

The Kent Range of Metering Products

Pulse Units

For retro-fitting to H4000, S2000, C4000 and C4200 meters

The H4000 Woltmann, S2000 Commercial single jet and C4000 and C4200 Combination meters, all have the facility for various types of pulse transmission, compatible with a wide range of data collection equipment.

Three versions of pulse unit are available. Two are dovetail designs, one being the conventional reed switch, (PG100), the other is an optical device (PV14 – German spec.) There is also a bi-directional optical pulse unit, (BPG20), designed to measure flows in either forward or reverse direction.

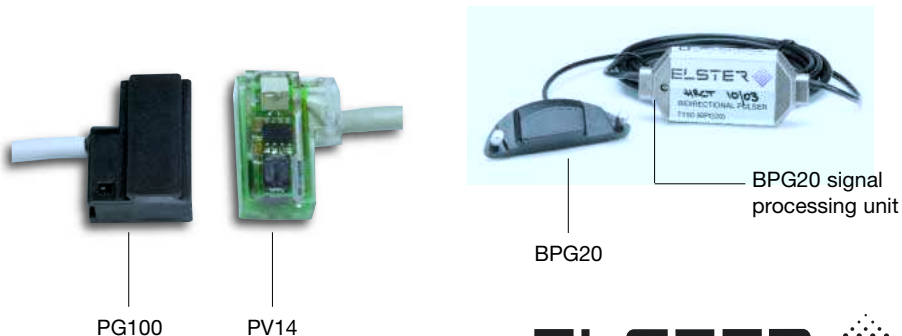
PG100 Uni-directional dovetail reed switch sensor for fitting to both copper can and polymer counters. (Produces pulses for forward and reverse with **no** direction identification).

PV14 Uni-directional dovetail optical sensor for fitting to polymer counters only. (Produces pulses for forward and reverse with **no** direction identification).

BPG20 Bi-directional optical sensor for fitting to copper can counters only. (Produces pulses for forward and reverse, with direction identification).

(The two dovetail pulse units are identified by pulse unit body colour. The PG100 (reed switch) is black, and the PV14 (optical switch) is clear.

The BPG20 has an in-line signal-processing unit, fitted close to the sensor head.



Counter Versions

The counter is available in three versions, detailed below (A, B and C).

Pulse output 40mm – 125mm				
Option	1:1 Optical	1:10 Reed	1:100 Reed	1:1000 Reed
A	✓			
B	✓		✓	✓
C	✓	✓		✓

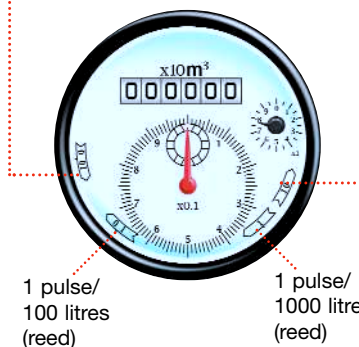
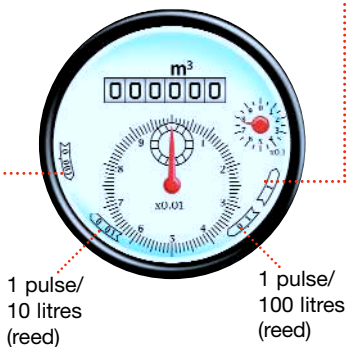
Pulse output 150mm – 300mm				
Option	1:10 Optical	1:100 Reed	1:1000 Reed	1:10000 Reed
A	✓			
B	✓		✓	✓
C	✓	✓		✓

1 pulse/
1 litre
(optical)

1 pulse/
1000 litres
(reed)

1 pulse/
10 litre
(optical)

1 pulse/
10000 litres
(reed)



Illustrations are for diagrammatical purposes only.

The dovetail slot position and pulsed output value, correspond to the markings on the dial face.

Copper Can Counters

Uni-directional Reed Switch (PG100)

A magnetically operated (reed switch) pulsed output, facility is provided, by the retrofitting of a dedicated 'dovetail' pulse unit to the copper can counter. The pulse unit is fitted with a 100 Ω series resistor to protect the reed switch from power surges and is usually provided with a 5 metre length of cable, terminating in a sealed flying lead.

Location and Operating Principle

The volt free switch closure is generated by the rotation of integral magnets, set within the circumference of the counter. There are three options available (not all active), dependant on counter version, (A, B or C) specified on the order. The pulse frequencies at the various slot positions (not visible with the shroud in place), correspond to the markings on the dial face.

PG100 Pulse Unit Fitting Instructions: (Copper can counter)

There are two opposing screws holding the shroud in place. Remove these and lift the shroud clear from the counter assembly. This will expose the plastic sensor holder surrounding the copper can counter. Select the appropriate pulse position as detailed on the dial face and remove the plastic closure panel from the holder, exposing the copper can.



Closure panel removed exposing copper can (magnet position).



PG100 fitted in position.

Hold the reed switch pulse unit at cable entry point in a vertical position and clip into place by locating the front dovetail edge, under the locating lug, applying pressure towards the counter, until the rear dovetail edge, snaps under the sensor holder. The pulse unit is now self-positioned with the internal magnet. Run the cable anti-clockwise inside the yellow base ring, to the most convenient exit slot, ensuring the small cable restraint is enclosed within the base ring. Re-fit the shroud with the two screws.

Note: The counter must be aligned with the m3 marking on the dial face, adjacent to the lid hinge position, to allow the shroud to be re-fitted correctly.

Cable Identification and Wiring Details

The factory potted cable is defined as 4 x 7 / 0.3mm with Red, Blue, Black and Yellow as the core colours, contained within a white outer sheath. RED and BLUE are the volt free pair of contacts, therefore Black and Yellow cores can be cut back and discarded.

Maximum output ratings:

Reed switch rating:	24 Vdc maximum working voltage.
Maximum current:	50 mA
Maximum power:	0.25 Watts
Switch closure duty cycle:	15% on, 85% off typically.

Copper Can Counters – BPG20

Bi-directional Optical Switch (BPG20)

The BPG20 (optical switch) is designed to measure flow in either forward or reverse direction. The circuitry provides bi-directional information, via four open collector output connections. It is usually provided with a 5 metre length of cable, from the signal processing unit, terminating in a sealed flying lead.

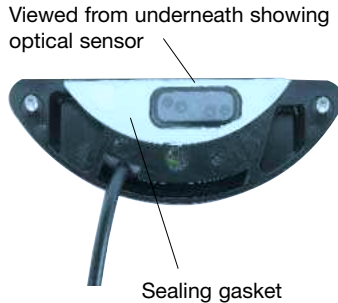
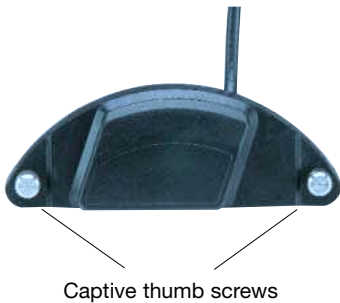
Location and Operating Principle

There are two threaded inserts in the counter shroud, which take the captive thumbscrews located in the BPG20 sensor. The pulse from the BPG20 (optical switch) is generated by viewing through the glass face and detecting the rotation of the

reflective disc. This will provide 1 Pulse / Litre from meter sizes 40mm – 125mm and 1 Pulse / 10 Litres from sizes 150mm – 300mm. Please refer to cable identification and electrical data.

BPG20 Pulse Unit Fitting Instructions: (Copper can counter)

Remove the two cover plugs on the top of the shroud, exposing the screw inserts. Place the BPG20 in position over the glass face, and tighten the thumbscrews, evenly clamping down on the sealing gasket. It is essential that no water passes between the sensor face and the reflective disc as this will distort the view and cause a false reading or malfunction. The sealing gasket (detailed below), is designed to reduce the risk of water ingress and when sealed correctly will ensure a consistent optical characteristic.



Cable Identification and Wiring Details

Function	Wire colour
Pulses (forward and reverse)	Green
Direction (Hi = forward, Lo = reverse)	Blue
Forward pulses	Yellow
Reverse pulses	White
Positive supply	Red
Negative supply 0 V	Black
Screen – connected to 0 V (or instrument earth)	

Electrical data

The output stages are Darlington transistors configured as open-collector with 330 Ω series resistor and 1 nF parallel capacitor to 0 V.

Maximum voltage applied to outputs = 30 Vdc

Typical active 'Low' output voltage = 1.2 V

Maximum continuous output sink current = 10 mA

Power requirements

Supply voltage = 4.5 to 15 V

Supply current = I max < 1500 μ A, typically 1100 μ A @ 5 Vdc supply

Note: The BPG20 is designed to be used with a continuous supply only. It will not perform correctly if the supply is pulsed, ie: flash fired as required by some data loggers.

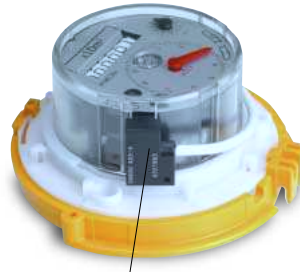
Polymer Counters

Uni-directional Reed Switch (PG100)

A magnetically operated (reed switch) pulsed output, facility is provided, by the retrofitting of a dedicated 'dovetail' pulse unit to the polymer counter. The pulse unit is fitted with a 100 Ω series resistor to protect the reed switch from power surges and is usually provided with a 5 metre length of cable, terminating in a sealed flying lead.



Various dovetail slots, showing magnet positions.



PG100 shown fitted vertically down in position

Location and Operating Principle

The volt free switch closure is generated by the rotation of integral magnets, set within the circumference of the polymer counter. There are three options available (not all active), dependant on counter version, (A, B or C) specified on the order. The pulse frequencies at the various slot positions (not visible with the shroud in place), correspond to the markings on the dial face.

PG100 Pulse Unit Fitting Instructions: (Polymer counter)

There are two opposing screws holding the shroud in place. Remove these and lift the shroud clear from the counter assembly. This will expose various dovetail slots in the circumference of the polymer counter. Select the appropriate pulse position as detailed on the dial face.

Hold the PG100 reed switch pulse unit at cable entry point in a vertical position and slide the pulse unit down into the dovetail to its extreme position. The pulse unit is now self-positioned with the internal magnet. Run the cable anti-clockwise inside the yellow base ring, to the most convenient exit slot, ensuring the small cable restraint is enclosed within the base ring. Re-fit the shroud with the two screws.

Note: The counter must be aligned with the m^s marking on the dial face, adjacent to the lid hinge position, to allow the shroud to be re-fitted correctly.

Cable Identification and Wiring Details

The factory potted cable is defined as 4 x 7 / 0.3mm with Red, Blue, Black and Yellow as the core colours, contained within a white outer sheath. RED and BLUE are the volt free pair of contacts, therefore Black and Yellow cores can be cut back and discarded.

Maximum output ratings:

Reed switch rating:	24 V maximum switching voltage.
Maximum current:	50 mA
Maximum power:	0.25 Watts
Switch closure duty cycle:	15% on, 85% off typically.

Polymer Counters – PV14 (German Spec.)

Uni-directional (Dovetail) Optical Switch (PV14)

The PV14 (optical switch) is designed to measure flow in the forward direction. The circuitry provides bi-directional information, via four open collector output connections. It is usually provided with a 2 metre length of cable, from the signal processing unit, terminating in a sealed flying lead.

Location and Operating Principle

The PV14 dovetail (optical switch) pulse unit is fitted in a similar manner to the reed switch PG100, in terms of its dovetail, slide in vertical location. The pulse is generated by viewing through the vertical face and detecting the rotation of the reflective drum. This will produce 1 Pulse / Litre from meter sizes 40mm - 125mm and 1 Pulse / 10 Litres from sizes 150mm - 300mm. Please refer to cable identification and electrical data.

PV14 Pulse Unit Fitting Instructions: (Polymer counter)

There are two opposing screws holding the shroud in place. Remove these and lift the shroud clear from the counter assembly. This will expose various dovetail slots in the circumference of the polymer counter.

Select the slot that corresponds to the 1 Pulse / Litre dial face marking, which is also apparent, as the reflective drum is clearly visible in the opto-sensor slot.



Dovetail slot, exposing the reflective drum.



PV14 shown fitted vertically down in position

Hold the PV14 optical switch pulse unit at cable entry point in a vertical position and slide the pulse unit down to its extreme position. The pulse unit is now self-positioned with the reflective drum. Run the cable anti-clockwise inside the yellow base ring, to the most convenient exit slot, ensuring the small cable restraint is enclosed within the base ring. Re-fit the shroud with the two screws.

Note: The counter must be aligned with the m³ marking on the dial face, adjacent to the lid hinge position, to allow the shroud to be re-fitted correctly.

Cable Identification and Wiring Details

Function	Wire colour
Positive supply	Brown
Output signal	Green
Negative supply 0 V	White

Sensor – Electrical

	Minimum	Nominal	Maximum
Supply voltage	5 Volts dc	12 Volts dc	15 Volts dc
Quiescent current (no load)	8 mA	20 mA	30 mA
Recommended load resistance to be:	≥ 1000 ohms		

Health and Safety at Work Act 1974

1. We wish to inform you that in accordance with Section 6 of the above Act, we take every care, as far as is reasonably practicable to ensure that our products are safe without risk to health when properly handled, transported, installed, used, maintained and disposed. However, as manufacturers and suppliers of a wide range of products, we would advise you that related information for these products will be found in the following literature.

- Regulations (such as the COSHH Regulations, Manual Lifting Regulations, Personal Protective Equipment Regulations), British Standards and other applicable ISO and European Specifications and Codes of Practice, as applicable to the intended application of the products.
- Regulations for electrical equipment of buildings (published by the Institution of Electrical Engineers).

- Catalogues and product leaflets of this Company or literature which may be obtained by specific request to the Company.
- 2.** It is important that the products concerned should be installed, handled, transported, commissioned and maintained by, or under the supervision of, competent persons in accordance with good engineering practice and:
- IEE Regulations for the electrical equipment of buildings.
 - Regulations, British, European, ISO and other standards, specifications and Codes of Practice, as applicable to the intended application of products, i.e. Water Supply Bye-Laws.
 - Statutory Requirements.
 - Any instructions specifically advised by the Company and, where appropriate, with particular reference to information marked on the product. The product must only be used in the condition supplied or specified by the Company, without modification, and for the purpose for which it was designed.
- 3.** In accordance with your statutory duties to employees and other persons, you are therefore requested to take such steps as are necessary to ensure that any appropriate information relevant to our products is made available by you to everyone concerned. The Company takes no responsibility for any failure to comply with the above guidelines.



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