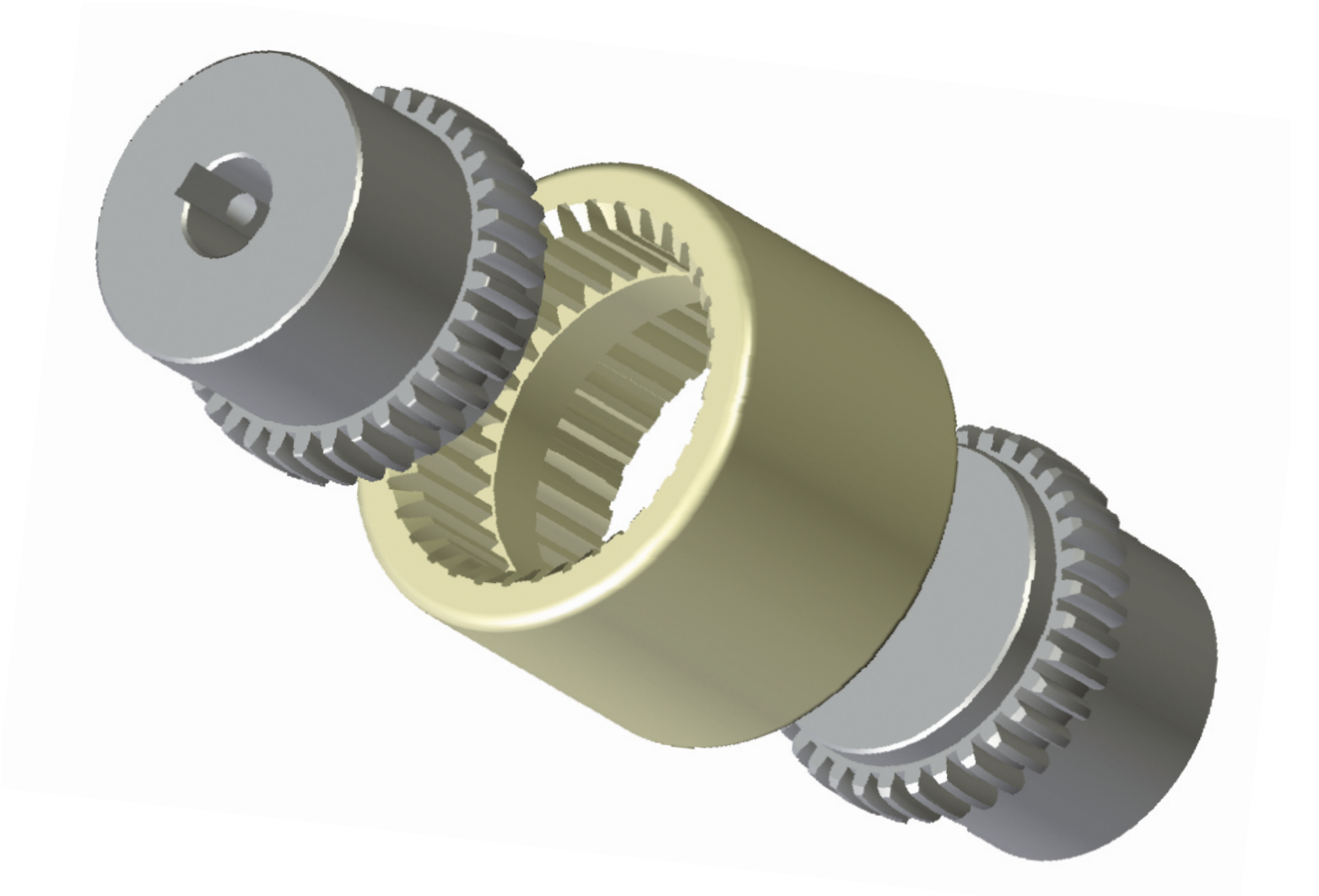
SITEX® Couplings

USER AND MAINTENANCE MANUAL



DRIVE SOLUTIONS

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1 General information

We recommend that you carefully read all the mounting instructions before installing the coupling, paying particular attention to the safety instructions.
SITEX® coupling is suitable for use in potentially explosive atmospheres. When using the coupling in hazardous areas, strictly observe the special information and instructions regarding safety in the ATEX attachment.

The mounting instructions are part of the product; please keep them safe and close to the coupling. They are available in electronic format on the website www.sitspa.com.

All the rights of this manual are reserved and are the property of SIT S.p.A.; therefore, its sale and reproduction without permission are prohibited.

1.1 Purpose of the document

The purpose of this document is the description of the SITEX® couplings, both in the standard version and in the version suitable for use in potentially explosive environments in accordance with ATEX Directive 2014/34/EU.
All the indications are provided, so that it is properly dimensioned, stored and assembled.
As regards the couplings that have to work in potentially explosive environments, all the indications and standards for identifying the installation areas for which the coupling is certified to operate in safe conditions are provided.

1.2 Proper use

Before handling a SIT coupling for moving, installing, or performing maintenance, it is advisable to carefully read the mounting instructions.

Any kind of changes aren't authorized except those expressly provided for in the User and Maintenance Manual.
SIT assumes no liability for damage resulting from tampered material and, therefore, no longer original.
SIT reserves the right to make changes to the product; as a consequence, this manual will be updated.
The technical specifications listed in the operating and maintenance manual exactly match the state of the art at the time of printing.

1.3 Warning symbols for safety

The warning symbols included in this manual alert the user to possible risks that may occur during handling, assembling and use of the coupling.
It is necessary to pay particular attention to them.

DANGER **Possible damages to the machine.**

CAUTION **Possible damages to the machine.**

ATTENTION **Important guidelines to follow.**

PRECAUTION **Hints about explosion protections.**

1.4 General advice in case of danger

DANGER!

Every operation performed on the coupling, either with mounting or maintenance, must be carried out with the machine not connected to the power supply. Accidental contact with the rotating parts can cause serious injury to the operator. It is recommended to read these operating instructions to ensure safety.

- Affix proper warning signs around the machine
- Instruct the operator before giving permission to work on the coupling
- Operate on the coupling and on the transmission in safe conditions
- Make sure the machine power is disconnected before carrying out any operation
- Do not touch any moving part of the machine and wait until it stops completely
- Protect the coupling against accidental contact with protection devices

1.5 Reference laws and standards

This evaluation was carried out in accordance with the provisions of the relevant laws, directives, standards mentioned below:

DIN 740/2	Reference standard for flexible couplings
ATEX DIRECTIVE 2014/34/EU	Equipment and protective systems intended for use in potentially explosive atmospheres
ATEX GUIDELINES 2014/34/EU	Guidelines to the application of Directive 2014/34/EU
EN 1127-1:2011	Explosion prevention and protection against explosion. Basic concepts and methodology
EN ISO 80079-36:2016	Explosive environments – part 36. Non-electrical equipment for potentially explosive atmospheres. Basic method and requirements
EN ISO 80079-37:2016	Explosive environments – part 37. Non-electrical equipment for potentially explosive atmospheres. Non-electrical equipment constructional safety type "c", control of the sources of ignition type “b”, immersion in liquid type “k”.

2 Characteristics of SITEX® couplings

SITEX® couplings are constant-velocity couplings to transmit torque and, at the same time, compensate axial, radial and angular misalignments.
There are three differentexecution to cover a wide range of applications:

- **SITEX®:** for common applications with a wide range of torque
- **SITEX® NYLEX:** for light applications
- **SITEX® FL:** for joining between diesel motor and hydraulic pump

The main characteristics are:

- Maintenence and lubrication free
- No loads on shafts in case of misalignments
- No wear due to special teeth with both profile and section crowned
- Safety coupling due to the sleeve in PA, weaker than the hub teeth; in case of overload, the rotation of the shafts is always not forbidden.

The SITEX® series is suitable for use in areas classified with the presence of flammable gases, vapours and mists or combustible dusts (Zone 1/21, category 2 GD, EPL Gb Db) and applications in mining (Group I, category M2, EPL Mb).
It is designed and built in accordance with the ATEX Directive 2014/34/EU and in accordance with the following European standards:

- **EN 1127-1:2011**
- **EN ISO 80079-36:2016**
- **EN ISO 80079-37:2016**

2.1 SITEX® hubs materials

The SITEX® coupling consists of two hubs made of steel and teeth with both profiled and section crowned. The standard material is steel. For special applications, is possible to use stainless steel.
For details, refer to the TABLE 2.1 - SITEX®: materials.

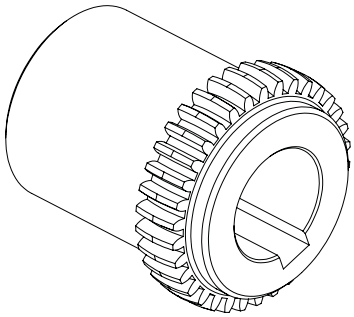
TABLE 2.1 - SITEX®: materials

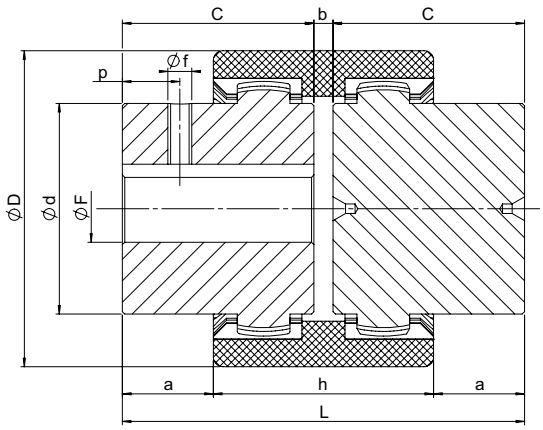
EXECUTION	COMPONENT	STD MATERIAL	OPTIONAL MATERIAL
SITEX®	Hub	Steel	Stainless steel
	Sleeve	Polyammide	PA + GF (CF)
SITEX® NYLEX	Hub	Polyammide	PA + GF (CF)
	Sleeve	Polyammide	PA + GF (CF)
SITEX® FL	Hub	Steel	Stainless steel
	Flange	Polyammide + glass fiber	PA + GF (CF)

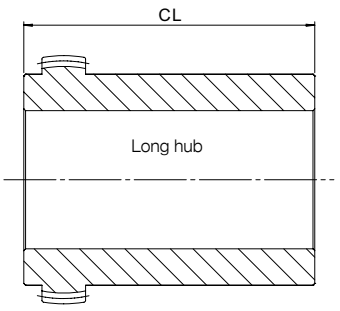
N.B.: For details contact the Technical Department.

2.1.1 SITEX® execution

SITEX® hubs are made, depending on size, in two executions, standard and long.
The only difference is the length of the hub. (TABLE 2.2 - SITEX® Dimensions).







Normal hub **Long hub**

Figure 2-1 - SITEX® Hubs

Table 2.2 - SITEX® Dimensions

SIZE	D	d	F (H7)		C	CL	b	a	h	L	f	p	W*	J*
			min	max										
14	40	24,5	8	14	23	30	4	6,5	37	50	M5	6	0,18	2.6
19	48	30	8	19	25	-	4	8,5	37	54	M5	6	0,24	5.4
24	52	35	11	24	26	50	4	7,5	41	56	M5	6	0,30	8.8
28	66	43	11	28	40	60	4	18,5	47	84	M8	10	0,73	31.2
32	76	50	14	32	40	60	4	17,5	48	84	M8	10	0,99	57.2
38	83	58	14	38	40	80	4	18	48	84	M8	10	1,20	87.7
42	92	65	14	42	42	110	4	18,5	51	88	M8	10	1,62	146.7
48	100	68	19	48	50	110	4	27	50	104	M8	10	1,79	186.9
65	142	96	19	65	70	140	4	35,5	73	144	M10	20	5,28	1054.2
80	175	124	-	80	90	-	6	46,5	93	186	M10	20	11,70	3677.4
100	210	152	36	100	110	-	8	63	102	228	M10	20	20,40	9574.2
125	270	192	45	125	140	-	10	78	134	290	M10	20	43,30	32939.7

*** = The values refer to the complete coupling with maximum hole diameter**
J = 10-5 kg · m²
W = kg
**** measures in mm**

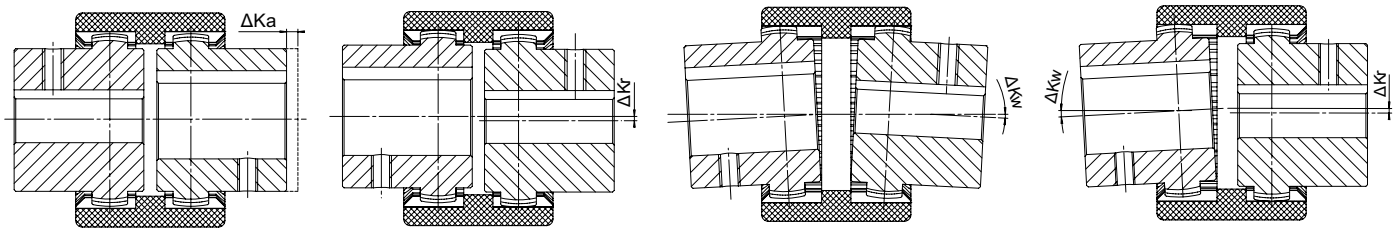
2.2.1 SITEX® sleeve performance

Table 2.3 - Sleeve performance

SIZE	T_{KN} [Nm]	T_{Kmax} [Nm]	T_{Kw} [Nm]	n max [rpm]
14	10	30	5	14000
19	16	48	8	11800
24	21	63	10,5	10500
28	45	135	22,5	8500
32	60	180	30	7600
38	81	243	40,5	6700
42	100	300	50	6000
48	142	426	71	5580
65	380	1140	190	4000
80	700	2100	350	3100
100	1210	3630	605	3000
125	2500	7500	1250	2100

2.2.2 SITEX® misalignment capability

The TABLE 2.4 - SITEX®: misalignment shows the value of the permissible misalignments.



Axial misalignments | **Angular misalignments** | **Radial misalignments** | **Angular and radial misalignments**

Figure 2-2 - SITEX®: misalignments

Table 2.4 - SITEX®: misalignments

SIZE	Axial misalignments ΔKa [mm]	Angular misalignments ΔKw [°]	Radial misalignments ΔKr [mm]
14	±1	±1	±0,3
19	±1	±1	±0,3
24	±1	±1	±0,3
28	±1	±1	±0,4
32	±1	±1	±0,4
38	±1	±1	±0,4
42	±1	±1	±0,4
48	±1	±1	±0,4
65	±1	±1	±0,6
80	±1	±1	±0,7
100	±1	±1	±0,8
125	±1	±1	±1,1

N.B.: Values valid under ambient temperature conditions of 20 °C and for speeds up to 1500 rpm.
For different conditions, contact our Technical Department.

To ensure the right lifetime of the coupling, pay attention to the alignment.

PRECAUTION!

In case of use in potentially explosive areas of group II with II 2GD and Group I M2 marking, only half of the above indicated misalignments is allowed. If these values are not complied with, the coupling is considered as deliberately damaged.

2.3 SITEX® NYLEX

SITEX® Nylex hubs are made of polyammide for light applications.
They are available for the following executions:

- CV: 2 components (1 sleeve including hub and 1 hub)
- C: 3 components (2 hubs e 1 sleeve)

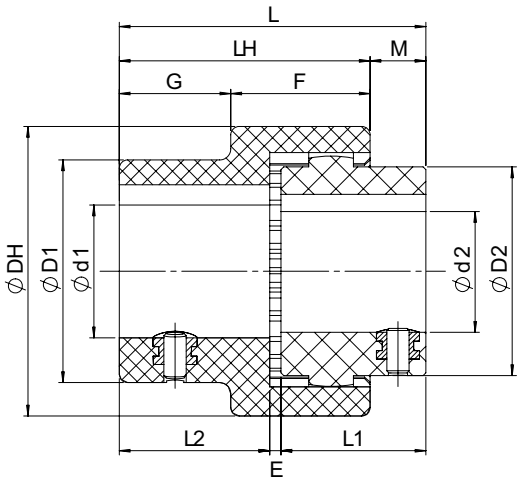


Figure 2-3 - SITEX® Nylex CV hub

Table 2.5 - SITEX® Nylex CV Dimensions

SIZE	d1		D1	d2		D2	DH	L1	L2	E	L	LH	M	F	G
	min	max		min	max										
14	6	14	25	6	14	26	40	23	23	2	48	40	8	23	17
19	14	19	31,5	14	19	40	48	25	25	2	52	42	9	23	19
24	10	24	37,5	10	24	40	52	26	26	2	54	45	10	25	20

*** measures in mm**

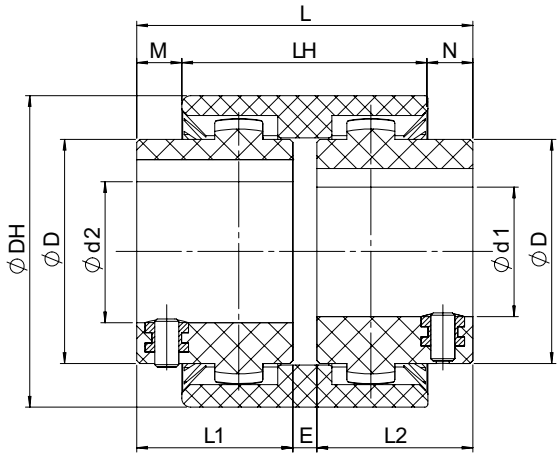


Figure 2-4 - SITEX® Nylex C hub

Table 2.6 - SITEX® Nylex C Dimensions

SIZE	d1 - d2		D	DH	L1	L2	E	L	LH	M	N
	min	max									
14	6	14	25	40	23	23	4	50	37	6,5	6,5
19	14	19	31,5	48	25	25	4	54	37	8,5	8,5
24	10	24	37,5	52	26	26	4	56	41	7,5	7,5

*** measures in mm**

2.3.1 SITEX® Nylex sleeve performance

Table 2.7 - SITEX® Nylex sleeve performance

SIZE	TKN [Nm]	TKmax [Nm]	TKW [Nm]	nmax [rpm]
14	5	10	2,5	6000
19	8	16	4	6000
24	12	24	6	6000

2.3.2 SITEX® Nylex misalignments capability

The TABLE 2.8 - SITEX® Nylex: misalignments shows the value of the permissible misalignments.

Table 2.8 - SITEX® Nylex misalignments

SIZE	Axial misalignments ΔKa [mm]	Angular misalignments ΔKw [°]	Radial misalignments ΔKr [mm]
14	±1	±1	±0,1
19	±1	±1	±0,1
24	±1	±1	±0,1

N.B.: Values valid under ambient temperature conditions of 20 °C and for speeds up to 1500 rpm.
For different conditions, contact our Technical Department.

To ensure the right lifetime of the coupling, pay attention to the alignment.

PRECAUTION!
In case of use in potentially explosive areas of group II with II 2GD and Group I M2 marking, only half of the above indicated misalignments is allowed. If these values are not complied with, the coupling is considered as deliberately damaged.

2.4 SITEX® FL

SITEX® FL couplings are designed to join a Diesel engine to a hydraulic pump through the flywheel.

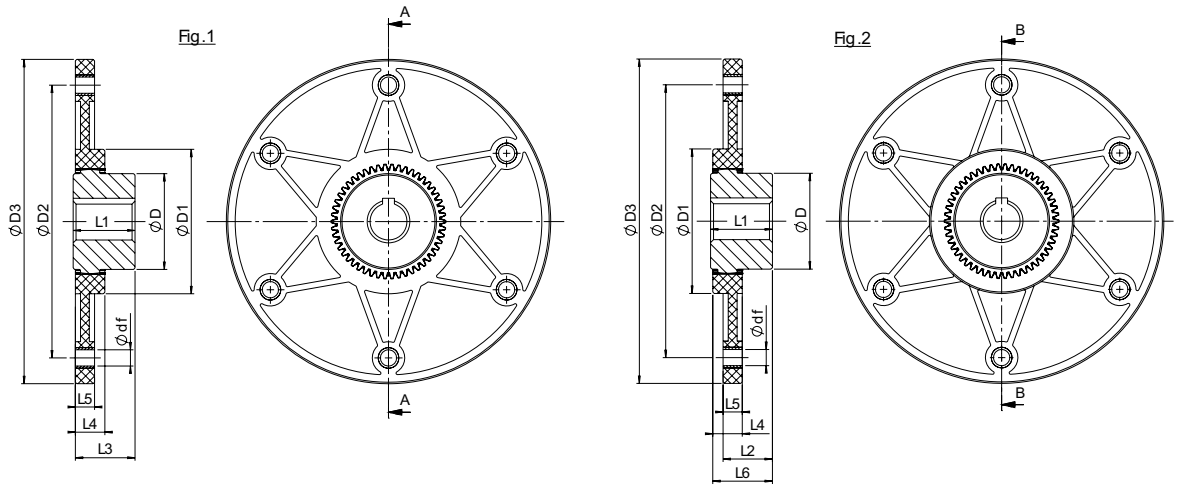


Figure 2-5 - SITEX® FL

Table 2.9 - SITEX® FL Dimensions

SIZE	FLANGE SAE MEASURE	bore max.	D2	D3	df x z	D	D1	L1	L2	L3	L4	L5	L6
42	6 ½"	42	200,02	215,9	9 x 6	65	100	42	33	42	20	13	40
	7 ½"		222,25	241,3	9 x 8								
	8"		244,47	263,52	11 x 6								
	10"		295,27	314,32	11 x 8								
48	6 ½"	48	200,02	215,9	9 x 6	68	100	50	41	50	20	13	48
	7 ½"		222,25	241,3	9 x 8								
	8"		244,47	263,52	11 x 6								
	10"		295,27	314,32	11 x 8								
48P	6 ½"	48	200,02	215,9	9 x 6	68	100	50	38	45	20	13	46
	7 ½"		222,25	241,3	9 x 8								
	8"		244,47	263,52	11 x 6								
	10"		295,27	314,32	11 x 8								
55	7 ½"	55	222,25	241,30	9 x 8	85	115	50	37	48	24	13	48
65	6 ½"	65	244,47	263,52	11 x 6	96	132	70	60	69	27	21	66
	7 ½"		295,27	314,32	11 x 8								
	8"		333,37	352,42	11 x 8								
65P	6 ½"	65	244,47	263,52	11 x 6	93	132	70	60	69	27	21	66
	7 ½"		295,27	314,32	11 x 8								
	8"		333,37	352,42	11 x 8								
80	11 ½"	80	333,37	352,42	11 x 8	124	170	90	78	87	30	21	87

*** measures in mm**

2.4.1 SITEX® FL sleeve performance

Table 2.10 - SITEX® FL sleeve performance

SIZE	TORQUE [Nm]			WEIGHTS / MOMENTS OF INERTIA							DYNAMIC TORSIONAL STIFFNESS* [x 103 Nm/rad]			
				HUB		SAE FLANGE								
	TKN	TKmax	TKw			6-1/2"	7-1/2"	8"	10"	11-1/2"	0,25 TKN	0,50 TKN	0,75 TKN	1,00 TKN
42	240	600	120	Kg	0,68	0,39	0,455	0,565	0,8	-	33	78	110	130
				Kgm²	0,0006	0,003	0,004	0,006	0,011	-				
48	250	620	125	Kg	0,75	0,4	0,52	0,5	0,75	-	33	78	110	130
				Kgm²	0,0007	0,003	0,004	0,006	0,011	-				
48P	310	780	155	Kg	0,85	0,4	0,52	0,5	0,75	-	38	88	125	148
				Kgm²	0,0007	0,003	0,004	0,006	0,011	-				
55	500	1250	250	Kg	1,4	-	0,45	-	-	-	50	140	175	200
				Kgm²	0,0019	-	0,0035	-	-	-				
65	660	1650	330	Kg	2,4	-	-	0,8	0,93	1,08	58	142	205	250
				Kgm²	0,005	-	-	0,009	0,015	0,023				
65P	800	1950	400	Kg	2,45	-	-	0,8	0,93	1,08	76	185	270	330
				Kgm²	0,005	-	-	0,009	0,015	0,023				
80	1300	3100	650	Kg	5,1	-	-	-	-	1,13	190	420	590	710
					0,015	-	-	-	-	0,023				

*** The dynamic torsional stiffness values are calculated at 60 °C and considering a relative damping equal to 0.4**

2.4.2 SITEX® FL misalignments capability

The Table 2.11 - SITEX® FL: misalignments shows the value of the permissible misalignments.

Table 2.11 - SITEX® FL: misalignments.

SIZE	Axial misalignments ΔKa [mm]	Angular misalignments ΔKw [°]	Radial misalignments ΔKr [mm]
42	2	1°	0,2
48	2	1°	0,2
48P	1	1°	0,2
55	1	1°	0,2
65	2	1°	0,3
65P	1	1°	0,2
80	2	1°	0,3

N.B.: Values valid under ambient temperature conditions of 20 °C and for speeds up to 1500 rpm.
For different conditions, contact our Technical Department.

To ensure the right lifetime of the coupling, pay attention to the alignment.

PRECAUTION!
In case of use in potentially explosive areas of group II with II 2GD and Group I M2 marking, only half of the above indicated misalignments is allowed. If these values are not complied with, the coupling is considered as deliberately damaged.

2.1.6 Hubs machining

Any machining of the hubs must not compromise its functionality.
As for the maximum diameter of the bore that can be achieved, please refer to the table in the catalogue.
The bore machining must be carried out in accordance with the concentricity values with the outer diameter and the perpendicularity values between the hole and the flat internal surface of the hub with a degree of tolerance IT8.

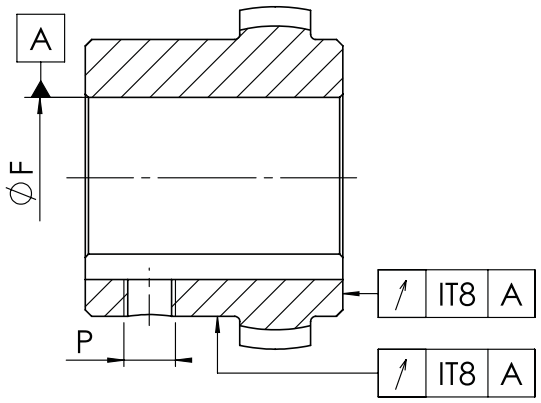


Figure 2-6 - Processing tolerance

It is important not to exceed, for all the materials of which the hub is composed, the maximum value of the hole provided by SIT and reported in the technical catalogue; if this value is not respected the coupling may break, causing serious dangers during the rotation.

DANGER!
The maximum bore allowed and indicated in the catalogue table must not be exceeded. Higher values could cause breakage and danger around the machine.
If the hub bore is machined by the customer, the concentricity and radial oscillation values specified by SIT must be respected.
Carefully align the hubs when machining the finished bore.

CAUTION!
The customer is responsible for all the machining performed.
SIT assumes no liability arising from incorrect machining or for failure to observe the instructions contained in this manual and in the technical catalogue.

PRECAUTION!
Except for the machining of the hole, the seat of the keyway and the threaded bore for the setscrew in accordance with the values shown in the technical catalogue, any machining of couplings that must be used in hazardous areas must obtain the express permission of SIT.
The customer must provide SIT with a technical drawing which shows the machining to be carried out. It is the responsibility of SIT to evaluate and approve it.
Any spare parts for these couplings must be standard hubs unbored or with pilot bore marked with the ATEX marking.

2.5.1 Setscrew position

SIT supplies flathead setscrews class 45H according to DIN 913 for fastening the hub on the shaft.
For the position and size of the setscrews, refer to TABLE 2.12 - SITEX® - SITEX® Nylex: Setscrew position and to the drawing of FIGURE 2-7 - Setscrew position.

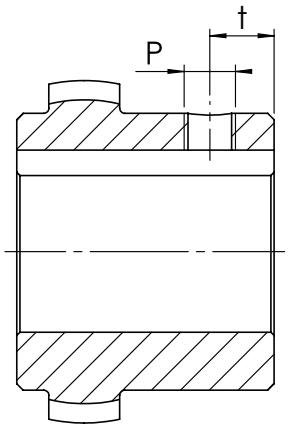


Figure 2-7 - Setscrew position

Table 2.12 - SITEX® - SITEX® Nylex: Setscrew position

SIZE	THREADING	DISTANCE [mm]	TIGHTENING TORQUE [Nm]
14	M5	6	2*
19	M5	6	2*
24	M5	6	2*
28	M8	10	10
32	M8	10	10
38	M8	10	10
42	M8	10	10
48	M8	10	10
65	M10	20	17
80	M10	20	17
100	M10	20	17
125	M10	20	17

*** for SITEX® Nylex the tightening torque is 0.7 Nm**

3 Storage

The couplings must be stored in covered and dry places.
It is important that the storage areas are protected against light sources, ultraviolet lamps, mercury vapour and high electrical voltage sources.
The moisture percentage must be maintained below 65%.
In good storage conditions the characteristics of the spiders can remain unchanged for up to 6 years.

4 Assembly

The SITEX® coupling is supplied unassembled, therefore it is recommended to check the presence of all the components and check that they match the application requirements.
About the hubs, the size is marked on the lateral surface.
The size of the sleeve is marked on one of the two front surface.

ATTENTION!
Install the hubs using only with the spider provided by SIT S.p.A. and of the same size.
SIT S.p.A. assumes no liability for malfunctions and/or failures due to incorrect assembly or that does not comply with the instructions provided in this Manual.

4.1 SITEX® assembly

Components:
- 2 steel hubs
- 1 sleeve in polyammide
- 2 setscrews (for specifications and position, refer to the TABLE 2.12 - SITEX® - SITEX® Nylex: Setscrew position

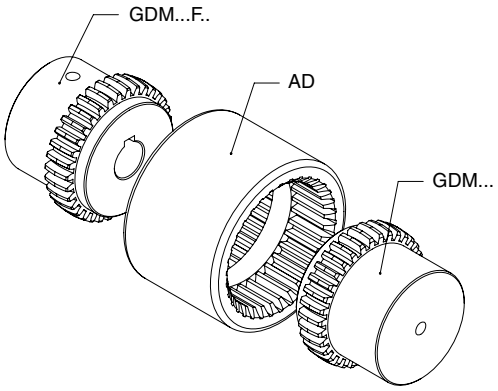


Figure 4-1 - SITEX® Couplings

ATTENTION!
Before assembling SIT recommends to check that the following parts are matching: shafts diameters, hubs bores, keyways size and their seat on the hubs.

- Install the hubs on the driving and driven shafts (FIGURE 4-2)
- Insert the sleeve into one of the two hubs
- Move the motor and the driven equipment up to get the dimension **b** (FIGURE 4-2 e TABLE 4.1)
- If the motor and driven machine are already firmly assembled, move axially the hubs on the shafts to adjust the **b** dimension
- Set the hubs using the setscrews, tightening according to TABLE 2.12 - SITEX® - SITEX® Nylex: Setscrew position

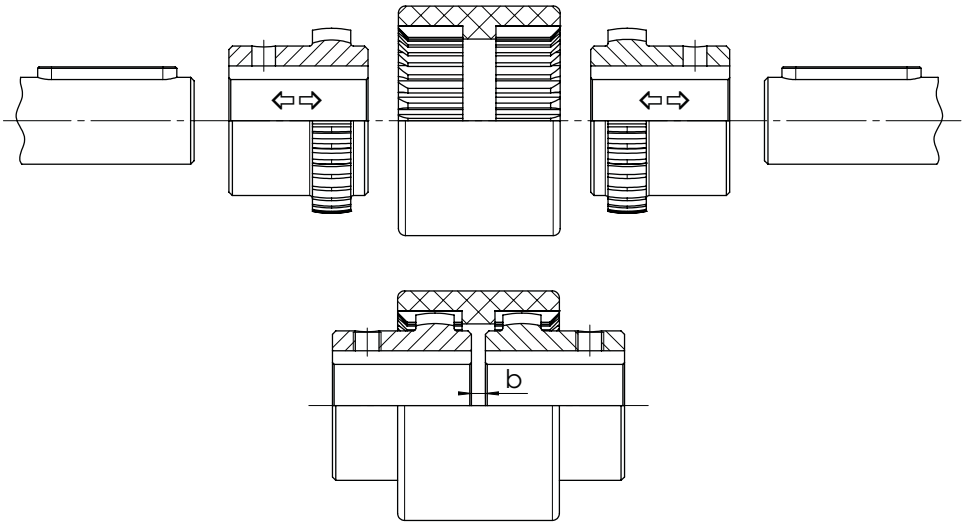


Figure 4-2 - SITEX®: mounting

Table 4.1 - b Value

SIZE	b VALUE [mm]
14	4
19	4
24	4
28	4
32	4
38	4
42	4
48	4
65	4
80	6
100	8
125	10

PRECAUTIONS!
Be very careful in the dangerous areas.

DANGER!
Touching overheated hubs may causes burns. We recommend wearing safety gloves.

CAUTION!
For the installation make sure that the distance M is maintained in order to ensure that the sleeve can be moved axially. If this advice is disregarded, the device could be damaged.

4.2 SITEX® Nylex assembly

4.2.1 CV execution (2 components)

Components:
- 1 hub in polyammide
- 1 sleeve including hub in polyammide

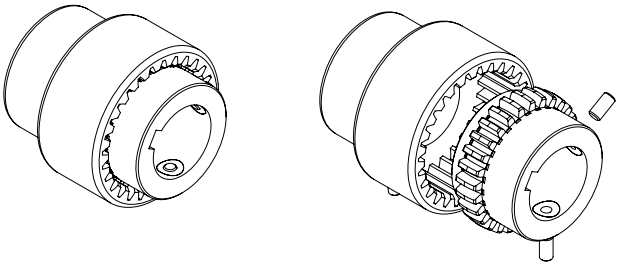


Figure 4-3 - SITEX® Nylex CV execution couplings

- Install the hub and the sleeve including the hub on the driving and driven shafts (see figure below)
- Move the motor and the driven equipment up to get the dimension E see FIGURE 4-4 - SITEX® Nylex execution CV: mounting and TABLE 4.2)
- Set the hubs using the setscrews, tightening according to TABLE 2.12 - SITEX® - SITEX® Nylex: Setscrew position

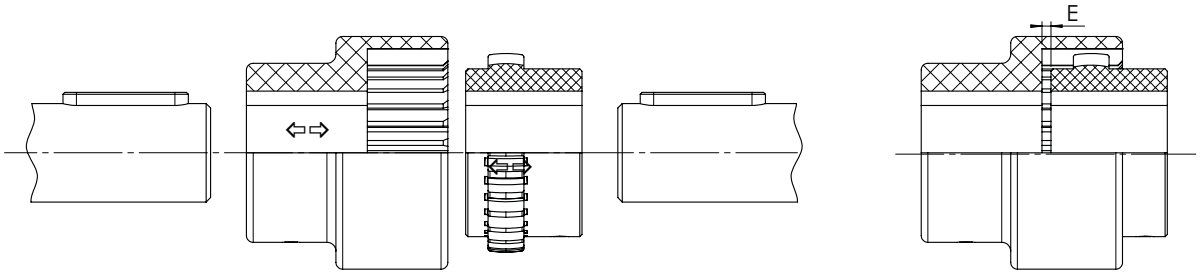


Figure 4-4 - SITEX® Nylex CV execution couplings mounting

Table 4.2 - SITEX® Nylex CV execution: E Value

SIZE	E VALUE [mm]
14	2
19	2
24	2

4.2.2 C execution (3 components)

Components:
- 2 hubs in polyammide
- 1 sleeve including hub in polyammide

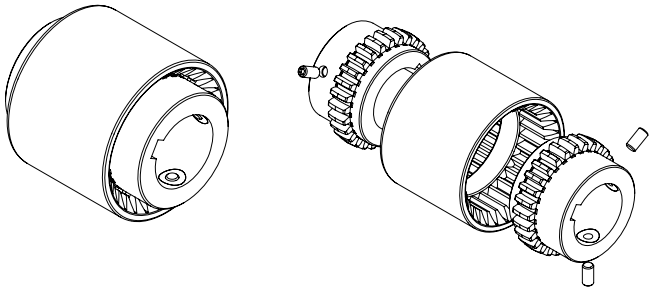


Figure 4-5 - SITEX® Nylex C execution coupling

- Install the hubs on the driving and driven shafts (FIGURE 4-2)
- Insert the sleeve into one of the two hubs
- Move the motor and the driven equipment up to get the dimension E (see FIGURE 4-6 e TABLE 4.3)
- If the motor and driven machine are already firmly assembled, move axially the hubs on the shafts to adjust the E dimension
- Set the hubs using the setscrews, tightening according to TABLE 2.12 - SITEX® - SITEX® Nylex: Setscrew position

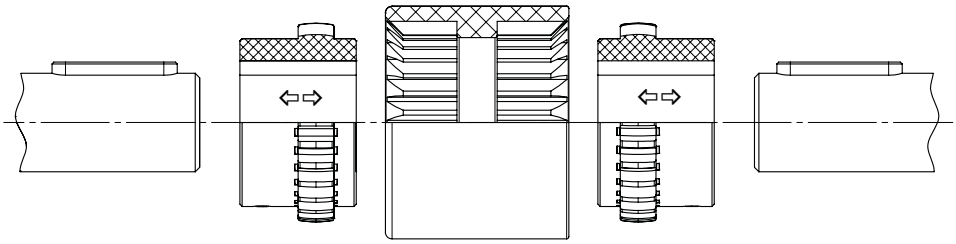


Figure 4-6 - SITEX® Nylex C execution coupling - mounting

Table 4.3 - SITEX® Nylex C execution: E Value

SIZE	E VALUE [mm]
14	4
19	4
24	4

PRECAUTIONS!
Be very careful in the dangerous areas.

CAUTION!
For the installation make sure that the distance M is maintained in order to ensure that the sleeve can be moved axially. If this advice is disregarded, the device could be damaged.

4.3 SITEX® FL coupling assembly

Components:
- 1 flange in polyammide
- 1 hub in steel
- 1 setscrew

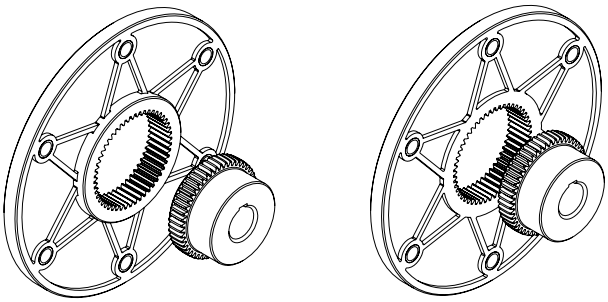


Figure 4-7 - SITEX® FL coupling

- Center the flange into the flywheel and the set with screws DIN 912 class 8.8
- Mount the hub on the pump shaft
- Move the motor and the driven equipment up to get alignment betweend the teeth of hub and flange, using the dimensions L3-L4 as reference (FIGURE 4-8 - SITEX® FL: mounting e TABLE 2.9)
- Set the hubs using the setscrews, tightening according to TABLE 2.12 - SITEX® - SITEX® Nylex: Setscrew position
- In case of hubs with clamping, respect the tightening torque of the TABLE 4.4

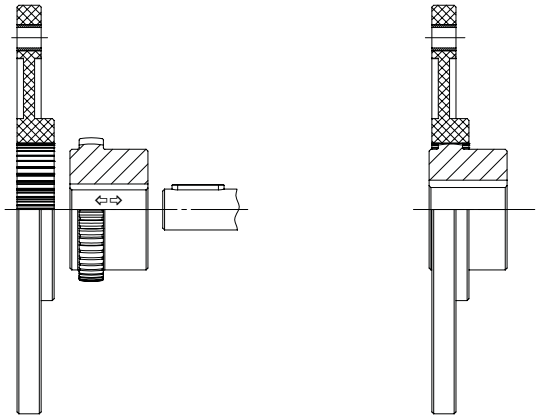


Figure 4-8 - SITEX® FL: mounting

Table 4.4 - Hubs with clamping: tightening torque

SIZE	Screw	Ms
42-48	M 10	49 Nm
55-65	M 12	86 Nm
80	M 16	355 Nm

5 ATEX Annex

This Annex is an integral part of the sale of the SIT SITEX® coupling according to the ATEX Directive 2014/34/EU, contains the Declaration of Conformity, and, therefore, is delivered together with the coupling.
The User and Maintenance Manual, may be downloaded in electronic format on the website www.sitspa.com.

The analysis of the coupling machining process was carried out by SIT S.p.A.

ATTENTION!
These instructions must be complied with in addition to the warnings provided in the technical specifications.

5.1 ATEX zone classification

Below is the cross reference between hazardous zones, substances and categories according to the ATEX Directive 2014/34/EU.

Table 5.1 - ATEX zone classification

SUBSTANCE	ZONE	ZONE DESCRIPTION	ATEX CATEGORY/MARKING	EPL
GASES, VAPOURS, MISTS	Zone 0	A place in which an explosive atmosphere, consisting of a mixture with air of dangerous substances in the form of a gas, vapour or mist, is present continuously or for long periods or frequently (>1000 hours/year).	1G	Ga
	Zone 1	A place in which an explosive atmosphere, consisting of a mixture of air of dangerous substances in the form of a gas, vapour or mist, is likely to occur in normal operation occasionally (10 - 1000 hours/year).	2G or 1G	Gb or Ga
	Zone 2	A place in which an explosive atmosphere, consisting of a mixture of air of dangerous substances in the form of gas, vapour or mist, is not likely to occur in normal operation but, if it does occur, will persist for a short period only (<10 hours/year).	3G, 2G or 1G	Gc, Gb or Ga
DUSTS	Zone 20	A place in which an explosive atmosphere, in the form of a cloud of combustible dust in air is present continuously or for long periods or frequently (>1000 hours/year).	1D	Da
	Zone 21	A place in which an explosive atmosphere, in the form of a cloud of combustible dust in air, is likely to occur in normal operation occasionally (10 - 1000 hours/year).	2D or 1D	Db or Da
	Zone 22	A place in which an explosive atmosphere, in the form of a cloud of combustible dust in air, is not likely to occur in normal operation but, if it occurs, will persist for a short period only (<10 hours/year).	3D, 2D or 1D	Dc, Db or Da

5.2 ATEX equipment classification

Below is the classification of equipment and protection systems according to the ATEX Directive 2014/34/EU.

Table 5.2 - ATEX groups and categories classification

GROUP	EPL	CATEGORY	RISK LEVEL	PROTECTION CHARACTERISTICS	OPERATING CONDITIONS
GROUP I (mining industry)	Ma	M1	Very high	Two independent means of protection or safety ensured even in the event of two faults occurring independently of each other.	The equipment remains connected to the power supply and in operation even in the presence of explosive atmospheres.
	Mb	M2	High	Suitable for normal operation and for severe operating conditions. Where appropriate, also suitable for frequent disturbances or defects which normally need to be taken into account.	The equipment is disconnected from the power supply in the presence of explosive atmospheres.
GROUP II GAS (industry, except mining industry)	Ga	1	Very high	Two independent means of protection or safety ensured even in the event of two faults occurring independently of each other.	The equipment remains connected to the power supply and in operation in zones 0, 1, 2.
	Gb	2	High	Suitable for normal operating conditions and for frequent disturbances or devi- ces in which faults normally need to be taken into account.	The equipment remains connected to the power supply and in operation in zones 1, 2.
	Gc	3	Normal	Suitable for normal operation.	The equipment remains connected to the power supply and in operation in zones 2.
GROUP III DUSTS (industry, except mining industry)	Da	1	Very high	Two independent means of protection or safety ensured even in the event of two faults occurring independently of each other.	The equipment remains connected to the power supply and in operation in zones 20, 21, 22.
	Db	2	High	Suitable for normal operating conditions and for frequent disturbances or devices in which faults normally need to be taken into account.	The equipment remains connected to the power supply and in operation in zones 21, 22
	Dc	3	Normal	Suitable for normal operation.	The equipment remains connected to the power supply and in operation in zones 22.

5.3 Appropriate use of SITEX® couplings in ATEX zones

The analysis carried out by SIT S.p.A. led to the conclusion that the couplings can be used in the presence of flammable gases, vapours, mists or combustible dusts according to the following scheme:

- Gases, vapours or mists in zones 1 and 2 (not suitable for zone 0)
- Dusts in zones 21 and 22 (not suitable for zone 20)
- Equipment in group I (mining) and categories M2 (not suitable for category M1)
- Equipment in group II and categories 2 and 3 (not suitable for category 1)
- Explosion group IIC, including groups IIA and IIB
- Equipment in group III (dust) and categories 2 and 3 (not suitable for category 1)
- Explosion group IIIC, including groups IIIA and IIIB

5.3.1 Gas temperature classes for Group II equipment and maximum surface temperature for equipment of Group III

Table 5.3 - Gas temperature classes

TEMPERATURE CLASS	MAXIMUM SURFACE TEMPERATURE [°C]	AMBIENT OR OPERATING TEMPERATURE, Ts [°C]
T4	120	**-30 °C < Ta < 100 °C**
T5	100	**-30 °C < Ta < 80 °C**
T6	80	**-30 °C < Ta < 60 °C**

The table indicates the temperature above which the gases, belonging to the respective class, ignite.
The ambient or operating temperature of the couplings was determined by SIT according to the characteristics of the coupling and taking into account a safety factor equal to 20 K.
For every class of temperature, there is a safety factor of 5 K.
The maximum surface temperature of 110 °C refers to the applications with potential deposit of inflammable dust.
The environment and operating temperature are limited to 90 °C due to the limits of the compound of the sleeves and the flanges.

5.3.2 Temperature classes for Group I equipment

Couplings mounted on Group I Category M2 equipment can operate in environments with the following temperature range:

-30 °C < Ta < 100 °C

The coupling is **not** suitable for Category M1 equipment.

5.4 Marking

SIT SITEX® couplings are marked as required by Directive ATEX 2014/34/EU for equipment operating in zones classified for the presence of a potential hazardous atmosphere.

The marking is indelible and positioned, at SIT's discretion, in a suitable area of the hub surface.

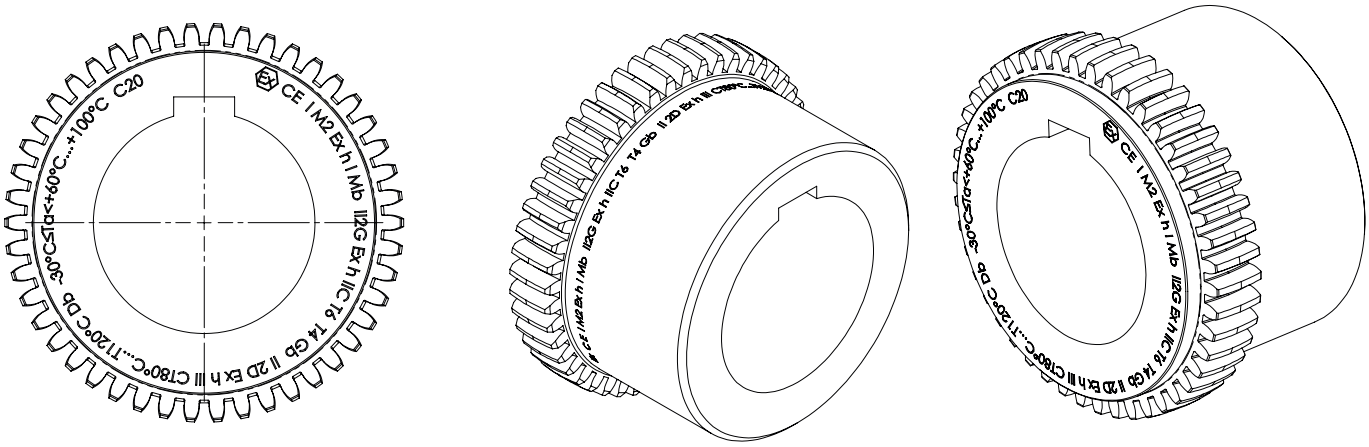


Figure 5-1 - ATEX marking

5.4.1 Complete marking

I M2 Ex h I Mb
II 2G Ex h IIC T6...T4 Gb
II 2D Ex h IIIC T80 °C...T120 °C Db
-30 °C ≤ Ta < +60 °C...+100 °C

SYMBOL	DESCRIPTION
I/II	Group (I mining industry, II surface machine)
2	Category 2 (zone 1 / zone 21)
G	Explosive atmosphere with gases, vapours or mists
D	Explosive atmosphere with dust
Ex h	Type of protection - Constructional safety
IIC	Explosion group for gases
IIIC	Explosion group for dusts
T6...T4	Temperature class (gas)
T80...T110	Maximum surface temperature (dusts)
Mb, Gb, Db	EPL
Ta	Ambient and operating temperature range

The line regarding gases shows the temperature classes and the related admissible ambient temperature range, given the coupling characteristics and a safety factor of 20 K.

5.4.2 Compact marking

Where the size of the coupling does not allow complete marking, the Directive allows a reduced version which refers to this manual for its comprehension.

I M2 / II 2GD Ex h X

The letter **X** refers to this manual which includes a summary table of the temperature class and the resulting maximum permissible ambient temperature that must be at least 20 K less, in accordance with the elastic spider's ability to resist.

5.5 Hub machining in ATEX environment

The machining of the bore, the seat of the keyway and the threaded bore for the fixing screw must follow the instructions provided in the UNI-ISO 2768 standard. Any other machining on couplings to be used in hazardous zones must obtain the express consent of SIT. The customer must provide SIT with a technical drawing showing the machining to be carried out. It is the responsibility of SIT to evaluate and approve it.

The spare parts could have a pre-bore or a machined bore, depending on the size, and the ATEX marking.

5.6 Sleeve check

The sleeve must undergo periodic checks for wear.

The first check must be made after 2000 hours of operation or after 3 months from the start of use.
The next check should be made after 4000 hours or 12 months, provided that the first inspection did not show excessive wear values that led to replacement of the sleeve.

The check is performed measuring the torsional backlash between the teeth of hubs and sleeve.

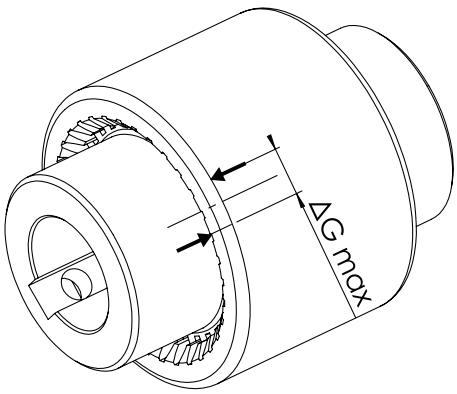


Figure 5-2 - Sleeve check

CAUTION!
To make the check of the torsional backlash, block the motor to avoid automatic and unintentional starts.

Measure the torsional backlash according to the following scheme:
- Block the sleeve
- Rotate the motor hub in the opposite direction of the transmission rotation, taking care not to generate an axial movement of the sleeve
- Mark this position on the hub and on the sleeve
- Rotate the motor hub along the transmission direction and measure the torsional backlash G

If the measured value G is higher than that indicated in the G VALUE FOR CHECKING TORSIONAL BACKLASH, it is recommended to replace the sleeve with an equivalent one.

ATTENTION!
Replace the sleeve with an equivalent one of the same size.
SIT S.p.A. does not accept any liability for incorrect replacements.
For information on correct assembly, please refer to the User and Maintenance Manual.

Table 5.4 - G value for checking torsional backlash

SIZE	G VALUE [mm]
14	0.8
19	0.8
24	1
28	1
32	1
38	1
42	1
48	1
65	1.4
80	1.6
100	1.8
125	2

5.7 Internal manufacturing check

Before marking and placing on the market, SITEX® transmission couplings have been subjected to the checks and inspections provided for by the internal manufacturing system and by the company's quality system.
SIT S.p.A. has in fact obtained Certification of the Quality Management System according to international UNI EN ISO 9001 standard.

5.8 Starting

ATTENTION!
All operations must be performed by trained and qualified personnel; different or additional uses to those envisaged in this User and Maintenance Manual are not permitted.

Before placing the coupling into service, check:
- The tightening torque of the hub screws.
- The correct alignment has been achieved.
- The correct distance between the hubs.

Working in hazardous zones, tightening of the screws must be made even more securely by using Loctite (medium strength).

The user must periodically check, depending on the type of use and the substances used:
- the state of wear and correct functioning of the coupling
- the presence of vibrations and/or noise: in this case, the user must identify the causes and contact the manufacturer

For use in zones classified for the presence of combustible dust, ensure regular cleaning in order to avoid the formation of dust layers; for this purpose, use equipment suitable for the classification of the zone.
This operation must be performed with the elements tightly coupled and in the absence of electrical voltage.
Ensure routine maintenance, according to a frequency to be determined according to the operating conditions, environment and temperature. Nevertheless, residual risks can be present during normal operation of the coupling, if:
- it is not subjected to the normal maintenance plans provided from the User and Maintenance Manual
- it is not used as provided in the design specifications

Different or additional uses not included in the technical specification are not permitted and SIT shall not be liable for any damage related to unauthorised uses.

All maintenance operations must be carried out as indicated in the User and Maintenance Manuals: no modifications are permitted without the written consent of SIT.

Unauthorised replacements or those using non-original parts invalidate the safety of SITEX® couplings; all spare parts must be obtained from SIT.

5.8.1 Protection devices for couplings in hazardous atmospheres

Protection devices for couplings against unintended contact must be firmly attached.
Couplings for use in hazardous atmospheres must be protected by sturdy guards (if possible made of stainless steel) against falling objects. They must be able to be easily opened and the aperture size must not exceed the following limits:

- lateral aperture: 8 mm
- upper aperture: 4 mm

The minimum distance between the mechanical guard and the rotating parts must be equal to 5 mm in all directions.

The guard must be electrically conductive within the range allowed by law and can only be removed after having isolated the machine from the electrical supply.
Those in aluminium and NBR can be used between the pump and the electric motor only if the magnesium, titanium and zirconium content is less than 7,5%.

5.8.2 Electrical continuity

SITEX® couplings must be installed and maintained in accordance with the standards and rules of good practice for classified environments against the risk of explosion due to gases, vapours and dusts.

CAUTION!
SITEX® couplings must not be insulated from the earth; ensure that connection of the couplings with the earth is always guaranteed over time.

The electrical continuity between the two metal parts of SITEX® couplings is ensured by the conductivity of the components on which it is mounted (for example motor-pump).
The electrical resistance, measured between the various metallic parts of the coupling and the point of reference, must be verified at the time of initial installation and, subsequently, during periodic checks.

5.9 Declaration of Conformity

DECLARATION OF CONFORMITY

We

SIT S.p.A.
Viale A. Volta 2
20090 Cusago (MI)

we declare under our sole responsibility that the product:

SITEX® Coupling

to which this declaration refers,
is in conformity with the following European Directive

Directive ATEX 2014/34/UE

The conformity is under observance of the following standards or standards documents:

EN ISO 80079-36:2016 EN ISO 80079-36:2016

The technical documentation is deposited with the

DNV GL Presafe AS
Veristasveien 3
1363 HOVIK
Norway

Cusago, 04/03/2020

SIT S.p.A.
Riccardo Scaglia
Amministratore Delegato