# AP MOTRONIX PRIVATE LIMITED

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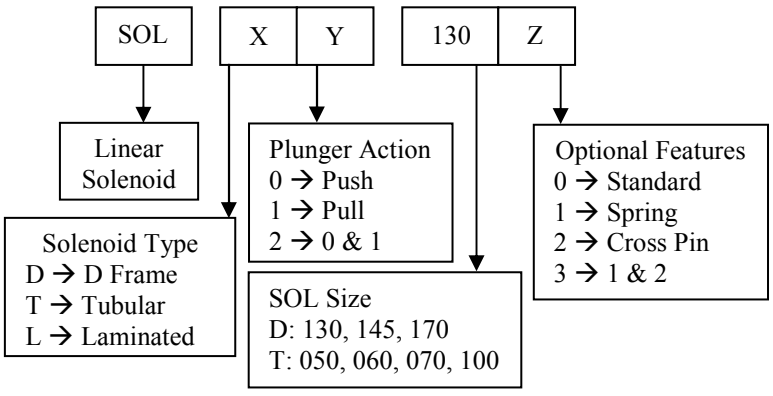
## SOLENOID SERIES

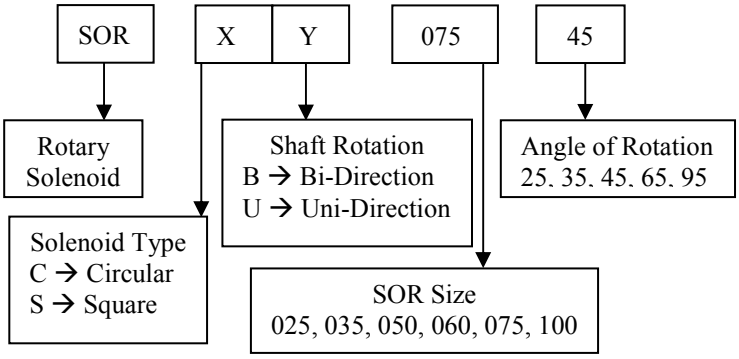
Solenoids are classified based on the type of Voltage (AC or DC), Action (Linear or Rotational) and Electrical Duty Cycle (EDC). Solenoid consists of a coil wound on a bobbin encapsulated in a frame of suitable size. The bobbin has a through hole in which the plunger operates. When the coil is energized magneto motive force develops, forcing the plunger to minimize the path of magnetic reluctance. While in a Linear Solenoid this motion of the plunger is converted to either the Pull or Push based on the type of end style of the plunger; in case of Rotary Solenoid the motion is rotational. The stroke length and force developed by the pulling or pushing action of the plunger is intelligently used to perform predetermined work (similarly, the angular rotation and the torque of the Rotary Solenoid). These find applications in machineries like textile, pharmaceutical, security, office, and robotics.

**SERIES CODE:**

**LINEAR SOLENOID:**

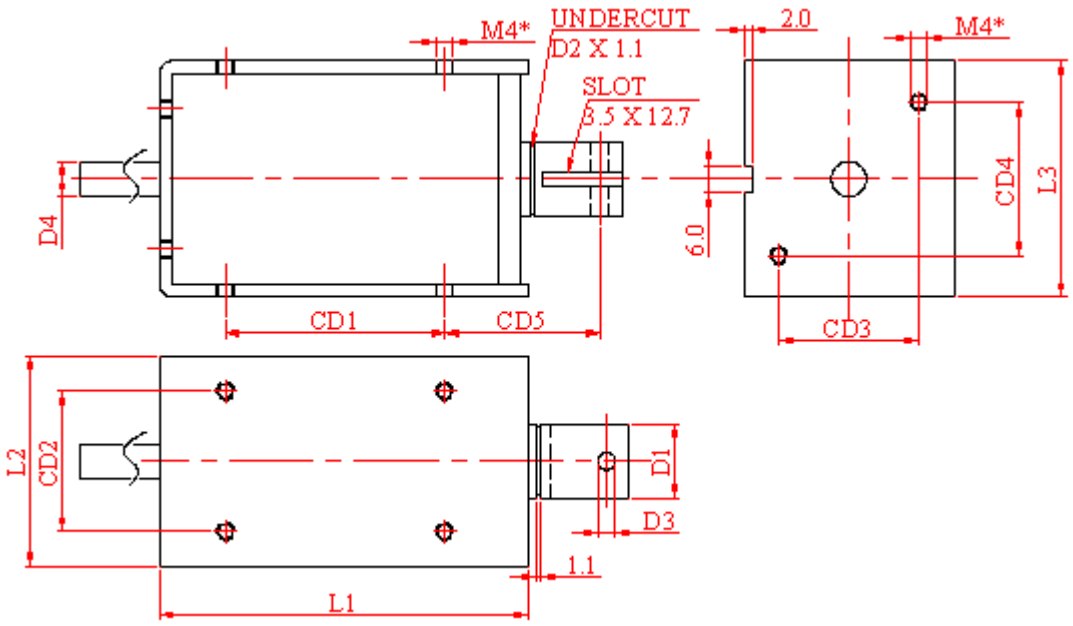


## ROTARY SOLENOID:




## MECHANICAL SPECIFICATIONS:

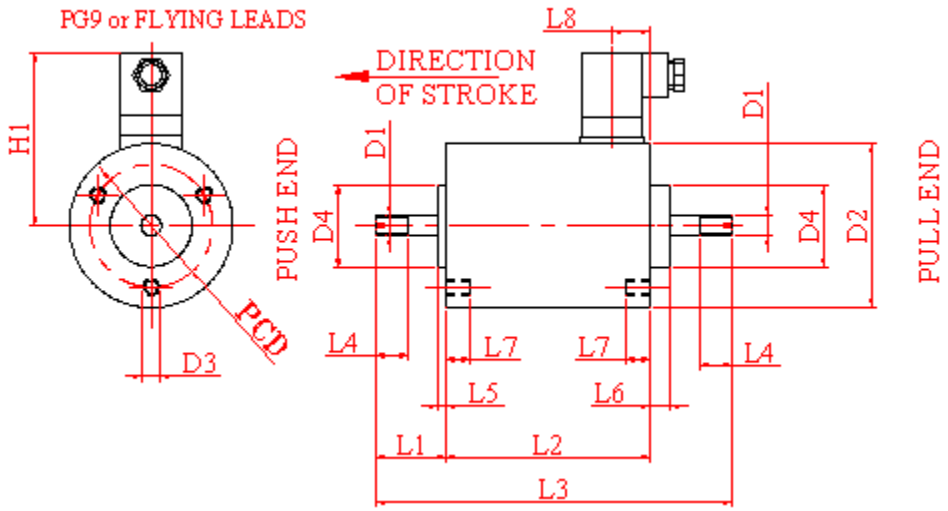
## LINEAR SOLENOID:(OPEN FRAME):




| SOL-D2- | MECHANICAL DIMENSIONS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D1 (PULL) | D2 | D3 | D4 (max.) | CD1 | CD2 | CD3 | CD4 | CD5 | L1 (max.) | L2 (max.) | L3 (max.) |
| 130 | 12.8 | 12.2 | 3.2 | 4.0 | 38.10 | 17.46 | 17.46 | 18.26 | 17.00 | 59.2 | 26.7 | 32.0 |
| 145 | 14.3 | 13.2 | 4.0 | 4.0 | 28.57 | 31.75 | 31.75 | 34.94 | 20.60 | 49.4 | 41.5 | 47.5 |
| 170 | 16.8 | 16.0 | 4.0 | 5.0 | 50.0 | 32.0 | 32.0 | 35.0 | 37.0 | 84.0 | 48.0 | 54.0 |

**M4*:** Over-length mounting screws will damage the coil.

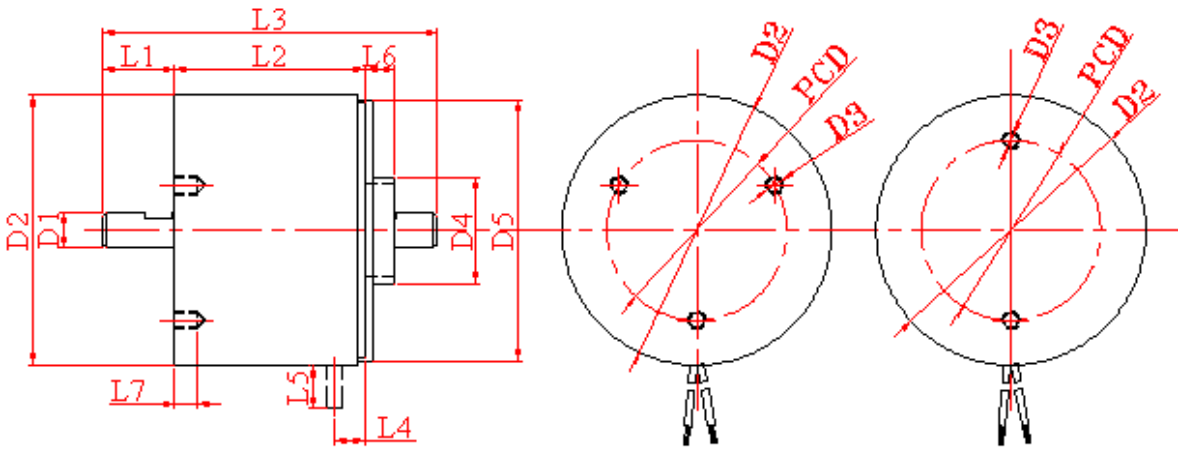
## TUBULAR:




| MODEL SOL-T2- | MECHANICAL DIMENSIONS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D1 | D2 | D3 | D4 | PCD | L1 | L2 | L3 | L4 | L5 | L6 | L7* | L8 | H1 |
| 050 | M5 | 50 | M4 | 30 | 40 | 37 | 50 | 134 | 16 | 2 | 10 | 6 | 17 | 70 |
| 070 | M8 | 70 | M5 | 38 | 52 | 50 | 75 | 177 | 20 | 5 | 12 | 6 | 25 | 80 |
| 100 | M12 | 100 | M8 | 58 | 76 | 60 | 120 | 270 | 35 | 8 | 26 | 10 | 34 | 95 |

**L7*:** Over-length mounting screws will damage the coil.

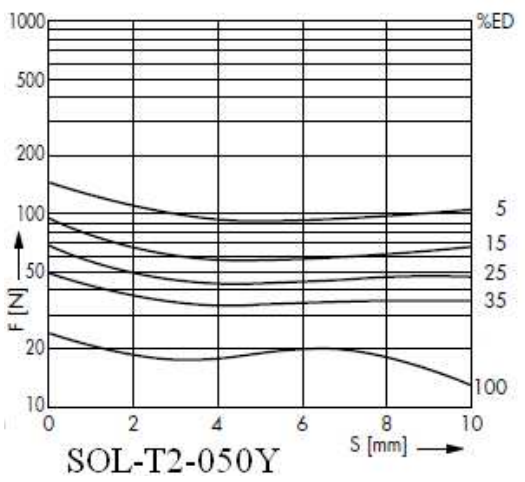
## ROTARY SOLENOID:



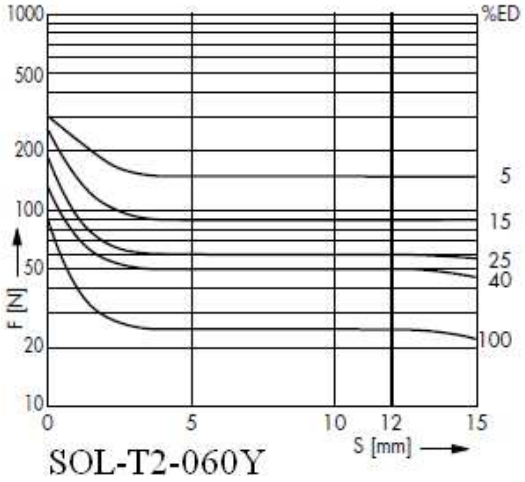

| MODEL SOR-CU- | MECHANICAL DIMENSIONS (FOR ALL ROTATION ANGLES) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D1 | D2 | D3 | D4 | D5 | PCD | L1 | L2 | L3 | L4 | L5 | L6 | L7* |
| 025 | 3.0 | 25.0 | M3 | 11.4 | 23.2 | 18.0 | 15.0 | 25.0 | 55.0 | 5.5 | 100.0 | 3.2 | 3.0 |
| 035 | 4.0 | 35.0 | M3 | 14.6 | 33.4 | 25.0 | 10.0 | 27.5 | 47.5 | 7.0 | 100.0 | 4.5 | 3.5 |
| 050 | 6.0 | 50.0 | M4 | 20.8 | 48.0 | 35.0 | 20.0 | 38.0 | 78.0 | 8.5 | 150.0 | 4.7 | 5.0 |
| 060 | 8.0 | 60.0 | M4 | 24.0 | 57.5 | 40.0 | 18.0 | 42.0 | 78.0 | 10.0 | 150.0 | 6.0 | 6.0 |
| 075 | 10.0 | 75.0 | M5 | 29.5 | 72.0 | 50.0 | 25.0 | 53.0 | 103.0 | 12.5 | 200.0 | 8.5 | 8.0 |
| 100 | 12.0 | 100.0 | M6 | 32.0 | 96.0 | 70.0 | 25.0 | 68.0 | 118.0 | 16.0 | 260.0 | 10.0 | 9.0 |

**L7*:** Over-length mounting screws will damage the coil.

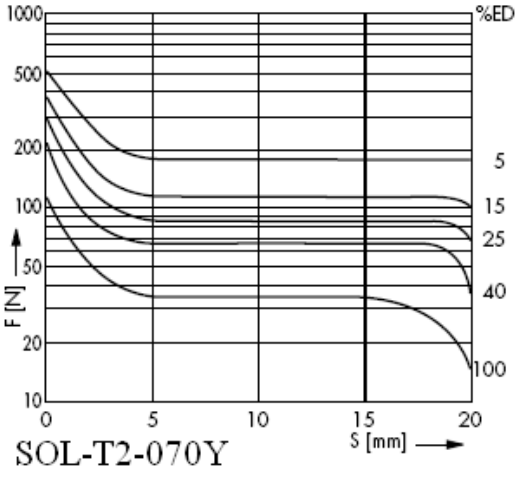
## FORCE-STROKE: TUBULAR LINEAR SOLENOID:



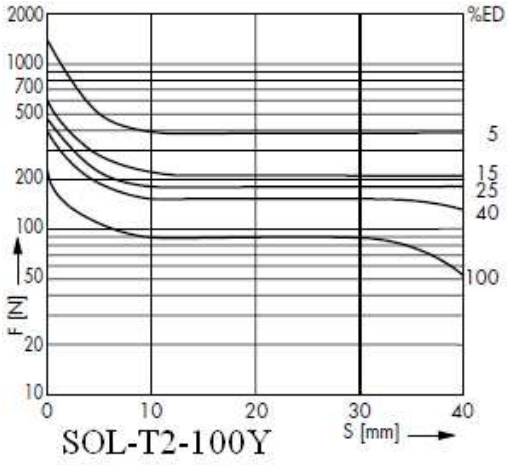
SOL-T2-050Y



SOL-T2-060Y



SOL-T2-070Y



SOL-T2-100Y

## ELECTRICAL SPECIFICATIONS:

## TUBULAR LINEAR SOLENOID:

| MODEL SOL-T2- | 050 | | 060 | | 070 | | 100 | |
|---|---|---|---|---|---|---|---|---|
| STROKE mm(max.) | 10 | | 15 | | 20 | | 40 | |
| | EDC (%) | Power (W) | EDC (%) | Power (W) | EDC (%) | Power (W) | EDC (%) | Power (W) |
| | 5 | 300 | 5 | 385 | 5 | 475 | 5 | 1080 |
| | 15 | 115 | 15 | 150 | 15 | 200 | 15 | 400 |
| | 25 | 70 | 25 | 100 | 25 | 125 | 25 | 260 |
| | 35 | 55 | 40 | 60 | 40 | 80 | 40 | 170 |
| | 100 | 20 | 100 | 30 | 100 | 35 | 100 | 75 |

## ROTARY SOLENOID:

| MODEL SOR-CU-025- | Voltage (V) | | | 24 | | | | | 205 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EDC (%) | | | 100 | 48 | 27 | 14 | 4.4 | 100 | 50 | 18 | 8 | 5 |
| | Current (A) | | | 0.16 | 0.32 | 0.55 | 1.02 | 3.04 | 0.01 | 0.03 | 0.09 | 0.19 | 0.30 |
| | Torque (Kg-cm) | $25^0$ | $M_i$ | 0.03 | 0.06 | 0.10 | 0.15 | 0.28 | 0.02 | 0.05 | 0.11 | 0.19 | 0.25 |
| | | | $M_f$ | 0.05 | 0.01 | 0.14 | 0.18 | 0.27 | 0.04 | 0.09 | 0.15 | 0.22 | 0.26 |
| | | $35^0$ | $M_i$ | 0.02 | 0.05 | 0.08 | 0.12 | 0.25 | 0.02 | 0.04 | 0.09 | 0.16 | 0.22 |
| | | | $M_f$ | 0.04 | 0.09 | 0.12 | 0.16 | 0.25 | 0.03 | 0.08 | 0.13 | 0.19 | 0.24 |
| | | $45^0$ | $M_i$ | 0.01 | 0.04 | 0.06 | 0.10 | 0.21 | 0.01 | 0.03 | 0.07 | 0.13 | 0.19 |
| | | | $M_f$ | 0.04 | 0.08 | 0.11 | 0.15 | 0.22 | 0.03 | 0.07 | 0.12 | 0.17 | 0.21 |
| | | $65^0$ | $M_i$ | 0.01 | 0.03 | 0.05 | 0.08 | 0.18 | 0.008 | 0.02 | 0.05 | 0.11 | 0.16 |
| | | | $M_f$ | 0.04 | 0.07 | 0.10 | 0.13 | 0.19 | 0.03 | 0.06 | 0.10 | 0.15 | 0.17 |
| | | $95^0$ | $M_i$ | 0.006 | 0.01 | 0.03 | 0.05 | 0.13 | 0.004 | 0.01 | 0.03 | 0.07 | 0.11 |
| | | | $M_f$ | 0.003 | 0.06 | 0.09 | 0.11 | 0.13 | 0.02 | 0.06 | 0.09 | 0.12 | 0.13 |

$M_i$ is torque at start of angular stroke. $M_f$ is torque at $5^0$ before end of stroke.

| MODEL SOR-CU-035- | Voltage (V) | | | 24 | | | | | 205 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EDC (%) | | | 100 | 38 | 24 | 15 | 4.4 | 100 | 39 | 22 | 14 | 5 |
| | Current (A) | | | 0.25 | 0.58 | 0.87 | 1.36 | 4.28 | 0.03 | 0.07 | 0.11 | 0.17 | 0.40 |
| | Torque (Kg-cm) | $25^0$ | $M_i$ | 0.11 | 0.24 | 0.33 | 0.42 | 0.69 | 0.10 | 0.21 | 0.32 | 0.41 | 0.59 |
| | | | $M_f$ | 0.21 | 0.35 | 0.41 | 0.48 | 0.63 | 0.20 | 0.32 | 0.04 | 0.47 | 0.59 |
| | | $35^0$ | $M_i$ | 0.09 | 0.22 | 0.30 | 0.37 | 0.64 | 0.08 | 0.20 | 0.26 | 0.36 | 0.53 |
| | | | $M_f$ | 0.18 | 0.33 | 0.38 | 0.43 | 0.49 | 0.17 | 0.28 | 0.36 | 0.41 | 0.48 |
| | | $45^0$ | $M_i$ | 0.06 | 0.18 | 0.26 | 0.34 | 0.56 | 0.05 | 0.15 | 0.23 | 0.31 | 0.47 |
| | | | $M_f$ | 0.16 | 0.29 | 0.34 | 0.38 | 0.43 | 0.14 | 0.26 | 0.32 | 0.38 | 0.42 |
| | | $65^0$ | $M_i$ | 0.04 | 0.11 | 0.15 | 0.22 | 0.44 | 0.03 | 0.08 | 0.14 | 0.20 | 0.35 |
| | | | $M_f$ | 0.13 | 0.24 | 0.28 | 0.33 | 0.37 | 0.12 | 0.22 | 0.26 | 0.32 | 0.36 |
| | | $95^0$ | $M_i$ | 0.01 | 0.05 | 0.09 | 0.13 | 0.25 | 0.01 | 0.04 | 0.08 | 0.12 | 0.21 |
| | | | $M_f$ | 0.12 | 0.21 | 0.24 | 0.25 | 0.25 | 0.10 | 0.19 | 0.23 | 0.24 | 0.25 |

| MODEL SOR-CU-050- | Voltage (V) | | | 24 | | | | | 205 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EDC (%) | | | 100 | 44 | 21 | 13 | 5 | 100 | 35 | 22 | 13 | 5 |
| | Current (A) | | | 0.42 | 0.87 | 1.74 | 2.76 | 6.49 | 0.04 | 0.12 | 0.19 | 0.32 | 0.84 |
| | Torque (Kg-cm) | $25^0$ | $M_i$ | 0.68 | 1.14 | 1.60 | 1.85 | 2.35 | 0.58 | 1.15 | 1.45 | 1.75 | 2.30 |
| | | | $M_f$ | 1.15 | 1.53 | 1.90 | 2.13 | 2.60 | 1.05 | 1.54 | 1.75 | 2.10 | 2.5 |
| | | $35^0$ | $M_i$ | 0.52 | 0.94 | 1.35 | 1.60 | 2.20 | 0.44 | 0.95 | 1.22 | 1.52 | 2.10 |
| | | | $M_f$ | 1.02 | 1.35 | 1.60 | 1.75 | 2.00 | 0.94 | 1.36 | 1.52 | 1.70 | 1.95 |
| | | $45^0$ | $M_i$ | 0.36 | 0.68 | 1.10 | 1.38 | 1.88 | 0.31 | 0.69 | 0.96 | 1.25 | 1.80 |
| | | | $M_f$ | 0.93 | 1.25 | 1.45 | 1.60 | 1.80 | 0.86 | 1.25 | 1.40 | 1.55 | 1.77 |
| | | $65^0$ | $M_i$ | 0.22 | 0.44 | 0.81 | 1.03 | 1.55 | 0.19 | 0.45 | 0.67 | 0.98 | 1.45 |
| | | | $M_f$ | 0.86 | 1.15 | 1.35 | 1.43 | 1.50 | 0.81 | 1.16 | 1.28 | 1.40 | 1.50 |
| | | $95^0$ | $M_i$ | 0.08 | 0.22 | 0.41 | 0.56 | 0.98 | 0.06 | 0.22 | 0.33 | 0.51 | 0.91 |
| | | | $M_f$ | 0.72 | 0.89 | 0.98 | 0.98 | 0.92 | 0.66 | 0.90 | 0.96 | 0.98 | 0.92 |

| MODEL SOR-CU-060- | Voltage (V) | | | 24 | | | | | 205 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EDC (%) | | | 100 | 44 | 27 | 17 | 5 | 100 | 34 | 20 | 12 | 5 |
| | Current (A) | | | 0.56 | 1.13 | 1.75 | 2.70 | 8.60 | 0.14 | 0.16 | 0.28 | 0.43 | 0.98 |
| | Torque (Kg-cm) | $25^0$ | $M_i$ | 1.20 | 2.10 | 2.45 | 2.85 | 4.00 | 1.10 | 2.15 | 2.55 | 2.95 | 3.80 |
| | | | $M_f$ | 2.50 | 3.10 | 3.45 | 3.80 | 4.45 | 2.30 | 3.10 | 3.50 | 3.80 | 4.40 |
| | | $35^0$ | $M_i$ | 0.90 | 1.55 | 1.90 | 2.30 | 3.30 | 0.75 | 1.60 | 2.10 | 2.40 | 3.10 |
| | | | $M_f$ | 2.20 | 2.70 | 3.00 | 3.20 | 3.60 | 2.00 | 2.70 | 3.00 | 3.20 | 3.55 |
| | | $45^0$ | $M_i$ | 0.60 | 1.15 | 1.50 | 1.90 | 2.85 | 0.50 | 1.20 | 1.60 | 2.00 | 2.70 |
| | | | $M_f$ | 2.00 | 2.50 | 2.70 | 2.90 | 3.05 | 1.90 | 2.50 | 2.70 | 2.90 | 3.05 |
| | | $65^0$ | $M_i$ | 0.32 | 0.74 | 1.05 | 1.45 | 2.35 | 0.26 | 0.75 | 1.10 | 1.50 | 2.20 |
| | | | $M_f$ | 1.95 | 2.30 | 2.40 | 2.50 | 2.60 | 1.75 | 2.30 | 2.40 | 2.50 | 2.60 |
| | | $95^0$ | $M_i$ | 0.13 | 0.33 | 0.47 | 0.70 | 1.32 | 0.11 | 0.32 | 0.52 | 0.76 | 1.20 |
| | | | $M_f$ | 1.50 | 1.70 | 1.70 | 1.66 | 1.42 | 1.42 | 1.70 | 1.70 | 1.66 | 1.40 |

| MODEL SOR-CU-075- | Voltage (V) | | | 24 | | | | | 205 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EDC (%) | | | 100 | 37 | 23 | 14 | 5 | 100 | 36 | 23 | 14 | 5 |
| | Current (A) | | | 0.82 | 2.10 | 3.20 | 4.90 | 12.60 | 0.10 | 0.23 | 0.36 | 0.55 | 1.40 |
| | Torque (Kg-cm) | $25^0$ | $M_i$ | 3.55 | 5.50 | 6.50 | 7.20 | 8.90 | 3.20 | 5.10 | 6.00 | 7.00 | 8.60 |
| | | | $M_f$ | 4.80 | 6.40 | 7.30 | 8.00 | 8.90 | 4.70 | 6.10 | 7.00 | 7.50 | 8.80 |
| | | $35^0$ | $M_i$ | 2.80 | 4.80 | 5.70 | 6.50 | 8.10 | 2.60 | 4.40 | 5.10 | 6.20 | 8.00 |
| | | | $M_f$ | 4.30 | 5.60 | 6.00 | 6.30 | 6.70 | 4.15 | 5.30 | 5.80 | 6.20 | 6.60 |
| | | $45^0$ | $M_i$ | 2.30 | 4.10 | 5.00 | 5.80 | 7.50 | 2.10 | 3.70 | 4.60 | 5.40 | 7.30 |
| | | | $M_f$ | 4.00 | 5.00 | 5.40 | 5.60 | 5.80 | 3.80 | 4.90 | 5.20 | 5.50 | 5.80 |
| | | $65^0$ | $M_i$ | 1.35 | 2.60 | 3.40 | 4.20 | 6.00 | 1.20 | 2.40 | 3.10 | 3.80 | 5.70 |
| | | | $M_f$ | 3.40 | 4.20 | 4.40 | 4.40 | 4.20 | 3.30 | 4.00 | 4.50 | 4.40 | 4.20 |
| | | $95^0$ | $M_i$ | 0.62 | 1.50 | 2.15 | 2.70 | 4.20 | 0.56 | 1.30 | 1.85 | 2.50 | 4.10 |
| | | | $M_f$ | 2.60 | 3.00 | 3.00 | 3.00 | 2.50 | 2.50 | 2.95 | 3.00 | 3.00 | 2.50 |

| MODEL SOR-CU-100- | Voltage (V) | | | 24 | | | | | 205 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Current (A) | | | 1.35 | 2.70 | 3.40 | 5.30 | 8.30 | 0.16 | 0.38 | 0.76 | 1.19 | 2.42 |
| | EDC (%) | | | 100 | 46 | 36 | 22 | 14 | 100 | 37 | 18 | 11 | 5 |
| | TORQUE (Kg-cm) | $25^0$ | $M_i$ | 8.80 | 12.5 | 13.8 | 16.0 | 17.5 | 7.90 | 12.5 | 16.0 | 17.7 | 20.4 |
| | | | $M_f$ | 12.5 | 15.5 | 16.3 | 18.2 | 19.5 | 11.7 | 15.2 | 18.2 | 19.8 | 22.0 |
| | | $35^0$ | $M_i$ | 7.1 | 10.4 | 11.6 | 13.7 | 15.4 | 6.10 | 10.40 | 13.70 | 15.70 | 18.40 |
| | | | $M_f$ | 11.20 | 13.80 | 14.70 | 16.00 | 16.80 | 10.60 | 13.80 | 16.00 | 16.80 | 17.00 |
| | | $45^0$ | $M_i$ | 5.30 | 8.60 | 9.80 | 11.90 | 13.70 | 4.60 | 8.60 | 11.90 | 14.00 | 16.70 |
| | | | $M_f$ | 10.80 | 13.00 | 13.60 | 14.50 | 15.00 | 10.20 | 13.00 | 14.50 | 15.00 | 15.00 |
| | | $65^0$ | $M_i$ | 3.10 | 5.20 | 6.20 | 8.30 | 10.00 | 2.60 | 5.20 | 8.30 | 10.50 | 12.50 |
| | | | $M_f$ | 9.70 | 11.20 | 11.70 | 12.20 | 12.30 | 9.10 | 11.20 | 12.20 | 12.30 | 11.50 |
| | | $95^0$ | $M_i$ | 1.30 | 2.20 | 2.70 | 3.70 | 4.60 | 1.10 | 2.20 | 3.70 | 4.80 | 6.30 |
| | | | $M_f$ | 7.20 | 8.30 | 8.50 | 8.70 | 8.60 | 6.80 | 8.20 | 8.70 | 8.50 | 7.80 |

**ORDERING DATA:** Apart from the series, clearly indicate in your order the following:

**Operating Voltage** **:** Value and if AC or DC.

**Duty Cycle** **:** In Percentage (or the Solenoid ON & OFF Times).

**Force/Torque** **:** In Kg (for SOL) / Kg-cm (for SOR)

**Stroke** **:** In mm (SOL) / Deg. (SOR)

**Pin Size** **:** For Push type, indicate the pin diameter D4 and its length (for Linear Solenoids).

**Special Requirement:** Please specify additional features like Plunger End Style, Retractable Spring Loaded Plunger, and Cross Pin etc (SOL); micro switch (for end of stroke angle indication), Retractable Spring loaded shaft, special shaft lengths (SOR).