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## Industrial trucks — Specifications for indicator lights for container handling and grappler arm operations

*Chariots de manutention — Spécifications relatives aux voyants  
lumineux pour la manutention de conteneurs et les opérations de bras  
de grappin*

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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 110, *Industrial trucks*, Subcommittee SC 2, *Safety of powered industrial trucks*.

This second edition cancels and replaces the first edition (ISO 15871:2000), which has been technically revised.

The main change compared to the previous edition is that the minimum luminous intensity for other types of light sources has been added, e.g. LED, expressed in cd (candela).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Industrial trucks — Specifications for indicator lights for container handling and grappler arm operations

## 1 Scope

This document specifies requirements for indicator lights to show the status of freight-container-handling spreaders and grappler arms.

It is applicable to:

- a) container-handling spreaders with twistlocks for handling unladen and/or laden freight containers;
- b) grappler (bottom lift) arms for handling semi-trailers and swap bodies;

when fitted to:

- counterbalance lift trucks, with masts, as defined in ISO 5053-1:2015, 3.3;
- rough terrain trucks, with masts, as defined in ISO 5053-1:2015, 3.7;
- non-stacking low-lift straddle carriers, as defined in ISO 5053-1:2015, 3.18;
- stacking high-lift straddle carriers, as defined in ISO 5053-1:2015, 3.19;
- variable-reach trucks, as defined in ISO 5053-1:2015, 3.20;
- rough-terrain variable-reach trucks, as defined in ISO 5053-1:2015, 3.21;
- variable-reach container handlers, "reach stackers", as defined in ISO 5053-1:2015, 3.23;
- counterbalance container handlers, as defined in ISO 5053-1:2015, 3.24.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### light "on"

#### "on"

illumination from the indicator continuous with respect to time and at full output

### 3.2

#### light "flashing"

#### "flashing"

illumination from the indicator nominally equally divided between the conditions of *light "on"* (3.1) and *light "off"* (3.3)

**3.3**  
**light “off”**  
**“off”**

no illumination from the indicator

**3.4**  
**non-reflective shield**

device to minimize stray light from an unrelated source that would make the indicator light simulate an unintended "on" condition

**3.5**  
**clamped**

<grappler arm> with load-engaging part in full horizontal contact with the load

**3.6**  
**seated**

<grappler arm> with load-engaging part in full vertical contact with the load

**3.7**  
**fully up**

<grappler arm> raised to its highest position to provide clearance over the top of the load

**3.8**  
**fully down**

<grappler arm> completely lowered and ready to engage the load

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**4 Requirements**

**4.1 General**

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To minimize the number of lights required, three conditions of the light are employed: “off”, “flashing” and “on”.  
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**4.2 Freight-container-handling spreaders**

**4.2.1 General**

See [4.4.1](#) for location of indicator lights. See [Table 1](#) for a tabular presentation of [4.2.2](#) and [4.2.3](#).

**4.2.2 Twistlocks located in the freight container**

When all the twistlocks are fully located in the freight container corner pockets, orange light O shall be “on”. When the freight container is lifted, this light shall go “off”.

**4.2.3 Twistlocks locked/unlocked**

When all the twistlocks are fully unlocked, the red light R shall be “on”.

In any intermediate position of the twistlocks, the red light R may be “flashing”. Provision of this “flashing” red light is optional.

When all the twistlocks are fully locked in the freight container corner pockets, the green light G shall be “on”.

**Table 1 — Handling freight containers by twistlocks**

Twistlock position	Colour of light	Mode of operation of light		Comment
		On	Flashing	
Seated in container	Orange	X		
Fully unlocked	Red	X		
Neither locked nor unlocked	Red		X	Fitment optional
Fully locked	Green	X		

### 4.3 Grappler arms

#### 4.3.1 General

See [4.4.1](#) for location of indicator lights. See [Table 2](#) for tabular presentation of [4.3.2.1](#) to [4.3.2.4](#).

Normally indication by lights is only necessary for the front arms which are out of sight of the operator (for additional lights, see [4.4](#)).

#### 4.3.2 Arms

##### 4.3.2.1 Front arms fully up

When both front arms are fully up, the white light W shall be "on".

##### 4.3.2.2 Front arms fully down and fully unclamped

When both front arms are fully down and fully unclamped, the yellow light Y shall be "on".

##### 4.3.2.3 Front arms fully down and partially clamped

When both front arms are fully down and neither clamped nor unclamped, the yellow light Y shall be "on" and the red light R may be "flashing". Provision of this "flashing" red light condition is optional.

##### 4.3.2.4 Front arms fully down and fully clamped

When both arms are fully down, fully clamped and seated, the green light shall be "on".

**Table 2 — Handling loads by grappling arms**

Arm position	Colour of light	Mode of operation of light		Comment
		On	Flashing	
Front arms fully up	White	X		
Front arms fully down and fully unclamped	Yellow	X		
Front arms fully down and neither clamped nor unclamped	Yellow	X		
	Red		X	Fitment optional
Front arms fully down, fully clamped and seated	Green	X		

#### 4.4 Details of indicator lights

##### 4.4.1 Location

4.4.1.1 Indicator lights shall be mounted in a position visible to the operator from the normal operating position. A non-reflective shield can be necessary.

4.4.1.2 If fitted on the freight-container-handling spreader or grapppler arms, the relative position of the lights to one another shall be as shown in [Figure 1](#).

Lights within, or adjacent to, the operator's position shall be in the same relative positions.

4.4.1.3 The light displays may be duplicated to indicate the status at each end of the handling attachment, or quadrupled to show the status at each corner of the attachment. The relative positioning shall correspond to that of the function(s) that they are indicating.



##### Key

- 1 left
- 2 rear (truck side)
- 3 right

NOTE G = green; O = orange; R = red; W = white; Y = yellow.

Figure 1 — Relative positions of the lights

##### 4.4.2 Size, power, luminous intensity and frequency of the indicator lights

###### 4.4.2.1 Indicator lights on freight-container-handling spreader or grapppler arms

These lights shall have a minimum area of 1 200 mm<sup>2</sup> and shall, for filament lamps, have a minimum electrical power of 20 W, or, for other types of light sources, e.g. LED, have a minimum luminous intensity of 20 cd (candela).

###### 4.4.2.2 Indicator lights at the operator's position

These lights shall have a minimum area of 200 mm<sup>2</sup> and shall, for filament lamps, have a minimum electrical power of 2 W, or, for other types of light sources, e.g. LED, have a minimum luminous intensity of 2 cd (candela).

###### 4.4.2.3 Frequency

If flashing lights are used, their flash frequency shall be between 120 and 180 flashes per minute.



#### 4.5 Optional additional indicator lights — Grappler arms

**4.5.1** If required, additional indicator lights may be fitted on the attachment, or within or adjacent to the operator's position, to signal the status of the rear arms. In this case, they shall be as specified in [4.3.2.1](#) to [4.3.2.4](#) and shall be below or nearer to the operator than the indicators for the front arms.

**4.5.2** Any other indicator lights shall be agreed between the parties concerned.

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