OM 402

- 4-DIGIT PROGRAMMABLE PROJECTION
- MULTIFUNCTION INPUT (DC, PM, RTD, T/C, DU)
- DIGITAL FILTERS, TARE, LINEARIZATION
- SIZE OF DIN 96 x 48 MM
- POWER SUPPLY 80...250 V AC/DC
- Option
  Comparators • Data output • Analog output
  Data record • Power supply 10...30 V AC/DC
  Three-color display - 20 mm

The OM 402 model series are 4-digit panel programmable instruments designed for maximum efficiency and user comfort while maintaining their favourable price. Three models are available: UNI, LC and PWR.

Type OM 402UNI is a multifunction instrument with the option of configuration for 8 various input options, easily configurable in the instrument menu. By further options of input modules it is feasible to measure larger ranges of DC voltage and current or increase the number of inputs up to 4 (applies for PM).

The instrument is based on an 8-bit microcontroller and multichannel 24-bit sigma-delta converter, which secures high accuracy, stability and easy operation of the instrument.

OM 402UNI
DC VOLTMETER AND AMMETER
PROCESS MONITOR
OHMMETER
THERMOMETER FOR PT/CU/NI/TERMOCOUPLES
DISPLAY UNIT FOR LINEAR POTENTIOMETERS

OM 402LC
WEIGHING INDICATOR

OM 402PWR
AC VOLTMETER AND AMMETER
AC NETWORK ANALYSER

OPERATION

The instrument is set and controlled by five control keys located on the front panel. All programmable settings of the instrument may be performed in three adjusting modes:

LIGHT MENU is protected by optional number code and contains solely items necessary for instrument setting

PROFI MENU is protected by optional number code and contains complete instrument setting

USER MENU may contain arbitrary items from the programming menu (LIGHT/PROFI), which determine the right (see, change). Access w/o password.

Standard equipment is the OM Link interface, which together with operation program enables modification and filing of all instrument settings as well as perform firmware updates (with OML cable). The program is also designed for visualization and filing of measured values from more instruments.

All settings are stored in the EEPROM memory (they hold even after the instrument is switched off). The measured units may be projected on the display.

OPTION

COMPARATORS are assigned to monitor one, two, three or four limit values with relay output. The user may select limits regime: LIMIT/DOSING/FROM-TO. The limits have adjustable hysteresis within the full range of the display as well as selectable delay of the switch-on in the range of 0...99,9 s. Reaching the preset limits is signalled by LED and simultaneously by the switch-on of the relevant relay.

DATA OUTPUTS are for their rate and accuracy suitable for transmission of the measured data for further projection or directly into the control systems. We offer an isolated RS232 and RS485 with the ASCII/MESSBUS/MODBUS/PROFIBUS protocol.

ANALOG OUTPUTS will find their place in applications where further evaluating or processing of measured data is required in external devices. We offer universal analog output with the option of selection of the type of output - voltage/current. The value of analog output corresponds with the displayed data and its type and range are selectable in menu.

MEASURED DATA RECORD is an internal time control of data collection. It is suitable where it is necessary to register measured values. Two modes may be used. FAST is designed for fast storage (40 records/s) of all measured values up to 8 000 records. Second mode is RTC, where data record is governed by Real Time with data storage in a selected time segment and cycle. Up to 266 000 values may be stored in the instrument memory. Data transmis sion into PC via serial interface RS232/485 and OM Link.

STANDARD FUNCTIONS

PROGRAMMABLE PROJECTION
Selection: of input type and measuring range
Measuring range: adjustable as fixed or with automatic change (OHM)
Measuring modes (PWR): voltage (V_{RMS}), current (A_{RMS}), real power (W), frequency (Hz) and with calculation of Q, S, cos Fi
Setting: manual, in menu optional projection on the display may be set for both limit values of the input signal, e.g. input 0...39,99 V > 0...850.0
Projection: -99999...999999

EXCITATION
Range: 5...24 VDC, for feeding of sensors and transmitters

COMPENSATION
Of conduct (RTD, OHM): automatic (3- and 4-wire) or manual in menu (2-wire)
of conduct in probe (RTD): internal connection (conduct resistance in measuring head)
of CJC (T/C): manual or automatic, in menu it is possible to perform selection of the type of thermocouple and compensation of cold junctions, which is adjustable or automatic (temperature at the input brackets)

LINEARIZATION
Linearization: through linear interpolation in 50 points (solely via OM Link)

DIGITAL FILTERS
Floating/Exp./Arithmetic average: from 2...30/100/100 measurements
Rounding: setting the projection step for display

MATHEMATIC FUNCTIONS
Min/max. value: registration of min/max. value reached during measurement
Tare: designed to reset display upon non-zero input signal
Peak value: the display shows only max. or min. value
Mat. operations: polynome, 1/x, logarithm, exponential, power, root, sin x and mathematic operations between inputs

EXTERNAL CONTROL
Lock: control keys blocking
Hold: display/instrument blocking
Tare: tare activation
Resetting MM: resetting min/max value

TECHNICAL DATA

PROJECTION

Display: -99999...999999, red or green 14-segment LED, digit height 14 mm,
-999...9999, red/green/orange 7-segment LED, height 20 mm
Description: last two characters on the display may be used for description of measured quantities (adjustable in the menu)
Decimal point: setting - in menu
Brightness: setting - in menu

INSTRUMENT ACCURACY

TK: 50 ppm/°C
Accuracy: ±0,1 % of range + 1 digit (for projection 9999 and 5 meas./s)
±0,15 % of range + 1 digit — RTD, T/C
±0,3 % (0,6/0,9 %) of range + 1 digit — PWR
Accuracy of cold junction measurement:: ±1,5°C
Rate: 0,1...40 meas./s, 0,5...5 meas./s (PWR)
Overload capacity: 2x; 10x (t < 30 ms) - not for > 250 V and 5 A
Measuring modes (PWR): voltage [V_{RMS}], current [A_{RMS}], real power (W), frequency (Hz) and with calculation of Q, S, cos fi
Linearization: by linear interpolation in 50 points
Digital filters: Exp./Floating/Arithmetic average, Rounding
Functions: ofset, Min/max value, Tare, Peak value, Mat. operations
Ext. control: HOLD, LOCK, Tare, Min/Max
Data record: measured data record into instrument memory
RTC - 15 ppm/°C, time-date-display value, < 266k data
FAST (UNI) - display value, < 8k data
Resolution (RTD, T/C): 1°/0,1°/0,01°C
Watch-dog: reset after 0,4 s
OM Link: Company communication interface for operation, setting and update of instruments
Calibration: at 25°C and 40 % r.h.

COMPARATOR

Type: digital, setting in menu, contact switch < 30 ms
Limits: -99999...999999
Hysteresis: 0...999999
Delay: 0...99,9 s
Output: 2x relays Form A (250 VAC/30 VDC, 3 A)
and 2x Form C relays (250 VAC/50 VDC, 3 A), 2x/4x open collectors, 2x SSR, 2x bistable relays

DATA OUTPUT

Protocol: ASCII, MESSBUS, MODBUS - RTU, PROFIBUS
Data format: 8 bit + no parity + 1 stop bit (ASCII)
7 bit + even parity + 1 stop bit (Messbus)
Rate: 600...230 400 Baud, 0,0096...12 Mbaud (PROFIBUS)
RS 232: isolated
RS 485: isolated, addressing (max. 31 instruments)

ANALOG OUTPUT

Type: isolated, programmable with 16-bit D/A converter, type and range are selectable in programming mode
Non-linearity: 0,1% of range
TK: 15 ppm/°C
Rate: response to change of value < 1 ms
Ranges: 0...2/5/10 V, ±10 V, 0...5 mA, 0/4...20 mA
(comp. < 600 Ω/12 V or 1 000 Ω/24 V)

EXCITATION

Adjustable: 5...24 VDC/max. 1,2 W
Fixed: 10 VDC, max. load 80 Ω — LC

POWER SUPPLY

10...30 V AC/DC, ±10 %, max. 13,5 VA, PF ≥ 0,4, I_{STP} < 40 A/1 ms
80...250 V AC/DC, ±10 %, max. 13,5 VA, PF ≥ 0,4, I_{STP} < 40 A/1 ms
Power supply is protected by a fuse inside the instrument

MECHANIC PROPERTIES

Material: Noryl GFN2 SE1, incombustible UL 94 V-I
Dimensions: 96 x 48 x 120 mm
Panel cutout: 90,5 x 45 mm

OPERATING CONDITIONS

Connection: connector terminal board, section < 1,5/2,5 mm²
Working temperature: -20°...60°C
Storage temperature: -20°...80°C
Cover: IP64 (front panel only)
El. safety: EN 61010-1, A2
Dielectric strength: 4 kVAC after 1 min between supply and input
4 kVAC after 1 min between supply and data/analog output
4 kVAC after 1 min between supply and relay output
2,5 kVAC after 1 min between input and data/analog output
Insulation resistance: for pollution degree II, measuring cat. III.
Power supply > 670 V (ZI), 300 V (DI)
input, output, Exc. > 300 V (ZI), 150 V (DI)
EMC: EN 61326-1
Seismic capacity: IEC 980: 1993, par. 6
SW validation (UNI): Class B, C in compliance with IEC 62138, 61226

PI - Primary insulation, DI - Double insulation

MEASURING RANGES

OM 402 is a multifunction instrument available in following types and ranges

type UNI, standard (code „0")

DC:	±60/±150/±300/±1 200 mV
PM:	0...5/20 mA/4...20 mA; ±2/±5/±10/±40 V
OHM:	0...100 Ω/0...1/10/100 kΩ/Auto
RTD:	Pt 50/100/500/1 000
Cu:	Cu 50/100
Ni:	Ni 1 000/10 000
T/C:	J/K/T/E/B/S/R/N/L
DU:	Linear potentiometer (min. 500 Ω)

type UNI, Option A

DC:	±0,1/±0,25/±0,5/±2/±5 A; ±100/±250/±500 V

type UNI, Option B (expansion about three inputs)

PM:	3x 0...5/20 mA/4...20 mA; ±2/±5/±10/±40 V

type LC

LC:	1...4/2...8/4...16 mV/V

type PWR

input U:	0...10/120/250/450 V
input I:	0...60/150/300 mV; 0...1/2,5/5 A

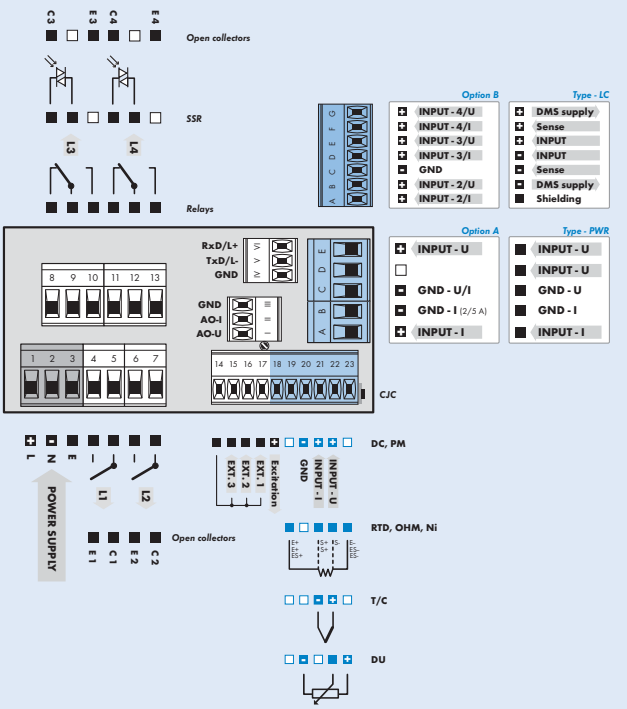
CONNECTING INDIVIDUAL INPUTS

	INPUT „I"	INPUT „U"
DC		±60/±150/±300/±1200 mV
PM	0...5/0...20 mA/4...20 mA	±2/±5/±10/40 V

ORDER CODE SPECIFICATION

	UNI	LC	PWR - U	PWR - I
W/O	standard	1...4/2...8/4...16 mV/V		
A	±0,1/±0,25/±0,5//±2/±5 A ±100/±250/±500 V			
B	Expansion about three inputs (PM)			
K				0...60/150/300 mV
P				0...1/2,5/5 A
S			0...10/120 V	
U			0...250/450 V	
Z	on request		on request	on request

CONNECTION



*GND (input + Option A) is galvanically connected with inputs EXT. and the OM Link connector
*In case of Option B we recommend to connect termianls GND (main board/additional board) by external connection

ORDER CODE

OM 402 — □□□ - □□□□□1□□ - □

Type

	U	N	I	•	•	•	•	•	•	•	•	
		L	C	•		•	•	•		•	•	
	P	W	R	•	•	•	•	•	•	•	•	

Order code shall not include blank spaces!

Power supply	10...30 V AC/DC	0									
	80...250 V AC/DC	1									
Option, see table „Order code specification*			?								
Comparators	no			0							
	1x relay (Form A)			1							
	2x relays (Form A)			2							
	3x relays (2x Form A + 1x Form C)			3							
	4x relays (2x Form A + 2x Form C)			4							
	2x open collectors			5							
	4x open collectors			6							
	2x open collectors + 2x relays (Form C)			7							
	2x relays (Form C)			8							
	2x SSR			9							
	2x relays, bistabil			A							
	1x relay (Form C)			B							
Analog output	no				0						
	yes (Compensation < 600 Ω/12 V)				1						
	yes (Compensation < 1000 Ω/24 V)				2						
Data output	no					0					
	RS 232					1					
	RS 485					2					
	MODBUS					3					
	PROFIBUS					4					
Excitation	yes						1				
Data record	no							0			
	RTC							1			
	FAST (only for UNI)							2			
Display color	red (14 mm)								1		
	green (14 mm)								2		
	red/green (20 mm)								3		
Other	customer version, do not fill in										00
	SW validation - IEC 62138, IEC 61226										VS

Default execution is shown in bold

* Launch for sale has not been set