

### High-performance servo motors for SV & Compax drives

Parker HDX and HBMR Series brushless motors are suitable for use with the SV and Compax range of servo drives and controllers. They offer high dynamic performance in a cost-effective package, and with the extensive list of available options they can be tailored to a wide range of applications.

HDX and HBMR motors are three-phase designs using high-energy Samarium Cobalt magnets in a low-inertia rotor. With their high resistance to demagnetisation, these rare-earth magnets allow high acceleration currents to be applied for optimum performance in point-to-point positioning. For contouring applications, the skewed rotor design helps to achieve very smooth rotation over the entire speed range. Optional failsafe holding brakes ensure power-failure security in vertical axes. All motors are fitted with a resolver as standard and in addition have the option of accepting a variety of encoder types.

The robust brushless construction and IP65 enclosure protection (IP64 at the shaft) ensure a long maintenance-free life in all normal industrial environments. Replaceable bearings and seals guarantee extended motor life in arduous applications.

Typical application areas include textile, printing and packaging machines, automatic assembly equipment and general industrial automation.

#### HDX & HBMR series features

- High-energy Samarium-Cobalt magnets
- Sinusoidal back-EMF
- Peak torque up to 3 times continuous rating
- Maximum speeds up to 8000 rpm
- Skewed stator design for smooth rotation
- Choice of six frame sizes
- Enclosure protection IP65, shaft sealing IP64
- Nitrile shaft seal
- Class F insulation
- Motor connections via terminal box or MS connector
- Integral resolver with MS connector
- Temperature sensors incorporated in windings
- Standard flanges to DIN 42955/IEC72
- All motors available with holding brake option
- Encoder mounting facility
- Extruded aluminium motor body
- Industry-standard keyed shafts
- Alternative shaft styles available
- Matt black paint finish



#### Options

HDX and HBMR Series motors can be supplied with a number of options as listed below. Please consult your supplier for ordering information.

##### **Holding brake**

All motor sizes may be fitted with a holding brake. This is installed behind the motor flange and in most cases does not affect the motor length. The addition of a brake to the HDX55 or HDX70 motors increases the body length by 36mm and 27mm respectively.

The brake must be energised to release and as standard operates from 24V DC. Alternative ratings of 90V AC and 110V AC can be supplied. There is also a high-torque brake available with certain motors.

##### **Encoder mounting flange**

If an encoder is required in addition to the integral resolver, a flange is fitted to the rear of the motor and the shaft is extended. An IP65 encoder cover is available.

##### **Rotational tolerance**

Motors are normally manufactured to DIN 42999 standard "N" for rotational tolerance (shaft/flange squareness and runout). For more critical applications, for instance when backlash-free gears are fitted, the motor can be supplied with a closer tolerance conforming to DIN standard "R".

##### **Flat shaft**

Standard motor shafts have a keyway as detailed in the dimension drawings. A shaft with a machined flat can be supplied as an alternative.

##### **Threaded shaft**

A tapped hole can be provided in the end of the shaft with the following dimensions:

HDX55:	M4 x 10	HDX70:	M5 x 10
HDX92:	M5 x 10	HDX115:	M6 x 15
HDX142:	M8 x 15	HBMR190:	M12 x 20

Compax or SV drive type	Motor type	Ref. No.①	Rated speed (rpm)②	Rated torque (Nm)③	Rated current (A rms)	Rated power (kW)	Moment of inertia④ (kg-mm <sup>2</sup> )	Weight (kg)
<b>P1xxM</b>	HDX55C4-32S	0126	5000	0.35	1.04	0.18	24	1.4
Icont 5.5A	<b>HDX70C4-44S</b>	<b>0123</b>	<b>5000</b>	<b>1.1</b>	<b>2.3</b>	<b>0.58</b>	<b>60</b>	<b>2.6</b>
Ipeak 8.5A	HDX92C4-44S	0124	5000	1.16	2.35	0.61	85	4.3
3 x 400V AC in	<b>HDX92E4-44S</b>	<b>0125</b>	<b>5000</b>	<b>1.8</b>	<b>3.6</b>	<b>0.94</b>	<b>118</b>	<b>5.2</b>
	<b>HDX115A6-88S</b>	<b>0221</b>	<b>3800</b>	<b>3.2</b>	<b>3.0</b>	<b>1.27</b>	<b>240</b>	<b>6.6</b>
<b>02xxM</b>	<b>HDX92E4-44S</b>	<b>0125</b>	<b>5000</b>	<b>1.8</b>	<b>3.6</b>	<b>0.94</b>	<b>118</b>	<b>5.2</b>
Icont 6.5A	HDX115A6-88S	0221	3800	3.2	3.0	1.27	240	6.6
Ipeak 8.5A	<b>HDX115C6-88S</b>	<b>0222</b>	<b>3800</b>	<b>5.2</b>	<b>5.1</b>	<b>2.07</b>	<b>460</b>	<b>9</b>
3 x 400V AC in	HDX115E6-130S	0223	2500	8.2	5.8	2.15	680	11.4
<b>05xxM</b>	<b>HDX115C6-88S</b>	<b>0222</b>	<b>3800</b>	<b>5.2</b>	<b>5.1</b>	<b>2.07</b>	<b>460</b>	<b>9</b>
Icont 11.5A	HDX115E6-88S	0320	3800	7.5	7.3	2.98	680	11.4
Ipeak 17A	<b>HDX142C6-88S</b>	<b>0321</b>	<b>3800</b>	<b>8.6</b>	<b>8.5</b>	<b>3.42</b>	<b>1150</b>	<b>14</b>
3 x 400V AC in	HDX142E6-130S	0322	2500	13.6	9.2	3.56	1700	18
<b>15xxM</b>	HDX142E6-88S	0420	3800	12.6	13.0	5.01	1700	18
Icont 25A	<b>HDX142G6-88S</b>	<b>0421</b>	<b>3800</b>	<b>16.0</b>	<b>15.6</b>	<b>6.36</b>	<b>2200</b>	<b>21</b>
Ipeak 50A	HDX142J6-88S	0520	3800	18.6	19.0	7.4	2700	25
3 x 400V AC in	HBMR190C6-130S	0403	2400	17.4	12.1	4.37	5500	26
	<b>HBMR190E6-88S</b>	<b>0500</b>	<b>3500</b>	<b>19.0</b>	<b>18.5</b>	<b>6.96</b>	<b>8200</b>	<b>32</b>
	HBMR190J6-180S	0501	1700	48.0	25.0	8.54	14000	45

This table shows typical motor-drive combinations. The preferred packages are shown in blue and these correspond to the torque-speed graphs on the next page. Details of additional motors and alternative combinations are available on request.

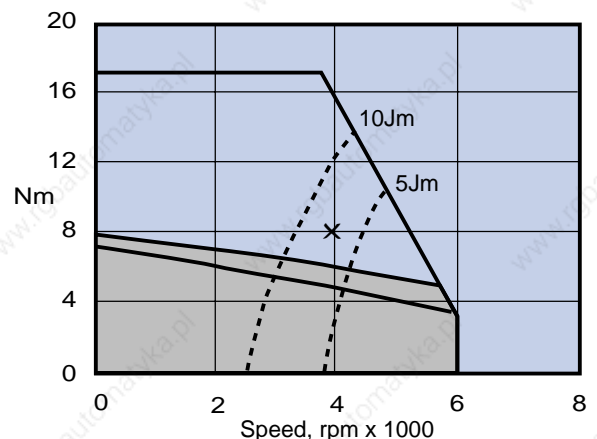
### Notes:

- ① The motor characteristics are stored in the Compax & SV drives under this number.
- ② The rated speed is based on a supply voltage 15% below nominal, and allows for 10% variation in drive characteristics and 10% tolerance on motor data.
- ③ Rated torque applies at the rated speed.
- ④ Moment of inertia figures include the feedback resolver. Inertia figures for the optional brake are listed separately.

### Power dump safe operating area

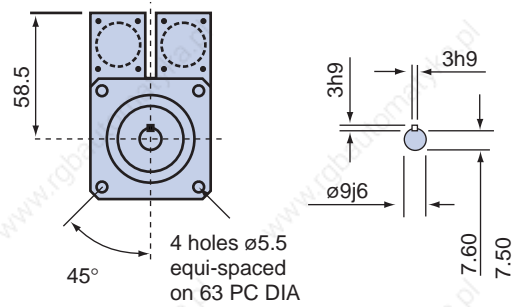
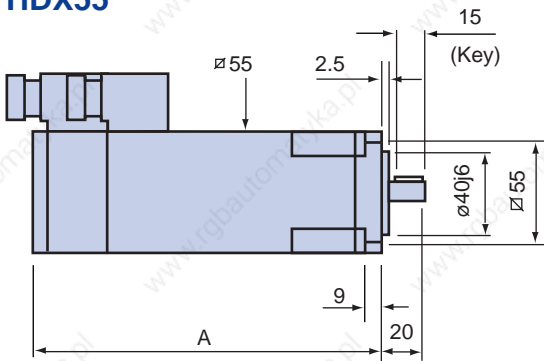
In addition to torque-speed data, the performance graphs also give an indication of the safe operating area of the power dump circuit in repetitive start-stop operation. The data is based on a 'worst case' system performing repeated trapezoidal moves with no dwell in between. The time at maximum speed is as short as the thermal rating of the motor will allow. Under these conditions, for any given load inertia, the power in the ballast resistor depends on the peak torque during deceleration and the maximum speed.

The broken lines represent different load inertias as a ratio of the motor inertia  $J_m$ . When the application requirements have been calculated, plot the point representing peak torque and maximum speed on the performance graph. If this point lies to the left of the corresponding inertia line, the resistor rating will not be exceeded. If it lies to the right, there is not necessarily a problem but further calculation is required to establish the dump power more accurately - please consult your supplier.



In the example shown, a peak torque of 8Nm and a maximum speed of 4000 rpm are acceptable with a load of 5 times the motor inertia. Note that this information is for general guidance purposes only and will not apply to light duty cycles.

### HDX55



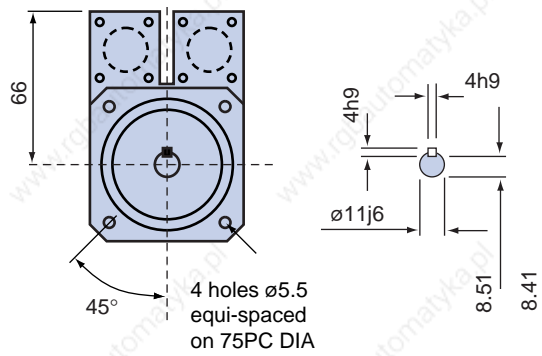
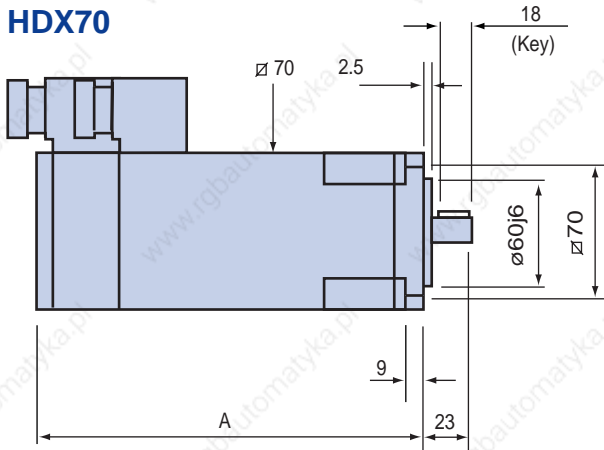
Length code	A	C	G
Dimension A (mm)*	122	140	176
Cont. torque (Nm)	0.2	0.4	0.8

\*Add 36mm for brake

Motor cable: **MOK15**

Resolver cable: **REK15**

### HDX70



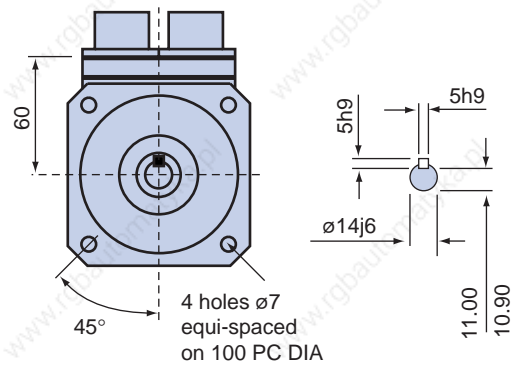
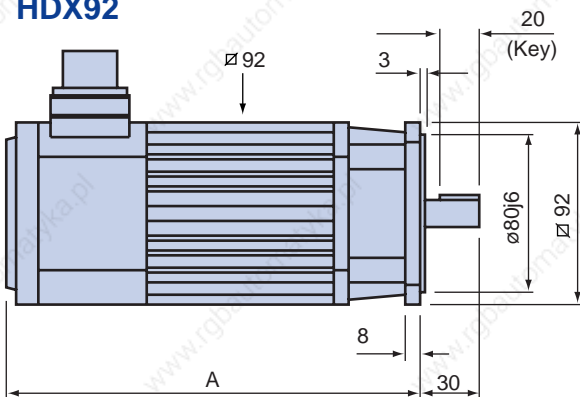
Length code	A	C	E
Dimension A (mm)*	131	158	185
Cont. torque (Nm)	0.6	1.2	1.8

\*Add 27mm for brake

Motor cable: **MOK15**

Resolver cable: **REK15**

### HDX92

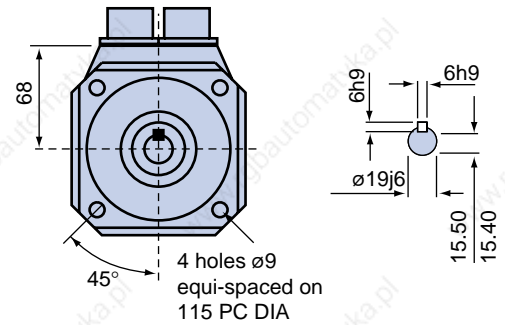
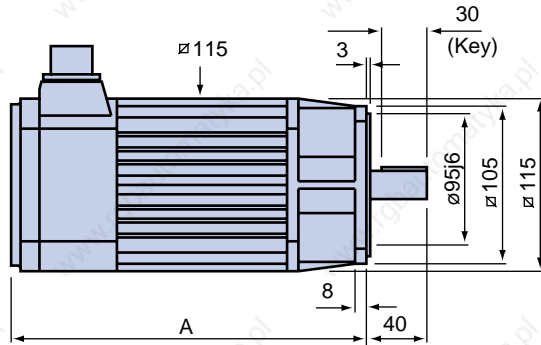


Length code	A	C	E	G
Dimension A (mm)	210	230	250	270
Cont. torque (Nm)	0.68	1.5	2.2	3.0

Motor cable: **MOK6**

Resolver cable: **REK5**

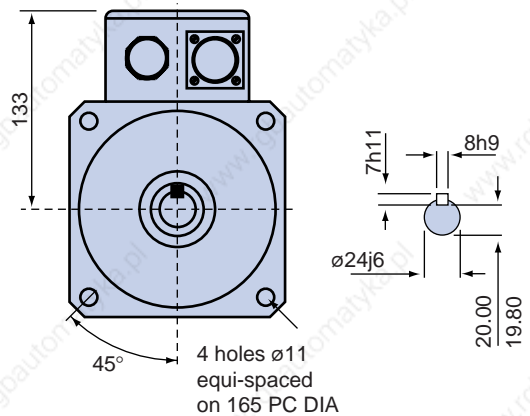
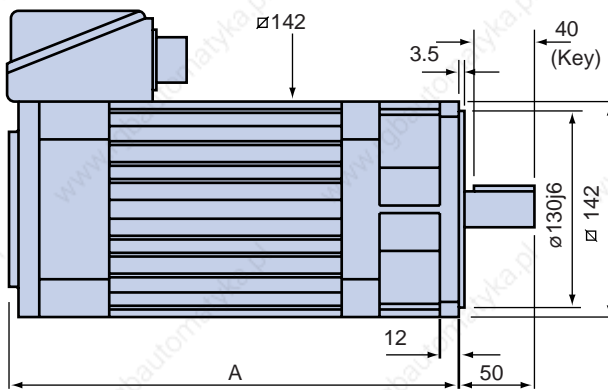
### HDX115



Length code	A	B	C	E
Dimension A (mm)	235	255	275	315
Cont. torque (Nm)	3.7	5.2	6.8	9.8

Motor cable: **MOK6**  
Resolver cable: **REK5**

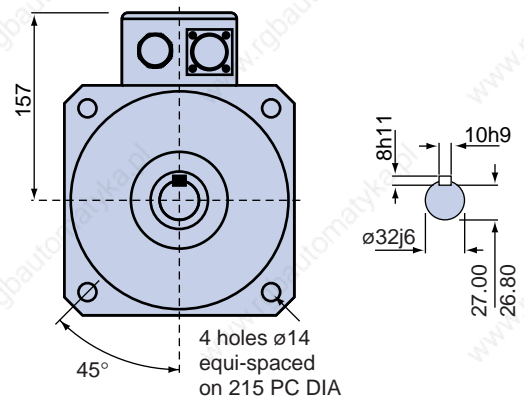
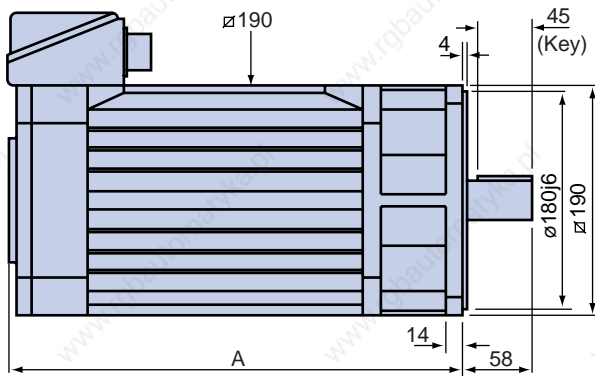
### HDX142



Length code	C	E	G	J
Dimension A (mm)	295	335	375	415
Cont. torque (Nm)	11.3	16.0	21.0	25.0

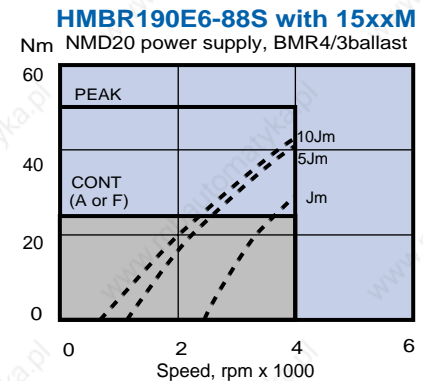
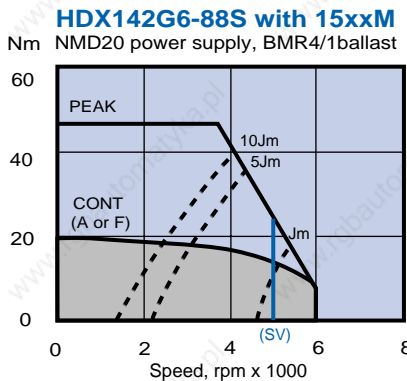
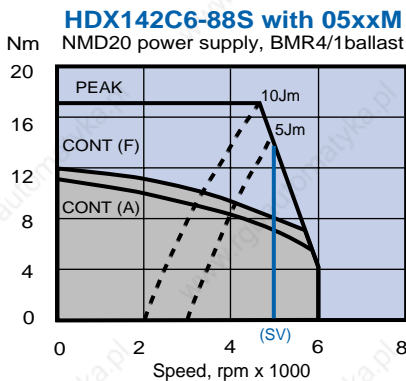
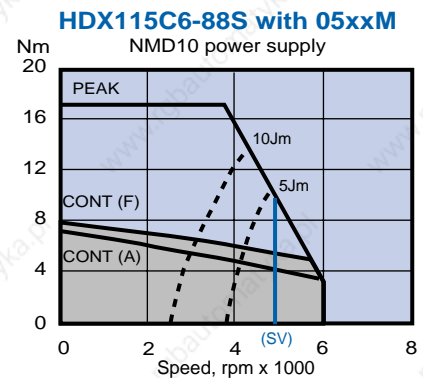
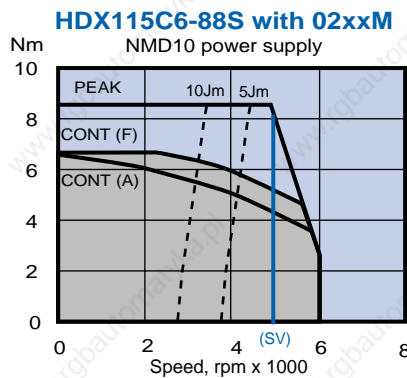
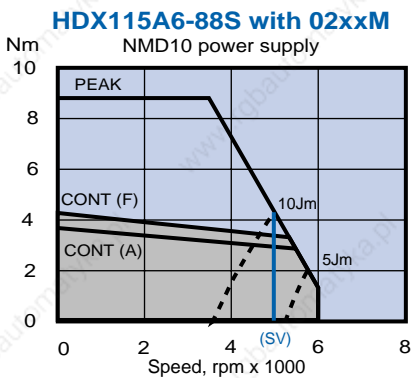
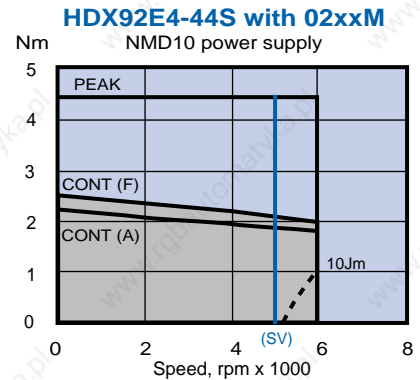
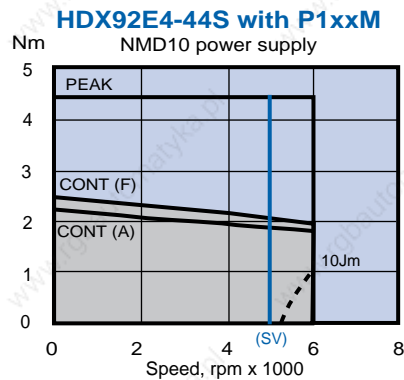
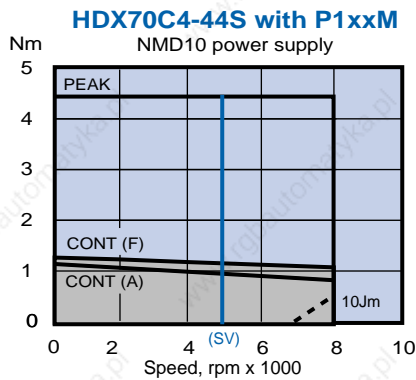
Motor cable: **MOK21**  
Resolver cable: **REK14**

### HBMR190



Length code	C	E	G	J
Dimension A (mm)	375	415	455	495
Cont. torque (Nm)	24	36	48	60

Motor cable: **MOK21**  
Resolver cable: **REK14**



- NOTES: 1) Continuous curves: (A) in free air, (F) flange mounted.  $\Delta T = 110^{\circ}\text{C}$ . Jm = motor inertia.  
2) When used with an SV-series drive, the maximum speed is limited to 5000 rpm as indicated by the blue line. The full speed range is available with Compax drives.

### Holding brake data (24V DC type)

Motor type	Holding torque (Nm)	Brake inertia (kg-mm <sup>2</sup> )	Brake current (A)
HDX55	1	1	0.29
HDX70	1 (2)	2 (4)	0.26 (0.35)
HDX92	5 (10)	13 (17)	0.5
HDX115	10 (13.5)	17 (17)	0.5
HDX142	18 (40)	200 (200)	1.0
HBMR190	50	940	1.6

Figures in brackets are for the high-torque version.

### Radial shaft loading

The following table shows the maximum load at the stated speed for a load applied half way along the shaft, and is based on a service life of 30,000 hours. Avoid applying large radial loads near the end of the shaft.

Motor	speed (rpm)	load (N)
HDX55	8000	150
HDX92	6000	200
HDX142	6000	600
HDX70	8000	200
HDX115	6000	350
HBMR190	4000	1150