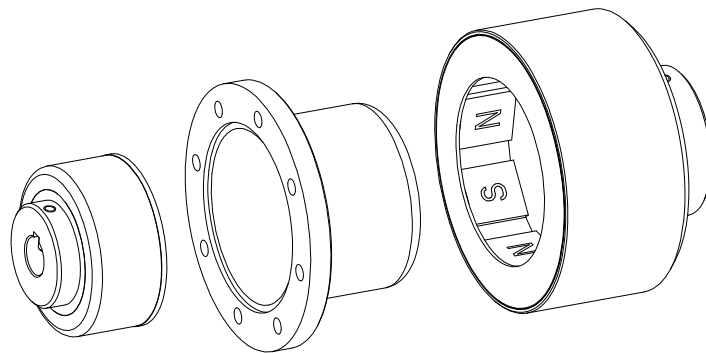


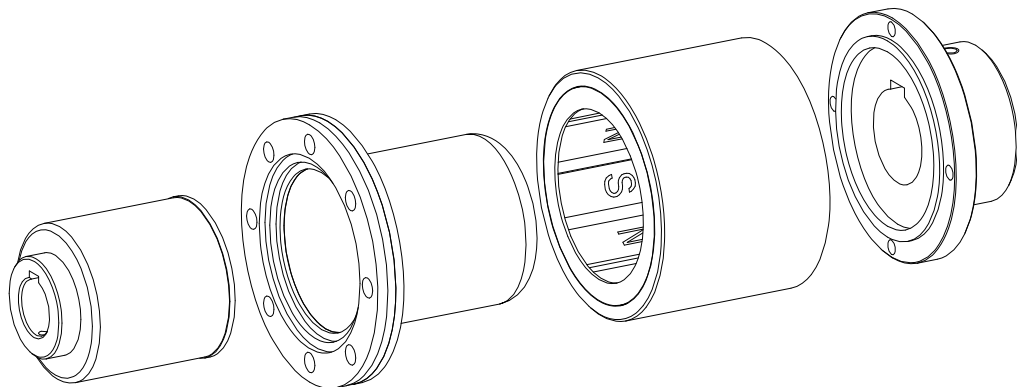


MINEX[®]-S Permanent magnetic coupling

according to Standard 94/9/EC (ATEX 95)
for finish bored, pilot bored and unbored couplings



Sizes SA 22/4 to SB 60/8



Sizes SA 75/10 to SF 250/38

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:



The **MINEX[®]-S** is a permanent magnetic synchronous coupling that can contactlessly transmit torques through magnetic forces. It is used in pumps and agitators, and it reliably separates the product space from the atmosphere.

Table of Contents

1 Technical Data

- 1.1 Sizes and Dimensions
- 1.2 Selection Data

2 Hints

- 2.1 General Hints
- 2.2 Safety Hints and Advice
- 2.3 General Hints to Danger
- 2.4 Proper Use
- 2.5 Coupling Hints






3 Storage

4 Assembly

- 4.1 Components of the MINEX[®]-S
- 4.2 Hint Regarding the Finish Bore
- 4.3 Hint for the Drive and the Driven Shaft
- 4.4 Assembly of Internal and External rotor
- 4.5 Assembly of the Containment Shroud and Putting the Coupling into Operation
- 4.6 Displacements - Alignment of the Couplings
- 4.7 Disassembly
- 4.8 Spares Inventory, Customer Service Addresses

5 Enclosure A

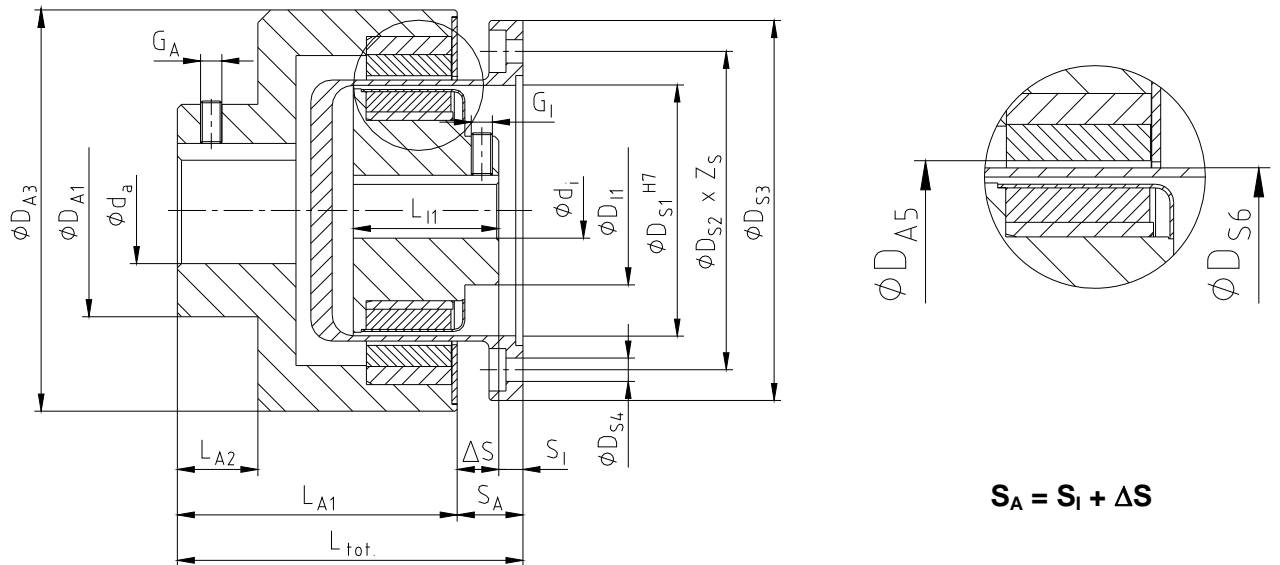
Hints and Instructions Regarding the Use in Hazardous Areas

- 5.1 Purposive Use in  Hazardous Areas
- 5.2 Control Intervals for couplings in  Hazardous Areas
- 5.3 Temperature Control in  Hazardous Areas
- 5.4 Permissible Coupling Materials in  Hazardous Areas
- 5.5  Marking of Coupling for Hazardous Areas
- 5.6 Starting
- 5.7 Breakdowns, Causes and Elimination
- 5.8 Statement of the Manufacturer According to EC Standard 94/9/EC dated 23 March 1994



1 Technical Data

1.1 Sizes and Dimensions



picture 1: MINEX[®]-S, SA 22/4 to SB 60/8

Table 1: dimensions – SA 22/4 to SB 60/8

MINEX [®] -S size	T_K max. [Nm] at ~20 °C	Dimensions [mm]											
		Internal rotor							Containment shroud				
		Finish bore ¹ d_i		D_{I1}	L_{I1}	S_I		G_I	D_{S1}	D_{S2}	D_{S3}	D_{S4}	Z_S
		min.	max.			min.	max.						
SA 22/4	0,15	5	9	20	20	2,0	2,0	M3	21,5	38	46	4,5	8
SA 34/10	1	5	12	20	22	2,0	5,5	M3	34	46	55	4,5	4
SA 46/6	3	8	16	28	33	6,5	7,0	M4	46	-	78	-	-
SA 60/8	7	12	22	36	36	2,2	3,5	M5	59	75	89,5	5,5	8
SB 60/8	14				56	0,0	3,5						

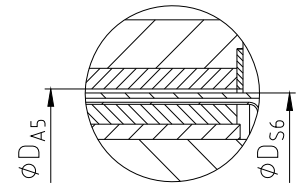
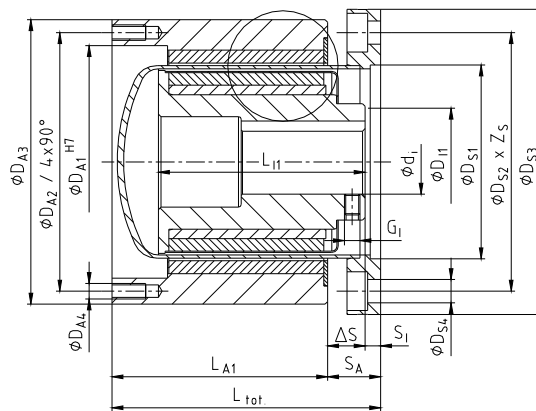
MINEX [®] -S size	Dimensions [mm]											
	External rotor							General				
	Finish bore ¹ d_a		D_{A1}	D_{A3}	L_{A1}	L_{A2}	ΔS	G_A	D_{S6}	D_{A3}	$L_{tot.}$	
	min.	max.									min.	max.
SA 22/4	5	11	18	38	35	8,5	5,0	M4	23,5	24,8	42	42
SA 34/10	5	14	22	53	38,5	10,5	5,5	M4	36,0	37,3	46	49,5
SA 46/6	5	19	30	69,5	53	16	9,0	M5	48,5	49,4	68,5	69,5
SA 60/8	9	28	50	94,5	66	19	12,0	M6	61,0	63,2	80	81,3
SB 60/8	9	38			93	15		M8	61,5	63,2	105	108

¹bore H7 with feather keyway DIN 6885 sheet 1 [JS9]



1 Technical Data

1.1 Sizes and Dimensions



$$S_A = S_I + \Delta S$$

picture 2: MINEX®-S,
SA 75/10 to SF 250/38

Table 2: Dimensions – SA 75/10 to SF 250/38

MINEX®-S size	T _{K max.} [Nm] at ~20 °C	Dimensions [mm]											
		Internal rotor						Containment shroud					
		Finish bore ¹ d _i		D _{I1}	L _{I1}	S _I		G _I	D _{S1}	D _{S2}	D _{S3}	D _{S4}	Z _S
min.	max.	min.	max.										
SA 75/10	10												
SB 75/10	24	12	28	45	39,5	4	46,5	M6	75	100	118	9	8
SC 75/10	40				58		26,5						
SA 110/16	25				80		6,0						
SB 110/16	60	14	55	72	45	4	51,0	M8	110	133	153	9	12
SC 110/16	95				65		31,0						
SB 135/20	100				85		11,0						
SC 135/20	145	20	70	90	65	4	46,5	M10	135	158	178	9	16
SD 135/20	200				85		26,5						
SC 165/24	210				110		7,0						
SD 165/24	280	24	90	110	85	6	66,5	M12	163,5	192	218	11	12
SE 165/24	370				110		41,0						
SD 200/30	430				130		22,0						
SE 200/30	550	38	90	130	135	6	18,0	M16	200	252	278	11	12
SD 250/38	670				115		7,0						
SE 250/38	820	38	90	165	135	-	26,0	M16	255	285	315	13,5	12
SF 250/38	1000				155		46,0						

MINEX®-S size	Dimensions [mm]								
	External rotor						General		
	D _{A1}	D _{A2}	D _{A3}	D _{A4}	L _{A1}	ΔS	D _{S6}	D _{A5}	L _{tot.}
SA 75/10					41				
SB 75/10	90	100	110	M6	61	12,5	74,6	76,4	102
SC 75/10					83,5	14,5			
SA 110/16					41				
SB 110/16	126	135	145	M6	61	19,0	111,5	113,1	115
SC 110/16					81				
SB 135/20					70				
SC 135/20	150	160	170	M6	90	18,5	136,5	138,5	139
SD 135/20					110	22,0			
SC 165/24					90	18,5			
SD 165/24	180	188	198	M6	110	21,0	167,0	169,2	170
SE 165/24					130				
SD 200/30	212	222	232	M6	130	26,0	198,0	199,5	180
SE 200/30									
SD 250/38					110				
SE 250/38	267	277	287	M6	130	26,0	253,0	255,0	183
SF 250/38					150				

¹bore H7 with feather keyway DIN 6885 sheet 1 [JS9]

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:



1 Technical Data

1.2 Selection Data

Perm. operating pressure:	16 bar at 300 °C ¹ 16 bar at 150 °C ² 25 bar at 300 °C ^{1, 3} 25 bar at 150 °C ^{2, 3} Higher resistances to pressure are possible on request, if required.
Perm. operating temperature:	300 °C ¹ / 150 °C ²
Max. speed:	3.600 1/min ⁴

¹ Figures are valid for magnets from Sm2Co17

² Figures are valid for magnets from NdFeB

³ Figures are valid for containment shrouds from hastelloy (tube) – 1.4571 (flange).

⁴ Figure is valid if metallic containment shrouds according to KTR standard are used.

The operation of several max. ratings existing at the same time must be avoided due to unsafe operation.

The materials of the magnetic coupling result from the use and are bound to the order.

2 Hints

2.1 General Hints

Please read through these operating/mounting instructions carefully before you set the coupling into operation. Please pay special attention to the safety instructions!



The **MINEX®-S** coupling is suitable and approved for the use in hazardous areas. When using the coupling in hazardous areas please observe the special hints and instructions regarding safety in enclosure A.

The mounting instructions are part of your product. Please keep them carefully and close to the coupling. The copyright for these mounting instructions remains with **KTR Kupplungstechnik GmbH**.

2.2 Safety Hints and Advice



DANGER!

Danger of injury to persons.



CAUTION!

Damages on the machine possible.



ATTENTION!

Pointing to important items.



PRECAUTION!

Hints concerning explosion protection.



2 Hints

2.3 General Hints of Danger



DANGER!

For people with pacemakers there is a danger within 2 m around the MINEX®-S. With assembly, operation and maintenance of the coupling it has to be made sure that the entire drive train is protected against unintentional engagement. You can be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety instructions.



CAUTION!

With magnetic data media (cheque cards, discs etc.) within a distance of 1 m around the MINEX-S. The internal and the external rotor have a strong magnetic field. Within a distance of 0.5 m around the MINEX®-S an uncontrolled handling close to metallic parts, a sudden mutual attraction of the rotors or of magnetizable parts can lead to injuries or to damages to the parts.

- Workings on the MINEX®-S are generally only permitted during standstill and in unpressurized condition.
- All operations on and with the coupling have to be performed taking into account "safety first".
- Please make sure to disengage the power pack before you perform your work.
- Protect the power pack against unintentional engagement, e. g. by providing hints at the place of engagement or removing the fuse for current supply.
- Do not touch the operation area of the coupling as long as it is in operation.
- Please protect the coupling against unintentional touch. Please provide for the necessary protection devices and caps.

The user is asked to check within the scope of his safety concept how a failure of the magnetic coupling influences the environment and which additional safety measures to protect people must be taken.

In addition to the hints given in this data sheet of safety the general instructions for operational safety and accident prevention must be observed.

2.4 Proper Use

You may only assemble, operate and maintain the coupling if you

- carefully read through the mounting instructions and understood them
- had technical training
- are authorized to do so by your company

The coupling may only be operated acc. to the conditions described under item 1.2 „Selection Data“.

Unauthorized modifications on the coupling design are not admissible. We do not take any warranty for resulting damages. To further develop the product we reserve the right for technical modifications.

The **MINEX®-S** described in here corresponds to the technical status at the time of printing of these mounting instructions.

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:

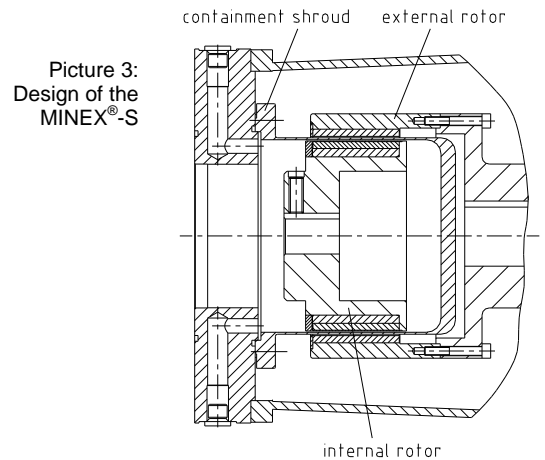


2 Hints

2.5 Coupling Hints

For a safe operation of the magnetic coupling a circulation of the medium is compulsorily necessary in order to ensure a permanent heat dissipation.

For dirty media containing abrasive or magnetic parts a separation in the circulation is recommended.



3 Storage

The coupling hubs are supplied in preserved condition and can be stored at a dry and roofed place for 2 years.



CAUTION!

The storage rooms may not include any ozone-generating devices, like e. g. fluorescent light sources, mercury-vapour lamps or electrical high-voltage appliances.

Humid storage rooms are not suitable.

Please make sure that there is no condensation. The best relative air humidity is under 65 %.

A direct contact with metallic parts must be avoided.

A direct heat influence (sun, heating) on the MINEX®-S must be avoided.

For the conservation of all units with an installed MINEX®-S the compatibility of the selected preservative with the MINEX®-S materials must be checked.

4 Assembly

Basically the coupling is supplied in individual parts. Before assembly the coupling has to be controlled for completeness.



CAUTION!

Please make sure that the coupling parts are not damaged when unpacking them.

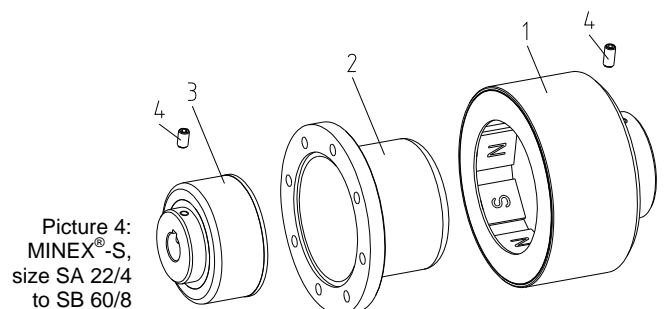
The coupling parts have a strong magnetic field.

4.1 Components of the MINEX®-S

Components of the MINEX®-S, size SA 22/4 to SB 60/8

Component	Quantity	Designation
1	1	External rotor
2	1	Containment shroud
3	1	Internal rotor
4	2	Setscrew DIN EN ISO 4029 ¹

¹only for finish bored design



Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:

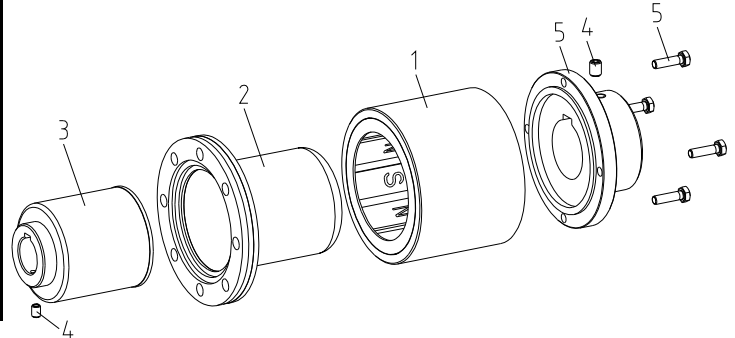


4 Assembly

4.1 Components of the MINEX®-S

Components of the MINEX®-S, size SA 75/10 to SF 250/38

Component	Quantity	Designation
1	1	External rotor
2	1	Containment shroud
3	1	Internal rotor
4	2	Setscrew DIN EN ISO 4029 ¹
5	1	Flange hub ² with cap screws DIN EN ISO 4762 or hexagon head screws DIN EN ISO 4017



Picture 5: MINEX®-S, size SA 75/10 to SF 250/38

¹only for finish bored design
²only on request



ATTENTION!

If KTR also supplies component 5, the following tightening torques must be considered when screwing the hub with the external rotor. The screws used also belong to the scope of delivery of KTR.

Table 3: Tightening torques of the cap screws or hexagon head screws

MINEX®-S size	75/10	110/16	135/20	165/24	200/30	250/38
Cap screws according to DIN EN ISO 4762 or hexagon head screws according to DIN EN ISO 4017 ¹	M6					
Tightening torque T _A [Nm]	14					

¹min. property class 10.9

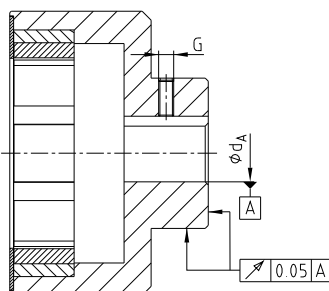
4.2 Hint Regarding the Finish Bore



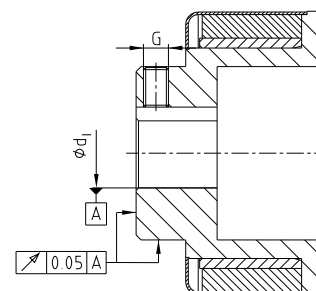
DANGER!

The maximum permissible bore diameters d (see table 1 and 2 in chapter 1.1 – Sizes and Dimensions) must not be exceeded. If these figures are disregarded, the coupling may tear. Rotating particles may cause serious danger.

- Hub bores machined by the customer have to observe concentric running or axial running, respectively (see picture 6 and 7).
- Please make absolutely sure to observe the figures for d_{max}.
- Carefully align the hubs when the finish bores are brought in.
- Use a setscrew acc. to DIN EN ISO 4029 with cup point or an end plate to axially secure the flange hubs.



Picture 6: Concentric running and axial running (external rotor)



Picture 7: Concentric running and axial running (internal rotor)



4 Assembly

4.2 Hint Regarding the Finish Bore



CAUTION!

The orderer is responsible for all subsequently made machinings to unbored or pilot bored and to finish machined coupling parts and spare parts. KTR does not assume any warranty claims resulting from insufficient refinish.



PRECAUTION!

Any mechanical rework to couplings that are used in hazardous areas require an explicit release by KTR.

The orderer must send a drawing to KTR acc. to which the manufacture must be made. KTR checks this drawing and returns it to the orderer with approval.

KTR supplies unbored or pilot bored coupling parts and spare parts on explicit customer's request. These parts are additionally labelled with the symbol .

Table 3: Setscrews according to DIN EN ISO 4029

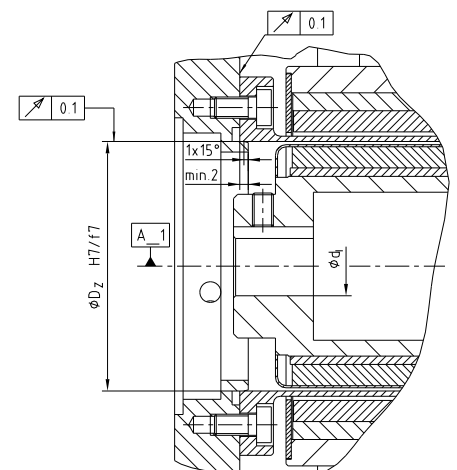
MINEX®-S size	22/4	34/10	46/6	60/8	75/10	110/16	135/20	165/24	200/30	250/38	
Internal rotor											
Dimension G	M3	M3	M4	M5	M6	M8	M10	M12	M16	M16	
Tightening torque T_A [Nm]	1	1	1,5	2	4,8	10	17	40	80	80	
External rotor											
Dimension G	M4	M4	M5	M6 ¹	M8 ¹	M8 ²	M10 ²	M12 ²	M12 ²	M12 ²	M16 ²
Tightening torque T_A [Nm]	1,5	1,5	2	4,8	10	10	17	40	40	40	80

¹ for type SA 60/8 – M6; for type SB 60/8 – M8

² if the flange hub is supplied by KTR

4.3 Hint for the Drive and the Driven Shaft

- When manufacturing the pump shaft and the adapter plate for the containment shroud, the concentricity and the axial running (picture 8) must be observed.
- Please use tolerance f7 for the centering of the containment shroud.
- Tolerance fits and surface for round sealing rings: finely finished R_z 6.3 μ m.



Picture 8:
Toleration of
driven-sided
connection parts



4 Assembly

4.4 Assembly of Internal and External Rotor



ATTENTION!

For the assembly we would recommend to have the data sheet of the magnetic coupling with you.



DANGER!

Shocks and pushes to the coupling parts are not allowed. This can lead to a damage to the parts.



ATTENTION!

We recommend to check bores, shaft, keyway and feather key for dimensional accuracy before assembly.

- Before the assembly the internal and the external rotor must be cleaned to remove the magnetic dust. Recommended utilities are: Propyl alcohol and cellulose cloths (no cleaning rags).
- Assemble the internal and external rotor onto the shaft of driving and driven side. Heating the internal and external rotor slightly (approx. 80 °C) allows for an easier installation onto the shaft.



DANGER!

Touching the heated hubs causes burns.
We would recommend to wear safety gloves.

- Please observe the distance dimensions S_I and S_A between the internal and the external rotor and the sealing surface of the containment shroud shown in table 1 and 2. Hereby you ensure that the outer and the inner magnets are flush above each other.



CAUTION!

The user must ensure a correct alignment of the internal rotor and the containment shroud.

- Please secure the rotors – according to the design – by tightening the grub screws acc. to DIN EN ISO 4029 or by using an end plate and end screw.

4.5 Assembly of the Containment Shroud and Putting the Coupling into Operation

- Put the round sealing ring or the flat sealing – according to the design – into the adapter flange or into the absorbing keyway of the containment shroud.



ATTENTION!

The material must be resistant to the conditions of use (medium, temperature).

- Push the containment shroud over the internal rotor and screw it with the adapter flange.

Table 4: Recommended tightening torques for cap screws from V2A-70 – DIN EN ISO 4762

MINEX®-S size	Thread	z = quantity	T _A [Nm]	MINEX®-S size	Thread	z = quantity	T _A [Nm]
22/4	M4	8	2,6	110/16	M8	12	21
34/10	M4	8	2,6	135/20	M8	16	21
46/6	M4	8	2,6	165/24	M10	12	41
60/8	M5	8	5,1	200/30	M10	12	44
75/10	M8	8	21	250/38	M12	12	74



4 Assembly

4.5 Assembly of the Containment Shroud and Putting the Coupling into Operation

Continuation:

- Circulation bores must ensure an automatic ventilation and emptying.
- Please make sure that driving and driven side are connected slowly to prevent the external rotor from striking against the containment shroud.



DANGER!

There is the danger of squeezing if the magnets of internal and external rotor are tightened suddenly.

- Please make sure that there is a radial direction during the assembly because the external rotor must not touch the containment shroud.



CAUTION!

Do not damage the external rotor and the containment shroud during the assembly.

- Fill the complete machine and containment shroud with one medium during standstill.
- Please carefully ventilate the containment shroud and the circulation cycle.
- After the initial operation and a longer standstill it must be checked (by manually turning the drive shaft) if coupling and aggregate can be turned easily.
- After a short initial operation the ventilation process must be repeated several times when the machine has been stopped.



CAUTION!

The MINEX®-S may never operate dryly throughout a longer period.

Please note:

In general the internal and the external rotor of the magnetic coupling must always run synchronously. The operation in a „torn-off condition“ throughout a longer period of time must be avoided because the containment shroud can be heated inadmissibly. There is no demagnetization. After switching off the engine the coupling synchronizes again and can transmit the full performance.

Before longer periods of standstill liquids tending to solidification, efflorescence, polymerization etc. must be removed from the machine and the containment shroud. If necessary, wash them with a suitable liquid.

A troublefree operation of the MINEX®-S can be expected if you observe the maximum ratings of operation and the hints given in these instructions.

4.6 Displacements - Alignment of the Couplings

The displacement figures shown in table 5 offer sufficient safety to compensate for environmental influences like, for example, heat expansion or lowering of foundation.



CAUTION!

In order to ensure a long lifetime of the coupling and to avoid dangers regarding the use in hazardous areas, the shaft ends must be accurately aligned.



Please absolutely observe the displacement figures indicated (see table 5). If the figures are exceeded, the coupling is damaged.

The exacter the alignment of the coupling is, the higher is its lifetime.

In case of a use in hazardous areas for explosion group IIC (marking II 2G c IIC T X), only the half displacement figures (see table 5) are permissible.

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz Geprüft: 14.07.10 Pz	Ersatz für: KTR-N vom 27.06.07 Ersetzt durch:
--------------------------------------	---	--

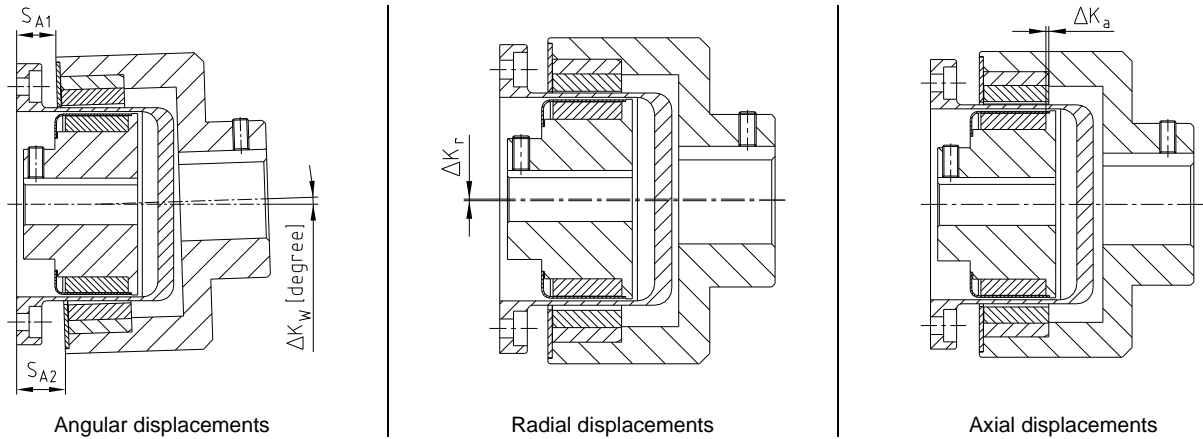


4 Assembly

4.6 Displacements - Alignment of the Couplings

Please note:

- The displacement figures mentioned in table 5 are maximum figures which must not arise in parallel. If radial and angular displacement arises at the same time, the permissible displacement values may only be used proportionately (see picture 10).
- Please check with a dial gauge, ruler or feeler whether the permissible displacement figures of table 5 can be observed.



$$\Delta K_w = S_{A2} - S_{A1} \text{ [mm]}$$

Picture 9: Displacements



CAUTION!

In case of a possible axial displacement please take into account that you may not fall below the min. distance dimension of the external rotor $S_{A \text{ min.}} = S_{I \text{ min.}} + \Delta S + \Delta K_w$ (tables 1, 2 and 5) in any case!
In case of non-observance the external rotor can touch the bottom of the containment shroud!

Example for the misalignment combinations given in picture 10:

Example 1:

$\Delta K_r = 30 \%$

$\Delta K_w = 70 \%$

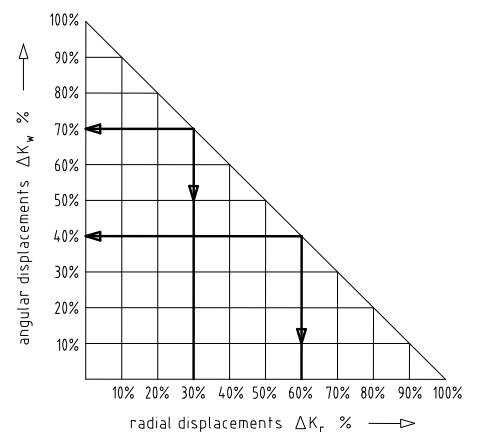
Example 2:

$\Delta K_r = 60 \%$

$\Delta K_w = 40 \%$

$$\Delta K_{\text{total}} = \Delta K_r + \Delta K_w \leq 100 \%$$

Picture 10:
Combinations of displacement





4 Assembly

4.6 Displacements - Alignment of the Couplings

Table 5: Displacement figures

MINEX® size	Max. angular displacements		Max. radial displacements ΔK_r [mm]	Max. axial displacements ¹ ΔK_a [mm]
	ΔK_w [degree]	ΔK_w [mm]		
SA 22/4	1,68	1,11	0,30	± 1
SA 34/10	1,92	1,78	0,29	
SA 46/6	0,88	1,07	0,19	
SA 60/8	1,52	2,48	0,37	
SB 60/8	0,8	1,32		
SA 75/10	1,6	3,07	0,40	
SB 75/10	0,8	1,54		
SC 75/10	0,56	1,08		
SA 110/16	1,28	3,24	0,32	
SB 110/16	0,64	1,62		
SC 110/16	0,48	1,21		
SB 135/20	0,88	2,61	0,42	
SC 135/20	0,56	1,66		
SD 135/20	0,40	1,19		
SC 165/24	0,48	1,66	0,37	
SD 165/24	0,40	1,38		
SE 165/24	0,32	1,11		
SD 200/30	0,40	1,62	0,39	
SE 200/30	0,32	1,30		
SD 250/38	0,38	1,92		
SE 250/38	0,31	1,56		
SF 250/38	0,26	1,32		

¹considering $S_{A \min}$. (see table 1 and 2)

4.7 Disassembly

If you disassemble the magnetic coupling please absolutely observe the instructions valid for operations with dangerous media and for accident prevention. If anything is not clear, please ask us for the necessary information before disassembly.



CAUTION!
Please observe the safety and warning notices!

The disassembly of the magnetic coupling is made in the reverse order of the assembly.

4.8 Spares Inventory, Customer Service Addresses


A basic requirement to guarantee the operational readiness of the coupling is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage under www.ktr.com.

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:



5 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas



CAUTION!

By reason of heat development when using metallic containment shrouds the following requirements for the use of the MINEX®-S must obligatorily be met:

- In order to exclude an inadmissibly high heat development the temperature of the containment shroud must be monitored ensuring that the pump drive is switched off if the temperature is too high (item 5.2).
- A dry operation of the magnetic coupling is not allowed, i. e. immediately after assembly and starting the operation of the magnetic coupling the inside of the containment shroud must be filled with the conveying medium.
- A compulsory cooling flow of the internal rotor by the conveying medium or a sealing liquid must be provided for a continuous removal of the heat generated in the air gap.

5.1 Purposive Use in  Hazardous Areas

Conditions of Use in  Hazardous Areas


The MINEX® couplings are suitable for the use according to EC Standard 94/9/EC.

5.2 Control Intervals for Couplings in  Hazardous Areas

Explosion group	Control intervals
all	<p>If the MINEX®-S magnetic coupling is duly operated, a maintenance is not required during the complete operating time.</p> <p>An inspection of the coupling, the shaft bearings and the auxiliary seals should be made by a suitable specialized staff within the scope of the revision of the unit, but at the latest after 2.5 years.</p>



5 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

5.3 Temperature Control in  Hazardous Areas

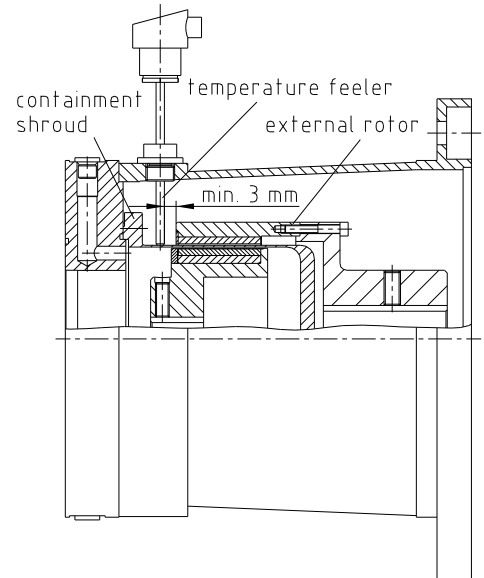
The compulsory control of the heat development in the coupling requires a suitable supervising system with respective temperature feeler.

The system for the temperature control must be suitable for the respective explosive area.



CAUTION!
The temperature feeler must be positioned between the containment shroud flange and the outer rotor!

- The assembly should be made in the coupling housing or in the bellhousing, dependent on the design.
- The position should be as close as possible to the external rotor because there is the highest temperature. However, a minimum distance of 3 mm must be observed.



Picture 11: Position of the temperature feeler

Dependent on the selected temperature class KTR stipulates the following switch-off temperatures for the T-supervising system:

Table 6:

Temperature class	Max. permitted surface temperature in °C	Switch-off temperature in °C		
		For T-measurement with platinum thermometer		For T-measurement with thermo elements directly on the casing of the containment shroud
		In the pocket bore in the containment shroud flange	Directly on the casing of the containment shroud	
T1	450	250 ¹	250 ¹	250 ¹
T2	300	250 ¹	250 ¹	250 ¹
T3	200	185 ²	190 ²	195 ²
T4	135	120	125	130
T5	100	85	90	95
T6	85	70	75	80

¹If the magnet material Sm2Co17 is used, the constructive switch-off temperature is + 250° C.

²If the magnet material NdFeB is used, the constructive switch-off temperature is + 150° C.

5.4 Permissible Coupling Materials in  Hazardous Areas

The materials available for the **MINEX®-S** coupling are generally permitted for explosive areas since these are only steel parts (external rotor) and parts from stainless steel (internal rotor, containment shroud).


Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:



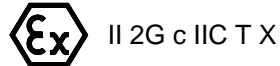
5 Enclosure A

Hints and Instructions Regarding the Use in Hazardous Areas



5.5 Marking of Coupling for Hazardous Areas

Couplings for the use in hazardous areas are marked on at least one component completely and on the remaining components at the outside diameter of the hub or on the front side with an  label for the respectively permitted conditions of use.

Complete labelling:



The labelling with Explosion Group IIC includes Explosion Groups IIA and IIB.

If the coupling part is labelled with  in addition to , KTR supplied it unbored or pilot bored.



CAUTION!

Any mechanical rework to couplings that are used in hazardous areas require an explicit release by KTR.

The orderer must send a drawing to KTR acc. to which the manufacture must be made. KTR checks this drawing and returns it to the orderer with approval.

5.6 Starting

Before putting the coupling into operation, check the tightness of the setscrews in the hubs, the alignment and correct, if necessary, and also check all screw connections regarding the stipulated tightening torques dependent on the type of coupling.



If used in hazardous areas the grub screws to fix the hub and the screws at the flange hubs must be additionally secured against self-loosening, e. g. glue with Loctite (medium strength).

Last but not least, the coupling protection against unintended contact must be fixed.

The cover must be electrically conductive and be included in the equipotential bonding. Bellhousings (magnesium part below 7,5 %) made from aluminium and damping rings (NBR) can be used as connecting element between pump and electro motor. The cover may only be taken off after having stopped the unit.

During operation, please pay attention to

- strange running noises
- occurring vibrations.

For covers with unlocked openings on the upper side no light metals may be used if the couplings are used as appliances of appliance group II (*if possible, from stainless steel*).

The minimum distance „Sr“ between the protection device and the rotating parts must at least correspond to the figures mentioned below.

If the protection device is used as cover, regular openings complying with the explosion protection demands can be made that must not exceed the following dimensions:

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:



5 Enclosure A

Hints and Instructions Regarding the Use in Hazardous Areas

5.6 Starting

Continuation:

Openings	Cover [mm]		
	Top side	Lateral parts	Distance „Sr“
Circular - max. diameter	4	8	≥ 10
Rectangular - max. lateral length	4	8	≥ 10
Straight or curved slot - max. lateral length/height	prohibited	8	≥ 20



CAUTION!

If you note any irregularities at the coupling during operation, the drive unit must be turned off immediately. The cause of the breakdown must be found out with the table „Breakdowns“ and, if possible, be eliminated according to the proposals. The possible breakdowns mentioned can be hints only. To find out the cause all operating factors and machine components must be considered.

Coupling layer:



If coated (priming, painting etc.) couplings are used in hazardous areas, the requirements to conductivity and layer thickness must be considered. In case of paintings up to 200 µm no electrostatic load can be expected. Multiple coatings that are thicker than 200 µm are prohibited for explosion group IIC.

5.7 Breakdowns, Causes and Elimination

The below-mentioned errors can lead to an incorrect use of the **MINEX®-S** coupling. In addition to the stipulations in these operating and mounting instructions please make sure to avoid these errors. The errors listed can only be clues to search for the errors. When searching for the error the adjacent components must be generally included.



Due to incorrect use the coupling can become a source of ignition. EC Standard 94/9/EC requires a special care from the manufacturer and the user.

General errors resulting from incorrect use

- Important data for the coupling selection was not forwarded.
- The calculation of the shaft/hub connection was not considered.
- Coupling parts with damage occurred during transport are assembled.
- If the heated hubs are assembled, the permissible temperature is exceeded.
- The fits of the parts to be assembled are not coordinated with each other.
- Tightening torques are below/exceeded.
- Components are exchanged by mistake/put together incorrectly.
- No original KTR parts (purchased parts) are used.
- The coupling used / the coupling protection used is not suitable for the operation in hazardous areas and does not correspond to EC Standard 94/9/EC, respectively.
- Maintenance intervals are not observed.

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz Geprüft: 14.07.10 Pz	Ersatz für: KTR-N vom 27.06.07 Ersetzt durch:
--------------------------------------	---	--



5 Enclosure A


Hints and Instructions Regarding the Use in  Hazardous Areas

5.7 Breakdowns, Causes and Elimination

Breakdowns	Causes	Danger hints for hazardous areas	Elimination
Change of the running noises and/or occurring vibrations	Misalignment	Increased temperature at the surface of the containment shroud and at the rotors. Increased danger of ignition due to hot surfaces.	<ol style="list-style-type: none"> 1) Put the unit out of operation. 2) Remove the reason for the wrong alignment (check the centering of the internal and the external rotor in the containment shroud and re-align, if necessary). 3) Check the wear and remove the magnetic chippings completely, if required.
	Tear off of the magnetic forces	Heating of the coupling due to missing heat removal, danger of ignition due to hot surfaces.	<ol style="list-style-type: none"> 1) Put the unit out of operation 2) Remove the reason for the tear off (blockade of the pump due to particles in the conveying medium, damage to the bearing, too high starting torque of the engine, „docking“ of the internal or the external rotor to the containment shroud by reason of bad alignment ⇒ please look above. 3) Synchronize the coupling parts again during standstill. 4) Start the drive again. 5) Please check the perfect function.
	Damaged external magnets due to wrong assembly (contact of the external rotor with the containment shroud).	Danger of ignition due to hot surfaces.	<ol style="list-style-type: none"> 1) Check the external rotor for damages to the magnet. 2) Replace the external rotor and assemble it carefully. Please make sure that there is a radial direction so that a contact with the containment shroud can be excluded.
Repeated tear off of the magnetic forces	Operating parameters do not correspond to the performance of the coupling.	Danger of ignition due to hot surfaces.	<ol style="list-style-type: none"> 1) Put the unit out of operation. 2) Check the operating parameters. 3) If there is a tear off during the starting process, the starting torque must be reduced and/or a larger coupling must be selected (considering the installation space). 4) Assemble new coupling size, check alignment.
	If the operating temperature is too high (magnet material: Sm2Co17 max 250° C or NdFeB max. 150° C), the magnetic field will be weakened.	Danger of ignition due to hot surfaces.	<ol style="list-style-type: none"> 1) Please check the function of the temperature feeler and the switch-off temperature. 2) Check the coupling torque. 3) Please exchange the internal and the external rotor if the torque is insufficient. 4) If required, please optimize the compulsory cooling flow of the internal rotor. If required, please optimize the material of the containment shroud (e. g. hastelloy, titan, ceramics).



5 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

5.7 Breakdowns, Causes and Elimination

Breakdowns	Causes	Danger hints for hazardous areas	Elimination
Repeated tear off of the magnetic forces	Abrasive particles in the conveying medium that block the pump.	Danger of ignition due to hot surfaces.	<ol style="list-style-type: none"> 1) Please check the internal rotor and the containment shroud for friction and exchange them, if necessary. 2) Empty and clean the inside of the containment shroud. 3) Use suitable filters re-ensuring the cleanness of the medium.



If you operate with worn out coupling parts and a subsequent contact of metal parts a due operation acc. to explosion protection and EC Standard 94/9/EC is not guaranteed.



ATTENTION!

KTR does not assume any liabilities or guarantees regarding the use of spare parts and accessories which are not provided by KTR and for the damages resulting herefrom.

Schutzvermerk ISO 16016 beachten.	Gezeichnet: 27.05.10 Pz	Ersatz für: KTR-N vom 27.06.07
	Geprüft: 14.07.10 Pz	Ersetzt durch:




KTR Kupplungstechnik
GmbH
D-48407 Rheine

MINEX®-S
Operating-/Assembly instructions

KTR-N 46510 EN
sheet: 20 of 20
edition: 5

5 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

5.8 Manufacturer's Statement

Manufacturer's Statement

corresponding to EC Standard 94/9/EC dated 23 March 1994
and to the legal regulations

The manufacturer - KTR Kupplungstechnik GmbH, D-48432 Rheine - states that the

MINEX®-S Magnetic couplings

described in these mounting instructions and explosion-proof designed correspond to Article 1 (3) c) of Standard 94/9/EC and comply with the general Safety and Health Requirements according to enclosure II of Standard 94/9/EC.


According to Article 8 (1) of Standard 94/9/EC the technical documentation is deposited with the:


IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7

09599 Freiberg

Rheine,

27.05.10
Date


i. V.
Reinhard Wibbeling
Engineering Manager


i. A.
Marco Vorholt
Product Manager

Schutzvermerk
ISO 16016 beachten.

Gezeichnet: 27.05.10 Pz
Geprüft: 14.07.10 Pz

Ersatz für: KTR-N vom 27.06.07
Ersetzt durch: