



BMA 0007 Instruction and Installation Manual SPIDEX®

- Torsional elasticity
- Dampening
- Blind assembly
- Safe against break-down
- No maintenance
- Hub material: Aluminium (Al), Cast Iron (GG/GGG), Sintered Steel (Si), Steel (St)

Table of contents

1.0 General information:	3
1.1 Safety and information symbols:	3
1.2 General hazard warnings:	3
2.0 Intended use:	4
3.0 Storage	4
4.0 Dimensions:	4
4.1 SPIDEX® jaw coupling	4
Figure 1: Diagram of the SPIDEX® jaw coupling.....	4
Table 1: Dimensions of the SPIDEX® jaw coupling.....	5
4.2 SPIDEX® flange couplings	5
Figure 2: Diagram of the SPIDEX® flange coupling, F series / FF series	5
Table 2: Dimensions of the SPIDEX® flange coupling, F series	5
Table 3: Dimensions of the SPIDEX® flange coupling, FF series.....	6
5.0 Assembly	6
5.1 Assembly instructions	6
5.2 Components of the coupling	7
Figure 3: SPIDEX® jaw coupling - assembly.....	7
Figure 4: SPIDEX® jaw coupling with clamped design - assembly.....	7
5.3 Assembling the SPIDEX® coupling.....	8
Table 4: Tightening torques for threaded pins	8
Table 5: Tightening torques for clamping screws.....	8
5.4 Displacement types and values.....	8
Figure 5: Displacement types and values	9
Table 6: Displacement values.....	9

R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 2 of 16 Version: 1ENG
---	--	---

6.0 Spare parts management & addresses:	9
7.0 Important information for Ex-zones	10
7.1 Instruction manual supplement “Ex”	10
7.2 Intended use	10
7.2.1 Explosive atmosphere	10
7.2.2 Instructions for use	10
7.3 Industrial safety instructions	12
7.4 Installation and assembly	13
7.5 Checks, maintenance and repairs	13
7.6 Testing.....	14
8.0 Additional information:	14

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R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 3 of 16 Version: 1ENG
---	--	---

The torsionally flexible SPIDEX® jaw coupling has the ability to compensate for the angular, radial and axial displacement produced by manufacturing and assembly tolerances.

1.0 General information:

Carefully read through this installation manual before installing the SPIDEX® jaw coupling. Pay particular attention to the safety instructions!

The installation manual is part of your product. Store it carefully and in the vicinity of the SPIDEX® jaw coupling.

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1.1 Safety and information symbols:



Danger Risk of injury to personnel



Caution Damage could occur to the machine



Note Note regarding important information



Caution Notes / instructions on use in Ex zones

1.2 General hazard warnings:



During installation and removal of the DENTEX® tooth coupling, make sure that the entire drive train is secured to prevent accidental activation, and that the system is depressurised. Failure to handle rotating parts in the proper manner can cause serious injury. For this reason, the following safety instructions should be read and followed without exception.

- All work on the DENTEX® tooth coupling should be performed from the perspective of ->„Safety first“.
- Switch off the drive unit before carrying out work on the DENTEX® tooth coupling.
- Secure the drive unit to prevent unintentional activation, e.g. by attaching information signs to the switch-on points or removing the fuse at the power supply.
- Do not reach into the working area of the machine while it is still in operation.
- Protect the rotating parts to prevent accidental touching. Attach the relevant protective devices and covers.

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2.0 Intended use:

You may only install and maintain the SPIDEX® tooth coupling if you:

- have carefully read and understood the installation manual
- are authorised and trained to do so.

The SPIDEX® jaw coupling may only be used in accordance with the technical specifications. Unauthorised structural changes to the SPIDEX® jaw coupling are prohibited. We will not accept any liability for damage occurring as a result of this. In the interest further development, we reserve the right to make technical changes. The SPIDEX® jaw coupling described here corresponds with the latest technical standards at the time of publication of this installation manual. The SPIDEX® jaw coupling is usually delivered ready for installation.

3.0 Storage

- It should be possible to store the coupling hubs in a covered, dry place for 6 months.
- Provided that storage conditions are favourable, the properties of the coupling sleeves will remain unaltered for up to 5 years.

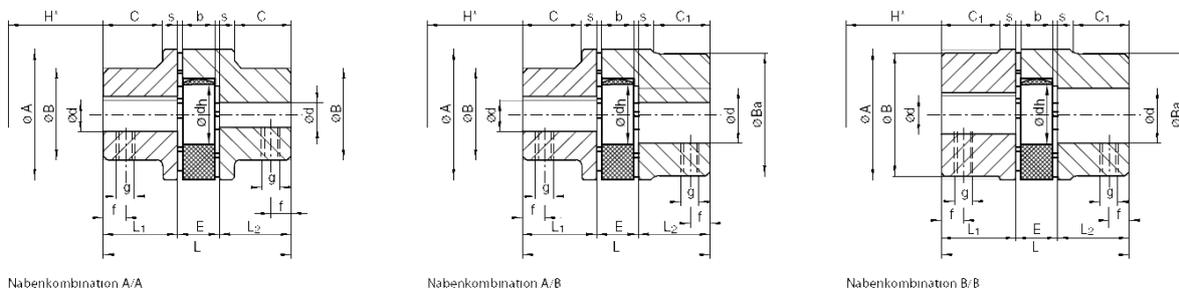


The storage areas must not contain any ozone-producing devices, such as fluorescent light sources, mercury-vapour lamps, or high-voltage electrical equipment. Damp storage areas are unsuitable. Make sure that no condensation is produced. A favourable relative humidity level would be below 65%.

4.0 Dimensions:

4.1 SPIDEX® jaw coupling

Figure 1: Diagram of the SPIDEX® jaw coupling



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--	---	----------------------------------

R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 6 of 16 Version: 1ENG
---	--	---

Table 3: Dimensions of the SPIDEX® flange coupling, FF series

Spidex® Type	Abmessungen Dimensions [mm]													Gewicht Weight [kg]	Massenträgheits- moment ²⁾ Moment of Inertia ²⁾ J [kgm²]
	A	L	E	s	b	dh	D6	D7	d2 DIN 69 ³⁾	z Anzahl Number	D3	D4			
FF 28	100	40	20	2.5	15	30	10	1.5	7	6	65	80	1.19	0.0015	
FF 38	115	44	24	3	18	38	10	1.5	7	6	80	95	1.66	0.0028	
FF 42	140	50	26	3	20	46	12	2	9	6	95	115	2.91	0.0072	
FF 48	150	52	28	3.5	21	51	12	2	9	8	105	125	3.35	0.0092	
FF 55	175	62	30	4	22	60	16	2	11	8	120	145	5.78	0.023	
FF 65	190	67	35	4.5	26	68	16	2	11	10	135	160	7.13	0.034	
FF 75	215	78	40	5	30	80	19	2.5	14	10	160	185	10.5	0.065	
FF 90	260	85	45	5.5	34	100	20	3	14	12	200	225	16.5	0.15	



SPIDEX® jaw couplings used with other add-on parts which could produce heat, sparks and static charges (e.g. JOYTORK safety couplings) are not approved for use in Ex-zones. These must be tested in advance.

5.0 Assembly

5.1 Assembly instructions



We recommend checking the dimensional accuracy of the hole, shaft, slot and feather key before commencing assembly.



Gently heating the hubs to approx. 80°C makes it easier to fit them onto the shaft.



Touching the heated coupling hubs can cause burns. Wear safety gloves.



During assembly, make sure that dimension E, see Tables 1-3, is adhered to, so that the coupling sleeve can still move axially during use. If this instruction is not observed, the coupling cannot work properly and may be damaged.



It is vital that you pay attention to hazards from ignition sources in areas where there is a risk of explosion!

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5.2 Components of the coupling

Figure 3: SPIDEX® jaw coupling - assembly

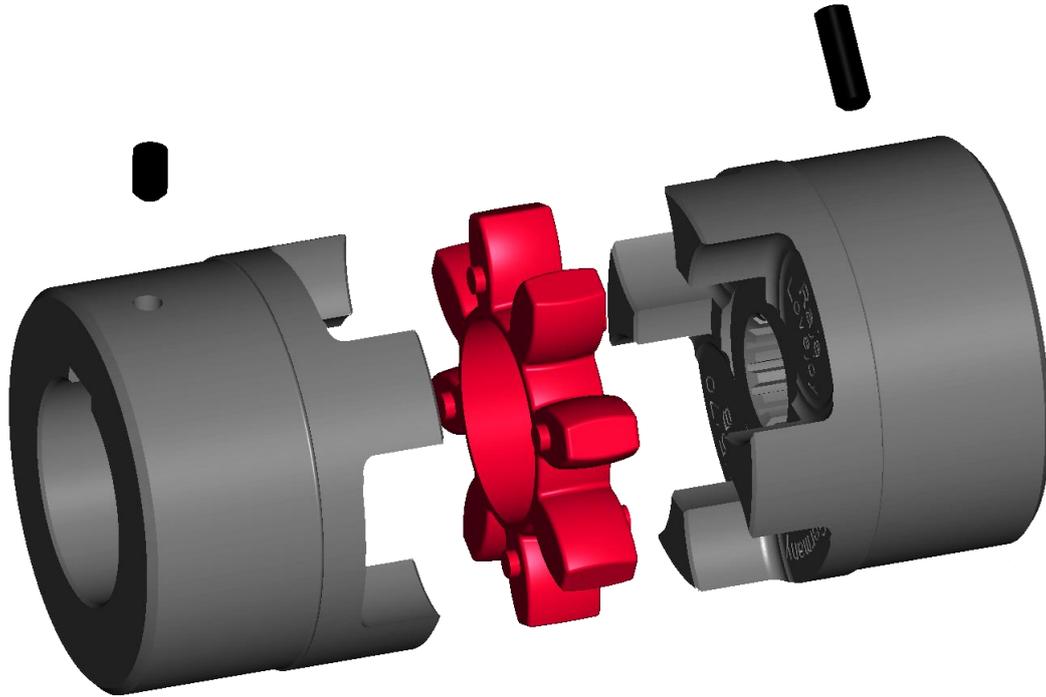
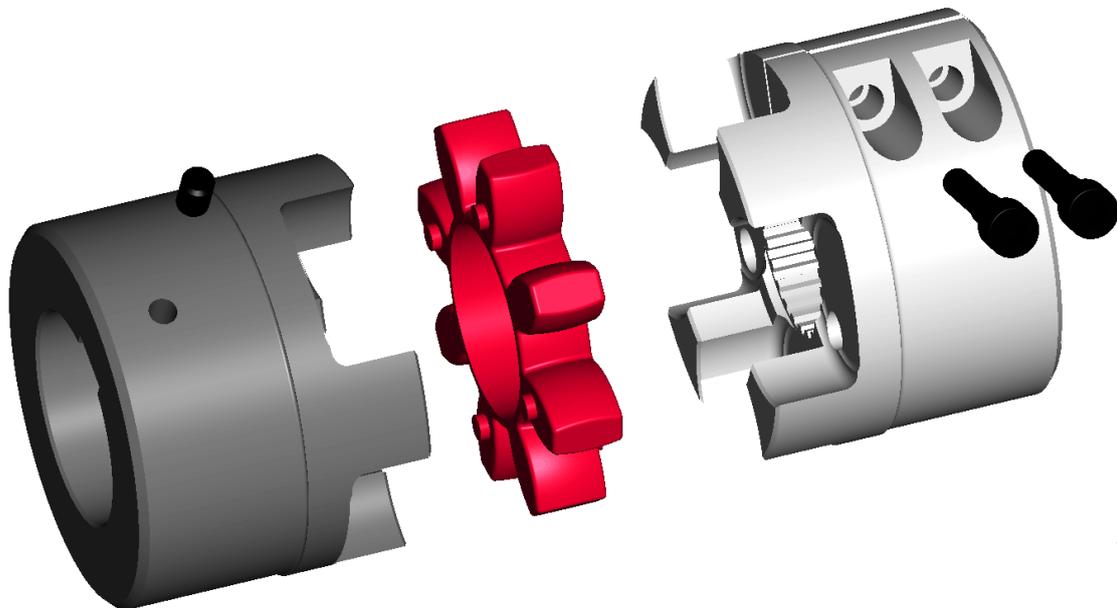


Figure 4: SPIDEX® jaw coupling with clamped design - assembly



5.3 Assembling the SPIDEX® coupling

- Fit the two coupling hubs onto the shafts of the drive and driven side.
- Insert the gear wheel into the cam geometry on one of the two sides.
- If you have an assembly drawing, fasten together the two coupling hubs as specified in the drawing. During this process, check dimension E (Figure 1) and if necessary readjust.
- If not, bring the unit together axially until dimension E (Figure 1) has been achieved.
- If the units on the motor and pump side are already attached, dimension E (Figure 1) can be set by moving the coupling hubs axially.
- Secure the hubs by tightening the radial threaded pins DIN EN ISO 4029 with cup point. You can find the tightening torques in Table 4.
- If you are fitting a SPIDEX® coupling hub with clamped design, you can find the tightening torque in Table 5.

Table 4: Tightening torques for threaded pins

Threaded pin DIN EN ISO 4029 with cup point	M4	M5	M6	M8	M10	M12	M16
Tightening torques T_A [Nm]	1.5	2	4	10	17	40	80

Table 5: Tightening torques for clamping screws

Cheese head screw with hexagonal socket acc. to DIN 912-12.9	M8	M10	M16	M20	M24
Tightening torques in GGG / ST - T_A [Nm]	25	69	295	410	710

5.4 Displacement types and values



In order to guarantee a long service life for the coupling and to avoid hazards during usage in Ex-zones, the shaft ends must be precisely aligned. It is vital to maintain the specified displacement values, see Table 6. Exceeding these values will damage the coupling. The more precisely the coupling is aligned, the longer its service life will be.



When using the coupling in an Ex-zone for explosion group IIC (designation II 2GD c IIC T X), these displacement values must be halved (see Tables 8 and 9).

Figure 5: Displacement types and values

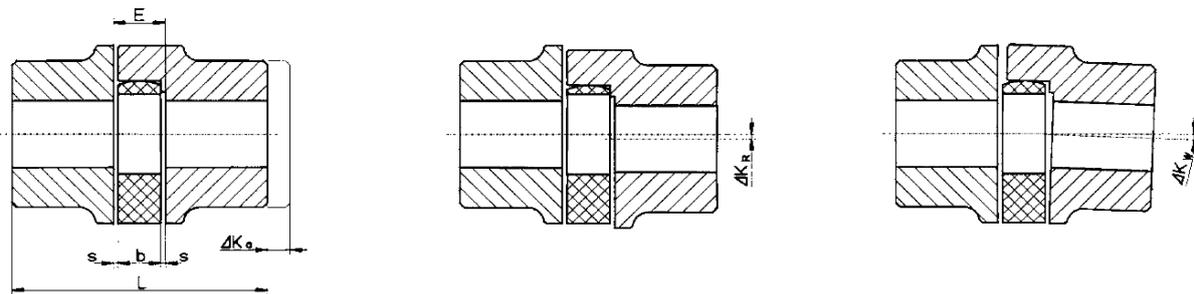


Table 6: Displacement values

Spidex® Type	Dimensions [mm]					Axial offset	Radial offset ΔKr (mm)				Angular offset ΔKw [°]			
	L	E	b	s	ΔKa [mm]	Rotation n[1/min]				Rotation n[1/min]				
						750	1000	1500	3000	750	1000	1500	3000	
A14	35	13	10	1.5	1.0	0.22	0.20	0.16	0.11	1.3	1.3	1.2	1.1	
A15	28	8	6	1	1.0	0.22	0.20	0.16	0.11	1.3	1.3	1.2	1.1	
A19	66	16	12	2.0	1.2	0.27	0.24	0.20	0.13	1.3	1.3	1.2	1.1	
A24	78	18	14	2.0	1.4	0.30	0.27	0.22	0.15	1.1	1.0	0.9	0.8	
A28	90	20	15	2.5	1.5	0.34	0.30	0.25	0.17	1.1	1.0	0.9	0.8	
A38	114	24	18	3.0	1.8	0.38	0.35	0.28	0.19	1.1	1.1	1.0	0.8	
A42	126	26	20	3.0	2.0	0.43	0.38	0.32	0.21	1.1	1.1	1.0	0.8	
A48	140	28	21	3.5	2.1	0.50	0.44	0.36	0.25	1.2	1.2	1.1	0.9	
A55	160	30	22	4.0	2.2	0.54	0.46	0.38	0.26	1.2	1.2	1.1	1.0	
A65	185	35	26	4.5	2.6	0.56	0.50	0.42	0.28	1.2	1.2	1.2	1.0	
A75	210	40	30	5.0	3.0	0.65	0.58	0.48	0.32	1.3	1.2	1.2	1.0	
A90	245	45	34	5.5	3.4	0.68	0.60	0.50	0.34	1.3	1.3	1.2	1.1	
A100	270	50	38	6.0	3.8	0.71	0.64	0.52	0.36	1.3	1.3	1.2	1.1	
A110	295	55	42	6.5	4.2	0.75	0.67	0.55	0.38	1.3	1.3	1.3	1.1	
A125	340	60	46	7.0	4.6	0.80	0.70	0.60	-	1.3	1.3	1.3	-	

- The displacement values stated in Table 6 are maximum values, which must not occur at the same time. If radial and angular displacements do occur simultaneously, the permissible displacement values may only be used proportionately.
- Use a measuring gauge, ruler or feeler gauge to check whether the permissible displacement values from Table 6 have been maintained.

6.0 Spare parts management & addresses:



Having important spare parts in stock at the installation location is a basic requirement for ensuring the operational readiness of the coupling.



You can find contact addresses of field service staff or partners for spare parts/orders on the R+L HYDRAULICS website at www.rl-hydraulics.com.

R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 10 of 16 Version: 1ENG
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7.0 Important information for Ex-zones

7.1 Instruction manual supplement “Ex”

If the SPIDEX coupling is operated in or in connection with an explosive atmosphere, the following supplementary instructions must be followed in addition to instruction manual “BMA0007”.

7.2 Intended use

The SPIDEX coupling is a component under the terms of RL 94/9/EC and may only be operated in or in connection with an explosive atmosphere if the conditions below are met.

7.2.1 Explosive atmosphere

Ambient pressure p_U 0.8 to 1.1 bar

Operation is forbidden in an explosive atmosphere resulting from explosive dust or unstable substances.

7.2.2 Instructions for use

The SPIDEX coupling was designed to be free of ignition sources in accordance with the respective category defined in standard DIN EN 13463-1. Use of the SPIDEX coupling in connection with an explosive atmosphere depends on the material used and the sprocket size. The following category assignments apply:

in Equipment Group I up to size ZK75 in Category M2 with the designation:

 ` I M2 X

in Equipment Group II up to size ZK65 in Category 2GD with the designation:

 ` II 2 GD IIC TX

up to size ZK125 in Category 2GD with the designation:

 ` II 2 GD IIB TX

from size ZK140 in Category 2D or 3G with the designation:

 ` II 2D 3G TX

The different sprocket materials are distinguished by colour-coding.

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R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 11 of 16 Version: 1ENG
---	--	--

The minimum ambient temperature is:

Colour of sprocket material	Ambient temperature
Blue	$-40^{\circ}\text{C} \leq T_a$
White	$-40^{\circ}\text{C} \leq T_a$
Green	$-20^{\circ}\text{C} \leq T_a$
Red	$-30^{\circ}\text{C} \leq T_a$

Maximum ambient temperature, temperature class and maximum surface temperature are as follows:

Colour of sprocket material	Ambient temperature	Temperature class	Max. surface temp.
Blue, white, green and red	$T_a \leq 40^{\circ}\text{C}$	T6	T85°C
White, green and red	$T_a \leq 60^{\circ}\text{C}$	T6	T85°C
White, green and red	$T_a \leq 70^{\circ}\text{C}$	T5	T95°C
Green and red	$T_a \leq 75^{\circ}\text{C}$	T5	T100°C
Green and red	$T_a \leq 80^{\circ}\text{C}$	T4	T105°C

The respective design limits must be adhered to. The permitted displacement values must not be exceeded.

Please refer to the instruction manual for information on the coupling types and materials available. Aluminium couplings are not available in Group I.

The operating company must ensure that the coupling is not operated in its natural vibration range. Coupling-specific parameters for the calculation of natural vibration may be found in the instruction manual.

The exposed surface of the sprocket may become charged with static electricity. Inadmissible charging may occur if the coupling runs in an accumulation of dust, which the operating company must take care to prevent.

In order to prevent the formation of mechanical ignition sources, contact with the rotating coupling must be avoided e.g. by means of a suitable coupling guard.

The materials used in the construction of the coupling must not be affected by chemical influences in the surrounding atmosphere.

The operating company is responsible for ensuring that all requirements for operation as intended are met.

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R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 12 of 16 Version: 1ENG
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7.3 Industrial safety instructions



If the SPIDEX coupling is used as a component of a device or sub-assembly under the terms of RL 94/9/EC, the manufacturer of the device or sub-assembly is responsible for ensuring and confirming the conformity of the device or sub-assembly with the relevant directive.

If the SPIDEX coupling is used as part of an installation, the company operating the installation is obliged to ensure that the requirements of RL 1999/92/EC and any additional national requirements are met.

The operating company is obliged to check whether, on the basis of the instructions for use, the SPIDEX coupling is suitable for operation in the explosive atmosphere that is actually present.

There are no effective ignition sources during trouble-free operation of the SPIDEX coupling. The operating company is obliged to perform the checks, maintenance and repairs set out in the instruction manual in order to ensure trouble-free operation.

The operating company must deactivate any coupling that is not in full working order. The coupling must not be operated again until the necessary repairs have been carried out.

Do not carry out checks, servicing or maintenance work on the SPIDEX coupling if an explosive atmosphere is present.

No flame cutting, welding or cutting apparatus is necessary to carry out maintenance and servicing.

Suitable safety measures in accordance with DIN EN 1127-1, Annex A must be implemented during work in an explosive atmosphere. Smoking, fire and naked flames are prohibited.

Only tools defined in DIN EN 1127-1, Annex A as suitable for such operating conditions may be used.

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7.4 Installation and assembly



The two halves of the coupling must be secured against axial displacement. If the coupling halves are not mounted against a shaft shoulder, they must be secured by a locking screw; in turn, the locking screw must be secured against loosening by the application of adhesive. The adhesive must be temperature resistant up to at least 125°C.

In order to ensure that metal-on-metal contact is completely eliminated, the coupling halves must be assembled with the specified play "s".

Coupling hubs in Category 2 are always equipped with a keyway. Coupling hubs without keyway may only be used as Category 3 components.

Flange screws and/or clamping screws must be tightened with the specified torque.

The coupling guard / separation safety guard must be configured in such a way as to prevent any mechanical contact with the coupling whatsoever.

The sprocket is made of insulating material that prevents a direct potential equalisation between the two halves of the coupling. The plant itself must be constructed in such a way as to ensure there is potential equalisation between the two halves of the coupling.

7.5 Checks, maintenance and repairs



In addition to the maintenance instructions contained in the instruction manual, the following directions must be observed in order to prevent and identify faults.

Any faults must be rectified immediately in accordance with the maintenance and repair instructions.

Carry out daily checks for alterations in running noise or manifest/audible vibration.

Friction can cause sprocket wear, resulting in contact between the two halves of the coupling and the formation of ignitable sparks. An initial check for wear must therefore be carried out after 3000 operating hours and repeated every 3000 operating hours or after 6 months at the latest. Replace the sprocket in the event of undue wear.

R+L HYDRAULICS GmbH Friedrichstr. 6 58791 Werdohl	SPIDEX® Operating- / Installation manual	Number: BMA0007 Page: 14 of 16 Version: 1ENG
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In order to maintain the explosion protection strategy, only replacement parts specified and approved by the manufacturer may be used in the event of repairs.

7.6 Testing



Under the terms of RL 1999/92/EC, the SPIDEX coupling must be tested before first operation to ensure that it is assembled correctly and in perfect working order. The tests must be carried out and the results documented by qualified personnel or an employee of R+L HYDRAULICS GmbH, Werdohl.

Under the terms of RL 1999/92/EC, the SPIDEX coupling must be tested at the latest every 3 years to ensure that it is in perfect working order. The tests must be carried out and the results documented by qualified personnel or an employee of R+L HYDRAULICS GmbH, Werdohl.

8.0 Additional information:



The customer bears sole responsibility for all subsequent machining on the coupling components, which are not performed by R+L HYDRAULICS GmbH. All claims for warranty are excluded.



Any subsequent work carried out on coupling components intended for use in Ex-zones, which is not performed by R+L HYDRAULICS, will result in those components becoming immediately unfit for use in Ex-zones. Furthermore, the customer shall bear sole responsibility for any such work. All claims for warranty are excluded.

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