INTERNATIONAL STANDARD

ISO 15081

Second edition
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Agricultural equipment — Graphical symbols for pressurized irrigation systems

Matériel agricole — Symboles graphiques des systèmes d'irrigation sous pression

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

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 15081 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

This second edition cancels and replaces the first edition (ISO 15081:2005), which has been technically revised.

Agricultural equipment — Graphical symbols for pressurized irrigation systems

1 Scope

This International Standard establishes graphical symbols for use on drawings and diagrams relating to the installation of pressurized agricultural irrigation systems. It is a collective application standard of the ISO 14617 series of International Standards.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

3 General rules

A group of devices/components is represented by a general symbol. This general symbol shall be completed for any special component of the group.

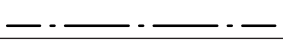
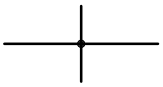
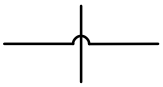
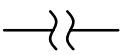
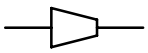
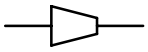
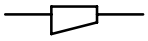
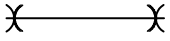
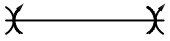
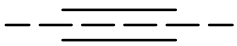
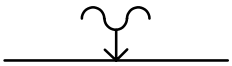
In this International Standard, various assemblies of actuators with valves are shown only on the valve general symbol (see 6.1.1), but they may operate various types of valves.

For a more detailed representation, these basic symbols may be combined with designations specified in a description, or else a system of more detailed symbols based on these basic symbols may be devised.

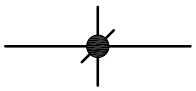
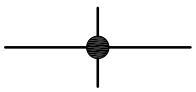
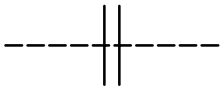
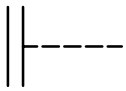
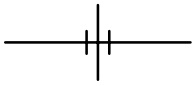
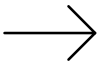
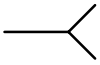
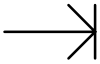
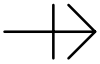
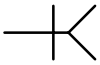
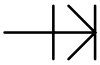
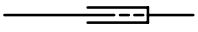
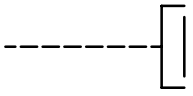
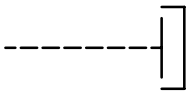
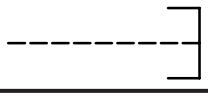
The graphical symbols in this International Standard have been designed according to the basic rules given in ISO 81714-1. When new symbols are designed, e.g. a combination of symbols as in the present document, those basic rules shall be followed.

This International Standard presents graphical symbols intended primarily for irrigation equipment. Additional graphical symbols for diagrams can be found in ISO 14617[17].

4 Symbols for piping and piping accessories

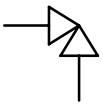
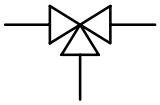
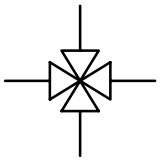
No.	Designation	Symbol
4.1	Major (main) pipeline	
4.2	Minor pipeline	
4.2.1	Minor (secondary) pipeline	
4.2.2	Minor (tertiary) pipeline	
4.3	Future extension (planned) pipeline	
4.4	Existing pipeline to be used	
4.5	Pipe connection	
4.6	Pipe (without connection)	
4.7	Direction of flow	
4.8	Interruption of piping	
4.9	Cross-section of pipe	
4.10	Pipe bore change	
4.10.1	Concentric	 or DN A/DN a 
4.10.2	Eccentric	 or DN A/DN a 
4.11	Pipe change	
4.11.1	Abolition of pipe	
4.11.2	Substitution of pipe	
4.12	Pipe sleeve	
4.13	Domestic drinking water	
4.14	Reclaimed (irrigation) water	
4.15	Flexible pipe/hose	 or 

5 Symbols for connections and joints

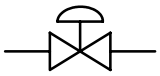
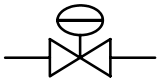
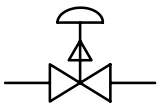
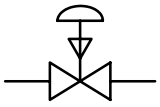
No.	Designation	Symbol
5.1	Detachable junction	
5.2	Non-detachable junction of pipelines	
5.3	Flange connection	
5.4	Blind flange	
5.5	Union	
5.6	Quick-release coupling	
5.6.1	Quick-release coupling element of male type	
5.6.2	Quick-release coupling element of female type	
5.6.3	Quick-release coupling element which fits into another coupling element of the same type	
5.6.4	Quick-release coupling element of male type with automatic closing when decoupled	
5.6.5	Quick-release coupling element of female type with automatic closing when decoupled	
5.6.6	Quick-release coupling element which fits into another coupling element of the same type, with automatic closing when decoupled	
5.7	Expansion joint	
5.8	Male plug	
5.9	Female plug	
5.10	End-cap for pipe	

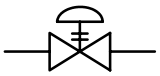
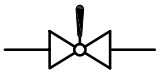
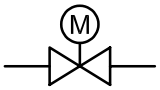
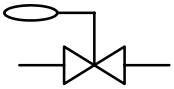
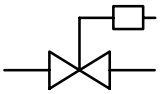
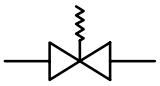
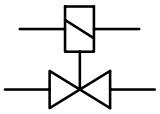
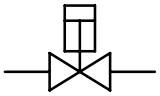
6 Symbols for valves

6.1 Symbols for valves according to structure

No.	Designation	Symbol
6.1.1	Valve — General symbol	
6.1.2	Gate type	
6.1.3	Globe type	
6.1.4	Needle type	
6.1.5	Butterfly type	
6.1.6	Ball type	
6.1.7	Diaphragm type	
6.1.8	Angle valve	
6.1.9	Three-way valve	
6.1.10	Four-way valve	

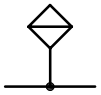
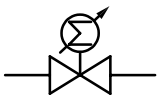
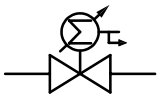
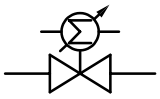
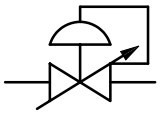
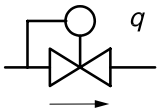
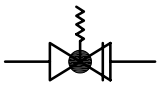
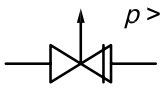
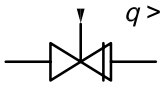
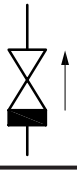
6.2 Symbols for valves according to operation

No.	Designation	Symbol
6.2.1	Hydraulically or pneumatically operated valve	
a)	— Single-acting diaphragm actuator	
b)	— Double-acting diaphragm actuator	
6.2.1.1	Opens on failure (normally open)	
6.2.1.2	Closes on failure (normally closed) NOTE The function of the valve on failure is also valid for 6.2.1 b), 6.2.3, 6.2.7 and 6.2.8.	

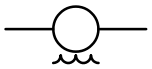
No.	Designation	Symbol
6.2.1.3	Retains position on failure NOTE The function of the valve on failure is also valid for 6.2.1 b), 6.2.3, 6.2.7 and 6.2.8.	
6.2.2	Manually operated valve	
6.2.2.1	Wheel-actuated	
6.2.2.2	Lever-actuated	
6.2.3	Electrical-motor-operated on/off valve	
6.2.4	Float-operated valve	
6.2.5	Weight/load-operated valve	
6.2.6	Spring-operated valve	
6.2.7	Solenoid-operated valve	
6.2.8	Cylinder-operated valve	

6.3 Symbols for valves according to function

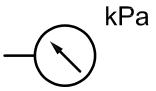
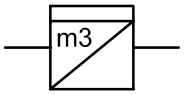
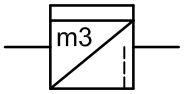
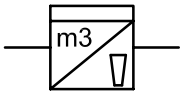
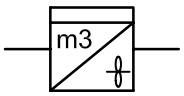
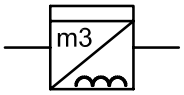
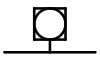
No.	Designation	Symbol
6.3.1	Non-return valve (basic type) The flow direction is from left to right. An arrow may be added to show the direction.	
6.3.1.1	Non-return swing type The flow direction is from left to right. An arrow may be added to show the direction.	
6.3.1.2	Non-return ball type The flow direction is from left to right. An arrow may be added to show the direction.	
6.3.1.3	Non-return lift (globe) type The flow direction is from left to right. An arrow may be added to show the direction.	
6.3.1.4	Non-return tilt type The flow direction is from left to right. An arrow may be added to show the direction.	

No.	Designation	Symbol
6.3.2	Air-release valve (basic type)	
6.3.2.1	Low-pressure type	
6.3.2.2	High-pressure type	
6.3.2.3	Dual/triple-function type	
6.3.3	Volumetric type	
6.3.3.1	Serial type	
6.3.3.2	Non-serial type	
6.3.4	Control valve	
6.3.4.1	Pressure-reducing valve (pressure regulator)	
6.3.4.2	Flow-regulation valve (flow regulator)	
6.3.5	Valve with safety function (basic type)	
6.3.5.1	Spring-loaded safety valve, globe type	
6.3.5.2	Opens when pressure, p, is higher than the set value	
6.3.5.3	Closes when flow, q, is higher than the set value	
6.3.6	Foot valve	

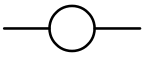
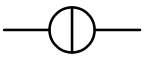
7 Symbols for pumps

No.	Designation	Symbol
7.1	Pump — Basic symbol	
7.1.1	Pumping station	
7.1.2	Submerged pump	
7.1.3	Non-submerged pump	
7.1.4	Vertically placed pump	
7.1.5	Horizontally placed pump	

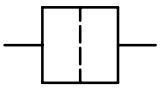
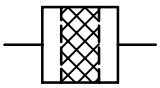
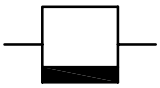
8 Symbols for measuring devices

No.	Designation	Symbol
8.1	Pressure gauge	
8.2	Water meter — Basic symbol	
8.2.1	Diaphragm-type water meter	
8.2.2	Rotameter-type water meter	
8.2.3	Turbine-type water meter	
8.2.4	Electromagnetic-coil-type water meter	
8.3	Recording (measuring) instrument	

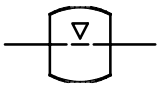
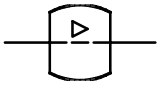
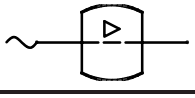
9 Symbols for water-application equipment

No.	Designation	Symbol
9.1	Sprinkler	
9.1.1	Sprinkler, full-circle	
9.1.2	Sprinkler, part-circle	
9.2	Pop-up	
9.2.1	Pop-up, full-circle	
9.2.2	Pop-up, part-circle	
9.3	Sprayer	
9.3.1	Sprayer, full-circle	
9.3.2	Sprayer, part-circle	
9.4	Dripper (emitter)	
9.5	Emitting pipe	

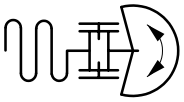
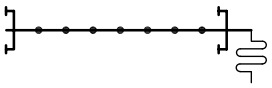
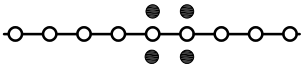
10 Symbols for filters

No.	Designation	Symbol
10.1	Filter, strainer-type	
10.2	Filter, media-type	
10.3	Filter, sand-type	

11 Symbols for chemical injectors

No.	Designation	Symbol
11.1	Chemical injection tank	
11.2	Chemical injection pump — Hydraulic	
11.3	Chemical injection pump — Electrical	

12 Symbols for irrigation machines

No.	Designation	Symbol
12.1	Irrigation machine — Reel machine	
12.2	Irrigation machine — Traveller machine	
12.3	Irrigation machine — Moving-lateral	
12.4	Irrigation machine — Centre-pivot	
12.5	Irrigation machine — Side-roll	

13 Symbols for irrigation controller

No.	Designation	Symbol
13	Irrigation controller	

Bibliography

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[2] ISO 7749-1, *Agricultural irrigation equipment — Rotating sprinklers — Part 1: Design and operational requirements*

[3] ISO 7749-2, *Agricultural irrigation equipment — Rotating sprinklers — Part 2: Uniformity of distribution and test methods*

[4] ISO 8026, *Agricultural irrigation equipment — Sprayers — General requirements and test methods*

[5] ISO 8224-1, *Traveller irrigation machines — Part 1: Operational characteristics and laboratory and field test methods*

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[9] ISO 9635 (all parts), *Agricultural irrigation equipment — Irrigation valves*

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[16] ISO 13457, *Agricultural irrigation equipment — Water-driven chemical injector pumps*

[17] ISO 14617 (all parts), *Graphical symbols for diagrams*

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