Marine motors

Frames 80 to 355L

2228E

Marine motors

Brook Crompton

Brook Crompton is a leading manufacturer of electric motors for the global industrial market, with motor solutions which benefit a wide range of customers.

Our products are used in almost every industrial activity including water treatment, building services, chemical/petrochemicals, general processing and manufacturing where they drive fans, pumps, compressors and conveyors, amongst other things.

Brook Crompton incorporates many well known names including Brook Motors, Crompton Parkinson, Electrodrives, Newman, Bull Electric and Hawker Siddeley Electric Motors.

We have extensive stocks of motors around the world, backed-up by a network of distributors, ensuring excellent local support wherever needed.

Quality assurance

Stringent quality procedures are observed from first design to finished product in accordance with the ISO9001 documented quality systems.

All of our factories have been assessed to meet these requirements, a further assurance that only the highest possible standards of quality are accepted.

Marine motors

Brook Crompton is the UK's leading manufacturer of low voltage ac motors for the marine and other industries. Features developed over many years for the arduous conditions of the North Sea have now been incorporated into standard motors. These include, for example, high performance paint treatments, stainless steel nameplates, higher standards of balancing and built-in electrical protection - all particularly important to the marine industry. The standard totally enclosed motors, which meet the latest requirements for high efficiency and low noise levels, are hoseproof and can be readily produced in deck watertight enclosures. Where weight is an important consideration, open drip-proof motors are available. Certified hazardous area motors are a speciality of the company which is also experienced in obtaining approval from most of the world's marine certifying authorities.

Multi-Mount

By simply changing the position of the feet, the user is able to obtain right, left or top mounted terminal box positions and by removing the standard endshield you can change it for a flange or face version.

Benefits include:

- low power consumption
- low noise levels
- Eurovoltage: 400 V ±10% 50 Hz
- dual frequency: 50 Hz and 60 Hz
- high power factors
- high torque with smooth acceleration and low current
- IP55/IP56 protection

Efficiency

Brook Crompton are an approved manufacturer of ac electric motors within the UK Government's Enhanced Capital Allowance (ECA) scheme.

A wide range of single and multi-speed motors are included on the UK Energy Technology List. Please check the ECA scheme website: www.eca.gov.uk at time of purchase for current listing.

Standards

Standards

Standards

Marine motors can be manufactured to the international standards listed below:

Range	*International*	*National standard*				*North American**
Standard	**IEC**	**BS**	**VDE**	**DIN**	**NF**	**NEMA**
Outputs	–	BS 5000 part 10	–	DIN 42673, DIN 42677	NF C51-110	MG1 part 10
Performance	IEC 60034-1	BS EN 60034-1	VDE 0530 part 1	–	NF C51-111	MG1 part 12
Dimensions	IEC 60072-1	BS 4999 part 141	–	DIN 42673, DIN 42677	NF C51-105, NF C51-120	MG1 part 4
Mounting	IEC 60034-7	BS EN 60034-7	–	DIN 42950	NF C51-117	MG1 part 4
Degrees of protection	IEC 60034-5	BS EN 60034-5	–	DIN 40050	NF C51-115	MG1-1.26B

standard BS and European specification motor complies

optional

BS specification motor complies except flange tolerances to IEC 60072-1 Annex C.1.7 Option 1

European specification motors

Motors complying with IEC 60034-1 also comply with many of the national standards of other European countries, eg CEI 203 (Italy), NBN7 (Belgium), NEN 3173 (Netherlands), SEN 2601 01 (Sweden)

** Motors to NEMA standards have CSA approval and generally comply with Canadian (EEMAC) standards*
Standard motors also meet CSA standard C390 (energy efficient) and USA 'EPAct' legislation

Motors certified by Underwriters Laboratories Inc (UL) can be supplied on request. The UL mark and certification number will be on each rating plate to show product compliance and certification.

Environment

Enclosure

All motors have degrees of IP protection as defined in IEC EN 60034-5.

European directives

Four European directives apply in varying degrees to ac induction motors. Brook Crompton comply in the following manner:

Motor cooling

Motors are cooled in accordance with EN 60034-6. The normal arrangement is IC411 (Totally Enclosed Fan Ventilated) via a fan mounted at the non-drive end. Alternative methods of cooling available on request.

Compliance with European directives applying to AC induction motors

Directives	Low voltage (LV)	Machinery (MD)	Electromagnetic compatibility (EMC)	ATEX
Reference numbers	73/23/EEC 93/68/EEC	89/392/EEC 91/368/EEC 93/44/EEC 93/68/EEC	89/336/EEC 92/31/EEC 93/68/EEC	94/9/EC
Motor CE marked	Yes	No	No	YES
Standards	EN 60034	Not applicable	EN 60034-1	EN 50014 EN50018 EN50019 EN 50021 EN50281
Documentation for customers' technical file	Declaration of conformity	Certificate of incorporation	Statement[1]	Declaration of conformity
Safety instructions with every motor	Yes	Yes	Yes	Yes
Comment	Relevant electrical equipment operating between 50 to 1000 volts AC	Statement[2]	Component	Hazardous atmosphere equipment - mandatory after July 2003

[1] Motors operating from a correctly applied, sinusoidal (AC) supply meet the requirements of the EMC directive and are within the limits specified in standard EN 60034-1

[2] When installed in accordance with our customer safety and installation and maintenance instructions, they can be put into service only when the machinery into which they are being incorporated, has been declared to be in conformity with the machinery directive in accordance with Article 4(2) and Annex IIB of that Directive (98/37/EEC)

Specification

Marine duty motors

The motors described in this catalogue are designed and rated for use on board merchant ships built anywhere in the world and in accordance with the requirements of the major marine classification authorities.

These requirements generally concern limits to winding temperature rises with given ambient temperatures, which determine the motor frame size for a given output. For certain larger motors, some authorities specify normalised shaft steel to give greater consistency.

The requirements for witnessed tests, type tests, certification etc, differ between authorities and can all be accommodated. However, these exceptional demands must be made clear at the time of ordering. The table opposite gives a list of the major classifying authorities and a summary of their specific requirements. Other classifications available on request, please contact Brook Crompton for details.

Standards for TEFV and open drip proof

Classifying authority	Service	Ambient temp °C	Permissible temp rise K		Key special requirements	
			Class B	Class F	Normalised shaft steel	Witnessed tests for essential service
Lloyds Register of Shipping (LRS)	Restricted	40	75	90	≥75kW	≥100kW
	Unrestricted	45	70	90		
Det Norske Veritas (DNV)	Restricted	35*	80	100	≥65mm shaft dia	≥100kW
	Unrestricted	45	70	90		
Germanischer Lloyd (GL)	Restricted	40	80	100	≥75kW	>100kW
	Unrestricted	45	75	95		
American Bureau of Shipping (ABS)	Non-essential	40	80	105	-	≥100kW
	Essential	50	70	95		
Korean Register of Shipping (KRS)	Essental and non-essential	50	70	90	All motors	All motors [1]
Chinese Classification Societies (CCS)	Essential and non-essential	50	70	90	**	**
Bureau Veritas (BV)	Auxiliaries	45	75	95	≥100kW	≥100kW Essential
		40	80	100		
	Essential	50	70	90		
Registro Italiano Navale (RINA)	Non-essential	40	80	100	All motors	≥100kW
	Essential	50	70	90		
Nippon Kaiji Kyokai (NKK)	Essential and non-essential	45	75†	95†	-	All motors for essential service

** Refrigerated holds only: 15°C allowed on non-ventilated, totally enclosed motors*
*** Refer to Brook Crompton [1] Discretion of local surveyor*

Construction and materials

Brook Crompton motors can be offered for marine use in either aluminium or cast iron material, the choice being determined by factors such as weight, appearance, efficiency, applications etc. There are differences in the availability of some features (see table opposite), however, the quality of materials used in the motors and the tolerances applied to their manufacture are consistently high. The paint finish and winding protection are chosen to suit the harsh marine environments in which the motors have to perform.

Marine motor features

	W cast iron	W aluminium	Drip proof cast iron
Frequency	50/60Hz	50/60Hz	50/60Hz
Enclosure	IP55	IP55	IP23
Cooling method	IEC411 TEFV*	IEC411 TEFV*	-
T-box position	80-180 right 200-355 top	Top	Top (IP55)
Lubrication	200-355 through greasing	Available on request	Through greasing - relief at DE
Balance	80-180 Grade N 200-355 Grade R	Grade N	Grade R
Bearings	Ball/ball C3 clearance	Ball/ball C3 clearance	Ball/ball C3 clearance
Drain holes	160-315	80-180	-
Temperature rise	Class B (80°C)	Class B (80°C)	Class B (80°C)
Insulation class	Class F (155°C)	Class F (155°C)	Class F (155°C)
Duty cycle	S1 continuous rated	S1 continuous rated	S1 continuous rated
Earth facility	Internal and external	Internal and external	Internal and external
Thermal protection	200-355 fitted as standard	Available on request	-

** TEFV - Totally Enclosed Fan Ventilated*

Specification

Insulation and thermal rating

Brook Crompton motors are manufactured using Class F insulating materials, giving a maximum operating temperature, including ambients of 145°C. Class H insulation, 165°C maximum temperature is available as an option.

Motor ratings depend upon:

- ambient temperature
- type of service
- maximum operating temperate, ie Class B (120°C), Class F (145°C)
- certifying authorities' special arrangements
- supply variations, ie tolerance on voltage and frequency

To simplify selection, it is assumed that standard supply conditions of voltage are +/-10%. Refer to output data on pages 6-11.

Ambient temperatures

If low (<-30°C) or high (>55°C), ambient temperatures are to be experienced, it may be necessary to use special materials, eg grease, shaft steel etc. This depends largely on the operational requirements of the vessel or its equipment.

Thermal protection devices

To protect motor windings against a variety of operational malfunctions, motors and associated control gear can be fitted with protection devices. Thermistors which are temperature-dependant, semi-conductor devices which are embedded in the motor windings, are in fact fitted as standard in many larger frame sizes. (See standards table on page 4)

Tropical protection

Standard motors will operate satisfactorily in the tropical environments experienced by many ships.

Where environmental conditions are conductive to the formation of fungal growth, algae or condensation, totally enclosed motors with extra tropic proof treatments are recommended as additional protection. The use of drain holes to assist in the release of any condensation is also recommended.

Where the motor is to be left standing for long periods of time in damp conditions, or subject to condensation forming atmospheres, it is recommended that anti-condensation heaters are fitted and energised to prevent condensation forming in the motor enclosure.

For more arduous applications, Brook Crompton has additional solutions, eg Argus monsoon tropical treatment, which enables the motor to operate satisfactorily in extreme tropical conditions.

Argus 55

The Argus 55 specification has been applied to most of Brook Cromptons marine motor range. This specification has been designed to enable the motor to operate and survive in the most arduous maritime conditions, and includes the following features as standard:

- IP55 weatherproof protection
- Anti-corrosive paint systems to suit each constructional material
- Stainless steel nameplate
- C3 clearance bearings
- internal and external earth terminals
- Tapped hole in shaft end

Performance data

W Aluminium construction - 50Hz

Marine classification authorities impose differing restrictions on equipment use, and limits on ambient temperatures and on motor winding temperature rises (see standards table on page 4).

These restrictions can all be met by choosing the correct marine rating (1), (2) or (3) from the right hand table and selecting the appropriate motor frame below for that rating against the required output and speed.

Marine ratings

Use/service		Unrestricted/essential		Restricted/non-essential	
Temperature rise class		B	F	B	F
LRS	**(Lloyds)**	(3)	(1)	(3)	(1)
DNV	**(Norway)**	(3)	(1)	(2)	(1)
GL	**(Germany)**	(3)	(1)	(2)	(1)
BV	**(France)**	(3)	(1)	(2)	(1)
RINA	**(Italy)**	(3)	(1)	(2)	(1)
ABS	**(USA)**	(3)	(1)	(2)	(1)
KRS	**(Korea)**	(3)	(1)	(3)	(1)
CCS	**(China)**	(3)	(1)	(3)	(1)
NKK	**(Japan)**	(3)	(1)	(3)	(1)

Maximum continuous output (kW) against selected rating, frame size and speed

Frame size	3000min-1 (2 pole)			1500min^{-1} (4 pole)			1000min^{-1} (6 pole)			750min^{-1} (8 pole)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
80M	1.35	1.2	1.1	0.82	0.75	0.7	0.55	0.5	0.48	-	-	-
90S	1.75	1.6	1.5	1..2	1.1	1.05	0.75	0.7	0.66	0.37	0.34	0.33
90L	2.4	2.2	2.1	1.6	1.45	1.4	1.1	1.0	0.95	0.55	0.5	0.48
100L	3.6	3.2	3.0	-	-	-	1.8	1.6	1.5	-	-	-
100LA	-	-	-	2.6	2.3	2.2	-	-	-	0.9	0.8	0.75
100LB	-	-	-	3.6	3.2	3.0	-	-	-	1.35	1.2	1.1
112M	4.4	4.0	3.8	4.4	4.0	3.8	2.6	2.3	2.2	1.5	1.3	1.2
132S	-	-	-	6.6	6.0	5.5	3.3	3.0	2.8	2.6	2.3	2.2
132SA	6.6	6.0	5.5	-	-	-	-	-	-	-	-	-
132SB	9.0	8.2	7.5	-	-	-	-	-	-	-	-	-
132M	-	-	-	8.6	8.0	7.5	-	-	-	3.6	3.2	3.0
132MA	-	-	-	-	-	-	4.4	4.0	3.8	-	-	-
132MB	-	-	-	-	-	-	6.0	5.5	5.2	-	-	-
160M	-	-	-	13.5	12	11	8.2	7.5	7.2	-	-	-
160MA	13.5	12	11	-	-	-	-	-	-	4.4	4.0	3.8
160MB	18	16.5	15	-	-	-	-	-	-	6.0	5.5	5.2
160L	20	18.5	17.5	16.5	15	14	12	11	10.5	8.2	7.5	7.0
180M	25	23	22	20	18.5	17.5		-	-	-	-	-
180L	-	-	-	24	22	21	16.5	15	14.3	12	11	10.5

Performance data

Aluminium construction - 60Hz

Maximum continuous output (kW) against selected rating, frame size and speed

Frame size	3600min^{-1} (2 pole)			1800min^{-1} (4 pole)			1200min^{-1} (6 pole)			900min^{-1} (8 pole)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
80M	1.6	1.45	1.3	0.98	0.9	0.84	0.66	0.6	0.58	-	-	-
90S	2.1	1.9	1.8	1.45	1.3	1.25	0.9	0.84	0.79	0.44	0.41	0.39
90L	2.9	2.6	2.5	1.9	1.75	1.7	1.3	1.2	1.15	0.66	0.6	0.58
100L	4.3	3.9	3.6	-	-	-	2.1	1.9	1.8	-	-	-
100LA	-	-	-	3.2	2.8	2.7	-	-	-	1.1	0.95	0.9
100LB	-	-	-	4.3	3.8	3.6	-	-	-	1.6	1.45	1.3
112M	5.3	4.8	4.5	5.3	4.8	4.5	3.1	2.7	2.5	1.8	1.5	1.4
132S	-	-	-	7.9	7.2	6.6	3.9	3.6	3.4	3.1	2.7	2.5
132SA	7.9	7.2	6.6	-	-	-	-	-	-	-	-	-
132SB	10.8	9.8	9.0	10.3	9.6	9.0	-	-	-	-	-	-
132M	-	-	-	-	-	-	-	-	-	4.3	3.8	3.6
132MA	-	-	-	-	-	-	5.3	4.8	4.5	-	-	-
132MB	-	-	-	-	-	-	7.2	6.6	6.2	-	-	-
160M	-	-	-	16	14.5	13	9.8	9.0	8.6	-	-	-
160MA	16	14.5	13	-	-	-	-	-	-	5.3	4.8	4.5
160MB	22	20	18	-	-	-	-	-	-	7.2	6.6	6.2
160L	24	22	21	20	18	17	14.5	13	12.5	9.8	9.0	8.6
180M	30	28	26	24	22	21	-	-	-	-	-	-
180L	-	-	-	29	26	25	20	18	17	14.5	13	12.5

Performance data

W Cast iron construction - 50Hz

Marine classification authorities impose differing restrictions on equipment use, and limits on ambient temperatures and on motor winding temperature rises (see standards table on page 4).

These restrictions can all be met by choosing the correct marine rating (1), (2) or (3) from the right hand table and selecting the appropriate motor frame below for that rating against the required output and speed.

Marine ratings

Use/service		*Unrestricted/essential*		*Restricted/non-essential*	
Temperature rise class		*B*	*F*	*B*	*F*
LRS	**(Lloyds)**	(3)	(1)	(3)	(1)
DNV	**(Norway)**	(3)	(1)	(2)	(1)
GL	**(Germany)**	(3)	(1)	(2)	(1)
BV	**(France)**	(3)	(1)	(2)	(1)
RINA	**(Italy)**	(3)	(1)	(2)	(1)
ABS	**(USA)**	(3)	(1)	(2)	(1)
KRS	**(Korea)**	(3)	(1)	(3)	(1)
CCS	**(China)**	(3)	(1)	(3)	(1)
NKK	**(Japan)**	(3)	(1)	(3)	(1)

Maximum continuous output (kW) against selected rating, frame size and speed

Frame size	3000min^{-1} (2 pole)			1500min^{-1} (4 pole)			1000min^{-1} (6 pole)			750min^{-1} (8 pole)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
80M	1.2	1.0	0.96	0.75	0.7	0.65	0.55	0.55	0.48	0.25	0.23	0.22
90S	1.5	1.4	1.3	1.1	1.0	0.96	0.75	0.7	0.65	0.37	0.34	0.32
90L	2.2	2.0	1.9	1.5	1.4	1.3	1.1	1.0	0.96	0.55	0.5	0.48
100L	3.0	2.8	2.6	-	-	-	1.5	1.4	1.3	-	-	-
100LA	-	-	-	2.2	2.0	1.9	-	-	-	0.75	0.7	0.65
100LB	-	-	-	3.0	2.8	2.6	-	-	-	1.1	1.0	0.96
112M	4.0	3.8	3.6	4.0	3.8	3.6	2.2	2.1	2.0	1.5	1.4	1.3
132S	-	-	-	5.5	5.3	5.0	3.0	2.8	2.7	2.2	2.0	1.9
132SA	5.5	5.3	5.0	-	-	-	-	-	-	-	-	-
132SB	7.5	7.2	6.8	-	-	-	-	-	-	-	-	-
132M	-	-	-	7.5	7.2	6.8	-	-	-	3.0	2.8	2.7
132MA	-	-	-	-	-	-	4.0	3.8	3.6	-	-	-
132MB	-	-	-	-	-	-	5.5	5.3	5.0	-	-	-
160M	-	-	-	12	10.5	10	7.5	7.2	6.8	-	-	-
160MA	11	10.5	10	-	-	-	-	-	-	4.4	3.8	3.6
160MB	15	14.3	13.7	-	-	-	-	-	-	5.5	5.3	5.0
160L	18.5	17.7	16.8	16	14.3	13.7	11	10.5	10	7.5	7.2	6.8
180M	22	21	20	20	17.7	16.8	-	-	-	-	-	-
180L	-	-	-	23	21	20	15	14.3	13.7	11	10.5	10
200LG	32	30	28	-	-	-	19.5	18.5	17	-	-	-
200LN	39	37	34	32	30	28	23.5	22.0	20.5	16	15	14
225SN	-	-	-	39	37	34	-	-	-	19.5	18.5	17
225MN	48	45	42	48	45	42	32	30	28	23.5	22	20.5
250SN	58	55	51	58	55	51	39	37	34	32	30	28
250MN	79	75	70	79	75	70	48	45	42	39	37	34
280SN	95	90	84	95	90	84	58	55	51	48	45	42
280MN	116	110	102	116	110	102	79	75	70	58	55	51
315SN	140	132	123	140	132	123	95	90	84	79	75	70
315MN	159	150	140	159	150	140	116	110	102	95	90	84
315LG	169	160	149	169	160	149	-	-	-	-	-	-
315LN	196	185	172	196	185	172	140	132	123	116	110	102

Performance data

W Cast iron construction - 60Hz

Maximum continuous output (kW) against selected rating, frame size and speed												
Frame size	3600min-1 (2 pole)			1800min-1 (4 pole)			1200min-1 (6 pole)			900min-1 (8 pole)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
80M	1.25	1.15	1.1	0.86	0.8	0.75	0.63	0.58	0.55	0.29	0.26	0.25
90S	1.7	1.6	1.5	1.25	1.15	1.1	0.86	0.8	0.75	0.43	0.39	0.37
90L	2.5	2.3	2.2	1.7	1.6	1.5	1.25	1.15	1.1	0.63	0.58	0.55
100L	3.5	3.2	3.0	-	-	-	1.7	1.6	1.5	-	-	-
100LA	-	-	-	2.5	2.3	2.2	-	-	-	0.86	0.8	0.75
100LB	-	-	-	3.5	3.2	3.0	-	-	-	1.25	1.15	1.1
112M	4.6	4.4	4.0	4.6	4.4	4.0	2.5	2.4	2.3	1.7	1.6	1.5
132S	-	-	-	6.4	6.1	5.8	3.5	3.2	3.0	2.5	2.4	2.3
132SA	6.3	6.1	5.8	-	-	-	-	-	-	-	-	-
132SB	8.6	8.3	7.8	-	-	-	-	-	-	-	-	-
132M	-	-	-	8.6	8.3	7.8	-	-	-	3.5	3.2	3.1
132MA	-	-	-	-	-	-	4.6	4.4	4.0	-	-	-
132MB	-	-	-	-	-	-	6.3	6.1	5.8	-	-	-
160M	-	-	-	13	12	11.5	8.6	8.3	7.8	-	-	-
160MA	13	12	11.5	-	-	-	-	-	-	4.6	4.4	4.0
160MB	17	16	15.5	-	-	-	-	-	-	6.3	6.1	5.8
160L	21	20	19	17	16	15.5	13	12	11.5	8.6	8.3	7.8
180M	25	24	23	21	20	19	-	-	-	-	-	-
180L	-	-	-	25	24	23	17	16	15.5	13	12	11.5
200LG	38	36	33	-	-	-	23.5	22	20.5	-	-	-
200LN	47	44	41	38	36	33	28	26.5	24.5	19	18	16.5
225SN	-	-	-	47	44	41	-	-	-	23.5	22	20.5
225MN	57	54	50	57	54	50	38	36	33	28	26.5	24.5
250SN	70	66	61	70	66	61	47	44	41	38	36	33
250MN	95	90	83	95	90	83	57	54	50	47	44	41
280SN	114	108	100	114	108	100	70	66	61	57	54	50
280MN	139	132	122	139	132	122	95	90	83	70	66	61
315SN	167	158	147	167	158	147	114	108	100	95	90	83
315MN	190	179	167	190	179	167	139	132	122	114	108	100
315LG	202	191	178	202	191	178	-	-	-	-	-	-
315LN	234	221	206	234	221	206	167	158	147	139	132	122

Performance data

Drip proof cast iron construction - 50Hz

Marine classification authorities impose differing restrictions on equipment use, and limits on ambient temperatures and on motor winding temperature rises (see standards table on page 4).

These restrictions can all be met by choosing the correct marine rating (1), (2) or (3) from the right hand table and selecting the appropriate motor frame below for that rating against the required output and speed.

Marine ratings

Use/service		*Unrestricted/essential*		*Restricted/non-essential*	
Temperature rise class		*B*	*F*	*B*	*F*
LRS	**(Lloyds)**	(3)	(1)	(3)	(1)
DNV	**(Norway)**	(3)	(1)	(2)	(1)
GL	**(Germany)**	(3)	(1)	(2)	(1)
BV	**(France)**	(3)	(1)	(2)	(1)
RINA	**(Italy)**	(3)	(1)	(2)	(1)
ABS	**(USA)**	(3)	(1)	(2)	(1)
KRS	**(Korea)**	(3)	(1)	(3)	(1)
CCS	**(China)**	(3)	(1)	(3)	(1)
NKK	**(Japan)**	(3)	(1)	(3)	(1)

Maximum continuous output (kW) against selected rating, frame size and speed

Frame size	3000min^{-1} (2 pole)			1500min^{-1} (4 pole)			1000min^{-1} (6 pole)			750min^{-1} (8 pole)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
180M	33	30	27	24	22	19	16	15	13	12	11	10
180L	40	37	34	33	30	27	20	18.5	16	16	15	13
200M	49	45	41	40	37	34	24	22	19	20	18.5	16
200L	60	55	50	49	45	41	33	30	27	24	22	19
225M	82	75	68	60	55	50	40	37	34	33	30	27
250S	98	90	82	82	75	68	49	45	41	40	37	34
250M	120	110	99	98	90	82	60	55	50	49	45	41
280S	164	150	135	120	110	99	82	75	68	60	55	50
280M	202	185	167	164	150	135	98	90	82	82	75	68
315S	240	220	198	202	185	167	120	110	99	98	90	82
315M	273	250	225	240	220	198	164	150	135	120	110	99
315M	-	-	-	273	250	225	180	165	140	130	120	108

Performance data

Drip proof construction - 60Hz

Maximum continuous output (kW) against selected rating, frame size and speed												
Frame size	3600min^{-1} (2 pole)			1800min^{-1} (4 pole)			1200min^{-1} (6 pole)			900min^{-1} (8 pole)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
180M	38	35	31	28	25	22	18	17	15	14	13	12
180L	46	43	39	38	35	31	23	21	18	18	17	15
200M	56	52	47	46	43	39	28	25	22	23	21	18
200L	69	63	58	56	52	47	38	35	31	28	25	22
225M	94	86	78	69	63	58	46	43	39	38	35	31
250S	113	104	94	94	86	78	56	52	47	46	43	39
250M	138	127	114	113	104	94	69	63	58	56	52	47
280S	189	173	155	138	127	114	94	86	78	69	63	58
280M	232	213	192	189	173	155	113	104	94	94	86	78
315S	276	253	228	232	213	192	138	127	114	113	104	94
315M	314	288	259	276	253	228	189	173	155	138	127	114
315M	-	-	-	315	288	259	207	190	161	150	138	124

BROOK CROMPTON

Brook Crompton
St Thomas' Road Huddersfield
West Yorkshire HD1 3LJ UK
Tel: +44 (0) 1484 557200
Fax: +44 (0) 1484 557201
E-mail: csc@brookcrompton.com
Internet: www.brookcrompton.com

Printed in England
gh105/09/02 2228E issue 1e