

HiCAD Plant Engineering

Version 2016 Creating new parts and variants

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Creating New Parts and Variants (PE)

Besides using the part and variants which have been predefined by the ISD you can also create,

- new Plant Engineering parts and
- new Feature Variants for Plant Engineering parts.

V Please note that for the creation of new parts and new variants certain rules, depending on the particular part type, need to be respected.

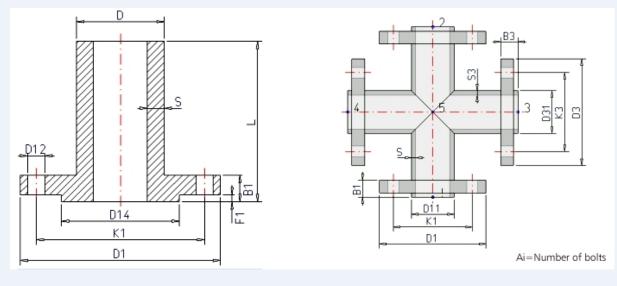
IMPORTANT - Please note the following when working with user-defined variants for flanges or parts with flanges:

You can use the **Flange connection, bolted** functions of the Plant Engineering module to place boltings on flange connections. To ensure that the boltings match the flanges, the functions will evaluate the variables of the part variant to which the flange belongs. This also needs to be considered if construct your own parts/variants with flange connections, because otherwise, problems will occur during their processing with the flange connection functions.

The following table shows the lists of variables. The <u>second</u> place of the variable's designation must match the connection number. The list here refers to the example of the first connection of a part.

- **B1** Thickness of flange plate (B1 = C1 + F1)
- C1 Thickness of flange plate (without collar)
- F1 Thickness of collar
- A1 Number of bolts
- K1 Diameter of bore circle
- D12 Bore diameter
- L Part length (not connection-specific)

Hence, the variables of the second connection will have the designations B2, C2, F2, A2, D22.





Additional, part-specific rules apply during evaluation:

- 1. If the variables C1 and F1 are defined in a loose flange, the grip length of the bolting will be determined via the value C1+F1 istead of using B1.
- 2. For blank flanges the variable L instead of B1 will be used for grip length determination provided that L has been defined.

The value of the variables NI (capital "N", capital "i", NO "1"!) is used as an additional attribute during creation or querying of an article master in HELiOS. It represents the nominal diameter in Inches



Using Connection Type Attributes (PE)



General information

In the data records of parts, the attributes

- Anschlussart (=Connection type),
- Anschlussart2 and
- Anschlussart3

enable a determination of the type of connection and of any required accessories. If a part to which particular connecting parts have been assigned via connection attributes is placed onto a guideline, the accessories will be automatically attached to connections 1 and 2 of the part.

If no own attribute entry exists for a connection, the entry with the next lower connection number will be used.

Example:

If we assume that entries only exist for **Anschlussart** (Connection type) and **Anschlussart3** (Connection type 3) respectively, then the attribute for **Anschluss** (Connection) also applies to connection 2.

ID	Meaning	ID	Meaning
1000x	welded	4100x	plugged, m
2000x	with flange	4200x	plugged, f
3100x	screwed, m	5100x	butt-welded, m
3200x	screwed, f	5200x	butt-welded, f

The attribute entry is comprised of an ID number (connection type ID) and a supplement.

The last digit (x) of the identification number provides additional information on the supplement:

- 0 no supplement
- 2 The supplement is composed of the connection number, part type ID and part standard of the part to be attached.

Example:

20002 1 5100010 DIN 2633

This means: "Attach flange according to DIN 2633 with Connection 1."

The wildcard character ('?') is not allowed for the part type ID (in this case 5100010).

The 4th digit of the ID is interpreted as a priority indicator. This digit is important in cases where two parts coincide on one connection which both specify additional parts to be inserted via their connection type (often Fasteners). If one part is connected to another part, on the connecting points of which fasteners are already located, the prioritization will be evaluated.

The meaning of the 3rd digit has not been defined yet.



 Parts with only one "genuine" connection still require two named isolated points (Designation: ! and 2) to enable them to be auto-aligned correctly. To prevent Point 2 from being falsely interpreted as a connection in the isometry, the attribute ANSCHLUSSART2 needs to be set to the value 0.



 If no entry concerning the "Anschlussart" ("Connection type") attribute exists for a part, HiCAD assumes 10000 (= welded, without supplement).



Connection type ID with priority information

In practice it can happen that two parts coincide which both specify additional parts to be inserted via their connection type (often Fasteners). In such cases, the last but one digit of the connection will be interpreted as a priority indicator. If one part is connected to another part, on the connecting points of which fasteners are already located, the prioritization will be evaluated. If the part to be connected has a higher priority, the fasteners that already exist on the connection will be removed and replaced with the part to be connected.

If the connection type of the part to be connected has a lower priority, its fasteners will not be inserted.

In cases of equal priority new fasteners will only be inserted if no fasteners exist on the connection yet.

The priority information will also be evaluated if a part does not supply any further elements. Even in such cases, existing fasteners will be removed if the part to be connected has a connection type with a higher priority than that of the existing connection. This means that a part can remove all fasteners because it acts as a fastener itself.



Connection type ID - List of part standards

Instead of specifying a standard in the supplement, it is also possible to specify a list of standards separated by commas, e.g.

41002 1 5971010 Standard_A, Standard_B, Standard_C

During part search in the catalogue or in the HELiOS database the standards will be combined by means of an OR condition. This means that not several parts are specified here, but the range of allowed parts will be extended here.



In the part standards list, whitespaces will be interpreted as allowed characters of a standard designation. Therefore, no additional whitespaces must be entered to the right and to the left of the separating commas. Since the standards are separated by commas, they must not contain any commas themselves.



List of Part Type IDs (PE)

In the data record of a part you can, with the help of the so-called connection type attributes, specify the connection types and the fasternes that may be required for this. If a part to which particular fasteners are assigned via connection attributes will be places on a guideline, these will be automatically placed onto the Connections 1 and 2 of the part.

For this the	nart tvne د	ID will he	required
	, puil lype		requireu.

ID	Part type	ID	Part type
1000010	Straight pipe	5810010	Pipe clamp
1010011	Nozzle	5900010	Other pipe part
2100010	Elbow	5910011	Double knee
2200010	Knee	5920010	Gauge part
3110010	T-piece	5970010	Fastener, symmetric
3210011	Y-piece	5971010	Fastener, unsymmetric
3230010	Branch	5990011	Seal
3300010	Cross	6110010	Saddle connection
4100010	Valve	6111010	Elbolet
4200010	Corner valve	9100001	Vessel
4300010	3-way valve	9110001	Pump
4400010	4-way valve	5902021	Other parts
5100010	Flange	5980010	Seal
5210010	Сар	9700001	Component
5310010	Reducer, concentric	9800001	Gauge
5320011	Reducer, excentric	9970001	Insulation
5710010	Blank flange		



Creating Individual Parts: Procedure (PE)

Besides Plant Engineering parts which are based on a variant and are generated via this variant, you can also create new, individual parts with fixed dimensions. If you want to construct a new, <u>non</u>- parameterised (fixed) Plant Engineering part for the available representation types, proceed as follows:

Please observe the Rules for the creation of the respective part type, as well as the Rules for the creation of symbolic representations.

With the HELiOS Database as part data source: (3 representation types are possible)

- 1. Construct a hollow body in HiCAD 3-D.
- 2. Save part as KRA file (without referencing, without part master and document master) to PlantParts\Parts2.
- 3. Check part with the Check part, Geometry 🎉 function.
- 4. Construct a solid body in HiCAD 3-D.
- 5. Save part as KRA file (without referencing, without part master and document master) to *PlantParts\Parts3*, with the same name as the hollow body representation.
- 6. Check part with the Check part, Geometry 🎉 function.
- 7. Load the new KRA file from *PlantParts\Parts3* with the **PAA-Editor** and modify it as desired (enter attribute values). Save the part, i.e. create a PAA file.
- 8. Activate the **Part data synchronisation** function to perform the part data synchronisation with the database.
- 9. Check the attribute data with the Check parts, Attributes 🎉 function.
- 10. Create the symbolic representation with the **Symbol Editor** and add it to the new PAA file.

With the HiCAD Catalogue as part data source: (2 representation types are possible)

- 1. Construct a hollow body in HiCAD 3-D.
- 2. Save part as KRA file ("Save as part", without referencing) to *PlantParts\Parts2*.
- 3. Check part with the Check part, Geometry Figure function.
- 4. Construct a solid body in HiCAD 3-D.
- 5. Save part as KRA file ("Save as part", without referencing) to *PlantParts\Parts3*, with the same name as the hollow body representation.
- 6. Check part with the Check part, Geometry 🏂 function.
- 7. Load the new KRA file from *PlantParts\Parts3* with the **PAA-Editor** and modify it as desired (enter attribute values). Save the part, i.e. create a PAA file.



8. Activate the **Part data synchronisation** function to perform the part data synchronisation (this function calls the **VarToCat** tool).

If you want to initially create only one representation type for a Plant Engineering part in order to check whether the part functions in the way you expect it, you can omit three steps in the procedures described above:

- If you initially only require the solid body representation, omit the steps 1 3.
- If you initially only require the hollow body representation, omit the steps 4 6. Continue with step 7 to load the KRA file from *PlantParts\Parts2*.

If you want to add another representation type later (here: hollow body), the following steps are required:

- 1. Construct a hollow body in HiCAD 3-D.
- 2. Save part as KRA file ("Save as part", without referencing) to *PlantParts\Parts2* with a different name than the other representation type.
- 3. Check part with the Check part, Geometry 🏂 function
- 4. Load the new KRA file from *PlantParts\Parts2* with the **PAA-Editor**. Do not modify it, but save it immediately, i.e. create a PAA file. (If you have created the solid body representation instead of the hollow body representation, load the new KRA file from *PlantParts\Parts3*).
- 5. Now load the PAA file of the representation type that you have first created and tested (here: Solid body) from

PlantParts with the **PAA Editor** . Use the **Edit archive** option to add the second representation type (here: Hollow body) from the corresponding PAA file. In the PAA Editor, save the - still open - PAA file of the first representation type, whereupon it will contain both representation types. The PAA file of the second representation type is now no longer needed.

Another part data synchronisation will not be required if you have only added the second representation type.



Rules for the Creation of User-Defined Parts (PE)

Besides Plant Engineering parts which are based on and created via a variant, you can also create new, individual parts with fixed dimensions. These parts are .PAA files. For their creation certain rules, depending on the particular part type, need to be respected.

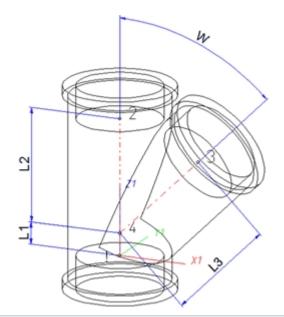
When using your own variants for flanges or parts with flanges, please read the notes on bolted flange connections!

- Part type: Branch
- Part type: Valve
- Part type: Blank flange
- Part type: Double knee
- Part type: 3-way valve
- Part type: Corner valve
- Part type: Flange
- Part type: Straight pipe
- Part type: Y-piece
- Part type: Cap
- Part type: Knee
- Part type: Cross
- Part type: Gauge part
- Part type: Reducer, concentric
- Part type: Reducer, excentric
- Part type: Elbow
- Part type: Pipe clamp
- Part type: Vessels, Pumps, Other components
- Part type: Nozzles
- Part type: Other pipe part
- Part type: T-piece
- Part type: 4-way valve
- Part type: Seal
- Part type: Fasteners





Part Type: Branch (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0
4	Auxiliary point	Branching point of centre line	X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor. Values need to be entered for at least the following attributes:



Attribute		Description	
BENENN	UNG	Designation of part	
NORMBEZEICHNUNG		Standard designation of the part.	
		An entry is mandatory, even if the part corresponds to no standard.	
WINKEL		Angle (see angle in drawing)	
NENNWE	ITE	Nominal diameter , Connection"!"	
NENNWE		Nominal diameter, Connection "2"	
NENNWE		Nominal diameter, Connection "3"	
		standard uses nominal diameters in inches):	
NPS_INC		Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!"	
NPS2_IN	СН	Nominal diameter (inches), Connection "2"	
 NPS3_IN		Nominal diameter (inches), Connection "3"	
•	rameters are to be consider ockets they refer to the pipe	red for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	EN	Outer diameter, Connection "!"	
D2_AUSS	6EN	Outer diameter, Connection "2"	
D3_AUSS	SEN	Outer diameter, Connection "3"	
WANDDICKE		Wall thickness, Connection "!"	
WANDDI	CKE2	Wall thickness, Connection "2"	
WANDDI	CKE3	Wall thickness, Connection "3"	
ANSCHL	JSSART	Connection type , Connection "!"	
ANSCHL	JSSART2	Connection type , Connection "2"	
ANSCHLUSSART3		Connection type, Connection "3"	
Possible v	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
	Screwed, socket		
3200x			
3200x 4100x	Plugged, nipple		
	Plugged, nipple Plugged, socket		
4100x			



Attribute	Description

0 = No supplement

2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected

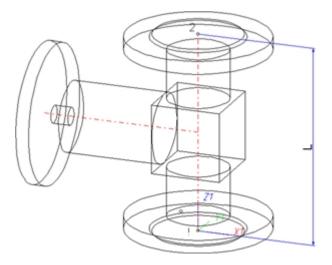
The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.





Part Type: Valve (PE)



The centre axis of the actuator should be located in the plane X < 0, Y = 0, Z > 0!

Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a c2
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.

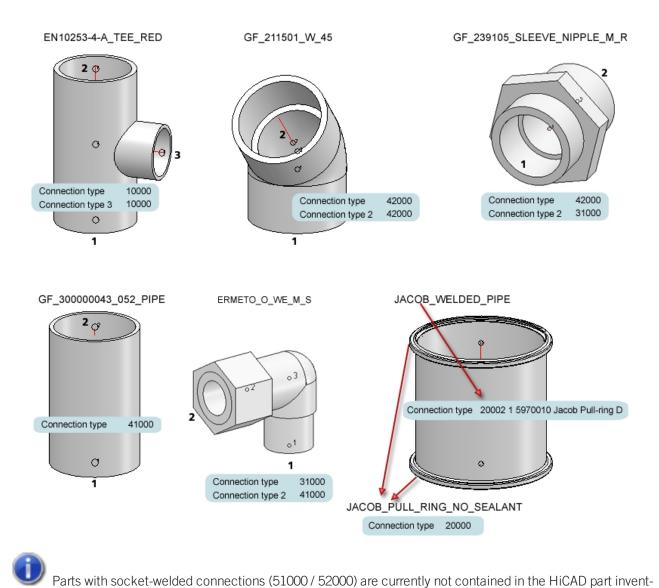


Attribute		Description
NENNWE	TITE	Nominal diameter, Connection "!" and "2"
Additiona	ally (only if the corresponding	g standard uses nominal diameters in inches):
NPS_INC	CΗ	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!" and "2"
-	rameters are to be considere ockets they refer to the pipe	ed for all connection types except for flange connections. For con- to be inserted:
D_AUSSE	EN	Outer diameter, Connection "!" and "2"
WANDDI	CKE	Wall thickness, Connection "!" and "2"
ANSCHLU	USSART	Connection type
Possible v	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is mod- elled as a sub-part and has no own part master attached to this connection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
	Socket-welded, socket	
5200x		he meaning of the supplement:

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.



Connection types: Examples

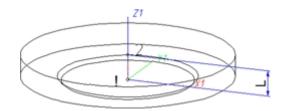


ory.





Part Type: Blank Flange (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Auxiliary point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute		Description
BENENNU	ING	Designation of part
NORMBEZEICHNUNG		Standard designation of the part. An entry is mandatory, even if the part corresponds to no stand- ard.
NENNWEI	TE	Nominal diameter, Connection "!"
Additionall	ly (only if the correspo	onding standard uses nominal diameters in inches):
NPS_INCH	1	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!"
ANSCHLU	SSART	Connection type for Connection "!" (always flange connection)
Possible va	lues of the attribute AN	NSCHLUSSART (CONNECTION_TYPE):
1000x	Butt-welded	Provide auxiliary part when fitting part
1000x 2000x	Butt-welded Flange connection	If appropriately preset in the ANSCHLUSSART
		If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange
2000x 3100x	Flange connection Screwed, nipple	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART
2000x 3100x 3200x	Flange connection Screwed, nipple Screwed, socket	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is
2000x 3100x 3200x 4100x	Flange connection Screwed, nipple Screwed, socket Plugged, nipple	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows:



Attribute

Description

The last character (x) provides information about the meaning of the supplement:

0 = No supplement

2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected

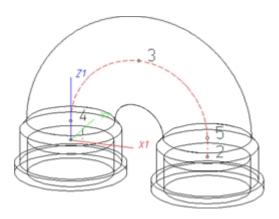
The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.

1 Pleas

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.



Part Type: Double Knee (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (X1=0,Y1=0,Z1=0)
2	Connecting point		X2 > 0, Y2 = 0, Z2 = 0
3	Auxiliary point		X3 = X2/2, Y3 = 0, Z3 > Z4
4	Auxiliary point		X4 = 0, Y4 = 0, Z4 > 0
5	Auxiliary point		X5 = X2, Y5 = 0, Z5 = Z4

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part.
	An entry is mandatory, even if the part corresponds to no standard.
NENNWEITE	Nominal diameter, Connection "!" and "2"
Additionally (only if the correspondin	ng standard uses nominal diameters in inches):
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!" and "2"
These parameters are to be consider necting sockets they refer to the pipe	red for all connection types except for flange connections. For con- e to be inserted:
D AUSSEN	Outer diameter, Connection "!" and "2"

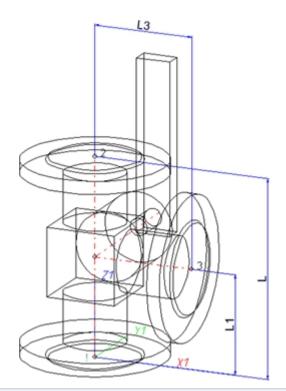


Attribute		Description
WANDDIC	CKE	Wall thickness, Connection "!" and "2"
ANSCHLU	JSSART	Connection type , Connection "!"
ANSCHLU	JSSART2	Connection type, Connection "2"
Possible v	alues of the attribute ANSCH	LUSSART (CONNECTION_TYPE):.
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
The last char 0 =No supple	racter (x) provides information about the	ne meaning of the supplement:
2 = The supp	plement consists of connection numbe	er, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.



Part Type: 3-Way Valve (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a c2	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.



Attribute		Description	
BENENNUNG		Designation of part	
NORMBEZEICHNUNG		Standard designation of the part.	
		An entry is mandatory, even if the part corresponds to no standard.	
NENNWE	ITE	Nominal diameter, Connection "!" and "2"	
NENNWE	ITE3	Nominal diameter, Connection "3"	
Additiona	ally (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Н	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters) , Connection "!" and "2"	
NPS3_IN	СН	Nominal diameter (inches), Connection "3"	
•	rameters are to be considere ockets they refer to the pipe	d for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	N	Outer diameter, Connection "!" and "2"	
D3_AUSS	SEN	Outer diameter, Connection "3"	
WANDDI	CKE	Wall thickness, Connection"!" und "2"	
WANDDI	CKE3	Wall thickness, Connection"3"	
ANSCHL	JSSART	Connection type, Connection "!", "2" and "3"	
Possible v	values of the attribute ANSCH	USSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
	Plugged, nipple		
4100x			
4100x 4200x	Plugged, socket		
	Plugged, socket Socket-welded, nipple		
4200x			

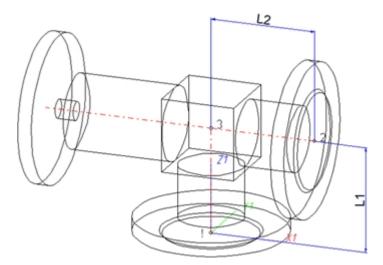


Attribute	Description
part standards.	





Part Type: Corner Valve (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a 2
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0
3	Corner point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.

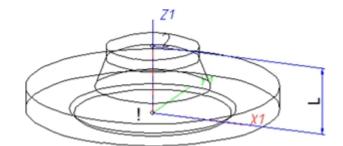


Attribute		Description	
NENNWE	EITE	Nominal diameter, Connection "!"	
NENNWE		Nominal diameter, Connection "2"	
Additiona	ally (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	CH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection"!"	
NPS2_INCH		Nominal diameter (inches), Connection "2"	
-	arameters are to be considere sockets they refer to the pipe	ed for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	EN	Outer diameter , Connection "!"	
D2_AUSS	SEN	Outer diameter, Connection "2"	
WANDDI	CKE	Wall thickness, Connection "!"	
WANDDI	CKE2	Wall thickness, Connection "2"	
ANSCHL		Connection type, Connection "!" and "2"	
Possible	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):.	
1000x 2000x	Butt-welded Flange connection	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for	
2000x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
0 =No supp 2 = The sup	plement consists of connection number	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	
Ple part standar	_	the paragraphs Connection type ID with priority information and Connection type ID - List	

When using the HELiOS database, please make sure that you use the correct Classification matching the part type!



Part Type: Flange (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a contraction of the second se
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description	
BENENNUNG	Designation of part	
NORMBEZEICHNUNG	Standard designation of the part.	
	An entry is mandatory, even if the part corresponds to no standard.	
NENNWEITE	Nominal diameter, Connection "!" and "2"	
Additionally (only if the corresponding standard uses nominal diameters in inches):		
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " char- acters), Connection"!" and "2"	

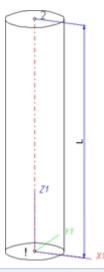


Attribute			Description		
D_AUSSEN			Outer diameter, Connection "2"		
WANDDI	CKE		Wall thickness, Connection "2"		
ANSCHLU	JSSART		Connection type , Connection"!" (always flange connection)		
ANSCHL	JSSART2		Connection type, Connection"2"		
Possible v	values of the attribu	ite ANSCHLU	SSART (CONNECTION_TYPE):		
1000x	Butt-welded		ry part when fitting part		
2000x	Flange connection	the part will pr	v preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, ovide and connect an auxiliary part of the standard specified in the attribute for the		
2010x	Flange connection of a loose flange	responding co	connection when being fitted. For example, if the part has a flange connection and the cor- responding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_ TYPE) attribute could look as follows:		
3100x	Screwed, nipple	EN 1092-1/11	20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.		
3200x	Screwed, socket	database.			
4100x	Plugged, nipple				
4200x	Plugged, socket				
5100x	Socket- welded, nipple				
5200x	Socket- welded, socket				
0 =No suppl 2 = The suppl	lement plement consists of conr	nection number, p	neaning of the supplement: part type, ID, and standard of the part to be connected tion with which the auxiliary part is to be attached to the current connection.		
Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.					

Loose flanges are assigned to the part type Flange. The attribute ANSCHLUSSART (=CONNECTION_ TYPE), however, must have the value 20100!



Part Type: Straight Pipe (PE)



Position of connecting points and determination of insertion lengths for various connection types

Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a contraction of the second se
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Designation
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.
BELIEBIG_TEILBAR	Indicates whether a cutting to length of the pipe is permissible



Attribute	Designation	
LIEFERLAENGE	Supplied length in m (!)	
NENNWEITE	Nominal diameter, Connection "!" and "2"	
Additionally (only if the	e corresponding standard uses nominal diameters in inches):	
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Con- nection"!" and "2"	
-	to be considered for all connection types except for flange connections. For con- efer to the pipe to be inserted:	
D_AUSSEN	Outer diameter, Connection"!" and "2"	
WANDDICKE	Wall thickness, Connection"!" and "2"	
ANSCHLUSSART	Connection type, Connection"!" (and "2") If you want both pipe ends to have the same connection type it will suffice to spe- cify a value for the ANSCHLUSSART attribute.	
ANSCHLUSSANTZ	If you want the two pipe ends to have different connection types, the connection type for Connection 1 must be specified for the ANSCHLUSSART attribute, and the connection type for Connection 2 for the ANSCHLUSSART2 attribute.	
	If you want to create a new feature variant of a straight pipe with different con- nection types, the part must be constructed in such a way that the value of the attribute ANSCHLUSSART is smaller than the value of the attribute ANSCHLUSSART2.	
	Example:	
	Let us assume that you require a pipe that can be butt-welded at one end, and has a screwed socket at the other end.	
	The connection type for butt-welded connections is 10000, the one for screwed sockets is 32000. This means that Connection 1 (Point designation "!") is required for the welded connection (ANSCHLUSSART = 10000) and Connection 2 (point designation "2") is required for the screwed connection (ANSCHLUSSART2 = 32000).	
Possible values of the a	attribute ANSCHLUSSART (CONNECTION_TYPE):.	

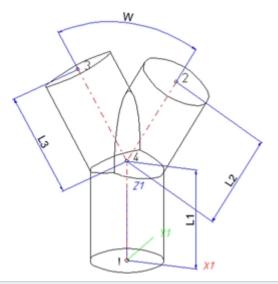


Attribute	Designation	
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
The last character (x) provides information about the meaning of the supplement: 0 =No supplement 2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.		





Part Type: Y-Piece (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0
3	Connecting point		X < 0, Y = 0, Z > 0
4	Auxiliary point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

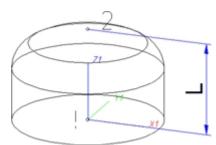
Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part.



Attribute			Description
			An entry is mandatory, even if the part corresponds to no standard.
NENNWE	ITE		Nominal diameter, Connection "!"
NENNWE	ITE2		Nominal diameter, Connection"2" and "3"
Additiona	ally (only if the corresponding	standard u	ses nominal diameters in inches):
NPS_INC	H		Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection"!"
NPS2_IN	СН		Nominal diameter (inches), Connection"2" and "3"
necting s	ockets they refer to the pipe		
D_AUSSE			Outer diameter, Connection"!"
D2_AUSS			Outer diameter, Connection"2" and "3"
WANDDI	CKE		Wall thickness, Connection"!"
WANDDI	CKE2		Wall thickness, Connection"2" and "3"
ANSCHLU			Connection type, Connection"!"
ANSCHLUSSART2			Connection type, Connection"2" and "3"
Possible v	values of the attribute ANSCH	LUSSART (C	ONNECTION_TYPE):
1000x	Butt-welded	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute 1	
2000x	Flange connection	a connection,	the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	4200x Plugged, socket		
5100x	Socket-welded, nipple		
5200x Socket-welded, socket			
0 =No suppl 2 = The suppl	plement consists of connection numbe	er, part type, ID,	ne supplement: and standard of the part to be connected ch the auxiliary part is to be attached to the current connection.
D Ple		the paragraphs	Connection type ID with priority information and Connection type ID - List of



Part Type: Cap (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt welding	Connecting nipple for screwed, plugged or socket-welded connection	Connecting socket for screwed, plugged or socket-welded connection		
a		a 2		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Auxiliary point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

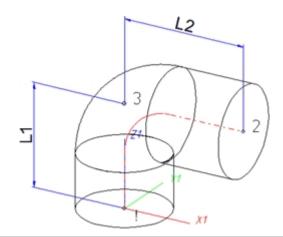
Attribute	Description	
BENENNUNG	Designation of part	
NORMBEZEICHNUNG	Standard designation of the part.	
	An entry is mandatory, even if the part corresponds to no stand- ard	
NENNWEITE	Nominal diameter, Connection "!"	
D_AUSSEN	Outer diameter, Connection "!"	
WANDDICKE	Wall thickness, Connection "!"	
Additionally (only if the corresponding standard uses nominal diameters in inches):		
NPS_INCH	Nominal diameter (inches) (e.g. $11/2^{\prime\prime}$, the $^{\prime\prime}$ consists of two $^{\prime\prime}$	



Attribute		Description
		characters), Connection "!"
ANSCHLUS	SART	Connection type, Connection "!"
Possible value	ues of the attribute ANSCHL	JSSART (CONNECTION_TYPE):.
1000x I	Butt-welded	Provide auxiliary part when fitting part
2000x I	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
i a i	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x 3	Screwed, nipple	
3200x 3	Screwed, socket	
4100x I	Plugged, nipple	
4200x I	Plugged, socket	
5100x \$	Socket-welded, nipple	
The last charact 0 =No supplem 2 = The suppler	ment consists of connection number,	meaning of the supplement: part type, ID, and standard of the part to be connected action with which the auxiliary part is to be attached to the current connection.



Part Type: Knee (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0
3	Corner point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.

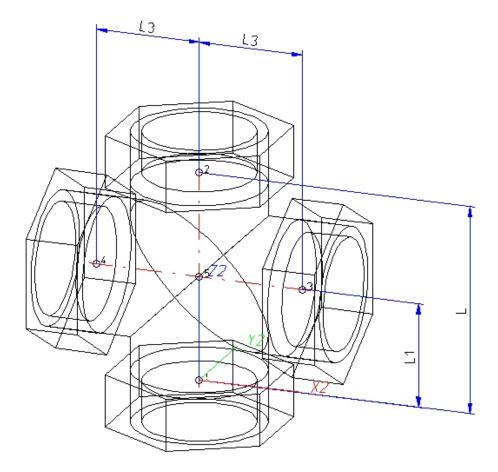


ttribute		Description	
NENNWE	ITE	Nominal diameter, Connection "!"	
NENNWEITE2		Nominal diameter, Connection "2"	
WINKEL		Angle between the distances "3" -> " !" and "3" -> "2"	
Additiona	lly (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC		Nominal diameter (inches) (e.g. 1 1/2", the " consists o two " characters) , Connection "!"	
NPS2_IN	СН	Nominal diameter (inches), Connection "2"	
-	rameters are to be considere ockets they refer to the pipe	d for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	N	Outer diameter, Connection "!"	
D2_AUSS	EN	Outer diameter, Connection "2"	
WANDDI	CKE	Wall thickness, Connection "!"	
WANDDI	CKE2	Wall thickness, Connection "2"	
ANSCHLU	ISSART	Connection type, Connection "!"	
ANSCHLU		Connection type, Connection "2"	
		LUSSART (CONNECTION_TYPE):	
1000x 2000x	Butt-welded Flange connection	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
0 =Nosuppl	plement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	

part standards.



Part Type: Cross (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Corner point	on branch	X > 0, Y = 0, Z > 0
4	Corner point	on branch	X < 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description	
BENENNUNG	Designation of part	
NORMBEZEICHNUNG	Standard designation of the part.	
	An entry is mandatory, even if the part corresponds to no standard.	
NENNWEITE	Nominal diameter, Connection "!" and "2"	
NENNWEITE3	Nominal diameter, Connection "3" and "4"	
Additionally (only if the corresponding standar	d uses nominal diameters in inches):	
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters) , Connection "!" and "2"	
NPS3_INCH	Nominal diameter (inches), Connection "3" and "4"	
These parameters are to be considered for all on necting sockets they refer to the pipe to be inse	connection types except for flange connections. For con- erted:	
D_AUSSEN	Outer diameter, Connection "!" and "2"	
D3_AUSSEN	Outer diameter, Connection "3" and "4"	
WANDDICKE	Wall thickness, Connection "!" and "2"	
WANDDICKE3	Wall thickness, Connection "3" and "4"	
ANSCHLUSSART	Connection type, Connection "!", "2", "3" and "4"	
Possible values of the attribute ANSCHLUSSART	(CONNECTION_TYPE):.	

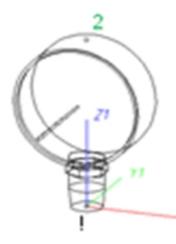


Attribute		Description
1000x	Butt-welded	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for
2000x	Flange connection	a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
0 =No supple 2 = The supp	lement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.





Part Type: Gauge part (PE)



Position of connecting poir	nts and determination of ir	nsertion lengths for various o	connection types
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimensior (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Auxiliary point or Connecting point	-	X > 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.

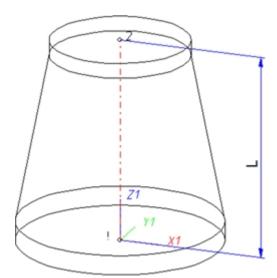


Attribute		Description	
NENNWEITE		Nominal diameter, Connection "!"	
Additiona	ally (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Ή	Nominal diameter (inches) (e.g. 1 1/2", the " consists or two " characters) , Connection "!"	
	rameters are to be considere ockets they refer to the pipe	ed for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	EN	Outer diameter, Connection "!"	
WANDDI	СКЕ	Wall thickness, Connection "!"	
ANSCHLU	USSART	Connection type, Connection "!"	
ANSCHLUSSART2		Connection type, Connection "2" (="0", if only one con- nection exists)	
Possible v	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):.	
1000x 2000x 2040x	Butt-welded Flange connection Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
0 =No suppl 2 = The suppl	plement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	
D Ple		the paragraphs Connection type ID with priority information and Connection type ID - List	

part standards.



Part Type: Reducer, Concentric (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a 2	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

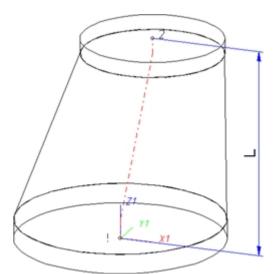
Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.



Attribute		Description	
NENNWEITE		Nominal diameter, Connection "!"	
NENNWE	ITE2	Nominal diameter, Connection "2"	
Additiona	lly (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Η	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!"	
NPS2_IN	СН	Nominal diameter (inches), Connection "2"	
-	rameters are to be considere ockets they refer to the pipe	d for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	N	Outer diameter, Connection "!"	
D2_AUSS	EN	Outer diameter, Connection "2"	
WANDDIC	CKE	Wall thickness, Connection "!"	
WANDDIC	CKE2	Wall thickness, Connection "2"	
ANSCHLU	JSSART	Connection type, Connection "!"	
ANSCHLUSSART2		Connection type, Connection "2"	
Possible v	alues of the attribute ANSCHI	LUSSART (CONNECTION_TYPE):.	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
	acter (x) provides information about the	ne meaning of the supplement:	
0=Nosupple		r, part type, ID, and standard of the part to be connected	



Part Type: Reducer, Excentric (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a 2	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

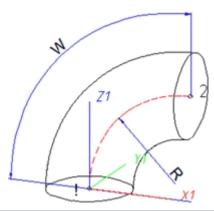
Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.



Attribute		Description	
		Newsing Life matters On a set 11 a 414	
NENNWE		Nominal diameter, Connection "!"	
NENNWE	ITE2	Nominal diameter, Connection "2"	
Additiona	lly (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Н	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!"	
NPS2_IN	СН	Nominal diameter (inches), Connection "2"	
-	rameters are to be considere ockets they refer to the pipe	d for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	N	Outer diameter, Connection "!"	
D2_AUSS	EN	Outer diameter, Connection "2"	
WANDDIC	CKE	Wall thickness, Connection "!"	
WANDDIC	CKE2	Wall thickness, Connection "2"	
ANSCHLU	JSSART	Connection type, Connection "!"	
ANSCHLUSSART2		Connection type, Connection "2"	
Possible v	alues of the attribute ANSCH	LUSSART (CONNECTION_TYPE):.	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
The last char 0 =No supple	acter (x) provides information about the ment	ne meaning of the supplement:	
	plement consists of connection numbe	r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	



Part Type: Elbow (PE)



Position of connecting poin	Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection		
a	a				
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin(0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

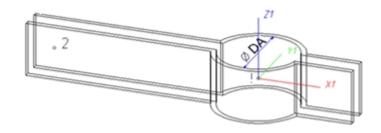
Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.
BELIEBIG_TEILBAR	Indicates whether a cutting to length of the elbow is per- missible.



Attribute		Description	
NENNWEITE		Nominal diameter, Connection "!" and "2"	
WINKEL		Angle	
RUEMMUNG		Bend radius	
Additionally (only i	f the corresponding	standard uses nominal diameters in inches):	
NPS_INCH		Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!" and "2"	
-	are to be considere ey refer to the pipe	ed for all connection types except for flange connections. For con- to be inserted:	
D_AUSSEN (Outer diameter, Connection "!" and "2"	
VANDDICKE		Wall thickness, Connection "!" and "2"	
ANSCHLUSSART		Connection type, Connection "!" and "2" The connection types on both ends must be identical.	
Possible values of	he attribute ANSCH	LUSSART (CONNECTION_TYPE):.	
1000xButt-weld2000xFlange co		Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
is not a fla a loose fla a sub-pa	onnection of a part that ange itself. The part has ange that is modelled as rt and has no own art- er attached to this con-	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x Screwed	, nipple		
3200x Screwed	socket		
4100x Plugged,	nipple		
4200x Plugged,	socket		
5100x Socket-w	elded, nipple		
5200x Socket-w	elded, socket		
=No supplement = The supplement con	sists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	



Part Type: Pipe Clamp (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordin- ate system
!	Fitting point	Reference point placed on the centre line of a pipe during fitting	in origin (0,0,0)
2	Auxiliary point		X < 0, Y = 0, Z = 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Values need to be entered at least for the attributes shown below:

Possibility 1:

Attribute	Description		
BENENNUNG	Designation of part		
NORMBEZEICHNUNG	Standard designation of the part.		
	An entry is mandatory, even if the part corresponds to no standard.		
NENNWEITE	Nominal diameter		
D_AUSSEN	Outer diameter of pipe (see DA in drawing)		
Additionally (only if the corresponding standard uses nominal diameters in inches):			
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters)		

Possibility 2:

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.
D_AUSSEN	Largest possible outer diameter of pipe that is still suitable for pipe clamp

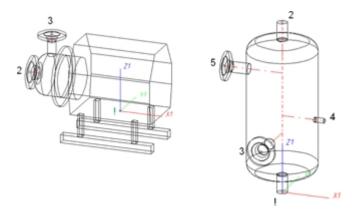


Attribute	Description		
D2_AUSSEN	Smallest possible outer diameter of pipe that is still suitable for pipe clamp		
NENNWEITE	Nominal diameter matching D_AUSSEN		
Additionally (only if the corresponding standard uses nominal diameters in inches):			
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the $^{\prime\prime}$ consists of two $^{\prime\prime}$ characters)		

For the insertion of a pipe clamp having these two outer diameter attributes the Also use Outer diameter 2 as search criterion for pipe clamps checkbox on the Part search tab of the Plant Engineering Settings dialogue must be active.



Part Type: Vessels, Pumps, Other components (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate sys- tem
!	Connecting point or Auxiliary point	Fitting point	in origin (0,0,0)
2, 3, 4 etc., unambiguous within the part	Connecting points or Auxiliary points		arbitrary

Connecting points should preferably be created via the **Component connection** function or by the insertion of nozzles.

Each component connection (and the fitting point, if it is an auxiliary point) needs to be located in a plane belonging to the part. It needs however not be located within the surface boundary.

Example



If the connecting point is located in the plane of the ring surface, the surface condition is fulfilled.

Caution: It would also be fulfilled if the point would be located in the same plane, but outside of the ring.

To assign an unambiguous orientation to a connection, a connecting point must not fulfil the surface condition for several surfaces at once.

Required attributes for entries into database or catalogue

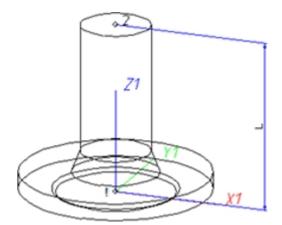
The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.





Part Type: Nozzle (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a			
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Attribute	Description	
BENENNUNG	Designation of part	
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no standard.	
NENNWEITE	Nominal diameter, Connection "!" and "2"	
D_AUSSEN	Outer diameter, Connection ["!" and] "2"	



Attribute		Description		
WANDDICKE		Wall thickness, Connection ["!" and] "2"		
Additiona	lly (only if the corresponding	g standard uses nominal diameters in inches):		
NPS_INCH		Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connections "!" and "2"		
ANSCHLU	JSSART	Connection type, Connection "!"		
ANSCHLU	JSSART2	Connection type, Connection "2" (value always 10000)		
Possible v	alues of the attribute ANSCH	LUSSART (CONNECTION_TYPE):.		
1000x	Butt-welded	Provide auxiliary part when fitting part		
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-		
		the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40		
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
2040x 3100x	is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con-	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
	is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
3100x	is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection. Screwed, nipple	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
3100x 3200x	is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection. Screwed, nipple Screwed, socket	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
3100x 3200x 4100x	is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection. Screwed, nipple Screwed, socket Plugged, nipple	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		

The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.



Part Type: Other Pipe Part (PE)

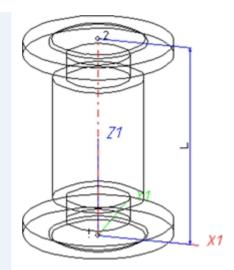
Up to 4 connections are possible for this part type.

The connections "!" and "2" need to be located on the Z-axis. The position of further connections is arbitrary. However, connections "3" and "4" cannot process guidelines during part insertion. The creation of guidelines starting from connections "3" and "4" can only be performed subsequently. Therefore, you will only have the following fitting options:

Type of insertion

In edge direction

➤In opposite edge direction



Example: Compensator with flanges

Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a			
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	optional	arbitrary
4	Connecting point	optional	arbitrary

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

For a part with two connections, values need to be entered for at least the following attributes:

Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part.



Attribute		Description	
		An entry is mandatory, even if the part corresponds to no standard.	
NENNWEITE		Nominal diameter, Connection "!" and "2"	
Additiona	Illy (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Н	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!" and "2"	
-	rameters are to be considere ockets they refer to the pipe	ed for all connection types except for flange connections. For con-	
D_AUSSE		Outer diameter, Connection "!" and "2"	
_ WANDDI		Wall thickness, Connection "!" and "2"	
ANSCHLI	JSSART	Connection type, Connection"!" and "2"	
Possible v	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 510010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
The last chai	racter (x) provides information about t ement	he meaning of the supplement: er, part type, ID, and standard of the part to be connected	

As mentioned above, the part can have up to 4 connections. If a connection "4" exists, it needs to have the same properties (nominal diameter, outer diameter, wall thickness, connection type) as connection "3". For three connections, different properties can be preset:

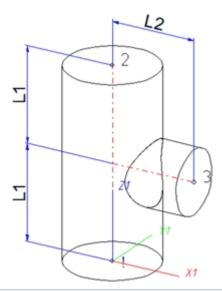


Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part.
	An entry is mandatory, even if the part corresponds to no standard.
NENNWEITE	Nominal diameter, Connection "!"
NENNWEITE2	Nominal diameter, Connection "2"
NENNWEITE3	Nominal diameter, Connection "3" [and "4"]
Additionally (only if the correspond	ding standard uses nominal diameters in inches):
NPS_INCH	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection "!" and "2"
NPS2_INCH	Nominal diameter (inches), Connection "2"
NPS3_INCH	Nominal diameter (inches), Connection "3" [and "4"]
These parameters are to be consid necting sockets they refer to the p	dered for all connection types except for flange connections. For con- ipe to be inserted:
D_AUSSEN	Outer diameter, Connection "!"
D2_AUSSEN	Outer diameter, Connection "2"
D3_AUSSEN	Outer diameter, Connection "3" [and "4"]
WANDDICKE	Wall thickness, Connection "!"
WANDDICKE2	Wall thickness, Connection "2"
WANDDICKE3	Wall thickness, Connection "3" [and "4"]
ANSCHLUSSART	Connection type for all connections
ANSCHLUSSART2	Connection type for Connection "2", if different from that for Connection "1"
ANSCHLUSSART3	Connection type for Connection "3" [and "4"], if different from that for Connection "2"





Part Type: T-Piece (PE)



Position of connecting poin	ts and determination of ir	nsertion lengths for various o	connection types
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

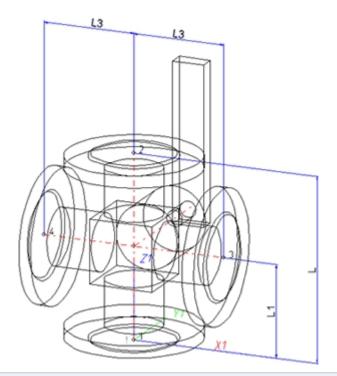
Attribute	Description
BENENNUNG	Designation of part
NORMBEZEICHNUNG	Standard designation of the part. An entry is mandatory, even if the part corresponds to no



Attribute		Description	
		standard.	
NENNWE	ITE	Nominal diameter, Connection "!" and "2"	
NENNWE	ITE3	Nominal diameter, Connection "3"	
Additiona	Ily (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Н	Nominal diameter (inches) (e.g. 1 1/2", the " consists o two " characters), Connection "!" and "2"	
NPS3_IN	СН	Nominal diameter (inches), Connection "3"	
ANSCHL	JSSART	Connection type, Connection "!" and "2"	
ANSCHLL	JSSART3	Connection type, Connection "3"	
-	rameters are to be consider ockets they refer to the pipe	ed for all connection types except for flange connections. For con to be inserted:	
D_AUSSE	N	Outer diameter, Connection "!" and "2"	
D3_AUSS	EN	Outer diameter, Connection "3"	
WANDDIC	CKE	Wall thickness, Connection "!"	
WANDDIG	CKE3	Wall thickness, Connection "3"	
Possible v	alues of the attribute ANSCH	LUSSART (CONNECTION_TYPE):	
1000x 2000x 2040x	Butt-welded Flange connection Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	4200x Plugged, socket		
5100x	Socket-welded, nipple		
0 =Nosuppl		ne meaning of the supplement: r, part type, ID, and standard of the part to be connected	



Part Type: 4-Way Valve (PE)



Position of connecting poir	nts and determination of i	nsertion lengths for various o	connection types
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinates system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0
4	Connecting point	on branch	X < 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor. Values need to be entered for at least the following attributes:



Attribute		Description	
BENENNUNG		Designation of part	
NORMBEZEICHNUNG		Standard designation of the part (identical for all sub-types	
		An entry is mandatory, even if the part corresponds to no standard.	
NENNWE	ITE	Nominal diameter, Connection "!" and "2"	
NENNWE	ITE3	Nominal diameter, Connection"3" and "4"	
Additiona	lly (only if the corresponding	standard uses nominal diameters in inches):	
NPS_INC	Н	Nominal diameter (inches) (e.g. 1 1/2", the " consists of two " characters), Connection"!" and "2"	
NPS3 IN	СН	Nominal diameter (inches), Connection "3" and "4"	
-	rameters are to be considere ockets they refer to the pipe	d for all connection types except for flange connections. For con- to be inserted:	
D_AUSSE	N	Outer diameter, Connection"!" and "2"	
D3_AUSS	EN	Outer diameter, Connection"3" and "4"	
WANDDIC	CKE	Wall thickness, Connection"!" and "2"	
WANDDIC	CKE3	Wall thickness, Connection"3" and "4"	
ANSCHLU	JSSART	Connection type for Connection"!", "2", "3" and "4"	
Possible v	alues of the attribute ANSCH	_USSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
0 =Nosupple		ne meaning of the supplement: r, part type, ID, and standard of the part to be connected	

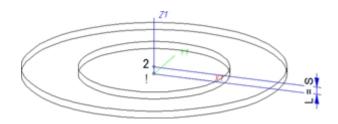


Attribute	Description
part standards.	





Part Type: Seal (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Required attributes for entries into database or catalogue

The entering of attribute values and the part type selection should be performed using the PAA Editor.

Values need to be entered for at least the following attributes:

Attribute		Designation	
BENENN	UNG	Designation of part	
NORMBE	ZEICHNUNG	Standard designat	on of the part.
		An entry is mandat	ory, even if the part corresponds to no standard.
NENNWE	ITE	Nominal diameter	, Connections "!" and "2"
DICKE		Seal thickness	
Additiona	Illy (only if the corresponding s	indard uses nomin	al diameters in inches):
NPS_INC	Н	Nominal diameter acters), Connectio	(inches) (e.g. 1 1/2", the " consists of two " char- ns "!" and "2"
ANSCHLU	JSSART	Connection types flange connection	For Connections "!" and "2" (value = 20000 for
Possible v	values of the attribute ANSCHLU	SART (CONNECTI	DN_TYPE):
2000x	Flange connection	lf appropr TYPE) attr auxiliary p	xiliary part when fitting part iately preset in the ANSCHLUSSART (CONNECTION_ ibute for a connection, the part will provide and connect an art of the standard specified in the attribute for the con-
2050x	Flange connection of a seal that is intended for the pushed in end of pipe. The effect of this value is th flange, together with the push-in pi connected to the seal. The pushed push-in pipe must have the connection.	push-innection ara loosecontent of, will becould lookn of the2000215ion typeEN 1092-	en being fitted. For example, if the part has a flange con- nd the corresponding counter-flange is required, the the ANSCHLUSSART (CONNECTION_TYPE) attribute as follows: 100010 EN 1092-1/11/A/PN 40 1/11/A/PN 40 is the standard designation with which the be entered into the database.



Attribute

Designation

The last character (x) provides information about the meaning of the supplement:

0 = No supplement

2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected

The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.



Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.



Rules for the Creation of User-Defined Feature Variants (PE)

When creating new, user-defined Feature Variants for Plant Engineering Parts, certain rules, depending on the particular part type, need to be respected.

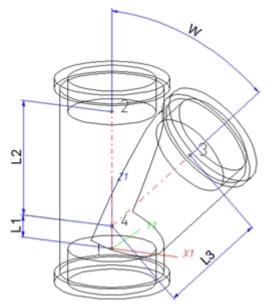
When using your own variants for flanges or parts with flanges, please read the notes on bolted flange connections!

- Variant for Part Type: Branch
- Variant for Part Type: Valve
- Variant for Part Type: Blank flange
- Variant for Part Type: Double knee
- Variant for Part Type: Three-way valve
- Variant for Part Type: Corner valve
- Variant for Part Type: Flange
- Variant for Part Type: Straight pipe
- Variant for Part Type: Y-piece
- Variant for Part Type: Cap
- Variant for Part Type: Knee
- Variant for Part Type: Cross
- Variant for Part Type: Gauge part
- Variant for Part Type: Reducer, concentric
- Variant for Part Type: Reducer, excentric
- Variant for Part Type: Elbow
- Variant for Part Type: Pipe clamp
- Variant for Part Type: Vessels, Pumps, Other Components
- Variant for Part Type: Nozzles
- Variant for Part Type: Other pipe parts
- Variant for Part Type: T-piece
- Variant for Part Type:4-way valve
- Variant for Part Type: Seal
- Variant for Part: Fastener





Variant for Part Type: Branch (PE)



Position of connecting points and determination of insertion lengths for various connection types			
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0
4	Auxiliary point	Branching point of centre line	X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L1	Length of distance between points "!" und "4"	LAENGE1
L2	Length of distance between points "2" und "4"	LAENGE2
L3	Length of distance between points "3" und "4"	LAENGE3



If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Nominal diameter, Connection "2"	N2	NENNWEITE2
Nominal diameter, Connection "3"	N3	NENNWEITE3
Angle	W	WINKEL

Additionally (only if the corresponding standard uses nominal diameters in inches):			
Nominal diameter (inches), Con- nection "!"	NI	N_INCH	
Nominal diameter (inches), Con- nection "2"	NI2	N2_INCH	
Nominal diameter (inches), Con- nection "3"	NI3	N3_INCH	

The nominal diameters in inches need to be entered as decimal values as well (e.g. 1.5 for 1 1/2").

These parameters are to be considered for all connection types except for flange connections. For connecting sockets they refer to the pipe to be inserted:

Outer diameter, Connection "!"	D	D_AUSSEN
Outer diameter, Connection "2"	D2	D2_AUSSEN
Outer diameter, Connection "3"	D3	D3_AUSSEN
Wall thickness, Connection "!"	S	WANDDICKE
Wall thickness, Connection "2"	S2	WANDDICKE2
Wall thickness, Connection "3"	S3	WANDDICKE3

If required, the attributes LAENGE1, LAENGE2 and LAENGE3 need to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant. Values must be entered for at least the following attributes:



Attribute		Description
BENENN	UNG	Part designation
COMPONENT_TYPE		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
NORMBE	ZEICHNUNG	Standard designation of the part (identical for all sub-types!)
		An entry is mandatory, even if the part corresponds to no stand- ard.
ANSCHL	JSSART	Connection type for Connection "!"
ANSCHLU	JSSART2	Connection type for Connection "2"
ANSCHLU	JSSART3	Connection type for Connection "3"
Possible v	values of the attribute ANSCHI	LUSSART (CONNECTION_TYPE):
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
The last chai 0 =No suppl 2 = The supp	racter (x) provides information about th lement plement consists of connection numbe	he meaning of the supplement: er, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.
Ple part standar	_	the paragraphs Connection type ID with priority information and Connection type ID - List



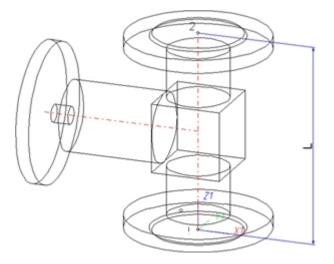
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH..





Variant for Part Type: Valve (PE)



The centre axis of the actuator should be located in the plane X < 0, Y = 0, Z > 0.

Position of connecting poin	Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection		
a	a		a 2		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance between point"!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.



VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Additionally (only if the correspond	ing standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameters in inches need to	be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the pi	ered for all connection types except f pe to be inserted:	or flange connections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE

If required, the attribute LAENGE need to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute	Description
BENENNUNG	Designation of part
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.
ANSCHLUSSART	Connection type for connection "!" and "2"
Possible values of the attribute ANSCHLU	ISSART (CONNECTION_TYPE):.



Attribute		Description
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
0 =No supple 2 = The supp	lement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.

Handling of nominal diameters in inches in the HELiOS database:

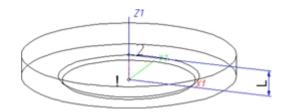
During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.

T





Variant for Part Type: Blank Flange (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Auxiliary point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance between points "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

Â

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA files

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.

Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Additionally (only if the corresponding stan	dard uses nominal diameters in	inches):
Nominal diameter (inches), Connection "!"	NI	N_INCH
Nominal diameters in inches need to be ente	ered as decimal values as well (e.g	g. 1.5 for 1 1/2").

If required, the attribute LAENGE need to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant. Values must be entered for at least the following attributes:



Attribute		Description
BENENN	UNG	Designation of the part
COMPONENT_TYPE		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
NORMBE	EZEICHNUNG	Standard designation of the part (identical for all sub-types!)
		An entry is mandatory, even if the part corresponds to no stand ard.
ANSCHL	USSART	Connection type for connection "!" (always flange connection)
ANSCHL	USSART2	Connection type for connection "2" (always 0)
Possible	values of the attribute AN	SCHLUSSART (CONNECTION_TYPE):
1000x	Butt-welded	Provide auxiliary part when fitting part
		, , , , , , , , , , , , , , , , , , , ,
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART
2000x 3100x	Flange connection Screwed, nipple	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the
	5	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange
3100x	Screwed, nipple	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART
3100x 3200x	Screwed, nipple Screwed, socket	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40
3100x 3200x 4100x	Screwed, nipple Screwed, socket Plugged, nipple	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows:
3100x 3200x 4100x 4200x	Screwed, nipple Screwed, socket Plugged, nipple Plugged, socket	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation
3100x 3200x 4100x 4200x 5100x 5200x The last cha	Screwed, nipple Screwed, socket Plugged, nipple Plugged, socket Socket-welded, nipple Socket-welded, socket racter (x) provides information a	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation
3100x 3200x 4100x 4200x 5100x 5200x The last cha 0 =No supp	Screwed, nipple Screwed, socket Plugged, nipple Plugged, socket Socket-welded, nipple Socket-welded, socket racter (x) provides information a lement	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.

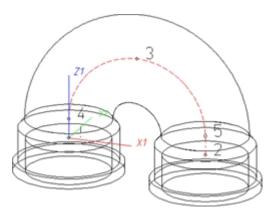


Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Variant for Part Type: Double Knee (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (X1=0,Y1=0,Z1=0)
2	Connecting point		X2 > 0, Y2 = 0, Z2 = 0
3	Auxiliary point		X3 = X2/2, Y3 = 0, Z3 > Z4
4	Auxiliary point		X4 = 0, Y4 = 0, Z4 > 0
5	Auxiliary point		X5 = X2, Y5 = 0, Z5 = Z4

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Additionally (only if the correspond	ing standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameters in inches need to	be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the pi	ered for all connection types except f pe to be inserted:	for flange connections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN



Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Wall thickness, Connection "!" and "2"	S	WANDDICKE

If required, the attributes LAENGE1 and LAENGE2 need to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute		Description	
BENENN	UNG	Designation of the part	
COMPONENT_TYPE		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only	
NORMBEZEICHNUNG		Standard designation of the part (identical for all sub-types!)	
		An entry is mandatory, even if the part corresponds to no stand- ard.	
ANSCHL	USSART	Connection type for connection "!"	
ANSCHL	USSART2	Connection type for connection "2"	
Possible v	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
	racter (x) provides information about t	he meaning of the supplement:	
	plement consists of connection numbe	er, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	
D Ple		the paragraphs Connection type ID with priority information and Connection type ID - List c	



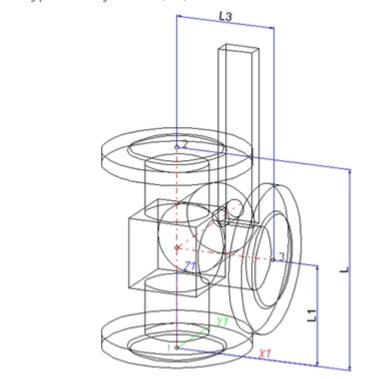
D Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: 3-Way Valve (PE)



Position of connecting points and determination of insertion lengths for various connection types

Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a 2
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0



Variables names

Name	Description	Attribute (optional)
L	Length of distance between points "!" and "2"	LAENGE
L1	Length of distance between point "!" and branching point of centre line	LAENGE1
L3	Distance of point "3" from the line through "!" and "2"	LAENGE3

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" und "2"	Ν	NENNWEITE
Nominal diameter, Connection "3"	N3	NENNWEITE3
		·
Additionally (only if the correspone	ding standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameter (inches), Con- nection "3"	NI3	N3_INCH
Nominal diameters in inches need t	to be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the p	dered for all connection types except i ipe to be inserted:	for flange connections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN
Outer diameter, Connection "3"	D3	D3_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE
Wall thickness, Connection "3"	S3	WANDDICKE3

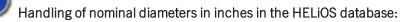
If required, the attributes LAENGE, LAENGE1 and LAENGE3 need to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.



Values must be entered for at least the following attributes:

Attribute		Description
BENENNUNG Designation of part		Designation of part
COMPONENT_TYPE		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
NORMBE	ZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.
ANSCHLL	JSSART	Connection type for Connection "!", "2" und "3"
Possible v	alues of the attribute ANSCHI	LUSSART (CONNECTION_TYPE):.
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
The last char 0 =No supple	acter (x) provides information about th ement olement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.

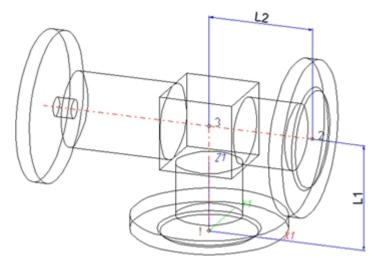


During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Corner Valve (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a 2	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0
3	Corner point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L1	Distance between point "!" and "3"	LAENGE1
L2	Distance between point "3" and "2"	LAENGE2

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..



A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Nominal diameter, Connection "2"	N2	NENNWEITE2
Additionally (only if the correspon	ding standard uses nominal diameters	s in inches):
Nominal diameter (inches) , Con- nection "!"	NI	N_INCH
Nominal diameter (inches), Con- nection "2"	NI2	N2_INCH
Nominal diameters in inches need	to be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
necting sockets they refer to the p	dered for all connection types except ipe to be inserted:	_
Outer diameter , Connection "!"	D	D_AUSSEN
Outer diameter , Connection "2"	D2	D2_AUSSEN
Wall thickness , Connection "!"	S	WANDDICKE
Wall thickness , Connection "2"	S2	WANDDICKE2

If required, the attributes LAENGE1 and LAENGE2 need to be assigned to the length variables. (see Variables names above).

For variant auto-synchronisation, attribute values need to be entered that shall apply equally to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute	Description
BENENNUNG	Designation of the part
COMPONENT_TYPE	Part type (always = Semi-finished products * Plant Engineering) for HELiOS database only
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.



Atta: buto		Description		
Attribute		Description		
ANSCHLU	JSSART	Connection type for connection "!" and "2"		
Possible v	alues of the attribute ANSCHL	USSART (CONNECTION_TYPE):.		
1000x	Butt-welded	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for		
2000x	Flange connection	a connection, the part will provide and connect an auxiliary part of the standard spe-		
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.		
3100x	Screwed, nipple			
3200x	Screwed, socket			
4100x	Plugged, nipple			
4200x	Plugged, socket			
5100x	Socket-welded, nipple			
5200x Socket-welded, socket The last character (x) provides information about the meaning of the supplement: 0 =No supplement 2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.				
Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.				



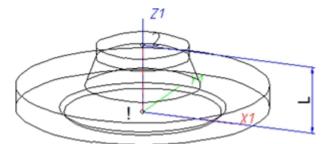
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Flange (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a contraction of the second se	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Variables names

Name	Designation	Attribute (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column...

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:



Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Additionally (only if the corresponding standard	uses nominal diameters in inc	hes).
Nominal diameter (inches), Connection "!" and "2"	NI	N_INCH
Nominal diameters in inches need to be entered a	s decimal values as well (e.g. 1.	5 for 1 1/2").
For connecting sockets these parameters refer	to the pipe to be inserted:	
Outer diameter , Connection "2"	D	D_AUSSEN
Wall thickness, Connection "2"	S	WANDDICKE

If required, the attribute LAENGE needs to be assigned to the length variables (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant. Values must be entered for at least the following attributes:

Attribute	Description		
BENENNUNG	Designation of the part		
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only_		
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!)		
	An entry is mandatory, even if the part corresponds to no stand- ard.		
ANSCHLUSSART	Connection type for connection "!" (always flange connection)		
ANSCHLUSSART2	Connection type for connection "2"		
Possible values of the attrib	ute ANSCHLUSSART (CONNECTION_TYPE):.		
1000x Butt-welded	Provide auxiliary part when fitting part		
2000x Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows:		
2040x Flange connection of a loose flange			
3100x Screwed, nipple	20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the		
3200x Screwed, socket	database.		
4100x Plugged, nipple			
4200x Plugged, socket			
5100x Socket-			
welded, nipple			

The last character (x) provides information about the meaning of the supplement:

0=Nosupplement



Attribute	Description		
2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection.			
Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.			
	art type Flange . The attribute ANSCHLUSSART (=CONNECTION		

Loose flanges are assigned to the part type Flange. The attribute ANSCHLUSSART (=CONNECTION_ TYPE), however, must have the value 20100!



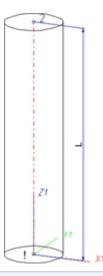
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Straight Pipe (PE)



Position of connecting points and determination of insertion lengths for various connection types

Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a 2
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	In origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.



VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal width, Connection "!" and "2"	Ν	NENNWEITE
Length (if a cutting to length of the pipe is permissible, the value is arbitrary. The length needs however to be smaller than the supplied length.)	L	LAENGE
Additionally (only if the corresponding standard uses nominated the corresponding standard uses nominated the standard uses noninated the standard uses nominated the standard uses nominated the standard uses nominated the standard uses nominated the standard uses noninated the standard uses nominated the stan	nal diameters in inches).	
Nominal diameter (inches), Connection "!" and "2"	NI	N_INCH
Nominal diameters in inches need to be entered as decimal v	alues as well (e.g. 1.5 for	1 1/2").
These parameters are to be considered for all connection t necting sockets they refer to the pipe to be inserted:	ypes except for flange co	nnections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE

If required, the attribute LAENGE needs to be assigned to the length variables (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Attribute	Description	
BENENNUNG	Designation of the part	
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) <u>for HELiOS data</u> - <u>base only</u>	
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!)	
	An entry is mandatory, even if the part corresponds to no standard.	
BELIEBIG_TEILBAR	Indicates whether the cutting to length of the pipe, is permissible.	
LIEFERLAENGE	Supplied length in m (!)	
ANSCHLUSSART	Connection type for connection "!" and "2"	
ANSCHLUSSART2	If you want both pipe ends to have the same connection type it will suffice to spe- cify a value for the ANSCHLUSSART attribute.	
	If you want the two pipe ends to have different connection types, the connect type for Connection 1 must be specified for the ANSCHLUSSART attribute, and connection type for Connection 2 for the ANSCHLUSSART2 attribute.	
	If you want to create a new feature variant of a straight pipe with different con- nection types, the part must be constructed in such a way that the value of the attribute ANSCHLUSSART is smaller than the value of the attribute ANSCHLUSSART2. Example:	
	Let us assume that you require a pipe that can be butt-welded at one end, and has a screwed socket at the other end.	
	The connection type for butt-welded connections is 10000, the one for screwed sockets is 32000. This means that Connection 1 (Point designation "!") is required for the welded connection (ANSCHLUSSART = 10000) and Connection 2 (point designation "2") is required for the screwed connection (ANSCHLUSSART2 = 32000).	

Values must be entered for at least the following attributes:

Possible values of the attribute ANSCHLUSSART (CONNECTION_TYPE) and ANSCHLUSSART2 (CONNECTION_TYPE2):

1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	



Attribute	Description		
The last character (x) provides inf 0 =No supplement	The last character (x) provides information about the meaning of the supplement:		
 2 = The supplement consists of connection number, part type, ID, and standard of the part to be connected The prefixed connection number indicates the connection with which the auxiliary part is to be attached to the current connection. 			
Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.			

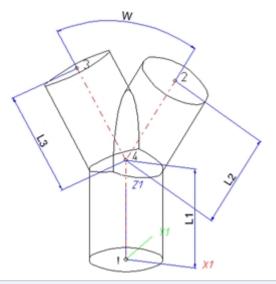


Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Variant for Part Type: Y-Piece (PE)



Position of connecting poin	Position of connecting points and determination of insertion lengths for various connection types		
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		a 2
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0
3	Connecting point		X < 0, Y = 0, Z > 0
4	Auxiliary point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L1	Distance between point "!" and "4"	LAENGE1
L2	Distance between point "2" and "4"	LAENGE2
L3	Distance between point "3" and "4"	LAENGE3



If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Nominal diameter, Connection "2" and "3"	N2	NENNWEITE2
Angle	W	WINKEL

Additionally (only if the corresponding standard uses nominal diameters in inches):		
Nominal diameter (inches), Con- nection "!"	NI	N_INCH
Nominal diameter (inches), Con- nection "2" and "3"	NI2	N2_INCH

As only decimal values are saved to the VAA file as parameter values, nominal diameters in inches need to be entered as decimal values as well (e.g. 1.5 for 1 1/2").

These parameters are to be considered for all connection types except for flange connections. For connecting sockets they refer to the pipe to be inserted:

Outer diameter, Connection "!"	D	D_AUSSEN
Outer diameter, Connection "2" und "3"	D2	D2_AUSSEN
Wall diameter, Connection "!"	S	WANDDICKE
Wall diameter, Connection "2" and "3"	S2	WANDDICKE2

If required, the attributes LAENGE1, LAENGE2 and LAENGE3 need to be assigned to the length variables (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute		Description	
BENENN	UNG	Designation of part	
COMPON	ENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only_	
NORMBE	ZEICHNUNG	Standard designation of the part (identical for all sub-types!)	
		An entry is mandatory, even if the part corresponds to no stand- ard.	
ANSCHLU	JSSART	Connection type for connection "!"	
ANSCHLU	JSSART2	Connection type for connection "2" and "3"	
Possible v	values of the attribute ANSCHI	LUSSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
0 =No suppl 2 = The suppl	plement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	
Ple part standar	_	the paragraphs Connection type ID with priority information and Connection type ID - List	



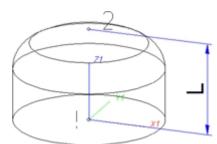
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Cap (PE)



Position of connecting points and determination of insertion lengths for various connection types		
Connection for butt welding	Connecting nipple for screwed, plugged or socket-welded connection	Connecting socket for screwed, plugged or socket-welded connection
a 2		a 2
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Auxiliary point		X = 0, Y = 0, Z > 0

Variables names

Name Designation		Attribute (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:



Parameter	Variable	Assigned attribute
All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	(suggestion)	
Nominal diameter, Connection "!"	Ν	NENNWEITE
Outer diameter, Connection "!"	D	D_AUSSEN
Wall thickness, Connection "!"	S	WANDDICKE
Additionally (only if the corresponding stan	dard uses nominal diameters in	inches):
Nominal diameter (inches), Connection "!"	NI	N_INCH
Nominal diameters in inches need to be ente	red as decimal values as well (e.	g. 1.5 for 1 1/2").

If required, the attribute LAENGE needs to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant. Values must be entered for at least the following attributes:

ttribute		Description	
BENENNUNG		Designation of part	
COMPON	ENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only	
NORMBE	ZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.	
ANSCHLU	JSSART	Connection type for connection "!"	
Possible v	alues of the attribute ANSCHI	LUSSART (CONNECTION_TYPE):.	
1000x 2000x 2040x	Butt-welded Flange connection Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
) =No suppl 2 = The supp	plement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	



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Description

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.



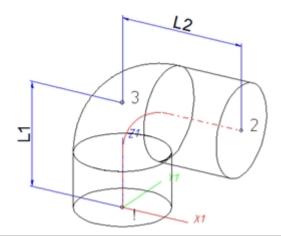
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Knee (PE)



Position of connecting poin	ts and determination of ir	nsertion lengths for various o	connection types
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0
3	Corner point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L1	Distance between point "!" and "3"	LAENGE1
L2	Distance between point "3" and "2"	LAENGE2

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.



VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Nominal diameter, Connection "2"	N2	NENNWEITE2
Angles between the distances "3" - > " !" and "3" ->"2"	W	WINKEL
Additionally (only if the correspond	ling standard uses nominal diam	eters in inches):
Nominal diameter (inches), Con- nection "!"	NI	N_INCH
Nominal diameter (inches), Con- nection "2"	NI2	N2_INCH
Nominal diameters in inches need to	be entered as decimal values as	well (e.g. 1.5 for 1 1/2").
These parameters are to be consic necting sockets they refer to the pi		ept for flange connections. For con-
Outer diameter , Connection "!"	D	D_AUSSEN
Outer diameter, Connection "2"	D2	D2_AUSSEN
Wall thickness, Connection "!"	S	WANDDICKE
Wall thickness, Connection "2"	S2	WANDDICKE2

If required, the attributes LAENGE1 and LAENGE2 need to be assigned to the length variables. (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute		Description
BENENN	UNG	Designation of part
COMPON	IENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
NORMBE	ZEICHNUNG	Standard designation of the part (identical for all sub-types!)
		An entry is mandatory, even if the part corresponds to no stand- ard.
ANSCHLU	JSSART	Connection type for Connection "!"
ANSCHL	JSSART2	Connection type for Connection "2"
Possible v	values of the attribute ANSCHI	USSART (CONNECTION_TYPE):
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
0 =No suppl 2 = The suppl	plement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.
Ple part standar		the paragraphs Connection type ID with priority information and Connection type ID - List \mathfrak{c}



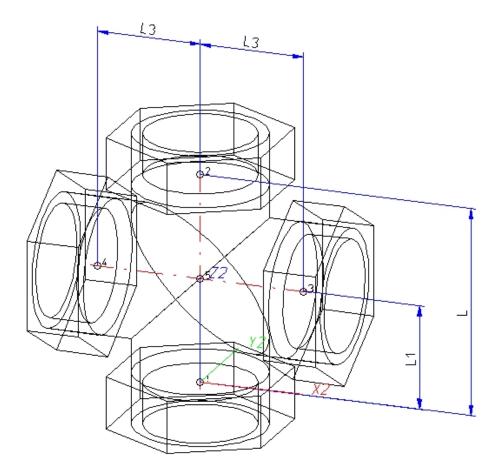
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Cross (PE)



Position of connecting poin	ts and determination of ir	nsertion lengths for various c	connection types
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection
a	a		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X = 0, Y = 0, Z > 0 X > 0, Y = 0, Z > 0
	Connecting point	on branch	$X \le 0, Y = 0, Z > 0$

Variables names

Name	Description	Attribute (optional)
L	Distance between point "!" and "2"	LAENGE
L1	Distance between point "!" and the intersection point of the centre lines	LAENGE1
L3	Distance between point "3" and "4"	LAENGE3

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Nominal diameter, Connection "3" and "4"	N3	NENNWEITE3
Additionally (only if the correspond	ling standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameter (inches), Con- nection "3" and "4"	NI3	N3_INCH
Nominal diameters in inches need to	o be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the pi	lered for all connection types except period to be inserted:	for flange connections. For con-
Outer diameter , Connection "!" and "2"	D	D_AUSSEN



Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Outer diameter, Connection "3" and "4"	D3	D3_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE
Wall thickness, Connection "3" and "4"	S3	WANDDICKE3

If required, the attributes LAENGE, LAENGE1 and LAENGE3 need to be assigned to the length variables. (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

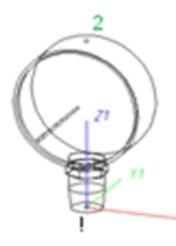
- part that	Designation of part Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard. Connection type for Connection "!", "2", "3" and "4" USSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified is the attribute for the standard spe- cified is the attribute for the standard spe-
- part that	for HELIOS database only_ Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no standard. Connection type for Connection "!", "2", "3" and "4" USSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
- part that	An entry is mandatory, even if the part corresponds to no stand- ard. Connection type for Connection "!", "2", "3" and "4" USSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
- part that	USSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
- part that	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
a part that	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
	a connection, the part will provide and connect an auxiliary part of the standard spe-
e part has odelled as	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
ation about the ection number,	e meaning of the supplement: , part type, ID, and standard of the part to be connected ection with which the auxiliary part is to be attached to the current connection.
n	t nation about the ection number

Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Variant for Part Type: Gauge part (PE)



Position of connecting points and determination of insertion lengths for various connection types					
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection		
a	a		a 2		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Auxiliary point or Connecting point		X > 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.



VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Additionally (only if the correspond	ling standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!"	NI	N_INCH
Nominal diameters in inches need to	be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
necting sockets they refer to the pi	• _	
Outer diameter , Connection "!" and "2"	D	D_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE

If required, the attribute LAENGE needs to be assigned to the length variables. (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

ne attribute ANSCHI ad nection nection of a part that nge itself. The part has ge that is modelled as and has no own art- rattached to this con-	Designation of part Part type (always = Semi-finished material + Plant Engineering), for HELiOS database only Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand ard. Connection type for Connection "!" Connection type for Connection "2" (="0", if only one connection exists) LUSSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
NG ne attribute ANSCHI and nection nection of a part that nge itself. The part has nection as is modelled as and has no own art-	for HELiOS database only Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand ard. Connection type for Connection "!" Connection type for Connection "2" (="0", if only one connection exists) LUSSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
ne attribute ANSCHI ed nection ge itself. The part that ge that is modelled as ; and has no own art-	An entry is mandatory, even if the part corresponds to no stand ard. Connection type for Connection "!" Connection type for Connection "2" (="0", if only one connection exists) LUSSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
ed nection inection of a part that ige itself. The part has ge that is modelled as ; and has no own art-	Connection type for Connection "2" (="0", if only one connection exists) LUSSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
ed nection inection of a part that ige itself. The part has ge that is modelled as ; and has no own art-	exists) LUSSART (CONNECTION_TYPE): Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
ed nection inection of a part that ige itself. The part has ge that is modelled as ; and has no own art-	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
nection nection of a part that ge itself. The part has ge that is modelled as ; and has no own art-	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
nection of a part that ige itself. The part has ge that is modelled as and has no own art-	a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
ge itself. The part has ge that is modelled as and has no own art-	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be		
	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40		
nipple			
socket			
ipple			
ocket			
lded, nipple			
lded, socket			
vides information about th	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.		
	ists of connection numbe		



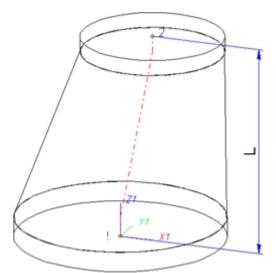
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Reducer, Excentric (PE)



Position of connecting points and determination of insertion lengths for various connection types					
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection		
a	a		a 2		
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance of the connecting surfaces from "!" to "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column..

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.





VAA file:

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	N	NENNWEITE
Nominal diameter, Connection "2"	N2	NENNWEITE2
Additionally (only if the correspond	ding standard uses nominal diameter	s in inches):
Nominal diameter (inches), Con- nection "!"	NI	N_INCH
Nominal diameter (inches), Con- nection "2"	NI2	N2_INCH
Nominal diameters in inches need t	o be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the p	dered for all connection types except ipe to be inserted:	for flange connections. For con-
Outer diameter, Connection "!"	D	D_AUSSEN
Outer diameter, Connection "2"	D2	D2_AUSSEN
Wall thickness, Connection "!"	S	WANDDICKE
Wall thickness, Connection "2"	S2	WANDDICKE2

If required, the attributes LAENGE needs to be assigned to the length variables. (see Variables names above)

For variant auto-synchronisation, attribute values need to be entered that shall apply equally to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute	Description		
BENENNUNG	Designation of the part		
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only		
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.		
ANSCHLUSSART	Connection type for connection "!"		
ANSCHLUSSART2	Connection type for connection "2"		
Possible values of the attribute ANSCHLUSSART (CONNECTION_TYPE):			



Attribute		Description
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
1 he last chara 0 =No supple	acter (x) provides information about the ment	ne meaning of the supplement:
		r, part type, ID, and standard of the part to be connected
		nection with which the auxiliary part is to be attached to the current connection.

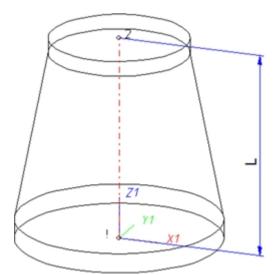
Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.

Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Variant for Part Type: Reducer, Concentric (PE)



Position of connecting points and determination of insertion lengths for various connection types					
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection		
a	a				
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Des	signation	Purpose	Comment	Position in coordinate system
!		Connecting point	Fitting point	in origin (0,0,0)
2		Connecting point		X > 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.



VAA file:

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Nominal diameter, Connection "2"	N2	NENNWEITE2
Additionally (only if the correspond	ling standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!"	NI	N_INCH
Nominal diameter (inches), Con- nection "2"	NI2	N2_INCH
Nominal diameters in inches need to	be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
-	lered for all connection types except	for flange connections. For con-
necting sockets they refer to the pi	-	
Outer diameter, Connection "!"	D	D_AUSSEN
Outer diameter, Connection "2"	D2	D2_AUSSEN
Wall thickness, Connection "!"	S	WANDDICKE
Wall thickness, Connection "2"	S2	WANDDICKE2

If required, the attributes LAENGE needs to be assigned to the length variables. (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute	Description	
BENENNUNG	Designation of the part	
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only	
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.	
ANSCHLUSSART	Connection type for connection "!"	
ANSCHLUSSART2	Connection type for connection "2"	
Possible values of the attribute ANSCHLUSSART (CONNECTION_TYPE):		



Attribute		Description
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
0 =No supple 2 = The supp	lement consists of connection numbe	he meaning of the supplement: er, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.

Handling of nominal diameters in inches in the HELiOS database:

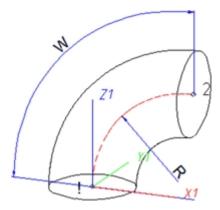
During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.

T





Variant for Part Type: Elbow (PE)



Position of connecting poin	Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection		
a	a				
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)		

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X > 0, Y = 0, Z > 0



VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Angle	W	WINKEL
Bend radius	R	KRUEMMUNG
Additionally (only if the correspond	ling standard uses nominal diameter	s in inchos).
Additionally (only if the correspond		s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameters in inches need to	o be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consic necting sockets they refer to the pi	lered for all connection types except ipe to be inserted:	for flange connections. For con-
Outer diameter, Connection"!" and "2"	D	D_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Attribute	Description	
BENENNUNG	Designation of the part	
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only_	
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.	
BELIEBIG_TEILBAR	Indicates whether a cutting to length of the elbow is permissible.	
ANSCHLUSSART	Connection type for connections "!" and "2" The connection types on both ends must be identical.	
Possible values of the attribute ANSCHLUSSART (CONNECTION_TYPE):		

Values must be entered for at least the following attributes:



Attribute		Description
1000x	Butt-welded	Provide auxiliary part when fitting part
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
0 =No supple 2 = The supp	lement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.

Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.

Handling of nominal diameters in inches in the HELiOS database:

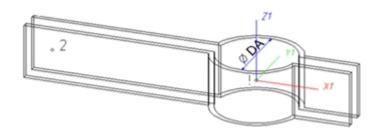
During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.

T





Variant for Part Type: Pipe Clamp (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Fitting point	Reference point placed on the centre line of a pipe during fitting	in origin (0,0,0)
2	Auxiliary point		X < 0, Y = 0, Z = 0

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes shown below, and that the predefined attribute assignment is entered.

Possibility 1:

Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute			
These parameters apply to pipes whic	These parameters apply to pipes which fit into the clamps				
Nominal diameter	Ν	NENNWEITE			
Outer diameter	DA	D_AUSSEN			
Additionally (only if the corresponding standard uses nominal diameters in inches):					
Nominal diameter (inches)	NI	N_INCH			
Nominal diameters in inches need to be entered as decimal values as well (e.g. 1.5 for $1 \frac{1}{2}$).					

Possibility 2:

Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
These parameters apply to pipes which fit into the clamps		
Outer diameter Largest possible outer diameter of pipe that is still suitable for pipe clamp	DA	D_AUSSEN



Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Outer diameter 2 Smallest possible outer diameter of pipe that is still suit- able for pipe clamp	D2	D2_AUSSEN
Nominal diameter	Ν	NENNWEITE
Additionally (only if the corresponding standard uses not	ninal diameters in inches)	:
Nominal diameter (inches)	NI	N_INCH
Nominal diameters in inches need to be entered as decima	l values as well (e.g. 1.5 for	1 1/2").

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:			
Attribute	Description		
BENENNUNG (DESIGNATION)	Designation of the part		
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) <u>for</u> HELiOS database only		

Values must be entered for at least the following attributes:

NORMBEZEICHNUNG (STANDARD_

DESIGNATION

リ	Handling of nominal	diameters in	inches in t	the HELiOS database:	
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During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.

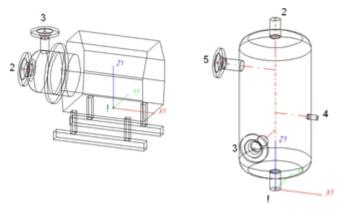
Standard designation of the part (identical for all sub-types!)

An entry is mandatory, even if the part corresponds to no standard.

For the insertion of a pipe clamp having these two outer diameter attributes the Also use Outer diameter 2 as search criterion for pipe clamps checkbox on the Part search tab of the Plant Engineering Settings dialogue must be active.



Variant for Part Type: Vessels, Pumps, Other Components (PE)



Named isolated points

Designation	Purpose	Description	Position in coordinate sys- tem
!	Connecting point or auxiliary point	Fitting point	in origin (0,0,0)
2, 3, 4 etc., unambiguous within the part	Connecting points or auxiliary points		arbitrary

Connecting points should preferably be created via the Component connection function, or (for various components) by the insertion of nozzles.

Each component connection (and the fitting point, if it is an auxiliary point) needs to be located in a plane belonging to the part. It needs however not be located within the surface boundary.

Example:



If the connecting point is located in the plane of the ring surface, the surface condition is fulfilled.

Caution: It would also be fulfilled if the point would be located in the same plane, but outside of the ring.

To assign an unambiguous orientation to a connection, a connecting point must not fulfil the surface condition for several surfaces at once.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that appropriate attributes such as HOEHE (HEIGHT), BREITE (WIDTH), LAENGE (LENGTH) etc.are assigned to the individual variables, enabling a distinguishing between various sub-types during part selection.

For variant auto-synchronisation, attribute values need to be entered that shall apply equally to all sub-types of the variant.

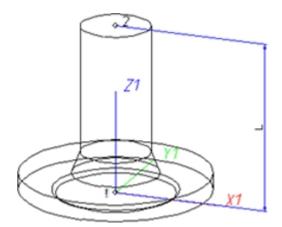


Values must be entered for at least the following attributes:

AttributE	Description
BENENNUNG	Designation of the part
COMPONENT_TYPE	Part type (always = Semi-finished material+Plant Engineering) <u>for HELiOS database</u> <u>only</u>
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no standard.



Variant for Part Type: Nozzle (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a 2	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Length of distance between points "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.



Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Nominal diameter, Connection "3" and "4"	N3	NENNWEITE3
Additionally (only if the correspond	ling standard uses nominal diameters	in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameter (inches), Con- nection "3" and "4"	NI3	N3_INCH
Nominal diameters in inches need t	be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the p	lered for all connection types except f pe to be inserted:	or flange connections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN
Outer diameter, Connection "3" and "4"	D3	D3_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE
Wall thickness, Connection "3" and "4"	S3	WANDDICKE3

If required, the attribute LAENGE need to be assigned to the length variables. (see Variables names above).

For variant auto-synchronisation, attribute values need to be entered that shall apply equally to all sub-types of the variant.



Values must be entered for at least the following attributes:

Attribute		Description
BENENNUNG D		Designation of part
COMPONENT_TYPE NORMBEZEICHNUNG		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
		Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.
ANSCHLU	ISSART	Connection type for connection "!"
ANSCHLU	JSSART2	Connection type for connection "2" (value always 10000)
Possible va	alues of the attribute ANSCHL	LUSSART (CONNECTION_TYPE):.
1000x	Butt-welded	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for
2000x	Flange connection	a connection, the part will provide and connect an auxiliary part of the standard spe- cified in the attribute for the connection when being fitted. For example, if the part has
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
3100x	Screwed, nipple	
3200x	Screwed, socket	
4100x	Plugged, nipple	
4200x	Plugged, socket	
5100x	Socket-welded, nipple	
5200x	Socket-welded, socket	
) =No supple 2 = The supp	lement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.

Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Other Pipe Parts (PE)

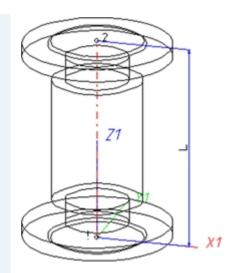
Up to 4 connections are possible for this part type.

The connections "!" and "2" need to be located on the Z-axis. The position of further connections is arbitrary. However, connections "3" and "4" cannot process guidelines during part insertion. The creation of guidelines starting from connections "3" and "4" can only be performed subsequently. Therefore, you will only have the following fitting options:

Type of insertion

In edge direction

➤In opposite edge direction



Example: Compensator with flanges

Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a			
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	optional	arbitrary
4	Fiting point	optional	arbitrary

Variables names

Name	Description	Attribut (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.



A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered.

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Additionally (only if the correspond	ling standard uses nominal diameters	s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameters in inches need t	o be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the p	lered for all connection types except f pe to be inserted:	or flange connections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE

If required, the attributes LAENGE needs to be assigned to the length variables. (see Variables names above).



As mentioned above, the part may have up to 4 connections. If a connection "4" exists, it needs to have the same properties (Nominal diameter, Outer diameter, Wall thickness, Connection type) as connection "3". For three connections, various properties can be preset:

Parameter	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!"	Ν	NENNWEITE
Nominal diameter, Connection "2"	N2	NENNWEITE2
Nominal diameter, Connection "3" [and "4"]	N3	NENNWEITE3
	-	
Nominal diameter (inches) , Connection "!"	NI	N_INCH
Nominal diameter (inches), Connection "2"	NI2	N2_INCH
Nominal diameter (inches) , Connection "3" [and "4"]	NI3	N3_INCH
Outer diameter, Connection "!"	D	D_AUSSEN
Outer diameter, Connection "2"	D2	D2_AUSSEN
Outer diameter, Connection "3" [and "4"]	D3	D3_AUSSEN
Wall thickness, Connection" !"	S	WANDDICKE
Wall thickness, Connection "2"	S2	WANDDICKE2
Wall thickness, Connection "3" [and "4"]	S3	WANDDICKE3

For variant auto-synchronisation, attribute values need to be entered that shall apply equally to all sub-types of the variant.



Values must be entered for at least the following attributes:

		Description		
BENENNUNG		Part type designation		
COMPON	ENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only		
NORMBEZEICHNUNG		Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.		
ANSCHLU	JSSART	Connection type for all connections		
ANSCHLU	JSSART2	Connection type for connection "2", if different from that for con nection "1"		
ANSCHLU	JSSART3	Connection type for connection "3" [and "4"], if different from that for connection "2" n		
Possible v	alues of the attribute ANSCH	LUSSART (CONNECTION_TYPE):		
1000x	Butt-welded	Provide auxiliary part when fitting part		
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-		
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.		
3100x	Screwed, nipple			
3200x	Screwed, socket			
4100x	Plugged, nipple			
4200x	Plugged, socket			
5100x	Socket-welded, nipple			
5200x The last char 0 =No supple		he meaning of the supplement: er, part type, ID, and standard of the part to be connected		

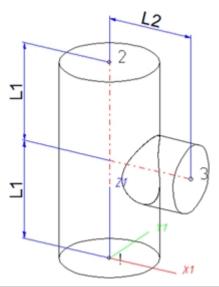


Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Variant for Part Type: T-Piece (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a		a 2	
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L1	Half the length of the distance between points "!" and "2" $$	LAENGE1
L2	Distance of point "3" from straight line through "!" and "2"	LAENGE3

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.



A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Nominal diameter, Connection "3"	N3	NENNWEITE3
Additionally (only if the correspon	ding standard uses nominal diameter	s in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameter (inches), Con- nection "3"	NI3	N3_INCH
Nominal diameters in inches need	to be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consi necting sockets they refer to the p	dered for all connection types except ipe to be inserted:	for flange connections. For con-
Outer diameter, Connection"!" and "2"	D	D_AUSSEN
Outer diameter, Connection "3"	D3	D3_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE
Wall thickness, Connection "3"	S3	WANDDICKE3

If required, the attributes LAENGE1 and LAENGE3 need to be assigned to the length variables. (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

		Description	
BENENN	UNG	Designation of the part	
COMPONENT_TYPE		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only	
NORMBE	ZEICHNUNG	Standard designation of the part (identical for all sub-types!)	
		An entry is mandatory, even if the part corresponds to no stand- ard.	
ANSCHLL	JSSART	Connection type for connections "!" and "2"	
ANSCHLU	JSSART3	Connection type for connection "3"	
Possible v	alues of the attribute ANSCHI	LUSSART (CONNECTION_TYPE):	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
0 =Nosupple	plement consists of connection numbe	ne meaning of the supplement: r, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	



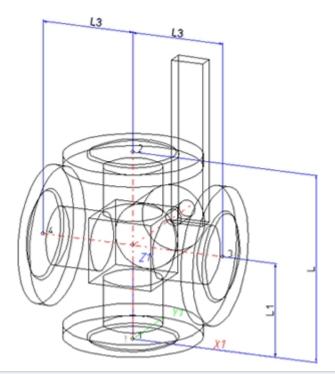
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: 4-Way Valve (PE)



Position of connecting points and determination of insertion lengths for various connection types				
Connection for butt weld- ing	Flange connection	Connecting nipple for screwed, plugged or socket-welded con- nection	Connecting socket for screwed, plugged or socket-welded con- nection	
a	a			
a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimen- sion (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	a = Insertion length dimension (e.g. L, L1 etc.)	

Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0
3	Connecting point	on branch	X > 0, Y = 0, Z > 0
4	Connecting point	on branch	X < 0, Y = 0, Z > 0



Variables names

Name	Description	Attribute (optional)
L	Length of distance between points "!" and "2"	LAENGE
L1	Length of distance between points "!" and the intersection point of centre lines	LAENGE1
L3	Half the length of the distance between points "3" und "4"	LAENGE3

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in mil- limetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	Ν	NENNWEITE
Nominal diameter, Connection "3" and "4"	N3	NENNWEITE3
Additionally (only if the correspond	ing standard uses nominal diameters	in inches):
Nominal diameter (inches), Con- nection "!" and "2"	NI	N_INCH
Nominal diameter (inches), Con- nection "3" and "4"	NI3	N3_INCH
Nominal diameters in inches need to	be entered as decimal values as well	(e.g. 1.5 for 1 1/2").
These parameters are to be consid necting sockets they refer to the pi	ered for all connection types except f pe to be inserted:	or flange connections. For con-
Outer diameter, Connection "!" and "2"	D	D_AUSSEN
Outer diameter, Connection "3" and "4"	D3	D3_AUSSEN
Wall thickness, Connection "!" and "2"	S	WANDDICKE
Wall thickness, Connection "3" and "4"	\$3	WANDDICKE3



If required, the attributes LAENGE, LAENGE1 and LAENGE3 need to be assigned to the length variables (see Variables names above).

Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute		Description	
BENENNUNG		Designation of part	
COMPONENT_TYPE NORMBEZEICHNUNG		Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only	
		Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.	
ANSCHLU	JSSART (CONNECTION_TYPE	E) Connection type for Connection "!", "2", "3" and "4"	
Possible v	values of the attribute ANSCH	LUSSART (CONNECTION_TYPE):.	
1000x	Butt-welded	Provide auxiliary part when fitting part	
2000x	Flange connection	If appropriately preset in the ANSCHLUSSART (CONNECTION_TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard spe-	
2040x	Flange connection of a part that is not a flange itself. The part has a loose flange that is modelled as a sub-part and has no own art- icle master attached to this con- nection.	cified in the attribute for the connection when being fitted. For example, if the part has a flange connection and the corresponding counter-flange is required, the content o the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.	
3100x	Screwed, nipple		
3200x	Screwed, socket		
4100x	Plugged, nipple		
4200x	Plugged, socket		
5100x	Socket-welded, nipple		
5200x	Socket-welded, socket		
	racter (x) provides information about th	ne meaning of the supplement:	
	plement consists of connection numbe	er, part type, ID, and standard of the part to be connected nection with which the auxiliary part is to be attached to the current connection.	
6		the paragraphs Connection type ID with priority information and Connection type ID - List	

part standards.

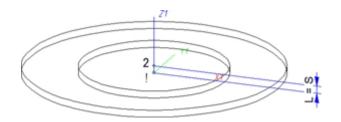
Handling of nominal diameters in inches in the HELiOS database:

During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.





Variant for Part Type: Seal (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	in origin (0,0,0)
2	Connecting point		X = 0, Y = 0, Z > 0

Variables names

Name	Description	Attribute (optional)
L	Distance between point "!" and "2"	LAENGE

If the variables names given in the **Name** column are used, you do not need to assign any attributes to them via the Variant Editor. If different variables are required, you need to assign the attributes given in the **Attribute** column.

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter, Connection "!" and "2"	N	NENNWEITE
Seal thickness (values same as for Variable L)	S	DICKE
Additionally (only if the corresponding standard	uses nominal diameters in inc	hes):
Nominal diameter (inches), Connection "!" and "2"	NI	N_INCH
Nominal diameters in inches need to be entered a	s decimal values as well (e.g. 1	.5 for 1 1/2").

If required, the attribute LAENGE (LENGTH) needs to be assigned to the length variables (see Variables names above).



Also in the Variant Editor, enter the values for the attributes which are to apply to all sub-types of the variant.

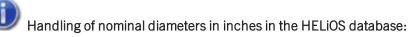
Values must be entered for at least the following attributes:

Attribute	Designation
BENENNUNG	Designation of the part
COMPONENT_TYPE	Part type (always = Semi-finished material + Plant Engineering) for HELiOS database only
NORMBEZEICHNUNG	Standard designation of the part (identical for all sub-types!) An entry is mandatory, even if the part corresponds to no stand- ard.
ANSCHLUSSART	Connection type for connection "!" and "2" (Value= 20000 for Flange connection)

Possible values of the attribute ANSCHLUSSART (CONNECTION_TYPE):

2000x	Flange connection	Provide auxiliary part when fitting part If appropriately preset in the ANSCHLUSSART (CONNECTION_ TYPE) attribute for a connection, the part will provide and connect an auxiliary part of the standard specified in the attribute for the con-
2050x	Flange connection of a seal that is exclusively intended for the pushed in end of a push-in pipe. The effect of this value is that a loose flange, together with the push- in pipe, will be connected to the seal. The pushed in of the push- in pipe must have the connection type 10xxx.Flange connection.	nection when being fitted. For example, if the part has a flange con- nection and the corresponding counter- flange is required, the content of the ANSCHLUSSART (CONNECTION_TYPE) attribute could look as follows: 20002 1 5100010 EN 1092-1/11/A/PN 40 EN 1092-1/11/A/PN 40 is the standard designation with which the flange is to be entered into the database.
The last char $0 = No supple$	acter (x) provides information about the meaning of the meaning of the mean	ne supplement:
	plement consists of connection number, part type, ID,	and standard of the part to be connected
		ich the auxiliary part is to be attached to the current connection.
_		

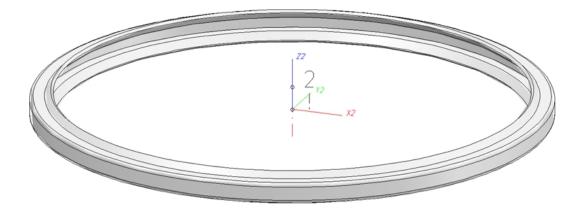
Please also read the information given in the paragraphs Connection type ID with priority information and Connection type ID - List of part standards.



During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Variant for Part Type: Fastener (PE)



Named isolated points

Designation	Purpose	Comment	Position in coordinate system
!	Connecting point	Fitting point	In origin (0,0,0)
2	Auxiliary point		X = 0, Y = 0, Z > 0
The part has no insertion length. When the part is inserted, it will be placed with its fitting point onto a con- nection of the target part. Connecting point 2 will only be used for a correct alignment.			

A variables name may consist of a maximum of 4 characters and must not contain any spaces or special characters.

VAA file

Use the Variant Editor to enter the suitable part type into the VAA file.

Then, use the Variant Editor to expand the VAA file in such a way that it contains values for the sizes specified here, and that the predefined attribute assignment is entered:

ParameterAll dimensions must be specified in millimetres;Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Nominal diameter for which the fastener is intended	Ν	NENNWEITE
Additionally (only if the corresponding standard uses nom Nominal diameter in inches (as decimal number) for which	inal diameters in inches):	N INCH
the fastener is intended		
Nominal diameter in inches needs to be entered as a decima	l number as well (e.g. 1.5	for 1 1/2").
These additional values make sense if the above attributes	should not be sufficient	as search criteria:

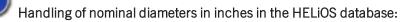


Parameter All dimensions must be specified in millimetres; Exception: Nominal diameters in inches	Variable (suggestion)	Assigned attribute
Outer diameter for which the fastener is intended	D	D_AUSSEN
Wall thickness for which the fasteners is intended	S	WANDDICKE

For variant auto-synchronisation, attribute values need to be entered that shall apply equally to all sub-types of the variant.

Values must be entered for at least the following attributes:

Attribute		Designation	n	
BENENN	BENENNUNG Designation		ion of the part	
COMPONENT_TYPE		Part type (always= Semi-finished product+Plant Engineering) <u>only</u> if HELiOS database is used		
NORMBEZEICHNUNG		Standard designation of the part (identical for all sub-types!) An entry will even be required if the part corresponds to no stand- ard.		
ANSCHL	JSSART	Connection	type for which the fastener is intended	
Possible v	values of the attribute ANSCHLUS	SSART (CONN	ECTION_TYPE):	
1000x	Butt-welded		Please note:	
2000x	Flange connection		The option to specify, via the attribute ANSCHLUSSART, a connected part that will automatically be inserted together with	
2040x	Flange connection of a part that is not The part has a loose flange that is moc part and has no own article master attac nection.	lelled as a sub-	the part (if the corresponding option has been set) is not avail- able here.	
3100x	Screwed, nipple			
3200x	Screwed, socket			
4100x	Plugged, nipple			
4200x	Plugged, sleeve			
5100x	Sleeve-welded, nipple			
5200x	Sleeve-welded, sleeve			
D Ple		paragraphs Conne	ection type ID with priority information and Connection type ID - List of	



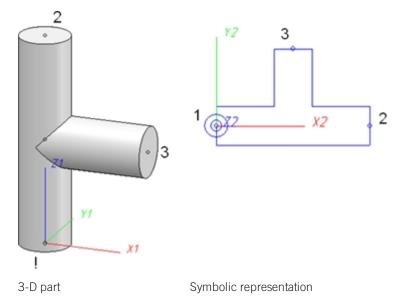
During part data synchronization, nominal diameters in inches will be taken over to the attributes N_INCH, N2_ INCH and N3_. The usual character strings for indication of the diameter in inches (e.g. 1 1/2" instead of 1.5) will be auto-generated in the database for the attributes NPS_INCH, NPS2_INCH und NPS3_INCH.



Rules for the Creation of Symbolic Representations (PE)

Symbolic representations are required for parts or part variants that are used for pipelines of which you want to generate isometries. You use the **Symbol Editor** to draw such symbolic representations.

Below please find the example of a T-piece:



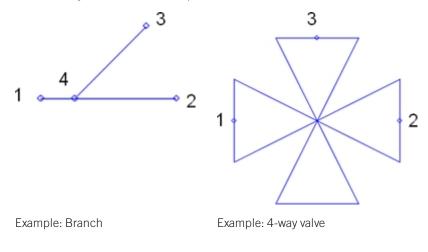
1. Position in the coordinate system

The symbolic representation is drawn in the **Symbol Editor** as a 2-D part in the XY-plane. The Z-axis in the 3-D part corresponds to the X-axis in the symbolic 2-D representation. The 3-D X-axis corresponds to the 2-D Y-axis.

2. Named isolated points:

The symbolic representation needs to contain (just as the 3-D part) named isolated points indicating the positions of connections or auxiliary points. The point "1" in the symbolic representation is located in the origin of the coordinate system and corresponds to the point "!" in the 3-D part. Points "2" and "3" correspond to the same-named points in the 3-D part.

There are only two parts that require a point "4" in their symbolic representations, namely **Branch** and **Y-piece** (the 4-way valve contains no point "4").







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