

Certified according to DIN EN ISO 9001

Technical Datasheet



MCM 400 Precision Evaluation Unit

Description

The MCM 400 is a high precision frequency counter. Thanks to a display of excellent readability, the MCM is suitable for many applications ranging from tough industry conditions to lab-use.

The MCM utilizes an edge-controlled pulse width measurement to precisely detect the actual input frequency which is indicated in a programmable unit (e.g. rpm, grammes per second, litres per minute etc.). An integral scaled totalizer simultaneously counts the input pulses to indicate consumption (revolutions, grammes, litres etc.). The programming of all parameters required is automatically adjusted to the programmed flow rate unit making complicated conversions superfluous. As a further feature the MCM 400 includes two limits which may be used for monitoring of real-time values or as a preset counter.

Features:

- 10-point-linearisation to correct the actual measuring signal and optimize accuracy.
- Analogue Output galvanically separated, 0/4 to 20 mA or 0 to 10 V (also 0 to 5 V), resolution 12 bit, free scaleable according to the programmed flow rate unit

Technical Data

Housing protection class:	Front: IP50 as per DIN 40050 (panel-mounted housing) Rear: IP30 as per DIN 40050 (panel-mounted housing) IP 64 for wall-mounted housing
Connections:	power supply: screw terminal 0.14 to 1.5mm ² in- and outputs: screw terminals 0.14 bis 1.5mm ²
Housing dimensions (type S):	DIN-panel mount housing: w = 144mm, h = 72 mm, d = 83 mm
Housing dimensions (type W):	for wall mounting IP 51: w = 165mm, h = 155mm, d = 94mm with 4 cable sleeves PG 13.5 (wire size 5 to 12mm)
Permissible ambient temperature:	0 up to +45 °C
Weight:	approx. 500 g
Power supply:	24V DC, 115V AC, 230V AC/50 Hz (pls. indicate with order) power consumption: 5VA
Pickup supply:	12VDC/50mA (partially short-circuit proof)
Frequency input:	Measuring accuracy: 0.02%, response time ≥ 20ms Current switch level: NAMUR DIN 19234 Voltage switch level: UI < 6V; Uh > 9V; Umax = 30V
Frequency measuring range:	0.4Hz up to 10kHz (with on/off > 40µs)
Control inputs:	/reset /hold /limit-wait: active with UI < 3V (tmin = 50ms) vs. GND
Analogue output:	Galvanically separated, resolution 12 bit, response time ≥ 20ms Current (0/4 to 20mA): 1,000Ω load or Voltage (0 to 5/10V): > 10 kΩ Linearity: 0.05% of full scale Temperature drift: 0.05% each 10K Residual ripple: 0.05% of full scale

Switch outputs:	2 potential free relay contacts, programmable Switch hysteresis adjustable from 0 to 9.9% of measuring value Contact load: 30V/100mA, low inductive
1:1 Frequency output:	Galvanically free: open collector 30V/50mA
Operation:	Input of parameters and selection of display mode via front-sided foil touch keyboard
Display:	6-digit, bright shining red LED display, digit height 20mm programmable flashing for limits
Indicators:	2 LEDs for limit status (lefthand front)
Flow rate unit:	Stickers are supplied for the righthand LEDs to indicate the programmed flow rate unit
Data memory:	EEPROM for at least 10 years

Layout of Terminals - Connections

Supply

- 50 L (+) supply voltage
- 51 N (-) supply voltage
- 52 PE, protected earth

Limits

- 1 operational contact A
- 2 Common operational contacts A / B
- 3 operational contact B

f_{out} 1:1

- 4 f 1:1 frequency output, emitter
- 5 f 1:1 frequency output, collector

Frequency input

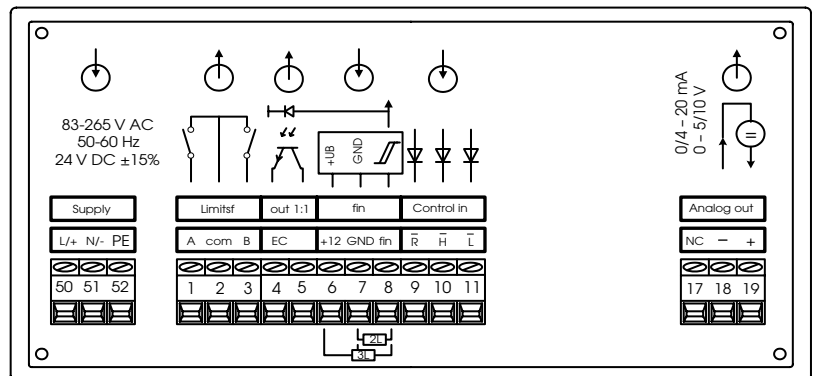
- 6 +12V/50mA external, pickup supply
- 7 GND, external, pickup supply
- 8 fin channel A measurement

Control Inputs

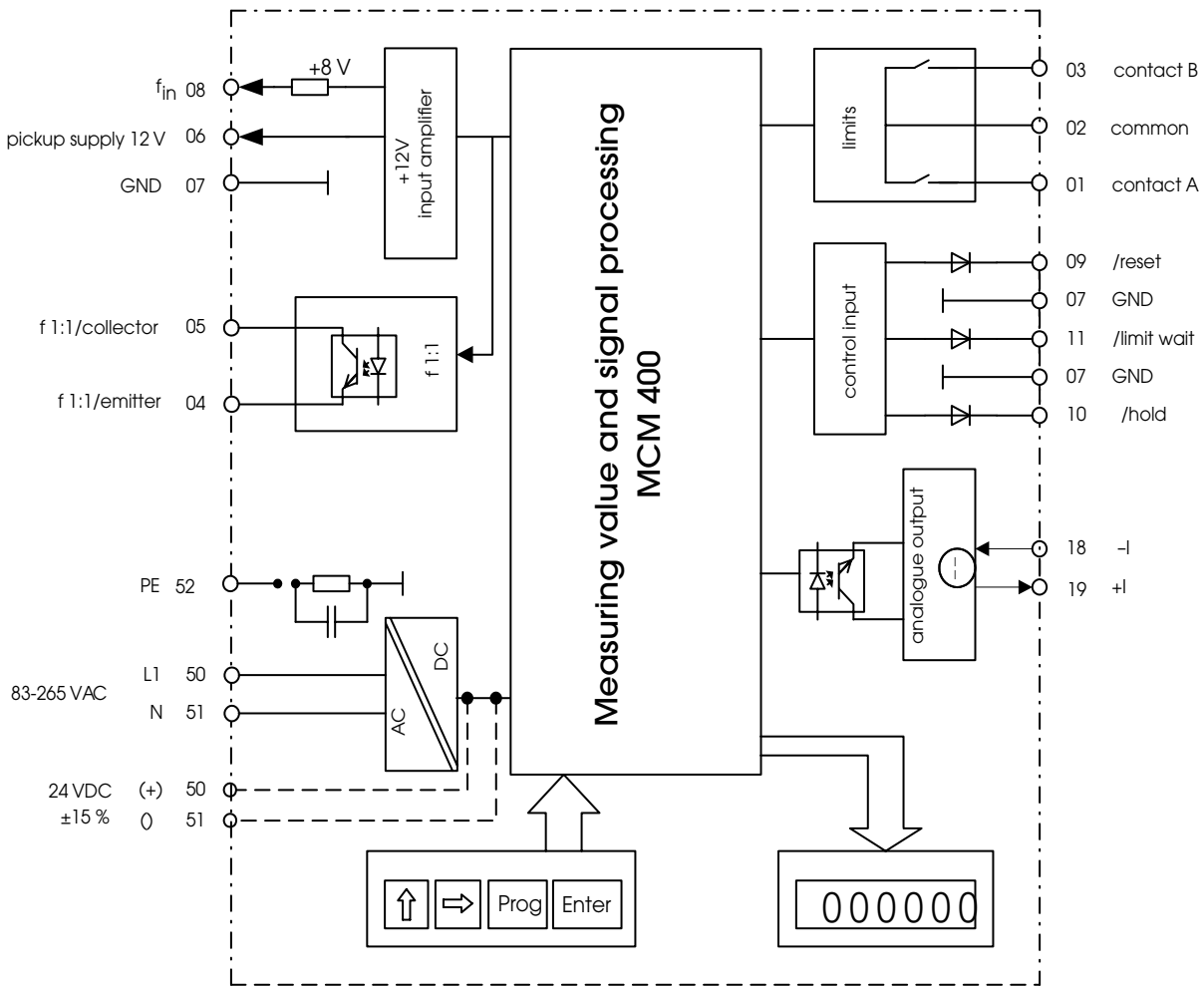
- 9 /reset totals (vs. GND)
- 10 /hold (vs. GND)
- 11 /limit-wait (vs. GND)

Current Output

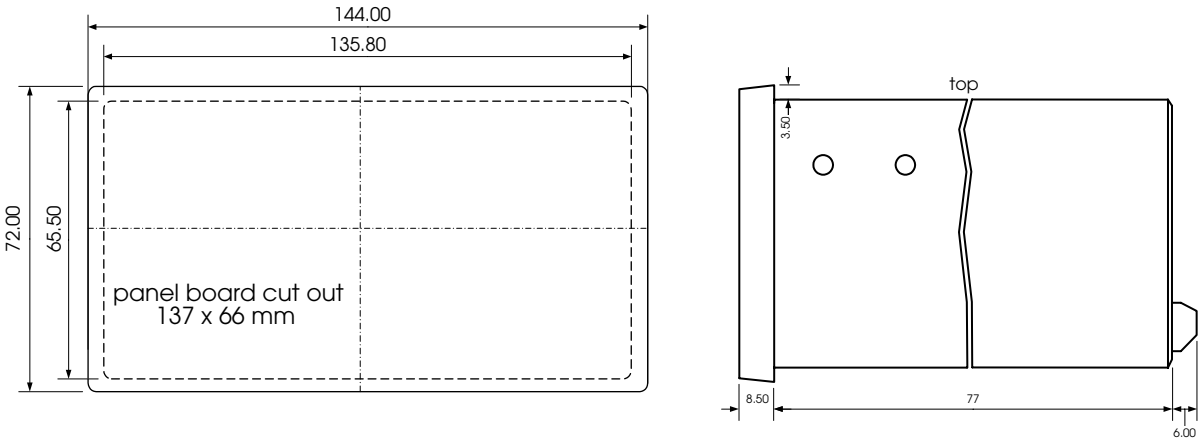
- 17 n. c.
- 18 I- or U- output
- 19 I+ or U+ output



Data Flow Chart

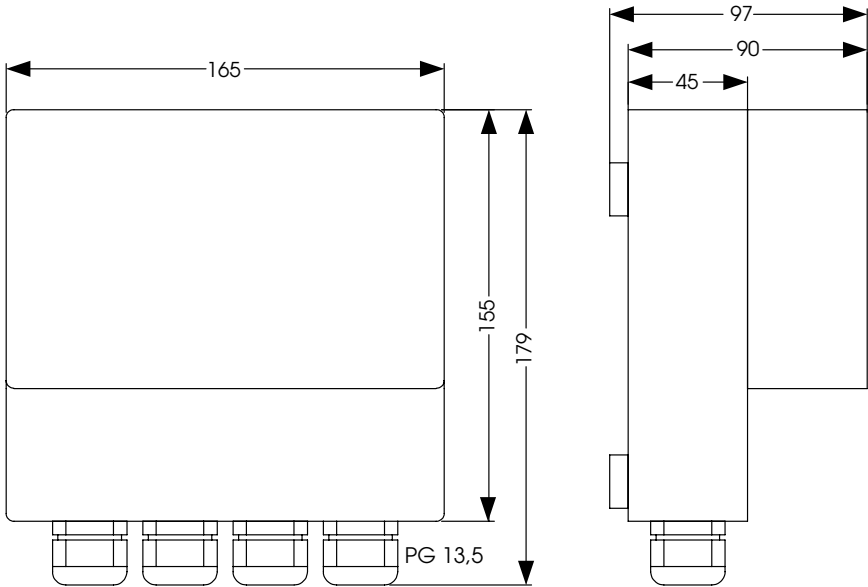


Drawing Panel-Mounted (mm)



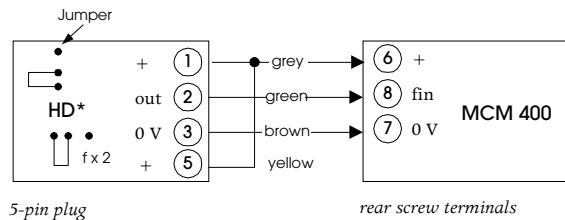
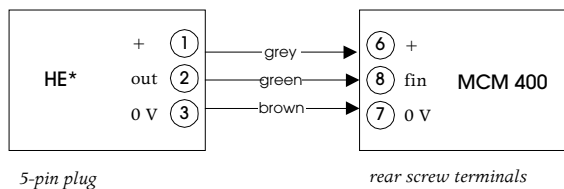
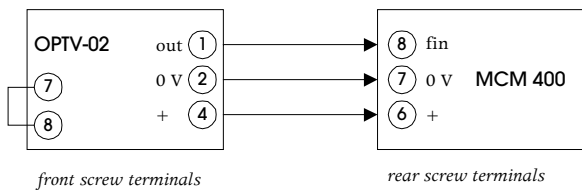
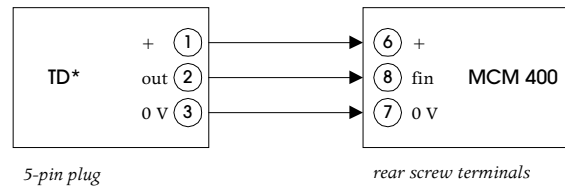
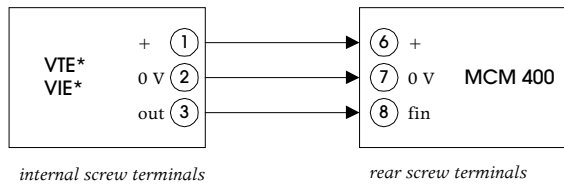
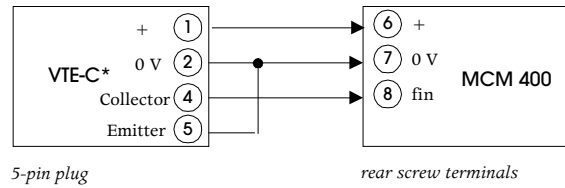
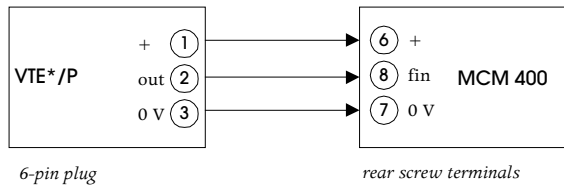
Please consider the bending radius of cables for installation. Avoid parallel cable runs of power and measuring lines.

Drawing Wall Mounting (mm)

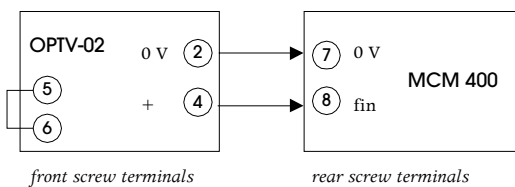
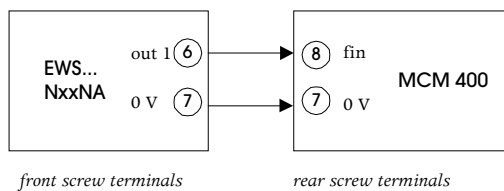
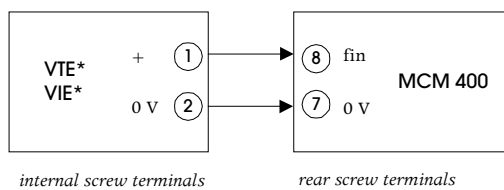


Connection

3-wire connection

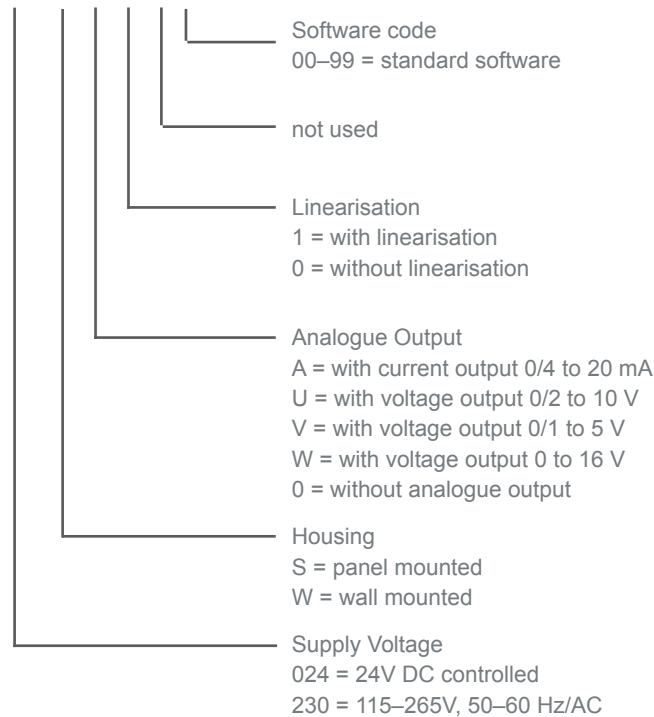


2-wire connection



Ordering Information

MCM 400 - *** - * * * * _**



Notes

The following has to be adhered to:

- Installation instructions for electrical devices. Installation instructions for associated intrinsically-safe devices
The »Special conditions for safe use« as per EC-Type Examination Certificate
- The amplifier has to be installed in a way that the max. ambient temperature does under no circumstances exceed +60°C (consider self heating).
- With cables care should be taken, that the max inductivity and capacity of the respective voltage or gas group are not exceeded.
- Exceeding or falling below the regular measuring range will cause invalid frequency output signals.
- Shielded cables are to be used as connecting lines.
- Generally, supplied units have to be connected by an expert according to EMC stipulations.
- Flammable media may only be used as measuring medium when they do not build an explosive atmosphere permanently or for a longer period of time. In addition, the amount of air and oxygen contained must be low enough to ensure the danger of explosion can definitely be excluded. The local display unit has to be included in repeated pressure tests.

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