The Stopless Flow Meter is as accurate as the Hopper Scale, another product of our company, and has better performance and characteristics. The Stopless Flow Meter has two sets of scale hoppers, enabling literally continuous charging and practically continuous discharging. It is compact in size, and can be installed simply. The Stopless Flow Meter is widely used in the flour making, food processing, chemicals and smelting industries.
Examples of Applications

For measuring the product yields at a flour mill, measuring the flow rate of flour grade 1, flour grade 2, flour grade 3, and bran.

For automatic blending at a chemical plant, measuring powder and pulverized materials at 1 kg/cm² pressure and 250°C temperature. 5 t/h

For usage in a radium waste treatment process. A completely sealed construction with due consideration for easy cleaning.

For feeding a pre-set quantity of material to a bagging process of an agricultural chemicals plant, at a 400 bag/hr rate, each bag containing either 500g or 1kg.

For application in a dairy process plant, a sanitary construction type. Model SH01

An example of using the standard SH03 series flow meter at flour mill factories, smelting shops, oil mill and so on with 25 t/h capacity.
主要計装例 Examples of Instrumentation

計測管理 Control of Measurement

流量自動制御 Automatic Control of Flow

在庫管理 Control of Stocks

図分供給 Batch Feeding

バッチ配合 Batch Blending

比例配合 Proportional Blending

Micon line
Integration
Instantaneous flow
Screw feeder
Bucket elevator

Table feeder
Rotary feeder
Micon line

Micon line
Silo, etc.
Pneumatic conveyance

Micon line
Micon line
Micon line

Mixer
ミキサー

Sugar
砂糖

Powdered Additive
粉末

Flour
小麦粉

フローコンベヤー
Flow conveyor
実施例

Examples of Actual Applications

小麦粉, ふすま, 小麦, 麦粉, 大麦, そば粉, 稻, 大豆, 牛乳, 砂糖, 塩, 香料, グルタミン酸, 大豆タンパク, ポリエチレンペレット等のプラスチック, 業剤, 顔料, 各種添加剤, 各種化学原料, ライト, 活性炭, 農薬, 石炭, 硫酸, 乾燥剤, セメント, 硅砂, 鉱石, アルミ粉, マグネシウム, 精練関係原料, セメント原料, 炭酸カルシウム, カーバイト, 生石灰, 鹽物質, タルク, ソーダ灰, 砕石, その他,

wheat flour, bran, wheat, starch, barley, soba powder, rice, soya beans, powdered milk, sugar, salt, spices, glutamic acid, soya bean protein, such plastics as polyethylene pellets, medicines, pigments, additives of various kinds, various chemicals raw materials, ferrite, pulverized coal, agricultural medicine, calcium cyanamid, de-sulphurizing agent, cement, silica, iron powder, aluminum powder, magnesium, various smelting raw materials, raw materials for cement, calcium carbonate, carbide, quick lime, waste materials, talc, soda ash, crushed stones, etc.
** Principle of Operation**

The Stopless Flow Meter is used for measuring powders and other substances as with the hopper scale, but differs from the hopper scale in that it is provided with two scale hoppers which permit substances to be charged into the system continuously for measurements. Also, its installation space is reduced substantially as shown in the diagrams below, and there is no generation of zero drift due to suction of inner dust, as contrasted with the hopper scale.

**Characteristics and Applications**

1. **Wide Scope of Measurements**
   The Stopless Flow Meter lends itself to a wide scope of applications, including the measurement of powders, slurries and liquids. Substances having temperatures from −40°C to 250°C, and flow rates from a minimum of 0–1 kg/hr to a standard maximum of 0–380 tons/hr, can be measured.

2. **Highly Accurate Measurements**
   Measuring accuracy of from 5/1,000 to 1/1,000 is possible.

3. **Accuracy Not Affected by Air Flow, as Contrasted with Hopper Scale**
   When working with specially strong pneumatic flows, a special design is available to eliminate the effects of pneumatic flows on the measuring accuracy.

4. **Continuous Charging of Substances**

5. **Virtually Continuous Discharging**
   The maximum measuring frequency being max. 600 times/hr, virtually continuous discharging of measured substance is possible.

6. **Totally Enclosed Construction**

7. **Intrinsically Safe, Explosion-Proof Construction Also Available**

8. **Specially Sanitary Construction Also Available**

9. **Designed Compact and for Much Smaller Installation Space than Hopper Scale**

10. **Simple Installation and Maintenance**
    Owing to the simple design of using load cells, hardly any maintenance work will be necessary. The Flow Meter can be installed with ease simply by fixing it into position on the floor by means of its anchor bolts. Inspection of inner parts can be done with ease from the outside.

11. **Use of ICs & Microcomputers Ensure Accurate Control, Trouble-Free Operation**
    Accordingly, various kinds of sophisticated arithmetic operations can be performed very accurately and economically, including calculation of instantaneous flow rate and yield, integration and blending. The Micon-Line is adopted for performing the necessary controls.

12. **Far-Reaching Measures to Cope with Troubles**

---

**特長および用途**

1. 被測定物および計測範囲が広範です。
   粉末、スラリー、
   液体用。
   −40℃より250℃まで。
   最少0～1kg/hrより標準最大0～380ton/hr。

2. 高精度計測です。
   5/1000より1/1000まで。

3. ホッパーケースを
   引き立ち空気の流れは
   精度に影響するからです。
   とくに強い流れの中には、さらに特別
   の構造を加えて精度
   への影響をなくします。

4. 物の連続退入が可能です。

5. 連続に近い出ます。最高計測精度：最大600回/時

6. 完全密閉構造です。

7. 本質安全防爆構造も可能です。

8. サニタリー構造も可能です。

9. 小型でホッパーケース等に比べて取付けスペースがはるかに小さいです。

10. 取付けおよびメンテナンスが簡単です。
    ロードセルを使用した単純な構造のため、保全作業をほとんどの必要としません。取付けはアンカーボルト等によって
    基に固定します。また外側より容易に点検ができます。

11. 1C化。マイクロコンピュータ化で、制御は実在で、事故
    もありません。

12. 2万の事例事故が施されています。
### 異常電流の選定 Selection of Transmitter

<table>
<thead>
<tr>
<th>シリーズ Series</th>
<th>SA</th>
<th>SH</th>
<th>SM</th>
</tr>
</thead>
<tbody>
<tr>
<td>スケールホッパ容量 Scale hopper capacity</td>
<td>5～4100ℓ</td>
<td>10～200ℓ</td>
<td>0.01～10ℓ</td>
</tr>
<tr>
<td>流量範囲(かさ比重0.58) Range of flow rate (Bulk density: 0.58)</td>
<td>0～11/h～0～380 t/h</td>
<td>0～2 t/h～0～25 t/h</td>
<td>0～1 kg/h～0～2500 kg/h</td>
</tr>
<tr>
<td>準度 Accuracy</td>
<td>0.1%</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

### 準度構造 Standard construction

Enclosed, normal pressure construction / with 3-item set for air supply system / Temperature of materials to be measured: up to 80°C / Material of parts to come in contact with powder: steel / Outer casing and frame base: stainless steel / Load cell: SUS304 / Air cylinder: steel + aluminum alloy / Coating: 7.5B/4, 1.5

### オプション構造 Optional construction

Pressureized construction up to 2 kg/cm² / Switching gate / Temperature of materials to be measured: 80°C, 250°C / Safe and explosion-proof construction / Sanitary construction / Materials of parts to come in contact with powder: SUS304, 316L / Outer casing and frame base: SUS304, 316L / Air cylinder: with stainless steel case / Air purging of damper gate at lower part of scale hopper / Special coating

### 排出の連続化 Continuous discharging

Screw feeder is installed at the bottom of transmitter (Model symbols with F)

### SAシリーズの外形寸法 External Dimensions of SA Series

<table>
<thead>
<tr>
<th>型式 Model</th>
<th>スケールホッパ容量 Scale hopper capacity</th>
<th>流量範囲(かさ比重0.58) Range of flow rate Bulk density (t/h)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>空気消費量 Air consumption (Nm³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>5 1274 600 1220 1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>004</td>
<td>10 2 1275 600 1350 1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>20 4 884 624 1450 1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>60 12 1034 734 1730 1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>150 20 1374 634 2130 5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>360 40 1760 626 2250 15.0</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>600 80 2250 1550 2250 20.0</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>1400 190 3330 1730 2340 30.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>2700 250 3680 250 3740 30.0</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>4100 380 4680 2520 4870 30.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>005F</td>
<td>5 1 754 630 1570 829 750 870 730 700 1.0</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09F</td>
<td>10 2 754 630 1710 969 750 980 960 980 820</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01F</td>
<td>20 4 884 624 1760 1019 750 1080 1020 1080 1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02F</td>
<td>60 12 1034 734 1983 1230 750 1260 1140 1050 1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03F</td>
<td>150 20 1374 634 2330 1580 750 1580 1270 1350 5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 05, 09, 01, 02, 03: 5, 9, 1, 2, 3 kg/cm²
- 005, 009, 01F, 02F, 03F: 5, 9, 1, 2, 3 kg/cm²
- All models have the same dimensions except for the air consumption. The air consumption may vary depending on the specifications.

The screw feeder is attached on the bottom of the transmitter to get continuous discharging. The control unit including Model GPC is attached to the transmitter.
標準外形寸法および仕様
Standard External Dimensions and Specifications

<table>
<thead>
<tr>
<th>型式</th>
<th>スケールホッパ容量</th>
<th>流量範囲</th>
<th>空気消費量</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>100</td>
<td>1</td>
<td>600</td>
</tr>
<tr>
<td>02</td>
<td>500</td>
<td>5</td>
<td>600</td>
</tr>
<tr>
<td>03</td>
<td>150cc</td>
<td>15</td>
<td>800</td>
</tr>
<tr>
<td>04</td>
<td>300cc</td>
<td>45</td>
<td>800</td>
</tr>
<tr>
<td>05</td>
<td>1 litter</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>06</td>
<td>3 litter</td>
<td>750</td>
<td>500</td>
</tr>
<tr>
<td>07</td>
<td>10 litter</td>
<td>2500</td>
<td>840</td>
</tr>
</tbody>
</table>

取付けは SH シリーズと同じ。アンカーボルトで簡単に取り付けることができます。接続も簡単です。本シリーズは、スケールホッパの代わりにスモールイングスを用いて、特に小流量用として開発されたものです。発信器の選定表により、各種の目的に応用いただけます。

The transmitter can be installed on the floor with ease by means of its anchor bolts. Both charging and discharging sides are directly connected by flanges to the chute, hopper, feeder, and pneumatic feed line.

Installation is achieved with ease by means of anchor bolts. Connections are also well achieved with ease.

This series of transmitters use Smaller flow meters in place of scale hopper and are specially designed for handling substances of small flow rates. A differential transformer is used as the medium for the transmission of signals which are then processed by means of the Micon-Line which permits all kinds of arithmetic operations and display to be performed very accurately.

The most suitable transmitter construction can be selected freely from the Table for Selection of Functions in order to meet a wide range of specific user needs.

取付けはSHシリーズと同様。アンカーボルトで簡単に取り付けられます。接続も同じく簡単です。本シリーズは、スケールホッパの代わりにスモールイングスを使用し、特に小流量用として開発されたものです。発信器の選定表により、各種の目的に応用いただけます。
<table>
<thead>
<tr>
<th>発信器</th>
<th>Transmitter</th>
<th>ケーブル（1台分）</th>
<th>Cable for 1 unit</th>
<th>発信器接続合数</th>
<th>Number of units of transmitter</th>
<th>型式</th>
<th>Model</th>
<th>表示</th>
<th>Indication</th>
<th>設定</th>
<th>Setting</th>
<th>入・出力</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA005〜SA08</td>
<td>Cable for load cell</td>
<td>6 cores</td>
<td>3 pairs</td>
<td>1台</td>
<td>1 unit</td>
<td>ML-AA</td>
<td>1台</td>
<td>1 unit</td>
<td>[積算用]</td>
<td>Totalizer</td>
<td>[積算用]</td>
<td>Totalizer</td>
<td>[積算用]</td>
</tr>
<tr>
<td>SH00〜SH03S</td>
<td>Electromagnetic valve</td>
<td>4 cores</td>
<td>1</td>
<td>SH005〜SA03</td>
<td>Up to 2 units</td>
<td>ML-AB</td>
<td>Up to 2 units</td>
<td>[積算]</td>
<td>Totalizer</td>
<td>[積算]</td>
<td>Totalizer</td>
<td>[積算]</td>
<td>Totalizer</td>
</tr>
<tr>
<td>SM01〜SM07</td>
<td>Proximity switch</td>
<td>4 cores</td>
<td>1</td>
<td>SA04〜SA08</td>
<td>Up to 12 units</td>
<td>ML-AC</td>
<td>Up to 12 units</td>
<td>[積算]</td>
<td>Totalizer</td>
<td>[積算]</td>
<td>Totalizer</td>
<td>[積算]</td>
<td>Totalizer</td>
</tr>
<tr>
<td></td>
<td>4芯</td>
<td>1</td>
<td>6台</td>
<td>1</td>
<td>6台</td>
<td>1</td>
<td>6台</td>
<td>1</td>
<td>6台</td>
<td>1</td>
<td>6台</td>
<td>1</td>
<td>6台</td>
</tr>
</tbody>
</table>

注) 1. ℹ印はオプションです。 2. 発信器SA[]Fシリーズの制御部にGPC型を使用する場合、スクリューフィーダの制御部が必要となります。

Note) 1. * marks indicate optional items. 2. When Model GPC is used as control unit of transmitter Model SA F, control unit of screw feeder is necessary.