
**Connectors for fluid power and
general use — Designation and
nomenclature**

*Connecteurs pour transmissions hydrauliques et applications
générales — Désignation et nomenclature*



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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. In general applications, a fluid can be conveyed under pressure.

Components can be connected through their ports by connections (connectors) and conductors (tubes and hoses). Tubes are rigid conductors; hoses are flexible conductors.

[Annexes A](#) and [B](#) are normative; [Annex C](#) is informative.

Connectors for fluid power and general use — Designation and nomenclature

1 Scope

This document collects the various designation and nomenclature schemes specified in International Standards for connectors and similar products standardized by ISO/TC 131/SC 4. It establishes a uniform nomenclature structure to facilitate standardization of product names used for threaded connectors, push-in connectors, flanges, hose fittings, port plugs and quick-action couplings.

The designation and nomenclature established in this document are applicable for procurement purposes when agreed to by user and supplier.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

There are no normative references in this document.

3 Terms and definitions

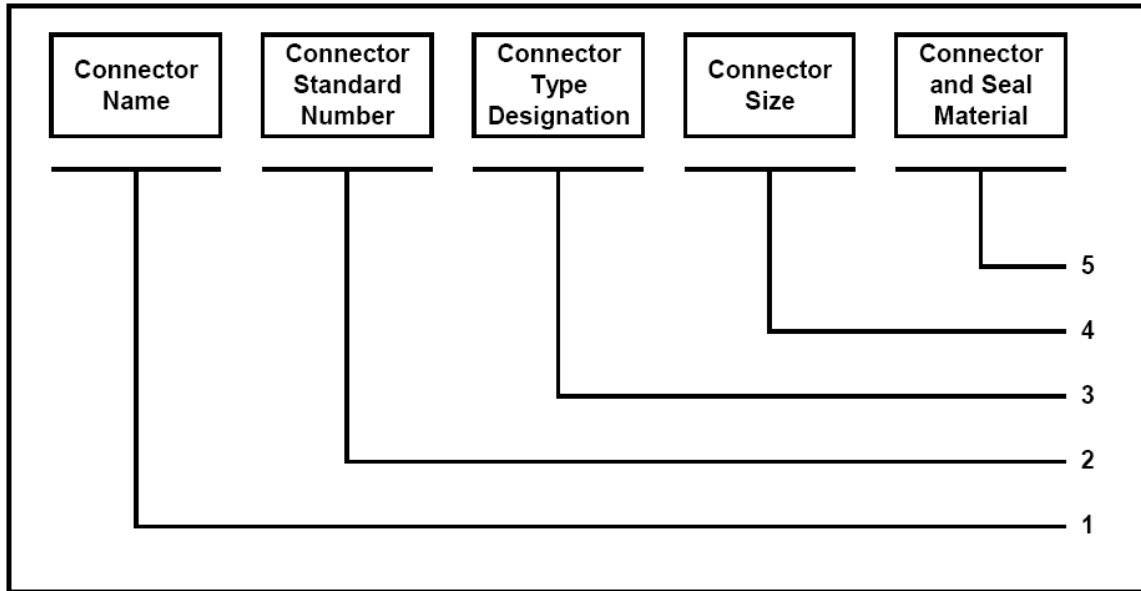
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

4 Designation and format

4.1 General

Designations use the format shown in [Figure 1](#) when specifying a part for procurement to International Standards for connectors developed by ISO/TC 131/SC 4. Tube ends are assumed, so there is no type symbol for unions. When multiple end types are required to describe a threaded connector type, use the stud end first, when applicable (e.g. SDSWS). If there is no stud end, the description of the part shall dictate the designation order (e.g. WDRDNP for a weld-on reducing nipple).



Key

- 1 connector name – the name for the part (for example, connector, hose fitting, coupling, etc.) from the standard.
- 2 connector standard number – the term “ISO” and the number of the relevant International Standard.
- 3 connector type designation – the abbreviated designation consists of symbol for connector end type (Table 1) followed by, when needed, symbol for connector shape (Table 2) followed by symbol for complete connector (Table 3), if so ordered.
- 4 connector size – see 5.2.
- 5 connector material symbol (Table 7) followed by seal material symbol (Table 8), where applicable.

Figure 1 — System for designating and specifying a part

4.2 Connector size

The appropriate size designator for the connector end(s) from the relevant International Standard.

4.2.1 Threaded connectors and cross connectors

The following general rules shall apply:

- larger tube end size shall precede the smaller one for straight unions and union elbows;
- tube end size shall precede that of stud, hose, or other ends of the connector;
- male tube end shall precede female (swivel) tube end;
- for tee connectors, designation shall start with the size of the larger end on the run followed by the size of the branch;
- if the tee connector has a swivel, it shall be designated first, and on run tees the branch size shall follow;
- for cross connectors, leg with the largest tube end size shall be considered the run and the other the branch;
- the sequence shall be run sizes (large followed by small) followed by branch sizes (large followed by small);

- for tube or hose ends, the size of tube or hose in millimetres is used (for 8434-1 connectors the size is followed by the duty symbol (Table 4));
- for stud ends with metric threads, symbol “M” followed by thread size (without pitch) followed by the duty symbol (Table 4), followed by type of sealing (Table 5), e.g. M14LB for M14×1,5 light duty stud with metal-to metal sealing.
- for stud ends with BSP threads, symbol “G” followed by thread size in inches followed by “A” (tolerance class), followed by duty symbol, followed by type of sealing, e.g. G1/4ASE for heavy duty stud end with G1/4 BSP threads and elastomeric sealing;
- for stud ends with UN/UNF threads, thread size in inches (without pitch) followed by UN or UNF, as appropriate, followed by duty symbol (no sealing type is needed as only O-ring sealing is used with these threads).

4.2.2 Flange connectors

For split flange clamps, FCS, the letter M if the split flange clamps are used with metric screws only, followed by a dash and the nominal size.

4.2.2.1 FCS-25 and FCSM-32

Most split flange clamps accept both inch and metric screws and shall use FCS. Those that only accept inch screws shall use FCS and those that accept metric screws only shall use FCSM.

For one-piece flange clamps, FC, the letter M if the one-piece flange clamps are used with metric screws only, followed by a dash and the nominal size e.g. FC-25 or FCM-32.

Most one-piece flange clamps accept both inch and metric screws and shall use FC. Those that only accept inch screws shall use FC and those that accept metric screws only shall use FCM

- For flange ports, P, followed by a dash and the nominal size and the letter M if the flange ports use metric screws e.g. P-76 or P-76M
- For flange heads, FH, followed by a dash and the nominal size e.g. FH-76

4.2.2.2 Push-in connectors

For tube ends, the outside diameter of the tubes with which they are to be connected, if all tubes are the same size, otherwise the largest and then the smallest each separated by a multiplication symbol (×).

For stud ends, the outside diameter of the tubes with which they are to be connected, followed by the stud end thread designation separated by a multiplication symbol (×).

4.2.2.3 Hose fittings

For ISO 12151-1, ISO 12151-5 and ISO 12151-6 hose fittings, the connection size, followed by a multiplication symbol (×) and the hose size e.g. 12×12,5.

For ISO 12151-2, ISO 12151-3 and ISO 12151-4 hose fittings, the duty symbol, the connection size, followed by a multiplication symbol (×) and the hose size e.g. L22×19.

4.2.2.4 Port plugs

Same as the stud ends for threaded connectors (see 5.2.1).

4.2.2.5 Quick-action couplings

Since there are no connector styles, only the coupling series (A, B, or C) and the nominal coupling diameter are required there.

4.3 Designation for ordering parts

Connectors, hose fittings, port plugs, flanges, push-in fittings and quick-action couplings are designated by an alphanumeric code to facilitate ordering. They are designated by the connector name and a space, followed by reference to the relevant standard (ISO XXXX), followed by a hyphen, then the type letter symbols (connector type and shape, where applicable), followed by a hyphen and followed by the size code (tube/hose/flange end and/or thread size designators) for the ends, followed by hyphen and followed by connector and seal (if applicable) material symbols.

Size designators for connector ends shall be separated by a multiplication symbol (×). There shall be no spaces on either side of the hyphens or the multiplication symbol.

See [Tables 1](#) through [9](#) for the alpha-numeric symbols to be used.

[Annex A](#) provides an index of the letter symbols used in alphabetical order.

[Annex B](#) provides examples of how the designation system is applied.

[Annex C](#) provides correlation of SAE dash sizes to ISO connector, tube and hose sizes.

Table 1 — Letter symbols to be used in designating connector types for fluid power and general use

Connector type	Letter symbol	Tube connectors			Hose fittings
		Threaded	Flange	Push-in	
Banjo	BJ			14743	
Bulkhead	BH	8434-1 8434-2 8434-3 8434-6		14743	
Braze-on	BR	8434-1 8434-3			
Cap	CP	8434-1 8434-2 8434-3			
Plug	PL	8434-1 8434-2 8434-3		14743	
Port	P		6162-1 6162-2	14743	
Reducer Reducer with nut Reducer without nut	RD RDA RDB	8434-1 8434-2 8434-6 8434-3 8434-3			
Stud	SD	8434-1 8434-2 8434-3 8434-6		14743	12151-4
Swivel With sealing surface not exposed With sealing surface exposed	SW SWA SWB	8434-1 8434-2 8434-6 8434-3 8434-3		14743	12151-2 12151-5 12151-6 12151-1 12151-1
Swivel with O-ring	SWO	8434-1			
Swivel bulkhead	SWBH			14743	

Table 1 (continued)

Connector type	Letter symbol	Tube connectors			Hose fittings
		Threaded	Flange	Push-in	
Swivel port	SWP			14743	
Tube end	TE			14743	
Weld-on / Weld-in	WD	8434-1 8434-3			

Table 2 — Letter symbols to be used in designating shapes of connectors for fluid power and general use

Shape	Letter symbol	Tube connectors		Hose fittings
		Threaded	Push-in	
Branch tee	BT	8434-1 8434-2 8434-3	14743	
90° elbow	E	8434-1 8434-2 8434-3 8434-6	14743	12151-1 12151-2 12151-3 12151-4 12151-5 12151-6
22,5° elbow	E22			12151-3
30° elbow	E30			12151-3
45° elbow	E45			12151-1 12151-2 12151-3 12151-5 12151-6
60° elbow	E60			12151-3
67,5° elbow	E67			12151-3
Cross	K	8434-1 8434-2 8434-3	14743	
Run tee	RT	8434-1 8434-2 8434-3	14743	
Straight	S	8434-1 8434-2 8434-3	14743	12151-1 12151-2 12151-3 12151-4 12151-5 12151-6
Tee	T	8434-1 8434-2 8434-3	14743	
Y shape	Y		14743	

Table 3 — Letter symbols to be used in designating types of components of connectors for fluid power and general use

Type of connector component	Letter symbol	Tube connectors	
		Threaded	Flange
Cutting ring	CR	8434-1	
One-piece flange clamp	FC		6162-1 6162-2
Split flange clamp pair	FCS		6162-1 6162-2
Flange head	FH		6162-1 6162-2
Locknut	LN	8434-1 8434-2 8434-3	
Sleeve: For metric tube For inch tube	SL MSL ISL	8434-2 8434-3 8434-2 8434-3	
Nut Standard strength nut High strength nut	N NA NB	8434-1 8434-2 8434-3 8434-3	
Nipple For metric tube For inch tube	NP MNP INP	8434-1 8434-3 8434-3	

Table 4 — Letter symbols to be used in designating completeness, with sleeve(s) or cutting ring(s) and nut(s), of connectors for fluid power and general use

Completeness indication	Letter symbol	Tube connectors
		Threaded
Complete connector	C	8434-1 8434-2

Table 5 — Letter symbols to be used in designating stud end sealing types of connectors for fluid power and general use

Stud end sealing types	Letter symbol	Tube connectors	Port plugs
		Threaded	
Metal-to-metal sealing	B	1179-4 8434-1 8434-2 9974-3	
Elastomeric sealing	E	1179-2 8434-1 8434-2 9974-2	9974-4
O-ring sealing	F	6149-2 6149-3 8434-1 8434-2 8434-3 11926-2 11926-3	6149-4
O-ring with retaining ring: Type G Type H	G H	1179-3 8434-2 8434-6 1179-3 8434-2 8434-6	

Table 6 — Letter symbols to be used in designating working pressure levels (duty) of connectors for fluid power and general use

Working pressure series	Letter symbol	Tube connectors	Hose fittings
		Threaded	
Extra light-duty	LL	8434-1	
Light-duty	L	1179-3 6149-3 8434-1 9974-3 11926-3	12151-2 12151-3 12151-4
Heavy-duty	S	1179-2 6149-2 8434-1 9974-2 11926-2	12151-2 12151-3 12151-4

Table 7 — Letter symbols to be used in designating connector material of connectors for fluid power and general use

Connector material	Letter symbol
Steel	S
Copper and copper alloys	B
Stainless steel	SS

Table 8 — Letter symbols to be used in designating seal material of connectors for fluid power and general use

Seal material	Letter symbol
Acrylonitrile-butadiene rubber (commonly known as nitrile rubber or NBR)	N
Hydrogenated NBR	H
Terpolymer of ethylene, propylene and a diene or EPDM	E
Fluoro rubber	F

Letter symbols used are intended to be as short as possible for use in designation of connectors and do not conform to the elastomeric seal material designations listed in ISO 1629.

Table 9 — Letter symbols to be used in designating miscellaneous features of connectors for fluid power and general use

Miscellaneous designations	Letter symbol	Tube connectors		Hose fittings	Port plugs
		Threaded	Flange		
Short	S			12151-1 12151-3 12151-5	
Medium	M			12151-1 12151-3 12151-5	
Long	L			12151-1 12151-5	
External hex	EH				6149-4 9974-4
Internal hex	IH				6149-4 9974-4
Metric	M				
Inch	I				
Sealing (style) with O-ring	A			12151-6	
Sealing (style) without O-ring	B			12151-6	

Annex A (normative)

Index of letter symbols in alphabetical order

A.1 Index

[Table A.1](#) provides an index of letter symbols in alphabetical order, along with each symbol's definition.

Table A.1 — Index of letter symbols in alphabetical order

Letter symbol	Definition
A	Sealing (style) with O-ring
B	Sealing (style) without O-ring
B	Metal-to-metal sealing
B	Copper and copper alloys
BH	Bulkhead
BJ	Banjo
BR	Braze-on
BT	Branch tee
C	Complete connector
CP	Cap
CR	Cutting ring
E	90° elbow
E	Elastomeric sealing
E	Terpolymer of ethylene, propylene and a diene or EPDM
EH	External hex
E22	22,5° elbow
E30	30° elbow
E45	45° elbow
E60	60° elbow
E67	67,5° elbow
F	O-ring sealing
F	Female component
F	Fluoro rubber
FC	One-piece flange clamp
FCS	Split flange clamp pair
FH	Flange head
G	O-ring with retaining ring - Type G
H	O-ring with retaining ring - Type H
H	Hydrogenated NBR
I	Inch tube, thread or screw
IH	Internal hex
INP	Nipple for inch tube

Table A.1 (continued)

ISL	Sleeve for inch tube
K	Cross
L	Long
L	Light-duty connection
LL	Extra light-duty connection
LN	Locknut
M	Medium
M	Male component
M	Metric tube, thread or screw
MNP	Nipple for metric tube
MSL	Sleeve for metric tube
N	Nut
N	Acrylonitrile-butadiene rubber (commonly known as nitrile rubber or NBR)
NA	Standard strength nut
NB	High strength nut
NP	Nipple
OR	O-ring face seal
P	Port
PL	Plug
RD	Reducer
RDA	Reducer with nut
RDB	Reducer without nut
RT	Run tee
S	Straight
S	Steel
S	Short
S	Heavy-duty connection
SD	Stud
SL	Sleeve
SS	Stainless steel
SW	Swivel
SWA	Swivel with sealing surface not exposed
SWB	Swivel with sealing surface exposed
SWBH	Swivel bulkhead
SWO	Swivel with O-ring
SWP	Swivel port
T	Tee
TE	Tube end
WD	Weld-on / Weld-in
Y	Y shape

Annex B (informative)

Application examples

B.1 Threaded connector examples

EXAMPLE 1

A 90° stud elbow connector, made of corrosion protected steel, for use with 12 mm OD tubing with a heavy-duty (S series) M18 × 1,5 stud end, in accordance with ISO 9974-2 with elastomeric sealing is designated as follows:

Connector ISO 8384-X-SDE-12×M18E-S

Symbol for the seal material will follow S, if ordered with seal, as follows:

Connector ISO 8384-X-SDE-12×M18E-SN (for NBR)

EXAMPLE 2

A bulkhead branch tee connector, made of stainless steel, to connect to tubes with a nominal outside diameter of 12 mm on the run and 16 mm on the branch end, is designated as follows:

Connector ISO XXXXX-BHBT-12×12×16-SS

B.2 Hose fitting examples

EXAMPLE 1

A 45° elbow swivel hose fitting for 12 mm OD tubing and 12,5 hose size, is designated as follows:

Hose Fitting ISO 12151-X-SWE45-12×12,5

EXAMPLE 2

A hose fitting with a medium drop length 45° elbow, a 42 MPa (420 bar) flanged head size 32 and 31,5 hose size, is designated as follows:

Hose Fitting ISO 12151-3, E45M-S32×31,5

NOTE Flanged hose fittings do not use a connector type symbol, since ISO 12151-3 is the default standard.

B.3 Port plug examples

EXAMPLES

A plug made of corrosion protected steel, with an internal hex (drive) for M12×1,5 size ISO 6149-1 port shall be designated as follows:

Plug ISO 6149-4-PLIH-M12-S

The O-ring material symbol will follow S, if ordered with O-ring, as follows:

Plug ISO 6149-4-PLIH-M12-SE (for Ethylene Propylene)

B.4 Flange connector examples

EXAMPLES

One-piece flange clamp (can be used with either inch or metric screws)	Flange ISO 6162-X-FC-25
One-piece flange clamp, metric screws only	Flange ISO 6162-X-FCM-32
Split flange clamp pair (can be used with either inch or metric screws)	Flange ISO 6162-X-FCS-25
Split flange clamp pair, metric screws only	Flange ISO 6162-X-FCSM-32
Flange head	Head ISO 6162-X-FH-25
Flange port with inch threads	Port ISO 6162-X-P-76
Flange port with metric threads	Port ISO 6162-X-P-76M

Annex C (informative)

Correlation of SAE dash sizes to ISO connector, tube and hose sizes

[Table C.1](#) shows the correlation of the dash sizes used in standards developed by SAE International and connector, tube and hose sizes used in International Standards for fluid power connectors.

Table C.1 — Correlation of SAE dash sizes to ISO connector, tube and hose sizes

SAE dash size	ISO nominal connector size	ISO nominal tube outside diameter	ISO hose size
- 2			3,2
---	4	4	
- 3	5	5	5
- 4	6	6	6,3
- 5	8	8	8
- 6	10	10	10
- 8	12	12	12,5
---		14 ^a	
---		15	
- 10	16	16	16
---		18	
- 12	20	20	19
- 14	22	22	
- 16	25	25	25
---		28	
- 20	30	30	31,5
---		32	
---		34 ^a	
---		35	
- 24	38	38	38
---		40 ^a	
---		42	
- 32	50	50	51
- 40	64		63
- 48	76		78
- 56	89		89
- 64	102		102
a Not to be used for new designs.			

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- [3] ISO 1179-3, *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 3: Light-duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)*
- [4] ISO 1179-4, *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 4: Stud ends for general use only with metal-to-metal sealing (type B)*
- [5] ISO 6149-2, *Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing — Part 2: Heavy-duty (S series) stud ends — Dimensions, design, test methods and requirements*
- [6] ISO 6149-3, *Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing — Part 3: Light-duty (L series) stud ends — Dimensions, design, test methods and requirements*
- [7] ISO 6149-4, *Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing — Part 4: Heavy-duty (S series) external hex and Light-duty (L series) internal hex port plugs — Dimensions, design, test methods and requirements*
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- [13] ISO 8434-2, *Metallic tube connections for fluid power and general use — Part 2: 37° flared fittings*
- [14] ISO 8434-3, *Metallic tube connections for fluid power and general use — Part 3: O-ring face seal fittings*
- [15] ISO 8434-6, *Metallic tube connections for fluid power and general use — Part 6: 60° cone connectors*
- [16] ISO 9974-2, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads and elastomeric or metal-to-metal sealing — Part 2: Stud ends with elastomeric sealing (type E)*
- [17] ISO 9974-3, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads and elastomeric or metal-to-metal sealing — Part 3: Stud ends with metal-to-metal sealing (type B)*

- [18] ISO 9974-4, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads and elastomeric or metal-to-metal sealing — Part 4: Dimensions, design, test methods and requirements for external hex and internal hex port plugs*
- [19] ISO 11926-2, *Connections for general use and fluid power — Ports and stud ends with ISO 725 threads and O-ring sealing — Part 2: Heavy-duty (S series) stud ends*
- [20] ISO 11926-3, *Connections for general use and fluid power — Ports and stud ends with ISO 725 threads and O-ring sealing — Part 3: Light-duty (L series) stud ends*
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- [23] ISO 12151-3, *Connections for hydraulic fluid power and general use — Hose fittings — Part 3: Hose fittings with ISO 6162 flange ends*
- [24] ISO 12151-4, *Connections for hydraulic fluid power and general use — Hose fittings — Part 4: Hose fittings with ISO 6149 metric stud ends*
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