HR SERIES
HRS SERIES

ISSUE 9

Brushless AC Servomotors

SEM
controlled motor technology

MOTOR TYPE DEFINITION

For example:

HR70C4-64S

HR High Response brushless servomotor.
Also - HRS Shortened version

70 70mm square frame servomotor.

C Motor length with A as shortest.

4 Number of motor poles.

-64 Voltage gradient (peak voltage per 1000 RPM between two phases).

S Sinusoidal normally fitted with resolver.

PERFORMANCE DATA

- Inertia values include the feedback device.
- Temperature rise ΔT on the windings is 110°C and applies to all rated torque values.
- TENV (IC400) = Totally Enclosed Non Ventilated.
- Tolerance: ±10%

  Except for voltage gradient (V/1000rpm) and torque constant (Nm/A) values which are to +15%/-5% tolerance.
- Heatsink torque ratings apply to motors fitted with an aluminium plate as follows:

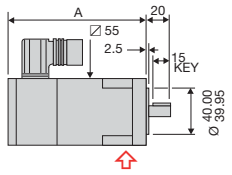
FRAME	PLATE SIZE (mm)
55/70	150 x 150 x 6
92/115	300 x 300 x 12
142/190	500 x 500 x 20

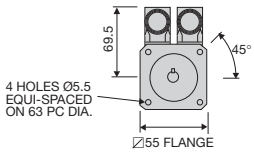
- Performance curves showing continuous/intermittent duties are available for selected drive DC link voltages

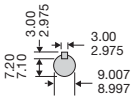
STANDARD FEATURES

- Sinusoidal three phase back EMF waveform.
- Integral Resolver feedback.
- Industry standard shaft and flange sizes.
- IP65 enclosure protection. Shaft protection IP64 with seal fitted.
- Shaft with keyway or plain shaft.
- Temperature sensor mounted in motor winding.
- Class F insulation.
- Matt black paint finish.
- Motor and feedback connector. Counterpart plugs optional.

Dimensions shown on the drawings are in millimetres.





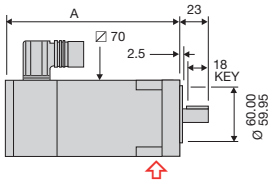


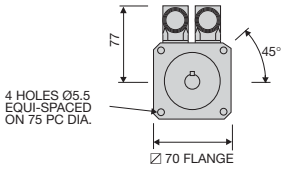
SHAFT END DETAIL

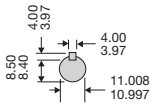
Frame	Dimension 'A' without brake	with brake
55A	122	158
55C	140	176
55G	176	212

HR55

FOR INCREMENTAL ENCODER ADD 30mm TO DIMENSION 'A'
FOR ABSOLUTE ENCODER ADD 30mm TO DIMENSION 'A'





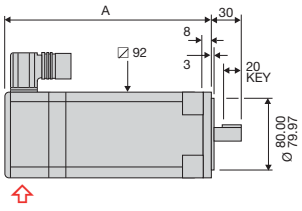


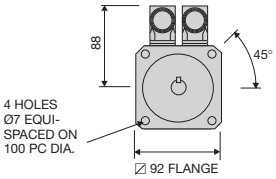
SHAFT END DETAIL

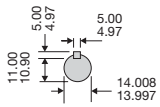
Frame	Dimension 'A' without brake	with brake
70A	131	158
70C	158	185
70E	185	212

HR70

FOR INCREMENTAL ENCODER ADD 18mm TO DIMENSION 'A'
FOR ABSOLUTE ENCODER ADD 28mm TO DIMENSION 'A'





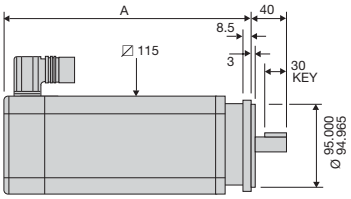


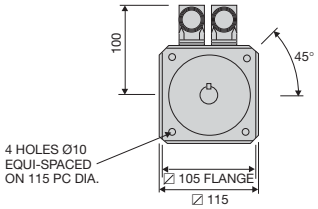
SHAFT END DETAIL

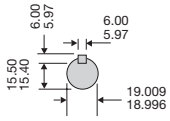
Frame	Dimension 'A' without brake	with brake
92C	160	200
92E	180	220
92G	200	240
92J	220	260

HRS92

FOR INCREMENTAL ENCODER ADD 20mm TO DIMENSION 'A'
FOR ABSOLUTE ENCODER ADD 30mm TO DIMENSION 'A'





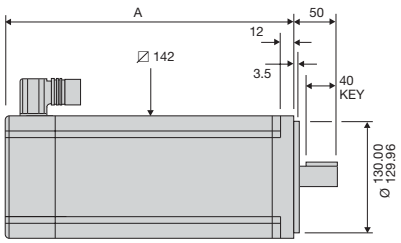


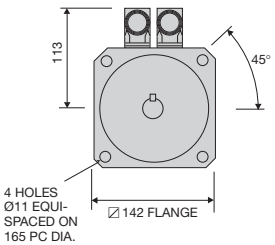
SHAFT END DETAIL

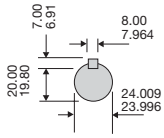
Frame	Dimension 'A' without brake	with brake
115A	189	209
115B	209	229
115C	229	249
115E	269	289

HRS115

FOR INCREMENTAL ENCODER ADD 23mm TO DIMENSION 'A'
FOR ABSOLUTE ENCODER ADD 33mm TO DIMENSION 'A'





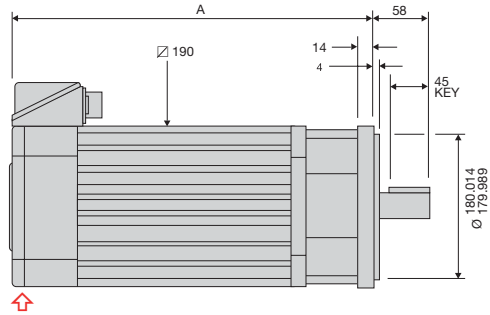


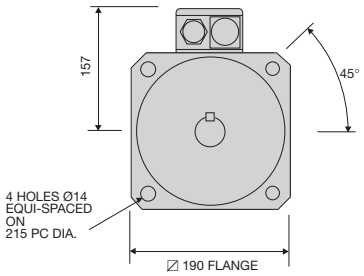
SHAFT END DETAIL

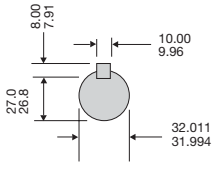
Frame	Dimension 'A' without brake	with brake
142C	236	276
142E	276	316
142G	316	356
142J	361	401

HRS142

NO ADDITIONAL LENGTH FOR INCREMENTAL OR ABSOLUTE ENCODERS







SHAFT END DETAIL

Frame	Dimension 'A' without brake	with brake
190C	378	378
190E	418	418
190G	458	458
190J	498	498

HR190

NO ADDITIONAL LENGTH FOR INCREMENTAL OR ABSOLUTE ENCODERS

⇧ = Fixed Bearing

The **High Response – HR** series of servomotors combine Neodymium Iron Boron magnets with low inertia rotors, giving cost effective performance.

Also **HRS** shortened version in 92 to 142 frame

Motor type- Voltage gradient V/1000rpm +15% -5%	Nett weight	Cont. stall torque TENV (IC400)	Cont. stall torque with Heatsink	Max. Cogging torque	Max. peak current	Resist -ance	Induct -ance	Maximum Speed	Max. EMF	Rotor inertia	Cont. stall current (rms)	Torque constant (3 x Ktrms)	Peak torque	NOMINAL VALUES (see below) Torque	Power
	kg	Nm	Nm	Nm	Amps	Ohms	mH	R.P.M.	V	kg.cm²	A	Nm/A	Nm	Nm	kW
HR55A4-22S	1.2	**0.2**	0.22	0.0125	4.5	29	17	8000	180	0.14	0.78	**0.258**	0.74	0.2 □	**0.06** □
HR55A4-32S	1.2	**0.2**	0.22	0.0125	3.1.	59	36	8000	260	0.14	0.53	**0.375**	0.74	0.2 □	**0.06** □
HR55A4-44S	1.2	**0.2**	0.22	0.0125	2.3	112	67	8000	350	0.14	0.39	**0.51**	0.74	0.2 □	**0.06** □
HR55C4-22S	1.4	**0.4**	0.44	0.0175	8.7	9.8	8.4	8000	180	0.19	1.6	**0.258**	1.4	0.32 □	**0.1** □
HR55C4-32S	1.4	**0.4**	0.44	0.0175	6.1	20	17	8000	260	0.19	1.07	**0.375**	1.4	0.32 □	**0.1** □
HR55C4-44S	1.4	**0.4**	0.44	0.0175	4.4	39	33	8000	350	0.19	0.78	**0.51**	1.4	0.32 □	**0.1** □
HR55G4-22S	1.9	**0.8**	0.85	0.0295	18	3.6	3.6	8000	180	0.28	3.1	**0.258**	3	0.69 □	**0.22** □
HR55G4-32S	1.9	**0.8**	0.85	0.0295	12.1	7.3	7.8	8000	260	0.28	2.1	**0.375**	3	0.69 □	**0.22** □
HR55G4-44S	1.9	**0.8**	0.85	0.0295	8.7	15	15	8000	350	0.28	1.6	**0.51**	3	0.69 □	**0.22** □
HR70A4-22S	2.0	**0.6**	0.7	0.0270	15	3.9	6.5	8000	180	0.32	2.3	**0.258**	2.2	0.6 □	**0.19** □
HR70A4-32S	2.0	**0.6**	0.7	0.0270	10.2	9.2	13.9	8000	260	0.32	1.6	**0.375**	2.2	0.6 □	**0.19** □
HR70A4-44S	2.0	**0.6**	0.7	0.0270	7.4	18	27	8000	350	0.32	1.17	**0.51**	2.2	0.6 □	**0.19** □
HR70C4-32S	2.6	**1.2**	1.3	0.0390	21	2.9	6	8000	260	0.47	3.2	**0.375**	4.5	1.11 □	**0.35** □
HR70C4-44S	2.6	**1.2**	1.3	0.0390	15	5.3	11.6	8000	350	0.47	2.3	**0.51**	4.5	1.11 □	**0.35** □
HR70C4-64S	2.6	**1.2**	1.3	0.0390	10.2	12.5	25	8000	510	0.47	1.6	**0.75**	4.5	1.11 □	**0.35** □
HR70E4-22S	3.2	**1.8**	2.0	0.0570	45	0.79	1.9	8000	180	0.62	7	**0.258**	6.6	1.73 □	**0.54** □
HR70E4-32S	3.2	**1.8**	2.0	0.0570	31	1.7	4	8000	260	0.62	4.8	**0.375**	6.6	1.73 □	**0.54** □
HR70E4-44S	3.2	**1.8**	2.0	0.0570	22	2.9	7.5	8000	350	0.62	3.5	**0.51**	6.6	1.73 □	**0.54** □
HRS92C4-32S	4.1	**1.5**	1.6	0.048	22	2.6	10.8	6000	190	0.94	4	**0.375**	4.6	1.3 □	**0.4** □
HRS92C4-44S	4.1	**1.5**	1.6	0.048	16	4.6	20	6000	260	0.94	2.9	**0.51**	4.6	1.3 □	**0.4** □
HRS92C4-64S	4.1	**1.5**	1.6	0.048	11	10.4	43	6000	380	0.94	2	**0.75**	4.6	1.3 □	**0.4** □
HRS92E4-32S	4.9	**2.2**	2.4	0.062	32	1.34	7.5	6000	190	1.3	5.9	**0.375**	6.7	2.0 □	**0.6** □
HRS92E4-44S	4.9	**2.2**	2.4	0.062	23	2.8	14	6000	260	1.3	4.3	**0.51**	6.7	2.0 □	**0.6** □
HRS92E4-64S	4.9	**2.2**	2.4	0.062	16	5.4	30	6000	380	1.3	2.9	**0.75**	6.7	2.0 □	**0.6** □
HRS92G4-32S	5.7	**3**	3.3	0.076	43	0.86	4.7	6000	190	1.6	8	**0.375**	9.2	2.6 □	**0.8** □
HRS92G4-44S	5.7	**3**	3.3	0.076	32	1.5	8.9	6000	260	1.6	5.8	**0.51**	9.2	2.6 □	**0.8** □
HRS92G4-64S	5.7	**3**	3.3	0.076	22	3.4	19	6000	380	1.6	4	**0.75**	9.2	2.6 □	**0.8** □
HRS92J4-44S	6.5	**3.8**	4.1	0.09	39	1.24	7.2	6000	260	2	7.4	**0.51**	11.4	3.3 □	**1.0** □
HRS92J4-64S	6.5	**3.8**	4.1	0.09	27	2.5	15	6000	380	2	5.1	**0.75**	11.4	3.3 □	**1.0** □
HRS92J4-88S	6.5	**3.8**	4.1	0.09	20	5	29	6000	530	2	3.7	**1.02**	11.4	3.3 □	**1.0** □
HRS115A6-64S	5.6	**3.7**	4.2	0.101	24	2.7	15	6000	380	2.7	4.9	**0.75**	11	3.4 □	**1.1** □
HRS115A6-88S	5.6	**3.7**	4.2	0.101	18	5.5	28	6000	530	2.7	3.6	**1.02**	11	3.4 □	**1.1** □
HRS115A6-130S	5.6	**3.7**	4.2	0.101	12.1	11.4	60	5400	700	2.7	2.4	**1.53**	11	3.4 □	**1.1** □
HRS115B6-64S	6.9	**5.2**	5.8	0.137	36	1.5	9.4	6000	380	3.9	6.9	**0.75**	16	4.5 □	**1.4** □
HRS115B6-88S	6.9	**5.2**	5.8	0.137	26	2.9	18	6000	530	3.9	5.1	**1.02**	16	4.5 □	**1.4** □
HRS115B6-130S	6.9	**5.2**	5.8	0.137	18	6.4	39	5400	700	3.9	3.4	**1.53**	16	4.5 □	**1.4** □
HRS115C6-64S	8.1	**6.8**	7.5	0.17	48	0.9	6.7	6000	380	5.1	9.1	**0.75**	22	5.7 □	**1.8** □
HRS115C6-88S	8.1	**6.8**	7.5	0.17	35	1.7	12.6	6000	530	5.1	6.6	**1.02**	22	5.7 □	**1.8** □
HRS115C6-130S	8.1	**6.8**	7.5	0.17	24	3.7	28	5400	700	5.1	4.5	**1.53**	22	5.7 □	**1.8** □
HRS115E6-88S	10.5	**9.8**	10.8	0.24	53	1.01	8.1	6000	530	7.5	9.5	**1.02**	33	7.5 □	**2.4** □
HRS115E6-130S	10.5	**9.8**	10.8	0.24	36	2.1	18	5400	700	7.5	6.4	**1.53**	33	8.0 □	**2.5** □
HRS115E6-180S	10.5	**9.8**	10.8	0.24	26	4.2	34	3900	700	7.5	4.7	**2.1**	33	8.0 □	**2.5** □
HRS142C6-64S	12.8	**11.3**	12.1	0.24	72	0.43	4.7	6000	380	11.5	15	**0.75**	30	9.8△	**2.1**△
HRS142C6-88S	12.8	**11.3**	12.1	0.24	52	0.76	8.9	6000	530	11.5	11	**1.02**	30	9.8△	**2.1**△
HRS142C6-130S	12.8	**11.3**	12.1	0.24	35	1.7	19	5400	700	11.5	7.4	**1.53**	30	9.8△	**2.1**△
HRS142E6-88S	16	**16**	17	0.34	78	0.42	5.3	6000	530	17	16	**1.02**	45	13.7△	**2.9**△
HRS142E6-130S	16	**16**	17	0.34	54	0.9	11.8	5400	700	17	10.5	**1.53**	45	13.7△	**2.9**△
HRS142E6-180S	16	**16**	17	0.34	39	1.9	22	3900	700	17	7.6	**2.1**	45	13.7△	**2.9**△
HRS142G6-130S	20	**21**	22	0.43	70	0.6	8.4	5400	700	22	13.8	**1.53**	60	17△	**3.5**△
HRS142G6-180S	20	**21**	22	0.43	50	1.24	16	3900	700	22	10	**2.1**	60	17△	**3.5**△
HRS142G6-260S	20	**21**	22	0.43	35	2.4	34	2700	700	22	6.9	**3.03**	60	17△	**3.5**△
HRS142J6-130S	24	**25**	26	0.52	89	0.43	6.3	5400	700	27	16	**1.53**	76	21△	**4.4**△
HRS142J6-180S	24	**25**	26	0.52	64	0.88	12.3	3900	700	27	11.9	**2.1**	76	21△	**4.4**△
HRS142J6-260S	24	**25**	26	0.52	44	1.8	25	2700	700	27	8.2	**3.03**	76	21△	**4.4**△
HR190C8-130S	28.5	**32**	35	0.56	100	0.39	4.9	4000	520	55(38*)	21	**1.53**	87	24△	**5.0**△
HR190C8-180S	28.5	**32**	35	0.56	173	0.77	9.7	3900	700	55(38*)	15	**2.1**	87	24△	**5.0**△
HR190C8-260S	28.5	**32**	35	0.56	51	1.5	20	2700	700	55(38*)	10.5	**3.03**	87	27■	**2.8**■
HR190E8-130S	36	**45**	49	0.76	150	0.19	3.4	4000	520	78(57*)	30	**1.53**	129	32△	**6.7**△
HR190E8-180S	36	**45**	49	0.76	108	0.38	6.4	3900	700	78(57*)	21	**2.1**	129	32△	**6.7**△
HR190E8-260S	36	**45**	49	0.76	75	0.83	13.7	2700	700	78(57*)	15	**3.03**	129	39■	**4.1**■
HR190G8-130S	43	**56**	59	1.0	200	0.126	2.5	4000	520	100(80*)	37	**1.53**	170	40△	**8.4**△
HR190G8-260S	43	**56**	59	1.0	100	0.55	10.5	2700	700	100(80*)	18	**3.03**	170	40△	**8.4**△
HR190G8-360S	43	**56**	59	1.0	73	1.02	20	1900	700	100(80*)	13.3	**4.2**	170	48■	**5.0**■
HR190J8-180S	50	**67**	70	1.2	180	0.18	3.8	3900	520	130(100*)	32	**2.1**	210	44△	**9.2**△
HR190J8-260S	50	**67**	70	1.2	125	0.37	8	2700	700	130(100*)	22	**3.03**	210	44△	**9.2**△
HR190J8-360S	50	**67**	70	1.2	91	0.75	16	1900	700	130(100*)	16	**4.2**	210	56■	**5.9**■

Preferred motor type
Standard motor type

(*) Low Inertia Version HRL

■ = 1000 rpm nominal speed △ = 2000 rpm nominal speed □ = 3000 rpm nominal speed

Nominal torque and power values are shown at a single specified speed. At higher speeds, the nominal power of the motor may also be higher. For further information or performance curves, please contact SEM.

FRAME SIZE		HR/HRS VOLTAGE GRADIENT AVAILABILITY												
		8	11	16	22	32	44	64	88	130	180	260	360	520
55	A	■	■	■	■	■	■							
	C		■	■	■	■	■	■	■					
	G				■	■	■	■	■	■				
70	A		■	■	■	■	■	■	■	■				
	C			■	■	■	■	■	■	■	■	■		
	E				■	■	■	■	■	■	■	■	■	
92	C			■	■	■	■	■	■	■	■			
	E				■	■	■	■	■	■	■	■		
	G					■	■	■	■	■	■	■	■	
	J					■	■	■	■	■	■	■	■	■
115	A			■	■	■	■	■	■	■	■	■		
	B				■	■	■	■	■	■	■	■	■	
	C					■	■	■	■	■	■	■	■	■
	E						■	■	■	■	■	■	■	■
142	C							■	■	■	■	■	■	■
	E								■	■	■	■	■	■
	G									■	■	■	■	■
	J									■	■	■	■	■
190	C								⊕	⊕	⊕	⊕	⊕	⊕
	E								+	⊕	⊕	⊕	⊕	⊕
	G									+	⊕	⊕	⊕	⊕
	J										+	⊕	⊕	⊕

⊕ – Available with size 1.5 power connector or terminal box only.
\+ – Terminal box only

SEM BRUSHLESS AC SERVOMOTORS

With a wealth of experience supplying world markets with quality servomotors, SEM designs, develops and manufactures all its products.

HR Series The HR range of servomotors combine Neodymium Iron Boron magnets with low inertia rotors giving cost effective performance.

HRS Series The shortened version HRS servomotors have near identical electrical and performance characteristics to the previously supplied HR range but are flat bodied with a substantially shortened mechanical form.

HR and HRS 92C4

HR55s with built-in absolute encoders

HR190 with terminal box

HRS92 with built-in incremental encoder

HR70 with optional flying leads

HRS92 with built-in absolute encoder

OPTIONS

STANDARD / OPTIONAL FEATURES							
DESCRIPTION	OPTIONS	SERVOMOTOR TYPE					
		55	70	92	115	142	190
WAVEFORM	SINUSOIDAL	■	■	■	■	■	■
MECHANICAL	FLANGE MOUNTED	■	■	■	■	■	■
	KEYWAY	■	■	■	■	■	■
	PLAIN SHAFT	●	●	●	●	●	●
	IP65 (IP64 AT SHAFT WITH SEAL FITTED)	■	■	■	■	■	■
	HRS COMPACT VERSION	○	○	■	■	■	○
	HRL LOW INERTIA VERSION	○	○	○	●	○	●
ELECTRICAL CONNECTION	INTERCONNECTRON MOTOR AND FEEDBACK CONNECTORS	■	■	■	■	■	●
	MS VERTICAL CONNECTORS	○	○	○	○	○	●
	TERMINAL BOX WITH FEEDBACK CONNECTOR	○	○	○	○	○	■
	FLYING LEADS	●	●	●	●	●	●
FAILSAFE HOLDING BRAKE	24V D.C. SPRING APPLIED	●	●	●	●	●	●
	90V D.C. SPRING APPLIED	●	●	○	○	○	●
	110V A.C. SPRING APPLIED	●	●	○	○	○	●
	ZERO BACKLASH 24V D.C. PERMANENT MAGNET	●	●	●	●	●	●
FEEDBACK DEVICE	2 POLE RESOLVER	■	■	■	■	■	■
	INCREMENTAL ENCODER WITH BLOCK COMMUTATION	●	●	●	●	●	●
	SINGLE OR MULTITURN ABSOLUTE ENCODER	●	●	●	●	●	●
	ENCODER MOUNTING KIT TO SUIT CUSTOMER SPECIFIED ENCODER	●	●	●	●	●	●
UL APPROVAL	UL CERTIFICATION	●	●	●	●	●	●

■ STANDARD FEATURE ○ OPTION NOT AVAILABLE
● OPTION

FOR OPTIONS NOT INCLUDED IN THE ABOVE LIST, PLEASE CONTACT SEM

SEM controlled motor technology

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UL VERSIONS AVAILABLE