

SCHEDULES

SCHEDULE 16

Regulation 34

Ecodesign requirements for electric motors and variable speed drives

Energy efficiency requirements for motors

1.—(1) From 1 July 2021, three-phase motors must meet the following requirements.

(2) In this Schedule “IE” means energy efficiency for motors, expressed in International Energy efficiency classes in accordance with the following provisions.

(3) The energy efficiency of three-phase motors—

- (a) with a rated output equal to or above 0.75 kW and equal to or below 1,000 kW;
- (b) with 2, 4, 6 or 8 poles; and
- (c) which are not Ex eb increased safety motors,

must correspond to at least the IE3 efficiency level set out in Table 22 or Table 25, as applicable.

(4) The energy efficiency of three-phase motors—

- (a) with a rated output equal to or above 0.12 kW and below 0.75 kW;
- (b) with 2, 4, 6 or 8 poles; and
- (c) which are not Ex eb increased safety motors,

must correspond to at least the IE2 efficiency level set out in Table 21 or Table 24, as applicable.

2.—(1) From 1 July 2023, motors must meet the following requirements.

(2) The energy efficiency of

(a) Ex eb increased safety motors—

- (i) with a rated output equal to or above 0.12 kW and equal to or below 1,000 kW; and
- (ii) with 2, 4, 6 or 8 poles; and

(b) single-phase motors with a rated output equal to or above 0.12 kW,

must correspond to at least the IE2 efficiency level set out in Table 21 or Table 24, as appropriate.

(3) The energy efficiency of three-phase motors—

(a) which are not—

- (i) brake motors;
- (ii) Ex eb increased safety motors; or
- (iii) other explosion-protected motors;

(b) with a rated output equal to or above 75 kW and equal to or below 200 kW; and

(c) with 2, 4, or 6 poles,

must correspond to at least the IE4 efficiency level set out in Table 23 or Table 26, as appropriate.

3.—(1) IE is set out in Tables 21 to 26, for different values of the motor rated output power P_N at 50 Hz or 60 Hz.

(2) IE classes are determined at rated output power (P_N), rated voltage (U_N), and based on 25 °C ambient reference temperature.

(3) For 50/60 Hz motors, the requirements in Tables 21 to 26 must be met at both 50Hz and 60 Hz at the rated output power specified for 50 Hz.

(4) For 50Hz motors the requirements in Tables 21 to 23 must be met at 50 Hz at the rated output power specified for 50 Hz.

(5) For 60Hz motors the requirements in Tables 24 to 26 must be met at 60 Hz at the rated output power specified for 60 Hz.

(6) Losses must be determined in accordance with Schedule 17.

Table 21

Minimum efficiencies (η_n) for IE2 efficiency level at 50 Hz (per cent)

Rated output power $P_N[kW]$	2 poles	4 poles	6 poles	8 poles
0.12	53.6	59.1	50.6	39.8
0.18	60.4	64.7	56.6	45.9
0.20	61.9	65.9	58.2	47.4
0.25	64.8	68.5	61.6	50.6
0.37	69.5	72.7	67.6	56.1
0.40	70.4	73.5	68.8	57.2
0.55	74.1	77.1	73.1	61.7
0.75	77.4	79.6	75.9	66.2
1.1	79.6	81.4	78.1	70.8
1.5	81.3	82.8	79.8	74.1
2.2	83.2	84.3	81.8	77.6
3	84.6	85.5	83.3	80.0
4	85.8	86.6	84.6	81.9
5.5	87.0	87.7	86.0	83.8
7.5	88.1	88.7	87.2	85.3
11	89.4	89.8	88.7	86.9
15	90.3	90.6	89.7	88.0
18.5	90.9	91.2	90.4	88.6
22	91.3	91.6	90.9	89.1
30	92.0	92.3	91.7	89.8
37	92.5	92.7	92.2	90.3
45	92.9	93.1	92.7	90.7
55	93.2	93.5	93.1	91.0

<i>Rated output power $P_N[kW]$</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
75	93.8	94.0	93.7	91.6
90	94.1	94.2	94.0	91.9
110	94.3	94.5	94.3	92.3
132	94.6	94.7	94.6	92.6
160	94.8	94.9	94.8	93.0
200 up to 1,000	95.0	95.1	95.0	93.5

Table 22

Minimum efficiencies (η_n) for IE3 efficiency level at 50 Hz (per cent)

<i>Rated output power $P_N[kW]$</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
0.12	60.8	64.8	57.7	50.7
0.18	65.9	69.9	63.9	58.7
0.20	67.2	71.1	65.4	60.6
0.25	69.7	73.5	68.6	64.1
0.37	73.8	77.3	73.5	69.3
0.40	74.6	78.0	74.4	70.1
0.55	77.8	80.8	77.2	73.0
0.75	80.7	82.5	78.9	75.0
1.1	82.7	84.1	81.0	77.7
1.5	84.2	85.3	82.5	79.7
2.2	85.9	86.7	84.3	81.9
3	87.1	87.7	85.6	83.5
4	88.1	88.6	86.8	84.8
5.5	89.2	89.6	88.0	86.2
7.5	90.1	90.4	89.1	87.3
11	91.2	91.4	90.3	88.6
15	91.9	92.1	91.2	89.6
18.5	92.4	92.6	91.7	90.1
22	92.7	93.0	92.2	90.6
30	93.3	93.6	92.9	91.3
37	93.7	93.9	93.3	91.8
45	94.0	94.2	93.7	92.2

<i>Rated output power $P_N[kW]$</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
55	94.3	94.6	94.1	92.5
75	94.7	95.0	94.6	93.1
90	95.0	95.2	94.9	93.4
110	95.2	95.4	95.1	93.7
132	95.4	95.6	95.4	94.0
160	95.6	95.8	95.6	94.3
200 up to 1,000	95.8	96.0	95.8	94.6

Table 23

Minimum efficiencies (η_n) for IE4 efficiency level 50 Hz (per cent)

<i>Rated output power $P_N[kW]$</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
0.12	66.5	69.8	64.9	62.3
0.18	70.8	74.7	70.1	67.2
0.20	71.9	75.8	71.4	68.4
0.25	74.3	77.9	74.1	70.8
0.37	74.3	77.9	74.1	70.8
0.40	78.9	81.7	78.7	74.9
0.55	81.5	83.9	80.9	77.0
0.75	83.5	85.7	82.7	78.4
1.1	85.2	87.2	84.5	80.8
1.5	86.5	88.2	85.9	82.6
2.2	88.0	89.5	87.4	84.5
3	89.1	90.4	88.6	85.9
4	90.0	91.1	89.5	87.1
5.5	90.9	91.9	90.5	88.3
7.5	91.7	92.6	91.3	89.3
11	92.6	93.3	92.3	90.4
15	93.3	93.9	92.9	91.2
18.5	93.7	94.2	93.4	91.7
22	94.0	94.5	93.7	92.1
30	94.5	94.9	94.2	92.7
37	94.8	95.2	94.5	93.1

<i>Rated output power P_N[kW]</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
45	95.0	95.4	94.8	93.4
55	95.3	95.7	95.1	93.7
75	95.6	96.0	95.4	94.2
90	95.8	96.1	95.6	94.4
110	96.0	96.3	95.8	94.7
132	96.2	96.4	96.0	94.9
160	96.3	96.6	96.2	95.1
200 up to 249	96.5	96.7	96.3	95.4
250 up to 314	96.5	96.7	96.5	95.4
315 up to 1,000	96.5	96.7	96.6	95.4

Table 24

Minimum efficiencies (η_n) for IE2 efficiency level at 60 Hz (per cent)

<i>Rated output power P_N [kW]</i>	<i>Number of poles</i>			
	<i>2</i>	<i>4</i>	<i>6</i>	<i>8</i>
2	4	6	8	
0.12	59.5	64.0	50.5	40.0
0.18	64.0	68.0	55.0	46.0
0.25	68.0	70.0	59.5	52.0
0.37	72.0	72.0	64.0	58.0
0.55	74.0	75.5	68.0	62.0
0.75	75.5	78.0	73.0	66.0
1.1	82.5	84.0	85.5	75.5
1.5	84.0	84.0	86.5	82.5
2.2	85.5	87.5	87.5	84.0
3.7	87.5	87.5	87.5	85.5
5.5	88.5	89.5	89.5	85.5
7.5	89.5	89.5	89.5	88.5
11	90.2	91.0	90.2	88.5
15	90.2	91.0	90.2	89.5
18.5	91.0	92.4	91.7	89.5
22	91.0	92.4	91.7	91.0
30	91.7	93.0	93.0	91.0

Rated output power P_N [kW]	Number of poles			
	2	4	6	8
37	92.4	93.0	93.0	91.7
45	93.0	93.6	93.6	91.7
55	93.0	94.1	93.6	93.0
75	93.6	94.5	94.1	93.0
90	94.5	94.5	94.1	93.6
110	94.5	95.0	95.0	93.6
150	95.0	95.0	95.0	93.6
185	95.4	95.4	95.0	93.6
220	95.4	95.4	95.0	93.6
250	95.4	95.4	95.0	93.6
300	95.4	95.4	95.0	93.6
335	95.4	95.4	95.0	93.6
375 up to 1000	95.4	95.8	95.0	94.1

Table 25

Minimum efficiencies (η_n) for IE3 efficiency level at 60 Hz (per cent)

Rated output power P_N [kW]	Number of poles			
	2	4	6	8
0.12	62.0	66.0	64.0	59.5
0.18	65.6	69.5	67.5	64.0
0.25	69.5	73.4	71.4	68.0
0.37	73.4	78.2	75.3	72.0
0.55	76.8	81.1	81.7	74.0
0.75	77.0	83.5	82.5	75.5
1.1	84.0	86.5	87.5	78.5
1.5	85.5	86.5	88.5	84.0
2.2	86.5	89.5	89.5	85.5
3.7	88.5	89.5	89.5	86.5
5.5	89.5	91.7	91.0	86.5
7.5	90.2	91.7	91.0	89.5
11	91.0	92.4	91.7	89.5
15	91.0	93.0	91.7	90.2

Rated output power PN [kW]	Number of poles			
	2	4	6	8
2	4	6	8	
18.5	91.7	93.6	93.0	90.2
22	91.7	93.6	93.0	91.7
30	92.4	94.1	94.1	91.7
37	93.0	94.5	94.1	92.4
45	93.6	95.0	94.5	92.4
55	93.6	95.4	94.5	93.6
75	94.1	95.4	95.0	93.6
90	95.0	95.4	95.0	94.1
110	95.0	95.8	95.8	94.1
150	95.4	96.2	95.8	94.5
185	95.8	96.2	95.8	95.0
220	95.8	96.2	95.8	95.0
250	95.8	96.2	95.8	95.0
300	95.8	96.2	95.8	95.0
335	95.8	96.2	95.8	95.0
375 up to 1000	95.8	96.2	95.8	95.0

Table 26

Minimum efficiencies (η_n) for IE4 efficiency level at 60 Hz (per cent)

Rated output power PN [kW]	Number of poles			
	2	4	6	8
2	4	6	8	
0.12	66.0	70.0	68.0	64.0
0.18	70.0	74.0	72.0	68.0
0.25	74.0	77.0	75.5	72.0
0.37	77.0	81.5	78.5	75.5
0.55	80.0	84.0	82.5	77.0
0.75	82.5	85.5	84.0	78.5
1.1	85.5	87.5	88.5	81.5
1.5	86.5	88.5	89.5	85.5
2.2	88.5	91.0	90.2	87.5
3.7	89.5	91.0	90.2	88.5

Rated output power P_N [kW]	Number of poles			
	2	4	6	8
2	4	6	8	
5.5	90.2	92.4	91.7	88.5
7.5	91.7	92.4	92.4	91.0
11	92.4	93.6	93.0	91.0
15	92.4	94.1	93.0	91.7
18.5	93.0	94.5	94.1	91.7
22	93.0	94.5	94.1	93.0
30	93.6	95.0	95.0	93.0
37	94.1	95.4	95.0	93.6
45	94.5	95.4	95.4	93.6
55	94.5	95.8	95.4	94.5
75	95.0	96.2	95.8	94.5
90	95.4	96.2	95.8	95.0
110	95.4	96.2	96.2	95.0
150	95.8	96.5	96.2	95.4
185	96.2	96.5	96.2	95.4
220	96.2	96.8	96.5	95.4
250	96.2	96.8	96.5	95.8
300	96.2	96.8	96.5	95.8
335	96.2	96.8	96.5	95.8
375 up to 1000	96.2	96.8	96.5	95.8

4.—(1) To determine the minimum efficiency of 50 Hz motors with rated power outputs (P_N) of between 0.12 and 200 kW not provided in Tables 21 to 26, the following formula must be used—

$$\eta_n = A \times [\log_{10}(P_N/1kW)]^3 + B \times [\log_{10}(P_N/1kW)]^2 + C \times \log_{10}(P_N/1kW) + D$$

(2) For the purposes of paragraph (1), A, B, C and D are interpolation coefficients to be determined according to Tables 27 and 28.

(3) The minimum efficiency of a motor with a rated power output (P) between 0.55 kW and 0.75 kW must be calculated by linear interpolation from the obtained minimum efficiencies of a motor with a rated power output of 0.55 kW and a motor with a rated power output of 0.75 kW.

5. The minimum efficiency of 60 Hz motors at a rated power not provided in Tables 24 to 26 must be determined as follows—

- (a) the efficiency of a rated power at, or above, the midpoint between two consecutive values in the tables is the highest of the two efficiencies;
- (b) the efficiency of a rated power below the midpoint between two consecutive values in the tables is the lowest of the two efficiencies.

Table 27

Interpolation coefficients for motors with rated power output P from 0.12 kW up to 0.55 kW

<i>IE code</i>	<i>Coefficients</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
IE2	A	22.4864	17.2751	-15.9218	6.4855
	B	27.7603	23.978	-30.258	9.4748
	C	37.8091	35.5822	16.6861	36.852
	D	82.458	84.9935	79.1838	70.762
IE3	A	6.8532	7.6356	-17.361	-0.5896
	B	6.2006	4.8236	-44.538	-25.526
	C	25.1317	21.0903	-3,0554	4.2884
	D	84.0392	86.0998	79.1318	75.831
IE4	A	-8.8538	8.432	-13.0355	-4.9735
	B	-20.3352	2.6888	-36.9497	-21.453
	C	8.9002	14.6236	-4.3621	2.6653
	D	85.0641	87.6153	82.0009	79.055

Table 28

Interpolation coefficients for motors with rated power output P from 0.75 kW up to 200 kW

<i>IE code</i>	<i>Coefficients</i>	<i>2 poles</i>	<i>4 poles</i>	<i>6 poles</i>	<i>8 poles</i>
IE2	A	0.2972	0.0278	0.0148	2.1311
	B	-3.3454	-1.9247	-2.4978	-12.029
	C	13.0651	10.4395	13.247	26.719
	D	79.077	80.9761	77.5603	69.735
IE3	A	0.3569	0.0773	0.1252	0.7189
	B	-3.3076	-1.8951	-2.613	-5.1678
	C	11.6108	9.2984	11.9963	15.705
	D	82.2503	83.7025	80.4769	77.074
IE4	A	0.34	0.2412	0.3598	0.6556
	B	-3.0479	-2.3608	-3.2107	-4.7229
	C	10.293	8.446	10.7933	13.977
	D	84.8208	86,8321	84.107	80.247

Product information requirements for motors

6.—(1) The product information on motors set out in sub-paragraphs (3) and (6) must be visibly displayed on—

- (a) the technical data sheet or user manual supplied with the motor, unless an internet link to that information is supplied with the product;
 - (b) the technical documentation for the purposes of conformity assessment pursuant to regulation 35;
 - (c) subject to sub-paragraph (10), websites of the manufacturer of the motor, its authorised representative or the importer, and for this purpose websites must be accessible to the public without charge; and
 - (d) the technical data sheet supplied with products in which the motor is incorporated.
- (2) In the technical documentation, the information in sub-paragraphs (3) and (6)—
- (a) must be provided in the order set out in those paragraphs; and
 - (b) may be displayed using clearly understandable graphs figures or symbols instead of text.
- (3) The information to be displayed is—
- (a) rated efficiency (η_N) at the full, 75 per cent and 50 per cent rated load, and voltage (U_N), determined based on 25 °C ambient reference temperature, rounded to one decimal place;
 - (b) efficiency level IE2, IE3 or IE4, as determined in paragraphs 3 to 5;
 - (c) manufacturer's name or trade mark, commercial registration number and address;
 - (d) the model identifier of the product;
 - (e) the number of poles of the motor;
 - (f) the rated power outputs (P_N) or range of rated power output in kW;
 - (g) the rated input frequency of the motor in Hz;
 - (h) the rated voltage or range of rated voltage in V;
 - (i) the rated speed or range of rated speed in rpm;
 - (j) whether the motor is single-phase or three-phase;
 - (k) information on the range of operating conditions for which the motor is designed, including—
 - (i) altitudes above sea-level;
 - (ii) minimum and maximum ambient air temperatures including for motors with air cooling;
 - (iii) water coolant temperature at the inlet to the product, where applicable;
 - (iv) maximum operating temperature;
 - (v) potentially explosive atmospheres;
 - (l) if the motor is considered exempt from efficiency requirements in accordance with paragraph 10, the specific reason why it is considered exempt.
- (4) The information in sub-paragraph (3) must be displayed—
- (a) from 1 July 2021 in respect of motors to which paragraph 1 applies; and
 - (b) from 1 July 2023 in respect of motors to which paragraph 2 applies.
- (5) From 1 July 2022, the information in sub-paragraph (6) must also be displayed.

(6) The information referred to in sub-paragraph (5) is the power losses expressed in percentage (per cent) of the rated output power at the following different operating points for speed versus torque—

- (a) (25;25);
- (b) (25;100);
- (c) (50;25);
- (d) (50;50);
- (e) (50;100);
- (f) (90;50);
- (g) (90;100)

determined based on 25 °C ambient reference temperature, rounded to one decimal place, and for this purpose losses must be determined in accordance with Schedule 17.

(7) If the motor is not suited for operation at any of the operating points for speed versus torque in sub-paragraph (6), “N/A” or “Not Applicable” must be indicated for such points.

(8) Subject to sub-paragraph (9), the information referred to sub-paragraph (3)(a) and (b) and the year of manufacture must be durably marked on or near the rating plate of the motor.

(9) If the size of the rating plate and surrounding area makes it impossible to mark all the information referred to in sub-paragraph (3)(a) and (b), only—

- (a) the rated efficiency at full rated load and voltage; and
- (b) the information referred to in sub-paragraph (3)(b);

must be marked.

(10) The information in sub-paragraphs (3) and (6) is not required to be published on free access websites for tailor-made motors with a special mechanical and electrical design manufactured on the basis of a specific customer request if this information is included in the commercial offers provided to the customers.

(11) Manufacturers must provide information in the technical data sheet or user manual supplied with the motor on any specific precautions that must be taken when motors are—

- (a) assembled;
- (b) installed;
- (c) maintained; or
- (d) used,

with VSDs.

(12) For motors exempt from the efficiency requirements in accordance with paragraph 10(1) (m), the motor or its packaging, and the technical documentation, must clearly indicate “Motor to be used exclusively as spare part for” and the unique model identification of the product for which it is intended.

(13) For 50 Hz and 60 Hz motors, the information set out above must be provided at the applicable frequency.

(14) For 50/60 Hz motors the information set out above must be provided at 50 Hz, except for the rated efficiency at full load, which must be specified at both 50Hz and 60Hz.

Efficiency requirements for variable speed drives

7.—(1) From 1 July 2021, VSDs must meet the following requirements.

(2) The power losses of VSDs rated for operating with motors with a rated output power equal to or above 0.12 kW and equal to or below 1,000 kW must not exceed the maximum power losses corresponding to the IE2 efficiency level.

(3) Energy efficiency for VSDs, expressed in International Energy efficiency classes (IE), is determined based on the power losses as follows—

- (a) the maximum power losses of the IE2 class are 25 per cent lower than the reference value referred to in Table 29;
- (b) where the apparent output power of a VSD is between two values in Table 29, the higher power loss value and the lower value of the test load displacement factor must be used for the IE class determination; and
- (c) losses are determined in accordance with Schedule 17.

Table 29

Reference VSD losses and test load displacement factor for the IE class determination of VSDs

<i>Apparent output power of VSD (kVA)</i>	<i>Rated power of motor (kW) (indicative)</i>	<i>Reference power losses (kW), at 90 per cent rated motor stator frequency and 100 per cent rated torque-producing current</i>	<i>Test load displacement factor cos phi (+/- 0.08)</i>
0.278	0.12	0.100	0.73
0.381	0.18	0.104	0.73
0.500	0.25	0.109	0.73
0.697	0.37	0.117	0.73
0.977	0.55	0.129	0.73
1.29	0.75	0.142	0.79
1.71	1.1	0.163	0.79
2.29	1.5	0.188	0.79
3.3	2.2	0.237	0.79
4.44	3	0.299	0.79
5.85	4	0.374	0.79
7.94	5.5	0.477	0.85
9.95	7.5	0.581	0.85
14.4	11	0.781	0.85
19.5	15	1.01	0.85
23.9	18.5	1.21	0.85
28.3	22	1.41	0.85
38.2	30	1.86	0.85

<i>Apparent output power of VSD (kVA)</i>	<i>Rated power of motor (kW) (indicative)</i>	<i>Reference power losses (kW), at 90 per cent rated motor stator frequency and 100 per cent rated torque-producing current</i>	<i>Test load displacement factor cos phi (+/- 0.08)</i>
47	37	2.25	0.85
56.9	45	2.70	0.86
68.4	55	3.24	0.86
92.8	75	4.35	0.86
111	90	5.17	0.86
135	110	5.55	0.86
162	132	6.65	0.86
196	160	8.02	0.86
245	200	10.0	0.87
302	250	12.4	0.87
381	315	15.6	0.87
429	355	17.5	0.87
483	400	19.8	0.87
604	500	24.7	0.87
677	560	27.6	0.87
761	630	31.1	0.87
858	710	35.0	0.87
967	800	39.4	0.87
1,088	900	44.3	0.87
1,209	1,000	49.3	0.87

Product information requirements for variable speed drives

8.—(1) From 1 July 2021 the product information set out in sub-paragraph (3) must be visibly displayed on—

- (a) the technical data sheet or user manual supplied with the VSD, unless an internet link to that information is supplied with the product;
- (b) the technical documentation for the purposes of the conformity assessment pursuant to regulation 35;
- (c) subject to paragraph (4), websites of the manufacturer of the VSD, its authorised representative or the importer, and for this purpose websites must be accessible to the public without charge; and
- (d) the technical data sheet supplied with products in which the VSD is incorporated.

(2) In the technical documentation, the information in sub-paragraph (3)—

- (a) must be provided in the order set out in that paragraph; and
 - (b) may be displayed using clearly understandable graphs figures or symbols instead of text.
- (3) The information to be displayed is—
- (a) power losses, determined in accordance with Schedule 17 and rounded to one decimal place, in per cent of the rated apparent output power at the following different operating points for relative motor stator frequency versus relative torque-producing current—
 - (i) (0;25);
 - (ii) (0;50);
 - (iii) (0;100);
 - (iv) (50;25);
 - (v) (50;50);
 - (vi) (50;100);
 - (vii) (90;50);
 - (viii) (90;100);
 - (b) standby losses, rounded to one decimal place, in per cent of the rated apparent output power, generated when the VSD is powered up but is not providing current to the load;
 - (c) efficiency level IE2, as determined in accordance with paragraph 3;
 - (d) the manufacturer's name or trade mark, commercial registration number and address;
 - (e) the model identifier of the product;
 - (f) the apparent output power or range of apparent output power in kVA;
 - (g) the indicative motor rated power outputs (P_N) or range of rated power output in kW;
 - (h) rated output current (A);
 - (i) maximum operating temperature in °C;
 - (j) rated supply frequencies (Hz);
 - (k) rated supply voltage or range of rated supply voltages in V;
 - (l) if the VSD is considered exempt from the efficiency requirements in accordance with paragraph 10, the specific reason why it is considered exempt.
- (4) The information in sub-paragraph (3) is not required to be published on free access websites for tailor-made VSDs with a special electrical design manufactured on the basis of a specific customer request if this information is included in the commercial offers provided to the customers.
- (5) Subject to sub-paragraph (6), the information referred to sub-paragraph (3)(a) and (b) and the year of manufacture must be durably marked on or near the rating plate of the VSD.
- (6) If the size of the rating plate and surrounding area makes it impossible to mark all the information referred to in sub-paragraph (3)(a) and (b), only—
- (a) the power losses in per cent of the rated apparent output power at (90:100), rounded to one decimal place; and
 - (b) the information referred to in sub-paragraph (3)(b);
- must be marked.

Technical documentation requirements

9.—(1) The technical documentation file required for the conformity assessment of the product must comply with the following.

(2) Where the information in the technical documentation for a particular model has been obtained—

- (a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer;
- (b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer; or
- (c) by both paragraphs (a) and (b);

the technical documentation must include the details of any such calculation and the assessment undertaken by the manufacturer to verify the accuracy of the calculation, and, where appropriate, the declaration of identity between the models of different manufacturers.

(3) The technical documentation must include a list of all equivalent models, including the model identifiers.

Exemptions

10.—(1) Paragraphs 1 to 5, 6(3)(a), (b), (e) to (k) and (5) of this Schedule do not apply to—

- (a) motors completely integrated into a product and whose energy performance cannot be tested independently from the product, even with the provision of a temporary end-shield and drive-end bearing, and for this purpose the motor must—
 - (i) share common components (apart from connectors) with the driven unit; and
 - (ii) not be designed in such a way that the motor can be separated in its entirety from the driven unit and operate independently;
- (b) motors with an integrated VSD (compact drives) whose energy performance cannot be tested independently from the VSD;
- (c) motors with an integrated brake which forms an integral part of the inner motor construction and can neither be removed nor powered by a separate power source during the testing of the motor efficiency;
- (d) motors specifically designed and specified to operate exclusively—
 - (i) at altitudes exceeding 4,000 metres above sea-level;
 - (ii) where ambient air temperatures exceed 60 °C;
 - (iii) in maximum operating temperature above 400 °C;
 - (iv) where ambient air temperatures are less than -30 °C; or
 - (v) where the water coolant temperature at the inlet to a product is below 0 °C or above 32 °C;
- (e) motors specifically designed and specified to operate wholly immersed in a liquid;
- (f) motors specifically qualified for the safety of nuclear installations;
- (g) explosion-protected motors specifically intended for use in mining, in accordance with paragraph 1 of Schedule 1A to the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016(1);
- (h) motors in cordless or battery-operated equipment;
- (i) motors in hand-held equipment whose weight is supported by hand during operation;
- (j) motors in hand-guided mobile equipment moved while in operation;
- (k) motors with mechanical commutators;

(1) [S.I. 2016/1107](#); Schedule 1A was inserted by [S.I. 2019/696](#).

- (l) totally enclosed non-ventilated motors;
 - (m) motors placed on the market before 1 July 2029 as substitutes for motors identical to those integrated in products placed on the market before—
 - (i) in the case of motors referred to in paragraph 1, 1 July 2021,
 - (ii) in the case of motors referred to in paragraph 2, 1 July 2023,and specifically marketed as such;
 - (n) multi-speed motors, which are motors with multiple windings or with a switchable winding, providing a different number of poles and speeds;
 - (o) motors designed specifically for the traction of electric vehicles.
- (2) Paragraphs 7, 8(3)(a) to (c) and (f) to (k) of this Schedule do not apply to—
- (a) VSDs integrated into a product and whose energy performance cannot be tested independently from the product, such that an attempt to do so would render the VSD or the product inoperative;
 - (b) VSDs qualified specifically for the safety of nuclear installations;
 - (c) regenerative drives;
 - (d) drives with sinusoidal input current;
 - (e) VSDs consisting of a single cabinet, comprising VSDs which all comply with these Regulations.
- (3) In this paragraph “nuclear installation” has the meaning given in section 26 of the Nuclear Installations Act 1965⁽²⁾.

(2) 1965 c.57.