2028 Mass flow display based on weighing

- **Input 0/4-20 mA, 0-5/10V**
- **Mass flow display (kg/s)**
- **6-digit processor-based display**
- **Output 4-20 mA as an option**
- **2 alarms as an option**
- **Front panel protection IP65**
- **Sensor supply 24 VDC, max. 150 mA**
- **Power supply 85..240 VAC**
  or12..32 VDC/ 24 VAC

The panelmeter 2028 is specially designed to satisfy the needs of massflow indication in difficult applications where other flowmeters are unsuitable or difficult to use, such as measurement of solid matters or molten metal. Based on the current signal of a strain gauge transmitter the panelmeter 2028 calculates the change of the weight per second and in that way shows the actual flow rate.
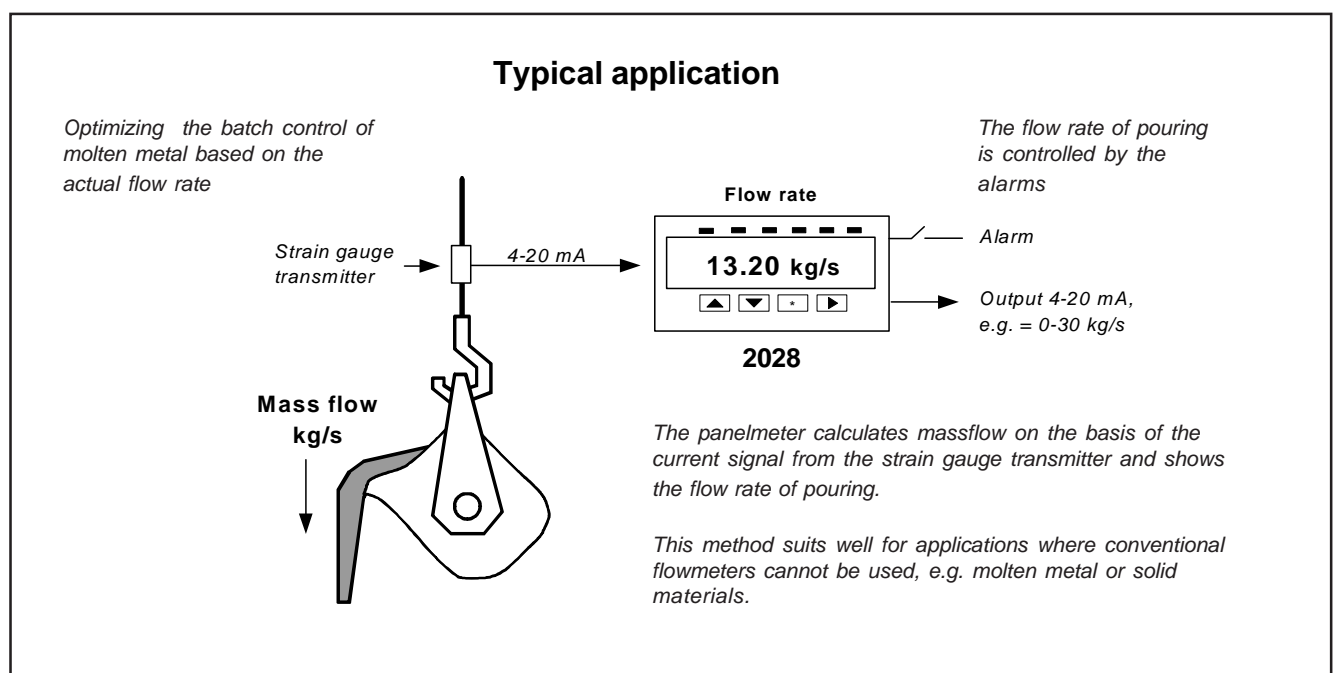
Typical applications are reservoirs containing solid materials or liquids whose emptying or filling process is monitored and controlled on the basis of the flow rate. This measuring method enables indication of the flow rate in two directions, i.e. during the filling or the emptying.

The linearity, 0.005 %, is exceptionally good because the mass to be weighed is usually large in comparison with the often small flowrate. The panelmeter may display either the flowrate or the weight of the object, the selection of which is done simply via a front panel key. A galvanically isolated output 4-20 mA and two alarm relays are available as options. Separate passwords can be set for access to the configuration menu and alarms.

The panelmeter series 2000 is very flexible and easy to modify by changing input cards for different kinds of sensors, such as temperature sensors, pulse sensors, serial inputs etc. The modification does not require any calibration. The optional cards are the same for all the instruments in this product family. Each panelmeter type has its own datasheet.

Separate field enclosures can be supplied for 1 to 3 panel-meters. The 2028 is also available in the field display series, model 2800-2028.

Typical application

Optimizing the batch control of molten metal based on the actual flow rate

Strain gauge transmitter

4-20 mA

Flow rate

13.20 kg/s

2028

The flow rate of pouring is controlled by the alarms

Alarm

Output 4-20 mA, e.g. = 0-30 kg/s

Mass flow kg/s

The panelmeter calculates massflow on the basis of the current signal from the strain gauge transmitter and shows the flow rate of pouring.

This method suits well for applications where conventional flowmeters cannot be used, e.g. molten metal or solid materials.

Technical specifications:

Process inputs:

Input	0..20 mA, 4..20 mA, 0..5 V, 0..10 V 20, 50, 100, 1000 mV
Display scaling	on the whole display range
Input resistance	current 50 ohm
Voltage input	>1 Mohm
Accuracy	0.03 % FS
Linearity	0.005 % FS

Supply for transmitter:
24 VDC, max. 150 mA

Display scaling:
The display is set to correspond to the range of the strain gauge transmitter. Flow rate setting in seconds.

Display of flow direction :
Filling is shown by a plus sign and emptying by a minus sign.

Alarms (optional):
Two adjustable alarm relays, max. 240 VAC, 2A.
Alarm range is adjusted via the front panel buttons.

Output:

Output signals	0..20 mA, 4..20 mA or 0..10 V.
Output resistance	max. 600 ohm current, min. 5 kohm voltage.
Accuracy	0.03 % FS
Repeatability	0.02 %

General:

Display	6 digits, bright red (or green) LED, digit height 14.5 mm, brightness selectable
Input filter	adjustable digital filter
AD-conversion	16 bits (1/64 000)
Temperature effect	0,0004 %/°C with voltage input
Terminals	removable, wire 2,5 mm²
Power	85..240 VAC or 12..32 VDC/ 24 VAC
Front panel protection	IP65 with a rubber gasket
Weight	240 g

How to order:

2028-OUT-REL2-24VDC

Type
Output 4/20 mA
Alarm card REL2
Power supply 12-32 VDC
/24 VAC or 85..240 VAC

Optional cards (2 options possible at a time)**:**
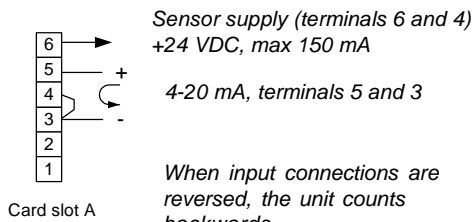Alarm card, 2 relays   2000-REL2
I/O card (4 I/O lines)   2000-I/O
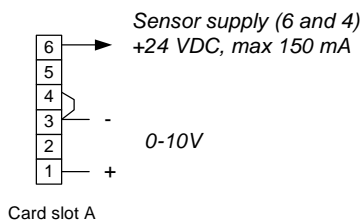*(When ordering a panelmeter, the "2000" of the cards is left out.)*

The panelmeter is also available with a green LED display: please specify 2028GR in the order code.
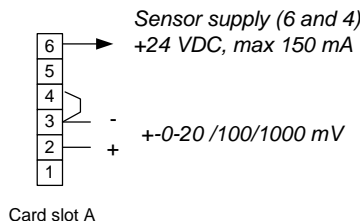
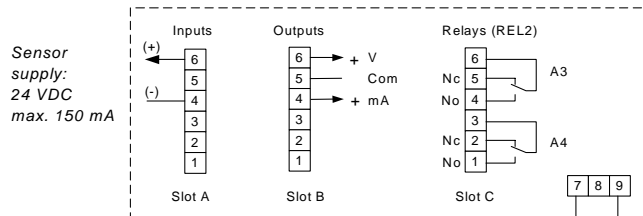## Connections and dimensions (mm):

Current inputs

Sensor supply (terminals 6 and 4) +24 VDC, max 150 mA

4-20 mA, terminals 5 and 3

When input connections are reversed, the unit counts backwards.

Card slot A

Terminals

Sensor supply: 24 VDC max. 150 mA

Inputs   Outputs   Relays (REL2)

Slot A   Slot B   Slot C

Card slot A only for input card.
Slot B and output card and slot C relay card

Power supply 85..240 VAC or 12..32 VDC/ 24 VAC (no polarity)

Voltage inputs

Sensor supply (6 and 4) +24 VDC, max 150 mA

0-10V

Card slot A

mV-inputs

Sensor supply (6 and 4) +24 VDC, max 150 mA

+-0-20 /100/1000 mV

Card slot A

96

48

105

Rubber gasket (IP65)

6   10

Panel cut out
43,5 x 90.5 mm

Centering tabs on corners R 1,5 mm

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