

**CALEFFI**



# FLOMET

Electronic Meter for measuring  
pressure difference and flow

Code 130000

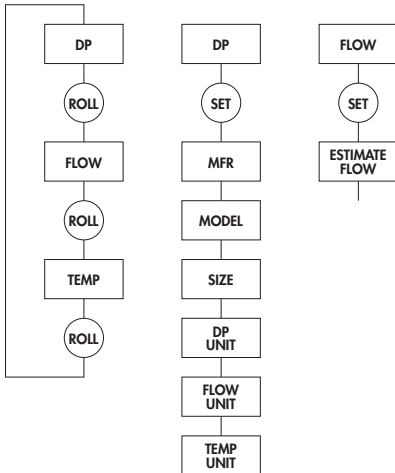
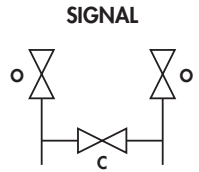
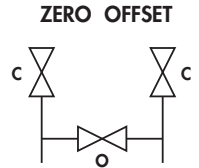
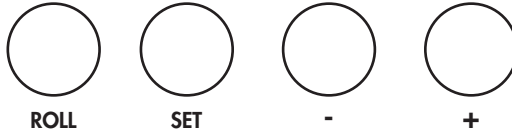
Flow measurement  
of Caleffi series: 130  
131  
135  
683

Verification of the control range  
for Autoflow series: 119  
120  
125  
103

- Technical data
- Operation
- Measurements
- Free kv introduction
- Estimate flow for  
balancing valves



# *FLOMET*



ON  
●  
OFF

**ELECTRONIC METERS FOR MEASURING  
PRESSURE DIFFERENCE AND FLOW**

## GENERAL DATA

### Pressure

Measuring range (work): Dia. + 210 KPa (Dia. +2 bar/Dia. + 20 m)

Unit of measurement which can be selected: Pa, KPa, mmW, mW, in.W. m bar, PSI

Max. line pressure: 16 bar

Max. differential pressure in line: 2,5 bar (differential pressure values greater than **2,5 bar cause the measuring component to fracture**).

**Flow:** The following characteristic Kv values have been introduced into the EPROM memory:

MAKER	MODEL	SIZE
CALEFFI	130	1/2" - 2"
CALEFFI	135	DN 65 - DN 150
CALEFFI	683	DN 20 - DN 300
FLOW DESIGN	FAS	050L - 400

10 different values of Kv and  $\alpha$  (exponent) related to the equation of the relationship between flow (G) and pressure difference (DP) can be fed into the EEPROM memory through MAKER FREE.

$$G = K_v \cdot DP^\alpha$$

The fact that the value of Kv to be introduced should be related to the following units of measurement must be taken into account:

Flow [l / h]  
Pressure difference [Pa]

If Kv is derived according to different units of measurement, it must be recovered to the units of measurement given above. A conversion table for the main units of measurement is attached.

The equipment will provide a display of the information relating to correlated flow according to the following units of measurement: l/s, l/m, l/h, GPM, mc/h for all models with Kv and for any models with Kv,  $\alpha$  introduced by the operator.

### Temperature

The temperature of the fluid can be measured with the FLOMET model:

Range of measurement: 0 + 100°C (32 -212°F)

The flows (where possible) can be calculated with the aid of the temperature sensor whilst taking into account the density of the fluid.

If the temperature sensor is not connected the flow (where possible) is calculated whilst taking into account a fluid density related to 50°C (122°F)

**Fluid:** water, hot water

### Power supply

220V AC - 50/60 Hz **(IT A version)**

110V AC - 50/60 Hz **(US version)**

The FLOMET module can be equipped with a recharging unit **(RIC version)**

The recharging unit (220 V/110 V) takes 12 hours to give a maximum recharge.

It is not advisable to leave the equipment under load for long periods the maximum period being 2 days.

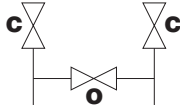
**The electrical system has an operating time of 4 hours.**

The FLOMET module in the version with a recharging unit is equipped with AUTO POWER SAVE. In the event of a failure to digitize any key for a period of 5 minutes AUTO POWER SAVE will be activated on the display and after 30 seconds the equipment will be disconnected electrically.

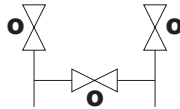
## OPERATING INSTRUCTIONS

The FLOMET module is supplied with plastic pipes for connecting in to the system and two isolation valves.

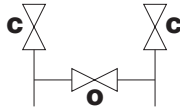
When connected to the system these valves must be in the CLOSED (C) position, the incorporated by-pass valve should be OPEN (O) and the FLOMET module should be switched off.



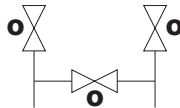
1. After making sure that **the by-pass valve is open**, open the two isolation valves and allow to flow for a period so as to remove all the air that is present.



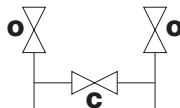
2. Close the two isolation valves again so as to isolate the system temporarily and whilst continuing to keep the by-pass valve open start up the module.  
The notice "ZERO OFFSET" will appear and the module will initialize and be recalibrated.



3. When the "ZERO OFFSET" notice disappears the module is ready for measuring.
4. Open (O) the isolation valves.



5. Close (C) the by-pass valve again.

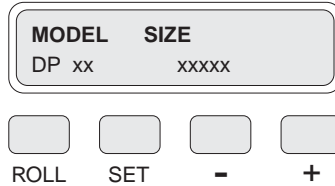


In the case of measuring operations which last for a long time it is recommended to repeat as a cycle this "ZERO OFFSET" operation **having opened the by-pass valve and switched off the module** (starting again from Section 2).

If there are considerable variations in flow it is advisable to repeat the "ZERO OFFSET" operation so as to obtain the maximum calibration of the measuring system.

## MEASUREMENT

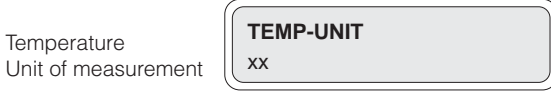
After the "ZERO OFFSET" operation the module is placed in the measurement mode and displays the DP (pressure difference) according to the unit of measurement shown on the screen. This unit of measurement is however the last unit of measurement selected during the previous period of operation.



The display also suggest the MODEL and SIZE selected during the previous period of operation. At the display level of DP **and only at this level**, the definition routine can be entered by pressing the **SET** key.



This screenful will only appear if a variable calibration model (130-135) has been selected.



**Note: Whenever the number of turns of the valve of Series 130 - 135 is changed, the new number of calibration turns (position  ) must be set so as to obtain an accurate measurement.**

Inside each screenful the selection is made by operating the   keys.

Once the selection has been made the  key confirms the selection itself and moves on to the next screenful.

At the end of the definition cycle there is a return to the mode for measuring the pressure difference (DP) with the display of what has been selected previously.

In the measurement mode with the  key the cycle is carried out between:

Pressure  
difference

MODEL	SIZE
DP xx	xxxxx

Flow

MODEL	SIZE
FLOW (xxx)	xxxxx

Temperature

MODEL	SIZE
TEMP. (x)	xxxxx

If the version of FLOMET with the temperatur sensor is not available the notice "NONE" (no sensor) will appear.

Note: Unit of measurement definition.

kPa ⇒ kPascal

mmW ⇒ millimetres of column of water

mB ⇒ millibar

inW ⇒ inches of column of water

PSI ⇒ Pound per square inch

mW ⇒ metres of column of water

l/s ⇒ litres per second

l/m ⇒ litres per minute

GPM ⇒ gallons per minute (1 GPM = 227,1 l/h)

mc/h ⇒ cu.m. per hour

## MAKER FREE

With the MAKER screenful a selection can be made from among all the possible makers present.

Having selected MAKER FREE it is possible to define or redefine a maximum number of 10 typologies however free.

In this cases the following screenful will not be for defining the model and size of precoded valves but for the definition of Kv (coefficient) and  $\alpha$  (exponent) of the equation of the relationship between flow and pressure difference

$$G = K_v \cdot DP^\alpha$$

Allowance must be made for the fact that the values of KV and  $\alpha$  to be introduced must be related by valves of

Flow (G) expressed in l/h

Pressure difference (DP) expressed in Pa

Selection  
No. typology

<b>SELECT</b>	<b>KVE</b>	<b>FREE</b>
KVE - x	xxx	

Definition of  
coefficient (Kv)

<b>DEFINE</b>	<b>KVE - x</b>	●
COEFF.	xxxxx.xxx	

Definition of  
exponent ( $\alpha$ )

<b>DEFINE</b>	<b>KVE - x</b>	●
EXP.	.xxxx	

The operations of the keys which have already been described continue to apply.

With the following conversion tables the new coefficient (Kv) of the relationship between flow and pressure difference can be determined which is derived from the Kv which is known and available according to the various units of measurement of the official ones (Pa - l/h)

	C <sub>p</sub>	C <sub>G</sub>	
KPa	1000	3600	l / s
mm H <sub>2</sub> O	9,81	60	l / m
m bar	100	227,1	GPM
in W	249,174	1000	mc / h
PSI	6897,411		
m H <sub>2</sub> O	9810		
bar	100000		

$$Kv' = Kv \cdot \frac{C_G}{C_p^\alpha} \quad \text{is obtained so that } G' = Kv' \cdot DP'^\alpha$$

Example: If initial Kv = 5,3 and  $\alpha = 0,5$  with the flow expressed in mc/h and the pressure difference in bar by comparing the table C<sub>G</sub> = 1000 and C<sub>p</sub> = 100000 are obtained so that the new coefficient is:

$$Kv' = 5,3 \cdot \frac{1000}{100000^{0,5}} = 16,7596$$

The following is introduced therefore:  
 definition of coefficient (Kv) = 16,7596  
 definition of exponent ( $\alpha$ ) = 5000

## ESTIMATE FLOW

For valves with a variable orifice with ESTIMATE FLOW the desired flow value can be set with return on display of the number of turns of the regulating handwheel.

The procedure is as follows from an operational point of view.

Starting at the screenful selected for flow

MODEL SIZE	x.x
<b>FLOW (xx)</b>	<b>xxxx</b>

and pressing the **SET** key ESTIMATE FLOW is entered.

MODEL SIZE	x.x
<b>ESTI. (xxx)</b>	<b>xxxxx</b>

 ●

Having selected the desired flow value with keys **-** **+** and **SET** which have a scanning function, the **ROLL** key moves the procedure into the next screenful where the new number of handwheel turns is displayed.

MODEL SIZE	x.x
<b>NEW TURN</b>	

The **ROLL** key does not confirm this new setting on the part of the operator; it is the **SET** key which confirms it and in any case the instrument is again positioned on the flow screenful.

● On the screenfuls marked ( ● ) the cursor can be scanned with the **SET** key and with the **-** **+** keys the figure can be increased or decreased.

