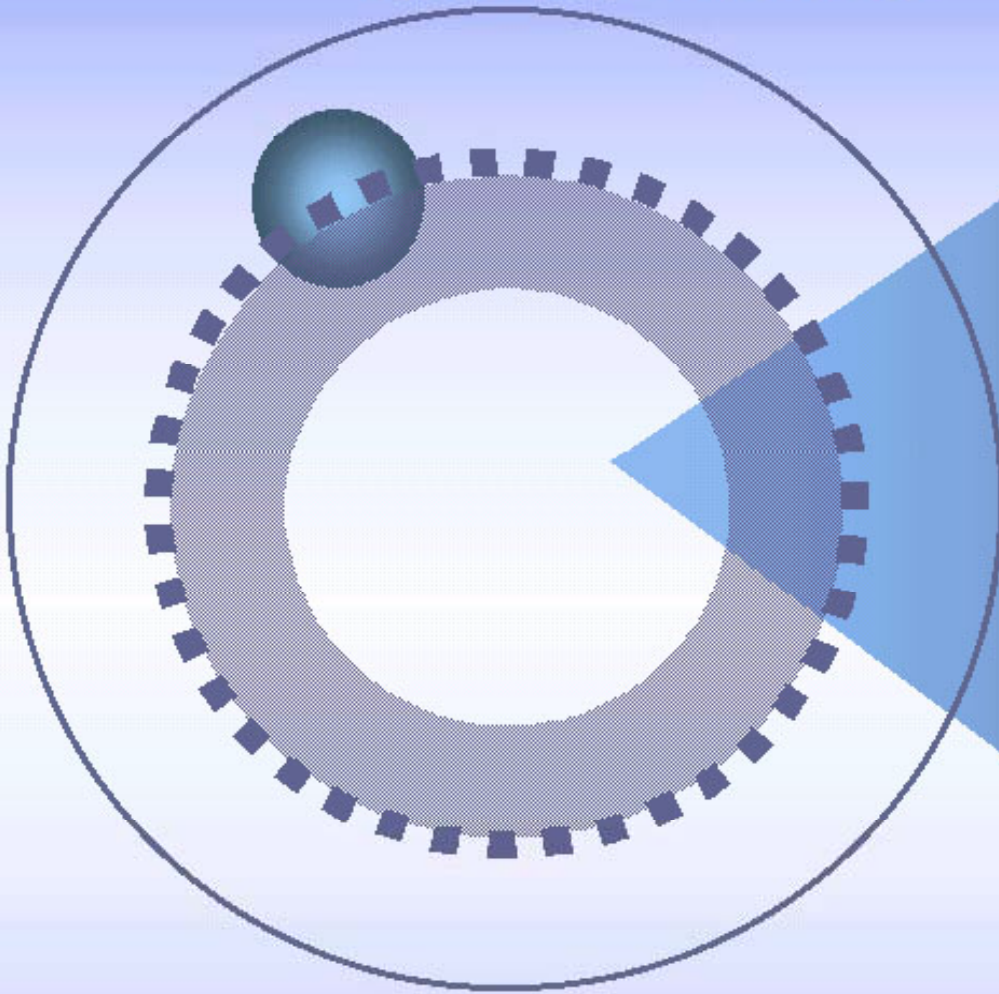


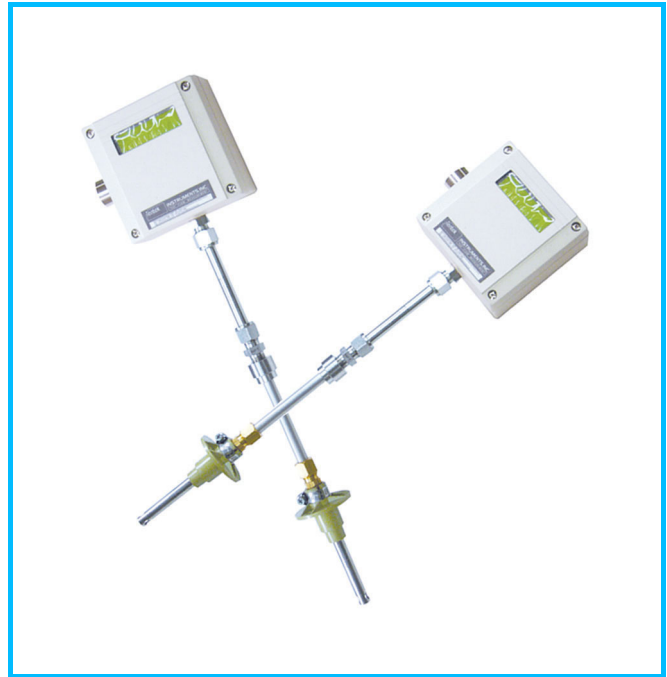
100% customer satisfaction -

# Thermal-Mass Flowmeter (Series TMHV)



## Features

- Fast response flow meter ideal for inert gas and liquid mass flow measurement applications
- Smart electronics permit field adjustment of critical flow meter settings
- Field validation of flow meter calibration
- 200 millisecond response to changes in flow rate
- Outstanding range ability
- Optional 2 x 16 backlight LCD display
- Minimal flow blockage and low pressure drop
- RS-232 communication
- Gas & Liquid



## Description

MaxiFlo Thermal Mass Flow Meter for HVAC application

HVAC series provides an alternative for inert gas and clean water flow measurement applications. The meter's sensor offers long-term reliability and 200 millisecond response to changes in flow rate.

The versatile microprocessor-based transmitter integrates the functions of flow-range adjustment, meter validation and diagnostics in a probe-mounted NEMA 4X (IP65) housing. Mass flow rate and totalized flow, as well as other configuration variables, can be displayed on the meter's optional 2 x 16 backlight LCD panel.

The meter also provides an optical / galvanic isolated 4-20 mA, 0-10VDC output and two alarm outputs.

The programmable transmitter is easily configured via RS-232 and Smart Interface Windows<sup>®</sup>-based software minimum 8 MB of RAM, preferred 16 MB of RAM. HVAC series is suitable for pipes or ducts from 2 inches to 48 inches (DN 50 to DN 1200)

## Performance Specifications

### Accuracy of Point Velocity

± 1% of full scale

### Repeatability

± 0.2% of full scale

### Temperature Coefficient

±0.02% of reading per °F within ±50°F of customer specified conditions.

±0.03% of reading per °F within ±50°F to 100°F of customer specified conditions.

±0.04% of reading per °C within ±25°C of customer specified conditions.

±0.06% of reading per °C within ±25°C to 50°C of customer specified conditions.

### Pressure Coefficient

0.02% per psig for air, consult factory for other gases  
, Liquid

### Response Time

200 milliseconds to 63% of final velocity value

## Operating Specifications (Gas)

### Gases

Most non-combustible, non-corrosive gases

### Mass Flow Rates

0 to 200 sfpm (0 to 1 nmmps) minimum, 0 to 20,000 sfpm (0 to 100 nmmps) maximum for air and nitrogen (maximum full scale varies with other gases consult factory)

### Gas Pressure

145 psig (10 barg) maximum

### Pressure Drop

Negligible

### Gas & Ambient Temperature

Gas ..... 14°F to 176°F (-10°C to 80°C)

Ambient ..... Operating : 32°F to 122°F (0°C to 50°C)

Storage : -40°F to 180°F (-40°C to 80°C)

0 to 90% relative humidity, non-condensing conditions

### Power Requirements

DC 24 V ±10% (regulated), 150 mA maximum

Warm-up time : 10 minutes(max)

## Operating Specifications (Liquid)

### Flow Rates

0 to 200 sfpm (0 to 1 nmmps) minimum

0 to 2000 sfpm (0 to 10 nmmps) maximum

### Liquid Pressure

145 psig (10 barg) maximum

### Pressure Drop

Negligible

### Water & Ambient Temperature

Water ..... 14°F to 176°F (-10°C to 80°C)

Ambient ..... Operating : 32°F to 122°F (0°C to 50°C)

Storage : -40°F to 180°F (-40°C to 80°C)

0 to 90% relative humidity, non-condensing conditions

### Power Requirements

DC 24 V ±10% (regulated), 300 mA maximum

Warm-up time : 10 minutes(max)

## Operating Specifications (Gas)

### Output Signal

Linear 0~10 VDC, 1000 ohms minimum load resistance or

Linear 4~20 mA proportional mass flow rate.

700 ohms maximum resistance power supply dependent

User-selectable ... Active non-galvanic ally separated or

passive galvanic ally separated

(loop power required)

### Alarms

Hard contact user-adjustable high and low dead band

adjustable with Smart Interface windows<sup>®</sup> software

Relay ratings ... Maximum 42 VDC or VAC, 140 mA

### Displays

Alphanumeric 2 x 16 digit backlight LCD

Adjustable variables via on-board switches

(password protected) or with Smart Interface windows<sup>®</sup> software

Adjustable variables ... Full scale (50 to 100 %)

Time Response (1 to 7 seconds)

Correction factor setting (0.5 to 5)

Zero and span

High and low alarm settings

### Totalize

Seven digits (9,999,999.9) in engineering units

Reset table by software, on-board switches or external magnet

### Software

Smart Interface Windows<sup>®</sup>-based software minimum

8 MB of RAM, preferred 16 MB of RAM

RS-232 communication

Additional features ... Alarm dead band adjustment

Zero cut-off adjustment

Linearization adjustment

Save / Load configurations

Flow meter validation

## Physical Specifications

### Wetted Materials

316L, 304 stainless steel

### Enclosure

NEMA 4X

(IP65)

Powder-coated cast aluminum

### Electrical Connections

One 1/2 inch NPT ... NEMA 4X Enclosure (IP65)

### Mounting (Optional)

1/2-inch tube compression fitting with 1/2-inch male NPT

1/2-inch duct mounting bracket

### Certifications\*

CE (All enclosures)

CSA -----

(Explosion-proof for Class 1, Division 1, Groups B, C, D)

EEx (EEx d IIC T6...T2)

FM -----

(Explosion-proof for Class 1, Division 1, Groups B, C, D)

\* Certifications Pending, Contact factory

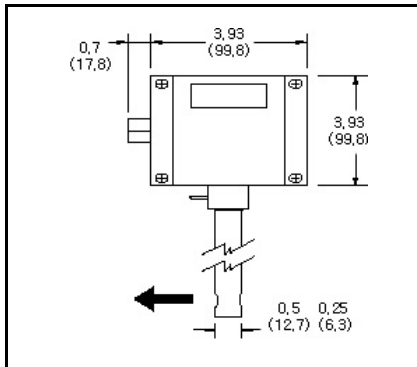
## Mass Flow Ranges (Gas)

### HVAC-Minimum pipe diameter 1"

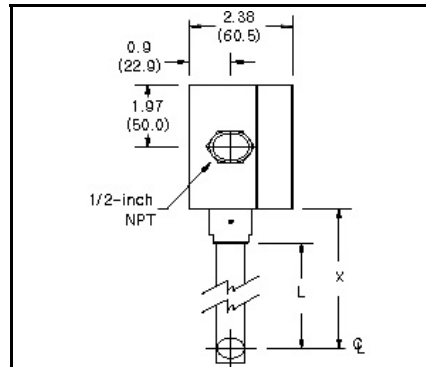
| Gas Code | Spec(%FS)             | Gas             | Max Vel (SFPM) | Max Vel (NMPS) | Max PSIG |
|----------|-----------------------|-----------------|----------------|----------------|----------|
| 0        | Standard accuracy     | Air             | 20,000         | 102            | 145      |
| 1        | Standard accuracy     | Argon           | 28,000         | 142            | 145      |
| 2        | Standard accuracy     | CO <sub>2</sub> | 20,800         | 106            | 145      |
| 6        | Standard accuracy     | Helium          | 12,400         | 63             | 145      |
| 10       | Standard accuracy     | N <sub>2</sub>  | 19,800         | 101            | 145      |
| 99       | Other-consult factory |                 |                |                |          |

## Dimensional Specification

Compression Fitting-Front View (EN2)



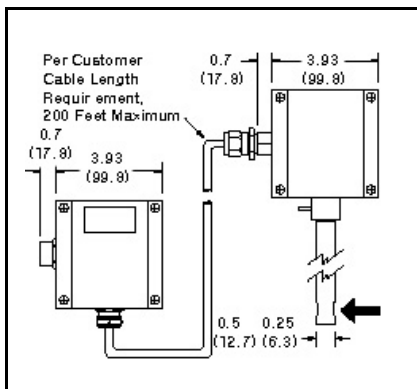
Compression Fitting-Side View (EN2)



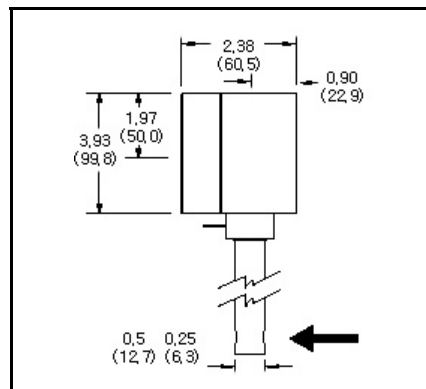
## Table

| Length Chart |                 |                 |
|--------------|-----------------|-----------------|
| Code         | L               | X               |
| L06          | 6.0<br>(152.4)  | 8.6<br>(218.4)  |
| L09          | 9.0<br>(228.6)  | 11.6<br>(294.6) |
| L13          | 13.0<br>(330.2) | 15.6<br>(396.2) |
| L18          | 18.0<br>(457.2) | 20.6<br>(523.2) |
| L24          | 24.0<br>(609.6) | 26.6<br>(675.6) |
| L36          | 36.0<br>(914.4) | 38.6<br>(980.4) |

Remote Mount Junction Box-Front (EN4)

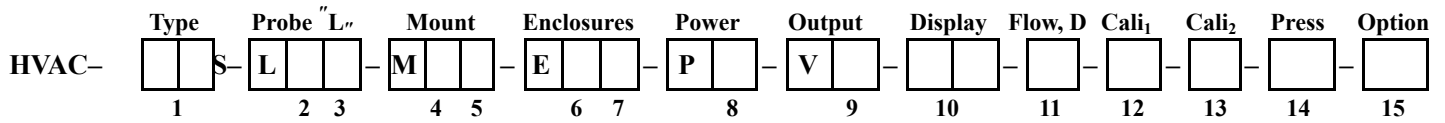


Remote Mount Junction Box-Side (EN4)



105-403 Keukdong A. 454 Hongeun-2-Dong Seodaemoon-Ku  
 Seoul, Korea  
 Tel: 82-2-396-7993 FAX: 82-2-6670-2401  
 Email: sales@maxiflo.co.kr  
 www.maxiflo.co.kr

**HVAC Series**



| Model Direction                     | Code 1 |
|-------------------------------------|--------|
| Gas Mass Flow                       | 10     |
| Liquid Flow                         | 20     |
| Agency approved, customer specified | W      |

| Input Power                         | Code 8 |
|-------------------------------------|--------|
| DC24V ±10%                          | 2      |
| 220VAC±10%, E20 ONLY.               | N/A    |
| Agency approved, customer specified | W      |

| Calibration 2 <sup>9</sup>                              | Code 13 |
|---|---------|
| 70 °F (21.1 1 °C) <sup>8</sup><br>14.7 psig (1.103 bar) | A       |
| 32 °F (0 °C)<br>14.7 psig (1.103 bar)                   | B       |
| Agency approved, customer specified                     | W       |

| Insertion Length <sup>2</sup>        | Code 2,3 |
|--------------------------------------|----------|
| 6-inch (15cm)                        | 06       |
| 9-inch (23cm)                        | 09       |
| 13-inch (33cm)                       | 13       |
| 18-inch (46cm)                       | 18       |
| 24-inch (61cm)                       | 24       |
| 36-inch (92cm)                       | 36       |
| Special Length                       | (in)     |
| Probe with 1-inch 1501b Flange       | (in)-M5  |
| High Pressure Hot Tap with Retractor | (in)-M9  |
| Agency approved, customer specified  | WW       |

| Output                              | Code 9 |
|-------------------------------------|--------|
| Relay output(High, Low)             | 1      |
| 0-10 VDC, Linear                    | 3      |
| 4-20 mA, Linear                     | 4      |
| Agency approved, customer specified | W      |

| Pressure                                    | Code 14 |
|---|---------|
| Low pressure<br>50 psig [ 3.5 bar ] Max.    | L       |
| Medium pressure<br>250 psig [ 17 bar ] Max. | M       |
| Agency approved, customer specified         | W       |

| Mounting   | Code 4,5 |
|--|----------|
| None   | 0        |
| Compression Fitting <sup>2</sup><br>(3/4-inch tube x 1-inch Male NPT)                          | 10       |
| Thread let (3/4-inch Female NPT)<br>Specify pipe O.D. in parentheses                           | 2 ( )    |
| Flat Duct Bracket<br>(3/4-inch tube compression Fitting)                                       | 3        |
| Curved Duct Bracket (3/4-inch tube<br>compression Fitting) Specify duct O.D.<br>in parentheses | 4 ( )    |
| Low Pressure Hot Tap.<br>Specify duct O.D. in parentheses                                      | 8 ( )    |
| Quick Removal Tap.<br>Maximum 40 psig (2.8 barg)   | 15 ( )   |
| Agency approved, customer specified  | WW       |

| Flow Direction                                | Code 11 |
|---|---------|
| Horizontal right to left, or<br>Vertical up   | 1       |
| Horizontal left to right, or<br>Vertical down | 2       |
| Agency approved, customer specified           | W       |

| Option                     | Code 15 |
|----------------------------|---------|
| Pressure Test Certificate  | PT      |
| Certificate of Conformance | CC      |
| NACE Certificate           | NC      |
| 24VDC Supply Unit          | DC      |
| RS-232 Cable 1M            | RS      |

| Enclosures <sup>5</sup>  | Code 6,7 |
|--|----------|
| Hazardous-Area Location Enclosure  | 20       |
| Remote Hazardous-Area Location <sup>10</sup><br>Enclosure (Only with EEx Meters) | 3(ft)    |
| Remote Hazardous-Area Location<br>Enclosure with Junction Box                    | 4(ft)    |
| NEMA 4X  | N2       |
| Remote NEMA 4X with Junction Box   | N4(ft)   |
| Agency approved, customer specified  | WW       |

| Calibration 1 <sup>9</sup>  | Code 12 |
|---|---------|
| Standard Calibration  | A       |
| Air, only for 3 inch and large pipe<br>size                                   |         |
| Compressed Air, only for 3 inch<br>and larger pipe sizes                      | D       |
| Customer Calibration  | B       |
| Air   |         |
| Air equivalency (digester gas, flue,<br>gas, etc).                            | C       |
| Nitrogen, helium, argon, carbon<br>dioxide, compressed air or digester<br>gas | E       |
| Hydrocarbons(natural gas, methane,<br>ethane, propane, etc).                  | F       |
| Hydrogen or hydrogen mixture  | G       |
| Agency approved, customer specified   | W       |

**Notes**

- Flange is tapped and threaded on the compression fitting.
- Material matches the selection in Box 2. Metal ferrule permanently locks after tightening compression fitting.
- Flange must be ANSI or DIN specifications.
- Maximum length is 60 inches [1524 mm].
- Enclosure required for agency approvals. T6 rated at 104°F [40°C].
- Wire resistance must be less than 8 ohms.
- Turndown ratio is 10:1 minimum and 100:1 maximum
- SFPS is the abbreviation for standard feet per second at 14.7 psia [1.01 bar(a)] and 70°F [21.1°C].
- Customer specified calibration must not exceed temperature and pressure limitations of the 1500. 1800.3000 series product specifications.
- Remote configuration is only available with aluminum local enclosure.

**CUSTOMER INFORMATION**

|                                      |                           |
|--------------------------------------|---------------------------|
| <b>Customer Name &amp; Address :</b> | <b>P.O. No :</b>          |
|                                      | <b>Customer Order No:</b> |
| <b>Contact :</b>                     | <b>Tag Number(s) :</b>    |
| <b>Phone :</b>                       |                           |
| <b>Fax :</b>                         | <b>E-mail :</b>           |

**PROCESS DETAILS**

**INSTRUMENT DETAILS**

| <p><b>Application Description</b><br/>Describe type of application (example; boiler feed, flare gas, etc.)</p> <hr/> <p><b>Process Media</b><br/>Include gas name and percent composition by volume (moles) or Weight (mass). Please attach a gas composition list or fill in composition below. Total composition must add up to 100%</p> <p>Gas Components :      <input type="checkbox"/> % Volume (moles)    <input type="checkbox"/> % Weight (mass)</p> <p>_____ %</p> <p>_____ %</p> <p>_____ %</p> <p>_____ %</p> <p>_____ %</p> <p>_____ %</p> | <p><b>Flow Element Mounting</b></p> <p><input type="checkbox"/> Horizontal pipe, side mount, flow left to right<br/> <input type="checkbox"/> Horizontal pipe, side mount, flow right to left<br/> <input type="checkbox"/> Horizontal pipe, top mount, flow left to right<br/> <input type="checkbox"/> Horizontal pipe, top mount, flow right to left<br/> <input type="checkbox"/> Vertical pipe, Flow up<br/> <input type="checkbox"/> Vertical pipe, Flow down</p> <hr/> <p><b>Flow Transmitter Setup</b></p> <p>Input Power :    <input type="checkbox"/> 110VAC±10%   <input type="checkbox"/> 220VAC±10%   <input type="checkbox"/> 24VDC±10%<br/> <input type="checkbox"/> 80 ~ 240 VAC</p> <p>Application :    <input type="checkbox"/> Flow (default)<br/> <input type="checkbox"/> Temperature</p> <p>Signal Output : <input type="checkbox"/> 4 to 20mA<br/> <input type="checkbox"/> 1 to 5VDC<br/> <input type="checkbox"/> 0 to 5VDC<br/> <input type="checkbox"/> 0 to 10VDC<br/> <input type="checkbox"/> RS-232C</p> <p>Output Units    _____</p> <p>Zero Value      _____</p> <p>Full Scale       _____</p> <p>Alarm Set points _____</p> |         |         |            |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |
|---|---|---------|---------|------------|------------|-------------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|------------|-------|-------|-------|-------|--|
| <p><b>Process Conditions</b></p> <table border="0"> <thead> <tr> <th></th> <th>Nominal</th> <th>Minimum</th> <th>Maximum</th> <th>Flow Units</th> </tr> </thead> <tbody> <tr> <td>Flow Rate :</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Temperature :</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Pressure :</td> <td>_____</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>   |   | Nominal | Minimum | Maximum    | Flow Units | Flow Rate : | _____ | _____ | _____ | _____ | Temperature : | _____ | _____ | _____ | _____ | Pressure : | _____ | _____ | _____ | _____ | <p><b>Stander Temperature and Pressure</b></p> <p>70 °F and 14.7 psia [ 21.1 °C and 1.013 bar(a) ] is the factory calibration default for standard temperature and pressure unless otherwise indicated below.</p> <p>Standard        <input type="checkbox"/> 70 °F [ 21.1 °C ]    <input type="checkbox"/> 14.7 psia [ 1.013 bar(a) ]</p> <p>Other            _____</p> |
|   | Nominal   | Minimum | Maximum | Flow Units |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |
| Flow Rate :   | _____   | _____   | _____   | _____      |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |
| Temperature :   | _____   | _____   | _____   | _____      |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |
| Pressure :  | _____   | _____   | _____   | _____      |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |
| <p><b>Required Dimensions</b></p> <p>Pipe/Dute Size (ID and units of measurement) _____</p> <p>B-dimension per diagram below : _____</p> <p>Upstream diameters of unobstructed pipe/duct : _____</p> <p>Downstream diameters of unobstructed pipe/duct : _____</p> <p>Upstream disturbance _____</p>  | <p><b>Note (Remark)</b></p><br><br><br>   |         |         |            |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |
| <p><b>Installation Details or Drawing</b></p><br><br><br><p>Hot tap            <input type="checkbox"/> No            <input type="checkbox"/> Yes</p>  |   |         |         |            |            |             |       |       |       |       |               |       |       |       |       |            |       |       |       |       |  |

Seil Enterprise Co., Ltd.

**MAXIFLO**

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