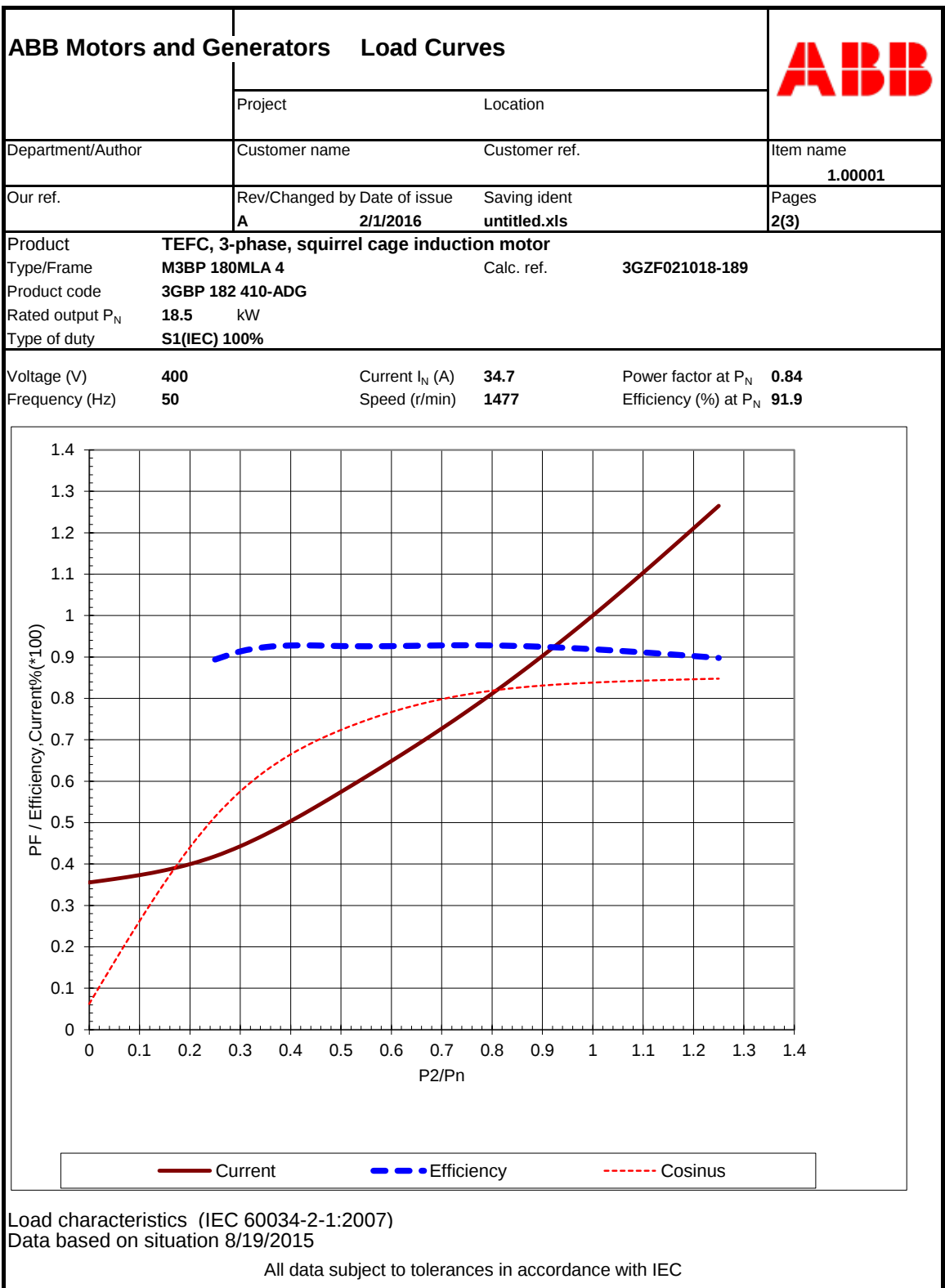


ABB Motors and Generators		Technical Data Sheet - DOL		
Project		Location		
Department/Author	Customer name	Customer ref.		Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 2/1/2016	Saving ident untitled.xls	Pages 1(3)
No.	Definition	Data	Unit	Remarks
1	Product	TEFC, 3-phase, squirrel cage induction motor		
2	Product code	MM18184-PPN (3GBP182410-A) Calc. ref. 3GZF021018-189		
3	Type/Frame	M3BP 180MLA 4		
4	Mounting	IM1001, B3(foot)		
5	Rated output P_N	18.5	kW	
6	Service factor	1		
7	Type of duty	S1(IEC) 100%		
8	Rated voltage U_N	400	VD	$\pm 5\%$ (IEC 60034-1)
9	Rated frequency f_N	50	Hz	$\pm 2\%$ (IEC 60034-1)
10	Rated speed n_N	1477	r/min	
11	Rated current I_N	34.7	A	
12	No-load current	12.3	A	
13	Starting current I_s/I_N	7.2		Fullfilled IEC 60034-12 design N,H
14	Nominal torque T_N	120	Nm	
15	Locked rotor torque T_s/T_N	2.6		
16	Maximum torque T_{max}/T_N	2.9		
17	Minimum torque T_{min}/T_N	1.7		
18	Speed at minimum torque	300	r/min	
Load characteristics (IEC 60034-2-1:2007)		Load %	Current A	Efficiency %
19	PLL determined from residual loss	100	34.7	91.9 / IE2
20		75	26.7	92.8
21		50	19.9	92.6
22		Start	250	0.47
23	Maximum starting time from hot	15	s	
24	Maximum starting time from cold	27	s	
25	Insulation class / Temperature class	F / B		
26	Ambient temperature	40	°C	
27	Altitude	1000	m.a.s.l.	
28	Enclosure	IP55		
29	Cooling system	IC411 self ventilated		
30	Bearing DE/NDE	6310/C3 - 6209/C3		
31	Type of Grease			
32	Sound pressure level (LP dB(A) 1m)	62	dB(A)	at load
33	Moment of inertia $J = \frac{1}{4} GD^2$	0.166	kg-m2	
34	Balancing			
35	Vibration class			
36	Position of terminal box	Top		
37	Terminal box entries; no, dimens.			
38	Number of power terminals			
39	Direction of rotation	CW or CCW		
40	Total weight of motor	205	kg	
41	Dimension drawing no.			
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Ex-motors				
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Option Variant Codes / Definition				
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Remarks:				
Data based on situation 8/19/2015				
All data subject to tolerances in accordance with IEC				
Guaranteed values on request				



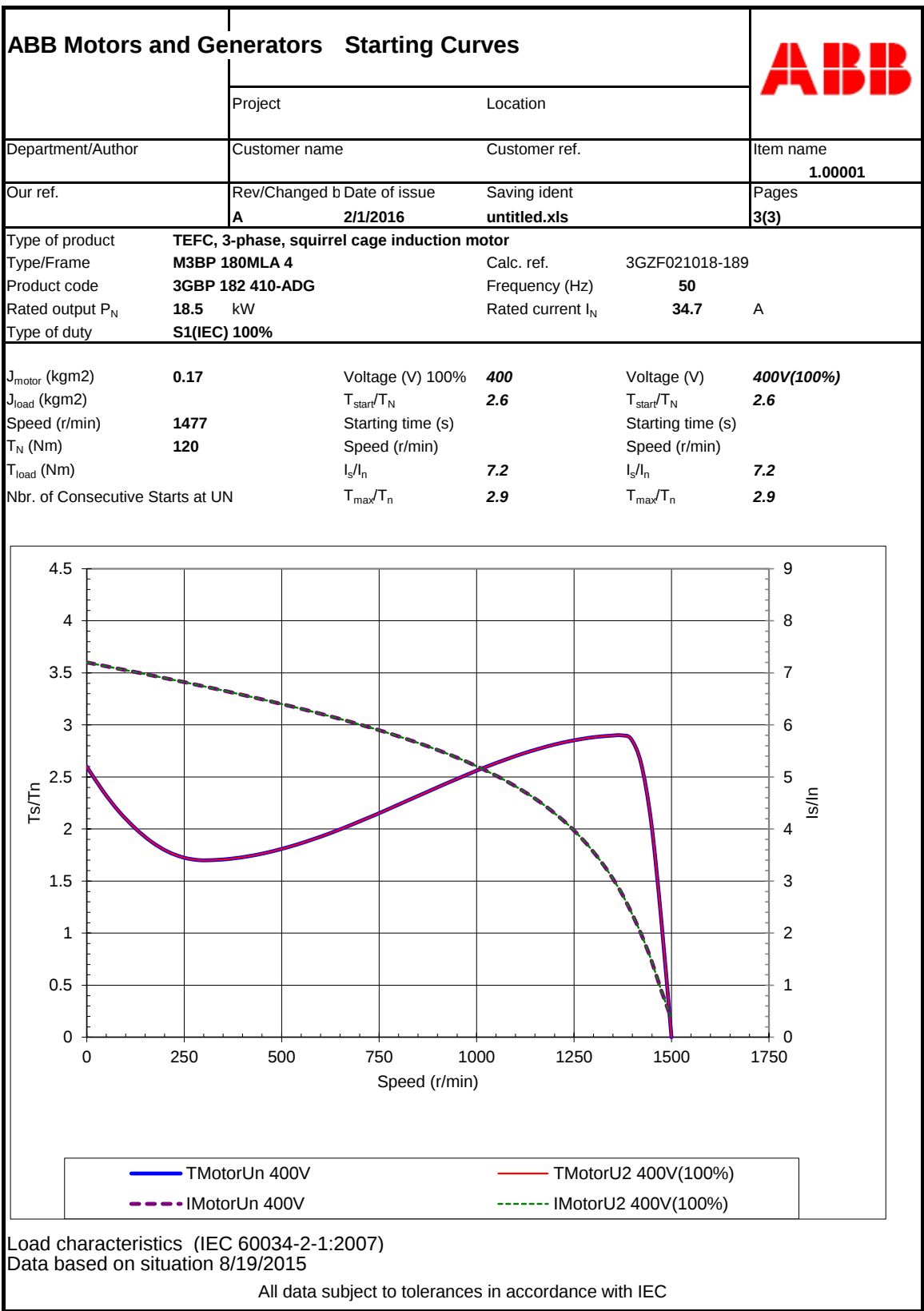
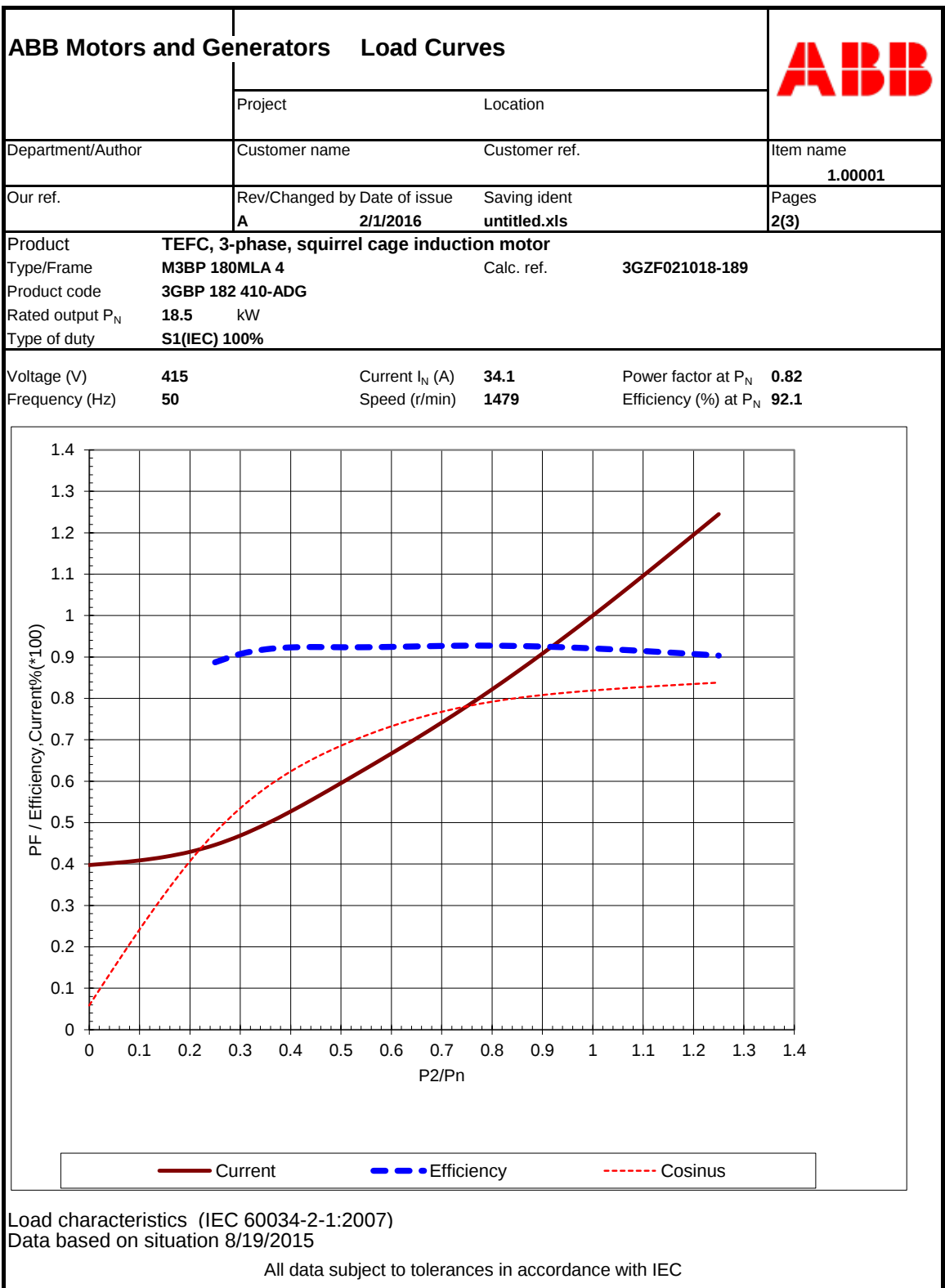


ABB Motors and Generators		Technical Data Sheet - DOL		
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Department/Author	Customer name	Customer ref.		Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 2/1/2016	Saving ident untitled.xls	Pages 1(3)
No.	Definition	Data	Unit	Remarks
1	Product	TEFC, 3-phase, squirrel cage induction motor		
2	Product code	MM18184-PPN (3GBP182410-A) Calc. ref. 3GZF021018-189		
3	Type/Frame	M3BP 180MLA 4		
4	Mounting	IM1001, B3(foot)		
5	Rated output P_N	18.5	kW	
6	Service factor	1		
7	Type of duty	S1(IEC) 100%		
8	Rated voltage U_N	415	VD	$\pm 5\%$ (IEC 60034-1)
9	Rated frequency f_N	50	Hz	$\pm 2\%$ (IEC 60034-1)
10	Rated speed n_N	1479	r/min	
11	Rated current I_N	34.1	A	
12	No-load current	13.6	A	
13	Starting current I_s/I_N	7.7		Fullfilled IEC 60034-12 design N,H
14	Nominal torque T_N	119	Nm	
15	Locked rotor torque T_s/T_N	2.8		
16	Maximum torque T_{max}/T_N	3.1		
17	Minimum torque T_{min}/T_N	1.7		
18	Speed at minimum torque	300	r/min	
Load characteristics (IEC 60034-2-1:2007)		Load %	Current A	Efficiency %
19	PLL determined from residual loss	100	34.1	92.1 / IE2
20		75	26.7	92.7
21		50	20.3	92.3
22		Start	263	0.48
23	Maximum starting time from hot	15	s	
24	Maximum starting time from cold	27	s	
25	Insulation class / Temperature class	F / B		
26	Ambient temperature	40	°C	
27	Altitude	1000	m.a.s.l.	
28	Enclosure	IP55		
29	Cooling system	IC411 self ventilated		
30	Bearing DE/NDE	6310/C3 - 6209/C3		
31	Type of Grease			
32	Sound pressure level (LP dB(A) 1m)	62	dB(A)	at load
33	Moment of inertia $J = \frac{1}{4} GD^2$	0.166	kg-m2	
34	Balancing			
35	Vibration class			
36	Position of terminal box	Top		
37	Terminal box entries; no, dimens.			
38	Number of power terminals			
39	Direction of rotation	CW or CCW		
40	Total weight of motor	205	kg	
41	Dimension drawing no.			
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Ex-motors				
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Option Variant Codes / Definition				
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Remarks:				
Data based on situation 8/19/2015				
All data subject to tolerances in accordance with IEC				
Guaranteed values on request				



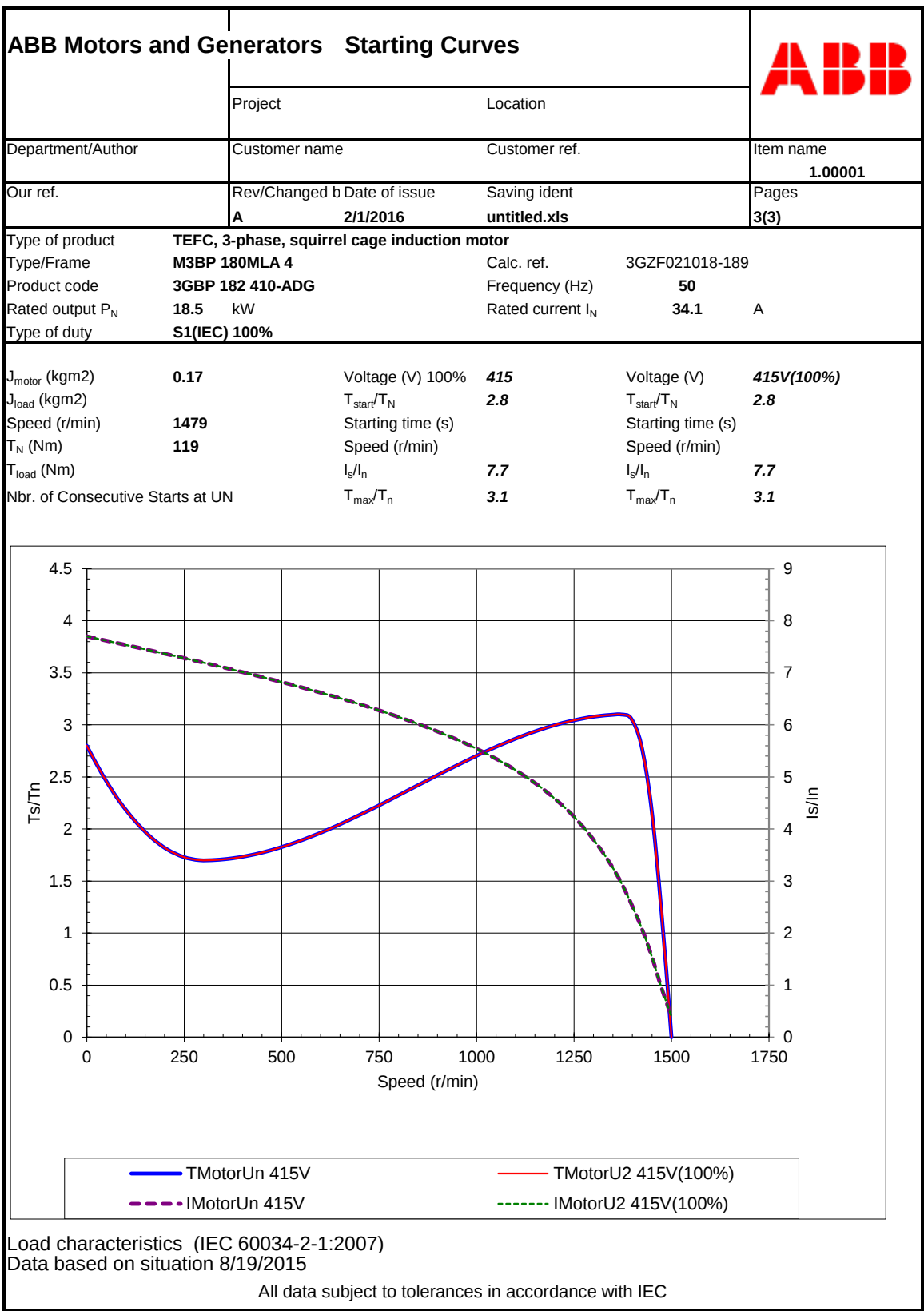
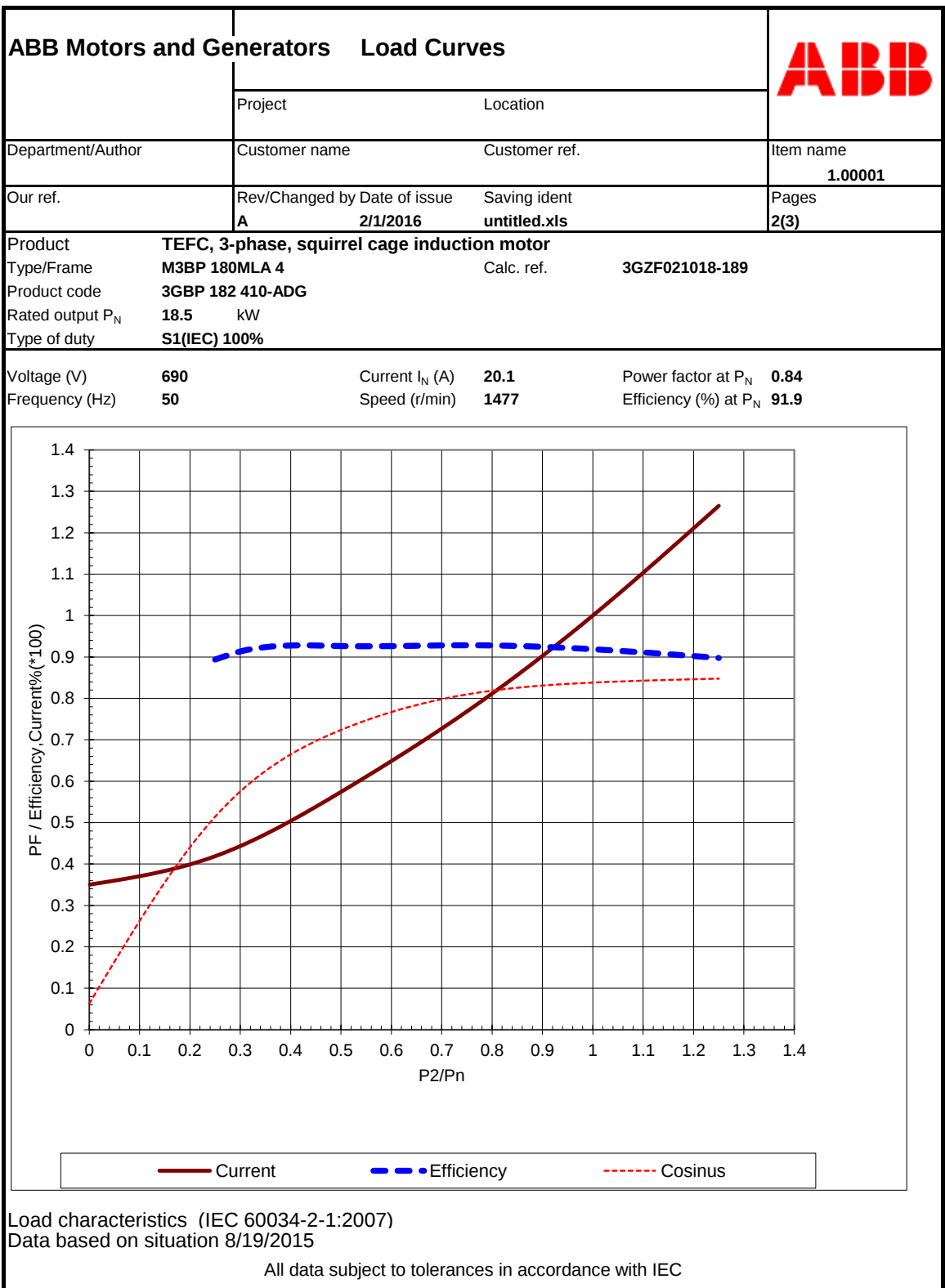


ABB Motors and Generators		Technical Data Sheet - DOL		
Project		Location		
Department/Author	Customer name	Customer ref.		Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 2/1/2016	Saving ident untitled.xls	Pages 1(3)
No.	Definition	Data	Unit	Remarks
1	Product	TEFC, 3-phase, squirrel cage induction motor		
2	Product code	MM18184-PPN (3GBP182410-A) Calc. ref. 3GZF021018-189		
3	Type/Frame	M3BP 180MLA 4		
4	Mounting	IM1001, B3(foot)		
5	Rated output P _N	18.5	kW	
6	Service factor	1		
7	Type of duty	S1(IEC) 100%		
8	Rated voltage U _N	690	VY	± 5 % (IEC 60034-1)
9	Rated frequency f _N	50	Hz	± 2 % (IEC 60034-1)
10	Rated speed n _N	1477	r/min	
11	Rated current I _N	20.1	A	
12	No-load current	7	A	
13	Starting current I _s /I _N	7.2		Fullfilled IEC 60034-12 design N,H
14	Nominal torque T _N	120	Nm	
15	Locked rotor torque T _s /T _N	2.6		
16	Maximum torque T _{max} /T _N	2.9		
17	Minimum torque T _{min} /T _N	1.9		
18	Speed at minimum torque	300	r/min	
Load characteristics (IEC 60034-2-1:2007)		Load %	Current A	Efficiency %
19	PLL determined from residual loss	100	20.1	91.9 / IE2
20		75	15.5	92.8
21		50	11.5	92.6
22		Start	145	0.47
23	Maximum starting time from hot	15	s	
24	Maximum starting time from cold	27	s	
25	Insulation class / Temperature class	F / B		
26	Ambient temperature	40	°C	
27	Altitude	1000	m.a.s.l.	
28	Enclosure	IP55		
29	Cooling system	IC411 self ventilated		
30	Bearing DE/NDE	6310/C3 - 6209/C3		
31	Type of Grease			
32	Sound pressure level (LP dB(A) 1m)	62	dB(A)	at load
33	Moment of inertia J = ¼ GD2	0.166	kg-m2	
34	Balancing			
35	Vibration class			
36	Position of terminal box	Top		
37	Terminal box entries; no, dimens.			
38	Number of power terminals			
39	Direction of rotation	CW or CCW		
40	Total weight of motor	205	kg	
41	Dimension drawing no.			
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Ex-motors				
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Option Variant Codes / Definition				
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Remarks:				
Data based on situation 8/19/2015				
All data subject to tolerances in accordance with IEC				
Guaranteed values on request				



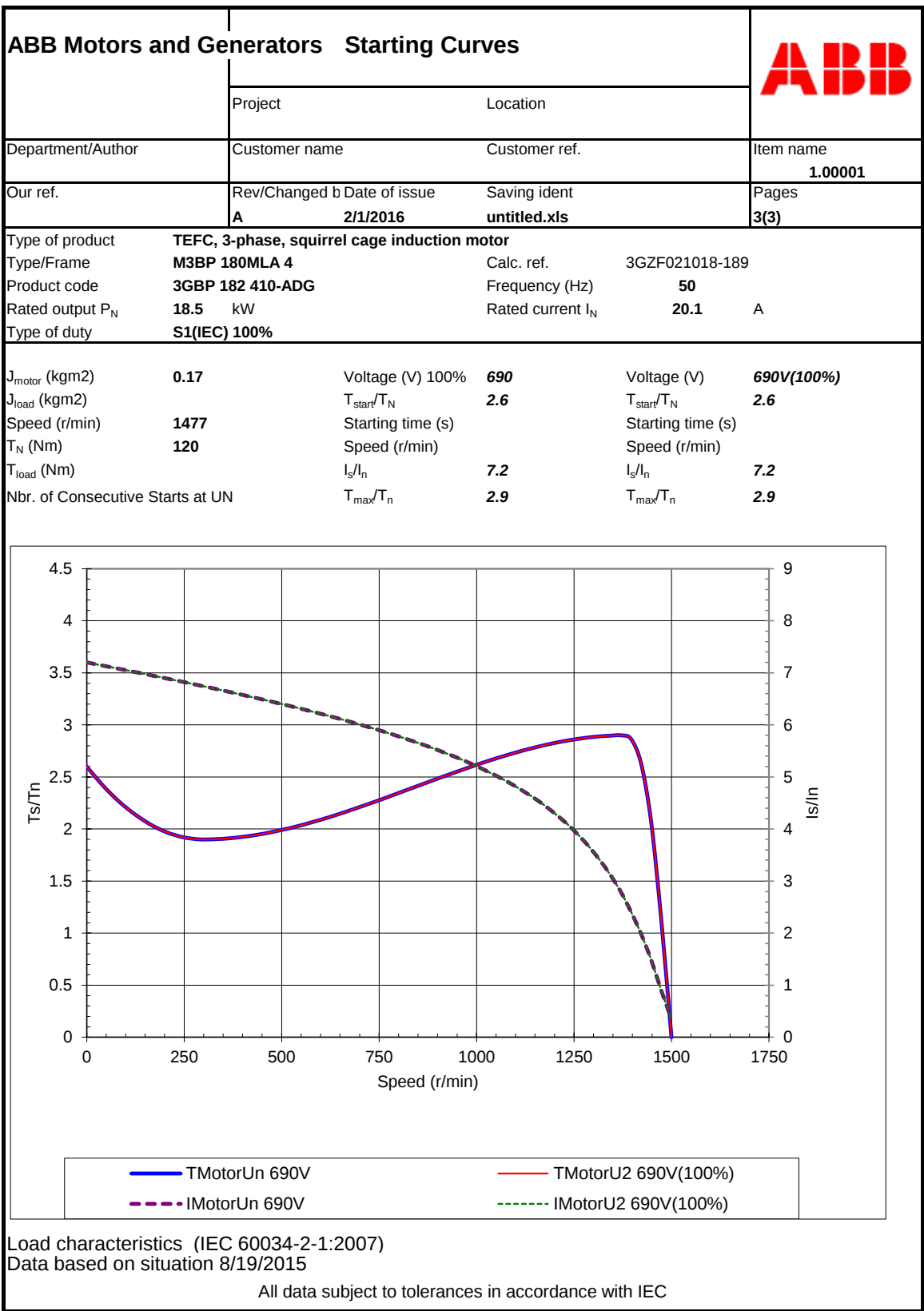


ABB Motors and Generators		Technical Data Sheet - DOL		
Project		Location		
Department/Author	Customer name	Customer ref.		Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 2/1/2016	Saving ident untitled.xls	Pages 1(3)
No.	Definition	Data	Unit	Remarks
1	Product	TEFC, 3-phase, squirrel cage induction motor		
2	Product code	MM18184-PPN (3GBP182410-A) Calc. ref. 3GZF021018-189		
3	Type/Frame	M3BP 180MLA 4		
4	Mounting	IM1001, B3(foot)		
5	Rated output P_N	18.5	kW	
6	Service factor	1		
7	Type of duty	S1(IEC) 100%		
8	Rated voltage U_N	460	VD	$\pm 5\%$ (IEC 60034-1)
9	Rated frequency f_N	60	Hz	$\pm 2\%$ (IEC 60034-1)
10	Rated speed n_N	1781	r/min	
11	Rated current I_N	30.3	A	
12	No-load current	11.1	A	
13	Starting current I_s/I_N	8.2		Fullfilled IEC 60034-12 design N,H
14	Nominal torque T_N	99	Nm	
15	Locked rotor torque T_s/T_N	2.8		
16	Maximum torque T_{max}/T_N	3.2		
17	Minimum torque T_{min}/T_N	2.1		
18	Speed at minimum torque	360	r/min	
Load characteristics (IEC 60034-2-1:2007)		Load %	Current A	Efficiency %
19	PLL determined from residual loss	100	30.3	92.5 / IE2
20		75	23.5	92.8
21		50	17.9	92
22		Start	248	0.44
23	Maximum starting time from hot	15	s	
24	Maximum starting time from cold	27	s	
25	Insulation class / Temperature class	F / B		
26	Ambient temperature	40	°C	
27	Altitude	1000	m.a.s.l.	
28	Enclosure	IP55		
29	Cooling system	IC411 self ventilated		
30	Bearing DE/NDE	6310/C3 - 6209/C3		
31	Type of Grease			
32	Sound pressure level (LP dB(A) 1m)	70	dB(A)	at load
33	Moment of inertia $J = \frac{1}{4} GD^2$	0.166	kg-m2	
34	Balancing			
35	Vibration class			
36	Position of terminal box	Top		
37	Terminal box entries; no, dimens.			
38	Number of power terminals			
39	Direction of rotation	CW or CCW		
40	Total weight of motor	205	kg	
41	Dimension drawing no.			
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Ex-motors				
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Option Variant Codes / Definition				
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Remarks:				
Data based on situation 8/19/2015				
All data subject to tolerances in accordance with IEC				
Guaranteed values on request				

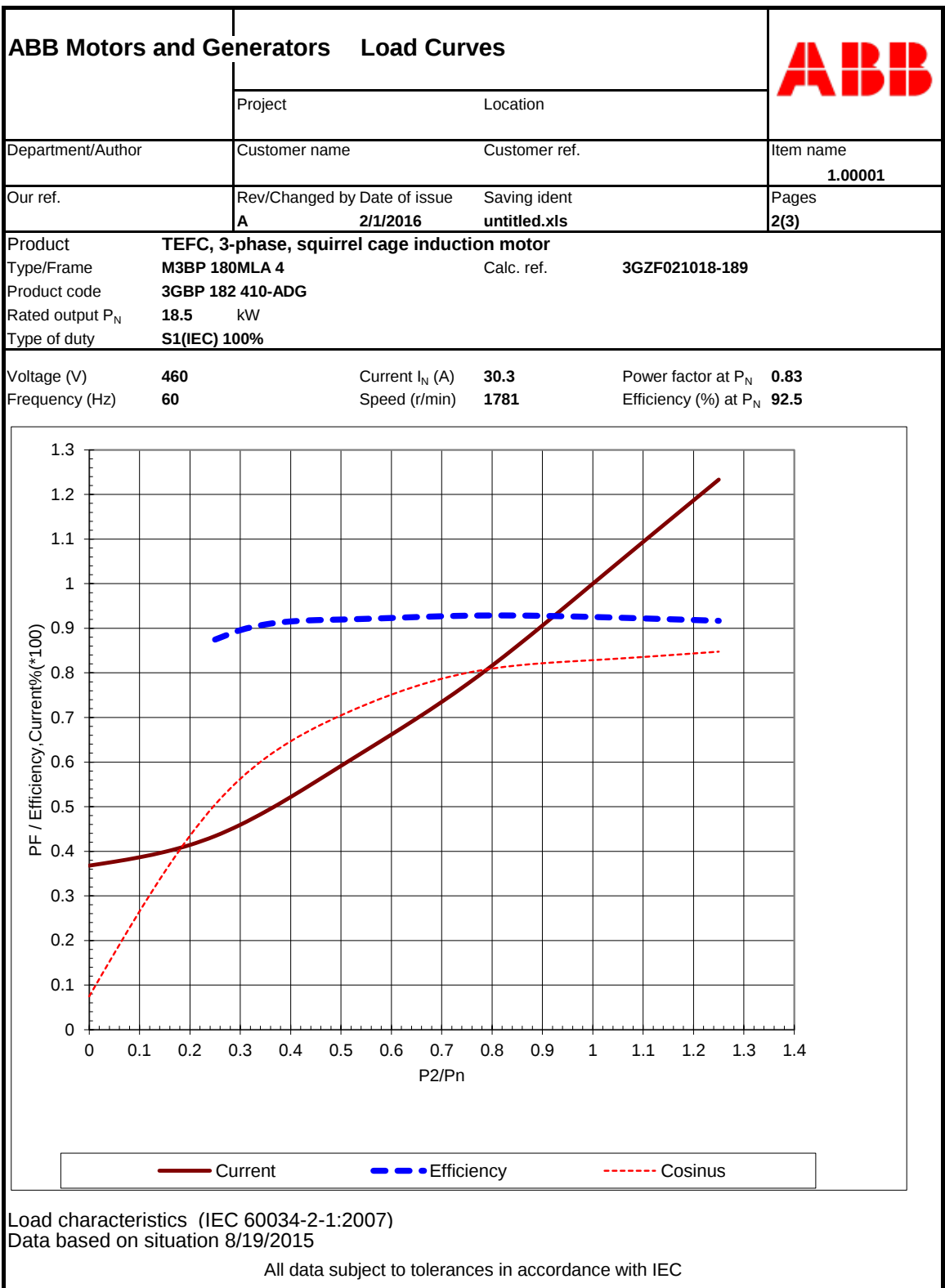


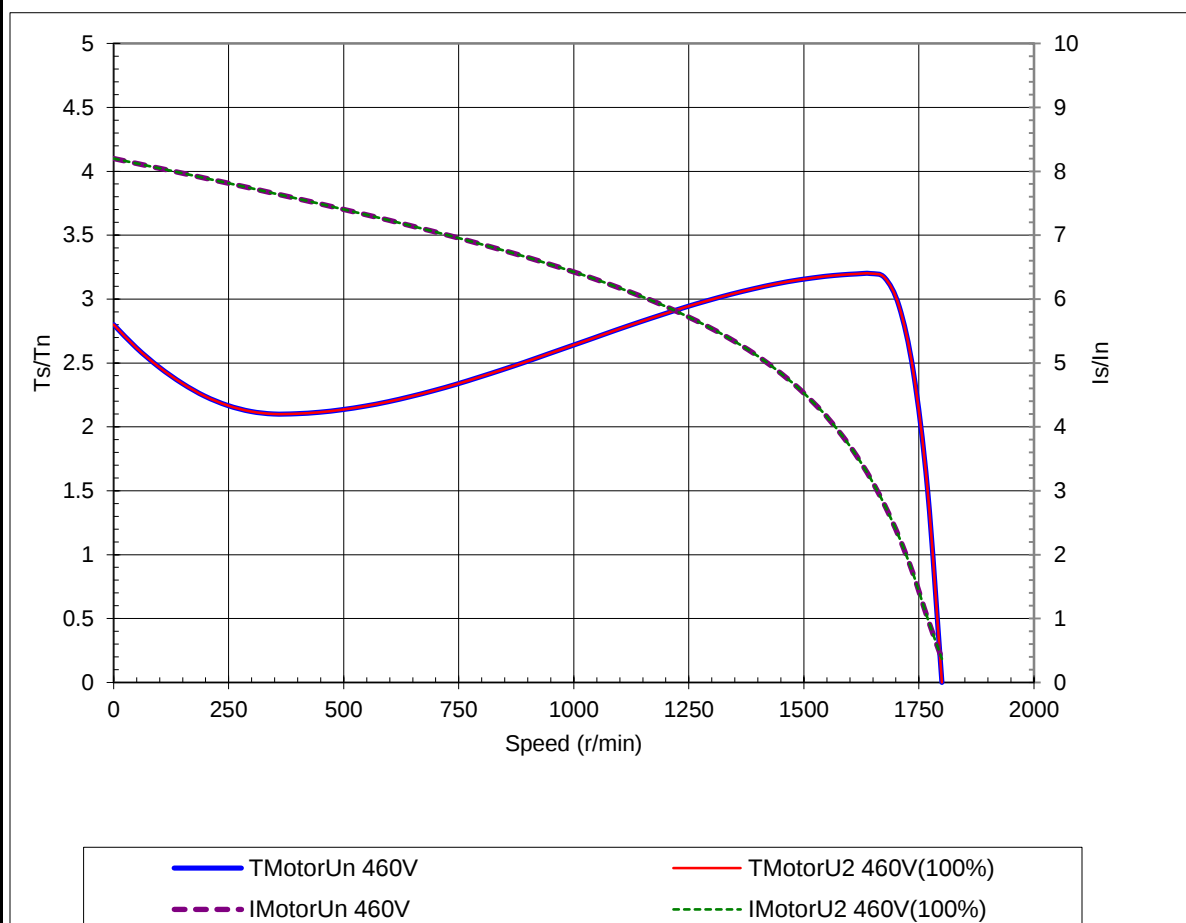
ABB Motors and Generators Starting Curves



	Project	Location	
Department/Author	Customer name	Customer ref.	Item name
			1.00001
Our ref.	Rev/Changed b Date of issue	Saving ident	Pages
	A 2/1/2016	untitled.xls	3(3)

Type of product	TEFC, 3-phase, squirrel cage induction motor		
Type/Frame	M3BP 180MLA 4	Calc. ref.	3GZF021018-189
Product code	3GBP 182 410-ADG	Frequency (Hz)	60
Rated output P_N	18.5 kW	Rated current I_N	30.3 A
Type of duty	S1(IEC) 100%		

J_{motor} (kgm ²)	0.17	Voltage (V) 100%	460	Voltage (V)	460V(100%)
J_{load} (kgm ²)		T_{start}/T_N	2.8	T_{start}/T_N	2.8
Speed (r/min)	1781	Starting time (s)		Starting time (s)	
T_N (Nm)	99	Speed (r/min)		Speed (r/min)	
T_{load} (Nm)		I_s/I_n	8.2	I_s/I_n	8.2
Nbr. of Consecutive Starts at UN		T_{max}/T_n	3.2	T_{max}/T_n	3.2



Load characteristics (IEC 60034-2-1:2007)
Data based on situation 8/19/2015

All data subject to tolerances in accordance with IEC