



BARTEC VARNOST



**ELEKTROMOTORJI V PROTIEKSPLOZIJSKI
ZAŠČITI**

DRUCKFESTGEKAPSELTE MOTOREN

SQUIRREL-CAGE MOTORS



I M2 Ex db I Mb resp. Ex db eb I Mb

4KTCR 71 - 160



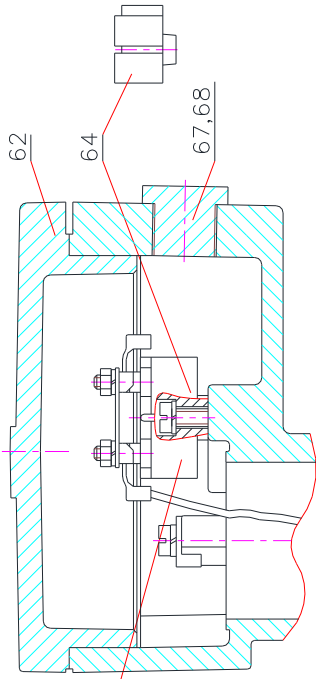
- 3 – 6** NADOMESTNI DELI – RISBE : 4KTCR 71, 4 KTCR 80-132, 4KTCR 160
ERSATZTEILE - ZEICHNUNG : 4KTCR 71, 4 KTCR 80-132, 4KTCR 160
SPARE PARTS – DRAWINGS : 4KTCR 71, 4 KTCR 80-132, 4KTCR 160
- 7 – 19** NADOMESTNI DELI - KOSOVNICA
ERSATZTEILLISTE
PARTS LIST
- 20 – 23** NAVODILA ZA PRIKLJUČITEV
- 24 – 28** AUFSTELLUNGSRICHTLINIEN FÜR DRUCKFESTGEKAPSELTE MOTOREN
- 29 – 32** INSTALLATION GUIDELINES FOR SQUIRREL-CAGE MOTORS
- 33** PRENAŠANJE MOTORJA S KAVLJI
HEBEVORRICHTUNG FÜR DEN TRANSPORT
LIFTING POINTS FOR MOTOR LIFT
- 34, 35** VEZNI NAČRT
ANSCHLUSS SCHALTBILD
CONNECTION DIAGRAMM
- 36 - 39** IZJAVA O SKLADNOSTI BVS 15 ATEX E 037 X
KONFORMITÄTSBESCHEINIGUNG BVS 15 ATEX E 037 X
CERTIFICATE OF CONFORMITY BVS 15 ATEX E 037 X
- 40 - 43** IZJAVA O SKLADNOSTI IECE_x BVS 15 15.0031 X
KONFORMITÄTSBESCHEINIGUNG IECE_x BVS 15.0031 X
CERTIFICATE OF CONFORMITY IECE_x BVS 15.0031 X
- 44 - 48** IZJAVA O SKLADNOSTI BVS 16 ATEX E 077 X
KONFORMITÄTSBESCHEINIGUNG BVS 16 ATEX E 077 X
CERTIFICATE OF CONFORMITY BVS 16 ATEX E 077 X
- 49** IZJAVA O SKLADNOSTI CE
EG KONFORMITÄTSEKTLÄRUNG
EC DECLARATION OF CONFORMITY
- 50** RECIKLAŽA / RECYCLING

PIECES DE RECHANGE - SPARE PARTS - ERSATZTEILE
4KTCR71

REMARQUE - REMARK - BEMERKUNG

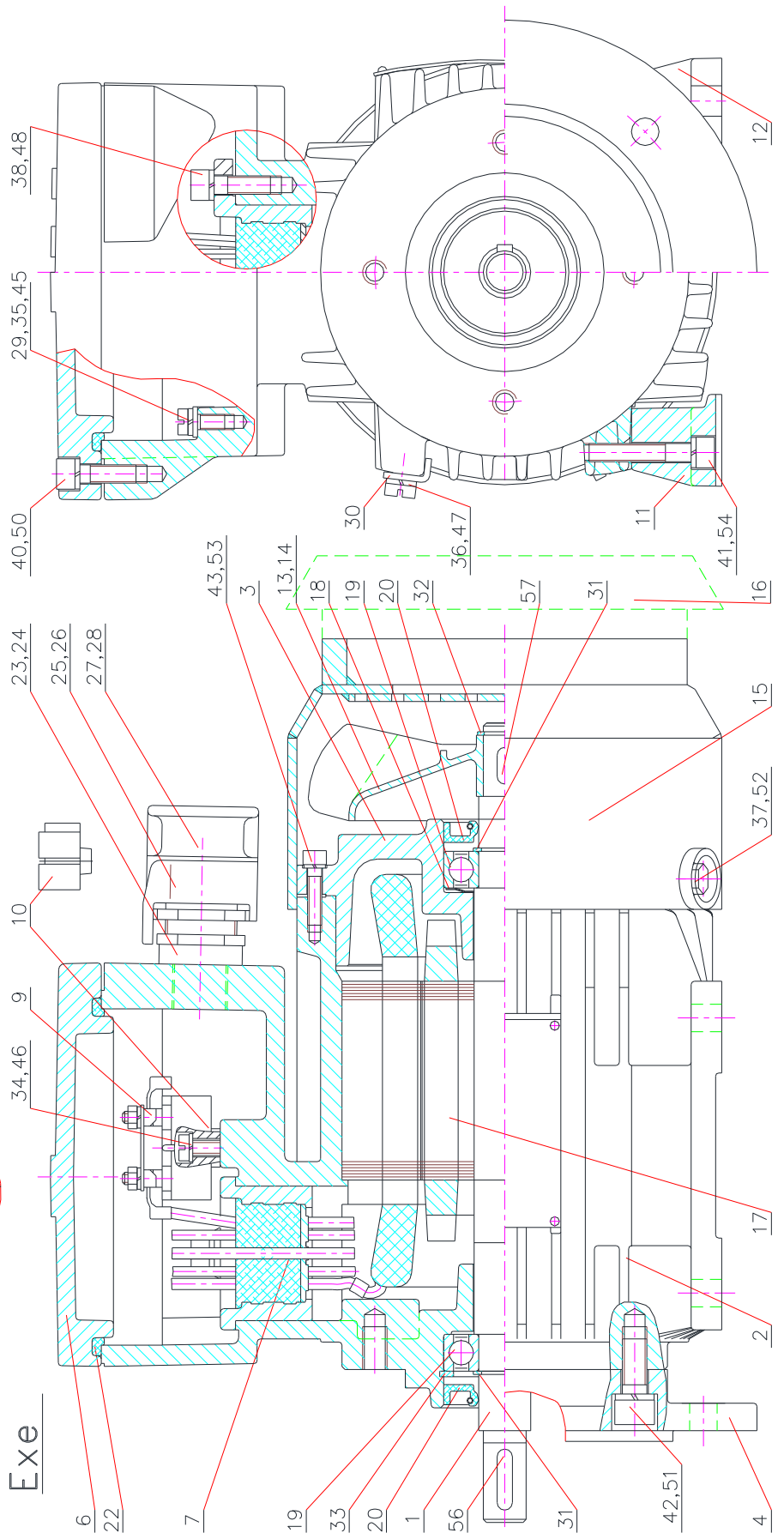
10=64

9=63



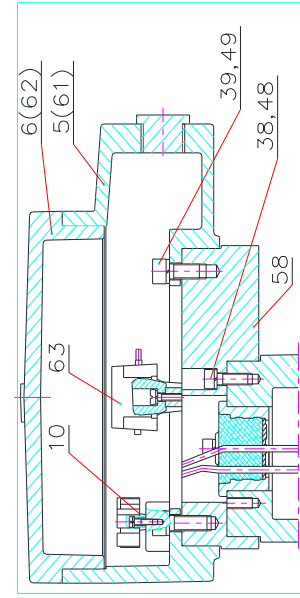
Exd

63



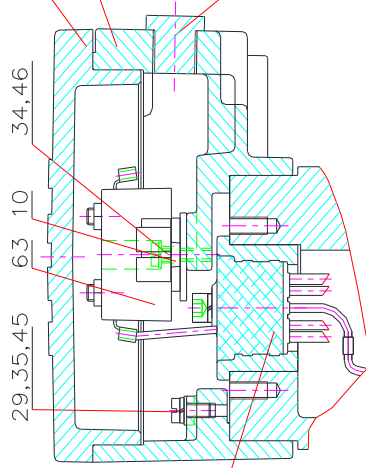
Exe

Exd PIECES DE RECHANGE - SPARE PARTS - ERSATZTEILE

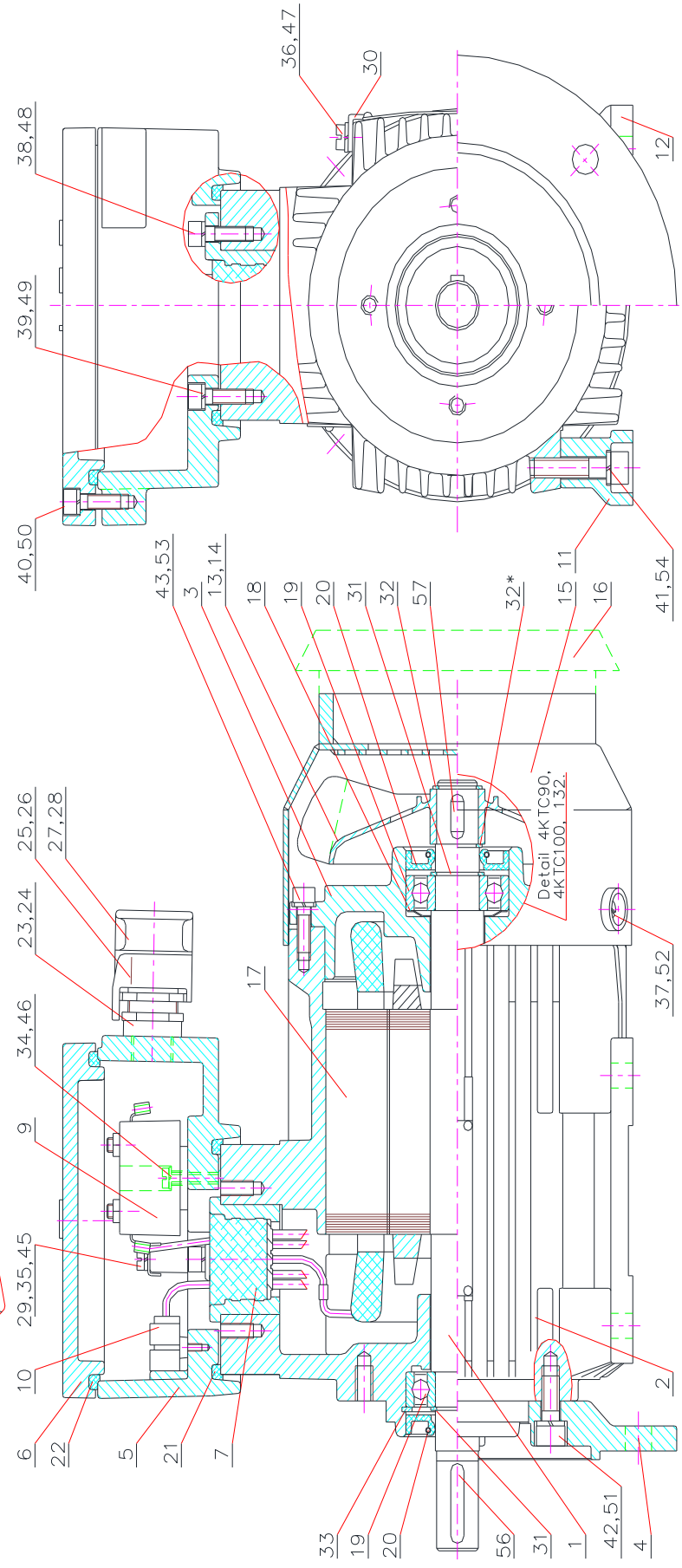


REMARQUE - REMARK - BEMERKUNG
 *32 - Hauteur d'axe 80 et 112 pas de circlips intérieur
 *32 - Internal clipping not fitted on size 80 and 112
 *32 - Baugrosse 80 und 112 ohne innerer Sprengring

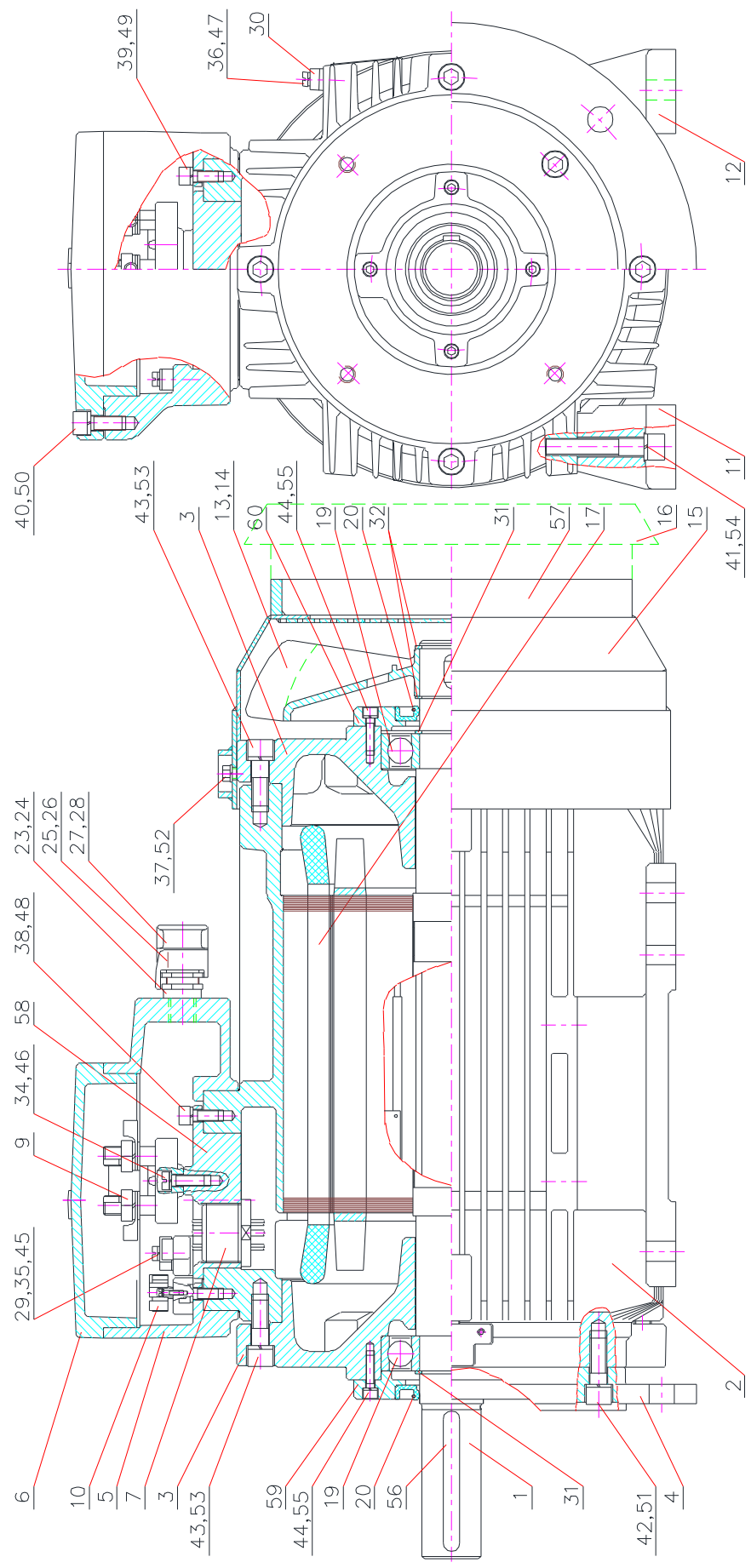
62 4KTCR80-132



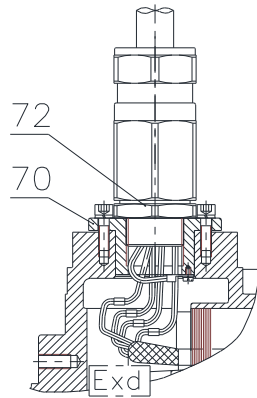
Exe



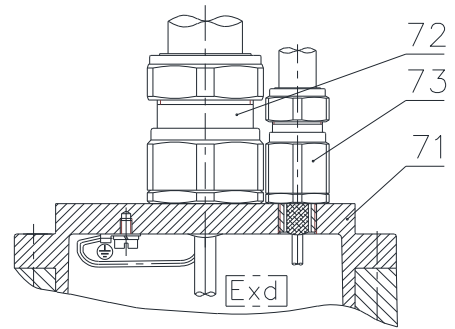
PIECES DE RECHANGE—SPARE PARTS—ERSATZTEILE
4KTCR160



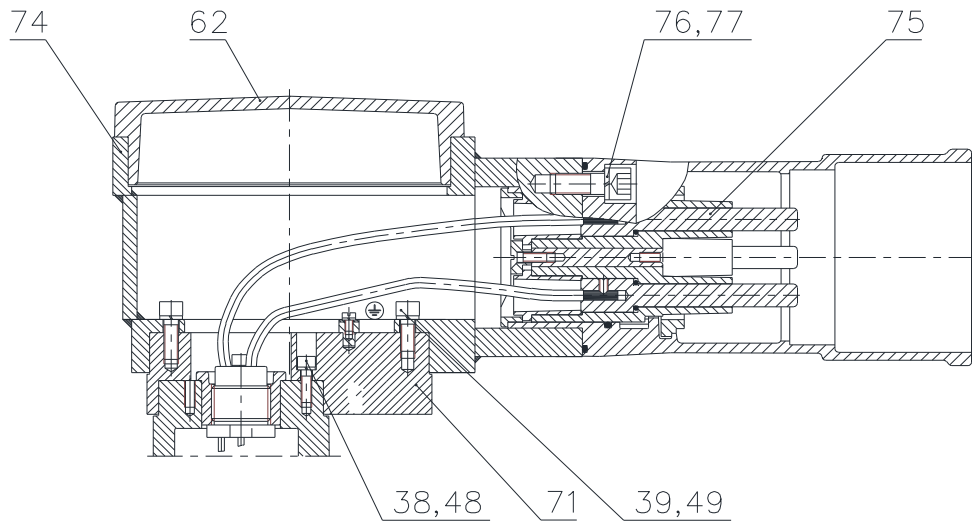
DIREKTNI UVOD 4KTCR80-132
DIRECT ENTRY 4KTC80-132



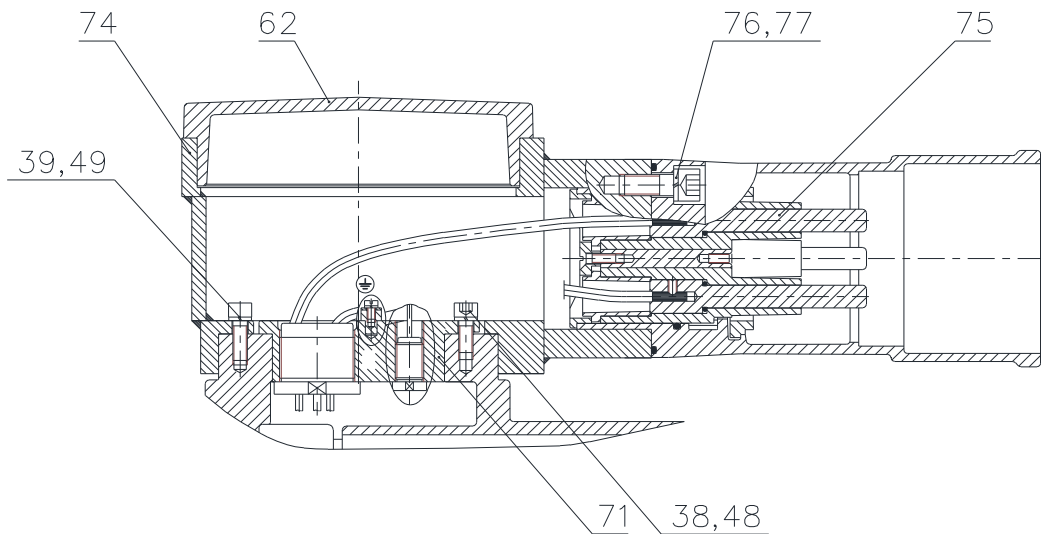
DIREKTNI UVOD 4KTCR160
DIRECT ENTRY 4KTCR160



VTIČNICA "VICTOR" 4KTCR80-132
"VICTOR" SOCKET 4KTCR80-132



VTIČNICA "VICTOR" 4KTCR160
"VICTOR" SOCKET 4KTCR160



POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

1.	ROTOR	1
	SHAFT ROTOR UNIT	
	LAÜFER	

		4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300052	A2	*						
29300050	A4	*						
29300054	A6,8	*						
29300053	B2	*						
29300051	B4	*						
29300055	B6,8	*						
29330052	A2		*					
29330050	A4		*					
29330054	A6		*					
29330054	A8		*					
29330053	B2		*					
29330051	B4		*					
29330055	B6		*					
29330055	B8		*					
29360052	L2			*				
29360050	L4			*				
29360054	L6			*				
29360054	L8			*				
29360053	S2			*				
29360051	S4			*				
29360055	S6			*				
29360055	S8			*				
29390052	L2				*			
29360050	LA4				*			
29360051	LB4				*			
29390054	L6				*			
29390054	LA8				*			
29390053	LB8				*			
29420051	M2					*		
29420050	M4					*		
29420052	M6					*		
29420052	M8					*		
29450058	SA2						*	
29450057	SB2						*	
29450051	S4						*	
29450052	S6						*	
29450055	S8						*	
29450050	M4						*	
29450053	MA6						*	
29450054	MB6						*	
29450056	M8						*	
29480050	MA2							*
29480051	MB2							*
29480053	M4							*
29480055	M6							*
29480057	MA8							*
29480058	MB8							*
29480052	L2							*
29480054	L4							*
29480056	L6							*
29480059	L8							*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

2.	OHIŠJE STATORJA	1
	HOUSING	
	GEHAUSE	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300010	*						
29330010		*					
29360010			*				
29360010				*			
29420010					*		
29450010						*	
29480010							*

3.	STATORJEV ŠČIT	
	END SHILD	
	LAGERSCHILD	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300060	1						
29330060		1					
29360060			1				
29390060				1			
29420060					1		
29450060						1	
29480060							2

4.	PRIROBNICA	1
	FLANGE STANDARD	
	FLANSCH GENORMT	

		4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300140	F130 I	*						
29330140	F165 I		*	*				
29390140	F215 I				*	*		
29450140	F265 I						*	
29480140	F300 I							*
29300141	F 85 II	*						
29330142	F100 II		*					
29360140	F115 II	*		*				
29330141	F130 II		*	*				
29390141	F165 II				*	*		
29390142	F130 II				*	*		

5.	PRIKLJUČNA OMARICA Exe	1
	TERMINAL BOX Exe	
	KLEMMENKASTEN Exe	

	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29330041	*	*	*	*	*	
29480041	*	*	*	*	*	*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

6.	POKROV PRIKLJUČNE OMARICE Ex	1
	COVER Ex	
	KLEMMENKASTENDECKEL Ex	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300080	*						
29330080		*	*	*	*	*	
29480081		*	*	*	*	*	*

7.	SKOZNIK	1
	LINE BUSHING	
	ADERLEITUNGSDURCHFÜHRUNGEN	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29330200	*	*	*	*	*		
29330190						*	
23870020							*

9.	PRIKLJUČNI BLOK Ex	1
	TERMINAL BOARD Ex	
	KLEMMBRETT Ex	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29450250	*						
1000 V – 07-9721-0340	*						
29450200		*	*	*	*	*	
1000 V – 07-9721-0340		*	*	*	*	*	
29450300							*
1000 V – 07-9721-0380							*

10.	MINI PRIKLJUČNI BLOK Exe CTP	
	MINI TERMINAL Exe CTP	
	MINIKLEMMME Exe PTC	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
R002117	2	3	3	3	3	3	3

11.	NOGA – LEVA	1
	FOOT – LEFT	
	FUSS - LINKS	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300070	*						
29330070		*					
29360069			*				
29390070				*			
29420070					*		
29450069						*	
29480069							*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

12.	NOGA – DESNA	1
	FOOT – RIGHT	
	FUSS – RECHT	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300070	*						
29330070		*					
29360070			*				
29390070				*			
29420070					*		
29450070						*	
29480070							*

13.	VENTILATOR 2-polni	1
	FAN 2-poles	
	LUFTER –2polig	

	Material	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
R007407	Plastic	*						
29330130	plastic		*					
29360130	plastic			*				
29390130	plastic				*			
29420130	plastic					*		
29450130	plastic						*	
29480125	plastic							*

14.	VENTILATOR 4,6,8-polni	1
	FAN 4,6,8-poles	
	LUFTER 4,6,8polig	

	material	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
R007407	plastic	*						
R006889	plastic		*					
R006891	plastic			*				
R006893	plastic				*			
R006896	plastic					*		
R006897	plastic						*	
29480130	plastic							*

15.	VENTILATORSKI ŠČIT	1
	FAN COVER	
	LUFTERHAUBE	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
29300125	*						
29330125		*					
29360125			*				
29390125				*			
29420125					*		
29450125						*	
29480133							*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

16.	VENTILATORSKI ŠČIT IMV1/IMV5	1
	FAN COVER WITH RAIN CUP IMV1/IMV5	
	LUFTERHAUBE MIT REGENSCHUTZDACH IMV1/IMV5	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	*						
		*					
			*				
				*			
					*		
						*	
							*

17.	NAVIT STATORSKI PAKET	1
	STATOR WINDING	
	STATORPAKET MIT WICKLUNG	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
A2	*						
A4	*						
A6,8	*						
B2	*						
B4	*						
B6,8	*						
A2		*					
A4		*					
A6		*					
A8		*					
B2		*					
B4		*					
B6		*					
B8		*					
L2			*				
L4			*				
L6			*				
L8			*				
S2			*				
S4			*				
S6			*				
S8			*				
L2				*			
LA4				*			
LB4				*			
L6				*			
LA8				*			
LB8				*			
M2					*		
M4					*		
M6					*		
M8					*		
SA2						*	
SB2						*	
S4						*	
S6						*	
S8						*	
M4						*	
MA6						*	

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

	MB6						*	
	M8						*	
	MA2							*
	MB2							*
	M4							*
	M6							*
	MA8							*
	MB8							*
	L2							*
	L4							*
	L6							*
	L8							*

18.	LEŽAJNA PODLOŽKA	1
	PRE LOAD SPRING	
	VORSPANNFEDERN	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132
R002725	40					
R002677		47				
R006443			52			
R002679				62	62	
R002706						80

19.	LEŽAJ **** 2Z C3	2
	BEARING **** 2Z C3	
	LAGER **** 2Z C3	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
R002876	6203						
R007467		6204					
R006803			6205				
R006802				6206	6206		
R006805						6208	
R002924							6309

20.	OLJNO TESNILO DIN 3760 NBR	2
	OIL SEAL DIN 3760 NBR	
	DICHTRING DIN 3760 NBR	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
R007899	A17x40x7						
R006813		A20x47x7					
R006812			A25x52x7				
R006811				A30x62x7	A30x62x7		
R006810						A40x80x10	
R007675							A45x80x10

21.	TESNILO	1
	SEAL FOR TERMINAL BOX Exe	
	KLEMMENKASTEN DICHTUNG Exe	

	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132
R007463	*	*	*	*	*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

22.	TESNILO	1
	SEAL FOR TERMINAL BOX COVER Exe	
	KLEMMENKASTENDECKEL DICHTUNG Exe	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132
R007463	*					
R007463		*	*	*	*	*

	PRILAGODITVENI ČLEN Exe	
	REDUCER Exe	
	UBERGUNGSSTUCKE Exe	

23.	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	max. 2						
		max. 2	max. 2	max. 2	max. 2	max. 2	max. 2

24.	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	*	*	*	*	*	*	*

25.	DOVODNICA Exe	
	CABLE GLAND Exe	
	KABELVERSCHRAUBUNG Exe	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
011104 – M20x1.5	max. 2						
011105 – M25x1.5		max. 2	max. 2				
011387 – M32x1.5				max. 2	max. 2	max. 2	
011107 – M40x1.5							max. 2

26.	DOVODNICA Exe - CTP	
	CABLE GLAND Exe - CTP	
	KABELVERSCHRAUBUNG Exe - CTP	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
011104 – M20x1.5	*	*	*	*	*	*	*

	SLEPI ČEP Exe	
	PLUG Exe	
	VERSCHLUSSSTOPFEN Exe	

27.	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	011388 – M20x1.5	max. 2					
	011389 – M25x1.5		max. 2	max. 2			
	– M32x1.5				max. 2	max. 2	max. 2

28.	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	*	*	*	*	*	*	*

29.	OZEMLJILNA PLOŠČICA	1
	EARTH PLATE	
	ERDUNGSPLATTE	

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
25140620	*						
25140620		*	*	*	*	*	
23720070							*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

30.	PRITRDILNA PLOŠČICA							1
	LACH WASHER							
	SICHERUNGSSHEIBE							

	4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
23710070	*						
23710070		*	*	*	*	*	
23720070							*

	VSKOČNIK DIN 471						
	EXTERNAL CIRCLIP DIN 471						
	SPRENGRING DIN 471						

31.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R007898	17	2						
	R002805	20		2					
	R002782	25			2				
	R006427	30				2	2		
	R002784	40						2	
	R002785	45							2

32.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002797	14	1						
	R002779	18		1					
	R002781	24			2				
	R006427	30				2	1		
	R002784	40						2	
	R002785	45							2

33.	VSKOČNIK DIN 472						
	INTERNAL CIRCLIP DIN 472						
	SPRENGRING DIN 472						

			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132
R004857	40		1					
R006828	48			1				
R006830	52				1			
R006428	62					1	1	
R006831	80							1

	VALJNI VIJAK						
	SLOTTED HEAD BOLD AND SCREW						
	SCHLITZSCHRAUBEN						

34.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R006975	M5x18	2	2	2	2	2	2	
	R007691	M8x25							2

35.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002484	M6x12	1						
	R002490	M6x15		1	1	1	1	1	
	R007691	M8x25							1

36.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002484	M6x12	1	1	1	1	1	1	
	R002490	M6x15							1

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA						
ITEM No.	PART No.	DENOMINATION	QUANTITY						
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL						

		VALJNI VIJAK							
		SLOTTED HEAD BOLD AND SCREW							
		SCHLITZSCHRAUBEN							

37.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002481	M5x10	4	4	4	4	4	4	
	R002490	M6x15							4

		VIJAK S ŠESTROBO LUKNJO							
		HEXAGO SOCKET HEAD BOLD							
		INNERSECHKANTSCHRAUBEN							

38.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002547	M6x20	2	2	2	2	2	2	
	R002553	M8x20							4

39.			4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160	
	R002547	M6x20	4	4	4	4	4		
	R002553	M8x20							4

40.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002547	M6x20	4	4	4	4	4	4	
	R002560	M10x25							4

41.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R007897	M6x35	4						
	R002617	M8x35		4					
	R002558	M8x40			4				
	R002557	M8x50				4	4		
	R002563	M10x60						4	
	R002574	M12x70							4

42.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002553	M8x20	4	4	4				
	R002554	M8x25				4	4		
	R002560	M10x25						4	
	R002567	M12x35							4

43.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002547	M6x20	4						
	R002553	M8x20		4	4				
	R002554	M8x25				4	4		
	R002560	M10x25						4	
	R002567	M12x35							8

44.									4KTCR160
	R002554	M8x25							8

		VZMETNA PODLOŽKA							
		SPRING VASHER							
		GLATTET FEDERING							

45.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	1	1	1	1	1	1	1

46.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	2	2	2	2	2	2	

POZICIJA	RAZPOZNAVNA ŠT.	IME						KOLIČINA
ITEM No.	PART No.	DENOMINATION						QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG						ANZAHL

	002684	8							2
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47.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002769	5	1	1	1	1	1	1	
	R002765	6							1

48.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	2	2	2	2	2	2	
	R002684	8							4

49.			4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	4	4	4	4	4	
	R002684	8						4

50.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	4	4	4	4	4	4	
	R002685	10							4

51.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002684	8	4	4	4	4	4		
	R002685	10						4	
	R002764	12							4

52.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002769	5	4	4	4	4	4	4	
	R002765	6							4

53.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	4						
	R002684	8		4	4	4	4		
	R002685	10						4	
	R002764	12							8

54.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002765	6	4						
	R002684	8		4	4	4	4		
	R002685	10						4	
	R002764	12							4

55.									4KTCR160
	R002684	8							8

		MOZNIK							
		KEY							
		PASSFEDER							

56.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R003014	A5x5x20	1						
	R002992	A6x6x32		1					
	R002994	A8x7x40			1				
	R002991	A8x7x50				1	1		
	R002996	A10x8x70						1	
R002998	A12x8x100							1	

57.			4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	R002995	A5x5x12	1						
	R003008	B6x6x10		1					
R003008	B6x6x14			1	1	1			

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

R003002	B8x7x18						1	
R007682	B12x8x16							1

58.	VMEŠNA PLOŠČA							1
	TERMINAL PLATE							
	ANSCHUSSPLATTE							

	4KTCR132	4KTCR160
282984	*	
265989		*

59.	LEŽAJNI ŠČIT AS							1
	BEARING COVER AS							
	LAGERDECKEL AS							

	4KTCR160
29480065	*

60.	LEŽAJNI ŠČIT BS							1
	BEARING COVER BS							
	LAGERDECKEL BS							

	4KTCR160
29480066	*

	DOVODNICA Exd							1(2)
	CABLE GLAND Exd							
	KABELVERSCHRAUBUNG Exd							

67.		4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	M20x1.5	*						
	M25x1.5		*	*				
	M32x1.5				*	*	*	
	M40x1.5							*

	SLEPI ČEP Exd - CTP							1
	STOPPING PLUG Exd - CTP							
	VERSCHLUSSSTOPFEN Exd - CTP							

68.		4KTCR71	4KTCR80	4KTCR90	4KTCR100	4KTCR112	4KTCR132	4KTCR160
	012145 M20x1.5	*	*	*	*	*	*	*

70.	OHIŠJE SKOZNIKA Z NAVOJEM M32x1.5							1
	HOUSING WITH THREAD M32x1.5							
	GEHAUSE MIT GEWINDE M32x1.5							

	4KTCR 80-132
420664	*

POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL

71.	PRIKLJUČNA PLOŠČA «VICTOR SOCKET»	1
	TERMINAL PLATE«VICTOR SOCKET»	
	ANSCHLUSSPLATTE«VICTOR SOCKET»	

	4KTCR 80-132	4KTCR160
336703	*	*

72.	UVODNICA DU «CMP PRODUCT»	1(2)
	CABLE GLAND DU «CMP PRODUCT»	
	KABELVERSCHRAUBUNG DU «CMP PRODUCT»	

	4KTCR 80-132	4KTCR 160
420661	*	
434056		*

73.	UVODNICA DU «CMP PRODUCT»	1
	CABLE GLAND DU «CMP PRODUCT»	
	KABELVERSCHRAUBUNG DU «CMP PRODUCT»	

	4KTCR 160
434056	*

74.	POKROV PRIKLJUČNE OMARICE Ex	1
	COVER Ex	
	KLEMMENKASTENDECKEL Ex	

260919	*
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74.	VTIČNICA « VICTOR »	1
	« VICTOR » SOCKET	
	« VICTOR » SOCKET	

438843	*
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75.	VIJAK S ŠESTROBO LUKNJO	4
	HEXAGO SOCKET HEAD BOLD	
	INNERSECHKANTSCHRAUBEN	

271845	M12x30
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76.	VZMETNA PODLOŽKA	4
	SPRING VASHER	
	GLATTET FEDERING	

271712	12
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Pri naročilu nadomestnega dela, prosimo navedite:
Pozicija, tip motorja, serijska številka.

When ordering spare parts, please state:
Item No., motor type, serial No.

PRIMER:

1. _____ Rotor 4KTCR 80 A2 000000

EXAMPLE:

1. _____ Rotor 4KTCR 80 A2 000000

Bei Ersatzteil Bestellung sind folgende
Angaben erforderlich:
Ersatzteillbezeichnung Typ, Motornummer
Serial Nr.

BEISPIEL:

1. _____ Rotor 4KTCR 80 A2 000000

**OPOMBA: SESTAVNI DELI, NAPISANI Z POUČARJENIMI ČRKAMI SO POSEBEJ KONTROLIRANI
(GLEJ EN 60079-0, EN 60079-1).**

**ATTENTION: THE SPARE PARTS WRITTEN IN BOLD LETTERS ARE SUBJECT TO DIMENSIONAL
ACCURACY INSPECTION (SEE EN 60079-0, EN 60079-1).**

**ACHTUNG: DIE MASSE DER FETT GEDRUCKT GEKENNZEICHNETEN ERSATZTEILE MÜSSEN
BESONDEREN GENAUIGKEITSKONTROLLEN UNTERZOGEN WERDEN (SIEHE EN
60079-0, EN 60079-1).**

Navodila za montažo in priključitev ne zajemajo vseh posebnosti, ki se lahko pojavijo pri priključitvi in uporabi elektromotorja. Zahteva se, da elektromotor priključi in vzdržuje kvalificirana oseba (IEC 364).

1. TRANSPORT IN SKLADIŠČENJE

ELEKTROMOTORJE MORAMO TRANSPORTIRATI V POLOŽAJU, KOT SO PREDVIDENI ZA OBRATOVANJE! ELEKTROMOTORJE, KI JIH NE UPORABIMO TAKOJ, MORAMO SKLADIŠČITI V SUHEM PROSTORU.

2. UPORABA IN PROTIEKSPLOZIJSKA ZAŠČITA

Trifazni asinhronski elektromotorji v protieksplzijski izvedbi tipa 4KTCR so namenjeni za obratovanje v rudnikih. Protieksplzijsko zaščito elektromotorjev sestavljajo:

- »nepredirni okrov« za ohišje elektromotorja in »povečana varnost« za priključno omarico, ki sta v skladu z zahtevami standardov EN 60079-0: 2012+A11: 2013, EN 60079-1: 2014 in EN 60079-7: 2007. Na pokrovu priključne oznake je oznaka Ex.
- »nepredirni okrov« za ohišje elektromotorja in za priključno omarico, ki sta v skladu z zahtevami standardov EN 60079-0: 2012+A11: 2013 in EN 60079-1: 2014. Na pokrovu priključne oznake je oznaka Ex.

Ohišja elektromotorjev so za skupino plinov I.

Standardna izvedba elektromotorjev je za temperaturni razred I - 150°C.

Točna oznaka protieksplzijske zaščite je na napisni tablici.

3. NAMESTITEV (MONTAŽA) ELEKTROMOTORJA

MONTAŽO ELEKTROMOTORJA NAJ IZVEDE STROKOVNJAK, DA SE IZOGNEMO MOREBITNIM OKVARAM MED OBRATOVANJEM ZARADI NEPRAVILNE MONTAŽE.

Pri namestitvi elektromotorja moramo:

- upoštevati zahteve instalacijskih predpisov
- preveriti, če protieksplzijska zaščita elektromotorja ustreza okolju (cona, skupina plinov, temperaturni razred)
- preveriti kako okolje vpliva na delovanje elektromotorja (agresivno okolje, temperatura, prah itd.)
- upoštevati lokalne in tovarniške posebnosti ter zahteve
- zagotoviti uporabo pravega orodja in priprav
- upoštevati zahteve za varno obratovanje
- zagotoviti uporabo osebnih zaščitnih sredstev

Elektromotorji so izdelani tako, da brez dodatne zaščite lahko obratujejo v zmerno vlažni in prašni atmosferi s temperaturo od -20°C do +40°C. V primeru, da je temperatura nižja kot -20°C, mora imeti motor vgrajene grelce (glej točko 4.).

Pri montaži (postavitvi) elektromotorja na prostem priporočamo, da ga zaščitimo pred neposrednimi sončnimi žarki. Na elektromotorju, ki obratuje v navpičnem položaju, moramo nad odprtini štita ventilatorja namestiti pokrov, za zaščito elektromotorja pred vdorom vode vzdolž osi.

Izolacija elektromotorjev je iz materialov, ki ne vpijajo vlage in je kvalitetno impregnirana, zato pravilno skladiščenih, novih elektromotorjev pred priključevanjem na omrežje, ni potrebno posebej preizkušati.

Pri montaži elementov, npr. sklopke, jermenice) na gred elektromotorja, je potrebno posebej paziti na ležaje. Aksialnih sil zaradi morebitnih udarcev ob montaži, ne smejo prevzeti ležaji.

4. PRIKLJUČEK NA OMREŽJE

POMEMBNO!

NAPRAVE V PROTIEKSPLOZIJSKI IZVEDBI SME MONTIRATI IN PRIKLJUČITI NA OMREŽJE LE STROKOVNO USPOSOBLJENA OSEBA, KI IMA DODATNO ZNANJE S PODROČJA PRITIEKSPLOZIJSKE ZAŠČITE.

Pred priključitvijo elektromotorja na omrežje je potrebno preveriti:

- ali podatki na napisni tablici ustrezajo napetosti in frekvenci omrežja
- ali protieksplzijska zaščita motorja ustreza za okolje v katerem bo motor obratoval (skupina plinov in temperaturni razred).
- ali je instalacija (cevna ali kabelska) korektno izvedena

Elektromotorji se vrtijo desno, če fazne vodnike L1, L2, L3, priključimo na priključke U, V, W, (1U, 1V, 1W, oziroma U1, V1, W1). Spremembo smeri vrtenja dosežemo z zamenjavo priključnih mest dveh dovodnih faznih vodnikov.

Naslednji element se nahajajo na številkah:

10 – 11 ali 12 – 13:	PTC termistor
14 – 15:	NC termostat – odpirajoč (normalno zaprt kontakt)
16 – 17:	NO termostat – zapirajoč (normalno odprt kontakt)

Navitja elektromotorjev imajo vgrajene temperaturne senzorje (PTC termistor DIN 44081). Odklopna naprava s katero so povezani, mora biti odobrena in nositi ustrezno oznako pooblaščenega Ex institucije. Odklopna naprava ni eksplozijsko varna in mora biti instalirana zunaj eksplozijsko nevarnega območja (ali vgrajena v atestiranem eksplozijsko varnem ohišju). Oznaka ustreznosti služi le za potrditev skladnosti električnih veličin v povezavi s temperaturnimi senzorji in dovoljuje uporabo odobrene odklopne naprave v povezavi s PTC senzorji, ki ustrezajo zahtevam DIN 44081 za termično zaščito eksplozijsko varnih elektro naprav.

Grelci so priključeni na sponke 30 – 31 ali 32 – 33.

Motorji z vgrajenimi grelci so označeni z dodatno tablico z imenskimi podatki grelnega sistema ali pa so ti podatki vključeni na tablici s podatki motorja.

Krmiljenje mora zagotoviti, da napetost ni istočasno priključena na grelce in priključne sponke elektromotorja.

Priključek kablskih žil na skoznike mora biti izveden posebej pazljivo. Izolacije kablške žile naj bo čim bližje priključnemu mestu, vse žice finožičnatih žil pa morajo biti vpete na priključnem mestu.

Moment privitja priključkov na priključni blok ne sme presegati 7,5 Nm.

Pri izvedbi protieksplozijske zaščite omarice Exd (nepredirni okrov), je potrebno obvezno upoštevati instalacijske predpise in zagotoviti korektno protieksplozijsko zaščito na uvodu kabla (Exd uvodnica).

Pred priključitvijo na omrežje v priključni omarici kontroliramo:

- da v notranjosti priključne omarice ni prahu, žičnih ostankov in podobno
- da izvede priključitev strokovno usposobljena oseba, ki zagotavlja, da bodo električni spoji kvalitetni in vijaki primerno pritrjeni
- da je medsebojna zračna razdalja pri napetosti 630V minimalno 10 mm, pri 1000 V, minimalno 14mm
- da so neuporabne žice ločene in primerno pritrjene
- da so stične ploskve očiščene in rahlo namazane z brez kislinasto mastjo
- da je kabel na uvodnici pravilno zatesnjen

5. ZAŠČITA ELEKTROMOTORJEV IN OBRATOVANJE

Pri postavitvi elektromotorja je vse vrteče dele potrebno zavarovati pred dotikom.

S stroji smejo opravljati samo kvalificirane osebe.

Pri trajnem obratovanju (oznaka S1), je motorsko zaščitno stikalo zadostna zaščita z ozirom na temperaturni razred, če ima vgrajeno ustrezno bimetalno zaščito, ki omogoča nastavitev imenskega toka.

Pri obratovanju S2 (kratkotrajno obratovanje s trajno obremenitvijo) ali S3 (prekinjeno obratovanje) ter pri (frekvenčno reguliranem pogonu), obratovanje s frekvenčnim pretvornikom, morajo imeti trifazni kratkostični elektromotorji v vsakem navitju temperaturne senzorje, po enega v vsaki fazi (DIN 44 080, DIN 44 081, DIN 44 082).

Izklopna temperatura senzorjev je običajno 145°C. Odgovarjajoča odklopna naprava z oznako ustreznosti tvori skupaj s temperaturnimi senzorji ustrezen sistem zaščite z ozirom na zahtevani temperaturni razred.

Elektromotorji z dvema hitrostma vrtenja (dvoje ločenih navitij ali eno navitje v Dahlander stiku), morajo biti zaščiteni za vsako hitrost posebej.

Ohišje elektromotorja mora biti povezano z zaščitnim vodnikom in ozemljeno. V priključni omarici je vijak za priključitev zaščitnega vodnika, na ohišju statorja pa je vijak za ozemljitev.

Če je elektromotor napaján preko frekvenčnega pretvornika, je potrebno preveriti, da nastavitev na pretvorniku ustreza deklariranemu območju na dodatni napisni tablici. Elektromotor mora biti varovan dvojno, to je z motorskimi zaščitnimi stikalom, ter s temperaturno zaščito. Izklopna naprava, vezana na temperaturno zaščito, mora biti v območju: $2k\Omega < R_o < 4k\Omega$, pri čemer je R_o – upornost izklopa. Motorsko zaščitno stikalo mora biti certificirano.

6. VZDRŽEVANJE

Elektromotorji so robustne konstrukcije in nezahtevni za vzdrževanje.

V rednih časovnih obdobjih (odvisno od okolja), je potrebno elektromotor očistiti, še posebej vhodne odprtine na ventilatorskem ščitu: tako zagotovimo zadosten pretok zraka za hlajenje.

Elektromotorji so opremljeni z zaprtimi trajno mazanimi ležaji. Življenjska doba ležajev je 25000 ur obratovanja dvopolnih elektromotorjev ($n_s=3000 \text{ min}^{-1}$) pri normalnih pogojih obratovanja ali 40000 ur obratovanja štiri in več polnih motorjev.

Redni kontrolni pregledi in kontrolne meritve, ki jih opravijo za ta dela usposobljene osebe, so ukrepi, s katerimi zmanjšamo možnost okvar in prekinitev obratovanja.

Vsako odstopanje od imenskih vrednosti (večji tok obratovanja, povečana temperatura, vibracije, neobičajni hrup ali vonj, reagiranje zaščitno – kontrolnih naprav itd.) so znak, da s pogonom nekaj ni v redu! Da bi se izognili večji okvari, ki bi lahko neposredno ali posredno povzročila večjo škodo na materialnih dobrinah ali se poškodovale osebe, je potrebno o teh pojavih takoj obvestiti odgovorno osebo.

7. POPRAVLJANJE

ELEKTROMOTORJE V PROTIEKSPLOZIJSKI IZVEDBI SME POPRAVLJATI SAMO PROIZVAJALEC ALI POOBLAŠČENA DELAVNICA. OSEBE, KI RAZSTAVLJAJO ALI POPRAVLJAJO Ex APARATE, MORAJO BITI STROKOVNO USPOSOBLJENE IN IMETI DODATNO ZNANJE S PODROČJA PROTIEKSPLOZIJSKE ZAŠČITE.

Pri razstavljanju elektromotorja je potrebno paziti, da ne poškodujemo ploskev, ki tvorijo Ex reže!

Po popravilu elektromotorja morajo tehnične zahteve elektromotorja ostati v skladu s certifikatom.

Če se pri popravilu ugotovi, da »nepredirni okrov« ne ustreza več zahtevam protieksplzijske zaščite in zahtevam v certifikatu, se mora s tega elektromotorja odstraniti znak protieksplzijske zaščite.

MOMENT PRIVITJA VIJAKOV

Navoj		M4	M5	M6	M8	M10	M12
Moment privitja	min	0,8	1,8	2,7	5,5	9,0	14,0
-Nm-	max	1,2	2,5	4,0	8,0	13,0	19,0

8. MOMENT PRIVIJANJA VIJAKOV

Tabela 1.: Moment privitja vijakov Ex ohišja. Material vijakov 8.8 ali A4-70.

Navoj	Moment privitja vijakov (Nm)	Navoj	Moment privitja vijakov (Nm)
M4	2.3	M12	66
M5	4.6	M14	105
M6	7.9	M16	160
M8	19	M20	330
M10	38	M24	560

Tabela 2.: Moment privitja vijakov - električni priključki.

Navoj	Moment privitja vijakov (Nm)	Navoj	Moment privitja vijakov (Nm)
M4	1.2	M10	10
M5	2	M12	15.5
M6	3	M16	30
M8	6	M20	52

9. PRIPOROČENE VREDNOSTI MOMENTA ZA PRITRJEVANJE STANDARDNIH Exe UVODNIC

Tabela 3.: Priporočene vrednosti momenta za pritrjevanje Exe uvodnic

Navoj	Moment privitja (Nm)
M20x1.5	3.75
M25x1.5	5
M32x1.5	7.5
M40x1.5	7.5
M50x1.5	7.5
M63x1.5	7.5

AUFSTELLUNGSRICHTLINIEN FÜR DRUCKFESTGEKAPSELTE MOTOREN BAUREIHE 4 KTCR - BARTEC VARNOST

Diese Anleitungen für die Montage und Wartung enthalten nicht alle Besonderheiten, die bei der Installation und der Anwendung des Elektromotors erscheinen können. Es wird verlangt, dass der Elektromotor von der qualifizierten Person montiert und gewartet wird (IEC 364).

1. TRANSPORT UND LAGERUNG **WICHTIG !**

ELEKTROMOTOREN MÜSSEN IN SOLCHER LAGE TRANSPORTIERT WERDEN, IN WELCHER SIE FÜR DEN BETRIEB VORGESEHEN SIND! ELEKTROMOTOREN, DIE NICHT SOFORT GEBRAUCHT WERDEN, SOLLTEN IN EINEM TROCKENEN RAUM GELAGERT WERDEN.

2. ANWENDUNG UND EXPLOSIONSSCHUTZ

Drehstrom-Asynchronmotoren in explosionsgeschützter Ausführung des Typs 4KTCR sind für den Betrieb in Bergbau bestimmt.

Die explosionsgeschützte Ausführung der Motoren ist folgende:

"Druckfeste Kapselung" für das Gehäuse des Motors und "erhöhte Sicherheit" für den Anschlusskasten nach EN 60079-0: 2012+A11: 2013, EN 60079-1: 2014 und EN 60079-7: 2007. Auf dem Deckel des Anschlusskastens ist die Bezeichnung Ex.

"Druckfeste Kapselung" für das Gehäuse des Motors und für den Anschlusskasten nach EN 60079-0: 2012+A11: 2013 und EN 60079-1: 2014. Auf dem Deckel des Anschlusskastens ist die Bezeichnung Ex.

Gehäuse der Elektromotoren sind für die Gasgruppe I

Elektromotoren ist für die Maximale oberflächentemperatur Gruppe I 150°C.

Die genaue Bezeichnung des Explosionsschutzes befindet sich auf dem Schild.

2.1 Kennzeichnung

Die Kennzeichnung umfasst die folgenden Angaben:

Name und Anschrift des Herstellers

Typ 4KTCR 71

 I M2 Ex db I Mb oder Ex db e I Mb

Bescheinigungsnummer

3. AUFSTELLUNG (MONTAGE) **WICHTIG !**

DIE MONTAGE DES ELEKTROMOTORS SOLL VOM FACHMANN AUSGEFÜHRT WERDEN UM EVENTUELLEN BESCHÄDIGUNGEN WÄHREND DES BETRIEBES WEGEN DER NICHT RICHTIGEN MONTAGE AUSZUWEICHEN.

Bei der Aufstellung des Elektromotors muss man:

- Forderungen der Installationsvorschriften beachten,
- prüfen, ob der Explosionsschutz der Umgebung entspricht
- prüfen, wie die Umgebung auf den Betrieb des Elektromotors einwirkt (aggressive Umgebung, Temperatur, Staub usw.),
- Lokal- und Fabrikbesonderheiten und Forderungen berücksichtigen
- die Verwendung von richtigen Werkzeugen und Vorrichtungen zusichern,
- Forderungen für sicheren Betrieb beachten,
- die Verwendung von persönlichen Schutzmitteln versichern.

Die Elektromotoren sind derart gefertigt, dass sie ohne zusätzlichen Schutz in mässig feuchter und staubiger Atmosphäre mit der Temperatur von -20°C bis 40°C arbeiten können. Bei der Montage (Aufstellung) des Elektromotors im Freien wird empfohlen, dass der Motor vor unmittelbaren Sonnenstrahlen geschützt wird. Auf dem Elektromotor, der in senkrechter Lage in Betrieb ist, sollte über den Öffnungen des Lüfterschildes der Deckel für den Schutz vor dem Einbruch des Wassers entlang der Achse angebracht werden.

AUFSTELLUNGSRICHTLINIEN FÜR DRUCKFESTGEKAPSELTE MOTOREN BAUREIHE 4 KTCR - BARTEC VARNOST

Die Isolation der Elektromotoren ist aus solchen Materialien, die keine Feuchtigkeit einsaugen und sie ist qualitativ impregniert. Deswegen ist es nicht nötig neue Motoren vor dem Anschluss auf das Netz besonders zu prüfen, falls sie richtig gelagert wurden.

Bei der Montage der Elemente (z.B. der Kupplung, der Riemenscheibe) auf die Welle des Elektromotors muss man besonders auf die Lager achten. Die axialen Kräfte, verursacht durch die eventuellen Schläge bei der Montage, dürfen nicht von den Lagern übernommen werden.

4. NETZANSCHLUß **WICHTIG !!!**

DIE ANLAGEN IN EXPLOSIONSGESCHÜTZTER AUSFÜHRUNG DARF NUR FACHLICH QUALIFIZIERTE PERSON AUF DAS NETZ MONTIEREN UND ANSCHLIESSEN, DIE ÜBER ZUSÄTZLICHE KENNTNIS AUF DEM GEBIET DES EXPLOSIONSSCHUTZES VERFÜGT.

Vor dem Anschliessen des Elektromotors auf das Netz muss noch folgendes geprüft werden:

- ob die Angaben auf dem Schild der Spannung und der Frequenz des Netzes entsprechen,
- ob der Explosionsschutz der Umgebung entspricht, in welcher der Elektromotor in Betrieb sein wird
- ob die Installation (Kabel) richtig ausgeführt ist.

Die Elektromotoren drehen sich nach rechts, wenn die Phasenleiter L1, L2, L3 auf die Anschlüsse U, V, W (1U, 1V, 1W bzw. U1, V1, W1) angeschlossen werden. Die Veränderung der Drehrichtung erreicht man, wenn man die Anschlussstelle von zwei Zuleitungsphasenleitern verwechselt.

An die Anschlussstellen werden folgende Elemente angeschlossen:

10 – 11 oder 12 – 13	Kontrollsonden (Kaltleiter DIN 44081)
14 – 15	Thermostate NC (Öffner)
16 – 17	Thermostate NO (Schliesser)

Die Motoren sind mit Temperaturfühlern (Kaltleiter DIN 44081 - ...). Diese sind an ein Auslösegerät mit dem PTB-Prüfzeichen 3.53-PTC/A anzuschliessen. Das Auslösegerät ist nicht explosionsgeschützt und ist deshalb ausserhalb des explosionsgefährdeten Bereiches zu installieren. Durch das PTB-Prüfzeichen 3.53-PTC/A wird nur die Einhaltung der elektrischen Daten an der Schnittstelle zwischen Temperaturfühlerkreis und Auslösegerät bestätigt und die Anwendung des Auslösegerätes mit PTB-Prüfzeichen und Kaltleitertemperaturfühlern gemäss DIN 44081 zur thermischen Überwachung explosionsgeschützter elektrischer Maschinen zugelassen.

Auf die Anschlussstellen 30 – 30 oder werden die Stillstandsheizungen eingebaut. Motoren mit Stillstandsheizung sind durch ein Zusatzschild, aus dem die Nenndaten der Heizung ersichtlich sind, gekennzeichnet.

Durch die elektrische Steuerung ist sicherzustellen, dass die Motornennspannung und Heizspannung nicht gleichzeitig anliegen können.

Der Anschluss der Kabeladern auf die Anschlussplatte soll besonders sorgfältig ausgeführt werden. Die Isolierung der Kabeladern soll sich je näher der Anschlussstelle befinden, alle Drähte der feindrätigen Adern müssen an der Anschlussstelle eingespannt werden.

Bei der Ausführung des Explosionsschutzes des Kastens Exd ("druckfeste Kapselung") sind verbindlich die Installationsvorschriften zu beachten und der richtige Explosionsschutz an der Kabeleinführung (Exd Einführung) muss gesichert werden.

Vor dem Netzanschluss ist im Anschlusskasten folgendes zu kontrollieren:

- dass sich im Inneren des Anschlusskastens kein Staub, Reste der Drähte und ähnliches befindet
- dass die elektrischen Verbindungen qualitativ ausgeführt sind

AUFSTELLUNGSRICHTLINIEN FÜR DRUCKFESTGEKAPSELTE MOTOREN BAUREIHE 4 KTCR - BARTEC VARNOST

- und dass die Schrauben entsprechend befestigt sind
 - dass die gegenseitige Luftentfernung bei der Spannung 1000 V minimal 14 mm beträgt
 - dass die nicht verwendbaren Drähte getrennt und entsprechend befestigt sind
 - dass die anliegenden Flächen gereinigt und mit einem säurefreien Fett leicht angeschmiert werden
- dass der Kabel richtig an der Einführung abgedichtet wird

5. SCHUTZ DER ELEKTROMOTOREN IM BETRIEB **WICHTIG !**

Nach der Aufstellung des Elektromotors müssen alle rotierenden Teile vor der Berührung verbindlich gesichert werden.

Nur qualifiziertes Personal darf die Maschinen betätigen!

In der S1-Betriebsart reicht der Motorschutzschalter als alleinige Massnahme zur Einhaltung der Temperaturklasse aus. Dazu muss er auf den Bemessungsstrom des Drehstrommotors eingestellt werden. In den S2- bis S10 Betriebsarten und im Umrichterbetrieb müssen die Drehstrommotoren mit je 3 in den Wicklung untergebrachten PTC's nach DIN 44080, DIN 44081, bzw. DIN 44082 ausgestattet werden. Die Nennabschalttemperatur dieser PTC's beträgt 145 °C. Ein entsprechendes Ausschaltgerät, das ein Prüfzeichen der PTB (Lab. 3.43) besitzt, vervollständigt die Schutzeinrichtung zur Einhaltung der Temperaturklasse. Elektromotoren mit zwei Drehgeschwindigkeiten (zwei getrennte Wicklungen oder eine Wicklung in Dahlander Kontakt) müssen für jede Geschwindigkeit separat geschützt werden.

Das Gehäuse des Elektromotors muss mit dem Schutzleiter verbunden werden und geerdet sein. Im Anschlusskasten befindet sich die Schraube für den Anschluss des Schutzleiters und auf dem Gehäuse des Stators ist die Schraube für die Erdung.

5.1 Umrichterbetrieb

Falls der Elektromotor über den Frequenzumformer gespeist wird muss man prüfen, dass die Einstellung auf dem Umformer dem deklarierten Bereich auf dem zusätzlichen Schild entspricht. Der Elektromotor muss doppelt geschützt sein, das heisst mit dem Motorschutzschalter und mit dem Temperaturschutz. Das Ausschaltgerät, das mit dem Temperaturschutz verbunden ist, muss sich im Bereich von $2k\Omega < R_o < 4k\Omega$ befinden, wobei R_o den Ausschaltwiderstand darstellt. Das Ausschaltgerät muss vom PTB Lab. 3.53 bestätigt werden.

5.1.1 Die Ausgangsspannung des Umrichters ist so zu regeln, dass im Frequenzbereich bis zur Bemessungsfrequenz des Motors eine annähernd lineare Abhängigkeit zwischen der Spannung (Grundschiwingung) und der Frequenz (Grundschiwingung) eingehalten wird, d.h. Einhaltung eines praktisch konstanten Maschinenflusses entsprechend den Nenndaten.

Ein Betrieb mit Umrichtern ist nur zulässig, wenn am Motor ein entsprechendes Leistungsschild für Umrichterbetrieb angebracht ist.

5.1.2 I_{dauer} ist der Wert, auf den die Umrichterregelung den Strom im Dauerbetrieb begrenzt.

5.1.3 I_{kurz} ist der Wert, auf den die Umrichterregelung den Strom bei kurzzeitiger Überlastung für die Dauer von höchstens t_{kurz} begrenzt.

I_{kurz} ist maximal auf $1,5 \times I_{dauer}$ einzustellen.

5.1.4 t_{kurz} ist die Zeit, für die der Umrichter ein Überschreiten von I_{dauer} zulässt. t_{kurz} ist maximal auf 60 s einzustellen.

5.1.5 Spannungsspitzen (insbesondere bei Pulsumrichter mit langer Motorleitung)
Die Bemessung des Anschlusskastens hinsichtlich der Luft- und Kriechstrecken erlaubt den Betrieb am Umrichter mit Spannungsspitzen (ULL und ULE) bis $U=1060$ V.

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6. WARTUNG

Elektromotoren haben eine robuste Konstruktion und verlangen keine besondere Wartung.

In regelmässigen Zeitabschnitten (abhängig von der Umgebung) muss der Motor gereinigt werden, noch besonders die Eintrittsöffnungen auf dem Lüfterschild, so dass ein ausreichender Luftdurchfluss für die Kühlung gewährleistet wird.

Elektromotoren sind mit geschlossenen dauergeschmierten Lagern versehen. Die Lebensdauer der Lager beträgt 25000 Betriebsstunden von zweipoligen Elektromotoren ($n_s=3000 \text{ min}^{-1}$) bei normalen Betriebsbedingungen oder 40000 Betriebsstunden von vier- und mehrpoligen Motoren.

Regelmässige Inspektionen und Kontrollmessungen, die vom Personal ausgeführt werden, das für solche Arbeiten qualifiziert ist, sind Massnahmen, durch welche die Möglichkeiten der Schaden und der Betriebsunterbrechung vermindert werden.

Jede Abweichung von den Nennwerten (höherer Betriebsstrom, erhöhte Temperatur, Vibrationen, ungewöhnlicher Lärm oder Geruch, Reagieren von Schutz-Kontrollanlagen usw.) ist ein Zeichen, dass etwas mit dem Betrieb nicht in Ordnung ist! Um grösserer Beschädigung auszuweichen, die unmittelbar oder mittelbar grösseren Schaden auf Materialgütern verursachen könnte oder zur Beschädigung des Personals führen könnte, muss man über solche Erscheinungen sofort die verantwortliche Person benachrichtigen.
Elektromotoren haben eine robuste Konstruktion und verlangen keine besondere Wartung.

In regelmäßigen Zeitabschnitten (abhängig von der Umgebung) muß der Motor gereinigt werden, insbesondere die Eintrittsöffnungen auf der Lüfterhaube, so daß ein ausreichender Luftdurchfluß für die Kühlung gewährleistet wird.

Elektromotoren sind mit geschlossenen dauergeschmierten Lagern versehen. Die Lebensdauer der Lager beträgt 25000 Betriebsstunden von zweipoligen Elektromotoren ($n_s=3000 \text{ min}^{-1}$) bei normalen Betriebsbedingungen oder 40000 Betriebsstunden von vier- und mehrpoligen Motoren.

Regelmässige Inspektionen und Kontroll-messungen, die vom Personal ausgeführt werden, das für solche Arbeiten qualifiziert ist, sind Maßnahmen, wodurch mögliche Schäden und Betriebsunterbrechungen vermindert werden.

Jede Abweichung von den Nennwerten (höherer Betriebsstrom, erhöhte Temperatur, Vibrationen, ungewöhnlicher Lärm oder Geruch, Reagieren von Schutz-Kontrollanlagen usw.) ist ein Zeichen, daß etwas mit dem Betrieb nicht in Ordnung ist !

Um größere Beschädigungen zu verhindern, die unmittelbar oder mittelbar weiteren Schaden auf Materialgütern verursachen könnte oder zur Beschädigung des Personals führen könnte, muß man über solche Erscheinungen sofort die verantwortliche Person benachrichtigen.

7. REPARATUREN **WICHTIG !**

ELEKTROMOTOREN IN EXPLOSIONSGESCHÜTZTER AUSFÜHRUNG DARF NUR DER HERSTELLER ODER DIE BEVOLLMÄCHTIGTE WERKSTÄTTE REPARIEREN. PERSONEN, DIE EX APPARATE AUSEINANDERNEHMEN UND REPARIEREN, MÜSSEN FACHLICH QUALIFIZIERT SEIN UND ÜBER EINE ZUSÄTZLICHE KENNTNIS VOM GEBIET DES EXPLOSIONSSCHUTZES VERFÜGEN.

Beim Auseinandernehmen von Elektromotoren muss man darauf achten, dass die Oberflächen nicht beschädigt werden, welche die Ex Schutzspalte bilden!

Bei der Reparatur des Elektromotors müssen alle Bestandteile der seitens PTB bestätigter Dokumentation entsprechen.

Falls bei der Reparatur festgestellt wird, dass die "druckfeste Kapselung" nicht mehr den Forderungen des Explosionsschutzes und den Forderungen im Zertifikat entspricht, muss von diesem Motor das Zeichen des Explosionsschutzes beseitigt werden.

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SCHRAUBENANZUGSMOMENT

GEWINDE		M4	M5	M6	M8	M10	M12
Anzugsmoment	min	0,8	1,8	2,7	5,5	9,0	14,0
-Nm-	max	1,2	2,5	4,0	8,0	13,0	19,0

8. SCHRAUBENVERBINDUNGEN

Tabelle 1: Anzugsdrehmomente für Schrauben der Festigkeitsklasse 8.8 und A4-70 (A4-80) nur in Bauteilen mit höherer Festigkeit (z. B. Grauguss, Stahl) verwenden.

Gewinde	Anzugsdrehmoment (Nm)	Gewinde	Anzugsdrehmoment (Nm)
M4	2.3	M12	66
M5	4.6	M14	105
M6	7.9	M16	160
M8	19	M20	330
M10	38	M24	560

Tabelle 2: Schraubenverbindungen für elektrische Anschlüsse

Gewinde	Anzugsdrehmoment (Nm)	Gewinde	Anzugsdrehmoment (Nm)
M4	1.2	M10	10
M5	2	M12	15.5
M6	3	M16	30
M8	6	M20	52

9. EMPFOHLENE DREHMOMENT FÜR BARTEC VARNOST STANDARD Ex e KABELVERSCHRAUBUNGEN

Tabelle 3: Empfohlenes Anzugsmoment für Kabelverschraubungen

Gewinde	Anzugsdrehmoment (Nm)
M20x1.5	3.75
M25x1.5	5
M32x1.5	7.5
M40x1.5	7.5
M50x1.5	7.5
M63x1.5	7.5

INSTALLATION GUIDELINES FOR 4KTCR SQUIRREL- CAGE MOTORS

These instructions for the installation and maintenance do not contain all particulars which might arise during the installation and application of the cage motor. We therefore insist on its being mounted and maintained by qualified persons (IEC 364).

1. TRANSPORT AND STORAGE

THE MOTORS ARE TO BE STORED IN A CLOSED AND DRY AREA. Should they be stored outdoors, it is important to protect them against bad weather conditions. During transport make sure that the usual precautions for this kind of material are respected. 4KTCR motors are to be handled with lifting-claw.

2. APPLICATION AND EXPLOSION PROTECTION

The explosion-proof asynchronous three-phase squirrel-cage motors of the type 4KTCR are designed for their application in mining.

Explosion-proof motor versions are:

"Explosion-proof enclosure" for the motor housing and "Increased safety" for the terminal box according to EN 60079-0: 2012+A11: 2013, EN 60079-1: 2014 and EN 60079-7: 2007. The cover of the terminal box carries the Ex imprint.

"Explosion-proof enclosure" for the motor housing and the terminal box according to EN 60079-0: 2012+A11: 2013 and EN 60079-1: 2014. The cover of the terminal box carries Ex imprint.

Electric motor housings suitable for gas group I.

The standard electric motor is suitable for the temperature class I - 150°C.

The exact indication of the explosion protection can be found on the label.

3. INSTALLATION (MOUNTING) OF THE ELECTRIC MOTOR

THE ELECTRIC MOTOR MUST BE MOUNTED BY QUALIFIED PERSONS IN ORDER TO AVOID POSSIBLE DAMAGES DURING OPERATION CAUSED BY AN INCORRECT INSTALLATION.

The following rules must be observed during installation:

- strictly adhere to the installation instructions,
- check whether the explosion protection corresponds to the environment or not (sector, gas group, temperature group),
- check the effects of the environment on the operation of the electric motor (aggressive environment, temperature, dust ...),
- consider particulars and requirements of room/plant,
- make sure that the correct tools and devices are used,
- observe the motor safety instructions,
- make sure that the means for personal safety are used.

The electric motors are manufactured in such a way as to function in a mildly humid and dusty atmosphere under temperatures between -20°C and 40°C without requiring additional protection. If temperatures fall below -20 °C, the motors must be equipped with space heaters (Exd motors only).

If mounted (installed) outdoors, the motors must be protected from direct sunlight. If the motor is mounted and operated in vertical position, the fan openings must be protected against the ingress of water by fixing the lid above them.

The insulation of the electric motors consists of water-resistant materials and high-quality coating. If stored correctly, it is therefore not necessary to carry out special tests before connecting the motor to the power supply.

When mounting the elements (such as clutch, pulley) on to the motor shaft, please pay particular attention to the bearings. The axial forces caused by possible impacts during installation must not have any effect on the bearings.

4. CONNECTION TO THE POWER SUPPLY

IMPORTANT!

THE EXPLOSION-PROOF VERSIONS MAY BE MOUNTED AND CONNECTED TO THE POWER SUPPLY BY QUALIFIED PERSONS ONLY; THE INSTALLER MUST HAVE ADDITIONAL KNOWLEDGE ABOUT EXPLOSION PROTECTION.

INSTALLATION GUIDELINES FOR 4KTCR SQUIRREL- CAGE MOTORS

The following items must be checked before the electric motor can be connected to the mains power supply:

- that the data on the label correspond to voltage and frequency of the power supply,
- that the explosion protection indicated corresponds to the environment the electric motor will be operated in (gas group, temperature class),
- that the installation (pipes or cables) is carried out correctly.

The electric motors rotate clockwise when the phase conductors L1, L2 and L3 are connected to the terminals U,V,W (1U,1V,1W or U1,V1,W1). The direction may be changed by confusing the terminals of two phase conductors.

The following elements are connected to the terminals:

- 10 – 11 PTC 145°C built in
- 14 – 15 Thermostats NC (normally closed contact)
- 16 – 17 Thermostats NO (normally open contact)

The motors are equipped with 3 temperature detectors (PTC thermistor DIN 44081 -). These temperature detectors are to be connected to a tripping unit with one of Ex Notified Bodies mark of conformity. The tripping unit is not protected against explosions and must therefore be installed outside of the hazardous area. The mark of conformity serves merely to confirm the adherence to the electrical data at the interface between the temperature detector circuit and the tripping device and to allow the application of both the tripping device with mark of conformity and the PTC contacts according to DIN 44081 for the thermal control of explosion-proof electric machines.

The space heaters are mounted to the terminals 30 – 31 (230V) or 32-33 (110V). Motors with space heaters are marked with an additional label indicating the nominal data of the heating system.

The electric control unit must make sure that the nominal motor voltage and the heater voltage are not present simultaneously.

Take particular care over the connection of the cable cores to the terminal board. The insulation of the cable cores should be close to the terminal, all wires of the flexible cores must be clamped to the terminal.

The tightening torque of the connections on the terminal board must not exceed 7,5 Nm.

Pay close attention to the installation instructions when carrying out the explosion protection of the Ex d terminal box («explosion-proof enclosure») and check for the correct explosion protection cable entry (Ex d entry).

Prior to the mains connection, check the terminal box for the following items:

- there must not be any dust, pieces of wire or other foreign matters inside of the terminal box,
- the electrical connections must be carried out by qualified persons and the screws must be tightened correspondingly,
- that the mutual air distance is at least 10 mm for voltages of 400 V or 630 V
- that the unused wires are separated and fixed accordingly,
- that the contacting surfaces are clean and slightly lubricated with an acidfree grease,
- that the cable is sealed correctly at the cable entry.
- the unused openings must be sealed so as to guarantee that the flame-proof properties are maintained. The means foreseen to achieve this goal must be such so as to ensure that the sealing-plug can only be removed with the help of a tool

(according to EN 60079-0: 2012+A11: 2013).

5. PROTECTION OF THE ELECTRIC MOTORS AND OPERATION

Succeeding the installation of the electric motors, all rotating parts must be safely protected against contacts.

Only qualified personnel may handle the machines!

In the S1-mode of operation, the motor circuit-breaker is a sufficient device for the maintenance of the temperature class. To do so, it must be regulated to the rated current of the three-phase cage motor.

In both the S2- and S3- modes of operation and the converter operation, the three-phase cage motors must be equipped with 3 PTCs in each winding (DIN 44080, DIN 44081, DIN 44082). The nominal shutdown temperature of these PTCs are 145 °C. A corresponding shutdown device with the PTB mark of conformity (Lab. 3.43) completes the protective system for the maintenance of the temperature class.

INSTALLATION GUIDELINES FOR 4KTCR SQUIRREL- CAGE MOTORS

Electric motors with two velocities (two separate windings or one winding in Dahlander coupling) must have a separate protection for each speed.

The housing of the electric motor must be connected to the protective conductor, and earthed. The terminal box contains the screw for the connection of the conductor, the earthing screw sits on the stator housing.

If the electric motor is supplied via the frequency converter, please make sure that the settings on the converter correspond to the data indicated on the supplementary label. The electric motor must be double-protected, i.e. with the motor circuit-breaker and the temperature protection. The shutdown device connected to the temperature protection must be in the range of $2k\Omega < R_o < 4k\Omega$ with R_o representing the shutdown resistance. The shutdown device must be certified.

6. MAINTENANCE

Electric motors have a robust structure and need no particular maintenance.

The motor must be cleaned in regular intervals (depending on the environment), especially the entry openings on the fan as to guarantee a sufficient air flow for the cooling system.

Electric motors feature closed and prelubricated bearings. The life span of the bearings is 25000 service hours for two-way electric motors ($n_s=3000 \text{ min}^{-1}$) under normal operating conditions or 40000 service hours for four- and multiple-way motors.

Regular inspections and control measurements carried out by qualified persons are ways to reduce damages and possible standstills.

Each deviation from the nominal values (such as higher load current, increased temperatures, vibrations, unusual noise or smell, reactions of protective devices) must be understood as signal that something is out of order! To prevent consequential damages on machines or people, please inform the person responsible immediately on the appearance of such deviations.

7. REPAIRS

ELECTRIC MOTORS FOR EXPLOSIVE AREAS MAY BE REPAIRED EXCLUSIVELY BY THE MANUFACTURER OR OUR AUTHORIZED REPRESENTATIVE.

THOSE WHO DISASSEMBLE AND REPAIR THE EX MACHINES MUST BE HIGHLY QUALIFIED AND DISPOSE OF ADDITIONAL KNOWLEDGE CONCERNING EXPLOSION PROTECTION.

When disassembling the electric motor please pay attention not to damage the surfaces forming the Ex protection!

When repairing the electric motor all components must correspond to the PTB-documentation.

If it becomes clear during repairs that the »explosion-proof enclosure« no longer corresponds to the requirements on the explosion protection and specified in the certification, the mark for explosion protection must be cancelled from this motor.

SCREW TIGHTENING TORQUE

WINDING		M4	M5	M6	M8	M10	M12
Tightening torque	min	0,8	1,8	2,7	5,5	9	14
- Nm -	max	1,2	2,5	4	8	13	19

INSTALLATION GUIDELINES FOR 4KTCR SQUIRREL- CAGE MOTORS

8. SCREW TIGHTENING TORQUE

Table 1: Tightening torque: Ex enclosure. Tightening torques for screws of the strength class 8.8 and A4-70.

Thread	Tightening torque (Nm)	Thread	Tightening torque (Nm)
M4	2.3	M12	66
M5	4.6	M14	105
M6	7.9	M16	160
M8	19	M20	330
M10	38	M24	560

Table 2.: Tightening torque: for electrical connections

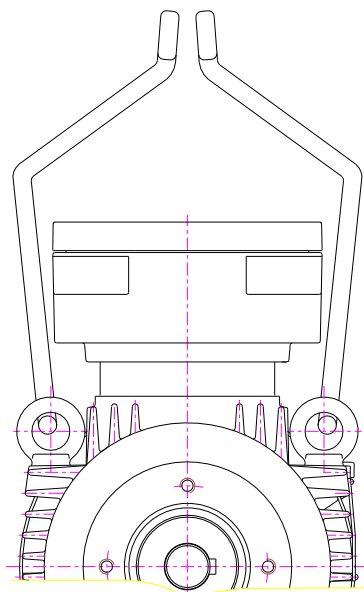
Thread	Tightening torque (Nm)	Thread	Tightening torque (Nm)
M4	1.2	M10	10
M5	2	M12	15.5
M6	3	M16	30
M8	6	M20	52

9. RECOMENDED TORQUES FOR BARTEC-VARNOST STANDARD Exe CABLE GLANDS

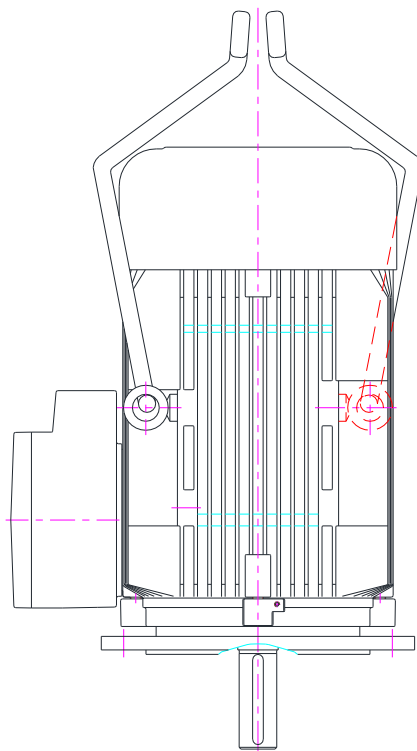
Table 3.: Recommended tightening torque for cable glands

Thread	Tightening torque (Nm)
M20x1.5	3.75
M25x1.5	5
M32x1.5	7.5
M40x1.5	7.5
M50x1.5	7.5
M63x1.5	7.5

PRENAŠANJE MOTORJA S KAVLJI
HEBEVORRICHTUNG FÜR DEN TRANSPORT
LIFTING POINTS FOR MOTOR LIFT



IM V1



PRIKLJUČKI / ANSCHLUSS SCHALTBILD/ CONNECTION DIAGRAM 01/02

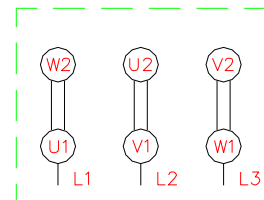
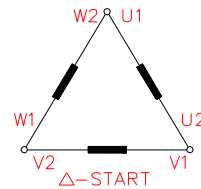
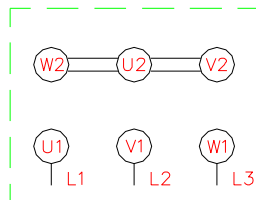
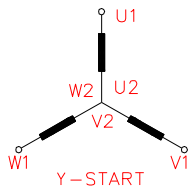
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Exd 4KTCR71 - 160

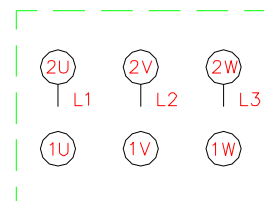
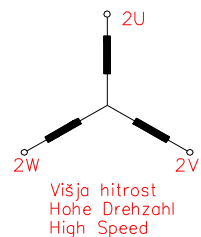
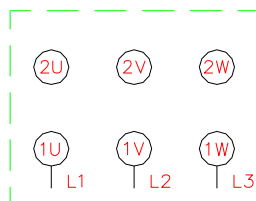
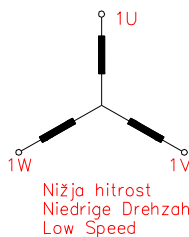
Exde 4KTCR

List / Seite / Page: 01 / 02

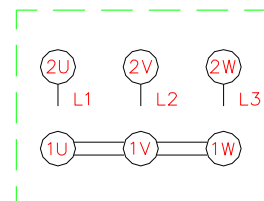
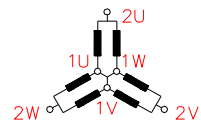
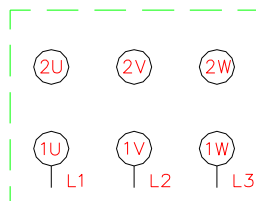
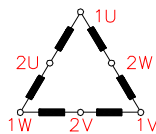
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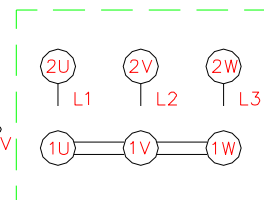
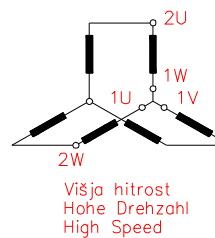
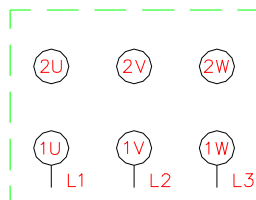
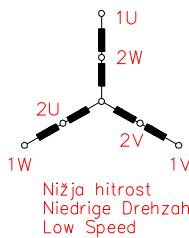
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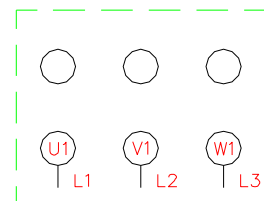
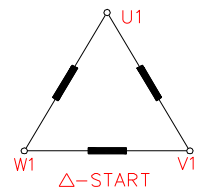
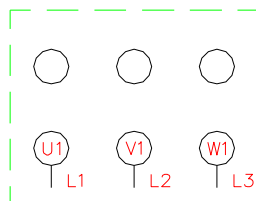
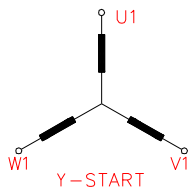
DAHLANDER-VEZAVA / DAHLANDER SCHALTUNG/ POLE CHANGING WINDING (DAHLANDER)



DAHLANDER-VEZAVA / DAHLANDER-SCHALTUNG/ POLE-CHANGING WINDING (DAHLANDER)



ENOHITROSTNI / EINTOURING / ONE SPEED



PRIKLJUČKI / ANSCHLUSS SCHALTBILD / CONNECTION DIAGRAM

BOITE A BORNES / KLEMMENKASTEN / TERMINAL BOX

Exd 4KTCR71 - 160

Exde 4KTCR

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10 - 11	TEMPERATURNO TIPALO/ KALTLEITER ABSCHALTUNG/ THERMISTORS	OPOZORILNO TIPALO/ KALTLEITER VORVARNUNG/ EARLY WARNING	
12 - 13	Najvišja delovna napetost Maximale betriebsspannung Maximum operating voltage MAX. 25 V	IZKLOPNO TIPALO/ KALTLEITER ABSCHALTUNG/ THERMISTORS-OVER LOAD	
14 - 15	TEMPERATURNO STIKALO/ THERMOSTATE/ THERMOSTAT	NC ODPIRAJOČ/ ÖFFNER/ CONT. NORMALLY CLOSED	
16 - 17		NO ZAPIRAJOČ/ SCHLIESSER CONT. NORMALLY OPEN	
18 - 19	KLIXON BIMETAL navitje wicklung winding		
20 21 22 23	TIPALO PT100/ THERMOSTATS PT100 THERMOSTATE PT100 navitje wicklung winding		
1) 25 - 26	TIPALO PT100/ THERMOSTATS PT100 THERMOSTATE PT100	ležaj AS lager AS bearing DE	
2) 27 - 28		ležaj BS lager BS bearing NDE	
30 - 31	GRELCI/ STILLSTANDHEIZUNG/ HEATERS	220-240V	
32 - 33		110V	
2) 34 - 35	KLIXON BIMETAL	ležaj AS lager AS bearing DE	
2) 36 - 37		ležaj BS lager BS bearing NDE	

1) Izvedba po posebnem naročilu/Implementierung nach besondere Bestellung/Execution on special request
Izvedba ni mogoča za vse polaritete/Implementierung ist nicht für jede Polarität möglich/Execution is not possible for all pole numbers

2) Izvedba po posebnem naročilu/Implementierung nach besondere Bestellung/Execution on special request
Izvedba ni mogoča za standarne izvedbe elektromotorjev/Implementierung ist für Standard-Motoren nicht möglich/Execution is not possible for standard motors

OPOMBA/BEMERKUNG/NOTE

Število in tip zaščitnih elementov je omejeno z maksimalnim številom sponk v priključni omarici motorja in sicer:
Die Anzahl und Art von Sicherheits-elementen wird durch die maximale Anzahl von Klemmen in Motorklemmkasten beschränkt und sonst:
Type and number of protection elements are limited by max. number of connections, possible in terminal box of motor accordingly:

- 4KTCR71: max: 4x
- 4KTCR80-132: max: 4x (Exd), 6x (Exe)
- 4KTCR160: max: 6x



Translation

(1) EC-Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
- (3) No. of EC-Type Examination Certificate: **BVS 15 ATEX E 037 X**
- (4) Equipment: **Flameproof electric motors type 4 KTCR *** ** */***
- (5) Manufacturer: **BARTEC VARNOST, d.o.o.**
- (6) Address: **Cesta 9. avgusta 59, 1410 Zagorje ob Savi, Slovenija**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this type examination certificate.
- (8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the Test and Assessment Report BVS PP 15.1008 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2012 + A11:2013	General requirements
EN 60079-1:2014	Flameproof enclosure "d"
EN 60079-7:2007	Increased Safety "e"
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.
- (11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment shall include the following:

 **IM2 Ex db I Mb** resp. **Ex db e I Mb**

DEKRA EXAM GmbH
Bochum, dated 2015-03-19

Signed: Schumann

Certification body

Signed: Dr. Wittler

Special services unit



Page 1 of 4 of BVS 15 ATEX E 037 X
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telephone +49 234.3696-105, Fax +49 234.3696-110, zs-exam@dekra.com



- (13) Appendix to
- (14) **EC-Type Examination Certificate**
BVS 15 ATEX E 037 X
- (15) **15.1 Subject and type**

Flameproof electric motors type 4 KTCR *** ** */*
 Type designation to 4 KTCR *¹⁾a¹⁾a¹⁾ a²⁾a²⁾ a³⁾a³⁾

¹⁾: Frame size

71	71 mm
80	80 mm
90	90 mm
100	100 mm
112	112 mm
132	132 mm
160	160 mm
180	180 mm
200	200 mm
225	225 mm

²⁾: Length of stator assembly

³⁾: Quantity of poles

15.2 Description

The enclosure of the flameproof electric motor is made of cast iron and has a mounting place for terminal boxes.

The shaft will be fixed with ball bearings.

A terminal compartment in type of protection Flameproof enclosure "d" or increased safety "e" or a direct cable entry is used for electrical connection of the motor. For electric power input into the motor compartment, separately certified cable glands or conductor bushings are used.

The cooling of the motor is realised by an external fan that is made of steel. The fan can be driven by the electrical machine itself or by a separately certified forced ventilation motor.

Optionally a space heater can be mounted inside the stator housing.

For direct temperature monitoring the winding of the motor is equipped with temperature sensors (thermistors according DIN 44081 respectively DIN 44082). The sensors are connected in series. Insulated bimetal switches can be mounted inside the windings as well.

Optionally the temperature at the bearings could be monitored separately certified resistance thermometers (Pt100).

The sensors respectively the thermometers will be connected to a trigger unit which is certified for this purpose.





15.3 Parameters

Electrical parameters

Circuits of the flameproof electric motors				
Rated voltage				
Frame size		up to	1100	V AC
Rated rotational speed	500	up to	3600	min ⁻¹
Rated rotational speed (with converter)	48	up to	6000	min ⁻¹
Frequency (mains)			50 / 60	Hz
Frequency (converter)	5	up to	100	Hz
Duty type	S1	up to	S9	

Rated power				
Frame size		50 Hz		60 Hz
71	up to	0.55	kW	0.66 kW
80	up to	1.1	kW	1.3 kW
90	up to	2.2	kW	2.6 kW
100	up to	3	kW	3.6 kW
112	up to	4	kW	4.8 kW
132	up to	7.5	kW	9 kW
160	up to	18.5	kW	21 kW
180	up to	22	kW	26 kW
200	up to	37	kW	42 kW
225	up to	45.5	kW	52 kW

The electrical data of the respective version is determined by a routine test carried out by the manufacturer.

Monitoring circuit

Temperature sensors (ptc thermistors)

According to the specifications given in the certificate of the trigger unit and the electrical design.

Circuits of the resistance thermometer (Pt100)

According to the specifications given in the certificate of the trigger unit and the electrical design.

(16) Test and Assessment Report

BVS PP 15.1008 EG as of 2015-03-19

(17) Special conditions for safe use

The lengths of the flameproof joints are in parts longer and the gaps of the flameproof joints are in parts smaller than the values of table 2 of EN 60079-1:2014. For information of the dimensions of the flameproof joints contact the manufacturer.

Fasteners with a minimum yield stress of 640 N/mm² must be used for the closing of the flameproof enclosure.

Motors which have to be equipped with a direct temperature control must be monitored by a separately certified trigger unit.

If the electrical machine will be cooled by forced ventilation, it has to be assured that the electrical machine can only run if the ventilation is running.



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IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEX BVS 15.0031X	issue No.:	0	Certificate history:	
Status:	Current				
Date of Issue:	2015-03-30	Page 1 of 4			
Applicant:	Bartec Varnost d.o.o. Cesta 9. avgusta 59 SI-1410 Zagorje ob Savi Slovenia				
Electrical Apparatus: Optional accessory:	Flameproof electric motors type 4 KTCR *** ** *)				
Type of Protection:	Equipment protection by flameproof enclosures "d", Equipment protection by increased safety "e"				
Marking:	Ex db I Mb	resp.	Ex db e I Mb		
Approved for issue on behalf of the IECEx Certification Body:			G. Schumann		
Position:			Deputy Head of Certification Body		
Signature: (for printed version)					
Date:			<u>2015-03-30</u>		

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany

 **DEKRA**
DEKRA EXAM GmbH



IECEX Certificate of Conformity

Certificate No.: IECEx BVS 15.0031X
Date of Issue: 2015-03-30 Issue No.: 0
Page 2 of 4
Manufacturer: **Bartec Varnost d.o.o.**
Cesta 9. avgusta 59
SL-1410 Zagorje ob Savi
Slovenia

Additional Manufacturing location
(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
Edition: 6.0
IEC 60079-1 : 2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition: 7.0
IEC 60079-7 : 2006-07 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition: 4

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
[DE/BVS/ExTR15.0027/00](#)

Quality Assessment Report:
[SI/SIQ/QAR11.0003/02](#)



IECEx Certificate of Conformity

Certificate No.: IECEx BVS 15.0031X

Date of Issue: 2015-03-30

Issue No.: 0

Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Subject and type

Flameproof electric motors type 4 KTCR *** ** 1*

Type designation to 4 KTCR *1/*1*1) *2/*2) *3/*3)

- 1): Frame size
 - 71 71 mm
 - 80 80 mm
 - 90 90 mm
 - 100 100 mm
 - 112 112 mm
 - 132 132 mm
 - 160 160 mm
 - 180 180 mm
 - 200 200 mm
 - 225 225 mm
- 2): Length of stator assembly
- 3): Quantity of poles

CONDITIONS OF CERTIFICATION: YES as shown below:

The lengths of the flameproof joints are in parts longer and the gaps of the flameproof joints are in parts smaller than the values of table 2 of IEC 60079-1:2014. For information of the dimensions of the flameproof joints contact the manufacturer.

Fasteners with a minimum yield stress of 640 N/mm² must be used for the closing of the flameproof enclosure.

Motors which have to be equipped with a direct temperature control must be monitored by a separately certified trigger unit.

If the electrical machine will be cooled by forced ventilation, it has to be assured that the electrical machine can only run if the ventilation is running.



IECEx Certificate of Conformity

Certificate No.: IECEx BVS 15.0031X

Date of Issue: 2015-03-30

Issue No.: 0

Page 4 of 4

EQUIPMENT(continued):

Description

The enclosure of the flameproof electric motor is made of cast iron and has a mounting place for terminal boxes.

The shaft will be fixed with ball bearings.

A terminal compartment in type of protection Flameproof Enclosure "d" or Increased Safety "e" or a direct cable entry is used for electrical connection of the motor. For electric power input into the motor compartment, separately certified cable glands or conductor bushings are used.

The cooling of the motor is realised by an external fan that is made of steel. The fan can be driven by the electrical machine itself or by a separately certified forced ventilation motor.

Optionally a space heater can be mounted inside the stator housing.

For direct temperature monitoring the winding of the motor is equipped with temperature sensors (thermistors according DIN 44081 respectively DIN 44082). The sensors are connected in series. Insulated bimetal switches can be mounted inside the windings as well.

Optionally the temperature at the bearings could be monitored separately certified resistance thermometers (Pt100).

The sensors or the thermometers will be connected to a trigger unit which is certified for this purpose.

Parameters

See Annex

Annex: BVS_15_0031X_BartecVarnost_Annex.pdf



EU-Type Examination Certificate

Equipment intended for use in potentially explosive atmospheres
Directive 2014/34/EU

EU-Type Examination Certificate Number: **BVS 16 ATEX E 077 X**

Product: **Flameproof electric motors type 3KTCR *** ** */-VS and
type 4KTCR *** ** */-VS**

Manufacturer: **BARTEC VARNOST, d.o.o.**

Address: **Cesta 9. avgusta 59, 1410 Zagorje ob Savi, Slovenia**

This product and any acceptable variation thereto are specified in the appendix to this certificate and the documents therein referred to.

DEKRA EXAM GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive
The examination and test results are recorded in the confidential Report No. BVS PP 16.1014 EU.


Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012 + A11:2013 General requirements
EN 60079-1:2014 Flameproof enclosure "d"

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:

 **I M2 Ex db I Mb**

DEKRA EXAM GmbH
Bochum, 2016-08-01



Certifier



Approver

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13 Appendix

14 EU-Type Examination Certificate
BVS 16 ATEX E 077 X

15 Product description

15.1 Subject and type

Flameproof electric motors type 3KTCR *** ** */*-VS and type 4KTCR *** ** */*-VS

Type designation for *KTCR *** ** */*-VS

Asterisk Description

1	Motor generation
3	Third generation
4	Fourth generation

2-4	Frame size
80	80 mm
90	90 mm
100	100 mm
112	112 mm
132	132 mm
160	160 mm
180	180 mm
200	200 mm
225	225 mm
250	250 mm
280	280 mm
315	315 mm

5-6	Length of stator assembly (A, B, S, SA, SB, L, LA, LB, M, MA, MB)
-----	--

7-8	Quantity of poles (2, 4, 6, 8, 4/2, 8/4, 6/4, 8/6)
-----	---

Types of motors covered by this certificate are:

- 4KTCR 80 ** */*-VS up to 4KTCR 315 ** */*-VS
- 3KTCR 180 ** */*-VS up to 3KTCR 225 ** */*-VS





15.2 Description

The stator housing is made of welded steel for type 3KTCR 180-225 and type 4KTCR 250-315. The stator housing of type 4KTCR 80-225 is made of cast iron. All stator housings have got a mounting place for a terminal box.

The stator shields are made of cast iron, the terminal plates are either made of cast iron or constructional steel and the terminal box is made of welded steel.

The shaft is fixed by ball bearings.

The terminal compartment is designed in type of protection Flameproof Enclosure "d". Separately tested and certified plugs/sockets are used to lead in the mains supply.

The cooling of the motor is realised by an external fan made of welded steel which is fixed to the shaft using a key and a circlip. Alternatively the motor can be cooled by forced ventilation.

Optionally a space heater can be installed inside the stator housing.

For direct temperature monitoring the windings of the motor are equipped with three temperature sensors (thermistors according DIN 44081 or DIN 44082). The sensors are connected in series.

Optionally the bearings can be monitored by separately tested and certified temperature sensors (PT100 or PTC).

The PTCs in the windings and the optionally installed PT100 or PTCs at the bearings must be connected to a trigger unit which is certified for this purpose.

If the motor is converter-fed the converter must be of type voltage-source converter with pulse width modulation.

Optionally a separately tested and certified brake can be installed either on the drive end or non-drive end.

Listing of all components used referring to older standards

Subject and type	Certificate	Standards
Restrained socket A42SR	Baseefa02ATEX0104U	EN 60079-0:2009 EN 60079-1:2007
Restrained socket A41SR	MESC02ATEX5102U	EN 60079-0:2009 EN 60079-1:2007
Line bushing BV	SIQ 13 ATEX 071 U	EN 60079-0:2012 EN 60079-1:2007



15.3 Parameters

15.3.1 Electrical parameters

15.3.1.1 Electrical ratings of the motor

Rated voltage		up to	1100	VAC
Rated rotational speed (mains supply)	500	up to	3600	min ⁻¹
Rated rotational speed (converter supply)	150	up to	5800	min ⁻¹
Frequency (mains)			50 / 60	Hz
Frequency (converter)	5	up to	87	Hz
Duty type	S1	up to	S9	

Rated power (depending on frame size)				
80		up to	1.3	kW
90		up to	2.6	kW
100		up to	3.6	kW
112		up to	4.8	kW
132		up to	9	kW
160		up to	21	kW
180		up to	26	kW
200		up to	42	kW
225		up to	52	kW
250		up to	55	kW
280		up to	90	kW
315		up to	200	kW

¹ In case of converter-fed: Voltage of the fundamental wave measured at the motor terminals. This voltage must not be decreased by 10 %, taken into account the minimum converter input voltage and the voltage drop caused by the supply line and an optional sinus filter.

15.3.1.2 Electrical parameters (voltage-source converter)

Maximum permitted input voltage	Rated voltage of the motor	V
Minimum switching frequency		1.2 kHz
Current limiting value		1.5 × I _N
Maximum overload time / Time for operation below minimum frequency ²		60 s
Output frequency		up to 87 Hz

² The maximum overload time and the permitted time for operation below the minimum output frequency are in relation with a period of 10 minutes.

15.3.1.3 Monitoring circuit

Temperature sensors (PTC thermistors)	According to the specifications given in the certificate of the trigger unit and the electrical design.
Circuits of the resistance thermometer (PT100)	According to the specifications given in the certificate of the trigger unit and the electrical design.

15.3.2 Thermal ratings

The electrical data, the surface temperature and the ambient temperature range of the respective version is determined by a routine test carried out by the manufacturer.

16 Report Number

BVS PP 16.1014 EU, as of 2016-08-01



17 Special Conditions for Use

- 17.1 The lengths of the flameproof joints are in parts longer and the gaps of the flameproof joints are in parts smaller than the values of table 2 of EN 60079-1:2014. For information of the dimensions of the flameproof joints contact the manufacturer.
- 17.2 Fasteners with a minimum yield stress of 640 N/mm^2 must be used for the closing of the flameproof enclosure.
- 17.3 Motors which have to be equipped with a direct temperature control must be monitored by a separate certified trigger unit.
- 17.4 The motor must be operated with a voltage source converter with pulse width modulation regarding the electrical parameters according to clause 15.3.1.2 Ratings.
- 17.5 Before setting-up operation it has to be ensured that no inadmissible over voltage caused by converter supply may occur at the terminals of the motor. Clearances and creepage distances inside the terminal box do not permit an overvoltage caused by the converter which increases:
 - $2.04 \times \text{UN}$ for rated voltages $\leq 1100 \text{ V}$The insulating system of the motor may require an additional limitation of a periodic over voltage.
- 17.6 If the electrical machine will be cooled by forced ventilation, it has to be assured that the electrical machine can only run if the ventilation is running.

18 Essential Health and Safety Requirements

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 Drawings and Documents

Drawings and documents are listed in the confidential report.



Page 5 of 5 of BVS 16 ATEX E 077 X
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EU Declaration of Conformity

The Manufacturer: **BARTEC VARNOST d.o.o.**
Cesta 9. Avgusta 59
1410 Zagorje ob Savi
Slovenia

Hereby declares that the products:

Group & category, temperature class, protection	Motor type, IEC frame size	Certification number	Year of CE-marking
I M2 Ex db I Mb or Ex db e I Mb	4 KTCR *** ** */^ (71-225)	BVS 15 ATEX E 037 X	2018

Notified Body (ExNB): 0158, DEKRAEXAM GmbH, Dinnendahlstrasse 9, 44809 Bochum, Germany

Are in conformity with provisions of the following Council Directives:

Directive 2014/34/EU

Directive 2009/125/EC (ErP of 20th November 2009)

The motors that are marked as IE2, IE3 are in conformity with the requirements set in the Commission Regulation (EU) No.4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009 – in this Regulation the flameproof motors are excluded from ECO-Design Directive.

Directive 2011/65/EU

Directive 2014/35/EU – Electrical equipment for use in an explosive atmosphere is excluded from the scope of this directive (Annex II of said Directive)

Directive 2014/30/EU - Induction motors belongs to Inherently benign equipment in terms of electromagnetic compatibility as they include no active electronic parts and are excluded from the scope of the EMC Directive (Article 2-point d of said Directive).

In respect of product categories the motors are in conformity with provisions of the following harmonized standards:

EN 60079-0:2012+A11:2013, EN 60079-1:2014, EN 60079-7:2015 and relevant parts of the EN 60034-series of standards.

The indicated product is intended for fitting into a machine. The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: When installing motors for converter supply applications additional requirements must be respected regarding the motor as well as the installation.

The sign »X« placed after the certificate number indicates that the repair of the flameproof joints with the values in tables 1 and 2 of EN 60079-1 is not accepted and that the equipment is subject to special conditions for safe use which are prescribed in the manual.

Motors which have to be equipped with a direct temperature control must be monitored by a separately certified trigger unit.

If the electrical machine will be cooled by forced ventilation, it has to be assured that the electrical machine can only run if the ventilation is running.

Signed by



Janez Gajski
 Technical Manager

Title

Date

28.05.2018

UVOD

Bartec Varnost je zavezana k spoštovanju okoljske politike. V Bartec Varnost neprenehoma skrbimo, da so izdelki okolju prijazni in pri načrtovanju upoštevamo njihovo življenjsko dobo in način predelave po njenem izteku. Izdelki, izdelovalni procesi ter tudi logistika so načrtovani tako, da upoštevajo okoljske vidike. Bartec Varnost ima vzpostavljen sistem varovanja okolja, certificiran po standardu ISO 14001, ki je učinkovito orodje pri varovanju okolja.

Priložena navodila služijo kot priporočila za okolju prijazno reciklažo po izteku življenjske dobe. Dolžnost kupca je, da zagotavlja, da so upoštevane zahteve lokalne skupnosti. Navodila ne vsebujejo vseh zahtev strank, zato je potrebno pridobiti dodatno dokumentacijo v projektni dokumentaciji.

MATERIALI, KI JIH VSEBUJE STANDARDNI ELEKTROMOTOR

Materiali, ki jih vsebuje standardni elektromotor so:

	Ohišja iz jeklene litine	Ohišja iz varjene jeklene pločevine
Jeklo	46%	82%
Baker	16%	11%
Jeklena litina	31%	1%
Materiali za izolacijo	3%	3%
Drugo	4%	3%

RECIKLAŽA MATERIALOV ZA EMBALAŽO

Takoj, ko izdelek pride na mesto vgradnje, je potrebno odstraniti material, ki služi za embalažo.

- Vse dele iz lesa je mogoče sežgati,
- Za nekatere države je potrebno embalažo za transport z ladjo izdelati iz impregniranega lesa, ki ga je potrebno reciklirati v skladu z lokalnimi zahtevami,
- Materiale iz plastike je mogoče reciklirati,
- Zaščito pred korozijo s katero je zaščiten izdelek med transportom, je potrebno odstraniti z razmastili in čistilnimi krpami. Onesnažene čistilne krpe je potrebno odstraniti v skladu z zahtevami zakonodaje in zahtev lokalne skupnosti.

PRAVILNO RAZSTAVLJANJE ELEKTROMOTORJEV

Razstavljanje elektromotorjev je osnovna naloga pri recikliranju, enako zahtevna kot samo sestavljanje. Glede na zahtevnost terja izkušeno in izučeno osebo, ki bo delo opravila strokovno in varno.

LOČEVANJE RAZLIČNIH MATERIALOV**OHIŠJE, OHIŠJA LEŽAJEV, ŠČITI IN VENTILATORJI**

Vsi ti sestavni deli so narejeni iz konstrukcijskega jekla, ki se mora reciklirati v skladu z zahtevami lokalne skupnosti. Vsa dodatna oprema, kabli, priključki kot tudi ležaji, se morajo odstraniti preden se material pretopi.

SESTAVNI DELI, KI VSEBUJEJO ELEKTRIČNO IZOLACIJO

Stator in rotor sta glavna sestavna dela, ki vsebujeta tudi elektro izolacijske materiale. Izdelek pa sestavljajo še druge komponente, ki prav tako vsebujejo podobne materiale, ki jih je potrebno obravnavati po enakih postopkih. To so različni skozniki, ki se uporabljajo v priključni omarici, vzbujevalniki, napetostni in tokovni transformatorji, priključni kabli, razne žice in kondenzatorji. Nekatere od teh komponent se uporabljajo le v sinhronskih motorjih, druge pa se porabljajo le v zelo specialnih napravah.

Po izteku življenjske dobe izdelka, so njegovi deli neuporabni. Nekateri deli, predvsem stator in rotor, vsebujejo velik delež bakra, ki ga lahko izločimo s pravilnim postopkom toplotne predelave, pri katerih organski materiali, ki so uporabljeni kot izolatorji, zgorijo. Da se zagotovi pravilno zgorevanje hlapov, mora

imeti peč za gorenje ustrezno predgrevalno enoto. Da se zagotovi minimalno emisijo med procesom toplotne predelave, je potrebno izpolnjevati naslednje pogoje:

POSTOPEK

Temperatura: 380-420°C (716...788°F)

Čas segrevanja: Ko se obdelovanec segreje na 90% ciljne temperature, ga je potrebno zadrževati na tej temperaturi minimalno pet ur.

POSTOPEK PO IZGOREVANJU BINDER (VKLJUČENIH) HLAPOV

Temperatura: 850-920°C (1562...1688°F)

Čas zgorevanja: Plini, ki jih vsebuje izdelek, se morajo zadržati najmanj tri sekunde v zgorevalni komori.

OPOMBA: Emisija vsebuje v glavnem O₂-, CO-, C NO_x-, -, NO_x-, C_x H_x-, pline in mikro prah. Upravljalec procesa predelave zagotavlja, da je postopek v skladu z zahtevami lokalne skupnosti in zakonodajo.

OPOMBA: Proces zgorevanja in rokovanje z opremo za izgorevanje zahteva posebno pozornost in znanje, da ne pride do požara ali eksplozije. Ker se pri tem uporabljajo različne naprave in postopki, ni mogoče zahtevati, da Bartec-Varnost izdela navodila za rokovanje in postopke za različne naprave. Zato mora prevzeti odgovornost za ustrezno izvajanje postopka stranka.

NEVARNI ODPADKI

Olje in mast iz sistema za mazanje predstavlja nevarne odpadke in se mora z njimi postopati glede na zahteve zakonodaje v državi uporabnika.

ODLAGALIŠČNI ODPADKI

S elotnim izolacijskim materialom je potrebno ravnati kot z odlagališčnimi odpadki.

Introduction

Bartec Varnost d.o.o. is committed to its environmental policy. Bartec Varnost d.o.o. continuously strives to make its products more environmentally sound by applying results obtained in recyclability and life cycle analyses. Products, manufacturing processes and even logistics have been designed to take environmental aspects into account. Bartec Varnost d.o.o. environmental management system, certified to ISO 14001, is the tool for carrying out the environmental policy.

The following instructions should only be seen as recommendations for environmentally sound disposal of machines. It is the customer's responsibility to ensure that local regulations are followed. Some customer-specific items may not be included in this User's Manual. Additional documentation will be found in the project documentation.

Average material content

The average material content used in the manufacturing of the electrical machine is as follows:

	Cast iron frame induction machines	Modular steel frame induction machines
Steel	46 %	82 %
Copper	16 %	11 %
Cast iron	31 %	1 %
Plastics, rubber, insulation materials etc.	3 %	3 %
Other	4 %	3 %

Recycling of packaging material

Once the machine has arrived on site, the packaging material will need to be removed.

- Any wood packaging can be burned
- For some countries, the packaging used for shipping by sea is made of impregnated wood that must be recycled according to local regulations
- Plastic material around the machine can be recycled
- Any anti-corrosive agent covering the machine surface can be removed using a petrol based detergent and a cleaning rag. The rag must be disposed of in accordance with local regulations.

Dismantling of the machine

Dismantling the machine is a basic procedure as it is assembled with bolts. However, due to the weight, it requires an operator trained in handling heavy components to prevent dangerous situations.

Separation of different materials

Frame, bearing housing, covers and fan

These parts are made of structural steel, which can be recycled according to local instructions.

All the auxiliary equipment, cabling as well as bearings have to be removed before melting the material.

Components with electrical insulation

The stator and the rotor are the main components, which include electrical insulation materials.

There are, however, auxiliary components which are constructed of similar materials and which are hence dealt with in the same manner. This includes various insulators used in the terminal box, exciter, voltage and current transformers, power cables, instrumentation wires, surge arrestors and capacitors.

Some of these components are used only in synchronous machines and some are used only in a very limited number of machines.

All these components are in an inert stage once the manufacturing of the machine has been completed. Some components, in particular the stator and the rotor, contain a considerable amount of copper which can be separated in a proper heat treatment process, where the organic binder materials of the electrical insulation are gasified. To ensure a proper burning of then fumes, the oven shall include a suitable after burning unit. The following conditions are recommended for the heat treatment and for the after burning to minimize the emissions from the process:

Heat treatment

Temperature: 380-420°C (716...788°F)

Duration: After obtaining 90% of the target temperature, the object shall stay a minimum of five hours at his temperature.

After burning of the binder fumes

Temperature: 850-920°C (1562-1688°F).

Flow rate: The binder fumes shall stay a minimum of three seconds in the burning chamber

NOTE: The emission consists mainly of O₂-, CO-, CO₂-, NO_x-, C_xH_y-gases and microscopic particles. It is on the user's responsibility to ensure that the process complies with the local legislation.

NOTE: The heat treatment process and the maintenance of the heat treatment equipment require special care in order to avoid any risk for fire hazards or explosions. Due to various installations used for the purpose it is not possible for Bartec Varnost to give detailed instructions of the heat treatment process, or the maintenance of the heat treatment equipment and these aspects must be taken care of by the customer.

Permanent magnets

If the permanent magnet synchronous machine is melted down as a whole, nothing needs to be done to the permanent magnets.

If the machine is dismantled for more thorough recycling and if the rotor must be transported after it, it is recommended that the permanent magnets are demagnetized. The demagnetization is done by heating the rotor in the oven until the permanent magnets reach a temperature of +300 °C (572°F).

WARNING: Magnetic stray fields, caused by an open or disassembled permanent magnet synchronous machine or by a separate rotor of such a machine, may disturb or damage other electrical or electromagnetic equipment and components, such as cardiac pacemakers, credit cards and equivalent.

Hazardous waste

The oil from the lubrication system is a hazardous waste and has to be handled according to local instructions.,

Land fill waste

All insulation material can be handled as a land fill waste.

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