

# Panasonic Servo Motors & Drives

ESSENTIALS  
FOR MACHINE  
BUILDING



# Panasonic MINAS servo motors & drives

The Panasonic servo range with four available versions gives you the ultimate choice for compact, high performance and economic small drive systems.

- matched motors & drives 50W to 1.5kW (higher powers on request)
- integrated encoder feedback & drive features such as Safe Torque Off
- gearboxes, cables, filters & I/O boards available
- operating software easy to use and free of charge
- worldwide approvals include CE and cUL



MINAS A5 drive with EtherCAT

## Four versions available:

### MINAS A5 EtherCAT

A5 drives with addition of EtherCAT input and output ports suiting easy connection of high performance multi-axis systems.

#### Features

- all the features of the A5 Analog plus EtherCAT
- easy to combine with Lenze & Trio motion controllers
- creates low cost systems that are easy to install
- Safe Torque Off to PL-d

Powers 50W to 1.5kW (higher on request)



### MINAS A5 Analogue

High performance general duty servos with matched low-inertia servo motors. The drives suit analog input signals.

#### Features

- 1.04 million pulse encoder is standard
- ultra-high response frequency of 2kHz
- input & output pulse frequency 4MHz
- smooth output from auto-tuning & notch filters
- Safe Torque Off to PL-d

Powers 50W to 1.5kW (higher on request)



### MINAS A5E Step & Direction

Suitable for pulse following or internal speed control for simple applications where steppers cannot achieve the required performance.

#### Features

- 8 internal jog speeds
- pulse train input
- 20 bit encoder
- ideal for gear locking applications

Powers 50W to 1.5kW  
No option for STO available



### MINAS A4 Positioner

The drive for simple positioning applications with up to 60 programmable positions.

#### Features

- sequential & automatic positioning
- 16 preset speeds
- simple low-cost system, no external motion controller
- 20 bit encoder

Powers 50 W to 1.5kW. No option for STO available



## Electrical supply & ambient conditions

Supply: 200-240V 1 phase +10%/-15%, 50/60Hz  
Ambient temperature: 0 to 55°C, storage -20 to 65°C  
Humidity: maximum 85% non condensing  
Altitude: 1000m or lower  
Vibration: 5.88m/s or less, 10 to 60Hz, no resonance

## Standards & approvals

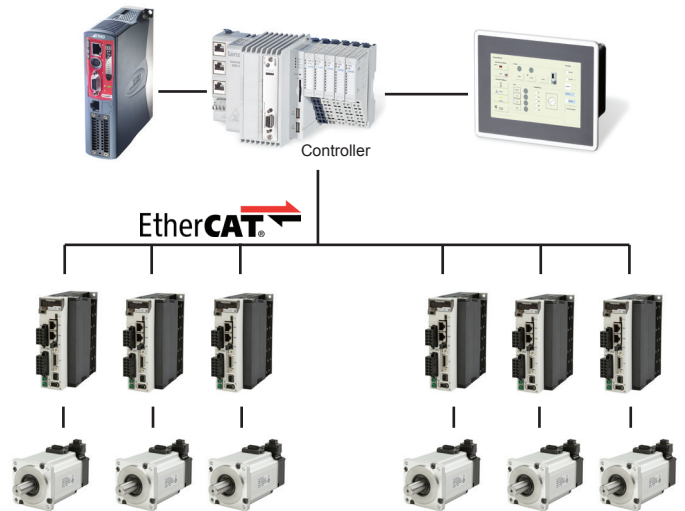
		Drives	Motor
EC Directives	EMC Directives	EN55011 EN61000-6-2 IEC6180-3	
	Low-Voltage Directives	EN61800-5-1	EN60034-1 EN60034-5
	Machinery Directives Functional Safety	ISO13849-(PL d) CAT.3 EN61508 (SIL2) EN62061 (SILCL2) EN61800-5-2 (STO) IEC61326-3-1	
UL Standards		UL508C (E164620)	UL1004 UL1004-1
CSA Standards		C22.2 NO.14	C22.2 NO.100

# EtherCAT networks

Minas A5 EtherCAT drives are ideal for multi-axis drive systems. EtherCAT is generally accepted as a fast and reliable real-time bus that is an economical solution with a wide range of sensors and actuators available on the market.

EtherCAT ports in the drives link directly to a motion controller and here we recommend either the Lenze 3200C or the Trio MC4N. The simplicity of the network leads to faster machine build and commissioning.

Communication profile - CoE (CANOpen over Ethernet)  
 Speed - 100 MBit/s band rate  
 Bus nodes - maximum 65535  
 Cable length between nodes - 100m maximum



## Safe Torque off (STO)

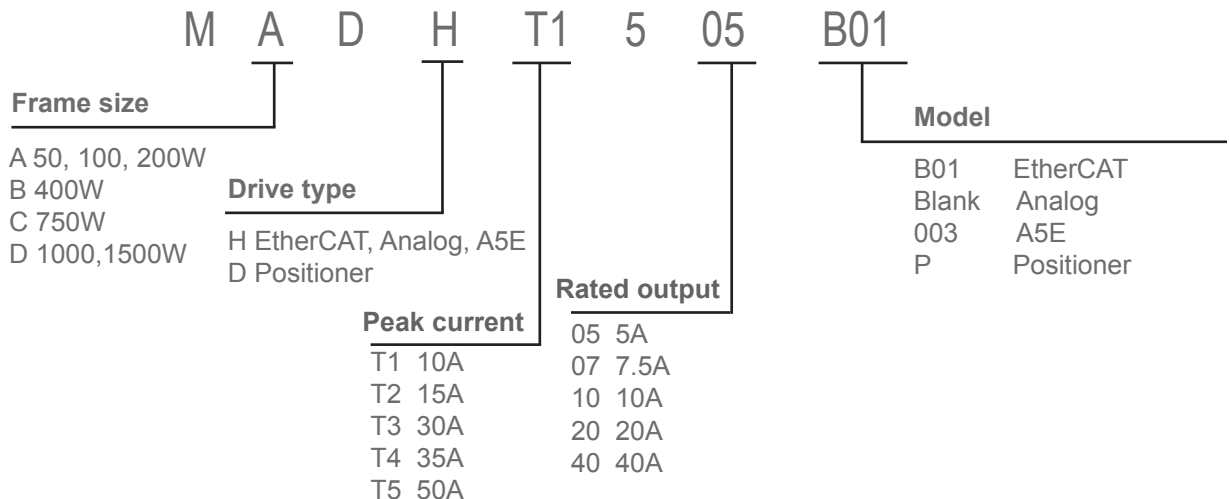
STO is UK standard for A5 EtherCAT and A5 Analog drives. It is supplied as a plug-in dongle that can be retrofitted to existing drives of these types.

Safe Torque Off provides a safety function that turns off the motor current and prevents any further torque generation on receipt of a safety input signal. It allows machines to be safely set and adjusted without disconnecting mains power and therefore it can improve productivity.

MINAS A5 Safe Torque Off meets PL-d of ISO 13849-1 and SIL2 of both EN61508 and EN62061.



## Type codes - drives



# Panasonic MINAS drives

## MINAS A5 EtherCAT®

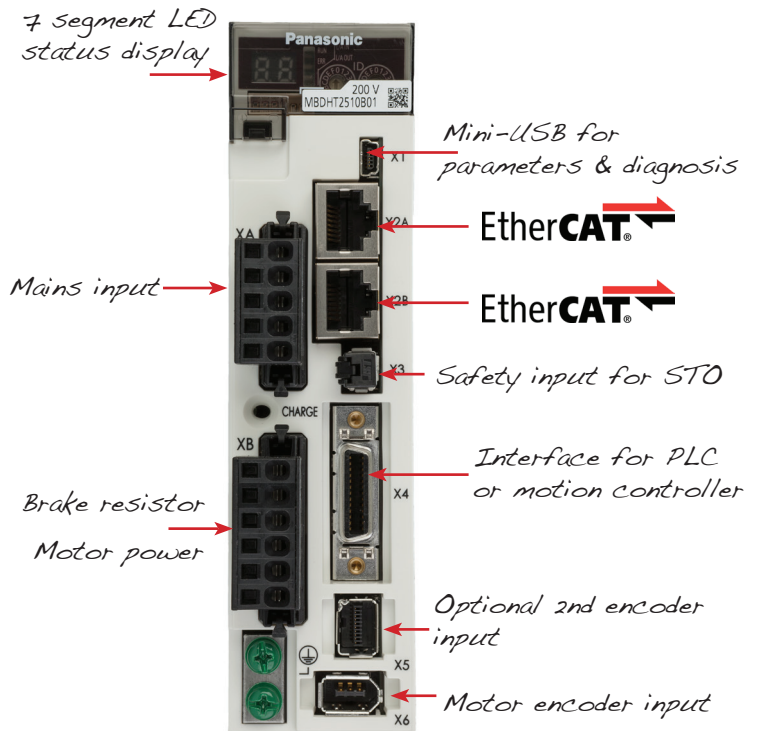
The addition of EtherCAT to the A5 drives suits the networking of high performance multi-axis systems. EtherCAT allows real-time connection to motion controllers and here we recommend either the Lenze 3200C or the Trio MC4N, see page 14. The network can extend to other motors, sensors and actuators.

### Features:

- EtherCAT input and output ports for easy cabling
- Performance as the A5 Analog with precision, accuracy & smooth running.
- Safe Torque Off to PL-d is standard
- Panaterm software is free, now with motion simulation

Supply 230-240V 1 phase 50/60Hz  
Cables & accessories - see page 13  
Higher powers available on request.

Motor Power (W)	Currents (A)		Type code	Part No.
	Rated	Peak		
50,100	1.3	3.4	MADHT1505B01	13442190
200	2.0	5.2	MADHT1507B01	13442191
400	3.7	9.7	MBDHT2510B01	13442212
750	6.0	15.7	MCDHT3520B01	13442213
1000, 1500	11.0	28.7	MDDHT5540B01	13474977



## Minas A5E Step & Direction

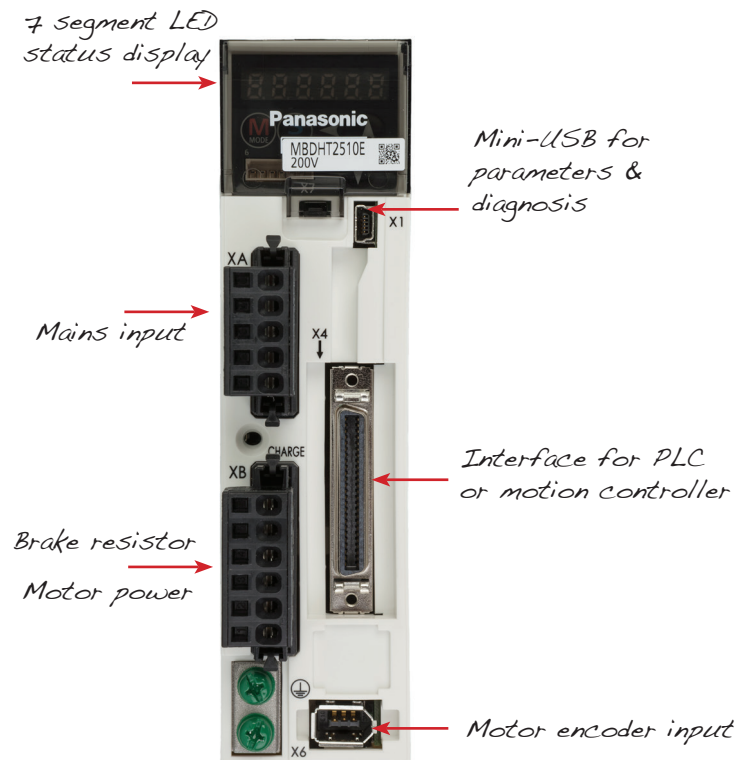
The A5E Step & Direction drives are designed for easy replacement of stepper motor systems with an increase in performance. They are controlled using the pulse following mode which determines speed and position.

### Features:

- Pulse following mode where an external pulse train determines speed & position (pulse/direction or full quadrature line driver).
- Alternative speed mode with 8 digital speeds set by digital inputs.
- Individual accel/decel ramps and 'S'-shaped curves
- User friendly Panaterm set-up software

Supply 230V-240V 1 phase 30/60Hz  
Cables & accessories - see page 13

Motor Power (W)	Currents (A)		Type code	Part No.
	Rated	Peak		
50,100	1.3	3.4	MADHT1505003	13474770
200	2.0	5.2	MADHT1507003	13474771
400	3.7	9.7	MBDHT2510003	13474812
750	6.0	15.7	MCDHT3520003	13474813
1000, 1500	11.0	28.7	MDDHT5540003	13474814



## Minas A5 Analogue

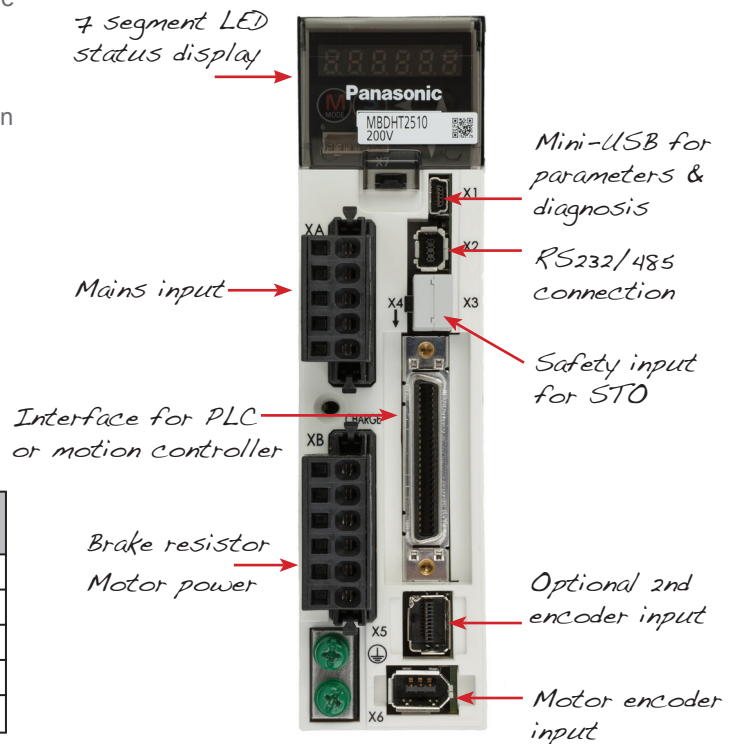
Minas A5 Analog drives suit high speeds and precision in a wide range of general duties. They operate with an analogue signal from a motion controller or PLC.

### Features:

- Ultra high response frequency of 2kHz combined with an input/output pulse frequency of 4MHz gives precision & accuracy.
- Real-time auto-tuning and automatic notch filters give smooth & stable running.
- Safe Torque Off to PL-d is standard.
- Panatorm software is free, now with motion simulation

Supply 230-240V 1 phase 50/60Hz  
Cables & accessories - see page 13  
Higher powers available on request.

Motor Power (W)	Currents (A)		Type code	Part No.
	Rated	Peak		
50,100	1.3	3.4	MADHT1505	13407153
200	2.0	5.2	MADHT1507	13407152
400	3.7	9.7	MBDHT2510	13407154
750	6.0	15.7	MCDHT3520	13407155
1000, 1500	11.0	28.7	MDDHT5540	13474821



## Minas A4 Positioner

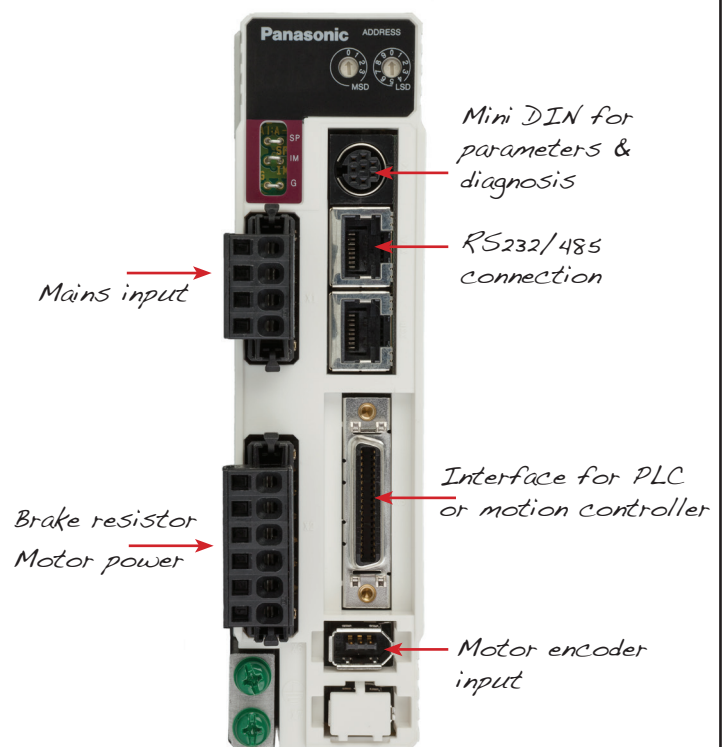
Positioner drives are a simple and economic solution for basic positioning requirements without the need for a separate motion controller or PLC.

### Features:

- Stores up to 60 positional moves that can be incremental or absolute.
- Sequential moves possible.
- Homing routine operates without sensor
- 16 speeds can be stored
- Set up by free Panatorm software

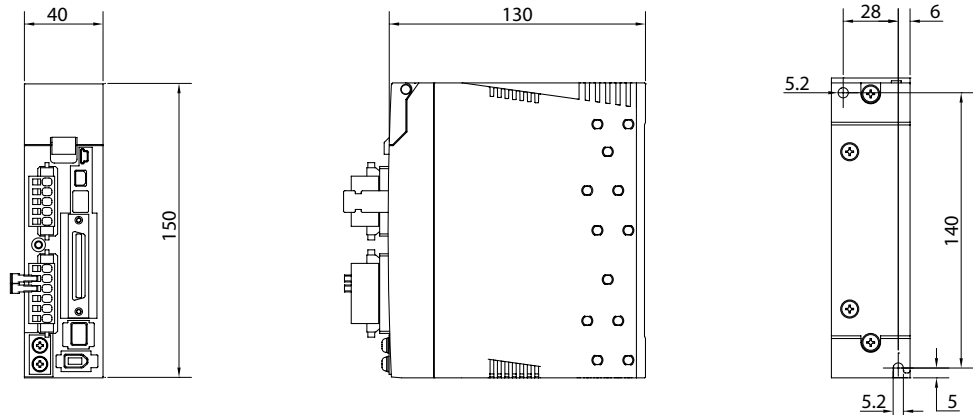
Supply 230V-240V 1 phase 50/60Hz  
Cables & accessories - see page 13

Motor Power (W)	Currents (A)		Type code	Part No.
	Rated	Peak		
50,100	1.3	3.4	MADDT1505P	13123287
200	2.0	5.2	MADDT1507P	13123288
400	3.7	9.7	MBDDT2510P	13123289
750	6.0	15.7	MCDDT3520P	13123290
1000, 1500	11.0	28.7	MDDDT5540P	13123291

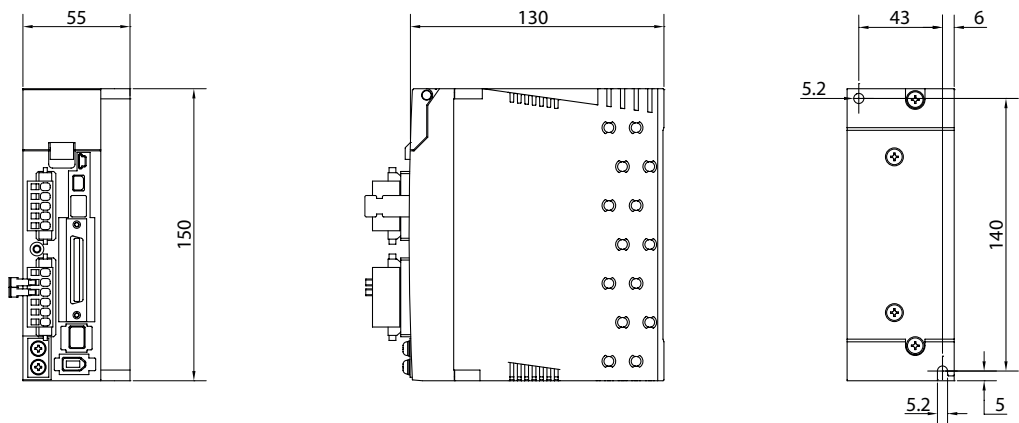


# Panasonic MINAS drives

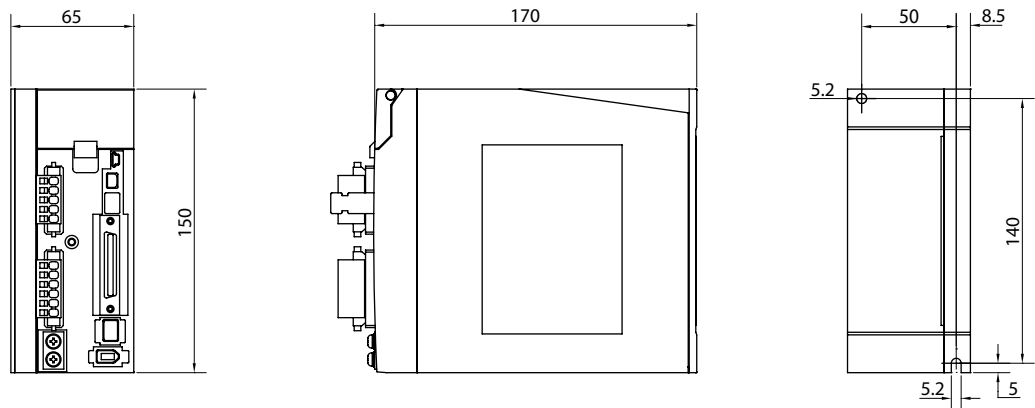
50W - 200W



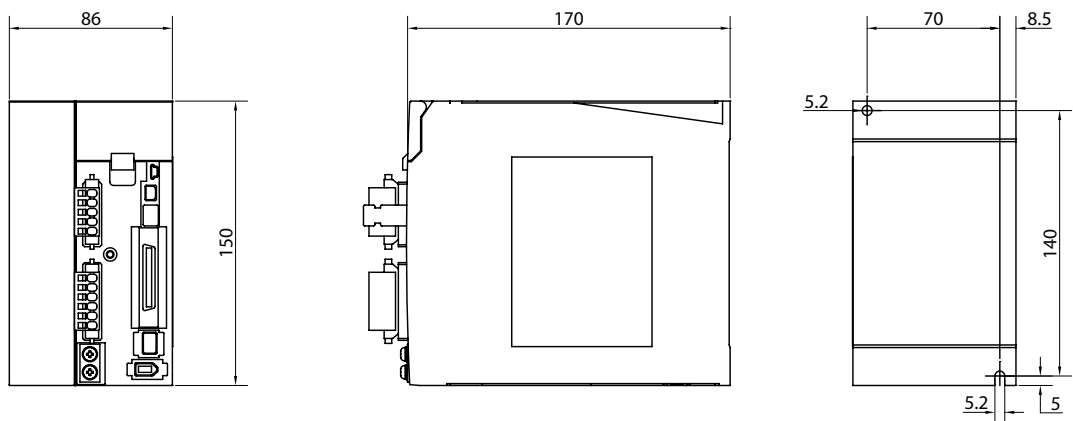
400W



750W



1.0W - 1.5kW



Face details shown match the A5 Analogue drives. For other drives the dimensions are the same but face details differ.

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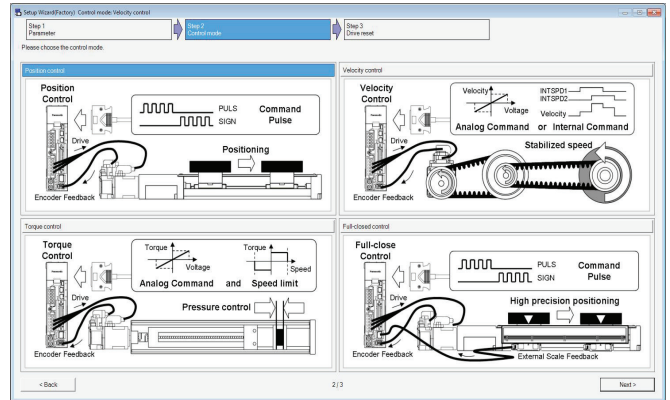


# Panaterm Software

New upgraded Panaterm software takes you through parameter setting, monitoring control conditions, diagnostics and fine tuning.

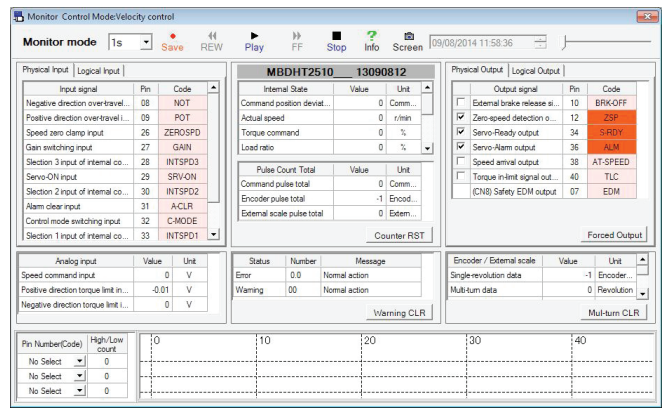
## Set up Wizard

The wizard supports parameter setting in each control mode in a simple and structured way, including the reading of default settings. When running on-line, input data related to each step can be monitored in real-time.



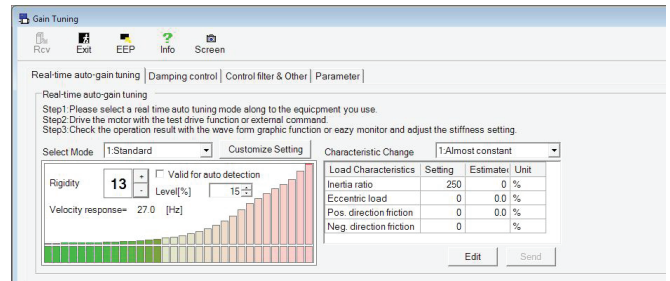
## Data logging

Panaterm allows a wide range of drive data to be recorded. A graphical output can be set with 1, 5 or 10 second intervals. The load factor, voltage and drive temperature can also be displayed and the logging function also records the interface history.



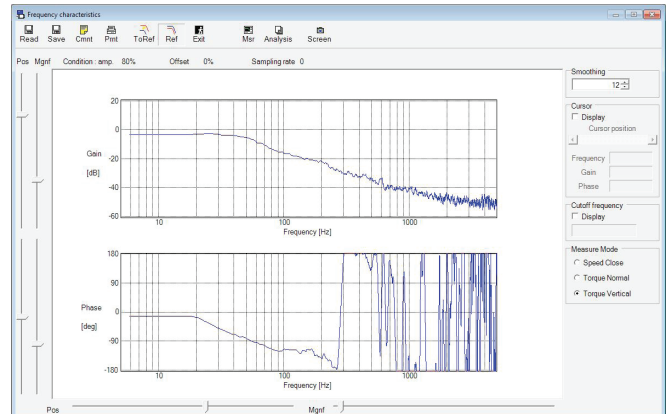
## Auto-gain tuning

After a simple set-up, fast and automatic tuning suppresses vibration. System stiffness is adjustable. Also four notch filters reduce vibration caused by machine resonance.



## Monitoring frequency response

Panaterm can check the frequency response characteristics of the mechanics and the motor. As the resonance frequency of the mechanism is measurable, this is an effective aid to reduce start-up times.



## Panasonic MINAS servo motors

Panasonic MINAS Servo motors are compact and dynamic. The latest A5 models feature higher speeds and increased encoder output.

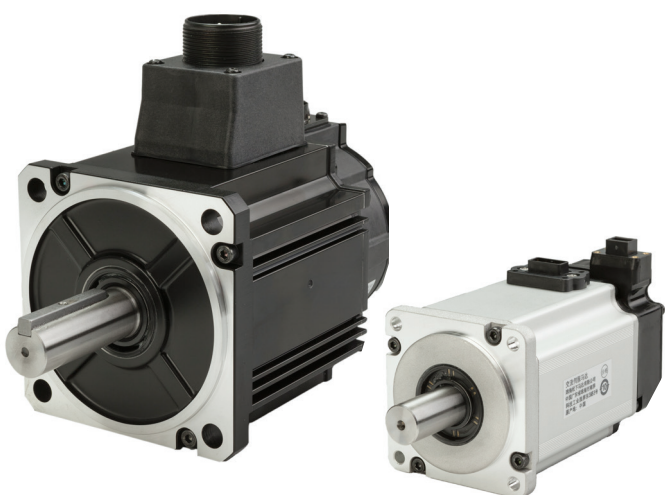
### Type MSME

Suits A5 EtherCAT, A5 Analog and A5E step & Direction drives.

These new Panasonic MINAS A5 servo motors have higher speed capacity, very low cogging torques, a new high output incremental encoder and upgraded IP67 connectors.

- Maximum speed 6000 r/min
- 20 bit incremental encoder with 1.04m pulse output
- 10 pole rotor gives very low cogging torques
- Peak torques 300% of rated
- IP67 enclosure to 750W, IP65 for 1.0kW and above
- More compact and lighter at 1000W+

MSME motors have plain shafts to 750W, keyways 6x6x45 at 1000 and 1500W.



### Type MSMD (50-750W) and MSMA (1000-1500W)

Suits A4 Positioner drives, but will also run with A5 drives.

These Panasonic MINAS A4 series motors are established high-performers

- Maximum speed 5000 r/min
- 17 bit incremental encoder
- Peak torques 300% of rated
- Supplied with IP20 plug connections. IP65 options also available

MSMD motors 50 - 750W have plain shafts  
MSMA motors 1000 - 1500W have a 6x6x45 keyway.



Type code	Power (W)	Rated speed (r/min)	Peak speed (r/min)	Rated torque (Nm)	Peak torque (Nm)	Motor inertia (kgm <sup>2</sup> )	Max axial Load (N)	Max radial Load (N)	Part No.
MSME5AZG1A	50	4000	6000	0.16	0.48	$0.25 \times 10^{-5}$	59	69	13407070
MSME012G1C	100			0.32	0.95	$0.51 \times 10^{-5}$	59	69	13407073
MSME022G1C	200			0.64	1.91	$0.14 \times 10^{-4}$	98	245	13407076
MSME042G1C	400			1.3	3.8	$0.26 \times 10^{-4}$	98	245	13407079
MSME082G1C	750			2.4	7.1	$0.87 \times 10^{-4}$	147	392	13407092
MSME102G1G	1000	3000	5000	3.2	9.5	$2.03 \times 10^{-4}$	196	490	13470397
MSME152G1G	1500			4.8	14.3	$2.84 \times 10^{-4}$	196	490	13474845
MSMD5AZP1C	50	3000	5000	0.16	0.48	$0.25 \times 10^{-5}$	58	68	13130203
MSMD012P1C	100			0.32	0.95	$0.51 \times 10^{-5}$	58	68	13130205
MSMD022P1C	200			0.64	1.91	$0.14 \times 10^{-4}$	98	245	13148873
MSMD042P1C	400			1.3	3.8	$0.26 \times 10^{-4}$	98	245	13148874
MSMD082P1C	750			2.4	7.1	$0.87 \times 10^{-4}$	147	392	13148875
MSMA102P1G	1000			3.2	9.5	$1.69 \times 10^{-4}$	147	392	13123305
MSMA152P1G	1500			4.8	14.3	$2.59 \times 10^{-4}$	196	490	13123309

#### See also:

Servo geared motors pages 10-11  
Torque/speed graphs page 12  
Optional cables page 13

Other options (available on request)

**Other motor types:** MDME mid inertia  
MHME high inertia  
MFME pancake style

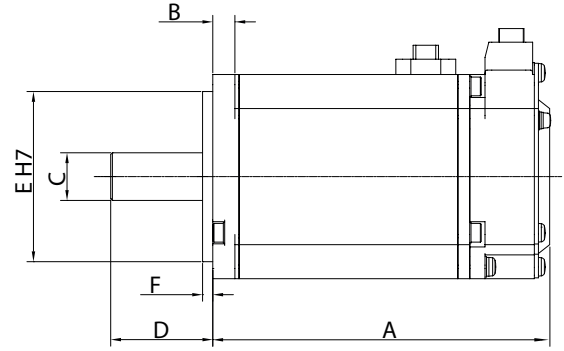
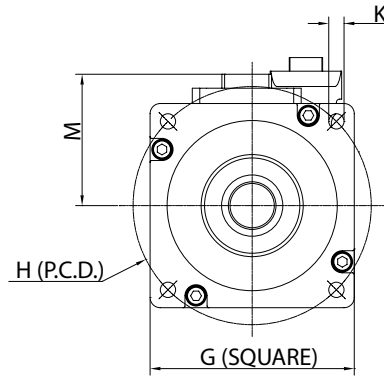
Brake motors available at all powers  
Higher power motors at 2,3,4 and 5kW  
Keyed shafts available on all powers



## Dimensions

### MSME motors 50W - 750W

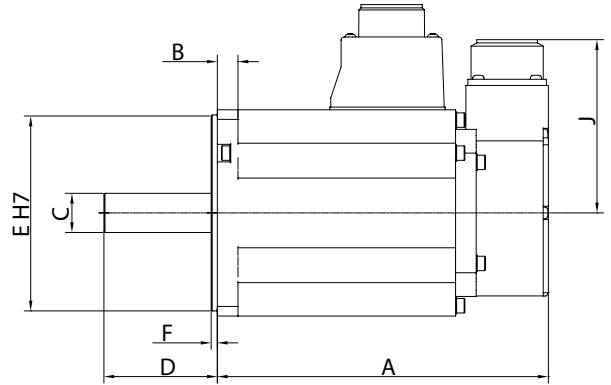
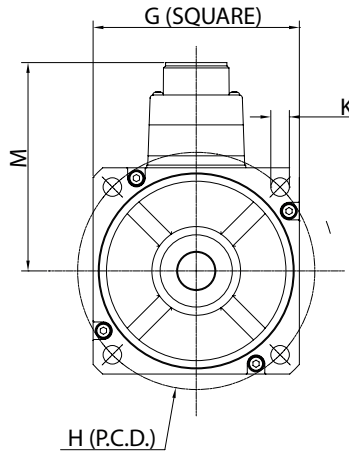
Supplied with plain shafts as standard. Keyed shafts available on request



### MSME motors 1.0kW - 1.5kW

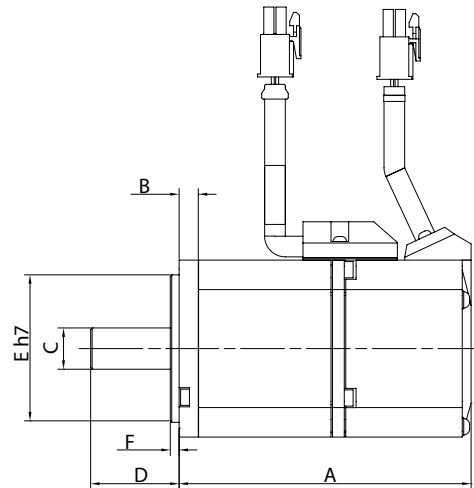
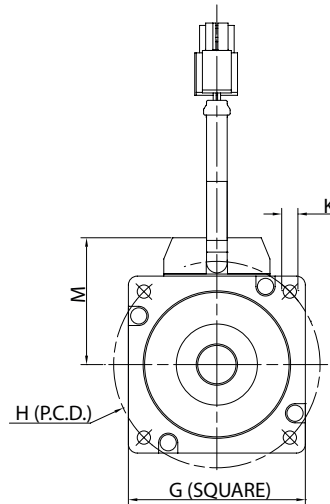
### MSMA motors 1.0kW - 1.5kW

Supplied with keyed shafts. Key dimensions are 6x6x45.



### MSMD motors 50W - 750W

Supplied with plain shafts as standard. Keyed shafts available on request



Motor type	Rated Power (W)	A	B	C h6	D	E h7	F	G	H	J	K 4 off	M	Weight (kg)
MSME	50	72	6	8	25	30	3	38	45	-	3.4	46.6	0.31
	100	92	6	8	25	30	3	38	45	-	3.4	46.6	0.46
	200	79.5	6.5	11	30	50	3	60	70	-	4.5	52.5	0.78
	400	99	6.5	14	30	50	3	60	70	-	4.5	52.5	1.2
	750	112	8	19	35	70	3	80	90	-	6.0	61.6	2.3
	1000	139	10	19	55	95	3	100	115	84	9.0	101	3.5
MSMD	1500	157.5	10	19	55	95	3	100	115	84	9.0	101	4.4
	50	72	6	8	25	30	3	38	45	-	3.4	32	0.32
	100	92	6	8	25	30	3	38	45	-	3.4	32	0.47
	200	79	6.5	11	30	50	3	60	70	-	4.5	43	0.82
	400	98.5	6.5	14	30	50	3	60	70	-	4.5	43	1.2
MSMA	750	112	8	19	35	70	3	80	90	-	6.0	53	2.3
	1000	175	7	19	55	80	3	90	100	84	6.6	98	4.5
	1500	180	10	19	55	95	3	100	115	84	9.0	103	5.1

Dimensions for brake motors available on request.

Power & encoder cables - see page 13

## Geared servo motors

Panasonic A5 and A4 servo motors combine with the Vogel MPV range of planetary gearboxes forming a compact in-line servo drive.

### Other options

- Motor powers 200W to 1.5kW
- Rated output torques 1.9 to 170Nm
- Rated maximum speeds 1000 to 60r/min
- Medium to low backlash 10-15 arc mins
- Exact ratios suit positioning applications



Motor power	Gearbox size	Ratio	Rated max speed(r/min)	Rated torque (Nm)	Peak torque (Nm)	Geared motor (kgm <sup>2</sup> )	Max load inertia at output (kgm <sup>2</sup> )	Max axial Load (N)	Max radial Load (N)
200W	00	3	1000	1.9	5.6	$3.2 \times 10^{-4}$	$1.06 \times 10^{-3}$	1550	1500
		4	750	2.5	7.4	$4.8 \times 10^{-4}$	$1.98 \times 10^{-3}$	1550	1500
		5	600	3.1	9.3	$7.00 \times 10^{-4}$	$3.15 \times 10^{-3}$	1550	1500
		7	429	4.3	13.0	$1.27 \times 10^{-3}$	$6.27 \times 10^{-3}$	1500	1500
		10	300	6.2	18.5	$2.50 \times 10^{-3}$	$1.29 \times 10^{-2}$	1550	1500
		16	188	9.7	29.0	$7.17 \times 10^{-3}$	$3.23 \times 10^{-2}$	1900	1500
		20	150	12.2	36.3	$1.04 \times 10^{-2}$	$5.12 \times 10^{-2}$	1900	1500
200W	01	35	86	21.7	64.8	$3.06 \times 10^{-2}$	$1.58 \times 10^{-1}$	1900	2500
		50	60	49	93	$6.25 \times 10^{-2}$	$3.25 \times 10^{-1}$	1900	2500
400W	00	3	1000	1.9	5.6	$3.2 \times 10^{-4}$	$1.06 \times 10^{-3}$	1550	1500
		4	750	2.5	7.4	$4.8 \times 10^{-4}$	$1.98 \times 10^{-3}$	1550	1500
		5	600	3.1	9.3	$7.00 \times 10^{-4}$	$3.15 \times 10^{-3}$	1550	1500
		7	429	4.3	13.0	$1.27 \times 10^{-3}$	$6.27 \times 10^{-3}$	1500	1500
		10	300	6.2	18.5	$2.50 \times 10^{-3}$	$1.29 \times 10^{-2}$	1550	1500
		16	188	9.7	29.0	$7.17 \times 10^{-3}$	$3.23 \times 10^{-2}$	1900	1500
		20	150	12.2	36.3	$1.04 \times 10^{-2}$	$5.12 \times 10^{-2}$	1900	1500
400W	01	10	300	12.6	36.9	$6.2 \times 10^{-3}$	$2.24 \times 10^{-2}$	1900	2500
		16	187.5	19.8	57.8	$1.08 \times 10^{-2}$	$6.25 \times 10^{-2}$	1900	2500
		20	150	24.7	72.2	$1.56 \times 10^{-2}$	$9.88 \times 10^{-2}$	1900	2500
		35	86	43.2	100*	$4.53 \times 10^{-2}$	$3.05 \times 10^{-2}$	1900	2500
		50	60	61.8	100*	$9.25 \times 10^{-2}$	$6.23 \times 10^{-2}$	1900	2500
750W	01	3	1000	7.0	20.8	$1.52 \times 10^{-3}$	$1.09 \times 10^{-3}$	1550	1500
		4	750	9.3	27.7	$2.30 \times 10^{-3}$	$1.30 \times 10^{-2}$	1550	1500
		5	600	11.6	34.7	$3.35 \times 10^{-2}$	$2.06 \times 10^{-2}$	1550	1500
		7	429	16.3	48.5	$6.13 \times 10^{-3}$	$4.08 \times 10^{-2}$	1500	1500
		10	300	23.3	69.4	$1.21 \times 10^{-2}$	$8.36 \times 10^{-2}$	1550	1500
		16	188	36.5	100*	$3.43 \times 10^{-2}$	$2.11 \times 10^{-1}$	1900	1500
		20	150	45.6	100*	$5.12 \times 10^{-2}$	$3.32 \times 10^{-1}$	1900	1500
1.0kW	01	3	1000	9.3	13.9	$2.26 \times 10^{-3}$	$1.45 \times 10^{-2}$	1550	1500
		4	750	12.3	18.5	$3.62 \times 10^{-3}$	$2.61 \times 10^{-2}$	1550	1500
		5	600	15.4	23.1	$5.40 \times 10^{-3}$	$4.11 \times 10^{-2}$	1550	1500
		7	429	21.6	32.4	$1.01 \times 10^{-2}$	$8.08 \times 10^{-2}$	1500	1500
		10	300	30.8	46.3	$2.03 \times 10^{-2}$	$1.66 \times 10^{-1}$	1550	1500
		16	188	48.3	72.5	$5.53 \times 10^{-2}$	$4.21 \times 10^{-1}$	1900	2500
		20	150	60.4	90.6	$8.40 \times 10^{-2}$	$6.60 \times 10^{-1}$	1900	2500
1.0kW	02	35	86	105	158	$2.52 \times 10^{-1}$	2.02	4000	4700
		50	60	151	226	$6.25 \times 10^{-2}$	4.14	4000	4700
1.5kW	02	3	1000	27.6	41.6	$5.00 \times 10^{-3}$	$2.06 \times 10^{-2}$	4000	4700
		4	750	36.9	55.5	$7.38 \times 10^{-3}$	$3.82 \times 10^{-2}$	4000	4700
		5	600	46.1	69.4	$9.83 \times 10^{-3}$	$6.14 \times 10^{-2}$	4000	4700
		7	429	64.5	97.1	$1.85 \times 10^{-2}$	$1.21 \times 10^{-1}$	4000	4700
		10	300	92.2	138	$3.17 \times 10^{-2}$	$2.53 \times 10^{-1}$	4000	4700
		16	188	144.4	217	$7.96 \times 10^{-2}$	$6.50 \times 10^{-1}$	4000	4700
		20	150	170*	250*	$1.21 \times 10^{-1}$	1.02	4000	4700

\* Denote peak torque capacity of the gearbox may be exceeded when 300% peak motor torque is demanded. Refer to Bedford office for details.

# Dimensions

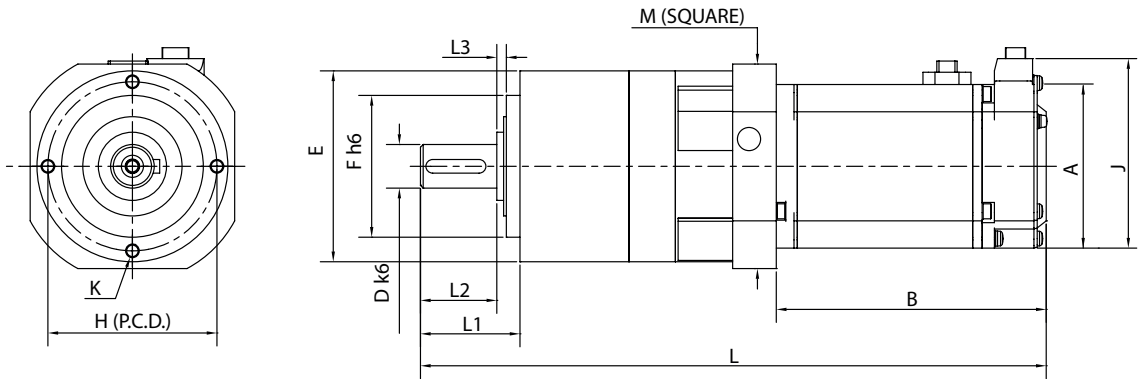
Backlash is 10arc mins for 1000 - 300r/min output, 15 arc mins at lower speeds (lower backlash is available on request).

## Other options

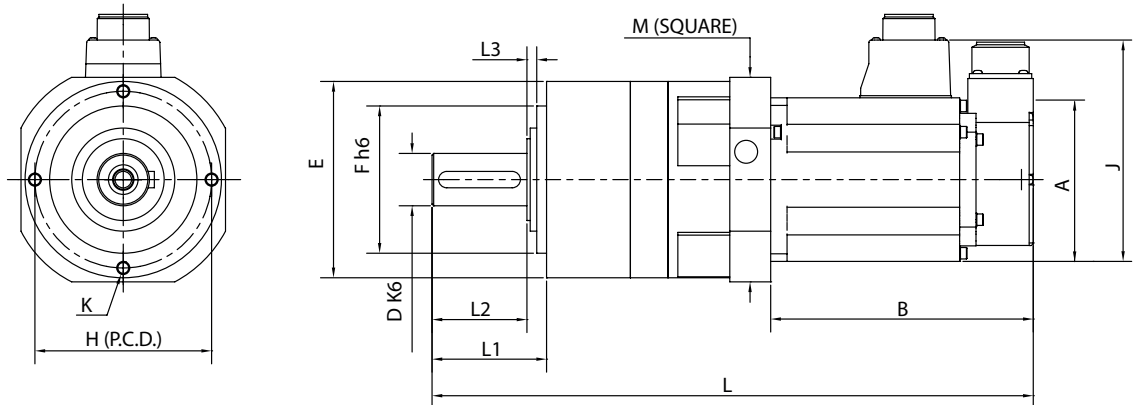
- Higher ratios up to 100:1
- Brake motors
- Gearboxes with reduced backlash 4-6 arc mins
- Other types of gearbox



MSME geared motors 200W, 400W & 750W



MSME geared motors 1.0kW & 1.5kW

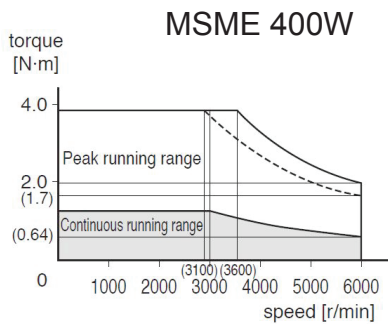
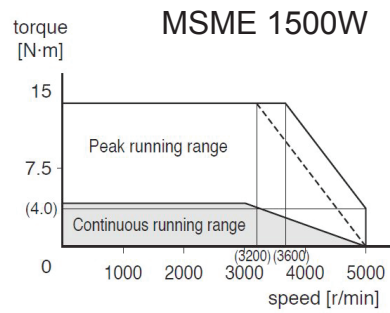
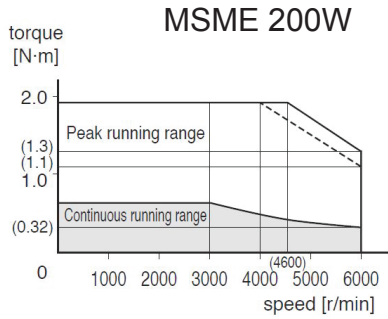
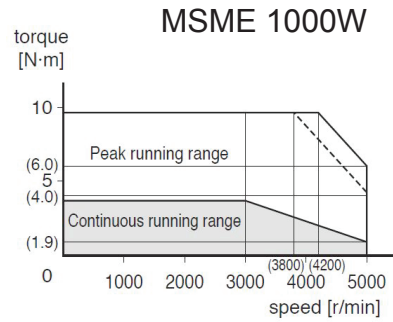
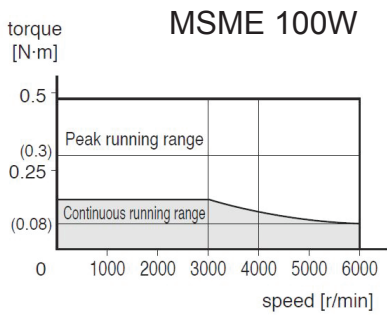
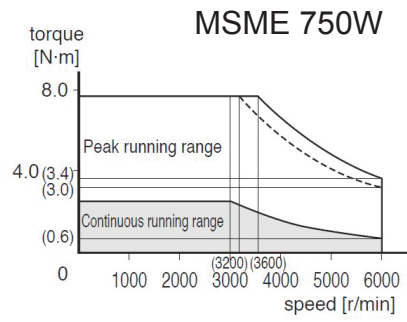
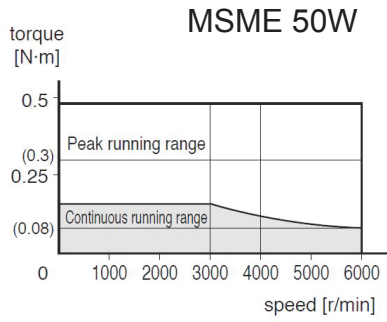


Dimensions L, B & J differ for MSMD & MSMA motors, details on request.

Keys to BS4235

Motor power	Gearbox size	A	B	D k6	E	F h6	L1	L2	L3	H	J	K	M	Output speed r/min	L	Weight (kg)
200W	00	60	80	16	70	52	36	28	3	62	83	M5	95	≥300	210	2.5
														<300	232	3.1
200W	01	60	80	22	90	68	46	36	5	80	83	M6	95	≥300	238	4.2
														<300	250	4.4
400W	00	60	99	16	70	52	36	28	3	62	83	M5	95	≥300	229	2.9
														<300	251	3.5
400W	01	60	99	22	90	68	46	36	5	80	83	M6	95	≥300	257	4.6
														<300	269	4.8
750W	01	80	112	22	90	68	46	36	5	80	102	M6	95	≥300	270	5.7
														<300	297	5.9
1.0kW	01	90	142	22	90	68	46	36	5	80	151	M6	95	≥300	297	6.9
														<300	324	7.1
1.0kW	02	90	142	32	120	90	70	58	6	108	151	M8	125	≥300	346	10.8
														<300	363	11.2
1.5kW	02	100	161	32	120	90	70	58	6	108	151	M8	125	≥300	365	11.7
														<300	382	12.1

# Panasonic MINAS motor speed-torque curves

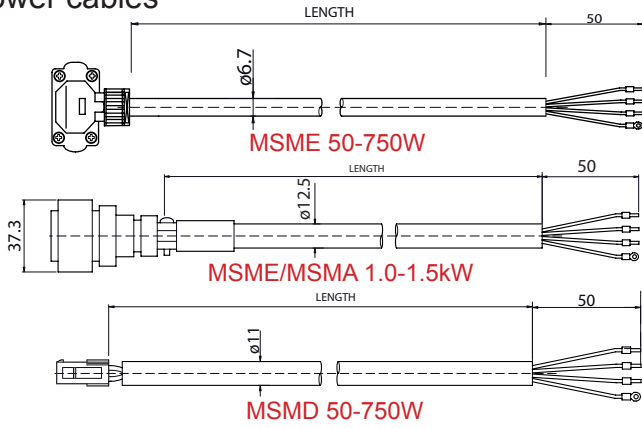


Dotted lines represent the torque with a 10% shortfall in the supply voltage.

Torque curves for MSMD and MSMA motors are similar but with a maximum speed of 5000r/min. Details on request.

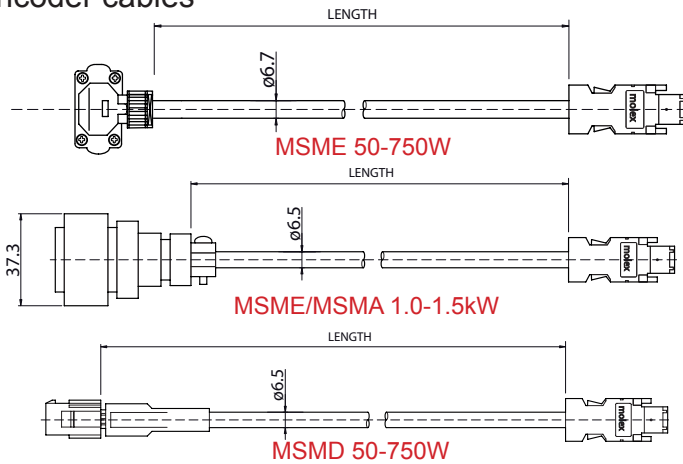
# Panasonic MINAS cables

## Power cables



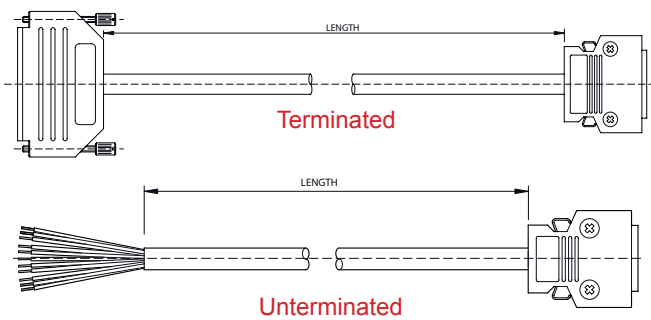
Length	Power cable part no.		
	MSME 50-750W	MSME & MSMA 1000 & 1500W	MSMD 50-750W
3m	13407162	13142345	13142325
5m	13407163	13142346	13125836
10m	13407164	13142347	13142326

## Encoder cables



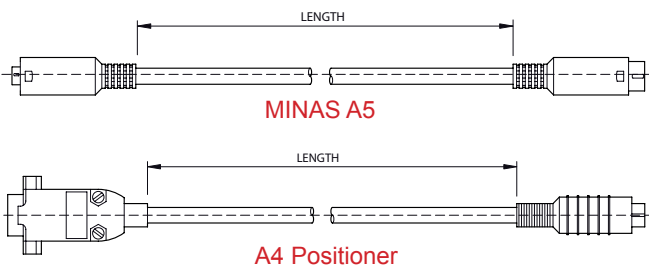
Length	Encoder cable part no.		
	MSME 50-750W	MSME & MSMA 1000 & 1500W	MSMD 50-750W
3m	13407173	13142309	13142322
5m	13407174	13142310	13125837
10m	13407175	13142311	13142323

## I/O cables



Length	50 Way		A4P - Positioner drives, 37 way	
	Terminated	Untermiated	Terminated	Untermiated
0.5m	13143729	-	13146591	-
1.0m	13143725	13143733	13146622	13146626
3.0m	13143724	13143727	13146623	13146627
5.0m	13143731	13143720	-	13146628

## RS232 communication cables (drive to PC)



Length	RS232 cable part no.	
	MINAS A5	A4 Positioner
2m	*N/A	13004152

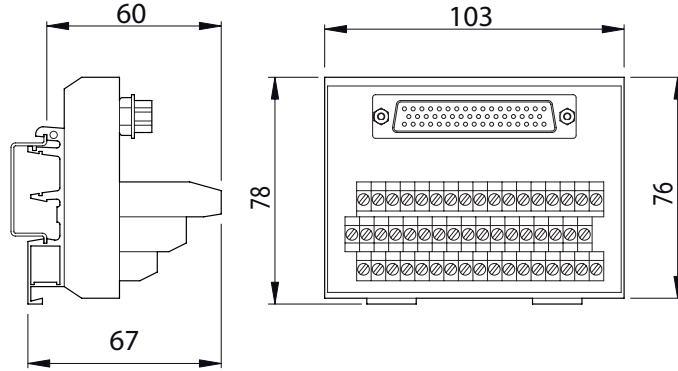
\*Standard Mini - USB cable can be used for programming

Available on request: brake motor cables, non standard lengths, panel mount and right angle connectors

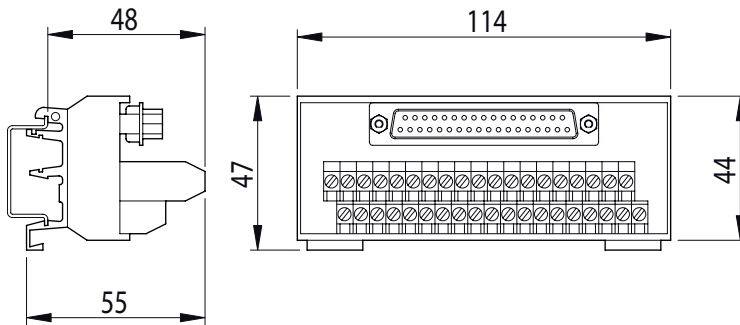


# Panasonic MINAS Accessories

## Control interface boards

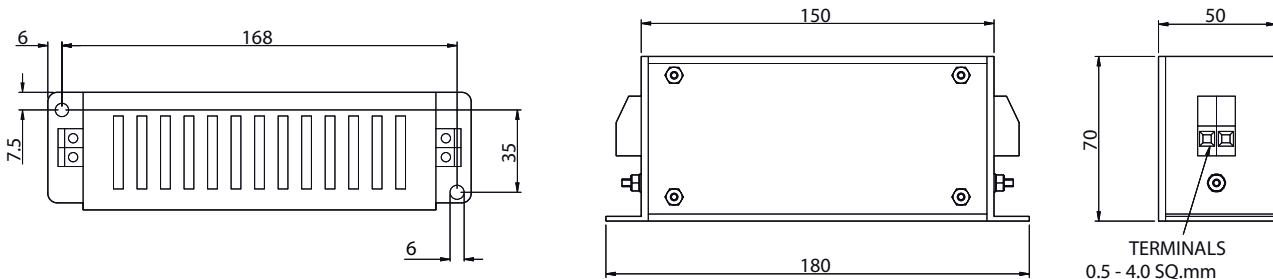


50 way I/O board	
Part no	13003990



37 way I/O board	
Part no	13004373

## Noise filters



RFI Filter	
50W-400W	13265769
750W-1.5kW	13265770

TERMINALS  
0.5 - 4.0 SQ.mm

## EtherCAT based controllers

We recommend two alternative controllers that are proven to work with EtherCAT Servo systems



### Lenze 3200C

The 3200C series of DIN-rail mounted controllers give highly flexible control for logic (PLC), motion and visualisation

- high precision with 1µs time stamp
- DVI-D link for easy visualisation
- Standard programming to IEC 61131-3, PLCopen and CoDeSys 3
- Lenze I/O System 1000 plugs to side
- SD card slot and integrated UPS



### Trio MC4N

The MC4N is a high performance motion coordinator for up to 32 axes with 64 bit integer position registers for ultra precise axis resolution.

- cyclic synchronous position, speed or torque modes
- linear, circular, helical and spherical interpolation
- TrioBASIC programming or IEC 61131-3 optional
- Ethernet and RS232, RS485 ports
- Connection of EtherCAT I/O



## Other Panasonic drive products

### 3-Series AC geared motors

Small AC geared motors with high Panasonic quality and global approvals. Available for 1 and 3 phase supply and with brake motors



- powers 6 to 90W with 6 increments
- output torques up to 29Nm
- output speeds 0.6 to 450 r/min
- CE, UL, cUL and CCC approvals
- suits fixed or variable speed drives

### B-Series brushless geared motors with integrated drives

Brushless geared motors for precise speed holding over a 100:1 speed range with integrated drive and IP65 enclosure



- powers 30, 50, 90 & 130W
- rated speeds 30-1000r/min with 100:1 range
- B1 general purpose drives with torques to 29Nm
- B3 4-point positioning drives to 18Nm, step angle 1.25°, RS232/483 comms.

### MINAS GV brushless geared motors General purpose drives

Compact and economic brushless motors drives for precise speed holding over a wide range



- powers 50,90 and 130W
- rated output speeds 1.5 to 1000 r/min
- constant torque over 133:1 range
- supply 230V 1-phase
- free Panaterm operating software

### Minas GV 24 brushless Low voltage drives

Similar to the standard GV model but 24V DC supply for cases an AC supply cannot be used.



- powers 50 and 100W (100W models at end 2015)
- rated output speeds 1.5 to 1000r/min
- speed holding better than 1%
- constant torque over 133:1 range
- 150% starting torque

### MINAS GP brushless geared motors. Positioner drives

Suiting 4-point positioning, the GP has S ramps for smooth indexing. Ideal for portioning, reciprocating and door drives.



- powers 50, 90 and 130W
- rated output speeds 5 to 600r/min
- positioning accuracy +/- 5° at the motor
- supply 230V 1-phase
- optional keypads, filters & cables

### MINAS KV brushless speed control

The KV offers servo-like performance at low cost. Ideal for speed controlled applications and upgrading of stepper drives.



- powers 50 to 750W in 5 increments
- rated torques 0.16 to 2.4 Nm
- rated speed 3000 r/min
- speed control range 100 to 4000 r/min
- supply 230V 1-phase

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