KOLMER ELECTRIC MOTORS

IE4
Super Premium Efficiency

3-PHASE INDUCTION MOTORS
SERIES 4SIE

KOLMER ELECTRIC MOTORS

3-PHASE INDUCTION MOTORS

SERIES 4SIE

TD 225
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Changes and misprints reserved

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1. General information

1.1. Cantoni product range

Cantoni offers a full range of induction electric motors, from 0,04 kW up to 6000 kW, in standard and special executions. Cantoni motors operate in almost all industrial segments like: pumps, fans, compressors, conveyors, mining, power plants and many other fields. The Cantoni product range consists of standard motors according to IEC standard in efficiency classes IE1, IE2, IE3, IE4 and motors according to NEMA standard e.g. NEMA Premium motors. Apart from standard motors, it is possible to offer motors for special applications in marine, oil, gas, energy, construction and many other industries. All main components of the motors are produced in Europe (Poland) in order to guarantee the highest quality level. Particular importance is attached to the raw materials used for production, they are delivered only by qualified suppliers exclusively from the European Union.

The designs and solutions correspond to the customer requirements and international norms. All motors are manufactured according to Quality Management System consistent with ISO 9001 and Environmental Management System consistent with ISO 14001. Cantoni motors are provided with CE mark and fulfil the EU Directives regarding the safety measures. The motors comply with almost all international standards: German standards DIN VDE, British standards BS, Italian standards CEI and on request Canadian standards CSA, American standards UL, NEMA or EU standard ATEX.

1.2. Standards

The electric motors are manufactured according to the international standards:

Description	Standard
Rating and performance	IEC 60034-1
Methods for determining losses and efficiency	IEC 60034-2-1
Classification of degrees of protection	IEC 60034-5
Methods of cooling	IEC 60034-6
Symbols of construction and mounting arrangements	IEC 60034-7
Terminal markings and direction of rotation	IEC 60034-8
Noise limits	IEC 60034-9
Dimensions and output of electric machines	IEC 60072-1
Vibration limits	IEC 60034-14

1.3. Standard operating conditions

Cantoni motors can operate under the following conditions:

- Motor of series 4SIE are efficiency class IE4
- Motors are insulated with Class F (105K) materials and Class B temperature rise
- Motors are equipped with PTC 140°C. Other temperature values are available on request
- The standard degree of enclosure protection is IP55. Shafts are fitted with oil seal as standard
- The cooling method is IC411: TEFC (Totally Enclosed Fan Cooled)
- The standard voltage of the motors is 230/400V or 400/690V at a frequency of 50 Hz
- Motors are suitable for operating mode S1 (continuous operation)
- Motors are suitable to operate at an ambient temperature of -20°C / +40°C
- Motors are balanced Class A (½ key)
- Special executions are available on request (for example brake motors, marine execution, etc)

For other operating conditions, please contact Kolmer to check whether this condition is suitable or not.

1.4. Tolerances of motor parameters

Permissible deviations between real values and catalogue values according to IEC 60034-1:

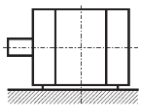
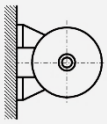
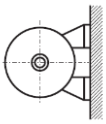
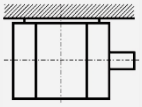
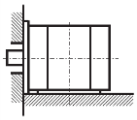
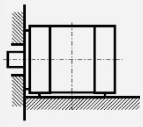
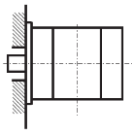
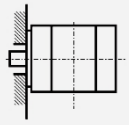
Description	Permissible deviations
Power factor cos φ	$\Delta\cos\varphi = -\frac{1}{6}\cdot(1-\cos\varphi_N)$
Efficiency η	$\Delta\eta = -15\%\cdot(100-\eta_N)$ for $P_N \le 150$ kW $\Delta\eta = -10\%\cdot(100-\eta_N)$ for $P_N > 150$ kW
Speed n	$\Delta n = \pm 20\%\cdot(n_s - n_N)$ for $P_N > 1$ kW $\Delta n = \pm 30\%\cdot(n_s - n_N)$ for $P_N \le 1$ kW
Locked rotor current I_L/I_N	$\Delta\frac{I_r}{I_N} = +20\%\cdot\frac{I_L}{I_N}$
Locked rotor torque T_L/T_N	$\mathrm{Min}\frac{T_L}{T_N} = -15\%\cdot\frac{T_L}{T_N}$ $\mathrm{Max}\frac{T_L}{T_N} = +25\%\cdot\frac{T_L}{T_N}$
Breakdown torque T_B/T_N	$\Delta\frac{T_B}{T_N} = -10\%\cdot\frac{T_B}{T_N}$
Moment of inertia J [kg·m^2]	$\Delta J = \pm 10\%\cdot J$
Sound pressure level L_{PA} [dB]	$\Delta L_{PA} = +3$ dB /A/

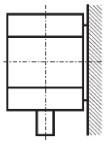
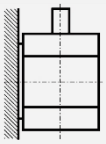
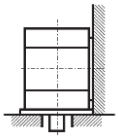
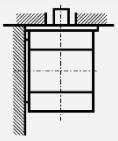
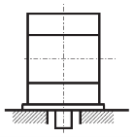
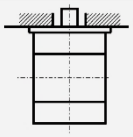
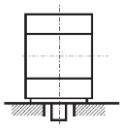
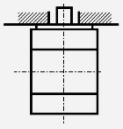
Standard motors comply with Voltage value and frequency variations within zone A according IEC 60034-1. Other tolerances of supply Voltage and their frequency are available on request.

Description	Permissible deviations
Voltage value U	ΔU = ±5%
Frequency f	Δf = ±2%

1.5. Mounting arrangements

The most commonly used mounting arrangements are shown in the table below. Other mounting arrangements are available on request. According to the safety standard for electrical machines, foreign objects must be prevented from falling into the fan cover. On request, a protective hood (rain cover) can be mounted over the fan cover.

Horizontal shaft			
	IEC EN 60034-7 code II	IEC EN 60034-7 code I	Frame size
	IM 1001	IM B3	56 - 315
	IM 1051	IM B6	56 - 280
	IM 1061	IM B7	56 - 280
	IM 1071	IM B8	56 - 280
	IM 2001	IM B35	56 - 315
	IM 2101	IM B34	56 - 160
	IM 3001	IM B5	56 - 315
	IM 3601	IM B14	56 - 160

Vertical shaft			
	IEC EN 60034-7 code II	IEC EN 60034-7 code I	Frame size
	IM 1011	IM V5	56 - 315
	IM 1031	IM V6	56 - 315
	IM 2011 IM 2111	IM V15 IM V17	56 - 315 56 - 160
	IM 2031 IM 2131	IM V36 IM V37	56 - 315 56 - 160
	IM 3011	IM V1	56 - 315
	IM 3031	IM V3	56 - 280
	IM 3611	IM V18	56 - 160
	IM 3631	IM V19	56 - 160

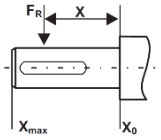
1.6. Terminal box equipment

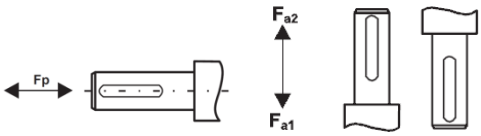
Frame size	Number of terminals	Terminal size	Terminal box position	Cable glands	Cable gland direction	Temperature sensors
56	6	M4	Top	M20 (1x)	To right	PTC 140°C
63	6	M4	Top	M20 (1x)	To right	PTC 140°C
71	6	M4	Top	M20 (1x)	To right	PTC 140°C
80	6	M4	Top	M20 (1x)	To right	PTC 140°C
90	6	M5	Top	M25 (1x), M20 (1x)	To right	PTC 140°C
100	6	M5	Top	M25 (1x), M20 (1x)	To right	PTC 140°C
112	6	M5	Top	M25 (1x), M20 (1x)	To right	PTC 140°C
132	6	M6	Top	M25 (2x)	To right	PTC 140°C
160	6	M6	Top	M40 (2x)	To right	PTC 140°C
180	6	M6	Top	M40 (2x)	To right	PTC 140°C
200	6	M8	Top	M50 (2x), M16 (1x)	To right	PTC 140°C
225	6	M8	Top	M50 (2x), M16 (1x)	To right	PTC 140°C
250	6	M10	Top	M63 (2x), M16 (1x)	To right	PTC 140°C
280	6	M10	Top	M63 (2x), M16 (1x)	To right	PTC 140°C
315S,M	6	M12	Top	M63 (2x), M16 (1x)	To right	PTC 140°C

1.7. Bearings

Frame size	Number of poles	Bearing DE	Bearing NDE
56	2 - 6	6201 2Z C3	
63	2 - 6	6202 2Z C3	
71	2 - 6	6203 2Z C3	
80	2 - 6	6204 2Z C3	
90	2 - 6	6205 2Z C3	
100	2 - 6	6206 2Z C3	
112	2 - 6	6306 2Z C3	
132	2 - 6	6308 2Z C3	
160	2 - 6	6309 2Z C3	
180	2 - 6	6311 2Z C3	
200	2 - 6	6312 C3	
225	2 - 6	6313 C3	
250	2 - 6	6315 C3	
280	2	6315 C3	
280	4 - 6	6318 C3	
315S,MA,MB	2	6315 C3	
315S,MA,MB	4 - 6	6318 C3	

1.8. Permissible loads on the shaft end

Radial load: 

Axial load: 

Frame size	Number of poles	Horizontal operation		Vertical operation		
		$F_{R\ (X=0)}$	$F_{R\ (X=max)}$	F_P	Fa_1	Fa_2
56	2	0,20	0,16	0,04	0,03	0,05
63	2	0,20	0,16	0,04	0,04	0,06
	4	0,25	0,20	0,06	0,05	0,07
71	2	0,29	0,24	0,07	0,05	0,09
	4	0,36	0,30	0,09	0,07	0,11
80	2	0,33	0,27	0,09	0,06	0,12
	4	0,44	0,37	0,12	0,09	0,15
90	2	0,79	0,66	0,64	0,44	0,84
	4	1,00	0,83	0,80	0,65	1,05
100	2	1,11	0,89	0,90	0,61	1,17
112	2	1,56	1,22	1,23	0,84	1,60
	6	2,20	1,80	1,69	1,26	2,20
132	2	2,11	1,65	1,82	0,98	2,37
160	2	2,43	1,88	1,97	1,00	2,56
	6	3,54	2,81	2,83	1,80	3,68
180	2	2,61	2,13	2,20	1,00	2,87
200LA	2	2,91	2,44	2,24	1,72	2,92
200LB	2	2,85	2,39	2,23	1,67	2,93
200L	4	3,61	3,03	2,81	2,12	3,70
200LA	6	4,31	3,62	3,62	2,92	4,56
200LB	6	4,06	3,40	3,54	2,71	4,65
225S	4	4,18	3,40	3,19	2,42	4,16

Frame size	Number of poles	Horizontal operation		Vertical operation		
		$F_{R\ (X=0)}$	$F_{R\ (X=max)}$	F_P	Fa_1	Fa_2
225M	2	3,31	2,81	2,53	1,93	3,29
	4	3,97	3,23	3,13	2,26	4,24
	6	4,57	3,72	3,98	2,95	5,33
250	2	4,09	3,39	3,11	2,33	4,13
	4	4,90	4,06	3,85	2,68	5,36
	6	5,92	4,90	4,99	3,81	6,55
280S	2	3,94	3,34	3,07	2,01	4,43
	4	6,69	5,67	5,01	3,65	6,77
	6	7,86	6,67	5,79	4,32	7,70
280M	2	3,80	3,22	3,03	1,89	4,49
	4	6,15	5,22	4,86	3,16	7,04
	6	7,69	6,52	5,75	4,19	7,75
315S	2	3,56	3,08	2,96	1,63	4,69
	4	5,75	4,82	4,74	2,71	7,37
	6	7,21	6,04	5,61	3,84	8,14
315MA	2	3,07	2,65	2,82	1,23	4,89
	4	5,40	4,52	4,64	2,41	7,53
	6	6,75	5,66	5,48	3,22	8,40
315MB	2	2,67	2,31	2,71	0,91	5,05
	4	5,16	4,33	4,58	2,20	7,64
	6	6,27	5,33	5,34	2,68	8,78

2. 4SIE series

2.1. Technical data

2-Pole motors (3000 rpm)

Type	Rated output	Rated speed	Rated torque	Efficiency			Power Factor	Full load current			Locked rotor current	Locked rotor torque	Breakdown torque	Moment of inertia	Sound pressure level	Netto weight B3
	P_N	n_N	T_N	η_N [%]			$\cos\varphi_N$	I_N [A]			I_L/I_N	T_L/T_N	T_B/T_N	J	L_{PA}	m
	[kW]	[min^{-1}]	[N·m]	50% load	75% load	100% load	[-]	230V	400V	690V	[-]	[-]	[-]	[$kg·m^2$]	[dB]	[kg]
4SIE 56-2B	0,12															
4SIE 63-2A	0,18	2880	0,6			70,8	0,68	0,96	0,55		3,9	3,4	3,6			4,1
4SIE 63-2B	0,25	2830	0,86			74,3	0,75	1,13	0,65		3,3	2,4	2,5			5,0
4SIE 71-2A	0,37	2920	1,2			78,1	0,72	1,65	0,95		8,0	4,5	5,0			7,8
4SIE 71-2B	0,55	2870	1,85			81,5	0,78	2,17	1,25		7,3	3,8	4,0			10,6
4SIE 80-2A	0,75	2940	2,45			83,5	0,70	3,1	1,8		11,0	6,4	6,4			11,9
4SIE 80-2B	1,1	2900	3,6			85,2	0,81	4,0	2,3		7,6	3,9	4,0			13,0
4SIE 90S2	1,5	2920	4,9	83,8	86,1	86,5	0,86	5,1	2,9	1,7	8,8	2,9	4,4	0,0019	63	18,5
4SIE 90L2	2,2	2930	7,2	84,9	87,6	88,0	0,85	7,4	4,2	2,5	9,6	2,9	4,5	0,0020	63	20,5
4SIE 100L2	3,0	2925	9,8	88,0	89,2	89,1	0,88	9,6	5,5	3,2	9,7	2,6	3,8	0,0039	62	30
4SIE 112M2	4,0	2940	13,1	86,5	89,3	90,0	0,87	12,8	7,4	4,3	9,3	2,5	3,8	0,0075	61	40
4SIE 132S2A	5,5	2945	17,8	88,8	90,5	90,9	0,90	16,9	9,7	5,6	9,5	3,0	4,2	0,017	68	64
4SIE 132S2B	7,5	2940	24,4	89,7	91,4	91,7	0,90	22,8	13,1	7,6	9,2	2,8	3,9	0,020	68	73
4SIE 160M2A	11,0	2955	35,5	90,5	92,2	92,6	0,90	33,1	19,1	11,0	9,0	2,6	3,8	0,059	70	132
4SIE 160M2B	15,0	2950	48,6	91,8	93,1	93,3	0,89	45,3	26,1	15,1	9,3	2,7	4,0	0,072	69	140
4SIE 160L2	18,5	2955	60,0	92,0	93,4	93,7	0,90	55,1	31,7	18,4	9,8	2,9	4,1	0,089	69	148
4SIE 180M2	22,0	2965	70,9	92,3	93,6	94,0	0,89	66,0	38,0	22,0	9,7	3,1	4,3	0,104	75	205
4SIE 200L2A	30	2968	97	93,8	94,7	94,5	0,89		52	30	7,2	2,3	2,7	0,21		305
4SIE 200L2B	37	2968	119	94,3	95,0	94,8	0,90		63	37	7,1	2,3	2,6	0,25		325
4SIE 225M2	45	2978	144	93,2	94,5	95,0	0,89		77	45	8,1	2,0	3,3	0,33		425
4SIE 250M2	55	2974	177	94,8	95,4	95,3	0,91		92	53	7,9	2,2	3,1	0,51		540
4SIE 280S2	75	2979	240	94,8	95,5	95,6	0,90		126	73	7,7	2,1	3,0	0,90		720
4SIE 280M2	90	2981	288	95,3	95,9	95,8	0,90		151	88	8,0	2,3	3,0	1,05		785
4SIE 315S2	110	2981	352	95,8	96,2	96,0	0,90		184	107	7,2	2,0	2,4	1,31		990
4SIE 315M2A	132	2982	423	96,2	96,6	96,2	0,91		218	126	8,1	2,5	2,7	1,63		1075
4SIE 315M2B	160	2976	513	95,7	96,2	96,3	0,92		261	151	7,4	2,2	3,0	1,78		1160

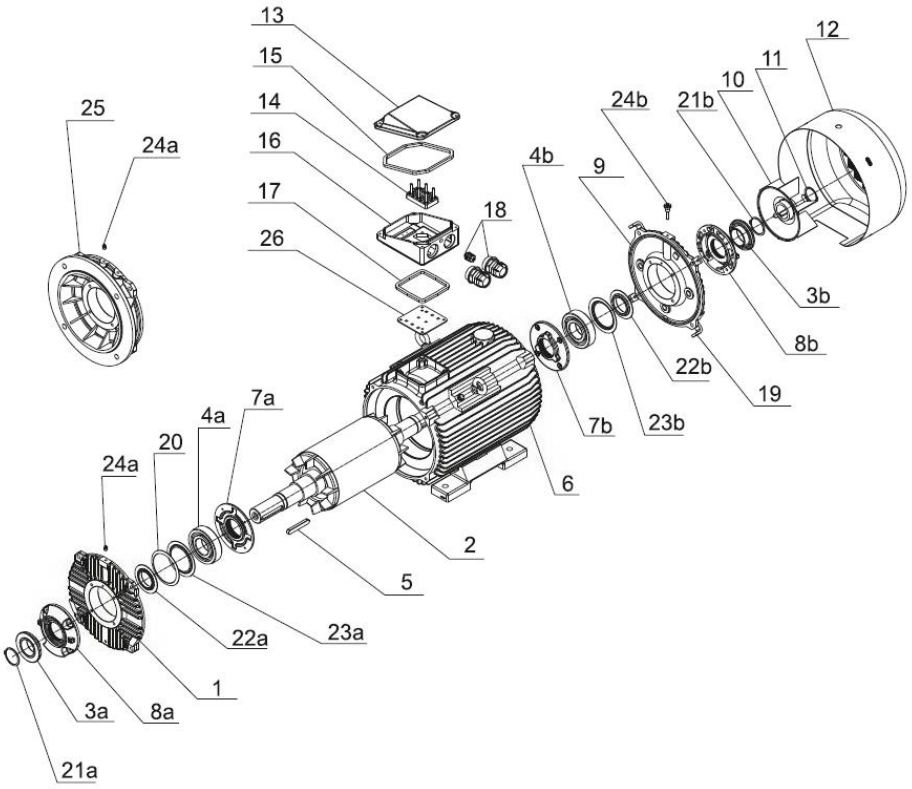
4-Pole motors (1500 rpm)

Type	Rated output	Rated speed	Rated torque	Efficiency			Power Factor	Full load current			Locked rotor current	Locked rotor torque	Breakdown torque	Moment of inertia	Sound pressure level	Netto weight B3
	P_N	n_N	T_N	η_N [%]			$\cos\varphi_N$	I_N [A]			I_L/I_N	T_L/T_N	T_B/T_N	J	L_{PA}	m
	[kW]	[min^{-1}]	[N·m]	50% load	75% load	100% load	[-]	230V	400V	690V	[-]	[-]	[-]	[$kg·m^2$]	[dB]	[kg]
4SIE 63-4A	0,12	1425	0,8			69,8	0,61	0,71	0,41		4,2	2,8	3,2			5,1
4SIE 63-4B	0,18	1430	1,2			74,7	0,53	1,13	0,65		4,6	3,2	3,4			6,0
4SIE 71-4A	0,25	1465	1,65			77,9	0,47	1,7	1,0		7,5	6,5	6,5			7,9
4SIE 71-4B	0,37	1440	2,45			81,1	0,63	1,7	1,0		6,8	4,3	4,2			9,6
4SIE 80-4A	0,55	1440	3,65			83,9	0,67	2,4	1,4		6,9	4,3	4,2			11,5
4SIE 80-4B	0,75	1435	5,0			85,7	0,68	3,3	1,9		7,0	4,5	4,4			12,7
4SIE 90S4	1,1	1460	7,2	83,6	86,5	87,2	0,75	4,2	2,4	1,4	8,2	2,8	3,9	0,004	75	21,0
4SIE 200L4	30	1480	194	94,8	95,2	94,9	0,89		51	30	7,9	2,6	2,7	0,42		345
4SIE 225S4	37	1487	238	94,9	95,6	95,2	0,86		65	38	7,5	2,0	2,9	0,55		385
4SIE 225M4	45	1485	289	95,2	95,8	95,4	0,86		79	46	7,8	2,2	3,1	0,67		430
4SIE 250M4	55	1488	353	95,1	95,8	95,7	0,89		93	54	8,5	2,5	3,3	1,19		570
4SIE 280S4	75	1488	481	95,9	96,2	96,0	0,91		124	72	7,9	2,3	2,5	1,68		770
4SIE 280M4	90	1488	578	96,1	96,4	96,1	0,91		149	86	8,0	2,7	2,7	2,05		780
4SIE 315S4	110	1488	706	96,0	96,4	96,3	0,90		183	106	8,0	3,2	2,7	2,53		1010
4SIE 315M4A	132	1487	848	96,2	96,6	96,4	0,90		220	128	7,6	3,1	2,6	2,74		1130
4SIE 315M4B	160	1489	1026	96,5	96,8	96,6	0,89		269	156	8,5	2,5	2,5	3,32		1220

6-Pole motors (1000 rpm)

Type	Rated output	Rated speed	Rated torque	Efficiency			Power Factor	Full load current			Locked rotor current	Locked rotor torque	Breakdown torque	Moment of inertia	Sound pressure level	Netto weight B3
	P_N	n_N	T_N	η_N [%]			$\cos\varphi_N$	I_N [A]			I_L/I_N	T_L/T_N	T_B/T_N	J	L_{PA}	m
	[kW]	[min^{-1}]	[N·m]	50% load	75% load	100% load	[-]	230V	400V	690V	[-]	[-]	[-]	[$kg·m^2$]	[dB]	[kg]
4SIE 112M6	2,2	970	21,7	83,4	87,0	87,4	0,75	8,4	4,9	2,8	5,7	2,2	3,0	0,0177	53	36
4SIE 160M6	7,5	975	73,5	91,5	91,7	91,3	0,80	25,8	14,8	8,6	7,5	2,5	3,0	0,096	60	125
4SIE 200L6A	18,5	990	178	92,1	93,3	93,4	0,81		35,5	21	7,7	2,7	3,1	0,60		310
4SIE 200L6B	22	990	212	92,3	93,5	93,7	0,80		42	24	7,5	2,4	3,0	0,74		340
4SIE 225M6	30	991	289	93,2	94,2	94,2	0,82		56	32	7,3	2,3	2,7	1,04		425
4SIE 250M6	37	992	356	93,4	94,4	94,5	0,80		71	41	6,8	2,2	2,6	1,60		505
4SIE 280S6	45	991	434	94,6	95,2	94,8	0,85		81	47	7,1	2,1	2,5	1,70		640
4SIE 280M6	55	991	530	94,8	95,4	95,1	0,84		99	57	7,5	2,3	2,6	1,91		700
4SIE 315S6	75	991	723	94,6	95,3	95,4	0,83		137	79	7,1	2,1	2,6	2,41		890
4SIE 315M6A	90	991	867	94,8	95,5	95,6	0,85		160	93	7,1	2,2	2,6	2,98		965
4SIE 315M6B	110	992	1059	95,1	95,8	95,8	0,85		195	113	7,6	2,3	2,7	3,68		1130

2.2. Spare parts



#	Description
1	DE shield
2	Rotor
3	Shaft seal
4	Bearing
5	Key
6	Housing with feet
7	Internal bearing cap
8	External bearing cap
9	NDE shield
10	Fan
11	Seeger ring
12	Fan cover
13	Terminal box cover

#	Description
14	Terminal board
15	Rubber gasket
16	Terminal box housing
17	Rubber gasket
18	Cable glands
19	Fan cover support
20	Spring washer
21	Seeger ring
22	Grease shield
23	Bearing internal ring
24	Grease nipple
25	Flange B5
26	Rubber gasket

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