

FM-2D/K

Frequency Converter
Flow-totalization of 2 water meters



Description

The FM-2D/K is a μ P-controlled frequency converter with two pulse inputs. It can be applied in linking the signals of two input pulses with flow direction signals.

Application

Flow accumulation
Forward and reverse totalization
Flowrate indicator
Monitoring of limit values
Remote reading
Remote transmission
Dosing
Automation
For single or compound meters

Special Features

Two freely programmable pulse outputs with flow direction processing
Variable pulse provider types connectable
Current output freely scaleable and separated for forward and reverse flow
Output for current type with direction identification (-20 mA...+20 mA)
Separate relay outputs for forward and reverse volumes
2 Opto-coupler outputs used for pulses and direction signals or limit value 1 and limit value 2
Pulse divisor for pulse output, adjustable
Integrated LC-Display for the display of volume, momentary flowrate and programming data
M-Bus/Minibus-Data connection for reading of instant values
Programmed data is retained after power failure
Galvanic isolation from supply, entry and output
Programmable on site by 5 buttons
Test mode as installation help
Housing equipped for wall or top hat railing

www.sensus.com
info.int@sensus.com



Description of Symbols

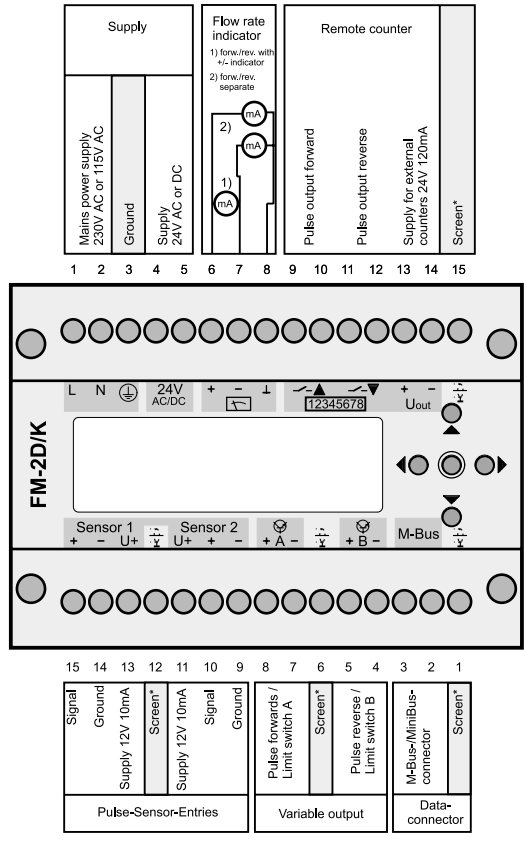
Symbols

- 100 Loop programming
- 100 Loop reading of programming values
- Loop reading of meter values
- Loop reading of statistics values

Symbols of status line (bottom line)

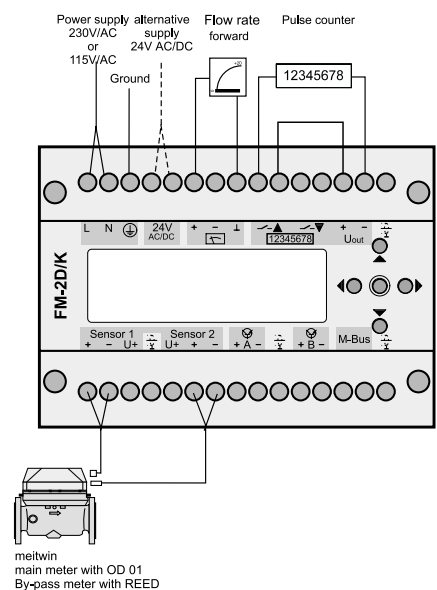
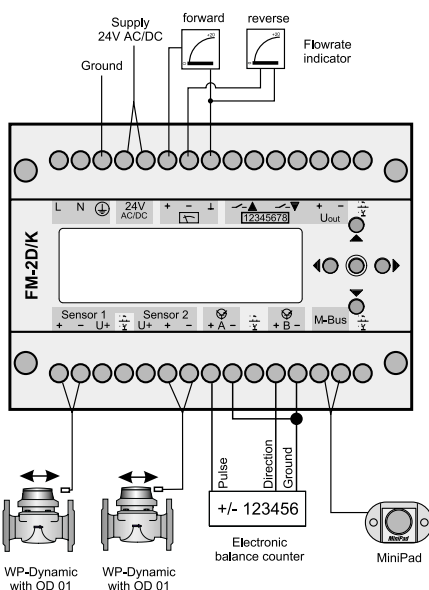
- A Loop programming
- B Loop reading programming data
- C Loop reading meter values
- D Loop statistics values
- Programming data stored
- Programming data can be changed
- Σ Summation of pulse inputs
- Δ Subtraction of pulse inputs
- E Π Choice of sensor type
- E1= Π Pulse value sensor 1
- E2= Π Pulse value sensor 2
- + - 100 Qmax (corresponds to 20mA)
- + - Π ... Current output and damping
- \wedge ∇ \square \square Limit switches and hysteresis
- = Π Pulse value Optocoupler output
- 0= Start index
- \surd = Π Pulse value and status of relays output
- K=? Optocoupler output
- Test Test mode
- + - Reading balanced volume and current flowrate
- Reading balanced volume
- + - Reading current flowrate
- R Reading reverse volume
- + - \uparrow Extreme value Maximum (resetable)
- + - \downarrow Extreme value Minimum (resetable)
- + - \uparrow 1 Extreme value Maximum 3 hour value
- + - \downarrow 1 Extreme value Minimum 3 hour value
- * upper limit is passed
- * lower limit is passed
- * * current value is within the limits
- + Display of active buttons

Connection Diagram



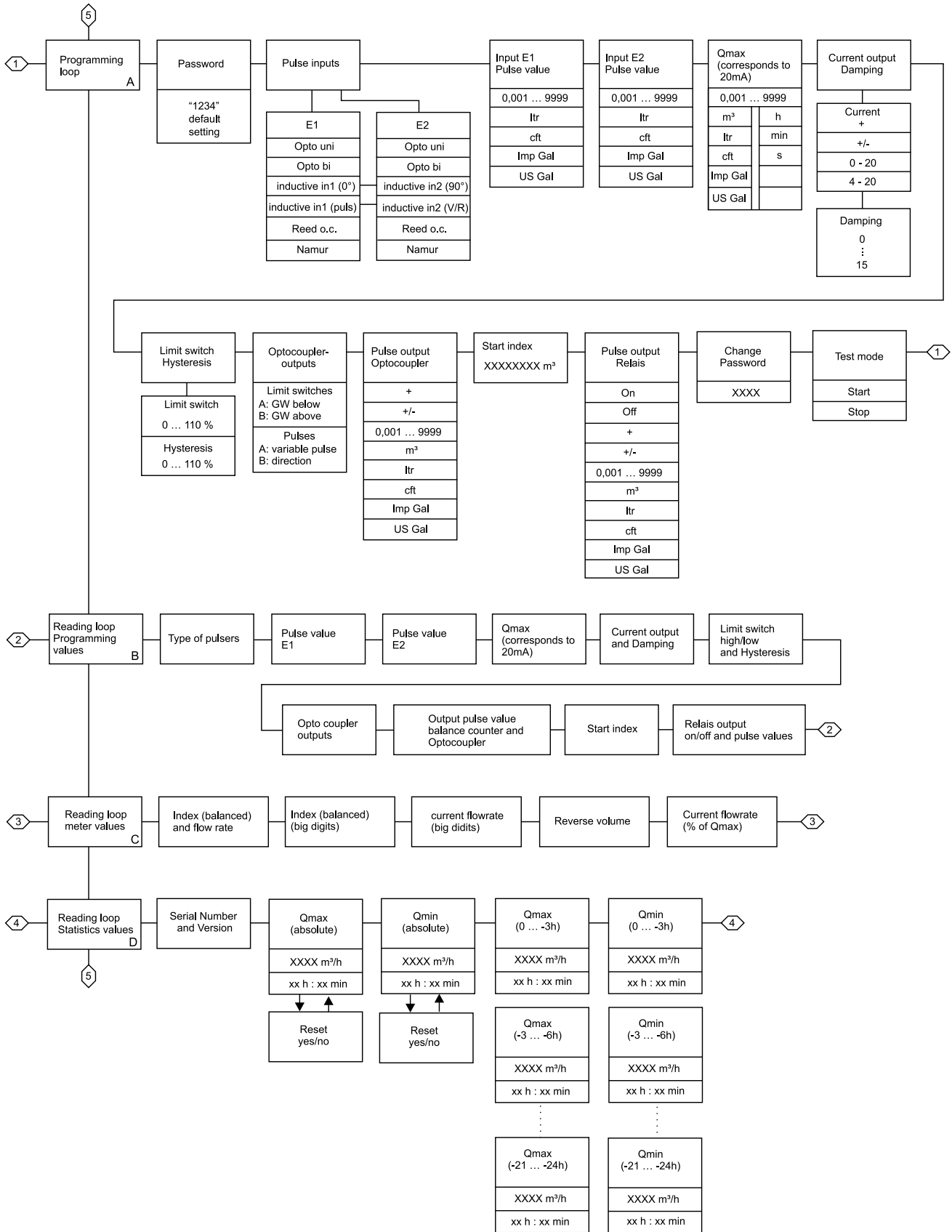
For cable length's more than 3 m we propose to use screened cable for all inputs and outputs

Connection Examples



FM-2D/K

Menu Structure FM-2D/K



Technical Data

Power supply

230 V AC (209...253 V), 115 V AC (105...126V),
24 V DC (20...27 V), 24 V AC (17...27 V)

Power consumption

8 VA

Dimensions

100 x 73 x 124 mm (W x H x D)

Weight

approx. 650 g

Protection class

Housing IP 40; Terminals IP 20

Temperature range

operation: 0 ... +50 °C
storage: -10 ... +80 °C

Input

Universal sensor input for Opto-pulser (Namur EN 50227), Reed- and open-collector-pulser
8.2 V, approx. 1kOhm

Auxiliary voltage for feeding 3-wire sensor
12 V, 10 mA

Input frequency range

0 ... 300 Hz
(0 ... 150 Hz Flow direction identification)

Maximum cable length

approx. 6 km
(depending on cable quality and pulser type)

Contact bounce suppression

automatic
(depending on the input frequency and sensor type)

Output

Current output

0 ... 20 mA or 4 ... 20 mA (selectable)

Load

max. 1000 Ohm (at nominal supply voltage)
(max. 700 Ohm with connected 3-wire pulser)

Response time

16 step selectable (no damping = 0, max. damping = 15)

Max. transmission distance

approx. 14 km at 500 Ohm-load with a cable cross section of 1 mm²

Relay-pulse output

Relay closed, max. 48 V AC/DC, 1 A voltage free, closure time 400 ms, max. 1 Hz, pulse value free selectable

Max transmission distance

approx. 500 m with direct connection
approx. 12 km with transistor relay

Opto-coupler outputs

max. 30 V, 30 mA, 150 mW, digit pulse 500 µs transmitted
Direction and limiting value continuous contact

M-Bus output:

in compliance with IEC 870

Display

Liquid crystal display(LCD):

- Momentary flowrate
- Counter reading
- 8 Maximum-values (3 hour interval of the last 24 hrs); resettable
- 8 Minimum-values (3 hour interval of the last 24 hrs); resettable

Programming data:

- Flowrate range
- Input pulse validity
- Output pulse validity
- Standardized current range 0/4 ... 20 mA
- Response time(16-levels)
- Limit value

Calibration

5-input keys used in conjunction with LCD, configurable program protection

Lightning protection

To protect the device from voltage surges caused by lightning, installation of lightning protection devices is recommended.

Intrinsic safety

If the water meter / pulser is to be installed in a hazardous area the FM-2D/K must be installed in a safe area with the pulser inputs isolated by means of suitable transistor relays.