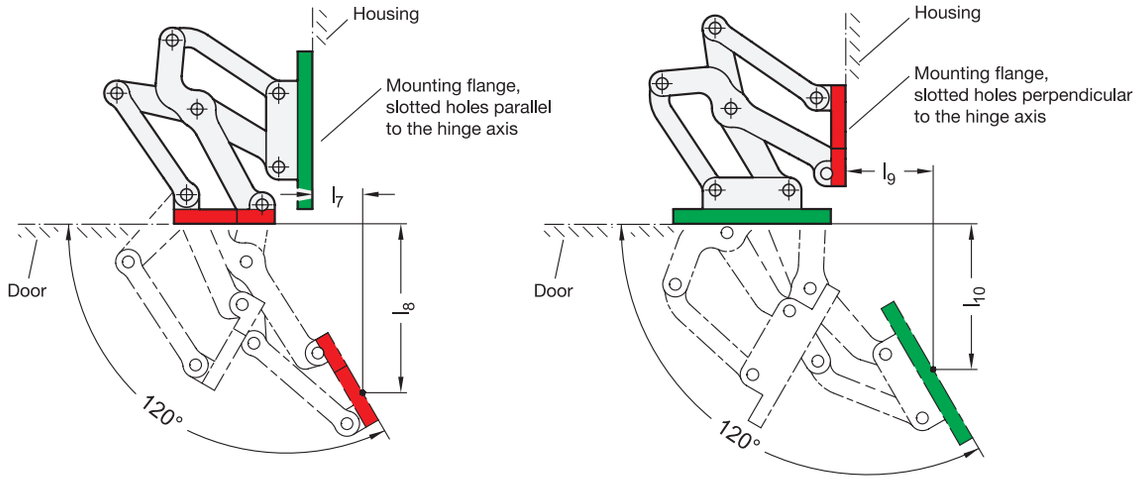
1 2 3

GN 7243-AL-75-EL

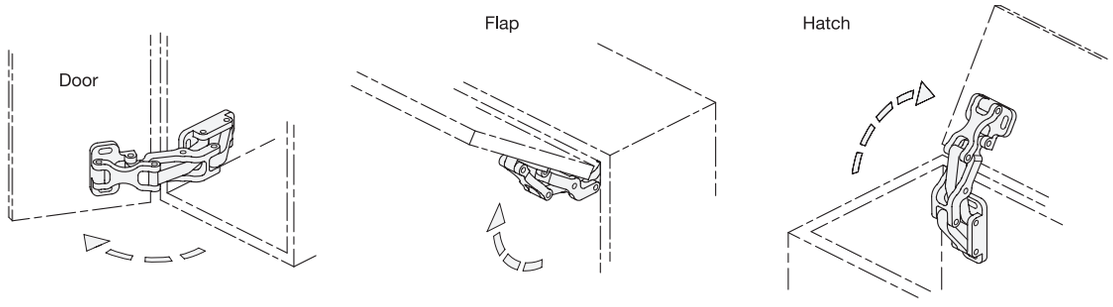
1	Material
2	Length l_1
3	Finish / Color

Installation position – pivot characteristics

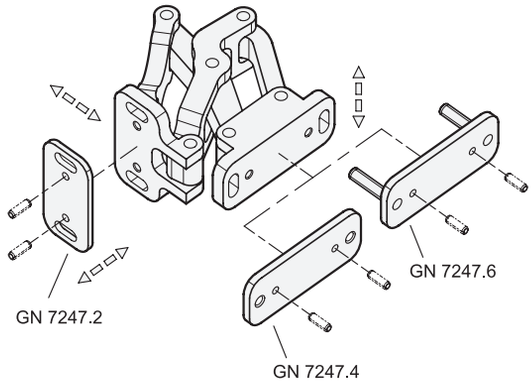
Multiple-joint hinges can be installed on the housing with the slotted holes of the mounting flanges that are either perpendicular or parallel to the hinge axis. This results in the two pivot characteristics depicted.



Application examples



Adjustment and mounting options



Multiple-joint hinges can be adjusted in three planes during installation. For example, this allows compensation for tolerances or establishing of required compressive forces for seals.

Two planes can be adjusted via parallel or perpendicular slotted holes in the mounting flanges. In the third plane, position corrections can be made using GN 7247.2 spacer plates.

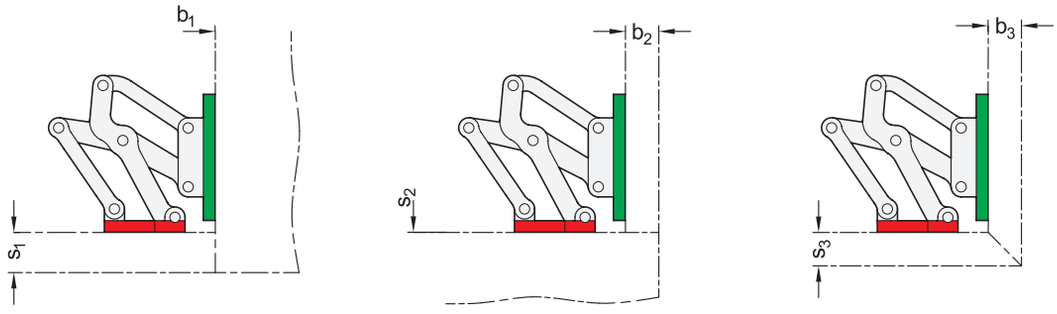
GN 7247.4 spacer plates with tapped holes as well as GN 7247.6 mounting plates with threaded studs are also available for mounting the hinges. The latter can be welded on or inserted through the wall from the outside and fastened in place.

The holes d_2 are used to accomodate clamping or positioning pins, making it easy to position the hinge. This also prevents unintended turning or slipping under load. The pins cannot be removed for subsequent adjustment.

Design variants

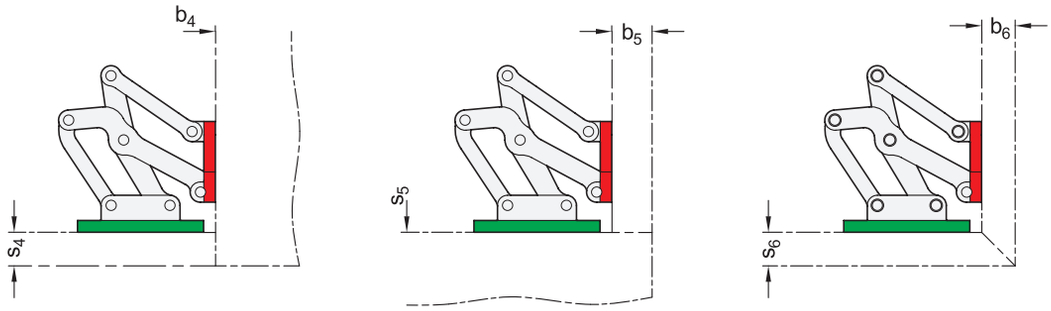
Flaps, hatches and doors can be inset, surface-mounted or mitered. The maximum wall thicknesses and bend sizes for planned sheet metal constructions arise from the respective installation type.

1. Mounting flange mounted to the housing with slotted holes parallel to the hinge axis:



l_1	$s_{1\ max.}$	b_1	s_2	$b_{2\ max.}$	$s_{3\ max.}$	$b_{3\ max.}$
75 *2.95*	24 *0.94*	1 ... ∞	1 ... ∞	20 *0.79*	20 *0.79*	20 *0.79*

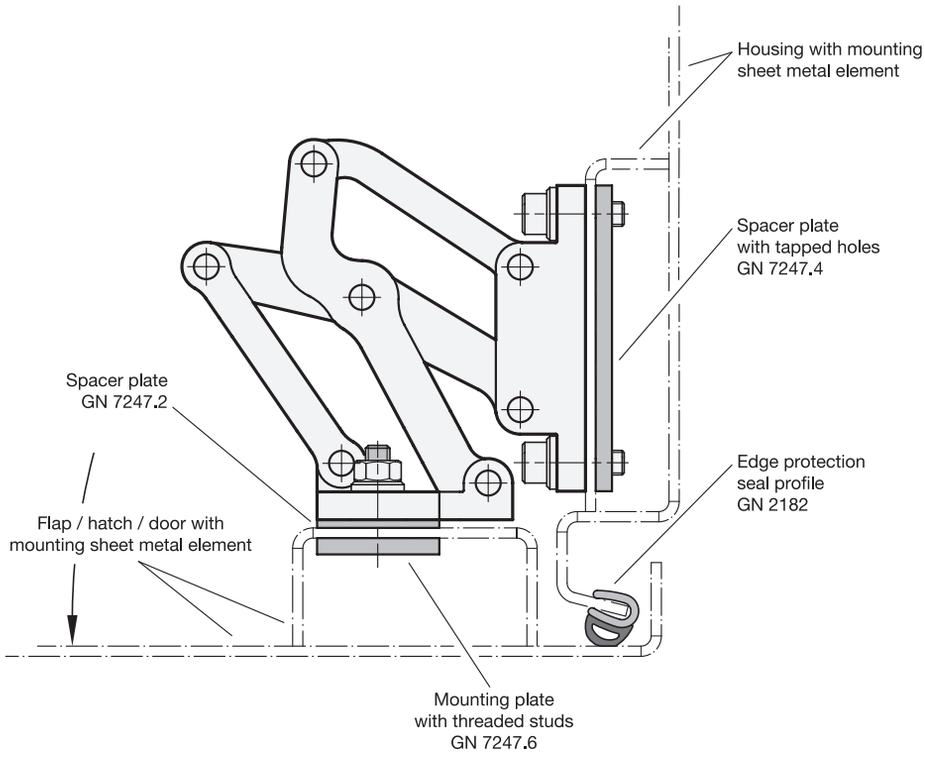
2. Mounting flange mounted to the housing with slotted holes perpendicular to the hinge axis:



l_1	$s_{4\ max.}$	b_4	s_5	$b_{5\ max.}$	$s_{6\ max.}$	$b_{6\ max.}$
75 *2.95*	20 *0.79*	1 ... ∞	1 ... ∞	24 *0.94*	20 *0.79*	20 *0.79*

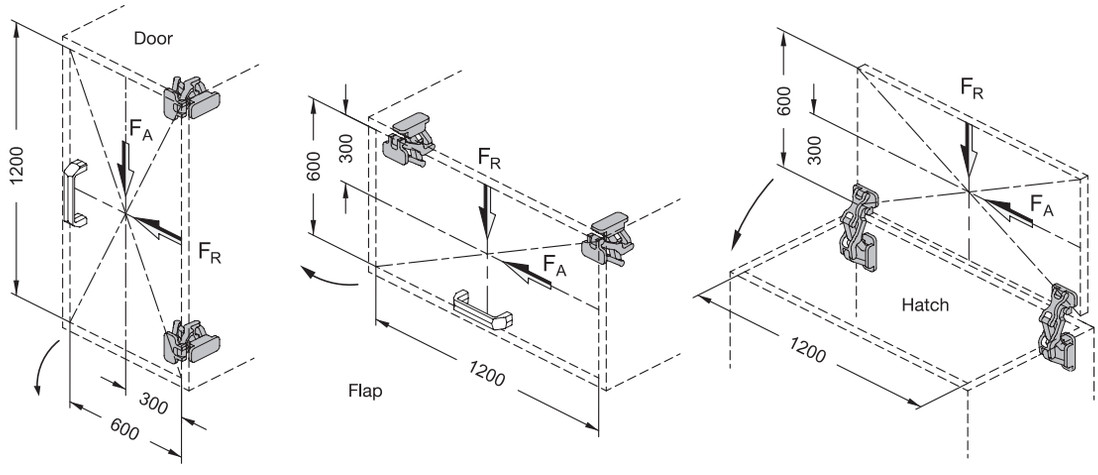
The design variants shown represent standard installation conditions. If the installation position of the hinge is changed or one of the two wall thickness dimensions s or b are lower, the maximum achievable dimensions change independently of each other. This makes it possible in some cases to work with larger wall thickness dimensions than those specified with the same hinge size. A simple design check via CAD or a test setup is therefore recommended.

Construction example



Load capacity

The maximum load of the multiple-joint hinges specified below applies to the standard use cases and serves for orientation in the case of deviating applications. The resulting forces lead to slight elastic deformation, which can be compensated for by means of the adjustment options, if necessary.

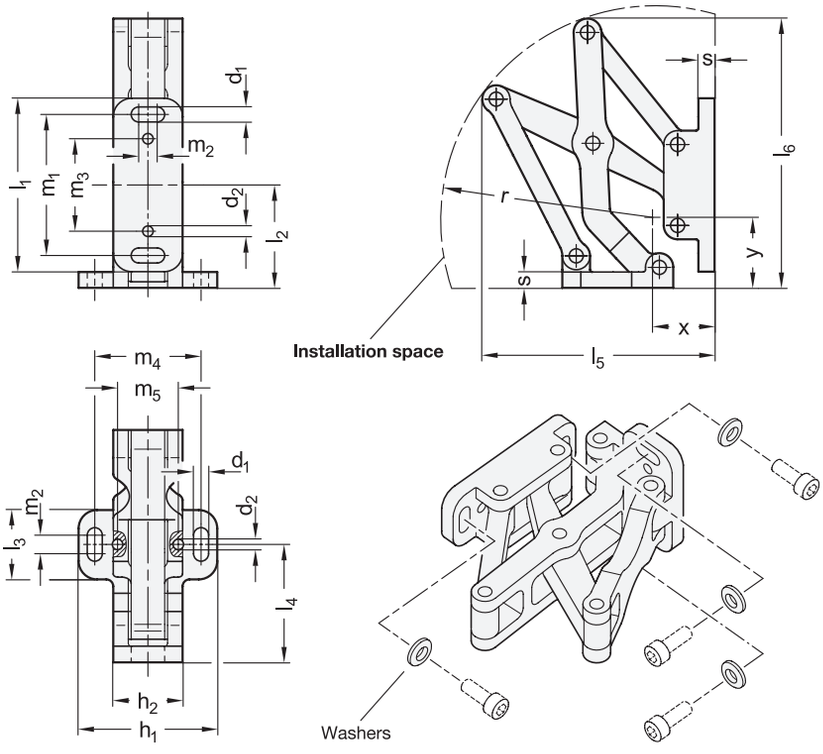


Max. load capacity per hinge pair		
l_1	**F_A (axial)**	**F_R (radial)**
75 *2.95*	650 N *146.13 lbf*	750 N *168.61 lbf*

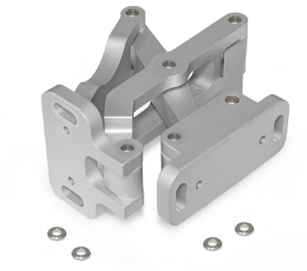
GN 7247 | Multiple-Joint Hinge

Aluminum, Concealed, with Opening Angle of 180°

JW WINCO® A Ganter Company



Metric



Metric table

Dimensions in: millimeters - *inches*

2																					
l_1	d_1	d_2	h_1	h_2	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	m_1	m_2	m_3	m_4	m_5	r	s	x	y
75	6.5	4	60	30	44.5	30	51	100.5	116.5	74.3	29.5	74	27	61	8	40	46	28	93	7	26	29
2.95	*0.26*	*0.16*	*2.36*	*1.18*	*1.75*	*1.18*	*2.01*	*3.96*	*4.59*	*2.93*	*1.16*	*2.91*	*1.06*	*2.40*	*0.31*	*1.57*	*1.81*	*1.10*	*3.66*	*0.28*	*1.02*	*1.14*

Specification

- Body
  Aluminum — AL
  Anodized finish, natural color — EL
- Hinge pins / washers
  Stainless steel AISI 304
- Friction bearing
  Plastic
  - Self-lubricated
  - Temperature resistant from -40 °F to +194 °F (-40 °C to +90 °C)
- *Stainless Steel Characteristics*
  → *Standard Parts Handbook page 2143*
- RoHS compliant

On request

- Other finishes / colors
- Other mounting flanges
- Other opening angles
- Other max. wall thicknesses
- Other lifting motion

Information

The GN 7247 multiple-joint hinge is installed on the inside of flaps, hatches and doors to save space and ensure protection against vandalism. The hinge has a maximum opening angle of 180°, which provides optimal accessibility and avoids the blocking of escape routes by open doors, for example.

Use of this hinge type leaves housing exteriors free of attachments that do not match the design or that should be avoided entirely in the interests of fast and easy cleaning.

Multiple-joint hinges are typically used in pairs. For higher loads, e.g. from large doors, these can be supplemented with additional hinges. Four reinforced washers are supplied for assembly, which can be used with mounting screws of thread size M6.

see also...

- *Spacer Plates GN 7247.2* → *page 38*
- *Spacer Plates with Tapped Holes GN 7247.4* → *page 39*
- *Mounting Plates with Threaded Studs GN 7247.6* → *page 40*

How to order

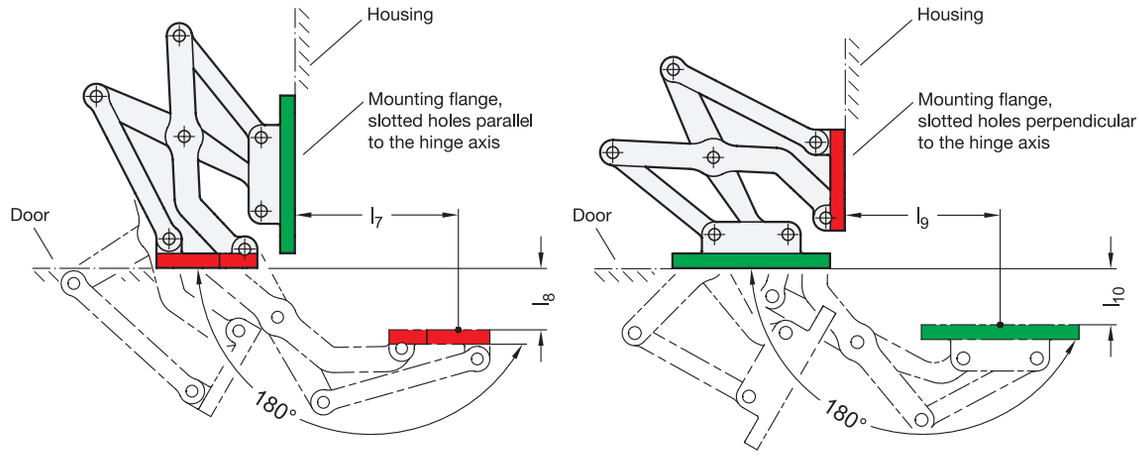
1 2 3

GN 7247-AL-75-EL

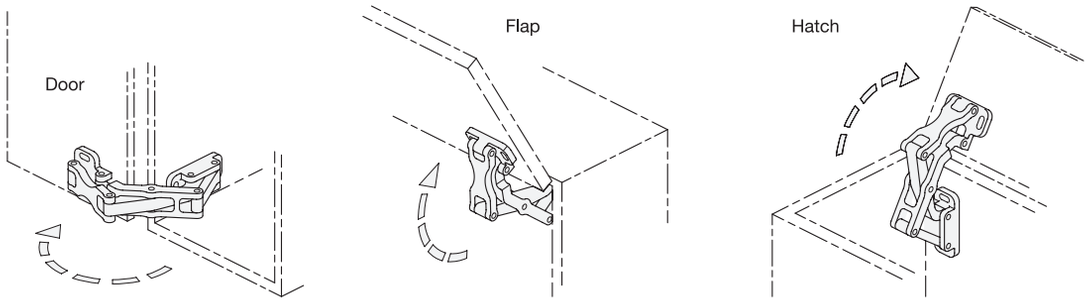
1	Material
2	Length l_1
3	Finish / Color

Installation position – pivot characteristics

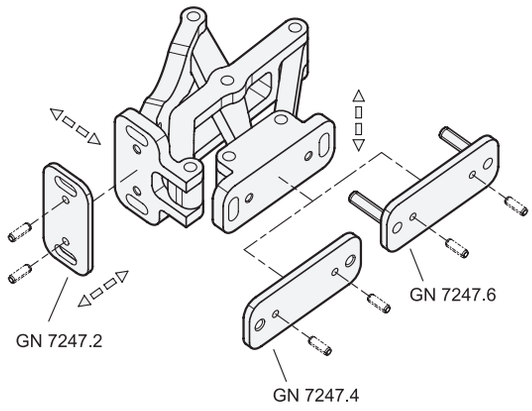
Multiple-joint hinges can be installed on the housing with the slotted holes of the mounting flanges that are either perpendicular or parallel to the hinge axis. This results in the two pivot characteristics depicted.



Application examples



Adjustment and mounting options



Multiple-joint hinges can be adjusted in three planes during installation. For example, this allows compensation for tolerances or establishing of required compressive forces for seals.

Two planes can be adjusted via parallel or perpendicular slotted holes in the mounting flanges. In the third plane, position corrections can be made using GN 7247.2 spacer plates.

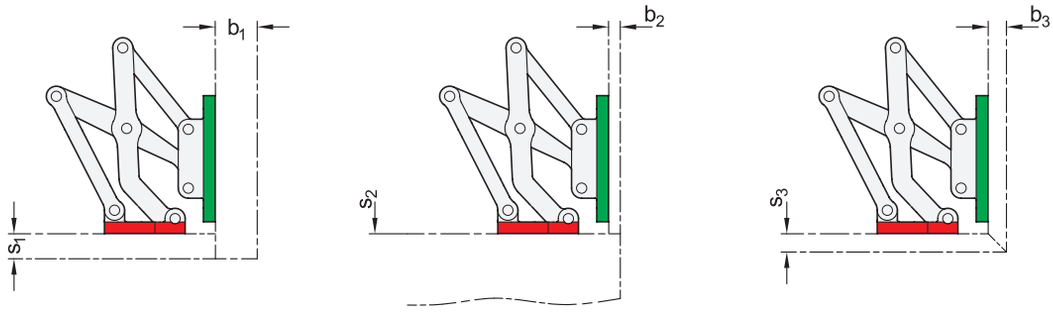
GN 7247.4 spacer plates with tapped holes as well as GN 7247.6 mounting plates with threaded studs are also available for mounting the hinges. The latter can be welded on or inserted through the wall from the outside and fastened in place.

The holes d_2 are used to accomodate clamping or positioning pins, making it easy to position the hinge. This also prevents unintended turning or slipping under load. The pins cannot be removed for subsequent adjustment.

Design variants

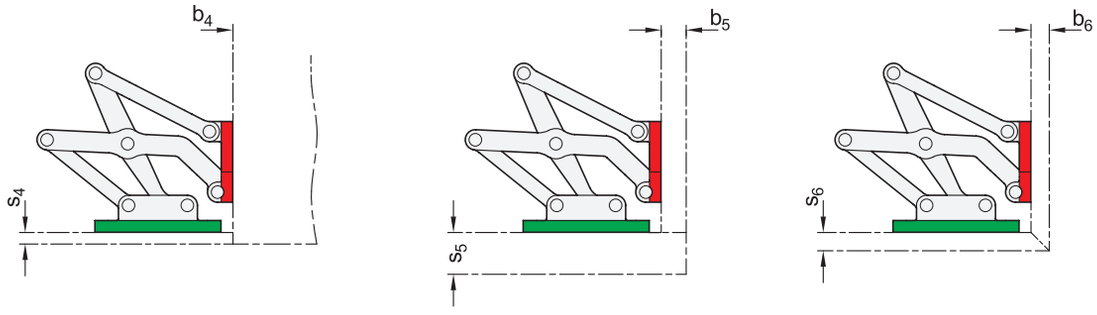
Flaps, hatches and doors can be inset, surface-mounted or mitered. The maximum wall thicknesses and bend sizes for planned sheet metal constructions arise from the respective installation type.

1. Mounting flange mounted to the housing with slotted holes parallel to the hinge axis:



l_1	$s_{1\ max.}$	b_1	s_2	$b_{2\ max.}$	$s_{3\ max.}$	$b_{3\ max.}$
75 *2.95*	15 *0.59*	24 *0.94*	1 ... ∞	8 *0.31*	11 *0.43*	11 *0.43*

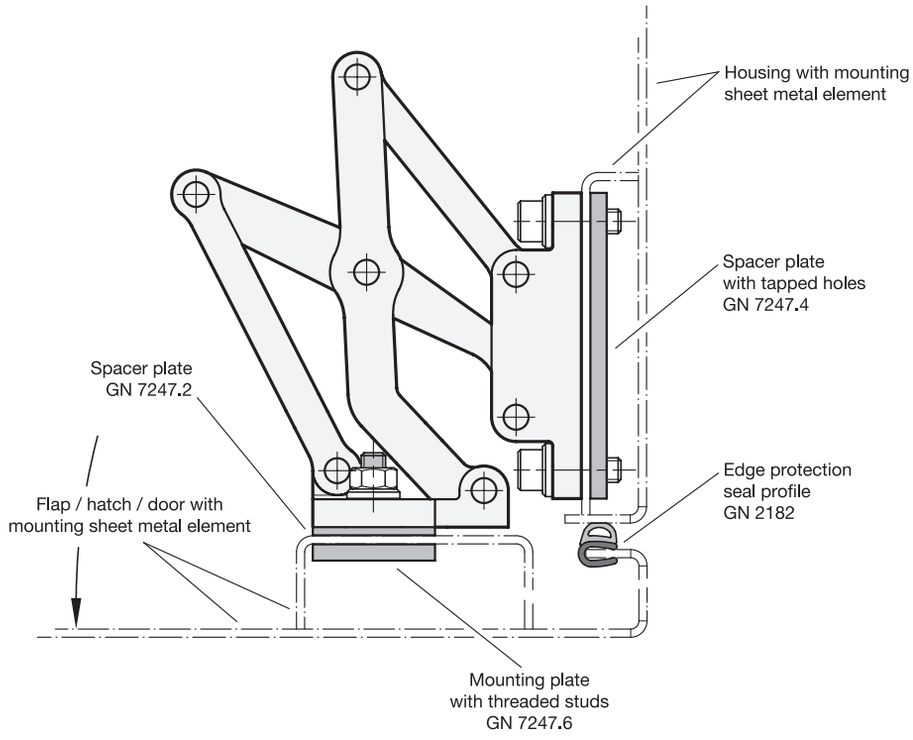
2. Mounting flange mounted to the housing with slotted holes perpendicular to the hinge axis:



l_1	$s_{4\ max.}$	b_4	s_5	$b_{5\ max.}$	$s_{6\ max.}$	$b_{6\ max.}$
75 *2.95*	8 *0.31*	1 ... ∞	24 *0.94*	15 *0.59*	11 *0.43*	11 *0.43*

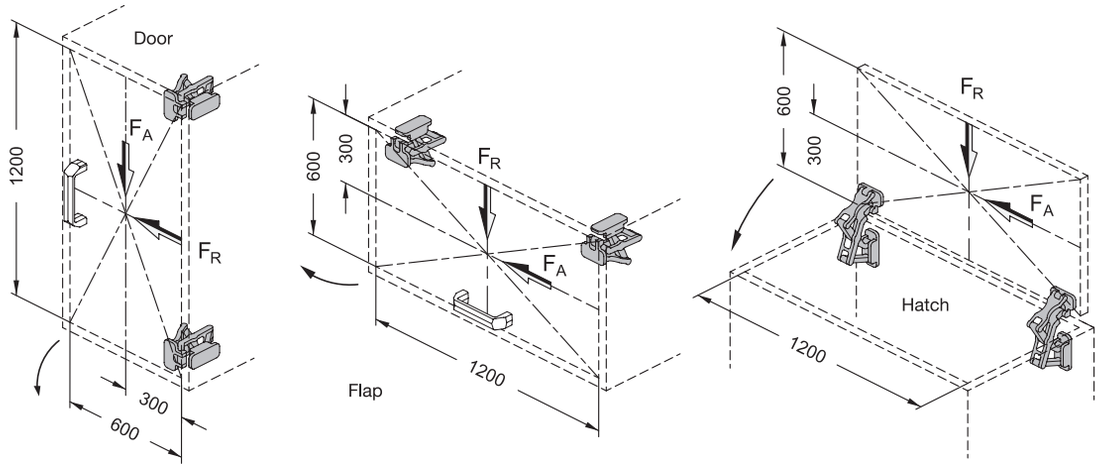
The design variants shown represent standard installation conditions. If the installation position of the hinge is changed or one of the two wall thickness dimensions s or b are lower, the maximum achievable dimensions change independently of each other. This makes it possible in some cases to work with larger wall thickness dimensions than those specified with the same hinge size. A simple design check via CAD or a test setup is therefore recommended.

Construction example



Load capacity

The maximum load of the multiple-joint hinges specified below applies to the standard use cases and serves for orientation in the case of deviating applications. The resulting forces lead to slight elastic deformation, which can be compensated for by means of the adjustment options, if necessary.

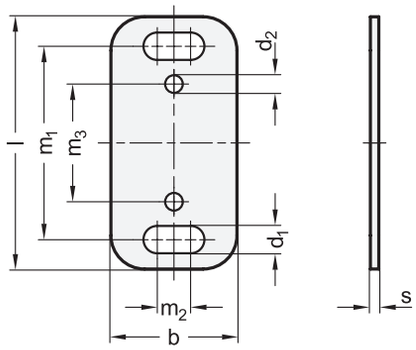


Max. load capacity per hinge pair		
l_1	F_A (axial)	F_R (radial)
75 *2.95*	650 N *146.13 lbf*	750 N *168.61 lbf*

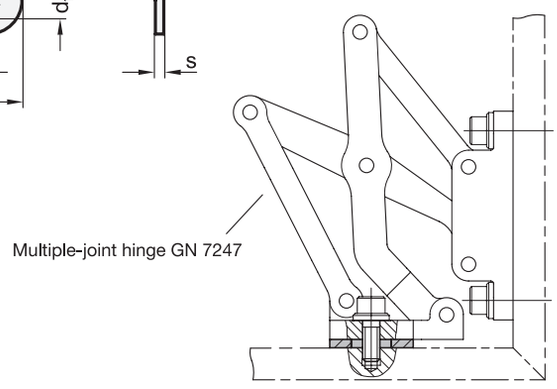
GN 7247.2 Spacer Plates

Stainless Steel, for GN 7241, GN 7243, GN 7247 Multiple-Joint Hinges

JW WINCO® A Ganter Company



Mounting example



Metric

SS Stainless Steel

Metric table

Dimensions in: millimeters - *inches*

2 Length l	3 s			b	d_1	d_2	m_1	m_2	m_3
60 *2.36*	0.5 *0.02*	1 *0.04*	2 *0.08*	30 *1.18*	6.5 *0.26*	4.2 *0.17*	46 *1.81*	8 *0.31*	28 *1.10*

Specification

	1	4
• Stainless steel AISI 304	NI	
Matte, tumbled finish		MT

• *Stainless Steel Characteristics*
→ *Standard Parts Handbook page 2143*

• RoHS compliant

On request

• Other plate thicknesses

Information

Tolerances of chamfers, different sheet metal thicknesses, or the use of seals could mean that the mounting surfaces of multiple-joint hinges on the frame and door are not at the desired distance to each other.

GN 7247.2 spacer plates are designed as accessories for GN 7241, GN 7243 and GN 7247 multiple-joint hinges. They allow for adjustment in the third plane during assembly. Shimmed individually or in combination, they ensure the appropriate position or height compensation on the mounting flanges.

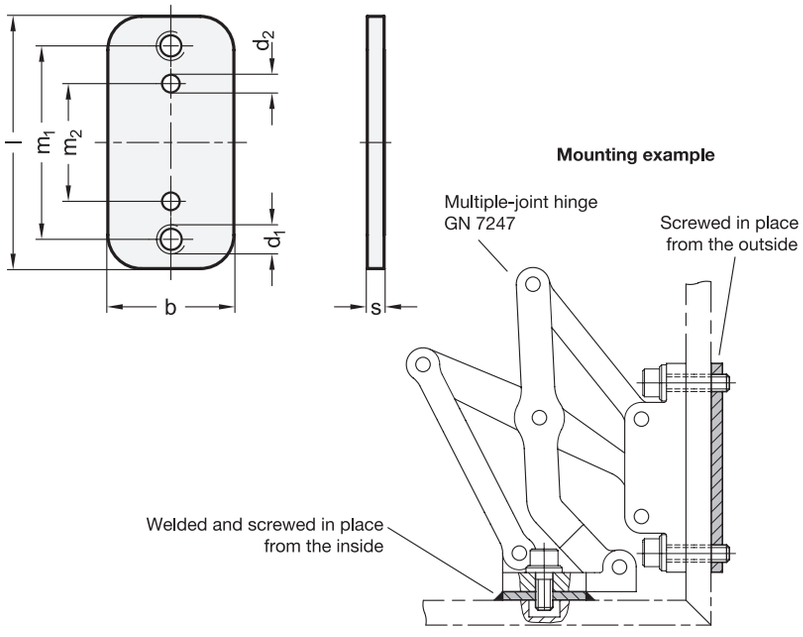
The holes d_2 are used to accomodate clamping or positioning pins, making it easy to position the spacer plates and the multiple-joint hinges.

see also...
• *Spacer Plates with Tapped Holes GN 7247.4 → page 39*
• *Mounting Plates with Threaded Studs GN 7247.6 → page 40*

How to order

1 2 3 4
GN 7247.2-NI-60-1-MT

1	Material
2	Length l
3	Width s
4	Finish



Metric

SS Stainless Steel

Metric table

Dimensions in: millimeters - *inches*

Length **l**	**b**	**d_1** Thread	**d_2**	**m_1**	**m_2**	**s**
60 *2.36*	30 *1.18*	M 6	4 *0.16*	46 *1.81*	28 *1.10*	4 *0.16*
75 *2.95*	30 *1.18*	M 6	4 *0.16*	61 *2.40*	40 *1.57*	4 *0.16*

Specification

	1	3
• Stainless steel AISI 304 Matte, tumbled finish	NI	MT

- *Stainless Steel Characteristics → Standard Parts Handbook page 2143*
- RoHS compliant

On request

- Other plate sizes
- Other plate geometries

Information

GN 7247.4 spacer plates with tapped holes are designed as accessories for the mounting flanges of GN 7241, GN 7243 and GN 7247 multiple-joint hinges.

The spacer plates are mounted from the outside via through-holes in the housing wall or alternatively by welding to the inside of the wall. This results in effective protection against vandalism, and the housing exteriors remain free of attachments that do not match the design or that should be avoided entirely in the interests of easy cleaning.

They eliminate the need for additional threads, nuts, and washers for mounting. There is no need for the time-consuming pre-assembly of the above components or for counterholding during tightening or loosening. The plate thickness **s** corresponds to the minimum screw-in depth of thread d_1, which should be fully achieved.

The holes d_2 are used to accomodate clamping or positioning pins, making it easy to position the spacer plates and the multiple-joint hinges.

see also...
- *Spacer Plates GN 7247.2 → page 38*
- *Mounting Plates with Threaded Studs GN 7247.6 → page 40*

How to order

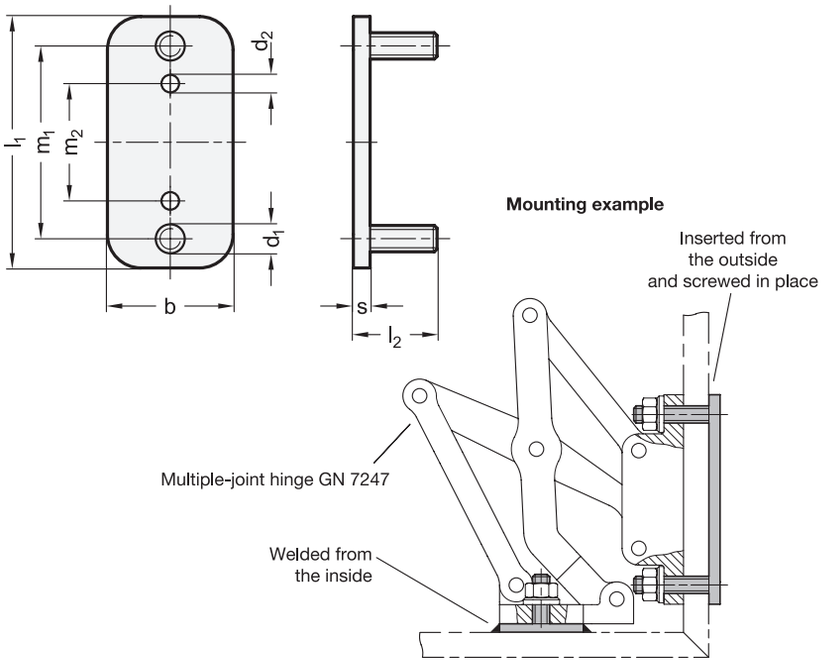
1 2 3

GN 7247.4-NI-75-MT

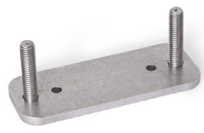
1	**Material**
2	**Length l**
3	**Finish**

GN 7247.6 Mounting Plates with Threaded Studs

Stainless Steel, for GN 7241, GN 7243, GN 7247 Multiple-Joint Hinges



Metric



SS Stainless Steel

Metric table

Dimensions in: millimeters - *inches*

2 l_1	3 l_2			b	d_1 Thread	d_2	m_1	m_2	s
60 *2.36*	20 *0.79*	25 *0.98*	30 *1.18*	30 *1.18*	M 6	4 *0.16*	46 *1.81*	28 *1.10*	4 *0.16*
75 *2.95*	20 *0.79*	25 *0.98*	30 *1.18*	30 *1.18*	M 6	4 *0.16*	61 *2.40*	40 *1.57*	4 *0.16*

Specification

	1	4
• Body		
Stainless steel AISI 304	NI	
Matte, tumbled finish		MT
• Threaded studs		
Stainless steel AISI 304		
Pressed-in		

- *Stainless Steel Characteristics*
  → *Standard Parts Handbook page 2143*
- RoHS compliant

On request

- Other threaded stud lengths
- Other plate sizes
- Other plate geometries

Information

GN 7247.6 mounting plates with threaded studs are designed as accessories for the mounting flanges of GN 7241, GN 7243 and GN 7247 multiple-joint hinges.

The mounting plates are mounted from the outside via through-holes in the housing wall or alternatively by welding to the inside of the wall. This results in effective protection against vandalism, and the housing exteriors remain free of attachments that do not match the design or that should be avoided entirely in the interests of easy cleaning.

They eliminate the need for additional threads, screws, and washers for mounting. There is no need for the time-consuming pre-assembly of the above components or for counterholding during tightening or loosening.

The holes d_2 are used to accomodate clamping or positioning pins, making it easy to position the mounting plates and the multiple-joint hinges.

see also...
- *Spacer Plates with Tapped Holes GN 7247.4* → *page 39*
- *Spacer Plates GN 7247.2* → *page 38*

How to order

1 2 3 4

GN 7247.6-NI-60-30-MT

1	Material
2	Length l_1
3	Length l_2
4	Finish

Design

The following principles should be observed when designing the hinge connection and mounting the multiple-joint hinges. This will help prevent wedging or jamming and ensure a smooth, low-wear movement. The function of the multiple-joint hinge is thus ensured in the long term.

- Multiple-joint hinges are installed at least in pairs.
- Multiple-joint hinges are aligned parallel to each other.
- Multiple-joint hinges are aligned plane-parallel to the door, flap or hatch opening.
- Suitable limiting or stop elements prevent the hinge mechanism from opening beyond the intended opening angle (less than 0° or more than 90°, 120° or 180°).
- All hinges involved in the movement bear roughly the same load (lever, center of gravity, ...).
- The specified load capacity of the multiple-joint hinges is not exceeded.

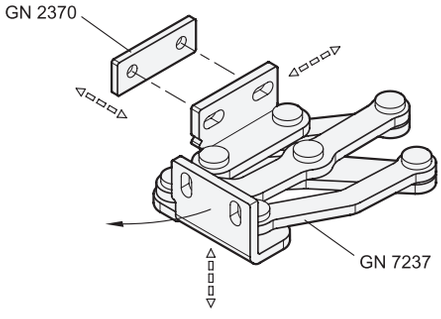
Installation

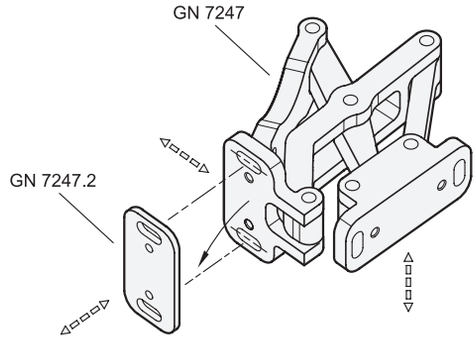
In addition to the design precautions to be implemented during installation, a number of additional points must be taken into account.

- The mounting screws correspond to at least property class 8.8 or A2-70 and are tightened with the appropriate torque. Reinforced washers are included with the aluminum hinges. Washers, e.g. as per DIN 125 A or ISO 7089, are used with the stainless steel hinges.
- The multiple-joint hinges must not be installed or aligned using force, e.g. with a pry bar or a hammer.
- If a hinge is stuck or warped, or starts making noises when moved, the cause must be determined and rectified by aligning and adjusting the hinge.

Adjustment

The slotted holes of the assembly angle brackets or mounting flanges can be used to adjust the hinges in two planes. For the third plane, GN 2370 spacer plates are available as compensation and shimming accessories for the stainless steel multiple-joint hinges, and the GN 7247.2 spacer plates are available for the aluminum multiple-joint hinges.





Modification

Subsequent modification of the hinges by painting, coating, welding or connecting additional components such as pneumatic springs, indexing elements, etc. can impair the functionality of the hinge or lead to a defect. Modifications should be tested in a test setup first to ensure reliable functioning.

Safety

When opening and closing the multiple-joint hinges, there is a risk of injury from the hinge mechanism. Fingers can be caught or crushed.

Load capacity

The maximum load capacity of the multiple-joint hinges depends on the hinge cross-section, the materials of the components and plain bearing bushings as well as the installation situation (flap, hatch or door). For example, the larger cross-section of aluminum multiple-joint hinges makes them better suited for installation in doors compared to the stainless steel version, which offer advantages in other areas. The distribution of the load also plays a major role. In the optimal case, the load should be evenly distributed among all hinges.

The load capacity values of multiple-joint hinges are based on the following sources of information:

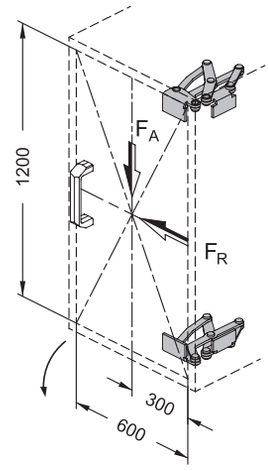
- Values from the simulation software
- Calculation based on material data
- Tensile and compression tests
- Endurance tests and empirical values

The endurance tests of the hinges in door installations were carried out under the following conditions:

- Hinge arrangement as a pair
- Adherence to the mounting information
- Warp-resistant test setup
- Standard door (flap or hatch) with overall dimensions 1200 x 600 mm
- Even distribution of the load F_A over the entire area (center of gravity)
- At least 15,000 test cycles (opening and closing once = one cycle)
- Gradual increase of the load

The wear, the movement characteristics and the elastic deformation were evaluated after every phase of the endurance test.

Standard door for endurance test



If more than two hinges are installed, the permissible loads are correspondingly higher. The load capacity increases linearly as long as the load is evenly distributed between the hinges. If this is not the case, a corresponding safety factor must be taken into account. Alternatively, it is recommended to test the function in a test setup.

Deformation

If the maximum load is applied to the hinges, slight elastic deformation will occur, which will have no effect on the functioning. In the least favorable load scenario (door installation) a deformation or lowering of ≈ 1-1.5 mm is permissible. If necessary, the hinges can be re-adjusted using the available adjustment options.

Lubrication and maintenance

The joints of the multiple-joint hinges have high-quality plain bearing bushings with lifetime lubrication. Under normal conditions, no further lubrication of the bearing points is required.

Operating temperatures

Depending on the hinge type (stainless steel or aluminum), various plain bearing materials are used, which determine the maximum temperature range. The following ranges are permissible:

- Stainless steel multiple-joint hinges: bronze bushings, temperature range +328 °F to +536 °F (-200 °C to +280 °C)
- Aluminum multiple-joint hinges: plastic bushings, temperature range -40 °F to +194 °F, briefly to +302 °F (-40 °C to +90 °C, briefly to +150 °C)

Accessory

In addition to the spacer plates available for compensating or positioning in the third plane, there are two other accessory parts that enable simple and universal mounting of the multiple-joint hinges.

- Mounting plates with threaded studs (GN 2376 and GN 7247.6)
- Spacer plates with tapped holes (GN 2372 and GN 7247.4)

Using the different plates eliminate the need for other parts during installation. This applies, for example, to screws, nuts or washers as well as any threaded holes in the surrounding construction.

If required, the plates can also be welded to the housing, allowing the hinges to be removed and reinstalled as often as necessary for maintenance or repairs. If the plates are installed inside the housing, the exterior surfaces remain free of interfering parts. This is ideal for applications with special design standards or when easy cleaning is required. Installed on the inside or outside, the plates also protect against vandalism because there are no accessible mounting screws.

Special versions

For special requirements, it may happen that none of the standard hinges will serve as desired, for example when the kinematics lead to collisions or additional options are required. To still offer a solution for such cases, it is possible to develop special hinges from certain minimum quantities with changes to the following specifications:

- **Other opening angles:** Based on the seven joints, it is possible to realize opening angles from 0 to 180°. Depending on the application, an angle of up to 270° is possible. For large opening angles, a simple design check via CAD is recommended in advance. This allows collisions to be identified and corrected at an early stage.
- **Other assembly angle brackets or mounting flanges:** Depending on the needs, different mounting geometries can be provided. The position and quantity of mounting holes can be changed as needed. Only the connection to the hinge itself must remain identical if a standard hinge is used.
- **Other max. wall thicknesses:** If the listed nominal wall thicknesses of the housings, doors, flaps and hatches are not sufficient, the hinges can be modified to make larger or smaller wall thicknesses possible with the given opening angle. However, this will alter the movement kinematics slightly.
- **Other lifting motions:** The opening and closing kinematics of a hinge can be changed as desired. For example, a hinge could first perform a lifting motion and then a pivoting motion or vice versa. Collisions with the housing or other nearby parts can be avoided in this way.
- **Other materials:** The multiple-joint hinges can be manufactured from other materials, e.g. zinc plated steel, stainless steel or aluminum to meet special requirements such as low weight, high corrosion resistance or higher load capacity.
- **Other finishes and colors:** Multiple-joint hinges can be delivered with a variety of surface finishes, such as painting or powder coating. Various colors can be applied to the aluminum hinges by anodizing. The stainless steel versions can be blasted, brushed or polished.
- **With indexing:** Depending on the application, multiple-joint hinges can be fitted with indexing elements, such as indexing plungers or spring plungers. This allows the hinges to be latched at any position within the opening angle or to be briefly locked until a specific force is applied. For example, hatches or flaps can be secured in open position until a maintenance or repair process is finished.
- **With pneumatic spring connection:** Flaps and hatches are often combined with pneumatic springs, which facilitate operation or hold the applications in a defined end position. To reduce the number of attachments, pneumatic springs can be attached to one of the assembly angle brackets of the hinge itself (usually on one side).
- **With reinforced design:** When installed in doors, stainless steel multiple-joint hinges can only accept relatively low loads due to their small cross-section. Larger loads can be achieved with a reinforced design consisting of a multi-layered arm geometry (e.g. two or three layers).

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