INTERNATIONAL STANDARD

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Process diagrams for power plants —

Part 2: Graphical symbols

Schémas de procédés pour centrales électriques —

Partie 2: Symboles graphiques

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.

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).

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).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 10, *Technical product documentation*, Subcommittee SC 10, *Process plant documentation*.

ISO 14084 consists of the following parts, under the general title *Process diagrams for power plants*:

— *Part 1: Specification for diagrams*

— *Part 2: Graphical symbols*

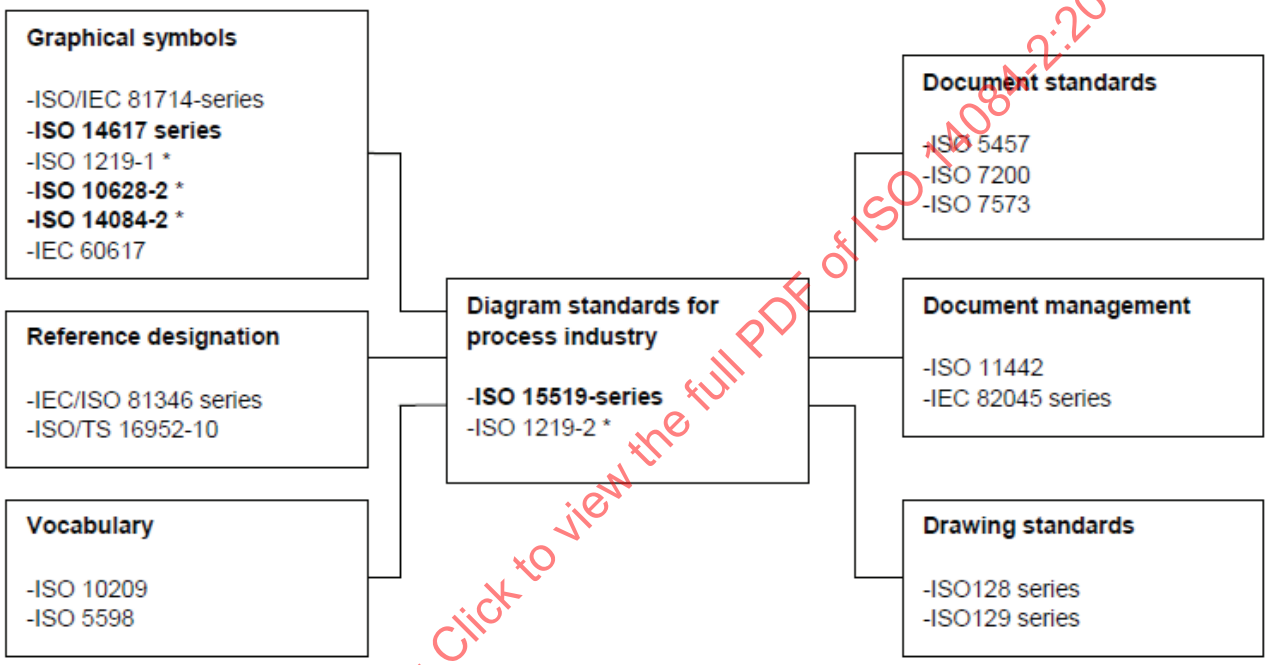
Introduction

General

This part of ISO 14084 deals with preparation of process diagrams for power plants.

ISO/TC 10/SC 10 prepares standards for diagrams including graphical symbols which together with standards prepared by other ISO committees and IEC constitute the basis for preparation of diagrams for process industry.

The interrelations between these standards are illustrated in Figure 1. Standards in bold are ISO/TC 10/SC 10 standards



NOTE Standards marked * are collective application standards.

Figure 1 — Interrelations between ISO and IEC standards for diagrams for power plants

Collective application standard

ISO/TC 10/SC 10 standards:

— ISO 15519-series: Specifications for diagrams for process industry;

— ISO 14617-series: Graphical symbols for diagrams;

are basic standards, which are general and apply to all fields of applications. Technical committees working in a specific application field are allowed to make extracts and publish them as collective application standards of ISO 15519-series, ISO 14617-series or both.

Application fields

This International Standard applies to the power plant field, which include conventional fossil and biomass fired power plants, hydro power plants, sea wave power plants, wind power plants, nuclear power plants, geothermal power plants, solar power plants, osmosis power plants, incineration plants, and industrial power plants.

Process diagrams for power plants —

Part 2:
Graphical symbols

1 Scope

This part of ISO 14084 specifies graphical symbols for process diagrams for power plants and guidelines for creation of new graphical symbol examples.

This part of ISO 14084 is a collective application standard of the ISO 14617-series.

Graphical symbols for fluid power diagrams can be found in ISO 1219-1.

Graphical symbols for electrotechnical diagrams can be found in IEC 60617.

2 Normative references

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

ISO 10209, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the ISO 15519-series and ISO 10209 and the following apply.

3.1
symbol example
graphical symbol created of basic and supplementary graphical symbols

4 Graphical symbols

4.1 General

Graphical symbols shall comply with ISO 14617-series.

General rules for graphical symbols are given in ISO 81714-1. Rules for CAx application of graphical symbols are given in IEC 81714-2.

Specific rules and guidelines for graphical symbols for use in diagrams are given in ISO 15519-1.

4.2 Size of graphical symbols

Graphical symbols in this part of ISO 14084 are shown in a grid system with module M = 2,5 mm.

4.3 Creation of new symbol examples

This International Standard includes the most common used graphical symbols for diagrams for power plants. In case a needed symbol cannot be found in this International Standard or in ISO 14617-series then, the needed graphical symbol example should be created on basis of basic and supplementary graphical symbols in ISO 14617 as illustrated in Annex A.

In case the needed graphical symbol neither exists in ISO 14617 nor can be created on basis of basic and supplementary symbols in ISO 14617 then, a new graphical symbol shall be requested according to ISO/IEC Directives, Part 1, Consolidated ISO Supplement, 2014, Annex SH.

4.4 Symbols for large/complex objects

Graphical symbols for large and complex objects like boilers, turbines, flue gas treatment plants, boiler feed pumps, etc. are not standardized in this International Standard.

In diagrams, large and complex objects should be represented with a silhouette which allow for correct placement of graphical symbols for equipment, connections, PCI (Process Control Information; see 18.1) symbols for measurement, etc. of which the large and complex object consists of.

Annex B gives examples of symbols for large and complex objects.

5 Structuring and representation

5.1 Overall structure

This part of ISO 14084 is divided in following groups:

— Clause 6 — Connections and related devices;

— Clause 7 — Fluid flow control, valves, dampers, safety devices;

— Clause 8 — Actuators;

— Clause 9 — Fluid transport, pumps, fans compressors;

— Clause 10 — Fluid energy transfer, heat exchangers, condensers, cooling towers, etc.;

— Clause 11 — Fluid processing, filtration, separation, mixing, etc.;

— Clause 12 — Storage, tanks, vessels, accumulators, etc.;

— Clause 13 — Material transport and flow control, conveyors, feeders, transport devices, etc.;

— Clause 14 — Material processing, screens, size reduction, mixing, etc.;

— Clause 15 — Thermal energy generators, boilers, boiler devices, etc.;

— Clause 16 — Engines, turbines, generators, motors, etc.;

— Clause 17 — Mechanical transmission, shafts, bearings, couplings, etc.;

— Clause 18 — Instrumentation, measurement and control, etc.

5.2 Registration numbers

Graphical symbols, symbol examples, and application rules in ISO 14617 are assigned unique registration numbers, see ISO 14617–1.

Symbol examples developed for this International Standard are assigned registration numbers in the 6000-7999 series, see Table 1.

NOTE New graphical symbols developed for this International Standard and which shall be implemented in ISO 14617 are assigned preliminary "P" registration numbers (*P* = power plants) in the development phase of this part of ISO 14084. In case of, that the preliminary registration numbers are not approved by ISO 14617 before publication of this part of ISO 14084 then the standard will be published with preliminary registration numbers which will be replaced with final ISO 14617 registration numbers at first periodical review.

Table 1 — Overview of types of ISO 14617 and ISO 14084 registration numbers

Subject	ISO 14617	ISO 14084	
Graphical symbols	nnn	nnn	Registration number from ISO 14617
		Pnnn	Preliminary registration number for new ISO 14617 symbols
Symbol examples	Xnnn	Xnnn	Registration number from ISO 14617
		X6nnn	Registration number for ISO 14084 symbol example

5.3 Representation of graphical symbols in the standard

In this part of ISO 14084 graphical symbols are represented in a 2,5 M dotted grid and imaginary connections as illustrated in Figure 2. The imaginary connections and the dotted grid are not part of the graphical symbol.

In case of mandatory flow direction, the imaginary connections are equipped with arrows as illustrated in Figure 2b.

a) Heat exchanger **b) Spring loaded safety valve**

Key

1 graphical symbol
2 imaginary connections
3 2,5 M dotted grid

Figure 2 — Representation of graphical symbols in the standard

5.4 Legend to table representation

Graphical symbols in this part of ISO 14084 are represented in tables with column headings according to Table 2.

Table 2 — Column headings

Column	Description
Entry number	Consecutive numbering within each clause/sub-clause
Graphics	Graphical symbol represented with solid lines on a dotted grid
Description	The preferred descriptors for the graphical symbol

Table 2 *(continued)*

Column	Description
Reference number	Registration number for the actual symbol
Code	2-digit letter code according to IEC 81346–2

6 Connections and related devices

6.1 Fluid connections

6.1.1 Functional connections

Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.1.1		Pipeline, duct, Line width 0,5	X6001	WP
6.1.1.2		Instrument connection, control connection in Process Control Diagrams (PCD) Line width 0,25	X6002	WP WG
6.1.1.3		Pilot line, control connection in Process Flow Diagrams (PFD) Line width 0,25, ISO 128-20 line 02	422	WG
6.1.1.4		Representation of pipeline in adjacent diagram Representation of adjacent pipeline in same diagram Line width 0,5, ISO 128-20 line 12	X6017	WG

6.1.2 Connections with indication of process media

Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.2.1		Steam Line width 1,0	X6005	WP
6.1.2.2		Condensate, cooling water, feed water Line width 0,5	X6006	WP
6.1.2.3		Water, oil contaminated Line width 0,25. Circles: line width 0,25, D = 2,0. Spacing 7,5	X6007	WP
6.1.2.4		Vapour, oil contaminated Line width 0,7. Circles: line width 0,25, D = 2,0. Spacing 7,5	X6008	WP
6.1.2.5		Raw water, untreated water Line width 0,25. Segments: line width 1,0 length 9 and 3. Spacing 3	X6009	WP
6.1.2.6		Sludge water, waste water Line width 0,25. Dots: D = 2,0. Spacing 7,5	X6010	WP

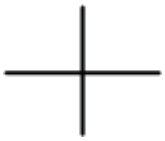
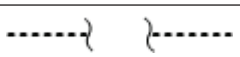
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.2.7		Air Line width solid 0,5. Dashed line = 422. Line gap 1,0	X6011	WP
6.1.2.8		Solvents, chemical Line width 0,25. Segments: line width 1,0, length 5. Spacing 5	X6012	WP
6.1.2.9		Solid fuels, bulk fuels Line width 0,25. Line gap 1,0. Segments/ spacing 4,0	X6013	WP
6.1.2.10		Combustible waste Line width 0,25. Line gap 1,0. Dots D = 2,0. Spacing. 7,5	X6014	WP
6.1.2.11		Oil Line width 0,25. Line gap 1,0	X6015	WP
6.1.2.12		Combustible gases Line width 0,25 + 0,7. Line gap 1,0	X6016	WP
6.1.2.13		Non-combustible gas, flue gas, inert gas Line width centre line 0,7. Outside lines width 0,25. Line gaps 1,0	X6018	WP
6.1.2.14		Ash, slag Line width 0,25. Vertical lines: spacing 4,0	X6019	WP
6.1.2.15		Fly ash Line width 0,25. Line gap 1,0. Segments/ spacing 2,0	X6020	WP

6.1.3 Simplified representation

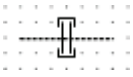
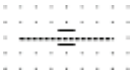
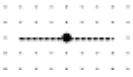
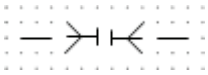
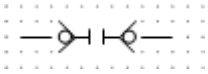
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.3.1		Transition between multi-line and single-line representation	X6030	WP

6.1.4 Symbols for direction, branching, crossing, etc.

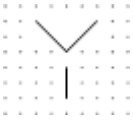
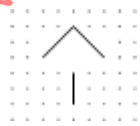
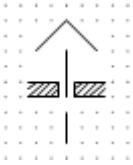
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.4.1		Direction in general	241	
6.1.4.2		Direction in general	242	
6.1.4.3		Energy or signal flow	249	
6.1.4.4		T-branch, form 1	X504	
6.1.4.5		T-branch, form 2	X505	
6.1.4.6		Crossing with connection	X506	

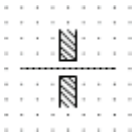
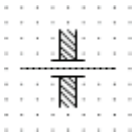
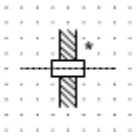
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.4.7		Crossing without connection	X6031	
6.1.4.8		Interruption of connection line	P078	

6.1.5 Pipeline joints, couplings, etc.

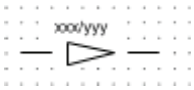
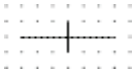
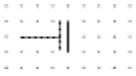
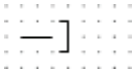
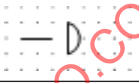
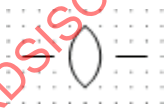
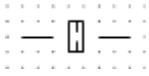
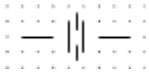
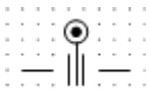
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.5.1		Flange joint	511	XL
6.1.5.2		Flange coupling, clamped	513	XL
6.1.5.3		Threaded joint	514	XL
6.1.5.4		Welded joint	515	XQ
6.1.5.5		Quick-release coupling, showed uncoupled	P032	XM
6.1.5.6		Quick-release coupling with automatic closing when uncoupled, showed uncoupled	P033	XM

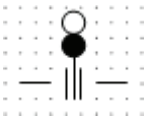
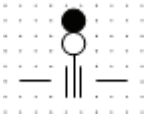
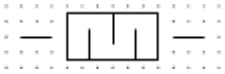
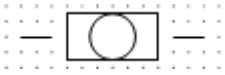
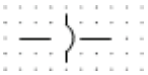
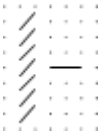
6.1.6 Accessories for connections

Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.6.1		Drain, funnel	2040	
6.1.6.2		Drain pan	X6035	
6.1.6.3		Vent, outlet to atmosphere	2039	
6.1.6.4		Vent, outlet outside enclosure or building	X6040	
6.1.6.5		Siphon	2038	

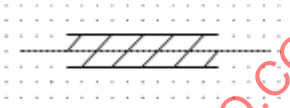
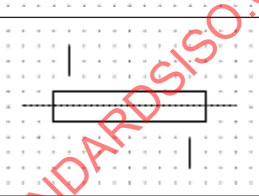
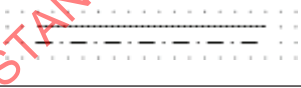
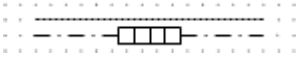
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.6.6		Slope	3061	
6.1.6.7		Wall or roof penetration, general	P009	
6.1.6.8		Penetration through wall, etc., general	3001	
6.1.6.9		Penetration through wall, etc. sealed The * should be replaced with a designation for the type of seal, e.g. fire.	3002	

6.1.7 Pipeline components

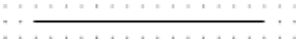
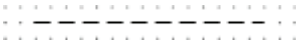
Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.7.1		Change of pipe dimension, pipe reducer,	P069	XL
6.1.7.2		Flange, single	P023	XL
6.1.7.3		Blind flange	P029	XL
6.1.7.4		End cap, threaded	518	XL
6.1.7.5		End cap	P028	XL
6.1.7.6		Compensator Form 1	533	XM
6.1.7.7		Compensator Form 2	P052	XM
6.1.7.8		Flexible pipe, hose	444	XM
6.1.7.9		Restrictor, multistage type	X6032	RN
6.1.7.10		Orifice encapsulated	P087	RN
6.1.7.11		Orifice plate between flanges Form 1	772	RN
6.1.7.12		Orifice plate between flanges Form 2	P053	RN

Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.7.13		Swing blind closed	2044	RN
6.1.7.14		Swing blind open	2045	RN
6.1.7.15		Flow straightener	2032	W_
6.1.7.16		Silencer	2033	RP
6.1.7.17		Viewing glass	2034	
6.1.7.18		Hose reel	P031	WN
6.1.7.19		Rupture disc	2035	FL
6.1.7.20		Air inlet or outlet grill	P030	HQ

6.1.8 Pipeline insulation, tracing, etc.

Entry no.	Symbol	Symbol name	Ref no.	Code
6.1.8.1		Pipe, insulated	X322	RQ
6.1.8.2		Jacketed pipe	X409	EP
6.1.8.3		Heating or cooling	P068 X8174	EB
6.1.8.4		Electrical tracing	X6050	EB

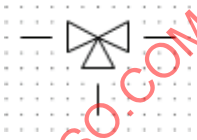
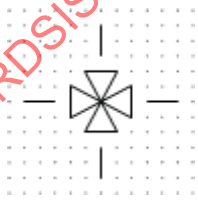
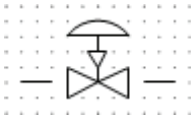
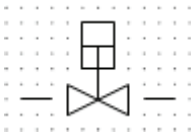
6.2 Mechanical connections

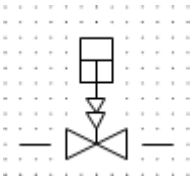
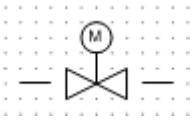
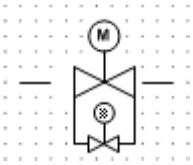
Entry no.	Symbol	Symbol name	Ref no.	Code
6.2.1		Mechanical link, shaft Form 1 Line width 0,5, line gap 1,0	402	WQ
6.2.2		Mechanical link, shaft Form 2 Line width 0,5	403	WQ
6.2.3		Electrically insulated mechanical link, shaft wire Line width 0,5, dashes 4,0, gaps 2,0	404	WQ

7 Fluid flow control

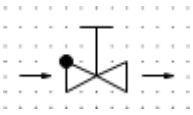
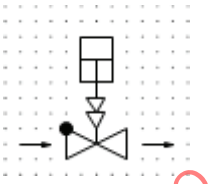
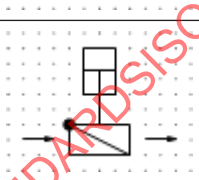
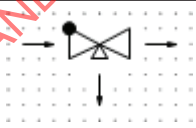
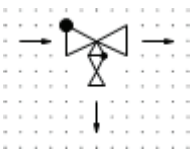
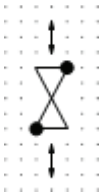
7.1 Valves

7.1.1 On-off valves

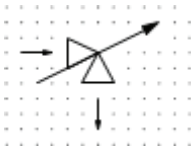
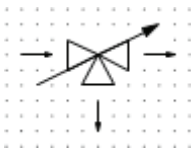
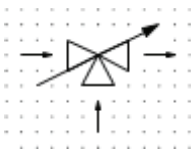
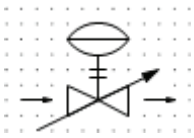
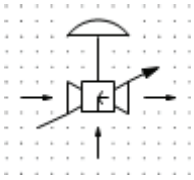
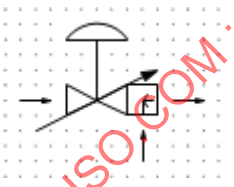
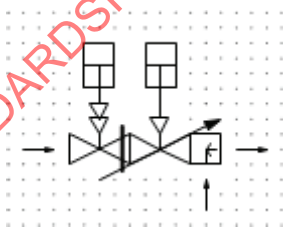
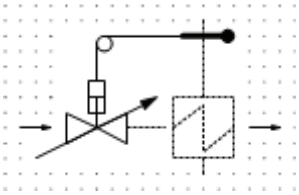
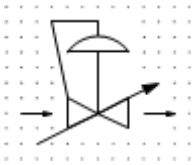
Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.1.1		2-way on-off valve, straight type, general	2101	QM
7.1.1.2		2-way valve, angle type, general	2102	QM
7.1.1.3		3-way valve, general	2103	QM
7.1.1.4		4-way valve, general	2104	QM
7.1.1.5		2-way on-off valve with diaphragm actuator, fail to close	X2101	QM
7.1.1.6		2-way on-off valve with cylinder actuator	X6101	QM

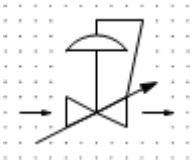
Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.1.7		2-way on-off valve with cylinder actuator and quick closing – fail to close	X6102	QM
7.1.1.8		2-way on-off valve with electric motor actuator	X2104	QM
7.1.1.9		2-way on-off valve and integrated bypass valve both with electric motor actuators	X6103	QM

7.1.2 Non-return valves

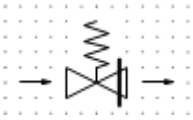
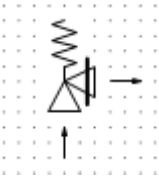
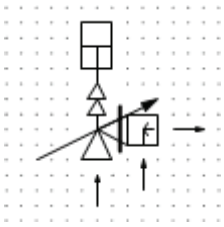
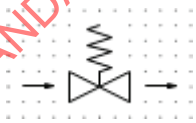
Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.2.1		Non-return valve, general Form 1	X6105	RM
7.1.2.2		Non-return valve, general Form 2	P090	RM
7.1.2.3		Non-return valve and manually actuated stop valve – combined	X2112	RM
7.1.2.4		Non-return valve with quick closing assisting cylinder actuator – fail to close	X6107	RM
7.1.2.5		Non-return valve with closing assisting cylinder actuator	X6104	RM
7.1.2.6		Pump combined non-return and recirculation valve	X6108	RM
7.1.2.7		Pump combined non-return and recirculation valve, non-return valve in the recirculation outlet	X6126	RM
7.1.2.8		Breather valve	X6109	RM

7.1.3 Control valves

Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.3.1		Control valve, general	X6110	QN
7.1.3.2		Control valve, angle type, general	X6111	QN
7.1.3.3		Control valve, 3-way distributing mode, general	X6112	QN
7.1.3.4		Control valve, 3-way mixing mode, general	X6113	QN
7.1.3.5		Control valve, double diaphragm actuator, fail freeze	X6118	QN
7.1.3.6		Steam conditioning valve – pressure and temperature reduction – with integrated water injection	X6114	QN
7.1.3.7		Steam conditioning valve – pressure and temperature reduction – with downstream water injection	X6115	QN
7.1.3.8		Combined steam conditioning valve and safety valve with downstream de-super-heater. Separate actuators, control valve actuator fail to close, safety valve actuator quick fail quick close	X6116	QN
7.1.3.9		Temperature control valve, self-acting, with separate sensor	X6117	QN
7.1.3.10		Self-operating back-pressure control valve	X2132	QN

Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.3.11		Self-operating pressure reducing control valve	X2133	QN
7.1.3.12		Pre-set control valve, e.g. flow balancing valve	X6119	QN

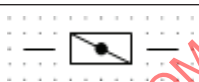
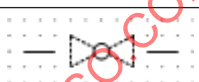
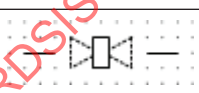
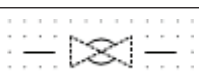
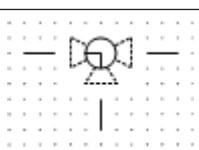
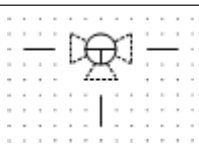
7.1.4 Safety and relief valves

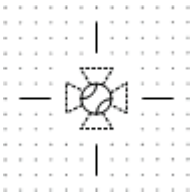
Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.4.1		Safety valve, general	X6120	FL
7.1.4.2		Safety valve, spring loaded, straight type, general	X6121	FL
7.1.4.3		Safety valve, spring loaded, angle type, general	X6122	FL
7.1.4.4		Steam bypass valve with quick fail safe open cylinder actuator and downstream de-superheater	X6123	FL
7.1.4.5		Breather valve with safety function, e.g. tank overpressure and vacuum protection	X6124	FL
7.1.4.6		Relief valve, spring loaded	X6125	FL

7.1.5 Special valves

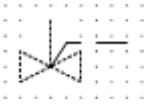
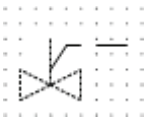
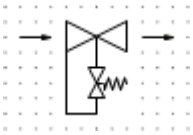
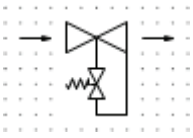
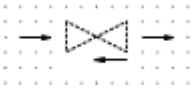
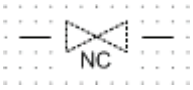
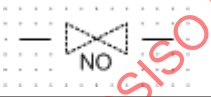
Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.5.1		Steam trap	X6130	QN
7.1.5.2		Air release valve	X6131	QN

7.1.6 Supplementary valve symbols

Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.6.1		Valve, needle type	2125	QM
7.1.6.2		Valve, globe type	2121	QM
7.1.6.3		Valve, piston or plunger type	2127	QM
7.1.6.4		Valve, gate type	2124	QM
7.1.6.5		Valve, butterfly type Form 1	2126	QM
7.1.6.6		Valve, butterfly type Form 2	P089	QM
7.1.6.7		Valve, ball type	2122	QM
7.1.6.8		Valve, plug type	2123	QM
7.1.6.9		Valve, diaphragm type	2128	QM
7.1.6.10		Valve, hose type	2129	QM
7.1.6.11		Valve, L-bore in 3-way or 4-way valves	2113	QM
7.1.6.12		Valve, T-bore in 3-way or 4-way valves	2114	QM

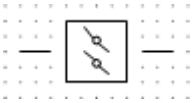
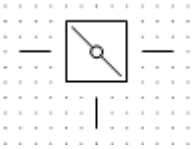
Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.6.13		Valve, Double L-bore in 4-way valve	2115	QM

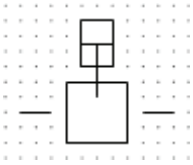
7.1.7 Specific valve features

Entry no.	Symbol	Symbol name	Ref no.	Code
7.1.7.1		Valve, connection for injection of sealing fluid	P058	WP
7.1.7.2		Valve, connection for suction	P059	WP
7.1.7.3		Valve, cavity overpressure relief valve, upstream connected	X6140	QM
7.1.7.4		Valve, cavity overpressure relief valve, downstream connected	X6141	QM
7.1.7.5		Valve, opposite flow direction installation	X6142	QM
7.1.7.6		Indication of valve normally closed	X6143	QM
7.1.7.7		Indication of valve normally opened	X6144	QM

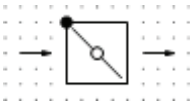
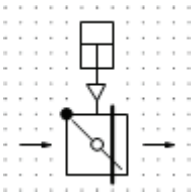
7.2 Dampers

7.2.1 On-off dampers

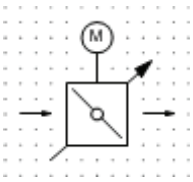
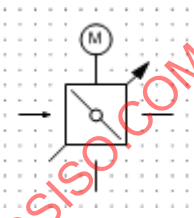
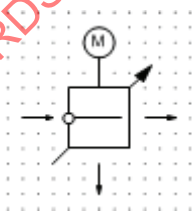
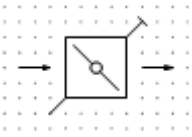
Entry no.	Symbol	Symbol name	Ref no.	Code
7.2.1.1		2-way on-off damper, general	X6150	QM
7.2.1.2		Multi-leaf damper, louvre damper	X2151	QM
7.2.1.3		3-way on-off damper, general	X6151	QM

Entry no.	Symbol	Symbol name	Ref no.	Code
7.2.1.4		2-way on-off damper, knife gate type with cylinder actuator	X6153	QM

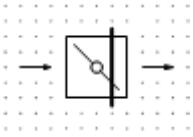
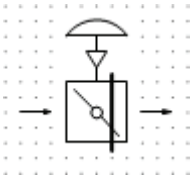
7.2.2 Non-return dampers

Entry no.	Symbol	Symbol name	Ref no.	Code
7.2.2.1		Non-return damper, general	X6160	RM
7.2.2.2		Non-return safety damper, cylinder actuator fail safe close	X6161	RM

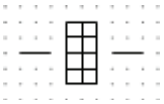
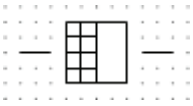
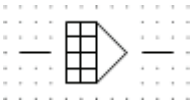
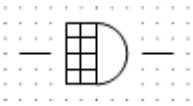
7.2.3 Control dampers

Entry no.	Symbol	Symbol name	Ref no.	Code
7.2.3.1		Control damper with electrical actuator	X6165	QN
7.2.3.2		Control damper, diverter or mixing type, electrical actuator Form 1	X6166	QN
7.2.3.3		Control damper, diverter or mixing type, electrical actuator Form 2	X6167	QN
7.2.3.4		Control damper, pre-set type	X6168	QN

7.2.4 Safety dampers

Entry no.	Symbol	Symbol name	Ref no.	Code
7.2.4.1		Safety damper, general	X6170	FL
7.2.4.2		Safety damper diaphragm actuator and fail-safe close	X6171	FL

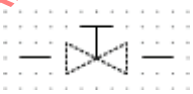
7.3 Safety devices other than valves

Entry no.	Symbol	Symbol name	Ref no.	Code
7.3.1		Flame arrester, general	2036	FM
7.3.2		Flame arrester, explosion proof	P016	FM
7.3.3		Flame arrester, detonation proof	P017	FM
7.3.4		Flame arrester, fire resistant	P018	FM

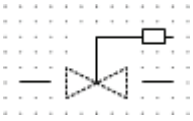
8 Actuators

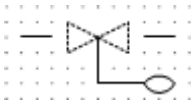
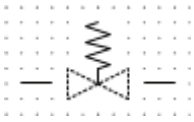
8.1 Manual actuators

NOTE For better illustration of graphical symbols for actuators, the symbols are shown together with symbols for general valves.

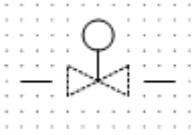
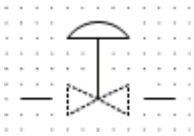
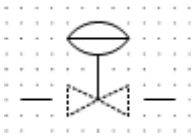
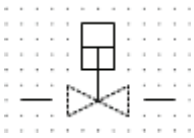
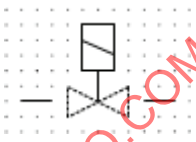
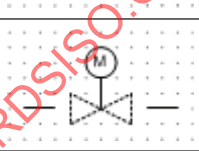
Entry no.	Symbol	Symbol name	Ref no.	Code
8.1.1		Manual actuator	681	QM

8.2 Mechanical actuators

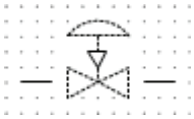
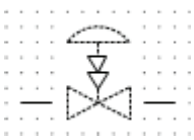
Entry no.	Symbol	Symbol name	Ref no.	Code
8.2.1		Weight	2001	ML

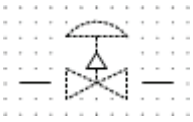
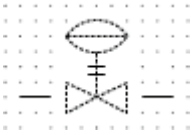
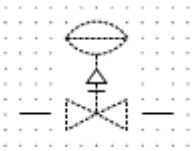
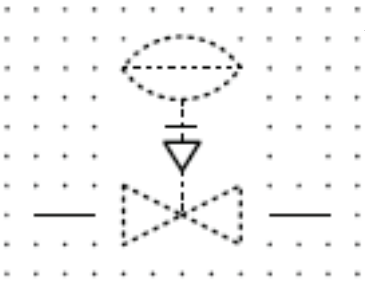
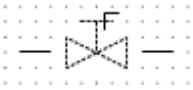
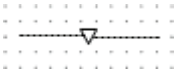
Entry no.	Symbol	Symbol name	Ref no.	Code
8.2.2		Fluid level actuator, e.g. float	715	ML
8.2.3		Spring	2002V1	ML

8.3 Automatic actuators

Entry no.	Symbol	Symbol name	Ref no.	Code
8.3.1		Actuator, without indication of type	P050	M_
8.3.2		Diaphragm actuator, single acting	725	MM
8.3.4		Diaphragm actuator, double acting	726	MM
8.3.5		Cylinder actuator, linear or rotating	P051	MM
8.3.6		Electromagnetic actuator	P001	MB
8.3.7		Electrical motor actuator	P002	MA

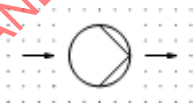
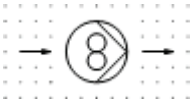
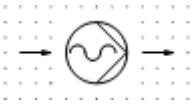
8.4 Supplementary symbols

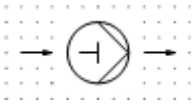
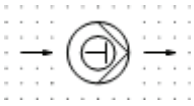
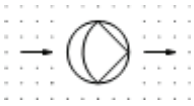
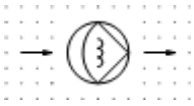
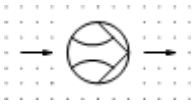
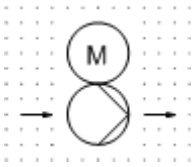
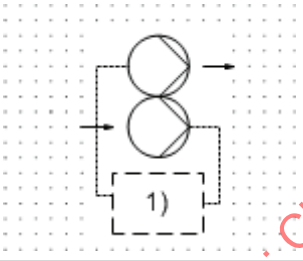
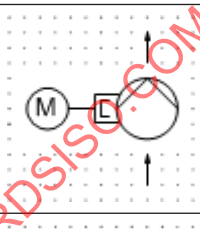
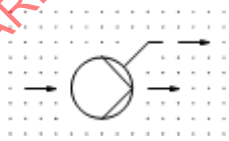
Entry no.	Symbol	Symbol name	Ref no.	Code
8.4.1		Automatic return, fail to close	X6201	
8.4.2		Automatic return, quick closing	X6202	

Entry no.	Symbol	Symbol name	Ref no.	Code
8.4.3		Automatic return, fail to open	X6203	
8.4.4		Double acting, fail freeze	X6204	
8.4.5		Double action, fail freeze, drifting in direction opening permitted	X6205	
8.4.6		Double action, fail freeze, drifting in direction closing permitted	X6206	
8.4.7		Valve locking device	P088	
8.4.8		Interlocking device	666	
8.4.9		Key	687	

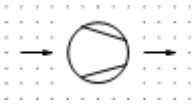
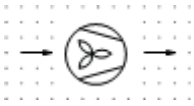
9 Fluid transport

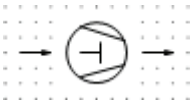
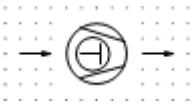
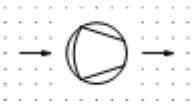
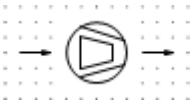
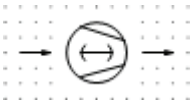
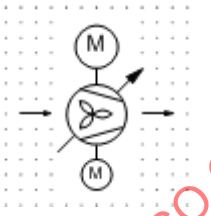
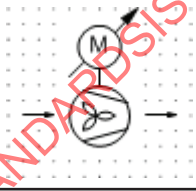
9.1 Pumps

Entry no.	Symbol	Symbol name	Ref no.	Code
9.1.1		Pump, general	2301	GP
9.1.2		Pump, gear type	X6301	GP
9.1.3		Pump, screw type	X6302	GP
9.1.4		Pump, progressive cavity type	X6303	GP

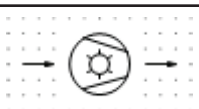
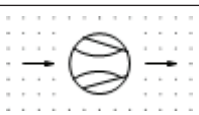
Entry no.	Symbol	Symbol name	Ref no.	Code
9.1.5		Pump, reciprocating piston type	X6304	GP
9.1.6		Pump, rotary reciprocating piston type	X6305	GP
9.1.7		Pump, diaphragm type	X6306	GP
9.1.8		Pump, diaphragm pump, electromagnetic type	X6309	GP
9.1.9		Ejector pump	X6312	GS
9.1.10		Pump, integrated motor	X2311	GP
9.1.11		Pump, re-entry type, e.g. condensate pump 1) Condensate treatment system	X6310	GP
9.1.12		Pump, glandless type, permanent magnet transmission	X6307	GP
9.1.13		Pump, extraction on multistage pump	X6311	GP

9.2 Fans, ventilators, blowers, compressors, etc.

Entry no.	Symbol	Symbol name	Ref no.	Code
9.2.1		Fan, ventilator, blower, compressor, general	2302	GQ
9.2.2		Fan, blower, ventilator, impeller type	X8164	GQ

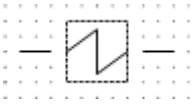
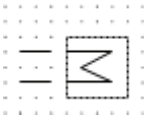
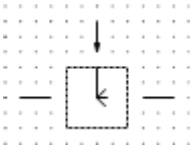
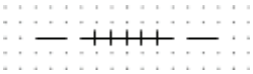
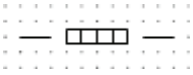
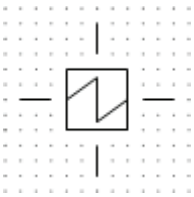
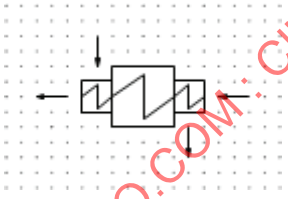
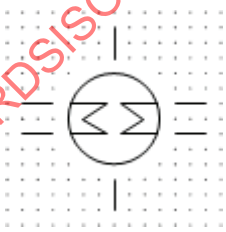
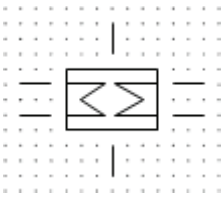
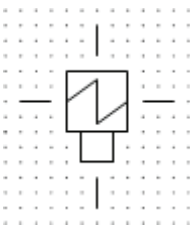
Entry no.	Symbol	Symbol name	Ref no.	Code
9.2.3		Fan Only to be used when integrated in another object, e.g. cooling towers	P070	GQ
9.2.4		Compressor, screw type	X8161	GQ
9.2.5		Compressor, reciprocating piston type	X6327	GQ
9.2.6		Compressor, rotary reciprocating piston type	X6328	GQ
9.2.7		Compressor, reciprocating diaphragm type	X6329	GQ
9.2.8		Compressor, turbo type	X6330	GQ
9.2.9		Compressor, rotary piston type, e.g. Roots compressor	X6331	GQ
9.2.10		Compressor, rotary vane type	X6334	GQ
9.2.11		Fan, guide vane or impeller blade type, controlled by electrical actuator	X6332	GQ
9.2.12		Fan, controlled by variable speed electrical motor	X6333	GQ

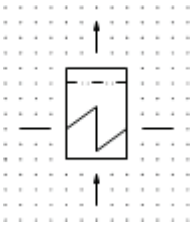
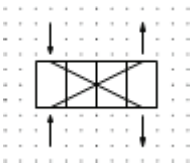
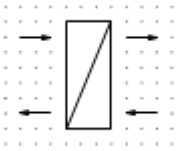
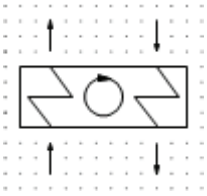
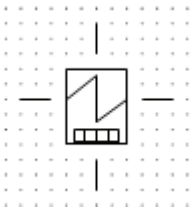
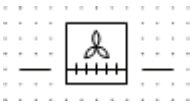
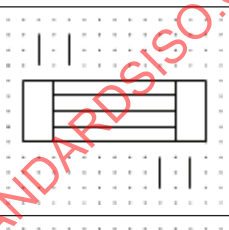
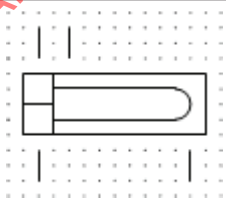
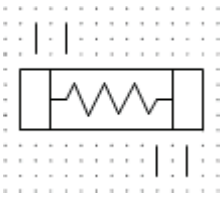
9.3 Vacuum pumps, etc.

Entry no.	Symbol	Symbol name	Ref no.	Code
9.3.1		Vacuum pump, liquid ring type	X6350	GQ
9.3.2		Vacuum pump, static, ejector type	X6351	GS

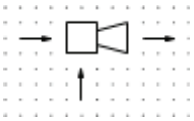
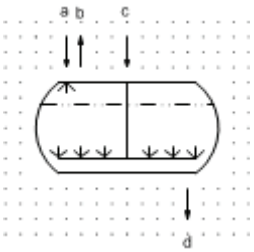
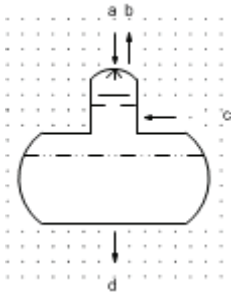
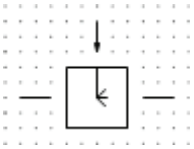
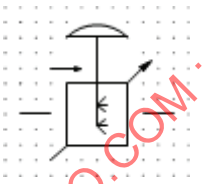
10 Fluid energy transfer

10.1 Heat exchangers

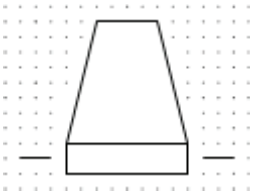
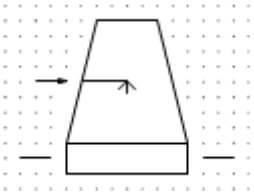
Entry no.	Symbol	Symbol name	Ref no.	Code
10.1.1		Heating or cooling surface Form 1	2501	EP
10.1.2		Heating or cooling surface Form 2	P014	EP
10.1.3		Spray nozzle	2037	EP
10.1.4		Finned tube	2502	EP
10.1.5		Electrical heating element	2542	EP
10.1.6		Heat exchanger, general	X2501	EP
10.1.7		Heat exchanger, feedwater pre-heater with steam de-superheater and condensate subcooler	X6401	EP
10.1.8		Condenser with 2 cooling water passes Form 1	X6402	EP
10.1.9		Condenser with 2 cooling water passes Form 2	X6409	EP
10.1.10		Condenser with hotwell	X6403	EP

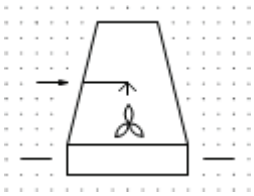
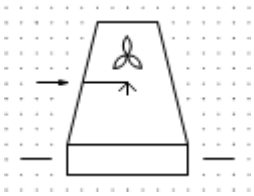
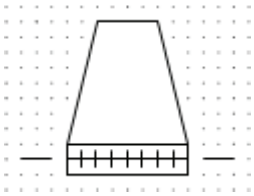
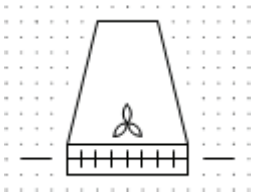
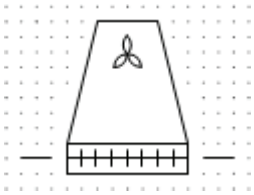
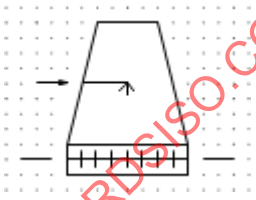
Entry no.	Symbol	Symbol name	Ref no.	Code
10.1.11		Evaporator, reboiler	X6404	EP
10.1.12		Plate heat exchanger Form 1	2516	EP
10.1.13		Plate heat exchanger Form 2	P081	EP
10.1.14		Rotating regenerative heat exchanger, Regenerative pre-heater	P083	EP
10.1.15		Electric heater, superheater	X6405	EP
10.1.16		Fin tube air cooler, condenser,	X6408	EP
10.1.17		Heat exchanger with straight tubes and fixed tube plates	2511	EP
10.1.18		Heat exchanger with U-shaped tubes	2513	EP
10.1.19		Heat exchanger with coil-shaped tubes, vertical	2514	EP

10.2 Energy transfer by mixing

Entry no.	Symbol	Symbol name	Ref no.	Code
10.2.1		Mixing nozzle, injector	P013	HW
10.2.2		Feed water tank, de-aerator with spray nozzle a: condensate inlet b: gas outlet c: steam inlet d: feedwater outlet	X6410	CP
10.2.3		Feedwater tank, de-aerator with dome a: condensate inlet b: gas outlet c: steam inlet d: feedwater outlet	X6411	CP
10.2.4		De-superheater	X2503	EP
10.2.5		De-superheater multi nozzle type with integrated water control	X6412	EP

10.3 Cooling towers

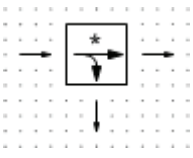
Entry no.	Symbol	Symbol name	Ref no.	Code
10.3.1		Cooling tower, general	2521	EP
10.3.2		Cooling tower, wet with natural draught	X2521	EP

Entry no.	Symbol	Symbol name	Ref no.	Code
10.3.3		Cooling tower, wet with forced draught	X6421	EP
10.3.4		Cooling tower, wet with induced draught	X6422	EP
10.3.5		Cooling tower, dry with natural draught	X6423	EP
10.3.6		Cooling tower, dry with forced draught	X6424	EP
10.3.7		Cooling tower, dry with induced draught	X6425	EP
10.3.8		Cooling tower, wet–dry with natural draught	X6426	EP

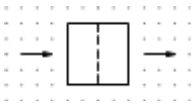
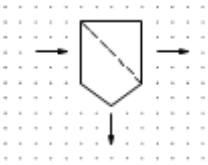
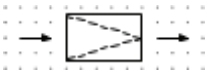
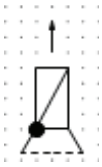
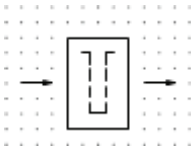
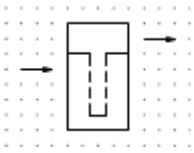
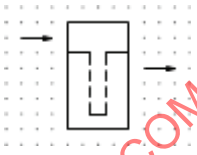
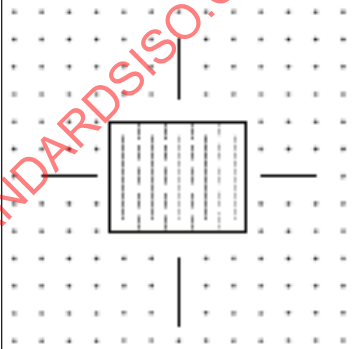
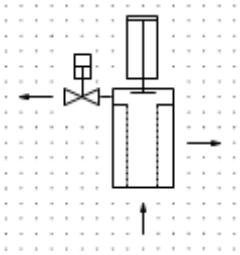
11 Fluid processing

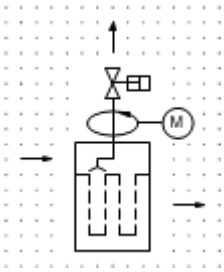
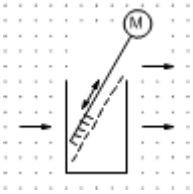
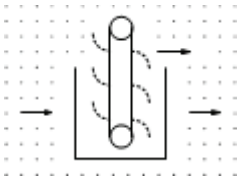
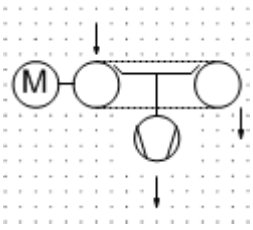
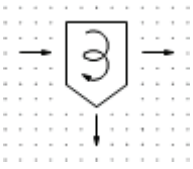
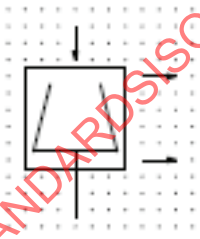
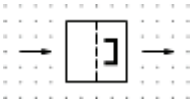
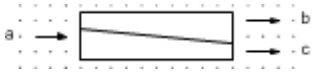
11.1 Separation

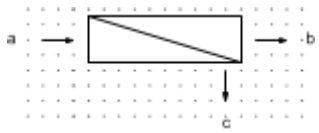
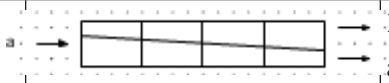
11.1.1 Separation, general

Entry no.	Symbol	Symbol name	Ref no.	Code
11.1.1.1		Separation, general Rule The * may be replaced by a graphical symbol representing the function of the separation process.	2601-M	HS

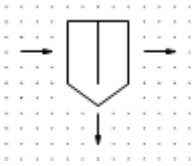
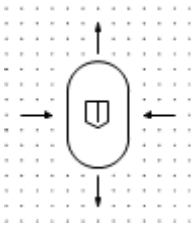
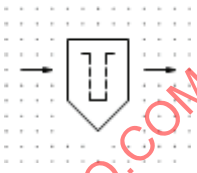
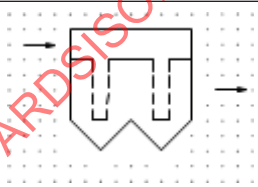
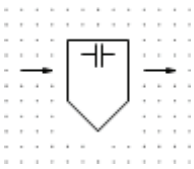
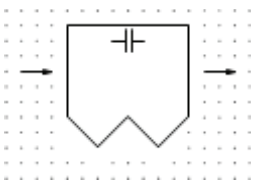
11.1.2 Separation of suspended substances in liquids

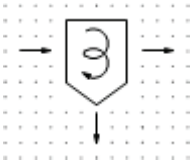
Entry no.	Symbol	Symbol name	Ref no.	Code
11.1.2.1		Screen, strainer, general	X2601	HQ
11.1.2.2		Screen, strainer, with pit for draining	X6501	HQ
11.1.2.3		Strainer, inline, e.g. pump inlet filter	X6502	HQ
11.1.2.4		Pump suction strainer with integrated non-return valve	X6506	HQ
11.1.2.5		Cartridge filter, bag filter, general	X6503	HQ
11.1.2.6		Cartridge filter, flow direction outside-in	X6504	HQ
11.1.2.7		Cartridge filter, flow direction inside-out	X6505	HQ
11.1.2.8		Filter press	X2611	HQ
11.1.2.9		Filter with back flush, Bernoulli type	X6509	HQ

Entry no.	Symbol	Symbol name	Ref no.	Code
11.1.2.10		Filter with back flush	X6510	HQ
11.1.2.11		Bar screen with rake	X6511	HQ
11.1.2.12		Basket screen travelling type	X6512	HQ
11.1.2.13		Vacuum band filter	X6513	HQ
11.1.2.14		Separator, cyclone type	X2618	HM
11.1.2.15		Centrifuge, general	X2619	HM
11.1.2.16		Permanent magnet filter	X6515	HR
11.1.2.17		Reverse osmosis, membrane element Form 1 a: raw water b: permeate c: concentrate	P091	HS

Entry no.	Symbol	Symbol name	Ref no.	Code
11.1.2.18		Reverse osmosis, membrane element Form 2 a: raw water b: permeate c: concentrate	P093	HS
11.1.2.19		Reverse osmosis, unit with four elements a: raw water b: permeate c: concentrate	X6516	HS

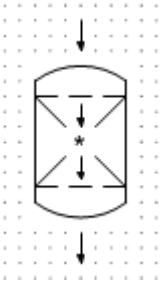
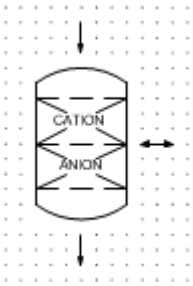
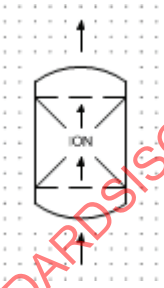
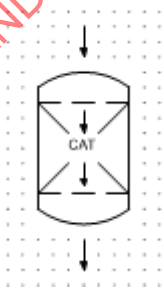
11.1.3 Separation of suspended substances in gasses

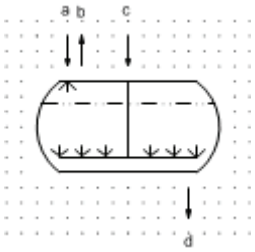
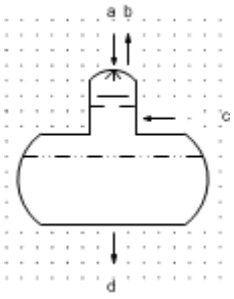
Entry no.	Symbol	Symbol name	Ref no.	Code
11.1.3.1		Separator, impact type	X6520	HN
11.1.3.2		Separator vessel	X6525	HN
11.1.3.3		Bag filter, general	X6521	HQ
11.1.3.4		Bag filter with two sections	X6522	HQ
11.1.3.5		Electrostatic precipitator, general	X6523	HR
11.1.3.6		Electrostatic precipitator with two sections	X6524	HR

Entry no.	Symbol	Symbol name	Ref no.	Code
11.1.3.7		Separator, cyclone type	X2618	HM

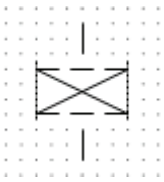
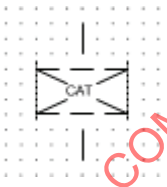
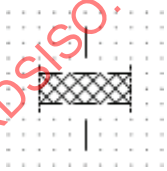
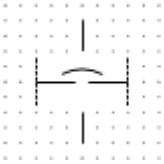
11.2 Processing of fluids by adsorption, catalysis, conversion, thermic, etc.

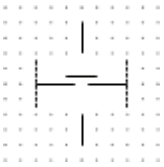
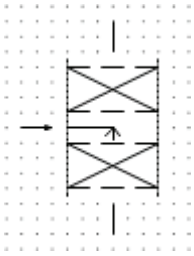
11.2.1 Liquids

Entry no.	Symbol	Symbol name	Ref no.	Code
11.2.1.1		Bed filter, general Flow direction through the bed is indicated. The * may be replaced with the type of filter, e.g. sand, ION, CAT, etc.	X6528	H_
11.2.1.2		Bed filter with two different fillings	X6529	HS
11.2.1.3		Bed filter, ion exchange type, flow direction through bed indicated	X6530	HS
11.2.1.4		Bed filter, catalytic type	X6531	HS

Entry no.	Symbol	Symbol name	Ref no.	Code
11.2.1.5		De-aerator, spray nozzle type, feed water tank a: condensate inlet b: gas outlet c: steam inlet d: feedwater outlet	X6410	HP
11.2.1.6		De-aerator, dome type, feed water tank a: condensate inlet b: gas outlet c: steam inlet d: feedwater outlet	X6411	HP

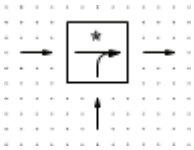
11.2.2 Gasses

Entry no.	Symbol	Symbol name	Ref no.	Code
11.2.2.1		Vessel, column packing section general	P060	HQ
11.2.2.2		Catalytic elements for duct installation	X6532	HT
11.2.2.3		Vessel, column, wire mesh packing, demister	P092	HQ
11.2.2.4		Vessel, column, tray general	2602V1	HQ
11.2.2.5		Vessel, column, tray, bubble cap type	P061	HP

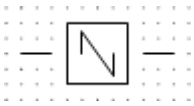
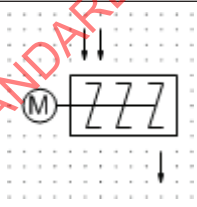
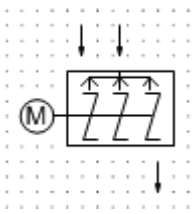
Entry no.	Symbol	Symbol name	Ref no.	Code
11.2.2.6		Vessel, column, tray, valve type	P062	HP
11.2.2.7		Vessel, column, two packing sections with intermediate spray nozzle	X6555	HQ

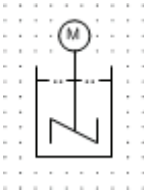
11.3 Mixing

11.3.1 General

Entry no.	Symbol	Symbol name	Ref no.	Code
11.3.1.1		Mixing, general Rule The * may be replaced by a graphical symbol representing the function of the mixing process.	2671-M	H_

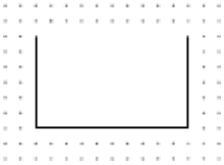
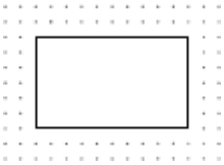
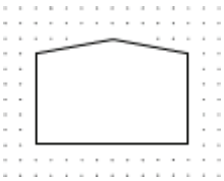
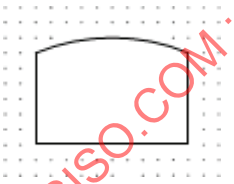
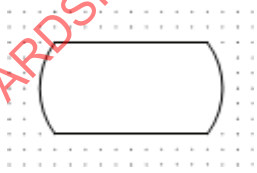
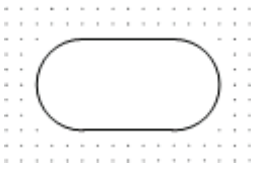
11.3.2 Devices for mixing

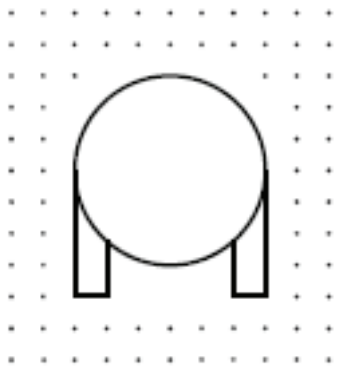
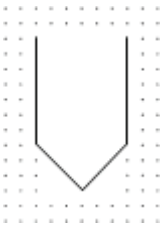
Entry no.	Symbol	Symbol name	Ref no.	Code
11.3.2.1		In-line static mixer Form 1	X2673	HW
11.3.2.2		In-line static mixer Form 2	X6570	HW
11.3.2.3		Mixer, dynamic, general	X6571	HW
11.3.2.4		Mixer, dynamic, e.g. ash humidifier	X6572	HW

Entry no.	Symbol	Symbol name	Ref no.	Code
11.3.2.5		Agitator, general	X2671	HW

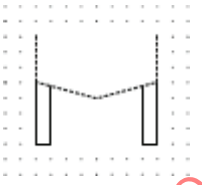
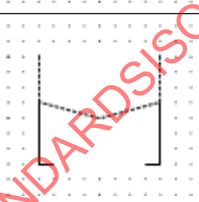
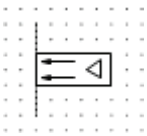
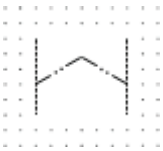
12 Storage

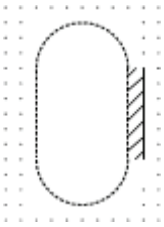
12.1 Permanent storage

Entry no.	Symbol	Symbol name	Ref no.	Code
12.1.1		Open tank, basin, pond	2061	CL
12.1.2		Closed tank	X2061	CM
12.1.3		Tank with flat bottom and conical roof	X2063	CM
12.1.4		Tank with flat bottom and dished roof	X2064	CM
12.1.5		Vessel with dished ends	2062	CM
12.1.6		Vessel with spherical ends	X6603	CM

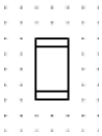
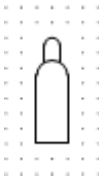
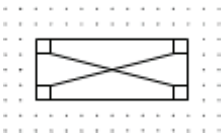
Entry no.	Symbol	Symbol name	Ref no.	Code
12.1.7		Spherical tank with supporting legs	X6601	CM
12.1.8		Bunker with conical bottom	2064	CL
12.1.9		Open store, stockpile	2065	CL

12.2 Storage devices, surface indications, etc.

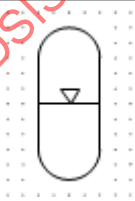
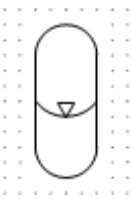
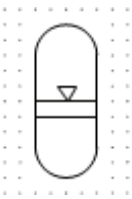
Entry no.	Symbol	Symbol name	Ref no.	Code
12.2.1		Supporting legs	P054	--
12.2.2		Supporting skirt	P055	--
12.2.3		Silo pneumatic air gun, shock blaster	P022	GZ
12.2.4		Indication of surface in bunker	X6602	--

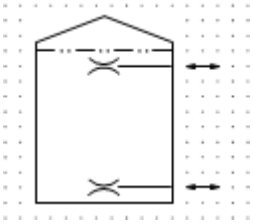
Entry no.	Symbol	Symbol name	Ref no.	Code
12.2.5		Indication of insulation	X6604	RQ

12.3 Mobile storage devices

Entry no.	Symbol	Symbol name	Ref no.	Code
12.3.1		Barrel, drum	2067	CN
12.3.2		Gas cylinder	P046	CN
12.3.3		Bag	2068	CN
12.3.4		Container	P047	CN

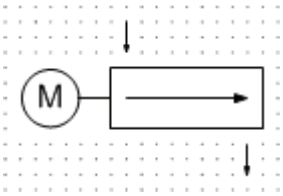
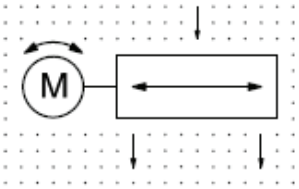
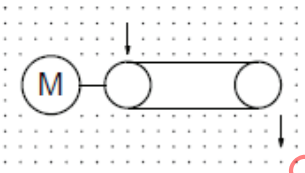
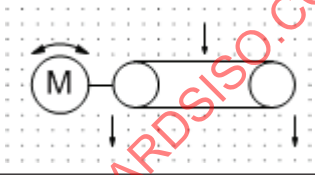
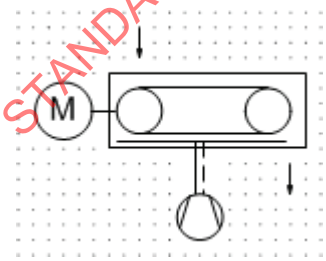
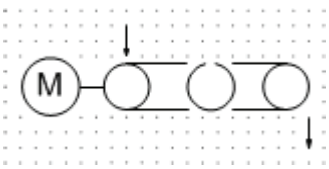
12.4 Energy storage, expansion devices

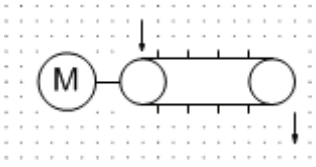
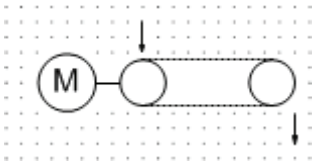
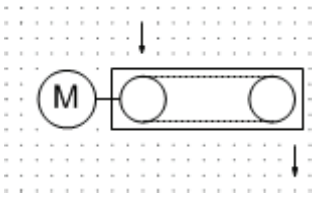
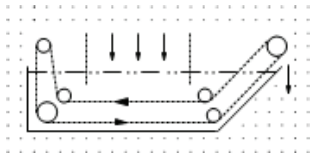
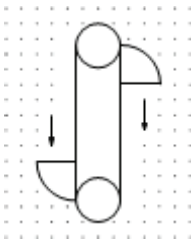
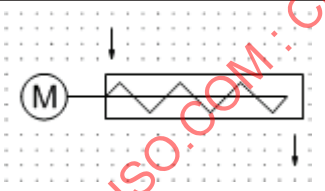
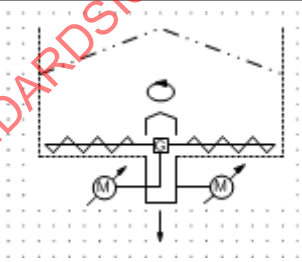
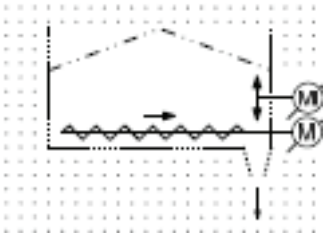
Entry no.	Symbol	Symbol name	Ref no.	Code
12.4.1		Accumulator, expansion vessel, diaphragm type, gas loaded	X2073	CQ
12.4.2		Accumulator, expansion vessel, bladder type, gas loaded	X6650	CQ
12.4.3		Accumulator, expansion vessel, piston type, gas loaded	X6651	CQ

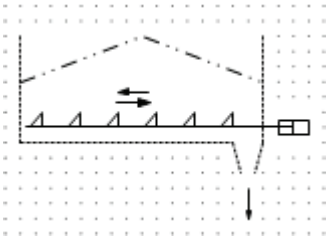
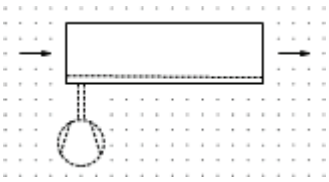
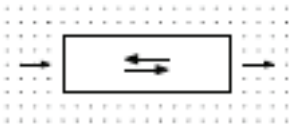
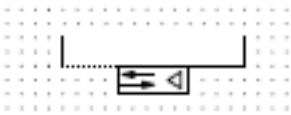
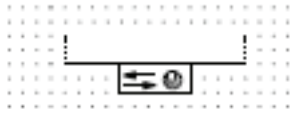
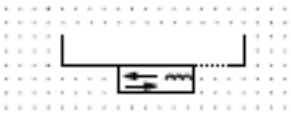
Entry no.	Symbol	Symbol name	Ref no.	Code
12.4.4		Hot water energy accumulator	X6652	CP

13 Material transport

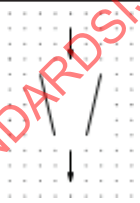
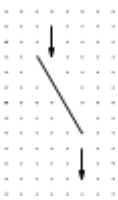
13.1 Conveyors, elevators, unloaders, etc.

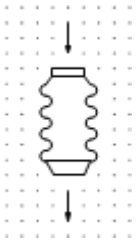
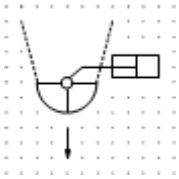
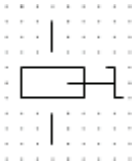
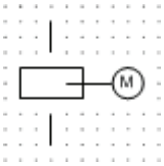
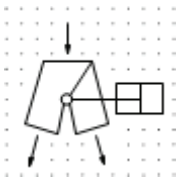
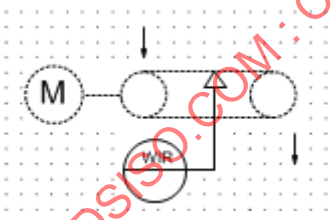
Entry no.	Symbol	Symbol name	Ref no.	Code
13.1.1		Conveyor, general	X6701	GL
13.1.2		Conveyor reversible, general	X6702	GL
13.1.3		Belt conveyor, general	X6703	GL
13.1.4		Belt conveyor, reversible type	X6704	GL
13.1.5		Belt conveyor, air belt type	X6708	GL
13.1.6		Belt conveyor, tube type	X6717	GL

Entry no.	Symbol	Symbol name	Ref no.	Code
13.1.7		Belt conveyor with scraper flights	X6705	GL
13.1.8		Chain conveyor, general	X6706	GL
13.1.9		Chain conveyor closed type	X6707	GL
13.1.10		Submerged boiler slag conveyor	X6709	GL
13.1.11		Elevator, bucket type	X6710	GL
13.1.12		Screw conveyor, closed type	X6711	GL
13.1.13		Screw unloader, rotating type	X6712	GL
13.1.14		Screw unloader, traversing type	X6713	GL

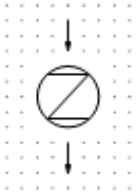
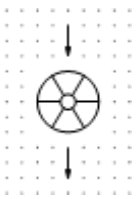
Entry no.	Symbol	Symbol name	Ref no.	Code
13.1.15		Bar unloader, reciprocating type, cylinder operated	X6714	GL
13.1.16		Conveyor, fluidized type The fan is not part of the symbol.	X6715	GL
13.1.17		Conveyor, vibrating type	X6716	GL
13.1.18		Conveyor vibrator, pneumatic type	X6727	GZ
13.1.19		Conveyor vibrator, electrical eccentric motor type	X6728	GZ
13.1.20		Conveyor vibrator, electromagnetic type	X6729	GZ

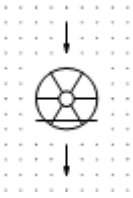
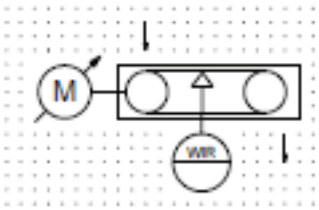
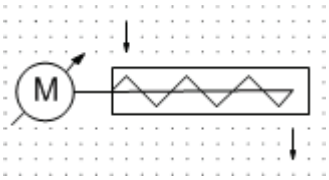
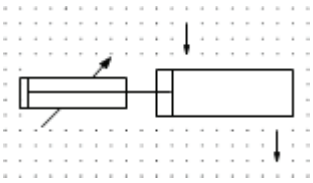
13.2 Material flow control

Entry no.	Symbol	Symbol name	Ref no.	Code
13.2.1		Funnel	3806	WL
13.2.2		Chute	P048	WL

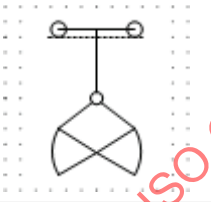
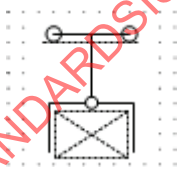
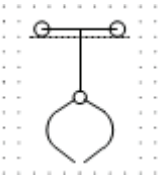
Entry no.	Symbol	Symbol name	Ref no.	Code
13.2.3		Flexible loading device	P049	WL
13.2.4		Bin gate, cylinder operated	X6720	QM
13.2.5		Damper, manually operated by turning	X6730	QM
13.2.6		Damper, electrical operated	X6731	QM
13.2.7		Diverter gate, cylinder operated	X6721	QM
13.2.8		Conveyor weighing device	X6722	BW

13.3 Feeders

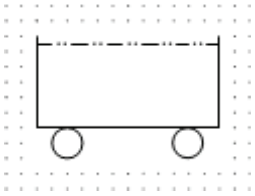
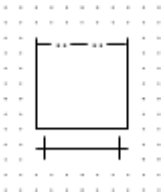
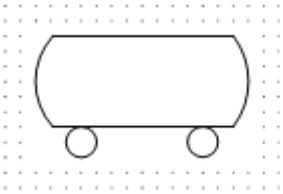
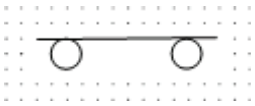
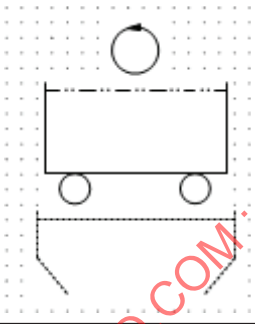
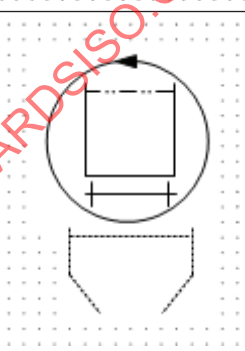
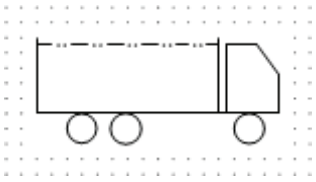
Entry no.	Symbol	Symbol name	Ref no.	Code
13.3.1		Feeder, general	P077	QN
13.3.2		Rotary vane feeder, rotary air lock	X6723	QN

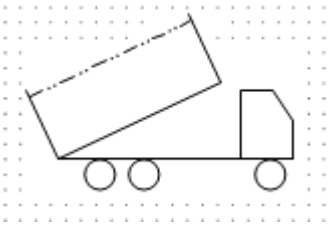
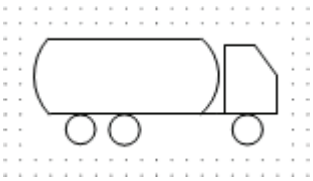
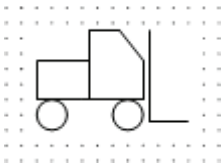
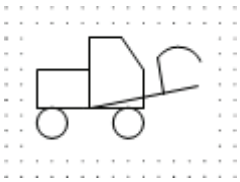
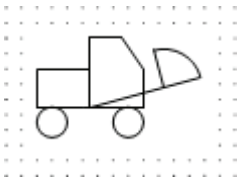
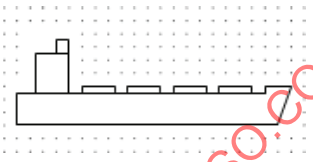
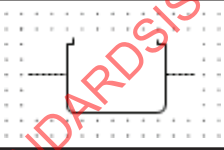
Entry no.	Symbol	Symbol name	Ref no.	Code
13.3.3		Rotary vane feeder with safety function	X6732	QN
13.3.4		Conveyor feeder, belt type, integrated weight, electrical variable speed motor	X6724	QN
13.3.5		Screw feeder, electrical variable speed motor	X6725	QN
13.3.6		Piston feeder, variable cylinder operated	X6726	QN

13.4 Handling equipment

Entry no.	Symbol	Symbol name	Ref no.	Code
13.4.1		Overhead travelling crane grab type	X6750	W_
13.4.2		Overhead travelling crane for straw bales	X6751	W_
13.4.3		Overhead travelling crane for timber logs	X6752	W_

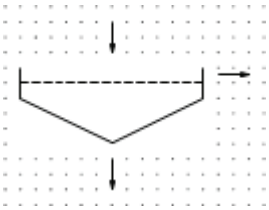
13.5 Mobile transport equipment

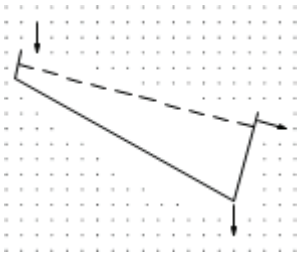
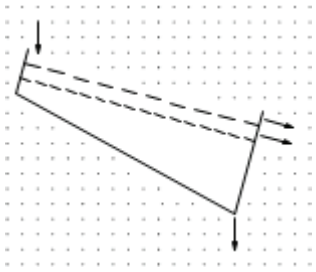
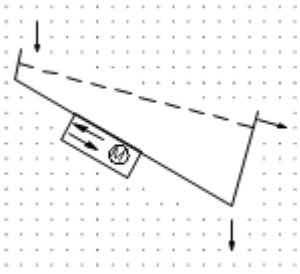
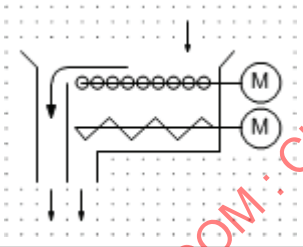
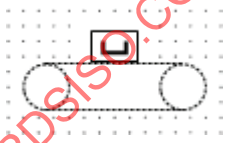
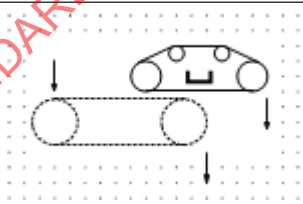
Entry no.	Symbol	Symbol name	Ref no.	Code
13.5.1		Railway wagon, bulk type Form 1	X6770	WR
13.5.2		Railway wagon, bulk type Form 2	X6771	WR
13.5.3		Railway wagon, tank type	X6772	WR
13.5.4		Railway wagon, open type	X6773	WR
13.5.5		Railway wagon tippler, rotary type, form 1	X6775	W_
13.5.6		Railway wagon tippler, rotary type, form 2	X6776	W_
13.5.7		Road truck, bulk type	X6780	W_

Entry no.	Symbol	Symbol name	Ref no.	Code
13.5.8		Road truck, bulk type, unloading	X6781	W_
13.5.9		Road truck, tank type	X6782	W_
13.5.10		Forklift truck	X6783	W_
13.5.11		Log loader	X6784	W_
13.5.12		Wheel loader	X6785	W_
13.5.13		Ship, form 1	X6790	W_
13.5.14		Ship, form 2	X6791	W_

14 Material processing

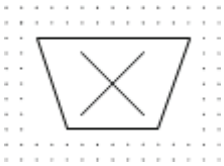
14.1 Separation

Entry no.	Symbol	Symbol name	Ref no.	Code
14.1.1		Screen, general	X6801	HQ

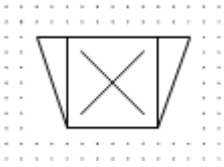
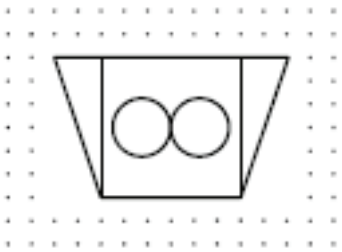
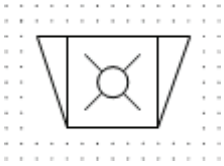
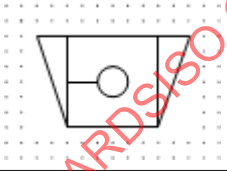
Entry no.	Symbol	Symbol name	Ref no.	Code
14.1.2		Screen, incline, coarse, single	X6802	HQ
14.1.3		Screen, inclined, separate coarse and fine screens	X6803	HQ
14.1.4		Screen vibration type	X6804	HQ
14.1.5		Roller screen with electrical motor, and conveyor for product transport	X6805	HQ
14.1.6		Magnet separator, general The conveyor is not part of the symbol.	X6811	HQ
14.1.7		Magnet separator, conveyor type	X6812	HQ

14.2 Processing, size reduction

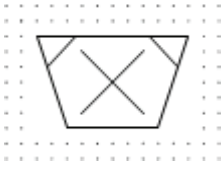
14.2.1 Size reduction

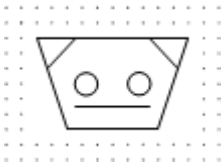
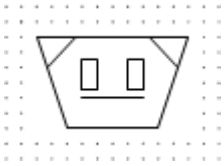
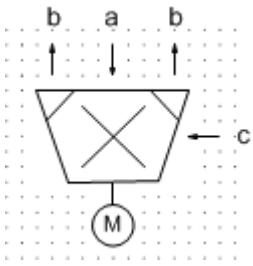
Entry no.	Symbol	Symbol name	Ref no.	Code
14.2.1.1		Size reduction machine, general	X6820	HU

14.2.2 Coarse size reduction, crushers

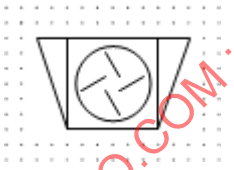
Entry no.	Symbol	Symbol name	Ref no.	Code
14.2.2.1		Crusher, general	X6821	HU
14.2.2.2		Crusher, roller type	P6822	HU
14.2.2.3		Crusher, impact type	X6823	HU
14.2.2.4		Crusher, jaw type	X6824	HU

14.2.3 Fine size reduction, mills

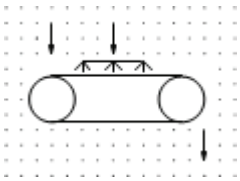
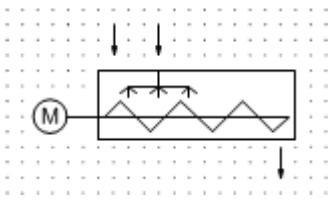
Entry no.	Symbol	Symbol name	Ref no.	Code
14.2.3.1		Mill, general	X6830	HU
14.2.3.2		Mill, hammer type	X6831	HU

Entry no.	Symbol	Symbol name	Ref no.	Code
14.2.3.3		Mill, ball type, vertical rotation	X6832	HU
14.2.3.4		Mill, roller type, vertical rotation	X6833	HU
14.2.3.5		Mill indication of process connections a: product inlet b: product outlet c: air inlet	X6834	–

14.2.4 Biomass processing

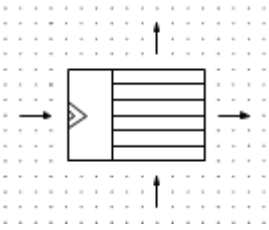
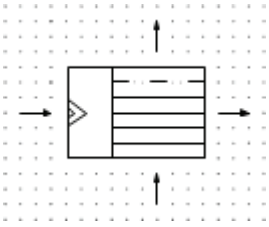
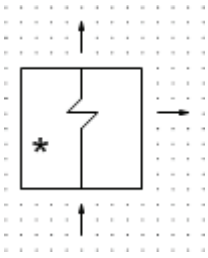
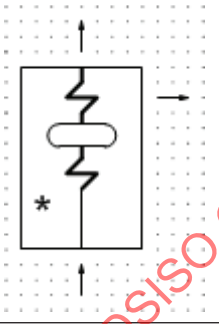
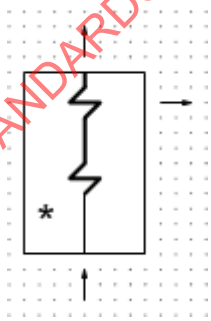
Entry no.	Symbol	Symbol name	Ref no.	Code
14.2.4.1		Shredder, general	X6840	HU
14.2.4.2		Wood chipper	X6841	HU

14.3 Humidifieing

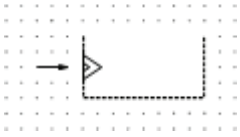
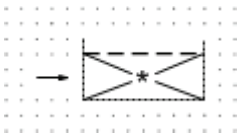
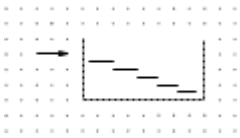
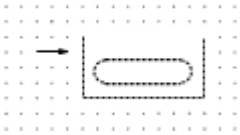
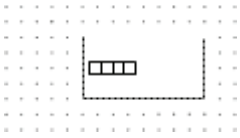
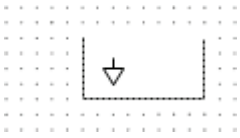
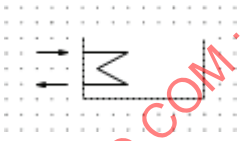
Entry no.	Symbol	Symbol name	Ref no.	Code
14.3.1		Belt conveyor with spray nozzles	X6850	HW
14.3.2		Screw conveyor with integrated spray nozzles	X6851	HW

15 Thermal energy generators

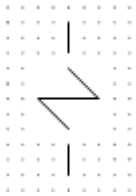
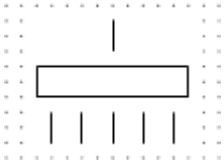
15.1 Conventional energy generators

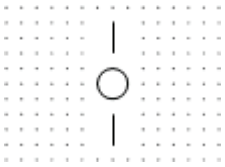
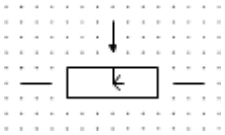
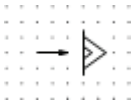
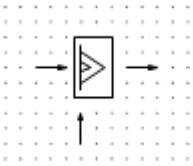
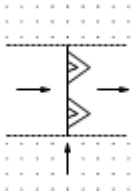
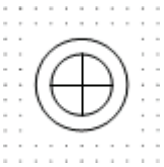
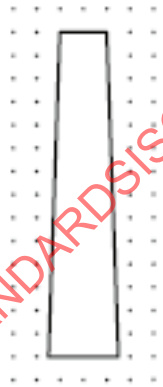
Entry no.	Symbol	Symbol name	Ref no.	Code
15.1.1		Hot water shell boiler	X6901	EM
15.1.2		Steam shell boiler	X6902	EM
15.1.3		Hot water tube boiler The * shall be replaced by the type of combustion/heating system — see 15.2.	X6903	EM
15.1.4		Steam tube boiler with drum The * shall be replaced by the type of combustion/heating system — see 15.2.	X6904	EM
15.1.5		Steam tube boiler The * shall be replaced by the type of combustion/heating system — see 15.2.	X6905	EM

15.2 Boiler combustion / heating systems

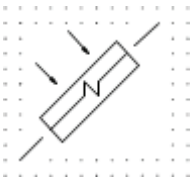
Entry no.	Symbol	Symbol name	Ref no.	Code
15.2.1		Burner, oil or gas	X6909	EM
15.2.2		Fluidized bed boiler. The * shall be replaced by the type of boiler. CFB Circulating fluidized bed boiler BFB Bubbling fluidized bed boiler	X6910	EM
15.2.3		Incline grate boiler	X6911	EM
15.2.4		Travelling grate boiler	X6912	EM
15.2.5		Electrical boiler resistance type	X6913	EB
15.2.6		Electrical boiler electrode type	X6914	EB
15.2.7		Heat exchanger	X6915	EP

15.3 Boiler devices

Entry no.	Symbol	Symbol name	Ref no.	Code
15.3.1		Heating surface	X6925	EM
15.3.2		Header Form 1	X6926	WP

Entry no.	Symbol	Symbol name	Ref no.	Code
15.3.3		Header Form 2	X6927	WP
15.3.4		De-superheater	X6928	EP
15.2.5		Burner	2541	EM
15.3.6		Combustion chamber	X6929	EM
15.3.7		Duct burner, afterburner	X6930	EM
15.3.8		Soot blower, steam type	X6932	
15.3.9		Chimney	2041 (M)	WP

15.4 Non-conventional energy generators

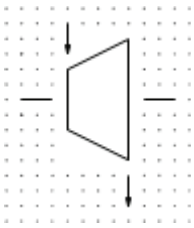
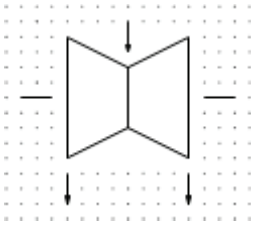
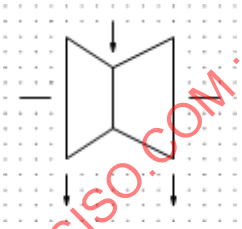
Entry no.	Symbol	Symbol name	Ref no.	Code
15.4.1		Thermal solar panel	X6951	EP

15.5 Thermal energy consumers

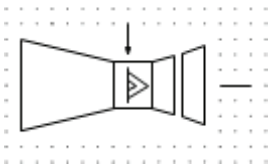
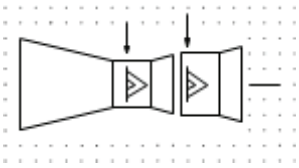
Entry no.	Symbol	Symbol name	Ref no.	Code
15.5.1		Thermal energy consumer, e.g. district heating or district cooling	P010	--

16 Machines, engines

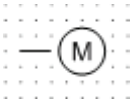
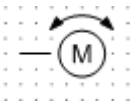
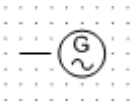
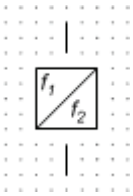
16.1 Steam turbines, steam engines

Entry no.	Symbol	Symbol name	Ref no.	Code
16.1.1		Steam turbine	2571	MN
16.1.2		Steam turbine with centre inlet	2572	MN
16.1.3		Steam turbine with centre inlet and asymmetric outlets, e.g. IP turbine	X7001	MN

16.2 Combustion engines, gas turbines

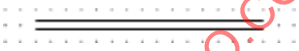
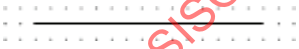
Entry no.	Symbol	Symbol name	Ref no.	Code
16.2.1		Gas turbine with separate power turbine	X7011	MP
16.2.1		Gas turbine, power turbine with separate combustion chamber(s)	X7012	MP

16.3 Electrical engines, motors, generators, converters

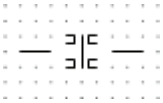
Entry no.	Symbol	Symbol name	Ref no.	Code
16.3.1		Electrical motor	P011	MA
16.3.2		Electrical motor, reversible	X7050	MA
16.3.3		Electrical generator	P012	GA
16.3.4		Electrical generator, alternating current type	X7051	GA
16.3.5		Electrical generator, direct current type	X7052	GA
16.3.6		Frequency converter	753	TA

17 Mechanical transmission, shafts, bearings, couplings, etc.

17.1 Shafts

Entry no.	Symbol	Symbol name	Ref no.	Code
17.1.1		Mechanical connection, shaft, form 1	402	WQ
17.1.2		Mechanical connection, shaft form 2	403	WQ

17.2 Bearings

Entry no.	Symbol	Symbol name	Ref no.	Code
17.2.1		Bearing, general type	2006	UP
17.2.2		Bearing, thrust type	P080	UP