

Mark 978LF-JD Series

Sanitary Diaphragm Sealed Low Flow Control Valves

The Mark 978LF-JD Sanitary Low Flow Control Valve is designed to meet the stringent specifications for low flow biopharmaceutical processes. These low flow control valves are suitable for a wide variety of sterile liquid and gaseous media. The Mark 978LF-JD is ideal for use on WFI, Growth Media, Buffer, Elution Media, Solvents, as well as Clean Utility applications like Clean Steam and CIP fluids. They can be used in a wide variety of applications in the cosmetic, dairy, and food & beverage industries.

Whether the need is to control pressure, temperature, flow pH, level, or other variables, the MK978LF-JD's true characterized trims and excellent repeatability makes it the right choice for your sanitary process applications.

FEATURES

- Jorlon™ Diaphragm Stem Seal.
- Maintenance-friendly – easy to perform maintenance with simple disassembly, reassembly
- Wetted parts made of 100% 316L Stainless Steel bar-stock
- No guiding surfaces in the fluid – prevents particulate generation
- Coated, or Optional 316L multi-spring actuators provide excellent corrosion resistance during washdown
- Self Draining
- CIP, and SIP capable
- SF5, 20 Ra μm (0,5 μm) Mechanically polished and electropolished wetted body and trim, with 8 Ra μm (0,2 μm) optional
- FDA and USP Class VI conformity on all process seal materials

DOCUMENTATION

The following documentation is kept in an electronic data base, and included with each order at no charge:

- Steriflow Unicert - Certificate of Compliance for:
 - Material, including MTR's
 - Surface Finish
 - FDA/USP Class VI

Each Unicert document lists the orders individual valve Serial/Suffix numbers and wetted component Heat numbers. MTR's for each Heat number follow on attached pages. The Serial numbers and Heat numbers are directly traceable to each individual valve.



AVAILABLE FINISHES

Body

- Standard: SF5, 20 Ra μm (0,5 μm) mechanical and electropolish finish on internal wetted surfaces; machine finish on exterior 40 Ra μm (1.0 μm), and electropolished inside and out
- Optional: 20 Ra μm (0,5 μm) mechanical and electropolish finish on external surfaces; 8 Ra μm (0,2 Ra μm) electropolish finish on internal or external surfaces

Stem

- Standard: SF5 20 Ra μm (0,5 Ra μm) mechanical and electropolish finish
- Optional: 8 Ra μm (0,2 μm) mechanical and electropolish finish

APPLICATIONS

For continuous precision low flow control of media, process, purified water and clean Utilities in the Biopharmaceutical, Pharmaceutical, Food & Beverage, and Consumer Health & Beauty industries:

- Small Bioreactor/Fermenter process input control: Growth Media, Buffer, WFI, Sparge and Blanket gas
- Separation input and output control: WFI, Process, Product and Waste Streams
- Purification input and output control: Elution media, Solvents, Buffer, WFI
- Clean Utilities: Pure Steam, WFI, CIP, CCA, CCG
- F&B and Consumer H&B Process Inputs, Outputs, Purified Water and Clean Utilities



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SPECIFICATIONS

Sizes: Standard: 1/2" (DN15) & 3/4" (DN20)

Optional: 1/4" & 3/8" ASME sizes only

Material: ASTM A479 316L, or 1.4435 SS Barstock body and trim

Body/ Bonnet & Stem Seal: Jorlon Diaphragm (FDA/ USP Class VI)

End Connections: ASME Tri-Clamp (1/4", 1/2", 3/4" only) and ASME Tube weld end standard (all sizes); DIN, ISO Tri-clamp and tube weld end (DN15, and DN20 only)

Cv (Kv) - Linear or Equal Percentage:

0.10 (0,086)

0.08 (0,069)

0.05 (0,043)

Cv (Kv) - Linear:

0.02 (0,017)

0.01 (0,008)

0.005 (0,004)

Shutoff: ANSI Class III

Actuator: 14M multispring actuator, White coated Aluminum Standard, Stainless Steel Optional

Non-wetted O-Ring Material: EPDM, Viton (FDA/ USP Class VI)

Maximum Pressure @ 100°F (37,8°C): 150 psi (10,3 bar)

Pressure @ Maximum Temperature: 100 psi @ +340°F (6,9 bar @ +171°C)

Weight:

- 8.2 lbs (3,7 kgs) – Body with Aluminum 14M actuator
- 10.2 lbs (4,6 kgs) – Body with Stainless Steel 14M actuator
- 15 lbs (6,8 kgs) - Complete valve, Aluminum 14M Actuator and Siemens Positioner

*Equal Percentage action can be configured through the positioner settings

Cv vs TRAVEL

| Cv | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|
| 0.05 EQ | 0.015 | 0.016 | 0.016 | 0.017 | 0.017 | 0.017 | 0.018 | 0.023 | 0.032 | 0.049 |
| 0.08 EQ | 0.024 | 0.026 | 0.027 | 0.028 | 0.029 | 0.030 | 0.034 | 0.042 | 0.054 | 0.079 |
| 0.10 EQ | 0.030 | 0.031 | 0.030 | 0.030 | 0.031 | 0.033 | 0.038 | 0.046 | 0.061 | 0.106 |
| 0.05 LN | 0.016 | 0.019 | 0.021 | 0.022 | 0.023 | 0.025 | 0.028 | 0.032 | 0.036 | 0.05 |
| 0.08 LN | 0.028 | 0.032 | 0.036 | 0.038 | 0.038 | 0.040 | 0.046 | 0.054 | 0.062 | 0.084 |
| 0.10 LN | 0.033 | 0.039 | 0.043 | 0.047 | 0.046 | 0.048 | 0.056 | 0.064 | 0.076 | 0.107 |
| 0.005 LN | 0.0005 | 0.001 | 0.0015 | 0.0020 | 0.0025 | 0.0031 | 0.0035 | 0.0042 | 0.005 | 0.0057 |
| 0.01 LN | 0.0009 | 0.0021 | 0.0029 | 0.0038 | 0.005 | 0.0058 | 0.007 | 0.0079 | 0.009 | 0.011 |
| 0.02 LN | 0.0021 | 0.004 | 0.0062 | 0.0082 | 0.0101 | 0.012 | 0.014 | 0.016 | 0.018 | 0.022 |

Note: other Cv's available upon request

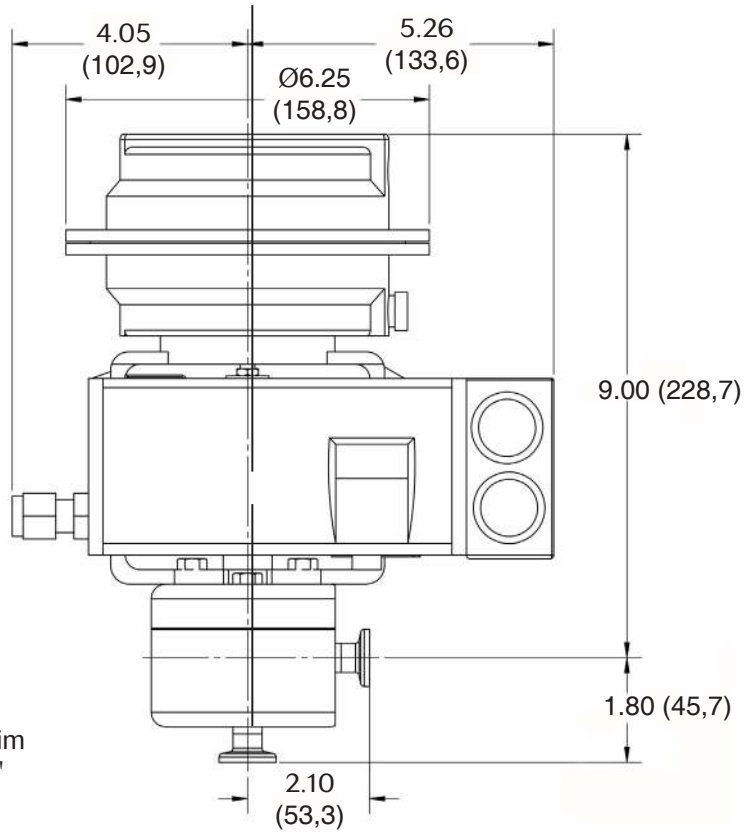
DIMENSIONS

ORIENTATION FOR DRAINABILITY

Gravity drainable when installed in the orientation shown at right, with flow in the side and out the bottom. See page 3.

Weight as shown with positioner:
15lbs (6,8 Kg)

Tolerance: FE, Tri-Clamp & Tube End F-F Dim
are $\pm 1/16$ " all other dimensions: $\pm 1/2$ "



FEATURES & BENEFITS

Rugged 14M actuator has been field-proven for smooth operation over the life of the valve

Lightweight, white, corrosion resistant coated aluminum actuator with SST fasteners is standard. 316LSS actuator available as option.

Compact design allows installation where space is limited

Wide base, solid Stainless steel NAMUR yoke bolted to body for stem rigidity regardless of valve orientation

Extended, non-wetted PEEK guide bushing ensures smooth, stable movement throughout entire stroke length

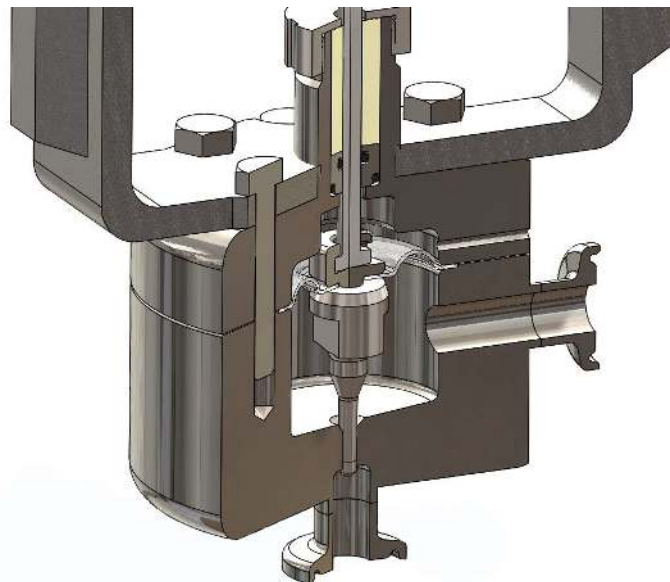
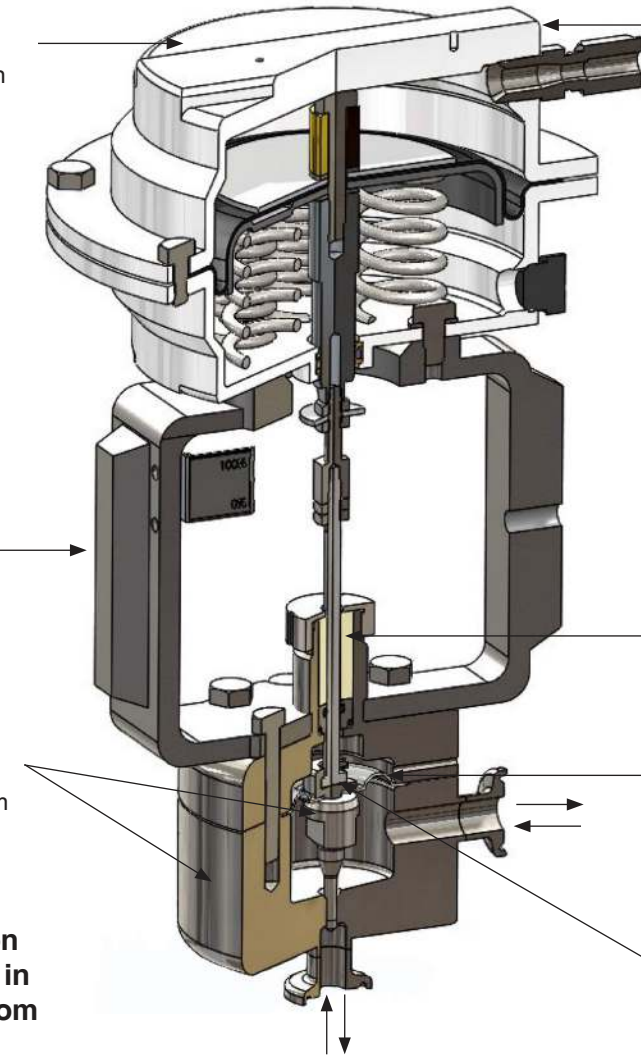
ASTM A479 316L standard, or DIN 1.4435 and other materials optional, for body and wetted trim

Jorlon™ Diaphragm for long lived performance

Valve flow is bi-directional

Gravity drainable when installed in the orientation shown at right, with flow in the side and out the bottom

Quick change trim feature: simply slide off and replace



ORDERING SCHEMATIC

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|-------|-------|--------|---------|---------|----|
| 1 | — | 2 | — | 3 | — | 4 | / | 5 & 6 | 7 & 8 | 9 & 10 | 11 & 12 | 13 & 14 | 15 |
|---|---|---|---|---|---|---|---|-------|-------|--------|---------|---------|----|

| 1 | Model |
|-------|-------------------------|
| 978MV | Motor Valve |
| 978SP | Side Mounted Positioner |
| 978TP | Top Mounted Positioner |

| 2 | Size |
|-----|------|
| 050 | 1/2" |
| 075 | 3/4" |

| 3 | Low Flow |
|----|----------|
| LF | Low Flow |

| 4 | Diaphragm |
|----|------------------|
| JD | Jorlon Diaphragm |

| 5 & 6 | 1/2" Tri-C Body, Cv, Char. Finish |
|--------|--|
| AALN6A | 1/2" LIN Cv 0.05 20Ra int./63RMS ext. |
| A1LN6A | 1/2" LIN Cv 0.05 20Ra int./20Ra ext. |
| A2LN61 | 1/2" LIN Cv 0.05 8Ra int./20Ra ext. |
| A3LN61 | 1/2" LIN Cv 0.05 8Ra int./8Ra ext. |
| A4LN61 | 1/2" LIN Cv 0.05 8Ra int./63 RMS ext. |
| AAEPA6 | 1/2" EQP Cv 0.05 20Ra int./63 RMS ext. |
| A1EPA6 | 1/2" EQP Cv 0.05 20Ra int./20Ra ext. |
| A2EP16 | 1/2" EQP Cv 0.05 8Ra int./20Ra ext. |
| A3EP16 | 1/2" EQP Cv 0.05 8Ra int./8Ra ext. |
| A4EP16 | 1/2" EQP Cv 0.05 8Ra int./63 RMS ext. |
| AALN7A | 1/2" LIN Cv 0.08 20Ra int./63 RMS ext. |
| A1LN7A | 1/2" LIN Cv 0.08 20Ra int./20Ra ext. |
| A2LN71 | 1/2" LIN Cv 0.08 8Ra int./20Ra ext. |
| A3LN71 | 1/2" LIN Cv 0.08 8Ra int./8Ra ext. |
| A4LN71 | 1/2" LIN CV 0.08 8Ra int./63 RMS ext. |
| AAEPA7 | 1/2" EQP Cv 0.08 20Ra int./63RMS ext. |
| A1EPA7 | 1/2" EQP Cv 0.08 20Ra int./20RA ext. |
| A2EP17 | 1/2" EQP Cv 0.08 8Ra int./20RA ext. |
| A3EP17 | 1/2" EQP Cv 0.08 8Ra int./8RA ext. |
| A4EP17 | 1/2" EQP Cv 0.08 8Ra int./63RMS ext. |
| AALN8A | 1/2" LIN Cv 0.1 20Ra int./63 RMS ext. |
| A1LN8A | 1/2" LIN Cv 0.1 20Ra int./20Ra ext. |
| A2LN81 | 1/2" LIN Cv 0.1 8Ra int./20Ra ext. |
| A3LN81 | 1/2" LIN Cv 0.1 8Ra int./8Ra ext. |
| A4LN81 | 1/2" LIN CV 0.1 8Ra int./63 RMS ext. |

| | |
|--------|--------------------------------------|
| AAEPA8 | 1/2" EQP Cv 0.1 20Ra int./63RMS ext. |
| A1EPA8 | 1/2" EQP Cv 0.1 20Ra int./20RA ext. |
| A2EP18 | 1/2" EQP Cv 0.1 8Ra int./20RA ext. |
| A3EP18 | 1/2" EQP Cv 0.1 8Ra int./8RA ext. |
| A4EP18 | 1/2" EQP Cv 0.1 8Ra int./63RMS ext. |

| | |
|--------|--|
| CALN3A | 1/2" LIN Cv 0.005 20Ra int.63 RMS ext. |
| C1LN3A | 1/2" LIN Cv 0.005 20Ra int.20 RMS ext. |
| C2LN31 | 1/2" LIN Cv 0.005 8Ra int.20 RMS ext. |
| C3LN31 | 1/2" LIN Cv 0.005 8Ra int.8 RMS ext. |
| C4LN31 | 1/2" LIN Cv 0.005 8Ra int.63 RMS ext. |

| | |
|--------|---------------------------------------|
| CALN4A | 1/2" LIN Cv 0.01 20Ra int.63 RMS ext. |
| C1LN4A | 1/2" LIN Cv 0.01 20Ra int.20 RMS ext. |
| C2LN41 | 1/2" LIN Cv 0.01 8Ra int.20 RMS ext. |
| C3LN41 | 1/2" LIN Cv 0.01 8Ra int.8 RMS ext. |
| C4LN41 | 1/2" LIN Cv 0.01 8Ra int.63 RMS ext. |

| | |
|--------|---------------------------------------|
| CALN5A | 1/2" LIN Cv 0.02 20Ra int.63 RMS ext. |
| C1LN5A | 1/2" LIN Cv 0.02 20Ra int.20 RMS ext. |
| C2LN51 | 1/2" LIN Cv 0.02 8Ra int.20 RMS ext. |
| C3LN51 | 1/2" LIN Cv 0.02 8Ra int.8 RMS ext. |
| C4LN51 | 1/2" LIN Cv 0.02 8Ra int.63 RMS ext. |

| | |
|-------|--------------|
| ZZZZZ | Non-Standard |
|-------|--------------|

continued

MARK 978LF-JD SANITARY LOW FLOW CONTROL VALVES

| 5 & 6 | 3/4" Tri-C Body, Cv, Char. Finish |
|--------|--|
| BALN6A | 3/4" LIN Cv 0.05 20Ra int./63RMS ext. |
| B1LN6A | 3/4" LIN Cv 0.05 20Ra int./20Ra ext. |
| B2LN61 | 3/4" LIN Cv 0.05 8Ra int./20Ra ext. |
| B3LN61 | 3/4" LIN Cv 0.05 8Ra int./8Ra ext. |
| B4LN61 | 3/4" LIN Cv 0.05 8Ra int./63 RMS ext. |
| BAEPA6 | 3/4" EQP Cv 0.05 20Ra int./63 RMS ext. |
| B1EPA6 | 3/4" EQP Cv 0.05 20Ra int./20Ra ext. |
| B2EP16 | 3/4" EQP Cv 0.05 8Ra int./20Ra ext. |
| B3EP16 | 3/4" EQP Cv 0.05 8Ra int./8Ra ext. |
| B4EP16 | 3/4" EQP Cv 0.05 8Ra int./63 RMS ext. |
| BALN7A | 3/4" LIN Cv 0.08 20Ra int./63 RMS ext. |
| B1LN7A | 3/4" LIN Cv 0.08 20Ra int./20Ra ext. |
| B2LN71 | 3/4" LIN Cv 0.08 8Ra int./20Ra ext. |
| B3LN71 | 3/4" LIN Cv 0.08 8Ra int./8Ra ext. |
| B4LN71 | 3/4" LIN CV 0.08 8Ra int./63 RMS ext. |
| BAEPA7 | 3/4" EQP Cv 0.08 20Ra int./63RMS ext. |
| B1EPA7 | 3/4" EQP Cv 0.08 20Ra int./20RA ext. |
| B2EP17 | 3/4" EQP Cv 0.08 8Ra int./20RA ext. |
| B3EP17 | 3/4" EQP Cv 0.08 8Ra int./8RA ext. |
| B4EP17 | 3/4" EQP Cv 0.08 8Ra int./63RMS ext. |
| BALN8A | 3/4" LIN Cv 0.1 20Ra int./63 RMS ext. |
| B1LN8A | 3/4" LIN Cv 0.1 20Ra int./20Ra ext. |
| B2LN81 | 3/4" LIN Cv 0.1 8Ra int./20Ra ext. |
| B3LN81 | 3/4" LIN Cv 0.1 8Ra int./8Ra ext. |
| B4LN81 | 3/4" LIN CV 0.1 8Ra int./63 RMS ext. |
| BAEPA8 | 3/4" EQP Cv 0.1 20Ra int./63RMS ext. |
| B1EPA8 | 3/4" EQP Cv 0.1 20Ra int./20RA ext. |
| B2EP18 | 3/4" EQP Cv 0.1 8Ra int./20RA ext. |
| B3EP18 | 3/4" EQP Cv 0.1 8Ra int./8RA ext. |
| B4EP18 | 3/4" EQP Cv 0.1 8Ra int./63RMS ext. |
| DALNBB | 3/4" LIN CV 0.005 20Ra int./63RMS ext. |
| D1LNBB | 3/4" LIN CV 0.005 20Ra int./20RMS ext. |
| D2LN1B | 3/4" LIN CV 0.005 8Ra int./20RMS ext. |
| D3LN1B | 3/4" LIN CV 0.005 8Ra int./8RMS ext. |
| D4LN1B | 3/4" LIN CV 0.005 8Ra int./63RMS ext. |
| DALNBC | 3/4" LIN CV 0.01 20Ra int./63RMS ext. |
| D1LNBC | 3/4" LIN CV 0.01 20Ra int./20RMS ext. |
| D2LNIC | 3/4" LIN CV 0.01 8Ra int./20RMS ext. |
| D3LNIC | 3/4" LIN CV 0.01 8Ra int./8RMS ext. |
| D4LNIC | 3/4" LIN CV 0.01 8Ra int./63RMS ext. |
| DALNBD | 3/4" LIN CV 0.02 20Ra int./63RMS ext. |
| D1LNBD | 3/4" LIN CV 0.02 20Ra int./20RMS ext. |
| D2LNID | 3/4" LIN CV 0.02 8Ra int./20RMS ext. |
| D3LNID | 3/4" LIN CV 0.02 8Ra int./8RMS ext. |
| D4LNID | 3/4" LIN CV 0.02 8Ra int./63RMS ext. |
| ZZZZZZ | Non-Standard |

| 7 & 8 | Stem Seal |
|-------|----------------------------|
| JH | Jorlon Diaphragm/Viton O/R |
| ZZ | Non-Standard |

| 9 & 10 | Actuator/Range |
|-------------|-------------------------------|
| 978 / 978TP | |
| D1 | 14M Aluminum / 3-15 / Direct |
| R1 | 14M Aluminum / 3-15 / Reverse |
| D2 | 14M Aluminum / 6-30 / Direct |
| R2 | 14M Aluminum / 6-30 / Reverse |
| D3 | 14M SST / 3-15 / Direct |
| R3 | 14M SST / 3-15 / Reverse |
| D4 | 14M SST / 6-30 / Direct |
| R4 | 14M SST / 6-30 / Reverse |
| 978SP | |
| D1 | 14M Aluminum / All / Direct |
| R1 | 14M Aluminum / All / Reverse |
| D3 | 14M SST / All / Direct |
| R3 | 14M SST / All / Reverse |
| 978MV | |
| ZZ | Non-Standard |

| 11 & 12 | Action |
|---------|--------------|
| DD | Direct |
| RR | Reverse |
| ZZ | Non-Standard |

| 13 & 14 | Accessories |
|---------|---------------------------|
| 00 | None |
| 1A | I/P Trans. 4-20MA / 3-15P |
| 2A | Air regulator with gage |
| 3A | I/P Trans. 4-20MA / 6-30P |
| ZZ | Non-Standard |

| 15 | Positioners |
|----|---|
| N | None |
| A | SMP Dir / Rev 3-15 |
| B | SMP Dir / Rev 3-9 |
| C | SMP Dir / Rev 9-15 |
| D | SMP/IP Dir / Rev 4-20 |
| E | SMP/IP Dir / Rev 4-12 |
| F | SMP/IP Dir / Rev 12-20 |
| G | MK 16IQ (with Hart, FM Approval) Dir / Rev |
| H | MK 16IQ-B (without Hart, FM Approval) Dir / Rev |
| J | MK 16IQ-FF Dir / Rev |
| Z | Non-Standard |



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