KOLMER ELECTRIC MOTORS

IE3
Premium Efficiency

3-PHASE INDUCTION MOTORS
SERIES 3SIE - INCREASED OUTPUT

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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 3SIE - increased output are efficiency class IE3
- 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:

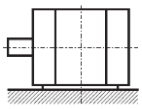
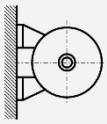
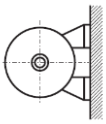
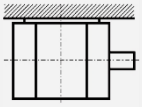
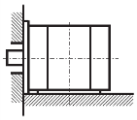
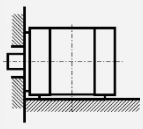
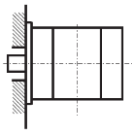
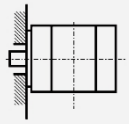
Description	Permissible deviations
Power factor cos φ	$\Delta\cos\varphi = -\frac{1}{6}\cdot(1-\cos\varphi_N)$
Efficiency η	$\Delta\eta = -15\%\cdot(100-\eta_N)$ for $P_N \le 150\ kW$ $\Delta\eta = -10\%\cdot(100-\eta_N)$ for $P_N > 150\ kW$
Speed n	$\Delta n = \pm 20\%\cdot(n_s - n_N)$ for $P_N > 1\ kW$ $\Delta n = \pm 30\%\cdot(n_s - n_N)$ 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]	$\Delta L_{PA} = +3\ dB\ /A/$

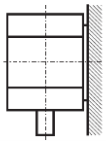
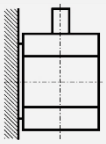
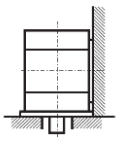
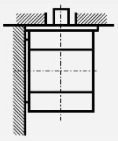
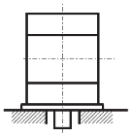
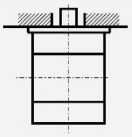
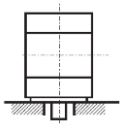
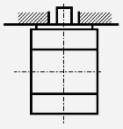
Standard motors comply with Voltage value and frequency variations within zone A according IEC 60034-1. Other tolerances of supply Voltage and their frequency are available on request.

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

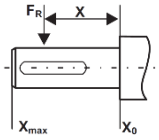
1.6. Terminal box equipment

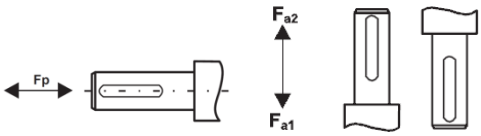
Frame size	Number of terminals	Terminal size	Terminal box position	Cable glands	Cable gland direction	Temperature sensors
71	6	M4	Top	M20 (1x)	To right	PTC 140°C
80	6	M4	Top	M20 (1x)	To right	PTC 140°C
90	6	M5	Top	M25 (1x), M20 (1x)	To right	PTC 140°C
100	6	M5	Top	M25 (1x), M20 (1x)	To right	PTC 140°C
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
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
315L	6	M16	Top	M63 (2x), M16 (1x)	To right	PTC 140°C

1.7. Bearings

Frame size	Number of poles	Bearing DE	Bearing NDE
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	
200	2 - 6	6312 C3	
225	2 - 6	6313 C3	
250	2 - 6	6315 C3	
280	2	6315 C3	
280	4 - 6	6318 C3	
315	4 - 6	6322 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
71	2	0,29	0,24	0,07	0,05	0,09
	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
	6	1,15	0,95	0,90	0,77	1,17
100	2	1,11	0,89	0,90	0,61	1,17
	4	1,39	1,12	1,12	0,90	1,46
	6	1,60	1,29	1,26	1,08	1,64
112	2	1,56	1,22	1,23	0,84	1,60
	4	1,92	1,58	1,50	1,19	1,96
	6	2,20	1,80	1,69	1,26	2,20
132	2	2,11	1,65	1,82	0,98	2,37
	4	2,67	2,08	2,31	1,36	3,00
	6	3,06	2,39	2,51	1,40	3,26

Frame size	Number of poles	Horizontal operation		Vertical operation		
		$F_{R\,(X=0)}$	$F_{R\,(X=max)}$	F_P	Fa_1	Fa_2
160	2	2,43	1,88	1,97	1,00	2,56
	4	3,06	2,38	2,54	1,43	3,31
200LC,LD	2	2,85	2,39	2,23	1,67	2,93
200L	4	3,61	3,03	2,81	2,12	3,70
225M	2	3,30	2,80	2,50	1,90	3,30
	4	4,10	3,30	3,20	2,30	4,20
	6	4,70	3,80	4,00	3,00	5,30
250	2	4,10	3,40	3,10	2,30	4,10
	4	5,20	4,30	3,90	2,90	5,20
	6	5,60	4,60	5,00	3,60	6,70
280M	2	3,80	3,20	3,00	1,90	4,50
	4	6,50	5,50	4,90	3,40	6,90
	6	7,40	6,30	5,70	3,90	7,90
315L	On request					

2. 3SIE series - increased output

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]
3SIE 71x-2C	0,75	2880	2,50	76,7	79,9	80,7	0,70	2,2	1,9		6,0	3,6	3,7	0,00070		8,1
3SIE 80x-2C	1,5	2880	5,00	82,0	84,0	84,2	0,82	5,45	3,15		6,1	3,3	3,0	0,00210		15,2
3SIE 90L2A	3	2920	9,81	86,7	87,7	87,1	0,85	10,2	5,8	3,4	9,0	2,6	3,9	0,0019	63	20,5
3SIE 100L2A	4	2920	13,1	88,1	88,8	88,1	0,85	13,4	7,7	4,5	9,0	3,2	4,1	0,0039	62	30
3SIE 112M2A	5,5	2925	17,9	88,9	89,8	89,2	0,87	17,8	10,2	5,9	7,4	2,0	3,2	0,0075	61	39,5
3SIE 112M2B	7,5	2930	24,4	90,9	91,1	90,1	0,87	24,0	13,8	8,0	8,4	2,5	3,5	0,0075	61	49
3SIE 132M2	9,2	2935	29,9	90,5	91,2	90,7	0,88	28,9	16,6	9,6	9,7	3,2	3,8	0,020	68	73
3SIE 132M2A	11	2925	35,9	92,1	91,9	91,2	0,89	34,1	19,6	11,4	8,1	2,6	3,8	0,021	68	76
3SIE 160L2A	22	2950	71,2	91,9	92,8	92,7	0,89	66,9	38,5	22,3	9,7	3,2	3,8	0,072	69	148
3SIE 200L2C	45	2962	145	94,5	94,6	94,0	0,90		77	44,6	7,3	2,6	2,5	0,21	78	301
3SIE 200L2D	55	2950	178	95,2	95,2	94,3	0,90		94	54	6,4	2,3	2,6	0,24	78	322
3SIE 225M2C	55	2970	177	94,8	95,0	94,5	0,89		94	54	7,1	2,1	3,1	0,33	80	425
3SIE 250M2C	75	2969	241	94,3	94,8	94,7	0,88		130	75	7,2	2,3	3,2	0,42	77	498
3SIE 280M2C	110	2978	353	95,4	95,6	95,2	0,92		181	105	6,9	1,9	2,9	0,98	82	748
3SIE 280M2D	132	2977	423	95,8	95,9	95,6	0,92		217	126	7,3	2,0	2,7	1,28	82	864

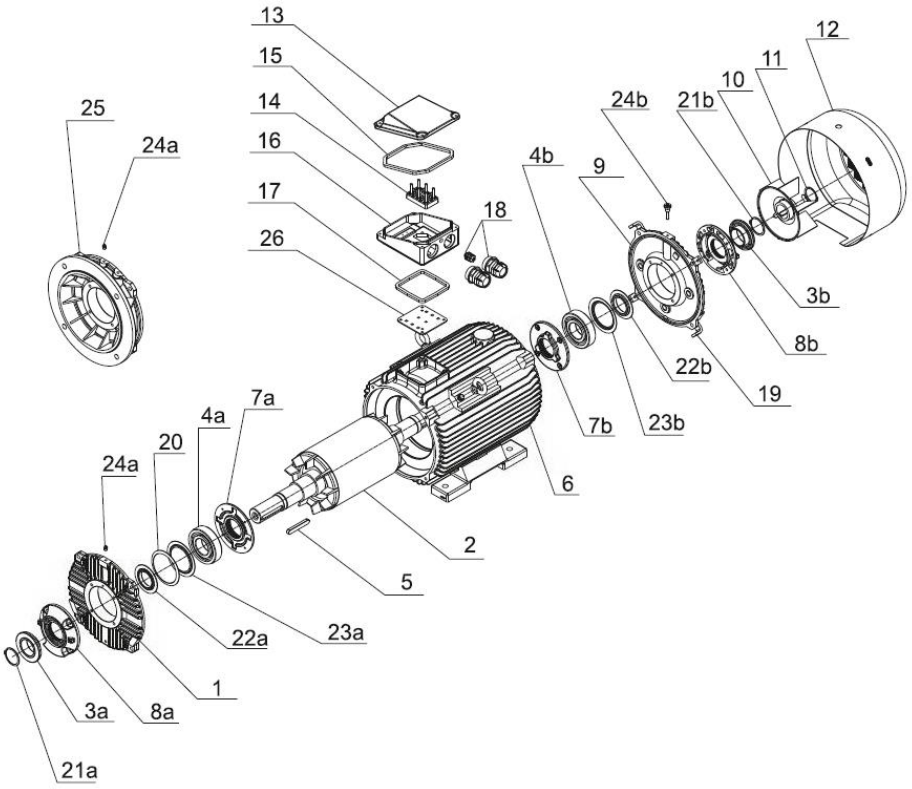
4-Pole motors (1500 rpm)

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]
3SIE 80x-4C	1,1	1410	7,45	82,5	83,3	84,1	0,69	4,75	2,75		5,6	3,7	3,2	0,00312		13,3
3SIE 90L4A	2,2	1455	14,4	84,8	86,7	86,7	0,77	8,3	4,8	2,8	8,1	2,9	3,9	0,004	54	25
3SIE 100L4C	4	1465	26,1	85,6	87,7	88,6	0,79		8,2	4,8	8,3	3,0	4,1	0,0086	55	34
3SIE 112M4A	5,5	1460	36,0	89,4	90,2	89,6	0,80		11,1	6,4	7,2	2,5	3,3	0,0115	58	54
3SIE 132M4A	9,2	1460	60,2	91,0	91,5	91,0	0,83		17,6	10,2	9,0	3,1	4,1	0,050	60	93
3SIE 132M4B	11	1460	72,0	91,7	92,1	91,4	0,83		20,9	12,1	9,5	3,2	4,4	0,057	60	97
3SIE 160L4A	18,5	1475	119,8	91,8	92,7	92,6	0,81		35,6	20,6	8,5	3,0	3,5	0,118	61	150
3SIE 200L4C	37	1475	240	93,2	93,5	93,9	0,86		66	38,3	6,7	2,3	2,7	0,38	70	330
3SIE 200L4D	45	1481	290	93,5	94,1	94,2	0,85		81	47,0	7,3	2,6	3,3	0,49	70	367
3SIE 225M4C	55	1484	354	93,6	94,6	94,6	0,86		98	57	7,1	2,1	2,9	0,66	63	431
3SIE 250M4C	75	1483	483	94,5	94,9	95,0	0,90		127	74	6,8	2,3	3,0	1,15	75	553
3SIE 280M4C	110	1488	706	95,1	95,5	95,4	0,90		185	107	6,6	2,0	2,4	2,25	77	839
3SIE 315L4	250	1485	1608			96,0	0.88		427	248	6,8	2,8	3,1			

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]
3SIE 80x-6C	0,75	940	7,6	73,0	77,0	78,9	0,57	4,15	2,4		3,8	2,7	2,7	0,003451		12,7
3SIE 90L6A	1,5	940	15,2	81,2	81,7	82,5	0,70	6,5	3,7		4,7	2,5	3,0	0,0090	50	21
3SIE 100L6A	2,2	960	21,9	84,2	84,7	84,3	0,73	9,0	5,2	3,0	6,5	2,9	3,6	0,0100	52	26
3SIE 112M6A	3	960	29,7	86,0	86,7	85,6	0,75	11,7	6,7	3,9	5,5	1,5	2,3	0,0177	53	36
3SIE 132M6C	7,5	965	74,2	88,4	89,5	89,1	0,76		16,0	9,3	7,7	3,1	3,8	0,0637	61	73
3SIE 225M6C	37	991	357	91,8	92,8	93,3	0,77		74	42,9	8,6	2,4	2,6	1,09	64	432
3SIE 250M6C	45	992	433	93,2	93,8	93,7	0,82		85	49,3	6,9	2,0	2,6	1,55	66	489
3SIE 280M6C	75	992	722	94,6	95,0	94,7	0,82		139	81	7,1	2,4	2,6	2,40	67	785
3SIE 315L6																

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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