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## Air cargo equipment — Handling systems for unit load devices (ULDs) — Symbols for pictorial representation

*Équipement pour le fret aérien — Systèmes de manutention des unités de charge — Symboles pour la représentation graphique*

Reference number
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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.





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# Air cargo equipment — Handling systems for unit load devices (ULDs) — Symbols for pictorial representation



## 1 Scope and field of application

This International Standard specifies symbols for the pictorial standardization of aircraft cargo-handling systems for unit load devices (ULDs).

These symbols are applicable to all aircraft cargo-handling systems for underfloor as well as for main-deck systems. The conveyance, guidance, restraint, power drive unit and the degree of automation for the total cargo-handling system can be depicted using the symbols.

## 2 Symbol system

Each cargo symbol consists of a basic symbol, which represents basic functions, such as a physical function, a load direction, etc. In the drafting of the symbols account has been taken of factors such as maximum simplicity, intelligible geometry, optical similarity and good retainability.

The symbols are designed to be self-explanatory, and they are used alone or in combination to generate multiple components.

A symbol characterizes a component function, but not the detail design and manufacturing method.

The standardized symbols are suitable for use with computer-aided design.

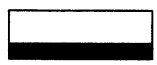
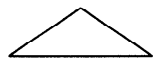
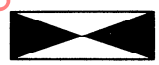
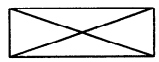
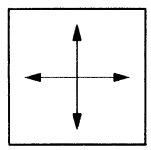
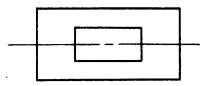
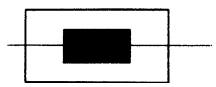
All symbols are given with an explanatory description in the table.

An example of how combinations of symbols are built up is given in figure 1.

## 3 Application

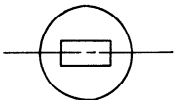
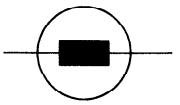
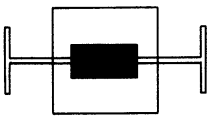
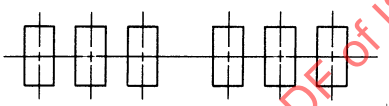
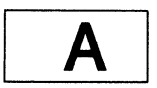
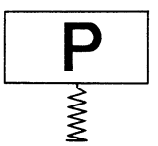
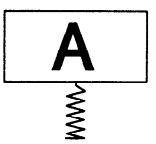
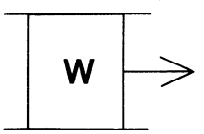
An example of the application of some of the symbols to a typical semi-automatic underfloor cargo system for the latching and guiding of pallets and containers is given in figure 2.

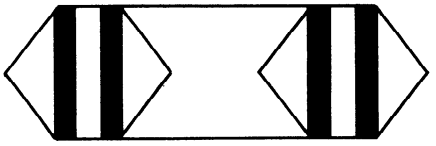
**Table — Symbols**

| Reference No. | Component | Symbol | Description |
|---|---|---|---|
| 1 | Latch |  1) | Retractable/relocatable restraint mechanism, capable of bearing a horizontal load perpendicular to its load-carrying side. |
| 2 | Double-acting latch |  1) | Retractable/relocatable restraint mechanism, capable of bearing a horizontal load perpendicular to both of its sides. |
| 3 | Stop |  1) | Fixed restraint, capable of bearing a horizontal load perpendicular to its length. |
| 4 | Vertical restraint |  | Horizontal protrusion from the upper part of a fixed or retractable restraint, capable of bearing a vertical load. |
| 5 | Overridable |  | Device which will cause the automatic overriding of a component in which it is incorporated. |
| 6 | Fixed guide |  | Fixed position device, capable of guiding along its length and of bearing a horizontal load perpendicular to its length. |
| 7 | Retractable guide |  | Retractable/relocatable position device, capable of guiding along its longest side and of bearing a horizontal load applied against its longest side. |
| 8 | Omnidirectional transfer area |  | Panel or area which contains a number of omnidirectional conveyor units for multidirectional conveyance of ULDs. |
| 9 | Power drive unit — retractable |  | Self-lifting and/or retractable power drive unit used to move ULDs along a conveyorized system. |
| 10 | Power drive unit — fixed-height |  | Spring-loaded or a fixed-height power drive unit used to move ULDs along a conveyorized system. |

1) Area shaded black = load-carrying side

**Table** (*concluded*)

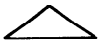
| Reference No. | Component | Symbol | Description |
|---|---|---|---|
| 11 | Power drive unit — rotatable/retractable |  | Rotatable or turnable power drive unit, which is also self-lifting and/or retractable, used primarily in an omni-transfer area to move ULDs. |
| 12 | Power drive unit — rotatable, fixed-height |  | Rotatable or turnable drive unit, which is spring-loaded or fixed-height, used primarily in an omni-transfer area to move ULDs. |
| 13 | Power drive unit — shuttle |  | Fixed-position power drive unit which moves ULDs by other means than by friction wheels or rollers. |
| 14 | Roller conveyor |  | Series of transport rollers in a common channel or support, continuous between the roller symbols as shown, for two-directional movement of ULDs. |
| 15 | Braking roller |  | Device used in conjunction with a roller which will retard the movement of ULDs generally in one direction. |
| 16 | Tie-down point (omnidirectional) |  | Tie-down device or provisions for a tie-down device, permanently attached to structure or cargo system components in order to allow use of supplementary straps. |
| 17 | Powered system control panel |  | Semi-automatic cargo-loading system. The conveyance of ULDs is achieved by means of power drive units, but the guiding and latching components are manually operated. |
| 18 | Automatic system control panel |  | Fully automatic cargo-loading system. The conveyance of ULDs is achieved by means of power drive units; the guiding, positioning and latching is activated automatically. |
| 19 | Powered system remote control system |  | Semi-automatic cargo-loading system. The conveyance of ULDs is achieved by means of power drive units, but the guiding and latching components are manually operated. |
| 20 | Automatic system remote control panel |  | Fully automatic cargo-loading system. The conveyance of ULDs is achieved by means of power drive units; the guiding, positioning and latching is activated automatically. |
| 21 | Winch |  | Fixed or relocatable, powered conveyance system using, for example, a winch indicating the direction of conveyance. |



a) Combined symbol in accordance with ISO 9031

**Symbol No. 2: Double-acting latch**

Retractable/relocatable restraint mechanism, capable of bearing a horizontal load perpendicular to both of its sides.



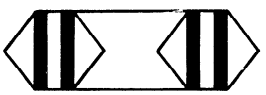
**Symbol No. 4: Vertical restraint**

Horizontal protrusion from the upper part of a fixed or retractable restraint, capable of bearing a vertical load.

**Step 1: separate symbols**

Combination of symbols Nos. 2 and 4

**Step 2: combination of separate symbols**



Further combination of combined symbols

**Step 3: build-up of combinations**

b) Step-by-step procedure for building up the combined symbol given in a)

**Figure 1 — Example of combination of symbols**