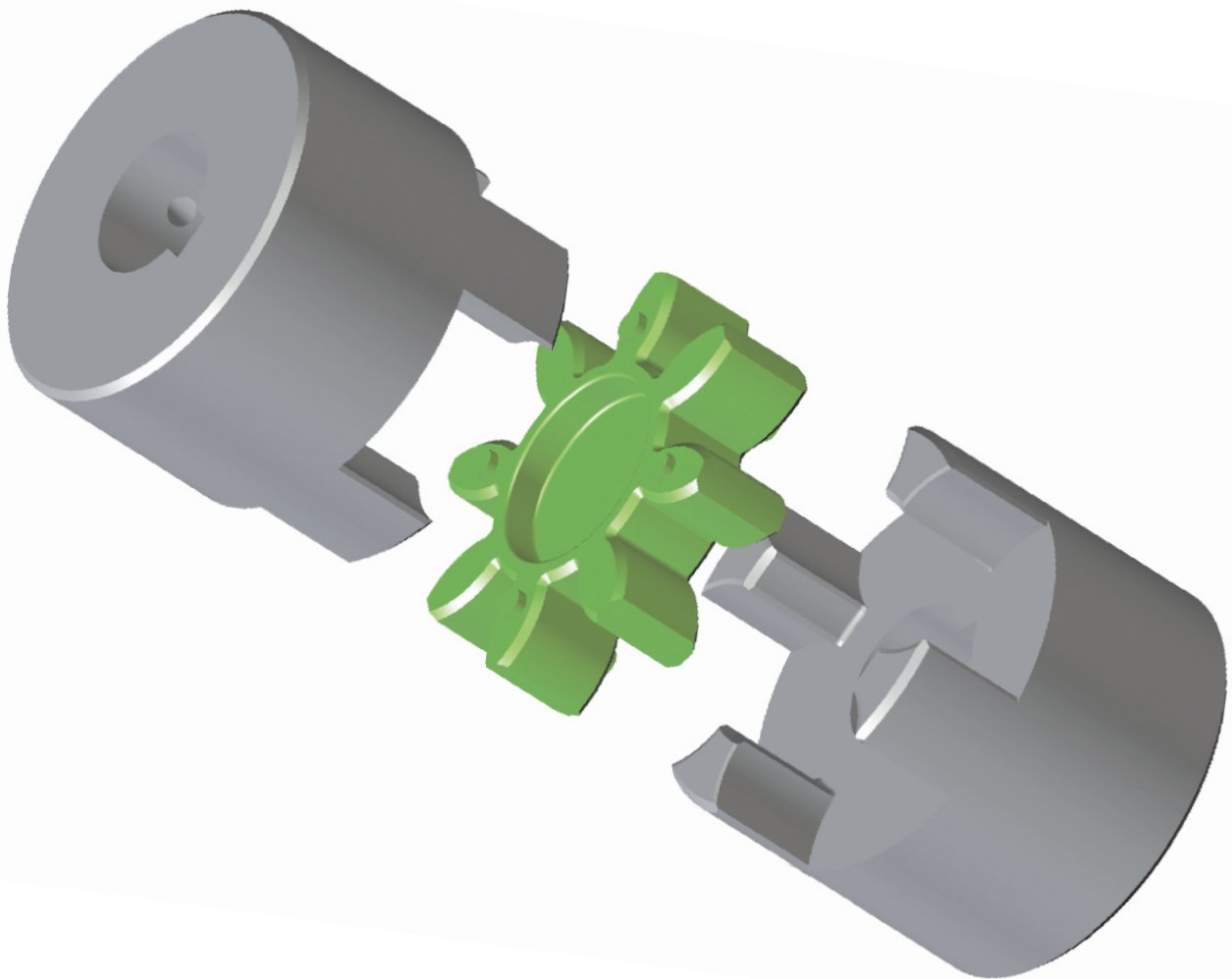


TRASCO® ES Couplings

HAJTASTECHNIKA  hu

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.

TRASCO® ES 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 TRASCO® ES 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 User 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

Danger of injury to persons.



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 TRASCO® ES couplings

TRASCO® ES coupling are a flexible and constant-velocity coupling that ensures maximum performance with same overall dimensions as TRASCO®. Moreover, it can ensure the maximum performance backlash free. It is very compact and allows a safe transmission of motion between the motor and the driven machine, absorbing shocks and torsional vibrations. It also allows, through the elastic deformation of the elastic spider, to compensate for angular, radial and axial misalignments due to small variations in length of the shafts. The hub teeth and spider profiles are designed so as to obtain a uniform pressure distribution.

The elastic element is subject only to compression stress and does not induce any axial or radial stresses, providing the TRASCO® ES coupling with great load capacity and durability. The coupling can be assembled both horizontally and vertically, and it correctly tolerates load variations and reversals.



The TRASCO® ES 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 Hubs

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The TRASCO® ES coupling consists of two metal hubs that have cutouts with circular sections which contain the teeth of the elastic spider. The tolerances of the machining give and precharge during the mounting to have a backlash free transmission.

The materials of standard hubs are aluminium and steel, depending on the types and sizes.

For details see [TABLE 2.1 - TRASCO® ES: hubs material](#).

TABLE 2.1 - TRASCO® ES: hubs material

EXECUTION	SIZE	STANDARD MATERIAL		OPTIONAL MATERIALS	
		HUB	LOCKING RING (GESA ONLY)	HUB	LOCKING RING (GESA ONLY)
GESP/GESF	up to 38/45	Aluminum	-	Steel / Stainless Steel	-
	from 42	Steel	-	Stainless Steel / Aluminum	-
GESM/GESMC	up to 38/45	Aluminum	-	Steel / Stainless Steel	-
	from 42	Steel	-	Stainless Steel / Aluminum	-
GES2M	all	Aluminum	-	Steel / Stainless Steel	-
GESA	up to 38/45	Aluminum	Steel	Steel / Stainless Steel	Aluminum Aluminum
	from 42	Steel	Steel	Stainless Steel/ Aluminum	Alluminio
GESA	all	Aluminum	-	Steel / Stainless Steel	-

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

2.1.1 TRASCO® ES hubs - finished bore executions (GESP/GESF)

They are available in 2 version:

- **GESP**: solid hub
- **GESF**: finished bore hub

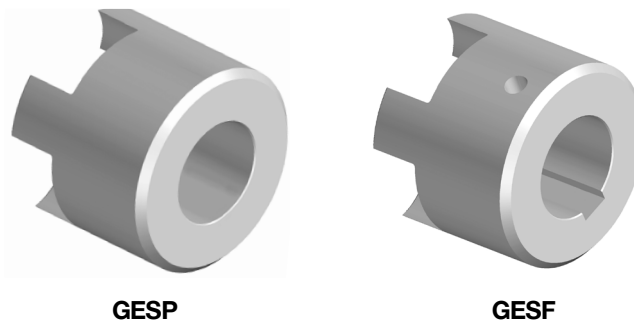


Figure 2-1 - TRASCO® ES GESP and GESF HUBS

Depending on sizes, there are 2 different way of fixing to the shaft: (for details see the [FIGURE 2-2](#) and [TABLE 2.2 - TRASCO® ES: GESP AND GESF Dimensions](#)):

- 2 setscrews at 120° (Fig. 1)
- Seat of the keyway and setscrew (Fig. 2)

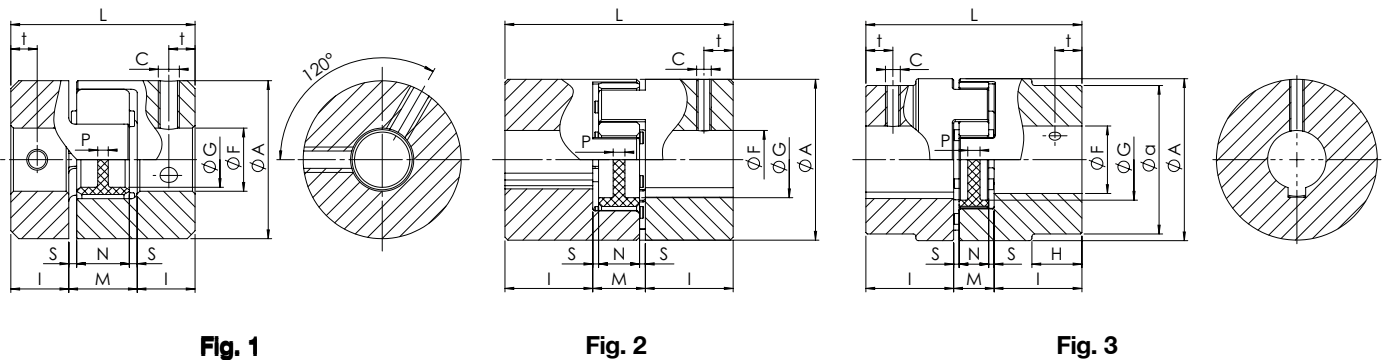


Figure 2-2 - TRASCO® ES: GESP AND GESF Dimensions

Table 2.2 - TRASCO® ES: GESP and GESF Dimensions

SIZE	F _{min}	F _{max}	C	Ms****	HUB		rpm	A	G	L	I	M	N	S	P	t	Fig.
					W**	J***											
ALUMINUM HUB																	
7	3	7	M3	0,3	0,003	0,085	40000	14	-	22	7	8	6	1	6	3,5	1
9	4	10	M3	0,3	0,008	0,48	28000	20	7,2	30	10	10	8	1	2	5	1
12	4	12	M4	1,5	0,015	1,5	22000	25	8,5	34	11	12	10	1	3	5	2
14	4	16	M4	1,5	0,019	2,7	19000	30	10,5	35	11	13	10	1,5	2	5	2
19/24	6	24	M5	2	0,066	20,4	14000	40	18	66	25	16	12	2	3,5	10	2
24/28	8	32	M5	2	0,140	74,5	10600	55	27	78	30	18	14	2	4	10	2
28/38	10	38	M6	4	0,253	200,3	8500	65	30	90	35	20	15	2,5	5,2	15	2
38/45	12	45	M8	10	0,455	400,6	7100	80	38	114	45	24	18	3	5,6	15	2
STEEL HUB																	
42	14	55	M8	10	2,000	2246	6000	95	46	126	50	26	20	3	5,6	20	2
48	20	60	M8	10	2,520	3786	5600	105	51	140	56	28	21	3,5	6	25	2
55	25	70	M10	17	4,100	9986	5000	120	60	160	65	30	22	4	9	20	2
65	25	80	M10	17	5,900	18352	4600	135	68	185	75	35	26	4,5	8,3	20	2
75	30	95	M10	17	6,900	27402	3700	160	80	210	85	40	30	5	8,3	25	3

* measures in mm
 ** weight in kg
 *** Moment of inertia in 10⁻⁶ kg · m²

**** tightening torque in Nm



Hubs just with bore and without setscrews are not suitable for potentially explosive atmospheres.

2.1.2 TRASCO® ES hubs - clamping executions (GESM-GESMC)

TRASCO® ES hubs with clamping execution GESM (GESMC in compact version) allow a fast and safe fixing without any gap between hub and shaft. Available in 2 versions:

- Cylindrical bore (GESM or GESMC)
- Bore and keyway (GESM...C or GESMC...C)

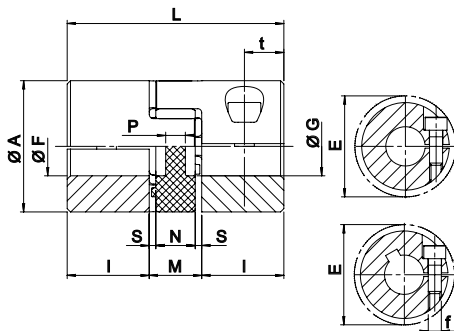


Fig. 1

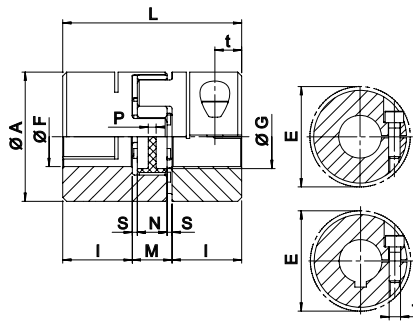


Fig. 2

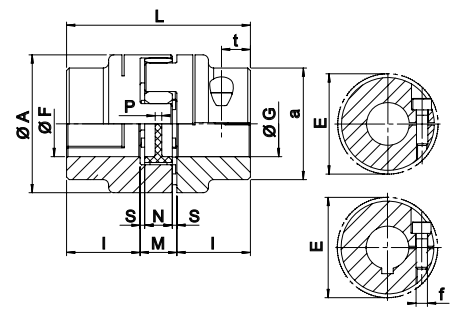


Fig. 3

Figure 2-3 - TRASCO® ES - GESM

Table 2.3 - TRASCO® ES GESM Dimensions

SIZE	Fmin	Fmax	C	Ms****	HUB		rpm	A	G	L	I	M	N	S	P	t	E	Fig.
					W**	J***												
ALUMINUM HUB																		
7	3	7	M2	0,35	0,003	0,085	40000	14	-	22	7	8	6	1	6	4	15	1
9	4	10	M2,5	0,75	0,007	0,42	28000	20	7,2	30	10	10	8	1	2	5	23,4	1
12	4	12	M3	1,4	0,015	1,4	22000	25	8,5	34	11	12	10	1	3	5	27	1
14	6	16	M3	1,4	0,018	2,6	19000	30	10,5	35	11	13	10	1,5	2	5,5	32,2	1
19/24	10	24 ⁽¹⁾	M6	11	0,071	18,1	14000	40	18	66	25	16	12	2	3,5	12	45,7 ⁽¹⁾	1
24/28	10	32	M6	11	0,156	74,9	10600	55	27	78	30	18	14	2	4	12	57,5	2
28/38	14	38	M8	25	0,240	163,9	8500	65	30	90	35	20	15	2,5	5,2	13,5	72,6	2
38/45	19	45	M8	25	0,440	465,5	7100	80	38	114	45	24	18	3	5,6	16	83,3	2
STEEL HUB																		
42	25	50	M10	70	2,100	3,095	6000	95	46	126	50	26	20	3	5,6	20	78	2
48	25	55	M12	120	2,900	5,160	5600	105	51	140	56	28	21	3,5	6	21	108	2
55	35	70	M12	120	4,000	9,737	5000	120	60	160	65	30	22	4	9	26	122	2
65	40	80	M14	190	5,800	17,974	4600	135	68	185	75	35	26	4,5	8,3	27,5	139	2
75	40	80	M16	295	8,100	29,304	2950	160	80	210	85	40	30	5	8,3	30	147,5	3

* measures in mm

**** tightening torque in Nm

** weight in kg

⁽¹⁾ Size 19/24 up to bore Ø 20 screw M6, over screw M5 (Ø E= 46,7 mm)

 *** Moment of inertia in 10-6 kg · m²

Using hub execution GESM without keyway, the maximum transmissible torque is the minor between the clamp-hub transmissible torque and the value stated in the section "Elastic spider performance" (For details see [TABLE 2.4](#) e [TABLE 2.9 - Elastic spider performance](#)).

Table 2.4 - Transmissible torque by clamp hubs GESM

SIZE	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8	Ø 9	Ø 10	Ø 11	Ø 12	Ø 14	Ø 15	Ø 16	Ø 18	Ø 19	Ø 20	Ø 22	Ø 24	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	
7	0,9	1,0	1,0	1,1	1,2																					
9		2,1	2,3	2,4	2,5	2,6	2,7																			
12		4,1	4,2	4,4	4,6	4,8	5,0	5,2	5,4	5,5																
14			5,0	5,2	5,4	5,5	5,7	5,9	6,1	6,3	6,7	6,8	7,0													
19/24								28	29	29	31	31	32	34	34	35	30	32								
24/28								24	27	29	34	37	39	44	46	49	54	59	61	68	73	78				
28/38											58	62	66	75	79	83	91	100	104	116	124	133	145			
38/45											62	66	75	79	83	91	100	104	116	124	133	145	158	166		
42																139	153	167	174	195	209	223	243	264	278	
48																		254	285	305	326	356	387	407		
55																					326	356	387	407		
65																						488	530	558		
75																									769	

Follow table 2.4

SIZE	Ø 42	Ø 45	Ø 48	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80
7										
9										
12										
14										
19/24										
24/28										
28/38										
38/45	174	187								
42	292	313	334	348						
48	428	458	489	509	560					
55	428	458	489	509	560	611	662	713		
65	586	628	670	697	767	837	907	976	1046	1116
75	808	865	923	961	1057	1154	1250	1346	1442	1538

* diameters in mm

** tightening torque in Nm

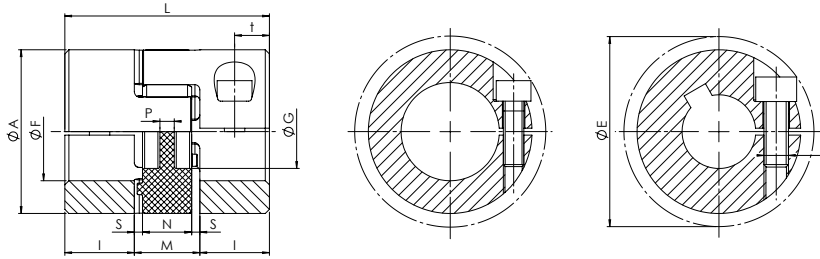


Figure 2-3b - TRASCO® ES - GESMC

Table 2.3b - TRASCO® ES GESMC Dimensions

SIZE	F min	F max	C	M _s **	rpm	A	L	I	M	N	S	P	t	E
ALUMINUM HUB														
7	3	7	M2	0,6	40.000	14	18	5	8	6	1	6	2,5	16,6
9	4	10	M2,5	1	28.000	20	24	7	10	8	1	2	3,5	21,3
12	4	12	M3	1,4	22.000	25	26	7	12	10	1	3	3,5	26,2
14	6	16 ⁽¹⁾	M4	2,9	19.000	30	32	9,5	13	10	1,5	2	4,8	30,5
19/24	10	24 ⁽¹⁾	M6	11	14.000	40	50	17	16	12	2	3,5	8,5	45 ⁽¹⁾
24/28	10	32	M6	11	10.600	55	54	18	18	14	2	4	9	57,5
28/38	14	35	M8	25	8.500	65	62	21	20	15	2,5	5,2	10,5	69
38/45	18	45	M10	49	7.100	80	76	26	24	18	3	5,6	13	86

* measures in mm

** tightening torque in Nm

⁽¹⁾ Size 14 up to bore Ø 12screw M4, over screw M3. Size 19/24 up to bore Ø 20 screw M6, over screw M5 (Ø E= 46,7)

Using hub execution GESMC without keyway, the maximum transmissible torque is the minor between the clamp-hub transmissible torque and the value stated in the section “Elastic spider performance” (For details see [TABLE 2.4](#) e [TABLE 2.9 - Elastic spider performance](#)).

Table 2.4b - Transmissible torque by clamp hubs GESMC

SIZE	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8	Ø 9	Ø 10	Ø 11	Ø 12	Ø 14	Ø 15	Ø 16	Ø 18	Ø 19	Ø 20	Ø 22	Ø 24	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45	
7	0,8	0,9	1,0	1,0	1,1																							
9		2,1	2,2	2,3	2,5	2,6	2,7	2,8																				
12		3,4	3,6	3,8	3,9	4,1	4,3	4,4	4,6	4,8																		
14			7,1	7,4	7,7	8,0	8,3	8,6	8,9	9,2	5,8	6,0	6,1															
19/24						24,4	25,1	25,8	26,5	27,1	28,5	29,2	29,9	31,2	31,9	32,6	25,4	26,3										
24/28								23	25	27	32	34	36	41	43	45	50	54	57	63	68	72						
28/38											58	62	66	75	79	83	91	100	104	116	124	133	145					
38/45											99	105	119	125	132	145	158	165	184	198	211	230	250	263	277	296		



Clamping hubs without feather keyway may be used just in Category 3.

2.1.3 TRASCO® ES hubs - shrink disc execution (GESA)

This type of coupling provides excellent kinetic uniformity. Furthermore, the absence of keys or set screws makes it a well-balanced coupling and greatly facilitates installation and removal. An exact radial/axial positioning is easy for those applications which require it. The absence of keyways also avoids fretting corrosion and backlash between the shaft and the hub. This is the ideal type of coupling for applications requiring precision and/or high rotational speeds.

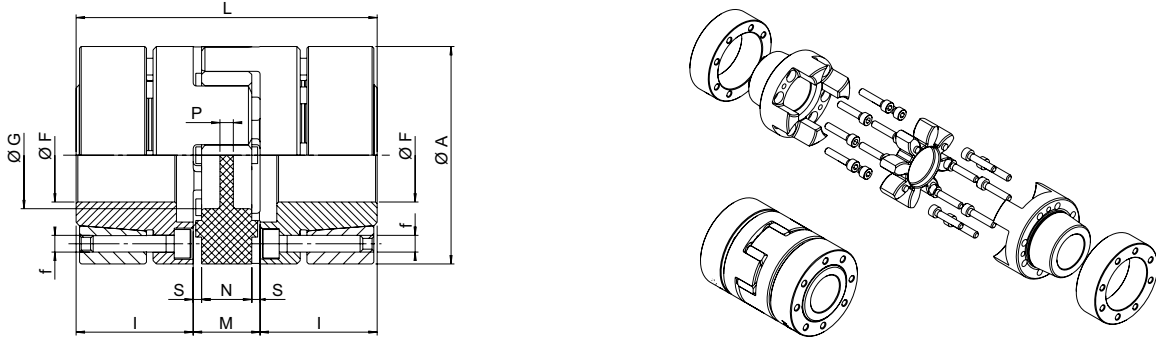


Figure 2-4 - TRASCO® ES GESA execution

Table 2.5 - TRASCO® ES GESA execution dimensions

SIZE	F _{min}	F _{max}	f	Ms****	Screw No.	HUB		rpm	A	G	L	I	M	N	S	P
						W**	J***									
ALUMINUM HUB - STEEL LOCKING ELEMENT																
14	6	14	M3	1,3	4	0,049	7	28000	30	10,5	50	18,5	13	10	1,5	2
19/24	10	20	M4	2,9	6	0,120	30	21000	40	18	66	25	16	12	2	3,5
24/28	15	28	M5	6	4	0,280	135	15500	55	27	78	30	18	14	2	4
28/38	19	38	M5	6	8	0,450	315	13200	65	30	90	35	20	15	2,5	5,2
38/45	20	45	M6	10	8	0,950	960	10500	80	38	114	45	24	18	3	5,6
STEEL HUB AND LOCKING ELEMENT																
42	28	50	M8	35	4	2,300	3150	9000	95	46	126	50	26	20	3	5,6
48	35	60	M8	35	4	3,080	5200	8000	105	51	140	56	28	21	3,5	6
55	35	65	M10	71	4	4,670	10300	6300	120	60	160	65	30	22	4	9
65	40	70	M12	120	4	6,700	19100	5600	135	68	185	75	35	26	4,5	8,3

* measures in mm

** weight in kg

*** Moment of inertia in 10⁻⁶ kg · m²

**** tightening torque in Nm

Using hub execution GESA without keyway, the maximum transmissible torque is the minor between the shrink disc hub transmissible torque and the value stated in the section "Elastic spider performance" (For details see [TABLE 2-6](#) e [TABLE 2-9](#)).

Table 2.6 - GESA transmissible torque

SIZE	Ø 10	Ø 11	Ø 14	Ø 15	Ø 16	Ø 17	Ø 18	Ø 19	Ø 20	Ø 22	Ø 24	Ø 25	Ø 28	Ø 30	Ø 32	Ø 35	Ø 38	Ø 40	Ø 42	Ø 45	Ø 48	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70
14	10	12	22																							
19/24	42	46	60	65	69	74	79	84	88																	
24/28				66	72	77	82	87	92	102	113	118	135													
28/38								175	185	205	225	235	266	287	308	339	373									
38/45									255	283	312	326	367	398	427	471	515	545	577	620						
42													420	460	500	563	627	670	714	790	850	880				
48																557	612	649	687	744	801	840	932	1033		
55																	986	1112	1140	1185	1284	1412	1420	1652	1680	1691
65																		1531	1580	1772	1840	1960	2049	2438	2495	2590

* diameters in mm

** tightening torque in Nm



When shrink disc hubs are used in potentially explosive atmospheres, all screws must be secured against losing with Loctite average strength.

2.1.4 TRASCO® ES hubs - split collar execution (GES2M)

TRASCO® ES split collar hubs allow an easy and fast mounting with moving the drive and the driven machine.

Available in 2 executions:

- cylindrical bore (GES2M...)
- cylindrical bore + feather keyway (GES2M...C)

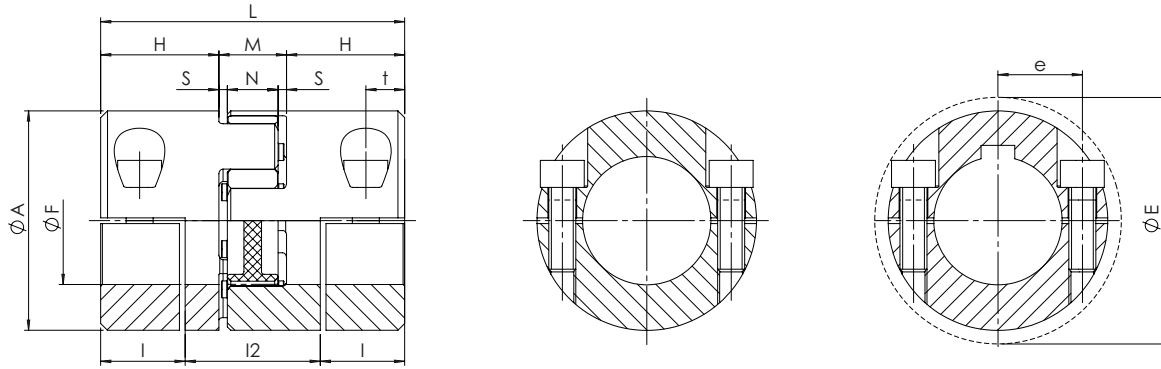


Figure 2-5 - TRASCO® ES - GES2M

Table 2.7 - TRASCO® ES GE2SM Dimensions

SIZE	Fmin	Fmax	f	Ms****	HUB		rpm	A	H	I	I2	L	M	N	S	E	t	e
					W**	J***												
ALUMINUM HUB																		
14	5	16	M3	1,3	0,025	4,6	12700	30	18,5	14,5	21	50	13	10	1,5	32	7,5	11,5
19/24	8	20	M6	10	0,078	2	9550	40	25	17,5	31	66	16	12	2	47	8	14,5
24/28	10	28	M6	10	0,160	76,3	6950	55	30	22	34	78	18	14	2	57	10,5	20
28/38	14	38	M8	25	0,240	176,3	5850	65	35	25	40	90	20	15	2,5	73	11,5	25
38/45	18	45	M8	25	0,470	503,9	4750	80	45	33	48	114	24	18	3	84	15,5	30
42	22	50	M10	49	0,750	1.121,7	4000	95	50	36,5	53	126	26	20	3	94	18	36
48	22	55	M12	86	1,08	1.870,4	3600	105	56	39,5	61	140	28	21	3,5	105	18,5	36

- * measures in mm
- ** weight in kg
- *** Moment of inertia in 10-6 kg · m²
- **** tightening torque in Nm



Clamping hubs without feather keyway may be used just in Category 3.

2.1.5 Double cardanic execution (GESS)

This execution allows higher misalignments. The 2 spiders allow a high vibration dampening providing a decrease in drive noise and longer life of related components (ex. bearings).

The intermediate element is made of aluminum alloy and may be used in combination with any type of hub execution.

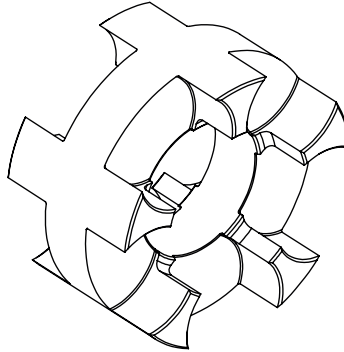


Figure 2-6 - TRASCO® ES GESS execution

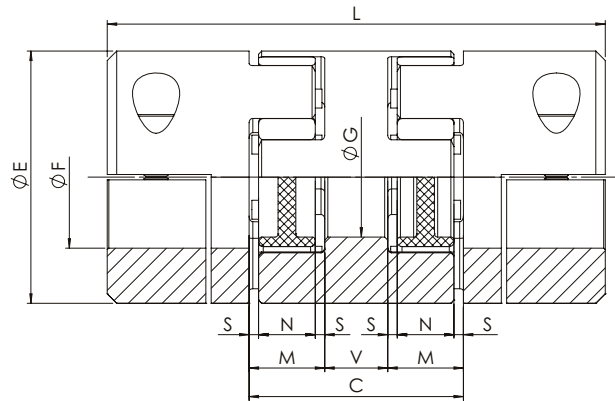


Table 2.8 - TRASCO® ES GESS executions dimensions

SIZE	Fa max**			E	C	L			V	M	S	N	G
	GESF	GESM	GES2M			GESF	GESM	GES2M					
ALUMINUM HUB - ALUMINUM GESS													
7	7	7	-	14	20	34	34	-	4	8	1	6	-
9	10	10	-	20	25	45	45	-	5	10	1	8	-
14	16	16	15	30	34	56	56	71	8	13	1,5	10	-
19/24	24	24	24	40	42	92	92	92	10	16	2	12	18
24/28	28	32	32	55	52	112	112	112	16	18	2	14	27
28/38	38	38	38	65	58	128	128	128	18	20	2,5	15	30
38/45	45	45	45	80	68	158	158	158	20	24	3	18	38
STEEL HUB - ALUMINUM GESS													
42	55	50	55	95	74	174	174	174	22	26	3	20	46
48	60	55	60	105	80	192	192	192	24	28	3,5	21	51
55	70	70	-	120	88	218	218	-	28	30	4	22	60
65	80	80	-	135	102	252	252	-	32	35	4,5	26	68

* measures in mm

** The max bire depends on the type of hub used

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.

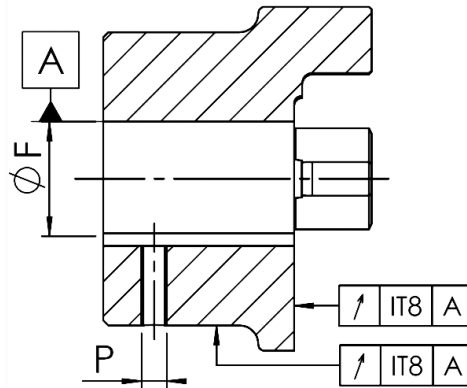


Figure 2-7 - Processing tolerance

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.

2.2 Elastic spider

The elastic spider is a toothed ring produced with special polyurethane compounds that allows for optimised coupling performance according to the application.

The particular shape of the teeth with the hubs allow the transmission of the torque backlash free for long time.

The flexible element is particularly resistant to ageing, hydrolysis (therefore also suitable for tropical climates), fatigue, abrasion and is self-damping.

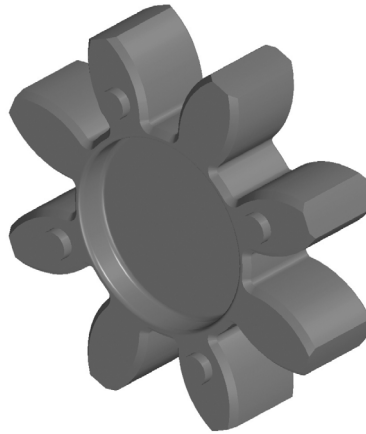


Figure 2-8 - Elastic spider

The spiders are available, as standard product, in three hardness to suit different applications and related operating temperature:

- Blue ring 80 Sh A -50 °C / + 80 °C
- Yellow ring 92 Sh A -40 °C / + 90 °C
- Red ring 98 Sh A -30 °C / + 90 °C
- Green ring 64 Sh D -30 °C / + 110 °C

For the performance of the various types of elastic spider, see [TABLE 2.9](#).

2.2.1 Performance of the elastic spider

Table 2.9 - Performance of the elastic spider

SIZE	SPIDER COLOR	SPIDER HARDNESS [Shore]	NOMINAL TORQUE T _{kn} [Nm]	MAXIMUM TORQUE T _{max} [Nm]
7	Blue	80 Sh A	0,7	1,4
	Yellow	92 Sh A	1,2	2,4
	Red	98 Sh A	2	4
9	Blue	80 Sh A	1,8	3,6
	Yellow	92 Sh A	3	6
	Red	98 Sh A	5	10
	Green	64 Ah D	6	12
12	Blue	80 Sh A	3	6
	Yellow	92 Sh A	5	10
	Red	98 Sh A	9	18
	Green	64 Sh D	12	24
14	Blue	80 Sh A	4	8
	Yellow	92 Sh A	8	15
	Red	98 Sh A	13	25
	Green	64 Sh D	16	32
19/24	Blue	80 Sh A	5	10
	Yellow	92 Sh A	10	20
	Red	98 Sh A	17	34
	Green	64 Sh D	21	42
24/28	Blue	80 Sh A	17	34
	Yellow	92 Sh A	35	70
	Red	98 Sh A	60	120
	Green	64 Sh D	75	150
28/38	Blue	80 Sh A	46	92
	Yellow	92 Sh A	95	190
	Red	98 Sh A	160	320
	Green	64 Sh D	200	400
38/45	Blue	80 Sh A	95	190
	Yellow	92 Sh A	190	380
	Red	98 Sh A	325	650
	Green	64 Sh D	405	810
42	Blue	80 Sh A	130	270
	Yellow	92 Sh A	265	530
	Red	98 Sh A	450	900
	Green	64 Sh D	560	1120
48	Blue	80 Sh A	150	300
	Yellow	92 Sh A	310	620
	Red	98 Sh A	525	1050
	Green	64 Sh D	655	1310
55	Blue	80 Sh A	200	400
	Yellow	92 Sh A	410	820
	Red	98 Sh A	685	1370
	Green	64 Sh D	852	1650
65	Yellow	92 Sh A	625	1250
	Red	98 Sh A	900	1800
	Green	64 Sh D	1040	2080
75	Red	98 Sh A	1920	3840
	Green	64 Sh D	2400	4800

N.B.: For the GESM and GESA types, it is necessary to check the transmissible torque, respectively, of the clamp and of the shrink ring.

2.3 Couplings misalignment

TABLE 2.10 shows the misalignment values based on the different coupling sizes that can accomodated.

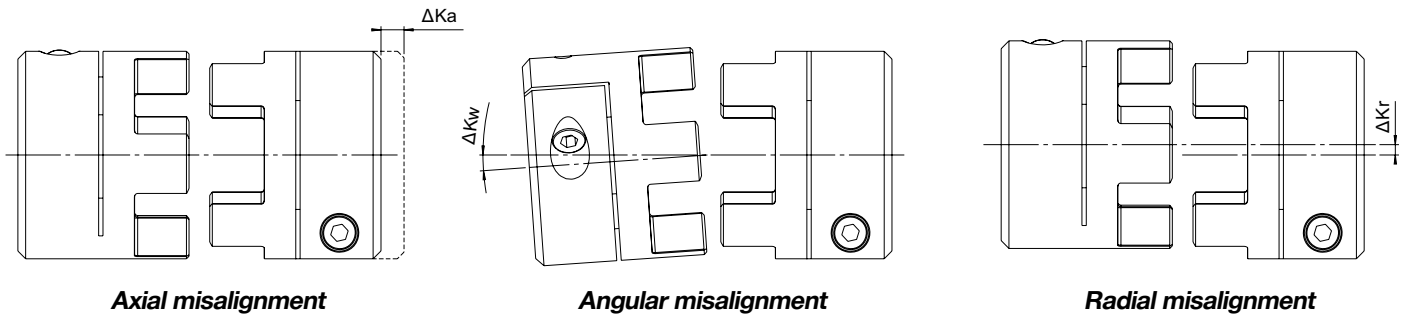


Figure 2-9 - TRASCO® ES: misalignment

Table 2.10 - TRASCO® ES: misalignment

SIZE	SPIDER COLOR	SPIDER HARDNESS [Shore]	Axial misalignment ΔK_a [mm]	Angular misalignment ΔK_w [°]	Radial misalignment ΔK_r [mm]
7	Blue	80 Sh A	0,6	0,15	1,1
	Yellow	92 Sh A	0,6	0,10	1
	Red	98 Sh A	0,6	0,10	0,9
9	Blue	80 Sh A	0,8	0,20	1,1
	Yellow	92 Sh A	0,8	0,15	1
	Red	98 Sh A	0,8	0,10	0,9
	Green	64 Ah D	0,8	0,08	0,8
12	Blue	80 Sh A	0,9	0,20	1,1
	Yellow	92 Sh A	0,9	0,15	1
	Red	98 Sh A	0,9	0,08	0,9
	Green	64 Sh D	0,9	0,05	0,8
14	Blue	80 Sh A	1	0,21	1,1
	Yellow	92 Sh A	1	0,15	1
	Red	98 Sh A	1	0,09	0,9
	Green	64 Sh D	1	0,06	0,8
19/24	Blue	80 Sh A	1,2	0,15	1,1
	Yellow	92 Sh A	1,2	0,10	1
	Red	98 Sh A	1,2	0,06	0,9
	Green	64 Sh D	1,2	0,04	0,8
24/28	Blue	80 Sh A	1,4	0,18	1,1
	Yellow	92 Sh A	1,4	0,14	1
	Red	98 Sh A	1,4	0,10	0,9
	Green	64 Sh D	1,4	0,07	0,8
28/38	Blue	80 Sh A	1,5	0,20	1,1
	Yellow	92 Sh A	1,5	0,15	1
	Red	98 Sh A	1,5	0,11	0,9
	Green	64 Sh D	1,5	0,08	0,8
38/45	Blue	80 Sh A	1,8	0,22	1,1
	Yellow	92 Sh A	1,8	0,17	1
	Red	98 Sh A	1,8	0,12	0,9
	Green	64 Sh D	1,8	0,09	0,8
42	Blue	80 Sh A	2	0,24	1,1
	Yellow	92 Sh A	2	0,19	1
	Red	98 Sh A	2	0,14	0,9
	Green	64 Sh D	2	0,10	0,8
48	Blue	80 Sh A	2,1	0,27	1,1
	Yellow	92 Sh A	2,1	0,23	1
	Red	98 Sh A	2,1	0,16	0,9
	Green	64 Sh D	2,1	0,11	0,8
55	Blue	80 Sh A	2,2	0,28	1,1
	Yellow	92 Sh A	2,2	0,24	1
	Red	98 Sh A	2,2	0,17	0,9
	Green	64 Sh D	2,2	0,12	0,8
65	Yellow	92 Sh A	2,6	0,25	1
	Red	98 Sh A	2,6	0,18	0,9
	Green	64 Sh D	2,6	0,13	0,8
75	Red	98 Sh A	3	0,21	0,9
	Green	64 Sh D	3	0,15	0,8

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.

In order to guarantee a long life of the coupling, it is necessary to pay close 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.

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 Assembling

The TRASCO® ES coupling is supplied unassembled, therefore it is recommended to check the presence of all the components and check that they match the application requirements.

The characteristic of the TRASCO® ES family of couplings gives the possibility of mounting any hub version provided that they belong to the same size.

As regards the hubs, the size is printed on the marking located on the lateral surface. The size of the spider is printed on a flat 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 GESF assembling

Components:

- 2 hubs
- 1 elastic spider
- 2 o 4 setscrews, depending on size

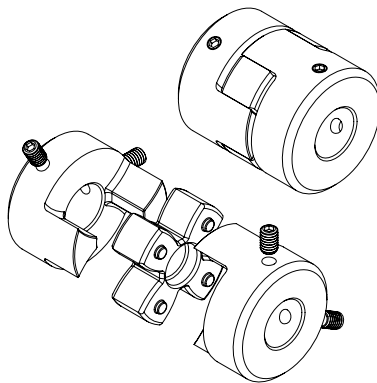


Fig. 1

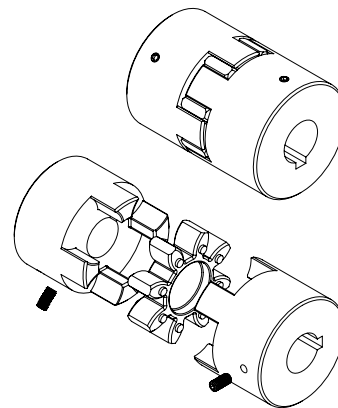


Fig. 2

Figure 4-1 - GESF



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.

If the dimensions of shaft and keyway is less than the diameter of the spider hole, one or both shafts may protrude into the spider.

- Install the hubs on the driving and driven shafts (see [FIGURE 4-2](#))
- Insert the spider into one of the two hubs
- Check the driving and driven hub to achieve the value M (see [FIGURE 4-2](#) and [TABLE 4.1](#))
- If the motor and driven machine are already firmly assembled, move axially the hubs on the shafts to adjust the M dimension
- Set the hubs using the setscrews, tightening according to [TABLE 4.2 - TRASCO® ES: Setscrew position](#)

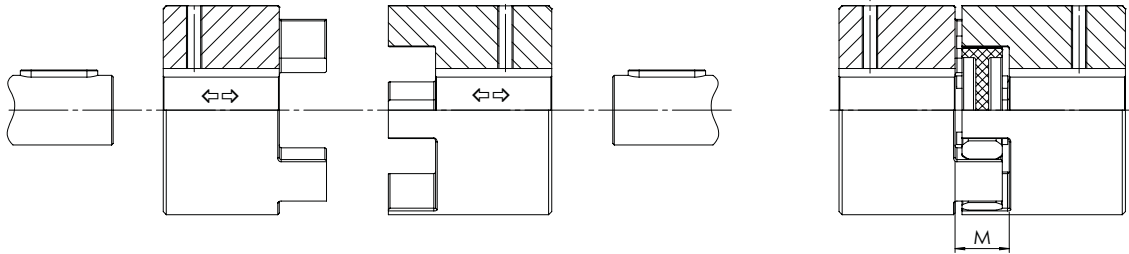


Figure 4.2 - TRASCO® ES: GESF mounting

Table 4.1 - M Value

SIZE	M VALUE [mm]
7	8
9	10
12	12
14	13
19/24	16
24/28	18
28/38	20
38/45	24
42	26
48	28
55	30
65	35
75	40



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 spider can be moved axially. If this advice is disregarded, the device could be damaged.



ATTENTION!
If the dimensions of shaft and key is lower than the diameter of the spider hole, one or both shafts may protrude into the spider.

4.1.1 Position of the setscrew (GESF)

To fix the hub onto to the shaft, SIT supplies setscrews with flat head class 45H according to DIN 913.

For the position and the size of the setscrew according to the sizes, please refer to the [TABLE 4.2 - TRASCO® ES: Setscrew position \(GESF\)](#) and the [FIGURE 2-2 - TRASCO® ES: GESF and GESF Dimensions](#)

TABLE 4.2 - TRASCO® ES: Setscrew position (GESF)

SIZE	THREAD	NUMBER OF GRAINS	DISTANCE [mm]	TIGHTENING TORQUE [Nm]	FIGURE
7	M3	2	3,5	0,3	1
9	M3	2	5	0,3	1
12	M4	1	5	1,5	2
14	M4	1	5	1,5	2
19/24	M5	1	10	2	2
24/28	M5	1	10	2	2
28/38	M6	1	15	4	2
38/45	M8	1	15	10	2
42	M8	1	20	10	2
48	M8	1	25	10	2
55	M10	1	20	17	2
65	M10	1	20	17	2
75	M10	1	25	17	3



When shrink disc hubs are used in potentially explosive atmospheres, all screws must be secured against losing with Loctite average strength.

4.2 GESM and GESMC assembling

Components:

- 2 hubs (GESM or GESMC without feather keyway, GESM...C or GESMC...C with feather keyway)
- 1 elastic spider
- 2 screws to clamp the hub

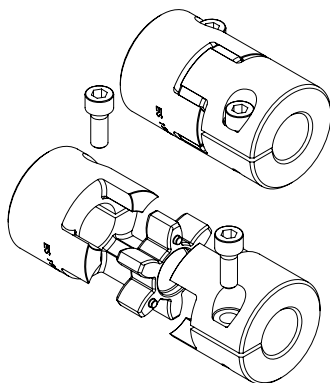


Fig. 1

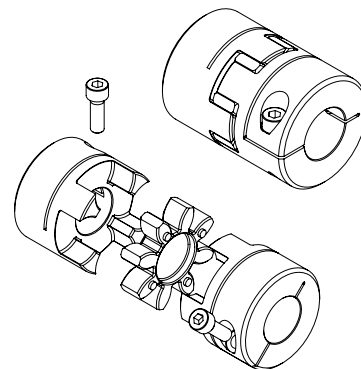


Fig. 2

Figure 4-3 - GESM - GESMC Assembling

- Install the hubs on the driving and driven shafts (see [FIGURE 4-4](#))
- Insert the spider into one of the two hubs
- Check the driving and driven hub to achieve the value M (see [FIGURE 4-2](#) and [TABLE 4.1 - M VALUE](#))
- If the motor and driven machine are already firmly assembled, move axially the hubs on the shafts to adjust the M dimension
- Set the hubs using the setscrews, tightening according to [TABLE 4.3](#).

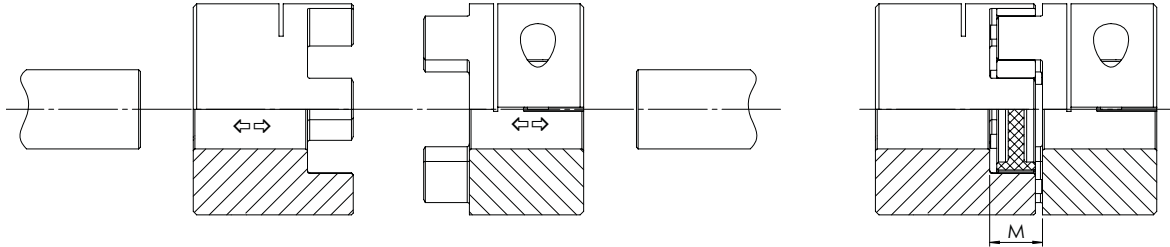


Figure 4-4 - TRASCO® ES: GESM - GESMC mounting

4.2.1 Screws for clamp fixing (GESM-GESMC)

The specifications of the screws to fix the hub onto the shaft are available on [TABLE 4.3 - TRASCO® ES: GESM and GESMC Setscrew position](#).

Per la posizione riferirsi alla [FIGURE 2-3 - TRASCO® ES - GESM](#) e [FIGURE 2-3b - TRASCO® ES - GESMC](#)

Table 4.3 - TRASCO® ES: GESM and GESMC Setscrew position

GESM SIZE	THREAD	TIGHTENING TORQUE [Nm]
7	M2	0,35
9	M2,5	0,75
12	M3	1,4
14	M3	1,4
19/24	M6	11
24/28	M6	11
28/38	M8	25
38/45	M8	25
42	M10	70
48	M12	120
55	M12	120
65	M14	190
75	M16	295

GESMC SIZE	THREAD	TIGHTENING TORQUE [Nm]
7	M2	0,6
9	M2,5	1
12	M3	1,4
14	M4	2,9
19/24	M6	11
24/28	M6	11
28/38	M8	25
38/45	M10	49



When shrink disc hubs are used in potentially explosive atmospheres, all screws must be secured against losing with Loctite average strength.

4.3 GESA and GESAP assembling

Components:

- 2 hubs
- 2 shrink discs
- 1 elastic spider (for GESAP with bore according to DIN 69002)
- Screws (the number of screws depends on the size)

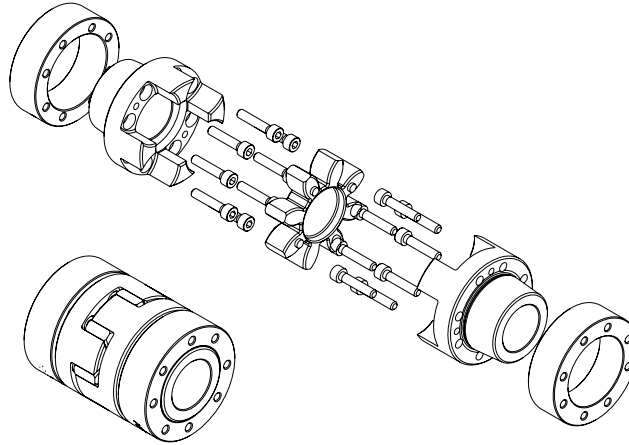


Figure 4-5 - GESA e GESAP assembling

- Install the hubs on the driving and driven shafts (see [FIGURE 4-5](#))
- Insert the spider into one of the two hubs
- Check the driving and driven hub to achieve the value M (see [FIGURE 4-6](#) and [TABLE 4.1 - M VALUE](#))
- If the motor and driven machine are already firmly assembled, move axially the hubs on the shafts to adjust the M dimension
- Set the hubs using the setscrews, tightening according to [TABLE 4.4](#) and/or [TABLE 4.5](#).

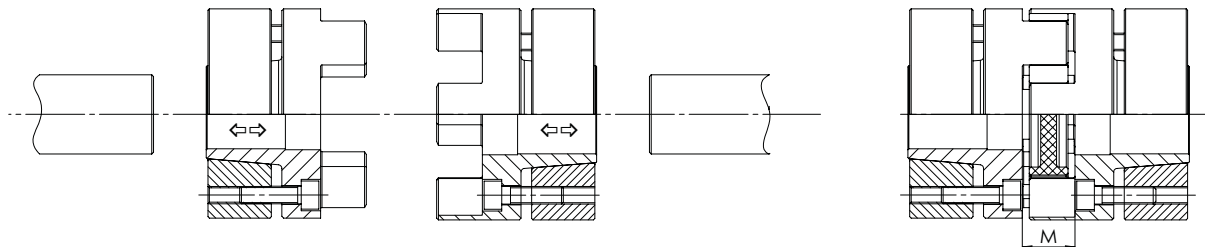


Figure 4-6 - TRASCO® ES: GESA-GESAP mounting

4.3.1 Position and measure of the screws (GESA-GESAP)

In [TABELLA 4.4](#) and [TABELLA 4.5](#) are available the specification of the screws to mount the hubs GESA and GESAP.

About the positioning, refer to the [FIGURE 2-4 - TRASCO® ES GESA execution](#).

Table 4.4 - TRASCO® ES: Screws for fixing with shrink disk (GESA)

SIZE	THREAD	No. SCREW	TIGHTENING TORQUE [Nm]
14	M3	4	1,3
19/24	M4	6	2,9
24/28	M5	4	6
28/38	M5	8	6
38/45	M6	8	10
42	M8	4	35
48	M8	4	35
55	M10	4	71
65	M12	4	120

Table 4.5 - TRASCO® ES: Screws for fixing with shrink disk (GESAP)

SIZE	THREAD	No. SCREW	TIGHTENING TORQUE [Nm]
14	M3	4	1,89
19/24 - 37,5	M4	6	3,05
19/24	M5	4	3,05
24/28 - 50	M5	8	4,9
24/28	M6	8	8,5
28/38	M6	8	8,5
38/45	M8	4	14
42	M8	4	35
48	M10	4	35
55	M12	4	71



When shrink disc hubs are used in potentially explosive atmospheres, all screws must be secured against losing with Loctite average strength.

4.4 GESS assembling

Components:

2 hubs (anyone of TRASCO® ES family)

2 spiders

1 intermediate element

2 setscrews

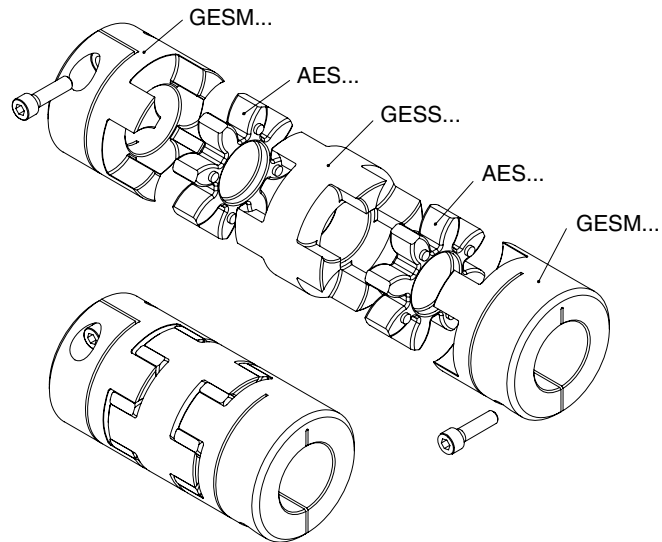


Figure 4-7 - GESS assembling

Follow the instructions of the outer hubs, making sure to check the value M (see [TABLE 4.1 - M Value](#)) for both spiders.

5 ATEX Annex

This Annex is an integral part of the sale of the SIT TRASCO® ES 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 devices 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 TRASCO® ES 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 (gas) 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

Depending on the presence of the keyway, the hubs can work in particular risk category. In the table "Hubs work classification" there is the working category for each type of hub

Table 5.3 - Hubs work classification

EXECUTION	KEYWAY	CATEGORY
GESF	NO	3
	YES	2
GESM / GESMC	NO	3
	YES	2
GESA	-	2
GESAP	-	2
GES2M	NO	3
	YES	2

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

Table 5.4 - Gas temperature classes / maximum surface temperature for powders

TEMPERATURE CLASS	MAXIMUM SURFACE TEMPERATURE [°C]	AMBIENT OR OPERATING TEMPERATURE Ts [°C]
T4	110	-30 °C < Ta < 90 °C
T5	95	-30 °C < Ta < 75 °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 is limited to 90 °C due to the limits of the compound of the spiders.

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:

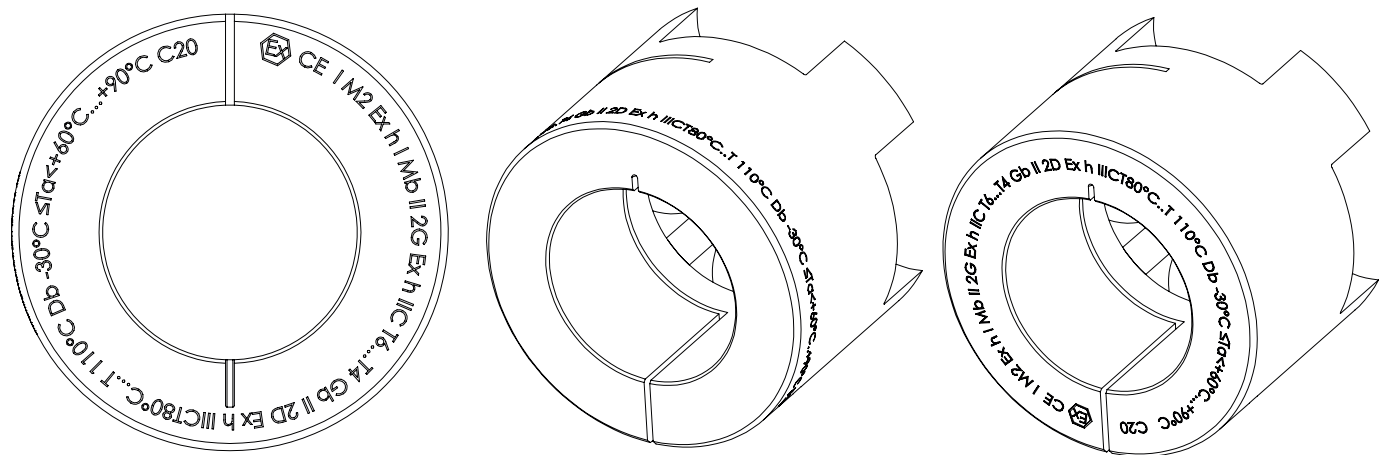
$$-30 \text{ °C} < Ta < 90 \text{ °C}$$

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

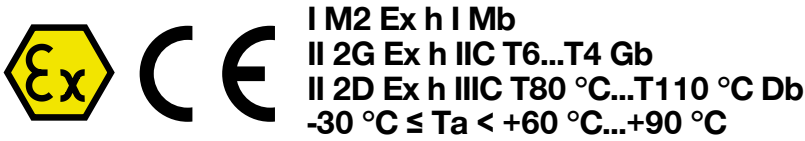
5.4 Marking

SIT TRASCO® ES 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.



5.4.1 Complete marking

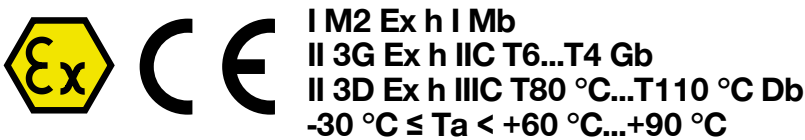


SYMBOL	DESCRIPTION
I/II	Group (I mining industry, II surface machine)
2	Category 2 (zone 1 / zone 21)
G	Explosive atmosphere with gases, vapours or mists
D	Explosive atmosphere with dust
Ex h	Type of protection - Constructional safety
IIC	Explosion group for gases
IIIC	Explosion group for dusts
T6...T4	Temperature class (gas)
T80...T110	Maximum surface temperature (dusts)
Mb, Gb, Db	EPL
Ta	Ambient or 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 Complete marking for executions GESM, GESMC and GES2M without feather keyway

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.



5.4.3 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.



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 UNHSO 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.

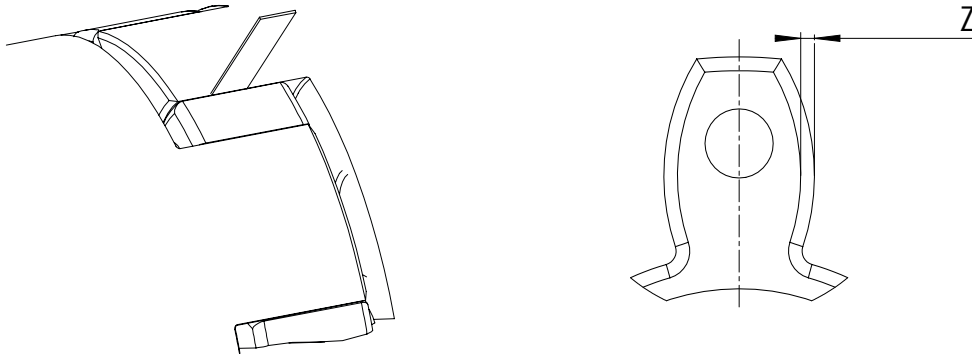
5.6 Elastic spider check

The elastic spider 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 elastic spider.

The check is performed using a feeler gauge to assess the wear of each element of the spider.



If the measured value (Z value) is higher than that indicated in the [Z VALUE FOR CHECKING SPIDER WEAR](#), it is recommended to replace the spider with an equivalent one.

Table 5.5 - Z value for checking spider wear

SIZE	Z VALUE [mm]
7	0,5
9	0,5
14	1
19/24	1,5
24/28	1,5
28/38	1,5

SIZE	Z VALUE [mm]
38/45	1,5
42	2
48	2
55	2,5
65	2,5
75	3



ATTENTION!

Replace the elastic spider 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 which can be downloaded in electronic format from the website www.sitspa.com.

5.7 Internal production inspection

Before marking and placing on the market, TRASCO® ES 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 TRASCO® ES 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

TRASCO® ES 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!
TRASCO® ES 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 TRASCO® ES 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:

TRASCO® ES 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, 19/12/2019

*SIT S.p.A.
Riccardo Scaglia
Amministratore Delegato*
