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Characteristics and dimensions subject to change without notice.

YOUR LOCAL CORRESPONDENT

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HV800, HV900, HVA00 PERMANENT MAGNET, AUTO-CONTROLLED, SYNCHRONOUS SERVOMOTORS FOR SPINDLES

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Spindle motors are characterized by their constant torque range at low speed and their constant power range at high speed. This characteristic lies behind their use as main drives on machine tools like lathes and milling machines.

The trend in this area is towards higher feed speeds, compelling manufacturers to come up with compact, light-weight motors especially for on-board applications. Reduced cycle times are also leading to ever shorter acceleration and braking phases, making spindle motors more like axis servomotors.

The Parvex range of spindle motors has been designed with all this in mind, and draws on an innovative, patented idea for defluxing the machine with carefully phased stator currents.



HV SPINDLE MOTOR: AN INNOVATIVE APPROACH

The innovative principle developed by Parvex means that, starting from a certain speed (base speed), the machine's stator flux can be reduced at will by suitable phasing of the stator currents. This progressive flux control requires a special design of brushless motor and in particular of its rotor.

Flux-focusing technology uses a rotor engineered from a stack of open metal plates in which magnets are fitted, ensuring more compact and much more rugged construction.

This focused flux technology for brushless motors is the force behind our HX, HS, HD range of axis motors and has been applied again for HV spindle motors.

ADVANTAGES OF THE HV SPINDLE MOTOR

This technique means a constant power speed range with a ratio of 1:10 can be achieved without difficulty. What's more, the dynamic characteristics of HV motors match those of axis or feed servomotors, i.e.:

- very high mass torque to reduce masses to be moved or allow more compact design of the receiving machine,
- low inertia for rapid speed variations to minimize cycle time,
- high holding torque,
- tool change positioning feature,
- positional servo-control with very high stiffness (C-axis).

ELECTROSPINDLE BASED ON HW SPINDLE MOTOR

The electrospindle is an electromagnetic assembly comprising :

- ◇ the spindle with its shaft and bearings
- ◇ the spindle motor
- ◇ the accessories such as the chuck or tool grip
- ◇ the cooling jacket.

The HW electrospindle motor uses the basic principles of the HV motor. As there are no rotor losses and as stator losses are dissipated by water circulation, the assembly does not heat up, meaning there is very little axial expansion of the shaft and so extremely precise machining can be achieved.

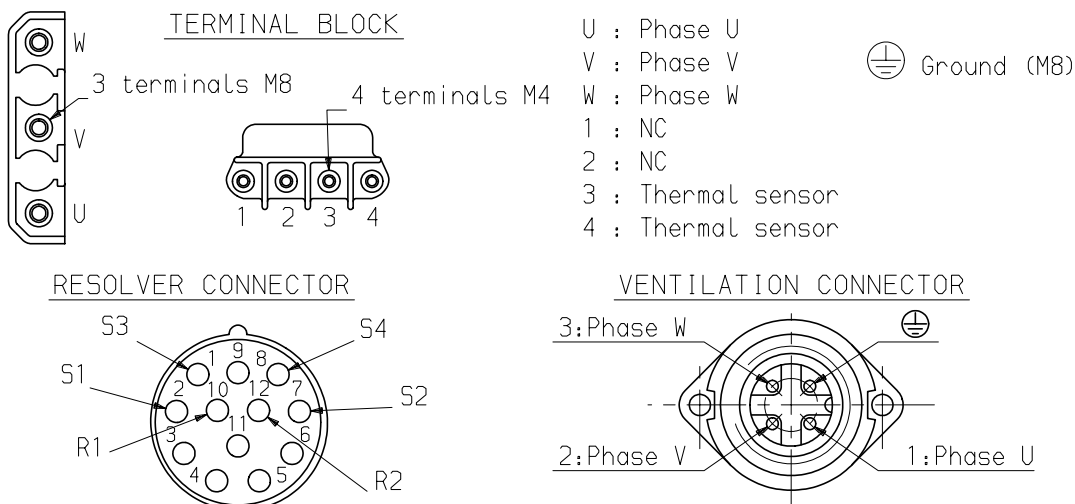
Ask for our special documentation on the HW motor for electrospindles.

HV SPINDLE MOTOR CONSTRUCTION

- TL flange fastening for HV8., brackets and flange for HV9.. and HVA..
- Smooth shaft as standard
- Rear fixed point
- Life-lubricated roller bearings
- Standard class R balance to ISO 2373
- IP 54 protection (including fan unit)
- Class F insulation
- Built-in resolver
- Black satin paint
- Independent axial ventilation :
 - ⇒ Supply voltage three-phase 230/400 Volts, 50 Hz
optional 460 V, 60 Hz
 - ⇒ Power consumption 40 W for HV8..
53/70 W for HV9..
110/150 W for HVA..
- Thermal protector, NC contact
 - ⇒ PTC sensor to be connected to variable speed control.
- OPTIONS :
 - ⇒ Tapped-hole flange
 - ⇒ Keyed shaft
 - ⇒ Class S balancing

HV MOTOR AND FAN CONNECTION

Power and thermal protector : terminal block
 Resolver and fan : connectors
 Connections below are viewed from above the connector plates fitted to the motor.



CHARACTERISTICS

HV8.. MOTOR + DIGIVEX 400 V AND 460 V SERVOAMPLIFIER

Motor-variable speed control combination	Motor torque S1/S3	Base / max motor speed 400 V	Motor power S1/S3 400 V	Base / max motor speed 460 V	Motor power S1/S3 460 V	Inertia	Mass	Maximum supply power during motor and brake duty (540V)
1	2	3	4	5	6	7	8	9
	N.m	tr/mn	kW	tr/mn	kW	kg.m ²	kg	kW
HV820EZ DIG. 16/32*	17/20.4	2390/8000	4.3/5.1	2790/8000	5/6	0.0035	21	5.6
HV830EM DIG. 32/64*	25/30	3400/8000	9/10.7	3940/8000	10.3/12.4	0.0049	26	11.4
HV840EM DIG. 32/64*	32/38.4	2660/8000	9/10.7	3060/8000	10.3/12.3	0.0063	30	11.5

HV9.. MOTOR + DIGIVEX 400 V AND 460 V SERVOAMPLIFIER

Motor-variable speed control combination	Motor torque S1/S3	Base / max motor speed 400 V	Motor power S1/S3 400 V	Base / max motor speed 460 V	Motor power S1/S3 460 V	Inertia	Mass	Maximum supply power during motor and brake duty (540V)
1	2	3	4	5	6	7	8	9
	N.m	tr/mn	kW	tr/mn	kW	kg.m ²	kg	kW
HV930EQ DIG. 32/64*	63.6/70	1480/7000	10/11	1730/7000	11.5/12.7	0.018	50	11.4
HV930EL DIG. 50/80	64/72.5	2170/7000	14.5/16.5	2580/7000	17/19.6	0.018	50	17
HV950EQ DIG. 32/64*	95/**	1020/7000	10/**	1200/7000	12/**	0.029	67	11.2
HV950EK DIG. 50/80	95/**	1570/7000	15.6/**	1810/7000	18/**	0.029	67	16.7

HVA.. MOTOR + DIGIVEX 400 V AND 460 V SERVOAMPLIFIER

Motor-variable speed control combination	Motor torque S1/S3	Base / max motor speed 400 V	Motor power S1/S3 400 V	Base / max motor speed 460 V	Motor power S1/S3 460 V	Inertia	Mass	Maximum supply power during motor and brake duty (540V)
1	2	3	4	5	6	7	8	9
	N.m	tr/mn	kW	tr/mn	kW	kg.m ²	kg	kW
HVA30JO DIG. 50/80	149/**	1050/6000	16.4/**	1210/6000	19/**	0.027	100	17.4
HVA30JH DIG. 100/120	140/157	1940/6000	28/32	2220/6000	33/36	0.027	100	32.4
HVA40JH DIG. 100/120	200/**	1500/6000	31/**	1740/6000	36/**	0.035	110	32.5
HVA40JG DIG. 150/150	200/240	1480/6000	31/37	1700/6000	36/43	0.035	110	38.6

* 460 V version available with DRS 15 kW supply only

** Motor with no S3 service

N.B. Torque values in column 2 are for slow rotation and base speed.

CHARACTERISTICS OF SPINDLE HV SERVOMOTORS

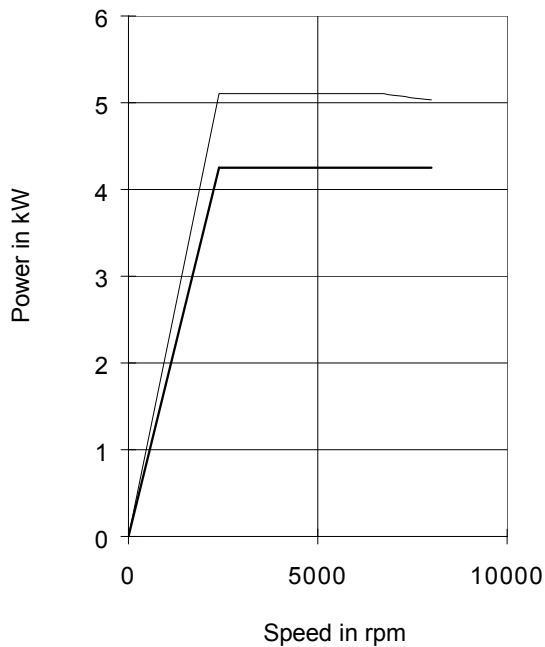
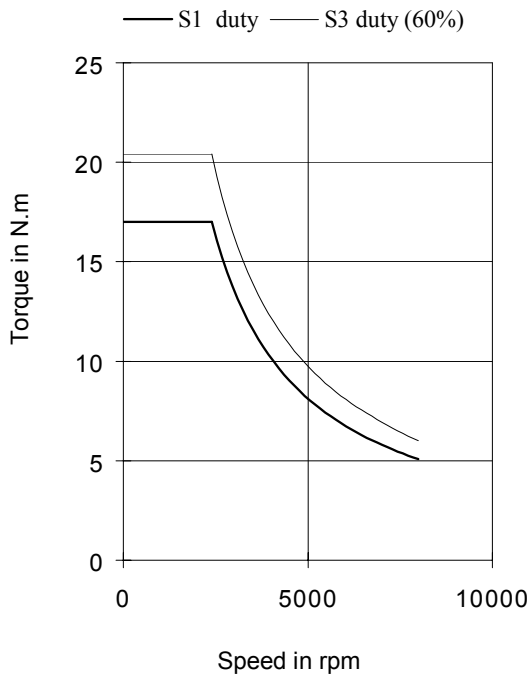
DC-BRUSHLESS MOTOR HV820EZ ELECTRONIC DRIVE DIGIVEX 16/32 - 400	<h1 style="margin: 0;">PARVEX</h1> 8 avenue du Lac / BP249 F-21007 DIJON Cedex
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<i>S1 power</i>	4.3	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	5.1	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	17	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	20.4	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	2390	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	8000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	540	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	12.3	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	15.2	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	2.43	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.0035	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	12	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	21	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

Creation: 04 avr 1997	Edition: 23/juin/1999	HV820EZ	c
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DC-BRUSHLESS MOTOR
HV830EM
 ELECTRONIC DRIVE
DIGIVEX 32/64 - 400

PARVEX

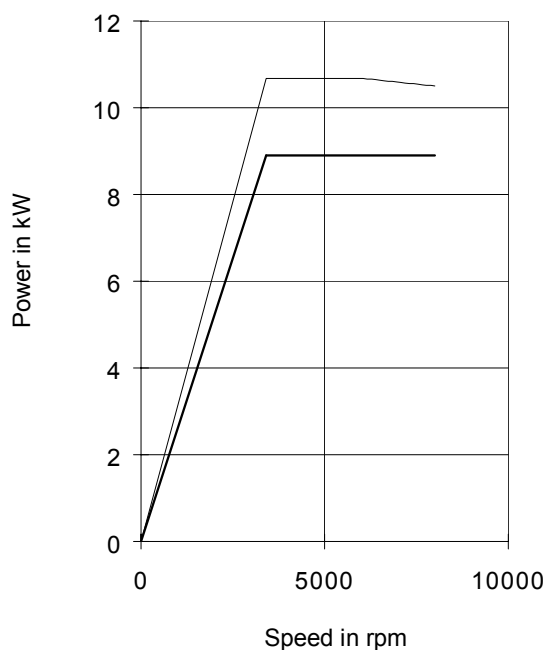
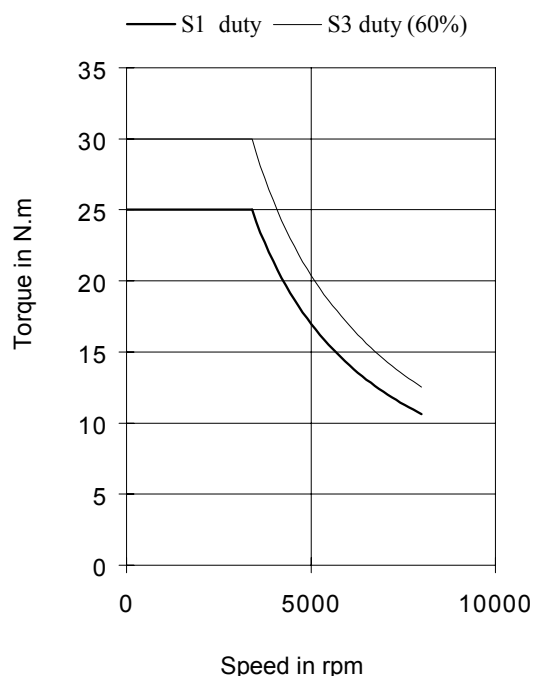
8 avenue du Lac / BP249
 F-21007 DIJON Cedex

<i>S1 power</i>	9	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	10.7	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	25	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	30	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	3400	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	8000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	540	<i>V</i>	<i>Û</i>
<i>Permanent current at low speed</i>	23.9	<i>Â</i>	<i>Î_o</i>
<i>S3 current at low speed</i>	29.4	<i>Â</i>	<i>Î_o S3</i>
<i>Winding resistance(25°C) *</i>	0.719	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.0049	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	15	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	26	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

Creation: 24 avr 1997

Edition: 23/juin/1999

HV830EM

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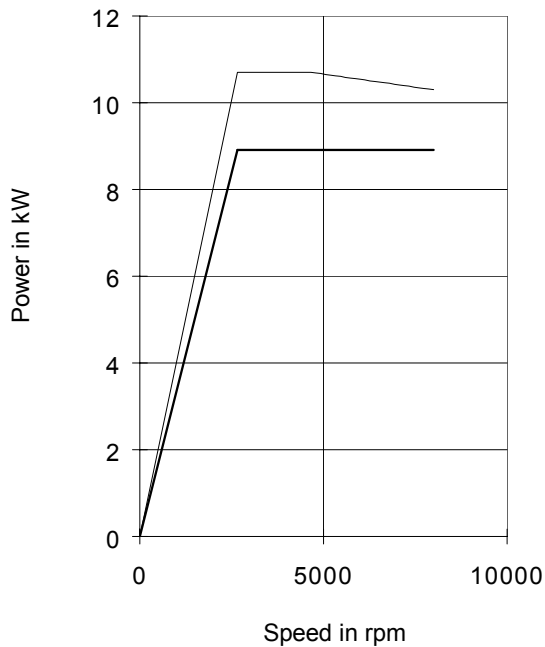
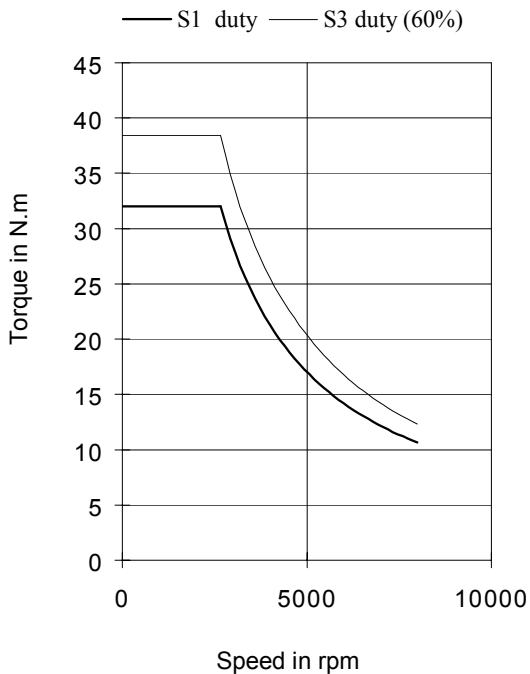
DC-BRUSHLESS MOTOR HV840EM ELECTRONIC DRIVE DIGIVEX 32/64 - 400	<h1 style="margin: 0;">PARVEX</h1> 8 avenue du Lac / BP249 F-21007 DIJON Cedex
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<i>S1 power</i>	9	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	10.7	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	32	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	38.4	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	2660	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	8000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	540	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	22.7	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	28	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	0.872	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.0063	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	17	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	30	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

Creation: 24 avr 1997	Edition: 23/juin/1999	HV840EM	d
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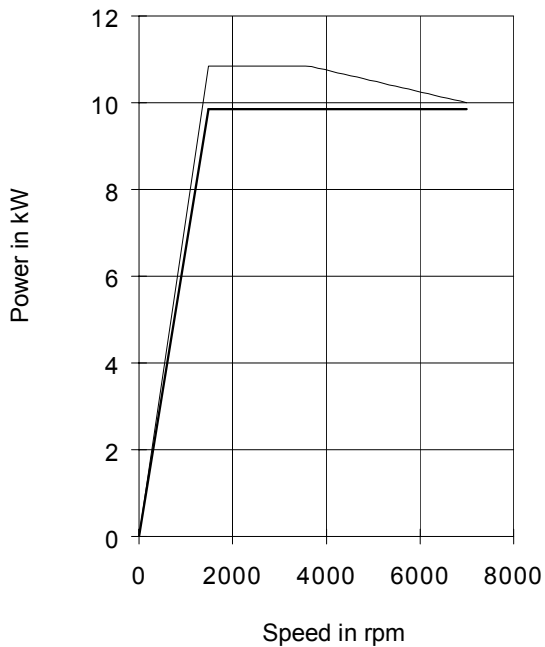
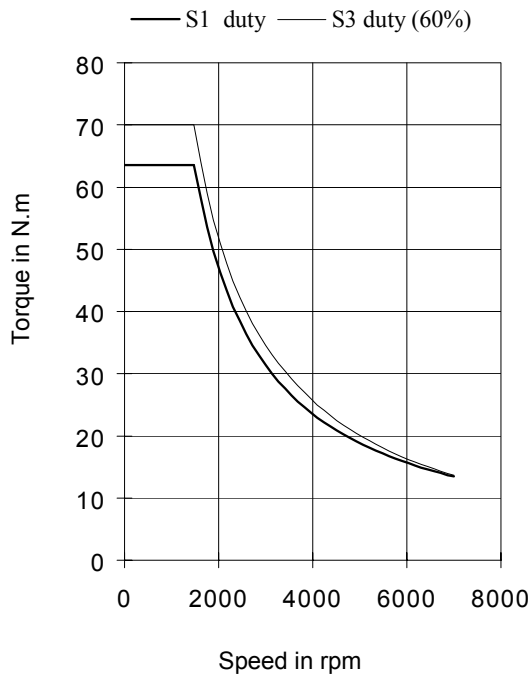
<p>DC-BRUSHLESS MOTOR HV930EQ ELECTRONIC DRIVE DIGIVEX 32/64 - 400</p>	<p>PARVEX 8 avenue du Lac / BP249 F-21007 DIJON Cedex</p>
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<i>S1 power</i>	10	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	11	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	63.6	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	70	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1480	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	7000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	540	<i>V</i>	<i>Û</i>
<i>Permanent current at low speed</i>	28.1	<i>Â</i>	<i>Î_o</i>
<i>S3 current at low speed</i>	31.5	<i>Â</i>	<i>Î_o S3</i>
<i>Winding resistance(25°C) *</i>	1.05	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.018	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	20	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	50	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



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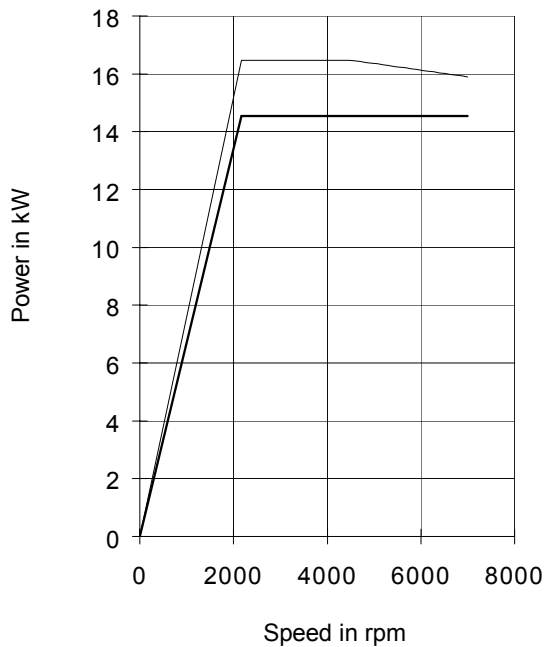
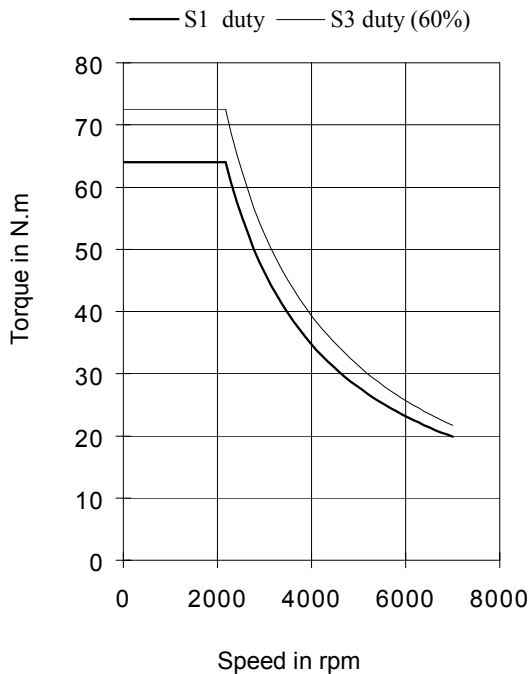
<p>DC-BRUSHLESS MOTOR HV930EL ELECTRONIC DRIVE DIGIVEX 50/80 - 400</p>	<p>PARVEX 8 avenue du Lac / BP249 F-21007 DIJON Cedex</p>
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<i>S1 power</i>	14.5	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	16.5	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	64	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	72.5	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	2170	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	7000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	530	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	43.1	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	50	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	0.464	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.018	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	20	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	50	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

Creation: 14 janv 1997 Edition: 23/juin/1999 HV930EL c

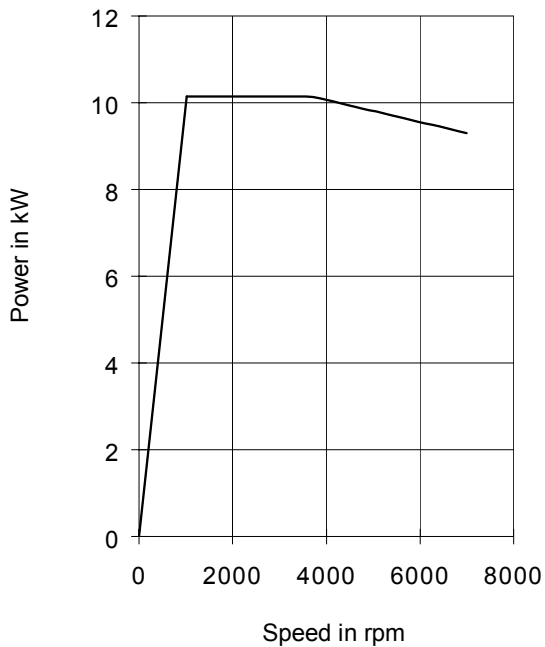
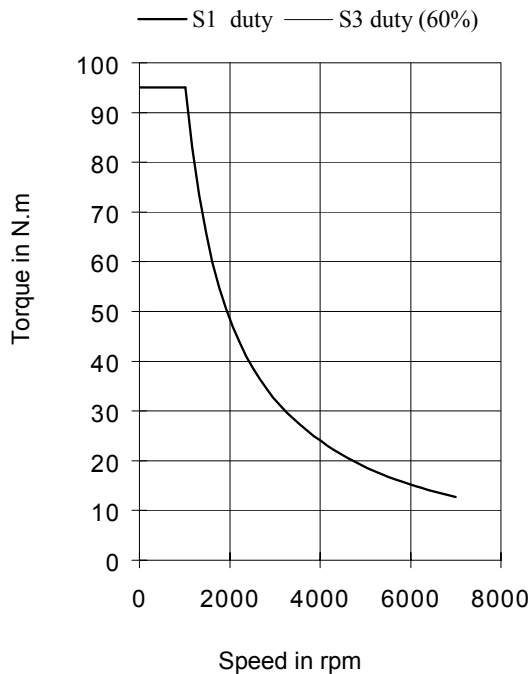
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<i>S1 power</i>	10	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	-	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	95	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	-	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1020	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	7000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	540	<i>V</i>	<i>Û</i>
<i>Permanent current at low speed</i>	30.8	<i>Â</i>	<i>Î_o</i>
<i>S3 current at low speed</i>	-	<i>Â</i>	<i>Î_o S3</i>
<i>Winding resistance(25°C) *</i>	1.27	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.029	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	42	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	67	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values

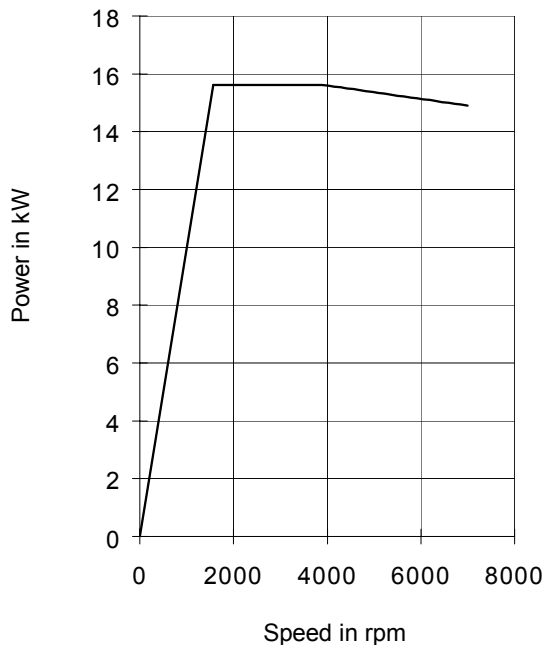
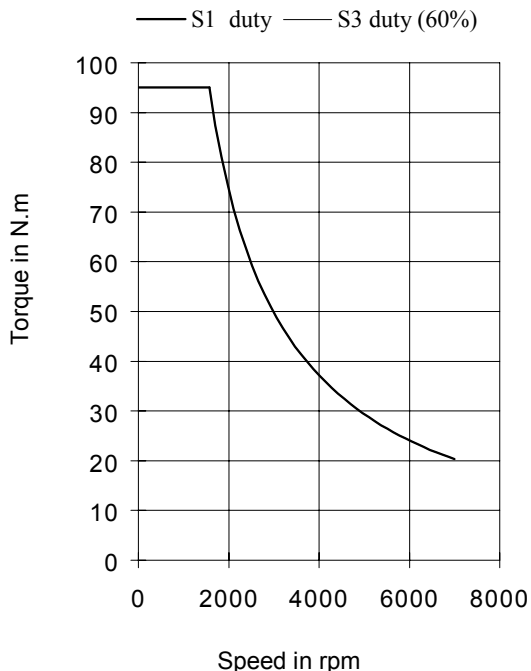


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<p>DC-BRUSHLESS MOTOR HV950EK ELECTRONIC DRIVE DIGIVEX 50/80 - 400</p>	<p>PARVEX 8 avenue du Lac / BP249 F-21007 DIJON Cedex</p>
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<i>S1 power</i>	15.6	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	-	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	95	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	-	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1570	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	7000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	530	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	46.9	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	-	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	0.548	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.029	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	42	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	67	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions
 * Phase to phase
 Voltages and currents given in peak values



DC-BRUSHLESS MOTOR
HVA30JO
 ELECTRONIC DRIVE
DIGIVEX 50/80 - 400

PARVEX

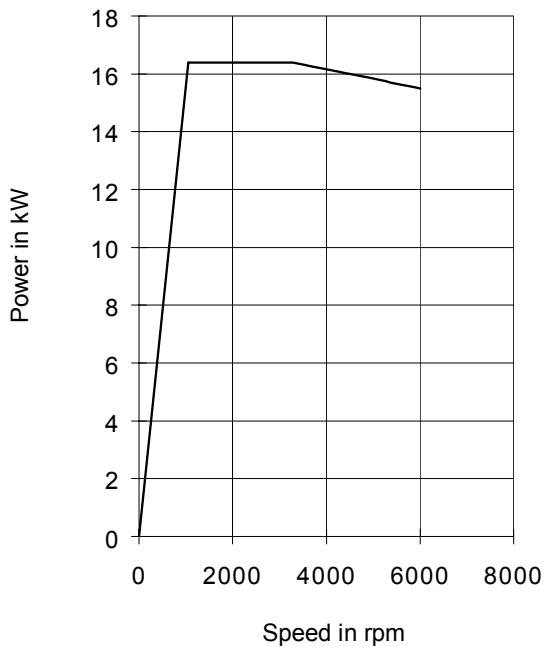
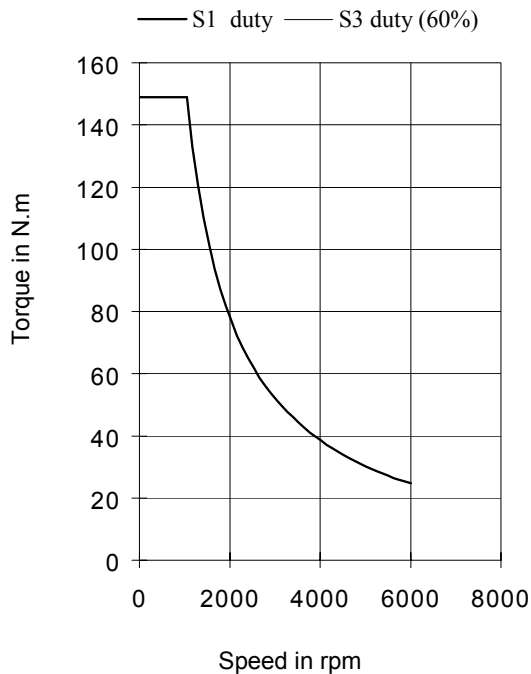
8 avenue du Lac / BP249
 F-21007 DIJON Cedex

<i>S1 power</i>	16.4	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	-	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	149	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	-	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1050	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	6000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	530	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	49.6	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	-	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	0.384	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.027	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	21	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	100	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

Creation: 20 janv 1998

Edition: 23/juin/1999

HVA30JO

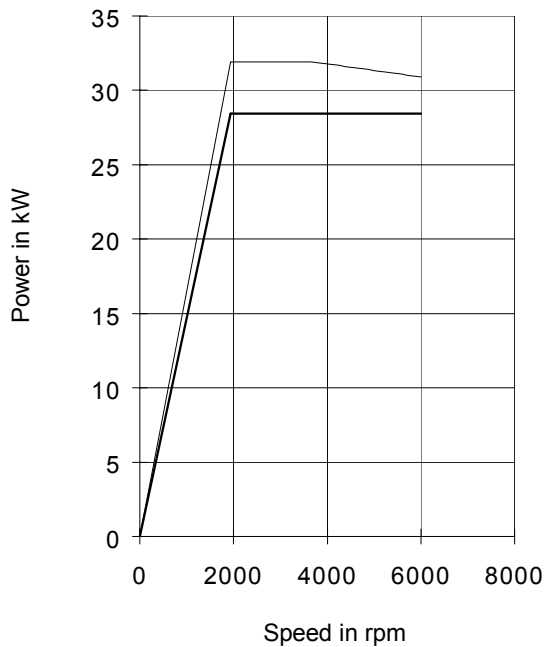
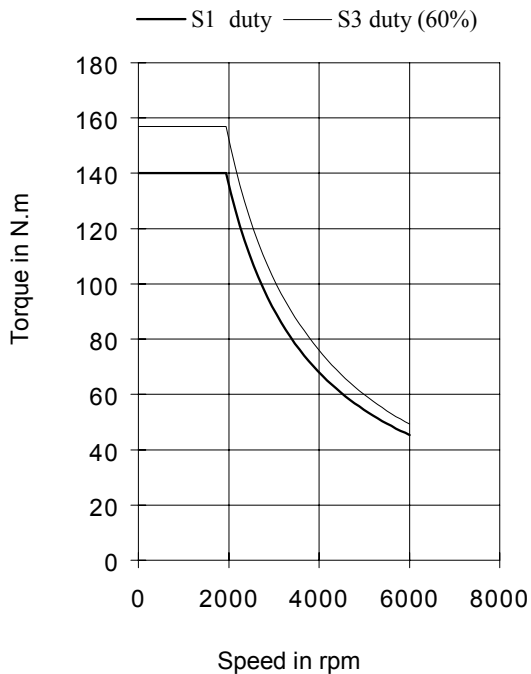
DC-BRUSHLESS MOTOR HVA30JH ELECTRONIC DRIVE DIGIVEX 100/120 - 400	<h1 style="margin: 0;">PARVEX</h1> 8 avenue du Lac / BP249 F-21007 DIJON Cedex
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<i>S1 power</i>	28	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	32	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	140	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	157	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1940	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	6000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	530	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	86	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	99.7	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	0.109	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.027	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	21	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	100	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

Creation: 20 janv 1998	Edition: 23/juin/1999	HVA30JH
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DC-BRUSHLESS MOTOR
HVA40JH
 ELECTRONIC DRIVE
DIGIVEX 100/120 - 400

PARVEX

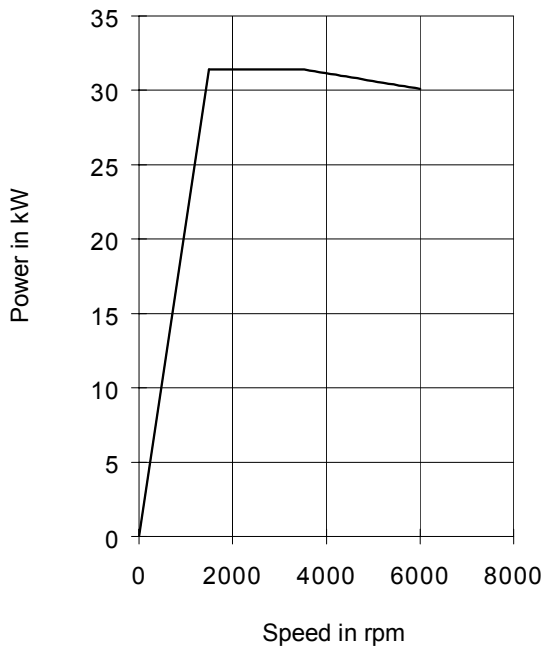
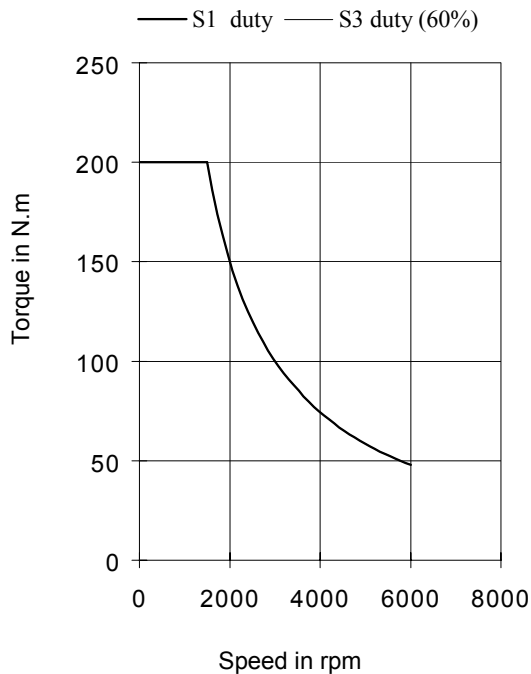
8 avenue du Lac / BP249
 F-21007 DIJON Cedex

<i>S1 power</i>	31	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	-	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	200	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	-	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1500	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	6000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	530	<i>V</i>	<i>Û</i>
<i>Permanent current at low speed</i>	93.9	<i>Â</i>	<i>Î_o</i>
<i>S3 current at low speed</i>	-	<i>Â</i>	<i>Î_o S3</i>
<i>Winding resistance(25°C) *</i>	0.135	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.035	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	22	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	110	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions

* Phase to phase

Voltages and currents given in peak values



FICHELV-008

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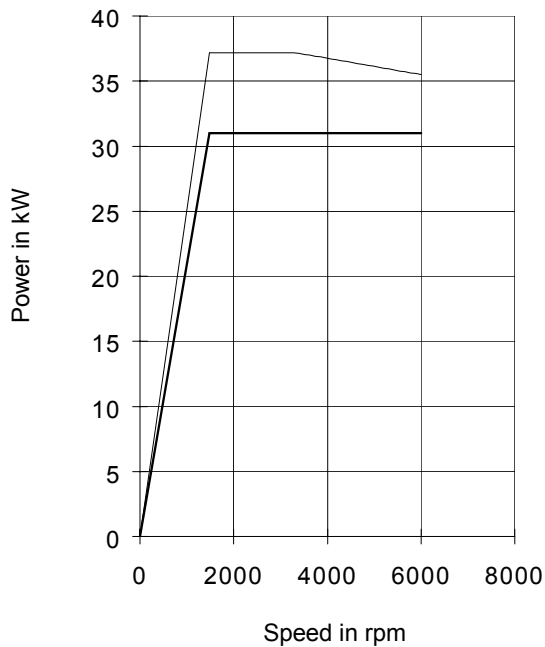
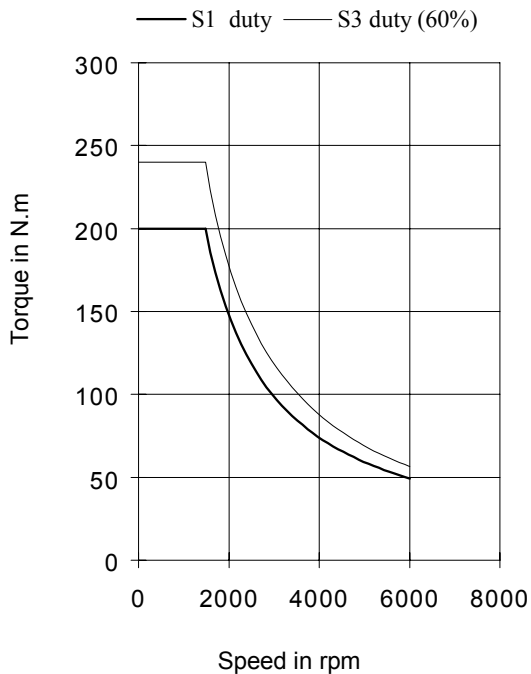
HVA40JH

a

<p>DC-BRUSHLESS MOTOR HVA40JG ELECTRONIC DRIVE DIGIVEX 150 - 400</p>	<p>PARVEX 8 avenue du Lac / BP249 F-21007 DIJON Cedex</p>
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<i>S1 power</i>	31	<i>kW</i>	<i>Ps1</i>
<i>S3 power</i>	37	<i>kW</i>	<i>Ps3</i>
<i>Low speed torque</i>	200	<i>N.m</i>	<i>M_o</i>
<i>Low speed S3 torque</i>	240	<i>N.m</i>	<i>M_o S3</i>
<i>Base speed</i>	1480	<i>rpm</i>	<i>Nb</i>
<i>Max speed</i>	6000	<i>rpm</i>	<i>N</i>
<i>DC voltage supply when motor is loaded</i>	530	<i>V</i>	<i>Ū</i>
<i>Permanent current at low speed</i>	107	<i>Ā</i>	<i>Ī_o</i>
<i>S3 current at low speed</i>	138	<i>Ā</i>	<i>Ī_o S3</i>
<i>Winding resistance(25°C) *</i>	0.105	<i>Ω</i>	<i>R_b</i>
<i>Rotor inertia</i>	0.035	<i>kg.m²</i>	<i>J</i>
<i>Thermal time constant</i>	22	<i>min</i>	<i>Tth</i>
<i>Motor mass</i>	110	<i>kg</i>	<i>M</i>
<i>Cooling type</i>	Forced-air cooling		

All data are given in typical values under standard conditions
 * Phase to phase
 Voltages and currents given in peak values



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DIMENSIONS

