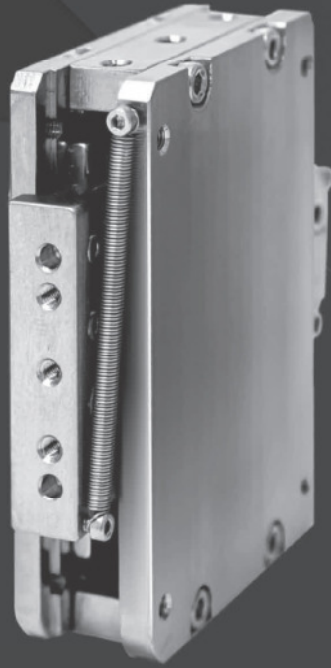




# **RVCA** SERIES

RECTANGULAR VOICE COIL ACTUATOR

- [PLAY VIDEO](#) -

# RVCA SERIES

RECTANGULAR VOICE COIL ACTUATOR



## Ultra-High Frequency for Short Stroke Motion Systems

Rectangular Voice Coil Actuators (RVCA) actuators are preferred to circular versions especially in designs where space constraints are critical in linear motion applications. The flat rectangular voice coil design has similar characteristics to the normal common circular voice coil assemblies.

RVCA stages are built with precision cross roller guides that provide high rigidity to complement the high acceleration capability of the CVC module which has very low electrical/mechanical time constants and zero hysteresis. The actuator is specially developed for high precision frequency motion of short strokes (<50mm).

- Compact and streamline form factor
- Cross roller bearing for excellent precision and rigidity
- Zero cogging, zero-backlash and zero hysteresis
- Low moving mass, fast response
- Integrated linear encoder
- Ease of use, plug and play
- Excellent reliability
- Sub-micron Resolution possibilities

DXB/BT

PIX

PSM/PSME

CVC

CVCA

**RVCA**

PDDR

PCA

PWA

PLA

PDAB

PIAB

OCTO

PRG

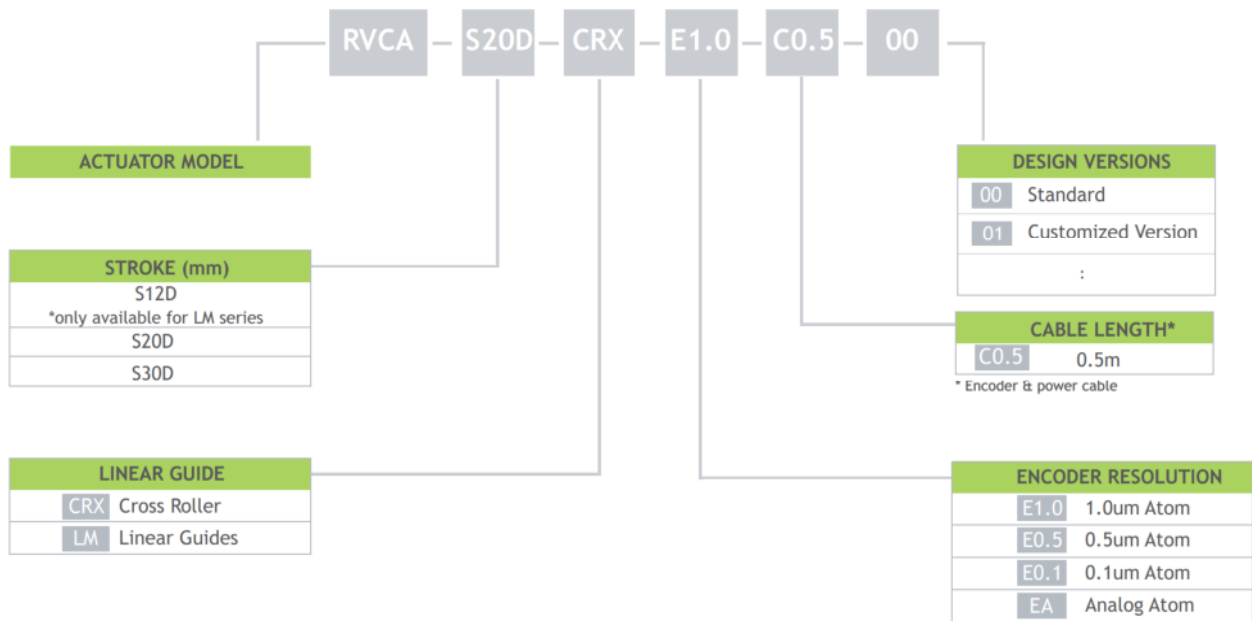
LINEAR ENCODER

SERVO AMPLIFIER

## ULTRA HIGH FREQUENCY

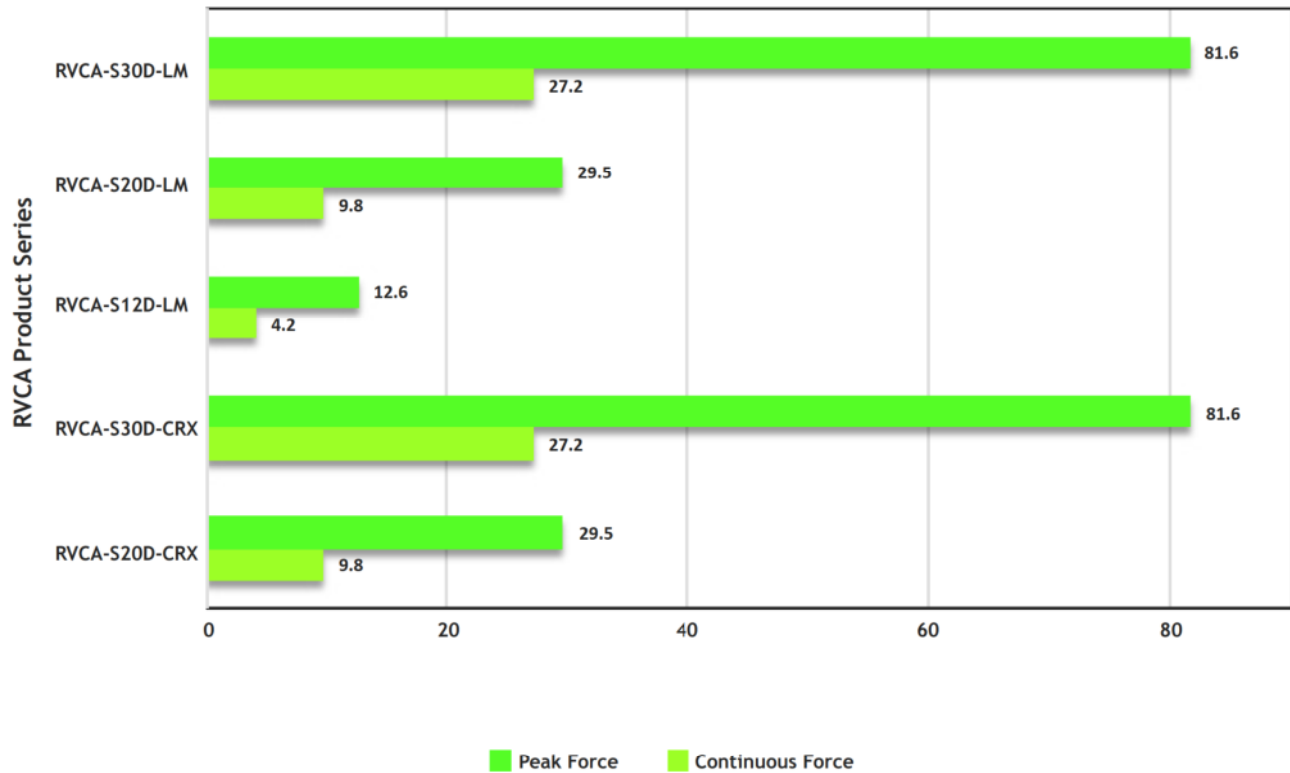
rectangular voice coil actuators

| Model         | Stroke (mm) | Continuous Force (N) | Peak Force (N) | Continuous Current (A) | Peak Current (A) |
|---------------|-------------|----------------------|----------------|------------------------|------------------|
| RVCA-S20D-CRX | 20          | 9.8                  | 29.5           | 1.31                   | 3.94             |
| RVCA-S30D-CRX | 30          | 27.2                 | 81.6           | 2.02                   | 6.05             |
| RVCA-S12D-LM  | 12          | 4.2                  | 12.6           | 1.17                   | 3.51             |
| RVCA-S20D-LM  | 20          | 9.8                  | 29.5           | 1.31                   | 3.94             |
| RVCA-S30D-LM  | 30          | 27.2                 | 81.6           | 2.02                   | 6.05             |



# FORCE CHART FOR RVCA MOTORS

Force Chart For RVCA Motors



DXB/BT

PIX

PSM/PSME

CVC

CVCA

**RVCA**

PDDR

PCA

PWA

PLA

PDAB

PIAB

OCTO

PRG

LINEAR ENCODER

SERVO AMPLIFIER



## RVCA SERIES

### RECTANGULAR VOICE COIL ACTUATOR

## RVCA SERIES

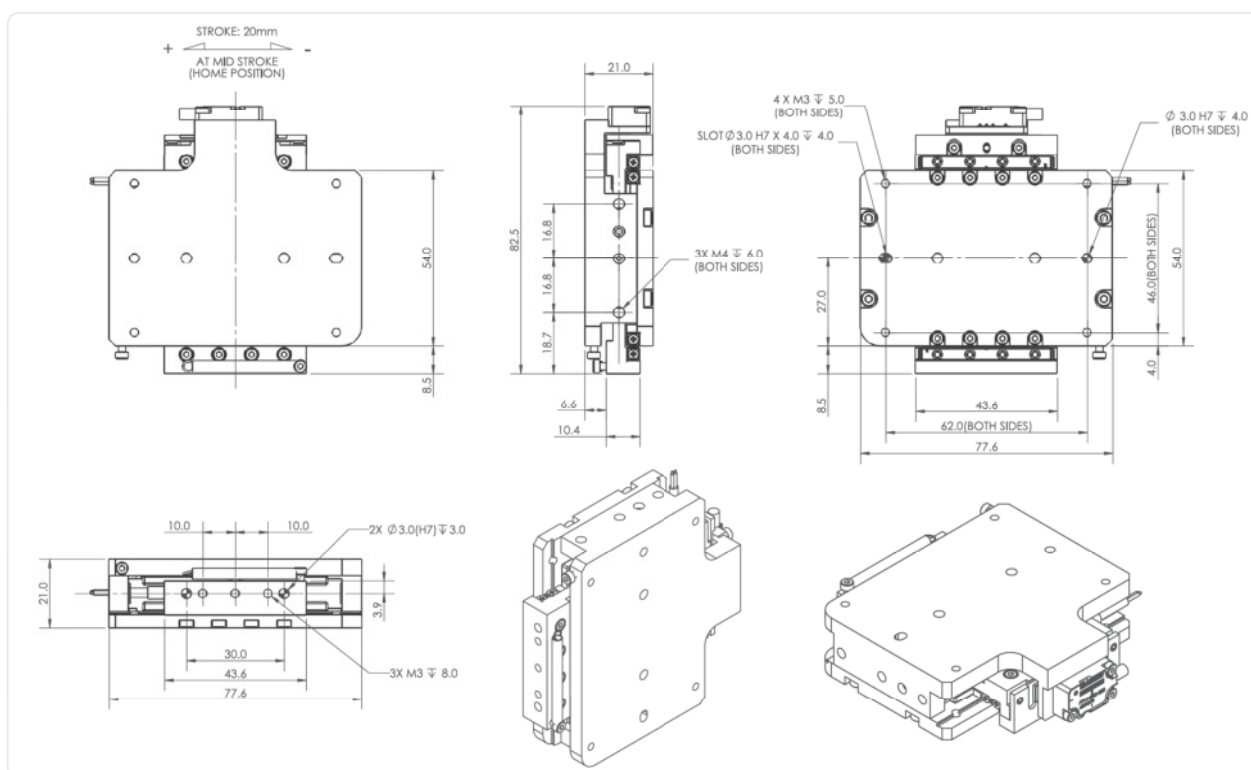
- Ideal for high speed pick-and-place applications
- Peak force to 81.7N, Continuous force to 27.3N
- Cross roller bearing for excellent precision and rigidity
- Direct drive, cogging free
- Low moving mass, fast response
- Integrated linear encoder
- Ease of use, plug and play
- Excellent reliability

| SPECIFICATION                     |             | MODEL         |               |
|-----------------------------------|-------------|---------------|---------------|
|                                   |             | RVCA-S20D-CRX | RVCA-S30D-CRX |
| <b>Performance</b>                | <b>Unit</b> |               |               |
| Stroke                            | mm          | 20            | 30            |
| Peak Force                        | N           | 29.5          | 81.7          |
| Continuous Stall Force @ 100°C*   | N           | 8.6           | 24.0          |
| Continuous Stall Force @ 125°C*   | N           | 9.8           | 27.3          |
| Peak Power @ 125°C*               | W           | 91.4          | 226.1         |
| Continuous Power @ 100°C          | W           | 7.3           | 18.2          |
| Continuous Power @ 125°C*         | W           | 10.2          | 25.2          |
| <b>Electrical</b>                 |             |               |               |
| Peak Current                      | A           | 3.94          | 6.1           |
| Continuous Stall Current @ 100°C* | A           | 1.15          | 1.8           |
| Continuous Stall Current @ 125°C* | A           | 1.31          | 2.0           |
| Force Constant @ Mid Stroke       | N/A         | 7.50          | 13.5          |
| Back EMF Constant @ Mid Stroke    | V/m/s       | 7.50          | 13.5          |
| Coil Resistance @ 25°C            | ohm         | 4.20          | 4.4           |
| Coil Resistance @ 100°C*          | ohm         | 5.47          | 5.7           |
| Coil Resistance @ 125°C*          | ohm         | 5.90          | 6.2           |
| Inductance @ 1kHz (Inside fully)  | mH          | 1.03          | 1.9           |
| Motor Constant @ 125°C*           | N//W        | 3.09          | 5.4           |
| Max. Terminal Voltage             | Vdc         | 48            | 100           |
| <b>Thermal</b>                    |             |               |               |
| Thermal Resistance @ 100°C*       | °C/W        | 10.31         | 4.1           |
| Thermal Resistance @ 125°C*       | °C/W        | 9.85          | 4.0           |
| Max. Coil Temperature             | °C          | 125           |               |
| <b>Mechanical Specifications</b>  |             |               |               |
| Moving Mass                       | kg          | 0.070         | 0.250         |
| Total Mass                        | kg          | 0.580         | 1.870         |
| Repeatability**                   | um          | ± 1.0         | ± 1.0         |
| Straightness***                   | um          | ± 3.0         | ± 3.0         |
| Flatness***                       | um          | ± 3.0         | ± 3.0         |
| <b>Static Moments</b>             |             |               |               |
| MY                                | Nm          | 2.8           | 19.4          |
| MR                                | Nm          | 3.1           | 19.9          |
| MP                                | Nm          | 3.3           | 22.8          |

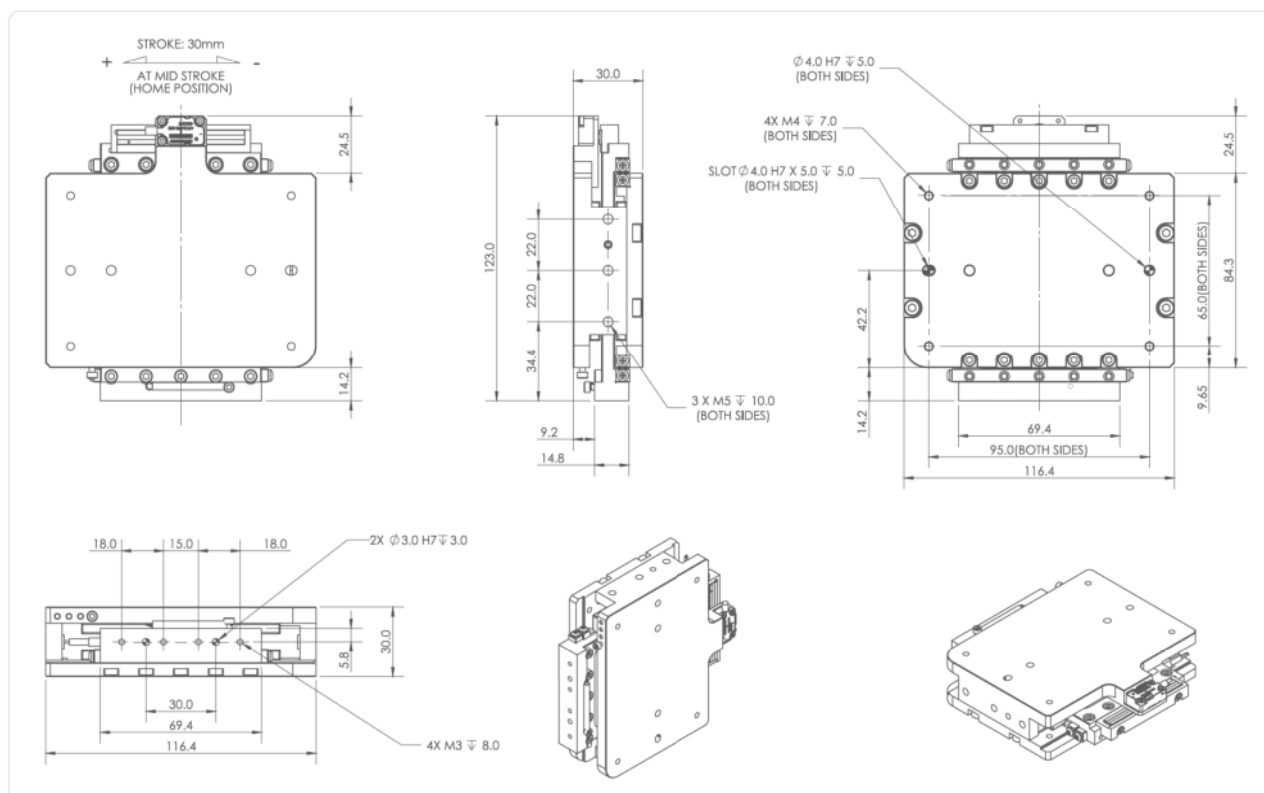
**Notes:**

- \* Ambient temperature 25°C, natural convection, no heat sink.
- Specifications tolerance - Inductance +/-30%, all others +/-10%.
- \*\* Depend on encoder resolution.
- \*\*\* Specific accuracy, straightness and flatness requirement, contact PBA for more information.
5. Peak force and current :4% duty ratio and 1 second duration.
6. Specifications are subject to change without prior notice.

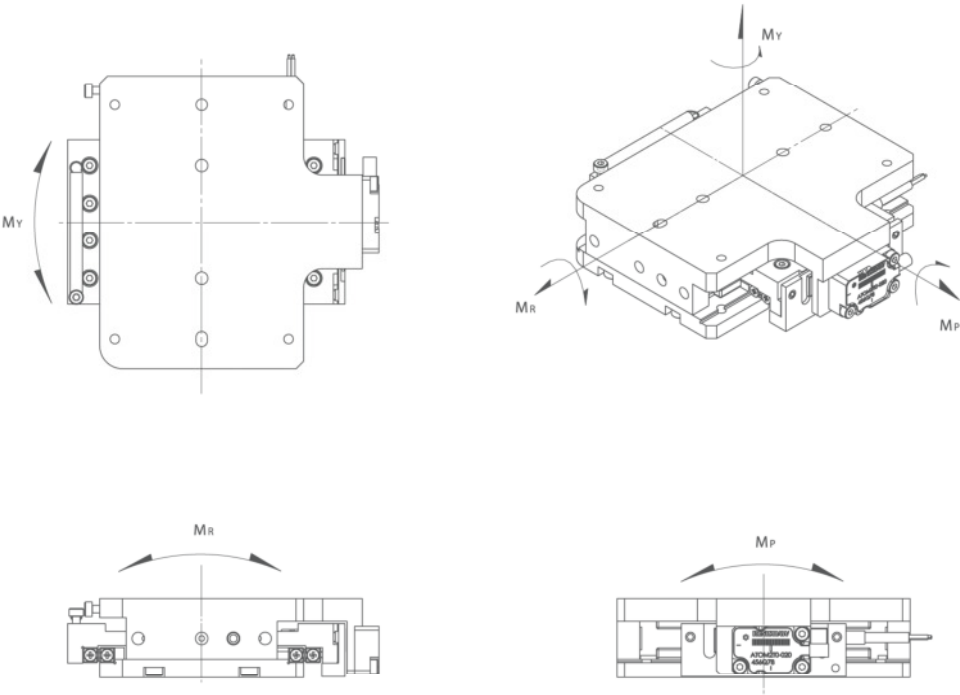
## SERVO AMPLIFIER



## SERVO AMPLIFIER



RVCA Static Moment Data



| RVCA STATIC MOMENT (N.m) |      |      |      |
|--------------------------|------|------|------|
| MODEL NO                 | My   | Mr   | Mp   |
| RVCA-S20D-CRX            | 2.8  | 3.1  | 3.3  |
| RVCA-S30D-CRX            | 19.4 | 19.9 | 22.8 |

## RVCA SERIES

### RECTANGULAR VOICE COIL ACTUATOR

## RVCA SERIES

- Ideal for high speed pick-and-place applications
- Peak force to 81.7N, Continuous force to 27.3N
- Direct drive, cogging free
- Low moving mass, fast response
- Integrated linear encoder
- Ease of use, plug and play
- Excellent reliability

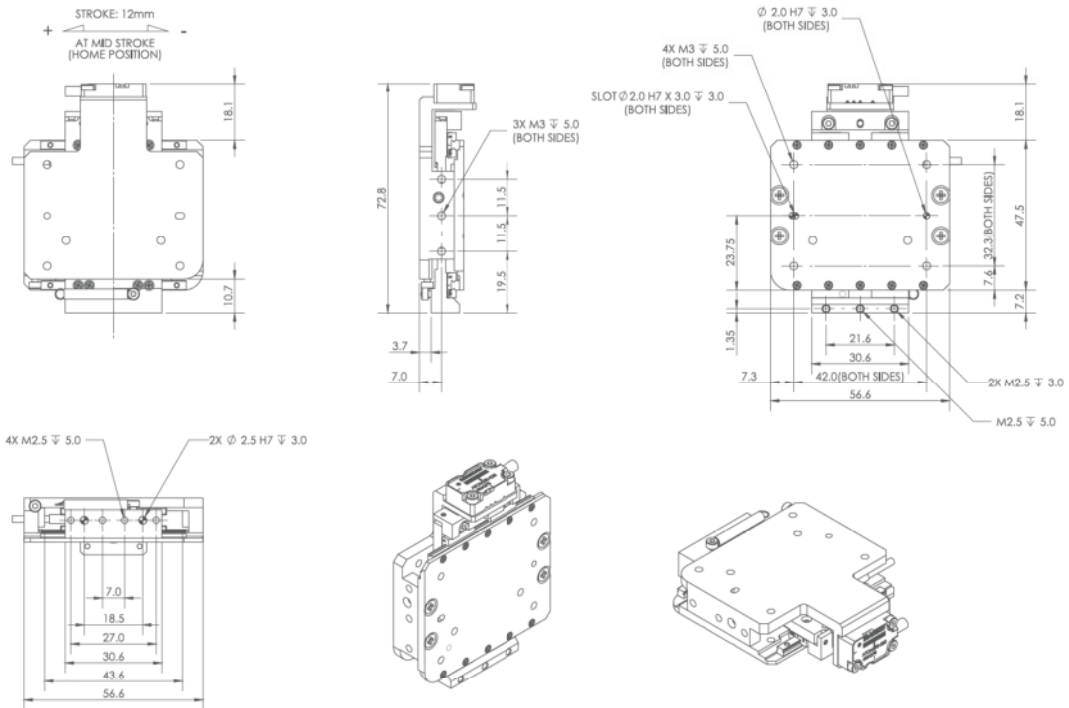
| SPECIFICATION                     |             | MODEL        |              |              |
|-----------------------------------|-------------|--------------|--------------|--------------|
|                                   |             | RVCA-S12D-LM | RVCA-S20D-LM | RVCA-S30D-LM |
| <b>Performance</b>                | <b>Unit</b> |              |              |              |
| Stroke                            | mm          | 12           | 20           | 30           |
| Peak Force                        | N           | 12.6         | 29.5         | 81.7         |
| Continuous Stall Force @ 100°C*   | N           | 3.7          | 8.6          | 24.0         |
| Continuous Stall Force @ 125°C*   | N           | 4.2          | 9.8          | 27.3         |
| Peak Power @ 125°C*               | W           | 51.9         | 91.4         | 226.1        |
| Continuous Power @ 100°C          | W           | 4.2          | 7.3          | 18.2         |
| Continuous Power @ 125°C*         | W           | 5.8          | 10.2         | 25.2         |
| <b>Electrical</b>                 |             |              |              |              |
| Peak Current                      | A           | 3.51         | 3.94         | 6.1          |
| Continuous Stall Current @ 100°C* | A           | 1.04         | 1.15         | 1.8          |
| Continuous Stall Current @ 125°C* | A           | 1.17         | 1.31         | 2.0          |
| Force Constant @ Mid Stroke       | N/A         | 3.60         | 7.50         | 13.5         |
| Back EMF Constant @ Mid Stroke    | V/m/s       | 3.60         | 7.50         | 13.5         |
| Coil Resistance @ 25°C            | ohm         | 3.00         | 4.20         | 4.4          |
| Coil Resistance @ 100°C*          | ohm         | 3.91         | 5.47         | 5.7          |
| Coil Resistance @ 125°C*          | ohm         | 4.21         | 5.90         | 6.2          |
| Inductance @ 1kHz (Inside fully)  | mH          | 0.32         | 1.03         | 1.9          |
| Motor Constant @ 125°C*           | N/√W        | 1.75         | 3.09         | 5.4          |
| Max. Terminal Voltage             | Vdc         | 48           |              | 100          |
| <b>Thermal</b>                    |             |              |              |              |
| Thermal Resistance @ 100°C*       | °C/W        | 17.88        | 10.31        | 4.1          |
| Thermal Resistance @ 125°C*       | °C/W        | 17.34        | 9.85         | 4.0          |
| Max. Coil Temperature             | °C          | 125          |              |              |
| <b>Mechanical Specifications</b>  |             |              |              |              |
| Moving Mass                       | kg          | 0.030        | 0.078        | 0.240        |
| Total Mass                        | kg          | 0.230        | 0.613        | 1.950        |
| Repeatability**                   | um          | ± 1.0        | ± 1.0        | ± 1.0        |
| Straightness***                   | um          | ± 3.0        | ± 3.0        | ± 3.0        |
| Flatness***                       | um          | ± 3.0        | ± 3.0        | ± 3.0        |
| <b>Static Moments</b>             |             |              |              |              |
| MY                                | Nm          | 1.9          | 5.5          | 3.0          |
| MR                                | Nm          | 0.9          | 2.0          | 4.5          |
| MP                                | Nm          | 4.3          | 8.4          | 17.4         |

#### Notes:

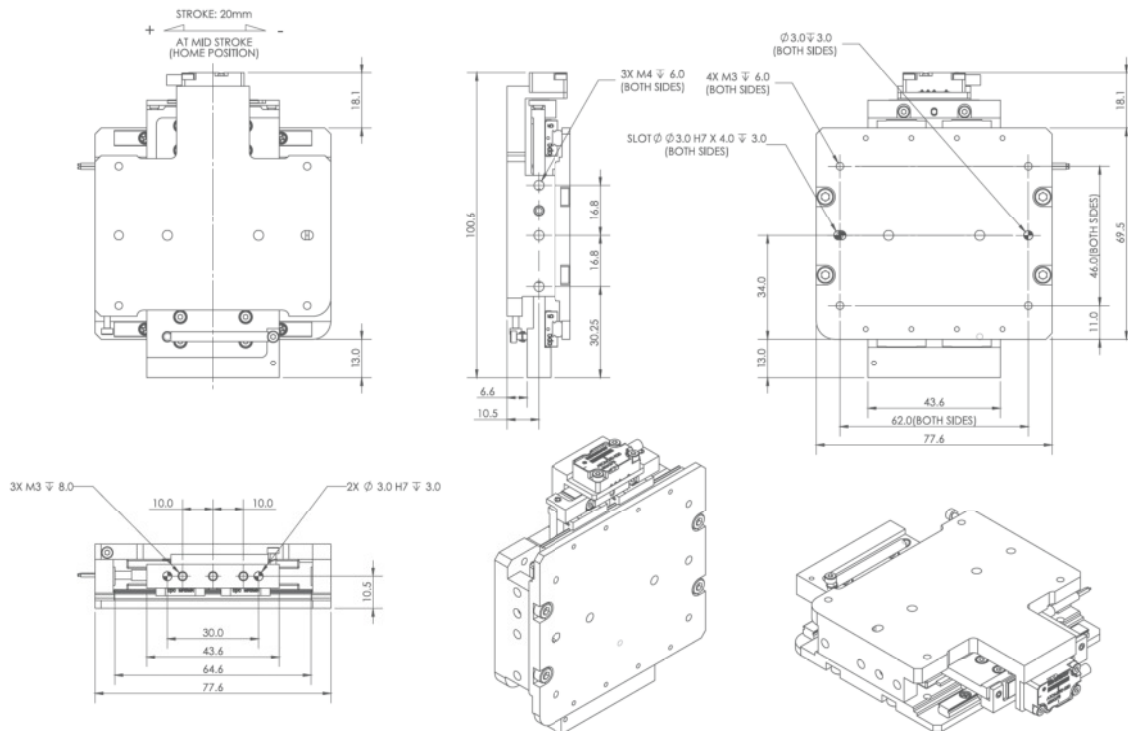
- \* Ambient temperature 25°C, natural convection, no heat sink.
- Specifications tolerance - inductance +/-30%, all others +/-10%.
- \*\* Depend on encoder resolution.
- \*\*\* Specific accuracy, straightness and flatness requirement, contact PBA for more information.
- Peak force and current :4% duty ratio and 1 second duration.
- Specifications are subject to change without prior notice.



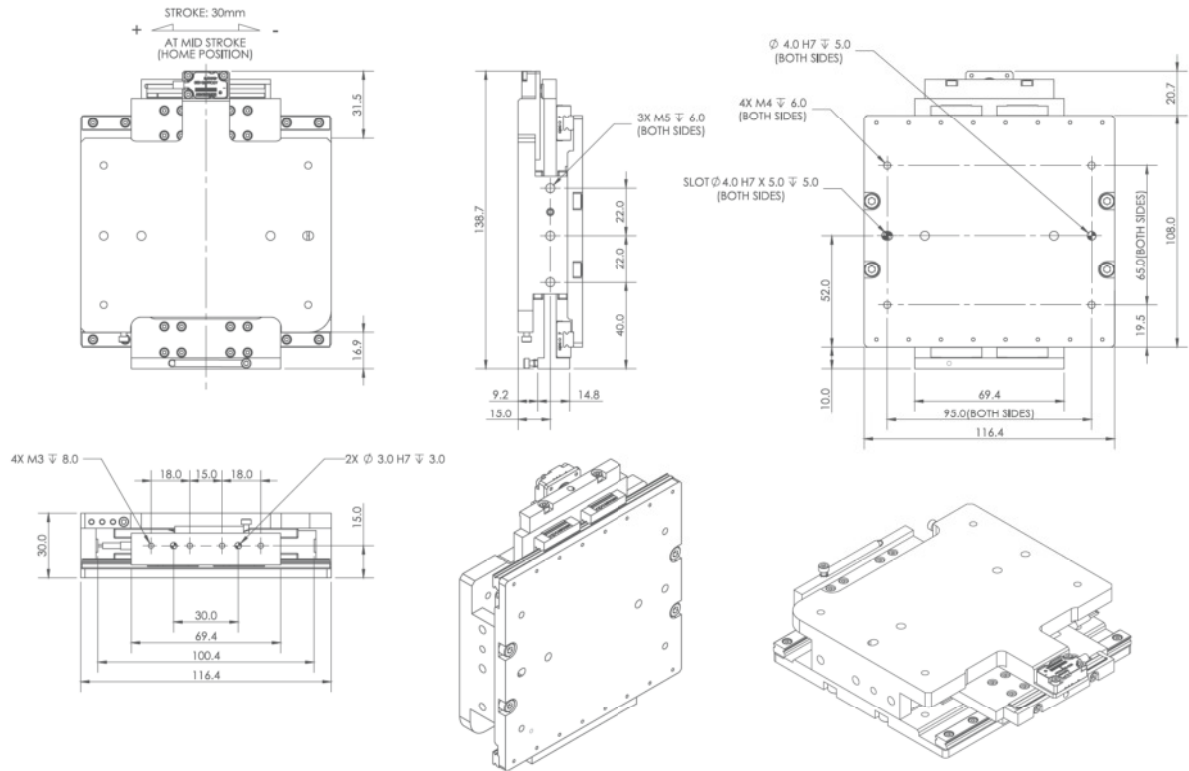
## RVCA-S12D-LM



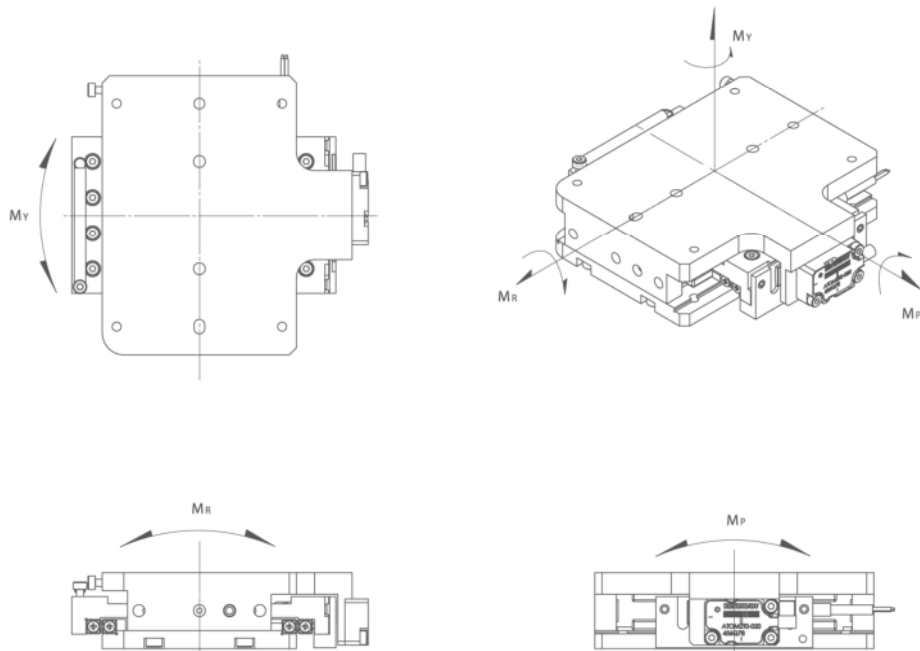
## RVCA-S20D-LM



## RVCA-S30D-LM



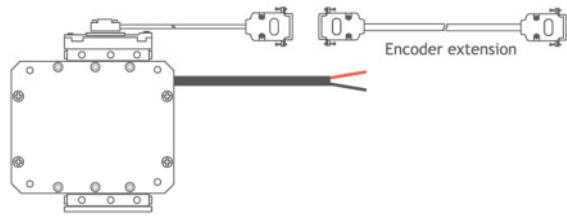
## RVCA Static Moment Data



| RVCA STATIC MOMENT (N.m) |       |       |       |
|--------------------------|-------|-------|-------|
| MODEL NO                 | $M_Y$ | $M_R$ | $M_P$ |
| RVCA-S12D-LM             | 1.9   | 0.9   | 4.3   |
| RVCA-S20D-LM             | 5.5   | 2.0   | 8.4   |
| RVCA-S30D-LM             | 3.0   | 4.5   | 17.4  |

# RVCA SERIES EXTENTION CABLE

Connection example:  
RVCA-S□D-CRX-E□-C□-00



Renishaw ATOM Ri Interface Connector Pin Out

| 15 pin D Sub Male Connector | ENCODER (DIGITAL) | ENCODER (ANALOG) |
|-----------------------------|-------------------|------------------|
| 1                           | -                 | COSINE-          |
| 2                           | GND               | SINE-            |
| 3                           | -                 | Z+               |
| 4                           | Z-                | +5V              |
| 5                           | B-                | +5V              |
| 6                           | A-                | -                |
| 7                           | +5V               | -                |
| 8                           | +5V               | -                |
| 9                           | GND               | COSINE+          |
| 10                          | -                 | SINE+            |
| 11                          | -                 | Z-               |
| 12                          | Z+                | GND              |
| 13                          | B+                | GND              |
| 14                          | A+                | -                |
| 15                          | -                 | -                |
| Case                        | Shield            | Shield           |

| Extension Cable               |                                                                                   |  |  | Part Number        |
|-------------------------------|-----------------------------------------------------------------------------------|--|--|--------------------|
| Encoder<br>Extension<br>Cable |  |  |  | CBL_EXT_REN05_X.X  |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  | CBL_EXT_REN05A_X.X |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  |                    |
|                               |                                                                                   |  |  |                    |

Notes: 1. X.X is the length of the cable in meters 2. For customized cable length, contact PBA