

W Ex e increased safety motors



Frame 80 to 355

**BROOK
CROMPTON**

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Every care has been taken to ensure the accuracy of the information contained in this publication, but, due to a policy of continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication

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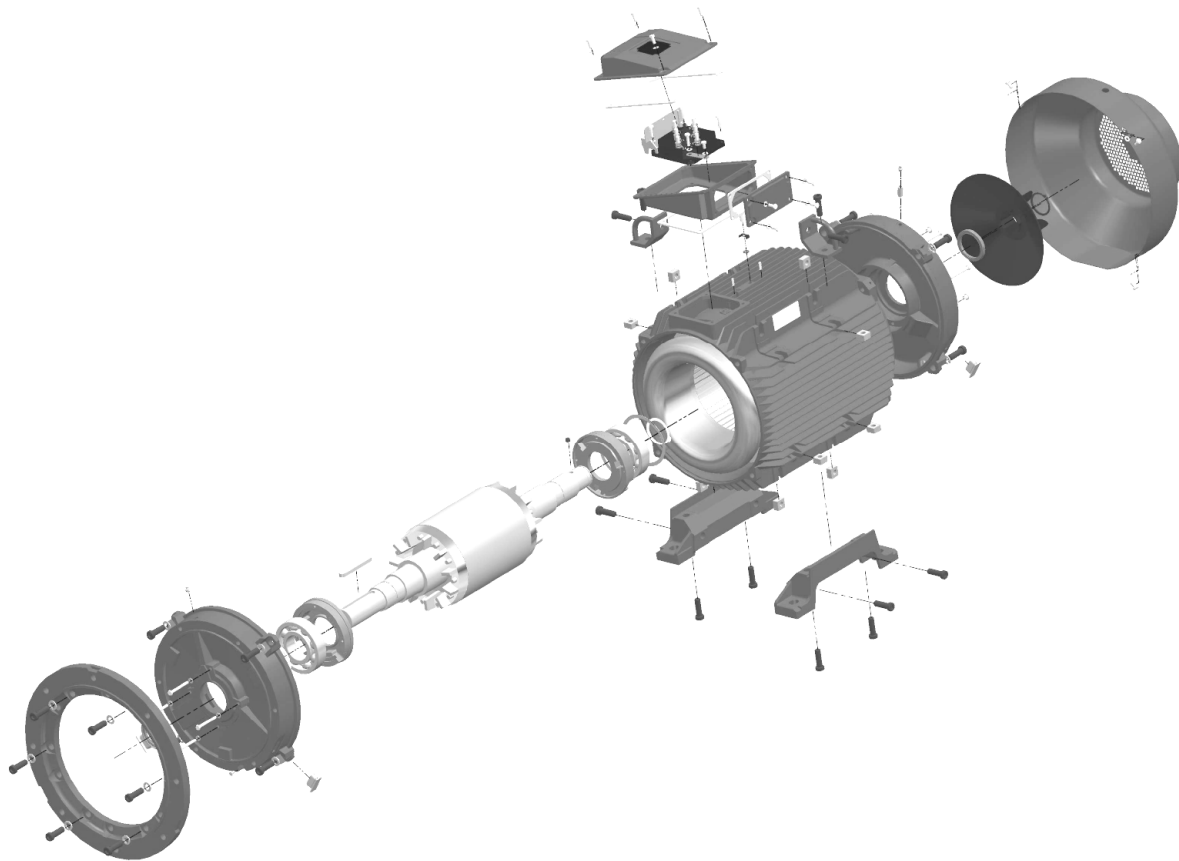
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Introduction



Brook Crompton a company of ATB group

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

Throughout the branch, new ATB developments and systems solutions are regarded as intelligent. This means that they are efficient, individually manufactured, extremely economic and underpinned by close co-operation with customers. Many years of experience and the know-how of the work force have been merged and play a fundamental role in product intelligence. In addition, the Group also provides on-site system integration, in order to guarantee customers optimum advantages from ATB solutions.

ATB also demonstrates flexibility in the production area.

Quality assurance

ATB is a name for quality production. For standards that are maintained by means of continuous investment in modern production systems such as resin impregnation plants, CNC processing centres, assembly robots and winding centres.

Efficiency is further raised by on-going improvements to the material flow and layout design.

Stringent quality procedures are observed from first design to finished product in accordance with the ISO9001:2008 documented quality systems.

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



Specification, standards and regulations

W Ex e increased safety motors

The W Ex e motor range covers products with outputs from 0.09kW to 260kW in frame sizes 80 to 355L.

Group II suitable for use in Zone 1.

Code: II 2 G Exe II Gb T3

Motors are designed and manufactured in factories that are assessed by a European notified body (eg Baseefa (2001) Ltd), meeting rigorous quality controls.

Efficiency

In connection with the international discussion on energy efficiency, a world-wide harmonized energy efficiency classification system has been established for low-voltage three-phase asynchronous motors.

New international efficiency classes of motors: (IE = international Efficiency)

The new IEC60034-30:2009 defines world-wide the following efficiency classes in the power range from 0,75kW to 375kW 2p, 4p and 6p motors.

IE1 – Standard Efficiency (equivalent of EFF2)

IE2 – High Efficiency (equivalent of EFF1)

IE3 – Premium Efficiency

IE4 – Super Premium Efficiency

A new method for determining efficiency

From now on, motors can be offered and sold with the new classes IE1, IE2 and IE3. In that case, the efficiency has to be determined according to the new measuring standard EN60034-2-1:2007.

The new method leads to substantially increased accuracy under exactly defined laboratory condition. When comparing the measurements of the same motor, it is expected that the energy efficiency level measured with the new method will be a few percentage points less than the efficiency levels defined by the old method.

There are a few different method of determining the efficiency with low medium and high uncertainty.

For IE1 (standard efficiency) and motors below standard efficiency, test associated with low and medium uncertainty are acceptable. For higher efficiency levels only methods associated with low uncertainty shall be acceptable.

ATEX

All W Ex e increased safety motors are fully compliant with the requirements of ATEX Directive (94/9/EC).

The motors meet requirements of EN 60079-0, EN 60079-7 and EN ISO/IEC 80079-34 (production quality requirements).

Standard compliance

Brook Crompton motors are of the totally enclosed, single or three phase squirrel cage type, built to comply with international IEC and EN standards. Motors conforming to other national and international specifications are also available on request.

Electrical	Mechanical
IEC/EN 60034-1	IEC 60072
IEC/EN 60034-2-1	IEC/EN 60034-5
IEC/EN 60034-30	IEC/EN 60034-6
IEC 60034-8	IEC/EN 60034-7
IEC 60034-12	IEC/EN 60034-9
	IEC 60034-14

Enclosure

All motors are totally enclosed with a minimum ingress protection of IP55 as defined in IEC 60034-5 (BS EN 60034 part 5).

Higher IP protection can be supplied for special request.

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.

Insulation and thermal rating

Standard motors will operate satisfactorily in an ambient temperature range of -20°C to $+40^{\circ}\text{C}$ (Class B temperature rise) and altitudes up to 1000 metres above sea level.

Duty cycle

All standard W-DF motors are suitable for S1 duty as described in IEC 60034-1.

Electrical characteristics

All 'W' motors are wound for the 'Eurovoltage'. Motors up to and including 3kW are normally supplied 400V Y, 4kW and above supplied 400V D and are suitable for $\pm 5\%$ tolerance in line with IEC60034-1 standard..

Exe Specification, standards and regulations

Type e - Increased safety

These motors are not flameproof and not built to withstand an internal explosion. They are designed to ensure safety by means of a number of special features to ensure freedom from arcs, sparks or dangerous surface temperatures.

They resemble standard motors in appearance but have special increased safety terminals within an IP55 terminal box. The main features of the increased safety motor are:

- Special attention to air gap concentricity and clearance of all rotating parts.
- Components subject to impact tests.
- Temperature rise 10 °C lower than permitted maximum for that class of insulation.
- Maximum surface temperature T3 (200 °C)
- Compliance with t_E characteristics
- Special terminal board to accommodate specified creepage and clearances
- Terminal box with IP55 enclosure
- Baseefa Certified

The maximum surface temperature T applies to all surfaces of the motor, both internal and external. Under locked rotor conditions, the rotor temperature in certain designs increases faster than that of the stator windings. In either event this is catered for in conjunction with compliance with the t_E time.

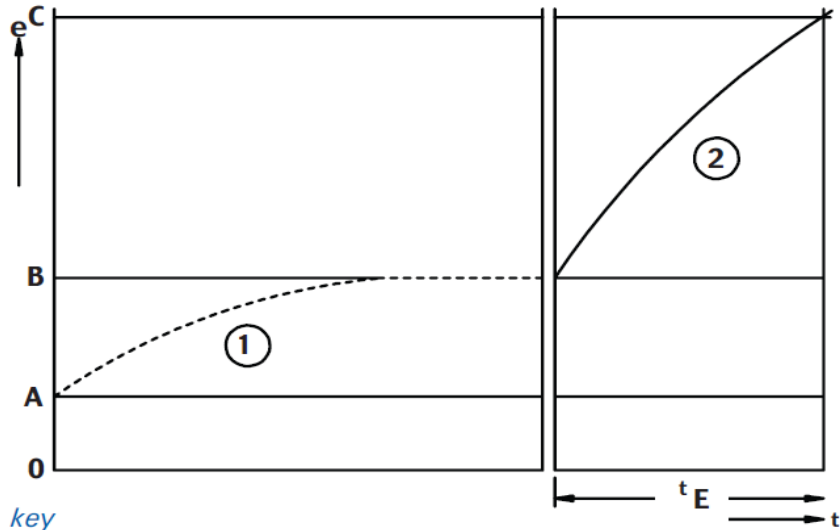
t_E Time

This is defined as the time taken for a.c. windings when carrying the starting current I_A to be heated up from temperature reached in rated service and at maximum ambient temperature to the limiting temperature. In the graph (top middle), OA represents the maximum ambient temperature and OB is that reached in normal working. If a fault should occur and the rotor becomes locked, then the conditions shown in part 2 of the graph will apply. The motor temperature will increase very rapidly to OC which is just less than the T classification for the motor.

The motor will reach point OC in time t_E .

Control gear must be provided to disconnect the motor from the supply within this time t_E .

These motors are Baseefa Certified and suitable for use in Zone 1 areas and have a maximum temperature of T3. They are intended for S1 duty, i.e. continuous running and are unsuitable for those involving frequent starts/stops or long run-up times.



key

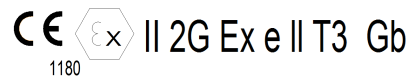
- O - temperature °C
- A - maximum ambient temperature
- B - temperature in rated service
- C - limiting temperature
- t - time
- e - temperature
- ① - temperature rise in rated service
- ② - temperature rise during stalled motor test

Temperature rise and outputs

Reduced winding temperature rises apply to Ex e motors according to the insulation system used. For Class B this is 700C by resistance i.e. 10 °C less than normal.

Marking

Typical marking is as shown below.



- II** for use in hazardous areas other than mines
- 2** apparatus category 2 for use in zone 1
- G** for use in gas hazardous areas
- Ex** for electrical equipment in hazardous atmospheres
- e** increased safety
- II** explosion group
- T3** temperature class
- Gb** equipment protection level

Terminal box

Terminal box positions available			
Frame size	Top	LHS	RHS
W-DF80-90	-	Alternative	Standard
W-DF100-180	Alternative	Alternative	Standard
W-DF200-355	Standard	Alternative	Alternative

(looking on drive end)

Impact covers

Designed to prevent the ingress of falling foreign bodies, impact covers are fitted on motors when mounted vertically, shaft down.

Certification

Component approval numbers	
Frame size	Certificate No BAS00ATEX
W-DF80 to W-DF180	2102U
W-DF200 to W-DF355L	2045U

Terminal pin cable capacity and terminal nut tightening torque					
Frame size	T box size	Cable capacity (mm ²)		Tightening torque (Nm)	
		Mains terminals	Aux terminals	Mains terminals	Aux terminals
80-100	80-100	4 (M4)	4	1.5	0.5-0.8
	112-132	10 (M5)	4	3	0.5-0.8
112-132	112-132	10 (M5)	4	3	0.5-0.8
	160-180	16 (M6)	4	5	0.5-0.8
160-180	160-180	16 (M6)	4	5	0.5-0.8
200L-280S	200-280S	95 (M10)	2.5	26	1
280M-355L	280M-355L	300 (M10)	2.5	26	1

Performance data

3000 min⁻¹ (2 pole)

Rated power	Full load speed	Frame reference and size	Full load current at rated voltage	Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Direct on line pull up torque ratio	Direct on line t _e time	Rotor inertia Wk ²	Sound pressure level @ 1m on no load
P _N Kw (HP)	n min ⁻¹	Type	I _N 400V A	η 1.0P _N 0.75P _N 0.5P _N	Cos φ 1.0P _N 0.75P _N 0.5P _N	M _N Nm	$\frac{M_A}{M_N}$	$\frac{I_A}{I_N}$	$\frac{M_K}{M_N}$	$\frac{M_S}{M_N}$	t _F s	J kgm ²	L _{PA} dB(A)
0.75 (1.0)	2880	W-DF80MJ ⁽¹⁾⁽⁴⁾	IE2 1.65	$\left\{ \begin{array}{l} 77.4 \\ 78.4 \\ 75.4 \end{array} \right.$	$\left\{ \begin{array}{l} 0.84 \\ 0.79 \\ 0.67 \end{array} \right.$	2.5	2.6	6.8	2.8	2.6	>5	0.0010	64
1.1 (1.5)	2880	W-DF80MM ⁽¹⁾⁽⁴⁾	IE2 2.36	$\left\{ \begin{array}{l} 79.6 \\ 79.6 \\ 77.2 \end{array} \right.$	$\left\{ \begin{array}{l} 0.84 \\ 0.78 \\ 0.70 \end{array} \right.$	3.7	3.6	7.5	2.9	2.3	>5	0.0013	64
1.3 (1.7)	2845	W-DF90LMX ⁽¹⁾⁽⁴⁾	IE2 2.65	$\left\{ \begin{array}{l} 80.5 \\ 81.0 \\ 79.0 \end{array} \right.$	$\left\{ \begin{array}{l} 0.89 \\ 0.84 \\ 0.76 \end{array} \right.$	4.4	2.5	6.5	2.7	2.3	>5	0.0014	64
1.85 (2.5)	2880	W-DF90LS ⁽¹⁾	IE2 3.9	$\left\{ \begin{array}{l} 82.4 \\ 82.9 \\ 82.4 \end{array} \right.$	$\left\{ \begin{array}{l} 0.83 \\ 0.77 \\ 0.67 \end{array} \right.$	6.0	3.2	8.4	3.2	2.8	5.8	0.0016	64
2.5 (3.4)	2880	W-DF100LM ⁽¹⁾	IE2 4.8	$\left\{ \begin{array}{l} 83.8 \\ 84.8 \\ 83.8 \end{array} \right.$	$\left\{ \begin{array}{l} 0.92 \\ 0.90 \\ 0.85 \end{array} \right.$	8.3	2.8	7.6	3.0	2.5	8.3	0.0055	60
3.3 (4.4)	2860	W-DF112MS ⁽¹⁾	IE2 6.3	$\left\{ \begin{array}{l} 85.0 \\ 86.5 \\ 87.0 \end{array} \right.$	$\left\{ \begin{array}{l} 0.94 \\ 0.93 \\ 0.88 \end{array} \right.$	11	2.3	7.4	2.6	2.0	6.3	0.007	60
4.6 (6.2)	2900	W-DF132SF ⁽¹⁾	IE2 8.6	$\left\{ \begin{array}{l} 86.5 \\ 87.0 \\ 86.0 \end{array} \right.$	$\left\{ \begin{array}{l} 0.91 \\ 0.89 \\ 0.83 \end{array} \right.$	15	2.4	8.3	2.7	2.1	6.9	0.0138	66
5.5 (7.5)	2900	W-DF132SM ⁽¹⁾	IE2 10	$\left\{ \begin{array}{l} 87.0 \\ 88.0 \\ 87.0 \end{array} \right.$	$\left\{ \begin{array}{l} 0.93 \\ 0.91 \\ 0.86 \end{array} \right.$	18	2.3	8.2	2.6	2.0	5.7	0.018	66
7.5 (10)	2935	W-DF160MF ⁽¹⁾	IE2 13.9	$\left\{ \begin{array}{l} 88.2 \\ 88.1 \\ 86.6 \end{array} \right.$	$\left\{ \begin{array}{l} 0.92 \\ 0.90 \\ 0.86 \end{array} \right.$	24	1.7	6.8	2.9	2.4	21.0	0.043	68
10 (13.4)	2930	W-DF160ML ⁽¹⁾⁽⁴⁾	IE2 18	$\left\{ \begin{array}{l} 89.5 \\ 90.5 \\ 87.0 \end{array} \right.$	$\left\{ \begin{array}{l} 0.90 \\ 0.92 \\ 0.89 \end{array} \right.$	33	2.0	6.2	2.3	1.8	>5	0.049	68
12.5 (16.8)	2940	W-DF160LS ⁽¹⁾	IE2 22.2	$\left\{ \begin{array}{l} 90.0 \\ 89.7 \\ 89.7 \end{array} \right.$	$\left\{ \begin{array}{l} 0.93 \\ 0.91 \\ 0.86 \end{array} \right.$	40	2.2	8.4	2.5	2.0	6.8	0.056	68
15 (20)	2940	W-DF180MF ⁽¹⁾	IE2 26	$\left\{ \begin{array}{l} 90.3 \\ 89.8 \\ 88.8 \end{array} \right.$	$\left\{ \begin{array}{l} 0.92 \\ 0.91 \\ 0.86 \end{array} \right.$	49	2.0	8.1	2.4	1.8	9.4	0.088	68
20 (27)	2935	WU-DF200LGX ⁽²⁾ W-DF200LGX ⁽³⁾	IE2 35	$\left\{ \begin{array}{l} 91.1 \\ 90.9 \\ 89.5 \end{array} \right.$	$\left\{ \begin{array}{l} 0.92 \\ 0.87 \\ 0.81 \end{array} \right.$	65	2.5	6.6	2.7	2.0	8.3	0.15	73
25 (34)	2950	WU-DF200LNX ⁽²⁾ W-DF200LNX ⁽³⁾	IE2 43	$\left\{ \begin{array}{l} 91.7 \\ 92.1 \\ 91.1 \end{array} \right.$	$\left\{ \begin{array}{l} 0.91 \\ 0.89 \\ 0.88 \end{array} \right.$	81	2.8	7.7	2.9	2.3	7.3	0.18	73
30 (40)	2950	WU-DF225MN ⁽²⁾ W-DF225MN ⁽³⁾	IE2 51	$\left\{ \begin{array}{l} 92.1 \\ 91.8 \\ 90.4 \end{array} \right.$	$\left\{ \begin{array}{l} 0.91 \\ 0.90 \\ 0.84 \end{array} \right.$	97	2.4	7.6	2.7	1.9	7.3	0.47	75

1) - European and BS frame reference

2) - European frame reference

3) - BS frame reference

4) - Parameters from calculation, could vary from final product data. Accurate tE time will be determined by test.

Performance data

3000 min⁻¹ (2 pole)

Rated power	Full load speed in revolutions per minute	Frame reference and size	Full load current at rated voltage	Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Direct on line pull up torque ratio	Direct on line t _e time	Rotor inertia WK ²	Sound pressure level @ 1m on no load
P _N Kw (HP)	n min ⁻¹	Type	I _N 400V A	η 1.0P _N 0.75P _N 0.5P _N	Cos φ 1.0P _N 0.75P _N 0.5P _N	M _N Nm	$\frac{M_A}{M_N}$	$\frac{I_A}{I_N}$	$\frac{M_K}{M_N}$	$\frac{M_S}{M_N}$	t _E s	J kgm ²	L _{PA} dB(A)
37 (50)	2945	WU-DF250MNE ⁽¹⁾⁽⁴⁾ W-DF250SN ⁽²⁾⁽⁴⁾	IE2 63	{ 92.5 93.1 92.6 0.92 0.86 0.79	120	2.3	6.1	2.8	1.9	>5	0.56	77	
50 (67)	2955	WU-DF280SNE ⁽¹⁾ W-DF250MN ⁽²⁾	IE2 83	{ 93.1 93.4 92.8 0.92 0.90 0.86	162	1.3	6.0	1.8	1.2	9.2	0.7	77	
60 (80)	2955	WU-DF280MNE ⁽¹⁾ W-DF280SN ⁽²⁾	IE2 100	{ 93.5 93.4 92.5 0.92 0.90 0.77	194	1.8	6.6	2.4	1.6	8.4	0.8	77	
75 (100)	2975	WU-DF315SNE ⁽¹⁾⁽⁴⁾ W-DF280MN ⁽²⁾⁽⁴⁾	IE2 125	{ 93.8 95.1 94.3 0.92 0.91 0.90	241	1.9	6.7	2.5	1.8	>5	1.4	78	
90 (125)	2975	WU-DF315MNE ⁽¹⁾⁽⁴⁾ W-DF315SN ⁽²⁾⁽⁴⁾	IE2 152	{ 94.1 95.2 94.3 0.93 0.91 0.90	290	2.2	7.9	2.7	2.0	7,1	1.8	78	
100 (134)	2975	WU-DF315MN ⁽¹⁾ W-DF315MN ⁽²⁾	IE2 166	{ 94.2 94.0 92.8 0.92 0.90 0.86	320	1.7	7.5	2.3	1.5	7.5	2.4	80	
105 (140)	2975	WU-DF315LR ⁽¹⁾ W-DF315LR ⁽²⁾	IE2 172	{ 94.3 93.8 92.7 0.93 0.92 0.89	338	2.1	7.2	2.8	1.7	9.1	3.07	80	
110 (150)	2980	WU-DF315MP ⁽¹⁾⁽⁴⁾ W-DF315MP ⁽²⁾⁽⁴⁾	IE2 183	{ 94.3 94.8 93.7 0.92 0.90 0.86	352.5	2.1	7.3	2.8	1.7	>5	2.6	80	
132 (175)	2975	WU-DF315LN ⁽¹⁾⁽⁴⁾ W-DF315LN ⁽²⁾⁽⁴⁾	IE2 219	{ 94.6 96.3 95.9 0.92 0.91 0.86	424	2.3	7.0	2.9	1.7	>5	2.8	80	
150 (200)	2988	WU-DF355SN ⁽¹⁾⁽⁴⁾ W-DF355SN ⁽²⁾⁽⁴⁾	IE2 253	{ 95.0 95.5 94.6 0.90 0.89 0.86	480	1.8	6.5	2.3	1.7	>5	5.9	80	
185 (250)	2985	WU-DF355MN ⁽¹⁾⁽⁴⁾ W-DF355MN ⁽²⁾⁽⁴⁾	IE2 312	{ 95.0 95.5 94.6 0.90 0.89 0.86	592	1.8	6.2	2.5	1.7	>5	7.0	80	
225 (300)	2985	WU-DF355LN ⁽¹⁾⁽⁴⁾ W-DF355LN ⁽²⁾⁽⁴⁾	IE2 376	{ 95.0 95.8 94.8 0.91 0.91 0.87	720	1.9	6.4	2.6	1.7	>5	8.0	80	

1) - European frame reference

2) - BS frame reference

4) - Parameters from calculation, could vary from final product data. Accurate t_E time will be determined by test.

Performance data

1500 min⁻¹ (4 pole)

Rated power	Full load speed in revolutions per minute	Frame reference and size	Full load current at rated voltage	Efficiency	Power factor	Full load torque	Direct on line starting torque ratio	Direct on line starting current ratio	Direct on line pull out torque ratio	Direct on line pull up torque ratio	Direct on line t _e time	Rotor inertia Wk ²	Sound pressure level @ 1m on no load
P _N Kw (HP)	n min ⁻¹	Type	I _N 400V A	η 1.0P _N 0.75P _N 0.5P _N	Cos φ 1.0P _N 0.75P _N 0.5P _N	M _N Nm	$\frac{M_A}{M_N}$	$\frac{I_A}{I_N}$	$\frac{M_K}{M_N}$	$\frac{M_S}{M_N}$	t _E s	J kgm ²	L _{PA} dB(A)
0.37 (0.5)	1390	W-DF80ME ⁽¹⁾	1.0	74.5 76.0 74.0	0.77 0.69 0.55	2.5	1.8	4.3	2.0	1.6	42.0	0.0015	47
0.55 (0.75)	1410	W-DF80ME ⁽¹⁾	1.59	75.0 75.0 72.5	0.73 0.64 0.50	3.7	1.7	4.5	2.2	1.5	16.6	0.0015	47
0.75 (1.0)	1440	W-DF80MS ⁽¹⁾	IE2 1.9	79.6 79.9 76.0	0.72 0.64 0.35	5	3.4	6	4.3	3.4	16.5	0.0019	47
1.0 (1.3)	1430	W-DF90LRX ⁽¹⁾⁽⁴⁾	IE2 2.3	81.0 78.5 76.5	0.77 0.66 0.36	6.7	2.1	5.4	2.4	1.9	>5	0.0034	48
1.35 (1.8)	1430	W-DF90LWX ⁽¹⁾⁽⁴⁾	IE2 3.2	82.3 81.0 19.5	0.73 0.70 0.42	9.0	3.2	6.5	3.6	3.1	>5	0.0042	48
2 (2.7)	1430	W-DF100LS ⁽¹⁾⁽⁴⁾	IE2 4.5	84.1 83.5 83.5	0.76 0.65 0.42	13.5	2.5	6.2	3.3	2.5	>5	0.0103	54
2.5 (3.4)	1440	W-DF100LRF ⁽¹⁾⁽⁴⁾	IE2 5.1	84.8 85.0 84.0	0.83 0.62 0.42	17	2.6	6.8	3.5	2.5	>5	0.0108	54
3.6 (4.8)	1440	W-DF112MT ⁽¹⁾	IE2 7.7	86.2 86.5 85.5	0.78 0.62 0.41	24	2.7	7.4	3.1	2.6	8.1	0.012	56
5 (6.7)	1450	W-DF132STX ⁽¹⁾⁽⁴⁾	IE2 10.2	87.3 90.0 87.0	0.81 0.75 0.69	33	2.5	6.6	2.3	1.8	22.4	0.030	59
6.8 (9.1)	1455	W-DF132MVX ⁽¹⁾⁽⁴⁾	IE2 13.7	88.3 88.5 88.0	0.81 0.81 0.71	45	2.8	7.0	3.3	2.5	12.4	0.033	60
10 (13)	1465	W-DF160MJ ⁽¹⁾	IE2 19.5	89.6 89.0 85.2	0.86 0.82 0.72	65	2.3	7.1	2.6	2.1	9.4	0.068	63
13.5 (18)	1465	W-DF160LU ⁽¹⁾	IE2 15.4	90.4 89.9 85.3	0.88 0.84 0.78	88	2.4	8.0	2.7	2.1	6.2	0.084	63
15 (20)	1470	W-DF180MF ⁽¹⁾	IE2 28.3	90.7 89.6 84.2	0.87 0.84 0.75	97	2.5	8.6	2.8	2.2	6.9	0.16	62
17.5 (23)	1465	W-DF180LM ⁽¹⁾	IE2 32	91.0 91.0 88.9	0.87 0.86 0.79	114	1.9	7.2	2.2	1.8	6.3	0.19	62
27 (36)	1470	WU-DF200LNx ⁽²⁾ W-DF200LNx ⁽³⁾	IE2 49	92.1 92.8 92.4	0.86 0.83 0.74	174	2.7	8.2	3.2	2.0	6.9	0.31	65

1) - European and BS frame reference

3) - BS frame reference

2) - European frame reference

4) - Parameters from calculation, could vary from final product data. Accurate tE time will be determined by test.

Performance data

1500 min⁻¹ (4 pole)

Rated power P_N Kw (HP)	Full load speed in revolutions per minute n min ⁻¹	Frame reference and size Type	Full load current at rated voltage I_N 400V A	Efficiency η $\frac{1.0P_N}{0.75P_N}$ $\frac{0.75P_N}{0.5P_N}$	Power factor $\cos \phi$ $\frac{1.0P_N}{0.75P_N}$ $\frac{0.75P_N}{0.5P_N}$	Full load torque M_N Nm	Direct on line starting torque ratio $\frac{M_A}{M_N}$	Direct on line starting current ratio $\frac{I_A}{I_N}$	Direct on line pull out torque ratio $\frac{M_K}{M_N}$	Direct on line pull up torque ratio $\frac{M_S}{M_N}$	Direct on line t_E time t_E s	Rotor inertia WJ^2 J kgm ²	Sound pressure level @ 1m on no load L_{PA} dB(A)
30 (40)	1470	WU-DF225SN ⁽¹⁾ W-DF225SN ⁽²⁾	IE2 54	92.3 92.1 91.7	0.87 0.81 0.71	194	2.0	7.3	2.8	1.7	6.2	0.45	66
36 (48)	1475	WU-DF225MN ⁽¹⁾ W-DF225MN ⁽²⁾	IE2 63	92.7 93.0 92.1	0.88 0.86 0.79	233	2.5	8.4	2.9	1.8	5.4	0.65	67
40 (54)	1475	WU-DF250MNE ⁽¹⁾ W-DF250SN ⁽²⁾	IE2 71	92.9 92.8 91.9	0.88 0.83 0.77	259	2.8	7.4	3.2	1.9	7.1	0.75	67
55 (75)	1480	WU-DF280SNE ⁽¹⁾ W-DF250MN ⁽²⁾	IE2 97	93.5 93.5 92.7	0.87 0.84 0.75	355	2.5	7.5	2.7	1.9	7.7	1.4	69
70 (94)	1480	WU-DF280MNE ⁽¹⁾ W-DF280SN ⁽²⁾	IE2 125	93.7 93.9 92.8	0.86 0.83 0.75	452	3.1	8.0	3.2	2.2	5.1	1.6	69
85 (114)	1480	WU-DF315SNE ⁽¹⁾ W-DF280MN ⁽²⁾	IE2 148	94.2 94.3 93.7	0.88 0.86 0.81	548	2.4	6.9	2.6	2.0	7.4	3.2	71
95 (127)	1485	WU-DF315MNE ⁽¹⁾⁽⁴⁾ W-DF315SN ⁽²⁾⁽⁴⁾	IE2 165	94.3 94.5 94.0	0.88 0.87 0.81	611	2.4	6.8	2.6	1.8	>5	3.7	71
110 (150)	1490	WU-DF315MR ⁽¹⁾ W-DF315MR ⁽²⁾	IE2 185	94.5 94.6 93.9	0.91 0.90 0.88	705	2.3	6.9	2.5	1.9	8.6	4.4	73
135 (181)	1490	WU-DF315LN ⁽¹⁾ W-DF315LN ⁽²⁾	IE2 226	94.7 94.8 94.1	0.91 0.90 0.88	865	2.3	6.9	2.5	1.9	6.8	5.5	73
150 (200)	1490	WU-DF355SG ⁽¹⁾⁽⁴⁾ W-DF355SG ⁽²⁾⁽⁴⁾	IE2 259	94.9 96.0 95.2	0.88 0.88 0.83	962	2.0	6.6	2.3	1.9	>5	8.2	76
160 (215)	1490	WU-DF355SJ ⁽¹⁾⁽⁴⁾ W-DF355SJ ⁽²⁾⁽⁴⁾	IE2 277	94.9 95.9 95.1	0.88 0.86 0.82	1026	2.0	5.7	2.4	1.9	>5	9.5	79
185 (250)	1490	WU-DF355SN ⁽¹⁾⁽⁴⁾ W-DF355SN ⁽²⁾⁽⁴⁾	IE2 319	95.1 96.0 95.5	0.88 0.87 0.83	1186	2.0	6.3	2.7	1.9	>5	10.6	79
200 (270)	1490	WU-DF355MJ ⁽¹⁾⁽⁴⁾ W-DF355MJ ⁽²⁾⁽⁴⁾	IE2 345	95.1 96.1 95.6	0.88 0.87 0.82	1282	2.0	6.3	2.4	1.9	>5	11.9	79
225 (300)	1490	WU-DF355MN ⁽¹⁾⁽⁴⁾ W-DF355MN ⁽²⁾⁽⁴⁾	IE2 383	95.2 96.3 95.7	0.89 0.88 0.85	1442	2.0	6.4	2.4	1.9	>5	13.5	79
260 (349)	1490	WU-DF355LN ⁽¹⁾ W-DF355LN ⁽²⁾	IE2 442	95.4 96.0 95.5	0.89 0.87 0.82	1666	2.2	6.8	2.5	1.9	5.3	14.6	79

1) - European frame reference

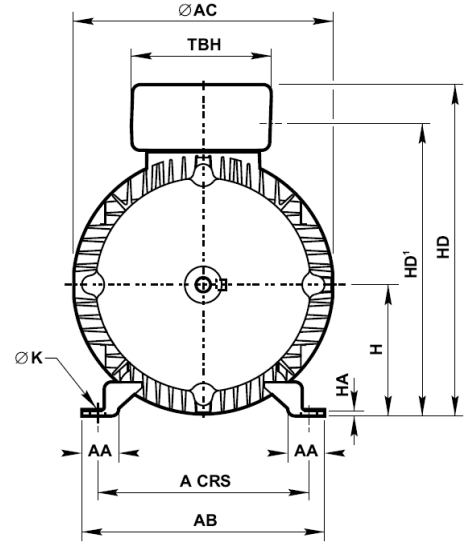
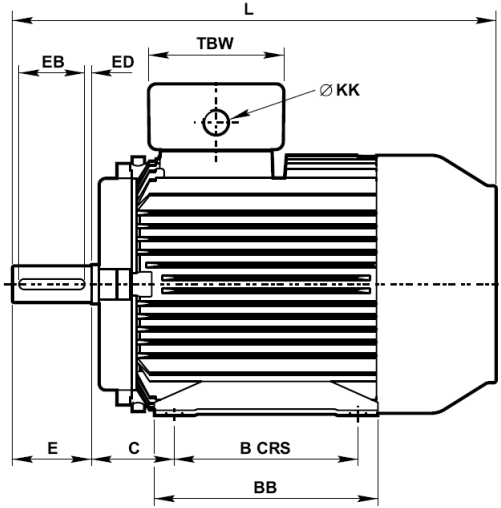
4) - Parameters from calculation, could vary from final product data. Accurate tE time will be determined by test.

2) - BS frame reference

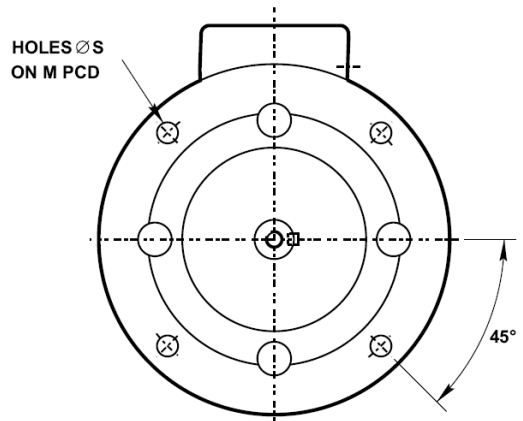
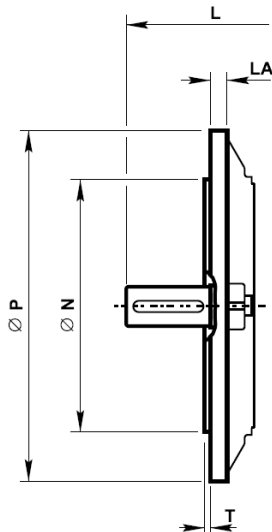
Dimensions - European and BS specification

Foot (B3) / Flange (B5) / Face mounting (B14) - TEFV frames 80-180

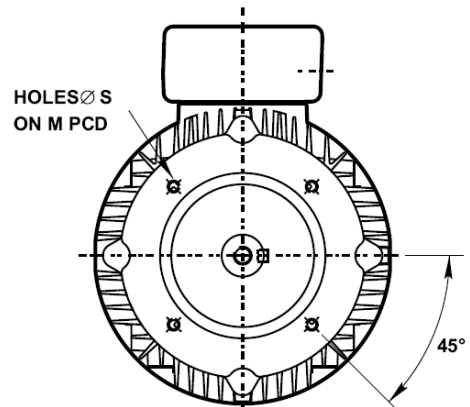
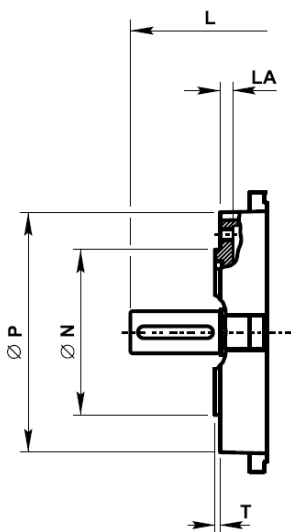
IM B3
IM 1001
Mounting options



IM B5/IM B35
IM 3001/IM 2001
Mounting options



IM B14/IM B34
IM 3601/IM 2101
Mounting options



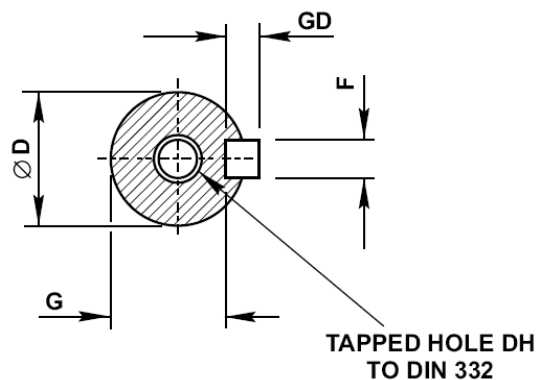
Dimensions - European and BS specification

Foot (B3) / Flange (B5) / Face mounting (B14) - TEFV frames 80-180

Type	General												Terminal box			
	A	B	C	H	K	L	AA	AB	AC	BB	HA	HD	HD ¹	TBW	TBH	KK
W-DF80M	125	100	50	80	10	278	35	157	158	127	10	236	195	120	120	1x M20
W-DF90S	140	100	56	90	10	322	38	175	174	155	12	-	-	120	120	1x M20
W-DF90L	140	125	56	90	10	322	38	175	174	155	12	-	-	120	120	1x M20
W-DF90LX	140	125	56	90	10	364	38	175	174	195	12	254	273	120	120	1x M20
W-DF100L	160	140	63	100	12	368	34	195	199	165	14	274	234	120	120	1x M20
W-DF100LF	160	140	63	100	12	409	34	195	214	206	14	283	242	120	120	1x M20
W-DF112M	190	140	70	112	12	382	40	230	220	182	16	305	258,5	135	135	1x M25
W-DF132S	216	140	89	132	12	447	47	255	260	220	17	348	308	135	135	1x M25
W-DF132SX	216	140	89	132	12	484,5	47	255	256	220	16	348	300	135	135	1x M25
W-DF132M	216	178	89	132	12	447	47	255	260	220	17	348	308	135	135	1x M25
W-DF132MX	216	178	89	132	12	484,5	47	255	256	220	16	348	300	135	135	1x M25
W-DF160M	254	210	108	160	15	604	55	300	315	300	22	428	368	174	174	1x M32
W-DF160L	254	254	108	160	15	604	55	300	315	300	22	428	368	174	174	1x M32
W-DF180M	279	241	121	180	15	663	64	344	355	326	22	469	410	174	174	1x M32
W-DF180L	279	279	121	180	15	663	64	344	355	326	22	469	410	174	174	1x M32

Type	IM B5 mounting						IM B14 mounting					
	M	N	P	S	T	LA	M	N	P	S	T	LA
W-DF80M	165	130	200	12	3.5	12	100	80	120	M6	3	9
W-DF90S/L/LX	165	130	200	12	3.5	10	115	95	140	M8	3	9
W-DF100L	215	180	250	14.5	4	12	130	110	160	M8	3.5	12.5
W-DF100LF	215	180	250	14.5	4	12	130	110	160	M8	3.5	12.5
W-DF112M	215	180	250	14.5	4	12	130	110	164	M8	3.5	13
W-DF132S	265	230	300	14.5	4	12	165	130	200	M10	3.5	14
W-DF132SX	265	230	300	14.5	4	12	165	130	200	M10	3.5	14
W-DF132M	265	230	300	14.5	4	12	165	130	200	M10	3.5	14
W-DF132MX	265	230	300	14.5	4	12	165	130	200	M10	3.5	14
W-DF160M	300	250	350	18.5	5	13	215	180	250	M12	4	13
W-DF160L	300	250	350	18.5	5	13	215	180	250	M12	4	13
W-DF180M	300	250	350	18.5	5	15	-	-	-	-	-	-
W-DF180L	300	250	350	18.5	5	15	-	-	-	-	-	-

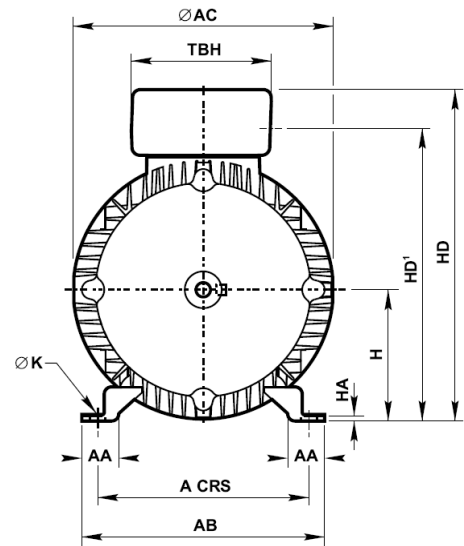
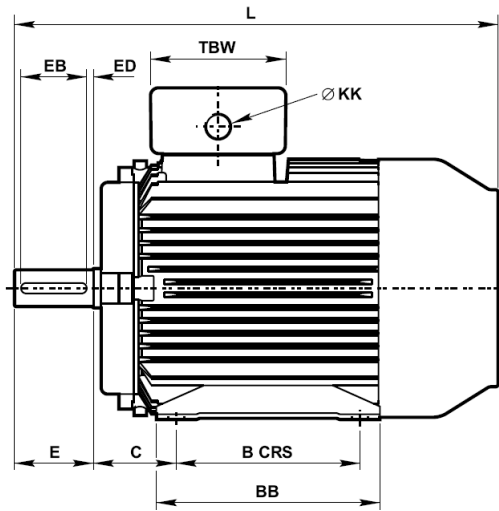
Type	Shaft							
	D	E	F	G	GD	EB	ED	DH
W-DF80M	19	40	6	15.5	6	32	4	M6x16
W-DF90S/L/LX	24	50	8	20	7	40	5	M8x19
W-DF100L	28	60	8	23.9	7	50	5	M10x22
W-DF100LF	28	60	8	23.9	7	50	5	M10x22
W-DF112M	28	60	8	23.9	7	50	5	M10x22
W-DF132S	38	80	10	33	8	70	5	M12x28
W-DF132SX	38	80	10	33	8	70	5	M12x28
W-DF132M	38	80	10	33	8	70	5	M12x28
W-DF132MX	38	80	10	33	8	70	5	M12x28
W-DF160M	42	110	12	37	8	100	5	M16x36
W-DF160L	42	110	12	37	8	100	5	M16x36
W-DF180M	48	110	14	42.5	9	100	5	M16x36
W-DF180L	48	110	14	42.5	9	100	5	M16x36



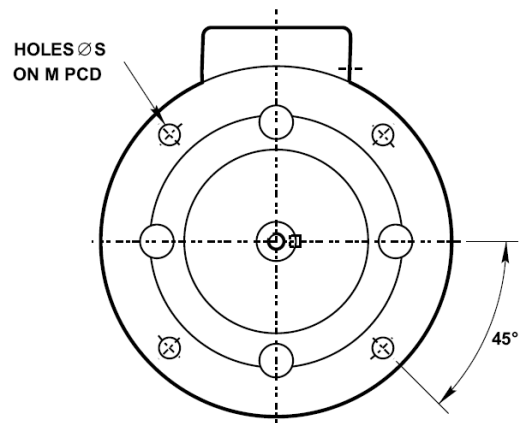
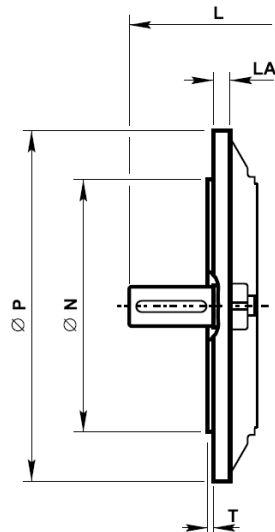
Dimensions - European specification

Foot (B3) / Flange (B5) - TEFV frames 200 - 355

IM B3
IM 1001
Mounting options



IM B5/IM B35
IM 3001/IM 2001
Mounting options



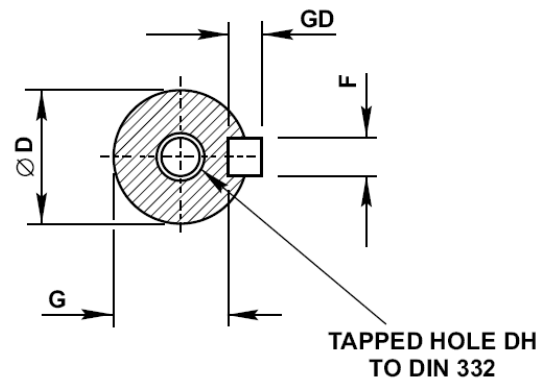
Dimensions - European specification

Foot (B3) / Flange (B5) - TEFV frames 200 - 355

Type	General														Terminal box			
	A	B	C	H	K	4 pole +		2 pole		AA	AB	AC	BB	HA	HD	HD ¹	TBW	TBH
WU-DF200LX	318	305	133	200	M16	787	787	74	382	381	359	30	501	444	176	220	220	2 x M32 + 1 x M20
WU-DF225S	356	286	149	225	M16	875	845	70	426	410	349	25	550 ¹	488	220	161	2 x M40 + 1 x M20	
WU-DF225M	356	311	149	225	M16	915	885	70	426	448	374	25	570	510	220	161	2 x M40 + 1 x M20	
WU-DF250ME	406	349	168	250	M20	985	985	79	482	448	419	28	595 ²	535	220	161	2 x M50 + 1 x M20	
WU-DF280SE	457	368	190	280	M20	1065	1065	83	540	508	438	35	655 ¹	595	220	161	2 x M50 + 1 x M20	
WU-DF280ME	457	419	190	280	M20	1070	1070	83	540	508	489	35	655 ¹	595	220	161	2 x M50 + 1 x M20	
WU-DF315SE	508	406	216	315	M24	1145	1115	89	597	563	482	38	845	744	330	326	2 x M63 + 1 x M20	
WU-DF315ME	508	457	216	315	M24	1215	1185	89	597	563	533	38	845	744	330	326	2 x M63 + 1 x M20	
WU-DF315M	508	457	216	315	M24	1245	1215	89	597	640	533	38	875	776	330	326	2 x M63 + 1 x M20	
WU-DF315L	508	508	216	315	M24	1315	1285	89	597	640	583	38	875	776	330	326	2 x M63 + 1 x M20	
WU-DF355S	610	500	254	355	M24	1485	1415	100	710	732	626	27	975	874	330	326	2 x M63 + 1 x M20	
WU-DF355M	610	560	254	355	M24	1605	1535	100	710	732	686	27	975	874	330	326	2 x M63 + 1 x M20	
WU-DF355L	610	630	254	355	M24	1655	1585	100	710	732	756	27	975	874	330	326	2 x M63 + 1 x M20	

Type	4 pole +								2 pole							
	Shaft								Shaft							
	D	E	F	G	GD	EB	ED	DH	D	E	F	G	GD	EB	ED	DH
WU-DF200LX	55	110	16	49	10	100	5	M20 x 42	55	110	16	49	10	100	5	M20 x 42
WU-DF225S	60	140	18	53	11	125	5	M20 x 42	55	110	16	49	10	100	5	M20 x 42
WU-DF225M	60	140	18	53	11	125	5	M20 x 42	55	110	16	49	10	100	5	M20 x 42
WU-DF250ME	65	140	18	58	11	125	5	M20 x 42	60	140	18	53	11	125	5	M20 x 42
WU-DF280SE	75	140	20	67,5	12	125	5	M20 x 42	65	140	18	53	11	125	5	M20 x 42
WU-DF280ME	75	140	20	67,5	12	125	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
WU-DF315SE	80	170	22	71	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
WU-DF315ME	80	170	22	71	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
WU-DF315M	80	170	22	71	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
WU-DF315L	80	170	22	71	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
WU-DF355S	100	210	28	90	16	200	5	M24 x 50	75	140	20	67,5	12	125	5	M24 x 50
WU-DF355M	100	210	28	90	16	200	5	M24 x 50	75	140	20	67,5	12	125	5	M24 x 50
WU-DF355L	100	210	28	90	16	200	5	M24 x 50	75	140	20	67,5	12	125	5	M24 x 50

Type	IM B5, IM B35 mounting					
	M	N	P	S	T	LA
WU-DF200LX	350	300	400	19	5	19
WU-DF225S	400	350	450	19	5	19
WU-DF225M	400	350	450	19	5	19
WU-DF250ME	500	450	550	19	5	25
WU-DF280SE	500	450	550	19	5	25
WU-DF280ME	500	450	550	19	5	25
WU-DF315SE	500	450	550	19	5	25
WU-DF315ME	600	550	660	24	6	29
WU-DF315M	600	550	660	24	6	29
WU-DF315L	600	550	660	24	6	29
WU-DF355S	740	680	800	24	6	28
WU-DF355M	740	680	800	24	6	28
WU-DF355L	740	680	800	24 <td 6	28	

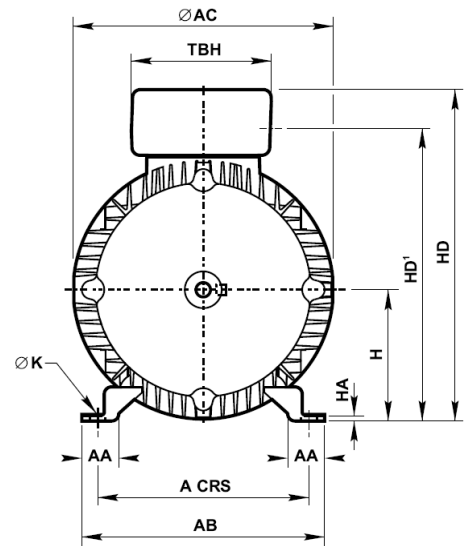
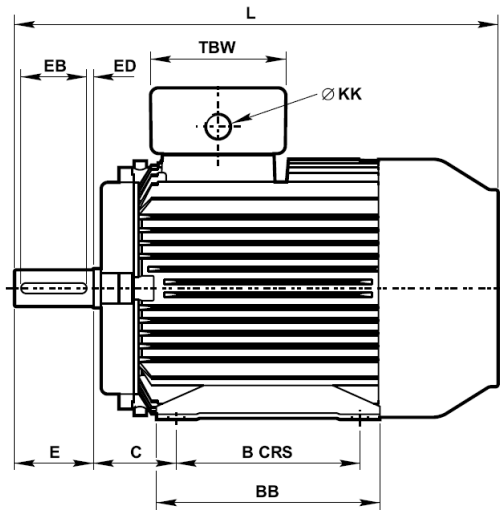


1 - add 25mm when cable entry is facing drive end
 2 - add 50mm when cable entry is facing drive end

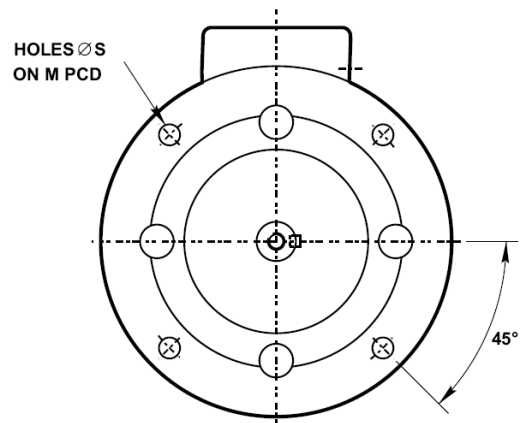
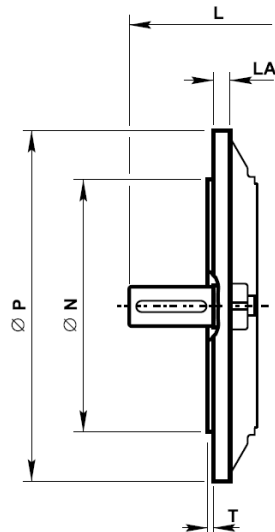
Dimensions - BS specification

Foot (B3) / Flange (B5) - TEFV frames 200 - 355

IM B3
IM 1001
Mounting options



IM B5/IM B35
IM 3001/IM 2001
Mounting options



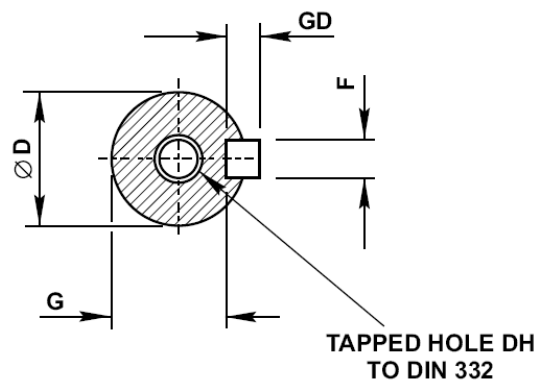
Dimensions - BS specification

Foot (B3) / Flange (B5) - TEFV frames 200 - 355

Type	General													Terminal box				
	A	B	C	H	K	4 pole +		2 pole		AA	AB	AC	BB	HA	HD	HD ¹	TBW	TBH
W-DF200LX	318	305	133	200	M16	787	787	74	382	381	359	30	501	444	176	220	2 x M32 + 1 x M20	
W-DF225S	356	286	149	225	M16	875	845	70	426	410	349	25	550 ¹	488	220	288	2 x M40 + 1 x M20	
W-DF225M	356	311	149	225	M16	915	885	70	426	448	374	25	570	510	220	288	2 x M40 + 1 x M20	
W-DF250S	406	349	168	250	M20	985	985	79	482	448	419	28	595 ²	535	220	288	2 x M50 + 1 x M20	
W-DF250M	457	368	190	280	M20	1065	1065	83	540	508	438	35	655 ¹	595	220	288	2 x M50 + 1 x M20	
W-DF280S	457	419	190	280	M20	1070	1070	83	540	508	489	35	655 ¹	595	220	288	2 x M50 + 1 x M20	
W-DF280M	508	406	216	315	M24	1145	1115	89	597	563	482	38	845	744	330	526	2 x M63 + 1 x M20	
W-DF315S	508	457	216	315	M24	1215	1185	89	597	563	533	38	845	744	330	526	2 x M63 + 1 x M20	
W-DF315M	508	457	216	315	M24	1245	1215	89	597	640	533	38	875	776	330	526	2 x M63 + 1 x M20	
W-DF315L	508	508	216	315	M24	1315	1285	89	597	640	583	38	875	776	330	526	2 x M63 + 1 x M20	
W-DF355S	610	500	254	355	M24	1485	1415	100	710	732	626	27	975	874	330	526	2 x M63 + 1 x M20	
W-DF355M	610	560	254	355	M24	1605	1535	100	710	732	686	27	975	874	330	526	2 x M63 + 1 x M20	
W-DF355L	610	630	254	355	M24	1655	1585	100	710	732	756	27	975	874	330	526	2 x M63 + 1 x M20	

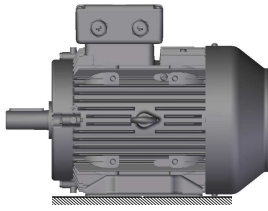
Type	4 pole +								2 pole							
	Shaft								Shaft							
	D	E	F	G	GD	EB	ED	DH	D	E	F	G	GD	EB	ED	DH
W-DF200LX	55	110	16	49	10	100	5	M20 x 42	55	110	16	49	10	100	5	M20 x 42
W-DF225S	60	140	18	53	11	125	5	M20 x 42	55	110	16	49	10	100	5	M20 x 42
W-DF225M	60	140	18	53	11	125	5	M20 x 42	55	110	16	49	10	100	5	M20 x 42
W-DF250S	70	140	20	62,5	12	125	5	M20 x 42	60	140	18	53	11	125	5	M20 x 42
W-DF250M	70	140	20	62,5	12	125	5	M20 x 42	60	140	18	53	11	125	5	M20 x 42
W-DF280S	80	170	22	71	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
W-DF280M	80	170	22	71	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
W-DF315S	85	170	22	76	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
W-DF315M	85	170	22	76	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
W-DF315L	85	170	22	76	14	160	5	M20 x 42	65	140	18	58	11	125	5	M20 x 42
W-DF355S	100	210	28	90	16	200	5	M24 x 50	75	140	20	67,5	12	125	5	M24 x 50
W-DF355M	100	210	28	90	16	200	5	M24 x 50	75	140	20	67,5	12	125	5	M24 x 50
W-DF355L	100	210	28	90	16	200	5	M24 x 50	75	140	20	67,5	12	125	5	M24 x 50

Type	IM B5, IM B35 mounting					
	M	N	P	S	T	LA
W-DF200LX	350	300	400	19	5	19
W-DF225S	400	350	450	19	5	19
W-DF225M	400	350	450	19	5	19
W-DF250S	500	450	550	19	5	25
W-DF250M	500	450	550	19	5	25
W-DF280S	500	450	550	19	5	25
W-DF280M	500	450	550	19	5	25
W-DF315S	600	550	660	24	6	29
W-DF315M	600	550	660	24	6	29
W-DF315L	600	550	660	24	6	29
W-DF355S	740	680	800	24	6	28
W-DF355M	740	680	800	24	6	28
W-DF355L	740	680	800	24	6	28

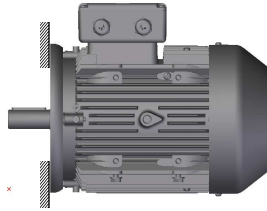


1 - add 25mm when cable entry is facing drive end
 2 - add 50mm when cable entry is facing drive end

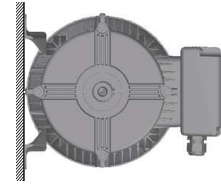
Mounting option



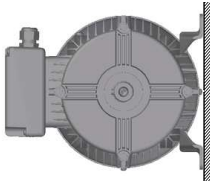
IM B3
IM 1001
foot mounted



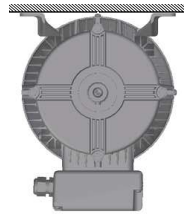
IM B5
IM 3001
flange at DE no feet



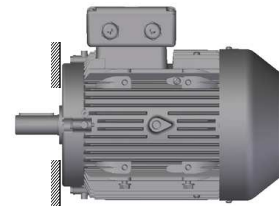
IM B6
IM 1051
foot wall mounted with
feet on left hand side



IM B7
IM 1061
foot wall mounted with
feet on right hand side



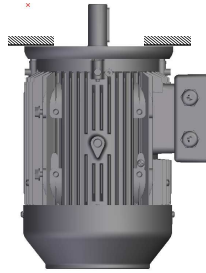
IM B8
IM 1071
ceiling mounted with feet
above motor



IM B14
IM 3601
face at DE no feet



IM V1
IM 3011
flange at DE shaft down
no feet



IM V3
IM 3031
flange at DE shaft up
no feet



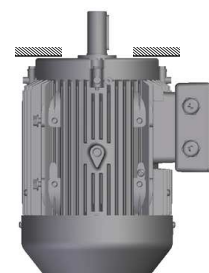
IM V5
IM 1011
vertical foot wall mounted
shaft down



IM V6
IM 1031
vertical foot wall mounted
shaft up



IM V18
IM 3611
face at DE no feet
shaft down



IM V19
IM 3631
face at DE no feet
shaft up

Technical information:

Mechanical

Bearings and greasing arrangement

Bearings are pre-packed with a grease type dependant on frame size and re-greasing facility as detailed in table opposite:

Standard and re-greasing facilities			
Type	Re-greasing facility	Polyurea	Lithium complex
80 - 180	Available	EA6 with temperature range of -40°C to +160°C	Esso Unirex N3 with temperature range of -30°C to +140°C
200 - 355	Standard		

Bearing references and oil seals							
Type		Polarity	Bearings ⁽¹⁾		Oil seals ⁽²⁾		
European	BS		Drive end	Non-drive end	Drive end	Non-drive end	
WU-DF80M	W-DF80M	All	6204ZZ	6003ZZ	20 x 30 x 7	17 x 28 x 6	
WU-DF90S/L	W-DF90S/L	All	6205ZZ	6203ZZ	25 x 35 x 7	17 x 28 x 6	
WU-DF100L/LF	W-DF100L/LF	All	6206ZZ	6205ZZ	30 x 42 x 7	25 x 37 x 7	
WU-DF112M	W-DF112M	All	6206ZZ	6205ZZ	30 x 42 x 7	25 x 37 x 7	
WU-DF132S/M	W-DF132S/M	All	6208ZZ	6305ZZ	40 x 52 x 7	25 x 37 x 7	
WU-DF160M/L	W-DF160M/L	All	6309ZZ	6307ZZ	45 x 60 x 8	35 x 47 x 7	
WU-DF180M/L	W-DF180M/L	All	6310ZZ	6308ZZ	50 x 65 x 8	40 x 52 x 7	
WU-DF200LX	W-DF200LX	All	6312	6312	60 x 80 x 8 ⁽³⁾	60 x 80 x 8 ⁽³⁾	
WU-DF225S	W-DF225S	All	6313	6313	65 x 90 x 10 ⁽⁴⁾	65 x 90 x 10 ⁽⁴⁾	
WU-DF225M	W-DF225M	All	6314	6314	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
WU-DF250ME	W-DF250S	2	6314	6314	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	6316	6316	80 x 110 x 10 ⁽³⁾	80 x 110 x 10 ⁽³⁾	
WP-UDF280SE	WP-DF250M	2	6314	6314	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	6318	6318	90 x 120 x 12 ⁽³⁾	90 x 120 x 12 ⁽³⁾	
WP-UDF280ME	WP-DF280S	2	6314	6314	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	6318	6318	90 x 120 x 12 ⁽³⁾	90 x 120 x 12 ⁽³⁾	
WP-UDF315SE	WP-DF280M	2	6316	6316	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	6319	6319	90 x 120 x 12 ⁽³⁾	90 x 120 x 12 ⁽³⁾	
WP-UDF315ME	WP-DF315S	2	6316	6316	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	6319	6319	90 x 120 x 12 ⁽³⁾	90 x 120 x 12 ⁽³⁾	
WP-UDF315M/L	WP-DF315M/L	2	6316	6316	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	6319	6319	90 x 120 x 12 ⁽³⁾	90 x 120 x 12 ⁽³⁾	
WP-UDF355S/M/L	WP-DF355S/M/L	2	N316	6316	70 x 90 x 10 ⁽⁴⁾	70 x 90 x 10 ⁽⁴⁾	
		4up	N324	6324	115 x 145 x 14 ⁽³⁾	115 x 145 x 14 ⁽³⁾	

(1) - Frame sizes 80 and 90 have bearings with CN clearances, frame sizes 100 to 355 have bearings with C3 clearance 'medium' series
(2) - Size are in mm, and represent bore x diameter x width
Material: (3) - Nitrile rubber (4) - Silicon rubber

Grease life expected at 80°C bearing temperature x 10 ³ hours									
Type		3000 min ⁻¹		1500 min ⁻¹		1000 min ⁻¹		750 min ⁻¹	
European	BS	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
WU-DF80-112	W-DF80-112	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
WU-DF132	W-DF132	30.0	25.0	30.0	30.0	30.0	30.0	30.0	30.0
WU-DF160	W-DF160	29.0	19.0	30.0	30.0	30.0	30.0	30.0	30.0
WU-DF180	W-DF180	24.0	16.0	30.0	30.0	30.0	30.0	30.0	30.0
WU-DF200LX	W-DF200LX	12.6	8.2	30.0	20.3	30.0	27.8	30.0	30.0
WU-DF225S	W-DF225S	12.6	8.2	30.0	20.3	30.0	27.8	30.0	30.0
WU-DF225M	W-DF225M	11.3	7.4	29.5	19.2	30.0	26.0	30.0	30.0
WU-DF250ME	W-DF250S	11.3	7.4	26.3	17.1	30.0	23.6	30.0	29.3
WP-UDF280SE	WP-DF250M	11.3	7.4	23.4	15.2	30.0	21.3	30.0	27.8
WP-UDF280ME	WP-DF280S	11.3	7.4	23.4	15.2	30.0	21.3	30.0	27.8
WP-UDF315SE	WP-DF280M	9.4	6.1	21.3	13.8	30.0	20.3	30.0	26.0
WP-UDF315ME	WP-DF315S	9.4	6.1	21.3	13.8	30.0	20.3	30.0	26.0
WP-UDF315M/L	WP-DF315M/L	9.4	6.1	21.3	13.8	30.0	20.3	30.0	26.0
WP-UDF355S/M/L ⁽¹⁾	WP-DF355S/M/L ⁽¹⁾	5.0	3.3	8.2	5.3	16.2	10.5	24.5	15.9
WP-UDF355S/M/L ⁽²⁾	WP-DF355S/M/L ⁽²⁾	9.4	6.1	13.5	8.8	22.5	14.6	30.0	19.5

(1) - DE = Drive End
(2) - NDE = Non Drive End

Technical information:

Mechanical

Approximate shipping specifications

European Type	BS Type	Net weight (kg)	Gross weight (kg)	Cubage (m ³)
WU-DF80M	W-DF80M	15	16.5	0.02
WU-DF90S/L	W-DF90L	30.5	31.5	0.02
WU-DF100L	W-DF100L	41.8	44.3	0.04
WU-DF112M	W-DF112M	55.2	58.2	0.06
WU-DF132S	W-DF132S	78.1	81.1	0.08
WU-DF132M	W-DF132M	82.6	88.6	0.08
WU-DF160M	W-DF160M	121	133	0.15
WU-DF160L	W-DF160L	133	145	0.15
WU-DF180M	W-DF180M	162	178	0.21
WU-DF180L	W-DF180L	177.5	193.5	0.21
WU-DF200LX	W-DF200LX	255	270	0.30
WU-DF225S	W-DF225S	320	335	0.37
WU-DF225M	W-DF225M	375	390	0.37
WU-DF250ME	W-DF250S	420	460	0.63
WU-DF280SE	W-DF250M	570	610	0.70
WU-DF280ME	W-DF280S	660	721	1.2
WU-DF315SE	W-DF280M	800	871	1.2
WU-DF315ME	W-DF315S	1000	1095	1.8
WU-DF315M	W-DF315M	1100	1195	1.8
WU-DF315L	W-DF315L	1300	1395	1.8
WU-DF355S	W-DF355S	2000	2120	2.3
WU-DF355M	W-DF355M	2300	2420	2.3
WU-DF355L	W-DF355L	2500	2620	2.3

Table includes average motor weight with B3 (foot) mounting type.

Axial and radial loads frames 80 - 180

Maximum permissible external axial and radial loads in Newtons*								
Type	Poles	Horizontal shaft		Vertical shaft				Maximum permissible radial load end of shaft (horizontal mounting)
		Load towards motor	Load away from motor	Shaft up		Shaft down		
				Load towards motor	Load away from motor	Load towards motor	Load away from motor	
WU-DF80M	2	339	539	321	565	362	521	774
	4	303	503	283	530	330	583	729
	6	284	484	260	516	316	460	646
WU-DF90L	2	444	684	421	716	476	661	915
	4	398	638	366	682	442	606	854
	6	349	589	309	641	401	549	720
WU-DF100L	2	781	1101	743	1159	839	1063	1295
	4	710	1030	655	1107	787	975	1215
	6	560	880	506	963	643	826	1145
WU-DF100LF WU-DF112M	2	768	1088	715	1170	850	1035	1295
	4	690	1010	612	1131	811	932	1202
	6	541	861	463	979	659	783	1141
WU-DF132	2	1355	1707	1266	1838	1486	1618	2114
	4	1253	1605	1130	1779	1427	1482	2068
	6	1167	1519	1035	1711	1359	1387	1968
WU-DF160	2	2144	2639	1951	2920	2425	2446	3613
	4	2123	2618	1895	2959	2464	2390	3738
	6	1973	2468	1669	2905	2410	2164	3544
WU-DF180	2	2711	3274	2465	3667	3104	3027	4374
	4	2749	3312	2426	3801	3238	2988	4556
	6	2575	3138	2166	3785	3222	2728	4334

* All figures are based on L_{na} bearing life of 20.000 hours. L_{na} = adjusted L10 life rating taking account of:
- reliability - material improvements - lubrication conditions

Technical information:

Mechanical

Axial and radial loads frames 200 - 355

Maximum permissible external axial thrust and radial loads in Newtons [N]*											
Type	Poles	Horizontal shaft		Vertical shaft				Maximum permissible radial load end of shaft (horizontal mounting)			
		Load towards motor	Load away from motor	Shaft up		Shaft down		Standard ball bearing		Roller bearing	
				Load towards motor	Load away from motor	Load towards motor	Load away from motor	European frame	BS frame	European frame	BS frame
WU-DF200LX W-DF200LX ¹	2	5435	4775	5005	5361	6021	4345	5125	5125	7541	7541
	4	6058	5398	5531	6121	6781	4871	5588	5588	7541	7541
	6	6055	5395	5457	6215	6875	4797	5536	5536	7541	7541
WU-DF225S W-DF225S ¹	4	6692	6122	5941	7177	7747	5371	5963	5963	8202	8202
	6	6770	6200	5935	7371	7941	5365	5982	5982	8202	8202
WU-DF225M W-DF225M ¹	2	6729	6197	6084	7082	7614	6213	6602	6602	8745	8745
	4	7530	6998	6745	8099	8631	6213	6868	6876	8921	8921
	6	7640	7108	6673	8463	8995	6141	6856	6856	8921	8921
WU-DF250ME W-DF250S ¹	2	6640	6108	5837	7209	7741	5305	6262	6262	8921	8921
	4	9012	8418	8030	9794	10388	7436	8163	8163	11342	14166
	6	9391	8797	8311	10311	10905	7717	8477	8477	11342	14166
WU-DF280SE W-DF250M ¹	2	6505	5911	5472	7352	7946	4878	5692	5897	8242	8921
	4	10241	9579	8943	11377	12039	8281	9260	9627	17105	14166
	6	10846	10184	9423	12157	12819	8761	9336	10182	17105	14166
WU-DF280ME W-DF280S ¹	2	6268	5736	5101	7355	7887	4569	5824	5795	9825	9503
	4	9774	9112	8014	11534	12196	7352	9136	8842	17423	17348
	6	10582	9920	8704	12524	13186	8042	9698	9386	17423	17348
WU-DF315SE W-DF280M ¹	2	7443	6849	5921	8957	9551	5327	6804	6804	11342	11342
	4	10305	9965	8299	12719	13059	7959	9443	9443	17414	17414
	6	11190	10850	9050	13810	14150	8710	10042	10042	17414	17414
WU-DF315ME W-DF315S ¹	2	7337	6743	5654	9082	9676	5060	6680	6680	11342	11342
	4	10077	9737	7672	13044	13384	7332	9121	9121	17414	20887
	6	10958	10618	8419	14131	14471	8079	9734	9734	17414	20887
WU-DF315M W-DF315M ¹	2	7398	6804	5664	9154	9748	5070	6885	6885	11342	11342
	4	10192	9852	8006	12862	13202	7666	9482	9482	17414	20748
	6	11060	10720	8715	13971	14311	8375	10066	10066	17414	20748
WU-DF315L W-DF315L ¹	2	7055	6461	5050	9164	9758	4456	6603	6606	11342	11342
	4	10008	9668	7501	13123	13463	7161	9207	9207	17414	20748
	6	10872	10532	8207	14229	14569	7867	9801	9801	17414	20748
WU-DF355S W-DF355S ¹	2	6118	5524	3136	9692	10286	2542			12627	12627
	4	12994	11454	8799	17389	18929	7259			27533	27533
	6	14038	12498	9387	19143	20683	7847			27533	27533
WU-DF355M W-DF355M ¹	2	5779	5185	2326	10050	10644	1732			12627	12627
	4	12528	10988	7511	18055	19595	5971			27533	27533
	6	13148	11608	7523	19533	21073	5983			27533	27533
WU-DF355L W-DF355L ¹	2	5595	5001	1734	10396	10990	1140			12627	12627
	4	12343	10803	7038	18282	19822	5498			27533	27533
	6	12936	11396	6980	19794	21334	5440			27533	27533

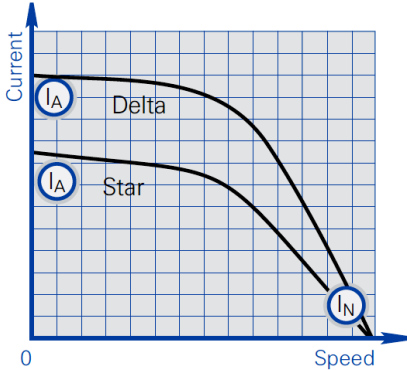
* All figures are based on L_{na} bearing life of 20.000 hours. L_{na} = adjusted L10 life rating taking account of:

- reliability - material improvements - lubrication conditions

1 - BS frame reference

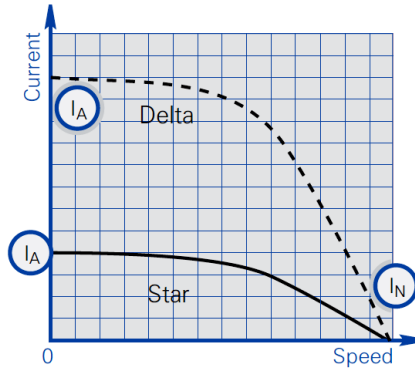
Technical information: Electrical

Typical speed/current curve



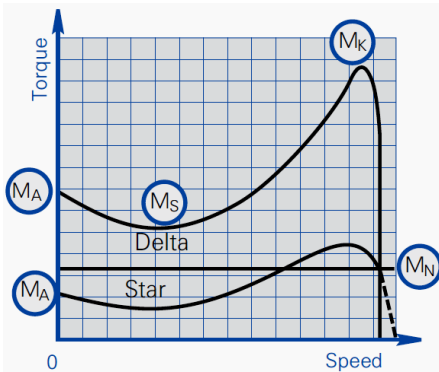
Frame size 80 - 180

Typical speed/current curve



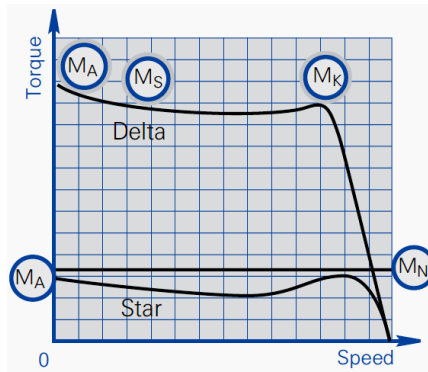
Frame size 200 - 355

Typical speed/torque curve



Frame size 80 - 180

Typical speed/torque curve



Frame size 200 - 355

Description

- I_A Starting current
- I_N Full load current
- M_A Starting torque or locked rotor torque
- M_S Pull up torque or run up torque
- M_k Pull out torque or breakdown torque
- M_N Full load torque

Torque/speed curves for specific motors can be supplied on request.

Performance figures are subject to IEC tolerance. Performance figures are based on a 400 volt winding.

To calculate I_N on special voltages, multiply the I_N at 400 volts by the following factors:

Voltage	220	346	365	420	440	500	550
Factor	1.82	1.16	1.1	0.95	0.91	0.80	0.73

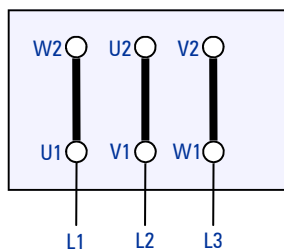
Notes

During the run up period in Star, there must be an adequate excess of motor torque over the load torque. The change to delta must not occur until the motor is near the operating speed.

Motors are wound for either 230/400 volts or 400/690 volts.

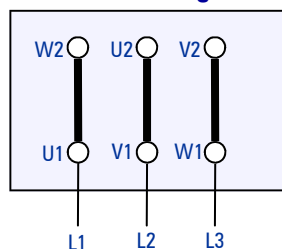
Connection diagrams

Star Delta



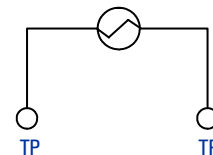
D.O.L.
 Δ

Dual Voltage



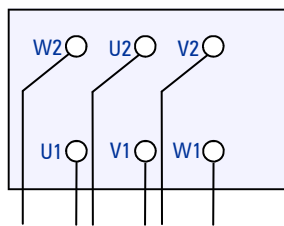
Δ

Thermistors



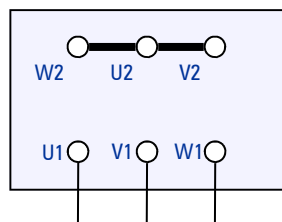
Connect to thermistor control unit.

In motor size 71 up to 180 thermistors are terminated in a separate auxiliary box



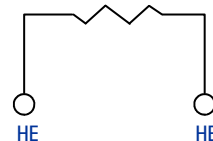
Motors output power => 4kW

Y/Δ



Y

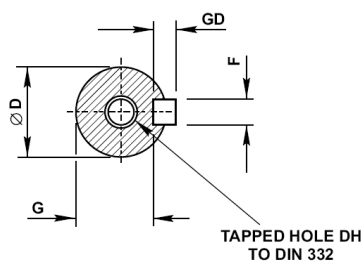
Heaters



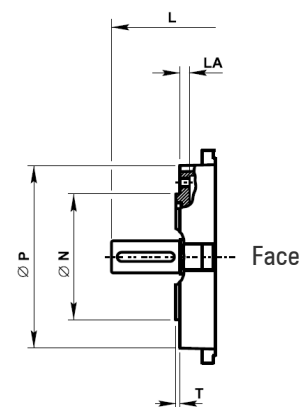
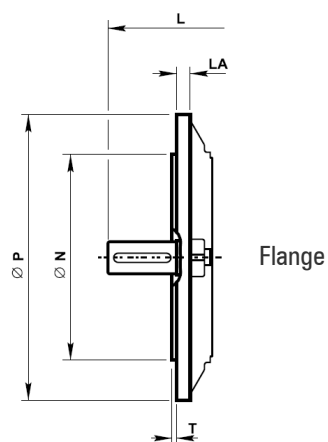
Connect to single phase voltage.

Dimensions

Shaft		
Dim D	British and European	
	Tol	Limits
19 to 28	j6	+0,009 - 0,004
32 to 48	k6	+0,018 - 0,002
55 to 80	m6	+0.030 +0.011
85 to 110	m6	+0.035 +0.013



Flange	Face	Tolerance to IEC 60072-1	
		Tol	Limits
80	80	j6	+0.012
			-0.007
95 to 110	95 to 110	j6	+0.013
			-0.009
130 to 180	130 to 180	j6	+0.014 - 0.011
230 to 250		h6	+0.016 - 0.013
300		h6	+0.000 -0.032
350		h6	+0.000 -0.036
450		h6	+0.000 -0.040
550		h6	+0.000 -0.044
680		h6	+0.000 -0.050



Notes

- All dimensions in millimetres
- Drain holes are standard on frames 160-355 and on request for frames 80-132
- Please note that 80 frame motors are available as terminal box right or left.
- Cable entry can be arranged in any one of four positions at 90° intervals
- No eyebolts on frame sizes 80 (all poles) and 90 (6p and 8p)
- Dimensions should not be used for installation purposes unless specially endorsed

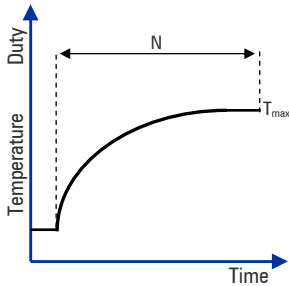
Notes

- B5 mounted motors have suffix '-D' in the frame reference, eg WU-DF132MVX-D and B3/B5 mounted motors have suffix '-H' in the frame reference, eg WU-DF132MVX-H
- B14 mounted motors have suffix 'C' in the frame reference, eg WU-DF132MVX-C and B3/B14 mounted motors have suffix '-H' in the frame reference, eg WU-DF132MVX-H
- Pad mounted motors have suffix '-P' in the frame reference, eg WU-DF132MVX-P

Useful information

Motor Duty Types

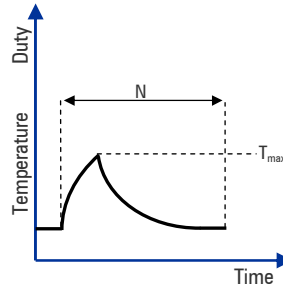
IEC 60034-1 defines various duty types that describe how the load and motor output varies with time. The motor must undergo a load test without exceeding the temperature limits laid down in the specification.



S1 continuous duty

Operation at a constant load and long enough for thermal equilibrium to be reached.

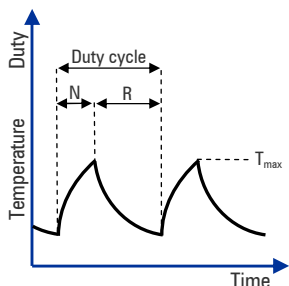
N - Operation Rated Condition
T_{max} - Maximum Temperature Rise



S2 short time duty

Operation at constant load for a given time that is shorter than the time needed to reach thermal equilibrium, followed by a rest and de-energised period. The de-energisation period should be long enough to allow the motor to reach a temperature that does not deviate from the temperature of the cooling medium by 2K.

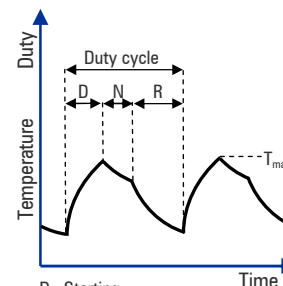
N - Operation Rated Condition
T_{max} - Maximum Temperature Rise



S3 intermittent duty

A sequence of identical duty cycles, where each cycle is in two parts, one at constant load and the other at rest and de-energised. In this type of duty the starting current has no significant effect on the temperature rise. The duty cycle is too short for thermal equilibrium to be reached.

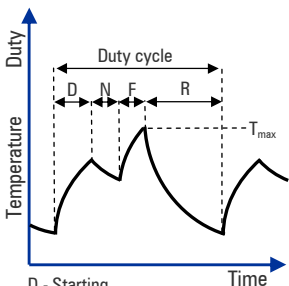
N - Operation Rated Condition
R - At rest / De-energised
T_{max} - Maximum Temperature Rise



S4 intermittent duty with starting

A sequence of individual duty cycles, where each cycle consists of a start that is sufficiently long to have a significant effect on the motor temperature, a period of constant load and a period at rest and de-energised. In this type of duty the starting current is insignificant on the temperature rise. The duty cycles are too short for thermal equilibrium to be reached.

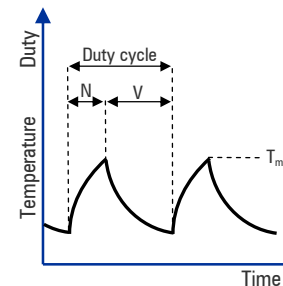
D - Starting
N - Operation Rated Condition
R - At rest / De-energised
T_{max} - Maximum Temperature Rise



S5 intermittent duty with electrical braking

A sequence of identical duty cycles, where each cycle consists of a start, a period at constant load followed by rapid electrical braking, and a rest and de-energised period. The duty cycle is too short for thermal equilibrium to be reached.

D - Starting
N - Operation Rated Condition
F - Electrical Braking
R - At rest / De-energised
T_{max} - Maximum Temperature Rise



S6 continuous operation periodic duty

A sequence of identical duty cycles, where each cycle is in two parts, one at constant load and the other at no load, no rest and no de-energised period. The duty cycles are too short for thermal equilibrium conditions to be reached.

N - Operation Rated Condition
V - Operation at No Load
T_{max} - Maximum Temperature Rise

IP Rating

1st Digit	Protection from solid objects	2nd Digit	Protection from moisture
0	No special protection	0	No special protection
1	Protection from a large part of the body such as a hand, from solid objects greater than 50mm in diameter.	1	Protection from dripping water.
2	Protection against fingers or other object not greater than 80mm in length and 12mm in diameter.	2	Protection from vertically dripping water.
3	Protection from entry by tools, wires, etc., with a diameter of thickness greater than 2.5mm.	3	Protection from water sprayed at an angle up to 60° from the vertical.
4	Protection from entry by solid objects with a diameter or thickness greater than 1.0mm	4	Protection from water splashed from any direction.
5	Protection from the amount of dust that would interfere with the operation of the equipment.	5	Protection from water projected from a nozzle from any direction.
6	Dust tight.	6	Protection against heavy seas, or water from temporary flooding.
		7	Protection against immersion.
		8	Protection against complete, continuous submersion in water.

IEC/EN 60034-5 and EN 60529 outlines an international classification system for the sealing effectiveness of enclosures of electrical equipment against the intrusion into the equipment of foreign bodies (i.e. tools, dust, fingers) and moisture. This classification system utilizes the letters "IP" ("Ingress Protection") followed by two or three digits. (A third digit is sometimes used. An "X" is used for one of the digits if there is only one class of protection; i.e. IPX4 which addresses moisture resistance only.)

Degrees of Protection - First Digit

The first digit of the IP code indicates the degree that persons are protected against contact with moving parts (other than smooth rotating shafts, etc.) and the degree that equipment is protected against solid foreign bodies intruding into an enclosure.

Degrees of Protection - Second Digit

The second digit indicates the degree of protection of the equipment inside the enclosure against the harmful entry of various forms of moisture (e.g. dripping, spraying, submersion, etc.)

Notes

A large rectangular area with a light blue background and horizontal white lines, intended for handwritten notes. The lines are evenly spaced and run horizontally across the entire width of the area.

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