

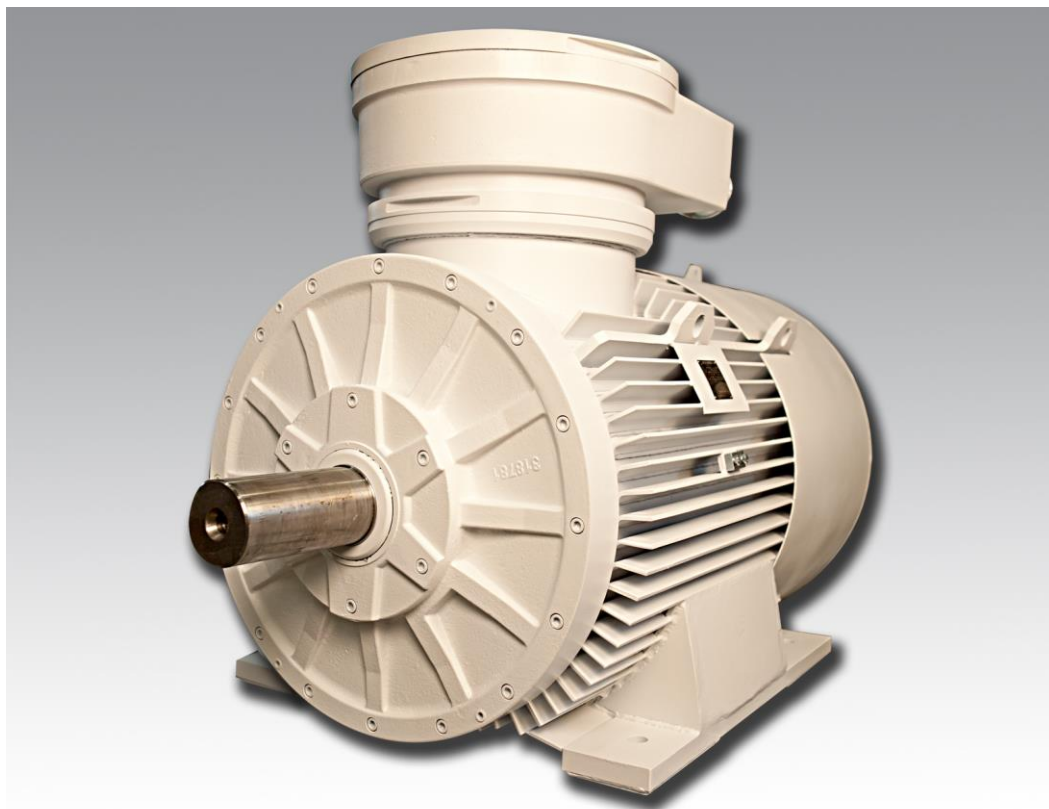


NAVODILA ZA UPORABO DIRECTIONS FOR USE



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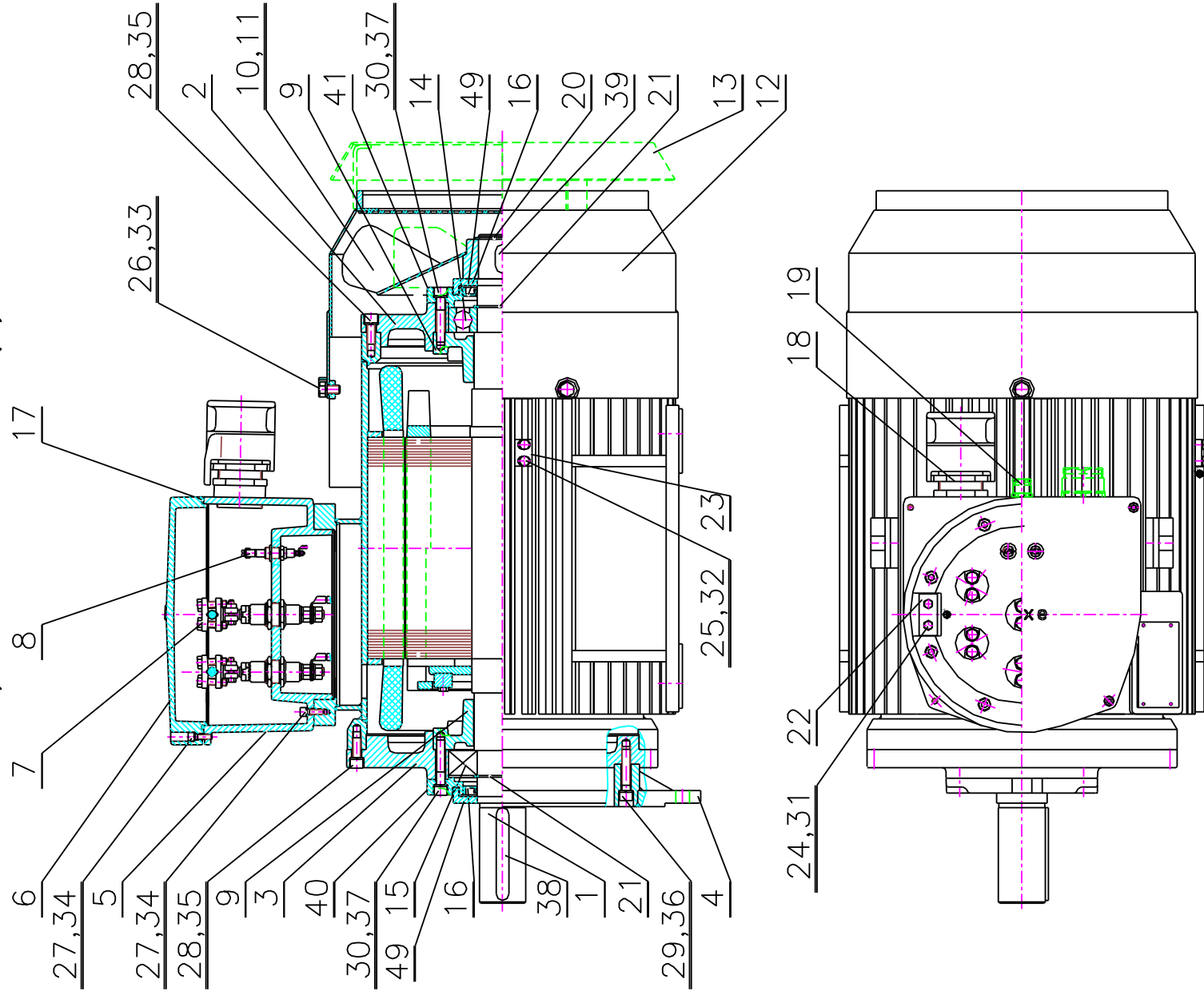
4(5)KTCR(P) 250 - 355



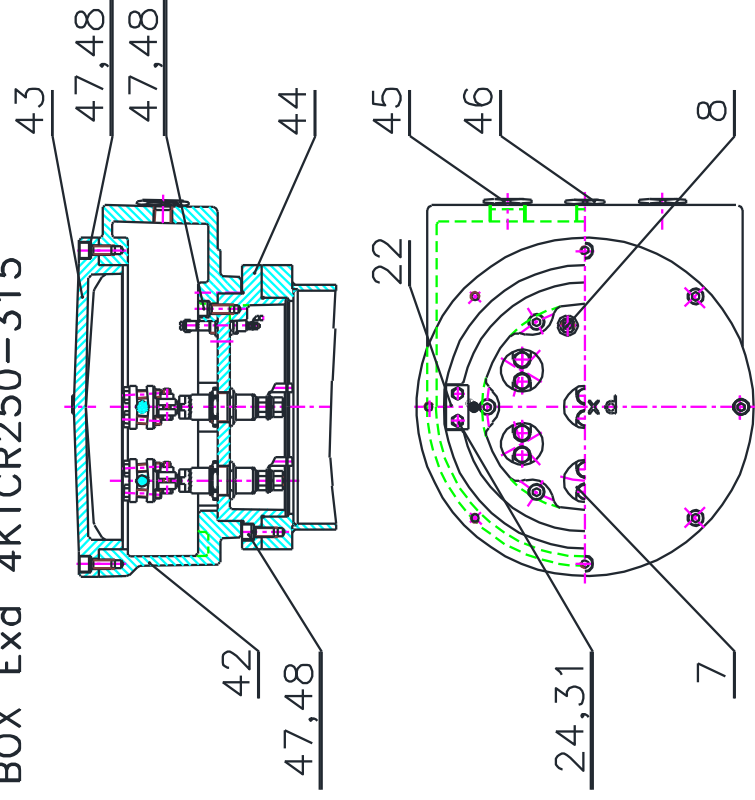
VSEBINA / CONTENT

- 1 – 2 VSEBINA
CONTENT
- 3 – 4 RISBE
DRAWINGS
- 5 – 14 SEZNAM NADOMESTNIH DELOV
PARTS LIST
- 15 – 21 NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV 4(5)KTCR
INSTALLATION GUIDELINES FOR THE 4KTCR SQUIRREL –CAGE MOTORS
- 22 NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV 4(5)KTCR
INSTALLATION GUIDELINES FOR THE 4(5)KTCR SQUIRREL- CAGE
MOTORS
- 23 VEZNA SHEMA
CONNECTION DIAGRAM
- 24 – 28 CERTIFIKAT BVS 15 ATEX E 075 X
CERTIFICATE OF CONFORMITY 15 ATEX E 075 X
- 29 – 32 CERTIFIKAT IECEX BVS 15.0066 X
CERTIFICATE OF CONFORMITY IECEX BVS 15.0066 X
- 33 – 38 CERTIFIKAT FTZU 13 ATEX 0111 X, IECEX FTZU 14.006 X
CERTIFICATE OF CONFORMITY FTZU 13 ATEX 0111 X, IECEX FTZU 14.006 X
- 39 - 40 IZJAVA O SKLADNOSTI CE
DECLARATION OF EC-CONFORMITY
- 41 - 44 RECIKLAŽA
RECYCLING

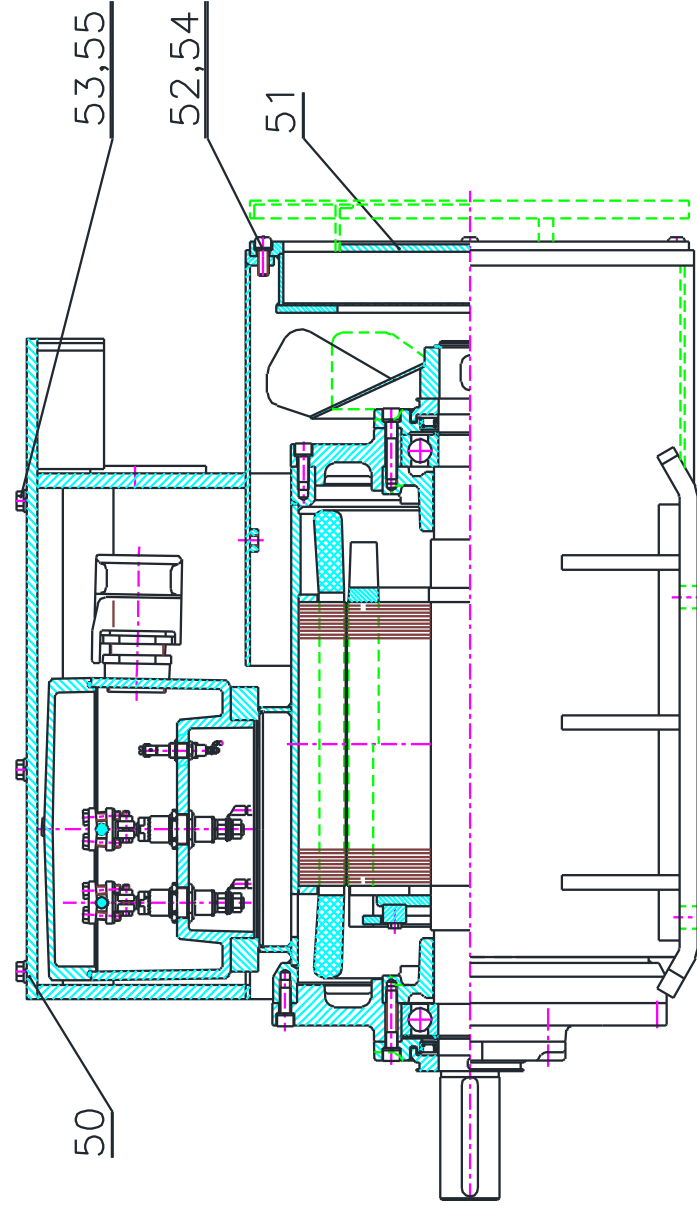
NADOMESTNI DELI / SPARE PARTS
 ELEKTROMOTOR / ELECTROMOTOR 4(5)KTCR250-355



NADOMESTNI DELI / SPARE PARTS
PRIKLJUČNA OMARICA Exd 4(5)KTCR250-355
TERMINAL BOX Exd 4KTCR250-315



ELEKTROMOTOR / ELECTROMOTOR 4KTCP250-315



	PIECES DE RECHANGE/ PARTS LIST/ ERSATZTEILLISTE/ SEZNAM NADOMESTNIH DELOV
	TYPE : 4KTCR 250, 280, 315, 5KTCR 355

1.	ROTOR	1
	SHAFT ROTOR UNIT	
	LAÜFER	
	ROTOR	

		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
25513055	M2	*			
25513065	M4	*			
25513075	M6	*			
25513085	M8	*			
25553055	S2		*		
25553065	S4		*		
25553075	S6		*		
25553085	S8		*		
25553095	M2		*		
25553105	M4		*		
25553115	M6		*		
25553115	M8		*		
25613055	S2			*	
25613065	S4			*	
25613075	S6			*	
25613085	S8			*	
25613095	MA-2			*	
25613105	MB-2			*	
25613115	MB-4			*	
25613116	MA-4			*	
25613125	M6			*	
25613135	M8			*	
	MD4			*	
	SA2				*
	SB2				*
	SA4				*
	SB4				*
	SB6				*
	SB8				*
	LA2				*
	L4				*
	M4				*
	LA6				*
	LB6				*
	LA8				*
	LB8				*

2.	FLASQUE BS	1
	END SHILD BS	
	LAGERSCHILD BS	
	STATORJEV ŠČIT BS	

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
25513240	*			
25553240		*		
25613240			*	
				*

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

3.	FLASQUE AS	1
	END SHILD AS	
	LAGERSCHILD AS	
	STATORJEV ŠČIT AS	

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
25513250	*			
25553250		*		
25613250			*	
AS				*
ASB5				*

4.	BRIDE DE FIXATION NORMALISEE	1
	FLANGE STANDARD	
	FLANSCH GENORMT	
	PRIROBNICA	

	4KTCR 250	4KTCR 280	4KTCR 315
25513260	*		
25513260		*	
25613260			*
MD4			*

5.	BOITE A BORNES Exe	1
	TERMINAL BOX Exe	
	KLEMMENKASTEN Exe	
	PRIKLJUČNA OMARICA Exe	

	4KTCR250-315	5KTCR355
25613670	*	
		*

6.	COUVERCLE DE BOITE A BORNES Exe	1
	COVER Exe	
	KLEMMENKASTENDECKEL Exe	
	POKROV PRIKLJUČNE OMARICE Exe	

	4KTCR250-315	5KTCR355
25611010	*	
		*

7.	BORNE DE RACCORDEMENT	3(6)
	TERMINAL STUD	
	LEITUNGSDURCHFÜHRUNGEN	
	PREVODNIK	

	TOS10/690V	*
	TOS10/1000V	*
	TOS12/690V	*
	TOS12/1000V	*
	TOS16/690V	*
	TOS16/1000V	*
	TOS20/690V	*
	TOS20/1000V	*

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

8.	BORNE CTP		
	TERMINAL STUD CTP		
	LEITUNGSDURCHFÜHRUNGEN CTP		
	PREVODNIK CTP		

	TOS4	2
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9.	COUVRE ROULEMENT INTERIEUR		*
	INNER BEARING COVER		
	LAGERDECKEL INNEN		
	VMESNIK		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
25513184	2			
25553184		2		
25613182			2	
25613182 BS			1	
MD4				
MD4 AS			1	
				2

10.	VENTILATEUR 2-pôles		1
	FAN 2-poles		
	LUFTER -2polig		
	VENTILATOR 2-polni		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
25510680	*			
25551010		*		
25610910			*	
				*

11.	VENTILATEUR 4,6,8-pôles		1
	FAN 4,6,8-poles		
	LUFTER 4,6,8polig		
	VENTILATOR 4,6,8-polni		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
25510690	*			
25551020		*		
25610920			*	
				*

12.	CAPOT VENTILATEUR		1
	FAN COVER		
	LUFTERHAUBE		
	VENTILATORSKI ŠČIT		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
25510583	*			
25550913		*		
25610833			*	
				*

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

13.	CAPOT VENTILATEUR AVEC TOLE PARAPLUIE		1
	FAN COVER WITH RAIN CUP IMV1/IMV5		
	LUFTERHAUBE MIT REGENSCHUTZDACH IMV1/IMV5		
	VENTILATORSKI ŠČIT IMV1/IMV5		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
25510630	*			
25550960		*		
25610860			*	
				*

14.	ROULEMENT BS		*1
	BEARING BS		
	LAGER BS		
	LEŽAJ BS		

		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
002940	63142ZC3	*			
002938	63162ZC3		*		
002941	63172ZC3			*	
	63192ZC3				*
	63212ZC3				*

15.	ROULEMENT AS		1
	BEARING AS		
	LAGER AS		
	LEŽAJ AS		

		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
002940	63142ZC3	*			
002938	63162ZC3		*		
002904	NU317C3			*	
MD4	NU322C3			*	
	NU319EC3				*
	NU321EC3				*

16.	JOINT D'ETANCHEITE		2
	SHAFT SEAL		
	WELLEN RING		
	TESNILO GREDI		

		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
011070	A13x70x100	*			
008055	A13x80x105		*		
008902	A13x85x115			*	
MD4	A110x140x13			*	
	A 95x125x12				*
	A105x140x12				*

17.	JOINT D'EMBASE DE BOÎTE A BORNES Exe		1
	SEAL FOR TERMINAL BOX Exe		
	KLEMMENKASTEN DICHTUNG Exe		
	TESNILO		

	4KTCR250-315	5KTCR355
006800	*	
		*

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

18.	PRESSE ETOUPE Exe		1(2)
	CABLE GLAND Exe		
	KABELVERSCHRAUBUNG Exe		
	DOVODNICA Exe		

008424	M50x1,5	*
010909	M63x1,5	*
	M65x1,5	*
	M75x1,5	*
	M80x2	*

19.	PRESSE ETOUPE Exe CTP		1
	CABLE GLAND Exe CTP		
	KABELVERSCHRAUBUNG Exe CTP		
	DOVODNICA Exe CTP		

006915	M20x1,5	*
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	CIRCLIPS EXTERIEUR DIN 471		
	EXTERNAL CIRCLIP DIN 471		
	SPRENGRING DIN 471		
	VSKOČNIK DIN 471		

20.		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
	002774	68	1		
	002798	78		1	
	002793	80			1 (2poles)
		100			1 (4,6,8 poles)

21.		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
	002792	70	2		
	002793	80		2	
	002794	85			2
		95			2 (2poles)
	100				2 (4,6,8 poles)

22.	CAVALIER DE MISE A LA TERRE		1
	EARTH PLATE		
	ERDUNGSPLATTE		
	OZEMLJILNA PLOŠČICA		

	4KTCR 250-280	4KTCR 315, 5KTCR355
25510710	*	
25610930		*

23.	CAVALIER DE MISE A LA TERRE		1
	LACH WASHER		
	SICHERUNGSSHEIBE		
	PRITRDILNA PLOŠČICA		

25610940	*
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POS. Nr.	CODE ARTICLE	DENOMINATION	QUANTITE
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL
POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA

		HEXAGON BOLTS	
		SECHSKANTSCHRAUBEN	
		VIJAK S ŠESTROBO GLAVO	

24.	002392	M8x25	2
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25.	002393	M8x25	2
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		VIS A TETE HEXAGONALE	
		HEXAGO SOCKET HEAD BOLD	
		INNERSECHKANTSCHRAUBEN	
		VIJAK S ŠESTROBO LUKNJO	

26.	002433	M12x20	3
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27.	002560	M10x25	16
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28.			4KTCR 250 - 280	4KTCR 315	5KTCR 355
	002566	M12x30	16	24	
		M12x40			32

29.			4KTCR 250	4KTCR 280	4KTCR 315
	002578	M12x60	8		
	002578	M12x70		8	12

30.			4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
	002577	M12x65	8			
	002574	M12x70		8	8	
		M12x90				12

		RONDELLE ELASTIQUE	
		SPRING VASHER	
		GLATTET FEDERING	
		VZMETNA PODLOŽKA	

31.	002684	8	2
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32.	002684	8	2
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33.	002764	12	3
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34.	002685	10	12
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35.			4KTCR 250-280	4KTCR 315	5KTCR 355
	002764	12	16	24	32

36.			4KTCR 250-280	4KTCR 315
	002764	12	8	12

37.			4KTCR 250-315	5KTCR 355
	002764	12	8	12

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

	CLAVETTE		1
	KEY		
	PASSFEDER		
	MOZNIK		

38.		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
	004899	A18x11x130			
	004899		A18x11x130- 2p		
	004894		A20x12x130- 4,6,8p		
	004899			A18x11x130- 2p	
	004900			A22x14x160- 4,6,8p	
					A28x16x200

39.		4KTCR 250	4KTCR 280	4KTCR 315	5KTCR355
	004896	B20x12x20			
	004898		B20x12x30		
	006797			B22x14x28	
					B28x16x56

40.		COUVRE ROULEMENT AVANT		1
		BEARING COVER AS		
		LAGERDECKEL AS		
		LEŽAJNI ŠČIT AS		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
25513202	*			
25553203		*		
25613195			*	
MD4				
				* (2 poles)
				* (4,6,8 poles)

41.		COUVRE ROULEMENT ARRIERE		1
		BEARING COVER BS		
		LAGERDECKEL BS		
		LEŽAJNI ŠČIT BS		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
25513201	*			
25553202		*		
25613195			*	
				* (2 poles)
				* (4,6,8 poles)

42.		BOITE A BORNES Exd		1
		TERMINAL BOX Exd		
		KLEMMENKASTEN Exd		
		PRIKLJUČNA OMARICA Exd		

	4KTCR250-315	5KTCR355
25614300	*	
		*

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

43.	COUVERCLE DE BOITE A BORNES 4KTCR 250-315 Exd		1
	COVER FOR TERMINAL BOX 4KTCR 250-315 Exd		
	KLEMMENKASTENDECKEL 4KTCR 250-315 Exd		
	POKROV PRIKLJUČNE OMARICE 4KTCR 250-315 Exd		

	4KTCR250-315	5KTCR355
25614280	*	
		*

44.	SUPPORT FAISCEAU DE CÂBLE		1
	TERMINAL PLATE		
	ANSCHUSSPLATTE		
	VMESNA PLOŠČA		

	4KTCR250-315	5KTCR355
25614401	*	
		*

45.	BOUCHON Exd		2
	PLUG Exd		
	VERSCHLUSSTOPFEN Exd		
	SLEPI ČEP Exd		

011062	*
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46.	BOUCHON Exd CTP		1
	PLUG Exd CTP		
	VERSCHLUSSTOPFEN Exd CTP		
	SLEPI ČEP Exd CTP		

006985	*
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	VIS A TETE HEXAGONALE		
	HEXAGO SOCKET HEAD BOLD		
	INNERSECHKANTSCHRAUBEN		
	VIJAK S ŠESTROBO LUKNJO		

47.			5KTCR 250-280	5KTCR 355
	002560	M10x25	6	
		M12x30		22

	RONDELLE ELASTIQUE		
	SPRING VASHER		
	FEDERRING		
	VZMETNA PODLOŽKA		

48.			5KTCR 250-280	5KTCR 355
	002685	10	6	
		12		22

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

49.			2
	LABYRINT SEAL BS		
	SCHUTZRING BS		
	LABIRINTNO TESNILO BS		

	4KTCR 250	4KTCR 280	4KTCR 315	5KTCR 355
25510490	*			
25550820		*		
25610720			*	
				*

50.			1
	COVER 4KTCP 4KTCP		
	DECKEL 4KTCP 4KTCP		
	POKROV 4KTCP 4KTCP		

25612330	*
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51.			
	CAPOT VENTILATEUR 4KTCP		
	FAN CASTING 4KTCP		
	LUFTER KAPPE 4KTCP		
		VENTILATORSKI ŠČIT 4KTCP	

	4KTCP 250	4KTCP 280	4KTCP 315
25510583	*		
25552290		*	
25612290			*

52.			4
	VIS A TETE HEXAGONALE 4KTCP		
	HEXAGO SOCKET HEAD BOLD 4KTCP		
	INNERSECHKANTSCHRAUBEN 4KTCP		
		VIJAK S ŠESTROBO LUKNJO 4KTCP	

002566	M12x30	*
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53.			6
	HEXAGON BOLTS 4KTCP		
	SECHSKANTSCHRAUBEN 4KTCP		
	VIJAK S ŠESTROBO GLAVO 4KTCP		

002395	M12x40	*
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			1
	RONDELLE ELASTIQUE 4KTCP		
	SPRING VASHER 4KTCP		
	FEDERRING 4KTCP		
		VZMETNA PODLOŽKA 4KTCP	

54.	002764	12	4
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55.	002764	12	6
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POS. Nr.	CODE ARTICLE	DENOMINATION	QUANTITE
ITEM No.	PART No.	DENOMINATION	QUANTITY
POS. Nr.	ARTIKEL Nr.	BEZEICHNUNG	ANZAHL
POZICIJA	RAZPOZNAVNA ŠT.	IME	KOLIČINA

Pri naročilu nadomestnega dela, prosimo navedite:

Pozicija, tip motorja, serijska številka.

PRIMER:

1. _____ Rotor 4KTCR 250 M2 000000
--

When ordering spare parts, please state:

Item No., motor type, serial No.

EXAMPLE:

1. _____ Rotor 4KTCR 250 M2 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).

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

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 rudnikuh.

Protieksplzijsko zaščito elektromotorjev sestavljajo:

- a) »nepredirni okrov« za ohišje elektromotorja in »povečana varnost« za priključno omarico, ki sta v skladu z zahtevami standardov EN 60079-0, EN 60079-1 in EN 60079-7. Na pokrovu priključne omarice je oznaka Ex.
- b) »nepredirni okrov« za ohišje elektromotorja in za priključno omarico, ki sta v skladu z zahtevami standardov EN 60079-0 in EN 60079-1. Na pokrovu priključne omarice je oznaka Ex.

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.

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 mines

Explosion-proof motor versions are:

- a) "Explosion-proof enclosure" for the motor housing and "Increased safety" for the terminal box according to EN 60079-0, EN 60079-1 and 60079-7. The cover of the terminal box carries the Ex imprint.
- b) "Explosion-proof enclosure" for the motor housing and for the terminal box according to EN 60079-0 and EN 60079-1. The cover of the terminal box carries the Ex imprint.

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.

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

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 $+40^{\circ}\text{C}$. 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.

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 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) onto 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.**

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

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 pooblaščne Ex institucije. Odklopna naprava ni eksplozijsko varna in mora biti instalirana zunaj eksplozijsko varnega 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 kabelskih žil na skoznike mora biti izveden posebej pazljivo. Izolacija kabelske 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 presežati 7,5 Nm.

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:

- 12 – 13 PTC 145°C built in
14 – 15 Thermostats NC (normally closed contact)
16 – 17 Thermostats NO (normally open contact)

The motors are equipped with 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.

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

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 690V ali 400 V, minimalno 10 mm, oziroma 14mm za 1000 V (za Exe izvedbo)
- da so neuporabne žice ločene in primerno pritrjene
- da so stične ploskve očiščene in rahlo namazane z brezislinsko mastjo
- da je kabel na uvodnici pravilno zatesnjen

Grelci so priključeni na priključkih 30 – 30 ali.... Motorji z grelci so označeni z dodatno napisno tablico, na katero so imenski podatki grelcev. Potrebno je zagotoviti,

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.

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

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 690 V, or 14mm for 1000V (for Exe version).
- 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.

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

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

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 motorskim zaščitnim 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.

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.

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

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.

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.

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

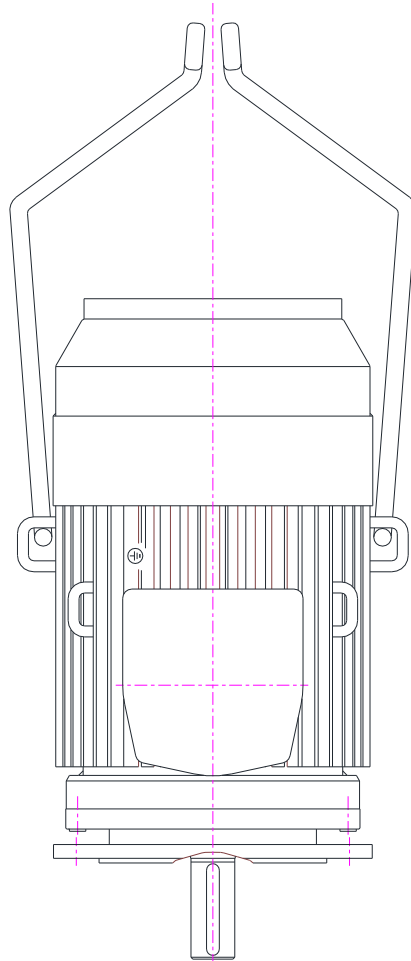
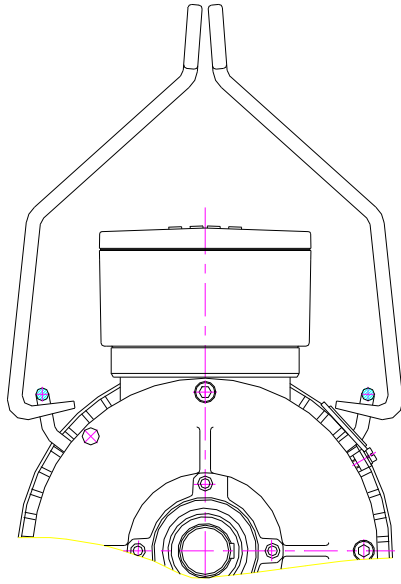
Thread	Tightening torque (Nm)	Thread	Tightening torque (Nm)
M4	1.2	M10	10
M5	2	M12	15.5
M6	3	M16	30
M8	6	M20	52

**NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355
/INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS**

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

Table 3.: Tightening torque: for Exe 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



IMV1

NAVODILA ZA MONTAŽO IN PRIKLJUČITEV ELEKTROMOTORJEV tip 4(5)KTCR 250-355 /INSTALLATION GUIDELINES FOR THE 4(5)KTCR 250-355 SQUIRREL – CAGE MOTORS

PRIKLJUČKI / CONNECTION DIAGRAM 4KTCR		Omarica / Terminal Box:	Exe Exd
Y-D vez za stik – Y direktni zagon, ista vez – obrni Y-D band – Y connection for direct start, the same contact and turn it Za zagon s stikalom Y-D odstrani Y-D vez / Start with Y-D switch – remove Y-D band ENOHITROSTNI / ONE SPEED			
POLNO-PREKLOPNI / POLE-CHANGING WINDING			
DAHLANDER VEZAVA / POLE-CHANGING WINDING (DAHLANDER)			
DAHLANDER VEZAVA / POLE-CHANGING WINDING (DAHLANDER)			
10 – 11	TEMP. TIPALO / TERMISTORS	OPOZORILNO TIPALO /EARLY WARNING	ODKLOPNA NAPRAVA Z CERTIFICIRANO ODKLOPNO NAPRAVO V Ex IZVEDBI. SHOUT – DOWN – DEVICE WITH ONE OF Ex NOTIFIED BODIES MARK OF CONFORMITY.
12 – 13	NAJVIŠJA DELOVNA NAPETOST 25V /MAKSIMUM OPERATING VOLTAGE 25V	IZKLOPNO TIPALO /THERMISTORS – OVER LOAD	
14 – 15	TEMP. STIKALO 250V / THERMOSTATS 250V	NC ODPIRAJČ /CONTACT NORMALLY CLOSED	
16 – 17		NO ZAPIRAJOČ /CONTACT NORMALLY OPEN	
20 21 22 23	TIPALO PT 100 / THERMOSTATS PT 100		
30 – 31	GRELCI / HEATERS	DELOVNA NAPETOST 220V-240V /OPERATING VOLTAGE 220V – 240V	
32 – 33		DELOVNA NAPETOST 110V /OPERATING VOLTAGE 110V	

Translation

EU-Type Examination Certificate Supplement 1

Change to Directive 2014/34/EU

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

EU-Type Examination Certificate Number: **BVS 15 ATEX E 075 X**

Product: **Flameproof electric motors type 3KTC 180-225
3KTCR 180-225-**, 3KTCP 180-225 and 4KTC 250-315,
4KTCR 250-315-**, 4KTCP 250-315**

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

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

This supplementary certificate extends EC-Type Examination Certificate No. BVS 15 ATEX E 075 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

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 15.2162 EU.

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


EN IEC 60079-0:2018	General requirements
EN 60079-1:2014	Flameproof enclosure "d"
EN 60079-7:2015	Increased Safety "e"

Except in respect of those requirements listed under item 18 of the appendix.

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:

	II 2G Ex db IIC T* Gb	or	II 2G Ex db eb IIC T* Gb	or
	II 2G Ex db IIB T* Gb	or	II 2G Ex db eb IIB T* Gb	or
	I M2 Ex db I Mb	or	I M2 Ex db eb I Mb	

*) see parameters

DEKRA Testing and Certification GmbH
Bochum, 2019-07-03

Signed: Jörg-Timm Kilisch

Managing Director

Page 1 of 5 of BVS 15 ATEX E 075 X / N1

This certificate may only be reproduced in its entirety and without any change.



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13 **Appendix**
 14 **EU-Type Examination Certificate**

**BVS 15 ATEX E 075 X
 Supplement 1**

15 **Product description**

15.1 **Subject and type**

Flameproof electric motors type 3KTC 180-225, 3KTCR 180-225, 3KTCP 180-225 and 4KTC 250-315, 4KTCR 250-315, 4KTCP 250-315

Type designation to *1)KT*2)*3) *4)*4)*4) *5)*5) *6)*6) _ *7)*7)

- 1): Motor generation
 - 3: Third generation
 - 4: Fourth generation
- 2): Explosion Group
 - B: Flameproof enclosure for Group IIB
 - C: Flameproof enclosure for Group IIC
- 3): Enclosure variant
 - R: Mining motor with standard housing
 - P: Mining motor with screened housing
- 4): Frame size

180	180 mm
200	200 mm
225	225 mm
250	250 mm
280	280 mm
315	315 mm
- 5): Length of stator assembly
- 6): Quantity of poles
- 7): Swan neck execution

15.2 **Description**

With this supplement the certificate is changed to Directive 2014/34/EU.
 (Annotation: In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.)

Reasons for the supplement:

- Change to the new Directive 2014/34/EU
- Update to the current standards
- Version with extended connecting tube between connection box and motor (swan neck execution)

Description of Product

The enclosures of the flameproof electric motors are made of welded steel and cast iron and have 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 or aluminium (only Group II). The fan is driven by the electrical machine itself.

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.

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.

The maximum permissible ambient temperatures are -50 °C to 60 °C . This temperature range may be limited as a result of the selected terminal boxes and components, or the electrical design.

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

The motor is also available in a version with extended connecting tube between connection box and motor.

15.3 Parameters

15.3.1 Electrical parameters

15.3.1.1 Circuits of the flameproof electric motors

Rated voltage¹			
3KTC 180 – 225		up to	690 V AC
3KTCR(P) 180 – 225; 4KTC 250 – 315; 4KTCR(P) 250 – 315		up to	1100 V AC
Rated rotational speed	500	up to	3600 min ⁻¹
Rated rotational speed (with converter)	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			
Frame size			
180		up to	22 kW
200		up to	37 kW
225		up to	45 kW
250		up to	55 kW
280		up to	90 kW
315		up to	250 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		$1.5 \times I_N$
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

Permitted ambient temperature range			
Motor type	Group II Ex db	Group II Ex db eb	Group I Ex db / Ex db eb
3KTC180 - 225	$-50\text{ °C} \leq T_a \leq +60\text{ °C}$	$-20\text{ °C} \leq T_a \leq +60\text{ °C}$	$-20\text{ °C} \leq T_a \leq +40\text{ °C}$
4KTC250 - 315			
3KTCR180 - 225			
4KTCR250 - 315			
3KTCP180 - 225			
4KTCP250 - 315			

The electrical data, the temperature class, 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 15.2162 EU, as of 2019-07-03

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 and 3 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/mm² 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 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 cause by the converter which increase:

- $3.1 \times U_N$ for rated voltages $\leq 600\text{ V}$
- $2.04 \times U_N$ for rated voltages $> 600\text{ V}$ and $\leq 1100\text{ V}$

The insulating system of the motor may require an additional limitation of a periodic over voltage.





18 **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed under item 9. For this product the standard EN IEC 60079-0:2018 is equivalent to the harmonized standard EN 60079-0:2012 + A11:2013 in terms of safety.

19 **Drawings and Documents**

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2019-07-03
BVS-WIo/Mu A 20180372



Managing Director





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 15.0066X Issue No.: 0 Certificate history:

Status: **Current**

Date of Issue: 2015-09-10 Page 1 of 4

Applicant: **BARTEC VARNOST, d.o.o.**
Cesta 9. avgusta 59
1410 Zagorje ob Savi
Slovenia

Electrical Apparatus: **Flameproof electric motors type 3KTC 180-225, 3KTCR 180-225, 3KTCP 180-225 and 4KTC 250-315, 4KTCR 250-315, 4KTCP 250-315**
Optional accessory:

Type of Protection: **Equipment protection by flameproof enclosures "d", Equipment protection by increased safety "e"**

Marking: Ex db IIC T* Gb or Ex db e IIC T* Gb or
Ex db IIB T* Gb or Ex db e IIB T* Gb or
Ex db I Mb or Ex db e I Mb
*) See Parameters

Approved for issue on behalf of the IECEx
Certification Body:

Dr. F. Eickhoff

Position:

Deputy Head of Certification Body

Signature:
(for printed version)


2015-09-10

Date:

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.

Certificate issued by:

DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany


DEKRA EXAM GmbH



IECEx Certificate of Conformity

Certificate No.: IECEx BVS 15.0066X

Date of Issue: 2015-09-10

Issue No.: 0

Page 2 of 4

Manufacturer: **BARTEC VARNOST, d.o.o.**
Cesta 9. avgusta 59
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 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition: 7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*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/ExTR15.0069/00](#)

Quality Assessment Report:

[SI/SIQ/QAR11.0003/02](#)



IECEx Certificate of Conformity

Certificate No.: IECEx BVS 15.0086X

Date of Issue: 2015-09-10

Issue No.: 0

Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

General product information:

Subject and Type

Flameproof electric motors type 3KTC 180-225, 3KTCR 180-225, 3KTCP 180-225 and 4KTC 250-315, 4KTCR 250-315, 4KTCP 250-315

Type designation to *1)K*2)3) *4)*4)*4) *5)*5) *6)*6)

1) Motor generation

- 3: Third generation
- 4: Fourth generation

2) Explosion group

- B: Flameproof enclosure for group IIB
- C: Flameproof enclosure for group IIC

3) Enclosure variant

- R: Mining motor with standard housing
- P: Mining motor with screened housing

4) Frame size

- 180 180 mm
- 200 200 mm
- 225 225 mm
- 250 250 mm
- 280 280 mm
- 315 315 mm

5) Length of stator assembly

6) Quantity of poles

CONDITIONS OF CERTIFICATION: YES as shown below:

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 and 3 of EN 60079-1:2014. For information of the dimensions of the flameproof joints contact the manufacturer.

2. Fasteners with a minimum yield stress of 640 N/mm^2 must be used for the closing of the flameproof enclosure.

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

4. 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 cause by the converter which increase:

- $3.1 \times UN$ for rated voltages $\leq 600 \text{ V}$
- $2.04 \times UN$ for rated voltages $> 600 \text{ V}$ and $\leq 1100 \text{ V}$

The insulating system of the motor may require an additional limitation of a periodic over voltage.



IECEx Certificate of Conformity

Certificate No.: IECEx BVS 15.0066X

Date of Issue: 2015-09-10

Issue No.: 0

Page 4 of 4

EQUIPMENT(continued):

Description

The enclosures of the flameproof electric motors are made of welded steel and cast iron and have 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 or aluminium (only group II). The fan is driven by the electrical machine itself.

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. 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.

The maximum permissible ambient temperatures are -20 °C to 60 °C. This temperature range may be limited as a result of the selected terminal boxes and components, or the electrical design.

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

Parameters

See Annex

Annex: BVS_15_0066X_BartecVamost_Annex.pdf



EC-Type Examination Certificate

- (1)
- (2) **Equipment or Protective Systems Intended for Use
in Potentially Explosive Atmospheres
(Directive 94/9/EC)**

(3) EC-Type Examination Certificate Number:

FTZÚ 13 ATEX 0111X

- (4) Equipment: **Asynchronous electromotor type 5KTCR 355...**
- (5) Manufacturer: **BARTEC VARNOST d.o.o**
- (6) Address: **Cesta 9. Augusta 59; 1410 Zagorje ob Savi; Slovenia**

(7) This equipment or protective system and any of acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physical Technical Testing Institute, notified body number 1026 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system 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 confidential Report N°:

13/0111 dated 24.03.2014


(9) Compliance with Essential Health and Safety Requirements has been assured by compliance with:


EN 60079-0:2012; EN 60079-1:2007; EN 60079-7:2007

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and testing of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

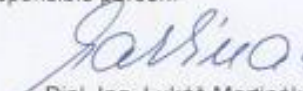
(12) The marking of the equipment or protective system shall include the following:

 **I M2 Ex de I Mb** or **Ex d I Mb**

 **II 2G Ex de IIA T4 Gb** or **Ex d IIA T4 Gb**

This EC-Type Examination Certificate is valid till: **24.03.2019**

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 24.03.2014

Page: 1/3

This certificate is granted subject to the general conditions of the FTZÚ, s.p.
This certificate may only be reproduced in its entirety and without any change, schedule included.

FTZÚ, s.p., Píkarská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic,
tel +420 595 223 111, fax +420 596 232 672, ftzu@ftzu.cz, www.ftzu.cz



**Physical Technical Testing Institute
Ostrava – Radvanice**

(13)

Schedule

(14) **EC-Type Examination Certificate N° FTZÚ 13 ATEX 0111X**

(15) Description of Equipment:


Three-phase squirrel-cage asynchronous electromotor type 5KTCR 355... and terminal box are protected by flameproof enclosure. Terminal box can be alternatively protected by increased safety. Terminal box is equipped with threaded entry for installation of Ex-cable glands. Enclosure is made out of cast iron; fan and fan-cover are made out of steal plate. In the terminal box are installed bushings type TOS16.400A.1600V, certificate PTB 04 ATEX 1099U for power circuits and line bushings type 07-9101-****, certificate PTB 97 ATEX 1047U for control circuits. In "e" terminal box are installed terminals type 07-9702-0220/1, certificate PTB 99 ATEX 3117U for connection of control circuits. Thermal protection of electromotor is ensured by PTC temperature sensors circuits. Nominal cut-off temperature of the PTC is +155 °C.

Entries into connection compartment enclosure of motor are designed for use of separately certified Ex-equipment cable glands.

Technical parameters:

TYPE 5KTCR 355	SA-4	SB-4	S(L)-4	M-4
Max. rated power	200 kW	250 kW	315 kW	400 kW
Rated supply voltage	1100 V ±5%			
Max. rated current	122 A	152 A	192 A	242 A
Rated frequency	50 Hz			
Duty type	S1 to S9			
Frequency range in inverter	5 Hz to 87 Hz			
Ambient temperature	-20 °C ≤ Ta ≤ +40 °C			

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 24.03.2014

Page: 2/3

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FTZÚ, s.p., Píkářská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic,
tel +420 595 223 111, fax +420 596 232 672, ftzu@ftzu.cz, www.ftzu.cz



Physical Technical Testing Institute
Ostrava – Radvanice

(13)

Schedule

(14) **EC-Type Examination Certificate N° FTZÚ 13 ATEX 0111X**

(16) Report No.: 13/0111

(17) Special conditions for safe use:

Verified values of the maximum gaps and minimum constructional length of flameproof joints of this enclosure are different from relevant minimum and maximum values mentioned in standard. To obtain information about joints dimension it is necessary to contact the manufacturer.

(18) Essential Health and Safety Requirements:

They are included in standards, which are mentioned in clause (9) of this certificate. The product was approved in accordance with above mentioned standards.

(19) List of Documentation:

<i>Document No.</i>	<i>Date:</i>
023972; 4pages	28.03.2013
023971; 8 pages	28.03.2013
023856; 13 pages; revision D	16.09.2013
018338	20.01.1999
024167; 9 pages; revision A	27.08.2013
024020	29.04.2013
023399; 6 pages	29.04.2013
020366; revision A	04.02.2008

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 24.03.2014

Page: 3/3

This certificate is granted subject to the general conditions of the FTZÚ, s.p.
This certificate may only be reproduced in its entirety and without any change, schedule included.

FTZÚ, s.p., Píkarská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic,
tel +420 595 223 111, fax +420 596 232 672, ftzu@ftzu.cz, www.ftzu.cz



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.: Issue No.: Certificate history:

Status:

Date of Issue: Page 1 of 3

Applicant: **BARTEC VARNOST d.o.o**
Cesta 9, Augusta 59
1410 Zagorje ob Savi
Slovenia

Electrical Apparatus: **Asynchronous electromotor 5KTCR 355...**
Optional accessory:

Type of Protection: **Flameproof enclosure, Increased safety**

Marking: **Ex de I Mb or Ex d I Mb**
Ex de IIA T4 Gb or Ex d IIA T4 Gb

Approved for issue on behalf of the IECEx
Certification Body:

Dipl. Ing. Lukáš Martinák

Position:

Head of the Certification Body

Signature:
(for printed version)

Date:

2014-03-25



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:





IECEx Certificate of Conformity

Certificate No.: IECEx FTZU 14.0006X

Date of Issue: 2014-03-25

Issue No.: 0

Page 2 of 3

Manufacturer: **BARTEC VARNOST d.o.o**
Cesta 9. Avgusta 59
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
Edition: 6.0 | Explosive atmospheres - Part 0: General requirements |
| IEC 60079-1 : 2007-04
Edition: 6 | Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d" |
| IEC 60079-7 : 2006-07
Edition: 4 | Explosive atmospheres - Part 7: Equipment protection by increased safety "e" |

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:
[CZ/FTZU/ExTR14.0006/00](#)

Quality Assessment Report:

[SI/SIQ/QAR11.0003/01](#)





IECEx Certificate of Conformity

Certificate No.: IECEx FTZU 14.0006X

Date of Issue: 2014-03-25

Issue No.: 0

Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Three-phase squirrel-cage asynchronous electromotor type 5KTCR 355... and terminal box are protected by flameproof enclosure. Terminal box can be alternatively protected by increased safety. Terminal box is equipped with threaded entry for installation of Ex-cable glands. Enclosure is made out of cast iron; fan and fan-cover are made out of steel plate. In the terminal box are installed bushings type TOS16.400A.1600V, certificate IECEx SIQ 13.0001U for power circuits and line bushings type 07-9101-****, certificate IECEx PTB 06.0093U for control circuits.

In "e" terminal box are installed terminals type 07-9702-0220/1, certificate IECEx PTB 07.0007U

for connection of control circuits. Thermal protection of electromotor is ensured by PTC temperature sensors circuits.

Nominal cut-off temperature of the PTC is +155 °C.

Entries into connection compartment enclosure of motor are designed for use of separately certified Ex-equipment cable glands.

Technical parameters:

TYPE 5KTCR 355	SA-4	SB-4	S(L)-4	M-4
Max. rated power	200 kW	250 kW	315 kW	400 kW
Rated supply voltage	1100 V ±5%			
Max. rated current	122 A	152 A	192 A	242 A
Rated frequency	50 Hz			
Duty type	S1 to S9			
Frequency range in inverter	5 Hz to 87 Hz			
Ambient temperature	-20 °C ≤ Ta ≤ +40 °C			

CONDITIONS OF CERTIFICATION: YES as shown below:



Verified values of the maximum gaps and minimum constructional length of flameproof joints of this enclosure are different from relevant minimum and maximum values mentioned in standard. To obtain information about joints dimension it is necessary to contact the manufacturer.





EU-Konformitätserklärung EU Declaration of conformity

Hersteller: **BARTEC VARNOST d.o.o.**
Manufacturer
Adresse: **Cesta 9. Avgusta 59**
Address: **1410 Zagorje ob Savi**
Slovenia
Produktbezeichnung: **Druckfeste elektrische Motoren**
Product: **Flameproof electric motors**

Kennzeichnung / Marking	Motor typ Motor type	EG-Baumusterprüfbescheinigung EC-Type Examination Certificate	Year of CE-marking
 II 2 G Ex db IIC T4-T6Gb or II 2 G Ex db eb IIC T4-T6Gb II 2 G Ex db IIB T4-T6Gb or II 2 G Ex db eb IIB T4-T6Gb	3KTC 180-225 4KTCB 180-225 4KTC 250-315 4KTCB 250-315	BVS 15 ATEX E 075 X	2015
 I M2 Ex db I Mb or I M2 Ex db eb I Mb	3KTCR 180-225 3KTCP 180-225 4KTCR 250-315 4KTCP 250-315		

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

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein/
The products are in conformity with provisions of the following Council Directives:

Directive 2014/34/EU und/ and **2011/65/EU**

In Bezug auf Produktkategorien sind die Motoren in Übereinstimmung mit den Bestimmungen der folgenden harmonisierten Normen/
In respect of product categories the motors are in conformity with provisions of the following harmonized standards:

EN 60079-0:2018 EN 60079-1:2014 EN 60079-7:2015

Das bezeichnete Produkt ist zum Einbau in eine andere Maschine bestimmt. Die Inbetriebnahme ist solange untersagt, bis die Konformität des Endproduktes mit der Richtlinie 2006/42/EG festgestellt ist.

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: Bei der Installation von Motoren für Umrichterbetrieb, zusätzliche Anforderungen müssen in Bezug auf den Motor sowie die Installation eingehalten werden. Motoren, die mit einer direkten Temperaturüberwachung ausgerüstet sein müssen, müssen über eine gesondert bescheinigte Auslöseeinheit überwacht werden. Vor der Inbetriebnahme ist sicherzustellen, dass bei Umrichterspeisung und den Klemmen des Motors keine unzulässig hohen Überspannungen auftreten.
When installing motors for converter supply applications additional requirements must be respected regarding the motor as well as the installation. Motors, which have to be equipped with a direct temperature control must be monitored by a separate certified trigger unit. 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

Die Reparatur der zünddurchschlagsicheren Spalte mit den Werten in den Tabellen 1 und 2 der EN 60079-1 ist nicht erlaubt. Informationen zu den Abmessungen sind beim Hersteller zu erfragen.

The repair of the flameproof joints with the values in tables 1 and 2 of EN 60079-1 is not allowed. For information of the dimensions of the flameproof joints contact the manufacturer.

Diese Erklärung liegt in der alleinigen Verantwortung des Herstellers.
This Declaration is issued under the sole responsibility of the manufacturer.

Signed by 
Title **Janez Gajski**
Technical Manager
Date **8.7.2019**

BARTEC Varnost d.o.o.
Cesta 9. avgusta 59
SI 1410 Zagorje ob savi

Tel.: +386 59 221 411
Fax: +386 59 221 400
Internet: www.bartec-varnost.si

VS-02 02 153D



EU-Konformitätserklärung EU Declaration of conformity

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

Adresse: **Cesta 9. Avgusta 59**
Address: **1410 Zagorje ob Savi**
Slovenia

Produktbezeichnung: **Druckfeste elektrische Motoren**
Flameproof electric motors

Kennzeichnung / Marking	Motor typ Motor type	EG-Baumusterprüfbescheinigung EC-Type Examination Certificate	Year of CE-marking
 II 2 G Ex de IIA T4Gb or II 2 G Ex d IIA T4Gb	5KTCR 355	FTZU 13 ATEX 0111X	2014
 I M2 Ex de I Mb or I M2 Ex d I Mb	5KTCR 280		

Notified Body (ExNB): 1026, FTZU, s.p., Pikartska 1337/7, 716 07 Ostrava-Radvanice, Czech Republic

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien überein/
The products are in conformity with provisions of the following Council Directives:

Directive 2014/34/EU und/ and 2011/65/EU

In Bezug auf Produktkategorien sind die Motoren in Übereinstimmung mit den Bestimmungen der folgenden harmonisierten Normen/
In respect of product categories the motors are in conformity with provisions of the following harmonized standards:


EN 60079-0:2012 EN 60079-1:2007 EN 60079-7:2007

Das bezeichnete Produkt ist zum Einbau in eine andere Maschine bestimmt. Die Inbetriebnahme ist solange untersagt, bis die Konformität des Endproduktes mit der Richtlinie 2006/42/EG festgestellt ist.
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.

The repair of the flameproof joints with the values in tables 1 and 2 of EN 60079-1 is not allowed. For information of the dimensions of the flameproof joints contact the manufacturer.

Note: Bei der Installation von Motoren für Umrichterbetrieb, zusätzliche Anforderungen müssen in Bezug auf den Motor sowie die Installation eingehalten werden.
When installing motors for converter supply applications additional requirements must be respected regarding the motor as well as the installation.

Die Reparatur der zünddurchschlagsicheren Spalte mit den Werten in den Tabellen 1 und 2 der EN 60079-1 ist nicht erlaubt. Informationen zu den Abmessungen sind beim Hersteller zu erfragen.
The repair of the flameproof joints with the values in tables 1 and 2 of EN 60079-1 is not allowed. For information of the dimensions of the flameproof joints contact the manufacturer.

Signed by: 
Title: **Janez Gajski**
Technical Manager
Date: **April 2016**

BARTEC Varnost d.o.o.
Cesta 9. avgusta 59
SI 1410 Zagorje ob savi

Tel.: +386 59 221 411
Fax: +386 59 221 400
Internet: www.bartec-varnost.si

VS-02 02 156

BARTEC VARNOST d.o.o.

Cesta 9. Avgusta 59
1410 Zagorje ob Savi, SLOVENIJA

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Telefax: +386 59 221 400
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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. Nekateri 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. Upravljalca 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 izdelava 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 v skladu z zahtevami lokalne skupnosti.

ODLAGALIŠČNI ODPADKI

S celotnim 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.

BARTEC VARNOST

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